Peak Service Study
Northwest Rail

We make lives better through connections.

Milestone 2 - Corridor Conditions Report

August 2024

Regional Transportation District
1660 Blake Street, Denver CO 80202

Corridor Conditions Report

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Acronyms and Abbreviations

2050 RTP	2050 Metro Vision Regional Transportation Plan
APE	Area of Potential Effects
AWSC	all-way stop control
BNSF	BNSF Railway
BRT	Bus Rapid Transit
BTUs	British Thermal Units
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CPW	Colorado Parks and Wildlife
dBA	A-weighted decibel
DRCOG	Denver Regional Council of Governments
EDR	Environmental Data Resources, Inc.
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FF	Flatiron Flyer
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GIS	Geographic Information Systems
IPaC	Information for Planning and Consultation
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
MSAT	mobile source air toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NWR	Northwest Rail
NWR Corridor EE	Northwest Rail Corridor Environmental Evaluation
OAHP	Office of Archaeology and Historic Preservation
OCS	overhead catenary system
OWSC	one-way stop control
Peak Service	rush-hour service
PEC	potential environmental concerns
PEM	Palustrine Emergent
PSS	Palustrine Scrub-Shrub
REC	recognized environmental conditions

RTD	Regional Transportation District
SHPO	State Historic Preservation Officer
SOP	System Optimization Plan
Study	Northwest Rail Peak Service Study
TIP	Transportation Improvement Program
TOD	Transit Oriented Development
TWSC	two-way stop control
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VCRP	Voluntary Cleanup and Redevelopment Program
VdB	vibration decibels

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Introduction

Regional Transportation District (RTD) is conducting the Northwest Rail Peak Service Study (Study) for a 35-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 best provide 'rush-hour' service (Peak Service) on the existing BNSF Railway (BNSF) tracks: three weekday morning trips from Longmont to Denver and three weekday evening trips from Denver to Longmont. The Study will update capital, operations, and maintenance costs to implement the Peak Service on the Northwest Rail (NWR) Corridor in a manner to not preclude a future buildout.

This Milestone 2 report summarizes the existing freight rail operations, infrastructure conditions, existing conditions at the proposed station locations, and existing social, economic, physical, and natural environmental resources within the NWR Corridor. The summary will guide the NWR development process to avoid and minimize impacts, set the stage for discussions around potential mitigation requirements, and inform the subsequent design and environmental phases. Information from this report will be summarized and referenced in the subsequent Milestone documents and technical reports. Milestone 3 will document the planning process and results defining the Base Configuration for Peak Service as requested by the RTD Board of Directors. The Milestone 3 work will also include a description of potential impacts and environmental constraints, with further recommendations on how to proceed during subsequent environmental and design project development steps.

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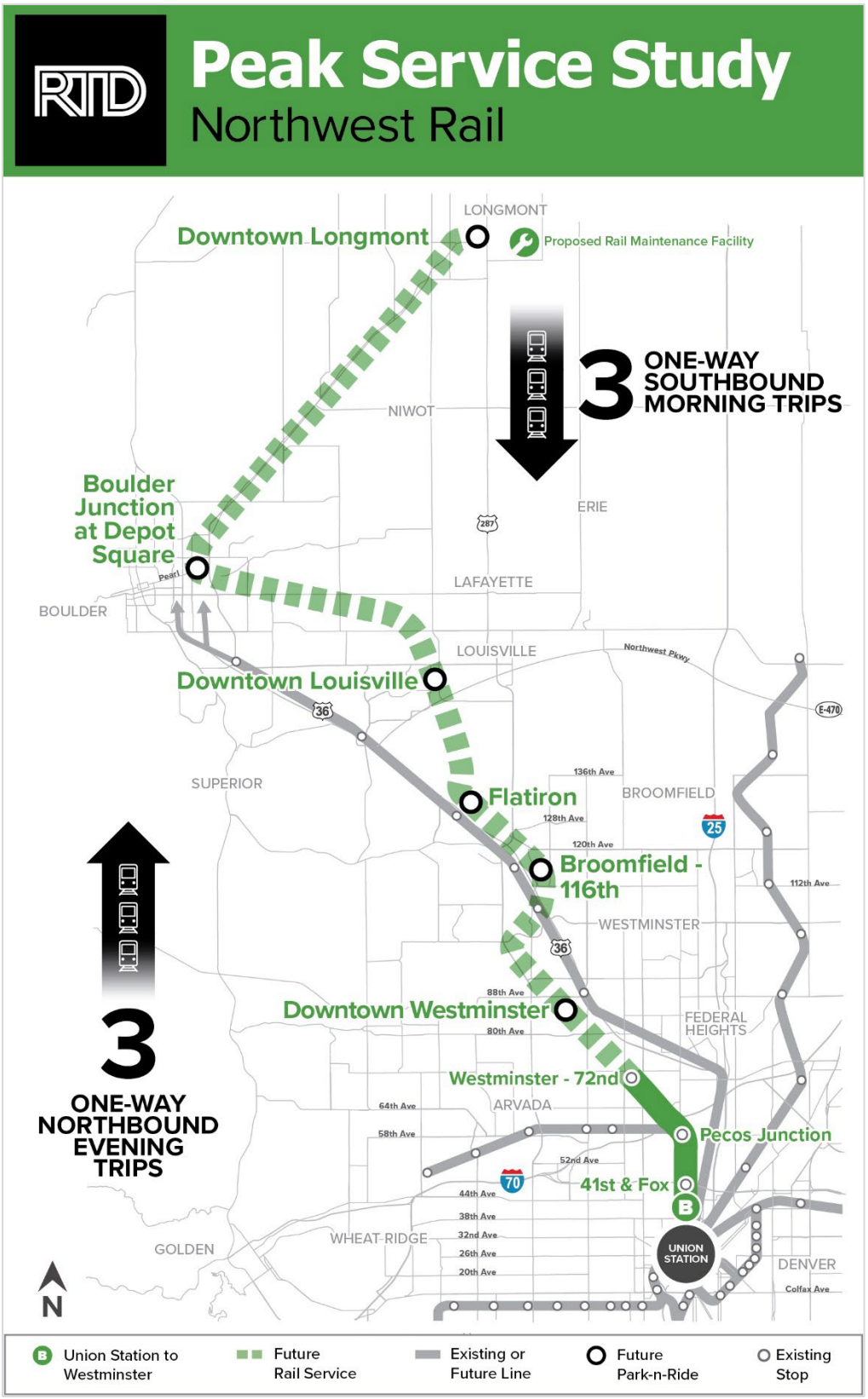
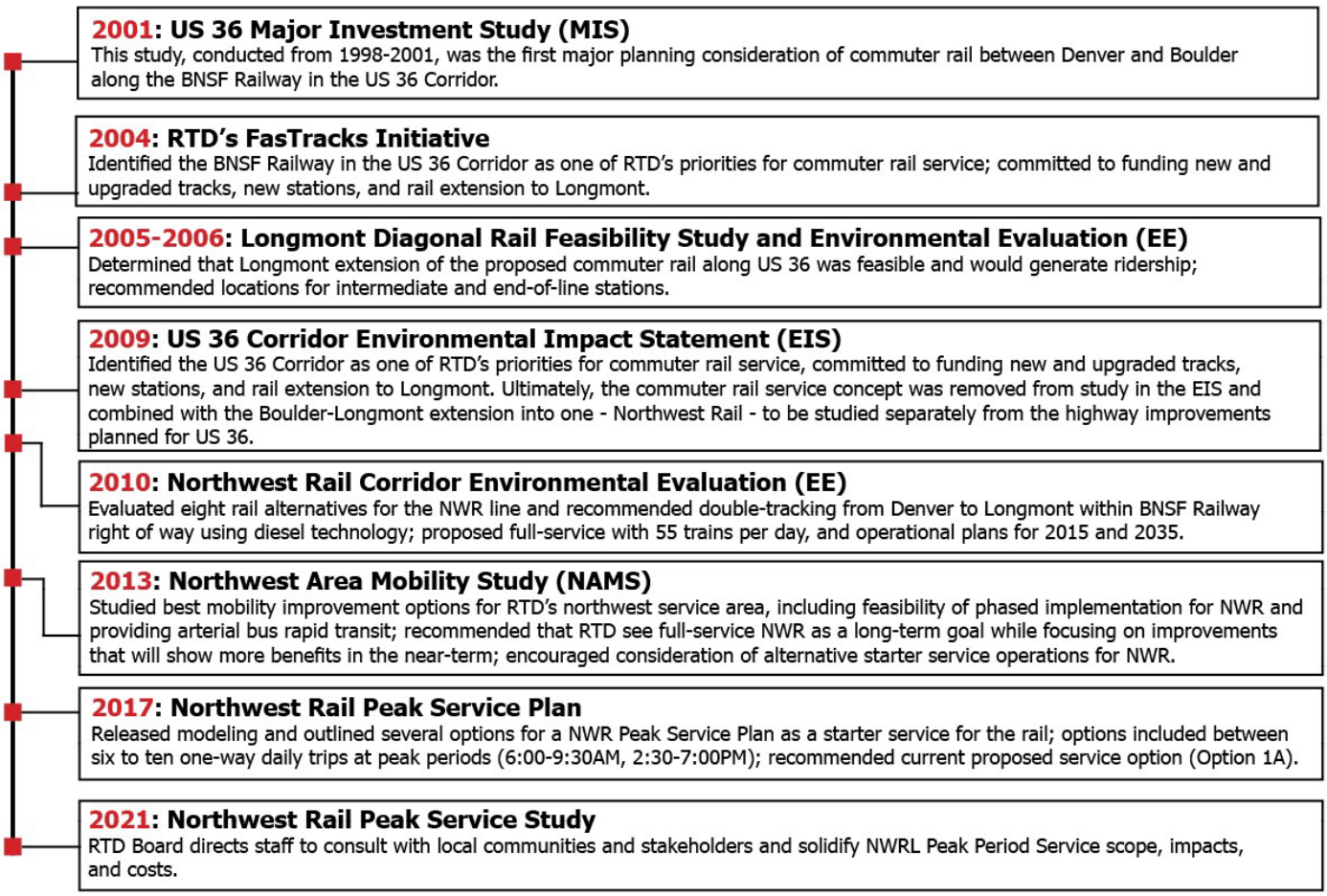
Figure 1: NWR Corridor



Previous Planning Context

Planning studies within the NWR Corridor have been conducted over the past two decades, as summarized in Figure 2. These planning efforts are detailed in the *Past Planning and Alternatives Development Memorandum* in the Milestone 1 Technical Report. This chapter summarizes these past planning efforts and provides background on the corridor and station locations assessed as part of this report.

Figure 2: Timeline of NWR Corridor Past Planning Studies



The NWR Corridor was originally studied in the *US 36 Major Investment Study* in 2001. In 2004, voters in the Denver area voted to approve RTD's *FasTracks Plan* through a sales tax increase, which included the conceptual transit corridor now known as the NWR Corridor. Then the *Longmont Diagonal Rail Feasibility Study* in 2005 and the *Longmont Diagonal Rail Final Environmental Evaluation* in 2006 both studied a proposed extension to Longmont from Boulder. In 2006, RTD combined the commuter rail portions of the US 36 Corridor and the Boulder-Longmont Corridor into one – NWR – to be studied and implemented separately from the highway improvements planned for US 36.

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RTD issued the Final Northwest Rail Corridor Environmental Evaluation (NWR Corridor EE) in 2010, evaluating eight commuter rail service alternatives, including single and double-track options within and outside BNSF's right of way and a no action option. Extensive analysis, including examination of capital costs, ridership, travel time, environmental impacts, and public and agency support, ultimately led to a single preferred design option: a double-track rail from Union Station in downtown Denver to Downtown Longmont on existing BNSF right of way. It is the most viable option for commuter rail in RTD's northwest region, as other options had characteristics that failed to meet the Study's stated purpose and need of providing consistent and reliable travel times or an affordable transit investment. Since the release of the Final NWR Corridor EE in 2010, the NWR Corridor planning activities have occurred within and along existing BNSF right of way and are supported by regional stakeholders.

In 2013, RTD conducted the Northwest Area Mobility Study, a collaborative effort with the Colorado Department of Transportation (CDOT), the Denver Regional Council of Governments (DRCOG), northwest area cities and counties, and the public to develop a prioritized list of mobility improvements for the NWR Corridor. From 2013-2016, RTD considered options for feasibly advancing the NWR Corridor in the near term by implementing a partial level of service. RTD's Peak Service Plan, proposed in 2017, would provide three one-way trips from Longmont to Union Station on weekday mornings and three one-way trips from Union Station to Longmont on weekday evenings. It could also capitalize on the potential to align RTD strategically with the agency's stated goals to partner with other entities, such as the Front Range Passenger Rail District, Amtrak, and CDOT.

In 2016, RTD completed the construction of the first segment of the NWR Corridor as part of its FasTracks Eagle P3 Project. This 6.2-mile segment operates as RTD's B Line from Union Station to Westminster Station, referred to as Westminster – 72nd Station in this Study to differentiate between multiple stations within Westminster. RTD has since added two station stops between the Westminster Station and Union Station, at Pecos Junction, and 41st & Fox in Denver as part of RTD's G Line service. RTD's existing B Line between Union Station and Westminster – 72nd Station is excluded from this report's existing condition assessment.

RTD recommended six stations between Westminster and Downtown Longmont to support its Peak Service Plan (City of Longmont, 2017). The additional stations bring the total for the NWR Peak Service Plan to 10. Four stations are already in service: Union Station, 41st & Fox, Pecos Junction, and Westminster – 72nd. The six new stations are Downtown Westminster, Broomfield – 116th, Flatiron, Downtown Louisville, Boulder Junction at Depot Square, and Downtown Longmont. In June 2021, RTD confirmed these station locations with local agencies. RTD's Pecos Junction Station, 41st & Fox Station, and Union Station are excluded from this report's existing conditions assessment.

Freight Infrastructure and Operations

The NWR Corridor is planned primarily within the existing BNSF right of way and would utilize the BNSF freight rail track. In recent years, RTD has coordinated with BNSF to develop an operating plan for passenger rail service on the NWR Corridor while maintaining BNSF's flexibility to continue to operate freight service.

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Existing Operations

The Study Team obtained data on freight operations from the Federal Railroad Administration (FRA) Office of Safety Analysis, which shares data on crossing and inventory and data on safety, such as accident, inventory, and highway-rail crossing data with the public. Railroad operations are proprietary data; however, the FRA conducts a crossing inventory. This inventory includes information on the number of trains that crossed a location during the day: 6 a.m. to 6 p.m., and during the night: 6 p.m. to 6 a.m. The most recent inventory was conducted in 2019, with three trains observed during the day and three trains observed during the night. This inventory omits train speed or the number of locomotives or cars; however, the accident reports provide the number of locomotives and cars. Based on the accident report data, the size of freight trains in the corridor since 2010 ranged between 68 to 238 cars and two to eight locomotives, and travel speeds ranged from 13 to 30 mph. RTD currently estimates that there are eight to 10 freight trains per day.

Existing Track Infrastructure

The Study Team identified existing track infrastructure using Google Satellite Imagery from October 2022 and FRA Inventory Reports. There is one main track with three double-track sections or sidings in the NWR Corridor. Double-track sections or sidings are identified at the following locations:

- Lowell Boulevard to West 72nd Avenue: the siding is approximately 780 feet long
- Nickel Street to Burns Junction: the siding is approximately 1.3 miles long; Burns Junction to approximately Brainard Drive: the siding is approximately 2,800 feet long; these two sidings are continuous, and at Burns Junction, there is another main track that separates to the north
- Boulder Creek Overpass to North Boulder Farmers Ditch, just south of Pearl Parkway: the siding is approximately 4,100 feet long

Roadway and Trail Crossing Infrastructure

The BNSF corridor includes 14 existing grade-separated roadway crossings and 36 existing at-grade roadway crossings. Additionally, there are 11 formal trail crossings along the corridor, and a desktop review observed 12 informal or social trail crossings. Existing crossings of the BNSF corridor are discussed in more detail in the Traffic, Circulation, and Parking Section and the Transit and Other Transportation Systems Section.

Quiet Zones

FRA guidelines require trains to sound locomotive horns before all at-grade rail crossings for 15 and 20 seconds. A local agency can apply for a quiet zone, which removes the requirement for conductors to sound the horn at the crossing. Roadway improvements at crossings, such as quad gates, median extensions, and additional signage, are required for the crossing to be eligible for a quiet zone. Municipalities along the NWR Corridor have recently made improvements to crossings or planned projects for their at-grade crossings to become quiet zones. The existing quiet zones by municipality as of October 2022 are listed below and shown in Figure 3 (Boulder County, 2022; City of Boulder, 2022; City and County of Broomfield, 2022; City of Lafayette, 2017; City of Louisville, 2022; FRA, 2022).

Boulder County – Existing Quiet Zones

- Second Avenue in Niwot
- Niwot Road
- Monarch Road
- 63rd Street (south of Diagonal Highway)
- 55th Street (south of Diagonal Highway)
- Jay Road
- Independence Road

City of Boulder – Existing Quiet Zones

- 47th Street
- 55th Street (north of Arapahoe Avenue)
- 63rd Street (north of Arapahoe Avenue)
- Pearl Parkway
- Valmont Road

Broomfield – Existing Quiet Zones

- Brainard Drive
- Nickel Street
- West 120th Avenue
- West 112th Avenue

City of Louisville – Existing Quiet Zones

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

Lafayette – Existing Quiet Zones

- Baseline Road

Westminster – Existing Quiet Zones

- 88th Avenue

Several municipalities have proposed or begun planning future quiet zones along the route. The existing quiet zones by municipality as of October 2022 are listed below and shown in Figure 3 (Boulder County, 2022; City and County of Broomfield, 2022; Times-Call, 2022; City of Westminster, 2022).

Boulder County – Proposed Quiet Zones

- 83rd Street

Longmont – Future Quiet Zones

- Coffman Street (expected 2024)
- Terry Street (expected 2024)
- Hover Street (expected 2025)

City of Westminster – Future Quiet Zones

- West 72nd Avenue (expected TBD)
- Lowell Boulevard (expected TBD)
- Bradburn Boulevard (expected TBD)

The following crossings are not designated as quiet zones and are not currently listed as being planned for quiet zones by the municipalities:

Longmont:

- Sunset Street
- Ken Pratt Boulevard

Boulder County:

- Ogallala Road

City of Boulder:

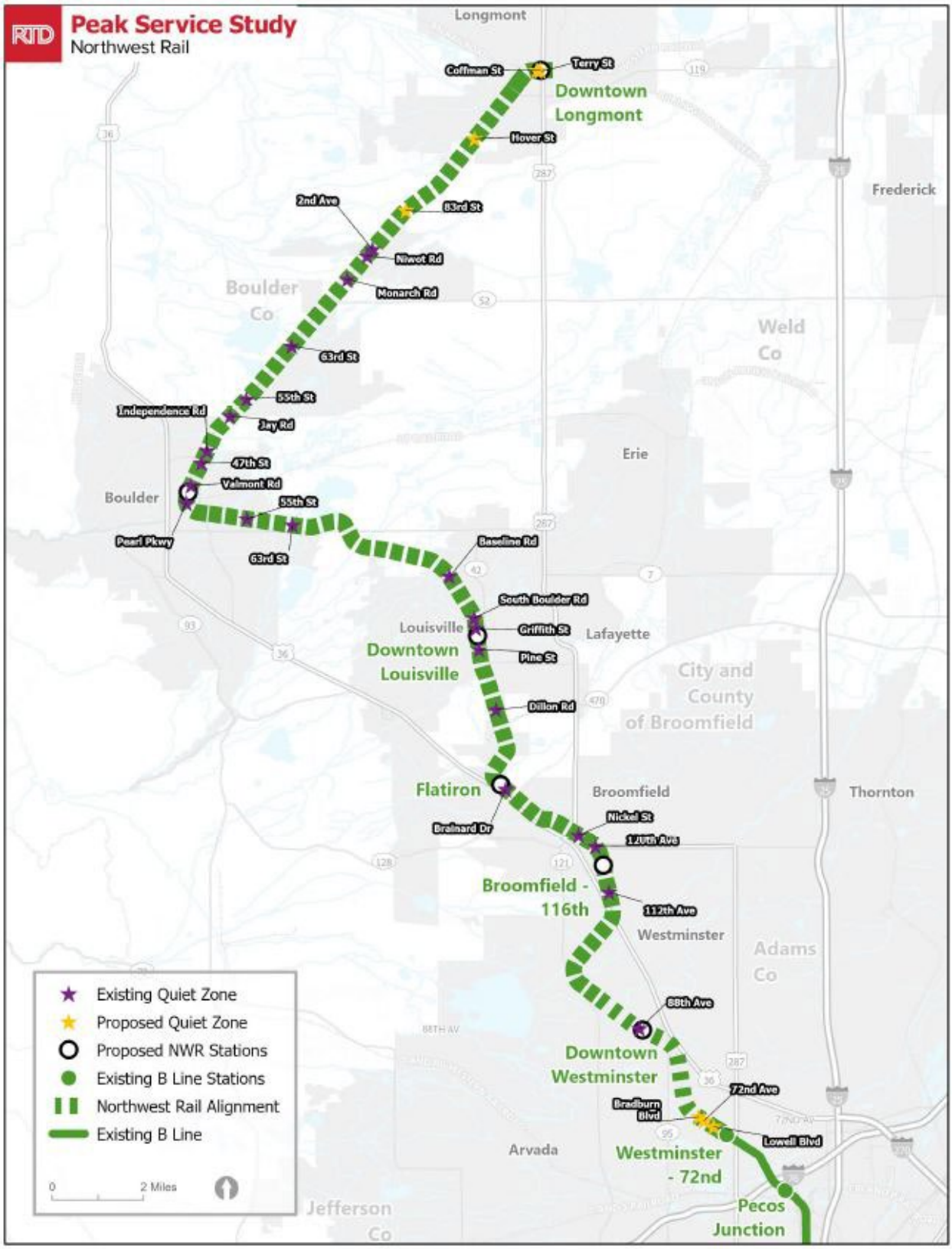
- Mineral Road

City of Westminster:

- Old Wadsworth Road
- Pierce Street
- 80th Avenue
- 76th Avenue

Quiet zones do not impact railroad operation or speeds at the crossings and, therefore, would not impact roadway traffic. All quiet zones listed above are expected to be in place before the operation of the Peak Service Plan.

Figure 3: Existing and Proposed Quiet Zones Locations



Station Area Planning and Development Context

RTD is planning six new stations between Westminster and Longmont to support its *Peak Service Plan* (City of Longmont, 2017) as part of the Study. This section provides a high-level summary of the development conditions near the stations. Figure 1 shows the locations of the stations.

Westminster – 72nd Station

The existing Westminster Station, referred to in this Study as Westminster – 72nd Station, is located west of Federal Boulevard between the BNSF trackway and 71st Avenue. This station is the end-of-line for the B Line, and new tracks would tie the existing RTD double-tracked electrified segment into the single-track BNSF freight track. A pedestrian tunnel is provided under the rail tracks to the commuter rail platform. Parking, bus loading and unloading, and passenger drop-off facilities are located north of the station platform between Hooker Street and Irving Street.

Downtown Westminster Station

This station area is located in Westminster, north of the BNSF trackway, south of 88th Avenue, and 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 Final NWR Corridor EE is now developed or acts as an overnight hotel or short-term restaurant parking. Currently, the concept is to utilize the one or two land parcels located south of 88th Avenue, where a connection to the Discovery Trail south of the proposed station in Arvada's Far Horizons neighborhood may be made through a grade-separated crossing to eliminate the existing issue of pedestrians illegally crossing the 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. In the short term, buses could stop along 88th Avenue, leaving more room for parking at a Park-n-Ride. In the long term, a bus turnaround could be constructed on the west corner of the site.

Downtown Louisville Station

This station area is located in Louisville, on both sides of the BNSF trackway, between Parkview Street and Griffin Street. Since the Final NWR Corridor EE, several developments have been completed surrounding the Downtown Louisville Station area, including the first two phases of the Downtown East Louisville development. Other developments are in the planning and design phases as well. Concept designs need to consider where the platform will be located; some facilities may remain closer to SH 42 to the east and Main Street in downtown Louisville to the west, and buses cannot serve Front Street due to narrow streets and on-street parking. Shared parking is being considered on both sides of the BNSF trackway. Still, additional shared parking opportunities may be warranted, which could serve commuters during weekdays and visitors in the evenings and on weekends.

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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 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 Bus Rapid Transit (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.

Flatiron Station

This station area is located in the City and County of Broomfield, west of West Midway Boulevard, approximately between W. 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 a great deal of Boulder County open space north of US 36 in this area, with development potential within the limits of the City and County of Broomfield. This station would likely require additional parking, as this station sees a great deal of Route AB customers to Denver International Airport, as well as Flatiron Flyer commuters. 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.

Boulder Junction at Depot Square Station

This station area is located in Boulder, on the east side of the BNSF trackway, between Goose Creek Path and Valmont Road. The area around the Boulder Junction at Depot Square site, west of the tracks, has been redeveloped with a significant amount of new residential and office development since the Final NWR Corridor EE. Boulder is expected to begin the second phase of its plan for this area, east of the tracks, likely in 2023 (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 may be considered 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.

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/Main Street and First Avenue intersection. Additionally, the area on the northwest quadrant is also planned for redevelopment. This area 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

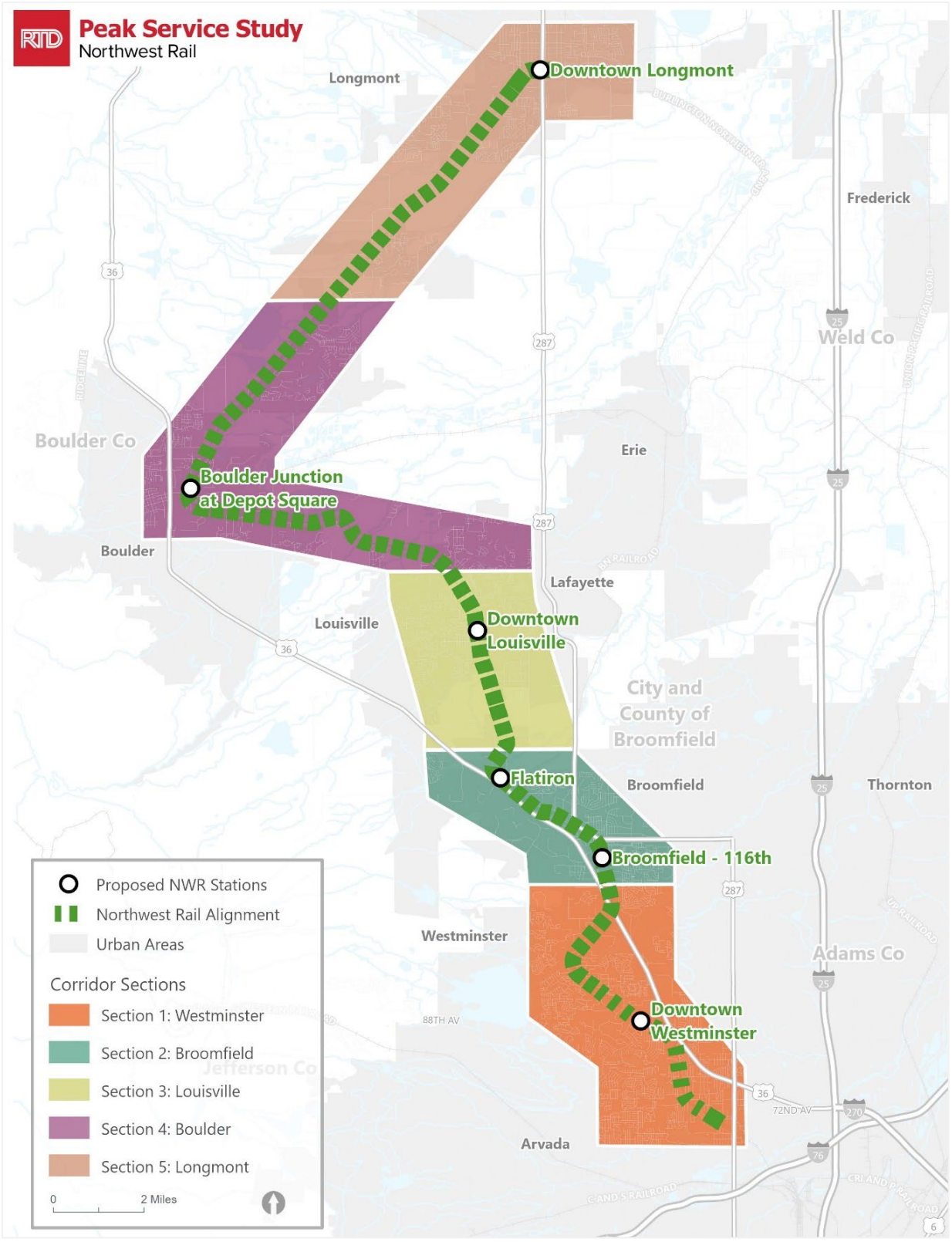
transit customers would be located between the extended Coffman Street and US 287/Main Street. The station is expected to become the transit hub in the downtown Longmont area where local bus routes, BRT, commuter rail, and potentially Front Range Passenger Rail could connect one day. The remaining area is to be redeveloped with multi-level, multi-family residential units, with the rail platform located on First Avenue, which is planned for closure.

Environmental Resources

This Corridor Conditions Report updates and builds upon an evaluation of environmental resources previously documented in the Final NWR Corridor EE. The resources discussed are most often included in National Environmental Policy Act (NEPA) compliance and documentation, and this assessment provides a starting point for that subsequent documentation effort. Each section discusses the existing conditions of the resource, the agencies involved with its regulation, and the next steps should the Study continue to NEPA. The study area used to establish the existing conditions for each environmental resource varies and is consistent with RTD's *Environmental Policies and Procedures Manual Volume I* (RTD, 2021). Methodologies used to establish the existing conditions are documented in the *Resource Evaluation Methodology Memorandum* attached to the *Planning and Environmental Study Methodology Plan Memorandum* (RTD, 2022).

