Peak Service Study
Northwest Rail

We make lives better through connections.

Milestone 3 - Base Configuration Confirmation Report

August 2024

Regional Transportation District
1660 Blake Street, Denver CO 80202

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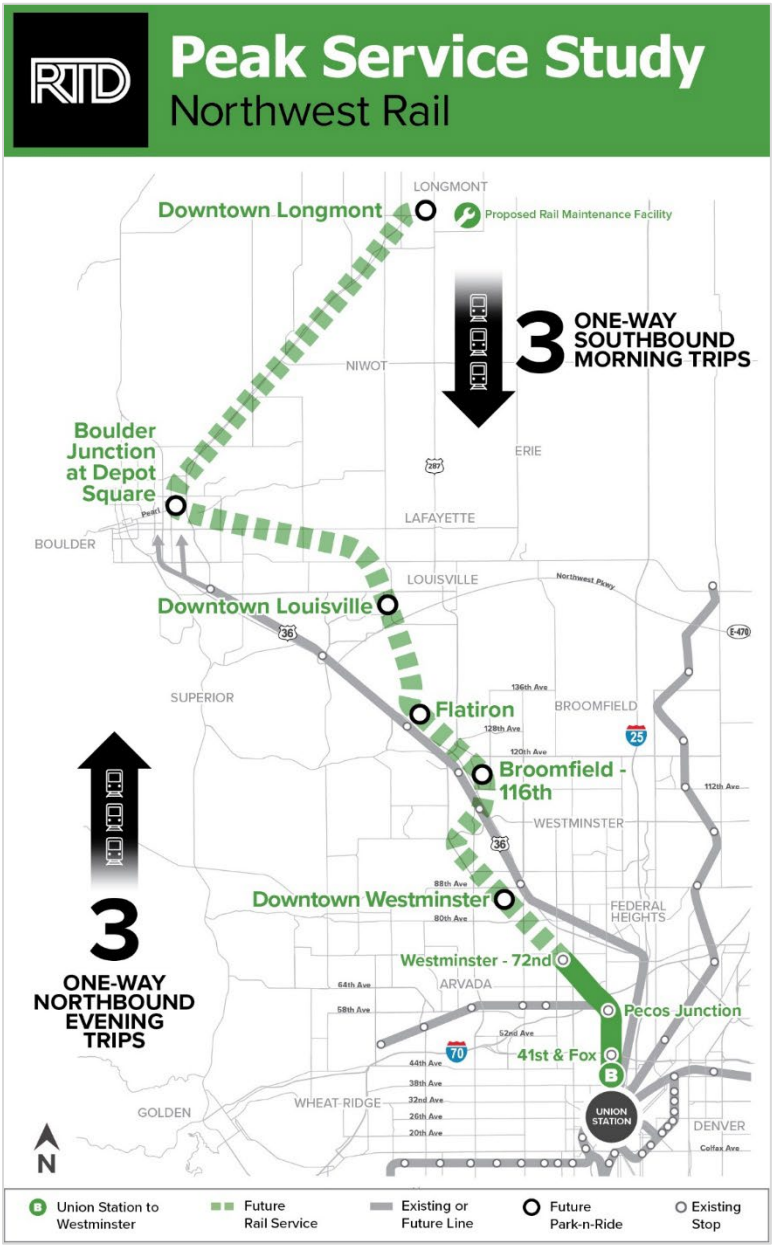
Acronyms and Abbreviations

ADA	Americans with Disabilities Act
BNSF	BNSF Railway
BRT	bus rapid transit
CDOT	Colorado Department of Transportation
CWA	Clean Water Act
DMU	diesel multiple unit
DRCOG	Denver Regional Council of Governments
DTO	Denver Transit Operators
DUS	Denver Union Station
EMU	electric multiple unit
FRPR	Front Range passenger rail (service)
FRPRD	Front Range Passenger Rail District (agency)
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
MU	multiple unit
NAMS	Northwest Area Mobility Study
NEPA	National Environmental Policy Act
NWR Corridor EE	Northwest Rail Corridor Final Environmental Evaluation
NWR	Northwest rail
OCS	overhead catenary system
P3	public-private partnership
RMF	NWR rail maintenance facility
RTD	Regional Transportation District
SAT	Study Advisory Team
Study	Northwest Rail Peak Service Study
TOD	transit-oriented development

Introduction

Regional Transportation District (RTD) is conducting the Northwest Rail Peak Service Study (Study) for a 39-mile extension of the B Line commuter rail service from the existing Westminster – 72nd Station to Boulder and Longmont. The extension would include six new stations with infrastructure to support the commuter rail service: Downtown Westminster, Broomfield – 116th, Flatiron, Downtown Louisville, Boulder Junction at Depot Square, and Downtown Longmont (Figure 1). The Study will evaluate how to implement the Peak Service Concept on the existing BNSF Railway (BNSF) tracks: three weekday morning trips from Longmont to Denver and three weekday evening trips from Denver to Longmont.

Figure 1. NWR Corridor



Milestone 3 - Base Configuration Confirmation Report

The Milestone 3 Base Configuration Confirmation Report identifies the minimum requirements (Base Configuration) for infrastructure, operations, and maintenance to implement the Peak Service Concept on the Northwest Rail (NWR) Corridor. The Base Configuration and the costs to build, operate, and maintain the Peak Service Concept are critical components of the Common Set of Facts that will serve as the decision-making basis for future implementation of the study. Preliminary design completed by BNSF is also incorporated into the Base Configuration. Costs to implement the Base Configuration are provided in the Milestone 5 Report.

Purpose of Study

The purpose of the Study is to identify the necessary infrastructure requirements, operational considerations, and costs to enable peak period commuter rail service between Denver, Boulder, and Longmont within the BNSF freight corridor. The peak period service must be planned to consider the potential full build-out of infrastructure that would allow for all-day commuter rail service as presented in the FasTracks Plan, envisioned in the 2010 Environmental Evaluation and the 2014 Northwest Area Mobility Study (NAMS). While not part of this Study, consideration for potential intercity rail was also considered.

The Study is being conducted to provide the technical information, informed through public and stakeholder input, for the RTD Board of Directors to determine the feasibility of implementing peak rail service in the corridor. The Study closely follows the traditional steps for transit infrastructure project development but is designed to produce a Common Set of Facts that serves as a decision-making tool for the next steps of the project. The methods and processes followed in the Study are consistent with the requirements of federal and state requirements, including the National Environmental Policy Act (NEPA), Federal Transit Administration (FTA) and Federal Railroad Administration (FRA) policies and procedures, and RTD FasTracks alternatives analysis and environmental evaluation guidelines embodied in the FasTracks Environmental Resource Guidance and the Environmental Methodology Manual.

Although RTD has previously evaluated rail service for the Northwest corridor in prior studies, the current Study is unique in that it is being planned concurrently with a separate study for intercity passenger rail along the Front Range of Colorado. CDOT is preparing a Service Development Plan as required by the FRA to outline the requirements for a passenger service between Fort Collins through Denver and Colorado Springs to Pueblo, including the proposed alignment on the BNSF railway tracks between Longmont and Denver Union Station (DUS) alongside the Peak Service Concept. The Study Team worked closely with CDOT and the Front Range Passenger Rail District (FRPRD) to ensure that the two projects are complementary.

Peak Service Concept Definition

Peak Service Concept

The Peak Service Concept for the NWR Corridor consists of three southbound peak period trains in the morning and three northbound peak period trains in the afternoon each weekday. The morning trains will run from the NWR Rail Maintenance Facility (RMF) near Downtown Longmont to DUS, replacing the B Line service

for those runs into and out of DUS operated by Denver Transit Operators (DTO). Due to train storage issues at DUS, trains operating peak service would return in revenue service to an expanded train storage location near the existing Westminster – 72nd Station where they would be stored during the day until they returned to service for the afternoon peak. Similarly, the afternoon trains would replace the B Line service run from Westminster – 72nd Station to Union Station and then return to the RMF in revenue service to Longmont. Once the trains return to the RMF site, the trains will be serviced, cleaned, and staged for use for the next weekday.

Alignment

The NWR corridor spans from DUS to Downtown Longmont within the existing BNSF right of way, an alignment that has remained consistent and supported since the release of the NWR Corridor EE in 2010. The alignment would utilize the existing BNSF freight rail track along this corridor but require the construction of three new freight rail sidings, or double tracking, to support freight and commuter rail operations on the same track. The corridor would continue from Downtown Longmont on BNSF and Great Western (Omnitrax) tracks to the NWR RMF in non-revenue service.

Stations

RTD identified six new stations between Westminster – 72nd and Downtown Longmont to support an initial peak service proposal that arose from the 2014 NAMS study. RTD developed a 2030 ridership forecast in 2017 for a service very similar in concept to the Peak Service Concept evaluated in this Study, and this Study refined the ridership forecast to 2045 using 2019 data. This section provides a high-level summary of the proposed stations and development conditions near the stations. Figure 1 (Introduction) shows the locations of the stations. Appendix A provides additional information about the platform area, bus facilities, bicycle and pedestrian access, surrounding development, and the potential for TOD.

Common Station Elements

The Peak Service Concept is unique, in comparison to other RTD commuter rail lines in that it would operate on the tracks of an operating freight railroad. While many of the station components would be similar, such as shelters and station furniture, ticket vending machines, and station access infrastructure and connections, one major point of difference involves level platform boarding from freight rail tracks. RTD also evaluated other components, such as the sizes and types of Park-N-Ride lots that would be significantly smaller for the Peak Service Concept than those at other commuter rail stations.

Stations Served

The Peak Service Concept includes service to ten stations, including four existing stations on the B Line (Westminster – 72nd, Pecos Junction, 41st & Fox, and the B Line Track 8 at DUS) and six new stations on the Northwest Rail extension (Downtown Longmont, Boulder Junction at Depot Square, Downtown Louisville, Flatiron, Broomfield – 116th, and Downtown Westminster). The four existing stations on the B Line have high platforms with level boarding, requiring that the six new rail stations also be constructed with high platforms since ADA accessibility cannot feasibly be maintained on a corridor with mixed platform heights. New stations would be located on station siding tracks to meet BNSF freight clearance requirements.

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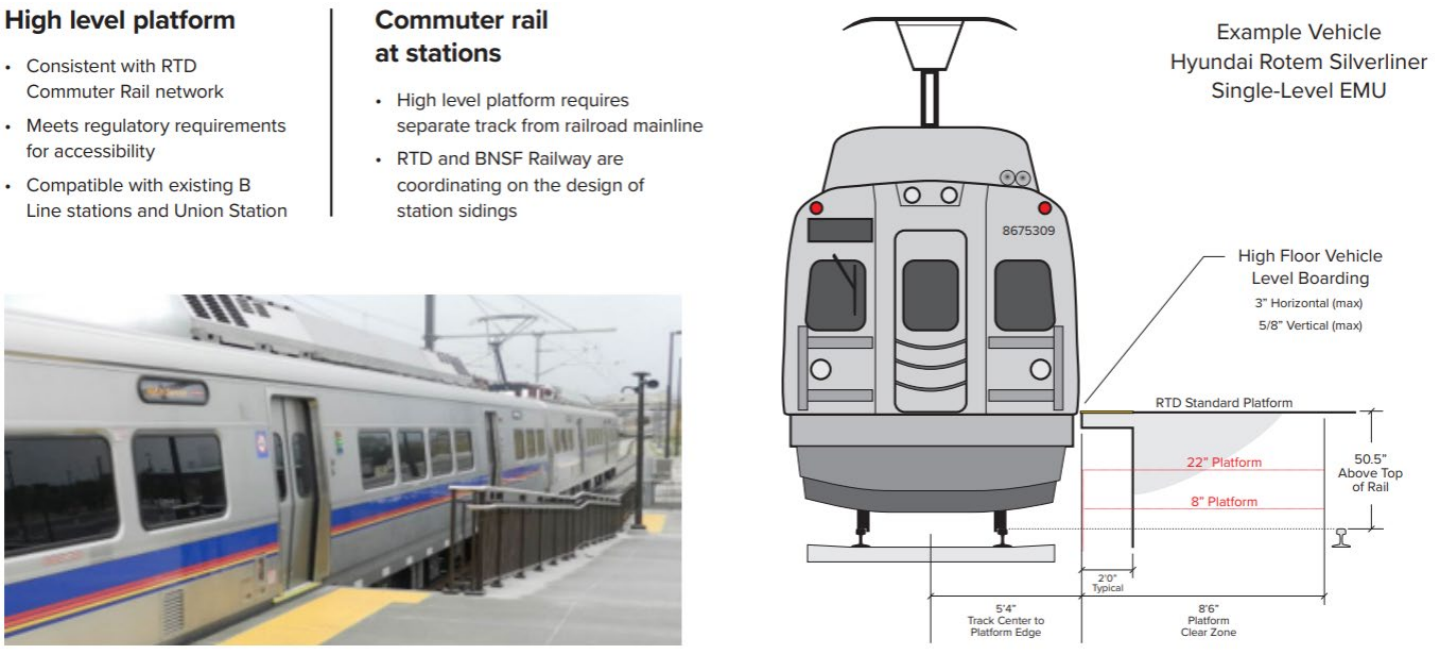
Level Platform Boarding

The Base Configuration concept includes level platform boarding with high-floor railcars and high-platform boarding at all stations, similar to the arrangement in Figure 2. Level boarding refers to a level interface between the boarding platform and the train interior with no steps. Level boarding maximizes equity of access for customers of all abilities and ensures a maximum level of compliance with the Americans with Disabilities Act (ADA) requirements for commuter rail stations and vehicles (Federal Transit Administration Standard Operating Practice 35, or FTA SOP-35). This interface type means wheelchairs, walkers, strollers, luggage, and bicycles can all roll directly onto the vehicle without lifting or ramps. Level boarding has been shown to decrease boarding, de-boarding, and dwell times at each station. Level boarding is the RTD standard for commuter rail stations across the system. In identifying high-floor railcars and high platforms as the recommended option for the Northwest Rail line, RTD evaluated multiple options, including high platforms, low platforms, and mixed platform heights.

Figure 2. High-floor vehicle and high-platform boarding with ADA-compliant level boarding at all side doors



BNSF's freight main line track clearance requirements mean high platforms cannot be built on the main line BNSF track. Inline station sidings would be constructed for the platforms at the six new stations to comply with this requirement. Constructing inline station sidings at the stations to facilitate high-platform level boarding does add cost to the Base Configuration of NWR Peak Service. However, it was determined to be the best option from a long-term perspective. It aligns with RTD's Community Value priority with initial investments toward long-term double-tracking of the corridor, supports a greater range of commuter rail vehicles that can operate on the corridor, simplifies operations, and provides the best accessibility to trains for persons with disabilities, a key Customer Excellence priority.

Connecting to the Existing B Line

The existing Westminster Station, referred to in this Study as Westminster – 72nd Station is the end-of-line station for the B Line, and a train storage area for EMUs operating on the B Line is located just north of the station. To provide continuous service, a track connection would be constructed to link the existing RTD electrified segment to the BNSF freight track. One of the two existing EMU storage tracks would be utilized for this connection, and the train storage area would be expanded to provide storage for both EMUs operating B Line service and NWR trains during the midday period.

New Stations

Six new stations would be built as part of the Peak Service Concept.

Downtown Westminster Station

This station area is located in Westminster, north of the BNSF trackway, south of 88th Avenue, and bordered by Arvada to the south. The station would connect to the new downtown Westminster development, where an increase in residents and employees is expected as redevelopment of the site progresses. Much of the parking area in the NWR Corridor EE is now developed. The Base Configuration concept for this station is to acquire land located south of 88th Avenue at the station site. A connection to the Discovery Trail south of the proposed station in Arvada's Far Horizons neighborhood is proposed along the BNSF right-of-way to make an at-grade pedestrian crossing at 88th Avenue, while security fencing would be installed along the trail extension to unsafe and illegal pedestrian crossings over railroad tracks. The new station would serve the downtown Westminster area, which is expected to have over two million square feet of office space; 750,000 square feet of retail, entertainment, and dining; 2,300 residential apartments, condominiums, and townhomes; and 300 hotel rooms. Buses would stop along 88th Avenue, a short distance from the proposed platform location. Figures 3 and 4 show the station area and concept plans, respectively.

Figure 3. Downtown Westminster Station Area Plan

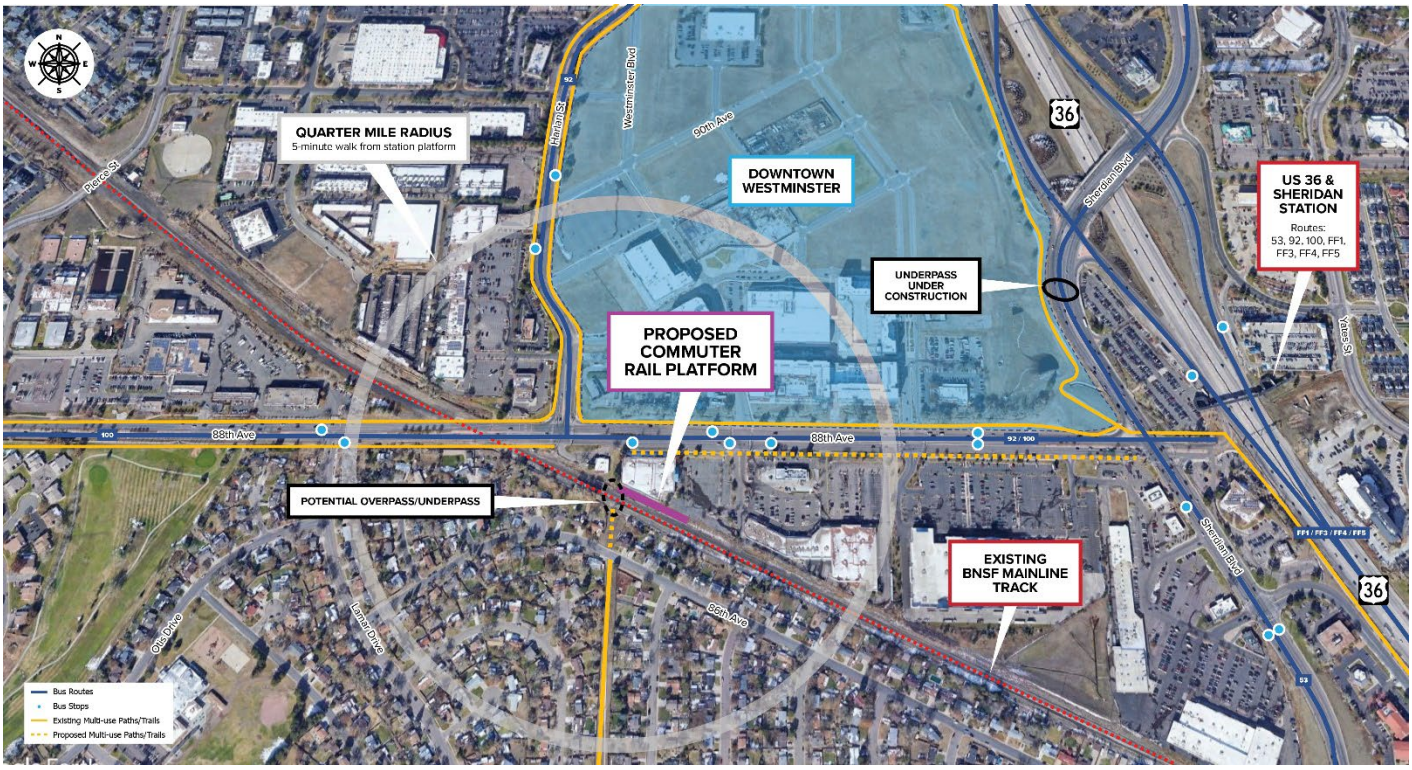
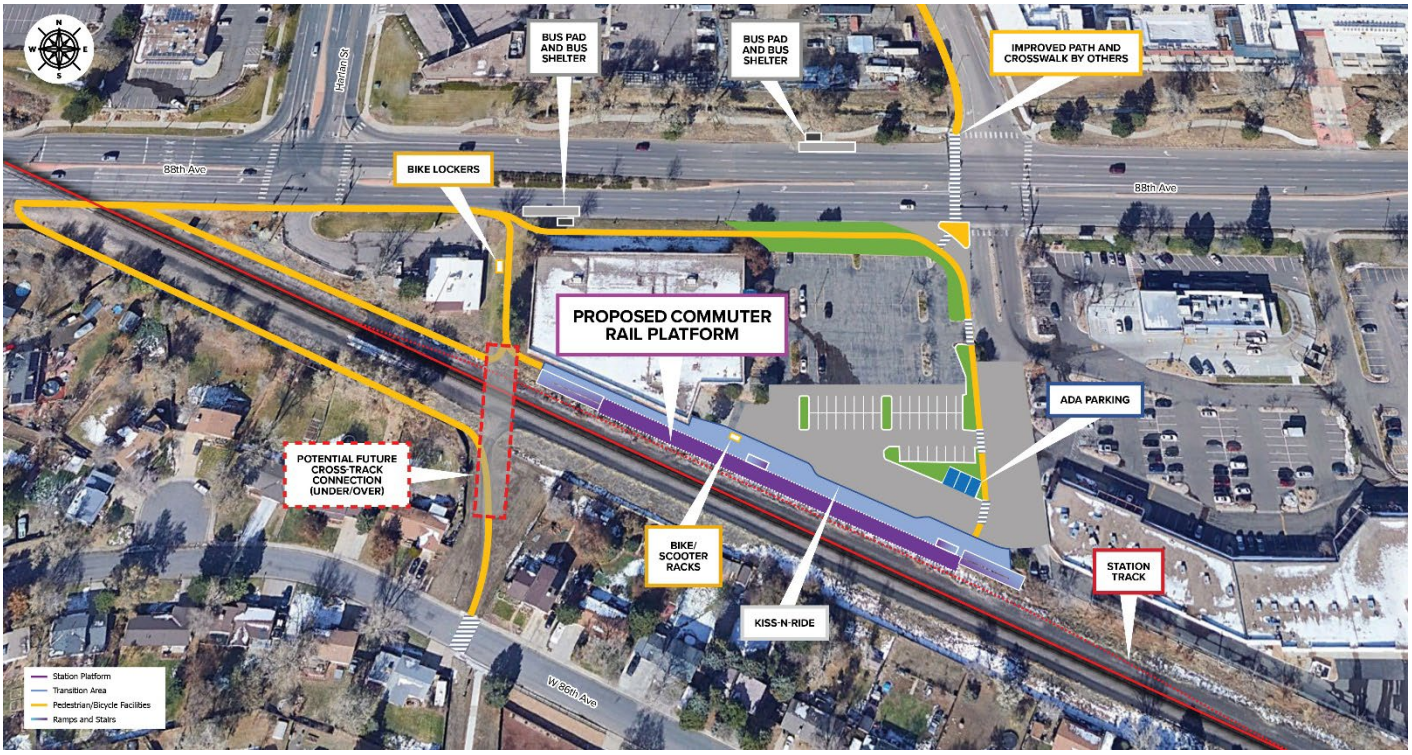


Figure 4. Downtown Westminster Station Concept Plan



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Broomfield – 116th Station

This station area is located in Broomfield on both sides of the BNSF trackway, approximately 600 feet north and south of 116th Avenue. The Broomfield – 116th Station is located approximately 0.25 miles east of the US 36 & Broomfield Station. The area has seen considerable recent development, with more forecasted in the coming years. The area between US 36 and the BNSF track will likely see the most residential development as east of the rail line comprises baseball fields and light industrial/warehousing. An important consideration is connecting west to the existing US 36 & Flatiron BRT station and the adjacent Arista/1STBANK Center development. An east-west connection under the railroad would also expand bicycle and pedestrian opportunities. Some parking would likely be located on both sides of the rail line, with the potential for a platted cul-de-sac adjacent to the new apartment complex west of the rail line, potentially allowing for a bus turnaround. Figures 5 and 6 show the station area and concept plans, respectively.

Figure 5. Broomfield – 116th Station Area Plan

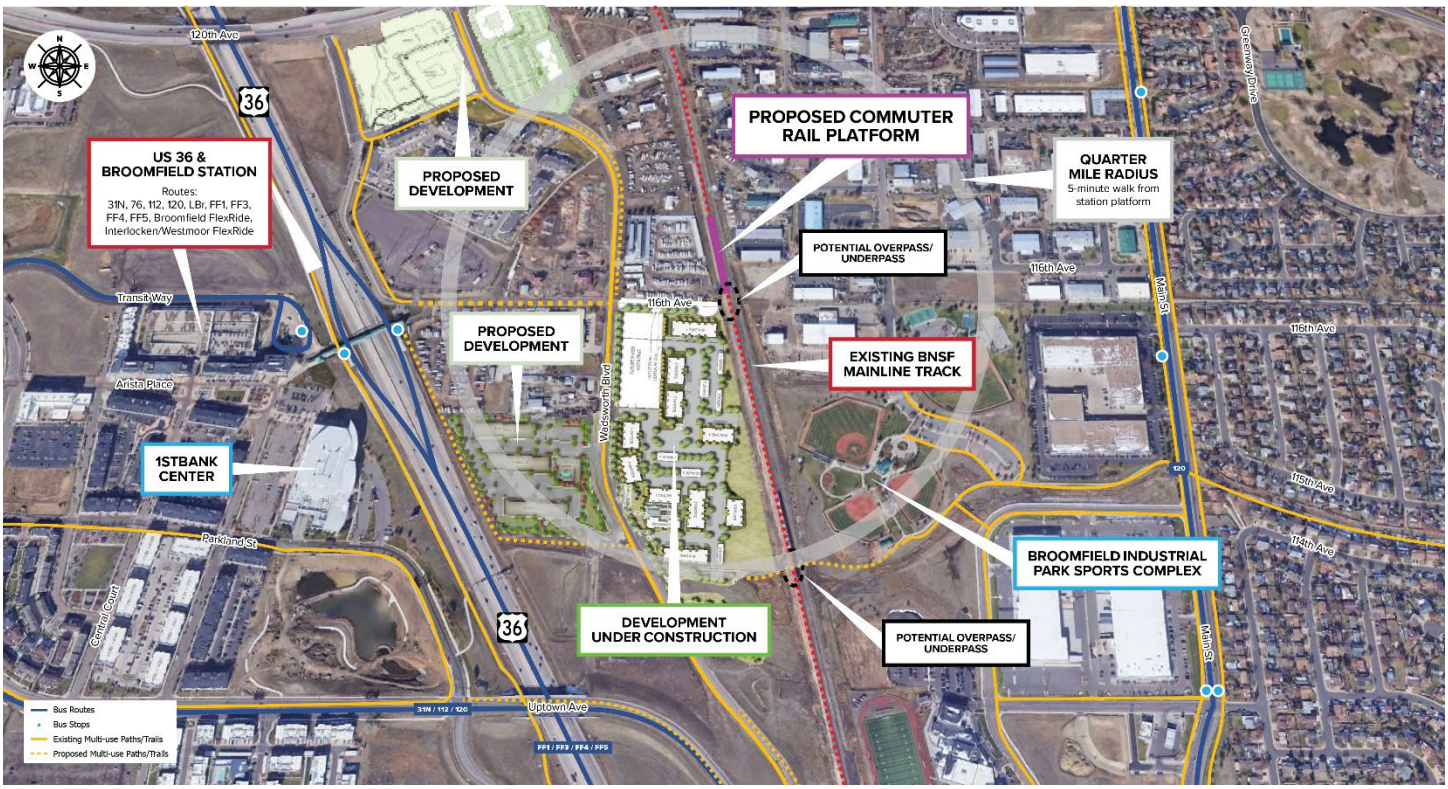
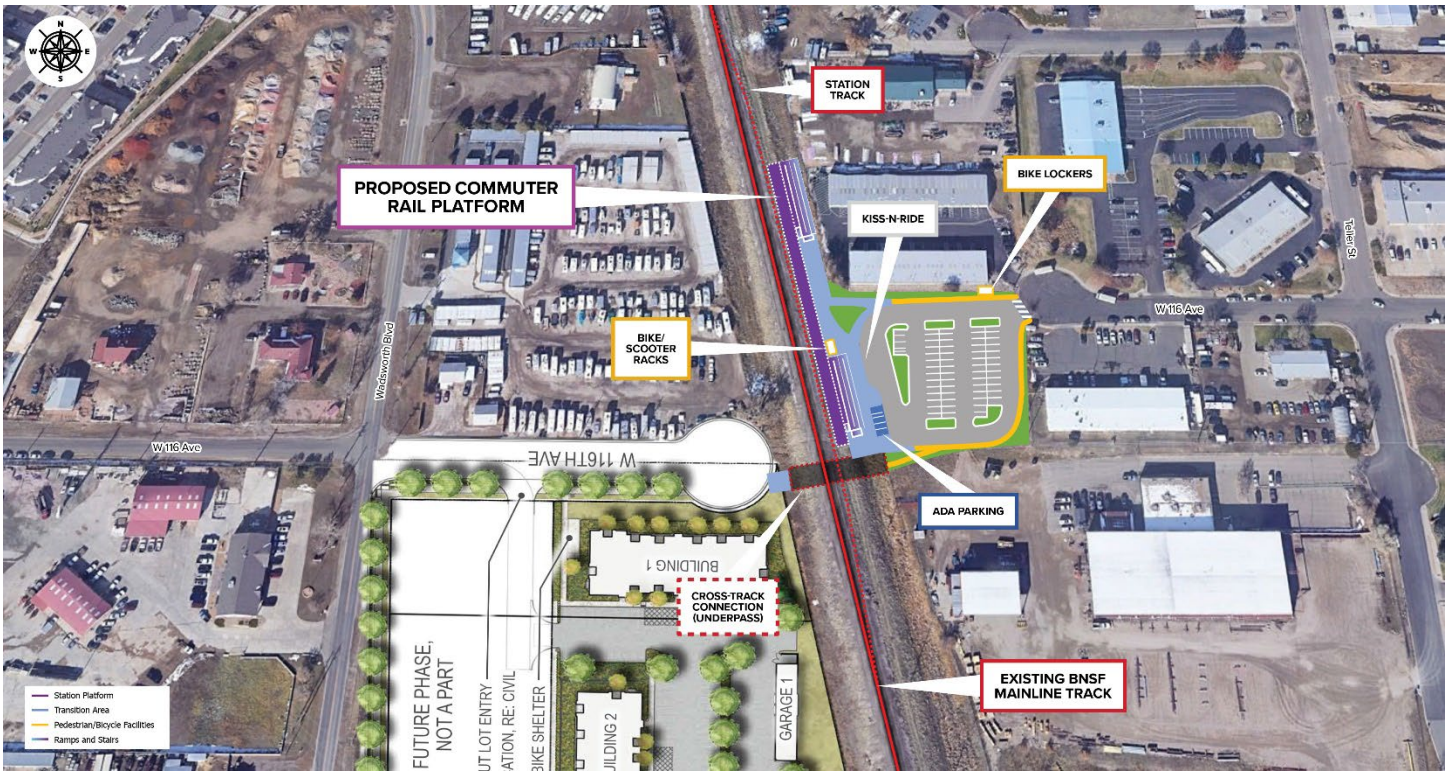


Figure 6. Broomfield – 116th Station Concept Plan



Flatiron Station

This station area is located in the City and County of Broomfield, west of West Midway Boulevard, approximately between West Flatiron Crossing Drive and Via Varra. This station is partially constructed with the US 36 & Flatiron Station and Park-n-Ride already serving Flatiron Flyer BRT routes. There is Boulder County open space north of US 36 in this area, with development potential within the limits of the City and County of Broomfield. To the south of US 36, redevelopment of the Flatiron Crossing commercial district is underway, with several new multi-family projects in process or planned.

As services are restored consistent with the RTD System Optimization Plan (SOP), this station would likely require additional parking, as this station is served by Route AB with service to Denver International Airport, as well as frequent service on the Flatiron Flyer. RTD owns parcels east and west of the existing Park-n-Ride on the north side of US 36. Buses currently only serve the south side of the station, but FlexRide could potentially serve the rail station in the future. Figures 7 and 8 show the station area and concept plans, respectively.

Figure 7. Flatiron Station Area Plan

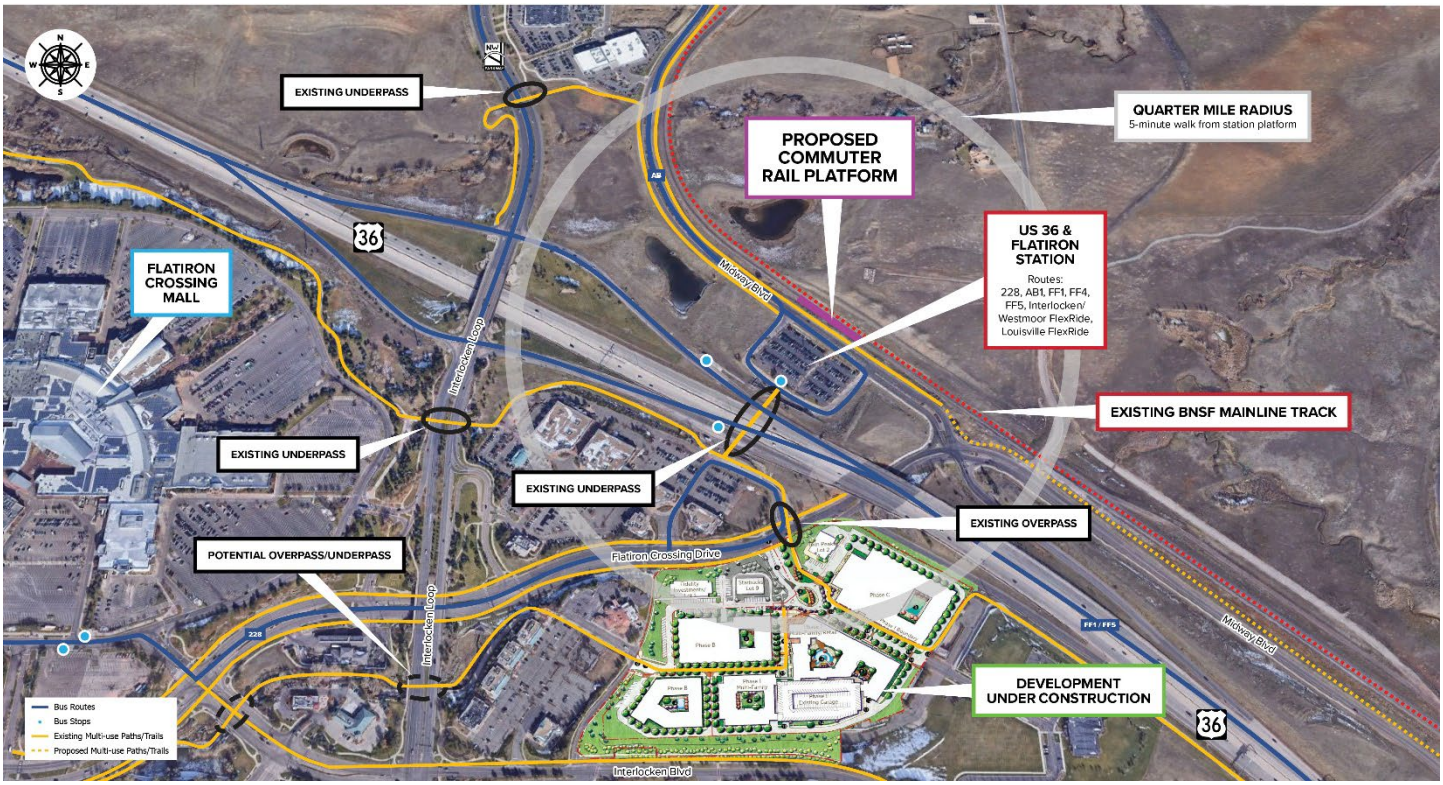
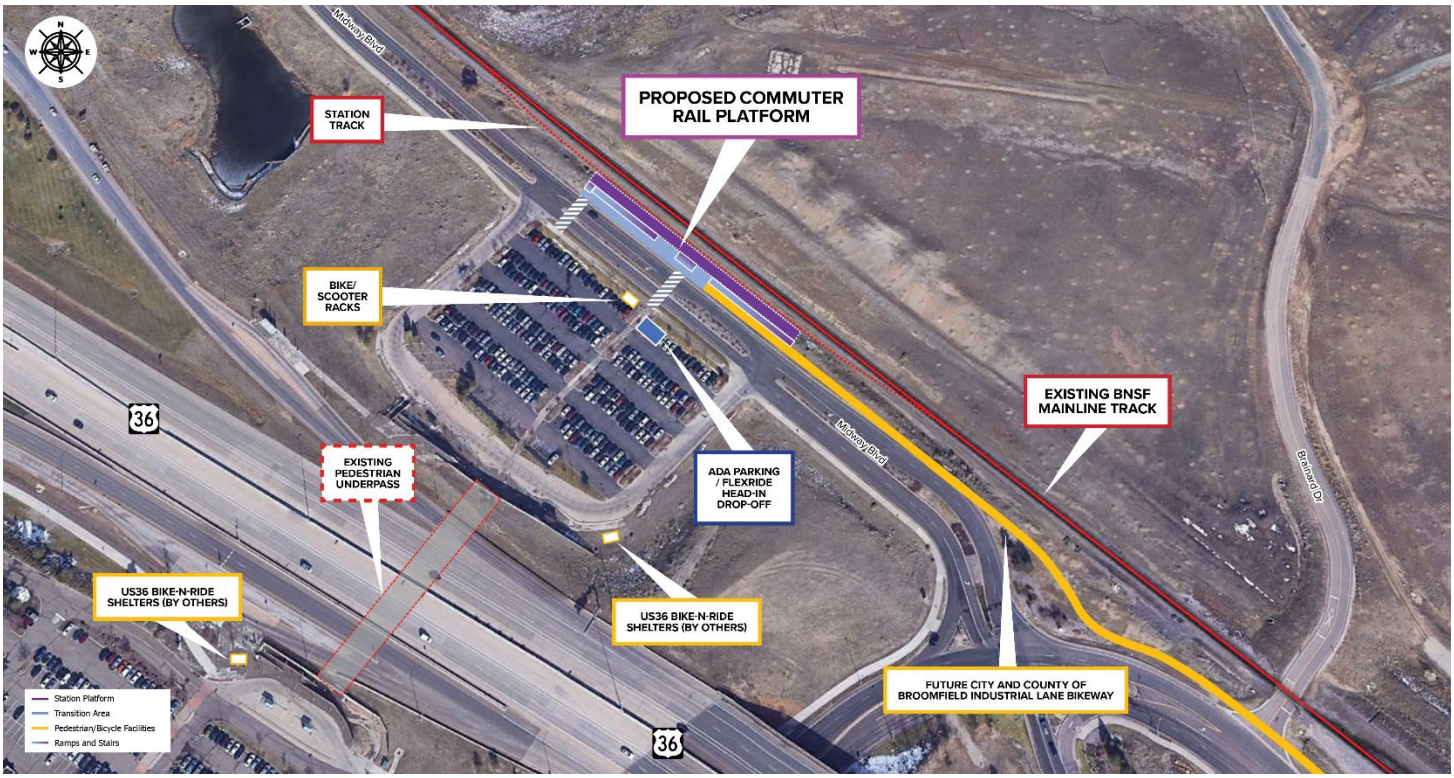


Figure 8. Flatiron Station Concept Plan



Downtown Louisville Station

This station area is located in Louisville east of the BNSF trackway north of the South Street pedestrian tunnel. Since the NWR Corridor EE, several developments have been completed surrounding the Downtown Louisville Station area, including the first two phases of the Downtown East Louisville (DELO) development. The new developments have constrained the space available for the proposed station site, requiring further evaluation of potential station locations after the completion of this study. Concept designs considered where the platform would be located as originally planned and forms the basis of cost estimates. Shared parking is being considered on east side of the BNSF trackway at a city-owned parking lot, and bus stops may be accommodated if the parking area is modified. Additional shared parking opportunities are under consideration as the City of Louisville continues planning for redevelopment in the station area. Figures 9 and 10 show the station area and concept plans, respectively.

Figure 9. Downtown Louisville Station Area Plan

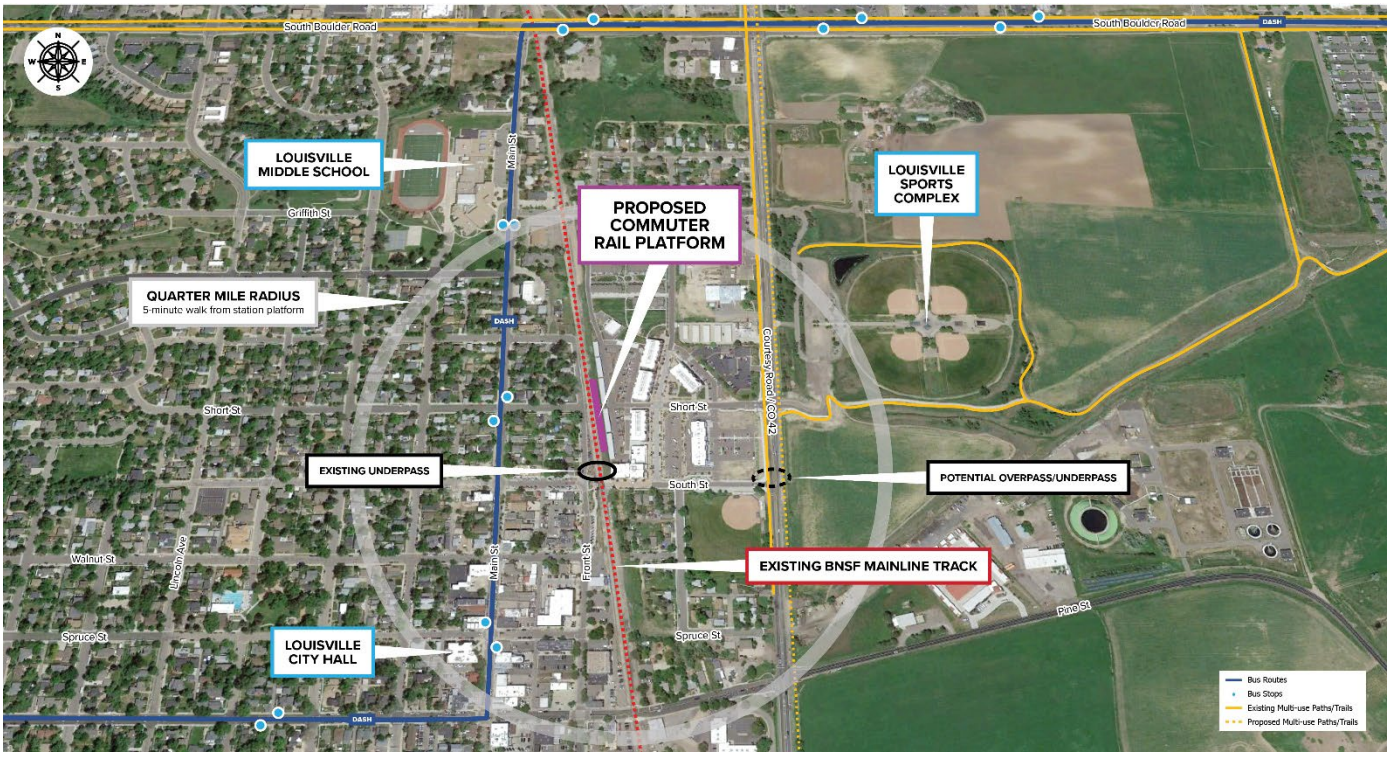
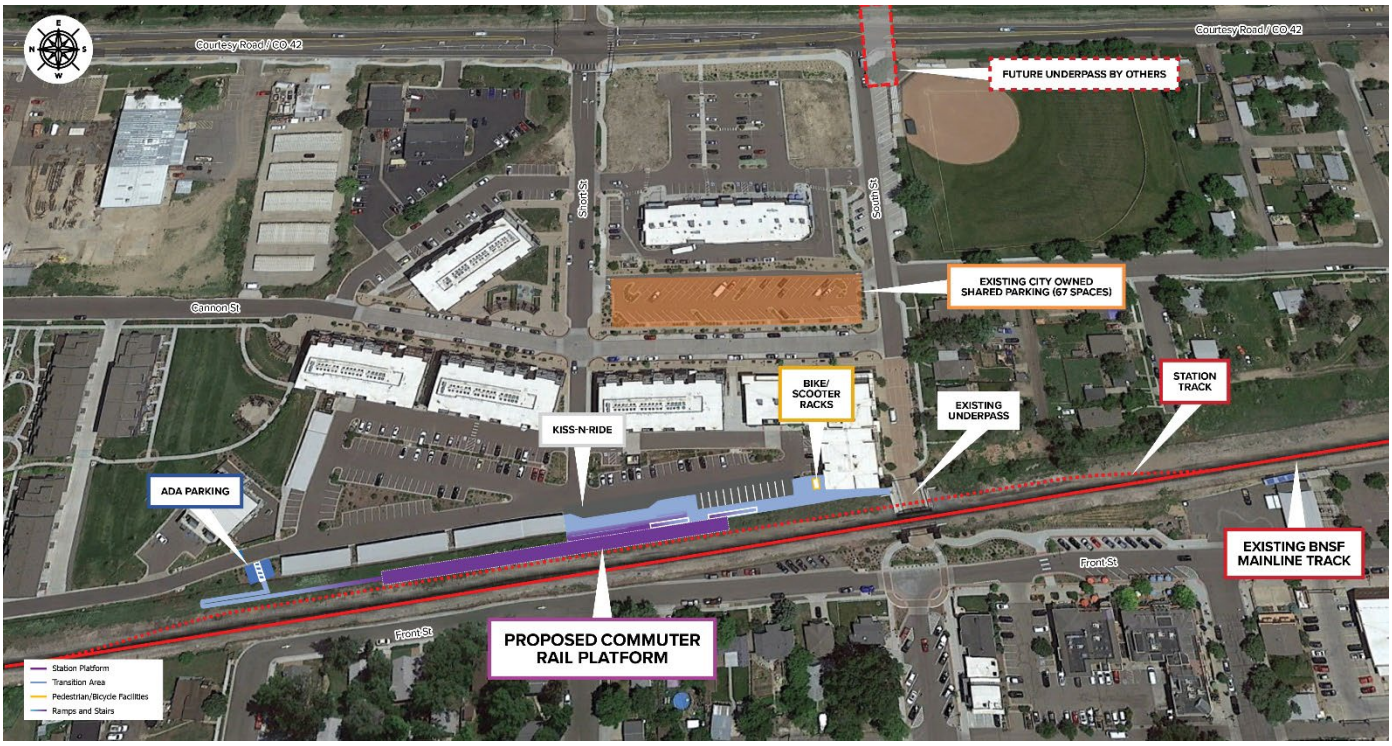


Figure 10. Downtown Louisville Station Concept Plan



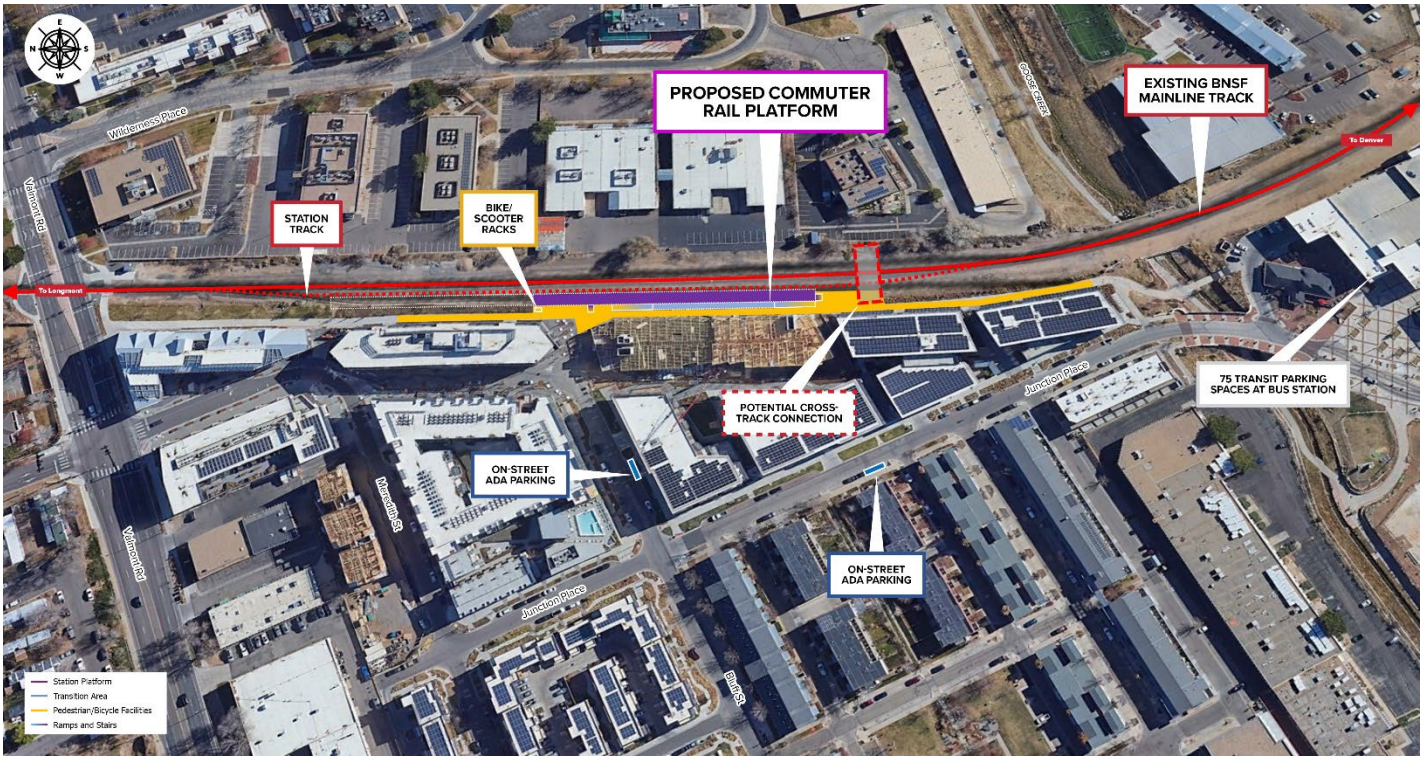
Boulder Junction at Depot Square Station

This station area is located in the City of Boulder, on the east side of the BNSF trackway, between Goose Creek Path and Valmont Road. The area west of the tracks and proposed platform has been redeveloped as a Transit Oriented Development (TOD) with residential, retail, and office development. Boulder is beginning to develop the second phase of its plan for the area east of the tracks (Transit Village Area Plan, Phase 1 completed in 2007).

The multi-level Boulder Junction at Depot Square has six bus bays and structured parking at the southern edge of the development along Pearl Parkway, providing 75 parking spaces for transit use. A small parking and passenger drop-off area has been recommended to be closer to the rail platform for the area around Bluff Street, for accessible parking, as the existing parking is about a quarter mile away from the rail platform. Further development would integrate the transition plaza to accommodate bicycle and pedestrian connections and provide bike storage and ticket vending machines while maintaining the viability of the existing multi-use path in this urban center. Figures 11 and 12 show the station area and concept plans, respectively.

Figure 11. Boulder Junction at Depot Square Station Area Plan

Figure 12. Boulder Junction at Depot Square Station Concept Plan



Downtown Longmont Station

This station area is located in Longmont, south of First Street, between South Pratt Parkway and Coffman Street. There has been some new development around this station site, including the northeast corner of the US 287 and Main Street and First Avenue intersection. Additionally, the area on the northwest quadrant is also planned for redevelopment. This area has been planned as a TOD and would likely continue adding multi-family residential in the coming years. Longmont has worked with RTD for the past decade, and the multi-level bus station and parking structure for transit customers would be located between the extended Coffman Street and US 287 and Main Street. With funding from RTD, the station and TOD area are expected to become the transit hub in the downtown area where local bus routes, BRT, commuter rail, and potentially FRPR could connect one day. The remaining area is to be redeveloped with multi-level, multi-family residential units, with the rail platform located on First Avenue, which is planned for closure. Figures 13 and 14 show the station area and concept plans, respectively.

Figure 13. Downtown Longmont Station Area Plan

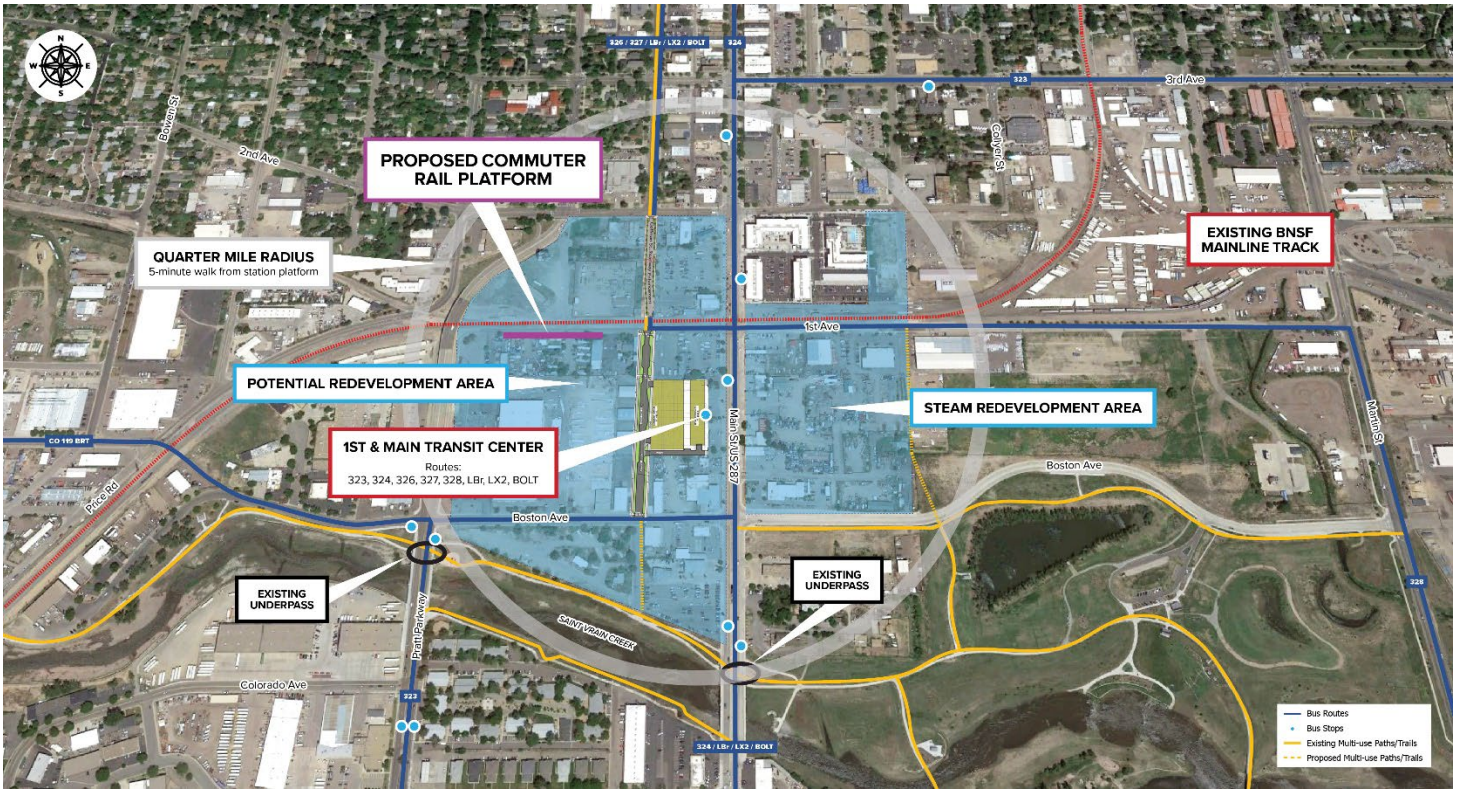
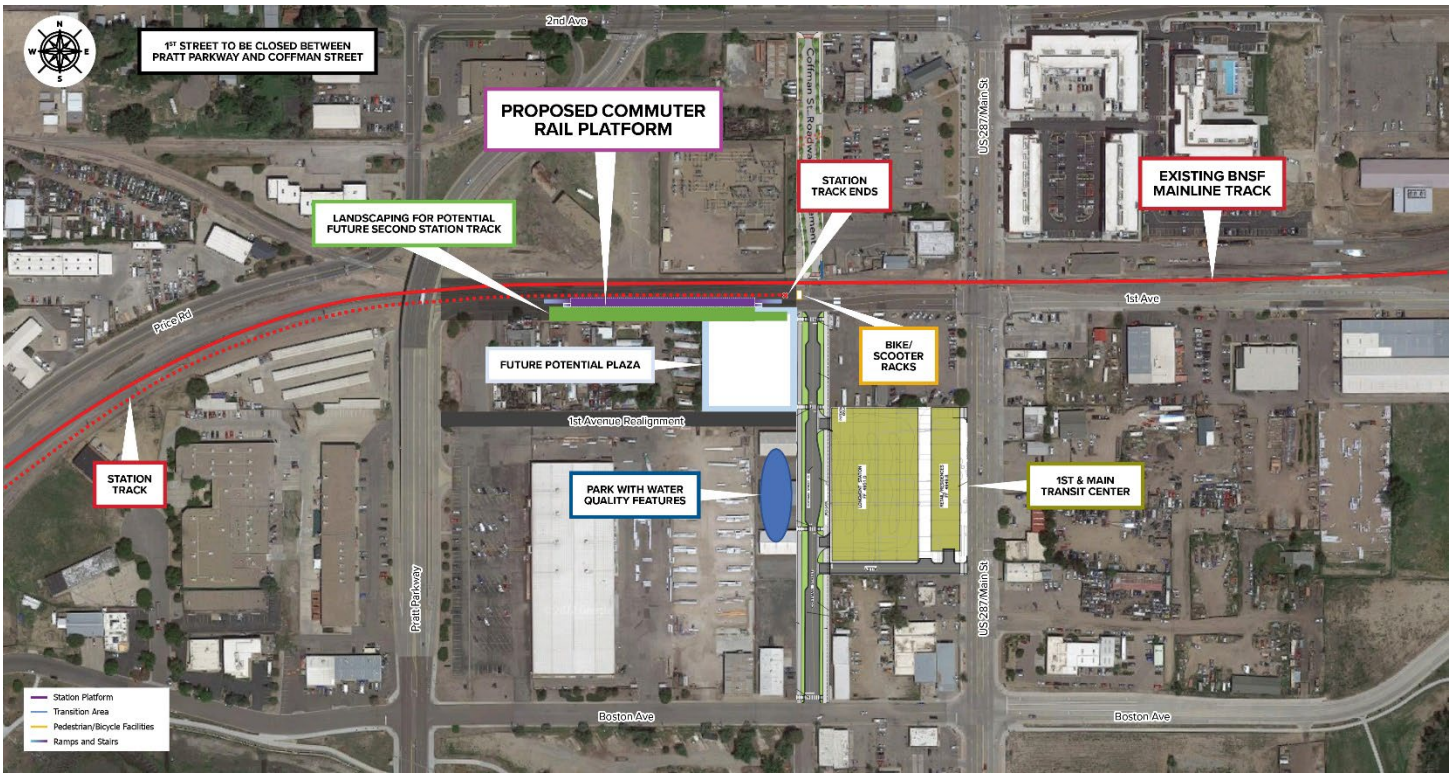


Figure 14. Downtown Longmont Station Concept Plan

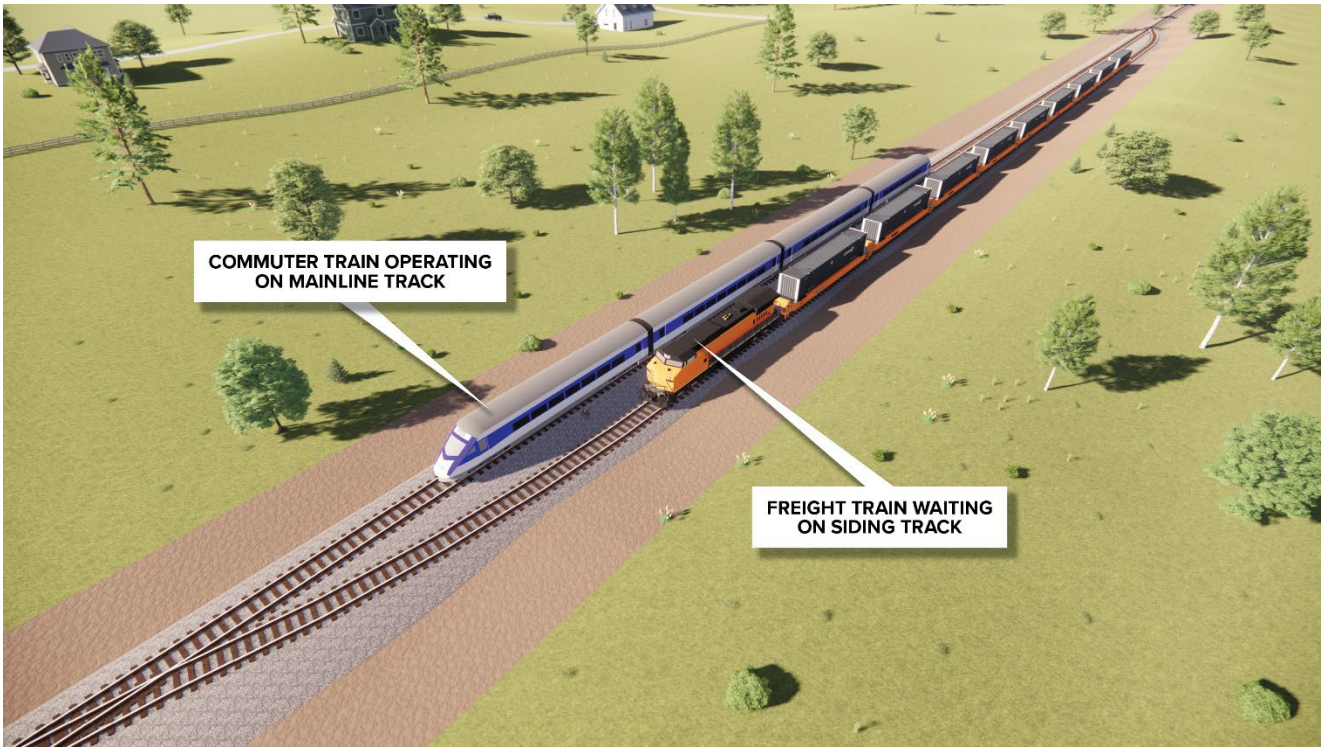


Freight Passing Sidings

Freight passing sidings are typically low-speed track sections connected to the main line typically used for storage, loading/unloading, or facilitating passing trains in the same or opposite directions. The NWR alignment currently consists of a single main line track requiring sidings to allow passenger trains to pass freight trains that may be operating near scheduled passenger service runs. A representation of a freight siding is presented in Figure 16. In this illustration, the freight train (right) is idled in the siding while the commuter train (left) uses the main line.

During the commuter rail operating periods, referred to as time blocks, freight trains within the corridor would be directed to and held in one of the freight sidings until commuter services were completed. The freight train would occupy the siding while passenger trains operate on the route. Early in the Study process, BNSF identified four freight passing sidings required to maintain freight rail service in the corridor. The four sidings were consolidated into three sidings with capacity to hold four freight trains to minimize roadway crossing impacts as BNSF developed its concept designs. Three freight passing sidings are required along the corridor and will range from approximately 6,000 to 25,000 feet in length.

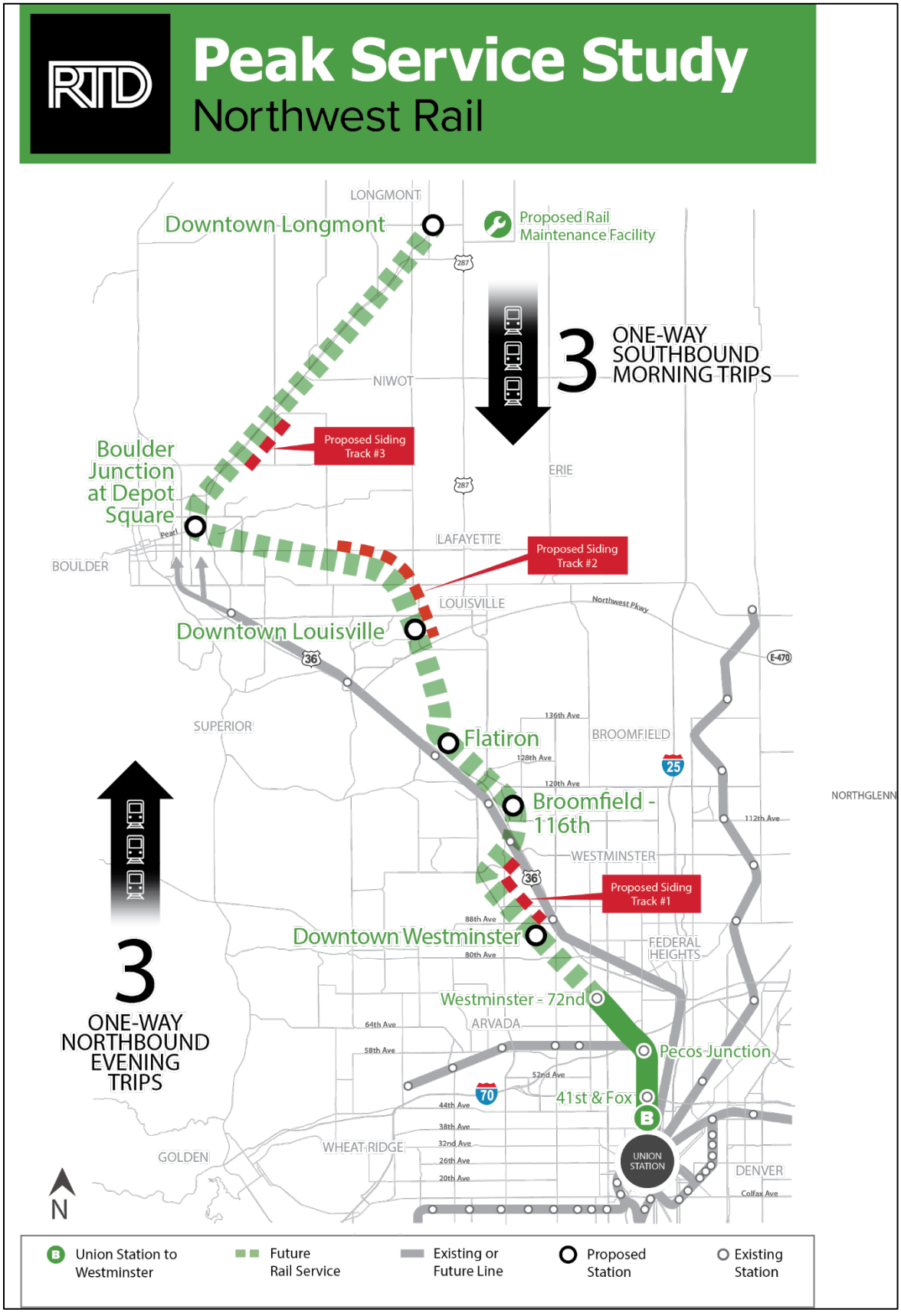
Figure 15. Freight Siding Concept



The general location of the three freight passing sidings proposed by BNSF is shown in Figure 16. Evaluation and analysis of these proposed siding locations identified potential impacts on the community and surrounding infrastructure. Surrounding communities also shared concerns regarding potential noise and air quality impacts to residential neighborhoods adjacent to the sidings and blockages of critical roadways and neighborhood access points. To reduce local impacts, freight passing sidings would be located and designed to:

- Maintain a relatively flat profile grade to manage freight train acceleration and braking (reduces noise and emissions impacts on adjacent properties)
- Minimize or eliminate storage tracks at roadway crossings
- Minimize impacts from noise, vibration, and emissions to adjacent sensitive uses such as residential, schools, healthcare, or other sensitive uses

Figure 16. Proposed Sidings



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Vehicle Selection

Rolling stock selection is driven by ridership, infrastructure requirements (platform height), propulsion type, Buy America compliance, FRA requirements, and procurement considerations. The Study Team evaluated various constraints (regulatory, operational, RTD requirements), physical configurations (boarding height, floor height, and platform height), propulsion type (fuel, power), and commuter rail vehicle offerings available in the North American market. Two primary rolling stock types were considered: locomotive-hauled passenger train and self-propelled multiple unit (MU) trains.

Vehicle Types and Propulsion

Locomotives carry no passengers but are paired with non-powered passenger coaches to form a train. The end passenger coach has an operator-control cab that allows remote locomotive control during reverse or cab-leading "push" operations. Intermediate coaches only carry passengers. A fleet of five locomotive-hauled passenger trains would each consist of a locomotive, a passenger coach, and a cab car and serves as the basis for the cost estimate in the Study.

MU rolling stock types refer to trains with one operator who controls multiple power units distributed throughout a train. In practice, an MU trainset is composed of multiple powered passenger vehicles that form a single train operated by an operator in the lead cab. Single-mode MU vehicles use only one onboard propulsion technology completely contained in the vehicle, such as a diesel-electric power unit or a hydrogen-electric power unit. The most common types of single-mode MU fleets are electric multiple units (EMUs) and diesel multiple units (DMUs). RTD operates EMUs on its A, G, N, and B lines. Dual-mode MU vehicles have onboard propulsion technology and an electric current collection system compatible with the wayside infrastructure.

Few options for DMU or dual-mode MUs are available in the North American market, and none are currently in production. The only compliant fleet currently available in the North American market that meet the requirements of the NWR corridor are diesel-electric locomotives with passenger and cab cars. This configuration is readily available and meets the capacity and configuration requirements of the corridor, but the rail vehicle market continues to evolve. Different fleet options may become available when the project is implemented.