Figure 4 shows the NWR Corridor in sections. These sections are approximately the same as those used in the Final NWR Corridor EE in 2010 (NWR, 2010). Some of the descriptions of the existing corridor conditions for resources use these geographic sections to facilitate the assessment, rather than the local agency boundaries.

Figure 4: NWR Corridor Sections



Note: A portion of the Westminster Section (Section 1) is located within the Arvada Municipal boundary

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Land Use and Zoning

Brief Description of Resource Studied

Land use describes how land, across a general area or on one or more specific lots, is developed and used by occupants. Zoning refers to the regulations that govern the characteristics of allowable development, including the built form of the development and typically the allowable uses at the lot level. They represent the activities allowed, practiced, and planned for in a given place: e.g., agricultural, residential, industrial, and commercial. Land uses are designated by state, county, or local agencies through land use plans (General Plans, Comprehensive Plans, Sub-Area Plans), zoning, and future development and growth areas.

Agencies Involved

RTD, working with BNSF, makes decisions about the transit infrastructure and services, while municipal governments make land use and zoning decisions. RTD leads Transit Oriented Development (TOD) on land it owns. However, the local agencies make decisions related to compatible land uses and connected, walkable street networks to support transit stations.

Relevant Regulations, Guidance, Studies, and Plans

Local agencies on the NWR Corridor have developed policies supporting transit services development. They have concentrated developments near the new station areas to create high-density residential areas with multimodal access to transit centers. Comprehensive, Sub-Area, and Transportation Plans reviewed for this analysis are listed and summarized in Table 1 and Table 2.

Table 1: Comprehensive and Transportation Plans

Plan	Policies
Adams County	
Advancing Adams Comprehensive Plan (2012)	Emphasizes complementary land uses to the adjacent transportation network, locating housing and parks to complement transportation networks, reducing transportation's impacts on the damage, and coordinating land use with the transit network.
Advancing Adams Transportation Master Plan (2012)	Prioritizes recommendations for all modes of travel, including transit, and evaluates strategic corridors for travel.
City of Westminster	
Westminster Comprehensive Plan (Amended 2015)	Highlights the existing Westminster – 72nd Station as a focus area for transit-supportive mixed-use development.
Westminster Downtown Specific Plan (2015)	Outlines plans for high-intensity mixed-use development in the downtown Westminster area.
Westminster Transportation & Mobility Plan (2021)	Promotes station improvements at 72nd and 88th Avenues and the extension of transit services beyond the current end of the B Line at 72nd Station.
City and County of Broomfield	
City of Broomfield Comprehensive Plan (2016)	Encourages and supports development focused around major transportation areas, including a station on West Midway Boulevard.

Plan	Policies
City of Louisville	
City of Louisville Comprehensive Master Plan (2013)	Recommends maintaining unique commercial areas and distinctive neighborhoods (i.e., downtown) as diverse, economically vital areas while promoting a balanced transportation system that includes transit and multimodal transportation options.
City of Louisville Transportation Master Plan (2019)	Policy 3 establishes guidelines for TOD in Louisville and highlights the Downtown Louisville Station for future TOD.
City and County of Boulder	
The Boulder County Comprehensive Plan (2020)	Aims to provide a multimodal transportation system and facilitate regional collaboration to integrate transportation and land use planning.
Boulder Valley Comprehensive Plan (2020 Mid-Term Update)	Promotes all modes of transportation to make it easier to travel without a car while emphasizing sustainability and compact, contiguous development.
City of Boulder Transportation Master Plan (2019)	Directs the City to create a complete, all-mode transportation system with a renewed vision for transit with concurrent land use and transportation planning.
City of Longmont	
Envision Longmont Multimodal & Comprehensive Plan (2016)	Supports the phased implementation of commuter rail in the NWR Corridor along Diagonal Highway/SH 119 and into the downtown Longmont area, as well as TOD near First and Main.
Southeast Longmont Urban Renewal Plan (2006)	Addresses blight within the industrial downtown area by establishing two Transit Oriented Developments near the station.
Amended and Restated Twin Peaks Area Urban Renewal Plan (2012)	Encourages the expansion of transit use and connecting NWR Corridor with the Twin Peaks area.

Table 2: TOD Plans

TOD Plan	Description
Adams County	
TOD and Rail Station Area Planning Guidelines	Guides overall TOD development in Adams County, emphasizing mixed-use development, local community benefits, and multimodal transportation options.
City of Westminster	
Westminster Station Area Specific Plan (2017)	Proposes a mix of transit-supportive uses, including a high-intensity mixed-use center with residential, commercial, and office uses, public green spaces, and additional outdoor amenity spaces. The 651,000-square-foot Station Area plan includes 1,340 residential units, 372,000 square feet of retail space, and 279,000 square feet of office space.
Westminster Mall Development Visioning Plan	102-acre site; development concept includes 1,125,000 square feet of retail space, 705,000 square feet of office space, 2,300 dwelling units, and 5,840 structured parking spaces.

TOD Plan	Description
City and County of Broomfield	
City of Broomfield Comprehensive Plan (2016)	Encourages and supports TOD in designated areas at US 36 near West 116th Avenue and West Midway Boulevard.
Original Broomfield Sub-Area Plan	Forecasted to include a mix of uses along 116th Avenue with coordinated connectivity efforts between US 36 BRT and Broomfield – 116th Station.
City of Louisville	
Downtown East Louisville Development	Mixed-used residential and mixed-use commercial development near the commuter rail station.
Highway 42 Revitalization Area Comprehensive Plan	Amended and updated to drive commercial and residential mixed-use development along Highway 42 near the commuter rail station.
City and County of Boulder	
Boulder Transit Village Area Plan (2007)	Designates a 160-acre Transit Village area and guides the area's long-term development in coordination with RTD. Plans for mixed-use land zoning, including service commercial, industrial mixed-use, commercial mixed-use, and affordable housing.
City of Longmont	
Longmont First & Main Station Transit & Revitalization Plan (2012)	Guides redevelopment and revitalization of the First and Main Station area for TOD.

Data Collection/Methodology

This land use analysis describes the existing and future land uses throughout the NWR Corridor. The study area for this analysis includes a 1,000-foot buffer from the BNSF corridor centerline and a 0.5-mile buffer from each new station platform so that it captures and characterizes land uses most influenced by the rail line.

Existing and future land uses within the study area are identified by reviewing Geographic Information Systems (GIS) parcel, land use, and zoning data collected for each jurisdiction and information gathered from local planners. Site visits and a review of corridor-specific, local, and regional planning documents were conducted to confirm and update the findings presented in the Final NWR Corridor EE (NWR, 2010). The compatibility of the NWR Corridor with existing and future land uses is assessed.

Findings/Results

The study area contains a variety of land uses, including residential, mixed-use developments, commercial, agricultural, industrial, and parks and recreation. While jurisdictional detail varies, land use and zoning are generalized in the text and figures to create consistent categories that allow for comparison and illustrate each area's primary land use types. Figure 5 illustrates current land use within the study area, and Figure 6 illustrates the current zoning within the study area. In locations where existing land use data is unavailable, zoning data is used – such as the city and county of Boulder and Louisville. The analysis that follows Figure 5 and Figure 6 is focused on station areas since these are the locations where new infrastructure is anticipated and, as a result, has the most potential for change.

Figure 5: Existing Land Use in the Study Area

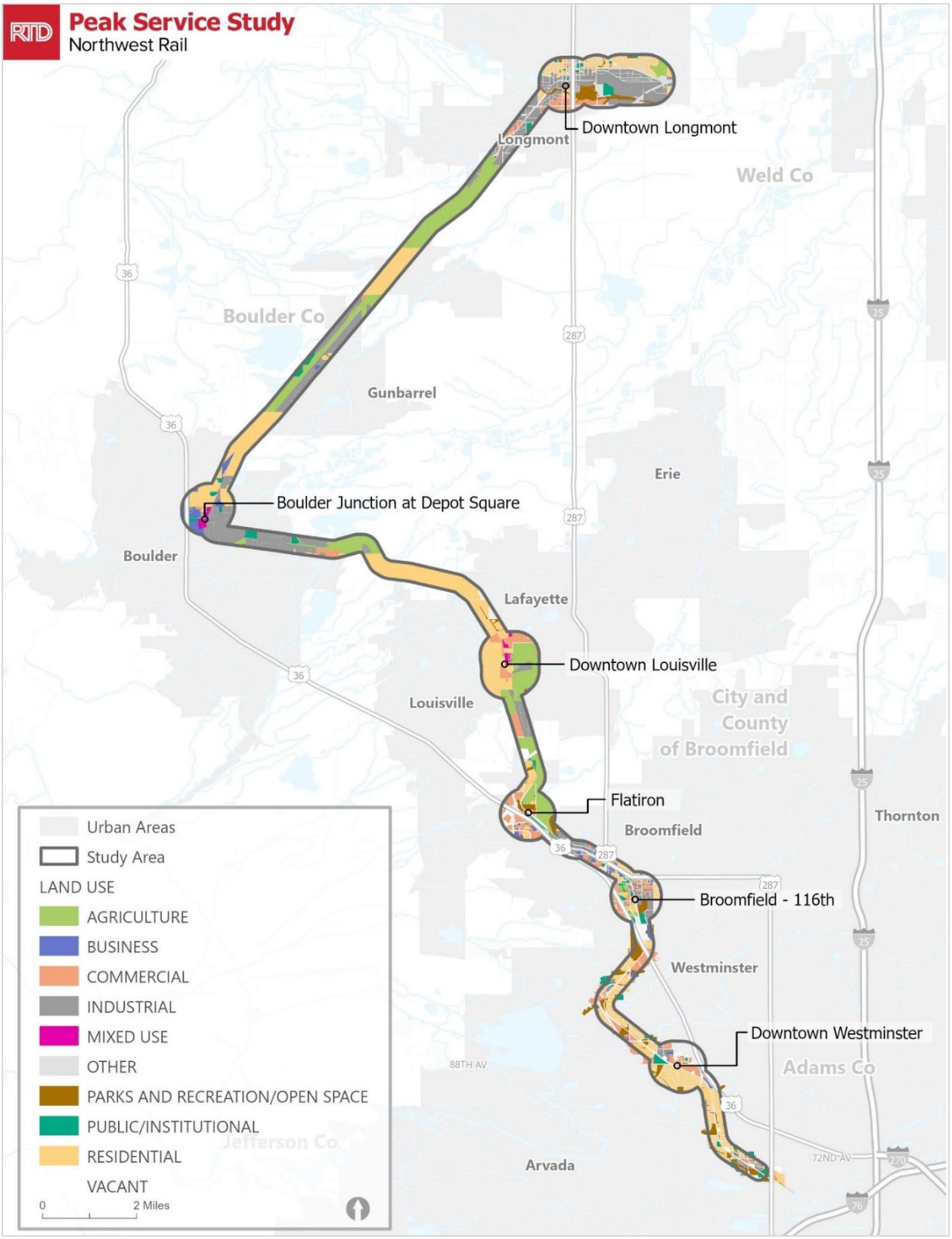
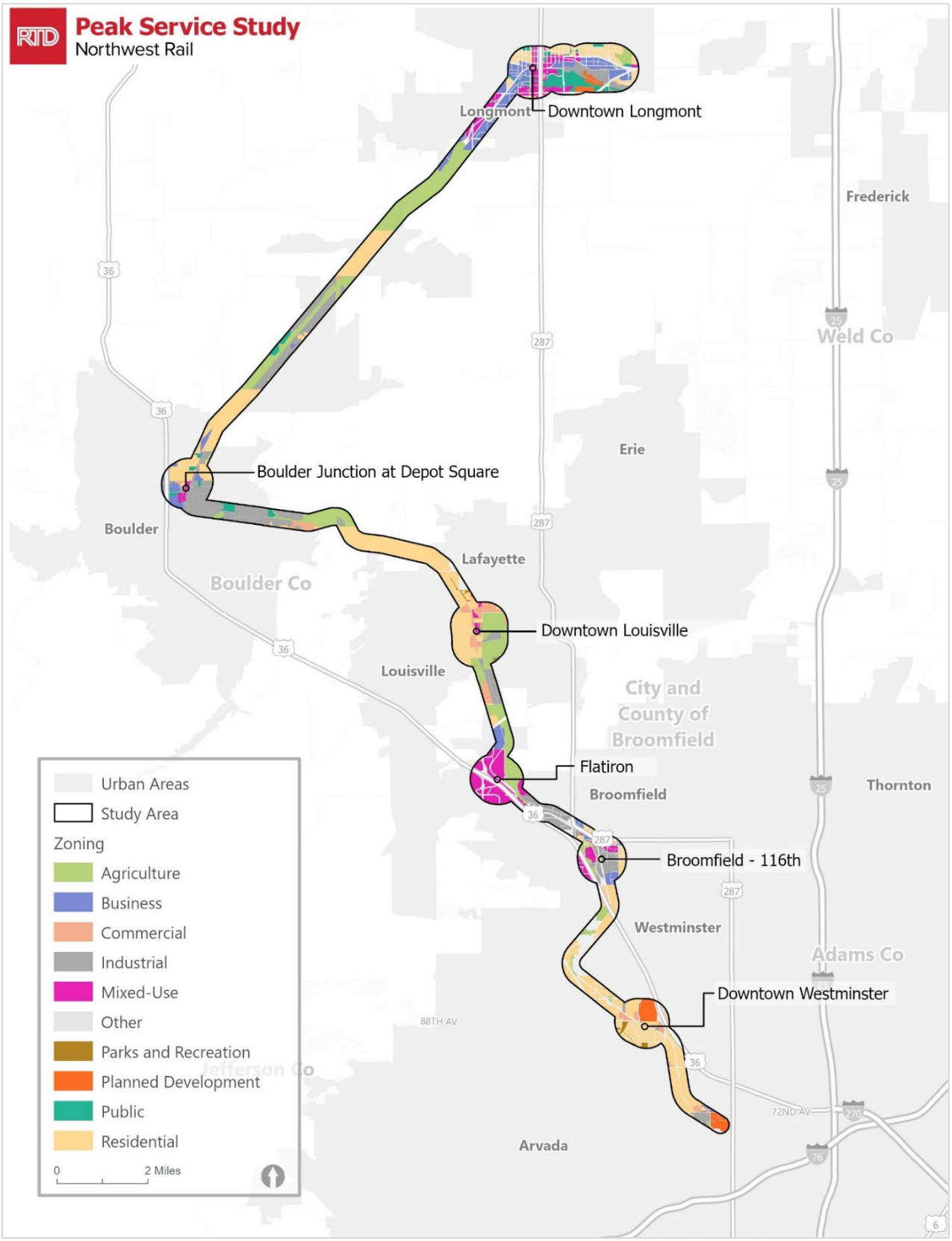


Figure 6: Existing Zoning in the Study Area



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The following text describes land use and zoning by the geographically defined study sections: Westminster, Broomfield, Louisville, Boulder, and Longmont.

Westminster Section

The Downtown Westminster Station area is located in this section, between 88th Avenue to the north and the BNSF track to the south. A cat adoption center and an appliance warehouse currently occupy the proposed station area. Across the BNSF track, south of the station, is a medium-density suburban neighborhood of single-family homes in Arvada's jurisdiction. Across 88th Avenue, to the north, is the former Westminster Mall complex, now known as the downtown Westminster area. This area includes a variety of commercial businesses, including retail stores, restaurants, hotels, and entertainment. The complex also includes some high-density residential apartment buildings. The City's Comprehensive Plan (City of Westminster, 2015) identifies this area for urban renewal. It is zoned for planned development, including a high-intensity mixture of commercial, office, civic, recreational, and residential uses as outlined in the *Westminster Downtown Specific Plan* (City of Westminster, 2015). Outside the station area, land within this section primarily consists of residential and commercial uses.

Broomfield Section

The NWR Corridor enters Broomfield at 112th Avenue near Main Street. In this section, the existing rail track runs along the eastern side of US 36. This section contains two stations: Broomfield – 116th Station and Flatiron Station. The Broomfield – 116th Station site is surrounded by discontinuous land use. Various land uses are present near the station, including commercial, industrial, residential, agricultural, and vacant lots. West of the existing tracks are storage lots, low-density residential areas, an apartment complex, several small offices, US 36, and a goat farm. The area east of the tracks is predominantly large industrial facilities. Nearby land uses include recreation associated with the Broomfield Industrial Park Sports Complex and a secondary school.

The Flatiron Station is located on land currently owned and operated by RTD for BRT service. To serve the NWR Corridor, a new station platform would be located within this area, directly adjacent to existing rail tracks. Land use to the south of the station is commercial, associated with the Flatiron Marketplace shopping mall. Some high-density residential apartment complexes and recreational park are also in the mall's vicinity. North of the station, agriculture and Broomfield Open Space are the primary land uses. The land between the two stations and the remainder of the Broomfield Section contains a mixture of land use, with industrial, commercial, and residential as the most prevalent.

Most of the land in the area is zoned by the city for mixed-use and industrial purposes. Two areas slated for redevelopment are present within the study area: the original Broomfield Urban Renewal Area and the US 36 West Corridor Urban Renewal Area, established in 2013 and outlined in the *City and County of Broomfield Comprehensive Plan 2016 Update* (City and County of Broomfield, 2016).

Louisville Section

The corridor enters Louisville to the south at West Dillon Road. The track passes on the eastern edge of historic downtown Louisville with a mix of retail, office, and residential uses. This area is defined as a revitalization district in the *City of Louisville Comprehensive Plan* (City of Louisville, 2013). The existing rail is

elevated on a berm approximately 10 feet above the adjacent Front Street and provides a physical barrier between western and eastern downtown land uses. East of the existing rail line to SH 42, industrial buildings, newly constructed high-density residential apartment complexes, mixed-use commercial, and the historic Miners and Little Italy neighborhoods are present. Directly across SH 42 is the expansive Louisville Sports Complex recreational facility. Southeast of the station is the Colorado Technology Center, a 600-acre industrial/office park adjacent to the rail corridor at 96th Street and Dillon Road, defined as a special district in the City's Comprehensive Plan. New suburban residential and commercial development occupies the land north of the station, between South Boulder Road and Baseline Road.

The Louisville Section comprises a variety of zoning, including agricultural, open space, single and multi-family residential, and industrial. Most zoning near the Downtown Louisville Station site is residential, commercial, mixed-use, and agricultural.

Boulder Section

At Baseline Road, the corridor enters unincorporated Boulder County and runs for approximately two miles between Baseline Road and Arapahoe Avenue. Uses in this area are widely scattered small residential subdivisions, agricultural land, and open space.

The corridor crosses Arapahoe Avenue just west of North 75th Street and turns directly west toward Boulder. The Boulder Junction at Depot Square Station is located near the southwest quadrant of Foothills Parkway and Valmont Road. This area is predominantly surrounded by high-density mixed-use, residential, commercial, and industrial land uses. To the west of the existing rail track is a recently constructed high-density residential and commercial complex known as Boulder Transit Village, where the new station platform would be located. Large offices for technology and software companies line this side of the rail tracks. The area to the east of the rail tracks is occupied by industrial buildings which house electrical, technology, and appliance facilities. Northwest of the station is a medium to high-density residential subdivision known as Glenwood Grove-North Iris. A business park, industrial buildings, and the National Center for Atmospheric Research are northwest of the station. East of this industrial land is another medium to high-density residential subdivision.

Traveling northeast past the Foothills Parkway and Diagonal Highway/SH 119 interchange, the corridor enters unincorporated Boulder County again and spans for approximately four miles along the eastern side of SH 119, past the town of Gunbarrel until crossing SH 52, where the track enters the Longmont Section of the study area. Land in this area is largely agricultural, vacant, open space, and low-density and rural residential.

Zoning in unincorporated Boulder County is mainly low-density residential, industrial, and agricultural. The land is zoned for industrial and residential uses to the east and business, mixed-use, residential, and commercial to the west. Near the Boulder Junction at Depot Square Station, land use and development are regulated by the *Boulder Transit Village Area Plan* (Boulder County, 2007).

Longmont Section

The corridor enters the Longmont Section at the crossing of SH 52. It passes through four miles of unincorporated Boulder County and the town of Niwot until entering Longmont municipal limits near the Diagonal Highway and South Fordham Street intersection. Land in this southern portion of the Longmont Section is primarily agricultural and rural residential. The Downtown Longmont Station is located in the Central

Industrial neighborhood on First Avenue. The downtown Longmont area is located within the Southeast Urban Renewal Area, as outlined in the *Envision Longmont Multimodal & Comprehensive Plan* (City of Longmont, 2016) and the *Southeast Longmont Urban Renewal Plan* (City of Longmont, 2006). As the corridor approaches the Downtown Longmont Station, it passes through light industrial, manufacturing, and commercial land. Industrial uses, including home supply warehouses, storage units, a used car dealer, a tire store, and several mobile home lots currently occupy the station area. West of the station is Longmont's utility plant. Across First Avenue to the north is a parking lot associated with a cheese importer business and a public parking lot. East of the station, across Main Street, there are newly constructed apartment buildings. Approximately 0.25 miles north of the station area is historic downtown Longmont, which hosts a mixture of commercial and residential land uses.

The Longmont Section's zoning is primarily for mixed-use, business/industrial, and public land use. Land associated with the center of downtown Longmont is zoned for residential and mixed-use development north of the station.

Next Steps

Although some undeveloped parcels remain along the corridor, many previously undeveloped parcels within the study area were recently developed or are currently under construction; these are primarily high-density residential, such as apartment complexes or high-density mixed-use. The amount and type of new developments vary throughout the five described Sections, with most new development occurring near proposed stations in Westminster, Louisville, and Boulder but less in Broomfield and Longmont. Local agencies have been redesigning their conceptual station area plans to address these changed conditions. The Study Team will continue coordinating with local agencies to ensure project planning is compatible with existing and planned land use. 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.

During NEPA, the land use impact analysis will assess the degree of land use impacts based on the compatibility of the NWR Corridor with current land use and zoning. The focus will be near station areas where new infrastructure has the greatest potential to impact current land use and planned development. Additional site visits will be conducted before the impacts assessment and final design to confirm existing conditions near stations in a quickly developing corridor.

Economic Conditions

Brief Description of Resource Studied

Economic conditions are the circumstances that facilitate commerce and economic activities, such as providing income, employment, retail, and creating goods and services. Analyzing the economic conditions in the NWR Corridor is important to understand how economic factors, such as business locations and operations, types of commerce, jobs and housing, and income, occur under current conditions.

Corridor Conditions Report

Agencies Involved

Economic conditions are most closely regulated by local agencies that oversee land use and zoning, permit access, and operations.

Relevant Regulations, Guidance, Studies, and Plans

The local agencies on the NWR Corridor have policies that support the development of economic activities within their communities. Comprehensive and Sub-Area Plans reviewed for this analysis are listed and summarized in Table 1 in the Land Use and Zoning Section.

Data Collection/Methodology

The study area for this analysis includes a 1,000-foot buffer from the BNSF corridor right of way and a 0.5-mile buffer from each new station platform. The methodologies associated with identifying the existing conditions within the study area related to employment, income, and property along the NWR Corridor are described below.

Employment

Employment data was collected using DRCOG's traffic analysis zone data for 2020 and 2040 to show the projected increases in each section of the NWR Corridor. The data were compiled for traffic analysis zones that fall partially or completely within the study area.

Jobs and Housing

The jobs-to-housing balance is the relationship between the number of persons employed in an area versus the potential housing opportunities in that area. In theory, a balanced community would have 1.0 to 1.5 employees for every housing unit. A ratio over this range indicates that more jobs than housing are available. Conversely, a ratio below this range indicates more housing than available jobs. Factors such as major employment centers, commercial/retail nodes, and housing density can significantly influence this balance.

Income

Median income was determined by using the American Community Study 2016-2020 table B19013 to determine the median income for the geographies that intersect the study area. Median income was collected for the overall municipalities and counties to encompass all passenger rail users.

Economic Clusters

Economic clusters were determined by using DRCOG employment concentration data. Any cluster labeled as having a high concentration is considered an economic cluster for this report.

Findings/Results

Employment Trends

In 2020, 139,061 jobs within the traffic analysis zones intersected the study area. According to data from DRCOG, employment is expected to grow 41.8%, reaching 197,201 by 2040. Table 3 displays employment trends by section from 2020 to 2040. Sections are shown in Figure 4.

Table 3: Employment Trends by Study Section

Section	2020 Total Employment	2040 Total Employment	Percent Increase
Westminster	28,620	37,077	29.5
Broomfield	23, 867	29,350	22.9
Louisville	12,775	19,138	49.8
Boulder	68,836	82,239	19.4
Longmont	28,830	33,800	17.2

The majority of jobs in the study area are service-related positions. Service jobs include higher-wage professional and business services, such as lawyers and accountants, and lower-wage jobs, such as clerical and hotel workers.

Major employment centers in the study area are concentrated along US 36, Flatiron Crossing, and within the Interlocken Business Park. The largest employers in the study area include Qwest (telecommunications), Wells Fargo Bank, US Bank, Westminster Municipal Complex, Level 3 Communications (telecommunications), Oracle (computer software), the University of Colorado, Ball Aerospace & Technology, Boulder Community Health, the University Corporation for Atmospheric Research, Seagate Technology (computer disk drives), Amgen (biopharmaceuticals), and Intrado (database and GIS mapping).

Job-to-Housing Balance

The study area has a 2.8 jobs-to-housing ratio, which indicates that overall, there are more jobs within the NWR Corridor than housing options (Table 4). The highest job-to-housing ratios are found in Broomfield and Boulder, the major employment centers within the study area. Boulder Section has a ratio of 6.4, and the Broomfield Section has a ratio of 3.4, which includes the growing employment center in the Interlocken and Flatiron Crossing area. Longmont also has a high job-to-housing ratio, which means more people are commuting to the area for work. Table 4 details the study area's jobs, housing units, and ratios.

Table 4: Jobs-to-Housing Ratio by Study Section

Section	Jobs	Housing Units	Ratio
Westminster	28,620	19,314	1.5
Broomfield	23, 867	6,982	3.4
Louisville	12,775	7,299	1.7
Boulder	68,836	10,636	6.4
Longmont	28,830	8,909	3.2

Median Household Income

Income data collected from Census 2020 reflects the median income of households for 2019. Table 5 shows that the median household income in the study area ranges from 73,817 to 116,073. Broomfield, Louisville, and Boulder have the largest median income in the study area.

Table 5: Median Household Income by Study Section

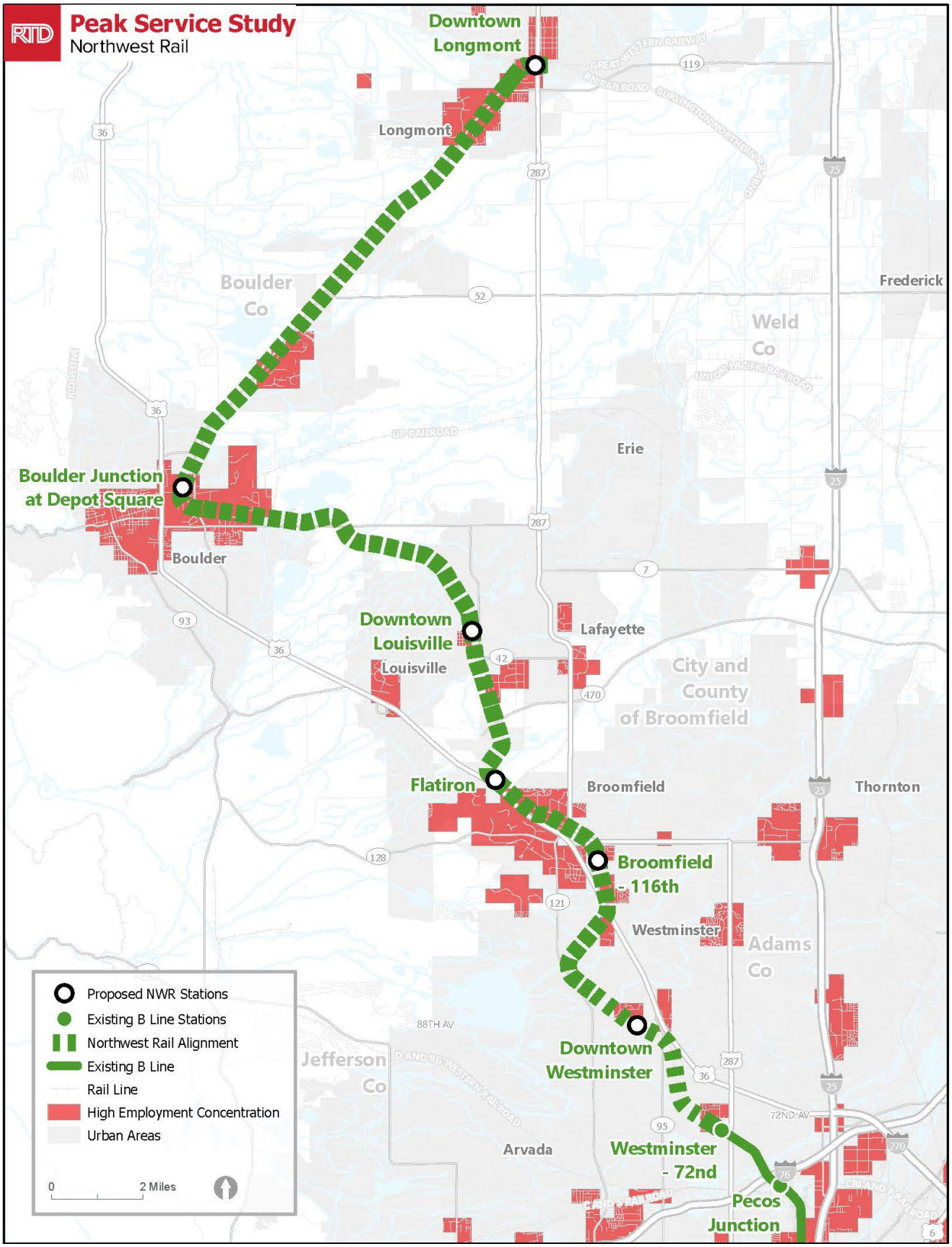
Section	Median Household Income
Westminster	$76,378
Broomfield	$101,206
Louisville	$116,073
Boulder	$87,476
Longmont	$79,140

Economic Cluster

An economic cluster is a network of companies and institutions near each other. The major economic clusters within the study area are listed below and shown in Figure 7.

- Downtown Longmont
- Downtown Boulder
- Downtown Louisville
- Downtown Broomfield
- Downtown Westminster
- 72nd Avenue and Highway 95

Figure 7: Economic Clusters



Next Steps

Several economic clusters are located within the study area. RTD will continue coordination with the counties, municipalities, businesses, and local agencies. 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. Further recommendations from the Study would show the effectiveness of investment and land use changes within and around the corridor.

Potential impacts on individual properties, businesses, and households will be identified during the planning process, and mitigation will be developed. The planning process will also focus on the effectiveness of the investment and recommendations for land use changes. Public and stakeholder outreach efforts will continue through subsequent design and environmental processes to better understand the existing conditions and potential impacts. Coordination will also ensure temporary access to businesses during construction and develop traffic maintenance plans to maintain access and circulation needed to keep businesses running.

Social Impacts and Community Facilities

Brief Description of Resource Studied

Social resources and community facilities are the circumstances that facilitate social activities and provide public services. Key elements include population, housing, community facilities (such as libraries, churches, and schools), and key commercial areas.

This report has a separate section for environmental justice that preliminarily identifies the existing minority and low-income communities based on readily available data.

Agencies Involved

Social resources are most closely regulated by local and state agencies that oversee land use and zoning, construct and operate the transportation network, and provide public places and services. Cities, counties, school districts, and private operators of community facilities are considered stakeholders.

Relevant Regulations, Guidance, Studies, and Plans

Local agencies on the NWR Corridor have policies supporting the development of social characteristics and community facilities. Comprehensive and Sub-Area Plans reviewed for this analysis are listed and summarized in Table 1 in the Land Use and Zoning Section.

The U.S. Department of Transportation (USDOT) has developed the *Community Impact Assessment: A Quick Reference for Transportation* (USDOT, 2018). Although not a regulation, it is a federal guideline when assessing social and community impacts.

Data Collection/Methodology

The study area for this analysis includes a 1,000-foot buffer from the BNSF corridor right of way and a 0.5-mile buffer from each new station platform. Population and housing characteristics that document past, present, and future conditions and trends are described as part of this analysis. This includes past and future

population counts, estimates, household size, and composition. The analysis establishes neighborhood characteristics, population and households, and community facilities.

Findings/Results

Neighborhood Characteristics

Residential neighborhoods flank both sides of the NWR Corridor in the suburban and urban areas. The areas with the most multi-family developments are in Westminster, with several apartment complexes within the study area, and in Louisville, Boulder, and Longmont. Fewer neighborhoods are located along the rail line in Broomfield and Boulder County between Boulder and Longmont because the existing rail line crosses through undeveloped and industrial areas. The existing rail line was built before suburban development occurred in the study area and can serve as a barrier between neighborhoods and developments. The rail line still has the potential to divide communities with increased service.

Population and Housing

The NWR Corridor occupies the northern reaches of the DRCOG planning area, terminating immediately south of the North Front Range Metropolitan Planning Organization planning area. According to DRCOG estimates, approximately 135,560 people lived in the study area in 2020. Based on future forecasts, population growth in the study area is anticipated to be 16.1%, with an estimated 157,347 people living in the study area in 2040. Households are anticipated to grow from 54,462 in 2020 to 69,310 in 2040, a 27% increase (DRCOG, 2022).

Table 6 shows the population forecasts in the study area by municipality.

Table 6: Population Forecasts within the Study Area by Study Section

Section	2020	2040	Percent Increase
Westminster	55,608	65,813	18.4
Broomfield	16,749	21,401	27.8
Louisville	16,218	17,569	8.3
Boulder	29,262	34,371	14.9
Longmont	22,675	23,482	3.5

DRCOG, 2022

Community Facilities

The most common community facility within the study area is a school. Other community facilities captured in the inventory are a library, museum, civic association, emergency responders, culture center, city hall, performing arts center, preschool, church, daycare center, community service organization offices, community garden, and hospital. The facilities that serve the study area are listed in Table 7, mapped in Figure 8 through Figure 12, and are located within 0.5 mile of the study area.

Table 7: Community Facilities that Serve the Study Area

Resource Name	Resource Description
Westminster	
Bowles House Museum	Museum
Adams County Head Start	School
Destinations Career Academy Of Colorado	School
Harris Park Elementary School	School
Colorado Preparatory Academy High School	School
Little Elementary School	School
Parr Elementary School	School
Jefferson Academy Elementary School	School
Rocky Flats Coalition	Civic association
Griffith Centers for Children	School
Primrose School	Daycare
Your Kid's Place	Daycare
Westminster Historical Society	Museum
Iddle Bits of This & That	Daycare
Broomfield	
Beautiful Savior Lutheran Early Learning	Daycare
Children's Garden	Daycare
Harvest Bible Chapel	Church
Colorado State Patrol Troop 6C	Emergency responders
Iluminar Aerial Dance	School
Xtreme Altitude Gymnastics	School
Louisville	
Louisville Historical Museum	Museum
Kindergarten Enrichment at Louisville	Daycare
Louisville Center for the Arts	Cultural Center
City of Louisville City Hall	City hall
Louisville Public Library	Library
The Patchwork School	Preschool
Louisville Preschool	Preschool
Louisville Fire Department Station 1	Emergency responders
Louisville Elementary School	School
Louisville Middle School	School
Discovery Christian Church	Church
Rock Creek Church	Church
Impact on Education	Civic association
Boulder County Clerk and Recorder	Civic association

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Resource Name	Resource Description
Active Louisville Kids	Daycare
La Petite Academy	Daycare
Bright Horizons at Louisville	Daycare
Dana V. Music School	School
Main Street Piano Studio	School
Fairview Montessori School	School
St. Louis Catholic School	School
Boulder	
Arapahoe Ridge High School	School
Tiny Minders Daycare & Preschool	Daycare
Boulder Bilingual Childcare	Daycare
Boulder Rural Fire Department Station 1	Emergency responders
Family Learning Center	Daycare
Naropa Nalanda Campus	College/University
Boulder Emergency Squad	Emergency responders
Boulder Technical Education Center	School
The Lesson Studio	School
Rocky Mountain School for the Gifted and Creative	School
Net Library – A Division of OCLC	Library
Intercambio de Comunidades	Civic association
The Acorn School	Daycare
KinderCare Learning Center	Daycare
YMCA of Boulder County	Daycare
City of Boulder Human Resources	Government Office
Boulder County Planning Department	Government Office
Longmont	
Sunset Academy	Daycare
Smiling Faces Academy	Daycare
Front Range Community College	School
Twin Peaks Preschool	School
Mountain Peak Private School	School
Olde Columbine High School	School
Saint Vrain Valley Teen Parenting Program	School
Sunset Middle School	School
Jump Start Early Learning Center and Quality Child Care	Daycare
Rocky Mountain Elementary School	School
Central Elementary School	School
St. Vrain Community Montessori School	School

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Resource Name	Resource Description
Twin Peaks Charter Academy	School
Apex Home Enrichment Program	School
Flagstaff Charter Academy	School
Grace Fellowship Church	Church
UC Health Longs Peak Hospital	Hospital
YMCA of Longmont at Twin Peaks	Daycare
Longmont Wastewater Treatment	Government Office
Saint John the Baptist School	Daycare
One Way Waste Management	Government Office
Longs Peak Learning Center	Daycare

Figure 8: Community Facilities that Serve the Study Area (South to North)

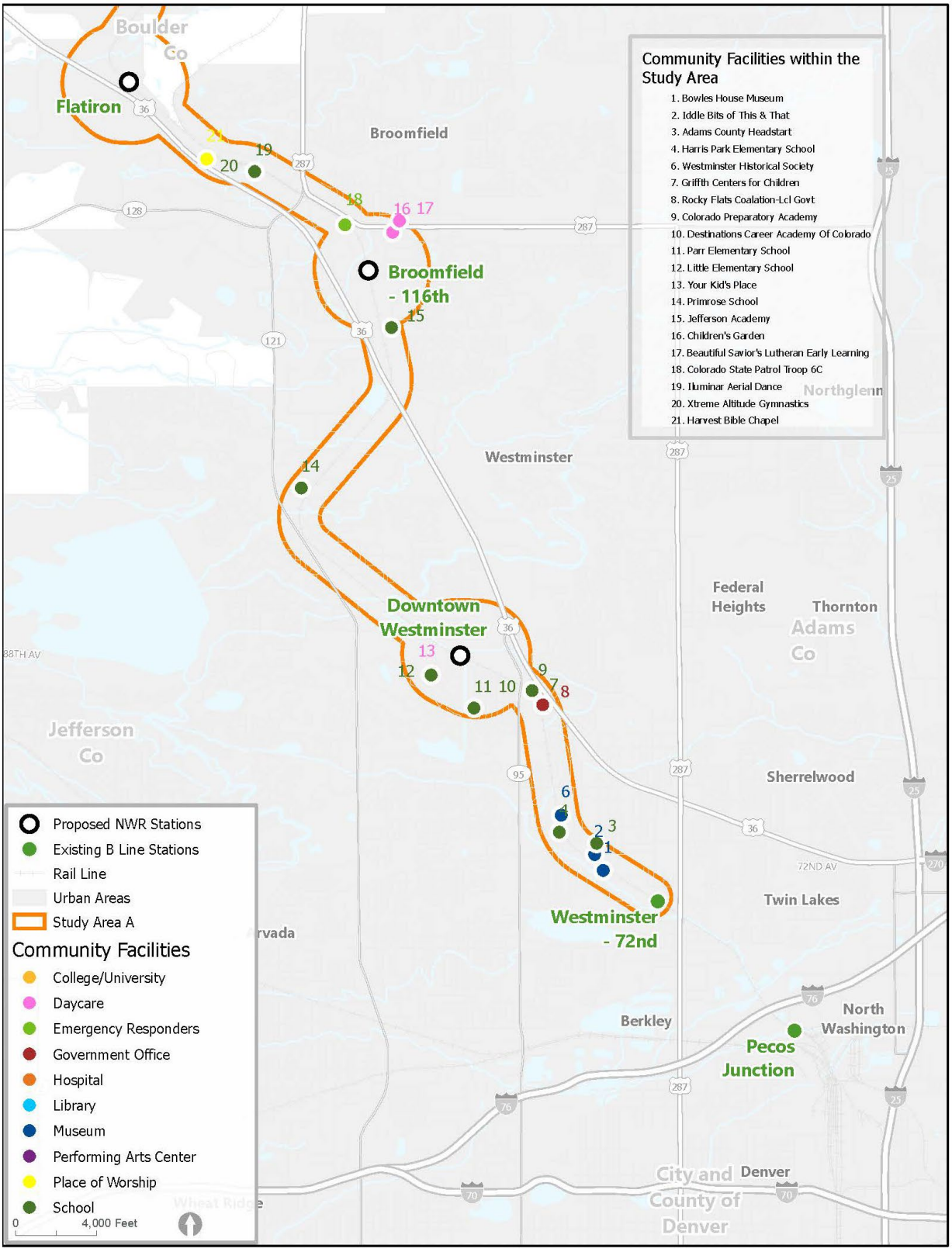


Figure 9: Community Facilities that Serve the Study Area (South to North)

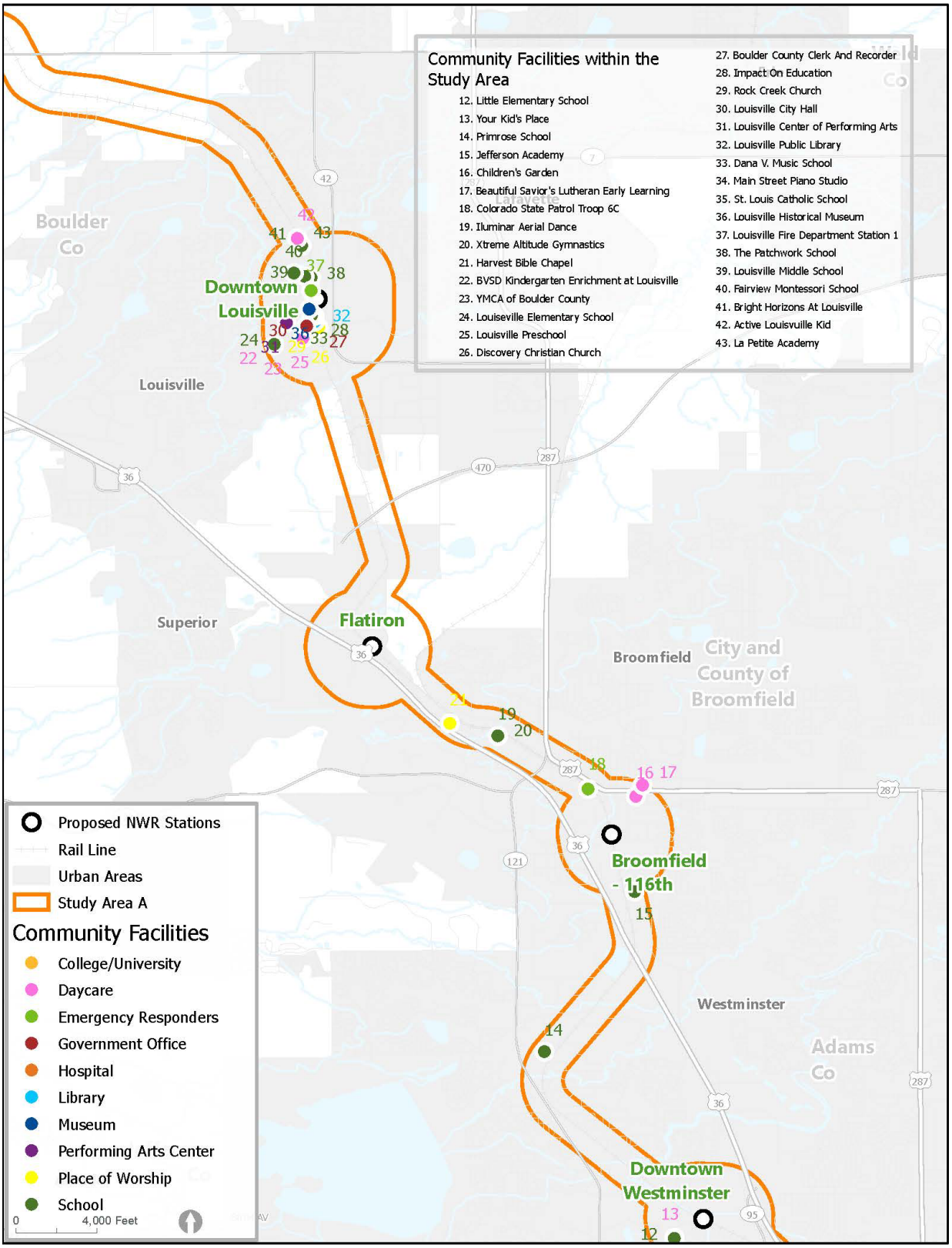


Figure 10: Community Facilities that Serve the Study Area (South to North)

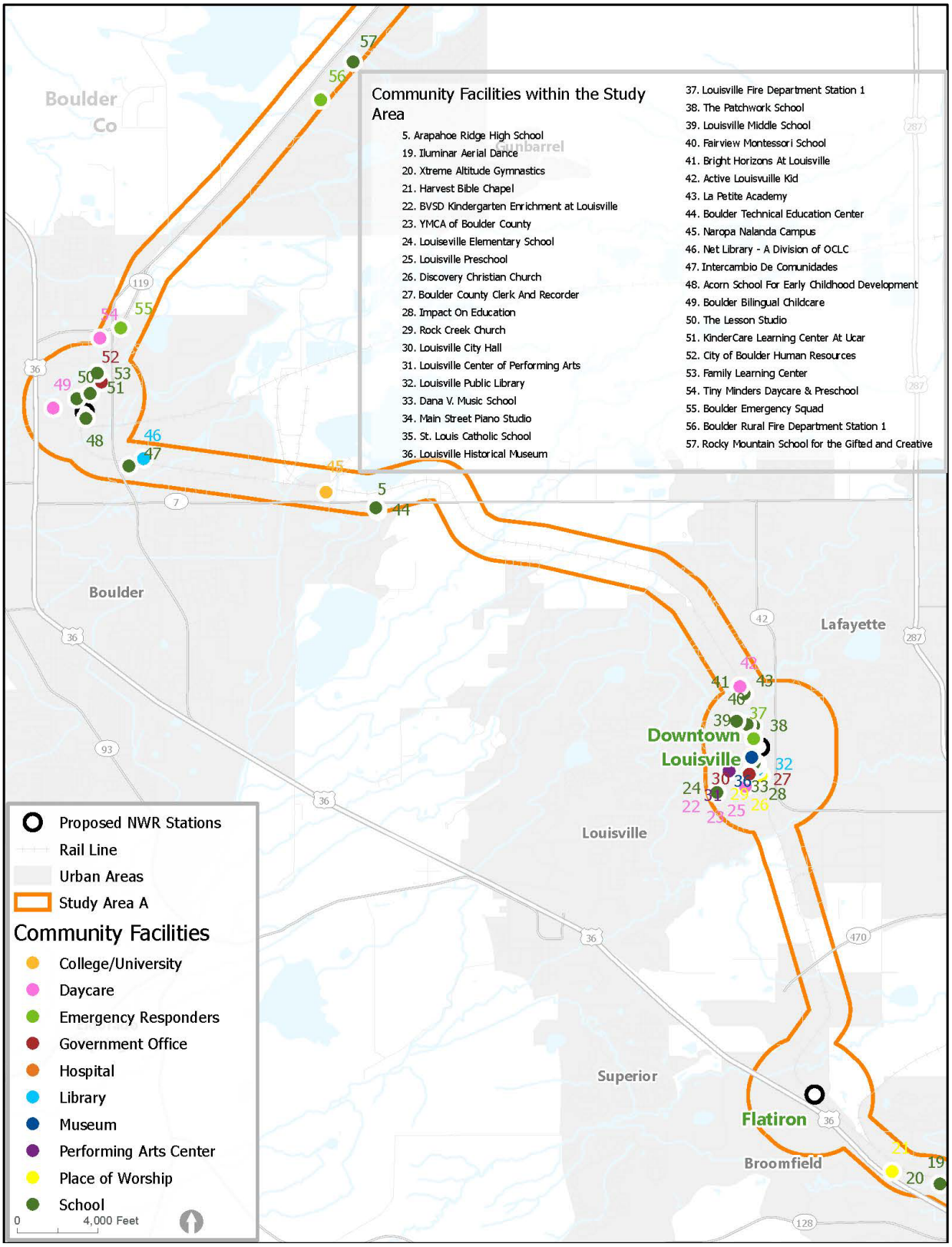


Figure 11: Community Facilities that Serve the Study Area (South to North)

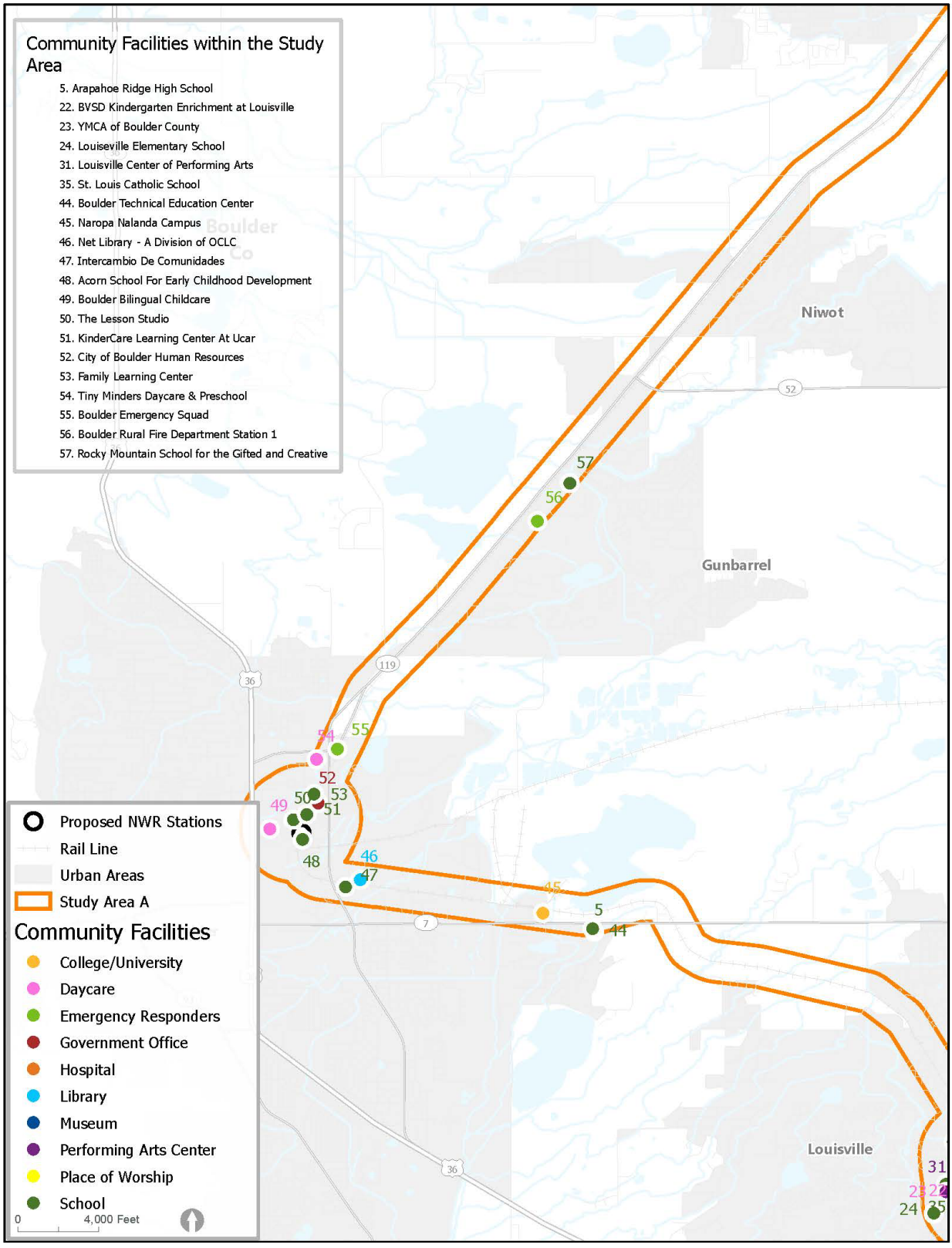
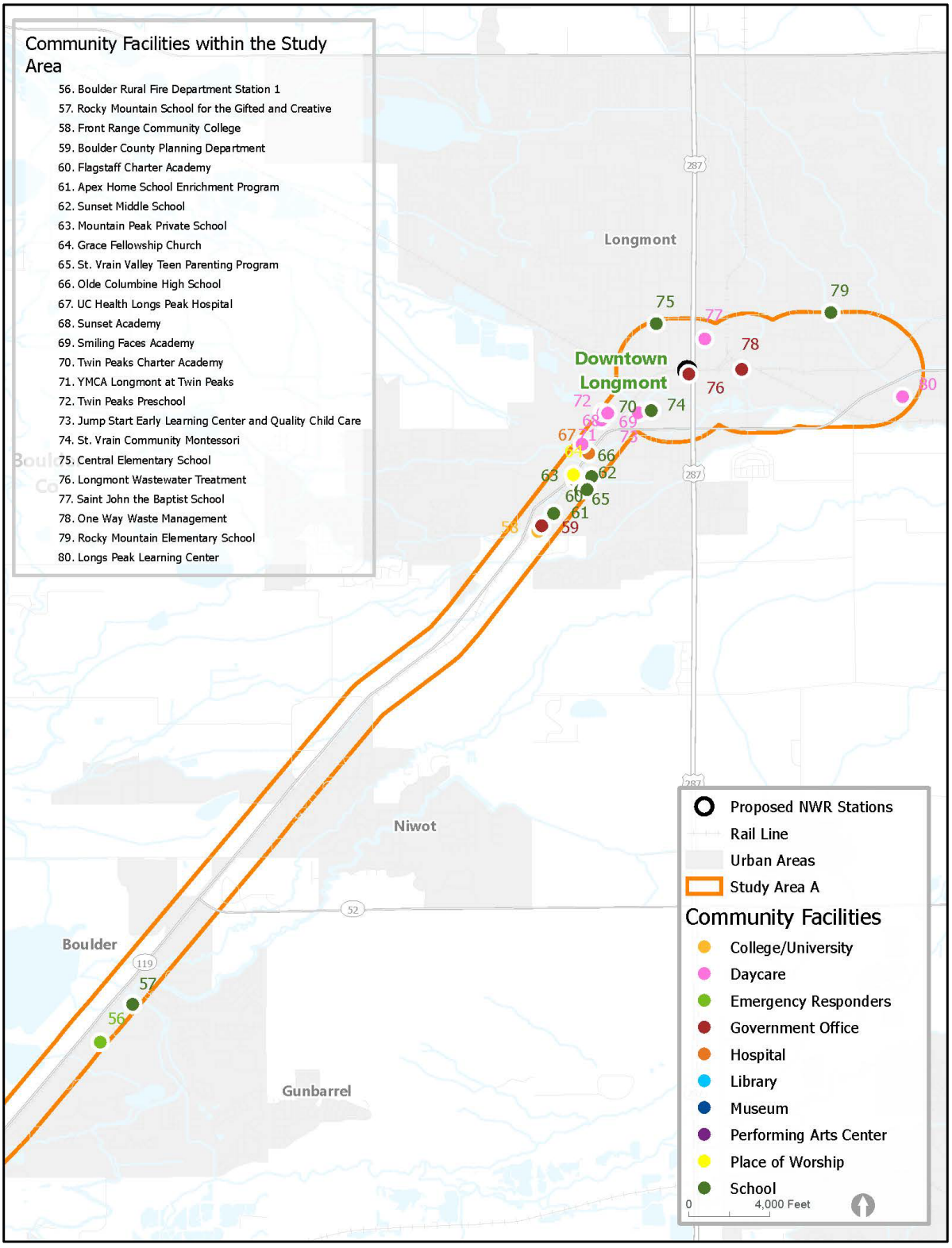


Figure 12: Community Facilities that Serve the Study Area (South to North)



Next Steps

Social resources and several community facilities are located 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.

RTD will continue coordinating with the counties, businesses, and local agencies during NEPA. During the subsequent design and environmental processes, impacts to individual properties, businesses, households, and community facilities will need to be calculated, and mitigation developed for identified impacts. Public and stakeholder outreach efforts will continue through subsequent design and environmental processes to better understand the existing conditions and potential impacts. Coordination will also ensure temporary access to social resources and community facilities during construction and the development of traffic maintenance plans to maintain access and circulation.

Preliminary Environmental Justice Analysis

Brief Description of Resource Studied

Environmental justice analysis evaluates the impacts of programs, policies, and activities on low-income and minority communities to achieve an equitable distribution of benefits and burdens. RTD would identify and address disproportionately high and adverse human health and environmental effects on low-income and minority communities. This environmental justice analysis is preliminary.

The purpose of the existing conditions analysis is to understand the demographic makeup of communities within and surrounding the study area to establish a baseline for evaluating potential impacts and benefits to disadvantaged communities. The analysis findings will guide the RTD engagement efforts, ensuring environmental justice communities are invited and are provided ample opportunity to participate.

Agencies Involved

Environmental justice is a federal directive executed by agencies that carry out federal actions, such as the USDOT. RTD is a recipient of federal funds and complies with environmental justice directives. Local agencies, stakeholders, businesses, and residents provide information and input to the implementing agencies to inform their environmental justice analysis through interagency coordination, stakeholder, and public outreach.

Relevant Regulations, Guidance, Studies, and Plans

This environmental justice analysis complies with Executive Order 12898 and DOT Order 5610.2 on Environmental Justice, in addition to *RTD's Environmental Policies and Procedures Manual Volume I* (RTD, 2021). The existing conditions demographic analysis is more comprehensive than the requirements for environmental justice analysis, incorporating additional demographic characteristics and built environment assessment. These demographic attributes are analyzed to identify the benefits and burdens of the Peak Service to communities that may be historically disadvantaged or have a higher propensity to use transit.

The regulatory framework for this environmental justice analysis includes the following:

- Executive Order 12898, Environmental Justice for Low-Income & Minority Populations
- Title VI of the Civil Rights Act of 1964, Federal Highway Administration (FHWA) Order 6640.23A on Environmental Justice
- 2000 Executive Order 13166, Improving Access to Services for Persons with Limited-English Proficiency
- FHWA Guidance on Environmental Justice and NEPA Memorandum (FHWA, 2021)
- 2011 USDOT Order 5610.2(a) on Environmental Justice, 2012
- USDOT Order 5610.2c
- FHWA *Environmental Justice Reference Guide* (FHWA2015)
- *CDOT NEPA Manual*, Version 6 (CDOT, 2020)
- Colorado HB21-1266 Environmental Justice Disproportionate Impacted Community
- RTD *Environmental Policies and Procedures Manual Volume I* (RTD, 2021)
- FTA Circular C 4703.1, Environmental Justice Policy Guidance for FTA Recipients
- Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government
- USDOT Equity and Access Policy Statement
- USDOT *Equity Action Plan* (USDOT, 2022)

Data Collection/Methodology

Demographic attributes were chosen for analysis to identify low-income and minority communities and communities with a higher transit propensity than the general population. The definition of low-income and minority communities, along with other community types discussed in this analysis, is provided in Table 8. Additionally, aspects of the built environment were analyzed due to their ability to impact or benefit environmental justice communities. The analysis incorporated the U.S. Census 2016-2020 American Community Survey 5-Year Estimates is the most recent data. The level of geography selected for this Study is block group level data; this is the smallest scale of demographic data available.

Study Areas

Multiple study areas were used to determine impacts and benefits. The study areas are defined as follows:

- Identification of Impacts/Burdens: the impact study area is defined as 0.5 miles from the corridor centerline, around the stations, and all candidate maintenance facility locations advancing in the Study. Several demographic characteristics, described more fully in the next section, would be collected and analyzed to help define the baseline social conditions in the Study.
- Identification of Benefits: the benefits study area is defined as a three-mile radius around each station location. This study area would be used to determine the communities that can easily access the station (either by walking, biking, or driving) and can benefit from the rail investment.