Constraints and Considerations

The NWR Corridor's unique constraints require commuter rail trains to:

- Have off-wire propulsion capability between Westminster – 72nd and Downtown Longmont; shared tracks are not planned to be electrified due to clearance envelope height requirements
- Not to exceed the maximum axle design loadings of the B Line undergrade bridges
- Have at least 12 axles, as required by BNSF, for signal shunting (track sensor control) reliability
- Provide level boarding compliant with the ADA at all stations in the corridor, including the existing high platform stations
- Include 5 trainsets: three in revenue service, one maintenance spare, and one operational spare

Rail Maintenance Facility

Under the operating plan to run three trains from Downtown Longmont to DUS during the weekday morning peak period and three trains from DUS to Downtown Longmont during the weekday evening peak period, past and current studies identified the need for a rail maintenance facility (RMF) in Longmont to repair, maintain, clean, fuel, and store the new rail car fleet overnight. Unlike other RTD commuter rail lines, the NWR commuter rail service would operate on freight rail tracks, which eliminates OCS-powered vehicles from consideration due to clearance issues with existing structures. Due to differing vehicle types from the existing RTD commuter rail fleet, NWR would need its own specialized RMF. RTD conducted a programming exercise defining the RMF maintenance, storage, and administration requirements (Appendix B). The RMF in Longmont would include a maintenance shop, employee facilities, administrative offices, and parking, among other amenities. The following text summarizes steps taken for the site selection process for the RMF by RTD as part of the Study:

- Nine potentially viable RMF sites were identified. An alternatives analysis was conducted to determine which would best serve the NWR Corridor.
- Level 1 Screening: A fatal flaw analysis identified concerns from a preliminary investigation. It narrowed the number of potential site candidates from nine to three due to a lack of ability to accommodate the rail line, environmental concerns, or inconsistency with local planning.
- Level 2 Screening: The remaining three sites (Sites 2, 8, and 9) were carried through a more detailed screening to identify specific environmental and community resource concerns. In the Level 2 Screening, resource-specific environmental and community data was reviewed to determine the presence of nearby resources and identify the RMF site with the least potential to cause impacts on these resources.

Through this analysis, RTD confirmed all three remaining sites as viable locations for the RMF. The analysis identified similar concerns at each site, including the need for right of way acquisition, wetlands mitigation, historic preservation, and hazardous material testing. Because all three sites are in the same vicinity and require private railroad tracks to access, RTD will consider different solutions to possibly operate on multiple freight companies' tracks. Regardless of the RMF location, the cost and impacts of the solution should be similar between the three sites and will be considered moving forward.

RTD is concluding this effort with three potential sites and will not recommend a specific site placement of the RMF at the conclusion of the Peak Service Study. Through the various analyses, it is determined that the three remaining sites are all viable options and present similar obstacles and costs associated with these obstacles.

In addition to a newly constructed RMF, RTD continues exploring outsourcing fleet maintenance to a third party for Peak Service. This option would reduce capital costs but increase annual operational costs. In this scenario, RTD would still likely require the purchase of one of the sites for storage track, crew changes, light cleaning, and maintenance facilities and to preserve the option to construct an RMF for a Full-Service scenario. An additional operation or hand-off agreement may be required for this scenario and will not be determined through the Peak Service Study.

Roadway Crossings

There are a total of 37 at-grade crossings within the 39-mile NWR Corridor. An additional 1.35 miles to an end-of-line proposed RMF requires four more at-grade crossings, including the US 287 and Main Street crossing, to a total of 41 crossings. The crossings are grouped by jurisdiction in Table 2.

Corridor Conditions

Jurisdictions along the corridor have improved the at-grade crossings over several years. Field inventories were conducted to confirm existing conditions, which were used to propose improvements.

To date, there are 29 crossings that have been upgraded to a Quiet Zone or are scheduled to be upgraded. Field inventories were conducted to confirm existing conditions, which were used to propose improvements. Quiet Zones are implemented to eliminate the requirement for the train to blow the whistle as it approaches a crossing. To qualify for a Quiet Zone, improvements must ensure the crossing will operate safely to protect crossing vehicles, pedestrians, and bicyclists.

Potential improvements include gates, visual and audio warning devices, and civil infrastructure such as extended medians and pedestrian pathways or sidewalks. Additional radar-based equipment and closed-circuit television cameras are required by RTD to detect anyone trapped between the downed gates and to record each crossing event.

Identification of Proposed Crossing Improvements

Using the field inventory and assessment in the Crossing Condition Inventory (Appendix C), a set of improvements was identified for each crossing. The process of selecting improvements for each crossing is documented in the "Traffic Operations Analysis Technical Report"; HDR; December, 2023.

Table 2 presents the improvements for the 41 crossings along the corridor. The crossing at Terry Street in Longmont is scheduled to be closed permanently as a part of TOD in that area; that location is not included. A new crossing is proposed by the city at Boston Street, subject to approval by BNSF and regulatory agencies. The new crossing would be designed as a Quiet Zone. Columns including RTD indicate that those improvements have been included within the Base Configuration design. Columns, including other designations, indicate that the improvement already exists at that location or is anticipated to be implemented by the local jurisdiction. Columns with blank spaces indicate that the improvement is not required at that location.

To develop the improvements shown in Table 2, the following assumptions were used:

- Radar and cameras are required at all crossings; only five locations have radar in place, and all will need cameras
- Additional safety modifications may be required near schools and other sensitive land uses
- Cities will be implementing Quiet Zones before Peak Service begins in 2030 such that those locations are designated as "City," and those projects would carry those costs
- Some civil infrastructure improvements are likely at most locations; improvements include adding or extending the median to 100 feet to prohibit vehicles from avoiding the gates

- Pedestrian improvements were assumed at locations where there are none today or where the continuity through the crossing zone is lacking
- Costs for installation and testing must be included at each location where systems elements (gates, radar, cameras, or cabling) are required

Milestone 3 - Base Configuration Confirmation Report

Table 1. Required Roadway Crossing Improvements

Crossing	Street	City / County	Quiet Zone?	# of Gates?	Radar	Ped Imps	Civil Imps	CCTV	Relay House Mods	Testing	Median S/M/L	Gates	System - Relay Housing Station	System - Cable
1	Lowell Blvd.	Westminster	Future	2	RTD	RTD	RTD	RTD	RTD	RTD	City	City	City	City
2	72nd Avenue	Westminster	Future	2	RTD	RTD	RTD	RTD	RTD	RTD	City	City	City	City
3	Bradburn Blvd.	Westminster	Future	2	RTD	RTD	RTD	RTD	RTD	RTD	City	City	City	City
4	76th Avenue	Westminster	No	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
5	80th Avenue	Westminster	No	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
6	88th Avenue	Westminster	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
7	Pierce Street	Westminster	No	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
8	Old Wadsworth Blvd	Westminster	No	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
9	112th Avenue	Broomfield	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
10	120th Avenue	Broomfield	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
11	Nickel Street	Broomfield	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
12	Brainard Drive	Broomfield	Yes	4	RTD		RTD	RTD	RTD	RTD	RTD	RTD	RTD	RTD
13	Dillon Road	Louisville	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
14	Pine Street	Louisville	Yes	4	Existing			RTD						
15	Griffith Street	Louisville	Yes	4	Existing			RTD						
16	South Boulder Road	Louisville	Yes	4	Existing			RTD						
17	Baseline Road	Lafayette	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
18	63rd Street	Boulder	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
19	55th Street	Boulder	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD

Milestone 3 - Base Configuration Confirmation Report

Crossing	Street	City / County	Quiet Zone?	# of Gates?	Radar	Ped Imps	Civil Imps	CCTV	Relay House Mods	Testing	Median S/M/L	Gates	System - Relay Housing Station	System - Cable
20	Pearl Parkway	Boulder	Yes	4	Existing		RTD	RTD						
21	Valmont Road	Boulder	Yes	4	RTD		RTD	RTD	RTD	RTD				
22	47th Street	Boulder County	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
23	Independence Road	Boulder County	Yes	4	RTD	RTD	RTD	RTD	RTD	RTD	RTD			
24	Jay Road	Boulder County	Yes	3	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
25	55th Street	Boulder County	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
26	63rd Street	Boulder County	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
27	Mineral Road/SH 52	Boulder	No	3	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
28	Monarch Road	Boulder County	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
29	Niwot Road	Boulder County	Yes	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
30	2nd Avenue	Boulder County	Yes	4	Existing	RTD	RTD	RTD	RTD	RTD	RTD			
31	83rd Street	Boulder County	Future	2	RTD	RTD	RTD	RTD	RTD	RTD	RTD	RTD		
32	Ogallala Road	Boulder County	No	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
33	Hover Street	Longmont	Future	2	RTD	RTD	RTD	RTD	RTD	RTD	RTD	RTD		
34	Sunset Street	Longmont	No	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD

Milestone 3 - Base Configuration Confirmation Report

Crossing	Street	City / County	Quiet Zone?	# of Gates?	Radar	Ped Imps	Civil Imps	CCTV	Relay House Mods	Testing	Median S/M/L	Gates	System - Relay Housing Station	System - Cable
35	Ken Pratt Blvd.	Longmont	No - Improve to Quad Gates	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
36	Terry Road - Part of TOD	Longmont	To be closed for TOD	None										
37	Coffman Street - Part of TOD	Longmont	Future	None	RTD		RTD	RTD	RTD	RTD	RTD	RTD		
38	Main Street/US 287	Longmont	Future	2	RTD		RTD	RTD	RTD	RTD	RTD	RTD		
39	Emery Street	Longmont	No	4	RTD	RTD	RTD	RTD	RTD	RTD				
40	Marlin Street	Longmont	No	2	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD
41	Sugar Mill Road	Longmont	No	None	RTD	RTD	RTD	RTD		RTD	RTD	RTD	RTD	RTD

Note: RTD = Improvements assumed to be implemented by RTD at the location as part of Base Configuration; Existing = Improvements are already present at the location; City = Improvements assumed to be implemented by local jurisdiction at the location as part of Base Configuration; Blank Cell = Improvement not required at the location.

Operations & Maintenance

Operating Concept

The NWR Peak Service operating concept has been defined as:

- Three morning peak inbound trains
- Three evening peak outbound trains
- Commuter rail maintenance and storage east of the Downtown Longmont Station presented previously
    - Location selected to minimize non-revenue train movements at the start and end of service
- Midday train storage near Union Station (Greenbox Option) or Westminster – 72nd Station (Westminster Option)
    - Location selected to minimize non-revenue train movements and to minimize costs to utilize BNSF freight tracks

Figure 1 previously showed the NWR future rail service alignment (dashed line) as an extension of the existing B Line commuter rail service (solid line). NWR peak trains are proposed to serve along the combined NWR and B Line route from Downtown Longmont to DUS.

Transit System Changes

Because the Peak Service Plan would be limited to the three trains in each peak period, there would be no significant changes to the existing transit system. Bus routes would continue to operate as they would throughout the day. Adjustments to provide feeder bus connections would be considered as commuter rail ridership grows.

The existing bus system would support the initial Peak Service Plan even without redirecting buses to the commuter rail stations. Table 3 shows the bus routes and any proposed changes for each of the six stations along the route.

Table 2. Bus Service to NWR Stations

Station	Bus Route Service in the Station Planning Area	Bus Service Accessing Station Site
Downtown Westminster	51, 53, 92, 100, FF1, FF5, FF7	92, 100; will stop on 88th Ave. next to the site
Broomfield – 116th	76, 112, 120/120E/120W, LD/LD3, FF1/FF3/FF4/ FF5	None; all but 76 and 112 routes access the US 36/Broomfield Station on the west side of US 36
Flatiron	FF1/FF4, AB, 228	AB and 228 could stop near the train platform; FF1/FF4 serve the US 36 platforms
Downtown Louisville	DASH	DASH would operate on Main Street two blocks west
Boulder Junction at Depot Square	206, 236, FLEX, FF4, FF6, AB2, BOLT	206, 236, FLEX, FF4, FF6, AB2, BOLT; all access the Boulder Junction Transit Village

Station	Bus Route Service in the Station Planning Area	Bus Service Accessing Station Site
Downtown Longmont	323, 324, 326, 327, BOLT, LD/LD1/LD2, LX1/LX2	323, 324, 326, 327, BOLT, LD/LD1/LD2, LX1/LX2; all access the planned Longmont 1st/Main Transit Center

Source: RTD Current Service Plan; RTD Service Optimization Plan; April 2023

FlexRide is a successful paratransit service in Boulder, Broomfield, and Jefferson Counties. Consistent with its name brand, FlexRide could be operated in a more focused approach during morning and evening Peak Service. In certain locations, such as the area around the Downtown Louisville or Broomfield – 116th stations, FlexRide could operate as a subscription service to pick up and shuttle patrons to and from the train within the windows of departure or arrival. Once the subscription riders are served, FlexRide could go back to its scheduled services.

Midday Storage Facility

A key goal of facility locations is to minimize non-revenue train movements to reduce system operating costs and to avoid unnecessary impacts on DTO, the current operator of the B Line. DTO is the operating concession of RTD's Eagle P3 and is contracted by RTD to operate and maintain service on the A, B, and G Lines, along with fleet maintenance for the N Line. The existing Commuter RMF is designed to accommodate only RTD's electric multiple unit (EMU) train fleet; therefore, a primary RMF has been identified as an overnight facility near the origin of service (Downtown Longmont Station). Since trains operate in only one direction each peak, a midday storage area near the service destination (DUS) is required. Two options were evaluated for the midday storage facility:

- Near Union Station at an existing Amtrak storage track (referred to as the "Greenbox Option" for its adjacency to the Greenbox self-storage facility)
- Northwest of the existing Westminster – 72nd Station in Westminster (on BNSF property between Lowell and 72nd, referred to as the "Westminster Option")

RTD conducted a simulation of Peak Service for both midday storage options. The simulation concluded that both are viable under current freight and passenger service operations between Union Station and each of the two layover options.

RTD staff evaluated the conclusions from the simulation and identified that the Greenbox Option created an impact under the existing operating scenario (B and G Line service into Union Station) that requires trains to utilize three platform edges at DUS for revenue service instead of two; the third platform edge is currently used to stage a train in case of a service disruption. Its use as a revenue platform would eliminate the possibility of staging a spare train at DUS, where it can quickly serve any RTD commuter rail line Further complicating the Greenbox option are unknown future service changes for RTD's commuter rail service combined with the potential for schedule changes in on Amtrak's California Zephyr and FRPR that could impair the non-revenue terminal movements of NWR service between Union Station and the Greenbox Option. Amtrak occasionally uses the storage track and may not grant RTD permission to utilize it.

RTD staff concluded that the Westminster Option provides several minor advantages under existing operating conditions and poses fewer potential risks of future operating conflicts with Amtrak and FRPR than the

Greenbox Option. The resolution requires working with BNSF and DTO to secure the use of the Westminster Option for midday train storage as the preferred midday storage location.

Operations staffing

RTD prefers to be the operator of the services they provide. This is true for their commuter rail system, which they own and operate. RTD procured DTO to operate those services for the A Line, B Line, and G Line commuter rail routes. For NWR Peak Service, RTD may consider procuring operations from a private operator.

Regardless of what organization is responsible for operations, staffing will remain consistent across the management options. Facility staffing levels determine the number of parking spaces, the size of support facilities, and occupancy levels. Table 4 summarizes the projected staffing levels for each group/department to be located at the RMF to implement the Peak Service Concept.

Table 3. Preliminary Staffing Summary

Position Title	Staff Required
Operations Administration	4
Operations	14
Vehicle Maintenance	13
Warehouse	3
Maintenance of Way	0
Facility Maintenance	3
Service and Clean	5
Total	42

Operations Control

Because NWR Peak Service trains will be running on BNSF tracks, BNSF will likely control the dispatch of trains. In other locations, BNSF provides the dispatch from a central location, such as their Fort Worth, TX facility. Because of the intricate interface at DUS with other commuter rail lines and Amtrak, a hand-off will probably be made between the NWR dispatch and the operations of all trains in and out of Union Station. The dispatch function by BNSF will also facilitate the movement of freight trains off the main line on freight sidings for the periods in which the commuter rail trains are operating.

As part of their work to develop the preliminary design for the different track changes necessary to run joint operations, BNSF and RTD will need to form an agreement to implement and operate Positive Train Control. This process will take place as design elements are clarified.

DTO operates the A, B, and G commuter rail lines. As part of their operations, DTO manages operations into and out of DUS daily. Coordination with BNSF to hand off the NWR Peak Service trains will be necessary for that program.

Overview of Ridership Forecasts

Regional Travel Model Description

The regional travel model utilized by RTD, uses a coded network of roads and transit routes to generate future travel demand forecasts for vehicle trips and transit mode share assignment. These forecasts are based on primary inputs of estimated future socioeconomic, geographical data of population, and employment. Travel models are calibrated at the regional metropolitan level based on observed roadway volumes and transit route boardings. As such, regional models have inherent limitations when considering local travel behaviors specific to corridors, areas, or segments. For example, it is important that the future socioeconomic data is up to date. Because the model is built to produce a regional forecast, characteristics of local travel networks and travel behaviors are not always accurately captured.

Current Ridership Forecast

The regional travel model developed by DRCOG and utilized by RTD was used to produce 2030 ridership forecasts for the NWR Peak Service Study. The limited Peak Service consisted of three trains in the inbound direction (Longmont to Denver) during the A.M. Peak period and three trains in the outbound direction (Denver to Longmont) during the P.M. Peak period. The model indicated a forecast of 1,100 riders per weekday in 2030. The forecasted ridership of this start-up service is modest, with each train operating at about 60-65% of seated capacity.

Comparison of Travel Times Between NWR Station Pairs

Table 6 provides a comparison of the travel times for the proposed commuter rail service in comparison to the current bus service between and among station pairs in the NWR Corridor.

Rail travel times were provided to RTD through run-time simulations by Hatch/LTK following the proposed track geometry and station spacing in the Peak Service configuration

Current bus travel times were provided by the RTD Trip Planner application by providing the trip pair and choosing the fastest travel time if there was more than one estimate

Table 6 shows longer rail travel times at Longmont and then along US 287, where the LD1 operates with few intermediate stops. Shorter trip times on the train are possible from Boulder and Louisville because of the transfer requirement on the bus from local to the Flatiron Flyer. However, bus travel time to DUS is about 10 minutes shorter when considering only the Flatiron Flyer departing from downtown Boulder Transit Center, even with the Flyer making each of the intermediate stops along US 36.

Table 4. Comparison of Bus versus Train Travel Times for NWR Station Pairs

Station Pair	Current Bus Routing	Travel Time to Union Station	Train Modeled Run-Time	Difference + = longer by train; - = shorter by train
Longmont to Union Station	LD1 • 57 minutes • 30 stops • 33 miles	57 minutes	64 minutes	+ 7 minutes
Boulder Junction to Union Station	Bound to Broadway/Baseline • 28 minutes FF1 to Union Station • 41 minutes • 8 stops • 25.9 miles	69 minutes	50 minutes	19 minutes
Louisville to Union Station	DASH to Lafayette PNR • 11 minutes • 12 stops • 3.1 miles LD1 to Union Station • 33 minutes • 12 stops • 20.8 miles	64 minutes	38 minutes	26 minutes
US 36 – Flatiron/Broomfield to Union Station	FF1 • 20 minutes • 3 stops • 16.8 miles	24 minutes	32 minutes	+ 8 minutes

Station Pair	Current Bus Routing	Travel Time to Union Station	Train Modeled Run-Time	Difference + = longer by train; - = shorter by train
US 36 – Broomfield Event Center (116th Ave) to Union Station	FF1 • 20 minutes • 2 stops • 14 miles	20 minutes	27 minutes	+ 7 minutes
US 36 – Sheridan Westminster to Union Station	FF1 • 12 minutes • No stops • 10.2 miles	12 minutes	20 minutes	+ 8 minutes
Longmont to Boulder Junction	BOLT • 27 minutes • 17 stops • 13.1 miles	27 minutes	14 minutes	13 minutes
Boulder Junction to Louisville	Bound to Broadway/27th • 10 minutes • 11 stops • 2.3 miles DASH to Lafayette PNR • 21 minutes • 31 stops • 9.1 miles	57 minutes	12 minutes	45 minutes
Boulder Junction to US 36 – Broomfield Event Center (116th Ave)	Bound to Broadway/27th • 11 minutes • 12 stops • 2.5 miles FF1 to US 36/Broomfield • 21 minutes • 5 stops • 11.9 miles	48 minutes	23 minutes	25 minutes

Source: RTD NW StarterService memo 12-21-22; RTD Trip Planner, 12-28-22

Process Used to Define Concept

The process used to define the NWR Peak Service Concept included reviewing previously gathered information, such as transportation plans and studies throughout the NWR corridor and collecting new information from activities like stakeholder and public involvement and studying environmental and community conditions.

Milestone 3 - Base Configuration Confirmation Report

Stakeholder Outreach

To better understand the current context of the NWR corridor and the communities it would serve, a Study Advisory Team (SAT) was established as part of the Study to guide the RTD team; assisting in identifying technical team members, key stakeholders, and community members; establishing coordinated communications outreach plans; and providing insight and guidance during key Study milestones. The SAT includes leaders and representatives from RTD, CDOT, DRCOG, FRPR, and local communities and organizations, including the City of Arvada, City of Westminster, City and County of Broomfield, City of Louisville, City and County of Boulder, Boulder Transportation Connections/Boulder Chamber, and the City of Longmont. SAT members also serve as liaisons between the Study team and their organizations.

Activities

The SAT met throughout the development of the Study to discuss specific items of importance. Five workshops were held during the development of the Base Configuration, in which the SAT reviewed plans and commitments, prepared for public outreach, and discussed Initial and Base Configurations, station planning considerations, and partnership opportunities. During these workshops, members provided unique input on Study topics from the perspectives of their local communities. In addition to meetings, the team also had the opportunity to review RTD deliverables and submit feedback that helped refine concepts during key milestones, including completing the Initial and Base Configurations.

SAT Input

In SAT meetings throughout the development of the Base Configuration, common points of emphasis included station configuration, refinement of siding locations, ridership forecasts, and collaboration with the intercity rail planning effort. Additionally, the SAT expressed general interest about the benefits of NWR beyond the ridership potential, including improvements in multimodal access and economic benefits in TOD and downtown areas. Overall, the SAT expressed support for Peak Service implementation and extent to which the Peak Service concept and Base Configuration can be modified or expanded upon to include additional trips, reverse commutes or coordination with intercity rail service in the long term. After this Study concludes, RTD will continue working with FRPR on the potential for joint implementation of commuter and intercity rail in the corridor.

Public Outreach

Public outreach conducted as part of developing the Base Configuration of the NWR Peak Service Study included pop-up events, public open houses, and a self-guided online public meeting. The primary goals of outreach were to notify the public about events and opportunities to participate in the Study and to share refined draft concepts of the NWR alignment, stations, facilities, and service characteristics. Outreach events provided opportunities for members of the public to share their thoughts, questions, and concerns or provide general feedback about the Study.

Milestones 1, 2, and Initial Milestone 3 Activities

The Study team hosted several pop-up events to promote and inform members of the public about the upcoming public open houses and the self-guided online public meeting. Visual boards, handouts, comment cards, and coloring sheets were available at each event, and participants could ask questions about the Study

and learn about additional opportunities to participate. The following pop-up events had approximately 110 people who visited the booths:

- Louisville WinterSkate – Saturday, January 21, and Saturday, February 2, 2023
- Broomfield Library – Wednesday, January 25, 2023
- Longmont Ice Rink – Tuesday, January 24, 2023
- Winter Bike to Work Day (Boulder and Superior) – Friday, February 10, 2023

Public open houses were held in Boulder and Westminster on January 31 and February 2, 2023. These events provided an overview of the Study, including rail alignment, station concepts, facilities, and service characteristics; discussed Study history, goals, milestones, and next steps; and gathered feedback on these refined draft concepts for the Study. At both open houses, the team provided Spanish and American Sign Language interpretation, visual boards, handouts, comment cards, QR codes for station surveys and the Study's website, and the opportunity to talk with subject-matter experts. The open houses had a total of 195 attendees, and 29 attendees submitted comment cards.

A self-guided online public meeting was also hosted for three weeks from January 31 to February 21, 2023, and incorporated the same content shared at the in-person open house events. This platform also allowed participants to review the study information and provide feedback. The self-guided online public meeting had 1,560 unique visitors, and 173 users completed surveys. The open houses and self-guided online public meeting were promoted through stakeholder and SAT members, a press release, social media posts in English and Spanish, and pop-up events.

Public Input for Milestones 1, 2, and Initial Milestone 3

The results of survey responses and comment cards collected as part of this first touchpoint and public outreach process expressed sentiments of overall excitement for the NWR conversation to continue and curiosity about how NWR will fit together with parallel efforts, including FRPR. Responses also included concern regarding gentrification and equity of growth around stations, the desire for reverse commutes, midday service, evening service, weekend service, and the need for clarification around construction and right of way acquisition. Those who indicated their needs would not be met by the current concept expressed a need for additional service timing (i.e., weekend, midday, and evening). Non-traditional commuters (service industries and healthcare, for example) expressed a need for different services. With many details still unknown, more than 300 people signed up for email updates on the Study, which is expected to generate more public interest and participation during future milestone opportunities.

Milestone 3 Confirmation of Base Configuration Activities

The Study team hosted several pop-up events to promote and inform members of the public about the upcoming public open houses and the self-guided online public meeting. Visual boards, handouts, comment cards, and coloring sheets were available at each event, and an interactive survey was added for the Westy Fest. Participants had the opportunity to ask questions about the Study and learn about additional opportunities to participate. The following pop-up events had approximately 885 people who visited the booths. Between June 15 and Nov. 15, we received 73 sign-ups and 50 surveys completed.

- BrewHaHa – Broomfield, Saturday, June 17, 2023

- Bike to Work Day (two events) – Boulder, Wednesday, June 28, 2023
- Climate Action Sunday: The Ways We Travel – Longmont, Sunday, Sept. 10, 2023
- Funktion at the Junction – Boulder Junction, Thursday, Sept. 14, 2023
- Rhythm at Roosevelt – Longmont, Saturday, Sept. 16, 2023
- Louisville Farmers Market – Louisville, Saturday, Sept. 23, 2023
- Mo Betta Farmers Market – Denver, Saturday, Oct. 14, 2023
- Westy Fest – Westminster, Saturday, Oct. 21, 2023

Additional events were attended by RTD representatives and RTD Transit Equity Office (Multicultural Outreach Consultant) representatives.

- Sustainable Transportation Summit-Peak Service– Longmont, Wednesday, Aug. 30, 2023
- St. Cajetan Celebration– Boulder, Sunday, Aug. 6, 2023
- Community Event– Denver, Saturday, Aug. 12, 2023
- Community Event– Boulder, Saturday, Aug. 26, 2023
- XVII Cumbre de Mujeres Compañeras – Boulder, Saturday, Sept. 23, 2023

Public open houses were held in Longmont and Broomfield on Nov. 8 and Nov. 9, 2023. These events provided an overview of the Study, including rail alignment, siding locations, facilities, and service characteristics; discussed Study history, goals, milestones, and next steps; and gathered feedback on these refined draft and basic configuration concepts for the Study. At both open houses, the team provided Spanish and American Sign Language interpretation, visual boards, handouts, comment cards, station surveys, a formal presentation and the Study's website, and the opportunity to talk with subject-matter experts. The open houses had a total of 195 attendees, and 29 attendees submitted comment cards.

A self-guided online public meeting was also hosted for four weeks from Nov. 8 to Dec. 8, 2023, and incorporated the same content shared at the in-person open house events. This platform also allowed participants to review the study information and provide feedback. The self-guided online public meeting had 2,584 unique visitors, and 250 users completed surveys. The open houses and self-guided online public meeting were promoted through stakeholder and SAT members, an E-blast, social media posts in English and Spanish, and pop-up events.

Public Input for Milestone 3 Confirmation of Base Configuration

The results of survey responses and comment cards collected as part of the public outreach process for this Milestone were similar to that of the first outreach effort and expressed sentiments of overall excitement for the NWR conversation to continue and curiosity about how NWR will fit together with parallel efforts including FRPR. Responses also included concern regarding gentrification and equity of growth around stations, the desire for reverse commutes, midday service, evening service, and weekend service, and the need for clarification around construction and right of way acquisition and operations. Those who indicated their needs would not be met by the current concept expressed a need for additional service timing (i.e., weekend, midday, and evening). Although it did not fit their needs, these people saw the value and how it would serve

others within the community. Non-traditional commuters (service industries and healthcare, for example) expressed a need for different services. With many details still unknown, more than 200 people signed up for email updates on the Study, which is expected to generate more public interest and participation during future milestone opportunities. Appendix E provides greater detail about outreach activities undertaken for this project.

Other Considerations

To define the Base Configuration for Peak Service, the Study has utilized the significant volume of previous work, the foundational investments in policies, programs, and infrastructure by the local jurisdictions, and concept planning and design for the requirements that will allow RTD to operate commuter rail in the corridor. The Base Configuration provides Study participants with a series of findings and outcomes for review and comments relative to two other important efforts: the preliminary design by BNSF and the Service Development Plan by the FRPR District

BNSF Railway Coordination

BNSF, through its consulting engineer, prepared the preliminary design plans and rough order of magnitude cost estimates for the Peak Service Concept. The plans were compared to work RTD has done on the Study and informed the Base Configuration.

Front Range Passenger Rail District Service Development Plan Coordination

The FRPR team is preparing a Service Development Plan (SDP) under FRA requirements that includes alternatives development and analysis, governance, refinement, and implementation considerations. Frequent coordination with CDOT and FRPRD allowed the Study Team to develop the Base Configuration in a way that would support intercity rail improvements in the future.

Denver Transit Partners (DTO) Coordination

DTO is the operator of three of the four existing RTD commuter rail lines consisting of the A Line to Denver International Airport, the B Line to Westminster Station, and the G Line to Wheat Ridge. The N Line to Thornton/Northglenn is operated by RTD.

The proposed operating plan would have RTD assume responsibility for operating the three roundtrip trains between Union Station and Westminster – 72nd each peak period (6 daily roundtrips). The reasons to consolidate the train operations in this segment include the fact that expected ridership demands do not require added trains at this time. In addition, operations into and out of the Union Station track configuration would be significantly impacted by increased train congestion and the lack of available platform space at DUS during the busy peak periods. This is especially true in considering the potential for added service from the FRPR proposals and Amtrak. Continued coordination with DTO to develop and agree to an operating plan will be needed throughout the following phases of any Peak Service project.

Potential Impacts

Potential Traffic Impacts

Traffic operations impacts were assessed for station access, at-grade crossings under passenger rail service, and at-grade crossings while freight sidings are in use.

Station Area Access

Given the levels of ridership forecast, overall traffic impacts due to the NWR Peak Service are expected to be minimal. Traffic volumes for this analysis are estimates based on the forecasted 2030 peak period transit ridership presented in the previous section.

To conduct the assessment of potential impacts from traffic that will access the stations, a threshold of 100 peak period vehicles that would be generated by station activity was selected as the level at which impacts could become significant. The level was established using requirements from corridor jurisdictions and standard traffic impact assessment experience. Five of the six proposed stations fall below 100 vehicles per hour in the peak hour, indicating that impacts from traffic accessing the stations are not expected. Only the Downtown Longmont Station exceeds the threshold. That station has been considered as part of a larger study and resulting project to establish a Transit Center for bus, rail, and parking integrated with a TOD redevelopment project that is moving forward.

Traffic Delay for At-grade Crossings During Passenger Service

The NWR Peak Service will use the same tracks as the existing BNSF freight service. Freight service will be suspended during passenger rail operations. Due to the shorter trains used in the passenger rail service, it is anticipated that gate closures would occur for much less time than they would for freight operations. Therefore, the passenger rail service is not expected to worsen traffic conditions during peak traffic congestion. Furthermore, simulations using estimated traffic data showed that existing crossings would not experience excess queuing during passenger rail gate closures.

As presented previously, the majority of the at-grade crossings have been or will be improved to serve as Quiet Zones. Upgrades at each location would be made to be consistent with RTD policies and with requirements for FRA and Colorado PUC regulations. Additional information on potential traffic impacts for the at-grade crossings is included in the "Traffic Operational Analysis" Technical Report; HDR; December, 2023.

Environmental Scan Results

The environmental scan for the Baseline Configuration focused on differentiator resources. Differentiator resources have the highest potential to influence decisions during the planning process, may require additional scoping ahead of NEPA, and potentially require longer lead times and a larger level of effort during NEPA to determine impacts and commit to mitigations. The rationale for which resources are considered differentiators is provided in Appendix D. Please note that the environmental scan is not a substitute for RTD's Environmental Evaluation process or the NEPA process. All resources would be considered during scoping for the NEPA phase, as appropriate. Table 6 provides a summary of the environmental screening results.

Table 5. Screening Results for Differentiator Resources

Differentiator Resources	Description
Air Quality	Based on a qualitative analysis of potential air quality impacts, if diesel locomotives or DMUs are employed for passenger service, minimal emissions would be expected during the operation. These emissions would primarily occur during two peak periods: A.M. Peak for approximately 2 hours and P.M. Peak for approximately 2 hours. Freight sidings, which would hold the idling freight trains during passenger service, are expected to produce diesel emissions near residential areas. The potential pollutants from diesel engines would include the criteria air pollutants such as Particulate Matter, Nitrogen Oxides, Carbon Monoxide, Sulfur Dioxide, and Volatile Organic Compounds, and mobile source air toxics such as Benzene, 1,3-Butadiene, Formaldehyde, Acetaldehyde, Naphthalene, and Polycyclic Organic Matters. A schedule or operations plan for using the sidings is not known at this conceptual stage. Each siding is not expected to be used during every passenger service session. Calculating the distance of the emissions would require dispersion modeling analysis, which considers meteorological and engine conditions. No modeling was completed during this planning phase. It is assumed that the locomotives or DMUs would be shut down overnight and during midday layovers, avoiding extensive idling. As a result, even if diesel locomotives or DMUs are used, air emissions from the maintenance facility in Longmont and midday layover in Westminster would be minimal. Ozone is a regional pollutant. Colorado is currently in violation of the National Ambient Air Quality Standards for ozone as established by the EPA in 2008 and 2015, being classified as severe nonattainment and moderate attainment, respectively. Despite the Region's violation, DRCOG's Regional Transportation Plan and Transportation Improvement Program will need to be updated to ensure that transportation conformity requirements are met at the regional level. Utilizing an electric locomotive for operations on the NWR ensures that no emissions are produced.
Cultural Resources	Historic properties in the design footprint consist of 12 sites and seven linear segments. In addition, nine cultural resources are listed as "needs data" and will require evaluation to determine if they are eligible for inclusion in the National Register of Historic Places and are considered historic properties. If the Section 106 process is initiated for a future associated undertaking, and historic properties are within the area of potential effects, consultation may be required with the Colorado Office of Archaeology and Historic Preservation to avoid, minimize, or mitigate adverse effects to these cultural resources. Analysis of indirect effects, such as visual or auditory impacts, may also be required for historic properties outside the direct footprint. If impacts cannot be avoided, early coordination with federal, state, and local officials is recommended, as applicable.

Differentiator Resources	Description
Recreational Resources	Several recreational resources exist within the study area. For the FasTracks program, RTD has mitigated impacts considered high-moderate or above. Additionally, if U.S. Department of Transportation funding or decisions are involved, the resources could be subject to Section 4(f) or Section 6(f) regulations. Potential impacts on recreational resources occur primarily in two ways: BNSF right of way linework overlaps with recreational parcel boundaries. It is assumed that no impact would happen here, but the linework would be cleaned up to confirm no overlap. BNSF main line crosses an existing recreational trail or property. This occurs at the following resources: • Lowell Boulevard Trail • Farmers' High Line Canal Trail • Big Dry Creek Trail • US 36 Bikeway Trail • Carolyn Holmberg Preserve at Rock Creek Farm – Hewit • Coal Creek Trail • Lewis Open Space • South Boulder Creek Path • Boulder Creek Path • Foothills Parkway Path • Pearl Parkway Path • Goose Creek Path • Cottonwood Trail • 63rd St Path • IBM Connector Trail • St. Vrain Greenway Additional analysis is required to confirm Section 4(f) and Section 6(f) applicability for these resources and determine if impacts would occur. For example, a trail alignment may pass over or under a section of the BNSF main line with no proposed construction activities or improvements and, therefore, have no notable impacts. As design advances, avoidance will be considered an initial option in the next development phase. If impacts cannot be avoided, early coordination with federal, state, and local officials is recommended, as applicable.
Noise and Vibration	Noise analysis results from the model indicate that noise impacts, as defined by FTA, are not projected to occur at residential parcels in the study area. Noise levels associated with all three candidate transit vehicle types (locomotive, DMU, and EMU) and freight train idling at proposed sidings remain below moderate and severe noise impact thresholds at all modeled parcels. Vibration analysis results from the model indicate that vibration impacts, as defined by FTA, are not projected to occur at residential parcels in the study area. Vibration levels associated with all three candidate transit vehicle types (locomotive, DMU, and EMU) and freight train operations below FTA vibration impact thresholds at all modeled parcels in the study area. Note: Proposed Alternative Siding Locations #1 and #2 were not modeled for noise and vibration impacts at the time of this analysis.

Differentiator Resources	Description
Wetlands and Waters of the US	Though dated, the 2010 survey data remains the best available. In the intervening period since the survey, wetlands may have been filled or expanded, and rivers and drainages may have shifted course. It is expected that current conditions differ from 2010, but not to such a degree to undermine the usefulness of this Study. Comparing the 2010 data to current (2022) aerial imagery confirms this. Nonetheless, a current waters delineation would be required to proceed with formal impact determination and eventual impact permitting. The following potential wetlands impacts were identified: • Broomfield Station: Wetlands, 0.56 acres • Longmont Station: Open Water, 0.05 acres; Wetlands, 0.02 acres • Alternative Siding #2: Open Water, 0.04; Wetlands, (BNSF design) • Siding #3: Open Water, 0.23 acres; Wetlands, 0.83 acres • Siding #4: Open Water, 0.01 acres; Wetlands, 0.19 acres • Alternative Siding #1: Open Water, 0.03; Wetlands, 0.12 acres This Study does not consider the connectivity of waters to downstream receiving waters. Isolated waters may be considered non-jurisdictional pursuant to the Clean Water Act (CWA), therefore obviating the need for CWA compliance for their impacts.
Hazardous Materials	Based on the research and review of properties along the alignment and proposed Base Configuration design, only two sites were identified to potentially impact construction activities. Only one property was evaluated for mitigation costs since it is an adjoining site to the NWR alignment. The second site was not evaluated for mitigation costs because it was a potential maintenance facility site that was not carried forward as part of the Base Configuration design.
Environmental Justice	The Study Team has identified environmental justice communities throughout the corridor. Appendix DG provides maps showing the location of Environmental Justice communities. Direct impacts, such as temporary or permanent right of way acquisitions, are expected to be limited to the acquisition of property for the maintenance facility and station areas, as the Base Configuration is utilizing existing BNSF railroad right of way for the passenger service and freight train sidings. Indirect impacts, such as development pressure, may also occur around train stations. Proximity impacts such as noise and vibration are not anticipated to occur at moderate or high levels. In fall 2023, the Study Team held an impacts and benefits workshop with partners to discuss potential disproportionately high and adverse impacts. The final report will include the workshop results in the Planning and Environmental Study. During NEPA, the U.S. Department of Transportation will formally determine if a project has disproportionately high and adverse human health and environmental effects on low-income and minority communities.
Preliminary Right of Way Expectations	Right of way acquisitions are not expected along the main line track alignment and freight siding alignments for the Base Configuration, as these are assumed to be within the BNSF right of way and would be included in an agreement between BNSF and RTD. Station areas may require some right of way acquisition for constructing and operating the rail platforms and ancillary infrastructure.

Summary of the Base Configuration

This section is a summary of the infrastructure elements and operating components that are required to provide the Peak Service operating plan.

Overview of Peak Service Operating Plan: The Peak Service Concept is an initial commuter rail service along the Northwest Corridor, operating three trips in the morning and three trips in the evening during weekday peak periods. The morning service would run from Longmont inbound to Denver Union Station (DUS), and the evening service would run outbound from DUS to Longmont.

The commuter rail passenger service would operate on BNSF Railway freight tracks from Longmont to the separate RTD trackway that carries the B Line Commuter Rail service between the Westminster Station at 72nd Avenue and Lowell Boulevard and DUS. The distance of the new alignment is 39 miles. Freight trains that may be in the segment during those peak periods would be shunted to passing sidings for the duration of the Peak Service operating windows.

Commuter rail vehicles would need to be different from the current RTD fleet because the overhead catenary system to deliver electric power lacks height clearance for freight operations. Therefore, a different type of vehicle that uses a different motive source or a hybrid of sources would be deployed.

RTD continues to assess operating scenarios, preferring to own and operate the service. Other options that may include outsourcing are under review.

Station Locations: There will be six new stations between the existing Westminster Station on the B Line at 72nd and Lowell and Downtown Longmont. Table 7 lists the existing B Line stations and the proposed six new stations.

Table 6. Existing B Line and Proposed NWR Corridor Stations

Station	Location
Existing B Line Stations	
Westminster – 72nd	72nd Avenue and Lowell Boulevard
Pecos Junction	Pecos Street and 62nd Parkway
41st & Fox	41st Avenue and Fox Street
Union Station	Wynkoop at 17th Street
Proposed NWR Stations	
Downtown Westminster	88th Avenue at BNSF
Broomfield 116th	116th Avenue at BNSF
Flatiron	US 36 and Flatiron BRT Station
Downtown Louisville	Front Street
Boulder Junction at Depot Square	Boulder Junction and Transit Village; 30th and Pearl Street
Downtown Longmont	1st Street and Main Street/US 287 Transit Center

Level Platform Stations: The RTD commuter rail standard station layout uses a boarding platform that is level with the floor of the rail car. This requires the platform's top to be 50.5 inches above the top of the rail on the adjacent rail line. The higher-level platform requires the station to be offset from the existing BNSF mainline tracks for dynamic clearances for the freight train. The separation would be accomplished by using a siding from the mainline that only passenger trains would use. The siding would be accessed through a pair of switches, one at each end that connects to the mainline. Freight trains would remain on the mainline when operating through the corridor.

Freight Passing Sidings: The Operating Plan for Peak Service will require any freight trains in the corridor to pull into a freight passing siding located along the corridor. BNSF requires three freight passing sidings with a capacity to hold four freight trains during when passenger service is operating.

Total Siding Lengths: Where possible, the new track needed for the Base Configuration would be built to serve as a future second track. Slightly over 10% of the trackway is already double tracked. With the addition of freight passing sidings the total double trackway segments would equal about 35%. This includes eight bridges that would be widened or rebuilt to accommodate the second track.

Roadway Crossings: There are 41 existing at-grade roadway crossings along the Peak Service route. Of these, the cities and counties along the route have upgraded or planned to upgrade 30 crossings to serve as a Quiet Zone. The improvements include gated vehicle protection, bicycle and pedestrian safety improvements, additional detection and safety systems, and civil infrastructure. One crossing will be closed as part of the Downtown Longmont TOD plan. These are invested costs from the corridor jurisdictions and savings to the overall required Peak Service commuter rail improvements.

Operations: There are several options available to RTD to operate and maintain the new Peak Service. A summary of those options follows:

RTD plans to operate and maintain the commuter rail fleet for the NWR Corridor. Operations, vehicle maintenance, right of way maintenance (as required by BNSF), and administrative functions will be staffed by RTD or outsourced to one or more providers.

It is anticipated that BNSF Railway will require its staff to control train operations and dispatch trains through the segment. RTD coordinates its current commuter rail operations with BNSF and other railroads such that the Peak Service will be an extension of those relationships.

Two new facilities will be needed to operate and maintain the Peak Service trains:

- Commuter Rail Maintenance Facility – Three candidate sites have been evaluated in Longmont as the end of the line. This facility would provide heavy and light maintenance, store trains overnight, and provide space for administration and other services. Expansion space would be included in the site.
- Midday Layover Facility – Following an analysis of the space available and the operating requirements into and out of Denver Union Station, the preferred operation would be to replace the Denver Transit Partners B-Line runs both into and out of Union Station each peak with Peak Service trains. Those trains would layover near the existing B Line Westminster Station in the vicinity of 72nd Avenue and Lowell Boulevard. A layover facility to perform limited duties like cleaning and inspection would be constructed in this area.

Vehicles:

RTD evaluated vehicles that are currently on the market, can serve high platform stations, and are both FRA and Buy-America compliant. RTD determined that no vehicle option could serve both high (50.5" ATOR) and low (8" or 22" ATOR) platforms and fully provide accessibility to all cars and doors on a train. One diesel-electric locomotive-hauled train was identified that falls below the maximum axle weight to operate on RTD's existing system, and the same manufacturer offers high-floor trains compatible with existing RTD platforms. For purposes of this report, a diesel-electric locomotive with one coach and one cab car was assumed for this study. This fleet option may also be compatible with the fleet used in intercity service.

References

City of Boulder. 2007. Transit Village Area Plan. https://bouldercolorado.gov/sites/default/files/2021-03/transit-village-area-plan.pdf. Amended September 2023.

Northwest Area Mobility Study (NAMS), 2014 (RTD). https://commutingsolutions.org/wp-content/uploads/Final-Report-5081-1.pdf

Regional Transportation District (RTD). 2010. Northwest Rail Corridor Final Environmental Evaluation

Appendix A
Existing Conditions - Proposed Stations

Appendix B
Rail Maintenance Facility Programming and Space Needs Report

Appendix C
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Appendix D
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Appendix E
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Appendix A

Existing Conditions – Proposed Stations

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Introduction

The RTD Board directed staff to conduct the Northwest Rail Peak Service Study (NWR PSS) to analyze various factors for implementing peak period commuter rail service in the NWR corridor. The NWR Corridor would be extended from the Westminster 72nd Station (current end-of-line station for the B-line) to Downtown Longmont.

Project Overview

In November 2004, voters in the Denver Area RTD approved the FasTracks initiative through a sales tax increase. The FasTracks Plan (RTD 2004) is a comprehensive program to construct and operate new rail infrastructure and improve elements of bus rapid transit (BRT), bus service, and Park-n-Rides throughout the region. The NWR is a 41-mile segment of the FasTracks Plan. Six miles of NWR are in operation as the B-line from Denver to Westminster and 35 miles have not been constructed due to financial constraints.

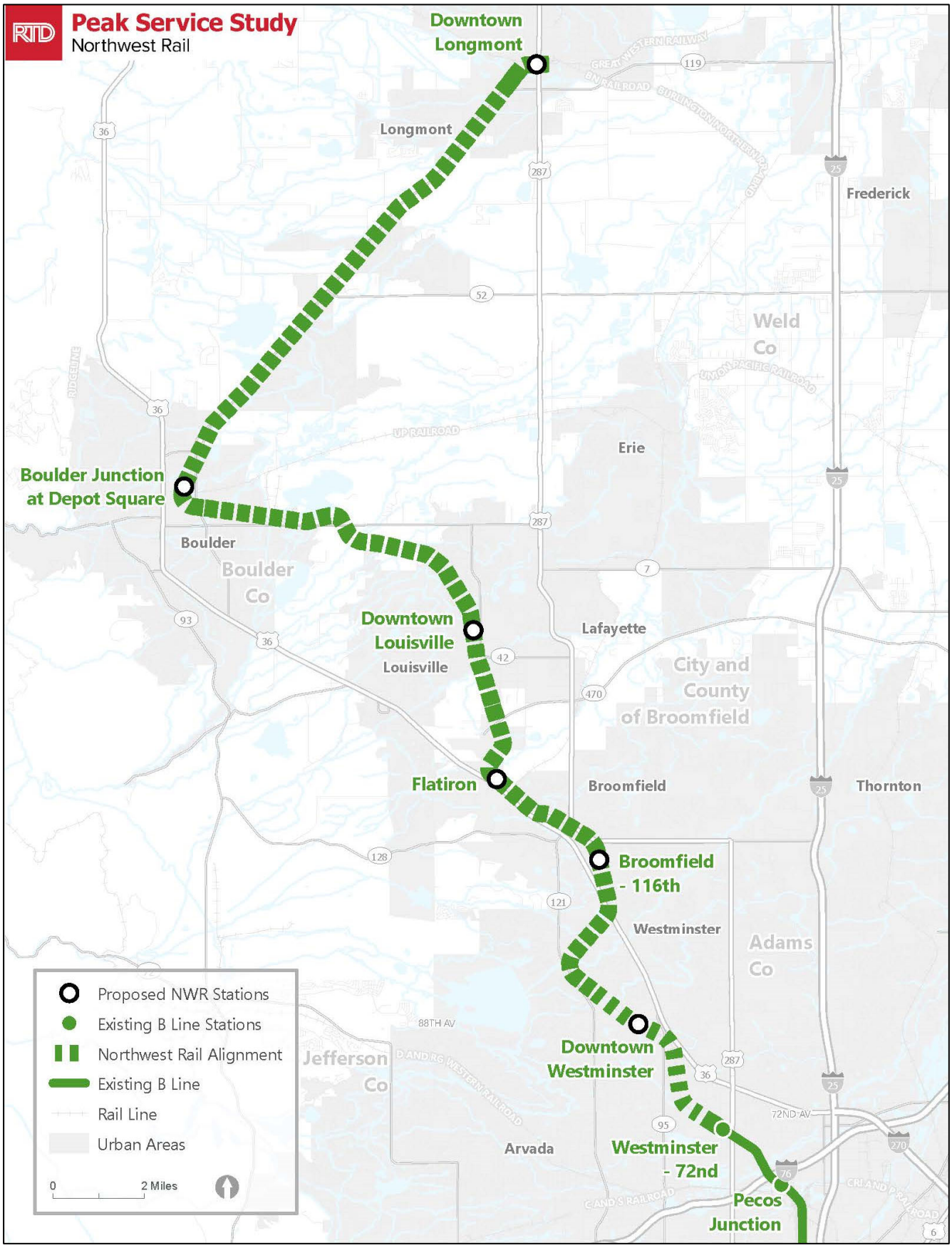
RTD completed an Environmental Evaluation Study of NWR in 2010 and the Northwest Area Mobility Study in 2014. Since then, conceptual details have changed. RTD developed an intermediate Peak Service Concept for NWR in 2016 and in 2021 the RTD Board of Directors authorized funding to conduct the Northwest Rail Peak Service Study. The PSS will analyze various factors such as infrastructure improvements, train operations, and service options. Subsequently, socioeconomic, physical, and environmental impacts associated with implementing the Peak Service Plan for NWR will be completed following consultation with local communities and stakeholders. The PSS will determine the Preferred Configuration for the Peak Service Plan, determine at a high-level what impacts could occur during construction and operation, and provide a cost estimate to the RTD Board. High level environmental and planning assumptions will be used in the decision-making process. More detailed environmental planning and permitting information will be included in any future National Environmental Policy Act (NEPA) clearances, if the RTD Board decides to advance the Plan.

Study Area

The study areas used for the establishment of existing conditions and impacts analysis of resources is consistent with RTD's FasTracks Environmental Resource Manual (FERG) (2021). In the event that an alternate study area is developed, it will be documented in the resource-specific analysis. The general NWR Corridor study area is illustrated in **Figure 1**.

Existing Conditions – Proposed Stations

Figure 1: NWR Corridor Study Area



Existing Conditions – Proposed Stations

Roadway Network/Traffic

The FERG states that the Study Area for the Roadway Network/Traffic is the alternatives under consideration and intersections on either side of the alternative or adjacent to Park-n-Rides. While only adjacent roadways/ intersections will be evaluated, mapping will show a one-half mile radius from the center of the proposed platform.

Transit Service and Bicycle and Pedestrian Facilities

The FERG states that the Study Area for Transit and Bicycle and Pedestrian Facilities is the existing and proposed corridor. While the focus of impacts will focus on these corridors, mapping will show a one-half mile radius from the center of the proposed platform.

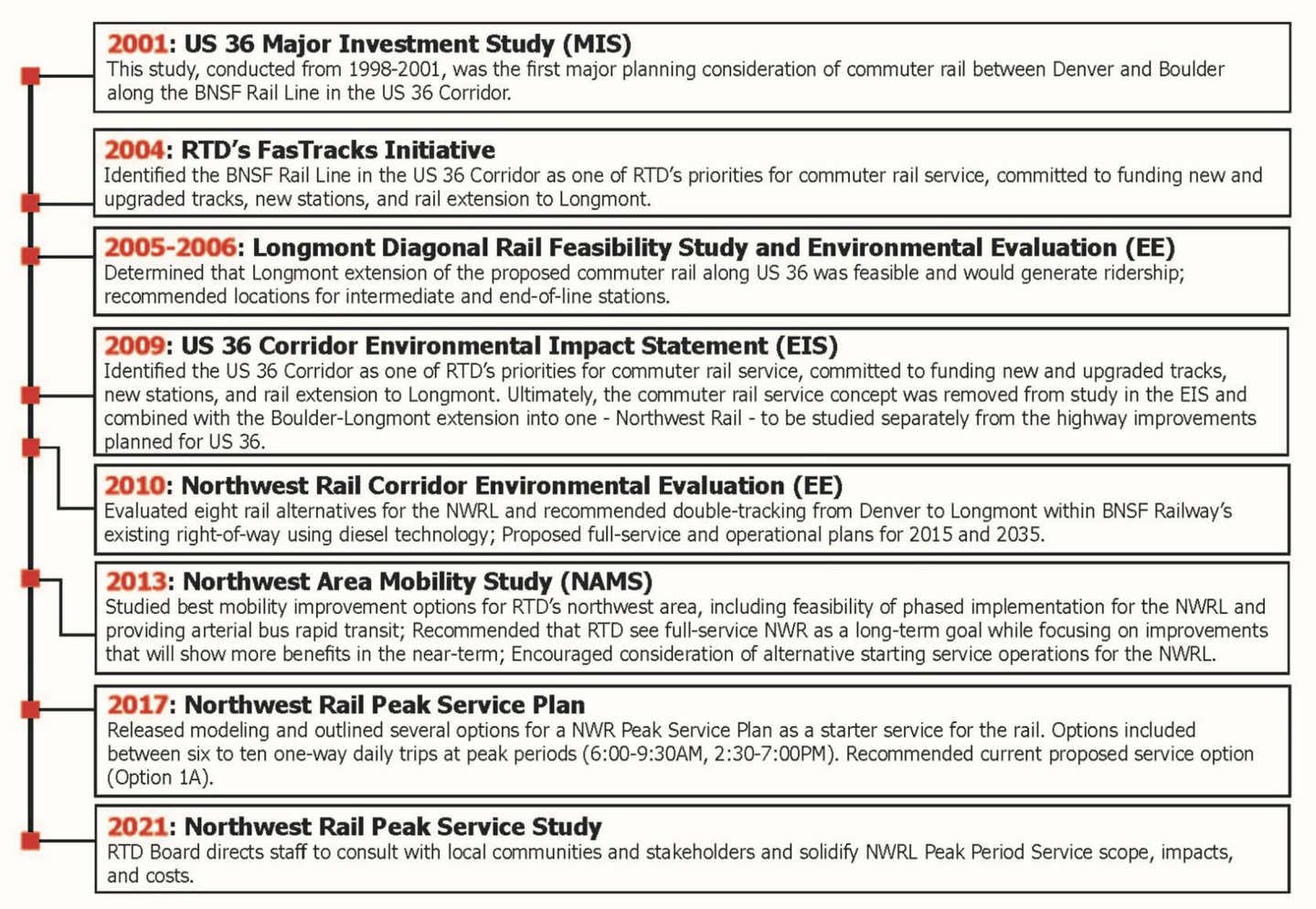
Existing and Future Land Use

The Study area for Land Use is a one-half mile radius from the center of the proposed platform.

Station Planning History

This memorandum provides a summary of previous station planning that has occurred along the 41-mile NWR Line. As summarized in **Figure 2**, planning studies for the NWR Corridor have been conducted over the past two decades, and RTD has continued efforts to enable NWR development.

Figure 2: Timeline of NWR Corridor Past Planning Studies



2001 Major Investment Study

RTD conducted a Major Investment Study (MIS) between 1998 and 2001 for the corridor, which recommended a set of multimodal transportation improvements including 28 miles of Regional Rail Service on one new track and one track shared with BNSF Railway. The line would include stations at Denver Union Station, near US 36 at 104th Avenue/Church Ranch Boulevard in Westminster, Flatiron/96th Street (also called Interlocken Loop/Storage Tek Drive) in Broomfield, Downtown Louisville, and 30th Street/Pearl Street (in Boulder). Bus Rapid Transit (BRT) was also proposed along US 36 as well.

Station layouts do not appear to have been developed during the MIS (based on the list of Project Documents included in the Appendix of the MIS), but it was described that, in general, stations would include transit

customer parking, station canopies, ticket vending machines, and facilities for bus connections. Specific numbers of parking spaces were not included at individual stations.

2004 RTD FasTracks Initiative

For the *2004 FasTracks Plan*[1], the US 36 Corridor/Longmont Extension included a 38.1-mile commuter rail corridor between downtown Denver, Boulder, and downtown Longmont. The FasTracks line was proposed to have seven stations at Denver Union Station, 71st Avenue and Lowell Boulevard, Westminster Promenade/ Mandalay Town Center (Church Ranch/104th), Flatiron/96th Street, Downtown Louisville, 30th Street/Pearl Street in Boulder, IBM (Diagonal Highway), and Twin Peaks Mall (Diagonal Highway) in Longmont. The number of proposed parking spaces from the FasTracks Plan is included in **Table 1**.

Table 1: Proposed Parking Spaces at Rail Stations in FasTracks Plan

Proposed Rail Station	Proposed Rail Parking Spaces
Denver Union Station	0
71st Avenue and Lowell Boulevard	100
Flatiron/96th Street*	560
Downtown Louisville	400
30th Street/Pearl Street	100
IBM (Diagonal Highway)	500
Twin Peaks Mall (Diagonal Highway)	300
Additional Parking Spaces TBD**	1,000
Total Spaces	**2,960**

* Shared Rail/BRT station

** An additional 1,000 spaces were needed for commuter rail in the corridor. The location of these spaces was to be determined in subsequent planning.

2005-06 Longmont Diagonal Rail Feasibility Study

The *Longmont Diagonal Rail Feasibility Study*[2] discusses RTD's proposal to add commuter rail service to the Longmont corridor by using the BNSF track and right-of-way as part of RTD's FasTracks Plan. The new Longmont corridor service would extend the proposed Denver-to-Boulder commuter rail service from its terminus at the 30th Street/Pearl Street Station in Boulder, to a Longmont Station proposed near Hover Road and SH 119, near the Twin Peaks Mall. However, the *Longmont Diagonal Rail Feasibility Study* determined that due to existing high traffic volumes, along with other issues, the 1st Avenue and Terry Street site in downtown Longmont would be a more suitable end-of-line station site. Additional analysis found that the costs for the extension of the corridor to 1st Avenue and Terry Street were similar to the costs associated with mitigating the traffic impacts created by a station at Hover Road and SH 119.

A second downtown station was also evaluated. This would require an extension of service across US 287 to the proposed Sugar Mill Station site. An examination of estimated capital costs and impacts associated with extending the line to the Sugar Mill showed that this extension would be unlikely. FasTracks funds would likely be insufficient to cover the Sugar Mill extension, so the focus in downtown Longmont became the 1st Avenue and Terry Street site.

The intermediate station between Boulder and Longmont was also evaluated as part of the *Longmont Diagonal Rail Feasibility Study*. RTD originally evaluated three intermediate station location sites but eliminated the two

[1] 2004 RTD FasTracks Plan (https://www3.drcog.org/documents/archive/2004_FasTracks_Plan.pdf)

[2] 2006 RTD Longmont Diagonal Rail Feasibility Study (https://www.gatewaycog.org/media/userfiles/subsite_9/files/rl/HSRReferenceMaterialsReportsMapsandOtherHSTSections/References-Longmont_Diagonal_Rail_Feasibility_Study-Final_Report_Executive_Summary_5-2-05.pdf)

sites proposed near Niwot and near SH 52. The report stated that RTD would continue to evaluate Boulder's Gunbarrel neighborhood station options near the intersection of SH 119 and 63rd Street.

2009 US 36 Corridor Environmental Impact Statement

From 2003 to 2009, the Colorado Department of Transportation (CDOT) and RTD, in partnership with the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), studied multimodal transportation improvements for the US 36 corridor between Denver and Boulder[3]. During the project development phase, both rail and highway elements were evaluated and combined into alternatives (or packages of improvements).

In November 2004, following the initial development of the packages, the voters in the Denver metropolitan area approved the FasTracks Program through an increase in the sales tax for transit purposes. FasTracks provides funding for a program of transit improvements, such as rail transit and BRT improvements throughout the Denver metropolitan area, including the US 36 project area. Due to this availability of local funding for commuter rail improvements, CDOT and RTD agreed with FTA and FHWA to move forward separately with rail and highway improvements in the US 36 project area. Once the US 36 project got to the Final Environmental Impact Statement (FEIS), the proposed rail improvements were included in the No Build Alternative, as they had a dedicated funding source (FasTracks) and were included in the conforming *2025 Metro Vision Regional Transportation Plan* (Denver Regional Council of Governments [DRCOG] 2002) and were therefore considered planned and funded improvements.

The No Build Alternative used in the US 36 FEIS included the seven rail stations contained in the FasTracks Plan (South Westminster, Church Ranch Boulevard, Flatiron in Broomfield, Downtown Louisville, Boulder Transit Village, Gunbarrel, and Twin Peaks Mall in Longmont). Additional rail stations at 88th Avenue/Sheridan Boulevard in Westminster (now downtown Westminster), 116th Avenue in Broomfield (linked to the Arista/1st Bank Center and BRT station), and 63rd Avenue/Arapahoe Road in Boulder, were added in the early planning stages of the US 36 EIS process at the request of corridor stakeholders when the NWR Corridor and US 36 projects were one combined project. The FEIS concluded that the exact station locations and amenities at each station will be determined in RTD's *Northwest Rail Environmental Evaluation*, which was the separate study that split off from the US 36 project.

Denver and Adams Segment

Denver Union Station has become the railroad terminal for passenger service in the Denver metropolitan area handling RTD light rail and Amtrak services. Denver Union Station was to be upgraded as part of the FasTracks Program, so it was included in the No Build Alternative. Improvements assumed consisted of the consolidation of existing and future light rail tracks; the 16th Street Mall shuttle turnaround; commuter rail tracks from the Gold Line Corridor, NWR Corridor, North Metro Corridor, and East Corridor; regional bus (including the relocation of Market Street Station); and the future downtown circulator and pedestrian circulation into one multimodal transportation center.

Westminster and Broomfield Segment

There are three rail stations in this segment: Church Ranch/104th Avenue, 116th Avenue (linked to Arista/1st Bank Center), and Flatiron.

All of the Park-n-Ride/rail stations for the Westminster and Broomfield segments would have parking on both sides of US 36, except the 116th Avenue Park-n-Ride. The 116th Avenue Park-n-Ride would have parking on the

[3] 2009 CDOT/RTD US 36 Corridor Environmental Impact Statement (https://www.codot.gov/projects/archived-project-sites/us36eis/documents/us-36-final-eis-volume-i)

south side of US 36, a pedestrian crossing to connect the parking areas, and would be accessed by BRT on US 36 via bus pull-outs. Rail stations would also have a boarding platform to access the NWR Line.

Louisville and Boulder Segment

There are three stations in this segment consisting of the Downtown Louisville, Boulder Transit Village and Gunbarrel West (also referred to as IBM). Boulder Transit Village would have both bus and rail service. The Downtown Louisville and Gunbarrel rail stations would be constructed as part of the NWR Corridor Project. The exact location and number of parking spaces associated with these stations would be determined as part of that project. The City of Boulder prepared a redevelopment plan for the Boulder Transit Village, which would be located at 33rd Street and Valmont Road in Boulder, west of the NWR Corridor Project. The number of proposed parking spaces from the US 36 FEIS is shown in **Table 2**.

Table 2: Proposed Parking Spaces at Rail Stations in No Build Alternative of US 36 FEIS

Proposed Rail Station	Proposed Rail Parking Spaces
Denver Union Station	0
South Westminster/71st Avenue	No Information*
Church Ranch/104th Avenue	230**
116th Avenue (US 36/116th Avenue)	360**
Flatiron (US 36/96th Street)	250 (shared with BRT)
Boulder Transit Village (30th Street/Pearl Street)	280**
IBM (Diagonal Highway)	No Information*
Twin Peaks Mall	No Information*

* The description in the text states that the Twin Peaks Mall station is part of the project, but it is not shown on the map. The IBM (Diagonal Highway) and South Westminster stations are both discussed in the text and shown on the map but are not included in the table with number of parking spaces.
** This number includes only the rail-specific parking spaces. In each case, these spaces are co-located with other parking spaces.

2010 Northwest Rail Corridor Environmental Evaluation

As part of FasTracks and as a result of the separation of the rail component from the US 36 EIS, RTD initiated the *Northwest Rail Corridor Environmental Evaluation* (NWR Corridor EE)[4] to identify and evaluate impacts of implementing a fixed-guideway, commuter rail transit service between Denver, Boulder, and Longmont. The project was planned to be phased. The first phase, from Denver Union Station to the South Westminster/71st Avenue Station, would use Electric Multiple Unit (EMU) technology. Phase 2 would use Diesel Multiple Unit (DMU) technology from Denver Union Station to Longmont and would share tracks used by the EMU vehicles in the Phase 1 segment between Denver Union Station and the South Westminster/71st Avenue Station.

There were 11 stations included as part of the Preferred Alternative, located at: South Westminster/ 71st Avenue, Westminster/88th Avenue, Walnut Creek (Church Ranch/104th), Broomfield/116th Avenue, Flatiron, Downtown Louisville, East Boulder, Boulder Transit Village, Gunbarrel, Twin Peaks, and Downtown Longmont. Four of the 11 stations (Westminster/88th Avenue, Broomfield/116th Avenue, East Boulder, and Twin Peaks) would not be funded by FasTracks and would require additional funding sources in order to be constructed. The number of proposed parking spaces is shown in **Table 3**.

Table 3: Proposed Parking Spaces at Rail Stations in NWR Corridor EE

Proposed Rail Station	Proposed Rail Parking Spaces
Denver Union Station	0
South Westminster/71st Avenue	925

[4] 2010 RTD Northwest Rail Corridor Environmental Evaluation (https://www.rtd-denver.com/sites/default/files/files/2019-06/Eagle-P3_EE_Summary.pdf)

Existing Conditions – Proposed Stations

Proposed Rail Station	Proposed Rail Parking Spaces
Westminster/88th Avenue*	1,055
Walnut Creek (Church Ranch/104th)	240
Broomfield/116th Avenue*	350
Flatiron	264
Downtown Louisville	425
East Boulder*	530
Boulder Transit Village	290
Gunbarrel	230
Twin Peaks*	100
Downtown Longmont**	590
Corridor Total	**4,999**

* Unfunded Stations
** Downtown Longmont Station would add 435 parking spaces by 2035.

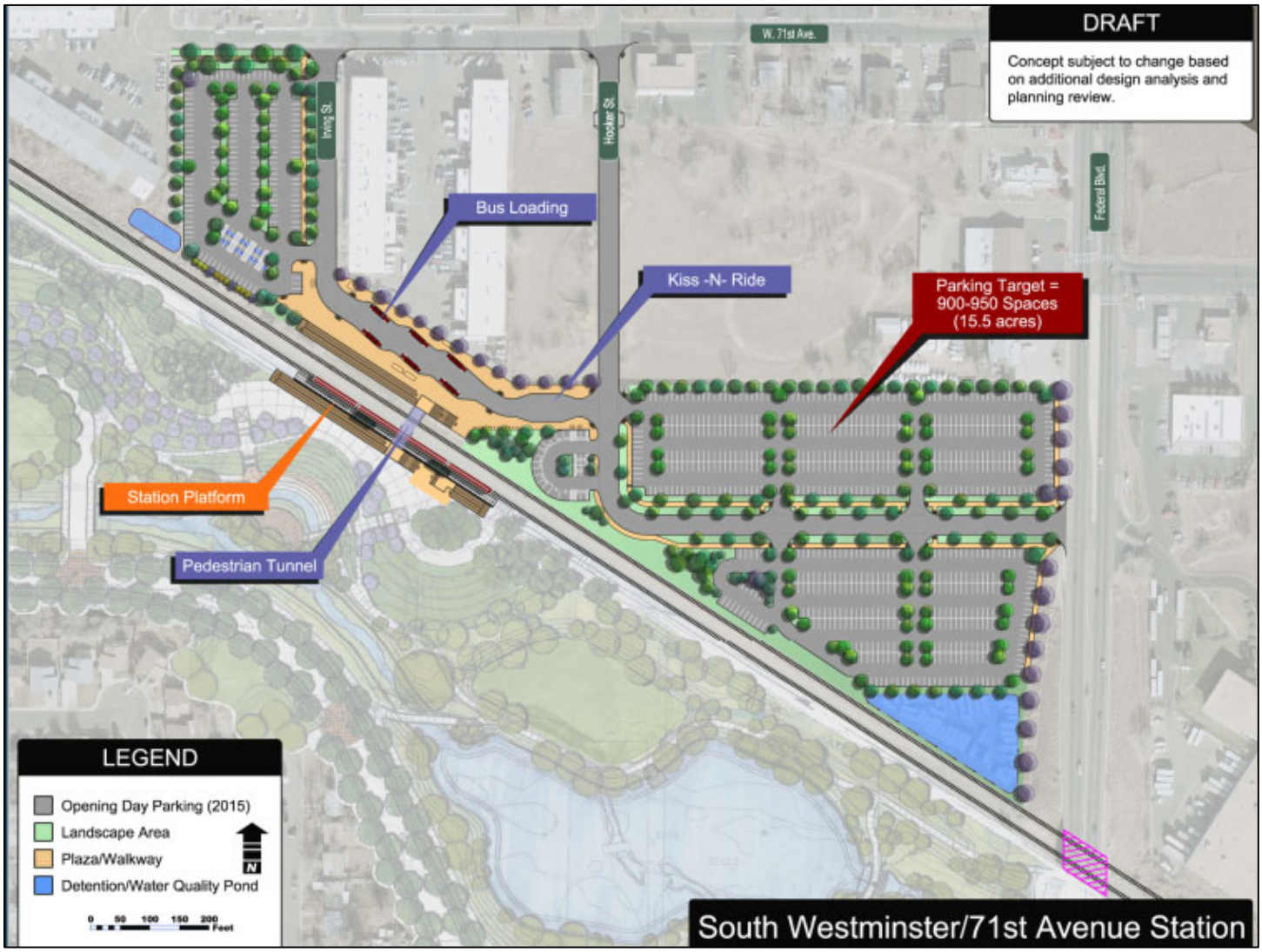
Figure 3 through **Figure 13** show the proposed station layouts from the NWR Corridor EE. Station descriptions were taken from Chapter 4 of the *NWR Corridor EE*.

Existing Conditions – Proposed Stations

South Westminster/71st Avenue Station (existing)

The South Westminster/71st Avenue Station would be located west of Federal Boulevard between the railroad tracks and 71st Avenue. Bus loading and unloading and passenger drop-off facilities are adjacent to the station platform between Hooker Street and Irving Street. A small parking area would be provided northwest of the station platform adjacent to Irving Street as needed in the future. The main parking area is located southeast of the station platform between Federal Boulevard and Hooker Street. A pedestrian tunnel is provided under the rail tracks to the commuter rail platform. A total of 925 parking spaces will be provided for the whole station when fully built out. Automobile access to the station is provided by access points on Hooker Street, Irving Street and Federal Boulevard.