These study areas are more comprehensive than those identified in RTD's *Environmental Policies and Procedures Manual Volume I* (RTD, 2021). At this level of analysis, the study area is typically wider than what would be used in NEPA. The study area would ensure that the Study Team can identify pertinent information that may arise later in the NEPA analysis.

Table 8 details the demographic and built environment attributes analyzed, how they are defined in this Study, and the data source used.

Table 8: Definitions and Data Sources

Demographic or Built Environment Attribute	Definition for this Study	Data Source
Minority	Any readily identifiable group or groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed or transient persons, such as migrant workers or Native Americans who would be similarly affected by a proposed DOT program, policy, or activity. Minority persons include American Indian and Alaska Native, Asian, Black, or African American, Hispanic or Latino, and Native Hawaiian or other Pacific Islander.	2020 American Community Survey 5-Year Estimates, Table B03002 Hispanic or Latino Origin by Race
Low-income	Low-income households are at or below 150% of the federal poverty level.	2020 American Community Survey 5-Year Estimates. Table C17002: Ratio of Income to Poverty Level in the Past 12 Months
Multimodal access	Assess the current multimodal network and its ability to connect to the stations.	Commuting Solutions Bike Data, RTD data, desktop review through Google
Minority-owned businesses, businesses employing minorities, businesses serving minorities	Determined through an overlay of the areas with high percentages of environmental justice communities overlaid with the economic clusters.	Economic clusters from DRCOG overlaid with environmental justice minority and low-income populations
Limited-English Proficiency	Includes a count of individuals who speak English "not well" and "not at all" for both native and foreign-born categories.	Table B16004: Age by Language Spoken at Home by Ability to Speak English for the Population 5 Years and Over
Households without access to a personal vehicle	Includes a count of households that have zero vehicles available.	Table B08201 Household Size by Vehicles Available
Community resources in the environmental justice study area	Community resource data was collected through a desktop review and overlayed with environmental justice communities.	Desktop review with Google

Thresholds

The minority and low-income thresholds used for this Study were developed by RTD's Transit Equity Office and are those used for RTD's Title VI equity analyses. The RTD thresholds are 36.9% for minority communities and 14.3% for low-income communities. The thresholds were developed from the 2016-2020 American Community Survey 5-Year Estimates.

Additional Data Collection

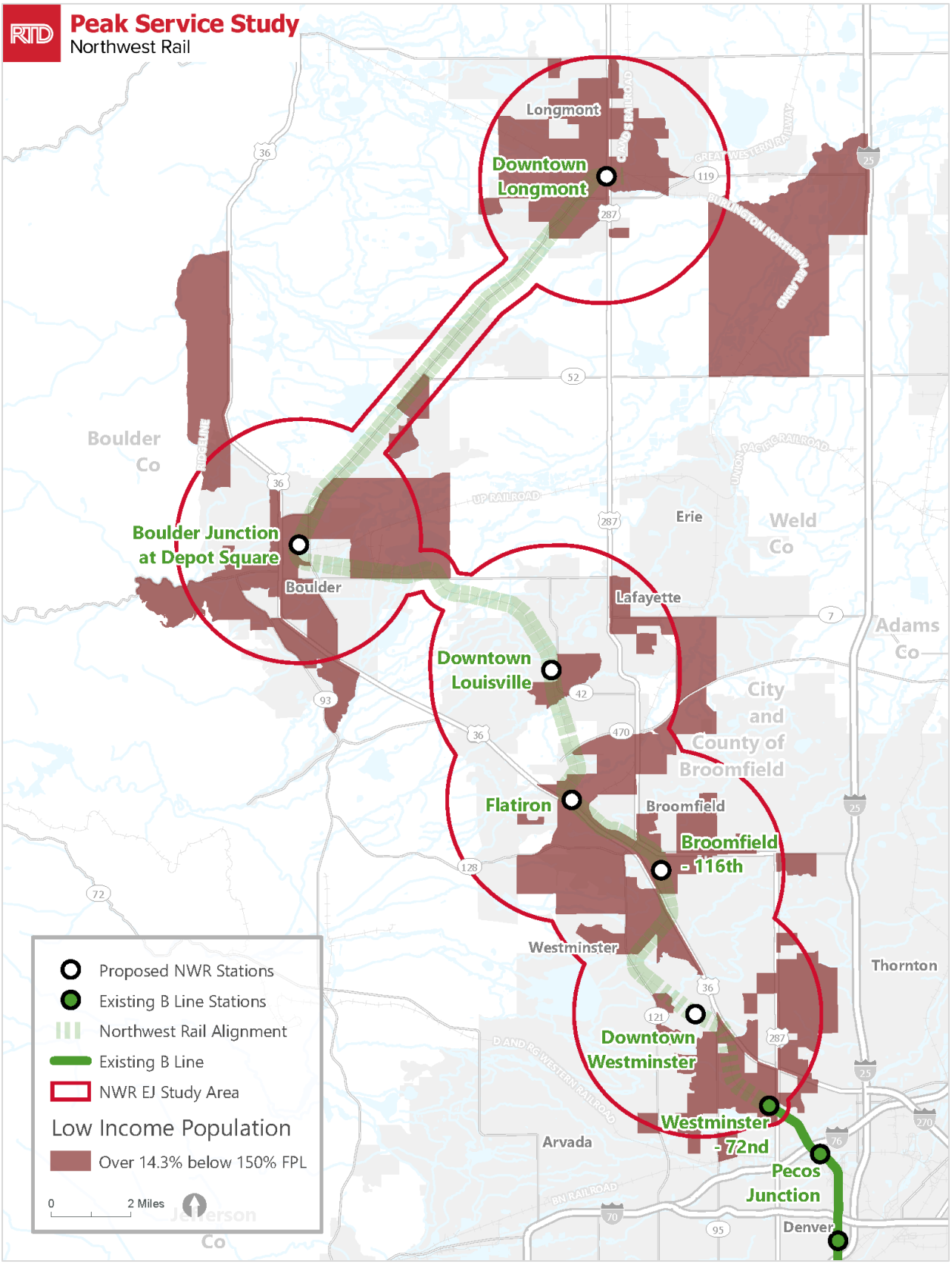
RTD is partnering with community leaders and organizations to understand the community beyond what can be learned from U.S. Census data. A survey and invitation for an interview were sent to community-based organizations and community leaders. The survey asks questions to help understand environmental justice communities and other disadvantaged communities within the study area. The data collected through the interview and survey would inform community outreach for the Study and be documented in the final environmental justice/equity report. Further data collection will be completed and documented later in the Study.

Findings/Results

Low-Income Communities

According to the threshold used in the analysis, 139 of the 368 block groups in the study area are considered low-income communities because they have larger percentages of households considered to be in poverty (14.3% of households). Low-income communities in the study area are depicted in Figure 13.

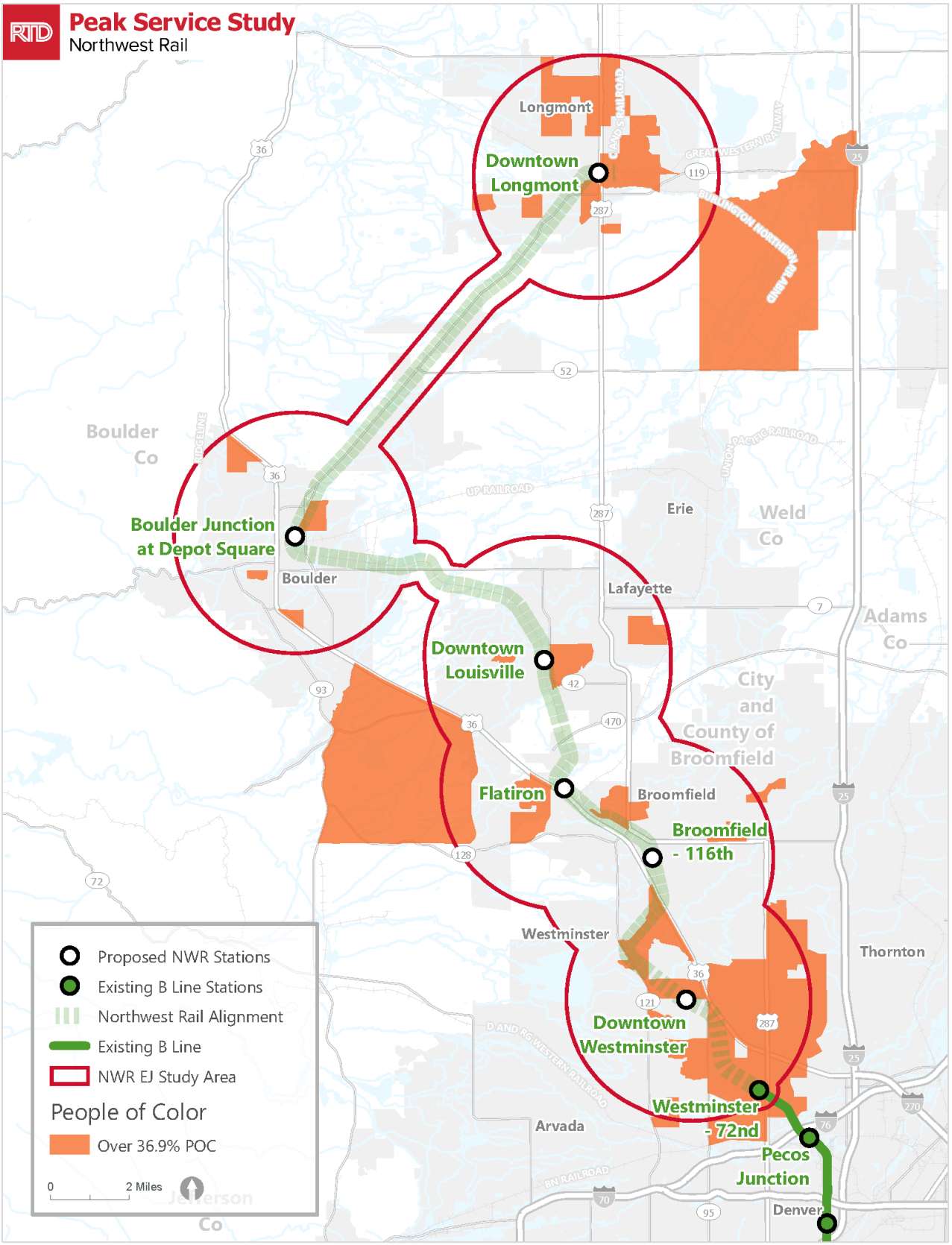
Figure 13: Low-Income Communities Within the Study Area



Minority Communities

According to the threshold used in the analysis, 100 of the 368 block groups in the study area are considered minority communities because they have larger percentages of persons considered to be a minority (36.9% of the population). Minority communities are depicted in Figure 14.

Figure 14: Minority Communities in the Study Area



Additionally, Table 9 summarizes locations in the study area preliminarily identified as having minority and low-income communities and describes housing development in the area. It is important to note that in future phases of project development, as more information becomes available, these data and locations of minority and low-income communities may be updated.

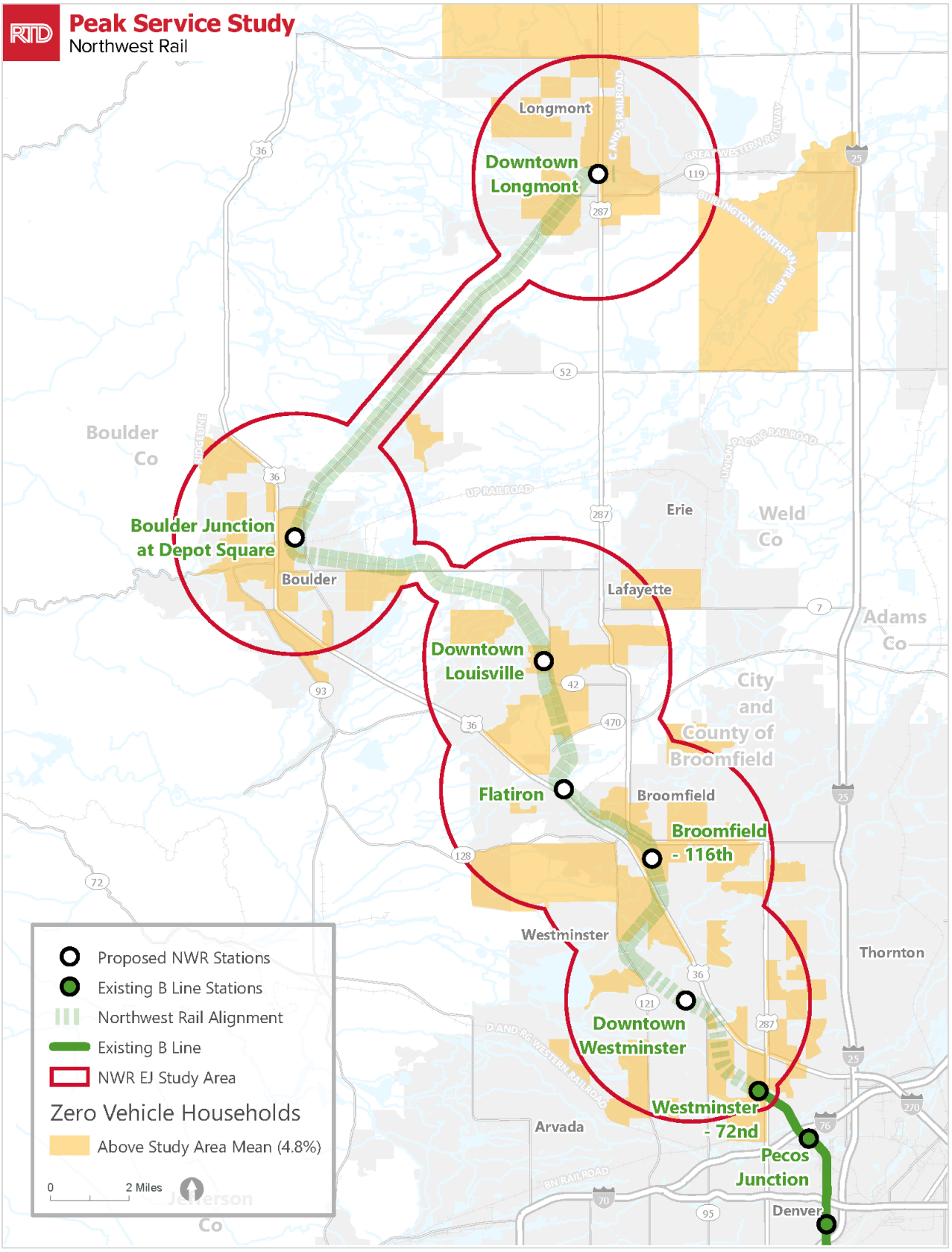
Table 9: Minority and Low-Income Communities in the Study Area

Community	Description
Adams County	Between Federal and Sheridan boulevards and 66th to 84th avenues, many residents live below 150% of the federal poverty line and identify as Hispanic/Latino. The area includes mostly single-family homes and apartments.
Boulder	Due to the large student population, areas near campus report a higher percentage of low-income residents. There are also several affordable housing complexes between BNSF and 28th Street, including 30PRL Development, Hayden Place, Diagonal Court, and the Orchard Grove Mobile Home Park.
Longmont	The St. Vrain Village is located near the corridor and Longmont Station Area at Prince Road and Francis Street.
Louisville	The Parco Dello Zingaro Mobile Home Community is located off West South Boulder Road, a half mile from the corridor.

Households Without Vehicle Access

Households without vehicle access are identified using American Community Survey 2016-2020 5-year estimates. The study area's households without vehicle access are 4.8% of the total households in the area. The data indicates that of the 368 block groups in the study area, 119 have a higher percentage of households without vehicle access than the rest. These 119 block groups are highlighted due to a high concentration of households without vehicle access in the study area. Figure 15 depicts zero-vehicle households.

Figure 15: Zero-Vehicle Households



Minority-Owned/Businesses that Employ Minorities/Minority Customers

Economic clusters from DRCOG are overlaid with environmental justice geographies for minority and low-income communities to identify areas that potentially have a high percentage of minority-owned businesses, employ minorities, or have minority customers. Figure 16 and Figure 17 depict the overlap of environmental justice communities and high economic concentration. Low-income and minority communities are located in similar areas, but Downtown Boulder has a significantly larger low-income population than minority population. The areas of overlap between environmental justice populations and high economic concentration are listed below:

- Downtown Longmont
- Downtown Louisville
- Downtown Boulder
- West of the new Flatiron Station
- Downtown Broomfield
- Downtown Westminster
- 72nd Ave and Highway 95

Figure 16: Low-Income Populations and High Economic Concentrations

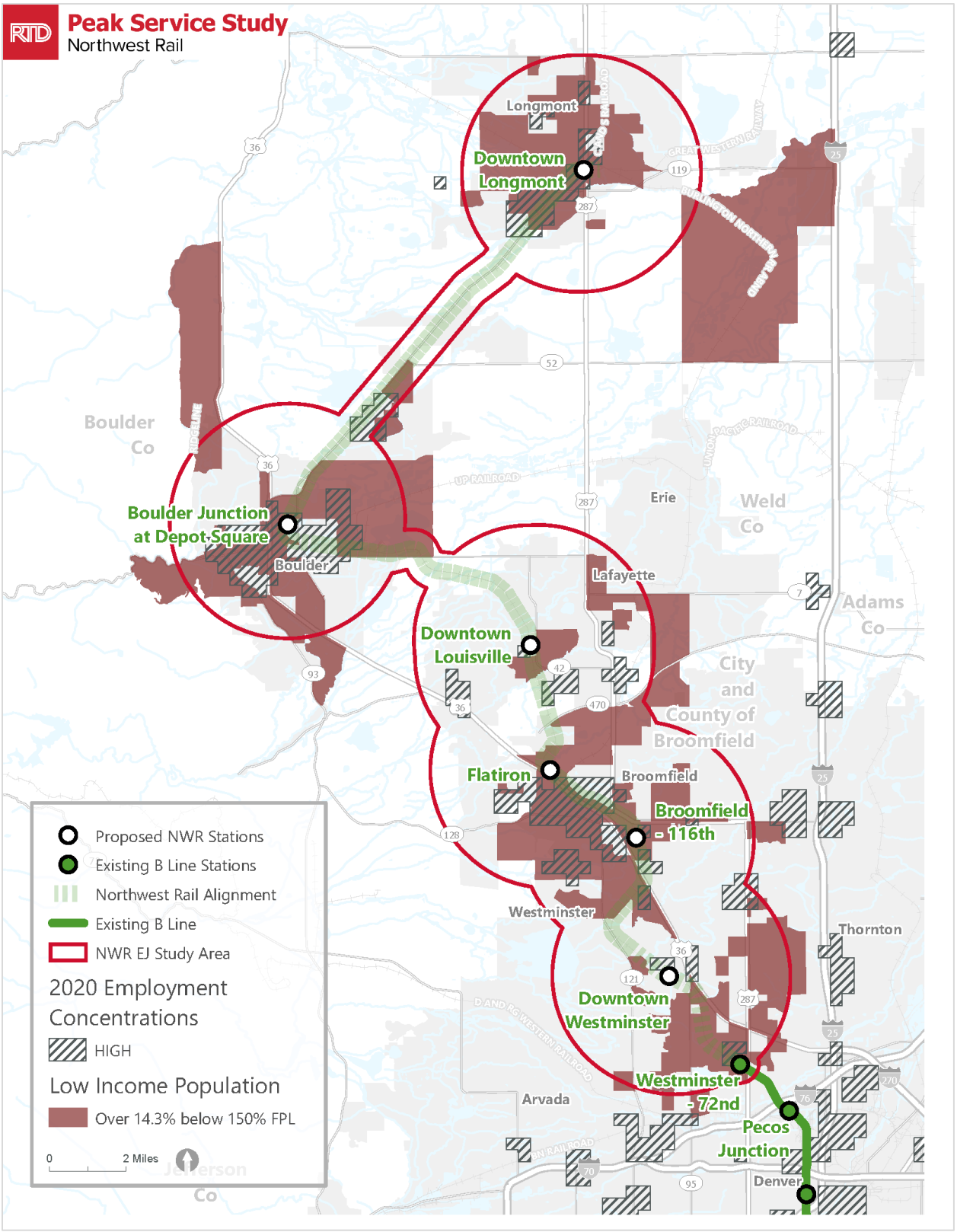
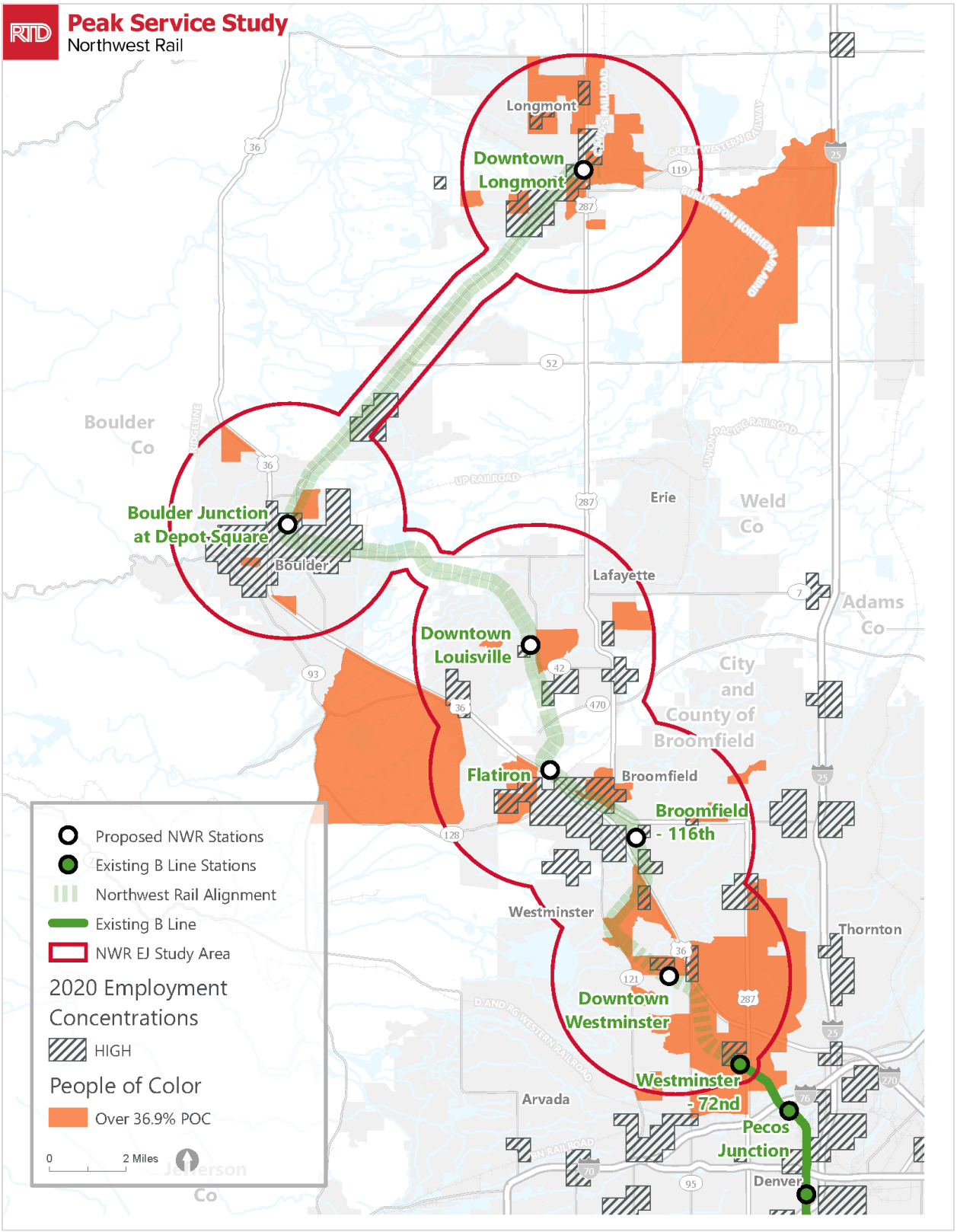


Figure 17: Minority Communities and High Employment Concentrations



Community Facilities

Community facilities data collected through a desktop review was overlayed with environmental justice data to identify areas with a potentially high percentage of minority and low-income people using these resources. The community facilities were evaluated within 1,000 feet of the proposed alignment, compared to a half mile for the environmental justice analysis. Based on the available community facilities data, 50 out of 80 are within block groups that meet the minority or low-income population thresholds. This indicates that many community resources are located in environmental justice communities. The main types of community resources within these areas are schools, places of worship, government offices, colleges, and libraries. The clusters are located in the economic clusters listed in the previous section. The community resources located in environmental justice minority and low-income areas are shown below in Figure 18 and Figure 19.

Figure 18: Low-Income Populations and Community Resources

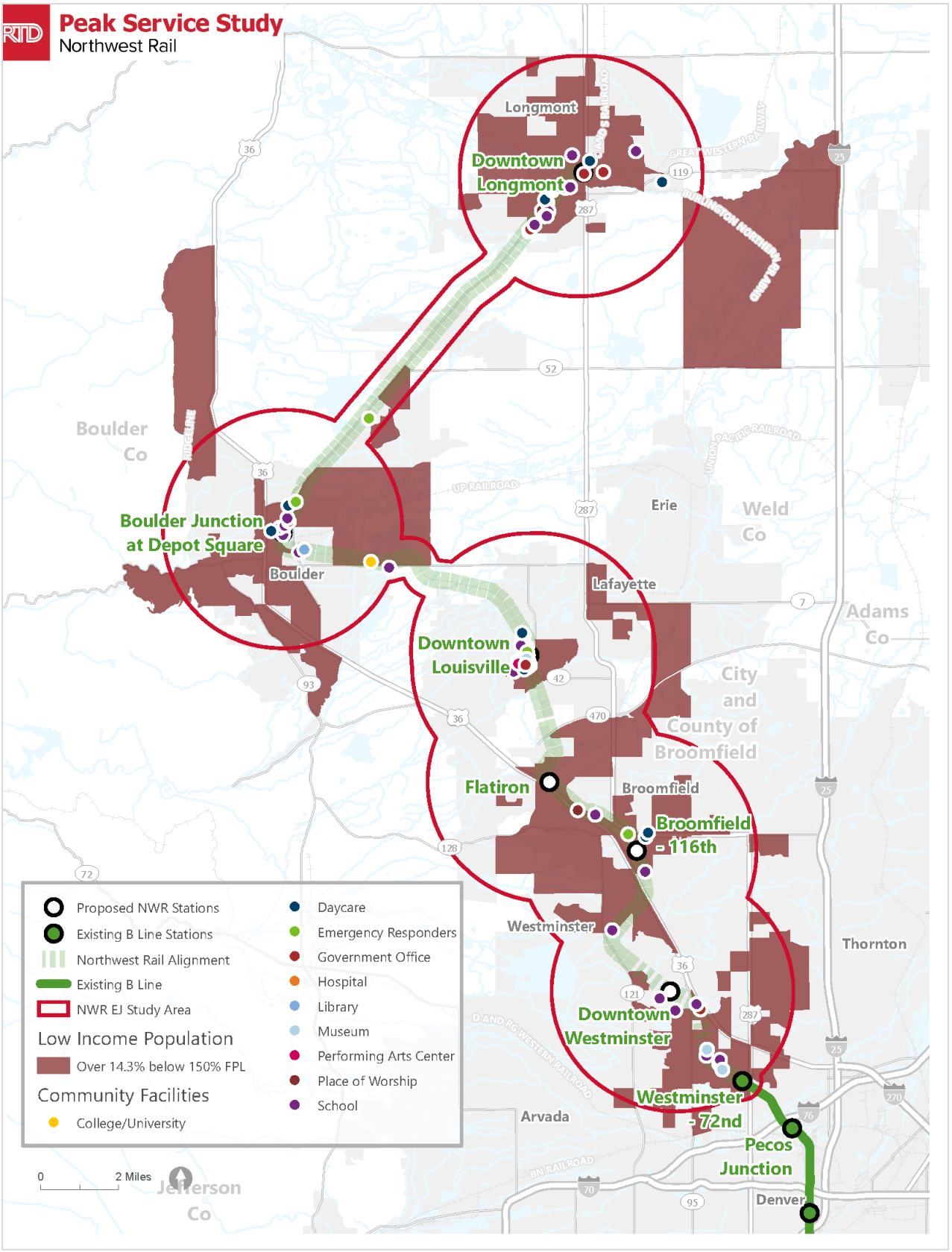
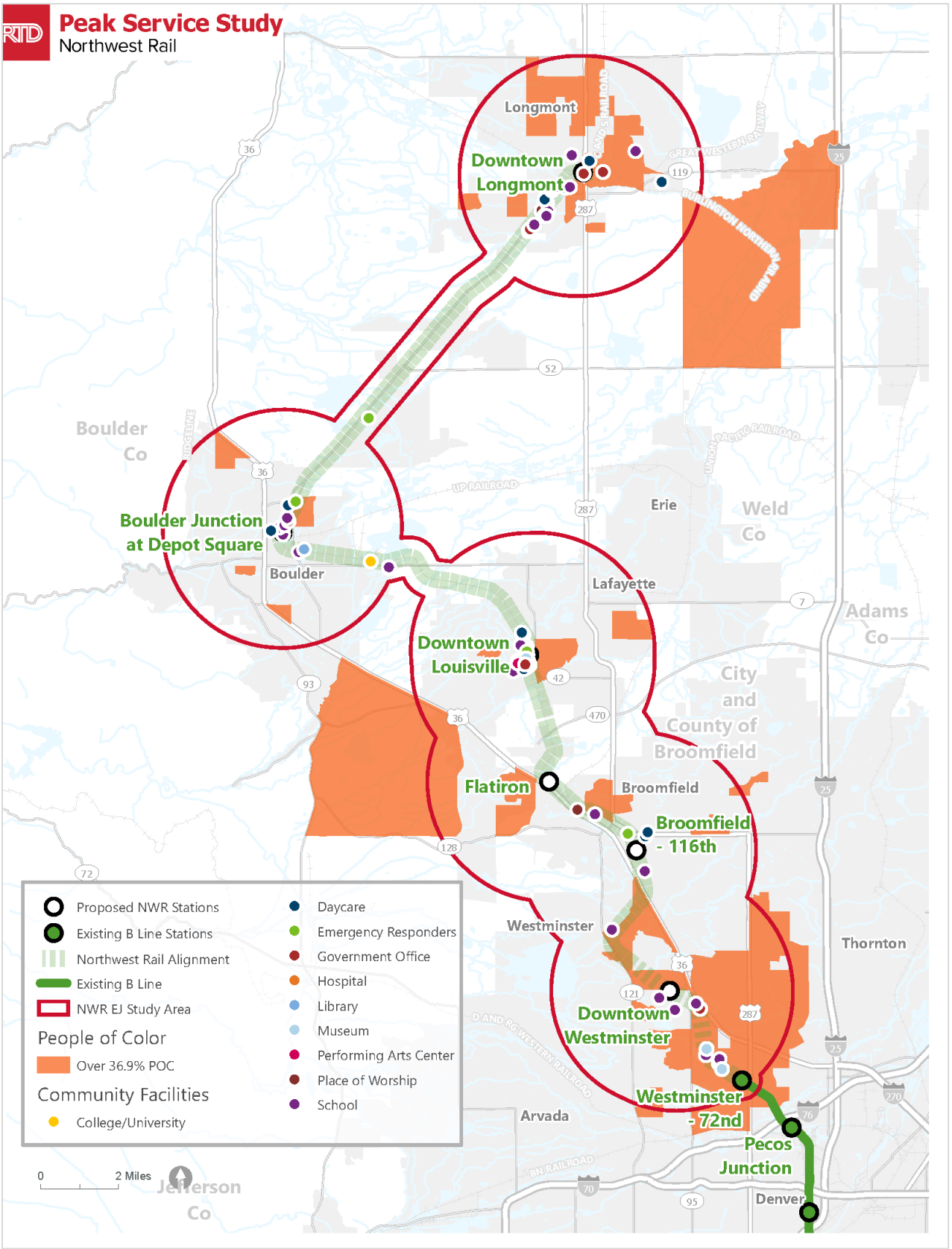


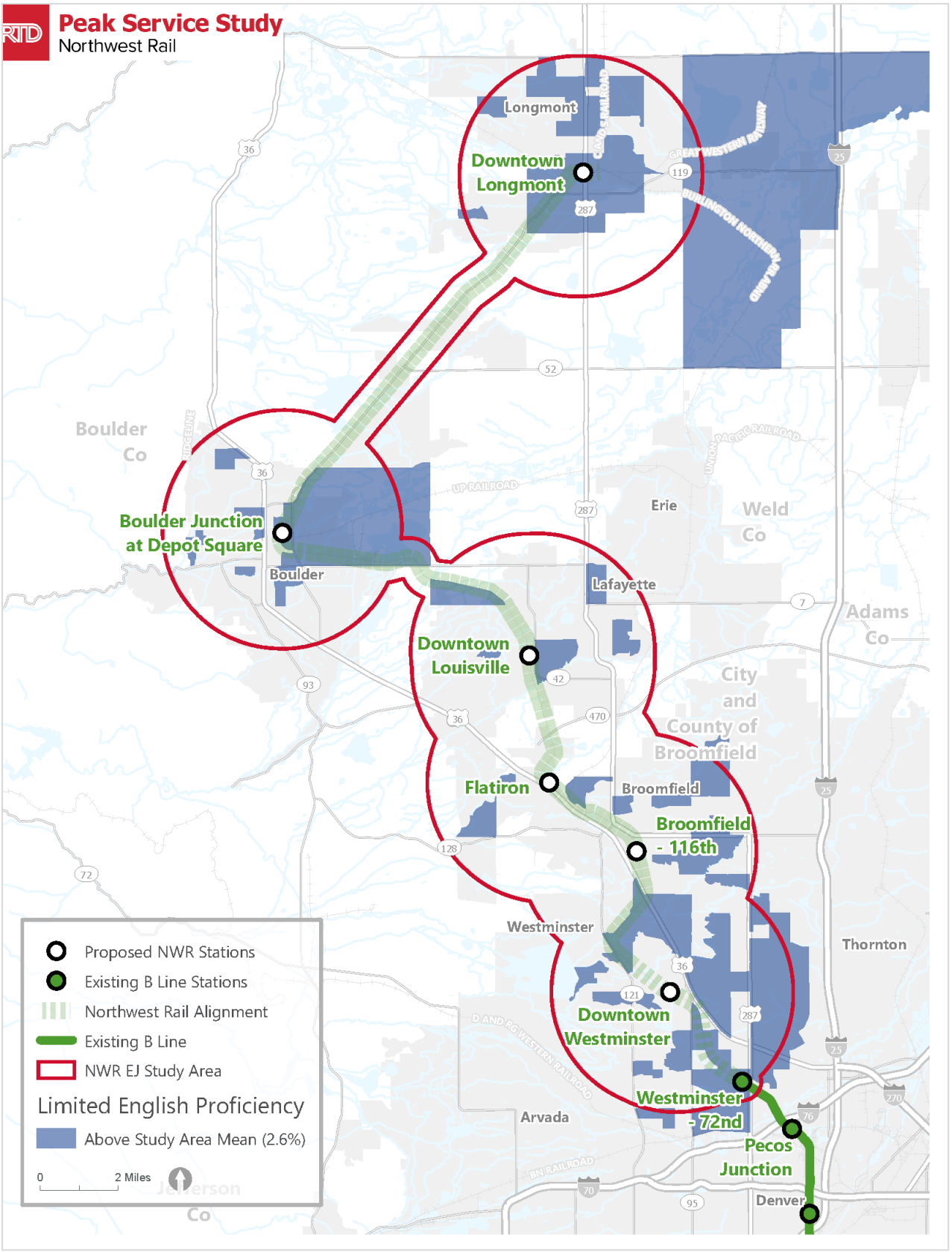
Figure 19: Minority Communities and Community Resources



Limited-English Proficiency

The study area's Limited-English Proficient population is 2.6% of the study area. The data indicates that of the 368 block groups in the study area, 115 have a higher percentage of Limited-English Proficient people than the rest. There are 115 block groups highlighted for having high concentrations of Limited-English Proficient populations in the study area, shown in Figure 20.

Figure 20: Populations with Limited-English Proficiency



Multimodal Access

Multimodal access to stations would enable all communities, especially environmental justice communities, to maximize the benefit of a station in their community. Multimodal access means that the stations have safe and convenient connections for individuals who walk, bike, take transit, or use other multimodal options to access stations. The multimodal connections are critical for households with zero or fewer vehicles than adults who drive. Furthermore, young people, people with disabilities, seniors, and other individuals benefit when transit is accessible.

The study area around the stations currently has varying levels of multimodal access. Public transportation is already in place for stations serving the Flatiron Flyer or other RTD services. Other stations are in industrial areas and have not yet incorporated bike, pedestrian, and transit networks with multimodal design and infrastructure. Certain station areas plan to include multimodal access with a robust sidewalk and bike lane network.

To address the opportunities to improve multimodal access to stations, the Study Team documented existing conditions and met with the municipalities to discuss improved connections. The municipalities are committed to improving safety and multimodal connections, and many with plans to do so. RTD is also evaluating opportunities to reroute buses and reconsider service levels so that RTD's bus network can better serve the stations to accommodate Peak Service.

Next Steps

The identified minority and low-income communities and other communities with a higher transit propensity than the general population provide a reference to guide the refinement of a project description and inform the environmental justice analysis during project development. 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.

During NEPA, the USDOT will formally determine if a project has disproportionately high and adverse human health and environmental effects on low-income and minority communities. Prior to NEPA, during this Study, the RTD Transit Equity Office will provide the updated thresholds developed from the 2016-2020 American Community Survey 5-Year Estimates before the end of the Study, and the Study Team will update the analysis with the new thresholds. To refine the demographic and built environment analysis, the Study Team will incorporate the new RTD thresholds into the analysis of minority and low-income communities. In addition, any environmental justice communities or disadvantaged communities identified through the community-based organization and community leader survey will be documented.

Safety and Security

Resource Description

Public safety and security are concerns during both construction and operation of a project. This section describes the existing safety and security resources, current station area, on-board crime, and emergency service providers in the area.

Agencies Involved

The RTD Transit Police Division operates a security model dedicated to providing a safe and secure transit system for its customers, employees, and the community. At the time of this report, the division comprises the chief of police, one deputy chief, one administrative lieutenant, four sergeants, and a team of transit police officers. The division is supported by two 911 dispatch centers operating 24/7, a video investigation unit, and more than 600 contracted police and uniformed security officers. The transit police jurisdiction encompasses nearly 2,400 square miles, operating in eight counties and 40 cities across the Denver Metropolitan Area (RTD, 2022).

For new rail projects, RTD convenes a Fire and Life Safety Committee comprised of local law enforcement and emergency services representatives. This committee assists with developing an emergency plan for the study area and coordinates responses to various emergencies. RTD also has design guidelines for station areas to reduce crime at stations and parking facilities.

In addition to the RTD Transit Policy Division, local agencies have police departments, fire departments, and emergency response units within the study area.

Relevant Regulations, Guidance, Studies, and Plans

RTD prioritizes the safety and security of its customers and implements a system-wide safety plan. The system-wide safety plan encompasses topics related to RTD's operations, customers, motorists, cyclists, and pedestrians. For the safety, convenience, and comfort of everyone, RTD established a Code of Conduct that addresses certain conduct prohibited on all RTD vehicles, facilities, and property (RTD, 2020).

RTD's Bus Infrastructure Design Guidelines and Criteria (RTD, 2016a) and Bus Infrastructure Standard Drawings (RTD, 2016b) include strategies for implementing bus user safety and crime protection measures. These strategies minimize potential threats, including visibility, lighting, and eliminating structural hiding places through design. In addition, RTD follows applicable Federal Transit Administration (FTA) safety and security measures and guidelines during the design, construction, and operation of transit service facilities. RTD- and FTA-funded projects follow a comprehensive Safety and Security Certification process to minimize the potential for harm to the public. Local agency law enforcement is also consulted on ways to minimize threats to the public.

RTD launched the Partners in Safety program in 2010, which is a collaborative effort between RTD employees, customers, and the public to create awareness of safety issues and take action to promote a safer environment around buses, trains, tracks, and crossings. In addition, RTD developed the Transit Watch app that is downloadable by phone and accessible to customers to report any safety and security concerns to RTD transit police.

Data Collection/Methodology

A desktop review of data related to crime, the location of emergency service providers, and incidents for jurisdictions within the NWR Corridor were conducted using FBI Open Crime Data Explorer (FBI, 2021) and the U.S. Department of Justice (U.S. Department of Justice, 2019) provided crime data. The jurisdictional boundaries of the crime data serve as the study area. Additionally, the USDOT provides incident report summary data (USDOT, 2021) related to RTD security event types.

Findings/Results

Crime Statistics

Crime statistics are gathered for each jurisdiction within the NWR Corridor to determine existing and on-board crime rates (Table 10).

Table 10: Existing Annual Crime Statistics, 2021

Department	Homicide	Rape	Robbery	Burglary	Auto Theft
County					
Broomfield Police Department[1]	2	13	32	254	369
Boulder County Sheriff's Office	0	21	3	152	105
Jefferson County Sheriff's Office	3	95	28	445	565
Municipality					
Arvada Police Department	3	33	87	438	859
Broomfield Police Department	2	13	32	254	369
Boulder Police Department	3	46	71	565	402
Lafayette Police Department	2	22	8	97	114
Longmont Police Department	2	141	50	268	405
Louisville Police Department	0	15	2	79	74
Westminster Police Department	12	60	103	438	1,491

Source: FBI Crime Data Explorer, 2021

[1]The county and municipal police department and crime data are the same for Broomfield.

Table 11 reports crime rates relative to the population based on 2019 population estimates and crimes reported in 2019.

Table 11: Summary of Crime Rates Relative to Population, 2019

Section	2019 Population Coverage	Violent Crimes[1]	Property Crimes[2]	Violent Crimes Per 1,000 People	Property Crimes Per 1,000 People
Municipality					
Arvada	122,312	266	3,642	2	29
Boulder	108,519	278	3,284	3	30
Broomfield	70,798	75	2,046	1	28
Lafayette	29,522	63	731	2	24

Section	2019 Population Coverage	Violent Crimes[1]	Property Crimes[2]	Violent Crimes Per 1,000 People	Property Crimes Per 1,000 People
Longmont	97,928	422	2,548	4	26
Louisville	21,532	16	301	0.7	13
Westminster	114,392	316	3,713	3	32

[1]Violent crimes include murder and nonnegligent manslaughter, rape, robbery, and aggravated assault.
[2]Property crimes include burglary, larceny-theft, motor vehicle theft, and arson.
Source: Department of Justice, FBI, 2019

Reported event types for light rail vehicles for 2016 and 2017 are presented in Table 12. According to the *Rail Safety Data Report* (USDOT FTA, 2021), rail-grade crossing collisions are the most common event type on transit vehicles, with 786 incidents reported in 2016 and 761,507 incidents reported in 2017. Rail-grade crossing collisions are a collision between a rail transit train and any other object or person at a grade crossing or street intersection. Homicide/assault is an attack against a person on transit agency property, whether deadly or not. Table 12 describes the security event types recorded by the USDOT.

Table 12: Event Types Recorded by the USDOT in 2017 and 2018

Security Event Type	2016	2017
Non-Rail-Grade Crossing Collision A collision between a rail transit train and any object or person that does not occur at a grade crossing street intersection. Suicide and trespassing events are excluded.	236	258
Rail-Grade Crossing Collision A collision between a rail transit train and any object or person at a grade crossing or street intersection. Suicide and trespassing events are excluded.	786	761
Derailment Derailment of a rail transit train.	87	100
Fire Fires on transit agency property.	17	20
Suicide or Trespasser All events resulting from suicide attempts and trespassing, including events involving collisions with a rail transit train.	166	186
Other Event Any other event, including but not limited to security events, slips, falls, and medical events that surpass a reporting threshold.	171	152

Source: Rail Safety Data Report, USDOT FTA, 2021

Police, Fire, and Emergency Services

Police, fire, and emergency services are provided by several different agencies, districts, and companies throughout the study area. Table 13 summarizes existing services within five miles of the study area.

Table 13: Police, Fire, and Emergency Services by County

County	Police/Sheriff	Fire	Emergency Services
Adams	• Westminster Police Department (9110 Yates St.) • Federal Heights Police Department (2380 W. 90th Ave.) • Thornton Police Department (9500 Civic Center Drive) • Northglenn Police Department (11701 Community Center Drive)	• Westminster Fire Department Station 1 (3948 W. 73rd Ave.) • Colorado Refining Company Fire Department (5800 Brighton Boulevard) • North Washington Fire Protection District Station 31 Headquarters (8055 Washington St.) • Westminster Fire Department Station 4 (4580 W. 112th Ave.) • Westminster Fire Station 6 (999 W. 124th Ave.)	• 84th Ave. Emergency Room (2551 W. 84th Ave.) • North Suburban Medical Center (9191 Grant St.) • Vibra Hospital of Denver-ER (8451 Pearl St.) • SCL Health Saint Joseph Emergency (11900 Grant St.)
Boulder	• Boulder County's Sheriff's Office (5600 Flatiron Parkway) • Boulder Police Department (1805 33rd St.) • Longmont Police Department (225 Kimbark St.) • Louisville Police Department (992 W. Via Appia Way) • Lafayette Police Department (1290 S. Public Road)	• Louisville Station 1 (1240 Main St.) • City of Boulder Station 7 (1380 55th Ave.) • City of Boulder Station 6 (5145 63rd St.) • Boulder Rural Fire Department Station 1 (6230 Lookout Road) • Longmont Fire Station 6 (501 S Pratt Parkway) • City of Boulder Station 8 (6075 Reservoir Road) • Mountain View Fire District Station 4 Niwot (8500 Niwot Road) • Mountain View Fire District Station 5 Brownsville (10911 Dobbins Run) • Longmont Fire Department Station 5 (617 Barberry Drive) • Longmont Fire Department Station 1 (501 S. Pratt Parkway) • Mountain View Fire District Station 1 Central (9119 E. County Line Road) • Longmont Fire Department Station 2 (2300 Mountain View Ave.) • Rocky Mountain Fire District Station 1 Headquarters (7700 Baseline Road) • Longmont Fire Department Station 3 (100 Pace St.) • Lafayette Fire Department (401 N. 111th St.)	• Avista Adventist Hospital & ER (100 Health Park Drive) • Boulder Emergency Squad (3532 Diagonal Highway) • Good Samaritan Medical Center (200 Exemple Circle) • Community Medical Center (1000 S. Boulder Road) • Foothills Hospital & ER (4747 Arapahoe Ave.) • Longmont United Hospital & ER (1950 Mountain View Ave.)

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County	Police/Sheriff	Fire	Emergency Services
		• Rocky Mountain Fire District Station 2 (921 Cherryvale Road) • Longmont Fire Department Station 4 (501 23rd Ave.)	
Broomfield	• Police Department (7 DesCombes Drive) • Colorado Highway Patrol (7701 W. 120th Ave.)	• North Metro Fire Station 61 (1275 W. Midway Boulevard) • North Metro Fire Station 67 (13975 S. 96th St.)	• UCHealth Broomfield Hospital (11820 Destination Drive) • Centura Health Church Ranch NHC-ER (7233 Church Ranch Boulevard) • SCL Health Comm
Jefferson	• Arvada Police Department (8101 Ralston Road) • Mountain View Police Department (4176 Benton Street) • Edgewater Police Department (5901 W. 25th Ave.) • Wheat Ridge Police Department (7500 W. 29th Ave.)	• Westminster Fire Department Station 3 (7702 W. 90th Ave.) • Westminster Fire Department Station 5 (10100 Garland St.) • Arvada Fire Protection District Station 5 (38100 Vance St.) • Arvada Fire Protection District Station 3 (7300 Kipling St.) • Arvada Fire Protection District Station 4 (6845 W. 68th Ave.) • Arvada Fire Protection District Station 7 (8027 Akire St.) • Arvada Fire Protection District Station 6 (6503 Simms St.) • Arvada Fire Protection District Station 1 (7900 W. 57th Ave.) • Arvada Fire Protection District Station 2 (12195 W. 52 Avey.) • Arvada Fire Protection District Station 8 (6385 Quaker St.) • Wheat Ridge Fire Protect District Station 1 (3880 Upham St.)	• SCL Health Community Hospital Westminster & ER (6500 W. 104th Ave.) • Centura Health Church Ranch NHC – ER (7233 Church Ranch Boulevard) • UCHealth Arvada-ER (9505 Ralston Road)

Sources: Boulder County, 2012 & Adams County, 2022

Boulder and Broomfield Counties are the only counties where wildfire risks were identified within the NWR Corridor. Approximately 15.5 miles of the NWR Corridor in Boulder County are located in low to moderate areas of risk for wildfires (Colorado State Forest Service, 2022). Approximately one-mile NWR Corridor in Broomfield County is located in low to moderate areas of risk for wildfires (Colorado State Forest Service, 2022). The City of Boulder and Boulder County provide Community Wildfire Protection Plans that establish how to prepare for wildfires and recover from a burning event (Boulder County, 2011 and City of Boulder, 2007). Table 13 establishes fire services in each county that provide emergency support throughout the NWR Corridor.

The Colorado State Patrol provides emergency response services and traffic enforcement throughout the NWR Corridor. However, their duties, responsibilities, and responses do not extend to municipalities. The Boulder County Sheriff's Office handles emergency dispatch services for Boulder County and the towns of Lyons and Superior. The Boulder Police Department handles emergency dispatch service for Boulder, and the Louisville Police Department and Fire Protection District handles dispatch for Louisville. Adams and Jefferson Counties also provide emergency response services and traffic enforcement.

Emergency service providers rely on major transportation networks to respond to incidents within the study area. The NWR Corridor contains several existing at-grade crossings that emergency responders must navigate. At-grade crossings are described in the Traffic, Circulation, and Parking Section.

Next Steps

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.

During NEPA and subsequent design processes, utilize RTD's Fire and Life Safety Committee and Bus Infrastructure Design Guidelines and Criteria (RTD, 2016a) and Bus Infrastructure Standard Drawings (RTD, 2016b). RTD will work with law enforcement, fire, and emergency service providers to provide facilities that best meet the needs of RTD and local communities. Identify emergency routes that may be temporarily closed during construction or permanently rerouted, and work with communities and local law enforcement to develop mitigation measures to ensure emergency response times are maintained.

Traffic, Circulation, and Parking

Brief Description of Resource Studied

This section summarizes the roadway network, including existing congestion levels and roadway volumes, future roadway projects, and parking facilities. Traffic conditions focus on locations where the BNSF rail line crosses the roadway network, at railway crossings along the NWR Corridor, and in the areas surrounding the six stations. The information provided in this section has been summarized from the *Traffic Corridor Context Report* (Appendix A). This section focuses only on the roadway network; however, the subsequent Transit, Bicycle, and Pedestrian Systems section focus on those modes of transportation.

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Agencies Involved

Information for this section was obtained from RTD, CDOT, DRCOG, US 36 Commuting Solutions, Westminster, Jefferson County, the City and County of Broomfield, Louisville, Boulder, Boulder County, and Longmont.

Relevant Regulations, Guidance, Studies, and Plans

Previous studies used in this analysis include the 2010 NWR Corridor EE, the 2014 Northwest Area Mobility Study, the Reimagine RTD System Optimization Plan (SOP) (RTD, 2022), and other local transportation planning documents.

Data Collection/Methodology

The study area for the analysis is a 0.5-mile buffer around the existing BNSF corridor, which includes six stations, 14 existing grade-separated crossings, 36 existing at-grade crossings, and four new sidings. For purposes of this report, Peak Service weekday morning trips are assumed to operate three times during the morning peak period: departing Longmont between 6 a.m. and 7 a.m. and three times in the afternoon departing Union Station between 4:15 p.m. and 5:15 p.m. Data for the existing traffic conditions were derived from online sources, including Google Maps, Google Earth, and Replica HQ. Google Earth satellite imagery was used to identify at-grade crossings, with the crossing locations mapped using the most current NWR Corridor.

Google Street View images were reviewed at the at-grade crossing locations to assess the number of lanes, crossing control arms, pedestrian crossing conditions, and lighting at the crossing. Next, the roadway classification at the crossing was noted. Traffic volume estimates at the crossings come from Replica HQ, a big data software that provides regional volume data similar to a travel demand model. Replica HQ simulates the movements and trips of a 'synthetic population' and uses this data to predict traffic volumes over the region's roadway network. This Study used data from Replica HQ's fall 2019 Thursday model run, which was chosen to represent typical weekday traffic. The volumes were used to give an approximate estimate of expected traffic on railway crossings. DRCOG data were also used to develop existing roadway volumes.

Google Earth was used to identify the nearest signalized and unsignalized intersections from the at-grade crossing in both directions. Locations, where the tracks cross close to a signalized intersection, have the greatest potential to cause wider traffic disruptions to the surrounding network. Adjacent cross streets also have the potential to be affected by backups caused by rail crossing activity. This work lays the foundation for a future traffic impact analysis, where these potential impacts will be studied in more detail.

Findings/Results

Existing Roadway Network

The existing roadway network in the NWR Corridor consists of freeways (I-25, US 36, and Northwest Parkway), United States Highways (US 287), State Highways (SH 128, SH 42, SH 7, SH 52, and SH 119), and a variety of arterial, collector, and local streets. The network's backbone is the US 36 corridor between Denver and Boulder and the SH 119 corridor between Boulder and Longmont. US 36 connects with I-25 and I-270 to bring commuters into downtown Denver and other destinations.

Existing Congestion

Traffic impacts at the at-grade crossings could be reduced with the regularity of the passenger train schedule because freight trains are not forecasted to operate when passenger trains are running during Peak Service times. Existing traffic congestion levels for the areas near at-grade crossings are approximated using Google Maps' typical traffic data for a Thursday when the train is projected to pass. A field visit has not verified these congestion levels.

Google Maps uses a color scheme to indicate levels of traffic congestion: green represents little traffic congestion, orange represents mild traffic congestion, red represents heavy traffic congestion, and dark red represents extremely heavy traffic congestion. On the day of data collection, typical traffic conditions at all at-grade crossings fell under either green or orange conditions, suggesting little to mild traffic congestion exists currently on the typical weekday.

Traffic conditions at the nearest cross streets to the at-grade crossings are observed using Google Maps traffic data. Congestion at an intersection near an at-grade crossing has the potential to be indirectly worsened by traffic conditions at the at-grade crossing and may contribute to the need for further study. The conditions at the nearest intersections to the crossings are included in the generalized congestion levels listed for each crossing.

Business activity can be potentially affected by traffic impacts at the crossings, and business activity can also contribute to the congestion at the crossings. Satellite imagery and Google Street views of areas surrounding the at-grade crossings are used to rate the level of business activity surrounding the crossings. Each crossing was subjectively assigned a Commerce Index rating based on observed land use, ranging from 1 to 5. A rating of 1 signifies a crossing in a low-density, rural setting with no surrounding business activity; a rating of 3 signifies a low-to-medium density of businesses served by low-volume driveways and parking lots; and a rating of 5 signifies a dense, urban business landscape. The ratings are meant only to indicate where further investigation may be necessary due to existing commerce and the potential for impacts and inform a future traffic operations analysis.

Table 14 lists the observed Google Maps traffic congestion levels at the at-grade crossings and the Commerce Index ratings.

Table 14: Existing Congestion Levels and Commerce Index Ratings

At-Grade Crossing	Google Maps Congestion Level AM	Google Maps Congestion Level PM	Commerce Index Rating (1-5)
Lowell Boulevard	Green	Orange	3
72nd Avenue	Orange	Orange	2
Bradburn Boulevard	Orange	Orange	2
76th Avenue	Green	Green	1
80th Avenue	Green	Green	1
88th Avenue	Green	Orange	1
Pierce Street	Green	Green	1
Old Wadsworth Boulevard	Green	Orange	1
112th Avenue	Orange	Green	1
120th Avenue	Orange	Orange	2
Nickel Street	Orange	Orange	2
Brainard Drive	Green	Green	1

At-Grade Crossing	Google Maps Congestion Level AM	Google Maps Congestion Level PM	Commerce Index Rating (1-5)
Dillon Road	Orange	Orange	1
Pine Street	Orange	Orange	3
Griffith Street	Green	Green	1
South Boulder Road	Orange	Orange	4
Baseline Road	Orange	Green	1
63rd Street	Orange	Orange	1
55th Street	Orange	Orange	1
Pearl Parkway	Green	Orange	3
Valmont Road	Green	Orange	2
47th Street	Orange	Green	1
Independence Road	Green	Red	1
Jay Road	Orange	Orange	1
55th Street	Green	Green	1
63rd Street	Green	Orange	3
Mineral Road	Orange	Orange	1
Monarch Road	Orange	Orange	1
Niwot Road	Orange	Orange	1
Second Avenue	Green	Green	3
83rd Street	Green	Orange	1
Ogallala Road	Green	Green	1
Hover Street	Green	Orange	3
Sunset Street	Orange	Orange	4
Ken Pratt Boulevard	Orange	Orange	4
Coffman Street	Green	Orange	3

Source: Google Maps, 2022

Existing Roadway Volumes

Roadway volumes vary depending on the roadway, but most arterials throughout the corridor see high traffic volumes throughout the day. DRCOG data are used to develop the existing roadway volumes in Table 15.

Table 15: NWR Corridor Existing Roadway Volumes

Road	Segment		Average Daily Volume (rounded)
	From	To	
North-South Roadways			
Sheridan Boulevard	84th Avenue	88th Avenue	44,000
Sheridan Boulevard	88th Avenue	US 36	57,000
Sheridan Boulevard	US 36	92nd Avenue	45,000
Wadsworth Boulevard	92nd Avenue	BNSF Railroad	8,200
Wadsworth Parkway	92nd Avenue	94th Avenue	41,000
Westminster Boulevard	Promenade Drive	112th Avenue	19,000
Main Street	112th Avenue	Reed Way	8,900
Wadsworth Parkway	Interlocken Loop/SH 128	US 36	52,000
Wadsworth Parkway	US 36	Midway Boulevard	63,000
SH 42/Courtesy Road	Pine Street	South Boulder Road	21,000
SH 42/Courtesy Road	South Boulder Road	Hecla Drive	22,000

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Road	Segment		Average Daily Volume (rounded)
	From	To	
Main Street	Pine Street	South Street	5,000
63rd Street	Arapahoe Road	Valmont Drive	3,300
55th Street	Arapahoe Road	BNSF Railroad	18,000
55th Street	BNSF Railroad	Central Avenue	12,000
47th Street	Edison Avenue	SH 119/ Diagonal Highway	6,300
63rd Street	Lookout Road	SH 119/ Diagonal Highway	16,000
Hover Road	SH 119/ Diagonal Highway	Clover Basin Drive	36,000
Hover Road	Pike Road	SH 119/ Diagonal Highway	21,000
Sunset Street	Kansas Avenue	SH 119/ Diagonal Highway	8,200
Sunset Street	SH 119/ Diagonal Highway	Sunset Way/Frontage Road	6,600
Martin Street	Boston Avenue	First Avenue	9,300
East-West Roadways			
88th Avenue	Harlan Street	Sheridan Boulevard	24,000
88th Avenue	Wadsworth Parkway	Pierce Street	26,000
92nd Avenue	Harlan Street	US 36	30,000
Church Ranch Boulevard	103rd Avenue	US 36	33,000
Church Ranch Boulevard	US 36	Westminster Boulevard	35,000
112th Avenue	US 36	Westminster Boulevard/ Main Street	11,000
120th Avenue	Upham Street	Main Street	34,000
Midway Boulevard	Flatiron Crossing Drive	Via Varra	3,800
Northwest Parkway	US 36	Via Varra	27,000
Dillon Road	96th Street	104th Street	16,000
Pine Street	Main Street	BNSF Railroad	6,300
South Boulder Road	Garfield Avenue	Main Street	26,000
South Boulder Road	SH 42/Courtesy Road	Ceres Drive	22,000
Baseline Road	BNSF Railroad	95th Street	9,100
Arapahoe Road	63rd Street	BNSF Railroad	22,000
Pearl Parkway	30th Street	Foothills Parkway	21,000
Pearl Parkway	Foothills Parkway	Pearl East Circle	24,000
Valmont Road	30th Street	Foothills Parkway	29,000
Independence Road	SH 119/ Diagonal Highway	57th Street	1,500
Jay Road	SH 119/ Diagonal Highway	55th Street	13,000
SH 52/Mineral Road	SH 119/ Diagonal Highway	71st Street	12,000
Niwot Road	SH 119/ Diagonal Highway	79th Street	5,900
First Avenue	Coffman Street	US 287/Main Street	1,100
First Avenue	US 287/Main Street	Emery Street	4,200

Source: DRCOG, 2022 (https://experience.arcgis.com/experience/340c2dea62164764a434b79ee61701c6/)

Corridor Conditions Report

Future Roadway Projects

The 2050 Metro Vision Regional Transportation Plan (2050 RTP) sets the region's transportation system's long-range vision and investment framework. Multiple agencies throughout the region contribute to implementing the 2050 RTP. State and local agencies take action to implement the strategies and projects identified in the 2050 RTP and program activities funded through the regional work program. Regionally funded roadway projects are shown in Table 16.