Figure 3: South Westminster/71st Avenue Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

The South Westminster/71st Avenue Station has been constructed and acts as the current end-of-line station for the B-Line.

Existing Conditions – Proposed Stations

Westminster/88th Avenue Station (Downtown Westminster)

The Westminster/88th Avenue Station would be located between Harlan Street and the west entrance to Westminster Mall on 88th Avenue. A parking lot with 1,055 available spaces would be located north of 88th Avenue. These spaces would be shared with the adjacent redevelopment of the Westminster Mall. A bus loop and a passenger drop-off area would be provided south of 88th Avenue adjacent to the rail tracks. The bus loop would be accessed from the Harlan Street/88th Avenue intersection while the passenger drop-off and a small parking area (approximately 50 spaces) would be accessed from the west mall entrance/88th Avenue intersection. A pedestrian bridge would be provided across 88th Avenue to the northbound and southbound rail platforms and the bus loading and unloading areas.

Figure 4: Westminster/88th Avenue Station Plan from NWR Corridor EE

Source: RTD NWR Corridor EE, 2010

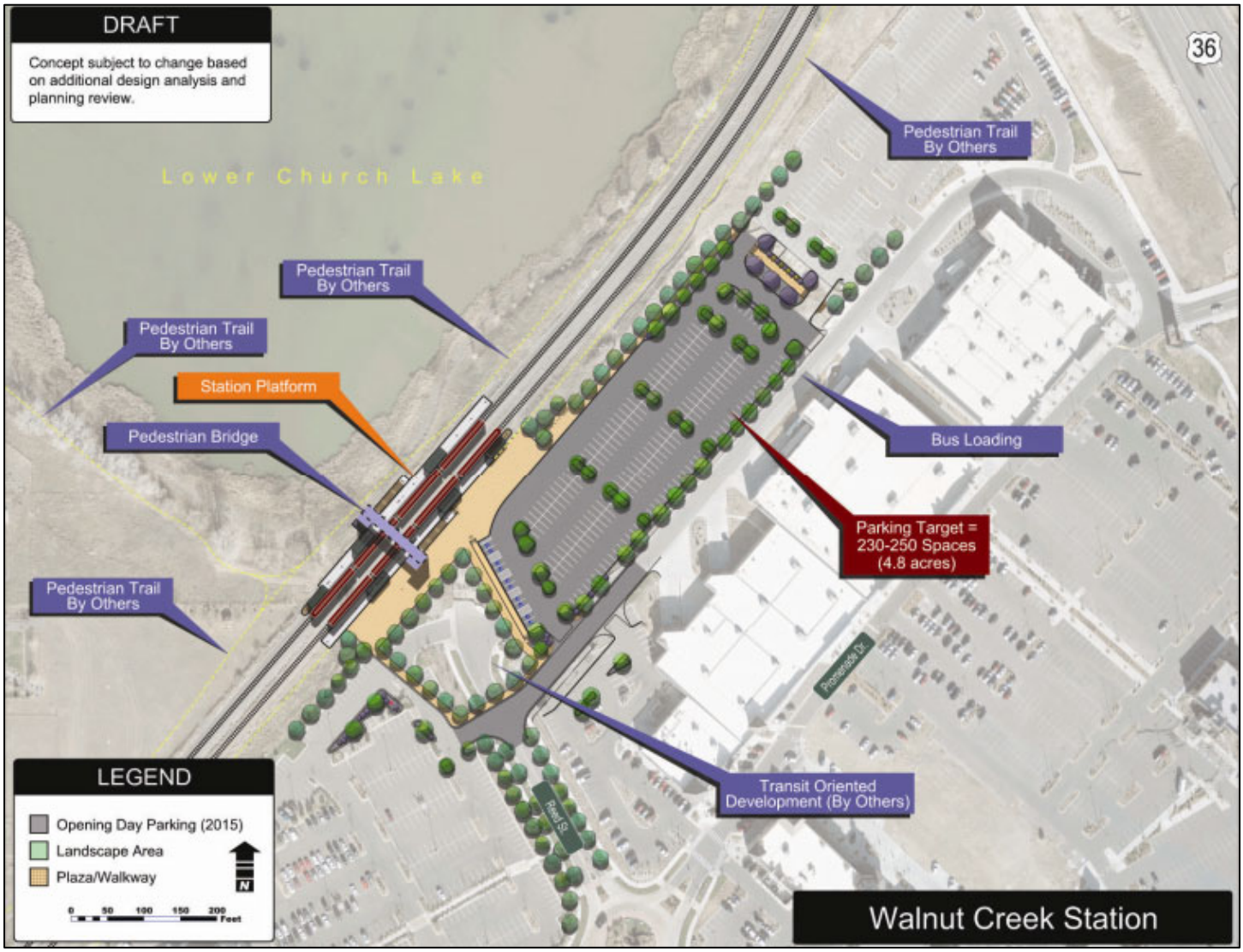
The Westminster/88th Avenue Station is now known as the Downtown Westminster Station and is being updated for the 2022 RTD NWR PSS.

Existing Conditions – Proposed Stations

Walnut Creek Station (formerly Church Ranch/104th Avenue)

The Walnut Creek Station would be located on the northwest side of the Walnut Creek retail development at the Church Ranch Boulevard/US 36 interchange. The rail station would be adjacent to the existing bus access on US 36. The Park-n-Ride lot would provide 240 parking spaces. Access for the station area would be provided by Promenade Drive from Westminster Boulevard and by Reed Street from Church Ranch Boulevard. A pedestrian bridge would be provided to access the southbound rail platform.

Figure 5: Walnut Creek Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

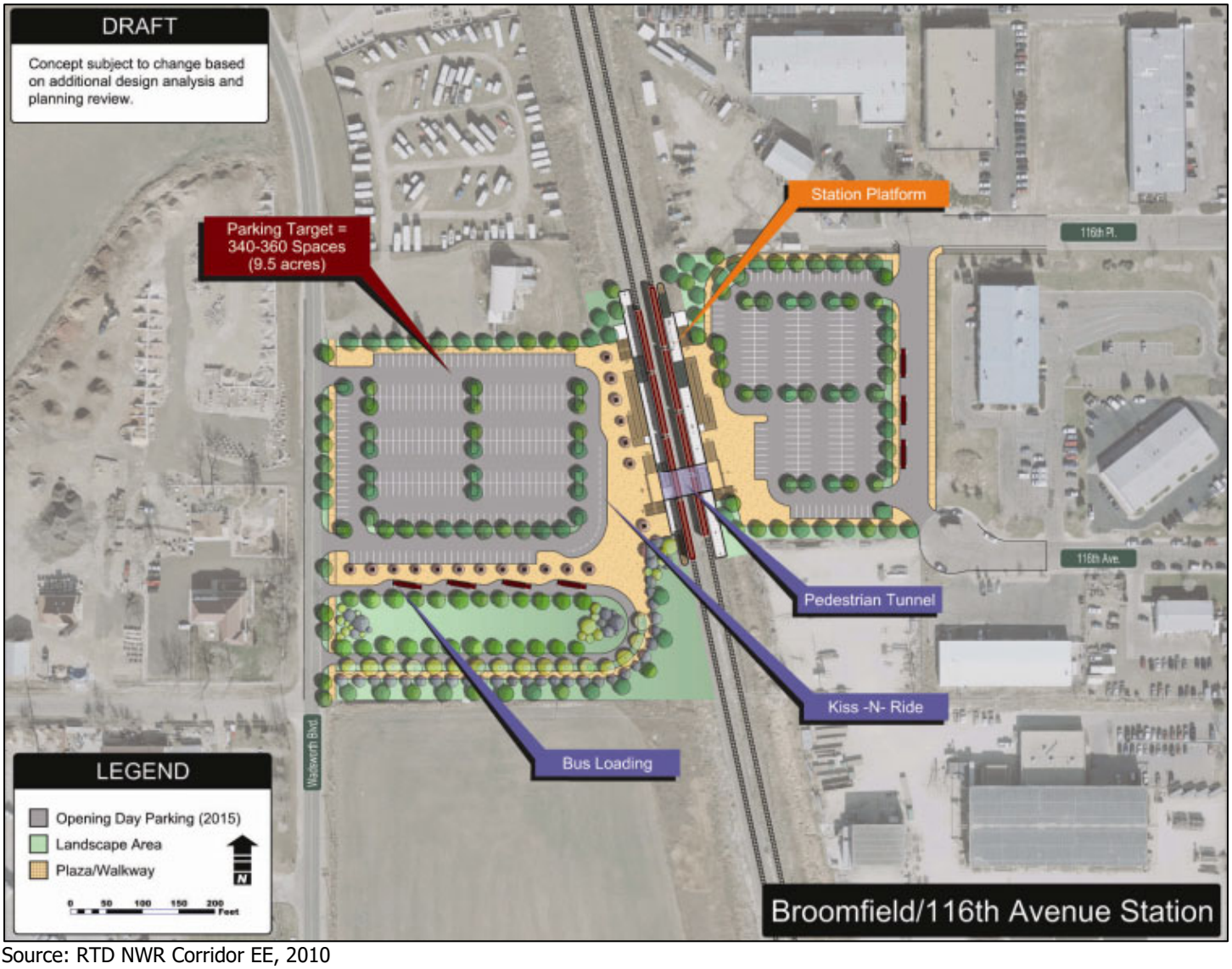
The Walnut Creek Station is no longer being studied for the 2022 RTD NWR PSS. It could become a future station.

Existing Conditions – Proposed Stations

Broomfield/116th Station

The Broomfield/116th Station would be located on 116th Avenue between Wadsworth Boulevard and Main Street. The site is immediately east of the northbound BRT passenger platform along US 36 with the pedestrian connection to the west platform at the Arista/1stBank Center development. Parking would be provided on both the east and west sides of the rail station. The parking area on the west side would provide the majority of the 350 total spaces. This parking area would be accessed from Wadsworth Boulevard north of 116th Avenue. The remainder of the parking would be on the east side of the platform, with access from 116th Avenue and 116th Place via 120th Avenue or Main Street. A bus loop and passenger drop-off area would also be provided in the west-side parking area with access from Wadsworth Boulevard at 116th Avenue. A pedestrian tunnel would provide access to the rail platforms from both parking areas.

Figure 6: Broomfield/116th Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

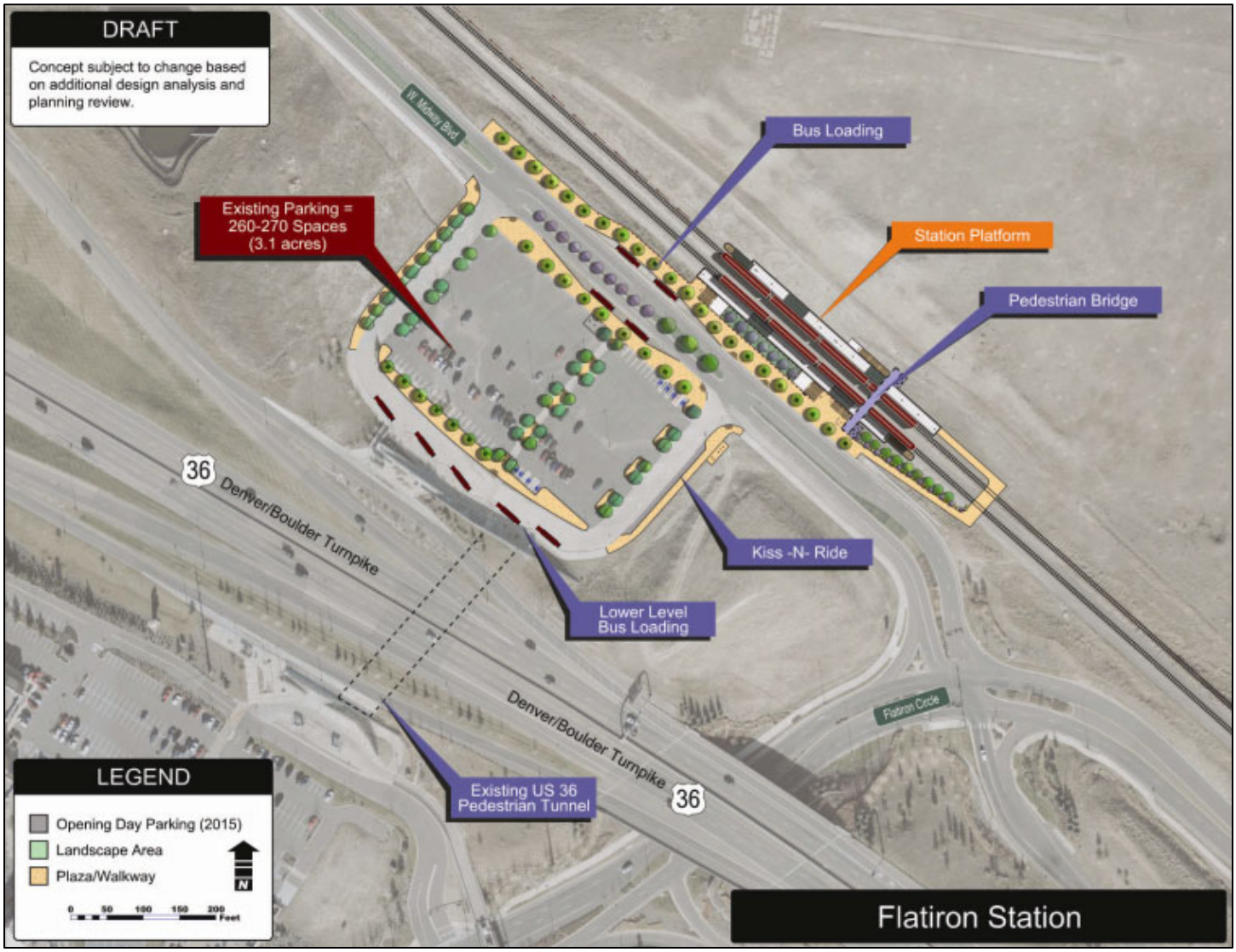
The Broomfield/116th Station is being updated for the 2022 RTD NWR PSS.

Existing Conditions – Proposed Stations

Flatiron Station

The Flatiron Station would be located adjacent to the existing Flatiron US 36 BRT Station. The station platform would be located across Midway Boulevard northeast of the parking area. The Park-n-Ride would provide 264 spaces. The rail station would use the existing passenger drop-off and bus loop facilities, with added bus access on Midway Boulevard. A pedestrian bridge would provide access to the northbound rail platform.

Figure 7: Flatiron Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

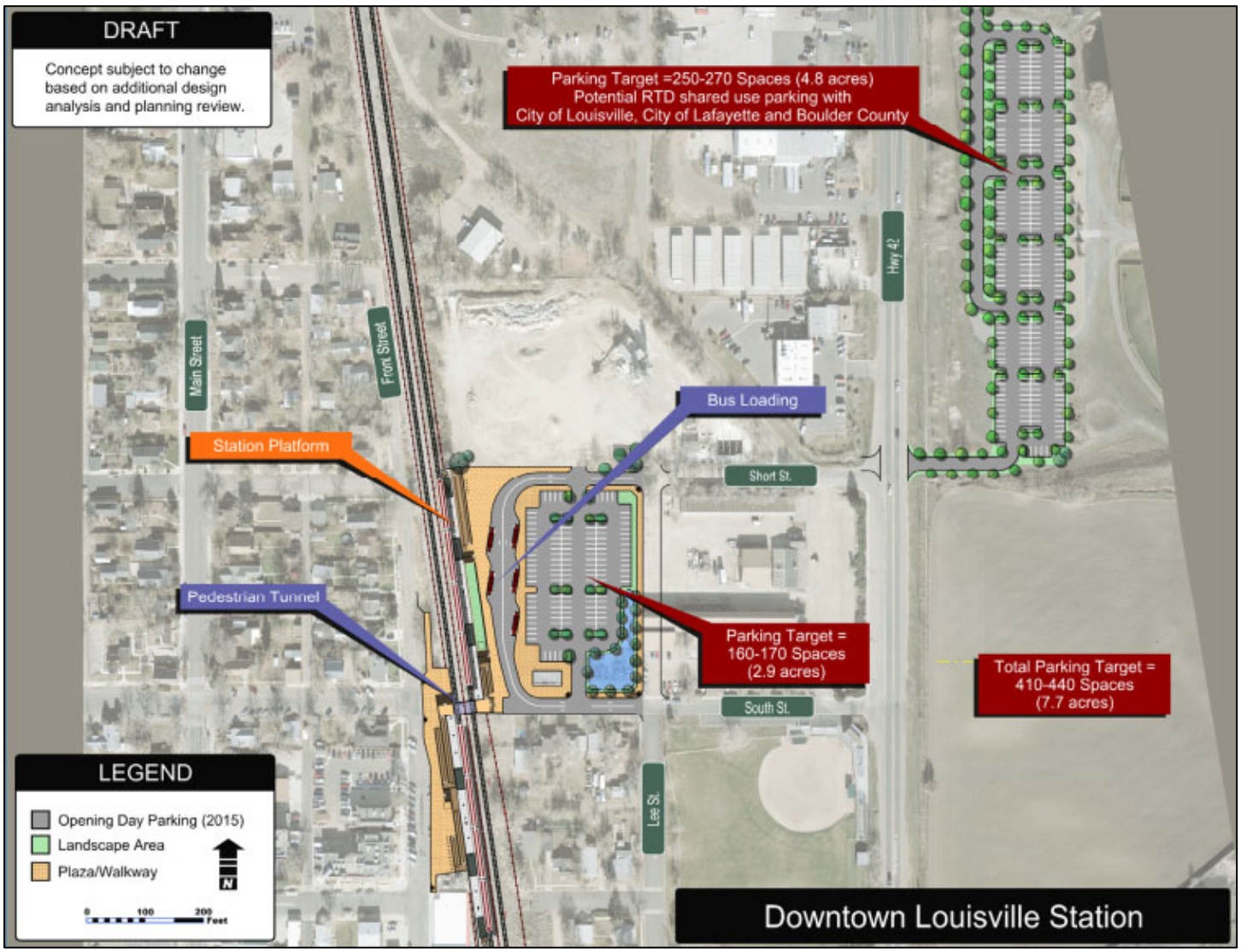
The Flatiron Station is being updated for the 2022 RTD NWR PSS.

Existing Conditions – Proposed Stations

Downtown Louisville Station

The Downtown Louisville Station would be located between the rail corridor and SH 42 in the city of Louisville. Access to the Park-n-Ride would be provided from South Street and Short Street from SH 42. The Park-n-Ride would provide 425 spaces. Approximately one-third of the spaces would be located west of SH 42; the remainder of the spaces would be located east of SH 42 in a joint-use arrangement with the athletic field complex. The rail station would provide passenger drop-off and bus loop facilities adjacent to the station platform. A pedestrian tunnel is now in place that provides access across the rail tracks.

Figure 8: Downtown Louisville Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

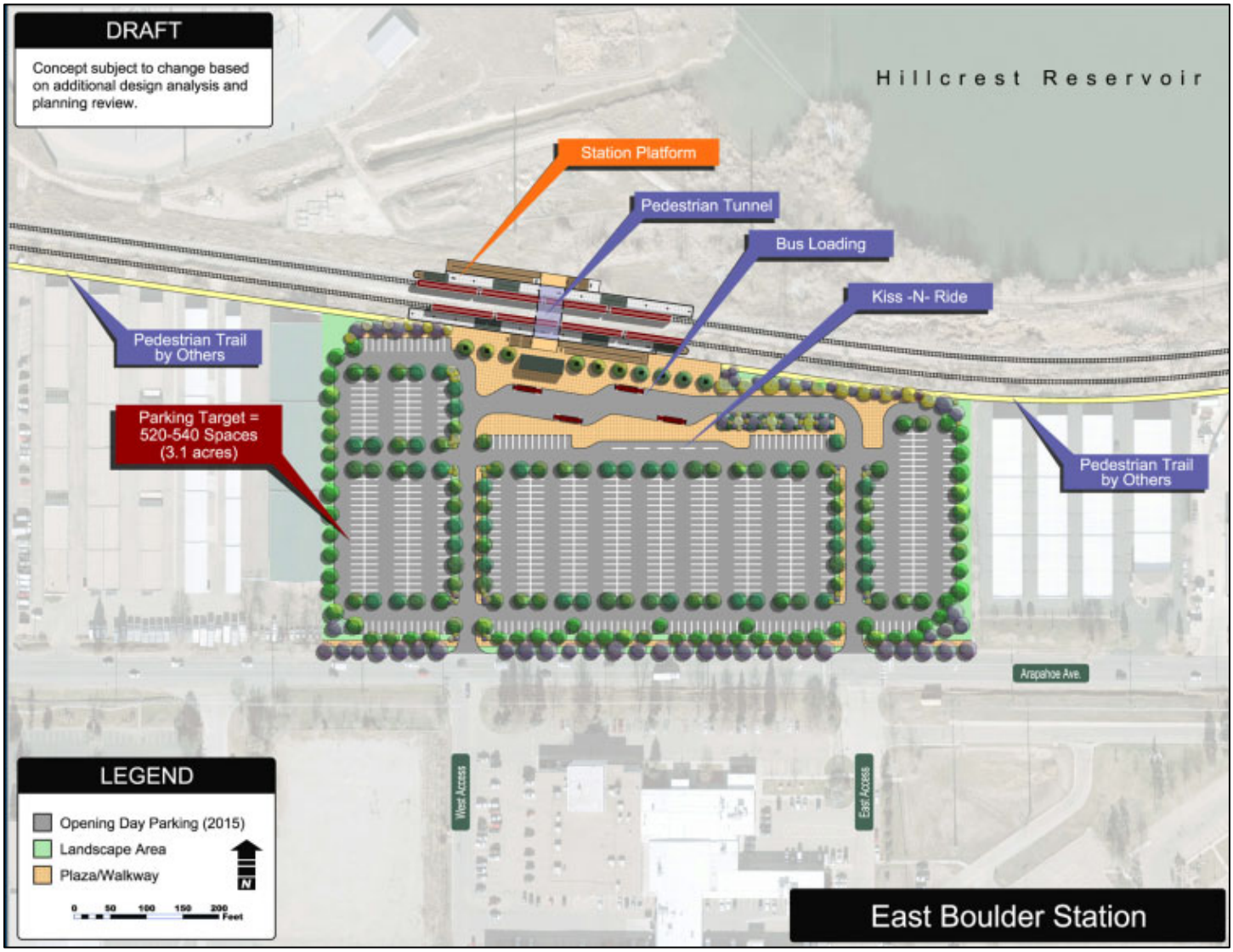
The Downtown Louisville Station is being updated for the 2022 RTD NWR PSS.

Existing Conditions – Proposed Stations

East Boulder Station

The East Boulder Station would be located east of 63rd Street and north of Arapahoe Avenue. The Park-n-Ride would provide 520 parking spaces as well as passenger drop-off and bus loading. Two access points to Arapahoe Avenue would be provided. A pedestrian tunnel would provide access to the northbound rail platform.

Figure 9: East Boulder Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

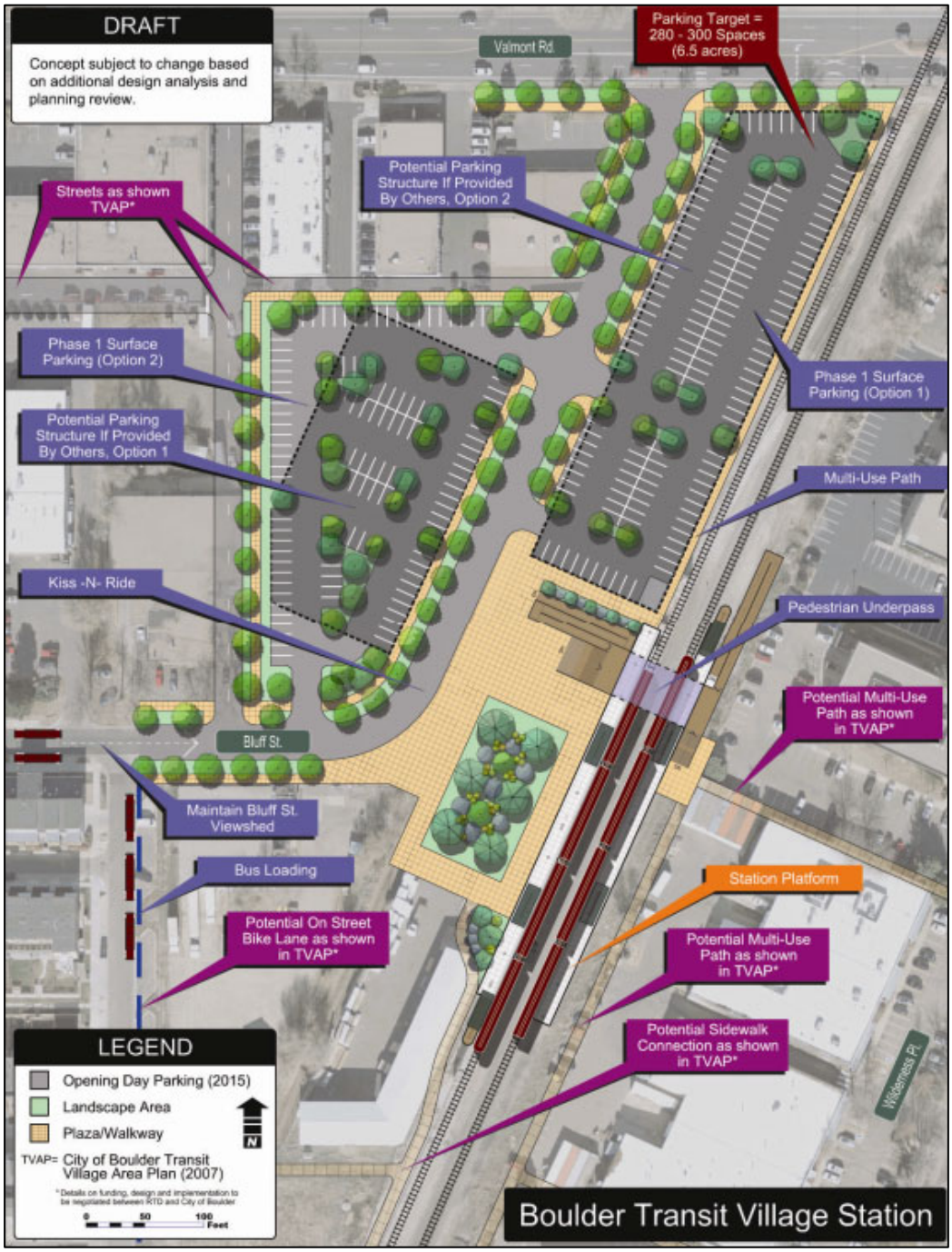
The East Boulder Station is no longer being studied for the 2022 RTD NWR PSS. It could become a future station.

Existing Conditions – Proposed Stations

Boulder Transit Village Station

The Boulder Transit Village Station would be located in central Boulder southeast of the intersection of Valmont Road and 30th Street. Station access would be provided by Bluff Street and 34th Street. The Park-n-Ride would provide 290 parking spaces. The parking area would be provided north and west of the rail platform. A pedestrian underpass would provide access to the commuter rail platforms. Bus loading and unloading and passenger drop-off facilities would be provided at the station.

Figure 10: Boulder Transit Village Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

The Boulder Transit Village Station is now known as the Boulder Junction at Depot Square Station and is being updated for the 2022 RTD NWR PSS.

Existing Conditions – Proposed Stations

Gunbarrel Station

The Gunbarrel Station would be located west of 63rd Street along Lookout Road adjacent to the rail corridor along SH 119. The Park-n-Ride would have 230 parking spaces with access provided to Lookout Road. Bus loading and unloading and passenger drop-off facilities would be provided at the station. A pedestrian bridge would provide access to the southbound rail platform.

Figure 11: Gunbarrel Station Plan from NWR Corridor EE

Source: RTD NWR Corridor EE, 2010

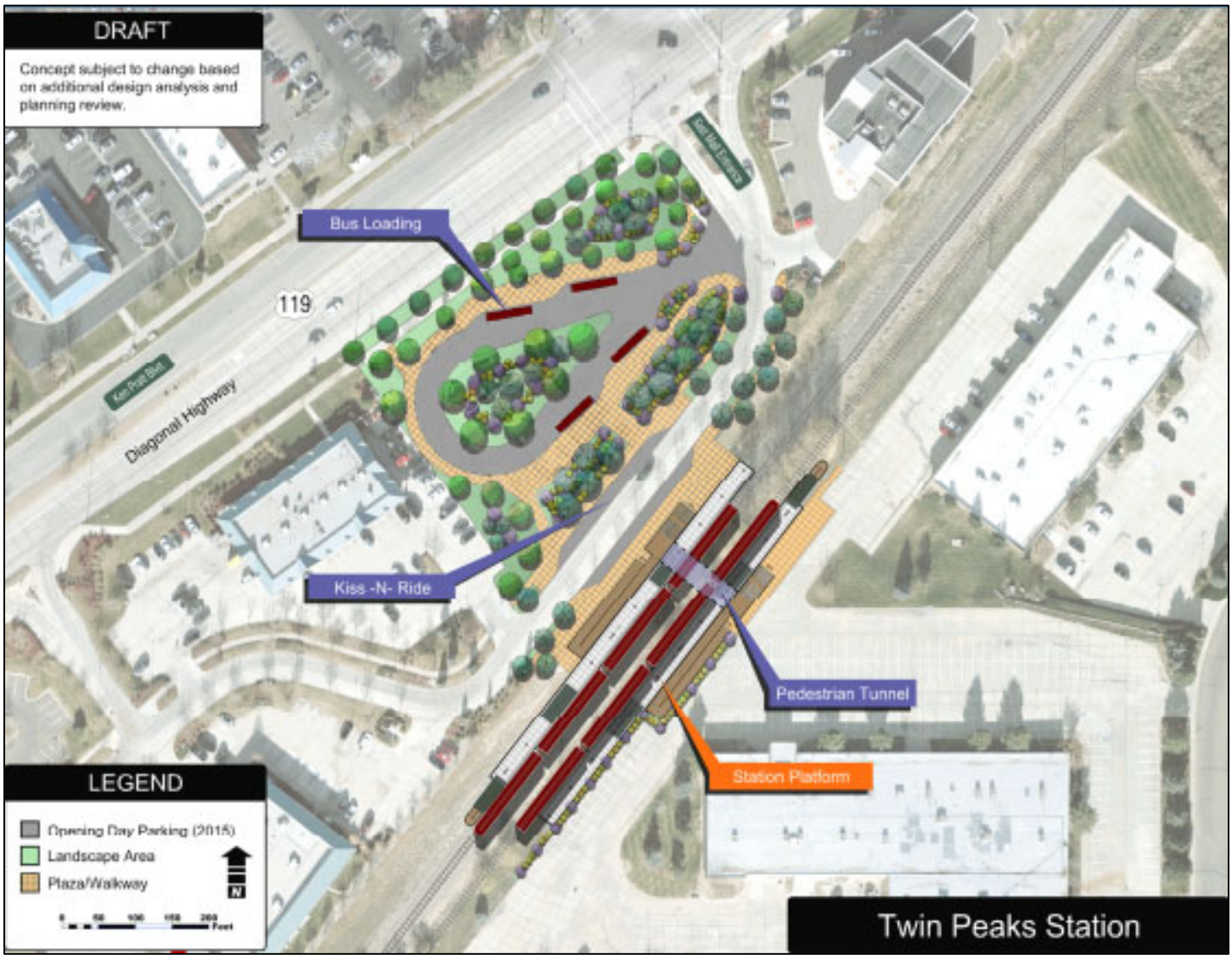
The Gunbarrel Station is no longer being studied for the 2022 RTD NWR PSS. It could become a future station.

Existing Conditions – Proposed Stations

Twin Peaks Station

The Twin Peaks Station would be located between Ken Pratt Boulevard and the rail tracks across from the Twin Peaks Mall in Longmont. New parking would not be constructed at this station; rather 350 spaces are assumed at the Twin Peaks Mall for shared use with the rail station. The parking estimate at this station is based on initial station usage forecasts for the year 2035. The estimated number of spaces may change as the station area is further analyzed. A bus loop and passenger drop-off would be provided adjacent to the rail platform with access provided at the Ken Pratt Boulevard/east mall access intersection. A pedestrian tunnel would be provided to access the northbound rail platform.

Figure 12: Twin Peaks Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

The Twin Peaks Station is no longer being studied for the 2022 RTD NWR PSS. It could become a future station.

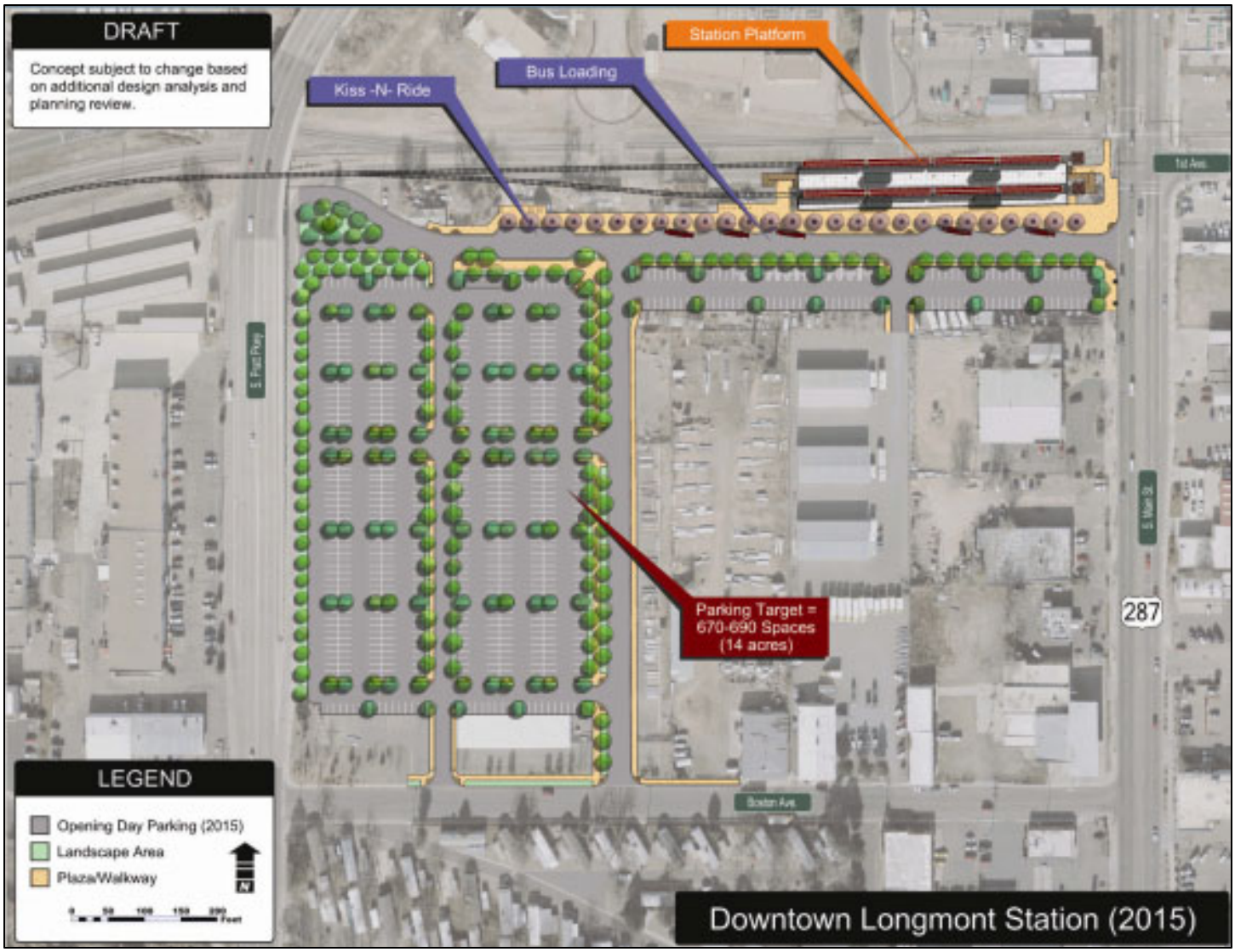
Existing Conditions – Proposed Stations

Downtown Longmont Station

The Downtown Longmont Station would be located between South Pratt Parkway and Main Street (US 287) with access from Boston Avenue and Main Street in downtown Longmont. The Park-n-Ride would provide 590 spaces in 2015 and be expanded to 1,025 spaces in 2035. The rail platform would be located west of the 1st Avenue/Main Street intersection. Bus loading and unloading and passenger drop-off facilities would be provided adjacent to the rail platform. Secondary Park-n-Ride access would be provided to Main Street and South Pratt Parkway.

In addition, the construction of the commuter rail platform would require the closure of 1st Avenue between South Pratt Parkway and Main Street. An access to the station area would be provided just to the south of the Main Street/1st Avenue intersection.

Figure 13: Downtown Longmont Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

The Downtown Longmont Station is being updated for the 2022 RTD NWR PSS.

Existing Conditions – Proposed Stations

2013 Northwest Area Mobility Study

In 2013, RTD conducted the *Northwest Area Mobility Study* (NAMS)[5], a collaborative effort with CDOT, DRCOG, northwest area cities and counties, and the public to develop a prioritized list of mobility improvements for RTD's NWR service area. The study evaluated transit options in the northwest region, including the feasibility of extending RTD's North Metro Rail Line to Longmont, adding new and confirming existing plans for BRT lines, as well as service, operational, construction, and phasing options for a full-service NWR Line with nine stations along the corridor.

The study stated that the NWR Corridor was an original element of the 2004 FasTracks Plan with commuter rail service utilizing the existing BNSF freight corridor between Denver Union Station and Longmont. This element of the NAMS Study evaluated operational/service and construction phasing options along the NWR Line from the existing South Westminster/71st station to Longmont as possible early implementation options. The Westminster/71st Station is the existing end-of-line station constructed as part of the Eagle P3 project that built the A Line to the Airport, G Line to Golden, and this initial segment of the B Line to Boulder. Phasing segments evaluated included Westminster Center/88th Avenue, Church Ranch, Broomfield/116th Avenue, Louisville, Boulder Junction and Downtown Longmont.

The purpose of the study was to evaluate operational/service and construction phasing options. A key assumption in terms of the potential segmenting of NWR commuter service was the need for BNSF to "chamber" freight trains during those times that RTD's commuter trains would be utilizing the corridor. To prevent these "waiting" freight trains from blocking vehicle traffic for significant amounts of time at street crossings, BNSF would require 10,000 feet of track without at-grade highway-rail crossings (unobstructed) to the north of the segment's "end-of-line" station.

The following chambering track criteria were used to determine the location of the track:

- 10,000 feet of unobstructed track
- Double track
- Avoiding grade crossings and/or minimizing the need for grade separations
- Stage freight trains as close to Denver as possible while avoiding impacts to commuter rail operations
- Chambering track would be incorporated into future segments of commuter rail

BNSF's track charts and the previously submitted 30% drawings that BNSF developed in response to the RTD's operating scenario were reviewed to establish end-of-line sketches. Those sketches were utilized to evaluate the feasibility of a particular segment to accommodate an end-of-line station location capable of meeting BNSF's 10,000-foot chambering track requirement.

Construction phasing was evaluated assuming possible phasing to the following locations:

- Westminster Center (88th Avenue)
- Church Ranch
- Broomfield/Flatiron
- Downtown Louisville
- Boulder Junction
- Longmont

[5] 2013 RTD Northwest Area Mobility Study (https://www.rtd-denver.com/sites/default/files/files/2020-07/NAMS-Final-Report-508.pdf)

Existing Conditions – Proposed Stations

Recommended Phasing Segments

The criteria described above to accommodate BNSF to chamber freight trains were applied to the potential phasing locations. This analysis led to the specific identification of recommended phases for more detailed analysis. The following phasing recommendation was approved by the Policy Committee for further analysis:

- Phase 1: 71st Avenue and Lowell Boulevard (current end-of-line station) to Broomfield/116th Avenue.
- Phase 2: Broomfield/116th Avenue to Downtown Louisville.
- Phase 3: Downtown Louisville to Boulder Junction.
- In addition, the study team analyzed the remaining features of the NWR Line from Boulder Junction to the end-of-line in Longmont.

Stations included in Northwest Area Mobility Study

The NAMS project focused on constructing the NWR Line in segments and would construct the associated stations within each of the proposed future segments as they are constructed. The study included a total of 12 stations (including the existing stations at Denver Union Station, 41st Avenue, Pecos Junction, and 71st Avenue/Lowell Boulevard, all of which are already built as part of the initial B Line configuration). The number phasing by segment is shown in **Table 4**.

Table 4: Proposed Station Phasing in NAMS

Proposed Rail Station	Construction Phase
Denver Union Station	Existing
41st Avenue	Existing
Pecos Junction	Existing
71st Avenue and Lowell Boulevard	Existing
Westminster Mall	Phase 1
Church Ranch	Phase 1
116th Avenue/Broomfield	Phase 1
Flatiron	Phase 2
Downtown Louisville	Phase 2
Boulder Junction	Phase 3
Gunbarrel	Future Phase
Downtown Longmont	Future Phase

The study showed that Phases 1 and 2 could be implemented rather easily in terms of being able to make the BNSF allowances work to chamber a freight train north of the end-of-line station in these phases. However, for Phase 3 to Boulder Junction, the 10,000 feet of additional track would extend near SH 119 at Jay Road past the proposed Gunbarrel Station location and require a new grade separation of North 63rd Street to cross over the BNSF tracks and the northbound lanes of SH 119. Station layouts and parking numbers were not updated as part of the NAMS analysis, as this study only focused on the potential implementation of the system.

The study concluded by stating that for the NWR corridor, reasonable phases (or segments) exist for building the NW Rail project at some point in the future. As owner of the corridor and operator of the existing freight rail service in the corridor, BNSF has listed the conditions for their further engagement in regard to allowing for the necessary rail infrastructure construction and agreements that would allow RTD to provide commuter rail service on the BNSF alignment to Longmont at some point in the future.

Considering the costs of the proposed project, RTD's current lack of FasTracks funds, ridership projections, BNSF's conditions, and other challenges within the corridor, the completion of NW Rail was considered to be a long-term goal. RTD and the stakeholders agreed to monitor the various future implementation strategies on

an annual basis, as circumstances affecting costs, ridership, the status of BNSF's freight operations, etc., continue to evolve. This conclusion was reached with RTD and the Northwest Area Stakeholders as part of the Final Consensus Statement, dated May 1, 2014.

2017 Northwest Rail Peak Service Plan

RTD recommended six stations between Westminster and downtown Longmont to support its *NWR Peak Service Plan* (2017). The proposed stations for the NWR Peak Service Plan include: Denver Union Station (already constructed), Westminster/71st Avenue (already constructed), Westminster/88th (Downtown Westminster), Broomfield/116th, Flatiron (partially constructed with BRT and Park-n-Ride services), Downtown Louisville, Boulder Junction, and Downtown Longmont. All stations would include bus drop-off lanes, multimodal connections, and parking areas for Park-n-Rides that serve NWR, bus service, and BRT. In June 2021, RTD confirmed these station locations with local jurisdictions. Similar to NAMS, the *NWR Peak Service Plan* did not update station layouts and parking numbers.

2022 RTD Northwest Rail Peak Service Study

The following stations from the 2017 NWR Peak Service Plan are being evaluated as part of the RTD NWR PSS Downtown Westminster Station, Broomfield/116th Station, Flatiron Station, Downtown Louisville Station, Boulder Junction at Depot Square Station, and Downtown Longmont Station.

RTD is conducting this NWR PSS to better understand how peak period, peak direction commuter rail service would work in the NWR Corridor. RTD Recently completed its Reimagine RTD project to better connect residents throughout the region to be places that they want to go.

Reimagine RTD

RTD is facing many challenges, including dramatic reductions in ridership and funding resulting from the COVID-19 pandemic. Additionally, by 2050, population in the Denver area is expected to grow by approximately 31%, resulting in increased congestion and an even greater need for transportation options. These challenges, combined with the introduction of new technologies and limited options for increasing transportation funding, is driving the need to reimagine RTD by looking at the transit network, services, and business practices to meet the transportation needs of the future. Reimagine RTD identifies strategies to better connect people to the places they want and need to go. Reimagine RTD redefines routes as Core, Connector, or Commuter routes:

- **Core Route**: Routes serving the region's largest employment centers, highest density housing, and major trip generators with a demonstrated demand for a minimum of an 18-hour span of service, 15-minute peak period and midday frequency, and service seven days per week
- **Connector Route**: Local bus routes with a minimum 14-hour span of service (6AM to 8PM)
- **Commuter Route**: Regional bus with limited stop spacing focused on serving a unique travel market (e.g., downtown workforce, Denver International Airport workforce, and travelers)

Each section below discusses what the outcomes from the Reimagine RTD study on the routes that serve that particular station.

Downtown Westminster Station

The Downtown Westminster Station would be located about a half-mile west of Sheridan Boulevard, on the south side of West 88th Avenue at Westminster Boulevard. Previous work in 2010 designated a shared parking lot with 1,055 available spaces that was originally proposed with most of these spaces north of West 88th Avenue. Further, a bus loop and a passenger drop-off area were proposed south of West 88th Avenue adjacent to the rail tracks. These features were proposed to be accessed via the new Westminster Boulevard at West 88th Avenue. Since the original station planning was completed, the Downtown Westminster development has taken many of the proposed surface parking spaces north of West 88th Avenue.

Existing Roadway Network

Highways

The US 36 Denver Boulder Turnpike is located less than one-half mile from the proposed Westminster Station location. At the Sheridan interchange, US 36 is a six-lane highway that includes express toll lanes. There is also an auxiliary lane between the Federal Boulevard and Sheridan Boulevard interchanges. The nearest US 36 entry/exit from the proposed Westminster station is at Sheridan Boulevard, as shown in **Figure 14**.

Figure 14: US 36 Relative to Proposed Downtown Westminster Station

Interchanges

US 36 at Sheridan Boulevard is a four-leg diamond interchange where Sheridan Boulevard overpasses US 36 about one-half mile east from the proposed station location. US 36 eastbound or westbound vehicular travelers would utilize this interchange to access the proposed station location, as shown in **Figure 15**.

Existing Conditions – Proposed Stations

Figure 15: US 36 at Sheridan Boulevard Interchange

Arterials

West 88th Avenue

- Two eastbound and three westbound through lanes, 40 mph speed limit.
- Signalized intersections with dedicated turn lanes at Harlan Street and Westminster Boulevard Access.
- At-grade rail crossing west of the Harlan Street/West 88th Avenue intersection, which has active warning devices including gates and flashing lights. Concrete medians separate traffic directions at this

crossing. Passive warning devices are also present including pavement warnings and crossbucks. This crossing is now signed as a quiet zone.

Sheridan Boulevard

- Up to three southbound and up to three northbound through lanes, 45 mph speed limit.
- Signalized intersections at the junction of Sheridan Boulevard and US 36 on/off ramps.
- Dedicated turn lanes between Sheridan Boulevard and US 36 on/off ramps.
- Dedicated turn lane between Sheridan Boulevard and West 88th Avenue.

Right-of-Way

The identified primary station area (orange triangle) is located in Jefferson County and encompasses privately owned commercial property (see **Figure 16**). It is bordered by West 88th Avenue to the north, the BNSF Railway right-of-way to the south and the privately owned commercial property to the east. South of the station area, across the BNSF railway right-of-way in the City of Arvada, is privately owned residential homes and right-of-way.

Figure 16: Downtown Westminster Station area from 2010 NWR Corridor EE

Source: https://gis.jeffco.us/webmaps/aspin/index.html

Station Access

Three potential points of entry for the Westminster station area have been previously proposed:

- West 88th Avenue at Harlan Street would be the entry/exit intersection for a potential bus loop.
- West 88th Avenue at Westminster Boulevard Access would be the entry/exit point for the primary station area and station platform. This access would accommodate automobiles, bicycles, pedestrians, and microtransit. This is a signalized intersection with a dedicated right turn from West 88th Avenue to Westminster Boulevard.
- Pedestrian Bridge Over West 88th Avenue, connecting to a secondary parking area on the north side of W 88th Ave was proposed in past NWR planning. It is not yet determined whether the pedestrian bridge

and parking area on the north side of West 88th Avenue will be included in the Peak Service conceptual station area design.

Major Utilities

Detailed utility information will be provided in the conceptual station design phase of this study. Preliminary desktop analysis has not revealed existing major utilities such as utility poles or overhead utilities in the vicinity of the existing track and proposed primary station area.

Existing Transit Service

Bus Routes Serving Station

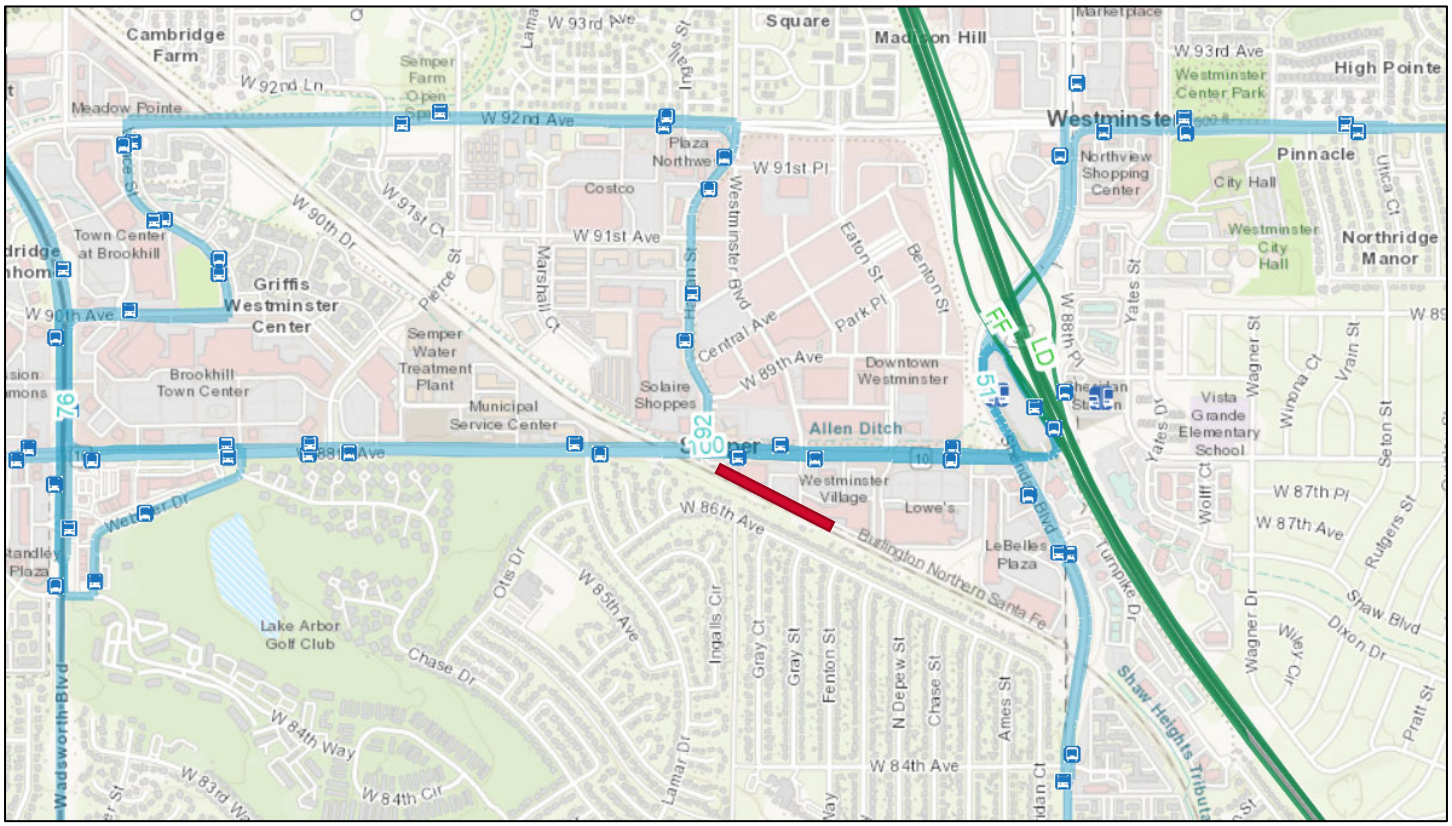
The Downtown Westminster Station would be located on the south side of the street at West 88th Avenue and Westminster Boulevard, approximately one-half mile west of the RTD US 36 & Sheridan Bus Station. The existing station serving US 36 commuters has 1,310 parking spaces (mostly on the east side of US 36 within a parking structure). The Park-n-Ride provides service to the FF1, FF3, and FF5 routes, and provides connections to Routes 51, 92, and 100. See **Figure 17** for existing bus routes serving the proposed Downtown Westminster Station area.

- **Route 51: Sheridan Boulevard** – Route 51 operates north-south service along Sheridan Boulevard. The route provides 30-minute service throughout the day (with hourly service for evening hours).
- **Route 92: 92nd Avenue** – Route 92 operates east-west service generally along West 88th Avenue and 92nd Avenue. The route provides 30-minute service throughout the day (with hourly service for early morning and evening hours).
- **Route 100: Kipling Street** – Route 100 operates north-south service generally along Kipling Street (and terminating at the RTD US 36 & Sheridan Bus Station, where it operates along West 88th Avenue). The route provides hourly service between 5:00 AM and 6:00 PM.

All three routes could likely be re-routed to serve both the existing RTD US 36 & Sheridan Bus Station and the proposed Downtown Westminster Station, although likely only Routes 92 and 100 would serve the proposed rail station.

Existing Conditions – Proposed Stations

Figure 17: Bus Routes Serving Downtown Westminster Station



Source: RTD Interactive System Map (accessed September 1, 2022) (https://www.rtd-denver.com/rider-info/system-map)

Transit Service Levels

As described above, Routes 51 and 92 currently operate at 30-minute frequencies throughout the day and Route 100 operates hourly throughout the day. Under the Reimagine RTD plan, Route 51: Sheridan Boulevard is classified as a core route and would operate at 15-minute frequencies throughout the day and 30-minute frequencies during evening and late evening hours. Route 92: 92nd Avenue is classified as a connector route and would operate at 30-minute frequencies throughout the day and 60-minute frequencies during evening and late evening hours. Route 100: Kipling Street is also classified as a connector route and would operate hourly service north of the Arvada Ridge Station on the G Line throughout the day.

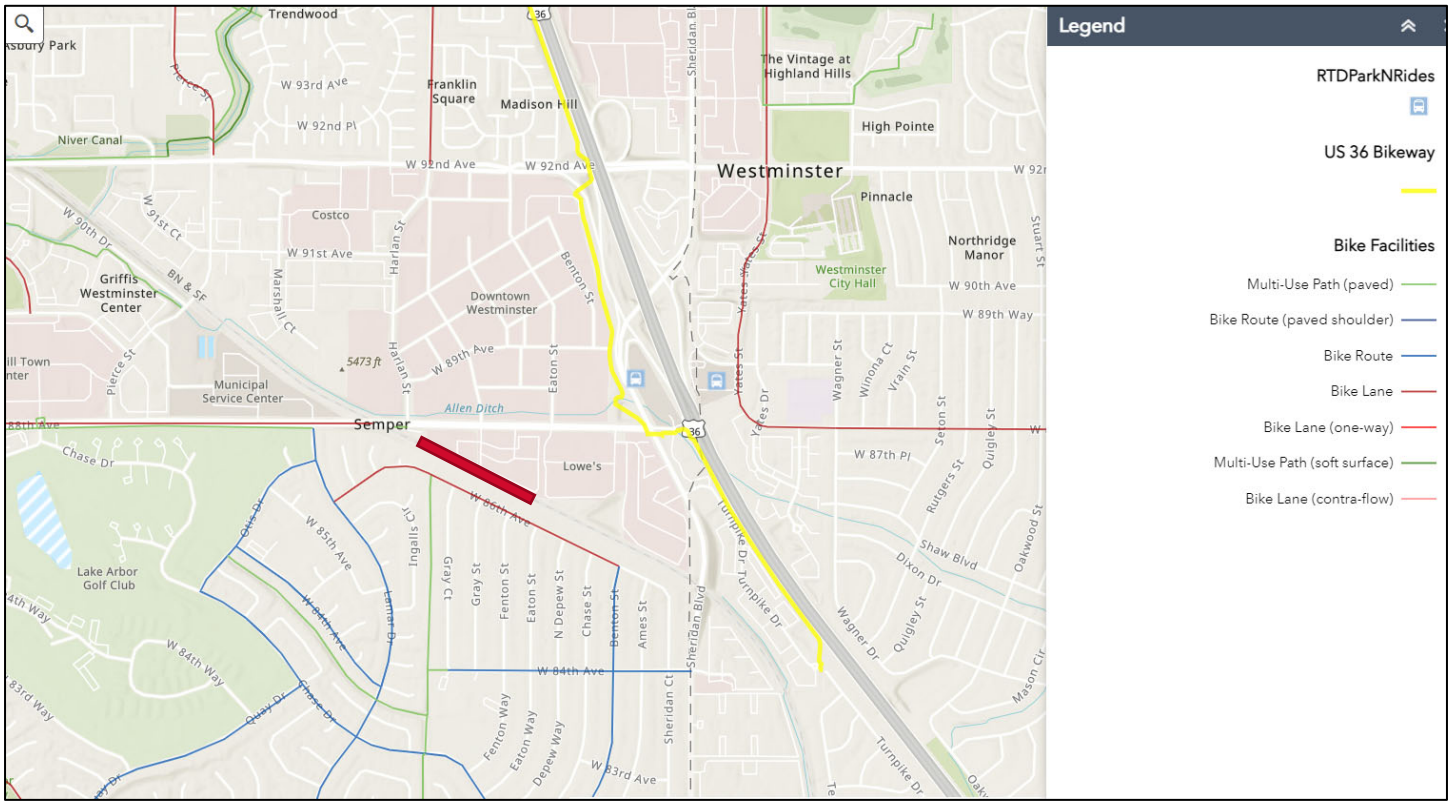
Existing Bicycle and Pedestrian Facilities

The US 36 Bikeway begins just south of West 88th Avenue at Turnpike Drive. South of the US 36 Bikeway, the bike route connects to other routes which lead to downtown Denver. North of this location, the US 36 Bikeway provides a direct route all the way to the Table Mesa Park-n-Ride in Boulder. The City of Westminster is also constructing an underpass under Sheridan Boulevard to provide a bicycle and pedestrian connection between the Downtown Westminster development and the RTD US 36 & Sheridan Bus Station. Along West 88th Avenue, there are lanes from just west of Harlan Street on the east to Wadsworth in both directions. Bike lanes have recently been added to Harlan Street between West 88th Avenue and West 92nd Avenue where it connects with Westminster Boulevard. The bike lanes continue along Westminster Boulevard to just north of 98th Avenue where they connect to multi-use paths through the Hyland Ponds Open Space. See **Figure 18** for the bicycle routes around the proposed Downtown Westminster Station. The *City of Westminster Transportation and Mobility Plan* (August 2021) shows planned upgrades to the bike lanes along West 88th Avenue and West 92nd Avenue, as well as bike lanes being implemented in the Downtown Westminster Development. All of these

upgrades have taken place except for the proposed upgrades along West 88th Avenue between Harlan Street and Sheridan Boulevard.

There are sidewalks on both sides of West 88th Avenue, Harlan Street, Westminster Boulevard, and other roadways within the Downtown Westminster development. There are also sidewalks along Sheridan Boulevard in the area surrounding the RTD US 36 & Sheridan Bus Station. There is also a pedestrian overpass for transit users (and others) that connects both sides of US 36. Finally, there is a vacant lot along 86th Avenue that could be used to provide a connection to the proposed station for residents in the neighborhood south of the existing rail line. There is a footpath through this area, and it would align with the proposed station platform as well. Sidewalk improvements are proposed along West 88th Avenue as part of the *City of Westminster Transportation and Mobility Plan.*

Figure 18: Bicycle Facilities near Proposed Downtown Westminster Station



Source: US 36 Commuting Solutions Bike Northwest Interactive Map (https://commutingsolutions.org/commuting-by-bike/us-36-bike-map/)

Existing and Future Land Use

Existing Land Use

In 2009, the City of Westminster began the process to transform the Westminster Mall, an auto-oriented shopping mall, into a mixed-use urban downtown. The result of this process is a long-term development vision that will guide the redevelopment of this 105-acre site into an urban center.

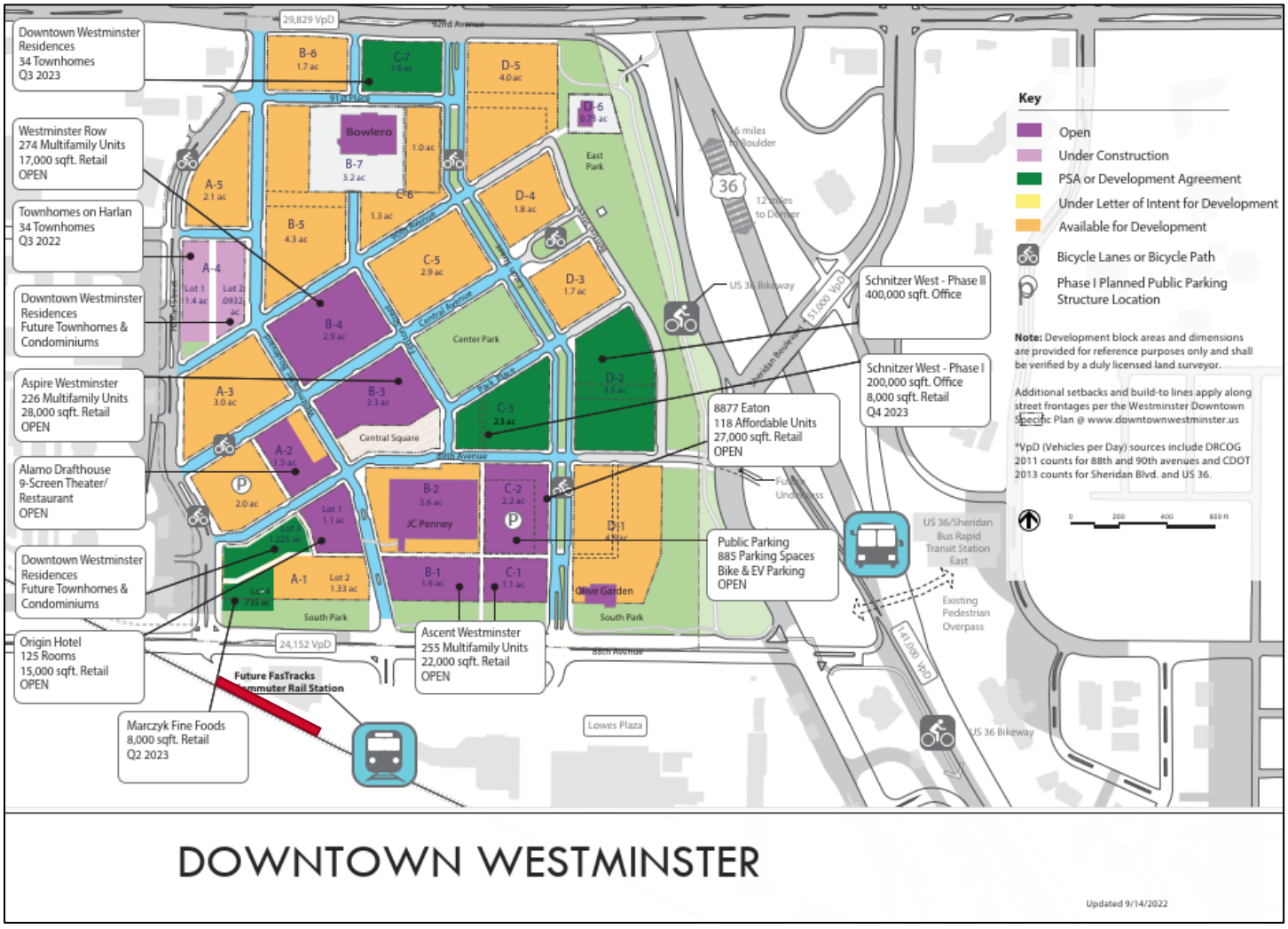
In 2013, the City approved the *Downtown Westminster Framework Plan*. This initial framework plan set forth a framework of streets, public spaces, and land use that has served as the basis for the *Downtown Specific Plan* approved on November 14, 2014 (and updated September 28, 2015).

The Westminster *Downtown Specific Plan* then intended to realize the vision of a high-density, urban-scale, mixed-use development that will be a regional and community-wide center of economic, cultural, and social

activity. Once complete, the 105-acre site will encompass over 2 million square feet of office space; 750,000 square feet of retail, entertainment, and dining; 2,300 residential apartments, condominiums, and townhomes; 300 hotel rooms; and 18 acres of parks and public spaces. To date, about 875 apartment units, 130 hotel rooms, and several retail, entertainment, and restaurants have opened.

The City of Westminster is connecting the Downtown Westminster development to the RTD US 36 & Sheridan Bus Station via a multimodal underpass under Sheridan Boulevard (under construction in 2022). The proposed Downtown Westminster Station (rail) would be built south of West 88th Avenue at Westminster Boulevard in an area that the city is calling the Downtown Expansion Area. Future redevelopment in this area could include office, mixed-use retail, and residential. **Figure 19** shows the planned Downtown Westminster Station site and its relationship to the downtown Westminster development.

Figure 19: Downtown Westminster Development at Potential Downtown Westminster Station



Note: Areas already constructed are shown in purple.
Source: Downtown Westminster Marketing Sheet (https://www.downtownwestminster.us/wp-content/uploads/2022/09/DTW-Marketing-Sheet_14_sept_2022.pdf), September 14, 2022.

Existing Site Constraints

When the major station planning effort was completed as part of the *2010 Northwest Rail Corridor Environmental Evaluation* the project team assumed about seven acres of land at the Westminster Mall could

be used for transit parking. With the redevelopment of the mall starting on the south side of the development along West 88th Avenue, this once available surface parking area has been partially developed, and much of the remaining nearby parking is dedicated for hotel guests and short-term parking for the Downtown Westminster Development.

Adjacent Land Ownership

The City of Westminster controls the entire 105-acre former Westminster Mall site and there have been zoning changes made to ensure that the development of the property occurs within parameters set forth in the *Downtown Specific Plan*. South of West 88th Avenue adjacent to the proposed station platform, there are several property owners where the station would likely be focused. **Table 5** shows the property owners for the previously planned Downtown Westminster Station.

Table 5: Property Ownership at Proposed Downtown Westminster Station

Parcel ID	Acres	Address	Owner
29-252-00-002	0.35	6010 West 88th Avenue, Westminster CO 80031	One LC LLC
29-251-12-004	3.00	5880 West 88th Avenue, Westminster CO 80031	5880 W 88th Avenue LLC

Source: Jefferson County Planning and Zoning interactive map (https://gis.jeffco.us/webmaps/pzpublic/index.html)

Future Development

The 2040 City of Westminster Comprehensive Plan calls the area south of West 88th Avenue part of the Downtown Westminster Vicinity Transition Area. In this area, Downtown Westminster Station is planned south of West 88th Avenue at Westminster Boulevard. The Downtown Westminster Focus Area and portions of the Vicinity Transition Area to the west of US 36 are located within a 10-minute walk of the planned station. The plan notes that the pace of build out of the Downtown Westminster development and the timing of RTD's extension of commuter rail service will be determining factors for land use changes in these areas. Premature land use changes could undermine the integrity of the immense public investments in Downtown Westminster, while thoughtful extensions of Downtown Westminster to the south and west would complement the buildout of Downtown Westminster and support the proposed Downtown Westminster Station with transit-oriented development.

In meetings with the City of Westminster and the City of Arvada in October 2022, both communities expressed interest in a connection to the station for Arvada residents just south of the proposed station site. Additionally, there may be opportunities to connect residents in both communities with RTD Flex Route service for Peak Period Service.

Broomfield/116th Station

The Broomfield/116th Station would be located on 116th Avenue between Old Wadsworth Boulevard and Main Street. In the 2010 EE, parking was planned on both the east and west sides of the rail station. The parking area on the west side would provide the majority of the 350 total spaces. This parking area would be accessed from Wadsworth Boulevard north of 116th Avenue. The remainder of the parking would be on the east side of the platform, with access from 116th Avenue and 116th Place via 120th Avenue or Main Street. A bus loop and passenger drop-off area was planned in the west-side parking area with access from Wadsworth Boulevard at 116th Avenue. A pedestrian tunnel was also planned to provide access to the rail platforms from both parking areas.

Existing Roadway Network

Highways

The US 36 Denver Boulder Turnpike is located less than one-half mile to the west from the proposed Broomfield/116th Station. US 36 is a 65-mph speed limit, six-lane freeway that includes managed (toll) lanes which is also used by the Flatiron Flyer BRT lines. The nearest US 36 entry/exit points from the proposed Broomfield/116th Station are Wadsworth Parkway and West 120th Avenue/US 287.

SH 128 is located less than one-half mile from the proposed Broomfield/116th Station location. SH 128 is a 40 mph speed limit, six-lane state highway which overpasses US 36 and underpasses the existing rail line north of the proposed Broomfield/116th Station. See **Figure 20** for an illustration of highway network near the proposed Broomfield/116th Station.

Existing Conditions – Proposed Stations

Figure 20: US 36 and SH 128 Relative to Proposed Broomfield/116th Station

Interchanges

US 36 at Wadsworth Parkway/US 287 (see **Figure 21**) are within one mile of the proposed Broomfield/116th Station. This interchange would be utilized by Broomfield/116th Station users traveling by automobile along US 36 eastbound or US 287 southbound. These would also be utilized by departing Broomfield/116th Station automobile travelers who need to access US 36 westbound or US 287 northbound.

Existing Conditions – Proposed Stations

Figure 21: US 36 at Wadsworth Parkway/US 287 Interchange

US 287 (West 120th Avenue) at SH 128 (**Figure 22**) is a two-leg signalized intersection less than one-half mile north of the proposed Broomfield/116th Station area. Vehicular traffic between this intersection and the Broomfield/116th Station area would utilize Main Street to and from West 116th Place or West 116th Avenue.

Existing Conditions – Proposed Stations

Figure 22: US 287 and SH 128 Intersection

Arterials

US 287/West 120th Avenue

- Four-lane east-west arterial, 35 mph speed limit.
- Dedicated turn lanes and signalized intersections.