Table 16: Regionally Funded Roadway Projects in 2050 RTP

Project Name or Corridor	Location/Limits	Project Description
DRCOG-Administered Projects		
US 287/120th Avenue	Midway Boulevard to Lowell Boulevard	Improve circulation, safety, active transportation access, business access, congestion, and transit operations
SH 66	US 287/Main Street to East County Line Road	Capacity, operations, and bicycle/pedestrian
Locally Funded Projects		
Interlocken Loop	96th Street to SH 128	Add two toll lanes
Jefferson Parkway	SH 128 at 96th Street to SH 93 at 64th Avenue	New four-lane road
Jefferson Parkway	Indiana Street/SH 128	New interchange
Jefferson Parkway	Candelas Parkway	New interchange
Jefferson Parkway	SH 72	New interchange
Nelson Road	75th Street to Affolter Drive	Widen from two to four lanes
SH 7	Boulder County Line to Sheridan Parkway	Widen from two to four lanes

Source: DRCOG 2050 RTP, 2021

The Transportation Improvement Program (TIP) assigns funding to transportation projects and implements the vision of the 2050 RTP. DRCOG develops a new program every two years and releases calls for projects every four years. Projects selected for inclusion in the TIP are limited by funds expected to be available. Projects selected to receive federal and state surface transportation funds and all regionally significant projects, regardless of funding type, are identified in the TIP. Table 17 lists the roadway projects included in the DRCOG 2022-2025 TIP.

Table 17: Funded Roadway Projects in 2022-2025 TIP

TIP ID	Title	Type	Project Description
2020-050	Industrial Lane and Nickel Street/Commerce Street Intersection Operational Improvements: Design	Roadway	Design for modifications of the three-way intersection to improve safety and reduce delay, including a coordinated traffic signal with US 287 and BNSF.
2020-081	SH 119 Corridor Safety/ Mobility Operational Improvements	Roadway	This project would address safety and mobility through operational and traffic improvements on the SH 119 corridor from Boulder to Longmont, including the intersection with SH 52. This includes study, design, and construction.
2020-075	SH 52 PEL Study: SH 119 to I-76	Roadway	Planning and Environmental Linkage study from SH 119 to I-76.
2020-007	SH 7 Preliminary and Environmental Engineering	Roadway	Develop preliminary and environmental engineering and identify right of way and utility needs on SH 7 from Folsom Street in Boulder to US 85 in Brighton.
2020-071	US 287/120th Avenue Multimodal & Safety Study	Roadway	Study to improve multimodal access, safety, and capacity from Alter Street to Lowell Boulevard.

Source: DRCOG 2022-2025 Transportation Improvement Program, April 2021

At-Grade Rail Crossings

Railway crossings are categorized by at-grade crossings and grade-separated crossings. At-grade crossings have the potential to impact traffic along the NWR Corridor. Gate closure times at the at-grade crossings impact traffic flow and congestion levels. Currently, gate closures occur when the BNSF freight trains pass. Current gate closure times for the freight trains are uncertain because the BNSF schedule is not readily available or routinely predictable. Three-car passenger trains' estimated gate closure time is approximately 30 to 60 seconds. Future traffic operations analysis could compare existing gate closure times and projected gate closure times during Peak Service periods.

Basic information was collected for each at-grade crossing. The existing conditions at each at-grade crossing are shown in Table 18.

Table 18: NWR Corridor At-Grade Crossing Characteristics

Street	Functional Classification	Replica HQ Volume (Average Daily Traffic)	# Lanes	Crossing Control Type	Median (Yes/No)	Pedestrian Crossing Condition	Lighting Location
Lowell Boulevard	Minor Arterial	2,200 – 3,400	2	Dual Gates	N	Fair	Both sides
72nd Avenue	Principal Arterial	14,300 – 21,500	4	Dual Gates	N	Good	East side only
Bradburn Boulevard	Collector	800 – 1,250	2	Dual Gates	N	Good	South side only
76th Avenue	Minor Arterial	2,700 – 4,100	2	Dual Gates	N	Good	East side only
80th Avenue	Principal Arterial	13,000 – 19,500	4	Dual Gates	N	Good	None
88th Avenue	Principal Arterial	26,500 – 39,500	5	Quad Gates	Y	Good	Both sides
Pierce Street	Collector	3,700 – 5,640	2	Dual Gates	Y	Poor	Both sides
Old Wadsworth Boulevard	Minor Arterial	8,000 – 12,000	2	Dual Gates	N	None	None
112th Avenue	Minor Arterial	6,100 – 9,000	2	Dual Gates	Y	None	West side only
120th Avenue	Collector	650 – 1,000	2	Dual Gates	Y	None	West side only
Nickel Street	Collector	4,000 – 6,000	5 Turn Lanes	Quad Gates	Y	Fair	None
Brainard Drive	Local	50 – 500	2	Quad Gates	N	None	None
Dillon Road	Minor Arterial	2,400 – 3,700	2	Dual Gates	Y	None	Both sides
Pine Street	Minor Arterial	8,600 – 13,000	2	Dual Gates	N	Good	Both sides
Griffith Street	Collector	200 – 1,000	2	Dual Gates	N	Fair	None
South Boulder Road	Principal Arterial	16,600 – 25,000	4	Quad Gates	Y	Good	Both sides
Baseline Road	Minor Arterial	14,000 – 21,500	2	Dual Gates	Y	None	None
63rd Street	Collector	890 – 1,300	2	Dual Gates	Y	None	North side only
55th Street	Collector	8,200 – 12,000	2	Dual Gates	Y	None	South side only
Pearl Parkway	Principal Arterial	16,700 – 25,000	4	Quad Gates	Y	High	Both sides
Valmont Road	Minor Arterial	18,000 – 27,000	4	Quad Gates	Y	Fair	Both sides
47th Street	Local	2,400 – 3,600	2	Dual Gates	Y	None	None
Independence Road	Local	200 – 1,000	2	Quad Gates	N	None	None
Jay Road	Local	6,600 – 9,900	2	Dual Gates	Y	Medium	Both sides
55th Street	Local	200 – 1,100	2	Dual Gates	Y	None	None

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Street	Functional Classification	Replica HQ Volume (Average Daily Traffic)	# Lanes	Crossing Control Type	Median (Yes/No)	Pedestrian Crossing Condition	Lighting Location
63rd Street	Minor Arterial	13,100 – 20,000	5	Quad Gates	Y	Good	Both sides
Mineral Road	Minor Arterial	13,000 – 19,500	3	Dual Gates	N	None	Both sides
Monarch Road	Local	300 – 1,000	2	Dual Gates	N	None	West side only
Niwot Road	Minor Arterial	6,000 – 9,100	2	Quad Gates	Y	High	Both sides
Second Avenue	Local	650 – 1,500	2	Dual Gates	N	Medium	East side only
83rd Street	Local	300 – 1,000	2	Dual Gates	N	None	East side only
Ogallala Road	Local	50 – 500	2	Dual Gates	N	None	None
Hover Street	Collector	11,000 – 16,800	4	Quad Gates	Y	Medium	Both sides
Sunset Street	Collector	3,200 – 4,800	3	Dual Gates	N	Low	Both sides
Ken Pratt Boulevard	Minor Arterial	42,000 – 63,000	4	Dual Gates	Y	Low	Both sides
Coffman Street	Local/Collector	300 – 1,000	2	Yield Sign	N	None	South side only

Gate closure times at the at-grade crossings impact traffic flow and congestion levels. Gate closure times for freight trains are substantially longer than the 30-60 second times projected for the three-car passenger trains because the trains are significantly longer than passenger trains and often travel at slower speeds. RTD estimates that there are between eight to 10 freight trains per day, and some of these trains may operate during peak times, including the Peak Service timeframes.

Grade-separated crossings do not impact local traffic and are therefore not described further in this report. The grade-separated crossings are:

- Sheridan Boulevard
- 92nd Avenue
- Church Ranch Parkway
- Wadsworth Boulevard
- US 36
- SH 128
- Wadsworth Parkway
- Northwest Parkway
- Courtesy Road
- 75th Street
- Arapahoe Road
- Foothills Parkway (south of Pearl Parkway)
- Foothills Parkway (north of Valmont Road)
- Pratt Parkway

Cross Streets and Signalized Intersections Near At-Grade Crossings

Turning movements on streets that cross the roads impacted by at-grade crossings can potentially be disrupted by the queue of vehicles backed up by the at-grade crossing. Existing conditions for these cross streets near the at-grade crossings are identified because these streets have the highest potential for disruption due to the traffic caused by the at-grade crossing. Two sets of data are listed: the nearest cross streets of any kind in both directions from the crossing and the two nearest signalized intersections in both directions. The control type and the classification of the nearest cross street are also listed. Types of control include signalized intersections, one-way stop control (OWSC), two-way stop control (TWSC), all-way stop control (AWSC), and yield signs. This data is summarized in Table 19 and Table 20

Table 19: Cross Streets Near At-Grade Crossings

Street	Nearest Cross Street 1* (Functional Class)	Cross Street 1 Distance (ft)	Cross Street 1 Control	Nearest Signal 1	Nearest Signal Distance (ft)	Nearest Cross Street 2* (Functional Class)	Cross Street 2 Distance (ft)	Cross Street 2 Control
Lowell Boulevard	71st Place (N) (Local)	250	OWSC	72nd Avenue	500	Creekside Drive (S) (Local)	1000	TWSC
72nd Avenue	72nd Way (E) (Local)	80	Yield	Bradburn Boulevard	500	Newton Street (W) (Local)	75	OWSC
Bradburn Boulevard	72nd Way (N) (Local)	70	OWSC	N/A	N/A	72nd Avenue (S) (Arterial)	400	OWSC
76th Avenue	Stuart Street (E) (Local)	300	TWSC	Lowell Boulevard	3400	Winona Court (W) (Local)	250	TWSC
80th Avenue	Tennyson Street (E) (Local)	200	OWSC	US 36	2300	Wolff Street (W) (Local)	70	OWSC
88th Avenue	Harlan Street (E) (Collector)	300	Signal	Harlan Street	300	Lamar Drive (W) (Collector)	620	Signal
Pierce Street	91st Avenue (N) (Local)	550	TWSC	92nd Avenue	1400	Unnamed Driveway (S)	550	TWSC
Old Wadsworth Boulevard	93rd Place (N) (Local)	250	TWSC	96th Avenue	2000	Unnamed Driveway (S)	400	TWSC
112th Avenue	Reed Way (E) (Local)	700	Signal	Reed Way	700	Wadsworth (W) (Collector)	400	Signal
120th Avenue	US 287 (E) (Arterial)	500	OWSC	N/A	N/A	Colemans Wy (W) (Local)	100	OWSC
Nickel Street	US 287 (N) (Arterial)	100	Signal	US 287	100	Industrial Lane/ Commerce Street (Arterial)	100	Stop/ Yield
Brainard Drive	Midway Boulevard (N) (Collector)	40	OWSC	N/A	N/A	N/A	N/A	N/A
Dillon Road	Pierce Avenue (E) (Collector)	430	Signal	Pierce Avenue	430	96th Street (W) (Collector)	1400	Signal

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Street	Nearest Cross Street 1* (Functional Class)	Cross Street 1 Distance (ft)	Cross Street 1 Control	Nearest Signal 1	Nearest Signal Distance (ft)	Nearest Cross Street 2* (Functional Class)	Cross Street 2 Distance (ft)	Cross Street 2 Control
Pine Street	East Street (E) (Local)	400	OWSC	Courtesy Road	600	Front Street (W) (Local)	200	AWSC
Griffith Street	Front Street (E) (Local)	130	TWSC	N/A	N/A	Main Street (W) (Local)	230	OWSC
South Boulder Road	Cannon Circle (E) (Local)	680	TWSC	Courtesy Road	1100	Main Street (W) (Local)	50	Signal
Baseline Road	Applewood Drive (E) (Local)	430	OWSC	Courtesy Road	3000	Elgin Drive (W) (Local)	450	OWSC
63rd Street	Power Plant driveway (N) (Local)	100	OWSC	Valmont Road	6000	Arapahoe Avenue (S) (Arterial)	650	Signal
55th Street	Central Avenue (N) (Collector)	380	TWSC	Central Avenue	380	Western Avenue (S) (Local)	200	OWSC
Pearl Parkway	Frontier Avenue (E) (Local)	900	TWSC	Northbound 157 Ramp	1300	Junction Place (W) (Collector)	470	Signal
Valmont Road	Wilderness Place (E) (Collector)	250	Signal	Wilderness Place	250	34th Street (W) (Collector)	250	Signal
47th Street	Diagonal Highway (N) (Arterial)	780	Signal	SH 119	780	Mitchell Lane (E) (Local)	350	TWSC
Independence Road	N/A	N/A	N/A	N/A	N/A	SH 119 (W) (Arterial)	130	TWSC
Jay Road	55th Street (E) (Local)	1900	N/A	Spine Rd	4500	SH 119 (W) (Arterial)	150	Signal
55th Street	SH 119 (N) (Arterial)	160	TWSC	N/A	N/A	Pioneer Road (S) (Local)	350	N/A
63rd Street	SH 119 (N) (Arterial)	180	Signal	N/A	N/A	Lookout Road (S) (Arterial)	760	Signal
Mineral Road	SH 119 (N) (Arterial)	125	Signal	N/A	N/A	71st Street (S) (Local)	700	OWSC

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Street	Nearest Cross Street 1* (Functional Class)	Cross Street 1 Distance (ft)	Cross Street 1 Control	Nearest Signal 1	Nearest Signal Distance (ft)	Nearest Cross Street 2* (Functional Class)	Cross Street 2 Distance (ft)	Cross Street 2 Control
Monarch Road	Secretariat Drive (E) (Local)	1200	N/A	N/A	N/A	SH 119 (W) (Arterial)	160	TWSC
Niwot Road	Peppertree Drive (E) (Local)	250	OWSC	N/A	N/A	SH 119 (W) (Arterial)	155	Signal
Second Avenue	Murray Street (E) (Local)	1200	OWSC	N/A	N/A	SH 119 (W) (Arterial)	170	OWSC
83rd Street	Unnamed Driveway (N)	720	OWSC	N/A	N/A	SH 119 (W) (Arterial)	130	OWSC
Ogallala Road	LOBO Regional Trail (N)	300	N/A	N/A	N/A	SH 119 (W) (Arterial)	130	OWSC
Hover Street	Unnamed driveway (N)	300	N/A	Ken Pratt Boulevard	1000	Pike Road (S) (Arterial)	300	Signal
Sunset Street	Ken Pratt Boulevard (N) (Arterial)	120	Signal	N/A	N/A	Kansas Avenue (S) (Collector)	250	OWSC
Ken Pratt Boulevard	Sherman Street (E) (Collector)	450	TWSC	Bowen Street	1475	Nelson Road (W) (Collector)	240	Signal
Coffman Street	Second Avenue (N) (Arterial)	560	TWSC	Third Avenue	1325	First Avenue (S)	30	OWSC

*Cross Street 1 is either north (N) or east (E) of the crossing, while Cross Street 2 is either south (S) or west (W) of the crossing.
TWSC = two-way stop control; OWSC = one way stop control; AWSC = all-way stop control; N/A = Not Applicable

Table 20: Signals Nearest the At-Grade Crossings

Street	Nearest Signal 1*	Distance	Nearest Signal 2*	Distance
Lowell Boulevard	72nd Avenue	500	68th Avenue	1,800
72nd Avenue	Bradburn Boulevard	500	Raleigh Street	800
Bradburn Boulevard	N/A	N/A	N/A	N/A
76th Avenue	Lowell Boulevard	3,400	Sheridan Boulevard	1,900
80th Avenue	US 36	2,300	Sheridan Boulevard	1,500
88th Avenue	Harlan Street	300	Lamar Drive	620
Pierce Street	92nd Avenue	1,400	88th Avenue	1,800
Old Wadsworth Boulevard	96th Avenue	2,000	92nd Avenue	920
112th Avenue	Reed Way	700	Wadsworth Boulevard	400
120th Avenue	N/A	N/A	N/A	N/A
Nickel Street	US 287	100	N/A	N/A
Brainard Drive	N/A	N/A	N/A	N/A
Dillon Road	Pierce Avenue	430	96th Street	1,400
Pine Street	Courtesy Road	600	N/A	N/A
Griffith Street	N/A	N/A	N/A	N/A
South Boulder Road	Courtesy Road	1,100	Main Street	50
Baseline Road	Courtesy Road	3,000	76th Street	9,000
63rd Street	Valmont Road	6,000	Arapahoe Avenue	650
55th Street	Central Avenue	380	Arapahoe Avenue	1,400
Pearl Parkway	N. Bound 157 Ramp	1,300	Junction Place	900
Valmont Road	Wilderness Place	250	34th Street	250
47th Street	SH 119	780	Valmont Road	2,700
Independence Road	N/A	N/A	N/A	N/A
Jay Road	Spine Road	4,500	SH 119	150
55th Street	N/A	N/A	N/A	N/A
63rd Street	N/A	N/A	Lookout Road	760

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Street	Nearest Signal 1*	Distance	Nearest Signal 2*	Distance
Mineral Road	N/A	N/A	79th Street	6,800
Monarch Road	N/A	N/A	N/A	N/A
Niwot Road	N/A	N/A	SH 119	155
Second Avenue	N/A	N/A	N/A	N/A
83rd Street	N/A	N/A	N/A	N/A
Ogallala Road	N/A	N/A	SH 119 SB	550
Hover Street	Ken Pratt Boulevard	1,000	Pike Road	300
Sunset Street	N/A	N/A	N/A	N/A
Ken Pratt Boulevard	Bowen Street	1,475	N/A	N/A
Coffman Street	Third Avenue	1,325	N/A	N/A

*Cross Street 1 is either north (N) or east (E) of the crossing, while Cross Street 2 is either south (S) or west (W) of the crossing.

Parking

Parking is an important component of the transportation network, as commuters who use transit need a place to park their vehicle in most suburban environments. Existing residential and commercial development generally has adequate parking for residents, employees, or customers throughout the corridor. As growth continues, new developments would be anticipated to add adequate parking to accommodate demand. The following provides more detail about the station areas regarding existing public and transit parking.

- **Downtown Westminster Station**: Westminster has actively worked to redevelop the former Westminster Mall into its new downtown Westminster development. Many of the streets would provide on-street parking. The City is working with RTD to provide parking spaces for transit users at the Downtown Westminster Station. The rail station would be approximately one-half mile west of the existing US 36 & Sheridan Station, providing over 1,300 parking spaces for transit users.
- **Broomfield – 116th Station**: West of the rail line along Wadsworth Boulevard, many new multi-family residential developments have already been constructed or are in the planning phase. The area comprises light industrial/warehouse land uses east of the rail line. The City and County of Broomfield are working with RTD to provide potential parking spaces for transit users on both sides of the corridor.
- **Flatiron Station**: The Flatiron Station currently serves the Flatiron Flyer and AB Routes at the US 36 & Flatiron bus station. The lot on the north side of US 36 has 264 parking spaces and is well utilized, mostly by employees and travelers to Denver International Airport using Route AB. RTD owns additional land at this station that may be required for parking lot expansion to accommodate rail customers at this station.
- **Downtown Louisville Station**: Louisville added several new visitor parking areas on both sides of the rail line in recent years. However, these spaces are often heavily utilized on weekends and weekday evenings. There may be a need, and some opportunities, to utilize some shared parking spaces that may be used for transit users on weekdays and visitors on weekends. Still, additional parking would be considered at this station location.
- **Boulder Junction at Depot Square Station**: Boulder has nearly completely redeveloped the area west of the rail line, now called Boulder Junction at Depot Square. The City worked with RTD to build an underground bus facility with six bus bays and parking. There are 75 parking spaces dedicated to transit patrons in this facility. A small amount of accessible parking may be needed closer to the rail platform, located approximately one-quarter mile north of the existing bus/parking facility at this station site.
- **Downtown Longmont Station**: Longmont worked with RTD to develop plans for a bus station and parking structure for transit customers between the extended Coffman Street and US 287/Main Street with 101 parking spaces. This would be located close to the rail platform and is expected to become the transit hub in downtown Longmont.

Next Steps

Based on a review of the data collected, most of the at-grade crossings have existing conditions that do not cause concern about traffic impacts due to the operation of Peak Service. A field visit to the at-grade crossings with higher congestion levels is advised and could be conducted as part of the future traffic operations analysis.

Each of the six new stations is expected to generate new roadway trips to and from the station. Exact trip generation numbers will be refined further in the traffic operations analysis conducted in the next project development phase as the project description is defined. Each station access driveway will be studied more deeply, along with nearby intersections based on congestion and expected trips.

To advance analysis in the next phase, existing turning movement counts and other data will be requested from municipalities.

The Study Team may order counts for future traffic operations analysis if there are still significant data gaps. 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. During NEPA, additional analysis will occur based on an increased level of detail and any new data that may be available. Traffic mitigation measures at stations would be considered near stations, as warranted.

Transit, Bicycle, and Pedestrian Systems

Brief Description of Resource Studied

With the implementation of the Peak Service, it is reasonable to expect increased transit ridership in RTD's northwest service area (northwest area). In a region experiencing rapid and significant population and economic growth, the worsening effects of climate change, along with federal and local agency policy decisions that are driving programs to seek environmentally conscious decisions, the promotion of transit will continue to be an increasing priority.

Even with increased traffic congestion and worsening environmental conditions, travel demands are not decreasing. RTD's Quality of Life State of the System (RTD, 2020) report states that in 2018, 21% of lane miles on major roadways in the Denver Metropolitan Area (1,489 miles) were congested for three or more hours on an average weekday. A typical vehicle spent 16% of its travel time in delayed conditions; in 2019, there were over 77 million vehicle hours of delay. Transit investments such as the NWR Corridor provide options for travelers and reduce trips along the roadway system.

This section outlines the past, current, and future conditions of transit service, the bicycle and pedestrian networks surrounding the six new NWR stations, and how current and future transit conditions would interact with the NWR Peak Service. The information provided in this section has been summarized from the *Transit Corridor Context Report* (Appendix B).

Agencies Involved

RTD is the primary regional transit provider within the NWR Corridor; however, local agencies within the NWR Corridor also provide some public transit services to residents. Local agencies also implement and maintain bicycle and pedestrian networks within the NWR Corridor.

Relevant Regulations, Guidance, Studies, and Plans

Previous studies used in this analysis include the Final NWR Corridor EE, the 2014 Northwest Area Mobility Study, the Reimagine RTD SOP (RTD, 2022), and other local transportation planning documents. Relevant regulations include 1994 Title VI of the Civil Rights Act of 1964, as amended FHWA Order 6640.23A on

Environmental Justice, and the FTA Circular 4702.1B, Title VI Requirements and Guidelines for Federal Transit Administration Recipients (FTA, 2012).

Data Collection/Methodology

Existing transit routes, frequency, and ridership information are included to describe the transit services available to riders and the existing transit demand within the study area. The Study Team identified the following:

- Existing transit service in the corridor, including FLEX Service
- Maintenance facilities in the corridor
- Rail freight service in the corridor
- Existing bicycle and pedestrian facilities in the corridor

Findings/Results

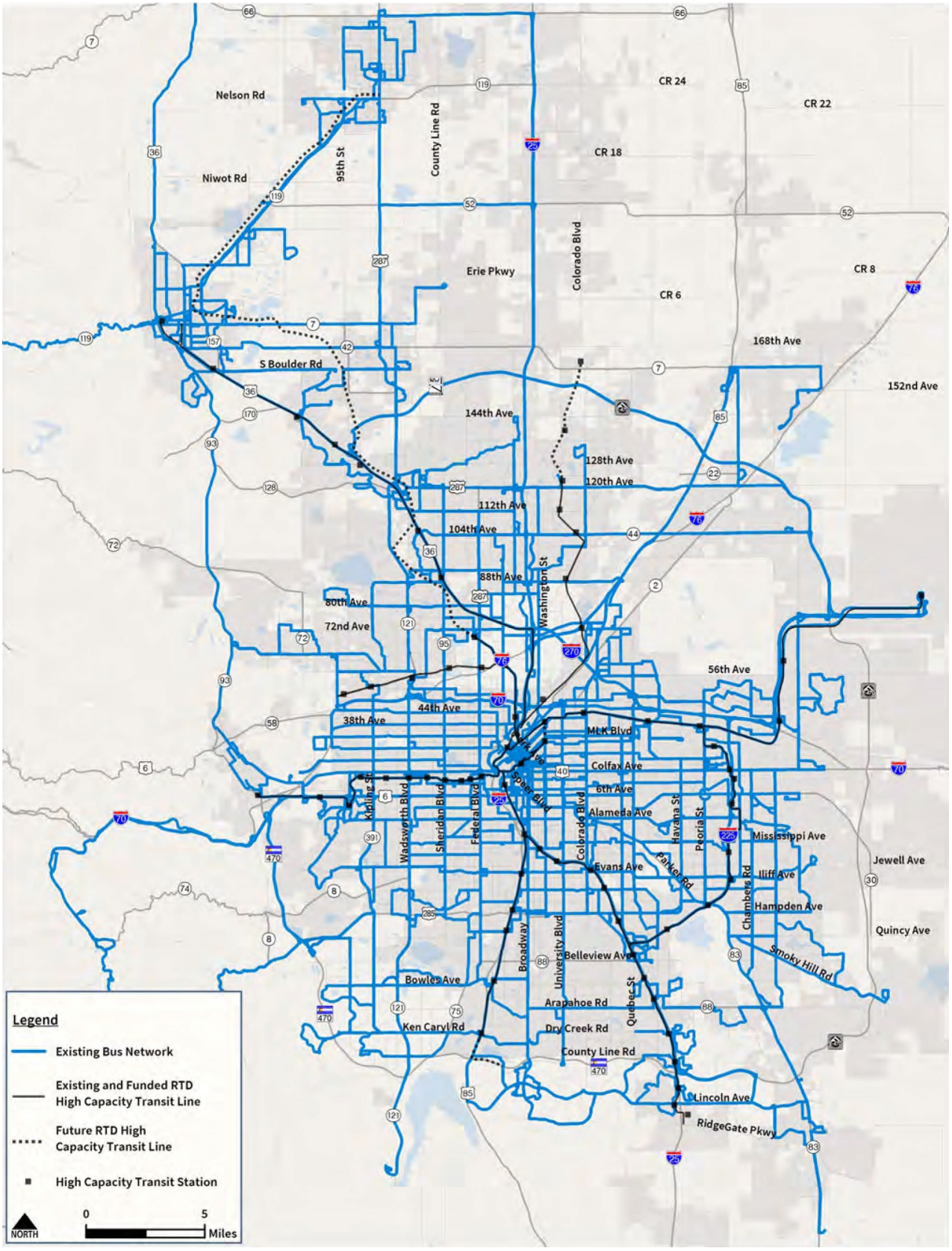
Existing Transit Network

Regionally, the greater Denver, Boulder, and Longmont areas have amateur grid-based transit systems (

Figure 21). The areas along the NWR Corridor have experienced significant growth in the last decade, which is predicted to continue. The area also sees high levels of people commuting by car as people drive to work and home along US 36 and I-25, contributing to undesirable traffic congestion in peak commuting times. Transit is in demand with increased population and travel demand in the region.

First- and last-mile connections provide important links to transit. Personal and shared E-bikes and e-scooters have helped fill some first-mile/last-mile gaps. These conveyances (particularly personal) are expected to expand in the service area and the metropolitan Denver area. In addition, many communities along the NWR Corridor have FlexRide, a curb-to-curb service operated by RTD where residents can reserve a ride and be picked up at any location within the service area.

Figure 21: RTD 2019 Regional Transit Network



Source: RTD Regional BRT Network Feasibility Study

Corridor Conditions Report

The following sections outline the existing transit services and routes in the northwest area that would support Peak Service.

Regional Express Routes

The current regional bus routes that parallel the NWR Corridor are described below. There are patterns of the Flatiron Flyer and Route LD to be reinstated with the SOP, as well as the change of the BOLT (and J) into the CO119 BRT project. These routes are described in the following sub-section.

Flatiron Flyer: The RTD Flatiron Flyer is one of the most successful bus services in terms of regional connectivity and ridership in the northwest area and connects Boulder to Denver. These routes are in proximity and could provide connections to several NWR stations (Downtown Westminster, Broomfield – 116th, and the existing Boulder Junction at Depot Square Bus Station). The Flatiron Flyer operates seven routes; however, four routes have been suspended due to COVID. The three routes currently in service include:

- Route FF1: Serves all stations all day, every 15 minutes during peak periods and every 30 minutes during off-peak periods
- Route FF3: Operates from Broomfield to Denver Union Station every 15 minutes during peak periods
- Route FF5: Operates from Downtown Boulder Station to Anschutz during peak periods

The FF Routes would service the US 36 & Sheridan Stations, Boulder Junction at Depot Square Bus Station, and US 36 & Broomfield Stations providing direct connections to the NWR Corridor.

BOLT: The BOLT Route runs from Boulder to Longmont and serves stops along SH 119. The BOLT operates every 30 minutes during peak periods and hourly during off-peak periods.

LD/LD1/LD3 Routes: Currently, RTD operates the LD, LD1, and LD3 Routes from Longmont to Denver with 13 stops. The LD provides north-south regional connectivity along US 287 with service to Broomfield, Lafayette, and Erie. This route departs Union Station, connects to US 287 at Broomfield, and arrives at 23rd and Main Street only twice daily during evening peak hours. It departs peak stations hourly all day during the week and weekend. The LD would provide a connection to the Downtown Longmont Station.

FLEX: FLEX provides express transit between Boulder, Longmont, Loveland, and Fort Collins. FLEX is operated by TransFort and provides connections to the Boulder Junction at Depot Square Station and the Downtown Longmont Station. The FLEX Boulder Express services the following limited stops:

- Fort Collins: Downtown Transit Center, All MAX Stations, Colorado State University, and South Transit Center
- Loveland: 8th Street
- Longmont: Downtown Longmont and Village at the Peaks Mall
- Boulder: Boulder Junction Bus Service Area, Downtown Boulder, and University of Colorado

A one-way trip from Fort Collins to Boulder on this bus service takes approximately 90 minutes.

FlexRide Service

FlexRide provides extended bus service in specific Denver Metropolitan Area, delivering first- and last-mile connections to other RTD Park-n-Rides and stations, medical centers, and business parks. Similar to a ride share, FlexRide is available to the general public. Reservations can be made up to 30 days in advance and as little as ten minutes prior to pick-up time, based on availability. Advanced reservations are recommended, as space is available on a first-come, first-served basis. For timed meets at RTD stations or Park-n-Rides, no reservations are needed. All 24 FlexRide zones operate Monday through Friday, generally from 5:30 a.m. to 7:00 p.m.

Routes Serving New NWR Rail Stations

Downtown Westminster Station: The Downtown Westminster Station is relatively well connected to transit. The transit routes near the Downtown Westminster Station are shown in Figure 22 and Table 21.

Figure 22: Existing Transit Service in Area Near Downtown Westminster Station

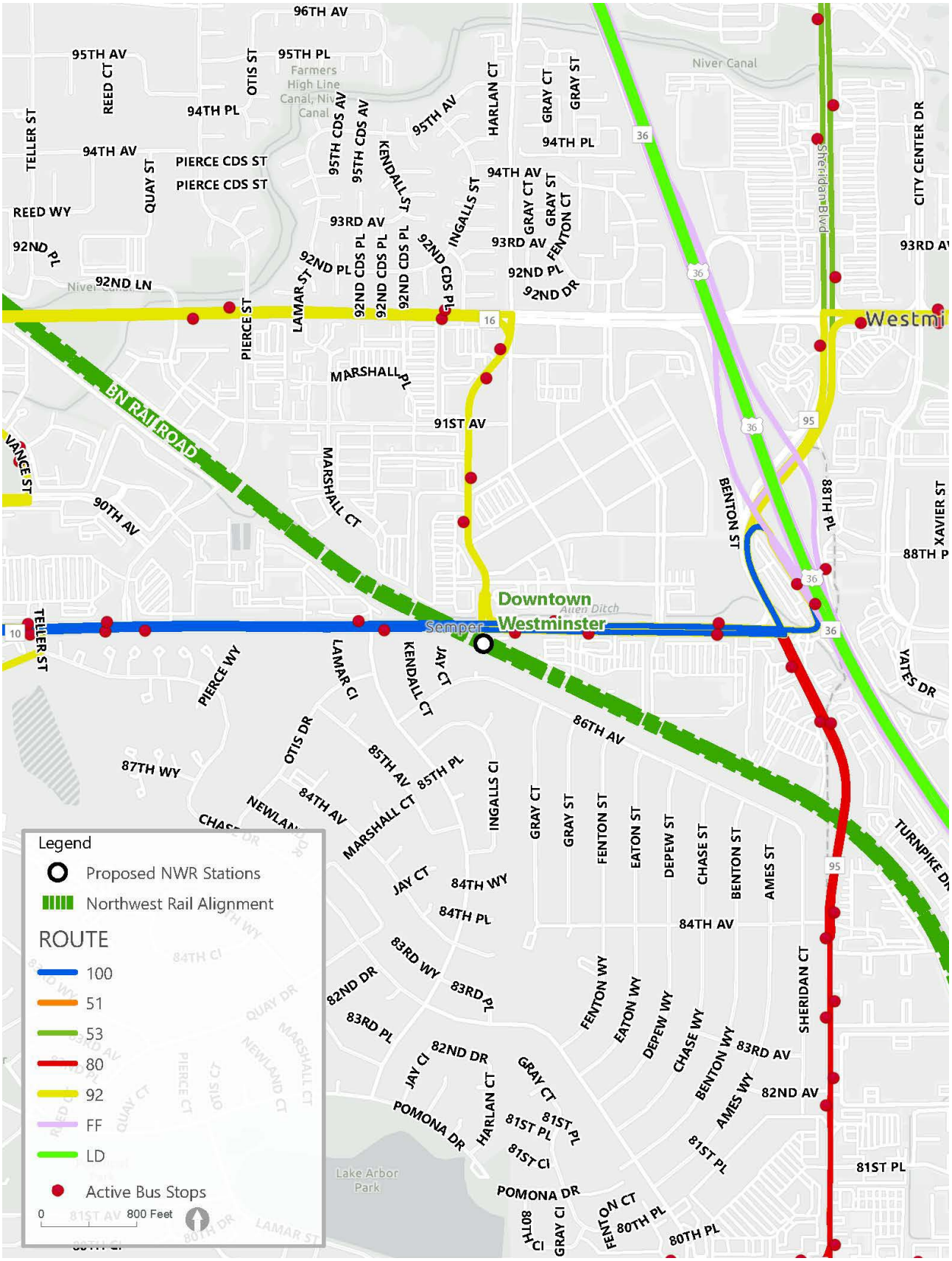


Table 21: Existing Transit Service in Area Near Downtown Westminster Station

Route	Station/Stop	Weekday Peak Headways	Weekday Off-Peak Headways	Saturday Headways	Sunday Headways
51	US 36 & Sheridan	30 minutes	30 minutes	30 minutes	30 minutes
53	US 36 & Sheridan	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	N/A	N/A
92	US 36 & Sheridan	30 minutes	30 minutes	30 minutes	60 minutes
100	US 36 & Sheridan	60 minutes	60 minutes	60 minutes	N/A
FF1	US 36 & Sheridan	15 minutes	15 minutes	15 minutes	30 min
FF5	US 36 & Sheridan	3 eastbound and 1 westbound trip in AM & 3 westbound trips in PM	N/A	N/A	N/A
FF7	US 36 & Sheridan	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	N/A	N/A

Note: Routes shown are RTD routes unless otherwise noted.
FF = Flatiron Flyer

Broomfield – 116th Station: The Broomfield – 116th Station is easily accessible from few nearby transit stops. The routes near the Broomfield – 116th Station are shown in Figure 23 and Table 22.

Figure 23: Existing Transit Service in Area Near Broomfield – 116th Station

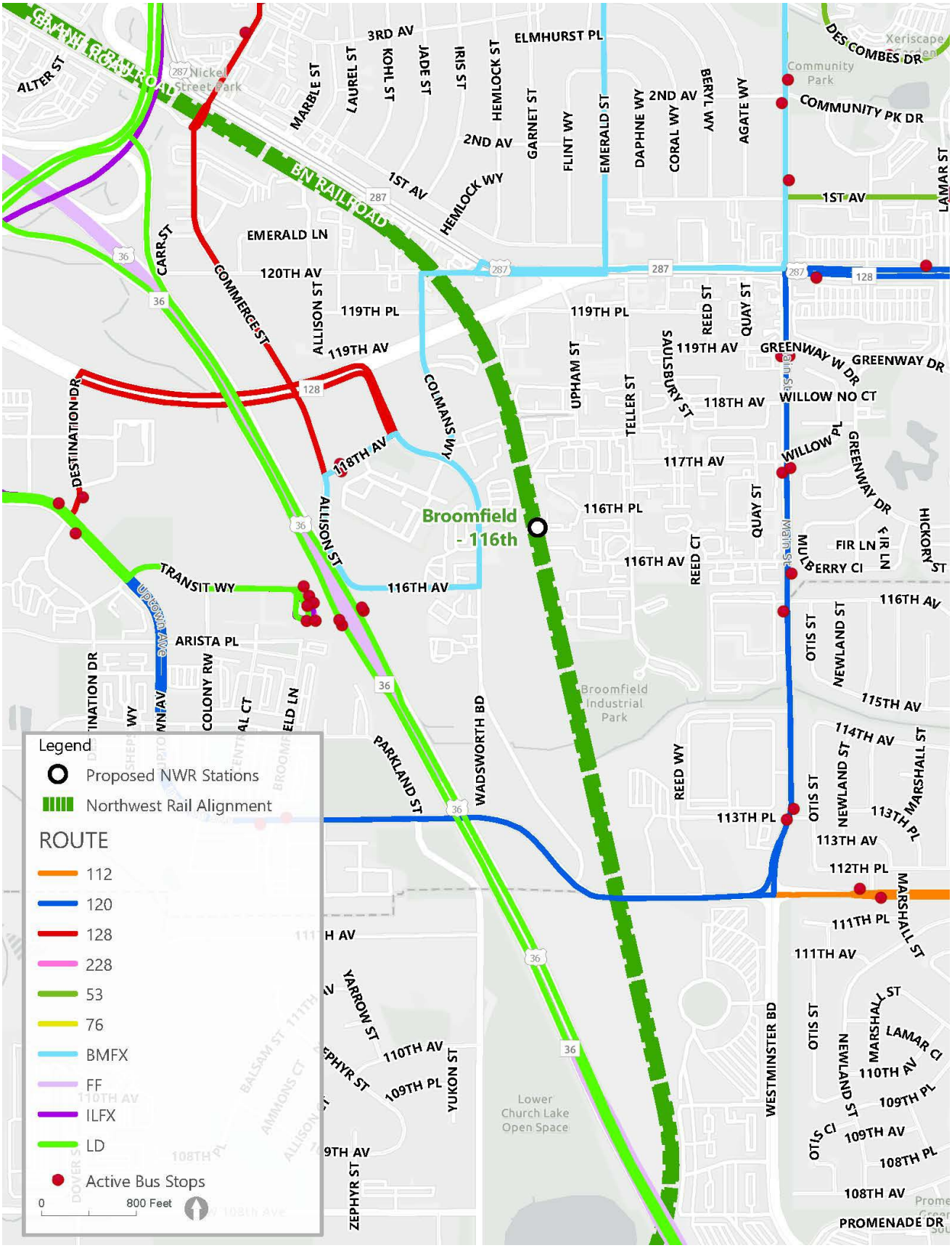


Table 22: Existing Transit Service in Area Near Broomfield – 116th Station

Route	Station/Stop	Weekday Peak Headways	Weekday Off-Peak Headways	Saturday Headways	Sunday Headways
76	US 36 & Broomfield	30 minutes	30 minutes	30 minutes	60 minutes
112	US 36 & Broomfield	60 minutes	60 minutes	60 minutes	60 minutes
120/120E/ 120W	US 36 & Broomfield	30 minutes	60 minutes	60 minutes	60 minutes
FF1	US 36 & Broomfield	15 minutes	15 minutes	15 minutes	30 minutes
FF3	US 36 & Broomfield	2 eastbound and 2 westbound trips in PM	N/A	N/A	N/A
FF4	US 36 & Broomfield	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	N/A	N/A
FF5	US 36 & Broomfield	3 Eastbound and 1 Westbound trip in AM & 3 westbound trips in PM	N/A	N/A	N/A
LD/LD3	US 36 & Broomfield	for LD – 2 Eastbound trips in AM & 2 Westbound trips in PM	N/A	N/A	N/A
	US 36 & Broomfield	LD3 – 60 minutes	120 minutes	N/A	N/A

Note: Routes shown are RTD routes unless otherwise noted.
FF = Flatiron Flyer

Currently, the Interlocken/Westmoor FlexRide serves the bus station.

Flatiron Station: The Flatiron Station is well connected to regional transit, as the AB and FF Routes connect to the US 36 & Flatiron Station, which is very close to the new Flatiron Station. The routes near the Flatiron Station are shown in Figure 24 and Table 23.

Figure 24: Existing Transit Service in Area Near Flatiron Station

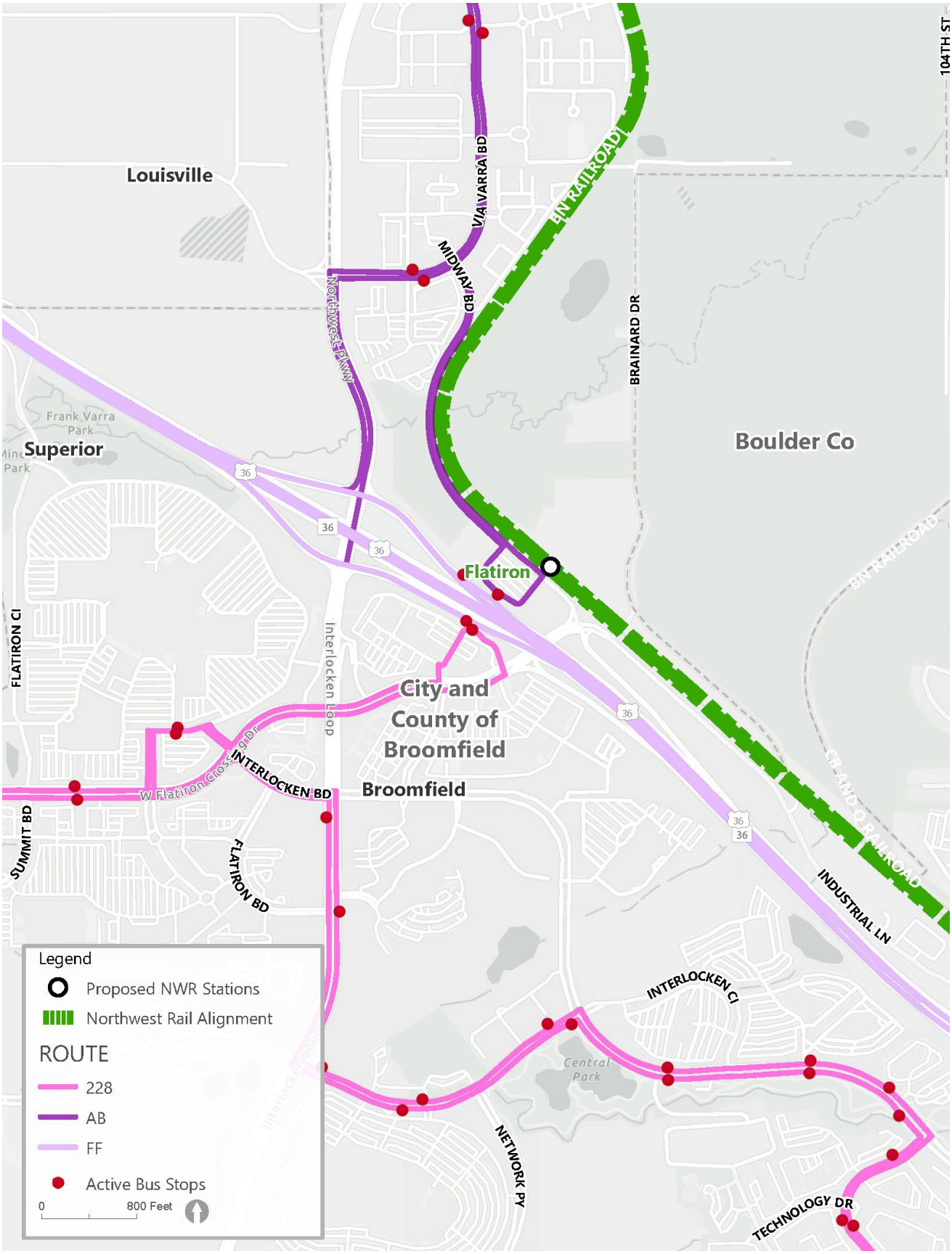


Table 23: Existing Transit Service in Area Near Flatiron Station

Route	Station/Stop	Weekday Peak Headways	Weekday Off-Peak Headways	Saturday Headways	Sunday Headways
228	US 36 & Flatiron	60 minutes	60 minutes	60 minutes	60 minutes
AB	US 36 & Flatiron	30 minutes	30 minutes	30 minutes	30 minutes
FF1	US 36 & Flatiron	15 minutes	15 minutes	15 minutes	30 minutes
FF4	US 36 & Flatiron	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	N/A	N/A

Note: Routes shown are RTD routes unless otherwise noted.
FF = Flatiron Flyer

Currently, the Interlocken/Westmoor and Louisville FlexRides serve the BRT station.

Downtown Louisville Station: The DASH serves Downtown Louisville, which provides local connectivity and connection to the 228. The DASH has several stops along Main Street within a short walking or biking distance from Downtown Louisville Station. The routes near the Downtown Louisville Station are shown in Figure 25 and Table 24. It should be noted that in the SOP, Route 228 will be extended north on 95th Street to Arapahoe Road, which is not illustrated on the existing route map.

Figure 25: Existing Transit Service in Area Near Downtown Louisville Station

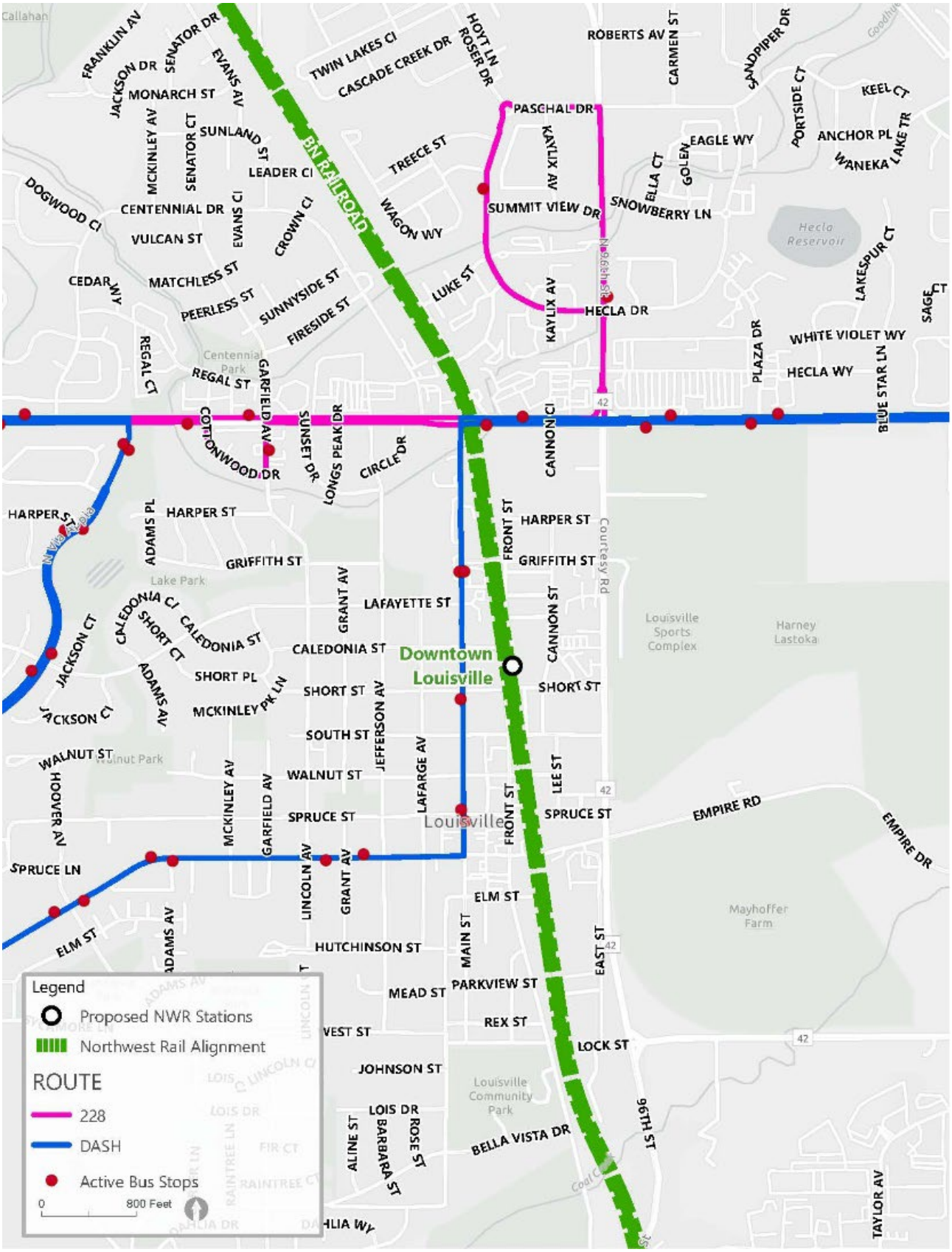


Table 24: Existing Transit Service in Area Near Downtown Louisville Station

Route	Station/Stop	Weekday Peak Headways	Weekday Off-Peak Headways	Saturday Headways	Sunday Headways
228	Garfield & South Boulder Road (northbound Only)	60 minutes	60 minutes	60 minutes	60 minutes
	SH 42/Hecla Drive(northbound Only)				
DASH	Main & Spruce	30 minutes	30 minutes	60 minutes	60 minutes

Note: Routes shown are RTD routes unless otherwise noted.

Currently, the Louisville FlexRide serves this area.

Boulder Junction at Depot Square Station: Boulder Junction at Depot Square is already well connected to transit stops and routes. Currently, there is an underground bus concourse with six bus bays and four on-street stops (two on 30th Street and two on Pearl Street) at the Boulder Junction at Depot Square Station. Pedestrians can access the underground bus bays via the Paseo pedestrian breezeway and the Goose Creek Bridge. The routes near the Boulder Junction at Depot Square Station are shown in Figure 26 and Table 25.

Figure 26: Existing Transit Service in Area Near Boulder Junction at Depot Square Station

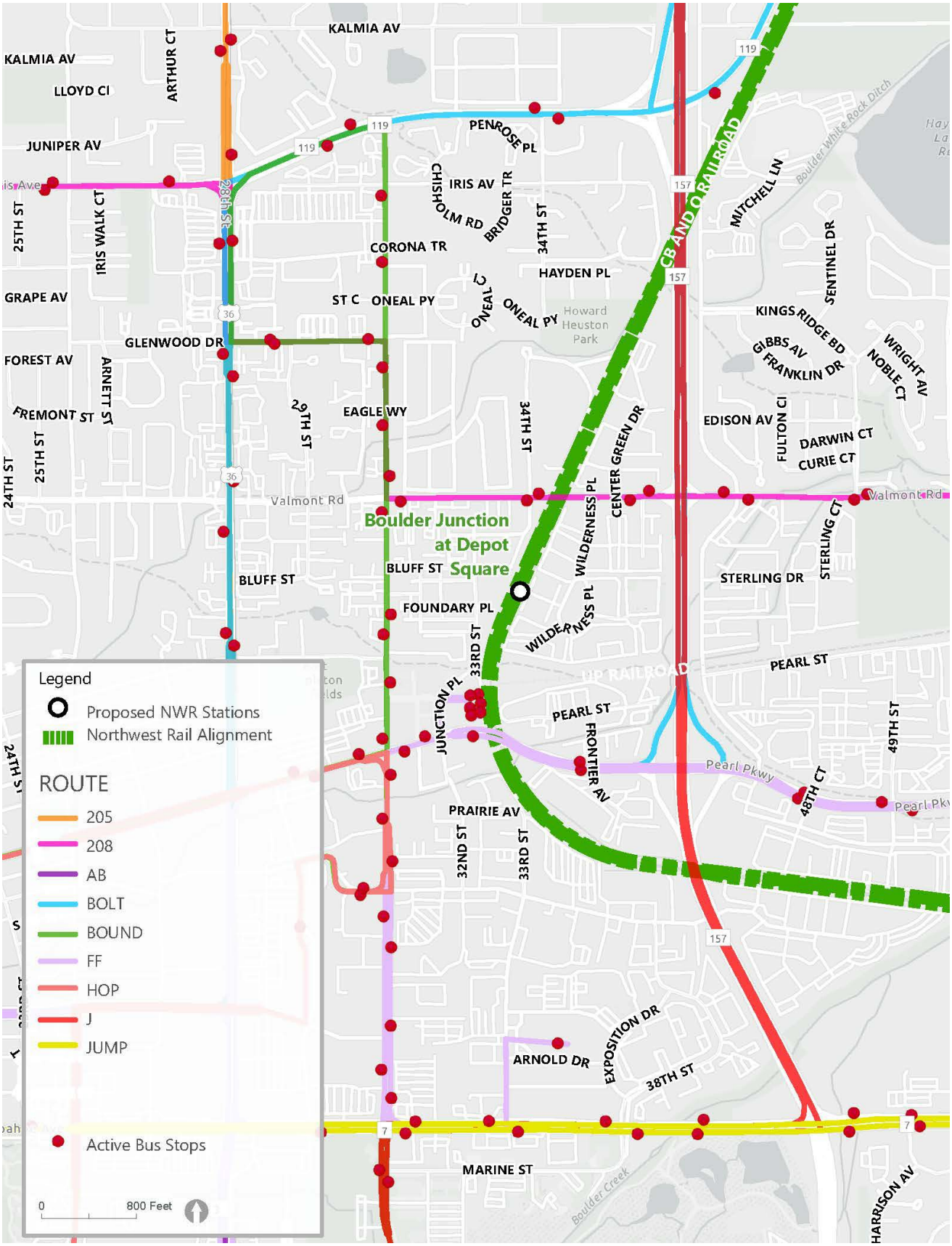


Table 25: Existing Transit Service in Area Near Boulder Junction at Depot Square Station

Route	Station/Stop	Weekday Peak Headways	Weekday Off-Peak Headways	Saturday Headways	Sunday Headways
208	Valmont/34th Street				
BOLT	Downtown Boulder Station (On-Street Stop)	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED
BOUND	Boulder Junction (Rail Station) (On-Street Stop)	15 minutes	15 minutes	30 minutes	30 minutes
HOP (City of Boulder)	Boulder Junction (Rail Station) (On-Street Stop)	12 minutes	15 minutes	15 minutes	23 minutes
AB	Boulder Junction Bus Service Area (Underground Bus Bay)	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED
FF4	Boulder Junction Bus Service Area (Underground Bus Bay)	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	N/A	N/A

Note: Routes shown are RTD routes unless otherwise noted.
FF = Flatiron Flyer

Note that Route 205 is shown in Figure 26, but this route does not serve Boulder Junction at Depot Square.

Downtown Longmont Station: Similar to the Boulder Junction at Depot Square Station, this stop is in a populated urban area with several established existing stops and routes. Longmont is also served by RTD's FlexRide service, which provides on-demand transit service to customers within a 48-square-mile area. The routes near the Downtown Longmont Station are shown in Figure 27 and Table 26.

Figure 27: Existing Transit Service in Area Near Downtown Longmont Station

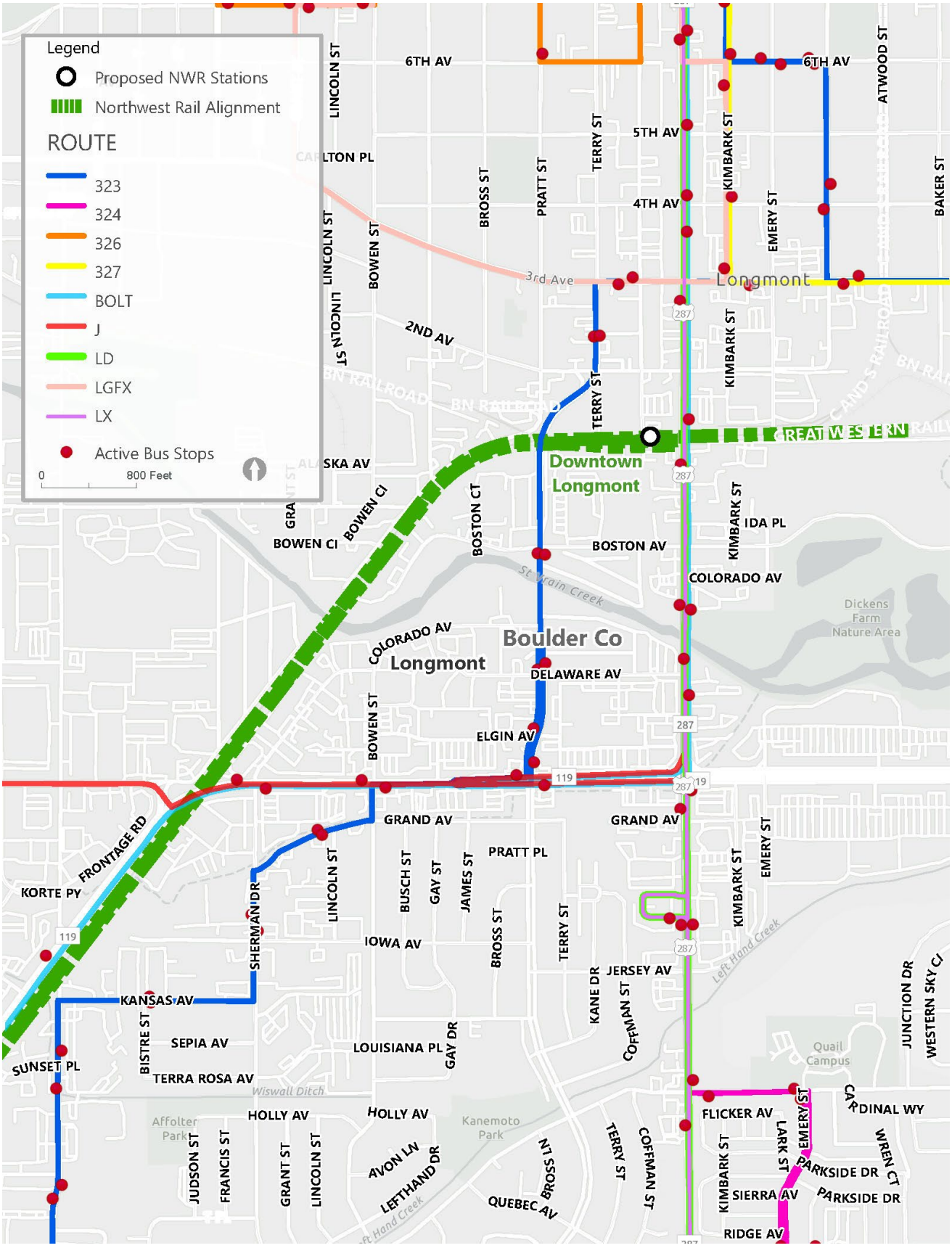


Table 26: Existing Transit Service in Area Near Downtown Longmont Station

Route	Station/Stop	Weekday Peak Headways	Weekday Off-Peak Headways	Saturday Headways	Sunday Headways
323	Ken Pratt & Pratt 3rd & Coffman	60 minutes	60 minutes	60 minutes	N/A
324	1st & Main	30 minutes	30 minutes	60 minutes	60 minutes
326	8th & Coffman Park-n-Ride	30 minutes	30 minutes	60 minutes	n/a
327	8th & Coffman Park-n-Ride	60 minutes	60 minutes	60 minutes	n/a
BOLT 1 (Future SH 119 BRT)	1st & Main	30 minutes	60 minutes	60 minutes	60 minutes
LD/LD1/LD3	1st & Main	Combined headway 30 minutes (AM southbound and PM northbound)	60 minutes	Combined headway 120 minutes	N/A
LX1/LX2	1st & Main	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	N/A	N/A

Note: Routes shown are RTD routes unless otherwise noted.