Wadsworth Parkway

- Four-lane north-south arterial, 45 mph speed limit.
- Dedicated turn lanes and signalized intersections

Main Street

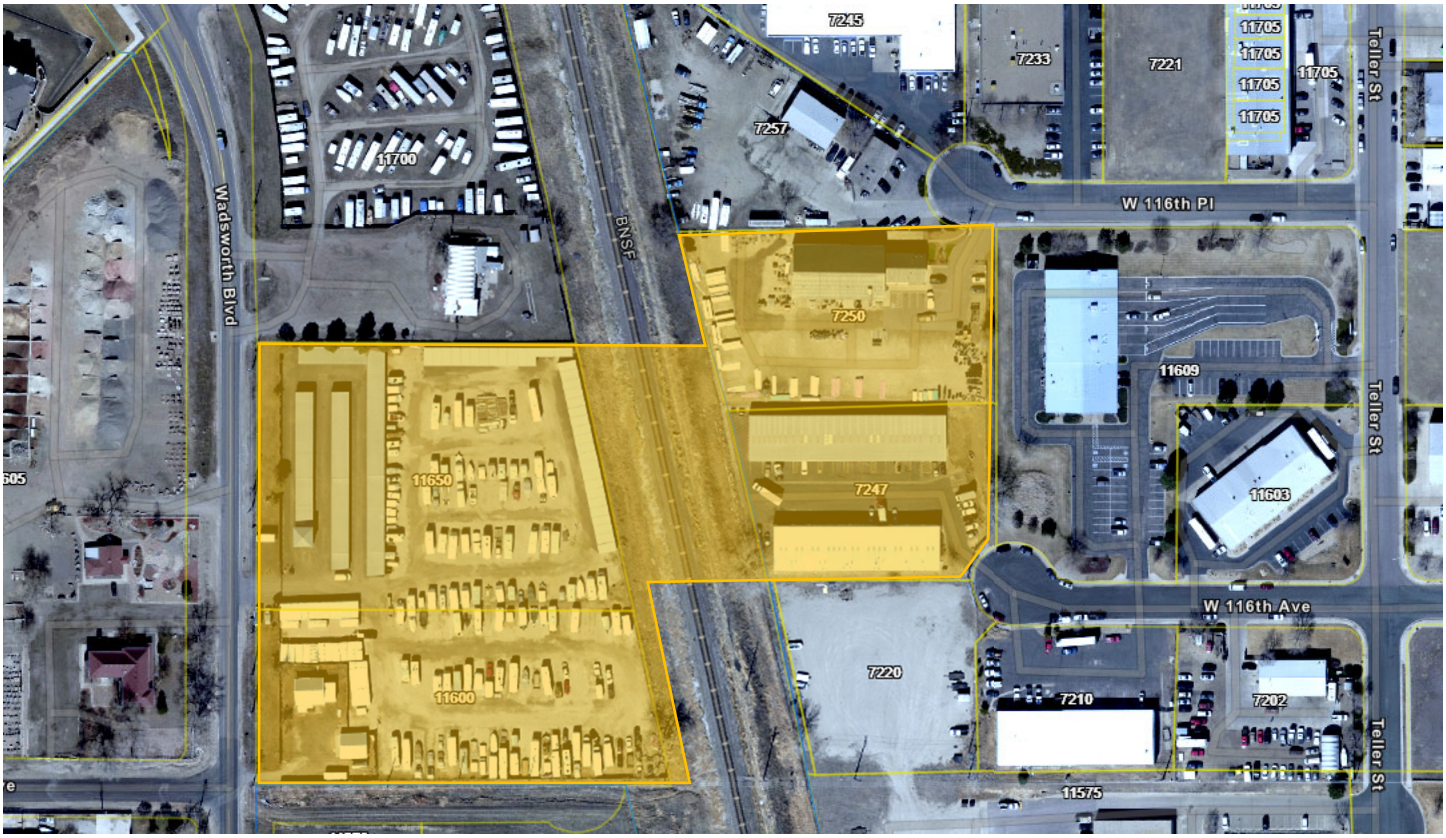
- Up to three-lane north-south arterial, 35 mph speed limit.
- Dedicated turn lanes and signalized intersections.
- Signalized intersection with West 116th Avenue, which provides access to Broomfield/116th Station area and platform.

Existing Conditions – Proposed Stations

Right-of-Way

The previously identified Broomfield/116th Station area (orange shape) is in Broomfield County and encompasses privately owned commercial properties, as shown on **Figure 23**. It is bordered by BNSF Railway right-of-way to the west and the privately owned commercial property to the north, east and south.

Figure 23: Broomfield/116th Station area from 2010 NWR Corridor EE



Source: https://www.broomfield.org/2739/Parcel-Search

Station Access

Three points of entry for the Broomfield station area have been previously proposed.

- West 116th Avenue would serve as entry/exit to access the primary parking area and station platform.
- West 116th Place would serve as an alternate entry/exit to the primary station parking area and station platform.
- A dedicated bus loop and parking area via Wadsworth Boulevard has been previously proposed, along with a pedestrian tunnel which would run beneath the railroad right-of-way and connect to the primary station area and platform.

Major Utilities

Detailed utility information will be provided in the conceptual station design phase of this study. Preliminary desktop analysis has revealed presence of utility poles and overhead utilities in the vicinity of the existing track and proposed station area as seen below in **Figure 24**.

Figure 24: Power Lines Looking Toward BNSF Railway Tracks at West 116th Avenue Cul-de-Sac

Existing Transit Service

Bus Routes Serving Station

The Broomfield/116th Station would be located on the west side of the BNSF rail line at about 116th Avenue and Wadsworth Boulevard, approximately a quarter-mile east of the US 36 & Arista/1st Bank Broomfield Event Center Station. This existing station has a shared use parking structure with 940 parking spaces within the Arista development. The parking structure is located west of US 36, about a half mile from the proposed Broomfield/116th Rail Station. See **Figure 25** for existing bus routes serving the proposed Broomfield/116th Avenue area.

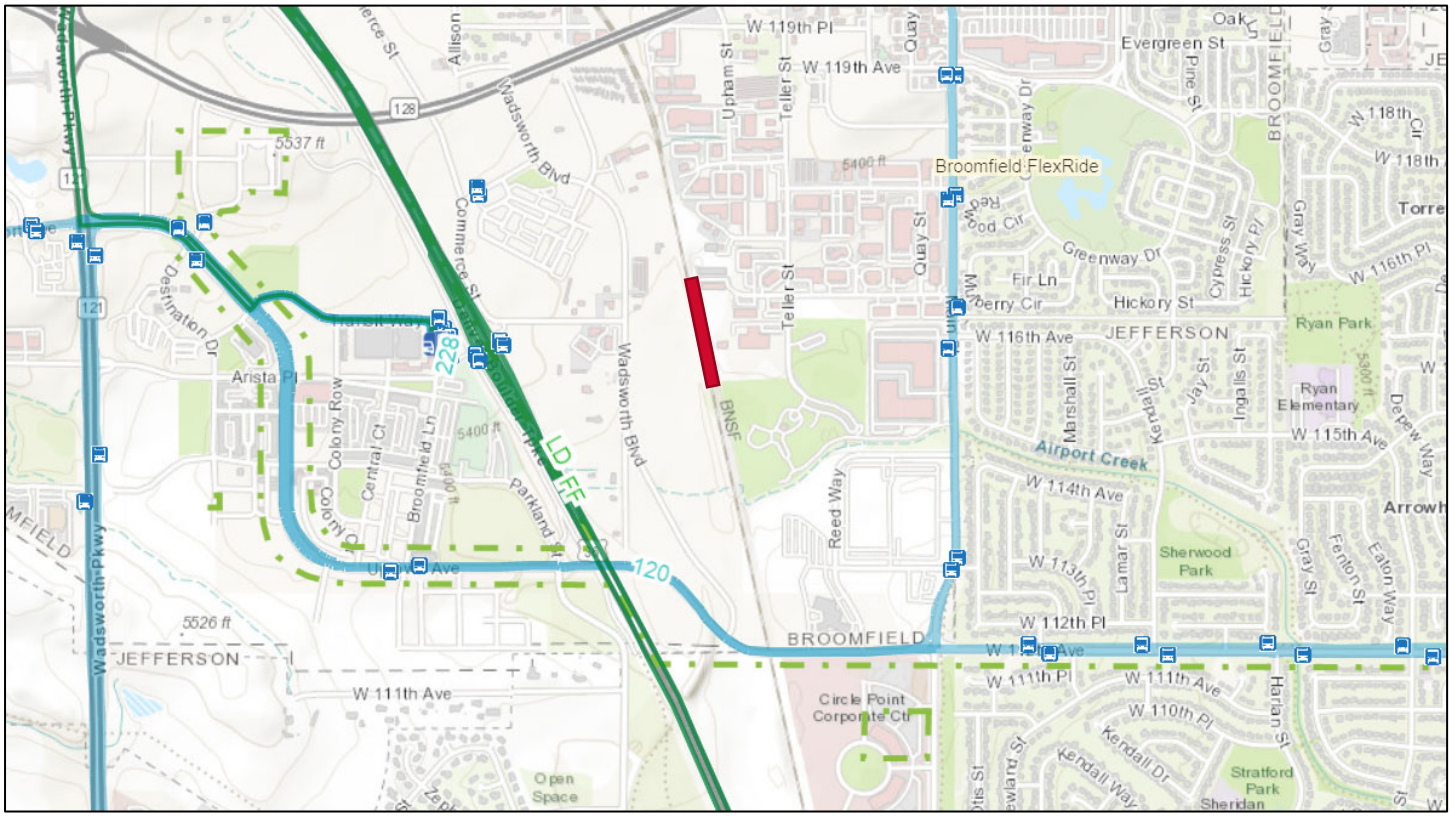
- **Route 112: West 112th Avenue** – Route 112 operates east-west service generally along 112th Avenue between the US 36 & Broomfield Station and the Northglenn/112th Avenue Station on the N Line. The route provides hourly service between 8:00 AM and 7:00 PM.
- **Route 120: 120th Avenue** – Route 120 operates east-west service generally along 120th Avenue between the US 36 & Broomfield Station and the Eastlake/124th Avenue Station on the N Line. The route provides 30-minute service throughout the day (with hourly service for early morning and evening hours).
- **Route LD: Longmont/Denver** – There are three patterns of the Longmont to Denver route, but in general the route operates along US 287 from Longmont to Broomfield where it uses US 36 to downtown Denver. The route provides 30-minute peak direction service during peak periods with service every two hours between 8:00 AM and 10:00 PM.
- **Broomfield FlexRide** – The Broomfield FlexRide serves the City and County of Broomfield with scheduled hourly departures from the Broomfield/116th Station from 6:00 AM to 6:00 PM. Overall the service operates from 5:30 AM to 7:00 PM.

Existing Conditions – Proposed Stations

- **Interlocken/Westmoor FlexRide** – The Interlocken/Westmoor Flexride serves portions of the City of Westminster, Flatiron Crossing, and areas of Interlocken and Westmoor Technology Park with scheduled hourly departures from the Broomfield/116th Station from 6:00 AM to 6:00 PM. Overall the service operates from 5:30 AM to 7:00 PM.

Both routes could likely be re-routed to serve both the existing US 36 & Broomfield RTD Bus Station and the proposed Broomfield/116th Avenue Rail Station. It should be noted that Route 228 also makes select trips to this station, but most trips terminate at the Flatiron Station. This route would not be extended to the proposed rail station. Additionally, Route 76: Wadsworth Boulevard and Route LD3: Longmont/Broomfield also serves the US 36 & Broomfield Station (bus).

Figure 25: Bus Routes Serving Broomfield 116th Station



Source: RTD Interactive System Map (accessed September 1, 2022) (https://www.rtd-denver.com/rider-info/system-map)

Transit Service Levels

As described above, Route 112 currently operates at 60-minute frequencies and Route 120 operates 30-minute frequencies throughout the day. Under the Reimagine RTD plan, Route 112: West 112th Avenue is classified as a Connector Route and would continue to operate at 60-minute frequencies throughout the day and evening hours. Route 120: 120th Avenue is also classified as a Connector Route and would continue to operate at 30-minute frequencies during peak periods and 60-minute frequencies during the rest of the day. The flex routes would likely remain unchanged.

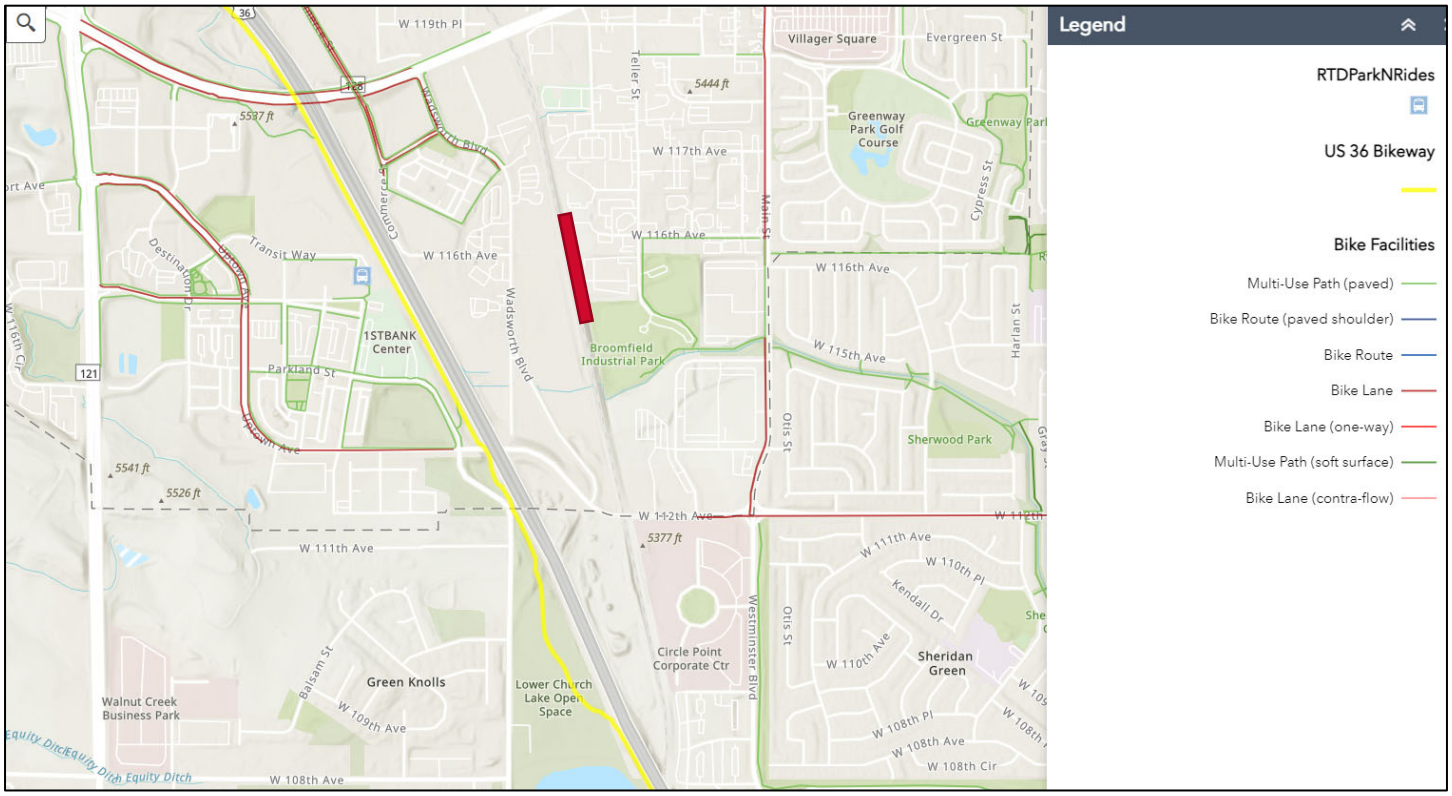
Existing Bicycle and Pedestrian Facilities

The US 36 Bikeway travels along the south side of US 36 near the Broomfield Event Center and the Arista Development. The bike route extends south to Westminster and north to the Table Mesa Park-n-Ride in Boulder. Uptown Avenue and Parkland Street in the Arista development south of US 36 have bike lanes in both directions. Other roadways through the development have multi-use paths along the roads. Nearer to the

proposed rail station, there are bike lanes on 112th Avenue east of the rail line, Main Street, and along the southern portion of Wadsworth Boulevard. However, there are no bike lanes for a stretch as there is a significant amount of construction in the area. Bike lanes do pick back up near the Harvest Station Apartments near Wadsworth Boulevard and Colmans Way. Bike lanes will be completed along this stretch of Wadsworth Boulevard as developments are completed. See **Figure 26** for the bicycle routes around the proposed Broomfield/116th Station.

There are sidewalks on both sides of the northern portion of Wadsworth Boulevard where development has already occurred near the proposed station and throughout the Arista Development south of US 36. East of the rail line in the Broomfield Industrial Park, there are generally sidewalks on both sides of the street, especially near the Broomfield Industrial Park Sports Complex. There is also a pedestrian overpass for transit users (and others) that connects both sides of US 36. The side streets north of US 36 and west of Wadsworth Boulevard do not have sidewalks.

Figure 26: Bicycle Facilities near Proposed Broomfield/116th Station



Source: US 36 Commuting Solutions Bike Northwest Interactive Map (https://commutingsolutions.org/commuting-by-bike/us-36-bike-map/)

The City and County of Broomfield also has several trail projects in the planning stages in the area around the proposed station. This includes a route along Airport Creek.

Existing and Future Land Use

Existing Land Use

Over the past few years, several new developments have been completed or are underway near the Broomfield/116th Station area, as this area was included as the Original Broomfield area in the *2016 Broomfield Comprehensive Plan and Transportation Plan*. In the plan, the land use is proposed to support TOD in this area. Northeast of the proposed station site, the Harvest Station Apartment community was completed in

2014. Additionally, the 352-unit, 10-building Wadsworth Station Apartment complex broke ground in 2022 (see **Figure 27**).

Further out, a new 8th to 12th grade charter school (Jefferson Academy) is located east of the rail line on the north side of 112th Avenue, and senior housing and affordable housing is also under review north of the Harvest Station Apartments. West of US 36, the Arista Development and adjacent 1st Bank Center development now has 1,600 of the proposed 3,000 multi-family units at buildout. Additionally, the area is projected to have 1.85 million square feet of commercial development (of which about half has been constructed). See recent station area developments around the proposed Broomfield/116th Station in **Figure 28**.

Figure 27: New Development between Wadsworth Boulevard and the BNSF Rail line

Existing Conditions – Proposed Stations

Figure 28: Recent Development near Potential Broomfield/116th Station

Existing Site Constraints

The Broomfield/116th Station was proposed to have 350 parking spaces in the *2010 NWR Corridor EE*. However, all of the land that was previously proposed for the parking facility on the east side of the railroad tracks has been developed, but the storage facility remains on the west side of the tracks. While there is no land owned by the City and County of Broomfield or RTD dedicated for parking at the proposed station site, there appears to be some smaller undeveloped parcels (or portions of parcels) that could be used for parking on both sides of the rail line, but there may not be sufficient land for the 350 parking spaces that were previously planned.

Adjacent Land Ownership

As noted above, none of the adjacent properties are owned by the City and County of Broomfield or RTD. Some smaller parcels could potentially be purchased, but those parcels may not align well with the station platform, depending on the size of parcels that are required for parking. **Table 6** shows the property owners for the previously planned Broomfield/116th Station.

Existing Conditions – Proposed Stations

Table 6: Property Ownership at Proposed Broomfield/116th Station

Parcel Number	Acres	Address	Owner
171702100014	2.70	11650 Wadsworth Boulevard, Broomfield CO 80021	Wadsworth Self Storage
171702100015	1.99	11600 Wadsworth Boulevard, Broomfield CO 80021	Wadsworth Self Storage
171702118019	1.52	7250 W 116th Place, Broomfield CO 80021	Solsbury Hill Land Company LLC
171702118014	1.25	7247 W 116th Avenue, Broomfield CO 80021	Wilson Investments GC LLC

Source: City and County of Broomfield interactive parcel map (https://www.broomfield.org/2739/Parcel-Search)

Future Development

As described above, there is a significant amount of new development that has recently occurred or is planned around the proposed Broomfield/116th Station area.

- Just north of the Broomfield/116th Station on the Ewing Landscape Materials site west of Wadsworth Boulevard, the proposed 120-unit Broomfield Station Apartments site development plan is currently under review by the City and County of Broomfield Planning Department.
- The land parcel bound by West 120th Avenue on the north, Commerce Street on the west, Wadsworth Boulevard on the east, and West 118th Avenue on the south is proposed as Harvest Station Affordable Housing. This is proposed as a 152-unit apartment complex that will be offered between 30-60% area median income (AMI). The building will have a mix of one-, two-, and three-bedroom units, ranging in size from 600 square feet to 1,200 square feet.
- The land parcel bound by West 120th Avenue on the north, Wadsworth Boulevard on the south and west, and Colmans Way on the east is proposed as senior housing. The Olivia at Harvest Station proposes two senior, independent living apartment buildings with on-site parking and a public park. The six-story building on the north portion of the site will house 160 senior housing units, ranging in size from 750 square-feet for a one-bedroom, to 1,250 square-feet for a two-bedroom unit. The second building is proposed as a three-story apartment building to be located at the southeastern portion of the site. That three-story 60,000 square-foot building is proposed for 72 units that will be offered at 40%-80% AMI.
- On the west side of Wadsworth Boulevard across from the Wadsworth Station Apartments there is a planned multi-family development proposed to have 227 unites called Wadsworth Junction. Plans show a combination of 1-, 2- and 3-bedroom units located within three apartment buildings. Buildings 1 and 2 are proposed to be five stories in height and Building 3 is planned to be four stories.

Flatiron Station

The Flatiron Station would be located adjacent to the existing Flatiron US 36 BRT Station. The station platform would be located across Midway Boulevard northeast of the parking area. The existing Park-n-Ride provides 264 spaces on the east side of US 36. The rail station would use the existing passenger drop-off and bus loop facilities, with added bus access on Midway Boulevard. As proposed in 2010, a pedestrian bridge would provide access to the northbound rail platform.

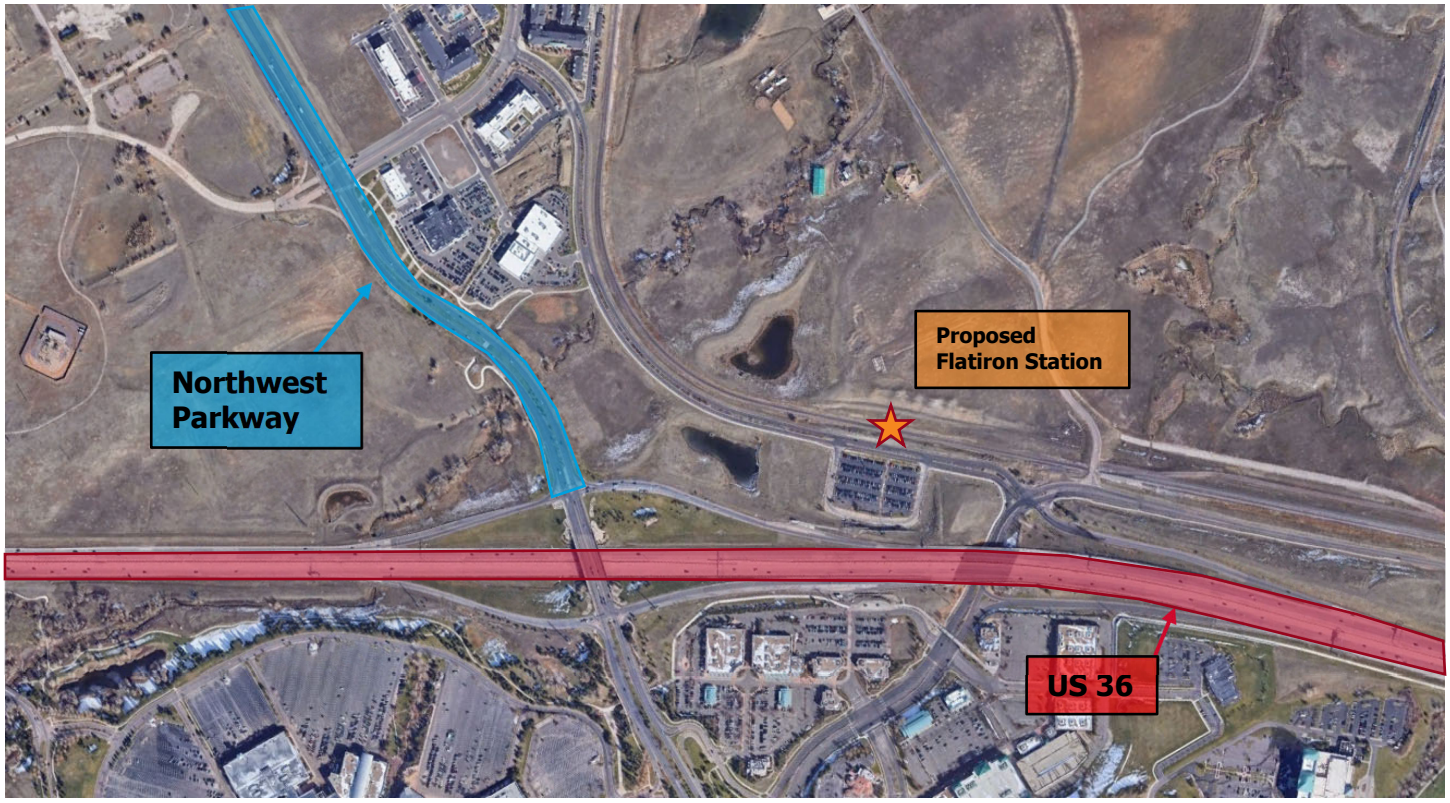
Existing Roadway Network

Highways

US 36 Denver Boulder Turnpike is located adjacent to the proposed Flatiron Station. US 36 is an eight-lane 65 mph speed limit freeway that includes managed (toll) lanes that are used by the Flatiron Flyer BRT that has stops at the Flatiron Station. The nearest US 36 entry/exit points from the proposed Flatiron station are East Flatiron Crossing Drive (south of the station location) and Northwest Parkway Interlocken Loop (north of the station location).

Northwest Parkway is 75 mph toll road which connects E-470 at I-25 in the north metro area with US 36 in Broomfield, Colorado. Access to the Flatiron station area to and from Northwest Parkway exists via Midway Boulevard and Via Varra, as shown on **Figure 29**.

Figure 29: US 36 Relative to Proposed Flatiron Station



Interchanges

US 36 at Interlocken Loop/Northwest Parkway is a four-leg interchange within one-quarter mile of the proposed Flatiron station location. The intersection of the on/off ramps with Interlocken Loop are signalized.

Existing Conditions – Proposed Stations

The northern intersection is the division point where Interlocken Loop (south) meets Northwest Parkway. Users would access the Flatiron station area from Northwest Parkway on Via Varra and Midway Boulevard.

Figure 30: US 36 at Interlocken Loop/Northwest Parkway Interchange

Arterials

East Flatiron Crossing Drive

- Up to six-lane, 35 mph speed limit arterial with dedicated bike lanes, turn lanes and signalized intersections.
- Turns to West Flatiron Drive at signalized Interlocken loop exit ramp west of Interlocken Loop overpass.
- Would serve as main vehicular route for travelers who exit US 36 southbound for the Flatiron Station.

West Flatiron Crossing Drive

- Up to six-lane, 35 mph arterial with dedicated bike lanes, turn lanes and signalized intersections.
- Turns to East Flatiron Drive at signalized Interlocken loop exit ramp intersection west of Interlocken Loop overpass.
- Would serve as vehicular and bicycle route for travelers in the Flatiron Crossing Mall area who wish to access the Flatiron Station.

Interlocken Loop

- Up to four-lane, 40 mph speed limit arterial with dedicated bicycle lanes, turn lanes, exit/entry ramps, and signalized intersections.
- Connects the Interlocken community from US 36/Wadsworth Parkway to US 36/Interlocken Loop as seen below in **Figure 31**.

Interlocken Boulevard

- Up to four-lane, 40 mph speed limit arterial with dedicated bike lanes, turn lanes and signalized intersections.
- Connects Interlocken communities and businesses to proposed Flatiron station area via Interlocken Loop, E Flatiron Crossing Dr, and Midway Blvd.

Existing Conditions – Proposed Stations

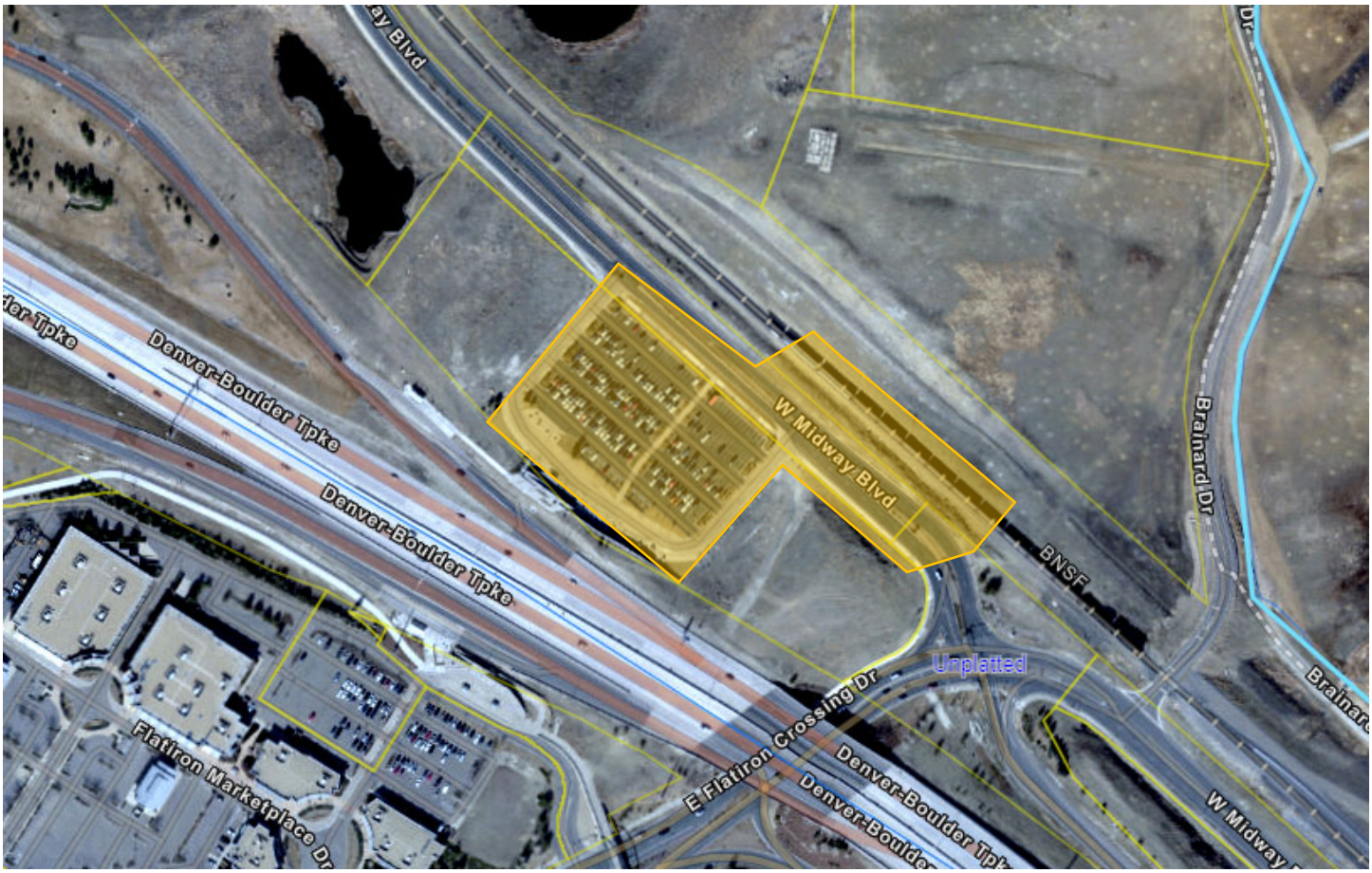
Figure 31: Extents of Interlocken Loop

Right-of-Way

The previously identified Flatiron Station area (orange shape) is in Broomfield County and spans RTD-owned and City and County of Broomfield-owned properties as shown on **Figure 32**. It is bordered by BNSF Railway right-of-way to the east.

Existing Conditions – Proposed Stations

Figure 32: Flatiron Station Area from 2010 NWR Corridor EE



Station Access

Primary access to the Flatiron Station has been proposed via West Midway Boulevard. Previous plans have detailed multiple access points:

- Bus loading pull-offs along West Midway Boulevard.
- Pedestrian bridge for vertical circulation of travelers to a station platform on the north side of the BNSF railway track.
- Existing US 36 pedestrian tunnel connecting the RTD parking areas on either side of US 36.

Major Utilities

Detailed utility information will be provided in the conceptual station design phase of this study. Preliminary desktop analysis has not revealed presence of major utilities such as overhead power lines in the vicinity of existing track or the proposed station area.

Existing Transit Service

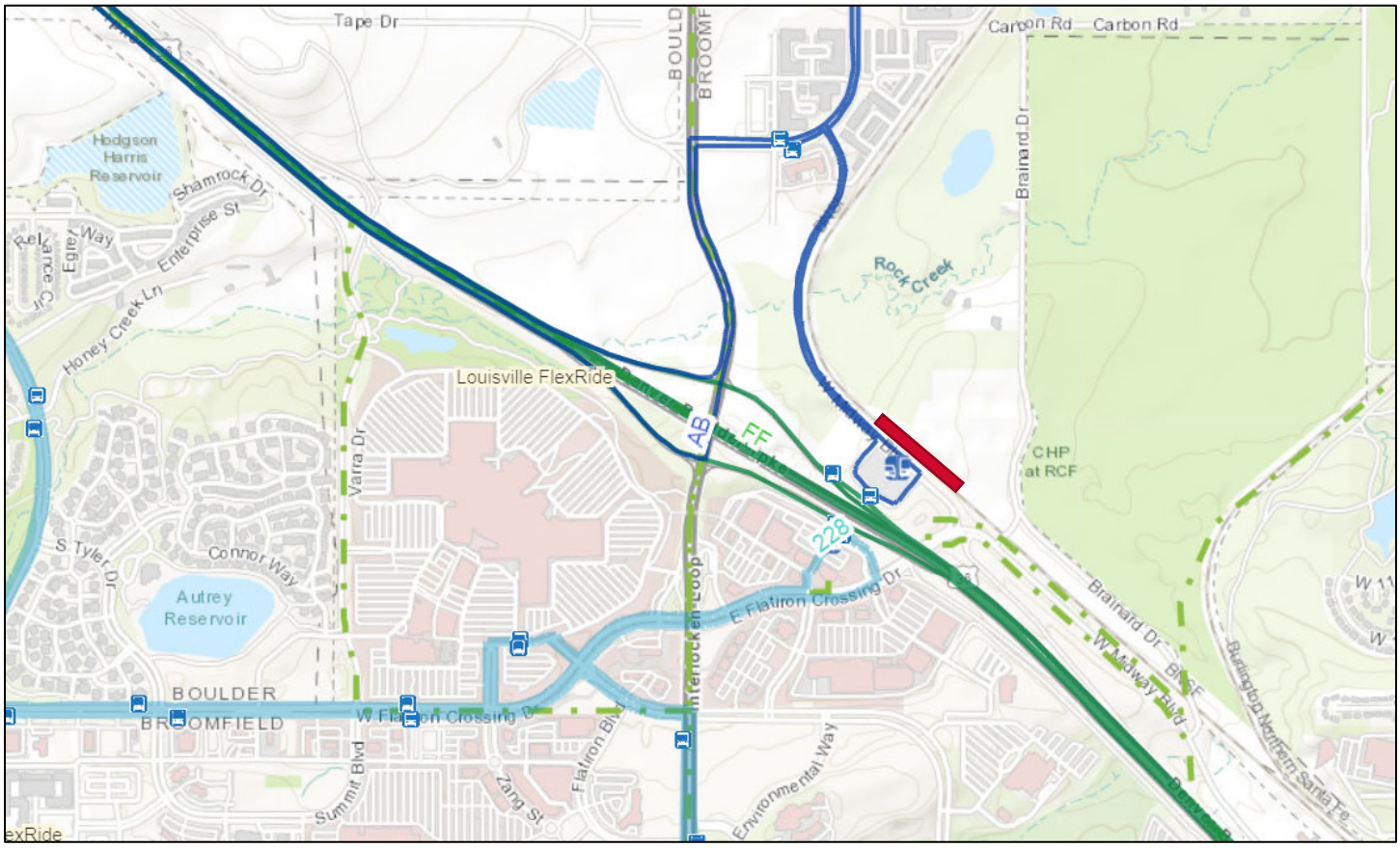
Bus Routes Serving Station

The Flatiron Station would be located on the south side of the BNSF rail line adjacent to the existing US 36 & Flatiron Bus Station. This existing station has a 264-space parking lot on each side of the freeway (for a total of 528 spaces). See **Figure 33** for existing bus routes serving the proposed Flatiron Station area.

Existing Conditions – Proposed Stations

- **Route 228: Louisville/Broomfield** – Route 228 operates between downtown Louisville and the Flatirons Crossing Mall along Via Appia, McCaslin, Rock Creek Parkway, and Colton Road. The route provides hourly service between 8:00 AM and 10:00 PM.
- **Route AB: Boulder/Denver Airport** – Route AB operates along US 36 and Northwest Parkway/E-470 between downtown Boulder and Denver International Airport. The route provides hourly service between 3:00 AM and 11:00 PM.
- **Louisville FlexRide** – The Louisville FlexRide serves the Town of Louisville from 5:30 AM to 7:00 PM.
- **Superior FlexRide** – The Superior FlexRide serves the town of Superior, Superior Marketplace, Flatiron Crossing, and parts of Interlocken including the Oracle Campus and Omni Interlocken from 5:30 AM to 7:00 PM.

Figure 33: Bus Routes Serving Flatiron Station



Source: RTD Interactive System Map (accessed September 1, 2022) (https://www.rtd-denver.com/rider-info/system-map)

Transit Service Levels

Under the Reimagine RTD plan, Route 228: Louisville/Broomfield would be eliminated. Route AB: Boulder/ Denver Airport is classified as a commuter route and would continue to operate hourly service throughout the day from 3:00 AM until 12:00 AM. The flex routes would likely remain unchanged.

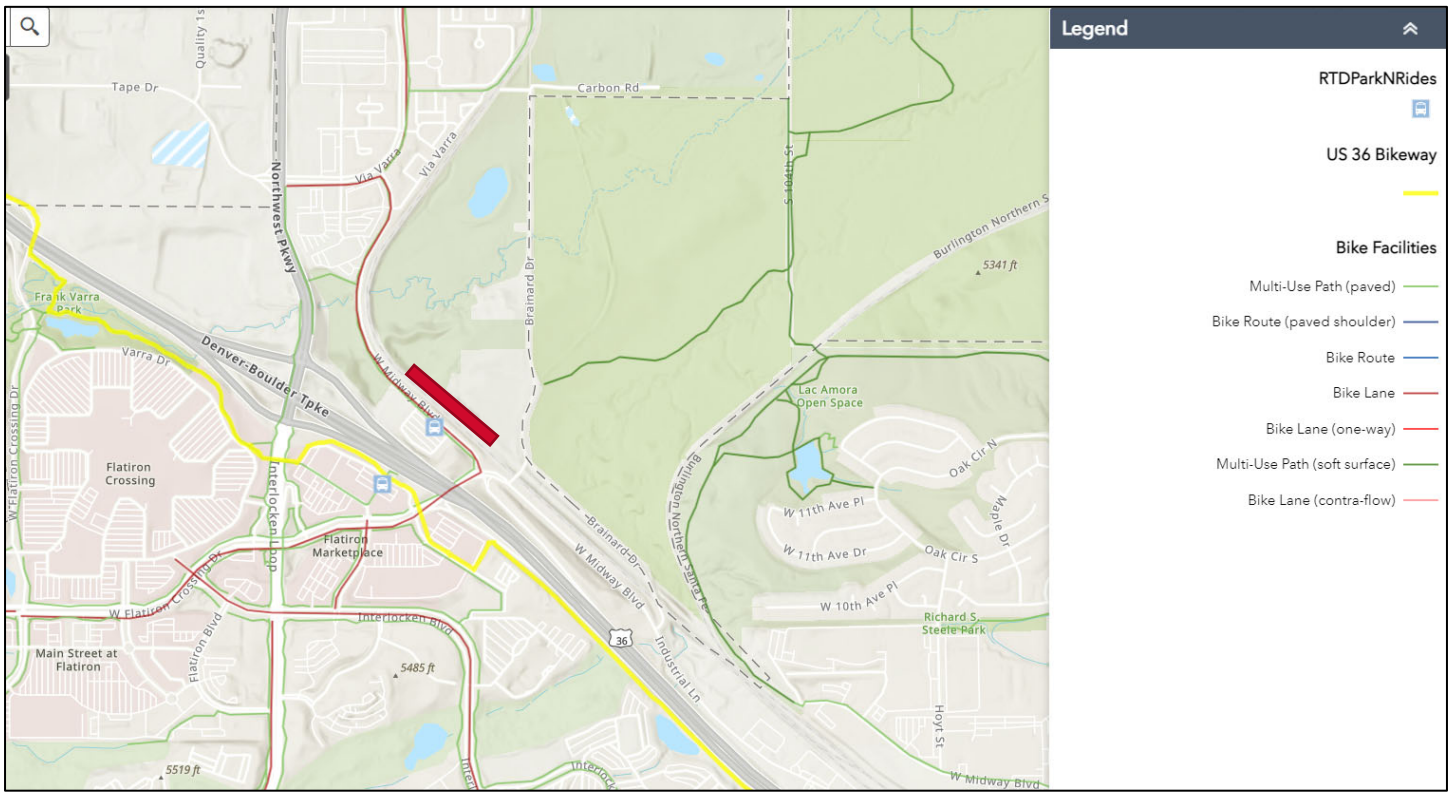
Existing Bicycle and Pedestrian Facilities

The US 36 Bikeway travels along the south side of US 36 near the Flatiron Station. The bike route extends south to Westminster and north to the Table Mesa Park-n-Ride in Boulder. There are bike lanes in both directions along Flatiron Crossing Drive, Interlocken Boulevard, Midway Boulevard, and Via Varra. See **Figure 34** for the bicycle routes around the proposed Flatiron Station.

Existing Conditions – Proposed Stations

There are sidewalks or multi-use paths along Flatiron Crossing Drive, Interlocken Boulevard, Interlocken Loop/ 96th Street, and along most local roads throughout the Interlocken area and Flatiron Crossing Mall and Flatiron Marketplace. There is a new crossing under Northwest Parkway near Rock Creek. There is also a pedestrian underpass under US 36 that connects the east and west sides of the US 36 & Flatirons Station. There are numerous recreational paths though the open space located north of Midway Boulevard near the proposed station. Additionally, there is a new bike path along Industrial Lane with a bicycle overpass that now connects Midway Boulevard, Industrial Lane, and the Interlocken development south of US 36.

Figure 34: Bicycle Facilities near Proposed Flatiron Station



Source: US 36 Commuting Solutions Bike Northwest Interactive Map (https://commutingsolutions.org/commuting-by-bike/us-36-bike-map/)

Existing and Future Land Use

Existing Land Use

The largest change near the proposed Flatiron Station is the Flatiron Marketplace Redevelopment located approximately a half-mile southwest of the station site at the southeast corner of US 36 and East Flatiron Crossing Drive. The project converted several vacant big-box retail sites into approximately 1,200 multi-family residential units and 14,000 square feet of commercial uses at build out, to be developed in three phases. Currently about 325 of the units have been completed, as part of the first phase.

North of the Flatiron Station, there have been several new developments including hotel (Hyatt House Boulder/Broomfield and Holiday Inn Express), multi-family residential (Caliber at Flatirons, Retreat at the Flatirons Apartments, Courtland Flatirons, Terracina Apartments, and Vantage Point), retail, and auto dealerships in the area surrounding Northwest Parkway, Via Verra, and Midway Boulevard that have been completed. Additional multi-family residential projects are also being planned, with approximately 1,700 of the 2,000 multi-family units constructed to date.

Existing Conditions – Proposed Stations

In Interlocken, several new multi-family developments have been completed in recent years with 1,400 of the 1,600 units complete. See recent station area developments around the proposed Flatiron Station in **Figure 35**.

Figure 35: Recent Development near Potential Flatiron Station

Existing Site Constraints

The biggest site constraint at the Flatirons Station is the fact that much of the adjacent land north of the proposed station platform is dedicated for open space, but it appears that there are some developable parcels adjacent to Midway Boulevard and Brainard Drive.

Adjacent Land Ownership

Table 7 shows the property owners for the previously planned Flatiron Station.

Table 7: Property Ownership at Proposed Flatiron Station

Parcel Number	Acres	Address	Owner
157528300035	7.80	5000 W Midway Boulevard, Broomfield CO 80020	Regional Transportation District
157528303001	2.31	N/A	City and County of Broomfield

Source: City and County of Broomfield interactive parcel map (https://www.broomfield.org/2739/Parcel-Search)

Existing Conditions – Proposed Stations

Future Development

Additional multi-family residential projects are also being planned in the area bound by Northwest Parkway, Via Verra, and Midway Boulevard, including the Vive Residential and Northwest Apartments as well as the Parkway Circle Multi-Family.

Further away, at the southwest corner of the Flatirons Crossing Mall, some of the parking and under-performing retail sites of the outdoor portion of the mall are planned to be redeveloped to include 350 multi-family residential units above ground floor retail and office uses. Again, in Interlocken, about 200 additional residential units are still in the planning phase.

Downtown Louisville Station

The Downtown Louisville Station was proposed to be located between the rail corridor and SH 42 in the city of Louisville. The 2010 EE illustrated access to the Park-n-Ride that would be provided from South Street and Short Street from SH 42. At that time, the Park-n-Ride was proposed to provide 425 spaces. Approximately one-third of the spaces would be located west of SH 42; the remainder of the spaces would be located east of SH 42 at the shared recreational fields parking lot. The rail station was planned to provide passenger drop-off and bus loop facilities adjacent to the station platform on the east side of the tracks. A pedestrian tunnel that could provide access to the southbound platform on the west side of the rail tracks is now in place.

Existing Roadway Network

Highways

There are no major highways within one-half mile of the proposed Downtown Louisville Station.

Interchanges

There are no major interchanges within one-half mile of the proposed Downtown Louisville Station.

Arterials

East South Boulder Road

- Up to four-lane, 35 mph speed limit, east-west arterial with dedicated bicycle lanes, turn lanes and signalized intersections. Outlined on **Figure 36**.
- At-grade rail crossing immediately east of the East South Boulder Road/Main Street intersection has active warning devices including gates and flashing lights. Concrete medians separate traffic directions at this crossing. Passive warning devices are also present including pavement warnings and crossbucks.
- Eastern terminus is the US 36 at Foothills Parkway interchange and western terminus is South 120th Street, one and a half miles east of the South Boulder Road/US 287 intersection.

Courtesy Road (SH 42)

- Two-lane, 45 mph speed limit, north-south arterial with dedicated turn lanes at signalized intersections. Outlined on **Figure 36**.
- Intersects with South Street and Short Street, the previously identified station access roads.

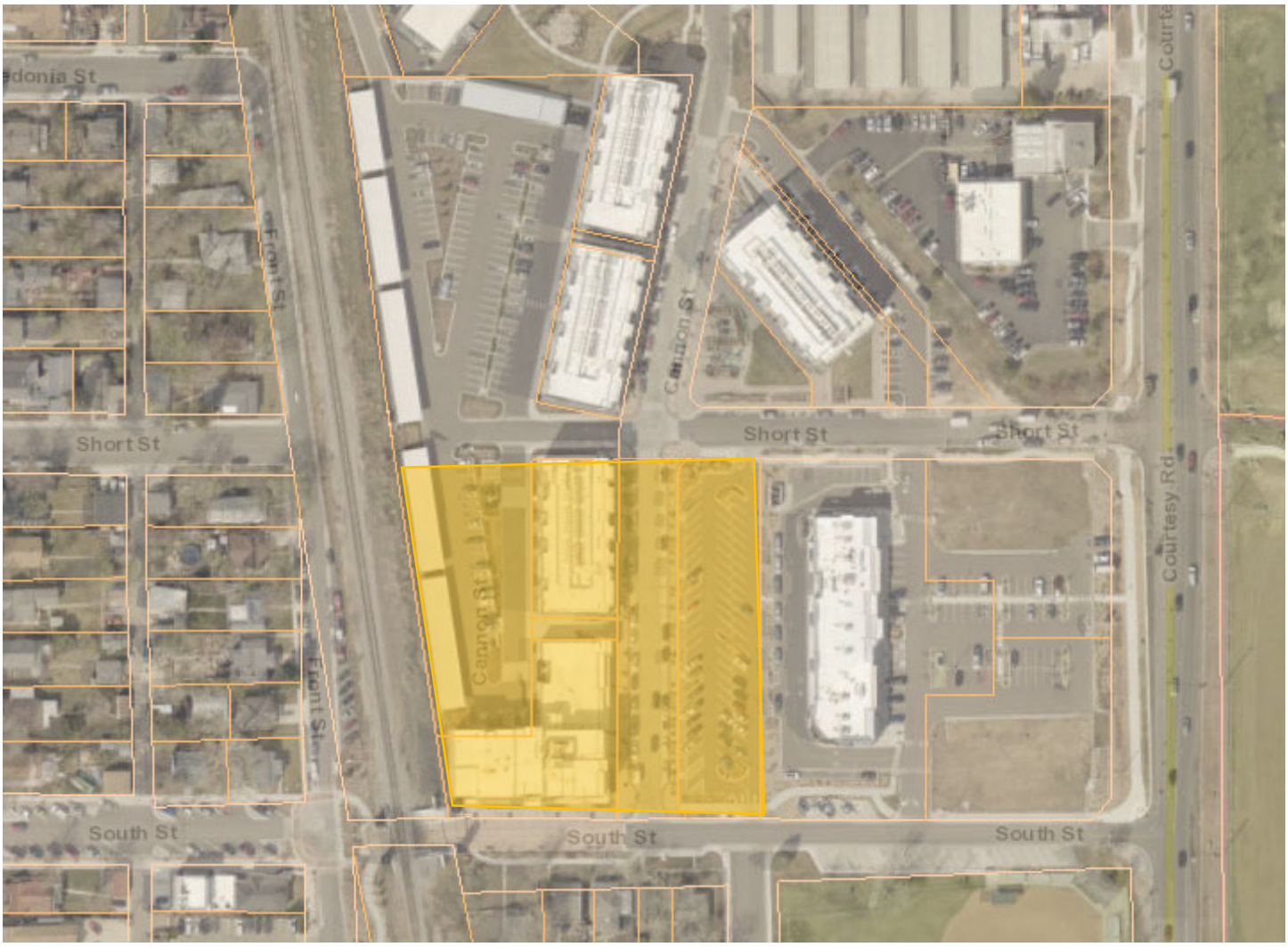
Figure 36: South Boulder Road and Courtesy Road Relative to Proposed Downtown Louisville Station

Right-of-Way

The previously identified Downtown Louisville Station is shown in orange on **Figure 37**. Since the timing of the original site planning to produce the 201 EE, residential apartments and supportive development have been constructed on this parcel of land.

Existing Conditions – Proposed Stations

Figure 37: Downtown Louisville Station Area from 2010 NWR Corridor EE



Station Access

The previously identified station location and access via Short Street and South Street will likely either be a station platform and on-street bus access or will need to be relocated considering the development that has taken place at this site. Existing conditions on an updated station location will be provided upon coordination with RTD, the City of Louisville, and the project team.

Major Utilities

Detailed utility information will be provided in the conceptual station design phase of this study.

Existing Transit Service

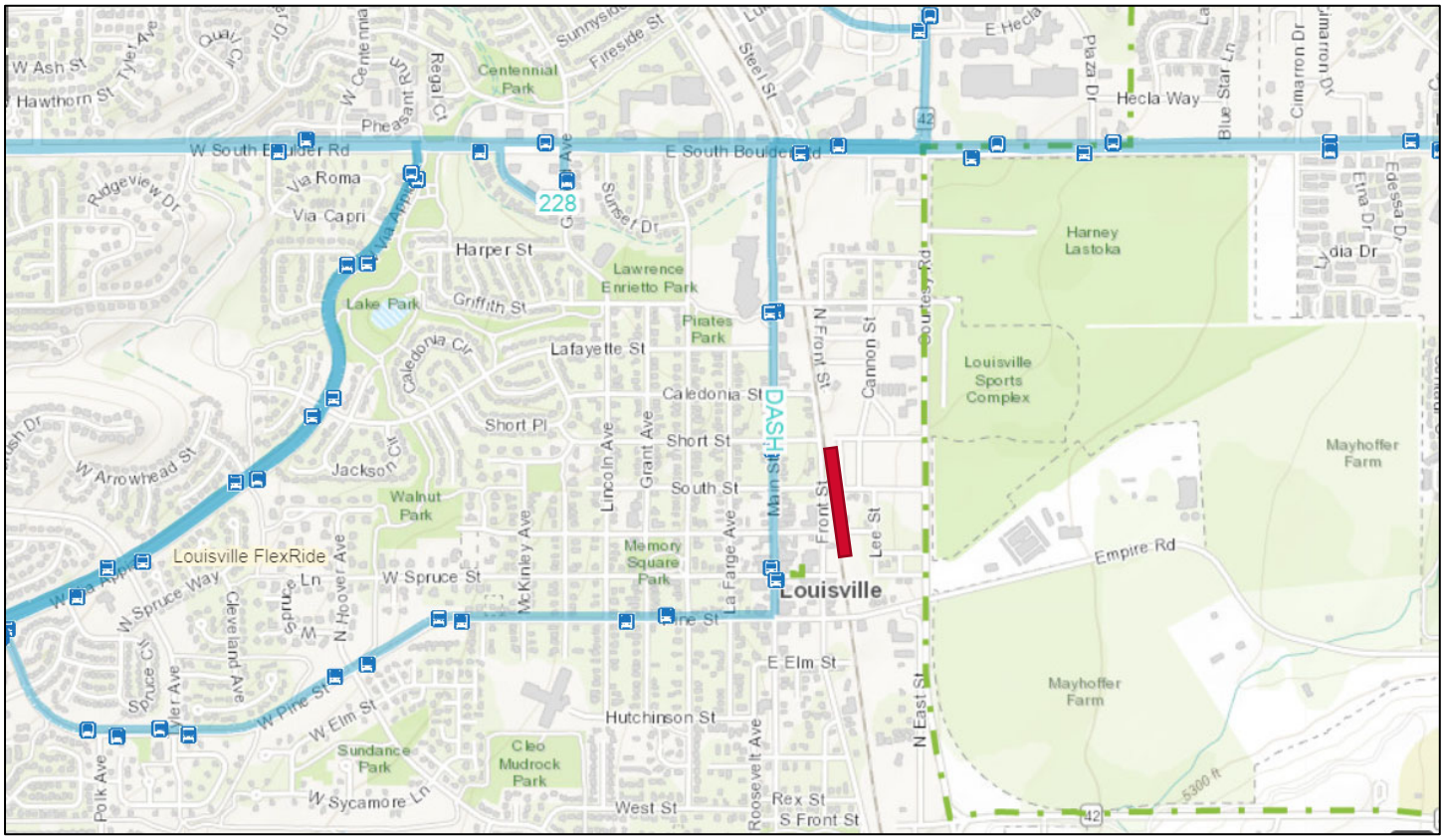
Bus Routes Serving Station

The Downtown Louisville Station would be located on the east side of the BNSF rail line near South Street. Much of the area around the proposed station has been developed with multi-family residential since previous planning activities have occurred. A new location for the platform will need to be selected. There is still the potential for some shared parking across Courtesy Road at the Louisville Sports Complex, and there is some

vacant land along Short Street and South Street east of Courtesy Road, closer to the station platform. See **Figure 38** for existing bus routes serving the proposed Downtown Louisville Station area.

- **Route 228: Louisville/Broomfield** – Route 228 operates between downtown Louisville and the Flatirons Crossing Mall along Via Appia, McCaslin, Rock Creek Parkway, and Colton Road. The route provides hourly service between 8:00 AM and 10:00 PM.
- **DASH: Boulder/Lafayette via Louisville** – The DASH operates along Broadway in Boulder and then along South Boulder Road to Lafayette. The route provides 15-minute service during peak periods and 30-minute service during off-peak periods.
- **Louisville FlexRide** - The Louisville FlexRide serves the Town of Louisville from 5:30 AM to 7:00 PM.

Figure 38: Bus Routes Serving the Downtown Louisville Station



Source: RTD Interactive System Map (accessed September 1, 2022) (https://www.rtd-denver.com/rider-info/system-map)

Transit Service Levels

Under the Reimagine RTD plan, Route 228: Louisville/Broomfield would be eliminated. The DASH: Boulder/Lafayette via Louisville is classified as a core route and would operate at 15-minute frequencies throughout the day, 30-minute frequencies during the evening, and 60-minute frequencies during late evening hours. The flex route would likely remain unchanged.

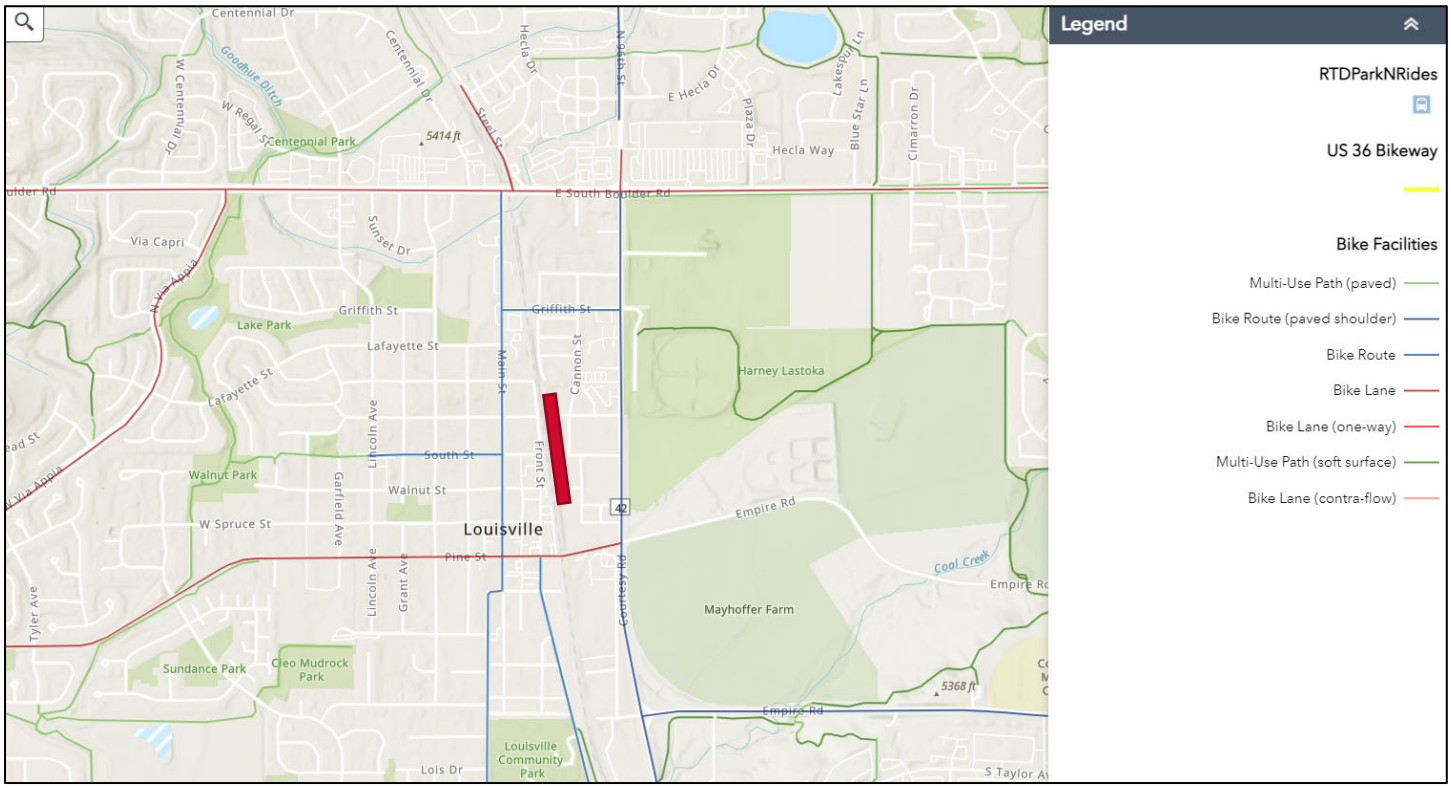
Existing Bicycle and Pedestrian Facilities

There are north-south bike routes on 96th Street/Courtesy Road east of the proposed station, and on Main Street west of the proposed station. There are also bike east-west bike routes along South Street and Griffith Street and bike lanes on Pike Street and South Boulder Road. See **Figure 39** for the bicycle routes around the proposed Downtown Louisville Station.

Existing Conditions – Proposed Stations

There are sidewalks on both sides the local roadways throughout most of downtown Louisville. However, there are no sidewalks along 96th Street/Courtesy Road near the proposed station. The City of Louisville constructed a pedestrian underpass under the rail line in 2015 at South Street.

Figure 39: Bicycle Facilities near Proposed Downtown Louisville Station



Source: US 36 Commuting Solutions Bike Northwest Interactive Map (https://commutingsolutions.org/commuting-by-bike/us-36-bike-map/)

Existing and Future Land Use

Existing Land Use

Nearly the entire area east of the railroad tracks between Caledonia Street on the north and South Street on the south has been redeveloped as the DELO Apartments with five three-story multi-family residential buildings (as shown in **Figure 40**) as well as a strip of retail that fronts onto Courtesy Road. Between Griffith Street on the north and Caledonia Street on the south, there are new row homes that have been constructed as well, as part of this development. Both phases of the residential project were completed in 2019. This new development has been built at the site of the previously proposed station platform, so a new site would need to be considered. A new underpass that allows pedestrians to cross under the railroad line was completed in 2015. A portion of the parking for the rail station was planned across Courtesy Road near the Louisville Sports Complex (as these could likely be shared fairly easily). See recent station area developments around the proposed Downtown Louisville Station in **Figure 41**.

Existing Conditions – Proposed Stations

Figure 40: New DELO Apartments east of the BNSF rail line (looking north)

Figure 41: Recent Development near Potential Downtown Louisville Station

Existing Conditions – Proposed Stations

Existing Site Constraints

The Downtown Louisville Station was proposed to have 410-440 parking spaces between two lots in the *2010 Northwest Rail Corridor Environmental Evaluation*. However, much of the land that was previously proposed for parking (160-170 spaces) between Short Street and South Street east of the rail line to Lee Street, has been developed. The proposed shared parking spaces at the Louisville Sports Complex are still used as parking and could still likely be used as a shared facility, as these spaces are largely used on weekends when there are generally far fewer transit trips taken. However, it is likely that a new location for the station platform will be required, as the development of the DELO Apartments has taken nearly all of the available land where the station platform was proposed. The remaining area east of the rail line is made up of single-family homes in this vicinity.

Adjacent Land Ownership

Table 8 shows the property owners for the previously planned Downtown Louisville Station.

Table 8: Property Ownership at Proposed Downtown Louisville Station

Parcel Number	Acres	Address	Owner
157508400002	0.14	900 Front Street, Louisville, CO 80027	City of Louisville
157508418001	0.09	834 Front Street, Louisville, CO 80027	City of Louisville
157508165006	2.43	0 Short Street, Louisville, CO 80027	DELO Apartments LLC
157508165004	N/A	1025 Cannon Street, Louisville, CO 80027	DELO 1025 LLC
157508165005	0.04	0 Cannon Street, Louisville, CO 80027	DELO Apartments LLC
157508165003	0.30	1055 Cannon Street, Louisville, CO 80027	DELO Apartments LLC
157508167005	0.48	0 Cannon Street, Louisville, CO 80027	City of Louisville
157508167004	0.63	0 Courtesy Road, Louisville, CO 80027	City of Louisville
157509000017	24.32	0 Empire Road, Louisville, CO 80027	City of Louisville

Source: Boulder County Community Planning and Permitting interactive map (https://maps.boco.solutions/propertysearch/)

Future Development

Much of land on the east side of the tracks south of the new DELO development is single-family residential. Further north at South Boulder Road, a new 185-unit multi-family residential development with 3,500 square feet of retail is being planned and going through the approval phase with the City of Louisville Planning Department. There is also land along SH 42 between Short Street on the south and Griffith Street on the north that may provide opportunities for redevelopment, including station parking or additional multi-family residential uses.

Boulder Junction at Depot Square Station

The Boulder Junction at Depot Square Station was proposed to be located in central Boulder northeast of the intersection of Pearl Parkway and 30th Street. Station access would be provided by Bluff Street and 34th Street. Parking, bus loading and unloading, and passenger drop-off facilities were proposed to be provided near the rail platform at the station focused at Bluff Street.

Existing Roadway Network

Highways

Foothills Parkway (SH 157) is a north-south, four- to five-lane highway with a 55 mph speed limit. SH 157 has a combination of grade separated and signalized intersections. SH 157 spans about 5 miles between SH 119 and US 36 to the north and south, respectively. Vehicular travelers going to or coming from the proposed Boulder Junction station location would utilize SH 157 via Valmont Road or Pearl Parkway.

Interchanges

Foothills Parkway at Pearl Parkway is a four-leg interchange, where Foothills Parkway overpasses Pearl Parkway, as shown on **Figure 42**. The intersections of Foothills Parkway on/off ramps and Pearl Parkway are signalized.

Existing Conditions – Proposed Stations

Figure 42: Foothills Parkway and Pearl Parkway Relative to Proposed Boulder Junction at Depot Square Station

Arterials

Valmont Road

- Up to four-lane, 35 mph speed limit, east-west arterial with dedicated bicycle lanes, turn lanes and signalized intersections.

- At-grade rail crossing between intersections of Valmont Rd/34th Street and Valmont Rd/Wilderness Place has active warning devices including gates and flashing lights. Concrete medians separate traffic directions at this crossing. Passive warning devices are also present including pavement warnings and crossbucks.
- Access to the Boulder Junction station area would be directly from Valmont Road or from Valmont Road to 30th Street to Bluff Street.

30th Street

- Up to four-lane, 35 mph speed limit, north-south arterial with dedicated bicycle lanes, turn lanes and signalized intersections.
- Pedestrian crosswalks with pedestrian-activated flashing beacons. Vehicles must yield to pedestrians when activated.

Pearl Street

- Up to four-lane, 35 mph speed limit, east-west arterial with dedicated bicycle lanes, turn lanes and signalized intersections.
- Pedestrian crosswalks with pedestrian-activated flashing beacons. Vehicles must yield to pedestrians when activated.
- Pearl Street ends and Pearl Parkway begins at 30th Street.

Pearl Parkway

- Up to four-lane, 35 mph speed limit, east-west arterial with dedicated turn lanes and signalized intersections.
- Existing wayfinding signage for Boulder Junction at Depot Square Station is present along route.
- Pearl Parkway begins at 30th Street and ends at 55th Street.

Right-of-Way

The previously identified primary station location is located in Boulder County and highlighted with an orange shape on **Figure 43**. Significant residential and commercial development has taken place since initial site plans were developed. Previous planning by the City of Boulder has preserved the rail platform location and surrounding space for the rail program.

Existing Conditions – Proposed Stations

Figure 43: Boulder Junction at Depot Square Station Area from 2010 NWR Corridor EE

Station Access

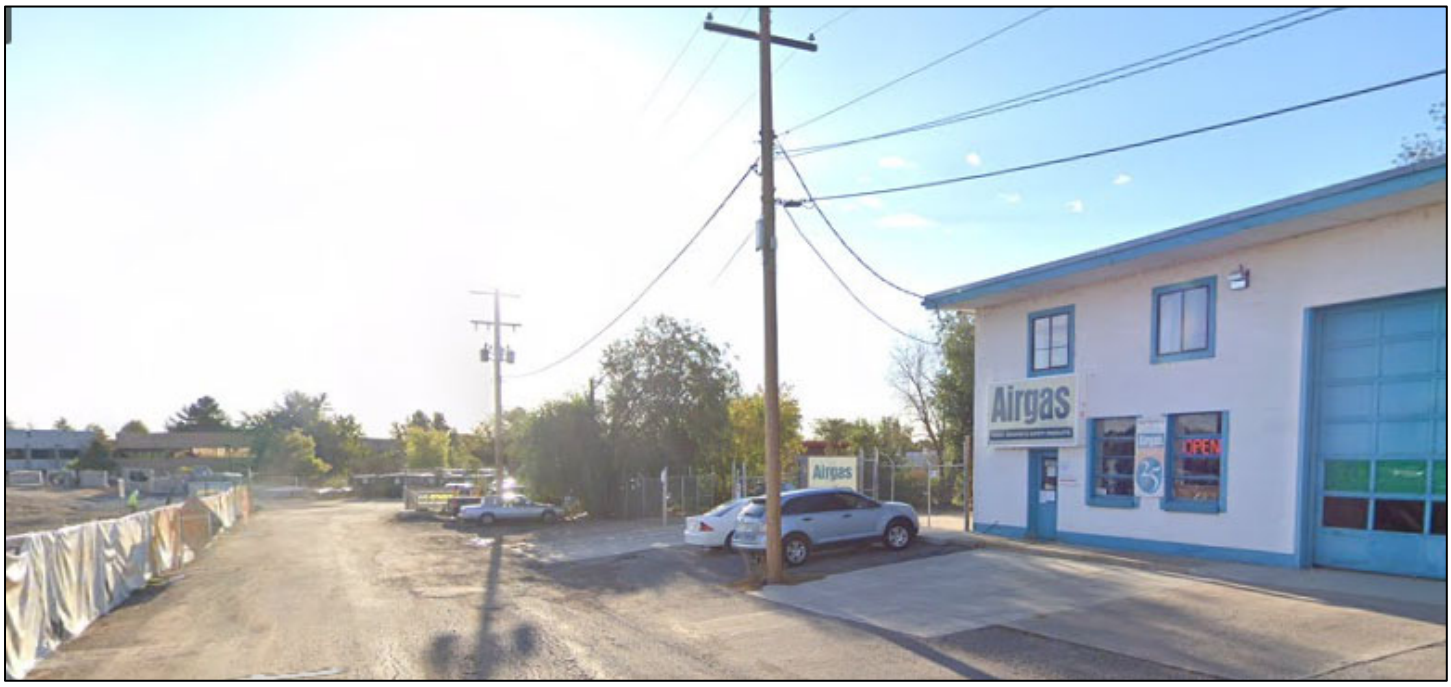
Multiple access points for pedestrians, microtransit, automobiles, and buses were previously identified. Valmont Road and Bluff Street would be utilized to access parking areas and the western station platform. A pedestrian underpass was proposed for passengers to access the eastern station platform. As development has taken place in previously identified parking areas, some accesses may be removed from consideration and others could be proposed. Detailed information regarding station layouts will be provided during the Conceptual Station Design phase of this study.

Existing Conditions – Proposed Stations

Major Utilities

Detailed utility information will be provided in the conceptual station design phase of this study. Preliminary desktop analysis has revealed the presence of utility poles and overhead utilities in the vicinity of the proposed station area as seen in **Figure 44**; however, this will be further evaluated.

Figure 44: Overhead Utility Lines on Bluff Street Near Proposed Boulder Junction at Depot Square Station



Existing Transit Service

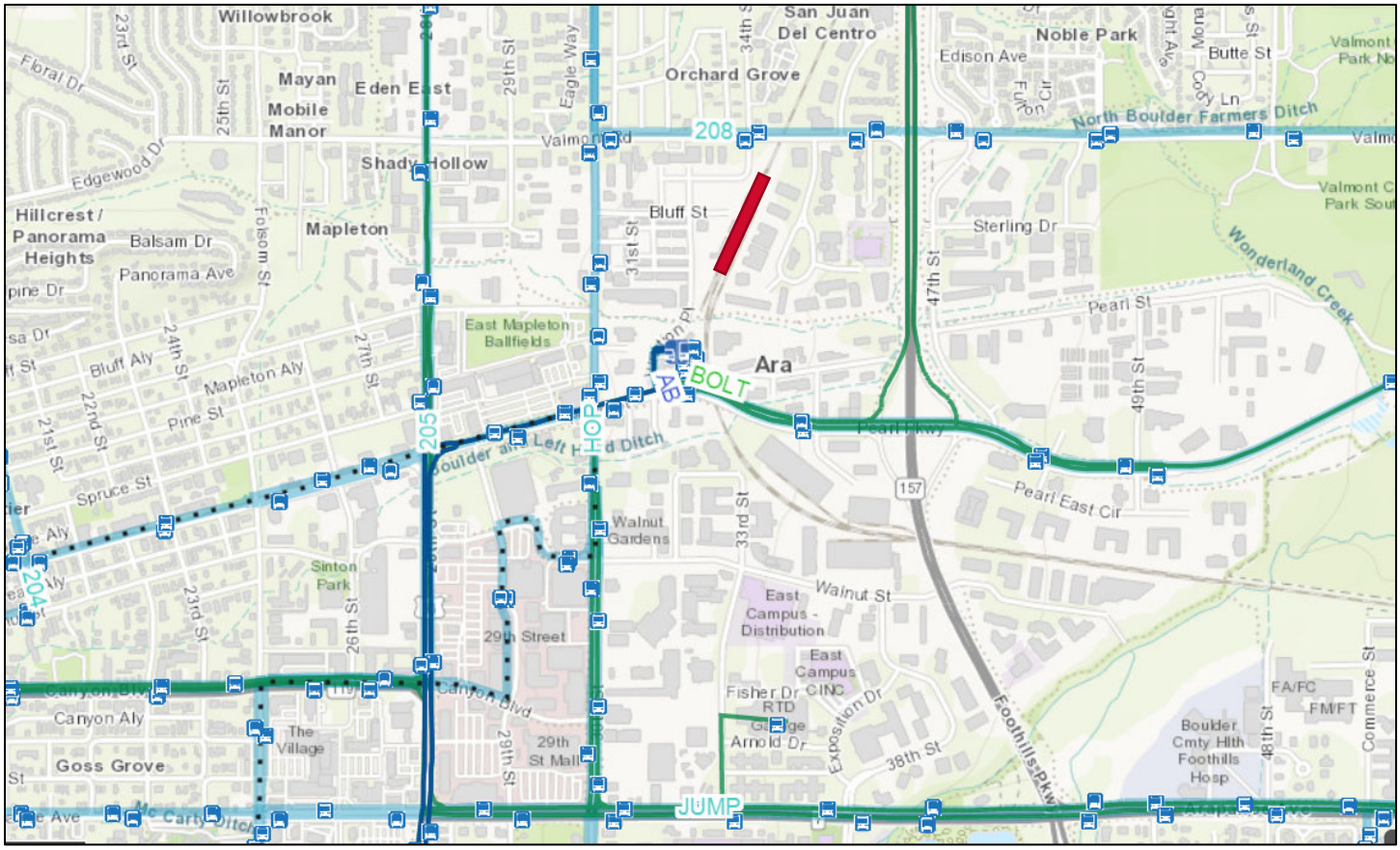
Bus Routes Serving Station

The Boulder Junction at Depot Square Station would be located between Valmont Road and Pearl Parkway on the west side of the BNSF Railway tracks. The existing Boulder Junction at Depot Square Station provides 75 parking spaces for transit patrons and six bus bays. The underground bus facility is located beneath apartments and parking structure, with access via a pedestrian breezeway from Pearl Parkway. Vehicles can access the facility via Junction Place. Additionally, pedestrians and bikes may access the development from the new Goose Creek Bridge, which connects to businesses on 33rd Street across the creek. See **Figure 45** for existing bus routes serving the proposed Boulder Junction at Depot Square Station area.

- **Route 206: Boulder Junction/Fairview High School** – Route 206 operates service generally along Pearl Parkway, 55th Street, Manhattan Drive, Table Mesa and Broadway. The route provides 30-minute service between 6:00 AM and 7:00 PM.
- **BOUND: 30th Street** – The BOUND operates service along 30th Street, just west of Boulder Junction. The route provides 30-minute service between 5:00 AM and 12:00 AM.
- **HOP: Boulder/Longmont** – The HOP operates on a bi-directional loop around boulder. The route travels east-west on Pearl Street and north south on 30th Street near Boulder Junction. The route provides 12-minute service between 7:00 AM and 7:00 PM (and 20-minute service from 7:00 to 10:00 PM).
- **BOLT: Boulder/Longmont** – The BOLT operates east-west service at SH 119/Diagonal between Boulder and Longmont. The route provides 30-minute service throughout the day (with hourly service

for early morning and evening hours). The Bold Route is planned to be converted to Bus Rapid Transit over the next few years.

Figure 45: Bus Routes Serving Boulder Junction at Depot Square Station



Source: RTD Interactive System Map (accessed September 1, 2022) (https://www.rtd-denver.com/rider-info/system-map)

Transit Service Levels

Under the Reimagine RTD plan, Route 228: Louisville/Broomfield, the Bound: 30th Street, and the HOP: Boulder/Longmont would be eliminated. The BOLT: Boulder/Longmont is classified as a connector route and would operate at 30-minute frequencies during peak periods.

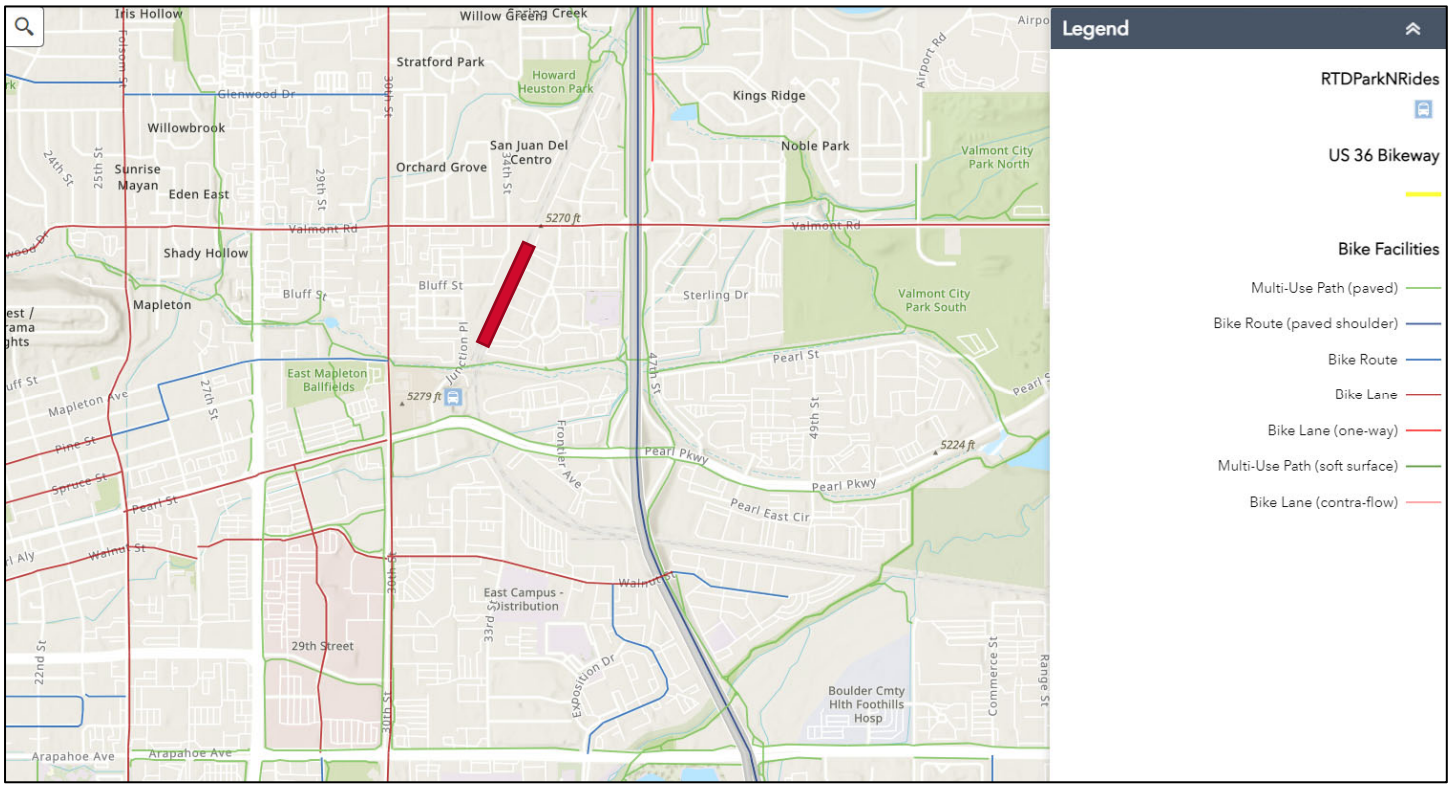
Existing Bicycle and Pedestrian Facilities

Along Valmont Road and Walnut Street as well as Pearl Street west of 30th Street, there are east-west bicycle lanes. Along 30th Street there are north-south bicycle lanes near the proposed Boulder Junction at Depot Square Station. There are also multi-use paths along Foothills Parkway, Pearl Parkway, and along Goose Creek. See **Figure 46** for the bicycle routes around the proposed Boulder Junction at Depot Square Station.

There are sidewalks on both sides of all streets within the Boulder Junction area bound by Valmont Road on the north, 30th Street on the west, Pearl Parkway on the south and the rail line on the east.

Existing Conditions – Proposed Stations

Figure 46: Bicycle Facilities near Proposed Boulder Junction at Depot Square Station



Source: US 36 Commuting Solutions Bike Northwest Interactive Map (https://commutingsolutions.org/commuting-by-bike/us-36-bike-map/)

Existing and Future Land Use

Existing Land Use

While the area to the east of the railroad tracks has not changed significantly in recent years, much of the area west of the tracks has been redeveloped. There is a significant amount of new three- and four-story multi-family residential development in the area from Valmont Road on the north to Pearl Parkway on the south. Developments include the 45-unit SPARKwest affordable housing development, Boulder Commons, Depot Square Apartments, 30Pearl Apartments, and a Hyatt Place hotel. This development continues south of Pearl Parkway as well with the Griffis 3100 Pearl development. **Figure 47** shows an example of the new development around Boulder Junction Station.

The goal of Boulder Junction is to create a mixed-use, pedestrian-oriented community where people will live, work, shop and have access to both local and regional transit. The *Transit Village Area Plan* guides long-term development at Boulder Junction. The plan is the collective work of the City of Boulder, private property owners, and RTD. See recent station area developments around the proposed Boulder Junction Station in **Figure 48**.

Existing Conditions – Proposed Stations

Figure 47: New development at Boulder Junction at Depot Square Station

Figure 48: Recent Development near Potential Boulder Junction at Depot Square Station

Existing Conditions – Proposed Stations

Existing Site Constraints

Boulder Junction is Boulder's first Transit-Oriented Development (TOD). The six-bus-bay RTD station located below the Depot Square apartments at Boulder Junction serves as the hub for bus transit at the site, and the rail platform has been proposed to be built at Bluff Street. In 2010, property owners in the Phase 1 area of Boulder Junction, west of the railroad tracks, petitioned the city council to create two overlaying, general improvement districts – one for parking and the other for Transportation Demand Management (TDM) programs.

These two overlaying general improvement districts allow for the construction, operation, and maintenance of public improvements and certain services within the district. Additionally, developers pay Payment in Lieu of Taxes (PILOT) fees for the first two years, after which point property taxes are used to continue funding benefits to residents and employees, including the RTD EcoPass, Boulder B-Cycle Membership, and CarSharing Membership.

Adjacent Land Ownership

Table 9 shows the property owners for the previously planned Boulder Junction at Depot Square Station.

Table 9: Property Ownership at Proposed Boulder Junction at Depot Square Station

Parcel Number	Acres	Address	Owner
146329161006	0.56	3303 Bluff Street, Boulder CO 80301	LOT 1 Block 5 SBO LLC
146329161007	1.11	3303 Bluff Street, Boulder CO 80301	LOT 1 Block 5 SBO LLC
146329161008	1.14	3401 Bluff Street, Boulder CO 80301	LOT 2 SBO LLC
146329161009	N/A	3400 Valmont Road, Boulder CO 80301	LOT 3 SBO LLC

Source: Boulder County Community Planning and Permitting interactive map (https://maps.boco.solutions/propertysearch/)

Future Development

Nearly all of the Boulder Junction site west of the rail line has been redeveloped, and the few remaining parcels are either under construction or are in the planning stages. East of the rail line, there are currently no large vacant parcels, but the light industrial nature of the land uses could present some limited opportunities for future redevelopment.

Downtown Longmont Station

The original proposed Downtown Longmont Station was to be located between South Pratt Parkway and US 287 (Main Street) with access from Boston Avenue and Main Street in downtown Longmont. As forecast in the 2010 EE, the Park-n-Ride would need to provide 590 spaces in 2015 and be expanded to 1,025 spaces in 2035. The rail platform would be located west of the 1st Avenue/Main Street intersection. Bus loading and unloading and passenger drop-off facilities would be provided adjacent to the rail platform. Secondary Park-n-Ride access would be provided to Main Street and South Pratt Parkway.

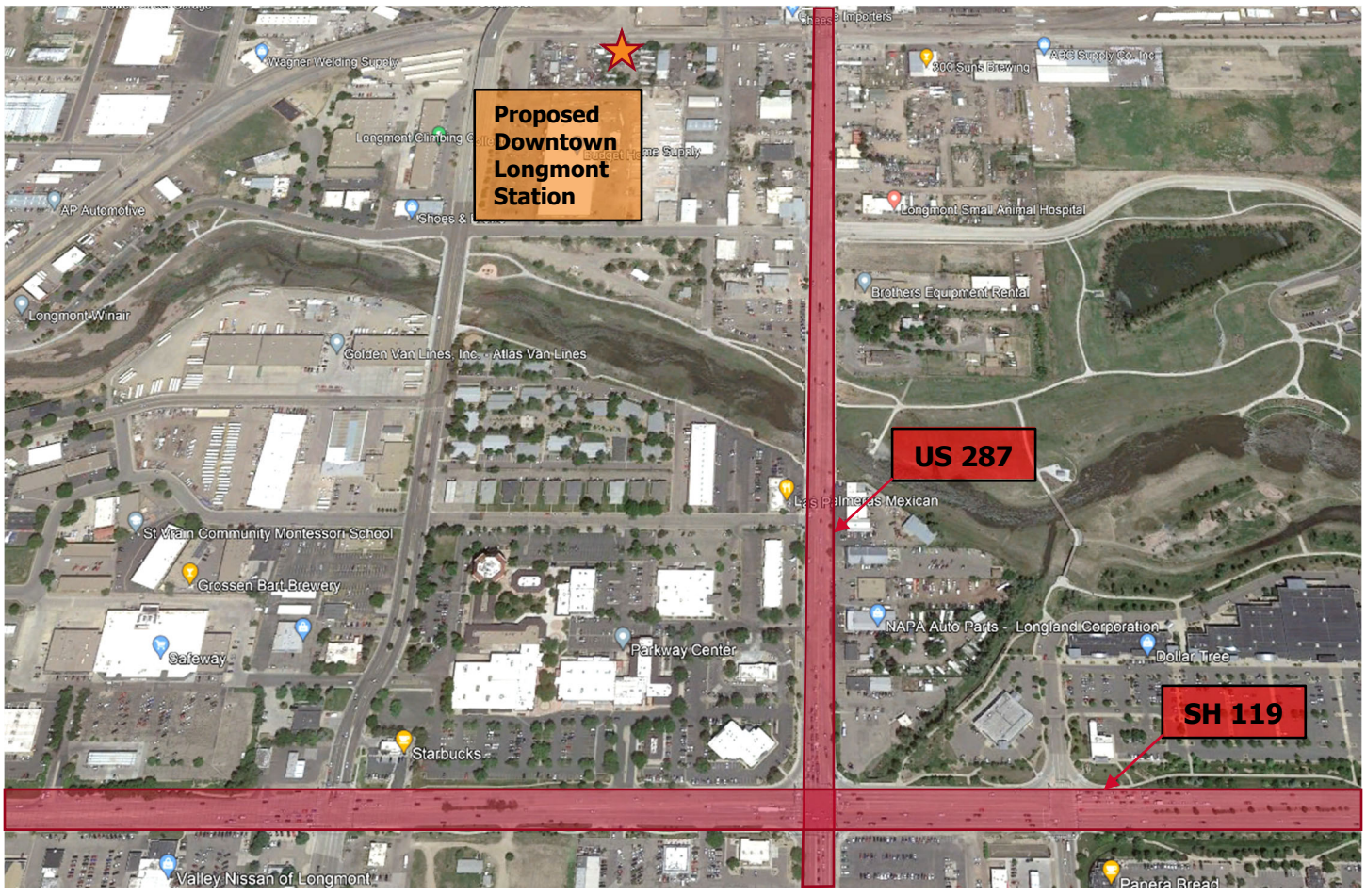
In addition, the construction of the commuter rail platform would require the closure of 1st Avenue between South Pratt Parkway and Main Street. An access to the station area would be provided just to the south of the Main Street/1st Avenue intersection.

Existing Roadway Network

Highways

US 287 (Main Street) is located just east of the proposed Downtown Longmont Station. US 287 is generally a four-lane north-south highway through Longmont (with a six-lane section at Ken Pratt Boulevard). SH 119 (Ken Pratt Boulevard) is a four-lane east-west highway through Longmont (with a six-lane section at Main Street) and is located one-half mile south of the proposed Downtown Longmont Station, as shown in **Figure 49**.

Figure 49: US 287 and SH 119 Relative to the Proposed Downtown Longmont Station



Existing Conditions – Proposed Stations

Interchanges

There are no nearby grade-separated interchanges near the proposed Downtown Longmont Station. At the US 287 (Main Street)/SH 119 (Ken Pratt Boulevard) intersection Ken Pratt Boulevard has three lanes and double left turn lanes in both directions. Main Street has two northbound lanes and three southbound lanes with single left turn lanes in both directions, as illustrated in **Figure 50**.

Figure 50: US 287 (Main Street) and SH 119 (Ken Pratt Boulevard) Intersection

Arterials

SH 119 (Ken Pratt Boulevard)

- Three eastbound and Three westbound through lanes, 35 mph speed limit.
- Dedicated double left turn lanes in each direction.

US 287 (Main Street)

- Three southbound and two northbound through lanes, 35 mph speed limit.
- Dedicated left turn lanes in each direction.

Right-of-Way

The proposed Downtown Longmont Station (orange outline) is located in Boulder County and generally encompasses privately owned commercial property, as shown on **Figure 51**. It is bordered by 1st Avenue on

the north, Boston Avenue to the south, and South Pratt Parkway on the west (with other commercial property to the east).

Figure 51: Downtown Longmont Station area from 2010 NWR Corridor EE

Source: https://maps.boco.solutions/propertysearch/

Station Access

Three points of entry for the Downtown Longmont Station have been previously proposed.

- 1st Avenue would be slightly realigned to accommodate the rail platform and would only be accessible for buses to operate in two directions.
- Boston Avenue would be the primary entry/exit for vehicular access to the Park-n-Ride.
- Terry Street would be extended to provide vehicular access to the Park-n-Ride off of Boston Avenue.
- South Pratt Parkway would provide access to the station area in general, but access to the station would be from Boston Avenue due to the grade of South Pratt Parkway as it overpasses the rail line.

Major Utilities

There is an electrical substation located on the northwest corner of the 1st Avenue and Coffman Street intersection north of the existing rail line. Powerlines extend northeast out of the site and then along 2nd Avenue and south out of the site and then west through the proposed Park-n-Ride. As stated in the *Longmont 1st & Main Station Transit & Revitalization Plan* (2012), "The presence of the electrical substation represents a

challenge from a redevelopment standpoint, so the challenge will be to minimize its impact in the short-term and to recognize the importance of utility infrastructure to the functioning of the center city in Longmont."

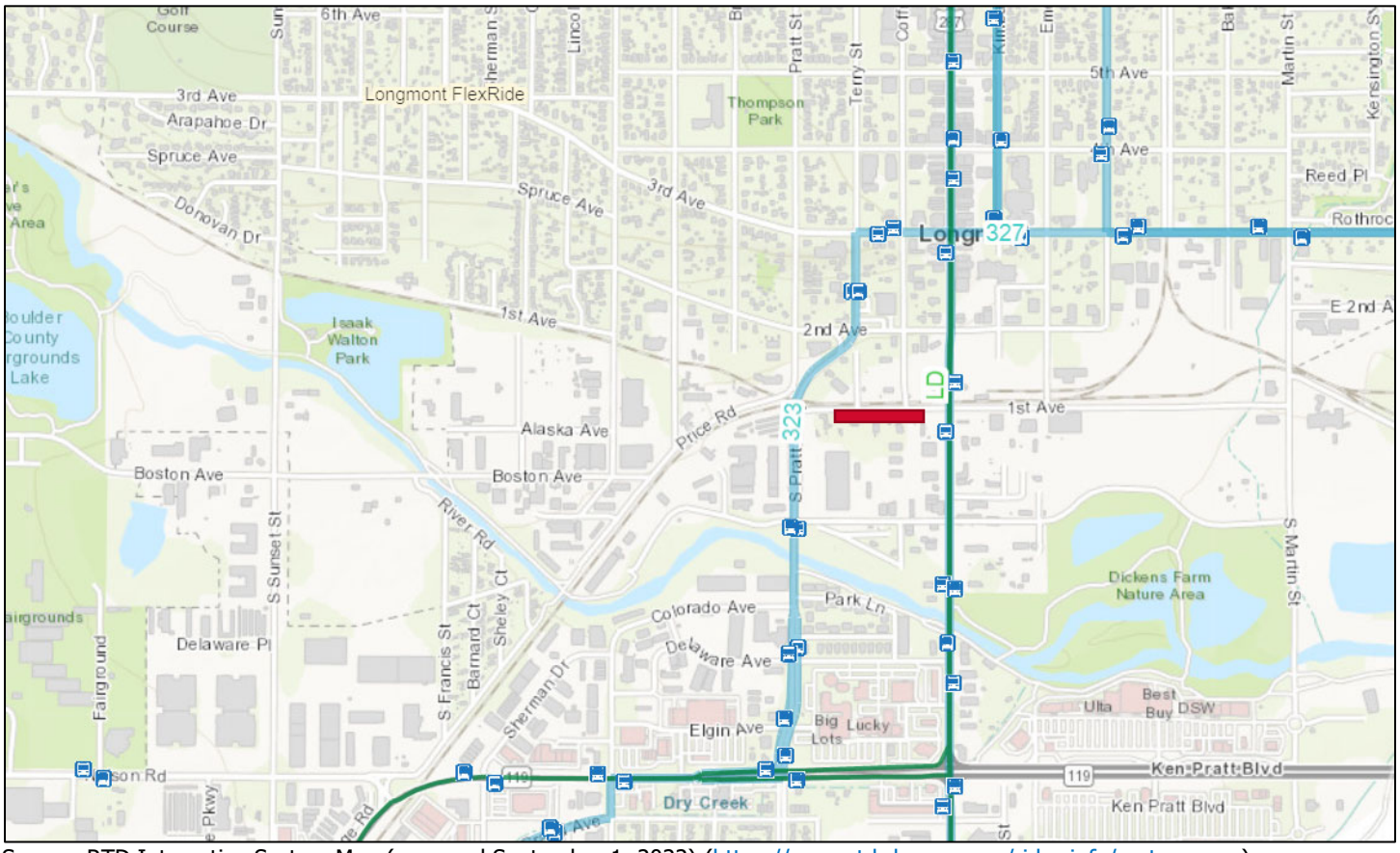
Existing Transit Service

Bus Routes Serving Station

The Downtown Longmont Station would be located on the southwest corner of the 1st Avenue and Main Street intersection in downtown Longmont. The Downtown Longmont Station would be served by Routes 323, 324, and the Longmont FlexRide. See **Figure 52** for existing bus routes serving the proposed Downtown Longmont Station area.

- **Route 323: Skyline Crosstown** – Route 323 operates service between southwest Longmont and northeast Longmont. The route provides hourly service between 8:00 AM and 6:00 PM.
- **Route 324: Main Street** – Route 324 operates north-south service along Main Street and east-west service along Pike Street in south Longmont. The route provides 30-minute service between 5:00 AM and 8:00 PM.
- **Longmont FlexRide** – The Longmont FlexRide serves the City of Longmont from 5:30 AM to 7:00 PM.

Figure 52: Bus Routes Serving Downtown Longmont Station



Source: RTD Interactive System Map (accessed September 1, 2022) (https://www.rtd-denver.com/rider-info/system-map)

Transit Service Levels

Under the Reimagine RTD plan, Route 323: Skyline Crosstown and Route 324: Main Street would be eliminated. The BOLT: Boulder/Longmont is classified as a connector route and would operate at 30-minute

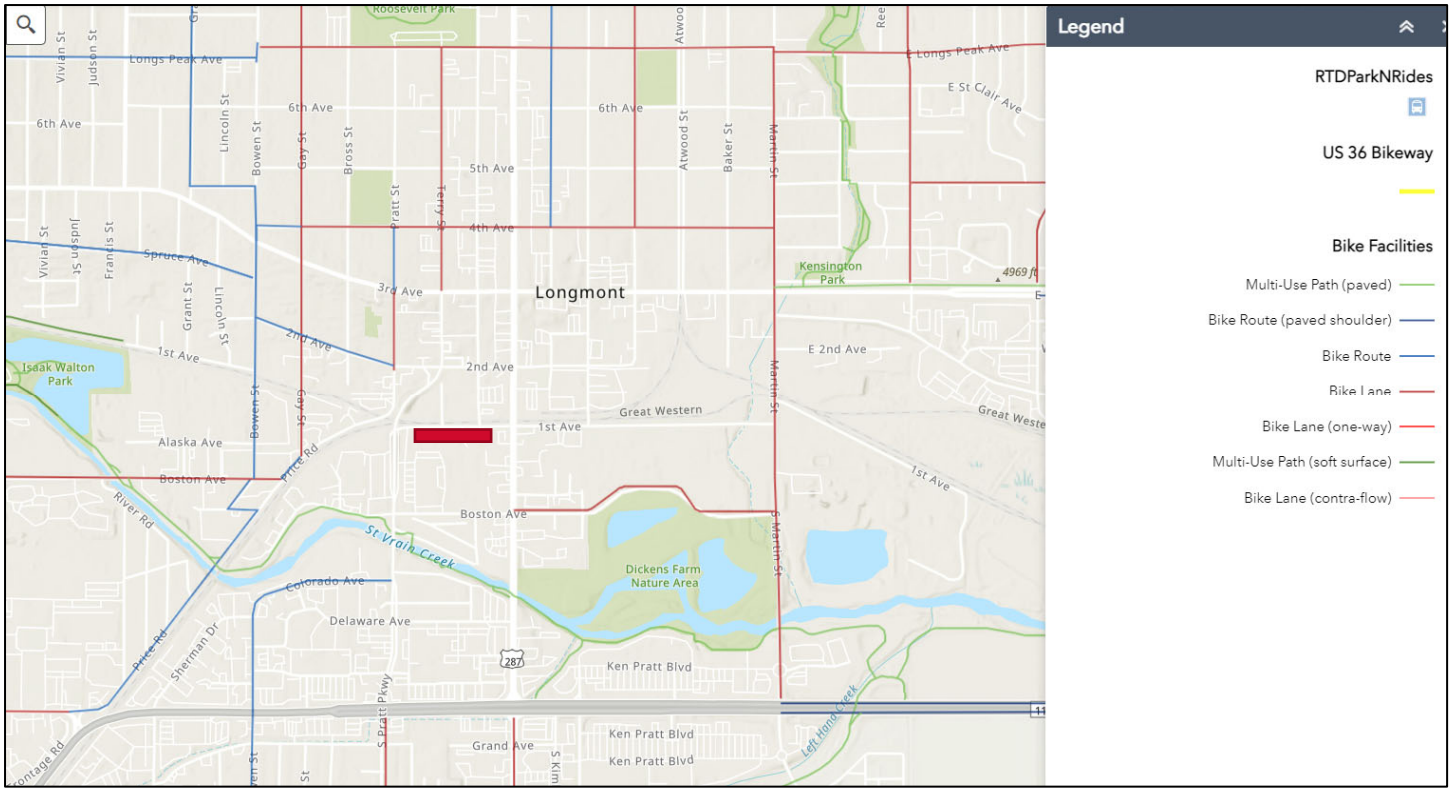
frequencies throughout the day and evening and 60-minute frequencies during late evening hours. The flex route would likely remain unchanged.

Existing Bicycle and Pedestrian Facilities

There are north-south bicycle lanes along Main Street and on Terry Street and Lashley Avenue north of 3rd Avenue. There are east-west bicycle lanes along Boston Avenue and 4th Avenue. There is also a multi-use path on 3rd Avenue east of Main Street. See **Figure 53** for the bicycle routes around the proposed Downtown Longmont Station.

There are sidewalks on both sides of Main Street, Boston Avenue, 2nd Avenue, and 3rd Avenue in the immediate area surrounding the proposed Downtown Longmont Station. However, there are currently no sidewalks along 1st Avenue. This area is expected to see a great deal of redevelopment in the coming years and sidewalks will be provided throughout the new development areas.

Figure 53: Bicycle Facilities near Proposed Downtown Longmont Station



Source: US 36 Commuting Solutions Bike Northwest Interactive Map (https://commutingsolutions.org/commuting-by-bike/us-36-bike-map/)

Existing and Future Land Use

Existing Land Use

The meat-packing plant that was located on the northeast corner of Main Street and 1st Avenue has been redeveloped as South Main Station, which will include 319 multi-family units in five buildings with 10,000 square feet of retail space when fully complete. **Figure 54** shows the area where the proposed station platform is planned. See recent station area developments around the proposed Downtown Longmont Station in **Figure 55**.

Existing Conditions – Proposed Stations

Figure 54: New development east of US 287 (Main Street) in Longmont

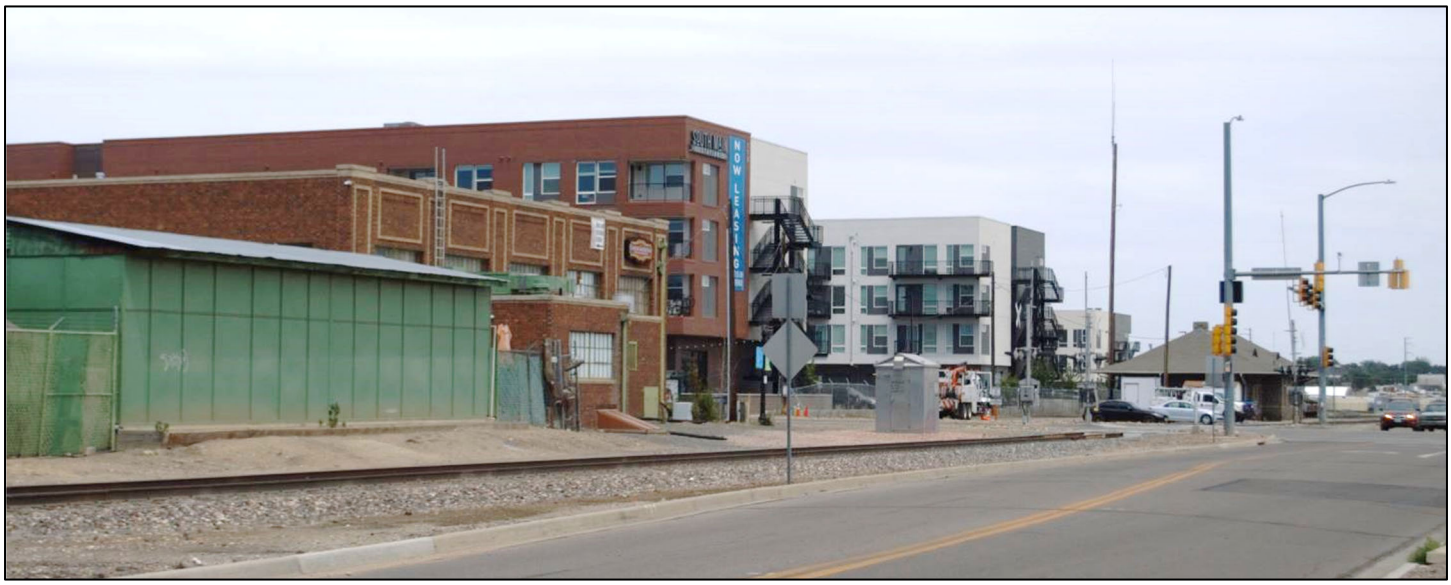


Figure 55: Recent Development near Potential Downtown Longmont Station

Existing Conditions – Proposed Stations

Existing Site Constraints

The biggest site constraint near the proposed Downtown Longmont Station is an electrical substation on the northwest corner of 1st Avenue and Coffman Street. While it does not preclude a station from being implemented at this location (with previous plans showing the station being constructed south of 1st Avenue), it does limit an entire city block from being redeveloped with TOD.

Adjacent Land Ownership

Table 10 shows the property owners for the previously planned Downtown Longmont Station.

Table 10: Property Ownership at Proposed Downtown Longmont Station

Parcel Number	Acres	Address	Owner
131503325013	0.50	825 1st Avenue, Longmont CO 80501	V & B Enterprises LLC
131503325009	N/A	815 1st Avenue, Longmont CO 80501	Knutson Steven & Larry L
131503325008	0.28	809 1st Avenue, Longmont CO 80501	Orban Donald B & Patricia G
131503325007	0.44	803 1st Avenue, Longmont CO 80501	Orban Donald B & Patricia G
131503325006	0.86	727 1st Avenue, Longmont CO 80501	Iron In The Fire LLC
		727 (1) 1st Avenue, Longmont CO 80501	187ONE Paradise Park LLC
		727 (2) 1st Avenue, Longmont CO 80501	Patio Park Mobile Home Park LLC
		727 (3) 1st Avenue, Longmont CO 80501	Patio Park Mobile Home Park LLC
		727 (4) 1st Avenue, Longmont CO 80501	187ONE Paradise Park LLC
		727 (6) 1st Avenue, Longmont CO 80501	187ONE Paradise Park LLC
		727 (8) 1st Avenue, Longmont CO 80501	187ONE Paradise Park LLC
		727 (9) 1st Avenue, Longmont CO 80501	187ONE Paradise Park LLC
		727 (10) 1st Avenue, Longmont CO 80501	Engler John J
		727 (11) 1st Avenue, Longmont CO 80501	187ONE Paradise Park LLC
		727 (12) 1st Avenue, Longmont CO 80501	187ONE Paradise Park LLC
131503325005	0.44	711 1st Avenue, Longmont CO 80501	711 FIRST PROPERTY LLC Dons Custom Cabinets Inc Northland Capital Financial Services LLC
131503325004	0.42	705 1st Avenue, Longmont CO 80501	Inskeep Ronald Dale
131503325016	0.32	617 1st Avenue, Longmont CO 80501	Walker Stanley R & Margaret Walker Stanley R & Margaret V
131503325002	0.56	613 1st Avenue, Longmont CO 80501	1st Ave Storage LLC
131503325001	0.83	1 South Main Street, Longmont CO 80501	Tebo Stephen D
131510213002	6.70	780 Boston Avenue, Longmont CO 80501	Budget Home Centers Vernon Voyle L Family Trust Et Al

Source: Boulder County Community Planning and Permitting interactive map (https://maps.boco.solutions/propertysearch/)

Future Development

The proposed station area is zoned Mixed-Use Downtown (MU-D) which preserves Longmont's "Downtown" and accommodates a mix of land uses including office, retail, entertainment, with supportive residential, government and civic uses. This zoning designation is intended to encourage walkable and pedestrian-friendly development that is well-served by transit.

On the northwest corner of Main Street and 1st Avenue, the 121 Main Street mixed-use development with 183 multi-family units, 11,000 square feet of commercial space, and 310 space shared parking structure is also proposed. Land acquisition at the site is underway and construction is expected to begin in 2023. While there

has not been a significant amount of redevelopment around the proposed Downtown Longmont Station to date, there likely will be in the years to come.

Observations/Conclusions

Each level of analysis has resulted in varying numbers of stations for the proposed NWR Corridor. In the recent studies, the list of stations now focus on the following set of stations. These stations are being evaluated as part of the NWR PSS.

- Denver Union Station (Existing): Denver Union Station was already constructed as part of the FasTracks program.
- Other B Line stations (Existing): 41st/Fox, Pecos Junction and Westminster/71st Avenue which serves as the initial end-of-line station for the B Line.
- **Downtown Westminster Station**: The City of Westminster is now focused on this station, as it will connect to the new Downtown Westminster development where there is expected to be a significant number of residents and employees as the site is built out. Much of parking area proposed in the 2010 NWR Corridor EE is now developed or acts as overnight hotel or short term restaurant parking. Currently, the focus is to utilize the one or two land parcels located south of 88th Avenue where a connection to the City of Arvada's Far Horizons neighborhood can be made while serving the Downtown Westminster area which is expected to have over 2 million square feet of office space; 750,000 square feet of retail, entertainment, and dining; 2,300 residential apartments, condominiums, and townhomes; and 300 hotel rooms. In the short term, buses could stop along 88th Avenue, leaving more room for parking at a proposed Park-n-Ride. In the longer term, a bus turnaround could be constructed on the west corner of the site.
- **Broomfield/116th Station**: The Broomfield/116th Station is located approximately a quarter-mile east of the US 36 & Broomfield Bus Station. The area has seen a great deal of development with even more to be built in the coming years. The area between US 36 and the BNSF rail line will likely see the most residential development as the area to the east of the rail line is made up of baseball fields and light industrial/warehousing. An important consideration is the connection to the west to the existing BRT station on US 36 and the adjoining Arista/1st Bank Center development. Additionally, an east-west connection under the railroad would also expand bicycle and pedestrian opportunities in this area. It is likely that some parking would be located on both sides of the rail line and there may be potential for a platted cul-de-sac to be constructed to allow for buses to turnaround.
- **Flatiron Station**: This station is partially constructed with the US 36 & Flatiron Station and Park-n-Ride already serving Flatiron Flyer BRT routes. There is a great deal of Boulder County open space north of US 36 in this area but still more area that can be developed within the limits of the City and County of Broomfield. This station would likely require some additional parking, as this station sees a great deal of Route AB riders to Denver International Airport. RTD owns both parcels to the east and west of the existing Park-n-Ride on the north side of US 36. Buses currently only serve the south side of the station, but future Flex Ride could potentially serve the rail station in the future.
- **Downtown Louisville Station**: There have been several developments that have been completed surrounding the proposed Downtown Louisville Station. There is another development that is in the planning and design process and others that are located further out as well. Concept designs will need to consider where the platform will be located, and some facilities may remain closer to SH 42 and Main Street in downtown Louisville. Shared parking is being considered east of the rail line, but additional shared parking may be warranted here, which could serve commuters during weekdays and visitors in the evenings and on weekends.
- **Boulder Junction at Depot Square Station**: The entire area around the Boulder Junction at Depot Square site has been redeveloped with a significant amount of new residential and office development

west of the rail line. The area to the east of the tracks has seen some development, but this area is currently largely built out. The bus station is located at the southern edge of the development along Pearl Parkway and provides 75 parking spaces for transit use. A small parking and passenger drop-off area may be considered closer to the platform, which is proposed to focus on the area around Bluff Street. This would likely focus on accessible parking. As the platform, parking area, and bus facilities are already sited, the focus from the City will be to integrate the transition plaza to accommodate bicycle and pedestrian connections and place required station infrastructure including bike racks and lockers and ticket vending machines, while maintaining the viability of the existing multi-use path in this urban center.

- **Downtown Longmont**: There has been some new development around this station site including on the northeast corner of the US 287/Main Street and 1st Avenue intersection. Additionally, the area on the northwest quadrant is also planned for redevelopment. It is likely that this area will continue to add multi-family residential in the coming years as well. The City of Longmont has worked with RTD for the past decade and the bus station and parking structure for transit riders would be located between the extended Coffman Street and US 287/Main Street. This is expected to become the transit hub in downtown Longmont where local bus routes, BRT, commuter rail, and potentially Front Range Passenger Rail could all one day connect. As noted above, the remaining area is proposed to be redeveloped with four-five story multi-family residential units, with the rail platform being located on 1st Avenue which is planned for closure.

Throughout the corridor there has been a significant amount of development around many of the proposed stations as communities have worked to begin implementing TOD around the stations in their respective communities. Station layouts will need to be modified for the stations being planned in the NWR PSS, as many of the station areas now have development on the parcels that were proposed for parking areas.

Milestone 3

Base Configuration Report

Appendix B

Rail Maintenance Facility Programming and Space Needs Report

Programming Report

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Tables

Introduction

Regional Transportation District (RTD) is conducting the Northwest Rail (NWR) Peak Service Study for a 35-mile extension of the B Line commuter rail service from the existing Westminster – 72nd Station to Boulder and Longmont. RTD plans to have new Rail Maintenance Facility (RMF) located in Longmont to support the NWR Line. Initially, the facility will be designed for Peak Service operation. However, the site and facility will be master planned for Full Service operation similar to RTD's existing Commuter Rail Maintenance Facility in Denver. The HDR Team is tasked with Programing and Master Planning the NWR RMF in close coordination with RTD staff.

Purpose and Use

The purpose of this report is to define the NWR RMF functional requirements and space needs, which will serve as a general basis for preliminary planning for the facility. RTD has not yet identified a specific site for the NWR RMF. There are nine potential sites in the City of Longmont. This report will help RTD confirm which site best fits the intended function of the site.

This document is intended for HDR Team use and coordination efforts with RTD staff. It is also a useful tool that encourages user involvement in the review and verification of data and assumptions.

Report Overview

This draft Programming Report has three sections and an appendix. The final report will have five sections. Below is a brief description of the contents of this draft report:

Methodology

This section describes the steps the HDR Team will use to define the NWR RMF Program Requirements and Master Plan Drawings.

Basis for Design

This section provides an overview of major functional areas noted during interview sessions and the tour of the existing Commuter Rail Maintenance Facility with RTD staff. It includes a description of the operations anticipated at NWR RMF, including hours of operation, staffing levels, and planning issues to be addressed. All of this is compiled for consideration during planning and design efforts and a summary of the more qualitative planning issues.

Space Needs Program Summary

This section contains a summary of the Space Needs Program for the building and site areas required for the NWR RMF.

Appendix A: Detailed Space Needs Program

The appendix contains the details for each of the programmed areas of the Space Needs Program.

Methodology

The HDR Team will work with RTD to define the Program Requirements for the NWR RMF that will be used to develop Master Plan Drawings. The following will be included in the overall program verification for the NWR RMF:

- Identify, Evaluate, and Develop the Functional Requirements
- Develop a detailed Space Needs Program
- Develop Functional Relationship Diagrams
- Develop Site Master Plan and Concept Building Drawing
- Develop a Cost Estimate

The best operation and maintenance facility projects begin with the HDR Team gaining an understanding of the functions or operations to be performed within the facility. The HDR Team began this effort by meeting with RTD staff for a programming workshop and a tour of the existing Commuter Rail Maintenance Facility in Denver. This provided valuable insight and direction for the HDR Team, which may not have been relayed through other programming and design methods. Subsequently, the HDR Team held interviews with the divisions/groups to collect the specific functional operational design data for the Space Needs Program.

The information gathered during the programming workshop, during the tour of Commuter Rail Maintenance Facility, at a follow-up meeting, and through interviews is documented in this report and will be utilized to develop the facility master plan.

Basis for Design

The Basis for Design is an important element in developing the requirements and space needs for the NWR RMF. The understanding gained by the HDR Team during the programming interview sessions and the tour of the existing Commuter Rail Maintenance Facility in Denver greatly influenced the planning decisions related to the functional design and layout of the building and site. The Basis for Design includes the functional and operational requirements for the following functional areas in the NWR RMF:

Building Areas

- Operations Administration
- Operations
- Vehicle Maintenance
- Warehouse
- Maintenance of Way
- Facility Maintenance
- Wash

Programming Report

Site Areas

- Train Storage Yard
- Tracked Vehicle Storage
- Exterior Areas (Storage and Spaces)
- Fuel Yard (If necessary)
- Exterior Vehicle Parking
- Employee/Visitor Parking

Programming Workshop

The NWR RMF programming effort began with a workshop on August 23, 2022, and a tour of the existing Commuter Rail Maintenance Facility on August 29, 2022. The workshop included an examination of the micro- and macro-level program requirements.

RTD staff who provided input on the anticipated facility needs for each group/division at the NWR RMF included:

- Joe Philips
- Brady Hollaway
- Ben Powell
- Ignacio Correa-Ortiz
- Erik Haugen
- Patrick Stanley
- Andrew Mahn
- Kirk Strand
- Annette Hunter
- Susan Wood

The HDR Team members who participated in the workshop included:

- Steve Long - HDR
- Ken Booth - HDR
- James Bond - HDR
- Michael Balash - HDR
- Zachary Bentzler - HDR
- Chrissy Breit - HDR
- Danielle Smith - Triunity

Assumptions

At this point in the planning process there are several assumptions that need to be made. As the project progresses, these assumptions will change and will be revised.

Programming Report

Design Fleet

RTD has not determined the railcar types. The general assumptions for the Draft Programming Report are the following:

- Vehicle overall length: 85 feet
- Trains: three vehicles
- Rail vehicles: single powered
- No double decker vehicles.
- No restrooms
- No married pairs
- Propulsion system (not yet determined)
  - Electric multiple unit (EMU) or diesel multiple unit (DMU)
- Fleet Quantity
  - Peak Service – 15 vehicles
  - Full Service – 30 vehicles

Service Plan

The current Peak Service plan for the NWR Line is three trains each in the morning and three trains in the afternoon during peak service hours Monday through Friday. The morning trains will run from the NWR RMF in Longmont to Union Station and remain there until the afternoon service. The afternoon trains will run from Union Station to the NWR RMF in Longmont. Once on site, the trains will be serviced, cleaned, and staged for use for the next weekday.

Another option still under consideration is that the trains would take a B Line run and be stored in Westminster during the day and return to Union Station in the afternoon, and then make the return trip from Union Station to Longmont during Peak Service hours in the afternoon.

The future Full Service plan for the NWR Line is to transition to full service seven days a week, 24 hours a day, with trains running on 30-minute headways.

Site

There will be no run around track on the site.

Right-of-Way

BNSF will maintain the right-of-way.

Functional and Operational Design Data

HDR held interviews with the divisions/groups that will be housed at the NWR RMF to identify each group's functions, staffing and hours of operation, vehicles, and key planning issues. For staffing and vehicles, data was gathered indicating the total quantities RTD anticipates being assigned to the facility. The following is a synopsis of the data collected for each department/group and functional area.

Programming Report

Operations Administration

Function

The Operations Administration is responsible for the day-to-day operation of the NWR commuter rail trains. This includes management, support, and oversight of engineers and the operators of the vehicles.

Staffing

Peak Service: The hours of operation for Operations Administration staff is anticipated to be from 8:00 a.m. to 5:00 p.m. Monday – Friday.

Full Service: The hours of operation for Operations Administration is anticipated to increase to 8:00 am to 5:00 pm seven days a week.

Table 1 presents a list of staff by position that will be assigned to Operations Administration and located at the NWR RMF. The first two columns represent the Peak Service (either DMU or EMU vehicles). The next two columns represent Full Service vehicles (either DMU or EMU vehicles).

Table 1: Operations Administration Staffing

Staffing/Position	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
General Manager	1	1	1	1
Operations Supervisor	1	1	2	2
Administrative Assistant	2	2	2	2
Total	**4**	**4**	**5**	**5**

Vehicles

Shared with Operations (refer to Table 3 Operations Non-Revenue Vehicles).

Key Planning Issues

The planning issues should be considered during the master planning process of this department.

Office Areas

- Provide separate private offices for the General Manager, Operations Supervisor(s). Each office shall include a desk, chair, and a drawer cabinet.
- Provide a Satellite Office – a space utilized by staff temporarily while on site. Each office shall include a desk, chair, and a drawer cabinet.
- Provide separate workstation(s) for each Administrative Assistant. Each workstation shall have a desk, chair, and a drawer cabinet.
- Administration could be an expansion (shell out later)

Office Support Areas

- Provide Conference Room for administrative staff sized for 12 people. Locate in the administrative office area.
- Provide an Office Supply/Copy Closet for storage of office supplies. Locate in Administrative office area.
- Provide a file storage Area. Space shall include multiple five-drawer file cabinets

- Provide Men's and Women's Restrooms located in administrative office area. Restroom shall include multiple toilets, urinals, and sinks.
- Provide Janitors Closet adjacent to restrooms

Building Support Areas

- Provide an IT Room
- Provide Electrical Room and Mechanical Rooms as required based upon the final build out

Operations

Function

The Operations team is responsible for dispatching the engineers to the trains and operating the commuter rail vehicles.

Staffing

Peak Service: The hours of operation for Operations staff is anticipated to be from 6:00 a.m. to 7:30 p.m. Monday – Friday.

Full Service: The hours of operation for Operations Administration is anticipated to increase to 3:30 a.m. to 1:30 a.m. seven days a week.

Table 2 presents a list of staff by position that will be assigned to Operations and located at NWR RMF. The first two columns represent the Peak Service (either DMU or EMU vehicles). The next two columns represent Full Service (either DMU or EMU vehicles)

Table 2: Operations Staffing

Staffing/Position	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Operations Dispatcher	2	2	5	5
Engineer	6	6	36	36
Conductor	6	6	36	36
Total	**14**	**14**	**77**	**77**

Assumptions:
Peak Service: 1 Engineer, 1 Conductor per shift per day. No weekend service only Monday through Friday
Trains total, 3 trains each day 2 spare trains
Full Service: 6 trains (3 cars each) each day 3 shifts per day. Spare ratio 4 spare trains. Seven-day operation

Vehicles

Table 3: Operations Non-Revenue Vehicles

Vehicle Type	Space size (LxW)	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Sedan/SUV (GM/Admin)	10x25	1	1	1	1
Sedan/SUV (Spare)	10x25	1	1	1	1
Sedan/SUV (Shift Change)	10x25			4	4
Total		**2**	**2**	**6**	**6**

Programming Report

Key Planning Issues

The planning issues should be considered during the master planning process for this facility.

Crew Dispatch Areas

- Provide a private office for Operator Dispatch. Include workstations, copy area, and counter space. Office and workstations will include a desk, chair, and drawer cabinet.
- Provide Report/Sign-Out Counter. Counter shall be adjacent to operator's office space.

Contracted Security Office

- Provide a Report/Sign Out Office
- Provide Locker Alcove for Contracted Security. Each officer shall have a locker.
- Provide Break Area for Contracted Security Staff. Break room shall include full kitchenette with refrigerator, microwave, water cooler, counter space, and cupboards.

Operators Support Areas

- Support area could be shared with Vehicle Maintenance for Peak Service. As the facility transitions to regular service and additional staff are added, the following spaces should be considered.
  - Provide Report/Sign Out Vestibule. The Vestibule will help to mitigate noise from the Lobby into the Administrative Staff office area and allow for easier interaction between an operator and an operator dispatch.
  - Provide an Assembly Room for Operations staff. Space shall be big enough to house all engineers assigned to facility for meetings and training sessions.
  - Provide Break Room Area for Operations staff. The Break Room shall include full kitchenette with refrigerator, microwave, water cooler, counter space, and cupboards. Include space for vending machine and extra water storage.
  - Provide full Men's and Women's Restrooms Include space for Men's and Women's shower and changing Area
  - Provide Men's and Women's Locker Rooms. The Rooms shall have one locker for every engineer assigned to facility.
- Fitness Room: Refer to the Vehicle Maintenance section

Training Areas

- Provide a Shared Office.
- Provide Classroom in operator office area. Classroom shall be sized to house 25 people. Classroom will include 25 desks, a projector, and a desk with computer for teacher/presenter.
- Provide storage areas for training supplies and classroom chairs and desks

Building Support Areas

- Provide an IT Room
- Provide Electrical and Mechanical Rooms as required based upon the final build out

Vehicle Maintenance

Function

This facility will primarily be used for service and inspection, preventative maintenance, wheel truing and component change out. Most of the heavy repair will be contracted out; components will be removed and sent out for repair as required. The design of the facility needs to be flexible to allow for spaces to be repurposed as the needs change in the future.

Staffing

Peak Service: The hours of operation for Vehicle Maintenance staff are anticipated to be from 6:00 a.m. to 7:30 p.m. Monday – Friday.

Full Service: The hours of operation for Vehicle Maintenance is anticipated to increase to 3:30 a.m. to 1:30 a.m. seven days a week.

Table 4 presents a list of staff by position that will be assigned to Vehicle Maintenance and located at NWR RMF. The first two column represent the Peak Service (either DMU or EMU vehicles). The next two columns represent Full Service (either DMU or EMU vehicles)

Table 4: Vehicle Maintenance Staffing

Staffing/Position	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Manager	1	1	1	1
Supervisor	4	4	7	7
Technician	8	8	12	12
Total	**13**	**13**	**20**	**20**

Assumptions:
Peak Service: 1 shift per for Technicians.
Full Service: 3 shifts per day for Technicians. Number of technicians is based upon shift overlap and number days per week.

Vehicle Parking

Table 5: Vehicle Maintenance Non-Revenue Vehicles

Vehicle Type	Space size (LxW)	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Forklifts	10x10	1	1	1	1
Large Truck	12x35	1	1	1	1
Total		**2**	**2**	**2**	**2**

Vehicles Maintained

The non-revenue vehicle will be maintained at other RTD locations.

Key Planning Issues

The planning issues should be considered during the master planning process of this department.

Programming Report

Office Areas

- Provide a separate Private Office for each Manager and Supervisor(s). Each office shall have a desk, chair, and a drawer cabinet.
- Plan for workstations for Technicians. These workstations should be placed throughout the shop. Each workstation shall include a computer kiosk.

Office Support Areas

- Provide Office Supply/Copy Room. Space shall include file cabinets, copier, and shelving for office supplies. Locate in Vehicle Maintenance office area.
- Provide Conference room for Vehicle Maintenance staff sized for 10 people. Locate in Vehicle Maintenance office area.
- Break Room Area will be shared with Operations staff. Refer to the Operations office support area section.
- Provide a Fitness Room which includes room for multiple pieces of exercise equipment. The Fitness Room will be shared by all employees at the NWR RMF. Locate the room so that is accessible by all staff.
- Men's and Women's Restrooms
  - Sized the restrooms for shift change of largest shift
  - The shower area which includes a door and changing area for privacy
  - At Peak Service the Restrooms could be shared with Operations staff
- Provide Men's and Women's Locker Rooms. Plan for full height 24x24 inch lockers. At Peak Service, the locker rooms could be shared with Operations. Locate adjacent to the Restrooms and Fitness Room.
- The Uniform Locker Area shall be used for vendors to drop off clean uniforms and pick up dirty uniforms. Space shall include (vendor provided) uniform lockers and a bin for dirty uniforms. Locate near an entrance to the building.
- Provide Janitors Closet adjacent to restrooms. Space shall be sized to include a cleaning cart, a mop sink, and storage shelving for janitorial supplies.

Training Areas

- Provide a Shared Office.
- Provide a Classroom sized for up to 25 people. The classroom will include tables with chairs, a projector, and a desk with computer for teacher/presenter.
- Provide storage rooms for training supplies and classroom chairs and desks
- Provide storage room for audio and visual equipment. Space shall include a shelving for projectors, speakers, and projection screens

Building Support Areas

- Provide an IT Room
- Provide Electrical and Mechanical Rooms as required based upon the final build out

Vehicle Maintenance

- Track shop will be built out on day 1, Approximately 200' feet 400'. There will be 5 total tracks. Two Service and Inspection tracks, a Preventive Maintenance track, and a Heavy Overhaul track.

- A single level Vehicle Maintenance Shop is preferred
- Overhead bridge cranes will be provided for PM Heavy, and PM tracks. Cranes will have a minimum capacity of 15 Tons.
- Vehicle Maintenance Shop will require Hydronic floors, a Cooling Shop with evaporating cooling with big destratification fans

Tracks

- Service and Inspection (S&I) Track
  - Provide 3 levels of access
    - Lower-Level Work Area (LLWA) for working underside of a vehicle
    - Vehicle Access level for access inside the vehicle.
    - Roof work platforms to access the top of the vehicle
  - The elevated floor platforms will have fall protection with removable railing, stair access
  - The parts lifts will access each level. LLWA, Main, Vehicle Access, and Roof access
  - Each track will be 3 vehicles in length
  - (Dependent on the final vehicle) The floor will ramp down about 15 inches beside the S&I tracks for ease of maintenance on the vehicle trucks
  - The Car Cleaners will use the S&I Bays to clean the inside of the vehicles
  - Provide a vehicle exhaust system for diesel trains (if DMU vehicles are selected)
- Preventative Maintenance (PM) Track, 3 level access. Will include a Lower-Level Work Area for working under a car and roof work platforms to access the top of the car.
  - Each track shall be 3 rail vehicles in length
  - 3 level access
    - Lower-Level Work Area (LLWA) for working on the underside of a vehicle
    - Vehicle Access level for access inside the vehicles
    - Roof work platforms to access the top of the car
  - The elevated floor platforms will have fall protection with removable railing, stair access
  - Provide a parts lifts to access all levels: LLWA, Main, Vehicle Access, and Roof access
  - The Car Cleaners will use the S&I Bays to clean the inside of the vehicles
- Lower Work Area at S&I and PM Tracks
  - Provide and locate trench drains to the edges of pit
  - Provide a ramp from Main Level to LLWA
  - Provide a lift table from Main Level to LLWA
- Wheel Truing: Functions will be outsourced to another facility

- Provide shunter vehicle
- Heavy Overhaul Track
  - Each track shall be 3 vehicles in length
  - 2 level access
    - Main level
    - Roof work platforms to access the top of the vehicle. The elevated floor platforms will have fall protection, stair access, and parts lifts.
  - Lifts shall be designed to lift one vehicle at a time. Lift needs to be able to remove trucks.
  - Bridge crane access for removing/replacing roof top equipment (HVAC, Pantograph, etc.) and setting them on the Main Level adjacent to the rail car

Truck Shop

- Provide Truck Shop and Storage. The Truck Shop shall include one truck hoist and a shop area adjacent to the hoist. The shop will be used for minor repairs only. Provide an open area for the truck storage of four to eight units (like units can be stacked). These areas should be accessible by the overhead crane and overhead door access to the exterior.
- The truck lift shall include a lift for testing and a shop area adjacent to the hoist
- Provide a Truck Wash Area adjacent to the truck shop. This space should include a large containment sump with grated area and remote wands for high pressure washing.
- Provide an area adjacent to the Truck Wash for the Wash Equipment room. This shall be sized to include a high-pressure washer and soaps.

Shop Areas

- Shop Areas shall be adjacent or near truck shop area
- Provide a Component Paint Shop. Space shall include a paint booth, workbench, and overhead hoist.
- Provide a Welding Shop. Space shall include welders, welding booths, welding exhaust extractors, and overhead hoist.
- Provide a Battery Shop. Space shall include storage shelving and racks for battery storage and workstations for minor testing and repair.
- Provide a HVAC Shop and Storage. Space shall be adjacent to Heavy overhaul track. The shop shall include a lift for testing and minor repair of HVAC units. Provide an open storage area for storing six to ten HVAC units (similar units can be stacked). Provide two to three units per vehicle type. Space should include overhead crane access. This space could be located on a mezzanine level.
- Provide a Pantograph Shop and Storage if EMU vehicles are used. Space shall be adjacent to Heavy overhaul track. The shop shall include a lift for testing and minor repair of Pantograph units. Provide an open storage area for storing pantograph units. Space should include overhead crane access. This space could be located on a mezzanine level.

- Provide a clean room for the Electronics Repair Shop and Storage. Space shall include storage shelving and racks for storage of electronics equipment and two workstations with electronic dissipative test benches for minor testing and repair.

Storage Areas

- Provide Portable Equipment Storage areas. This area can be shared with toolbox storage area.
- Provide an area for toolbox storage. Space shall be sized for one toolbox per Repairer. Space should be located adjacent to the Repair and Shop Areas. Provide locked tool crib for special tools if needed.
- Provide a Lube Room. Piping shall be run to the reel banks located in the S&I repair areas. Provide wall mounted pumps for fluids. Provide exterior access for deliveries.
    - EMU: Will include bulk fluids for Windshield Washer Fluid (WWF) and Gear Oil (GO)
    - DMU: Will include bulk fluids for Windshield Washer Fluid (WWF), Gear Oil (GO), Engine Oil (EO), Engine Coolant (EC), Transmission Fluid (TF), Used Oil (UO), and Used Coolant (UC).
- Provide a Compressor Room. The room shall be sized to include a compressor, a dryer. The Compressor Room will hold the shop air compressor system and the air brake compressor system.
- Provide an area for Vehicle Parking and Charging for Forklifts and Carts
- Cleaning Supply Storage Area

Shop Support Areas

- Provide a Unisex Restroom with shower and lockers. Locate adjacent to the Vehicle Maintenance Men's and Women's Restrooms.
- Provide a safety area for Hand and Eye wash. Include a drinking fountain adjacent to safety area.
- Provide a Janitors Closet adjacent to Unisex restroom. Space shall be sized to include a cleaning cart, a mop sink, and storage shelving for janitorial supplies.

Building Support Areas

- Provide a Mechanical/Boiler Room, Wastewater Treatment Area, Main Electrical Room, Water Entry Room, and a Fire Entry Room

Warehouse

Function

The Warehouse will be responsible for the storage of all materials needed for vehicle maintenance. This space will include tool crib, vertical lift modules (VLM), large item storage, long term storage, parts mezzanine, forklift charging.

Staffing

Peak Service: The hours of operation for Warehouse staff is anticipated to be from 6:00 a.m. to 7:30 p.m. Monday – Friday.

Full Service: The hours of operation for Warehouse is anticipated to increase to 3:30 a.m. to 1:30 a.m. seven days a week.

Programming Report

Table 6 presents a list of staff by position that will be assigned to Warehouse and located at NWR RMF. The first two column represent the Peak Service (either DMU or EMU vehicles). The next two columns represent Full Service (either DMU or EMU vehicles).

Table 6: Warehouse Staffing

Staffing/Position	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Supervisor	1	1	1	1
Warehouse Workers	2	2	7	7
Total	**3**	**3**	**8**	**8**

Vehicle Parking

Table 7: Warehouse Non-Revenue Vehicles

Vehicle Type	Space size (LxW)	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Forklift	10x10	1	1	1	1
Total		**1**	**1**	**1**	**1**

Key Planning Issues

The planning issues should be considered during the master planning process of this department.

Office Areas

- Provide Parts Counter. Parts counter shall include a stainless-steel countertop, shelving for parts manuals, and a rolling shutter to secure the window area.
- Provide private offices for supervisor. Each office shall include a desk, chair, and a drawer cabinet.
- Provide workstation for warehouse workers. Workstations will include a desk, chair, and drawer cabinet.

Storage Areas

- Provide Tool Crib, VLM Area, Large Item Pallet Rack Storage, Parts Mezzanine, Shipping/Receiving Area, Forklift Charging, and Long Term (overflow) Storage
- Provide an area near parts window for small parts storage. Space shall include drawer units and shelving or high-density storage such as vertical lift modules (VLMs). RTD prefers the use of VLM's for part storage in the NWR RMF.
- Provide an area for large parts storage. Space should include bulk storage racks and pallet racks or high-density storage units such as stack systems. Warehouse will store replacement seats, windows, and glass.
- Provide a secure tool storage for RTD owned tools. Foreman or Materials Handling Staff supervises tool check out.
- Provide overhead doors to the shop and narrow aisle forklifts
- Loading dock needs 2 positions (one set for semi-truck). Loading dock will also need to be heated.
- Provide Intercom system for deliveries outside of gate

Building Storage Areas

- Provide an Electrical Room, Mechanical Room, and Data/Comm Room

Maintenance of Way

Function

The current plan is that BNSF will maintain the Right of Way. Maintenance of Way (MOW) staff will be responsible for all maintenance in the yard only This includes maintenance and improvement of yard rail infrastructure, including tracks, ballast, grade, signals and signage, yard lighting, and catenary wire and poles (if EMU).

Staffing

There will be no staff assigned to the facility. MOW staff from other facilities will provide maintenance as required.

Key Planning Issues

The planning issues should be considered during the master planning process of this department.

Office Areas

- None

Shop Areas Storage Yard

- None

Storage Yard

- Provide storage areas for MOW. MOW Storage will be in the yard of the facility. Included in Yard Storage is rail, railroad ties, crossing signals, light poles, catenary poles.

Facility Maintenance

Function

Facilities Maintenance is responsible for ongoing preventative maintenance and long-term maintenance of NWR RMF assets including building's, exterior site, landscaping, and snow removal.

Staffing

Peak Service: The hours of operation for Facility Maintenance staff is anticipated to be from 6:00 a.m. to 7:30 p.m. Monday – Friday.

Full Service: The hours of operation for Facility Maintenance is anticipated to increase to 3:00 a.m. to 1:30 a.m. seven days a week.

Table 8 presents a list of staff by position that will be assigned to Facility Maintenance and located at NWR RMF. The first two column represent the Peak Service (either DMU or EMU vehicles). The second two columns represent Full Service (either DMU or EMU vehicles)

Table 8: Facility Maintenance Staffing

Staffing/Position	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Supervisor	1	1	1	1
Technician	2	2	2	2
Total	**3**	**3**	**3**	**3**

Vehicle Parking

Table 9: Facility Maintenance Non-Revenue Vehicles

Vehicle Type	Space size (LxW)	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Carts	10x10	0	0	0	0
Trucks	12x25	0	0	0	0
Trailer	12x35	0	0	0	0
Total		**0**	**0**	**0**	**0**

Key Planning Issues

The planning issues should be considered during the master planning process of this department.

Shop Areas

- Provide a private office for supervisor. Each office shall include a desk, chair, and a drawer cabinet.
- Provide Facility Maintenance Shop. Shop shall include a bench grinder, a vise, a workbench, and a drill press. Include bridge crane for maintenance shop. Facility Maintenance Shop will be connected to MOW shop.
- Facility Maintenance Parts Storage shall include cabinets and shelving units. This space should have exterior overhead door access for deliveries of parts, supplies, and equipment.

Service and Clean

Function

The Service and Clean staff is responsible for interior cleaning including monthly detail clean and nightly sweeping, and exterior vehicle cleaning which will serve to augment and as a back-up to the automated train wash equipment.

Staffing

The hours of operation for Peak Service for the Service and Clean staff at the NWR RMF are from 7:00 p.m. to 6:00 a.m., (M – F). Wash staff will work when trains are not in use. Hours will increase to seven days a week when facility transitions to Full Service.

Table 10: Service and Clean Staffing

Staffing/Position	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Supervisor	0	0	1	1
Train Hostler	1	1	3	3
Car Cleaners	4	4	10	10
Total	**5**	**5**	**14**	**14**

Assumptions: Peak Service: 1 Shift, 8 hours, Full Service: 1 shift, 8 hours

Vehicle Parking

There are no vehicles assigned to the Service and Clean staff.

Key Planning Issues

The planning issues should be considered during the master planning process of this department.

Wash Areas

Exterior cleaning of trains will occur either off site or with a mobile pressure washer.

Site Areas

Function

Train Storage Yard. Storage track for storing fleet of trains. Tracks shall be designed to allow Technicians to test the propulsion system.

Exterior Areas (Material Storage and Exterior Site Areas)

Fuel Tank Yard (if necessary)

Exterior Vehicle Parking

Vehicles

Table 11 presents the project rail vehicles which will be stored, operated, and maintained on the NWR RMF.

Table 11: Train Storage Yard

Vehicle Type	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Diesel	15	0	30	0
Electric	0	15	0	30
Subtotal	**15**	**15**	**30**	**30**
Total	**15**	**15**	**30**	**30**

Key Planning Issues

The planning issues should be considered during the master planning process of this department.

Train Storage Yard

- Allocate enough space for a minimum of three train storage tracks
- The surrounding surface of the yard will be asphalt and ballast
- Plan for pedestrian crossing for cleaning and operator access to tracks
- Plan for a minimum of 5-foot walkways on one side of the train for safe access to rail vehicles and for snow plowing during the winter
- Provide compressed air in the Train Storage Yard for air brakes
- The Train Wash needs to be accessible from the Train Yard
- If EMU are used for the facility provide overhead wire for changing in the yard
- If DMU are used for the facility, fueling will be by mobile fuel truck. The fuel truck will provide fuel to each DMU in the Train Storage Yard.

Exterior Areas (Material Storage and Exterior Site Areas):

- Provide space for MOW storage in the exterior areas of the yard
- Provide space for Facility Maintenance storage in the exterior areas of the yard
- Provide a Guard Shack close to the entrance of the yard
- Provide space for trash and recycling dumpsters. Locate dumpster area near entrance for easy removal.
- Provide space for standby power
- Provide clear path from gate to Warehouse loading dock. Provide space for 2 types of loading docks. One recessed for semi-trucks and one elevated for box truck deliveries.

Exterior Vehicle Parking

- Provide space for parking for all non-revenue vehicles needed for staff
- Provide space for parking for employee and guest vehicles

Space Needs Program

This section presents the Space Needs Program for the NWR RMF. The Space Needs Program estimates for Building Areas and Exterior Site Areas were developed to meet the operational needs for the various groups/departments to be located at the NWR RMF. The space requirements for a safe and efficient operations and maintenance facility and is based on applicable industry standards and RTD's existing Commuter Rail Maintenance Facility in Denver.

The Space Need Program estimate includes the Peak Service Program Requirements, as well as a 30-rail vehicle fleet. At the time of this report, the rail vehicle type was not determined. Therefore, there are separate columns for DMU (Diesel) and EMU (Electric) trains.

A summary of the Space Needs Program is provided at the end of this section. This summary includes the projected square footage needs for all building and exterior areas. These projected space needs are subtotaled into net square footage requirements and totaled to include site access, landscaping, and setbacks for a total site acreage requirement for the facility.

Space Needs Office Areas

Staffing Summary

Facility staffing levels determine the number of parking spaces, size of support facilities, and occupancy levels. Table 12 is a summary of the projected staffing levels for each group/department to be located at the NWR RMF. Refer to the Basis for Design section and the Detailed Space Needs Program in Appendix A for a detailed breakdown of each group/department staffing by position.

Table 12: Staffing Summary

Staffing/Position	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Operations Administration	4	4	5	5
Operations	14	14	77	77
Vehicle Maintenance	13	13	20	20
Warehouse	3	3	8	8
Maintenance of Way	0	0	0	0
Facility Maintenance	3	3	3	3
Service and Clean	5	5	14	14
Total	**42**	**42**	**127**	**127**

Vehicle Summary

Rail vehicles and support vehicle types, sizes, and quantities determine the size of the storage track needed for rail vehicles and parking space needs for the NWR RMF. The projected quantities were taken directly from interview sessions with RTD staff. Table 13, Table 14, and Table 15 summarize the projected rail vehicle support vehicles quantities for the NWR RMF. Refer to the Basis for Design section and the Detailed Space Needs Program in Appendix A for a detailed breakdown of each vehicle by each group/ department.

Table 13: Train Storage Yard

Vehicle Type	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Diesel	15	0	30	0
Electric	0	15	0	30
Subtotal	**15**	**15**	**30**	**30**
Total	**15**	**15**	**30**	**30**

Table 14: Tracked Vehicle Storage Yard

Vehicle Type	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
MOW Vehicle	0	0	0	0
Total	**0**	**0**	**0**	**0**

Table 15: Non-Revenue Vehicle Summaries

Vehicle Type	Peak Service - DMU	Peak Service - EMU	Full Service - DMU	Full Service - EMU
Operations	2	2	4	6
Vehicle Maintenance	2	2	2	2
Warehouse	1	1	1	1
Maintenance of Way	0	0	0	0
Facility Maintenance	0	0	0	0
Total	**5**	**5**	**9**	**9**

Space Standards

Space standards were applied to the Space Needs Program and generally apply to the Offices, Shops, Bays, and Vehicle Parking Areas. Area requirements in Shops and Storage Areas were derived from functional requirements and equipment space needs. The space standards listed in Table 16 were utilized to develop the facility program and overall area requirements. The space standards are based on functional needs and requirements established through the design of other facilities, rules of thumb, and specific requirements of each functional department/group.

Table 16: Planning Ratios and Calculations – Office/Office Support Areas

Staff	Space Standards			Area (SF)	Position
Private Office A	10	x	15	150	General Manager, Vehicle Maintenance Manager
Private Office B	10	x	12	120	Supervisor
Workstation A	8	x	8	64	Administrative Assistant
Workstation	4	x	4	16	Technician (Shared)
Space	**Space Standards**			**Area (SF)**	**Planning Ratios**
Operator Lockers - Two-tier	2.50	sf/ Operator			Assumes Two-tier 15-inch by 15-inch locker with 48 inches clear.
Contracted Security Officer Locker - Two Tier	2.50	sf/ Operator			Assumes - Two Tier 15-inch by 15-inch locker with 48 inches clear.
Technician Lockers	7.00	sf/ Technician			Technician Lockers 24-inch by 24-inch locker with 60 in. clear.
Uniform Lockers	2.00	sf/ Technician			Uniform Lockers 6-inch by 24-inch locker with 48 in. clear.
Service Staff Lockers - One-tier	4.00	sf/ Staff			One-tier 15-inch by 15-inch locker with 48 inches clear.

Table 17: Planning Ratios and Calculations – Shop and Storage Areas

Space	Space Standards			Area (SF)	Planning Ratios	
Tracks						
Service and Inspection (S&I) w/pit	25	x	335	8375	95	foot bay, 15-foot Door Aisle, 10 Aisle
Preventative Maintenance (PM)	25	x	335	8375	95	foot bay, 15-foot Door Aisle, 10 Aisle
Wheel Trueing	30	x	335	10050	335	foot bay
Heavy Overhaul	30	x	335	10050	95	foot bay, 15-foot Door Aisle, 10 Aisle
S&I Lower Work Area	25	x	335	8375		Stair and ramp access
PM Lower Work Area	25	x	335	8375		
S&I Vehicle Access Platform	10	x	335	3350		
PM Vehicle Access Platform	10	x	335	3350		
PM Roof Access Platform	10	x	335	3350		
Truck Shop						
Truck Lift	30	x	10	300		
Truck Wash	25	x	25	625		
Fuel Yard						
Fueling Position	20	x	265	5300		
Wash						
Wash Lane	25	x	150	3750		
Train Storage Track						
Rail Vehicle Storage	15	x	300	4050		
Rail Vehicle Storage	20	x	300	5400		Includes a 5-foot walkway between rail vehicles

Circulation Factors

The space requirements shown for each function are net usable area. By using the urban design approach to this development of the facility, the HDR Planning Team hopes to minimize the amount of circulation necessary for an efficient facility. The three Circulation Factors utilized in the Space Needs Program are described below

Interior or Building Circulation

This factor is applied to the program as a percentage of the total building square footage. It accounts for miscellaneous building spaces, such as hallways, stairwells, custodial closets, mechanical, plumbing, and electrical rooms; wall thickness; structure (Circ/Mech/Elec/Struct - Net: Gross); and access requirements. Table 18 is a list of the factors (in general) that were applied to the program:

Table 18: Interior or Building Circulation Factors

Department/Group/Area	
Operations Administration	45%
Operations	45%
Vehicle Maintenance Administration	45%
Vehicle Maintenance	30%
Warehouse	25%
Maintenance of Way	25%
Facility Maintenance	25%
Wash	20%

Exterior and Exterior Parking Circulation

This factor is included to account for the drive aisles, walkways, islands, and other areas created by site and access inefficiencies. This factor can vary from 15 to 100%of the actual space occupied by a vehicle. The factors used for the NWR RMF are shown in Table 19.

Table 19: Exterior and Exterior Parking Circulation

Exterior Areas	
Train Storage yard	120%
Tracked Vehicle storage yard	120%
Exterior Areas	100%
Fuel Yard	0%
Exterior Parking Areas	
Exterior Vehicle Parking	100%
Employee/Visitor Parking	100%

Site Circulation Factor

This factor is also applied to the program as a percentage of the total program square footage. It accounts for areas around buildings, site drive aisles, building access, and site access. For new construction, a 100%factor is normally applied to account for all site inefficiencies. As such, the better the site conditions, access, easement, etc., the more efficient the site layout can become, reducing this factor to as low as 50%.

Space Needs Program Summary

Table 20 is a summary of the Space Needs Program for the NWR RMF. It includes projected square footage needs for building areas, covered areas, exterior areas, train yard, and vehicle parking areas. Site circulation, landscaping requirements, and total acres required are also shown.

The Space Need Program Summary table has a Department/Area column that describes the major functional department/group/area on the site, and then four additional columns. The first two columns (DMU – 15 VEHICLES, EMU – 15VEHICLES) include the quantity (QTY) - staff or space and Area (SF) required for Peak

Service operations and maintenance. The next two columns (DMU –30, EMU-30) include the quantity (QTY) - Staff or Space and Area (SF) required for Peak Service operations and maintenance.

The Space Needs Program Summary is subsequently split into Building Area and Site Area areas. The Building Areas section includes all the physical building spaces planned for the site. The Site Areas section includes all the major storage and parking spaces planned for the site.

The Site and Building Areas are subtotaled, and a the Site Circulation factor is applied to determine the Grand Total Site requirement for the estimated total square footage and acreage.

Detailed Space Needs Program

The Detailed Space Needs Program is included in Appendix A. It displays the same information as the summary table, but includes additional detail for each programmed area.

Programming Report

Table 20: Space Needs Program Summary

NORTHWEST RAIL MAINTENANCE FACILITY — **Space Need Program**

LONGMONT, COLORADO — **Summary**

Summary - Space Needs Program 4/4/2023 Department/Area	PEAK SERVICE DMU - 15 CARS Qty. Staff	 Qty. Space	 Area (SF)	PEAK SERVICE EMU - 15 CARS Qty. Staff	 Qty. Space	 Area (SF)	FULL SERVICE DMU - 30 CARS Qty. Staff	 Qty. Space	 Area (SF)	FULL SERVICE EMU - 30 CARS Qty. Staff	 Qty. Space	 Area (SF)	
BUILDING AREAS													
OPERATIONS ADMINISTRATION	4		1,839	4		1,839	5		2,013	5		2,013	
OPERATIONS	14		812	14		812	77		2,777	77		2,777	
VEHICLE MAINTENANCE ADMININSTRATION	13		2,775	13		2,775	20		3,330	20		3,330	
VEHICLE MAINTENANCE SHOP			61,927			63,236			63,868			66,468	
WAREHOUSE	3		9,723	3		9,723	8		10,591	8		10,591	
MAINTENANCE OF WAY	0		0	0		0	0		0	0		0	Not at this facility
FACILITY MAINTENANCE	3		1,940	3		1,940	3		1,940	3		1,940	
TRAIN WASH	5		0	5		0	14		0	0		0	Wash Trains at CRMF
TOTAL BUILDING AREAS	42		79,015	42		80,324	127		84,519	113		87,119	
SITE AREAS													
TRAIN STORAGE YARD		5	62,700		5	62,700		10	132,000		10	132,000	Train sets
EXTERIOR AREAS			25,773			25,773			25,773			25,773	Exterior Storage Areas, Exterior Areas
FUEL YARD			0			0			0			0	Trains fueled by mobile fuel truck
EXTERIOR VEHICLE PARKING		5	2,540		5	2,540		8	4,040		8	4,040	
EMPLOYEE/VISITOR PARKING	42	40	19,584	42	40	19,584	127	74	36,100	127	74	36,100	
TOTAL SITE AREAS			110,597			110,597			197,913			197,913	
SUBTOTAL ALL AREAS	42		189,612	42		190,921	127		282,432	113		285,032	
SITE CIRCULATION, LANDSCAPING, SETBACKS	*100%*		*189,612*			*190,921*			*282,432*			*285,032*	
GRAND TOTAL ALL AREAS	42		379,224	42		381,843	127		564,863	113		570,063	
	Acres:		8.71	Acres:		8.77	Acres:		12.97	Acres:		13.09	

APPENDIX A.
DETAILED SPACE NEEDS PROGRAM

Space Needs Program April 4, 2023 Area/Space	Space Standards	PEAK SERVICE DMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	PEAK SERVICE EMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE DMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE EMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	Remarks
BUILDING AREAS														
OPERATIONS ADMINISTRATION														
Office Areas														
General Manager	150	1		150	1		150	1		150	1		150	Private Office
Satelite Office	120		1	120		1	120		1	120		1	120	Private Office
Operations Supervisor	120	1		120	1		120	2		240	2		240	Private Office
Administrative Assistant	64	2		128	2		128	2		128	2		128	Workstations
Subtotal Office Areas		4		518	4		518	5		638	5		638	
Office Support Areas														
Conference Room	25 sf/person		12	300		12	300		12	300		12	300	12 people
Office Supply/Copy Room			1	25		1	25		1	25		1	25	Closet
File Storage Area			1	25		1	25		1	25		1	25	
Men's Restroom	150		0	0		0	0		0	0		0	0	Use larger restroom
Women's Restroom	150		0	0		0	0		0	0		0	0	Use larger restroom
Unisex Restroom	100		1	100		1	100		1	100		1	100	
Janitor's Closet	80		0	0		0	0		0	0		0	0	
Subtotal Office Support Areas		0		450	0		450	0		450	0		450	
Building Support Space														
IT Room	100		1	100		1	100		1	100		1	100	
Electrical	100		1	100		1	100		1	100		1	100	
Mechanical	100		1	100		1	100		1	100		1	100	
Subtotal Building Support Space		0		300	0		300	0		300	0		300	
SUBTOTAL OPERATIONS ADMINISTRATION		**4**		**1,268**	**4**		**1,268**	**5**		**1,388**	**5**		**1,388**	
Circ/Mech/Elec/Struc (Net: Gross)														
Circulation/Struct	45%			571			571			625			625	
TOTAL OPERATIONS ADMINISTRATION		**4**		**1,839**	**4**		**1,839**	**5**		**2,013**	**5**		**2,013**	

Space Needs Program April 4, 2023 Area/Space	Space Standards	PEAK SERVICE DMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	PEAK SERVICE EMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE DMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE EMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	Remarks
OPERATIONS														
Crew Dispatch Areas														
Dispatch Office		2	1	200	2	1	200	5	1	200	5	1	200	Workstation, copy area, counter space
Report/Sign-out Counter			1	50		1	50		1	50		1	50	Counter space
Subtotal Crew Dispatch Areas		2		250	2		250	5		250	5		250	
Contracted Security Office														
Conductor		6			6			36			36			
Locker Alcove	2.5 sf/person		6	15		6	15		36	90		36	90	36 inch heigh lockers, one (1) for each Officer
Break Area			0	0		0	0		1	280			280	Share with Maintence for Peak Service Only
Tables and Chairs	15 sf/person		0	0		0			12	180		12	180	
Kitchenette				0						100			100	
Subtotal Contracted Security Office		6		15	6		15	36		370	36		370	
Operators Support Areas														
Engineer		6			6			36			36			
Report/Sign Out Vestibule			1	200		1	200		1	200		1	200	
Women's Restroom/Shower/Changing Area				---			---		0	---		0	---	Share with Vehicle Maintenance
Men's Restroom/Shower/Changing Area				---			---		0	---		0	---	Share with Vehicle Maintenance
Janitorial Closet			1	80		1	80		1	80		1	80	
Locker Alcove	2.5 sf/person		6	15		6	15		36	90		36	90	36 inch high lockers, one (1) for each Operator
Subtotal Operators Support Areas		6		295	6		295	36		370	36		370	
Training Areas														Training at 711
Classroom	25 sf/person								25	625		25	625	
Training Supply Storage									1	100		1	100	
Table/Chair Storage									1	200		1	200	
Subtotal Training Areas				0			0			925			925	
Building Support Space														See Admin Office
Subtotal Building Support Space				0			0			0			0	
SUBTOTAL OPERATIONS		**14**		**560**	**14**		**560**	**77**		**1,915**	**77**		**1,915**	
Circ/Mech/Elec/Struc (Net: Gross)														
Circulation/Struct	45%			252			252			862			862	
TOTAL OPERATIONS		**14**		**812**	**14**		**812**	**77**		**2,777**	**77**		**2,777**	

Space Needs Program April 4, 2023 Area/Space	Space Standards	PEAK SERVICE DMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	PEAK SERVICE EMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE DMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE EMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	Remarks
VEHICLE MAINTENANCE ADMININSTRATION														
Office Areas														
Manager	150	1		150	1		150	1		150	1		150	Private Office
Supervisor	60	4		240	4		240	7		420	7		420	Open workstation
Technician		8		--	8		--	12		--	12		--	
Subtotal Office Areas		13		390	13		390	20		570	20		570	
Support Areas														
Office Supply/Copy Room			1	100		1	100		1	100		1	100	
Conference/Training Room	25 sf/person			0			0			0			0	Shared with Admin
Break Room	20 sf/person		15	300		15	300		15	300		15	300	Shared with Operations (Peak Service)
Fitness Room			1	200		1	200		1	200		1	200	Shared with Operations
Kitchenette/Vending Alcove			1	200		1	200		1	200		1	200	Shared with Operations (Peak Service)
Universal Restroom/Shower/Changing Area			1	500		1	500		1	500		1	500	Shared with Operations (Peak Service)
Sink	*50 sf/unit*		*2*	*100*		*2*	*100*		*2*	*100*		*2*	*100*	
Toilet	*50 sf/unit*		*4*	*200*		*4*	*200*		*4*	*200*		*4*	*200*	
Shower/Changing Area	*100 sf/unit*		*2*	*200*		*2*	*200*		*2*	*200*		*2*	*200*	
Universal Locker Alcove	15 sf/person		8	120		8	120		12	180		12	180	
Uniform Lockers	8 sf/person		13	104		13	104		20	160		20	160	
Janitor's Room									1	80		1	80	
Subtotal Support Areas		0		1,524	0		1,524	0		1,720	0		1,720	
Training Areas														See Operations
Subtotal Training Areas				0			0			0			0	
Building Support Areas														
Subtotal Building Support Areas				0			0			0			0	
SUBTOTAL VEHICLE MAINTENANCE ADMININSTRATION		**13**	**0**	**1,914**	**13**	**0**	**1,914**	**20**	**0**	**2,290**	**20**	**0**	**2,290**	
Circ/Mech/Elec/Struc (Net: Gross)														
Circulation/Struct	45%			861			861			1,040			1,040	
TOTAL VEHICLE MAINTENANCE ADMININSTRATION		**13**		**2,775**	**13**		**2,775**	**20**		**3,330**	**20**		**3,330**	

Space Needs Program April 4, 2023 Area/Space	Space Standards	PEAK SERVICE DMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	PEAK SERVICE EMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE DMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE EMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	Remarks
VEHICLE MAINTENANCE SHOP														
Tracks														
Service and Inspection (S&I) w/pit	25 x 335		2	16,750		2	16,750		2	16,750		2	16,750	Full pit and railcar access platform
Preventative Maintenance (PM/Midlife)	25 x 335		1	8,375		1	8,375		1	8,375		1	8,375	Full pit, railcar access platform, roof access platform
Wheel Trueing	30 x 335		0	0		0	0		0	0		0	0	Wheel Trueing to outsource
Heavy Overhaul	30 x 335		1	10,050		1	10,050		1	10,050		1	10,050	
Subtotal Tracks			4	35,175		4	35,175		4	35,175		4	35,175	
Truck Shop														
Truck Repair Position	30 x 15		1	450		1	450		1	450		1	450	
Truck Lift	30 x 20		1	600		1	600		1	600		1	600	In-ground truck lift
Truck Storage	15 x 15		4	900		4	900		4	900		4	900	Includes turntables and storage track
Truck Wash	25 x 25		1	625		1	625		1	625		1	625	Includes rails into shop
Wash Equipment Alcove	8 x 10		1	80		1	80		1	80		1	80	High Pressure Washer
Subtotal Truck Shop			8	2,655		8	2,655		8	2,655		8	2,655	
Shop Areas														
Component Paint Shop	20 x 40		0	0		0	0		0	0		0	0	Other RTD Facilities
Welding Shop	30 x 30		1	900		1	900		1	900		1	900	
Battery Shop			1	1,100		1	1,100		1	1,100		1	1,100	
HVAC Shop/Storage	10 x 20		5	1,000		5	1,000		10	2,000		10	2,000	located on mezzanine
Pantograph Shop/Storage	10 x 20		0	0		5	1,000		0	0		10	2,000	located on mezzanine
Electronics Repair Shop	15 x 15		1	225		1	225		1	225		1	225	
Subtotal Shop Areas				3,225			4,225			4,225			6,225	
Storage Areas														
Portable Equipment Storage	30 x 20		1	600		1	600		1	600		1	600	
Tool Storage	15 x 20		0	0		0	0		0	0		0	0	In Warehouse
Lube Room				400			400			400			400	Windshield Washer Fluid (WWF), Gear Oil (GO), Used
Windshield Washer Fluid	*100*		*1*	*100*		*1*	*100*		*1*	*100*		*1*	*100*	
Gear Oil	*100*		*1*	*100*		*1*	*100*		*1*	*100*		*1*	*100*	
Engine Oil	*100*		*0*	*0*		*0*	*0*		*0*	*0*		*0*	*0*	
Engine Coolant	*100*		*0*	*0*		*0*	*0*		*0*	*0*		*0*	*0*	
Transmission Fluid	*100*		*0*	*0*		*0*	*0*		*0*	*0*		*0*	*0*	
Used Oil	*200*		*1*	*200*		*1*	*200*		*1*	*200*		*1*	*200*	
Used Coolant	*200*		*0*	*0*		*0*	*0*		*0*	*0*		*0*	*0*	
Compressor Room				*500*			*500*			*500*			*500*	
Shop Air Compressor	250		1	*250*		1	*250*		1	*250*		1	*250*	
Air Brake Compressor	250		1	*250*		1	*250*		1	*250*		1	*250*	Serve the yard 165 PSI
Vehicle Parking/Charging														
Forklift	10 x 10		1	100		1	100		2	200		2	200	
Carts	10 x 10		2	200		2	200		4	400		4	400	
Cleaning Supply Storage	8 x 20		3	480		3	480		3	480		3	480	S & I Tracks
Subtotal Storage Areas				2,280			2,280			2,580			2,580	
Shop Support Areas														
Unisex Restroom	8 x 10		2	160		2	160		2	160		2	160	
Hand wash/Eye wash/ Drinking Fountain	4 x 10		4	160		4	160		4	160		4	160	
Mechanic Workstations	4 x 4		6	96		6	96		8	128		8	128	
Janitor's Closet	8 x 10		2	160		2	160		4	320		4	320	
Subtotal Storage Areas				576			576			768			768	

Space Needs Program April 4, 2023 Area/Space	Space Standards	PEAK SERVICE DMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	PEAK SERVICE EMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE DMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE EMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	Remarks
Building Support Areas														
Mechanical/Boiler Room	35 x 40		1	1,400		1	1,400		1	1,400		1	1,400	
Wastewater Treatment Room	35 x 25		1	875		1	875		1	875		1	875	
Main Electrical	35 x 30		1	1,050		1	1,050		1	1,050		1	1,050	
Water Entry Room	10 x 20		1	200		1	200		1	200		1	200	
Fire Entry Room	10 x 20		1	200		1	200		1	200		1	200	
Subtotal Storage Areas				3,725			3,725			3,725			3,725	
SUBTOTAL VEHICLE MAINTENANCE SHOP				**47,636**			**48,636**	**0**		**49,128**			**51,128**	
Circ/Struc (Net: Gross)														
Circulation/Struct	30%			14,291			14,600			14,740			15,340	
TOTAL VEHICLE MAINTENANCE SHOP				**61,927**			**63,236**			**63,868**			**66,468**	
WAREHOUSE														
Office Areas														
Parts Counter			1	250		1	250		1	250		1	250	
Supervisor	120	1		120	1		120	1		120	1		120	
Warehouse Workers	64	2		128	2		128	7		448	7		448	
Subtotal Office Areas		3	1	498	3	1	498	8	1	818	8	1	818	
Storage Areas														
Tool Crib			1	325		1	325		1	325		1	325	
VLM	15 x 15		1	225		1	225		2	450		2	450	
Large Item Storage (Pallet Rack)			1	3,500		1	3,500		1	3,500		1	3,500	CRMF (7,760 sf)
Parts Mezzanine			1	1,200		1	1,200		1	1,200		1	1,200	CRMF (3,500 sf)
Shipping/Receiving			1	1,500		1	1,500		1	1,500		1	1,500	
Forklift Charging	10 x 15		1	150		1	150		2	300		2	300	
Long Term (Overflow) Storage														
Subtotal Storage Areas			6	6,900		6	6,900		8	7,275		8	7,275	
Building Support Areas														
Electrical Room			1	150		1	150		1	150		1	150	
Mechanical			1	150		1	150		1	150		1	150	
Data/Comm Room			1	80		1	80		1	80		1	80	
Subtotal Building Support Areas			3	380		3	380		3	380		0	380	
SUBTOTAL WAREHOUSE		**3**	**10**	**7,778**	**3**	**10**	**7,778**	**8**	**12**	**8,473**	**8**	**9**	**8,473**	
Net: Gross														
Circulation/Struct	25%			1,945			1,945			2,118			2,118	
TOTAL WAREHOUSE		**3**		**9,723**	**3**		**9,723**	**8**		**10,591**	**8**		**10,591**	

Space Needs Program April 4, 2023 Area/Space	Space Standards	PEAK SERVICE DMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	PEAK SERVICE EMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE DMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE EMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	Remarks
FACILITY MAINTENANCE														
Office Areas														
Supervisor	120	1		120	1		120	1		120	1		120	Private Office
Technician	16	2		32	2		32	2		32	2		32	Shared Workstation
Break Room														Assumed Shared with Other Areas
Men's Restroom														Assumed Shared with Other Areas
Women's Restroom														Assumed Shared with Other Areas
Custodial Room														Assumed Shared with Other Areas
Subtotal Office Areas		3		152	3		152	3		152	3		152	
Shop/Storage Areas														
Maintenance Shop			1	400		1	400		1	400		1	400	
Storage (Along Hall in Basement)			1	1,000		1	1,000		1	1,000		1	1,000	
Carpentry Shop														
Subtotal Shop Areas				1,400			1,400			1,400			1,400	
Building Support Areas														
Electrical Room														Assumed Shared with Other Areas
Mechanical														Assumed Shared with Other Areas
Data/Comm Room														Assumed Shared with Other Areas
Subtotal Building Support Areas				0			0			0			0	
SUBTOTALFACILITY MAINTENANCE		**3**		**1,552**	**3**		**1,552**	**3**		**1,552**	**3**		**1,552**	
Circ/Mech/Elec/Struc (Net: Gross)														
Circulation/Struct	25%			388			388			388			388	
TOTAL FACILITY MAINTENANCE		**3**		**1,940**	**3**		**1,940**	**3**		**1,940**	**3**		**1,940**	
TRAIN WASH														
Wash Building														
Wash Lane	25 x 150		0	0		0	0		0	0		0	0	Assume at CRMF
Wash Equipment Room	15 x 120		0	0		0	0		0	0		0	0	Assume at CRMF
Storage Room			0	0		0	0		0	0		0	0	
Subtotal Wash Building				0			0			0			0	
Building Support Areas														
Electrical Room			1	0		1	0		1	0		1	0	
Water Entry Room			1	0		1	0		1	0		1	0	
Data/Comm Room			1	0		1	0		1	0		1	0	
Subtotal Building Support Areas				0			0			0			0	
SUBTOTAL TRAIN WASH				**0**			**0**			**0**			**0**	
Circ/Mech/Elec/Struc (Net: Gross)														
Circulation/Struct	20%			0			0			0			0	
TOTAL TRAIN WASH		**5**		**0**	**5**		**0**	**14**		**0**	**14**		**0**	

Space Needs Program April 4, 2023 Area/Space	Space Standards	PEAK SERVICE DMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	PEAK SERVICE EMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE DMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE EMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	Remarks
SITE AREAS														
TRAIN STORAGE YARD														
Train Storage Track														
Rail Car Storage	15 x 300		3	13,500		3	13,500		5	22,500		5	22,500	90 foot long cars
Rail Car Storage	25 x 300		2	15,000		2	15,000		5	37,500		5	37,500	90 foot long cars, 12 foot truck access for mobile fueling
Subtotal Train Storage Track			5	28,500		5	28,500		10	60,000		10	60,000	
SUBTOTAL TRAIN STORAGE YARD			**5**	**28,500**		**5**	**28,500**		**10**	**60,000**		**10**	**60,000**	
Net: Gross														
Circulation	120%			34,200			34,200			72,000			72,000	
TOTAL TRAIN STORAGE YARD			**5**	**62,700**		**5**	**62,700**		**10**	**132,000**		**10**	**132,000**	**Train sets**
EXTERIOR AREAS														
Exterior Storage Areas														
MOW Yard				0			0			0			0	Main MOW operations located at other facilities
Warehouse Yard				10,000			10,000			10,000			10,000	
Subtotal Exterior Storage Areas			0	10,000		0	10,000	0		10,000			10,000	
Exterior Areas														
Dumpster														
Trash	6 x 6		1	36		1	36		1	36		1	36	
Recycle	6 x 6		1	36		1	36		1	36		1	36	
Steel	6 x 6		1	36		1	36		1	36		1	36	
Standby Power	15 x 25		1	375		1	375		1	375		1	375	
Warehouse														
Loading Dock	20 x 70		1	1,400		1	1,400		1	1,400		1	1,400	
Loading Areas	20 x 50		1	1,000		1	1,000		1	1,000		1	1,000	
Subtotal Exterior Storage Areas			6	2,883		6	2,883			2,883			2,883	
SUBTOTAL EXTERIOR AREAS				**12,883**			**12,883**			**12,883**			**12,883**	
Net: Gross														
Circulation/Struct	100%			12,890			12,890			12,890			12,890	
TOTAL EXTERIOR AREAS				**25,773**			**25,773**			**25,773**			**25,773**	**Exterior Storage Areas, Exterior Areas**

Space Needs Program April 4, 2023 Area/Space	Space Standards	PEAK SERVICE DMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	PEAK SERVICE EMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE DMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE EMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	Remarks
EXTERIOR VEHICLE PARKING														
Non-Revenue Fleet														
OPERATIONS														
Sedan/SUV (GM/Admin)	10 x 25		1	250		1	250		1	250		1	250	GM/Admin
Sedan/SUV (Spare)	10 x 25		1	250		1	250		1	250		1	250	Spare
Sedan/SUV (Shift Change)	10 x 25		1	250		1	250		4	1,000		4	1,000	Shift Change
VEHICLE MAINTENANCE SHOP														
Forklift	10 x 10		1	100		1	100		1	100		1	100	Exterior Forklift
Truck	12 x 35		1	420		1	420		1	420		1	420	Truck
MAINTENANCE OF WAY														No vehicles at this facility
FACILITY MAINTENANCE														No vehicles at this facility
Subtotal Non-Revenue Fleet			5	1,270		5	1,270		8	2,020		8	2,020	
SUBTOTAL EXTERIOR VEHICLE PARKING			**5**	**1,270**		**5**	**1,270**		**8**	**2,020**		**8**	**2,020**	
Net: Gross														
Circulation	100%			1,270			1,270			2,020			2,020	
TOTAL EXTERIOR VEHICLE PARKING			**5**	**2,540**		**5**	**2,540**		**8**	**4,040**		**8**	**4,040**	

Space Needs Program April 4, 2023 Area/Space	Space Standards	PEAK SERVICE DMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	PEAK SERVICE EMU - 15 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE DMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	FULL SERVICE EMU - 30 CARS PROGRAM Qty. Staff	Qty. Space	Area (SF)	Remarks
EMPLOYEE/VISITOR PARKING														
Employee Parking														
Employee Parking														
OPERATIONS ADMINISTRATION	10 x 25	4	4	1,000	4	4	1,000	5	5	1,250	5	5	1,250	
OPERATIONS	10 x 25	14	14	3,500	14	14	3,500	77	31	7,700	77	31	7,700	
VEHICLE MAINTENANCE SHOP	10 x 25	13	7	1,750	13	7	1,750	20	10	2,500	20	10	2,500	
WAREHOUSE	10 x 25	3	3	750	3	3	750	8	4	1,000	8	4	1,000	
MAINTENANCE OF WAY	10 x 25	0	0	0	0	0	0	0	0	0	0	0	0	
FACILITY MAINTENANCE	10 x 25	3	3	750	3	3	750	3	3	750	3	3	750	
CLEANING STAFF	10 x 25	5	5	1,250	5	5	1,250	14	14	3,500	14	14	3,500	
Subtotal Employee Parking		42	36	9,000	42	36	9,000	127	67	16,700	127	67	16,700	
Miscellaneous Parking														
Accessible Parking	13 x 18		2	468		2	468		3	702		3	702	
Visitor Parking	9 x 18		2	324		2	324		4	648		4	648	
Subtotal Miscellaneous Parking			4	792		4	792		7	1,350		7	1,350	
SUBTOTAL EMPLOYEE/VISITOR PARKING		**42**	**40**	**9,792**	**42**	**40**	**9,792**	**127**	**74**	**18,050**	**127**	**74**	**18,050**	
Net: Gross														
Circulation	100%			9,792			9,792			18,050			18,050	
TOTAL EMPLOYEE/VISITOR PARKING		**42**	**40**	**19,584**	**42**	**40**	**19,584**	**127**	**74**	**36,100**	**127**	**74**	**36,100**	

Milestone 3

Base Configuration Report

Appendix C

Existing Crossings Inventory

Contents

At-Grade Crossings Inventory

At-Grade Crossings Inventory

Tables

At-Grade Crossings Inventory

Acronyms and Abbreviations

ADT	Average Daily Traffic
FRA	Federal Railroad Administration

Introduction

This document provides an inventory of existing conditions of at-grade roadway crossings of the BNSF corridor along the proposed Northwest Rail alignment. Thirty-seven at-grade crossings along the 35-mile section of railroad from Denver to Longmont were reviewed in addition to four at-grade crossings between the terminal station in Downtown Longmont and the planned commuter rail maintenance facility; conditions are detailed in the following sections.

Contents

The at-grade crossings are grouped by jurisdiction: Westminster, Broomfield, Louisville, Lafayette, Boulder, Boulder County, and Longmont. A summary of the crossings is provided for each jurisdiction that details which have incorporated safety improvements to attain quiet zone status, general activity at the crossings, and the general existence/condition of safety infrastructure at the crossings.

A single page is dedicated to each individual crossing that includes the following:

- Crossing Features table that includes:
  - Quiet Zone Designation – Yes/No/Future
  - Quad Gates – Yes/No
  - Median – Yes/No/Flexible Bollards
  - Roadway Condition – Good/Fair/Poor
  - Pedestrian Infrastructure – Good/Fair/Poor/None
  - Bicycle Infrastructure – Multi-Use Path/Bike Lanes/Shared Use Arrows/None
- Traffic/Pedestrian Activity table that includes:
  - Road Volume – Low/Medium/High
  - Pedestrian Activity – Low/Medium/High
- Aerial image of the crossing
- Street-level image of crossing taken in Spring 2023
- Notes detailing important features
- Summary section detailing major features included/excluded at the crossing

Traffic activity is described as high, medium, or low based on the expected Average Daily Traffic (ADT) volume per lane at the given crossings. The ranges used for these qualitative assessments are:

- Low Activity = 7,000 or less ADT
- Medium Activity = 7,000 – 16,000 ADT

At-Grade Crossings Inventory

- High Activity = 16,000 – 50,000+ ADT

Pedestrian activity is a qualitative assessment based on field observations, surrounding land uses, and existing pedestrian amenities and connections in the area.

At the end of each municipal section, tables summarize the amenities, features, and existing conditions of the various crossings.

Westminster Crossings

Westminster Crossings Overview

The city of Westminster has eight at-grade roadway crossings of the Northwest Rail proposed alignment along the BNSF corridor:

- Lowell Boulevard
- 72nd Avenue
- Bradburn Boulevard
- 76th Avenue
- 80th Avenue
- 88th Avenue
- Pierce Street
- Old Wadsworth Boulevard

Only the 88th Avenue crossing is currently designated as a quiet zone. Westminster plans to install quiet zones at Lowell Boulevard, 72nd Avenue, and Bradburn Boulevard. The improvements at these quiet zones will be subject to agreement between the city, the BNSF Railway, and the Federal Railroad Administration (FRA). Asphalt conditions are good or fair at all Westminster crossings, but the crossing panel and striping are in poor condition at 72nd Avenue.

The 88th Avenue crossing has the highest roadway volumes and pedestrian activity of all the crossings in Westminster. A median is installed at 88th Avenue as a safety feature; however, the crossing lacks a sidewalk in the southwest quadrant to serve the high pedestrian volumes. The striping and asphalt are in good condition at the 88th Avenue crossing. The Old Wadsworth Boulevard crossing lacks sidewalks entirely, while Pierce Street has a sidewalk on only one side of the crossing. All other Westminster crossings have pedestrian infrastructure along both sides of the railroad crossing.

None of the Westminster crossings include four-quadrant gates, and only two crossings, 88th Avenue and Pierce Street, include medians. The other six crossings lack safety features to prevent vehicles from attempting to drive around the gates when they are closing.

Only the Lowell Boulevard and 88th Avenue crossings have lighting on both approaches. Pierce Street and Old Wadsworth Boulevard have no lighting infrastructure, while 72nd Avenue, Bradburn Boulevard, 76th Avenue, and 80th Avenue have lighting on one approach.

At-Grade Crossings Inventory

Westminster Crossing Elements and Conditions

Table 1: Westminster - Basic Roadway Information

Crossing	FRA ID	Quiet Zone	Roadway Classification	Lanes	Approx. AADT*	Crossing Control Type	Median/ Channelizing?	Proposed Siding?
Lowell Blvd.	244778B	FUTURE	Minor Arterial	2	2,200 - 3,400	TWO-QUAD	NO	NO
72nd Ave.	244779H	FUTURE	Minor Arterial	4	14,300 - 21,500	TWO-QUAD	NO	NO
Bradburn Blvd	244780C	FUTURE	Collector	2	800 - 1,250	TWO-QUAD	NO	NO
76th Ave	244781J	NO	Major Collector	2	2,700 - 4,100	TBD	TBD	NO
80th Ave	244782R	NO	Minor Arterial	4	13,000 - 19,500	TWO-QUAD	NO	NO
88th Ave	244784E	YES	Minor Arterial	6	26,500 - 39,500	TWO-QUAD	MEDIAN	NO
Pierce St	244785L	NO	Local	2	3,700 - 5,640	TWO-QUAD	MEDIAN	NO
Old Wadsworth Blvd	244786T	NO	Local	2	8,000 - 12,000	TWO-QUAD	NO	YES, SIDING 1

Table 2: Westminster - Pedestrian Elements

Crossing	Estimated Ped Activity	Existing Ped Infrastructure	NWR Station Proximity?	Detectable Warning?
Lowell Blvd.	LOW	E,W	NO	NONE
72nd Ave.	LOW	N,S	NO	NONE
Bradburn Blvd	LOW	E,W	NO	NONE
76th Ave	LOW	N, S	NO	NONE
80th Ave	MEDIUM	N,S	NO	YES, 4 CORNERS
88th Ave	HIGH	N,S	YES	NONE
Pierce St	MEDIUM	W	NO	NONE
Old Wadsworth Blvd	LOW	NONE	NO	NONE

Table 3: Westminster - Safety/Control Elements

Crossing	Crossing Panel Condition	Crossing Arms	Signal Poles	Pole-Mounted Flashing Light Pairs	Cantilevered Flashing Light Pairs	Signal to Adjacent Road?
Lowell Blvd.	GOOD	2	2	4	2	1 PAIR, TO BNSF ROW
72nd Ave.	POOR	2	2	4	2	YES, TO BNSF ROW
Bradburn Blvd	GOOD	2	2	4	0	YES, TO 72ND WAY
76th Ave	TBD	TBD	TBD	TBD	TBD	TBD
80th Ave	GOOD	2	2	4	4	YES, TO WOLF ST
88th Ave	FAIR	4	4	4	0	NO
Pierce St	GOOD	2	4	6	0	YES, TO 90TH ST
Old Wadsworth Blvd	GOOD	2	2	4	0	YES, TO 93RD ST

Table 4: Westminster - Pavement/Crossing Condition

Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
Lowell Blvd.	FAIR	FAIR	S	N,S
72nd Ave.	POOR	FAIR	W	E
Bradburn Blvd	FAIR	FAIR	W	S
76th Ave	TBD	TBD	TBD	TBD
80th Ave	GOOD	GOOD	W	S
88th Ave	GOOD	GOOD	N,S	E,W
Pierce St	GOOD	GOOD	W	NONE
Old Wadsworth Blvd	POOR	FAIR	N,S	NONE

At-Grade Crossings Inventory

Lowell Boulevard

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**Fair**
Bicycle Infrastructure:	**Bike Lane**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Sidewalk transitions to asphalt over crossing; no pedestrian-detectable warning panels
- Low pedestrian activity (primarily industrial area)

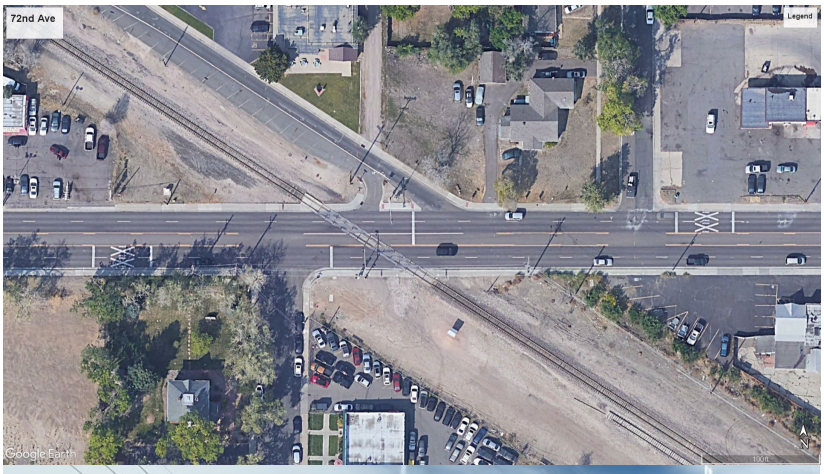
Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. The volumes of both vehicles and pedestrians are relatively low. Westminster plans to make this crossing a quiet zone in the future, but no specific improvements have been identified at this time.

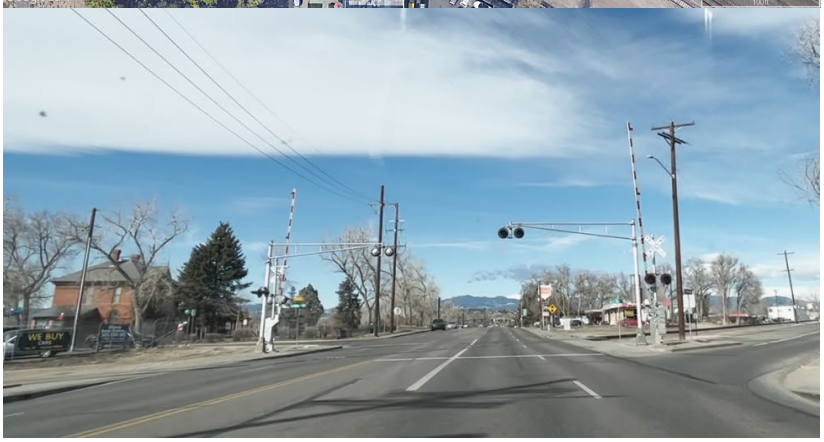
At-Grade Crossings Inventory

72nd Avenue

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**Low**





Notes:

- No pedestrian-detectable warning panels at sidewalk
- Concrete crossing panel in poor condition
- Low pedestrian activity
  - Primarily industrial area
  - 0.5 mi to Hidden Lake High School

Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. Pedestrian activity is expected to be low relative to other crossings, while vehicle volumes are expected to be high compared to other crossings. Westminster plans to make this crossing a quiet zone in the future, but no specific improvements have been identified at this time.

At-Grade Crossings Inventory

Bradburn Boulevard

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**Poor**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Sidewalk transitions to asphalt before the crossing panel; asphalt sidewalk section is in poor condition with no pedestrian-detectable warning panels
- Low pedestrian activity
  - Low-density residential area with some businesses

Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. Volumes of both vehicles and pedestrians are expected to be lower relative to other crossings along the Northwest Rail Corridor. Westminster plans to make this crossing a quiet zone in the future, but no specific improvements have been identified at this time.

At-Grade Crossings Inventory

76th Avenue

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Low pedestrian activity, low density residential area near park
- Sidewalks in good condition, no pedestrian detectable warning panels
- Was under BNSF construction on previous field visit, construction appears to have been maintenance-related with no major changes to crossing condition

Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. Volumes of both vehicles and pedestrians are expected to be lower relative to other crossings along the Northwest Rail Corridor.

At-Grade Crossings Inventory

80th Avenue

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Fair**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**Medium**

Notes:

- Sidewalk is not very wide on the south side; all sidewalk approaches have pedestrian-detectable warning panels
- Medium pedestrian activity
  - Businesses and residential on opposite sides of the track, medium-density apartments

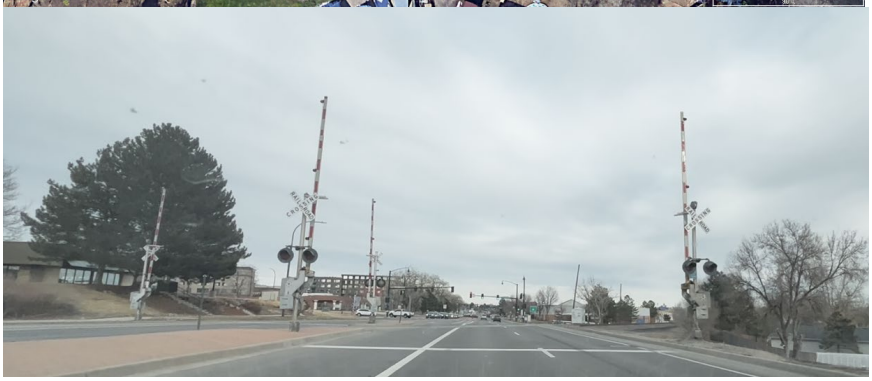
Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. Pedestrian volumes are expected to be moderate at this crossing, while vehicle volumes are high.

At-Grade Crossings Inventory

88th Avenue

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Poor**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**High**



Notes:

- No sidewalk southwest of crossing, very clear desire path present
- High pedestrian activity
  - Crossing is close to the proposed Northwest Rail Station
  - Many businesses, some residential close to crossing

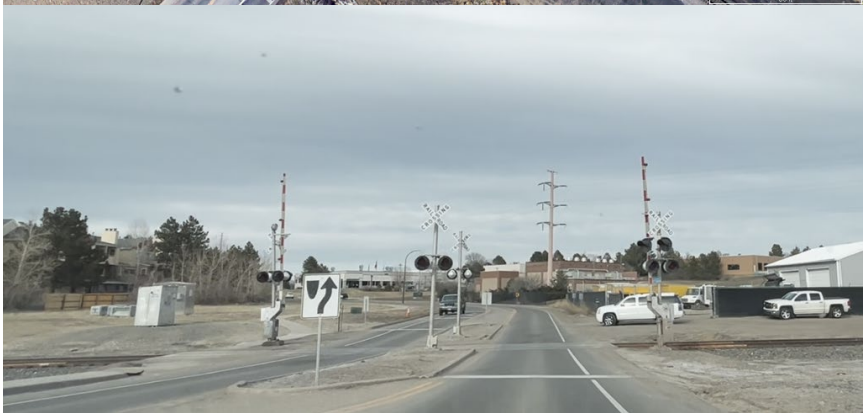
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing is one of the busiest of the Northwest Rail Corridor for both vehicles and pedestrians (but lacks a sidewalk in the southwest quadrant of the crossing). This crossing is adjacent to the proposed Downtown Westminster Station.

At-Grade Crossings Inventory

Pierce Street

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Medium**



Notes:

- Sidewalk is only on the north side
- Medium pedestrian activity:
  - Nearby apartment buildings
  - Sidewalk appears to be a popular walking path

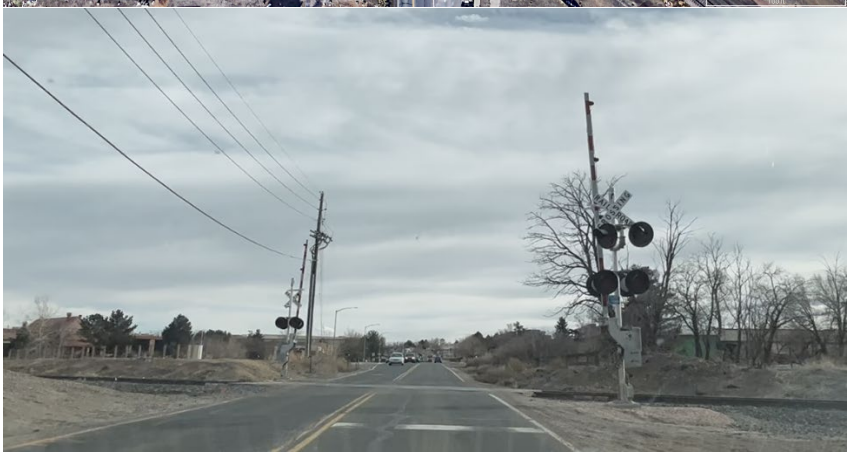
Summary: The crossing uses medians to prevent vehicles from crossing the road to drive around closing gates, but it is not designated as a quiet zone. The crossing is expected to have a low vehicle volume relative to other crossings along the Northwest Rail Corridor but is expected to have a medium pedestrian volume.

At-Grade Crossings Inventory

Old Wadsworth Boulevard

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Medium**
Pedestrian Activity:	**Low**



Notes:

- Proposed Siding #1 would extend across Old Wadsworth Boulevard at this crossing
- Low pedestrian activity
  - No sidewalk, but it might benefit from one to connect housing to the south and businesses to the north

Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. The crossing lacks any pedestrian or bicycle infrastructure. Vehicle volume is expected to be medium relative to other crossings along the Northwest Rail Corridor with low pedestrian activity. The crossing is part of proposed Siding #1, which may result in crossing reconstruction.

Broomfield Crossings

Broomfield Crossings Overview

The City and County of Broomfield have four at-grade roadway crossings of the Northwest Rail proposed alignment along the BNSF corridor:

- 112th Avenue (borders Westminster)
- 120th Avenue
- Nickel Street
- Brainard Drive

All crossings along the route in Broomfield are designated as quiet zones. All crossings in Westminster have safety features to prevent vehicles from attempting to drive around the gates when they are closing as an oncoming train approaches. The Brainard Drive crossing has four-quadrant gates, while the other three crossings have medians.

None of the crossings have particularly high traffic volumes or anticipated pedestrian activity. The crossing panel, asphalt, and striping are in good condition at the 120th Avenue and Brainard Drive crossings; the same items are in fair shape at Nickel Street and 112th Avenue. There is no lighting at the 112th Avenue, Nickel Street, or Brainard Drive crossings, while the 120th Avenue crossing only has lighting on one side.

The Nickel Street crossing is the most geometrically complex of the corridor, as the crossing passes through five turn lanes less than 100 feet from the intersection of Nickel Street and US Highway 287. The pedestrian infrastructure at Nickel Street is in poor condition, with a missing sidewalk on one side and a significantly damaged sidewalk on the other. The other three Broomfield crossings have no pedestrian infrastructure.

At-Grade Crossings Inventory

Broomfield Crossing Elements and Conditions

Table 5: Broomfield - Basic Roadway Information

Crossing	FRA ID	Quiet Zone	Roadway Classification	Lanes	Approx. AADT*	Crossing Control Type	Median/ Channelizing?	Proposed Siding?
112th Ave	244790H	YES	Minor Arterial	2	6,100 - 9,000	TWO-QUAD	MEDIAN	NO
120th Ave	244791P	YES	Collector	2	650 - 1,000	TWO-QUAD	MEDIAN	NO
Nickel St	089385S	YES	Minor Arterial	5	4,000 - 6,000	TWO-QUAD	MEDIAN	NO
Brainard Dr	929085A	YES	Local	2	50 - 150	FOUR-QUAD	NO	NO

Table 6: Broomfield - Pedestrian Elements

Crossing	Pedestrian Activity	Existing Ped Infrastructure	NWR Station Proximity?	Detectable Warning?
112th Ave	LOW	NONE	NO	NONE
120th Ave	LOW	NONE	NO	NONE
Nickel St	LOW	E	NO	NONE
Brainard Dr	LOW	NONE	YES	NONE

Table 7: Broomfield - Safety/Control Elements

Crossing	Crossing Panel Condition	Crossing Arms	Signal Poles	Pole-Mounted Flashing Light Pairs	Cantilevered Flashing Light Pairs	Signal to Adjacent Road?
112th Ave	FAIR	2	2	4	0	NO
120th Ave	GOOD	2	2	4	0	YES, TO ACCESS ROAD
Nickel St	FAIR	3	4	6	2	YES, TO INDUSTRIAL LN
Brainard Dr	GOOD	4	4	8	0	YES, TO MIDWAY BLVD

Table 8: Broomfield - Pavement/Crossing Condition

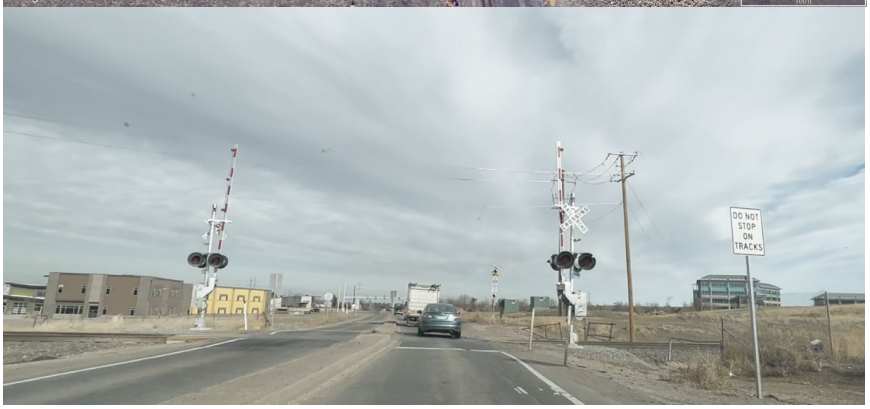
Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
112th Ave	FAIR	POOR	E,W	NONE
120th Ave	GOOD	GOOD	N,S	S
Nickel St	POOR	FAIR	N,S	NONE
Brainard Dr	GOOD	GOOD	N,S	NONE

At-Grade Crossings Inventory

112th Avenue

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Medium**
Pedestrian Activity:	**Low**



Notes:

- Low pedestrian activity
  - Jefferson Academy is near the crossing, but no direct pedestrian route to the crossing
- Some drivers were observed to slow down in advance of crossing due to poor pavement conditions

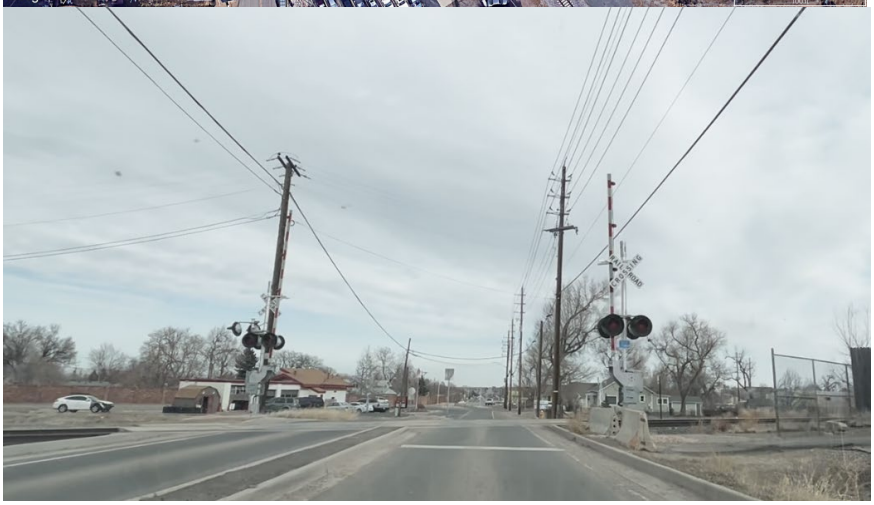
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing lacks any pedestrian or bicycle infrastructure. The crossing is expected to have medium vehicle and low pedestrian volumes relative to other crossings on the corridor. The roadway is in poor condition at the crossing, with drivers observed slowing in advance of the crossing due to roadway roughness.

At-Grade Crossings Inventory

120th Avenue

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**



Notes:

- Low pedestrian activity
- Industrial area, no sidewalk

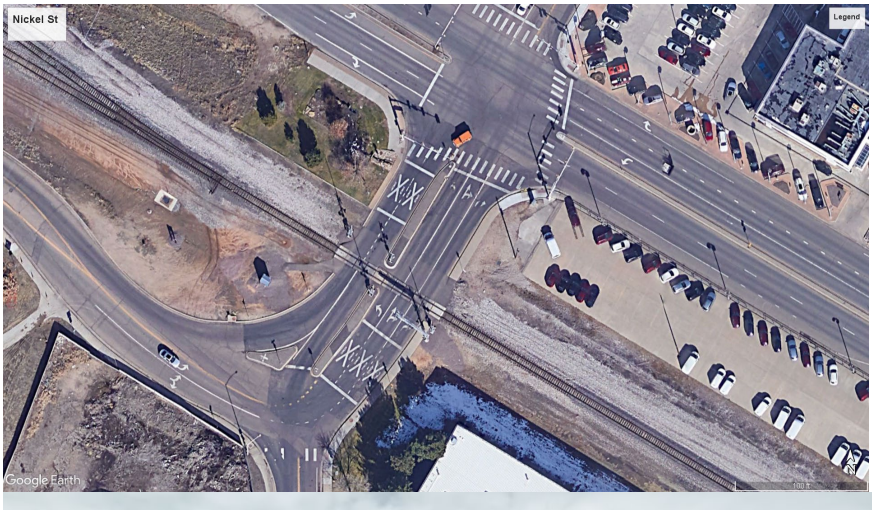
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing lacks any pedestrian or bicycle infrastructure. The crossing is expected to have low vehicle and pedestrian volumes relative to other crossings on the corridor.

At-Grade Crossings Inventory

Nickel Street

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**Poor**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**



Notes:

- Low pedestrian activity, primarily an industrial area
- No pedestrian infrastructure on the west side of roadway; desired path observed in the field
- Sidewalk is significantly cracked on the east side of crossing; no pedestrian-detectable warning panels
- Roadway striping is very worn

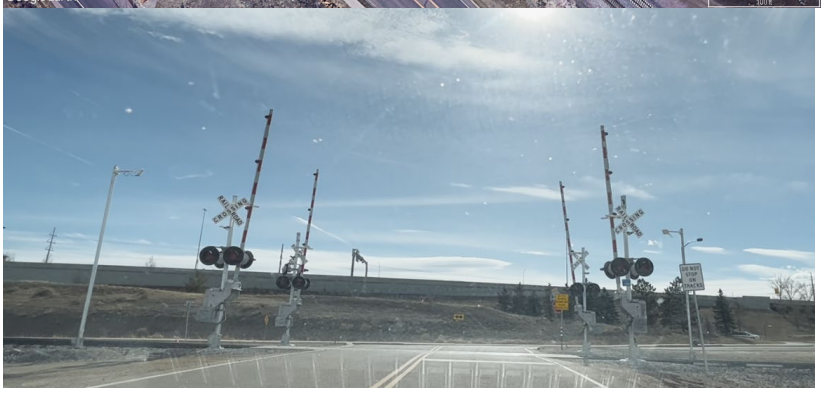
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing lacks bicycle infrastructure, and pedestrian infrastructure at the crossing is either worn, missing, or both. The crossing is expected to have low vehicle and pedestrian volumes relative to other crossings on the corridor. However, the roadway geometry is more complex because the crossing passes through five traffic lanes close to an intersection with US-287.

At-Grade Crossings Inventory

Brainard Drive

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**Yes**
Median:	**No**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**



Notes:

- Low pedestrian activity and no nearby development; the closest sidewalk is on the opposite side of Midway Boulevard
- Quad gate has radar in place to detect bicyclists and pedestrians

Summary: The crossing, designated as a quiet zone, uses four-quadrant gates to prevent vehicles from crossing the road to drive around closing gates. The crossing lacks any pedestrian or bicycle pathway or surface infrastructure but does have the quad gate radar from ped/bike detection. There is a continuous paved pathway/bikeway along the south side of Midway Boulevard extending east and west but separated from the crossing by about 150 feet. The crossing is expected to have low vehicle and pedestrian volumes relative to other crossings on the corridor.

Louisville Crossings

Louisville Crossings Overview

The city of Louisville has four at-grade roadway crossings of the Northwest Rail proposed alignment along the BNSF corridor:

- Dillon Road
- Pine Street
- Griffith Street
- South Boulder Road

All crossings along the route in Louisville are designated as quiet zones. All crossings in Louisville have safety features to prevent vehicles from attempting to drive around the gates when they are closing as an oncoming train approaches. The Pine Street and Griffith Street crossings have four-quadrant gates, the Dillon Road crossing has a median, and the South Boulder Road crossing has both four-quadrant gates and a median.

South Boulder Road has the highest vehicular and pedestrian traffic volumes in Louisville. The city recently improved the crossing and features asphalt, striping, crossing panel, pedestrian infrastructure, and bicycle lanes in good condition. The Griffith Street and Pine Street crossings also experience significant pedestrian volumes due to their proximity to businesses and schools. Pedestrian facilities at these crossings are in good condition. The Dillon Road crossing has no pedestrian infrastructure but has much lower pedestrian activity than other crossings in Louisville.

The asphalt condition at the Dillon Road crossing is poor, with vehicles having to slow down when approaching the crossing due to roadway roughness. Two crossings would be affected by proposed sidings to accommodate freight traffic during Peak Service operation: South Boulder Road and Griffith Street crossings. Lighting is present on both approaches at all crossings in Louisville except the Griffith Street crossing, which is lit on one side only.

At-Grade Crossings Inventory

Louisville Crossing Elements and Conditions

Table 9: Louisville - Basic Roadway Information

Crossing	FRA ID	Quiet Zone	Roadway Classification	Lanes	Approx. AADT*	Crossing Control Type	Median/ Channelizing?	Proposed Siding?
Dillon Rd	244798M	YES	Minor Arterial	2	2,400 - 3,700	TWO-QUAD	MEDIAN	NO
Pine St	244801T	YES	Minor Arterial	2	8,600 - 13,000	FOUR-QUAD	NO	NO
Griffith St	244803G	YES	Collector	2	400 - 600	FOUR-QUAD	NO	YES, SIDING 2
S Boulder Rd	244804N	YES	Principal Arterial	4	16,600 - 25,000	FOUR-QUAD	MEDIAN	YES, SIDING 2

Table 10: Louisville - Pedestrian Elements

Crossing	Pedestrian Activity	Existing Ped Infrastructure	NWR Station Proximity?	Detectable Warning?
Dillon Rd	LOW	NONE	NO	NONE
Pine St	HIGH	N,S	YES	NONE
Griffith St	HIGH	N,S	YES	NONE
S Boulder Rd	HIGH	N,S	NO	YES

Table 11: Louisville - Safety/Control Elements

Crossing	Crossing Panel Condition	Crossing Arms	Signal Poles	Pole-Mounted Flashing Light Pairs	Cantilevered Flashing Light Pairs	Signal to Adjacent Road?
Dillon Rd	FAIR	2	4	8	0	NONE
Pine St	FAIR	4	4	8	0	NONE
Griffith St	GOOD	4	4	8	2	YES, SW AND NW DRIVEWAY
S Boulder Rd	GOOD	8	8	10	0	YES, TO MAIN ST

Table 12: Louisville - Pavement/Crossing Condition

Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
Dillon Rd	GOOD	POOR	E,W	E,W
Pine St	GOOD	GOOD	N,S,W,E	E,W
Griffith St	GOOD	FAIR	N,S,W,E	N
S Boulder Rd	GOOD	GOOD	N,S,W,E	E,W

At-Grade Crossings Inventory

Dillon Road

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Low pedestrian activity
  - No sidewalks over the crossing; sidewalk on the north side ends just before crossing
  - Industrial area northeast of crossing, undeveloped in other quadrants
- Crossing is bumpy for eastbound vehicles; some slowing down observed

Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing lacks pedestrian infrastructure but does include bicycle lanes. The crossing is expected to have low vehicle and pedestrian volumes relative to other crossings on the corridor. The roadway is in poor condition at the crossing, with drivers observed slowing in advance of the crossing due to roadway roughness.

At-Grade Crossings Inventory

Pine Street

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**Yes**
Median:	**No**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Medium**
Pedestrian Activity:	**High**

Notes:

- High pedestrian activity due to the proximity to downtown Louisville and the proposed Northwest Rail Station
- Quad gates have radar installed to detect bicyclists and pedestrians

Summary: The crossing, designated as a quiet zone, uses four-quadrant gates to prevent vehicles from crossing the road to drive around closing gates. The crossing has sidewalks in good condition but does not have any bicycle infrastructure. The crossing is expected to have a medium vehicle volume and is expected to have one of the highest pedestrian volumes along the Northwest Rail Corridor. The crossing is close to the proposed Downtown Louisville Station.

At-Grade Crossings Inventory

Griffith Street

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**Yes**
Median:	**No**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**High**

Notes:

- High pedestrian activity due to proximity to downtown Louisville and the proposed Northwest Rail Station
  - Crossing also near Louisville Middle School
- Quad gates have radar installed to detect bicyclists and pedestrians
- Proposed Siding #2 would cross Griffith Street at this location

Summary: The crossing, designated as a quiet zone, uses both four-quadrant gates and medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has sidewalks in good condition but does not have any bicycle infrastructure. The crossing is expected to have a low vehicle volume. However, it is expected to have one of the highest pedestrian volumes on the corridor due to its proximity to Louisville Middle School. The crossing is also close to the proposed Downtown Louisville Station. Proposed Siding #2 would cross Griffith Street at this location which may result in crossing reconstruction.

At-Grade Crossings Inventory

South Boulder Road

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**Yes**
Median:	**Yes**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**High**

Notes:

- High pedestrian activity due to proximity to downtown Louisville and the proposed Northwest Rail Station
- Quad gates have radar installed to detect bicyclists and pedestrians
- Proposed Siding #2 would cross South Boulder Road at this location
  - Median, signals, and a small pedestrian bridge may lie in the path of the second track
- Traffic cameras on Main Street signal may cover the crossing

Summary: The crossing, designated as a quiet zone, uses both four-quadrant gates and medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has bicycle and pedestrian infrastructure in good condition and is one of the busiest crossings of the Northwest Rail Corridor for both vehicles and pedestrians. The crossing is also close to the proposed Downtown Louisville Station. Proposed Siding #2 would cross South Boulder Road at this location which may result in crossing reconstruction.

Lafayette Crossings

Lafayette Crossings Overview

The city of Lafayette has only one at-grade roadway crossing of the Northwest Rail proposed alignment along the BNSF corridor:

- Baseline Road

Baseline Road is designated as a quiet zone and uses a median to prevent vehicles from attempting to get around the railroad signal gates as they close. The asphalt is in fair condition at the Baseline crossing, while the striping and crossing panel are in good condition. The crossing does not have any pedestrian or bicycle infrastructure crossing it. There is a trailhead close to the crossing that accesses the Callahan Open Space, though there is no parking serving the trailhead and no pedestrian connection to the trailhead from Baseline Road. Because of this condition, trail users may be crossing the tracks at Baseline Road on the shoulder of the road due to the lack of a sidewalk.

The crossing has no lighting at either approach. Proposed Siding #2 would cross Baseline Road at this location to accommodate BNSF traffic during the Peak Service. Preliminary analysis shows that the roadway may be close to capacity as it is a two-lane roadway with relatively high volume.

At-Grade Crossings Inventory

Lafayette Crossing Elements and Conditions

Table 13: Lafayette - Basic Roadway Information

Crossing	FRA ID	Quiet Zone	Roadway Classification	Lanes	Approx. AADT*	Crossing Control Type	Median/ Channelizing?	Proposed Siding?
Baseline Rd	244805V	YES	Minor Arterial	2	14,000 - 21,500	TWO-QUAD	MEDIAN	YES, SIDING 2

Table 14: Lafayette - Pedestrian Elements

Crossing	Pedestrian Activity	Existing Ped Infrastructure	NWR Station Proximity?	Detectable Warning?
Baseline Rd	MEDIUM	NONE	NO	NONE

Table 15: Lafayette - Safety/Control Elements

Crossing	Crossing Panel Condition	Crossing Arms	Signal Poles	Pole-Mounted Flashing Light Pairs	Cantilevered Flashing Light Pairs	Signal to Adjacent Road?
Baseline Rd	GOOD	2	2	4	0	NONE

Table 16: Lafayette - Pavement/Crossing Condition

Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
Baseline Rd	GOOD	FAIR	N	NONE

At-Grade Crossings Inventory

Baseline Road

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**Medium**

Notes:

- Medium pedestrian activity due to the end of a north-south multi-use trail immediately west of the crossing
- No sidewalk connects pedestrians to the end of the multi-use trail

Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing lacks any pedestrian or bicycle infrastructure, though a multi-use trail terminates immediately west of the crossing resulting in some expected pedestrian volume. The crossing has a high vehicle volume relative to other crossings on the corridor.

City of Boulder Crossings

Boulder Crossings Overview

The city of Boulder has five at-grade roadway crossings of the Northwest Rail proposed alignment along the BNSF corridor:

- 63rd Street, north of Arapahoe Avenue
- 55th Street, north of Arapahoe Avenue
- Pearl Parkway
- Valmont Road
- Mineral Road (SH 52)

Four of these are quiet zone crossings, with the Mineral Road crossing the only one not designated as a quiet zone. The Pearl Parkway and Valmont Road crossings are in excellent condition, and the 55th Street crossing is in good condition. The Mineral Road crossing is in fair condition but lacks some safety features. The 63rd Street crossing is in poor condition.

Pearl Parkway and Valmont Road experience the highest roadway volumes and pedestrian exposure; however, these crossings also have the most developed safety features. Pearl Parkway has quad gates, median, good pedestrian facilities, and roadway infrastructure in good condition at the crossing. Valmont Road does not have quad gates but does have a median preventing traffic from crossing lanes while the signal is active. Valmont Road also has pedestrian facilities that are in good condition.

The 63rd Street crossing is in the worst shape of the Boulder crossings. The road approaching the crossing is in poor condition, and vehicles can be observed slowing down in advance of the crossing due to the roughness of the road over the crossing and the worn-out concrete crossing panel. The roadway has no median at the crossing and dual gates. Moreover, there are no pedestrian facilities crossing the tracks as the sidewalk ends on both sides of the road south of the crossing. Field review showed some pedestrian activity using desired paths north of the crossings, and it was observed that some pedestrians cross the tracks on foot despite the lack of sidewalk facilities.

The Mineral Road crossing also lacks pedestrian facilities, quad gates, and a median. The road is in fair condition, and pedestrian exposure is low due to a lack of nearby generators. The 55th Street Crossing has good pedestrian facilities, but these facilities lack detectable warning panels on the approach to the crossing. The pavement is in fair condition at the 55th Street crossing though the asphalt pavement between the concrete roadway and the concrete crossing panel shows some wear.

At-Grade Crossings Inventory

City of Boulder Crossing Elements and Conditions

Table 17: City of Boulder - Basic Roadway Information

Crossing	FRA ID	Quiet Zone	Roadway Classification	Lanes	Approx. AADT*	Crossing Control Type	Median/ Channelizing?	Proposed Siding?
63rd St	244811Y	YES	Collector	2	890 - 1,300	TWO-QUAD	MEDIAN	NO
55th St	244813M	YES	Collector	2	8,200 - 12,000	TWO-QUAD	MEDIAN	YES, SIDING 3
Pearl Pkwy	244815B	YES	Principal Arterial	4	16,700 - 25,000	FOUR-QUAD	MEDIAN	NO
Valmont Rd	244818W	YES	Minor Arterial	4	18,000 - 27,000	TWO-QUAD	MEDIAN	NO
Mineral Rd (SH 52)	244831K	NO	Minor Arterial	3	13,000 - 19,500	TWO-QUAD	NO	NO

Table 18: City of Boulder - Pedestrian Elements

Crossing	Pedestrian Activity	Existing Ped Infrastructure	NWR Station Proximity?	Detectable Warning?
63rd St	MEDIUM	NONE	NO	NONE
55th St	LOW	Sidewalk E, W	NO	NONE
Pearl Pkwy	HIGH	Sidewalk N, S	YES	NONE
Valmont Rd	HIGH	Sidewalk N, S	YES	NONE
Mineral Rd (SH 52)	LOW	NONE	NO	NONE

Table 19: City of Boulder - Safety/Control Elements

Crossing	Crossing Panel Condition	Crossing Arms	Signal Poles	Pole-Mounted Flashing Light Pairs	Cantilevered Flashing Light Pairs	Signal to Adjacent Road?
63rd St	POOR	2	4	6	0	YES, TO POWER PLANT DWY
55th St	GOOD	4	4	8	0	NO
Pearl Pkwy	GOOD	4	6	12	0	NO
Valmont Rd	FAIR	4	4	8	0	NO
Mineral Rd (SH 52)	FAIR	2	2	4	8	NO

Table 20: City of Boulder - Pavement/Crossing Condition

Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
63rd St	FAIR	POOR	W	NONE
55th St	GOOD	FAIR	E,W	N, S
Pearl Pkwy	GOOD	GOOD	N, S, E, W	N, S
Valmont Rd	FAIR	GOOD	E, W	N, S
Mineral Rd (SH 52)	FAIR	FAIR	N, S	N, S

At-Grade Crossings Inventory

63rd Street (North of Arapahoe Avenue)

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Sidewalks end south of the crossing
- Vehicles observed slowing down before crossing due to the roughness of the road at the crossing
- Medium pedestrian activity:
  - Sidewalks resume 300 feet north of the crossing
  - Pedestrians observed walking to the park north of the crossing in a field visit

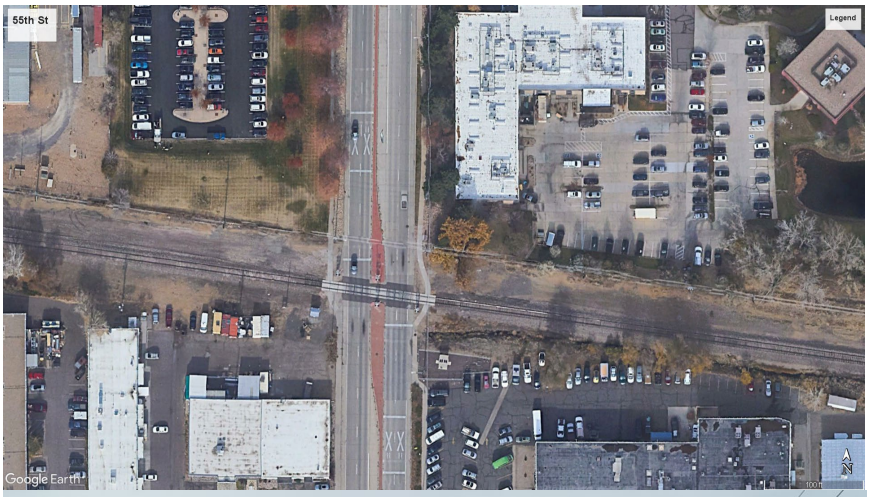
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing lacks pedestrian infrastructure as sidewalks terminate south of the crossing and continue north of the crossing. The crossing includes bicycle lanes along the roadway and across the railroad. The crossing is expected to have low vehicle and pedestrian volumes relative to other crossings on the corridor. The roadway is in poor condition at the crossing, with drivers observed slowing in advance of the crossing due to roadway roughness.

At-Grade Crossings Inventory

55th Street (North of Arapahoe Avenue)

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**Medium**
Pedestrian Activity:	**Low**



Notes:

- Pedestrian crossings lack pedestrian-detectable warning panels
- Low pedestrian activity; industrial zone

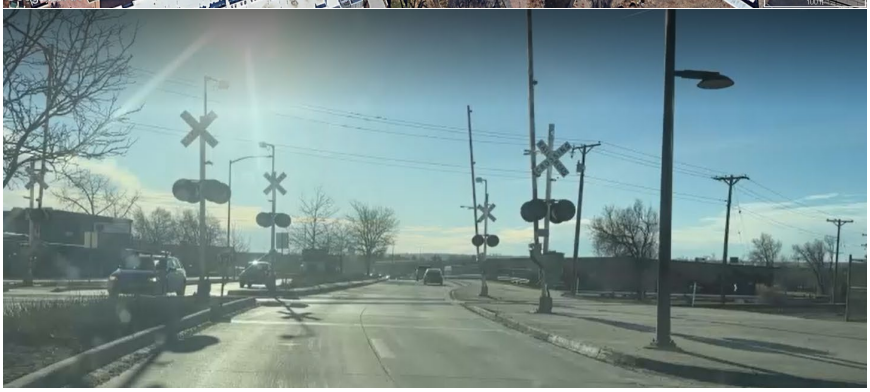
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has good pedestrian infrastructure and includes bicycle lanes. The crossing is expected to have medium vehicle and low pedestrian volumes relative to other crossings along the Northwest Rail Corridor.

At-Grade Crossings Inventory

Pearl Parkway

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**Yes**
Median:	**Yes**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**Multi-Use Path**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**High**



Notes:

- Multi-use path on the north side
- High pedestrian activity
  - Dense residential and business
  - Likely to increase due to future station proximity
- Radar detection in place with quad gates

Summary: The crossing, designated as a quiet zone, uses four-quadrant gates and medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has bicycle and pedestrian infrastructure in good condition and is one of the busiest crossings of the corridor for both vehicles and pedestrians. The crossing is close to the proposed Boulder Junction at Depot Square Station.

At-Grade Crossings Inventory

Valmont Road

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**High**

Notes:

- High pedestrian activity
  - Dense residential and business
  - Likely to increase due to future station proximity

Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has bicycle and pedestrian infrastructure in good condition and is one of the busiest crossings of the Northwest Rail Corridor for both vehicles and pedestrians. The crossing is close to the proposed Boulder Junction at Depot Square Station.

At-Grade Crossings Inventory

Mineral Road (SH 52)

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**Low**

Notes:

- Low pedestrian activity
  - Surrounded by open land and highway

Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates and is not designated as a quiet zone. The crossing lacks any pedestrian or bicycle infrastructure. Vehicle volume is expected to be high relative to other crossings on the corridor with low pedestrian activity.

Boulder County Crossings

Boulder County has the most crossings of any jurisdiction along the Northwest Rail Corridor, with 10 at-grade roadway crossings along the BNSF corridor:

- 47th Street
- Independence Road
- Jay Road
- 55th Street
- 63rd Street
- Monarch Road
- Niwot Road
- 2nd Avenue
- 83rd Street
- Ogallala Road

The BNSF Railway through Boulder County closely follows the Diagonal Highway (SH 119), with all of the crossings located within 100 yards of the highway on side streets that intersect the large roadway. Most of the crossings in Boulder County are in rural areas with minimal surrounding development. As such, the crossings generally experience lower volumes than other crossings along the Northwest Rail proposed corridor. The 63rd Street crossing is an exception, with as many as 20,000 vehicles expected to cross daily. The Jay Road and Niwot Road crossings may see as many as 10,000 daily vehicles, while 47th Street may see as many as 4,000 daily vehicles. All other crossings along the Northwest Rail proposed corridor in Boulder County are expected to experience fewer than 1,000 vehicles daily.

Some of the most rural crossings in Boulder County do not include sidewalks at the crossing. The rural crossings without pedestrian facilities are Independence Road, Jay Road, 55th Street south of the Diagonal Highway, Monarch Road, 83rd Street, and Ogallala Road. Some crossings lie closer to developed areas, with the Niwot Road and 2nd Avenue crossings located within the suburban town of Niwot. The Niwot Road crossing is expected to have medium pedestrian activity due to a sidewalk that connects Niwot to a Park-n-Ride. The 2nd Avenue crossing is close to downtown Niwot, but it does not have a sidewalk and does not attract significant pedestrian traffic. The 63rd Street crossing south of the Diagonal Highway is the only other Boulder County crossing with a sidewalk. The Independence Road crossing is the closest to the city of Boulder; there is nearby residential and commercial land use and an open space trailhead. However, the crossing does not have any pedestrian infrastructure crossing it.

All of Boulder County's crossings have been designated quiet zones except for 83rd Street and Ogallala Street. However, there are plans to upgrade the 83rd Street crossing to attain quiet zone status. Each of these quiet zone crossings includes some form of safety feature to prevent vehicles from crossing over lanes of traffic and going around the closing gates as a train approaches. Independence Road and 2nd Avenue include four-quadrant gates at their crossings. Medians are included at 47th Street, Jay Road, 63rd Street, Monarch Road, and Niwot Road crossings. Fifty-fifth Street has flexible delineators installed at the median lines.

Roadway condition is generally fair at all the Boulder County crossings; the pavement at the 2nd Avenue crossing is in good shape, while the pavement at the Independence Road crossing is in poor condition. Only some crossings are lit at night: Jay Road, 63rd Street, Monarch Road, Niwot Road, and 83rd Street.

At-Grade Crossings Inventory

Boulder County Crossing Elements and Conditions

Table 21: Boulder County - Basic Roadway Information

Crossing	FRA ID	Quiet Zone	Roadway Classification	Lanes	Approx. AADT*	Crossing Control Type	Median/ Channelizing?	Proposed Siding?
47th St	244821E	YES	Local	2	2,400 - 3,600	TWO-QUAD	MEDIAN	NO
Independence Rd	244822L	YES	Local	2	350 - 550	FOUR-QUAD	NO	NO
Jay Rd	244823T	YES	Local	2	6,600 - 9,900	TWO-QUAD	MEDIAN	NO
55th St	244824A	YES	Local	2	300 - 550	TWO-QUAD	CHANNELIZING	NO
63rd St	244827V	YES	Minor Arterial	5	13,100 - 20,000	TWO-QUAD	MEDIAN	NO
Monarch Rd	244832S	YES	Local	2	450 - 700	TWO-QUAD	MEDIAN	NO
Niwot Rd	244833Y	YES	Minor Arterial	2	6,000 - 9,100	TWO-QUAD	MEDIAN	NO
2nd Ave	244834F	YES	Local	2	650 - 960	FOUR-QUAD	NO	NO
83rd St	244836U	FUTURE	Local	2	300 - 500	TWO-QUAD	NO	NO
Ogallala Rd	244838H	NO	Local	2	50 - 100	TWO-QUAD	NO	NO

Table 22: Boulder County - Pedestrian Elements

Crossing	Pedestrian Activity	Existing Ped Infrastructure	NWR Station Proximity?	Detectable Warning?
47th St	MEDIUM	NONE	NO	NONE
Independence Rd	LOW	NONE	NO	NONE
Jay Rd	LOW	NONE	NO	NONE
55th St	LOW	NONE	NO	NONE
63rd St	LOW	E, W	NO	YES
Monarch Rd	LOW	NONE	NO	NONE
Niwot Rd	MEDIUM	N	NO	YES
2nd Ave	LOW	ADJACENT ONLY	NO	NONE
83rd St	LOW	NONE	NO	NONE
Ogallala Rd	HIGH	ADJACENT ONLY	NO	NONE

Table 23: Boulder County - Safety/Control Elements

Crossing	Crossing Panel Condition	Crossing Arms	Signal Poles	Pole-Mounted Flashing Light Pairs	Cantilevered Flashing Light Pairs	Signal to Adjacent Road?
47th St	FAIR	2	4	8	0	NO
Independence Rd	GOOD	4	4	8	0	YES, BOTH DIR. OF DIAG. HWY
Jay Rd	FAIR	3	4	6	0	NO
55th St	GOOD	2	2	4	0	NO
63rd St	GOOD	5	5	16	0	YES, TO RIGHT TURN LANE
Monarch Rd	GOOD	2	2	4	0	NO
Niwot Rd	FAIR	4	4	8	0	YES, TO RIGHT TURN LANE
2nd Ave	GOOD	4	4	16	0	NO
83rd St	GOOD	2	2	4	0	YES, TO RIGHT TURN LANE
Ogallala Rd	GOOD	2	2	5	0	YES, TO RIGHT TURN LANE

Table 24: Boulder County - Pavement/Crossing Condition

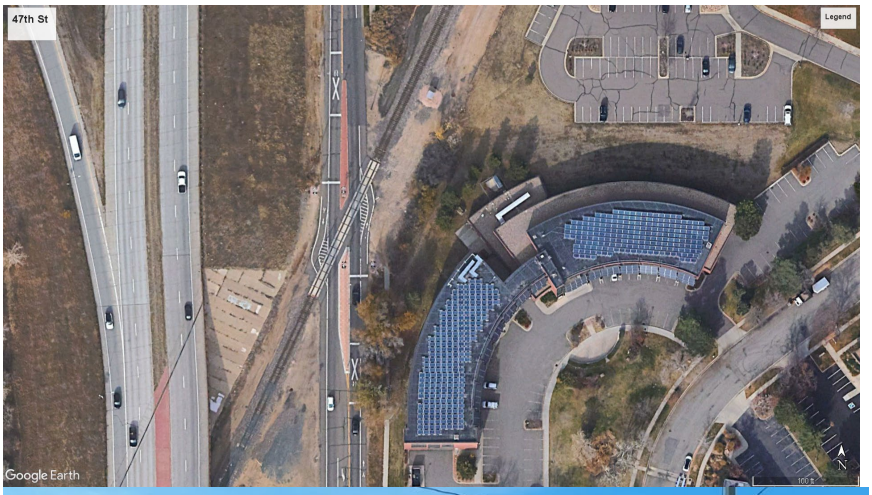
Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
47th St	FAIR	FAIR	E, W	NONE
Independence Rd	FAIR	POOR	N, S, E, W	NONE
Jay Rd	FAIR	FAIR	E, W	E, W
55th St	FAIR	FAIR	N	NONE
63rd St	FAIR	FAIR	N, S, E, W	N, S, E, W
Monarch Rd	GOOD	FAIR	E	W
Niwot Rd	FAIR	GOOD	N,S	N,S
2nd Ave	GOOD	GOOD	N, S, E, W	NONE
83rd St	FAIR	GOOD	N	N
Ogallala Rd	FAIR	FAIR	N,S	NONE

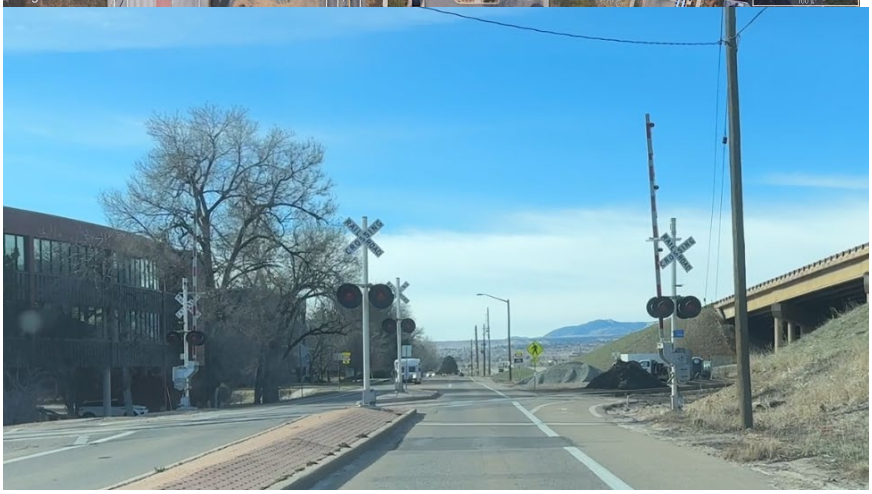
At-Grade Crossings Inventory

47th Street

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Medium**





Notes:

- Medium pedestrian activity
  - No sidewalk, but lots of housing and some walking paths nearby
  - Sidewalk ends just south of the crossing

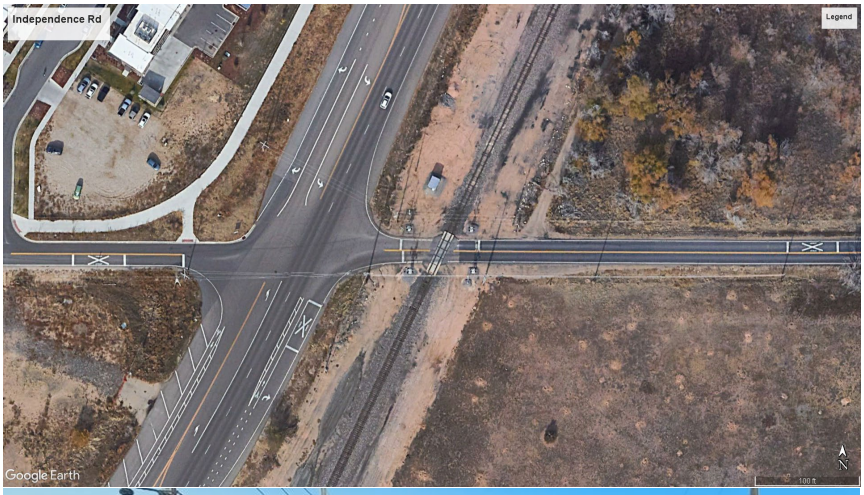
Summary: The crossing, designated as a quiet zone, includes medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has bicycle lanes but no sidewalks or pedestrian infrastructure. Medium pedestrian activity is expected due to nearby housing, business, and walking paths, while roadway volume is expected to be lower than other crossings.

At-Grade Crossings Inventory

Independence Road

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**Yes**
Median:	**No**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**



Notes:

- Pavement has potholes and cracking; vehicles must slow down before crossing as there is a bump in the road at the crossing
- Low pedestrian activity

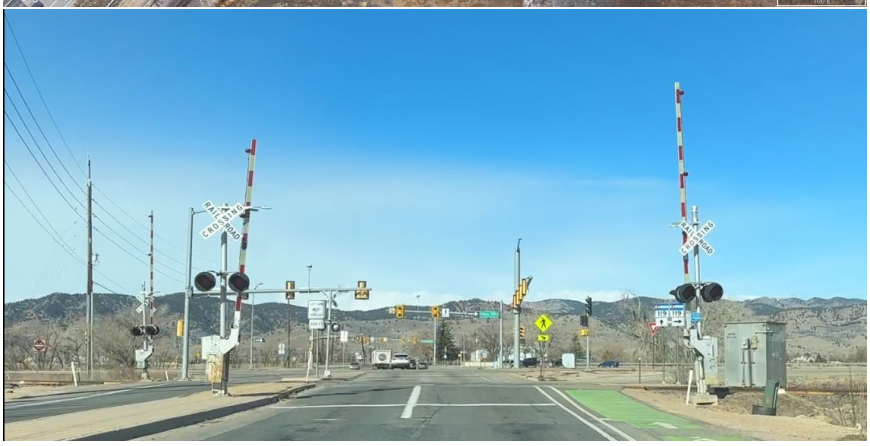
Summary: The crossing, designated as a quiet zone, includes four-quadrant gates to prevent vehicles from crossing the road to drive around closing gates. The crossing has no bicycle or pedestrian infrastructure. Low pedestrian activity is expected due to a lack of pedestrian generators in the area and connections to the crossing. The road is in poor condition as the crossing is located on a bump relative to the elevation of the roadway, and vehicles must slow down on the crossing's approach.

At-Grade Crossings Inventory

Jay Road

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**Medium**
Pedestrian Activity:	**Low**



Notes:

- Low pedestrian activity
  - Undeveloped area with no sidewalk
- Asphalt to concrete transition west of the crossing is somewhat worn

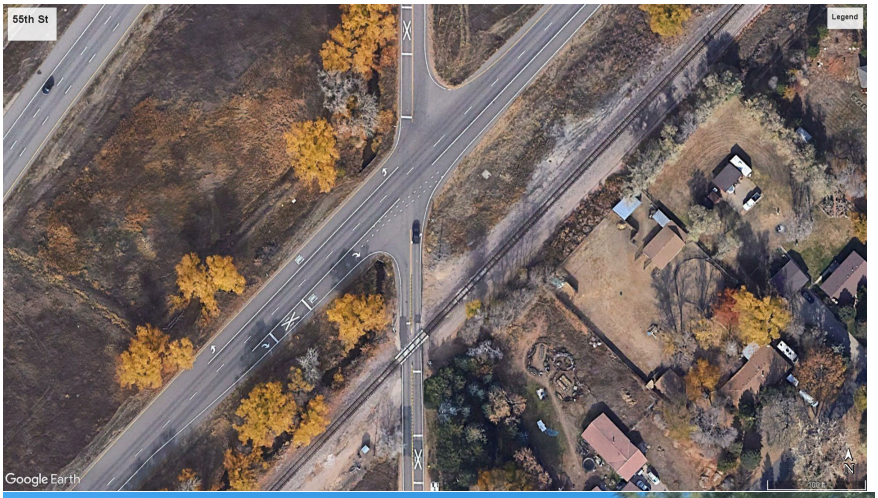
Summary: The crossing, designated as a quiet zone, includes medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has bicycle lanes but no sidewalks. Low pedestrian activity is expected due to the rural surroundings, and roadway volume is medium at this location.

At-Grade Crossings Inventory

55th Street (N)

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Flexible Bollards**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**



Notes:

- Low pedestrian activity in undeveloped area

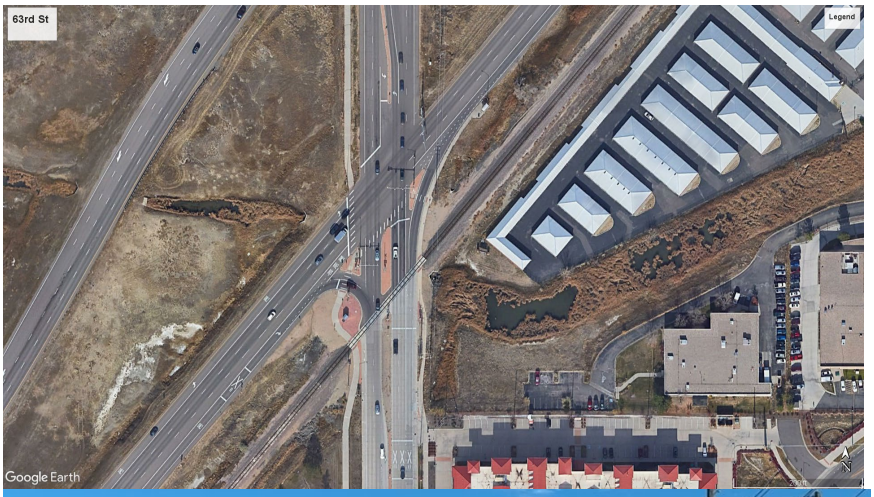
Summary: The crossing, designated as a quiet zone, uses flexible bollards at the roadway centerline to discourage vehicles from crossing the road to drive around closing gates. The crossing has no bicycle or pedestrian infrastructure. Low pedestrian activity is expected due to the rural surroundings, and roadway volume is low relative to other crossings on the corridor.

At-Grade Crossings Inventory

63rd Street (N)

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**Low**



Notes:

- Low pedestrian activity
  - Businesses and residential south of the crossing, but no attractors north of the crossing
- Both pedestrian approaches have detectable warning panels on both sides

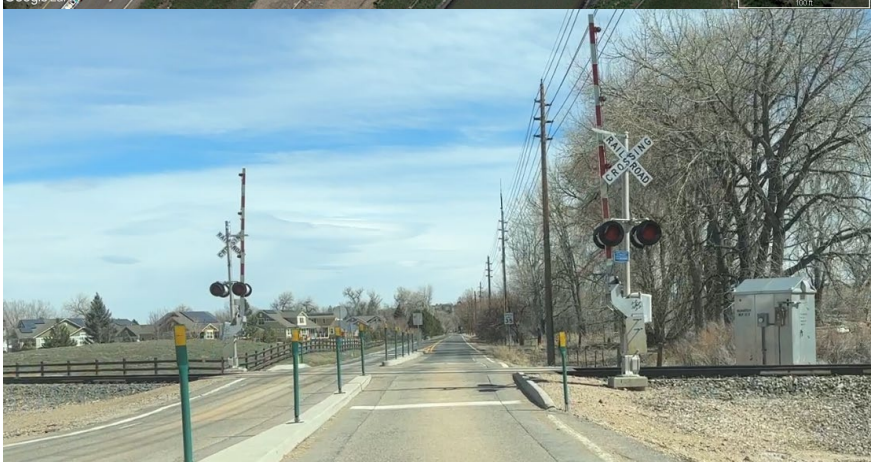
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has bicycle lanes, and sidewalks are in good condition. Pedestrian activity is expected to be low at this location while roadway volume is high.

At-Grade Crossings Inventory

Monarch Road

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**



Notes:

- Low pedestrian activity, undeveloped area

Summary: The crossing, designated as a quiet zone, includes medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has no bicycle or pedestrian infrastructure and is expected to have low pedestrian volumes due to the rural surroundings. Roadway volume is also low at the crossing.

At-Grade Crossings Inventory

Niwot Road

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good (Partial)**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**Medium**
Pedestrian Activity:	**Low**

Notes:

- Sidewalk is on the north side only
  - Pedestrian detectable warning panels on west pedestrian approach only
- Medium pedestrian activity
  - Direct sidewalk connection between RTD Park-n-Ride and downtown Niwot

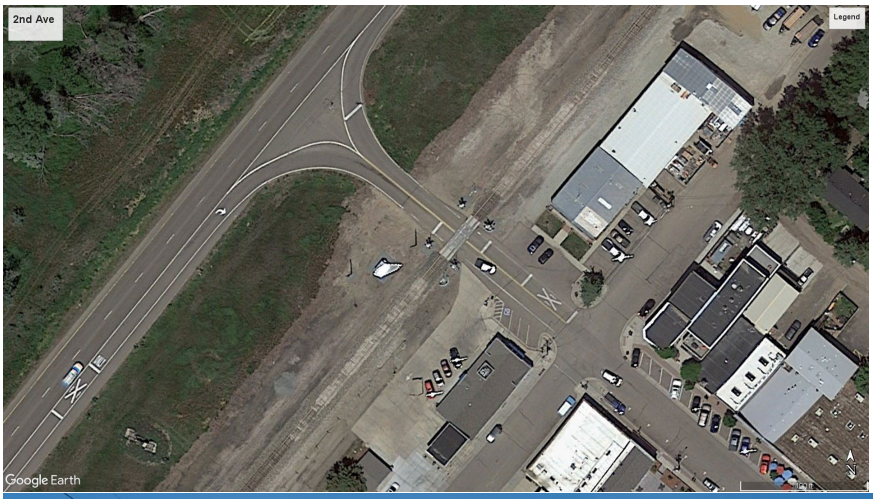
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has bicycle lanes and a sidewalk on the north side, with moderate pedestrian activity expected due to the connection between the RTD Park-n-Ride at Diagonal Highway and downtown Niwot. Roadway volumes are also expected to be medium at this location.

At-Grade Crossings Inventory

2nd Avenue

Crossing Features	
Quiet Zone:	**Yes**
Quad Gates:	**Yes**
Median:	**No**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**



Notes:

- Low pedestrian activity
  - Near downtown Niwot, but no connection or attractors north of the crossing
- Radar in place at quad gates to detect pedestrians and cyclists

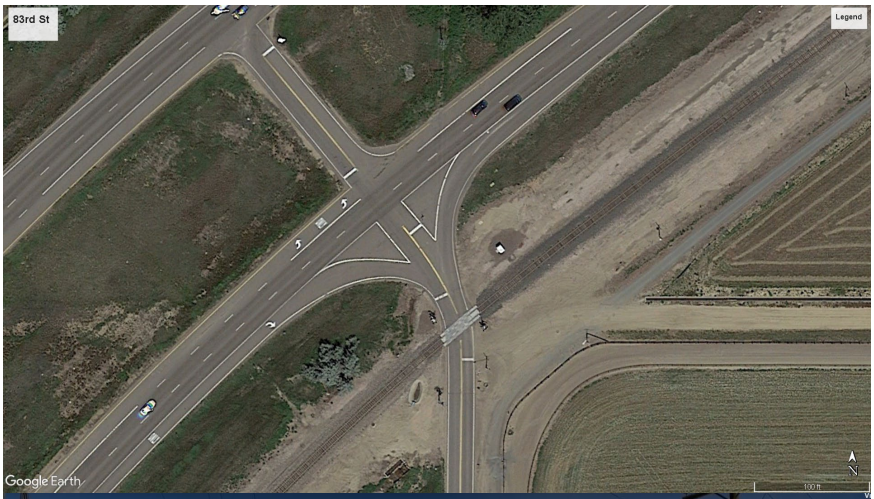
Summary: The crossing, designated as a quiet zone, includes four-quadrant gates to prevent vehicles from crossing the road to drive around closing gates. The crossing has no bicycle or pedestrian infrastructure and is expected to have low pedestrian volumes with no pedestrian attractors north of the crossing. Roadway volume is also low at the crossing.

At-Grade Crossings Inventory

83rd Street

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**



Notes:

- Low pedestrian activity in undeveloped, rural area

Summary: The crossing has no safety features to prevent vehicles from crossing the road to drive around closing gates and is not designated as a quiet zone. The crossing has no bicycle or pedestrian infrastructure and is expected to have low pedestrian volumes due to the rural surroundings. Roadway volume is also low at the crossing.

At-Grade Crossings Inventory

Ogalalla Road

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Medium**

Notes:

- Potentially high pedestrian activity due to trail crossings
- The only way to access the LoBo trail from the north is by crossing the tracks at Ogalalla
  - North/south sidewalk/multi-use trail ends west of Ogalalla Street
  - More study may be needed to determine the volume using this connection
- No railroad striping

Summary: The crossing has no safety features to prevent vehicles from crossing the road to drive around closing gates and is not designated as a quiet zone. The crossing has no bicycle or pedestrian infrastructure. Roadway volume is low at the crossing. Surroundings are rural, but multi-use trails converge in the area, and trail users may need to use this crossing to continue their journeys. Pedestrian activity is assumed to be medium.

Longmont Crossings

The city of Longmont has five at-grade roadway crossings of the Northwest Rail proposed alignment along the BNSF corridor:

- Hover Street
- Sunset Street
- Ken Pratt Boulevard (SH 119)
- Terry Street
- Coffman Street

The first three Longmont crossings, Hover Street, Sunset Street, and Ken Pratt Boulevard, are relatively busy roads, with the Ken Pratt Boulevard crossing the busiest of the entire Northwest Rail Corridor. None of the crossings are designated as quiet zones currently; however, the Hover Street, Terry Street, and Coffman Street crossings are slated for improvements to gain quiet zone status in the future. The Ken Pratt Boulevard and Hover Street crossings use medians to prevent vehicles from crossing over lanes of traffic to drive around crossing gates, while the other three crossings have no such features.

The Sunset Street crossing is less than 100 yards from a traffic signal which controls the intersection of Sunset Street and SH 119. The pavement is in good condition, has sidewalks on both sides, and the crossing has lighting on the north side. Sunset Street is expected to have medium pedestrian volume due to surrounding businesses. The Hover Street crossing also has pavement in good condition, sidewalks on both sides and medium pedestrian activity due to nearby residential areas. Hover Street has luminaires on both sides of the crossing to provide lighting. Ken Pratt Boulevard crossing has a high pedestrian activity expected due to the large number of surrounding businesses. Sidewalk conditions are good, and there is lighting on both sides of the crossing.

The Terry Street and Coffman Street crossings are very low-volume roadways in poor condition. Currently, there are low traffic volumes utilizing either crossing. As such, the crossings are not controlled by gates and are only marked by the railroad crossing crossbuck. These crossings are expected to change as part of the Peak Service plan, as they are close to the proposed Downtown Longmont Station. Per Longmont, both crossings are slated to become quiet zones, requiring improvements to add crossing control and other safety features.

At-Grade Crossings Inventory

Longmont Crossing Elements and Conditions

Table 25: Longmont - Basic Roadway Information

Crossing	FRA ID	Quiet Zone	Roadway Classification	Lanes	Approx. AADT*	Crossing Control Type	Median/ Channelizing?	Proposed Siding?
Hover St	244842X	FUTURE	Collector	4	11,000 - 16,800	TWO-QUAD	MEDIAN	NO
Sunset St	244844L	NO	Collector	3	3,200 - 4,800	TWO-QUAD	NO	NO
Ken Pratt Blvd	244845T	NO	Minor Arterial	4	42,000 - 63,000	TWO-QUAD	MEDIAN	NO
Terry Rd	244846A	FUTURE	Local	2	20 - 60	NONE	NO	NO
Coffman St	244847G	FUTURE	Local	2	300 - 700	NONE	NO	NO

Table 26: Longmont - Pedestrian Elements

Crossing	Pedestrian Activity	Existing Ped Infrastructure	NWR Station Proximity?	Detectable Warning?
Hover St	MEDIUM	E, W	NO	NONE
Sunset St	MEDIUM	N,S	NO	NONE
Ken Pratt Blvd	HIGH	E,W	NO	NONE
Terry Rd	LOW	W	YES	NONE
Coffman St	LOW	W	YES	NONE

Table 27: Longmont - Safety/Control Elements

Crossing	Crossing Panel Condition	Crossing Arms	Signal Poles	Pole-Mounted Flashing Light Pairs	Cantilevered Flashing Light Pairs	Signal to Adjacent Road?
Hover St	FAIR	4	4	6	0	NO
Sunset St	GOOD	2	2	4	4	YES, TO KEN PRATT BLVD
Ken Pratt Blvd	GOOD	2	4	6	0	YES, TO NELSON RD
Terry Rd	FAIR	NONE	0	0	0	NO
Coffman St	GOOD	NONE	0	0	0	NO

Table 28: Longmont - Pavement/Crossing Condition

Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
Hover St	FAIR	GOOD	N,S	N
Sunset St	FAIR	GOOD	N	N
Ken Pratt Blvd	FAIR	GOOD	N,S	N,S
Terry Rd	POOR	POOR	NONE	W
Coffman St	FAIR	POOR	NONE	W

At-Grade Crossings Inventory

Hover Street

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Medium**
Pedestrian Activity:	**Medium**

Notes:

- No pedestrian-detectable warning panels at pedestrian crossings
- Medium pedestrian activity due to the presence of businesses near the crossing

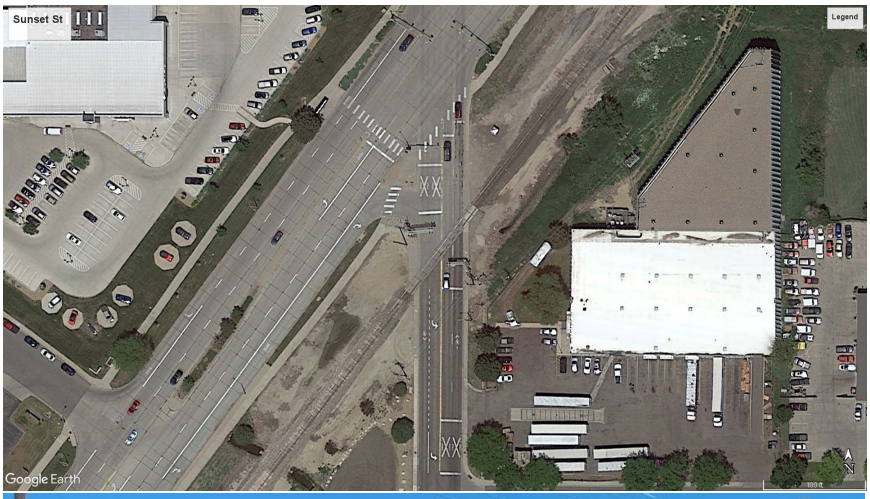
Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. Volumes of both vehicles and pedestrians fall in the medium range. Sidewalks are present, but there is no bicycle infrastructure at this crossing. Longmont plans to make this crossing a quiet zone in the future, but no specific improvements have been identified at this time.

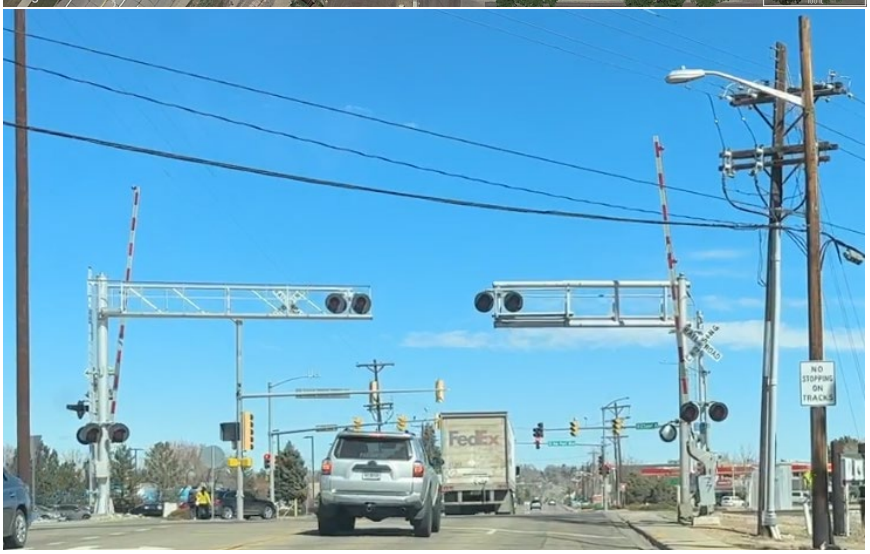
At-Grade Crossings Inventory

Sunset Street

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**Shared Use Arrows**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Medium**





Notes:

- No pedestrian-detectable warning panels at pedestrian crossings
- Medium pedestrian activity due to the presence of businesses near the crossing

Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. Pedestrian activity falls in the medium range, but roadway volumes are low at this crossing. Sidewalks are present, and there are shared-use arrows striped on the roadway.

At-Grade Crossings Inventory

Ken Pratt Boulevard

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**High**

Notes:

- No pedestrian-detectable warning panels at pedestrian crossings
- High pedestrian activity
  - Busy area with lots of businesses
- Highest volume roadway crossing along the line

Summary: The crossing, designated as a quiet zone, includes medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has the highest volume of vehicles along the Northwest Rail Corridor and has high pedestrian activity.

At-Grade Crossings Inventory

Terry Street

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**No**
Bicycle Infrastructure:	**No**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Crossing is not controlled by a railroad signal
- Proximity to the proposed terminal station will greatly increase pedestrian activity in future

Summary: This crossing is not controlled by any railroad signal and has no safety features for vehicles. Currently, vehicle and pedestrian traffic are very low, but both may increase due to the proximity of this crossing to the Downtown Longmont Station. The crossing is slated to become a quiet zone in the future, but improvements have yet to be determined.

At-Grade Crossings Inventory

Coffman Street

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**No**
Bicycle Infrastructure:	**No**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Crossing is not controlled by a railroad signal
- Proximity to the proposed terminal station will greatly increase pedestrian activity in future

Summary: This crossing is not controlled by any railroad signal and has no safety features for vehicles. Volumes at the crossing are very low for both vehicles and pedestrians currently but may be set to increase due to the proximity of this crossing to the Downtown Longmont Station. It is designated to become a quiet zone in the future, but improvements to the crossing have yet to be determined.

Longmont Crossings (Maintenance Facility)

Four at-grade crossings lie between the end of the passenger line at Downtown Longmont Station and the proposed commuter rail maintenance facility in Longmont. These crossings are:

- Main Street (US 287)
- Emery Street
- Martin Street
- Sugar Mill Road

These crossings are not part of the Northwest Rail passenger line that would be used by the peak service trains. Future planning work as part of this study will identify the exact location of the commuter rail maintenance facility in Longmont. The four crossings in this section would be used at different frequencies and intervals than the at-grade crossings on the passenger line, and the schedule of operations for RTD trains at these crossings have not been determined.

The Main Street crossing experiences high vehicular traffic and lies near the Downtown Longmont Station. It is also south of the business district in downtown Longmont but lies near some businesses and large apartment buildings. This crossing is the only one of the four crossings between he proposed station and proposed maintenance facility that is planned as a quiet zone in the future. Improvements made to the crossing as part of the quiet zone certification process are expected but have not yet been specifically determined yet. It has sidewalks on both sides, and runs immediately parallel to 1st Avenue, which means the crossing substantially influences signal operations at the 1st Avenue & Main Street intersection. The crossing is well illuminated by lighting from the adjacent signal.

The Emery Street crossing lies approximately a quarter mile east of the Main Street crossing. This crossing has been recently improved, with new signal equipment for both the roadway and the railroad as well as sidewalks, drainage infrastructure, a median north of the crossing, and other civil improvements. Google Street View imagery from July 2019 shows that the crossing was previously not signalized, nor was the nearby Emery Street & 1st Avenue intersection. Despite these improvements, the crossing is not designated as a quiet zone and is not planned to be in the future.

The Martin Street crossing is controlled by dual gates and medians, with the roadway and striping in fair condition. The median south of the crossing is approximately 15 feet long and is unlikely to be considered as a safety feature that would prevent vehicles from crossing over the tracks to avoid being stopped behind the crossing gates. The crossing has a wide sidewalk on the west side, and no pedestrian infrastructure on the east side.

The Sugar Mill Road crossing is on a very low-volume roadway and is in poor condition. The crossing is not controlled by railroad signals and is marked only by standard crossbuck signs which are also in poor condition.

At-Grade Crossings Inventory

Longmont (Maintenance Facility) Crossing Elements and Conditions

Table 29: Longmont (Maintenance Facility) – Basic Roadway Information

Crossing	FRA ID	Quiet Zone	Roadway Classification	Lanes	Approx. AADT*	Crossing Control Type	Median/ Channelizing?	Proposed Siding?
Main St	244849V	FUTURE	Principal Arterial	4	22,000 - 33,000	TWO-QUAD	NORTH SIDE	NO
Emery St	244850P	NO	Local	2	300 - 500	FOUR-QUAD	NORTH SIDE	NO
Martin St	057133C	NO	Minor Arterial	2	8,500 - 13,000	TWO-QUAD	MEDIAN	NO
Sugar Mill Rd	849313N	NO	Local	2	50 - 100	NONE	NO	NO

Table 30: Longmont (Maintenance Facility) - Pedestrian Elements

Crossing	Pedestrian Activity	Existing Ped Infrastructure	NWR Station Proximity?	Detectable Warning?
Main St	MEDIUM	E, W	YES	NONE
Emery St	LOW	E, W	NO	NONE
Martin St	LOW	W	NO	NONE
Sugar Mill Rd	LOW	NONE	NO	NONE

Table 31: Longmont (Maintenance Facility) - Safety/Control Elements

Crossing	Crossing Panel Condition	Crossing Arms	Signal Poles	Pole-Mounted Flashing Light Pairs	Cantilevered Flashing Light Pairs	Signal to Adjacent Road?
Main St	GOOD	3	3	5	0	NO
Emery St	GOOD	4	5	9	0	YES, BOTH DIR. OF 1ST AVE
Martin St	FAIR	4	5	8	0	1 TO EAST DWY, 3 TO WEST DWY
Sugar Mill Rd	POOR	NONE	0	0	0	NO

Table 32: Longmont (Maintenance Facility) - Pavement/Crossing Condition

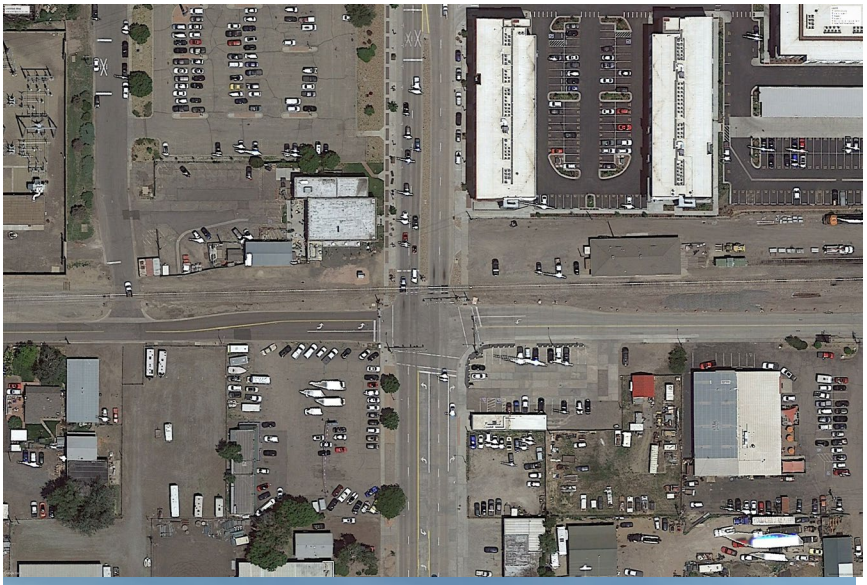
Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
Main St	GOOD	GOOD	N	N, S, E, W
Emery St	GOOD	GOOD	N, S	N, S, E, W
Martin St	FAIR	FAIR	2 N, 2 S	N, S
Sugar Mill Rd	POOR	POOR	NONE	NONE

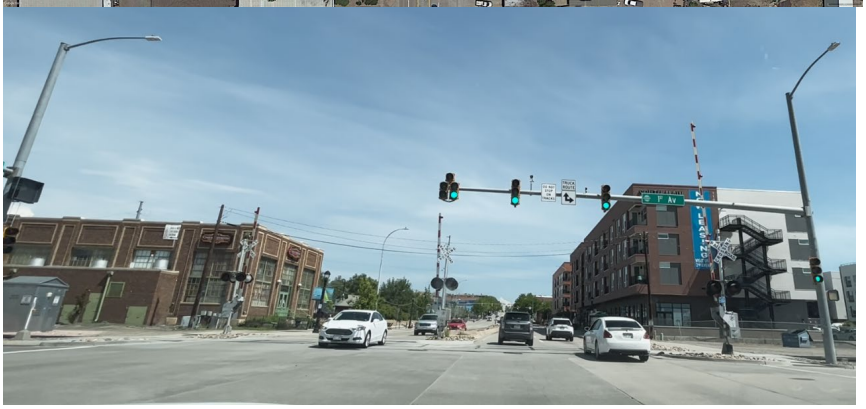
At-Grade Crossings Inventory

Main Street (US 287)

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**North Side Only**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**Medium**





Notes:

- Crossing is extremely close to the 1st & Main intersection
- Proximity to the proposed terminal station may increase pedestrian activity in future

Summary: This crossing is controlled by dual gates, with a median between travel directions on the north side but not the south side. Pedestrian activity is medium at this location due to proximity to the proposed terminal Downtown Longmont station and downtown Longmont businesses, however most of downtown Longmont lies north of the crossing. The crossing is slated to become a quiet zone in the future, but improvements have yet to be determined.

At-Grade Crossings Inventory

Emery Street

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**Yes**
Median:	**North Side Only**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Aerial imagery is out of date, the crossing has been recently improved as of June 2023
- Quad gates have radar installed to detect pedestrians and bicyclists in crossing
- Low pedestrian activity in industrial area, but near large apartment complex
- Crossing lies in the middle of the signalized 1st & Emery Intersection
- Crossing includes three BNSF tracks, only one of which is proposed to be used for access to RTD maintenance facility

Summary: This crossing is controlled by quad gates and has a median on the north side of the crossing. Sidewalks are present and the roadway and crossing equipment is in excellent shape; the crossing was recently improved to include signalization and roadway rehabilitation. Vehicle and pedestrian volumes are low at this crossing. Although the crossing is in good condition and has added safety features, it is not designated as a quiet zone and is not planned to become a quiet zone.

At-Grade Crossings Inventory

Martin Street

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**West Side Only**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**Medium**
Pedestrian Activity:	**Low**

Notes:

- Median at south end of crossing is short and not likely to prevent vehicles from driving around closing gates
- Crossing includes two BNSF tracks
- Low pedestrian activity in industrial area
- No sidewalk on east side, wide sidewalk with no pedestrian detectable warning on west side

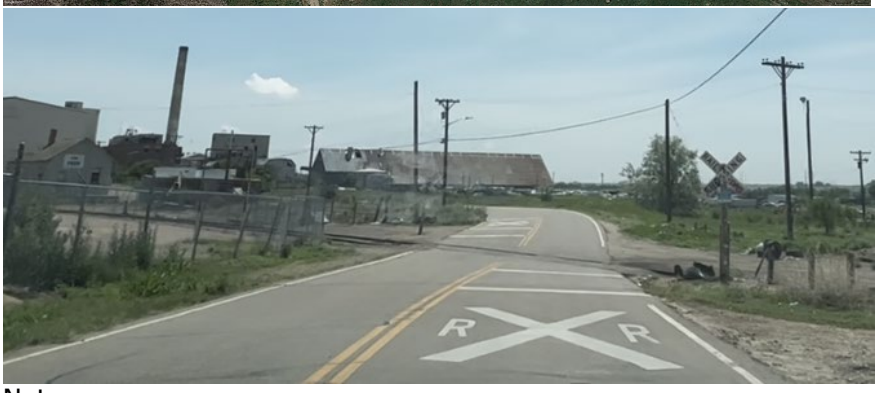
Summary: This crossing is controlled by dual gates and has medians on both sides of the crossing. The median on the south side of the crossing has a length of approximately 15 feet, which is shorter than other medians used to control potential crossover movements at other crossings. Vehicle and pedestrian volumes are low at this crossing.

At-Grade Crossings Inventory

Sugar Mill Road

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**



Notes:

- Crossing is unsignalized
- Low pedestrian activity in unpopulated industrial area
- No crossing panel present

Summary: This crossing is not controlled by any railroad signal and has no safety features for vehicles. The crossing also has no sidewalk. The roadway is in poor condition, and the tracks cross the asphalt with no crossing panel. Vehicle volumes and pedestrian volumes are very low at this crossing.

Next Steps

This document provides a planning-level inventory of existing conditions of at-grade crossings of the BNSF Railway along the proposed Northwest Rail alignment. The document details the existing safety features, quiet zone status, general vehicular and pedestrian activity, and the general condition of infrastructure at each of the 40 crossings.

Moving forward, this inventory will allow the project team to identify potential infrastructure needs at the various crossings to implement the Northwest Rail Peak Service along the proposed corridor. A follow-up document will be developed that includes a menu of improvement options designed to meet safety expectations for each crossing. Cost estimates will be developed based on the menu of options to provide an overall cost estimate/range for implementing the proposed Northwest Rail.

Menu of Improvement Options

Options used to achieve quiet zone status on other crossings in corridor:

- Quad gates + radar detection
- Raised medians
- Channelizing devices
- Pavement repairs
- Enhanced signing & striping
- Advance warning signs
- Constant warning time circuitry
- Detached sidewalks
- Improved crossing panels

Other improvement options:

- Add or improve pedestrian crossing
- Video cameras

Milestone 3

Base Configuration Report

Appendix D

Environmental Scan

Contents

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Introduction

Differentiator resources were identified from the Existing Conditions report. Differentiator resources are those that can influence decisions during the planning process, require additional scoping ahead of NEPA, and potentially require a larger level of effort during NEPA to determine impacts and commit to mitigations. Please note, the Planning and Environmental Study is not a substitute for the NEPA process, and all resources would be considered during scoping for the NEPA phase, as appropriate.

The Base Configuration for the Project was confirmed during Milestone 3. The differentiator resources discussed below were assessed for impacts as part of the Peak Service Planning and Environmental Study. This methodology is based on a review of the Corridor Conditions Report. The Corridor Conditions Report Contains instructions for "Next Steps" for all resources.

Air Quality

Brief Discussion of Resource Studied

Air quality issues are considered in infrastructure planning to determine regional and local transportation conformity requirements and to be considered part of overall impacts on communities. Mobile and stationary sources of airborne pollution can affect natural resources and human health.

Data Collection/Methodology

Air quality was assessed within counties serviced by the NWR Corridor, including Adams, Boulder, Broomfield, Denver, and Jefferson counties. The study area is located within the Denver Regional Council of Governments (DRCOG) planning area.

Information on the latest National Ambient Air Quality Standards (NAAQS) nonattainment, maintenance, and attainment designations for the study area was obtained from the U.S. Environmental Protection Agency (EPA) online Green Book website (based on updates through October 31, 2022) (EPA, 2022), which provides listings of NAAQS compliance status by state and county (EPA, 2022).

Findings/Results

Utilization of an electric locomotive for operations on the NWR ensures no emissions are produced. However, if diesel locomotives or a Diesel Multiple Units (DMU) are employed, a minimal level of emissions would be expected during the operation. These emissions would primarily occur during two peak periods: morning peak hours from approximately 6:30am to 8:35am and afternoon peak hours from approximately 4:30pm to 6:35pm.

RTD's operations plan assumes that the train cars will be shut down overnight and during mid-day layovers, thereby avoiding extensive idling. As a result, even if a diesel locomotive is selected, air emissions from the train yards at Longmont and Westminster should be minimal.

The freight sidings, which would house BNSF idle freight trains during the aforementioned morning and afternoon peak periods, are expected produce air emissions to the surrounding neighborhood. The potential pollutants from diesel engine would include the criteria air pollutant such as Particulate Matters (PM), Nitrogen Oxides (NOx), Carbon Monoxide (CO), Sulfur Dioxide (SO2), and Volatile Organic Compounds (VOCs) and

mobile source air toxics such as Benzene, 1,3-Butadiene, Formaldehyde, Acetaldehyde, Naphthalene, and Polycyclic Organic Matters. The idling would occur 2 hours at a time during the each of the peak operating periods.

Compliance Considerations

The study area is located in the Denver Metropolitan Area, designated a maintenance area for carbon monoxide and PM_{10}. Per 40 CFR 93.102(b)(4), transportation conformity applies to maintenance areas through the 20-year maintenance planning period unless the maintenance plan specifies that the transportation conformity requirements apply for a more extended period. According to the EPA Greenbook and the State Implementation Plan, the 20-year maintenance statuses for carbon monoxide and PM_{10} lapsed in 2022. As such, transportation conformity requirements for these pollutants will no longer apply. Therefore, quantitative carbon monoxide and PM_{10} hotspot analysis will not be required.

Transportation conformity still applies for ozone (precursor pollutants – nitrogen oxides and volatile organic compounds) in the study area, given that the region is currently in nonattainment status for the ozone National Ambient Air Quality Standard. However, a conformity demonstration for ozone does not require hot spot analysis. Rather, it can be demonstrated for a project by documenting that it is included in the latest approved long-range transportation plan and TIP. The interagency consultation process for NEPA will confirm the transportation conformity approaches.

The Northwest Rail Peak Service Study does not intend to select a specific vehicle technology for the proposed service. However, it is possible that Peak Service on the NWR Corridor could increase diesel trains in the region. At this time, no vehicle technology is being eliminated from consideration other than overhead catenary system (OCS) powered electric vehicles. If diesel trains are implemented, the increased mobile source air toxics (MSAT) emissions from diesel trains could be offset by the vehicle mile travel reduction in the region. Per the 2016 *FHWA's MSAT guidance*, NWR will be classified as Tier 1, Project with No Meaningful Potential MSAT Effects or exempt project because the NWR Corridor will likely reduce traffic volume in the region. The interagency consultation process for NEPA will confirm the MSAT analysis approaches.

Mitigation for long-term and construction-related air quality impacts will be developed on a project-to-project basis during NEPA, as applicable. Air quality mitigation measures for construction activities typically involve dust control measures and ensuring that equipment is properly maintained to eliminate any continuously visible exhaust emissions.

CDOT's Clean Transportation Strategic Policy Initiative (CDOT, 2022) will also be considered during the Planning and Environmental Study and NEPA. Updated CDOT-specific requirements during NEPA will be incorporated into projects and consistent with the future CDOT Performance Plan FY 2021-2022.

Finally, CDOT's Greenhouse Gas Reduction Roadmap pointed out that reducing vehicle miles traveled is essential to achieving the statewide greenhouse gas target. The NWR Corridor will introduce a viable way to change transportation from automobile to public transit. Therefore, the NEPA process can point out that the NWR Corridor can contribute to regional greenhouse gas reduction.

Noise and Vibration

Brief Description of Resource Studied

This section discusses the noise and ground-borne vibration assessments performed to evaluate noise and vibration conditions in the study area under the Build Alternative. These analyses focused on lands where overnight sleep occurs (FTA Land Use Category 2) to simplify the assessments and provide an initial order of magnitude estimate of potential noise and vibration effects on a level commensurate with the amount of engineering detail available to decision-makers. The *Noise and Vibration Technical Report* is attached (Attachment 1).

Noise is typically defined as unwanted or excessive sound. Sound becomes unwanted when it interferes with sleep, speech, or recreation activities. Sound is what we hear when fluctuations in air pressure occur above and below the standard atmospheric pressure. Three variables define noise characteristics: level (or amplitude), frequency, and time pattern. Ground-borne vibration consists of rapidly fluctuating ground motions transmitted into a receptor (building) from a vibration source, such as transit trains. FTA uses vibration velocity to describe vibration levels for transit projects.

Data Collection/Methodology

The noise and vibration analyses performed for this project are based on FTA noise and vibration impact assessment methods. FTA's methodologies consist of a screening assessment in which analysts determine if noise- or vibration-sensitive land uses are close enough to the new alignment to merit an impact assessment. If so, the next step in FTA's methodologies is a general noise and vibration analysis. There is also a third level of FTA impact assessments, which examines noise and vibration in detail, but those were not applied to this project.

The Corridor Conditions Report contains results of the screening assessments and the general assessments of existing noise and vibration. The *Noise and Vibration Technical Report* (Attachment 1) includes additional description of the methodology.

Findings/Results

Noise analysis results indicate that noise impacts as defined by FTA are not projected to occur at residential parcels in the study area. Noise levels associated with all three candidate transit vehicle types and freight train operations as described above remain below moderate and severe noise impact thresholds at all modeled parcels

Vibration analysis results indicate that vibration impacts as defined by FTA are not projected to occur at residential parcels in the study area. Vibration levels associated with all three candidate transit vehicle types and freight train operations as described above remain below FTA vibration impact thresholds at all modeled parcels in the study area.

Compliance Considerations

During NEPA, noise and vibration will be evaluated at parcels in all three FTA land use categories and at "special buildings" locations like recording and broadcast studios. This analysis will focus on lands where overnight sleep occurs to simplify the assessments and provide an initial order of magnitude estimate of

potential noise and vibration impacts on a level commensurate with the amount of engineering detail available to decision-makers.

Cultural Resources

The purpose of this section is to identify conflicts between known cultural resources and proposed upgrades, developments, and improvements for Peak Service implementation for the NWR Corridor. The previous NWR Corridor Conditions Report included a study of existing conditions for cultural resources. This study queried databases for the Colorado Office of Archaeology and Historic Preservation (OAHP) and local landmark commissions and identified 1,607 known cultural resources within a 1,000-foot buffer from the existing BNSF corridor centerline and a 0.5-mile buffer from each new station platform. This section will supplement the previous report by identifying known cultural resources which are within the construction footprint of proposed design elements. This section frames discussions around potential future consultation or mitigation requirements for cultural resources which may be directly affected by project design.

Brief Description of Resource Studied

Cultural resources include both historical built environment resources and archaeological resources. Under the National Historic Preservation Act of 1966 (NHPA), the significance of a cultural resource is determined by its eligibility to be listed in the National Register of Historic Places (NRHP). Cultural resources which are eligible for, or listed on, the NRHP are considered historic properties. Under the NRHP eligibility guidelines, potential historic properties must be 50 years of age or more, meet at least one of four criteria for significance, and retain sufficient integrity to convey that significance. Historic properties can be classified as sites, buildings, structures, objects, or districts. For linear cultural resources, such as historical roads or railroads, segments of resources may be considered as supporting or non-supporting of the NRHP eligibility of the overall resource. Cultural resources may also be significant if they are designated as a local historic landmark or are listed on, or eligible for listing on, the Colorado State Register of Historic Properties. Historical built environment resources include building, structure, and district property-types. Historical built environment resources identified by the previous NWR Corridor Conditions Report include single-family homes, commercial storefronts, bridges, culverts, ditches, roads, residential neighborhoods, and commercial downtown areas. Archaeological resources may range in age from the arrival of Indigenous peoples in Colorado over 13,000 years ago to 50 years before present. Archaeological resources identified by the previous NWR Corridor Conditions Report include precontact camps, historical mines, historical refuse dumps, historical artifact scatters, and historical building foundations. As with historical built environment resources, archaeological resources have the potential to be historic properties if they meet one of the four criteria needed for listing in the NRHP (36 CFR 60.4). However, archaeological resources may be subject to additional statutory requirements, including laws such as the Archaeological Resources Protection Act (ARPA) and Native American Graves Protection and Repatriation Act (NAGPRA). Information on archaeological sites may also be subject to additional confidentiality and data sharing restrictions.

Data Collection/Methodology

The OAHP is the State Historic Preservation Office (SHPO) for the State of Colorado. As the SHPO, the OAHP enforces the procedural requirements of the NHPA and consults on projects which may cause adverse effects to historic properties. Adverse effects are defined as alterations to the character or use of the cultural resource

which limit its ability to convey its historical significance under the NRHP. To identify potential historic properties which may be adversely affected during future stages of the project, a file search of Colorado OAHP records was completed on October 25, 2022. File search results from the OAHP database also include NRHP eligibility status for each cultural resource. Because the OAHP database does not always include recent surveys or information on local landmarks, seven local landmark commissions with jurisdictions overlapping the planning area were identified and contacted for information on protected local landmarks within the study corridor. The identified landmark commissions include the Boulder County Historic Preservation Advisory Board, Longmont Historic Preservation Commission, Boulder Landmarks Board, Louisville Historic Preservation Commission, City and County of Broomfield Historic Landmark Board, Jefferson County Historical Commission, and Westminster Historic Landmark Board. Of these local historic preservation authorities, Boulder, Louisville, the City and County of Broomfield, and Westminster contributed data to supplement the historic resources recorded within the OAHP database.

To supplement this previous file search and identify potential conflicts between known cultural resources and Peak Service implementation for the NWR Corridor, geospatial data for cultural resource locations was compared to preliminary design plans. Documented cultural resources which are within, cross, or overlap the direct footprint of proposed developments were identified as potentially being affected by future development for the project. The OAHP documented NRHP eligibility or local landmark status for these cultural resources was assessed to identify resources which may require consultation, mitigation, or further study. This analysis accounts only for potential direct effects from the limit of construction (LOC) and does not consider indirect impacts to cultural resources, such as visual or auditory effects.

Findings/Results

The previous OAHP file search identified 1,607 known cultural resources within a 1,000-foot buffer from the existing BNSF corridor centerline and a 0.5-mile buffer from each new station platform. Of these, 46 previously documented cultural resources directly overlap the LOC for freight rail sidings, station locations, walls, bridges, maintenance sites (Figure 1 to Figure 6). One historical archaeological site and 45 historical resources are within these areas. No precontact archaeological resources are known within the direct project footprint. In addition, linear resources (e.g. railroads) intersect proposed project developments at multiple locations. Cultural resources which overlap the LOC for proposed stations are shown in Figure 1 to Figure 6. Known cultural resources which are within the footprint for proposed Longmont maintenance facility sites are shown in Figure 7. Existing cultural resources which intersect proposed improvements for rail sidings are shown in Figure 8 to Figure 11. (Note: Locations of sidings may continue to be revised and the project progresses). Table 1 identifies known cultural resources within the footprint of proposed project design elements.

Table 1: Summary of Proposed Design Elements and Known Cultural Resources

Design Element	Number of Known Cultural Resources within Footprint	Known Cultural Resources within Direct Footprint
Longmont Station LOC	10	5BL.10666; 5BL.10669; 5BL.10671; 5BL.10676; 5BL.10687; 5BL.10706; 5BL.400; 5BL.400.3; 5BL.400.36; 5BL.7885
Boulder Station LOC	1	5BL.400
Louisville Station LOC	9	5BL.12071; 5BL.12072; 5BL.12073; 5BL.12074; 5BL.12076; 5BL.12077; 5BL.12324; 5BL.12351; 5BL.400
Flatiron Station LOC	3	5BF.104.1; 5BF.70.2; 5BF.70.7

Base Configuration Environmental Scan

Design Element	Number of Known Cultural Resources within Footprint	Known Cultural Resources within Direct Footprint
Broomfield Station LOC	2	5BF.98.2; 5BF.98.4
Westminster Station LOC	1	5JF.519
Maintenance Facility Site 1	2	5BL.10359.2; 5BL.514
Maintenance Facility Site 2	0	-
Maintenance Facility Site 3	1	5BL.514
Maintenance Facility Site 4	1	5BL.374
Maintenance Facility Site 5	1	5BL.374
Maintenance Facility Site 6	2	5BL.10370*; 5BL.513
Maintenance Facility Site 7	3	5BL.513; 5BL.514; 5BL.10355
Maintenance Facility Site 8	4	5BL.513; 5BL.514; 5BL.10355; 5BL.7606
Maintenance Facility Site 9	1	5BL.514
Maintenance Facility Site 8/9 West	2	5BL.11224; 5BL.514
Extension to BNSF Track	0	-
Proposed Siding 1	1	5JF.519
Proposed Siding 2	8	5BL.12080; 5BL.12324; 5BL.2719.40; 5BL.2719.47; 5BL.2730.16; 5BL.2730.17; 5BL.400; 5BL.400.21
Proposed Siding 3	8	5BL.1985.2; 5BL.374.9; 5BL.400; 5BL.400.27; 5BL.400.28; 5BL.400.29; 5BL.9576.1; 5BL.9576.2
Proposed Siding 4	2	5BL.400; 5BL.859.50

*Archaeological Resources

Of these 46 cultural resources, 26 have an official determination of eligibility for the NRHP. An official determination means that the Colorado OAHP has reviewed and concurred with the NRHP determination of eligibility for the cultural resource. Of these, 12 resources are officially eligible, and 14 resources are officially not eligible for inclusion in the NRHP. There are nine cultural resources which require additional data ("Needs Data") for an NRHP determination. Of the remaining cultural resources, seven are linear segments which support the eligibility of an eligible linear resource, and four are linear segments which are non-supporting of the eligibility of a linear resource. There are no designated local landmarks within these areas. Table 2 shows the NRHP eligibility status of known cultural resources within the footprint of proposed project design elements.

Table 2: Summary of Known Cultural Resources by NRHP Eligibility Status

Design Element	Officially Eligible	Supporting of Eligibility	Officially Not Eligible	Non-Supporting of Eligibility	Needs Data
Longmont Station LOC	2	1	7	-	-
Boulder Station LOC	1	-	-	-	-
Louisville Station LOC	1	-	-	-	8
Flatiron Station LOC	-	1	1	1	-
Broomfield Station LOC	1	-	1	-	-
Westminster Station LOC	1	-	-	-	-
Maintenance Facility Site 1	1	-	1	-	-
Maintenance Facility Site 2	-	-	-	-	-
Maintenance Facility Site 3	1	-	-	-	-
Maintenance Facility Site 4	1	-	-	-	-
Maintenance Facility Site 5	1	-	-	-	-

Base Configuration Environmental Scan

Design Element	Officially Eligible	Supporting of Eligibility	Officially Not Eligible	Non-Supporting of Eligibility	Needs Data
Maintenance Facility Site 6	1	-	1	-	-
Maintenance Facility Site 7	2	-	1	-	-
Maintenance Facility Site 8	3	-	1	-	-
Maintenance Facility Site 9	1	-	-	-	-
Maintenance Facility Site 8/9 West	1	-	1	-	-
Extension to BNSF Track	-	-	-	-	-
Proposed Siding 1	1	-	-	-	-
Proposed Siding 2	3	1	-	2	2
Proposed Siding 3	3	4	1	-	-
Proposed Siding 4	1	-	-	1	-

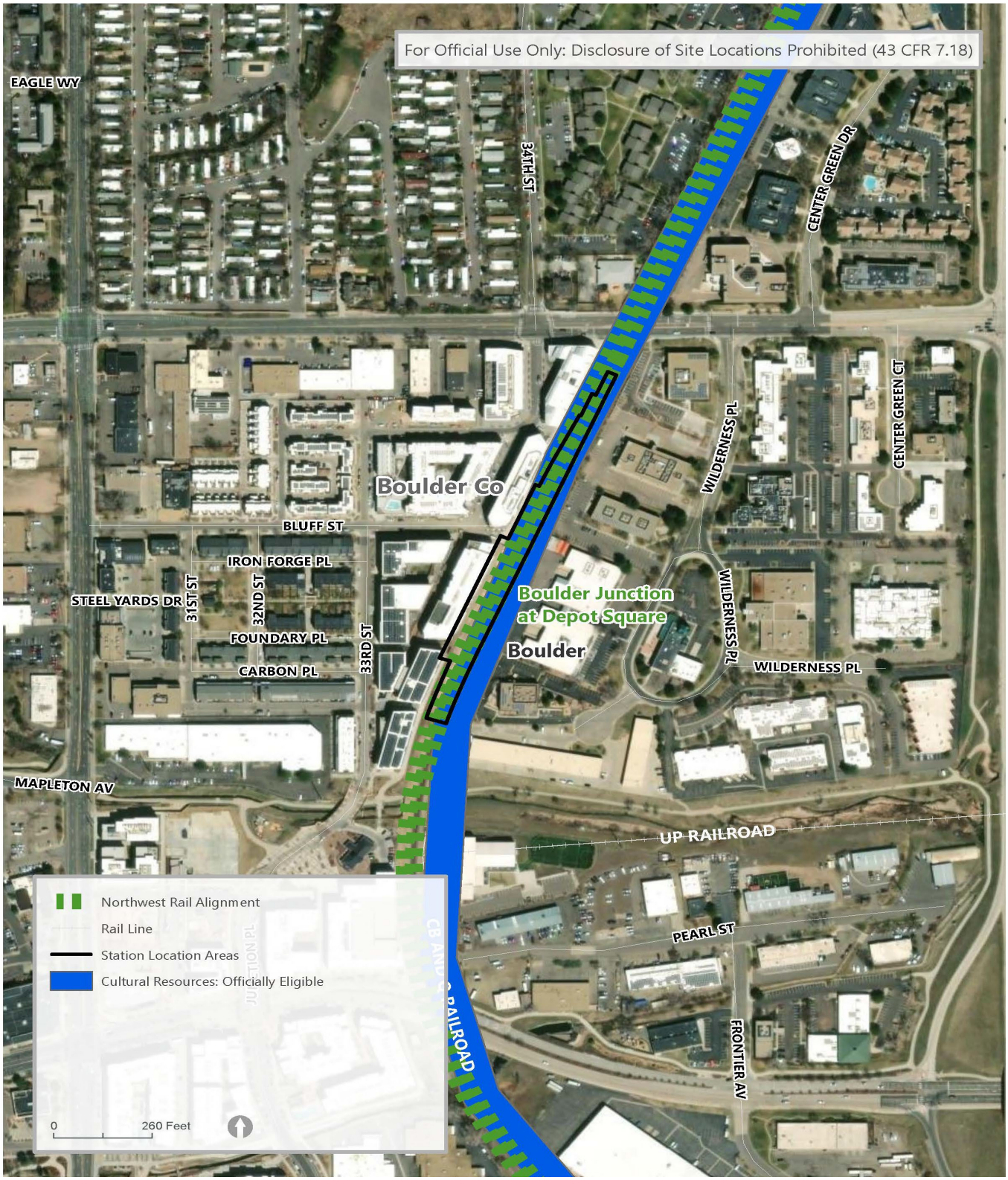
Compliance Considerations

Cultural resources reviews under Section 106 of the NHPA and Section 4(f) of the Department of Transportation (DOT) Act may be required alongside future compliance with the National Environmental Policy Act (NEPA). Each of these statutes require consideration of effects on cultural resources. Section 106 of the NHPA requires federal agencies to consider project effects on NRHP-listed or NRHP-eligible properties when a project is determined to constitute a federal undertaking. An undertaking is defined as any action which requires federal funds, permitting or licensure, or occurs on federal property and has the potential to affect properties listed in or eligible for listing in the NRHP. If the lead federal agency determines a project is an undertaking under Section 106 of the NHPA, an Area of Potential Effects (APE) will be delineated specific to the parameters and scope of that project. Identification and evaluation surveys of historic resources within a project-specific APE may be conducted to identify potential cultural resources which are not currently known. In contrast to the procedural requirements of the NHPA, Section 4(f) imposes substantive requirements on federal agencies. Section 4(f) prohibits the United States DOT from impacting parks, recreation areas, wildlife and waterfowl refuges, and historic properties unless there is no feasible and prudent alternative to that use. The action must also consider ways to minimize harm to the property resulting from such a use. An adverse effect determination under Section 106 of the NHPA will also typically constitute a use under Section 4(f).

Historic properties in the design footprint consist of 12 sites and seven linear segments. In addition, the nine cultural resources which are listed as "needs data" will require NRHP evaluation to determine if they are eligible for inclusion in the NRHP and constitute historic properties. If the Section 106 process is initiated for a future undertaking associated with the project, and historic properties are with the APE, consultation may be required with the OAHP to avoid, minimize, or mitigate adverse effects to these cultural resources. Analysis of indirect effects, such as visual or auditory impacts, may also be required for historic properties which are outside of the direct project footprint.

Base Configuration Environmental Scan

Figure 1: Known cultural resources in relation to the proposed Boulder Station footprint

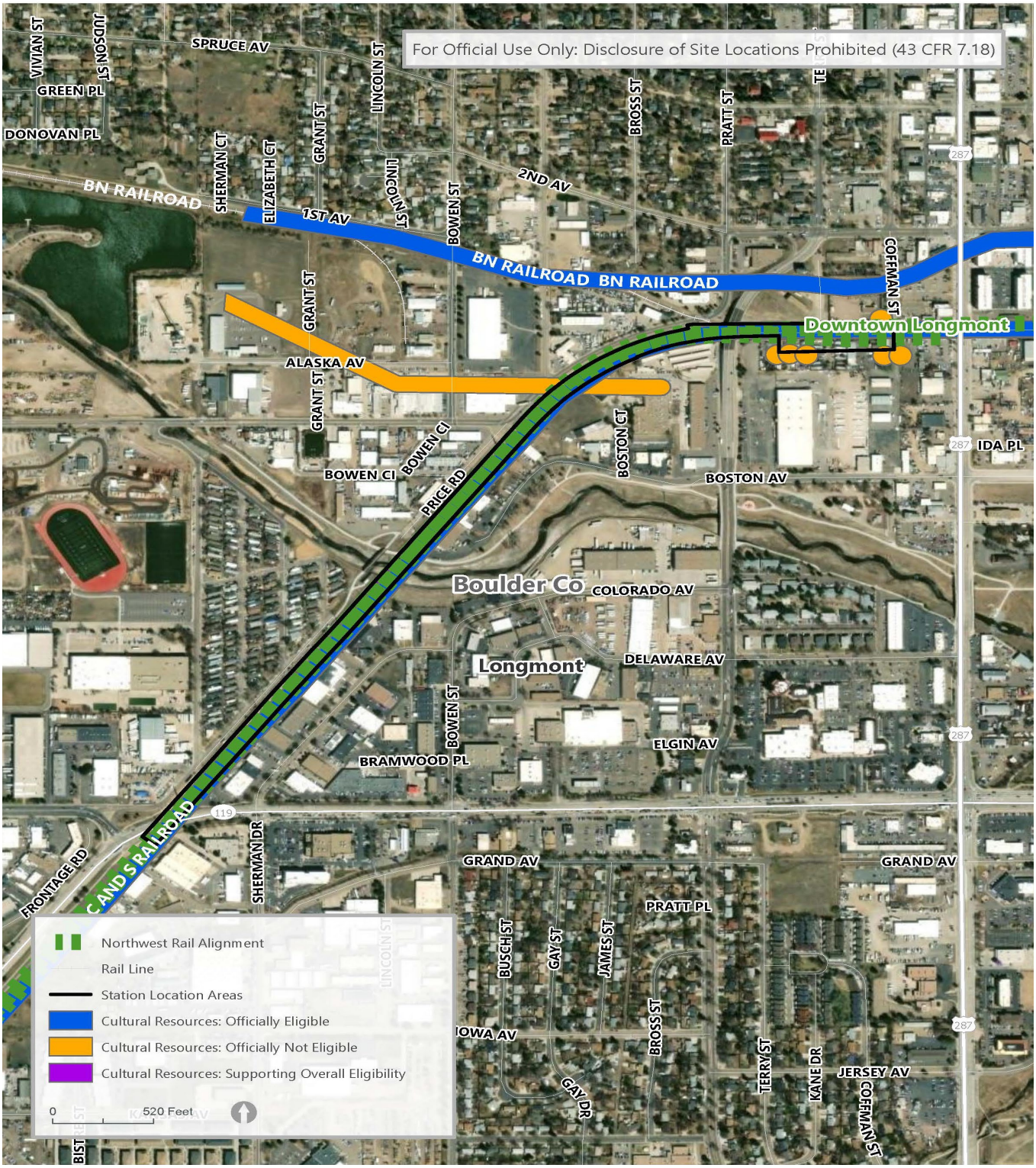


Base Configuration Environmental Scan

Figure 2: Known cultural resources in relation to the proposed Broomfield Station footprint

Base Configuration Environmental Scan

Figure 3: Known cultural resources in relation to the proposed Longmont Station footprint



Base Configuration Environmental Scan

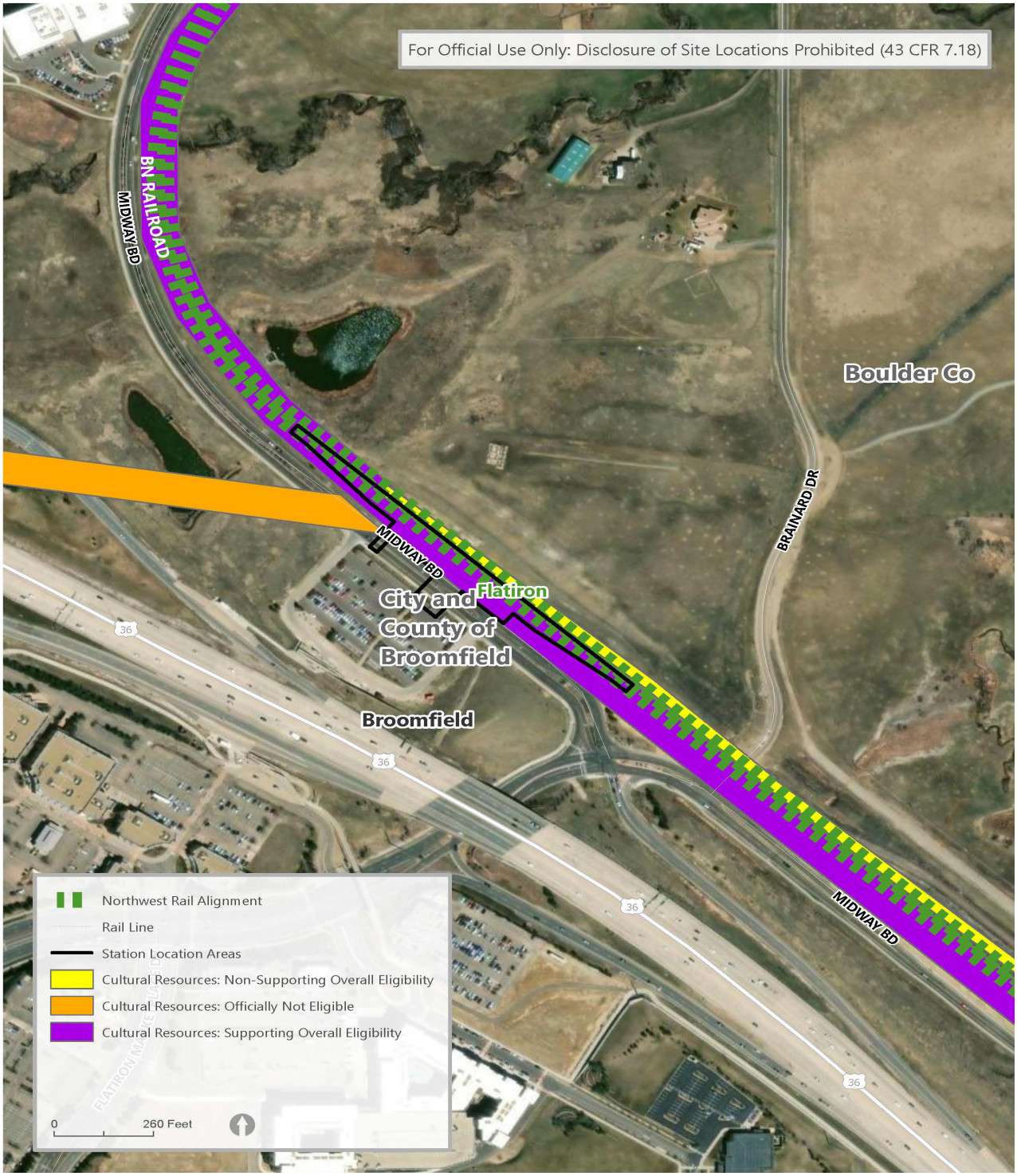
Figure 4: Known cultural resources in relation to the proposed Louisville Station footprint

Base Configuration Environmental Scan

Figure 5: Known cultural resources in relation to the proposed Westminster Station footprint

Base Configuration Environmental Scan

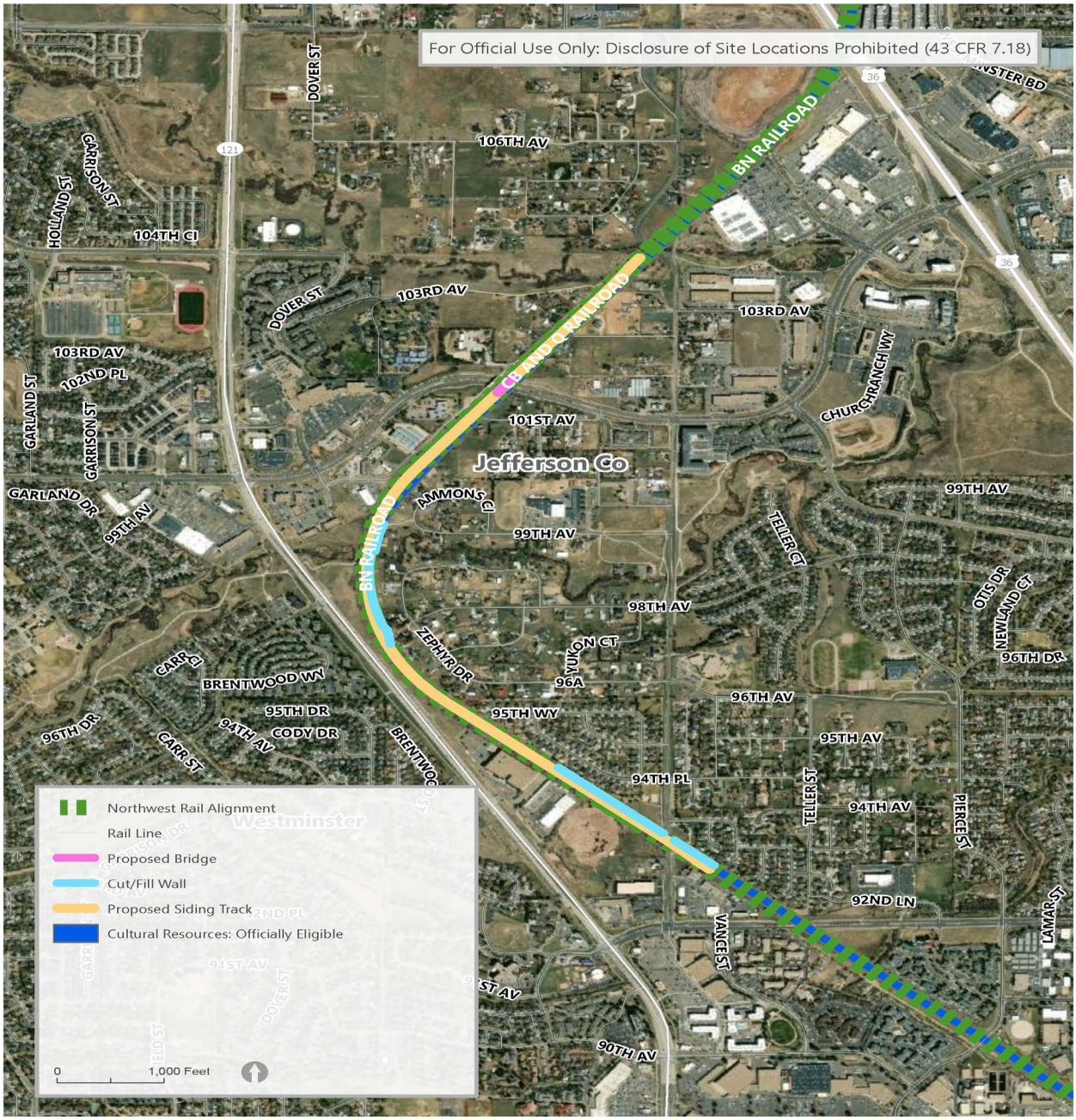
Figure 6: Known cultural resources in relation to the proposed Flatiron Station footprint



Base Configuration Environmental Scan

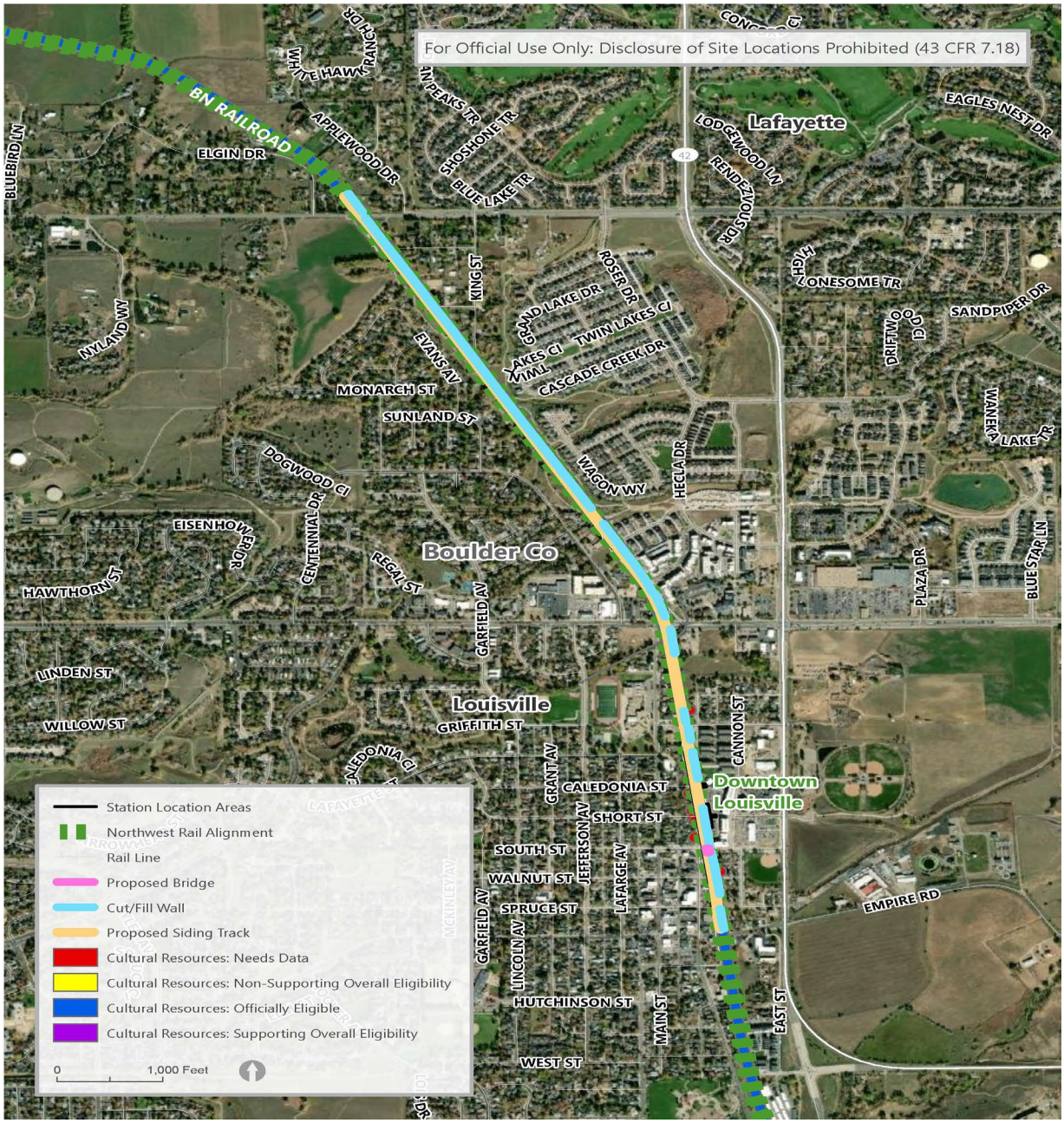
Figure 7: Known cultural resources in relation to potential maintenance facility sites

Figure 8: Known cultural resources in relation to proposed freight siding track #1



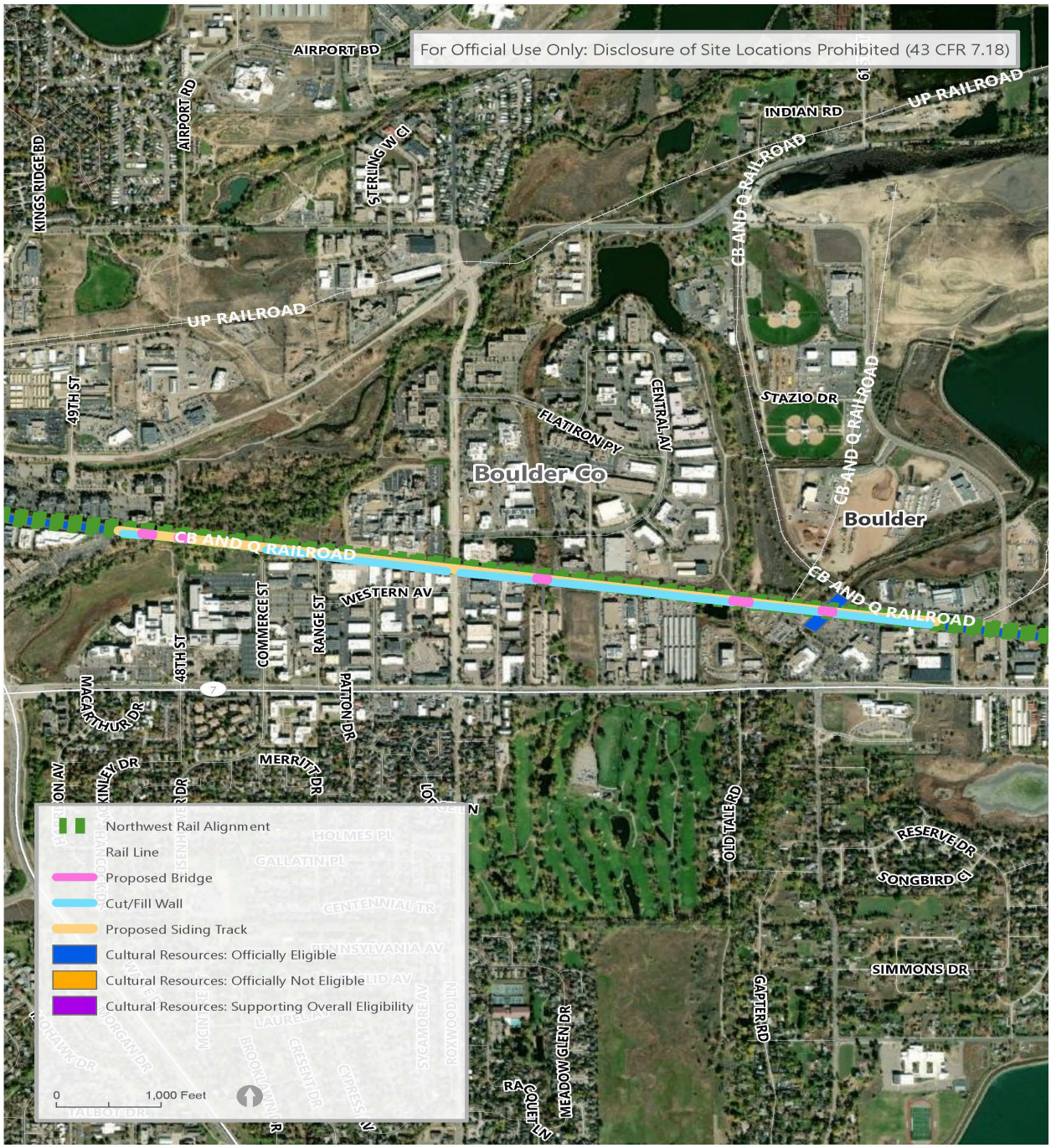
Base Configuration Environmental Scan

Figure 9: Known cultural resources in relation to the proposed freight siding track #2



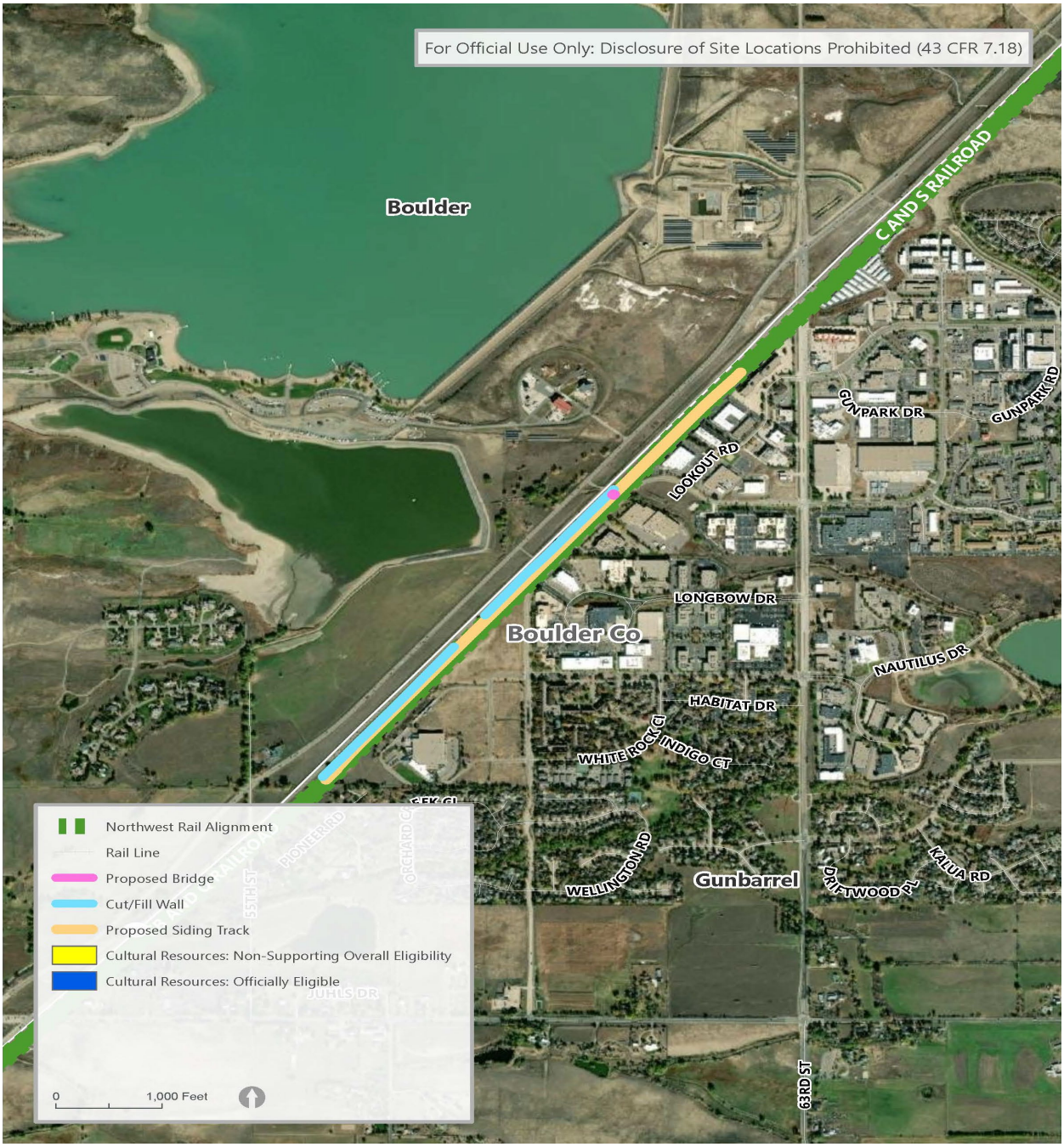
Base Configuration Environmental Scan

Figure 10: Known cultural resources in relation to the proposed freight siding track #3



Base Configuration Environmental Scan

Figure 11: Known cultural resources in relation to the proposed freight siding track #4



Recreational Resources

Brief Discussion of Resource Studied

Recreational resources, including parks, trails, open space areas, and wildlife and waterfowl refuges are important community assets that provide environmental, aesthetic, and recreational benefits. Additionally, these recreational resources may be eligible for protection under Section 4(f) of the USDOT Act and Section 6(f) of the Land and Water Conservation Fund Act. Section 4(f) properties include publicly owned public parks, recreation areas, wildlife, or waterfowl refuges, or any publicly or privately owned historic site listed or eligible for listing on the NRHP. Although not explicitly mentioned in the regulation, trails/multi-use paths and open space areas qualify as Section 4(f) resources if they are publicly owned, and its purpose is for park, recreation, or refuge activities. Section 6(f) properties have been funded through Land and Water Conservation Funds, which provides them special protections against converting their use from that investment.

Data Collection/Methodology

The study area for this analysis encompasses a 300-foot buffer from the edge of the right of way of the BNSF corridor and a 300-foot buffer around each station. Colorado Trail Explorer (CoTrex, 2020) trails and trailheads were downloaded as shapefiles and uploaded into ArcGIS Pro to overlay with the study area. New trail information was obtained from city and county comprehensive and master plans (City of Westminster Comprehensive Plan, 2021; City of Louisville Transportation Master Plan, 2019; South Boulder Road Small Area Plan, 2016; Southeast Longmont Urban Renewal Plan, 2006; Boulder Valley Comprehensive Plan, 2020; City and County of Broomfield Comprehensive Plan, 2016). Parklands and open spaces, size, location, and ownership were obtained from DRCOG Parks and Open Space Layer (DRCOG, 2021). Parks and recreational resource descriptions were obtained using publicly available data from the respective county or city website. Section 6(f) data were obtained from CDOT's Online Transportation Information System database (CDOT, 2022), which tracks properties with Land and Water Conservation funding.

Findings/Results

Recreational resources, including parks, open space properties, conservation easements, trails, and assumed Section 4(f) and Section 6(f) properties within the study area, are included in Table 3. Figure 12 through Figure 15 show the locations of these resources.

Base Configuration Environmental Scan

Table 3: Existing and New Parks, Trails, and Recreational Areas

Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership	Impact Occurrence
Adams County					
3	Little Dry Creek Open Space[A]	Open space and dog park	64.7	City of Westminster	
5	Lowell Boulevard Trail[A]	Trail	NA	City of Westminster	**High**
7	Bradburn Boulevard Trail[A]	Trail	NA	City of Westminster	**High**
13	Sunset Park[A]	Picnic tables and playground	3.5	City of Westminster	
Jefferson County					
20	Farmers' High Line Canal Trail[A]	Trail	NA	City of Westminster	**High**
23	Wadsworth Wetlands Open Space[A]	Open space and preserve	19.3	City of Westminster	
24	Big Dry Creek Open Space[A]	Open space, preserve, and trails	243.9	City of Westminster	
25	Big Dry Creek Trail[A,B]	Trail	NA	City of Westminster	**High**
30	Lower Church Lake Open Space[A]	Open space, lake, fishing, and trails	77.3	City of Westminster	
31	US 36 Bikeway Trail[A]	Trail	NA	City of Westminster	**High**
Broomfield County					
39	Lac Amora Open Space[A]	Open Space, pond, and trails	109.2	City and County of Broomfield	
42	Varra South Conservation Easement	Open space, preserve, and farms	51.7	Private/City and County of Broomfield	
51	Varra North Conservation Easement	Conservation easement and preserve	49.2	Private/City and County of Broomfield	
Boulder County					
38	Carolyn Holmberg Preserve at Rock Creek Farm[A]	Open space, preserve, and farms	6	Boulder County	**High**
54	Coal Creek Trail[A]	Trail	NA	City of Louisville	**High**

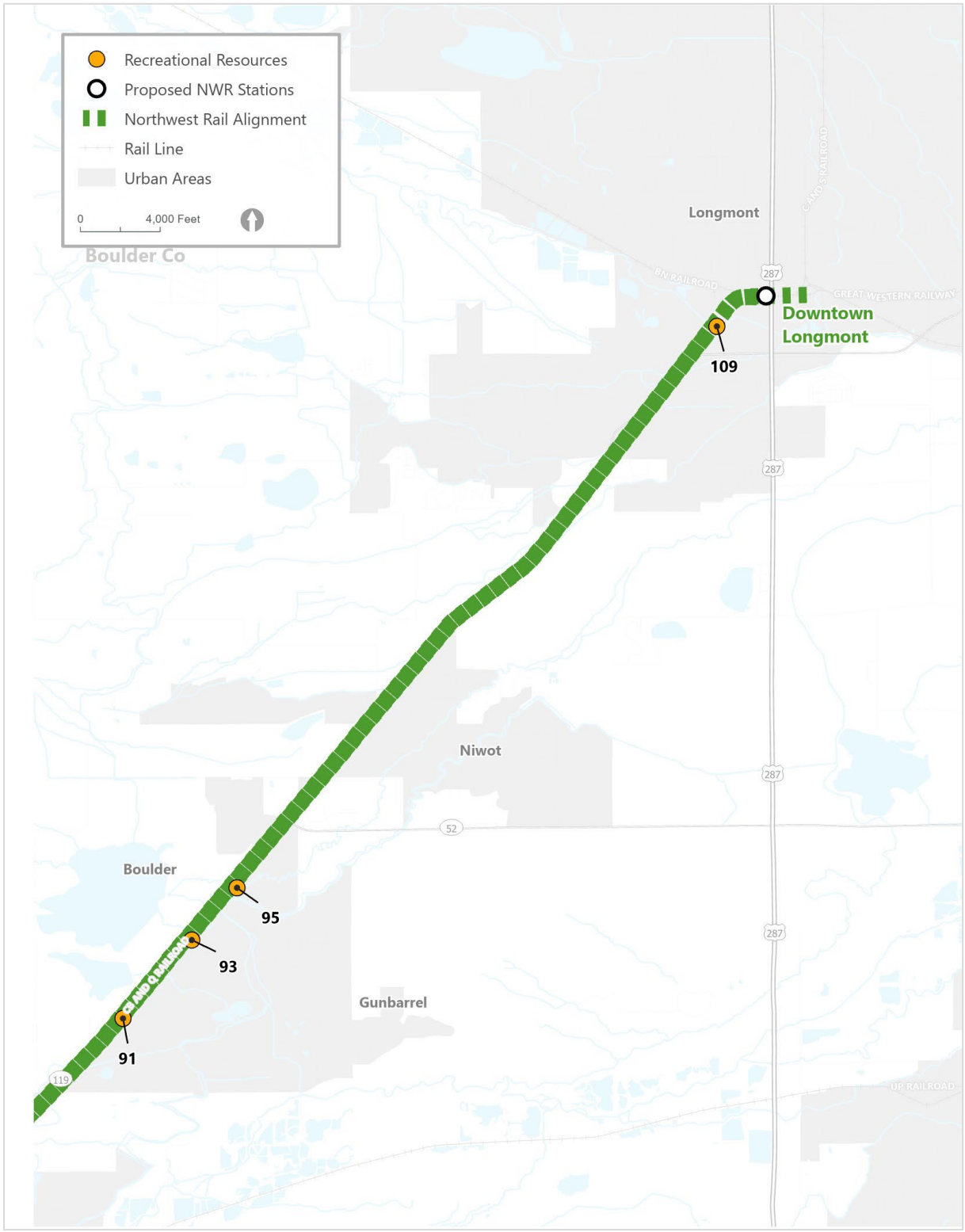
Base Configuration Environmental Scan

Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership	Impact Occurrence
63	Centennial Corridor Open Space Trail[A]	Trail	NA	City of Louisville	
65	Paclamar Farms Brooks[A]	Open space park and preserve	96.4	City of Boulder	
66	Anderson Open Space[A]	Open space, preserve, and farms	105.7	City of Boulder	
69	Autrey Open Space[A]	Open space park and preserve	176.1	City of Boulder	
72	Swartz Open Space[A]	Open space park and preserve	42.7	City of Boulder	
74	Lewis Open Space[A]	Open space park and preserve	58.9	City of Boulder	**High**
78	Flatirons Industrial Park[A]	Open space and preserve	36.6	City of Boulder	
80	South Boulder Creek Path [A]	Trail	NA	City of Boulder	**High**
83	Boulder Creek Path[A]	Trail	NA	City of Boulder	**High**
84	Foothills Parkway Path[A]	Trail	NA	City of Boulder	**High**
85	Pearl Parkway Path [A]	Trail	NA	City of Boulder	**High**
86	Goose Creek Path[A]	Trail	NA	City of Boulder	**High**
88	Reynold's Open Space[A]	Open space, preserve, and farms	17.1	City of Boulder	
90	Cottonwood Trail[A]	Trail	NA	City of Boulder	
91	Celestial Seasonings Easement[A]	Conservation easement and preserve	10	City of Boulder	
93	63rd St Path[A]	Trail	NA	City of Boulder	**High**
95	IBM Connector Trail[A]	Trail	NA	Boulder County	**High**
109	St. Vrain Greenway[A, B]	Trail	NA	City of Longmont	**High**

[A] Assumed to be eligible for protection under Section 4(f)
[B] Eligible for protection under Section 6(f). Boulder Reservoir not included as it's separated from the project alignment by CO 119.

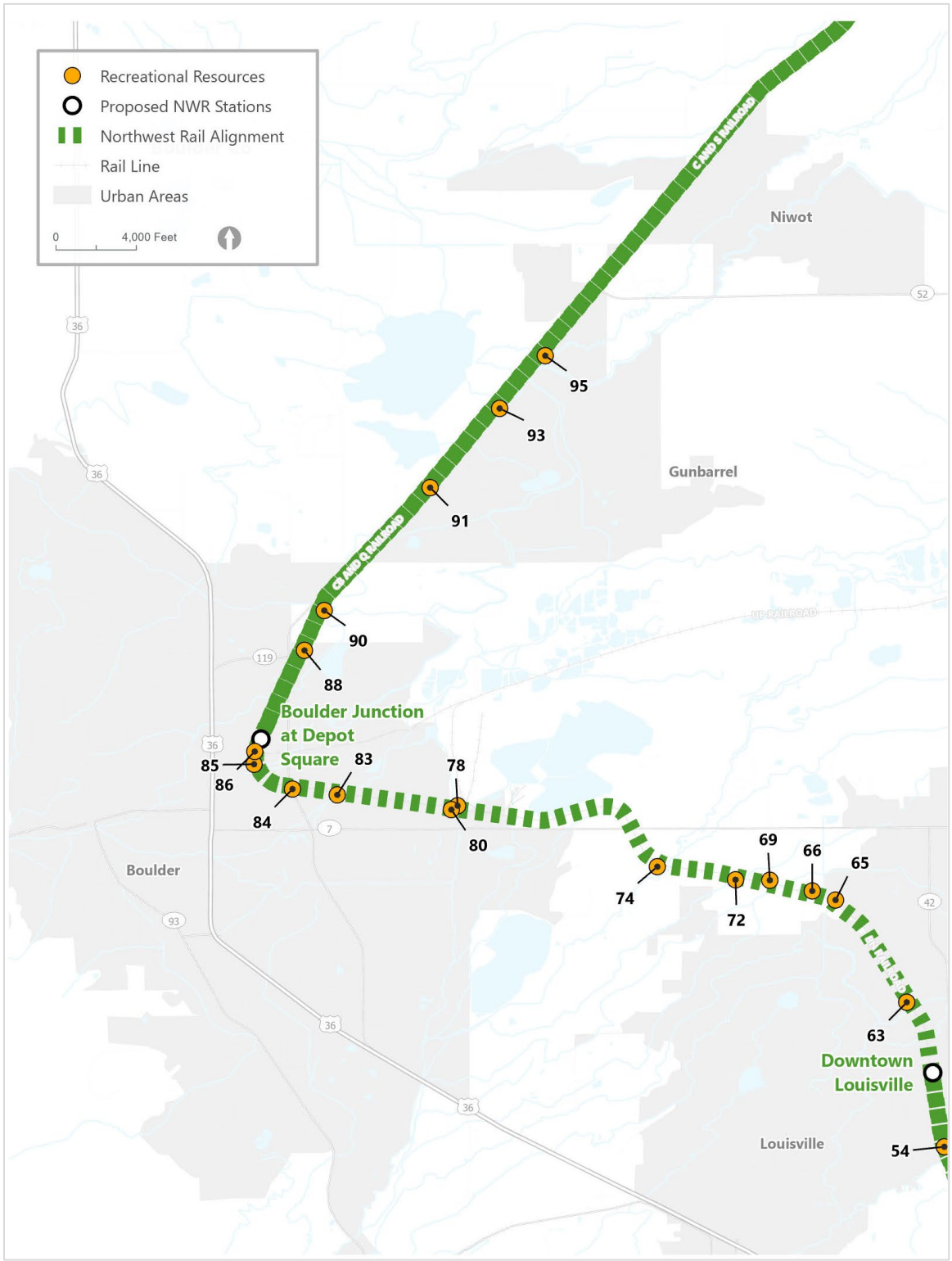
Base Configuration Environmental Scan

Figure 12: Potential recreational resource conflicts (1 of 4)



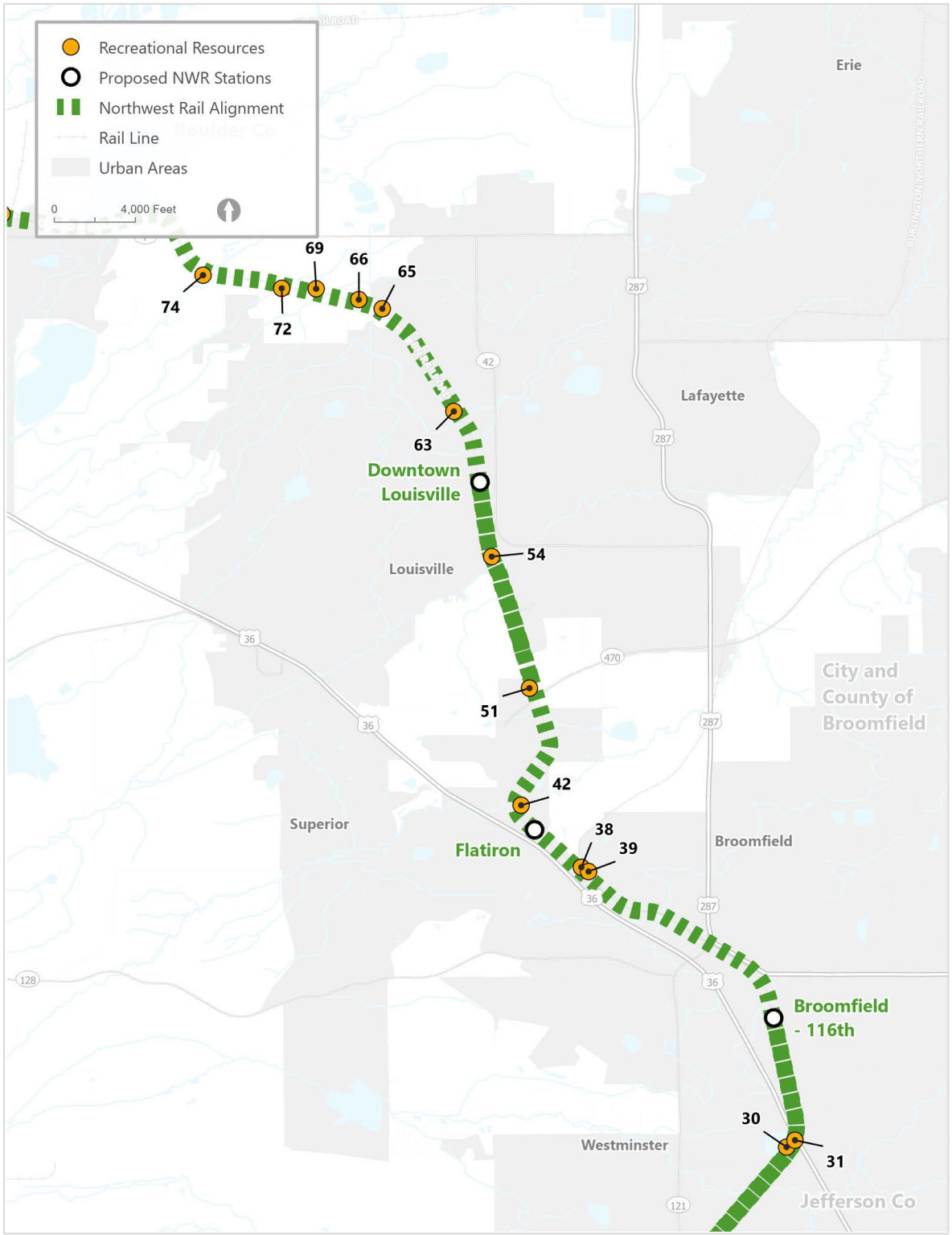
Base Configuration Environmental Scan

Figure 13: Potential recreational resource conflicts (2 of 4)



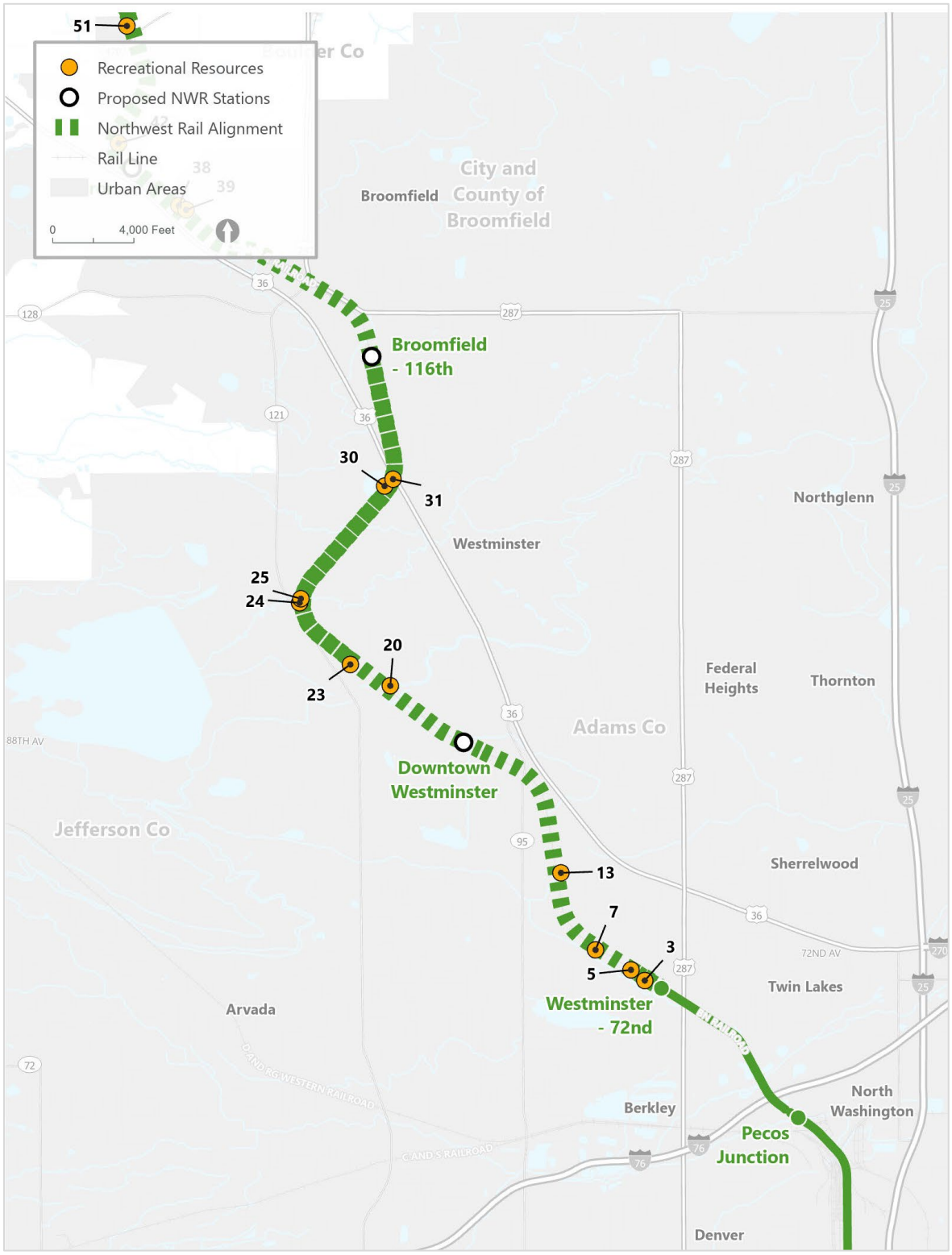
Base Configuration Environmental Scan

Figure 14: Potential recreational resource conflicts (3 of 4)



Base Configuration Environmental Scan

Figure 15: Potential recreational resource conflicts (4 of 4)



Base Configuration Environmental Scan

Compliance *Considerations*

Several recreational resources exist within the study area. The Planning and Environmental Study will include a high-level description of potential impacts and environmental constraints, with further recommendations on how to proceed during subsequent environmental and design project development steps, as applicable. For the FasTracks program, RTD has mitigated impacts considered high-moderate or above. During NEPA, additional study areas may be required to consider constructive use. Public parks and recreational facilities are protected by Section 4(f), which requires that these properties be avoided unless there are no feasible or prudent alternatives. As design advances, avoidance will be considered an initial option in the next development phase. If the project cannot avoid using a Section 4(f) property, a Section 4(f) Evaluation will be required, and concurrence on minimization and mitigation measures from the officials with jurisdiction over the affected properties will be necessary. Early coordination with officials with jurisdiction will be required.

If it is determined that the project may impact a property protected under Section 6(f), similarly to Section 4(f), design considerations to avoid the property are required. If a conversion of the parkland from a recreation to a transportation use is necessary, coordination between the CPW and the National Park Service / US Department of Interior will be required, and replacement parkland will be identified.

To avoid delays, early coordination with applicable agencies and stakeholders will occur at the onset of preliminary design and NEPA and continue through the alternatives selection process so that concurrence can be achieved through the Section 4(f) and Section 6(f) processes as efficiently as possible.

Hazardous Materials

Brief Discussion of Resource Studied

The acquisition of property right of way and potential construction disturbance requires the evaluation of hazardous material concerns to protect worker health and safety and public health, to provide liability due diligence for the purchasing entity, and improve the alternatives analysis based on potential hazardous material impacts. The *Environmental Liability Study* is attached (Attachment 2), and the results are discussed within this section.

Hazardous material sites are those properties that have been impacted by a current or previous use that could have resulted in a release of hazardous substances or petroleum products. These materials could include pesticides, volatile and semi-volatile organic compounds, heavy metals, petroleum products (gasoline, diesel fuel, lubricants), lead-based paint, and asbestos-containing building materials.

Base Configuration Environmental Scan

Data Collection/Methodology

The RECs identified in the CCR were further researched in this environmental liability review, to verify the presence of contaminated sites adjoining the Project alignment. Environmental liability refers to the potential environmental costs that a property and/or properties may require to remove contamination disturbed during construction. The properties listed as RECs along the Project alignment were screened by researching the past and present use and constituents of concern in soil and groundwater. The properties were reviewed in the Colorado Department of Public Health and Environment (CDPHE) online website to determine their potential to contaminate the Project, and the Boulder, Jefferson, and Adams County Assessor to review parcel information. The location of the properties with RECs were evaluated in relation to the railroad alignment, to assess impacts to the Project. The locations of proposed soil disturbance and construction along the railroad alignment were also reviewed against the CDPHE sites. The properties were identified as low or high risk for environmental hazards and environmental liability. Contamination can occur from past or current operations such as landfills, maintenance operation yards, industrial operations, automotive service businesses, dry cleaners, mine and mill sites, and unsanctioned activities.

Findings/Results

The proposed train stations, bridges, and sound wall locations were reviewed to evaluate potential impacts that would require mitigation. The train stations and most of the proposed construction areas did not have adjoining properties that were impacted and were found to be low risk. Along the Project alignment, only two adjoining properties were identified that would impact the proposed NWR construction, as most of the REC site locations were not adjoining the Project alignment. A table was prepared that listed the REC properties, previous and current land use, along with the surveyed station numbers along the Project alignment. Only two locations within the proposed construction area were identified as high risk and information for mitigation costs were estimated.

One property northeast of the Broomfield Station, located at 11811 Upham Street (REC site #1258 – Figure 2), is registered as an active Superfund site by the Environmental Protection Agency, however, it is not on the National Priorities List, and no further federal action is required. A partial right-of-way (ROW) take for the Project is shown along the western end of the site. Although no documentation was found identifying this area as being contaminated, an estimation of mitigation costs was completed for this portion of the property.

Another property, located at 11939 Sugar Mill Road (REC site #21, 24 – Figure 2), 1.5 miles east of the proposed Longmont Station, is the former Great Western Sugar Company Factory with 11 buildings and sugar silos, former diesel ASTs and landfill disposal on the property. The property is in disrepair with buildings crumbling and the sugar silos still intact on over 40 acres. This area is proposed for future additional transit-oriented development, as part of the NWR Project. Although no documentation was found identifying this area as being contaminated, it is an area of concern for future development east of the Project limits. The property is east of the

Base Configuration Environmental Scan

Project ROW and was not included in the estimation of mitigation costs for the NWR alignment. Table 4 summarizes the estimated costs for potential soil removal in the one site of concern northeast to the Project alignment.

Table 4: Preliminary Mitigation Estimates

Data	Potential Mitigation Sites	
Station #/Train Station	419/Broomfield - 116th	E of 1841/Boulder Junction at Depot Square
Subject Property	Chemical Handling Corp	Transportation Service Center Cleaning
APN	171702113018	131511000038
Address	11811 Upham Street, Broomfield	11939 Sugar Mill Road, Longmont
Owner	Broomfield Industrial Center Condos	Factory building still on site in poor condition, sugar silos remain.
Contaminant(s) of Concern	Metals and volatile organic materials in soil. Potential groundwater contamination	Nonhalogenated solvents, metals
Approximate Parcel Area (ft2)	113,108 SF	227,594 SF
Area of Soil Removal (ft2)	(389 x 65=) 25,285 SF	227,594 SF
Volume of Soil Removal (2.5 ft deep, ft3)	63,213 CF	568,985 CF
Tons of Soil Removal (0.025 tons/1 ft3)	1,580 tons	14,225 tons
Estimated Cost for Hazardous Waste, Excavation, Transport & Disposal ($300/ton)	$474,094	$4,267,388
-30% Estimated Cost for Hazardous Waste Excavation, Transport & Disposal	(-30% = $142,228) -> $331,866	(-30% = $1,280,216) -> $2,987,172
+50% Estimated Cost for Hazardous Waste, Excavation, Transport & Disposal	(+50% = $237,047) -> $711,141	(+50% = $2,133,694) -> $6,401,082

Compliance *Considerations*

The Planning and Environmental Study will include a high-level description of potential impacts and environmental constraints, with further recommendations on how to proceed during subsequent environmental and design project development steps, as applicable. RTD will complete a Phase I Environmental Site Assessment (ESA) during NEPA. Based on the Phase I ESA findings, if a Phase II ESA (i.e., materials testing) or remediation activities are required, there may be substantial delays for property acquisition or construction in the vicinity. Also, a Phase II ESA and remedial activities could require additional funding. These activities are associated with the acquisition of properties.

Base Configuration Environmental Scan

Hazardous materials concerns within the construction area will require specifications to guide contractors regarding safety precautions, protocols, and environmental commitments. A Materials Management Plan will be used if construction activities are anticipated to encounter hazardous materials.

ROW Assumptions

Right-of-way acquisitions are not expected along the mainline track alignment and freight siding alignments for the Base Configuration, as these are assumed to be within BNSF right-of-way and would be included in an agreement between BNSF and RTD. Station areas may require some right-of-way acquisition for constructing and operating the rail platforms and ancillary infrastructure.

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Milestone 3

Base Configuration Report

Appendix E

Consensus Building and Public Outreach Report

Executive Summary

The Northwest Rail Peak Service Study (the Study) was part of a continuing collaborative effort between the Regional Transportation District (RTD), local transportation partners, and community stakeholders to identify and address mobility solutions for peak period service along the Northwest Rail alignment, which extends from Denver Union Station to the existing Westminster Station and extending to Boulder and Longmont. The track alignment is owned by BNSF Railway who would continue to own the railroad if peak service is implemented.

The Study was part of RTD's ongoing commitment to the FasTracks plan, which includes commuter rail service from Denver Union Station to Boulder and terminating in Longmont. The Study advances the efforts toward this goal.

The Study was completed in five stages

- Milestone 1: Confirm and refine the Peak Service concept with stakeholders
- Milestone 2: Identify local, state, federal, and BNSF requirements for the operation of service (the "Base Configuration")
- Milestone 3: Conduct initial planning and develop preliminary engineering design and costs required to build and operate the Base Configuration service
- Milestone 4: Identify likely service expansion scenarios to avoid precluding expanded RTD or FRPRD passenger service
- Milestone 5: Identify potential project implementation strategies

The Study evaluated the feasibility of providing peak period service for the Northwest Rail. Over approximately two years, the Study identified the requirements, costs, and operational needs to upgrade existing track, develop rail stations, and provide peak service to northwestern metropolitan communities, which include Arvada, Westminster, Broomfield, Louisville, Boulder, and Longmont. As part of the feasibility study RTD engaged BNSF to conduct a preliminary engineering design to define the infrastructure improvements required to integrate commuter rail service with freight service on the BNSF tracks. The results of the BNSF design work were incorporated by the Project Team into the Base Configuration.

The Study included a public engagement to solicit public feedback regarding the peak service plan. The Study addressed Milestones 1-3 from Spring 2022 through Spring 2023 with extended focus on Milestone 3 through Winter 2023 and into early 2024. Milestone 4 took place from Fall 2023 to Spring 2024. The Study concluded with Milestone 5, which was the final Common Set of Facts and the final summary report.

In addition to the major touchpoints noted above, the Project Team held meetings and workshops monthly with the Study Advisory Team (SAT). Milestone 1 (Spring 2022-Summer 2022) established an agreed-upon Peak Service Concept that presented the analysis of alternatives from previous and existing strategic plans, studies and commitments from local jurisdictional partners. This allowed the Study team to understand potential opportunities or gaps with station locations, service amenities, etc. along the corridor. The SAT convened for a Plans & Initial Commitments Workshop to begin discussions on the project and were provided progress updates via email throughout this milestone.

Milestone 2 began in Summer 2022 and finished in the Fall, focusing on revisiting and confirming commitments from the study area communities, agencies and other stakeholders, and integrating them into the Peak Service concept plan. Throughout this milestone, the SAT gathered three times for update meetings and an Initial Configuration workshop was held. The Project Team confirmed an initial "footprint" to assess environmental impacts and identify direct and indirect effects to the adjacent communities, including Environmental Justice (EJ) populations. The identification of EJ populations was used to assess and avoid potential impacts and is part of both the planning effort and the equity analysis that is required prior to the siting of facilities and modification to service under Title VI of the Civil Rights Act of 1964, which prohibits discrimination based on race, color, or national origin in programs or activities that receive federal financial assistance. These concept plans are location-based and were presented to the public.

The focus of Milestone 3 (Spring 2023-Winter 2023) was to refine both the operating plan, and the infrastructure requirements gathered through Milestones 1 and 2 by solicitation and input from agency partners, technical subject matter experts (SME), and the public. This included service options and vehicle alternatives. The first public touchpoint took place during this milestone in January/February 2023 when RTD and local agencies hosted pop-up events, two public open houses, and a self-guided online meeting. The SAT, in addition to five update meetings, convened for two in-person workshops to discuss base configuration and explore partnerships.

Another round of pop-up events, public open houses, and a self-guided online meeting were hosted in the latter half of 2023 near the end of Milestone 3, where the basic peak period service requirements, or Base Configuration, was shared with the public. During this period, the Project Team continued to meet monthly with the SAT to discuss updates on BNSF design and negotiations, local plan agreements, and public engagement.

During Milestone 4, the Study team reviewed and considered long-range rail service plans and determined how those programs might fit into the NWR PSS concept and next steps. The Study team also assessed the role that the Peak Service plan would play at a regional transit level.

Milestone 5 showcased final implementation strategies and next steps. A final summary report for the Peak Service Concept was made available to the public following a presentation of the study findings to the RTD Board of Directors.

More detailed public outreach summaries for Milestones 1-3 and Milestone 3.5, which include all promotional and marketing efforts, can be found in Appendix A and B. SAT workshop summaries can be found in Appendix C, followed by SAT meeting agendas, notes, and emails in Appendix D.

Milestone Summaries

Milestone 1 – Confirm Peak Service Concept

Goals and Outcomes

Milestone 1 set expectations and cultivated shared understanding between RTD, the SAT, and the consultant team on the background leading up to the Peak Service concept and the goals of the Study. RTD and BNSF worked together to develop a concept for peak service in the corridor, including service option modeling and engineering design. To provide consistency with previous work on the corridor, the Study documented the alternatives considered in the past that led to the Peak Service concept. Elements of this plan were vetted through a stakeholder engagement process to understand desired community objectives. In addition, the concept must not preclude any future passenger rail service options that would encompass a larger rail program along the Front Range.

Milestone Input

Input during this milestone included the analysis of alternatives from previous and existing strategic plans and studies and understanding of commitments from local jurisdictional partners to understand potential opportunities or gaps at station locations, service amenities, etc.

Milestone Output

An agreed-upon Peak Service concept to represent to the stakeholders and public.

Milestone 2 – Confirm Partner/Stakeholder Plans and Commitments

Goals and Outcomes

Through previous efforts, study area communities, agencies, and stakeholders have developed plans and committed resources to support progress and implementation of Northwest Rail Line/B Line service. Elements include secured rights-of-way, infrastructure investments in station areas, and identified grade crossings in anticipation of NWR implementation.

Throughout Milestone 2, these commitments will be revisited and integrated into the Peak Service Concept plan. These commitments must be confirmed prior to moving to Milestone 3.

Milestone Input

Through interviews and a SAT meeting, individual plans from each community will be presented by that stakeholder, discussed, and assessed.

Milestone Output

An initial "footprint" was confirmed to assess environmental impacts and identify direct and indirect effects to the communities, including Environmental Justice (EJ) populations.

The identification of EJ populations was used to assess impacts, as well as to complete both the preliminary environmental planning screening Planning Environmental Linkage (PEL) and equity analysis efforts required under Title IV.

These location-based concept plans were presented to the public. This was the first public touchpoint in the study.

Milestone 3 – Initial Footprint

Goals and Outcomes

Milestone 3 used input from agency partners, technical subject matter experts, and the public from Milestones 1 and 2 to refine both the operating plan and the infrastructure requirements, including any service options and vehicle alternatives.

Milestone Input

Continued to engage SAT, Technical Advisory Committee, and Subject Matter Expert to refine operating and infrastructure plans. The Study team utilized feedback from previous SAT workshops, meetings, and the initial public open house to present conceptual site plans and high-level operating plans during this milestone's SAT workshop and public open house.

Milestone Output

Refined conceptual site plans based on SAT and public input.

Milestones 1-3 Public Engagement Outcomes and Findings

Events, Open Houses, and Online Meeting

The Study Team hosted four pop-up events where approximately **110** people visited the booths.

Open Houses #1 and #2 had a combined total attendance of **195** participants with a total of **29** comment cards submitted.

The Self-Guided Online Public Meeting saw **1,241** engaged sessions (viewer clicked a call-to-action, video, survey, etc.) and a total of **3,290** views. There were **116** total submissions to the surveys embedded in the meeting, **173** completed surveys, and **353** collected entries on the RTD Study Website.

Milestones 1-3 Study Advisory Team Outcomes and Findings

SAT Charter

During Milestone 1, a charter was developed to solidify the SAT's purpose in providing guidance to the Study team. The charter reaffirms the SAT's commitment to assist in identifying technical team members, key stakeholders, and community members; establishing coordinated communications and outreach plans; and providing insight and guidance during key study milestones. The charter also outlined guidelines for deliberation and decision making throughout the Study. The complete formal charter can be found in Appendix E.

In addition to hosting update meetings, the Study team held a total of four SAT workshops throughout the first three milestones. Summaries of each workshop are below.

Plans and Commitments Workshop

- Convened SAT and developed common understanding across the corridor regarding existing plans and commitments
- Identified synergies between plans and commitments and areas for further exploration
- Began to assemble how plans and commitments fit into Initial Configuration
- Discussed next steps to engage a broader public

Initial Configuration Workshop

- Developed a common understanding of Initial Configuration across the corridor
- Discussed next steps to engage the public to create awareness of the study
- Reviewed technical updates and next steps towards Base Configuration

Base Configuration Workshop

- Presented base configuration concept and initial draft "common set of facts"
- Discussed affordability and partnership opportunities
- Discussed possible paths for realizing NWR peak service
- Introduced elements of next public input opportunity (Milestone 4)

Partnership Workshop

- Reviewed Base Configuration concept and memos supporting "common set of facts"
- Discussed affordability and partnership opportunities
- Discussed possible paths for realizing NWR peak service

Final summaries for SAT workshops can be found in Appendix C.

Update Meetings

In addition to workshops, the SAT touched base frequently with the Study team through update meetings and email. Throughout Summer 2022, the RTD Study team provided status updates to the SAT via email covering project progress and upcoming SAT responsibilities during Milestone 1. During Milestone 2, the Study team convened with the SAT for two update meetings to gather feedback on engagement content, review SAT coordination and outreach approach, and provide technical updates on project progression. The SAT and Study team gathered for five update meetings during Milestone 3 to solidify the SAT's role in public engagement, prepare for open houses, determine the path moving forward regarding NWR partnership, and discuss outreach plans for upcoming milestones.

Further details on these meetings can be found in the agendas, notes, and email updates in Appendix D.

Milestone 3 – Confirmation of Base Configuration

Goals and Outcomes

The focus of Milestone 3.5 is to refine both the operating plan and the infrastructure requirements gathered through Milestones 1 and 2 through input from agency partners, technical SMEs, and the public. This includes track improvements, service options, and detailed station area schematics. The focus is also to determine siding locations and impacts or burdens of those locations, receive community feedback to determine the operations of peak service, and establish partnerships for operation by BNSF Railway and potentially Front Range Passenger Rail. This milestone included two public open houses, a self-guided online meeting and summer pop-up events.

Milestone Input

Throughout the year, the Project Team continued SAT and Technical Advisory Committee/Subject Matter Expert engagement to establish the final Base Configuration and refinements of operating and infrastructure plans. The Study team assessed the feedback from the SAT, the first public open houses, and summer pop-up events, and presented proposed station site plans, siding locations, potential partnerships, and high-level operating plans. Concurrently, RTD and BNSF were developing the 30% design to identify infrastructure needs

to operate Peak service. The results of that work were compared to the conceptual design in the Base Configuration.

Milestone Output

Using this information, the Study Team progressed the "common set of facts," adjusted station areas, continued coordination with BNSF Railway, and explored operational opportunities with Front Range Passenger Rail. The efforts over winter 2023/2024 informed Milestones 4 and 5.

Milestone 3.5 Public Engagement Outcomes and Findings

Website

In total, **7,875** people viewed the Study website **from Jan. 1 to Nov. 30, 2023**.

Events, Open Houses, and Online Meeting

The Study Team hosted pop-up events with approximately **885** visitors to the booths. Between June 15 and Nov. 15, the team received **73** sign-ups and **50** completed surveys.

Open Houses #3 and #4 had a combined total attendance of **130** participants with a total of **14** comment cards submitted.

The Self-Guided Online Public Meeting generated **2,598** engaged sessions and a total of **6,019** views. There were **393** total submissions broken down to **253** completed service station surveys, **34** completed siding opinion forms, and **106** total online meeting comment forms.

Key Takeaways, Top Public Comments, and Feedback Received

- **Themes of Support:**
- General sentiment in support of rail along this corridor
    - Excitement for renewed NWR conversation
    - Potential Partnerships with FRPR and BNSF Railway
- Benefits of peak service
- Avoid traffic congestion
- Opportunity to read, work, rest, etc. on commute
        - Reduce vehicle emissions
- **Themes of Concern:**
- Service limitations and concerns

- Lack of reverse commute options
- Lack of service for customers with non-traditional commute times

- Siding track concerns
  - Noise
  - Idling/derailing
  - Neighborhood interference (driving, biking, walking at crossings)

A majority of participants are in favor of peak service and a handful of comments mentioned the importance of FasTracks commitments, siding locations, land use, construction, and integrated service options. Many participants did not understand the difference between a siding track and station. That gap needs to be bridged for participants to fully understand the impacts.

General Outreach Takeaways

- The top station concerns were safety, pedestrian/ bike connections, and storage for cyclists. Many station locations face barriers that include safety issues, missing sidewalks, and lack of bus connections.
- Enhancement suggestions include weekend and evening service, improving the first/last mile connection, and offering a reverse direction train during the peak hour
- While rail along the corridor generally fits the community's needs, only serving in one direction in the morning and evening does not align with most community members' schedules
- The majority of those who participated do not consider themselves low-income

Milestone 3.5 Study Advisory Team Outcomes and Findings

Update Meetings

From Summer 2023 to Winter 2024, the Study team convened with the SAT for seven update meetings. Throughout the summer months, the SAT reviewed agreements between NWR, FRPR, and BNSF and assisted the Study team in preparing for a presentation to the RTD Board. Beginning in the later months of the year, the SAT reviewed BNSF preliminary design work and plan progression, discussing factors like platforms, vehicle options, rail maintenance facility, midday layover facility, and environmental justice analysis with the Study team. The SAT also assisted in open house planning and reviewed the CBO winter engagement plan during this time. In early 2024, the Study team and the SAT continued to examine public engagement efforts, in addition to discussing technical matters including station sidings, passing sidings,

storage, maintenance (drainage, service roads, track modifications, bridges, turnouts), and local plan agreements regarding station-specific improvements.

Further details on these meetings can be found in the agendas, notes, and email updates in Appendix D.

Milestone 4 – Assess and Refine Preliminary Configuration Relative to Long-Range Plans

Goals and Outcomes

Public and stakeholder comments in the previous milestones led to the Study team assessing the addition of a reverse commute trips to the Peak Service concept. The Project Team developed an operating concept to define a "time block" during the morning and evening peak periods that RTD would lease from BNSF Railway to run reverse commutes. Milestone 4 considered the implications of using the time block for trips in each direction. The Project Team also considered the coordination required between the Peak Service plan and a possible intercity passenger rail. The Study team considered long-range rail service plans, including the Front Range Passenger Rail (FRPR), how those plans might fit into the Northwest Rail Peak Service concept, and potential next steps. The RTD Strategic Plan – that serves as the functional pillars by which RTD plans, develops, evaluates and measures overall performance – was also assessed for the role that the Peak Service plan would play at the regional transit level.

Milestone Input

RTD Study Team reviewed other long-range rail plans including the Denver Regional Council of Government's (DRCOG) Metro Vision Plan – which guides the region's investments in the multimodal transportation system – to evaluate the merits of NWR integration within a larger program.

Milestone Output

This milestone produced an program of improvements for the Northwest Rail corridor, including capital and operating costs, and comparisons to peer agencies with similar service. A phased approach for rail service in this corridor is currently unknown but will be determined based on funding.

Milestone 5 – Project Development and Implementation

Goals and Outcomes

The Project Development and Implementation work in this milestone developed a "Common Set of Facts" to inform the RTD Board of Directors of possible next steps. The "Common Set of

Task 11: Consensus Building and Public Outreach Report

Facts" uses the Base Configuration to address five key components to implement the NWR Peak Service Concept:

- BNSF requirements
- Operating specifications
- Infrastructure requirements
- Ridership
- Capital and operating costs

The Study team determined two potential options for RTD Board consideration. One option would be RTD moving ahead independently. A second option would consist of a partnership with FRPR.

Milestone Input

Outcomes from Milestones 1-4 were incorporated into the Project Development and Implementation technical report.

Milestone Output

Stakeholder and public comments related to the final summary report will be captured as part of the final project documentation.