Currently, the Longmont FlexRide serves this area.

Existing Ridership

The COVID-19 pandemic impacted transit ridership for RTD. In 2019, pre-pandemic, RTD saw an annual total system transit ridership of 105,824,000. On April 19, 2020, service hours for all of RTD's services were reduced by approximately 40%, which was a result of a significant decline across all service types due to stay-at-home orders in response to the COVID-19 pandemic, resulting in a total annual transit system ridership of 52,617,000 in 2020. RTD saw a negative 56% change in total annual light rail ridership from 2019 to 2020 and a negative 48% change in annual commuter rail ridership from 2019 to 2020.

In 2022, ridership demonstrated signs of recovery. RTD reports that the ridership between 2021 (January to June) and 2022 (January to June) in all revenue services (bus, access-a-ride, light rail, and commuter rail) rose by 39%. The Flatiron Flyer alone saw a positive 62% change in this same date range, and combined commuter rail services saw a positive 40% change. This suggests that a return to higher ridership for RTD services is likely, and an increase in demand for more regional connectivity could be expected.

Ridership in Northwest Area

Like many of the transit services in the region, the Flatiron Flyer saw a large decline in service hours and routes. As mentioned previously, four of the seven routes have been suspended. In 2019, pre-pandemic, the Flatiron Flyer had a total ridership of over 3 million, whereas in 2020, ridership was only just over 1 million. In 2021, Flatiron Flyer annual ridership was 817,000, and between January and June of 2021, it was 304,000. Between January and June 2022, ridership on the Flatiron Flyer was 492,000, a 62% increase from 2021 in the same period.

In its first year of service, pre-pandemic, the N Line was projected to carry over two million riders annually. In 2021, ridership was only 763,000 riders annually. However, in the first half of 2022, ridership has increased. In 2021 and 2022, between January and June, the N Line had a ridership of 294,000 and 447,000, respectively, a 52% increase year over year from 2021 to 2022.

In January 2022, Flatiron Flyer had 63,000 monthly boardings, a 55% increase from 2021. The N Line had 62,000 monthly boardings, and the B Line had 10,000 monthly boardings in January 2022. According to the RTD Regional BRT Feasibility Study, the Flatiron Flyer had the second most annual boardings, surpassed only by transit on the East Colfax corridor.

Future Transit Network

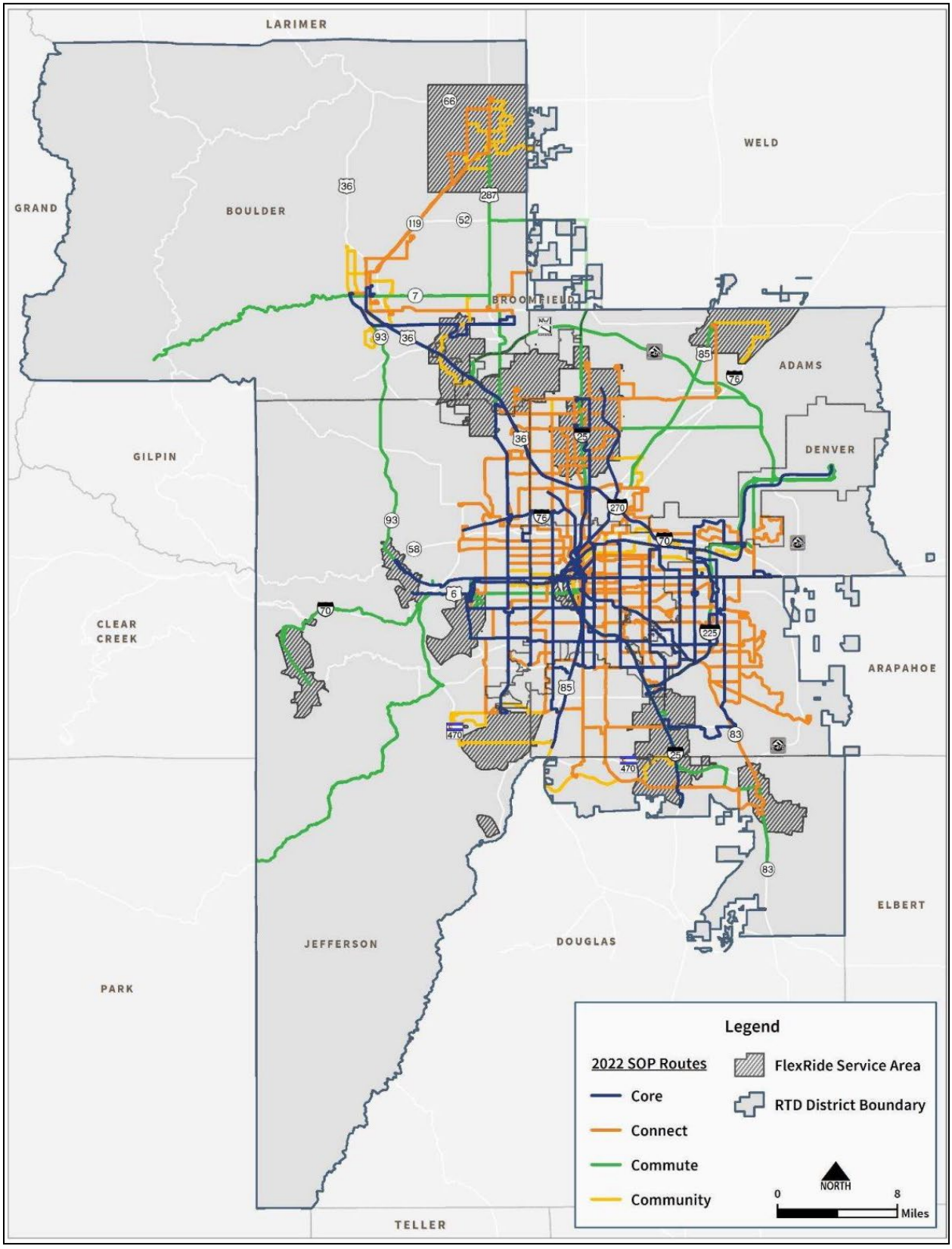
The Reimagine RTD effort includes the development of a SOP that the RTD Board of Directors adopted on July 26, 2022. The SOP outlines improvements to RTD service within the Denver Metropolitan Area, including the northwest area.

A key feature of the SOP is categorizing routes into a new travel market-based network of services. The new service categories are as follows:

- **Core Routes**: Regional routes serving prominent employment centers and high-density housing that are major trip generators with a demonstrated demand for frequent and extensive service hours; the Flatiron Flyer is a prime example of a Core route
- **Connect Routes**: Local bus routes with a minimum 14-hour span of service (6:00 a.m. to 8:00 p.m.), such as Route 100
- **Commute Routes**: Regional routes with limited stops serving unique travel markets (SkyRide and LX are examples)
- **Community Routes**: Community-focused local routes with a custom-built span of service, frequency, and days of service to meet local needs – examples of community routes are local routes, on-demand services, and other services, such as the 16th Street Mall Ride

RTD's SOP network is shown in Figure 28.

Figure 28: RTD SOP Bus Network



Source: RTD System Optimization Plan

The following sections outline RTD SOP improvements that would potentially influence or impact the NWR Peak Service and connections to each NWR station.

Downtown Westminster Station: The RTD SOP for routes connecting this station is shown in Table 27.

Table 27: RTD SOP Bus Routes Serving the Area Near the Downtown Westminster Station

Route	Station/Stop	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
53	US 36 & Sheridan	60 minutes	60 minutes	60 minutes	Connect
92	Downtown Westminster	30 minutes	30 minutes	60 minutes	Connect
	US 36 & Sheridan				
100	Downtown Westminster (Rail Station)	60 minutes	60 Minutes	N/A	Connect
	US 36 & Sheridan				
FF1	US 36 & Sheridan	15 minutes	15 minutes	30 minutes	Core
FF4	US 36 & Sheridan	10 minutes	N/A	N/A	Core
FF5	US 36 & Sheridan	30 minutes	N/A	N/A	Core

Note: Routes shown are RTD routes unless otherwise noted.
FF = Flatiron Flyer

Service to the existing US 36 & Sheridan Station, which is proximate to the Downtown Westminster Station and the NWR service, would be improved by:

- The restoration of Route 53
- Increased frequency to Route FF5, which would run every 30 minutes as opposed to limited trips
- The restoration of Route FF4

The SOP states that there would be no change to Routes 92 or FF1, which already provide frequent service to the future Downtown Westminster Station. Route 51 would no longer serve the US 36 & Sheridan Station and thus would not serve the Downtown Westminster Station.

There may also be opportunities to add FlexRide service focused on providing connections to the bus and rail stations for the residential neighborhoods surrounding the proposed Downtown Westminster Station during peak period service and the existing US 36 & Sheridan Station during off-peak periods.

Broomfield – 116th Station: The RTD SOP bus routes serving stations near the Broomfield – 116th Station are depicted in Table 28.

Table 28: RTD SOP Bus Routes Serving the Area Near the Broomfield – 116th Station

Route	Station/Stop	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
31	US 36 & Broomfield	30 minutes	60 minutes	60 minutes	Connect
76	US 36 & Broomfield	30 minutes	60 minutes	60 minutes	Connect
112	US 36 & Broomfield	60 minutes	60 minutes	60 minutes	Connect
120E/	Main & West 116th	60 minutes	60 minutes (only	60 minutes (only	Connect

Route	Station/Stop	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
120W	US 36 & Broomfield	(combined headway every 30 minutes)	120E)	120E)	
FF1	US 36 & Broomfield	15 minutes	15 minutes	30 minutes	Core
FF3	US 36 & Broomfield	10 minutes	N/A	N/A	Core
FF4	US 36 & Broomfield	10 minutes	N/A	N/A	Core
FF5	US 36 & Broomfield	30 minutes	N/A	N/A	Core
LBr	US 36 & Broomfield	60 minutes	60 minutes	N/A	Commute

Note: Routes shown are RTD routes unless otherwise noted.
FF = Flatiron Flyer

The Broomfield – 116th Station is close to the existing Main & 116th and the US 36 & Broomfield Station; it would benefit from improved service to each station, as noted in the SOP recommendations. Service to the US 36 & Broomfield Station would benefit the future service improvements to Routes 112 and 120, as well as the restoration of Routes FF2 and FF4. The US 36 & Broomfield Station would also benefit from the SOP's recommended improvements to Route 31, which include breaking up route 31 at the Clear Creek-Federal Station, improving service reliability, and route operation in the north segment with headways of 30 minutes.

There may also be opportunities to add FlexRide service focused on providing connections to the bus and rail stations for the residential neighborhoods surrounding the proposed Broomfield – 116th Station during peak period service and the existing US 36 & Broomfield Station during off-peak periods.

Flatiron Station: The RTD SOP bus routes serving stations near the Flatiron Station are depicted in Table 29.

Table 29: RTD SOP Bus Routes Serving the Area Near the Flatiron Station

Route	Station/Stop	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
228	US 36 & Flatiron	60 minutes	60 minutes	N/A	Community
AB1/AB2	US 36 & Flatiron	30 minutes	30 minutes	30 minutes	Commute
FF1	US 36 & Flatiron	15 minutes	15 minutes	30 minutes	Core
FF4	US 36 & Flatiron	10 minutes	N/A	N/A	Core

Note: Routes shown are RTD routes unless otherwise noted.
FF = Flatiron Flyer

The existing US 36 & Flatiron Station and the new Flatiron Station would be near one another and generally service the same area. Service improvements stated in the SOP to restore the FF4 would directly enhance service to the Flatiron Station and provide a connection to the NWR Corridor. As indicated in the SOP, improvements to the AB include restoring Route AB2's service to and from the Boulder Junction at Depot Square Station and suggesting headway operating times be 60 minutes in the peak periods all days of the week. Route AB from the existing Downtown Boulder Station would operate every 60 minutes daily and serve the US 36 & Flatiron Station, resulting in 30-minute headways between Flatiron Station and Denver International Airport. Improved service of Route 228 would also provide positive benefits to the Flatiron Station.

The US 36 & Flatiron Station (bus) is currently served by Interlocken/Westmoor and Louisville FlexRide service, which focuses on providing connections to the bus and rail stations from the surrounding area. The FlexRides would also serve the proposed Flatiron Station during peak periods.

Downtown Louisville Station: The RTD SOP bus routes serving stations near the Downtown Louisville Station are depicted in Table 30.

Table 30: RTD SOP Bus Routes Serving the Area Near the Downtown Louisville Station

Route	Station/Stops	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
228	South Boulder & Main	60 minutes	60 minutes	N/A	Community
DASH	Main & Spruce	15 minutes	30 minutes	60 minutes	Core

Note: Routes shown are RTD routes unless otherwise noted.
FF = Flatiron Flyer

The SOP indicates that future services would be modified in Lafayette to provide additional services to residential areas. The DASH currently serves the existing Main & Spruce Stop, located south on the same corridor as the Downtown Louisville Station. A new bus terminal is planned at the future Lafayette end-of-line location at 120th/Emma (Boulder County Willoughby Low-Income Housing).) Future service would include 15-minute weekday headways along the entire route.

There may also be opportunities to add FlexRide service focused on providing connections to the Rail station for the residential neighborhoods surrounding the proposed Downtown Louisville Station during peak period service. Currently, the Louisville FlexRide serves this area.

Boulder Junction at Depot Square Station: The RTD SOP bus routes serve stations near or at the Boulder Junction at Depot Square Bus Service Area, which is close to the Boulder Junction at Depot Square Rail Station, are depicted in Table 31.

Table 31: RTD SOP Bus Routes Serving the Area Near the Boulder Junction at Depot Square Station

Route	Station/Stop	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
BOLT (Future SH 119 BRT)	Boulder Junction Bus Service Area	30 minutes	N/A	N/A	Connect
BOUND	Boulder Junction (Rail Station)	15 minutes	30 minutes	30 minutes	Community
HOP (City of Boulder)	Boulder Junction (Rail Station)	10 minutes	15 minutes	15 minutes	N/A

Route	Station/Stop	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
AB	Boulder Junction Bus Service Area	60 minutes	60 minutes	60 minutes	Commute
FF4	Boulder Junction Bus Service Area	10 minutes	N/A	N/A	Core

Note: Routes shown are RTD routes unless otherwise noted.
FF = Flatiron Flyer

As stated in the RTD SOP, the Boulder Junction at Depot Square Station would also see some service restored. Restoration of Routes FF4 and AB would provide an additional connection to this station.

There may also be opportunities to add FlexRide service focused on providing connections to the Rail station for the residential neighborhoods surrounding the proposed Boulder Junction at Depot Square Station during peak period service.

Downtown Longmont Station: The RTD SOP bus routes serving stations near the Downtown Longmont Station are depicted in Table 32.

Table 32: RTD SOP Bus Routes Serving the Area Near the Downtown Longmont Station

Route	Station/Stop	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
323	1st & Ken Pratt	60 minutes	60 minutes	60 minutes	Community
324	1st & Coffman	30 minutes	60 minutes	60 minutes	Community
	1st & Main				
326	1st & Coffman	60 minutes	60 minutes	n/a	Community
327	1st & Coffman	60 minutes	60 minutes	n/a	Community
328	2nd & Main	30 minutes	60 minutes	60 minutes	Community
BOLT 1 (Future SH 119 BRT)	1st & Coffman	30 minutes	60 minutes	60 minutes	Connect
	1st & Main				
Future US 287 BRT	Downtown Longmont Station	30 minutes	60 minutes	N/A	Commute
	8th & Coffman				
	Future US 287/SH 66				
LBr	1st & Coffman	60 minutes	60 minutes	N/A	Commute
	1st & Main				

Note: Routes shown are RTD routes unless otherwise noted.
FF = Flatiron Flyer

The SOP outlines service improvements for Routes 324 and BOLT (future SH 119 BRT), which would provide a close connection to the Downtown Longmont Station. The current LD routes would remain in service with rail operations in place as the LD serves a separate ridership shed and purpose than the NWR Corridor. The LD connects Longmont, Erie, Lafayette, and Broomfield, while the NWR Corridor connects Longmont, Boulder,

Louisville, Broomfield, Westminster/Arvada, and Denver. The SOP indicates that the LD routes are slated to become the future US 287 BRT. The future SH 119 BRT would operate at 30-minute headways during peak weekday service hours and 60-minute headways on the weekends.

As part of the Longmont 'Fare-Buy-Up' program, Routes 324 and 323 are being bought up and paid for by the City of Longmont and included in the "Ride Free Longmont" program. This has increased ridership, as stated in the North Team Service Analysis & State Highway 119 BRT Feeder Plan; however, it is unclear if this service will remain once the SH 119 BRT is in place.

The North Team Service Analysis & State Highway 119 BRT Feeder Plan suggests splitting the existing 323 route into two distinct services to establish a more grid-like network in Longmont. The northern route would operate 30-minute peak headways and 60-minute non-peak headways, while the southern route would operate 30-minute headways all day and operate on Sundays, whereas the northern route would not. Both the north and south routes would access the First & Main Station. This plan also suggests that the 324 would be split at First & Main into a north and south segment. Both the north and south of this route would also access the First & Main Station.

There may also be opportunities to add additional FlexRide service, focused on providing connections to the Rail station for the residential neighborhoods surrounding the proposed Downtown Louisville Station during Peak Service. Currently, the Longmont FlexRide serves this area.

Existing Bicycle and Pedestrian Network

The US 36 Bikeway has become the backbone of the trail system extending from 80th Avenue in Westminster to Table Mesa/Foothills Parkway in Boulder. The bikeway was completed in 2016 and offers a 12-foot-wide concrete path with two-foot shoulders. The bikeway is located on the south side of US 36 from 80th Avenue in Westminster to West Flatiron Crossing Circle. It crosses under US 36 and connects to Tape Drive near 88th Street in Louisville and Superior. From there, it generally is located on the north side of US 36 to Table Mesa/Foothills Parkway in Boulder

At 80th Avenue, the Bradburn Trail extends south to 72nd Avenue and connects with the Little Dry Creek Trail, connecting to downtown Denver via the Clear Creek Trail and South Platte River Trail. Additionally, there are connections from the US 36 Bikeway to other trails throughout the corridor.

All the communities along the NWR Corridor contribute to a network of on-street and off-street bicycle facilities. Additionally, most streets have sidewalks around the stations in both directions to accommodate pedestrian travel.

Downtown Westminster Station

The US 36 Bikeway begins south of 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 to Table Mesa Park-n-Ride in Boulder. Westminster is also constructing an underpass under Sheridan Boulevard to provide a bicycle and pedestrian connection between the downtown Westminster development and the US 36 & Sheridan Station. Along 88th Avenue, there are bike lanes in both directions between Harlan Street and Wadsworth Boulevard. Bike lanes have recently been added to Harlan Street between 88th Avenue and West 92nd Avenue, which connect with Westminster Boulevard. The bike lanes continue along Westminster Boulevard to just north of 98th Avenue, connecting to multi-use paths through the Hyland Ponds Open Space. Figure 29 shows the bicycle routes around the Downtown Westminster Station. The *City of Westminster Transportation and Mobility Plan* (City of Westminster, August 2021) shows future upgrades to the bike lanes along 88th Avenue and West 92nd Avenue and bike lanes being implemented in the downtown Westminster development. All these upgrades have taken place except for the upgrades along 88th Avenue between Harlan Street and Sheridan Boulevard. This and other connections would be recommended for the City of Westminster to complete the implementation of the Downtown Westminster Station as part of the NWR project.

The station offers good pedestrian access to the developing Downtown Westminster area. Sidewalks are on both sides of 88th Avenue, Harlan Street, Westminster Boulevard, and other roadways within the downtown Westminster development (Figure 30). Sidewalks along Sheridan Boulevard surround the US 36 & Sheridan Station, and a pedestrian overpass for transit users and others connects both sides of US 36. Finally, a vacant lot along 86th Avenue could connect to the station for residents in the neighborhood south of the existing rail line. This area has a footpath, which also aligns with the station platform. Sidewalk improvements are along 88th Avenue as part of the *City of Westminster Transportation and Mobility Plan* (City of Westminster, August 2021).

Figure 29: Bicycle Facilities near Downtown Westminster Station

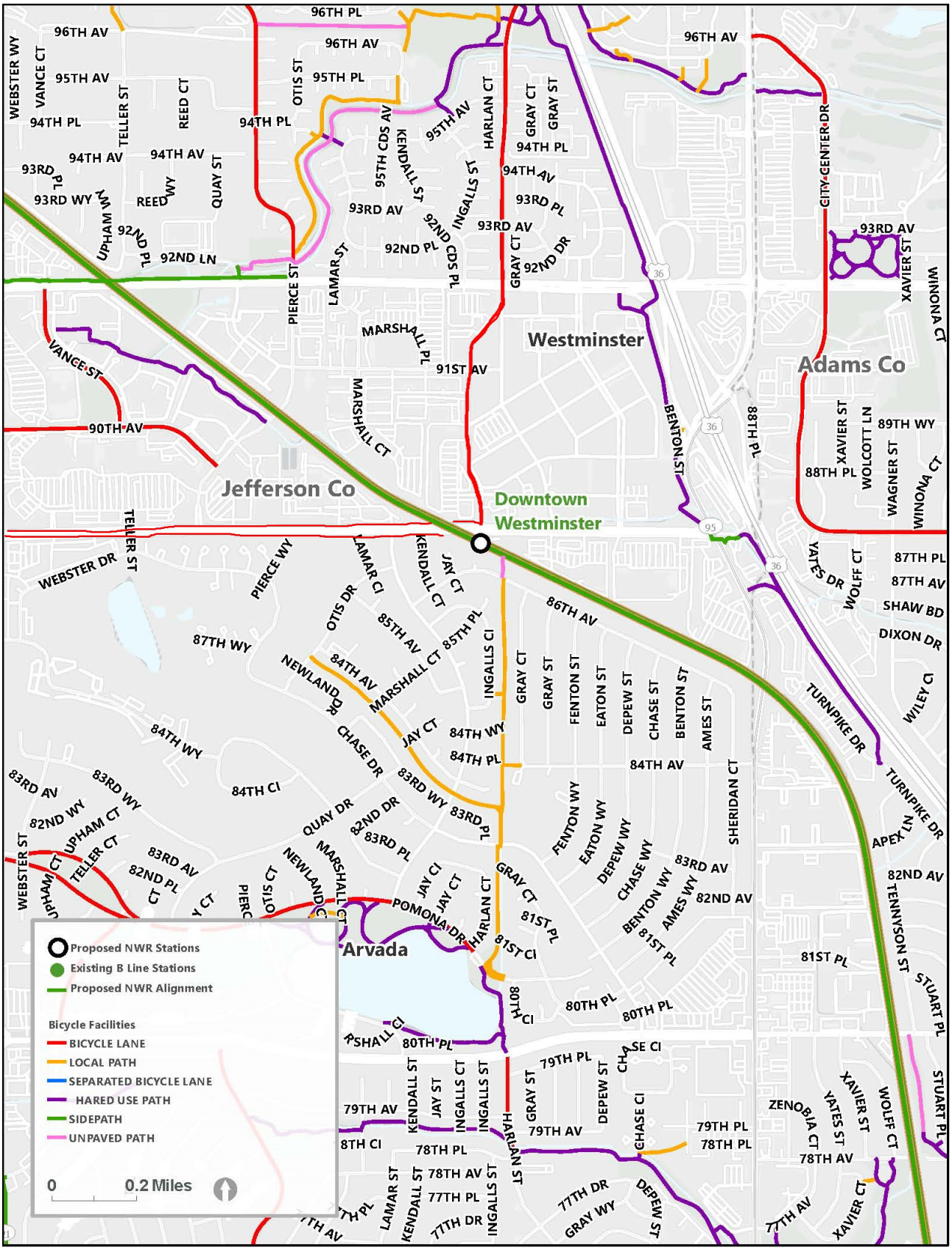
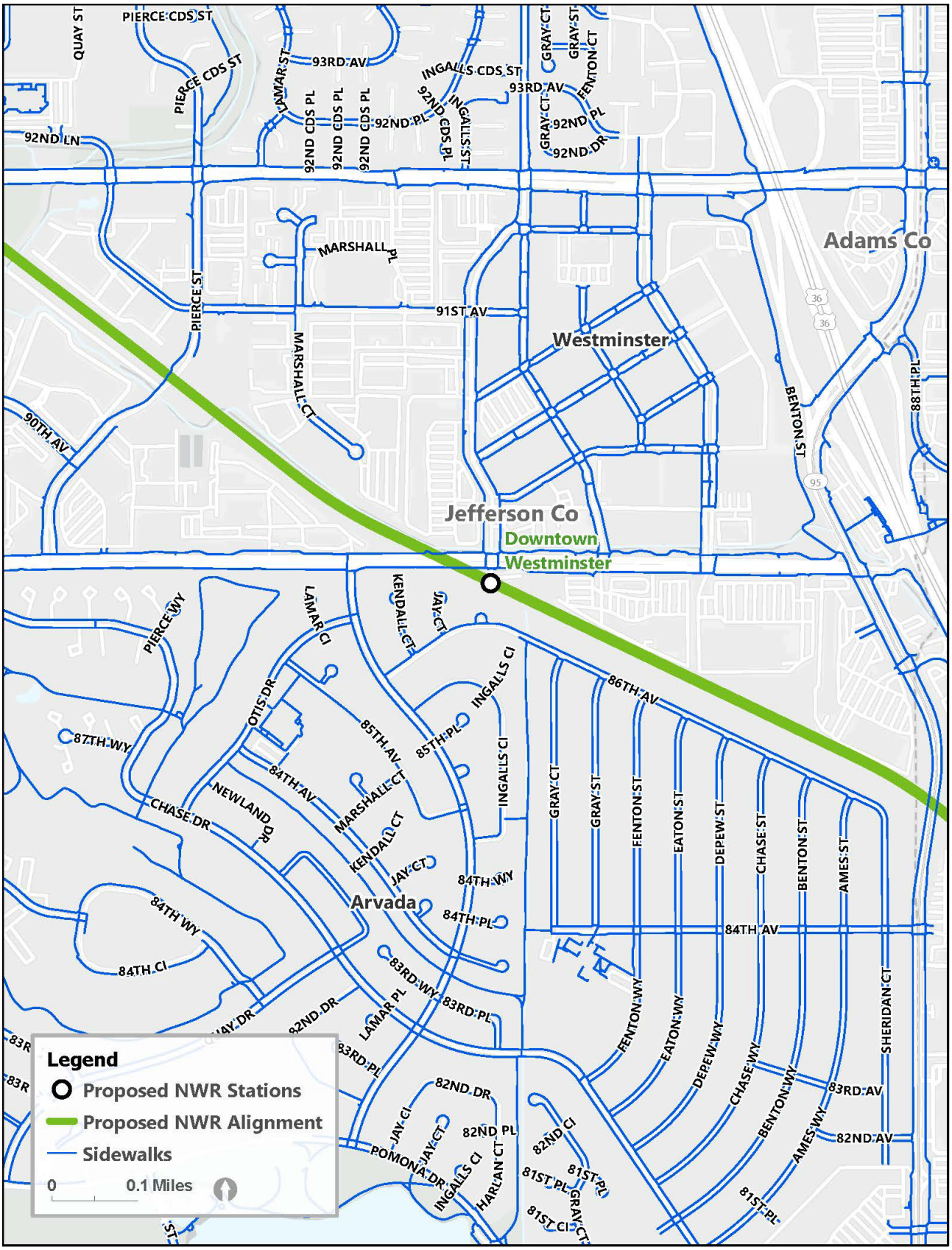


Figure 30: Existing Sidewalks near Downtown Westminster Station



Broomfield – 116th Station

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 station, bike lanes are located 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 significant construction in the area. Bike lanes pick back up near the Harvest Station Apartments near Wadsworth Boulevard and Colmans Way. Bike lanes would be completed along this stretch of Wadsworth Boulevard as developments are completed. Figure 31 shows the bicycle routes around the Broomfield – 116th Station. Other connections are also in this area's plans for the City and County of Broomfield.

The area closest to the station is a highly fragmented network. Significant sidewalk gaps exist in all directions from the station, and the street network is not currently very pedestrian friendly. The sidewalk and street network to the north are better formed to provide walkable access, but this needs to extend closer to the station. There are sidewalks on both sides of the northern portion of Wadsworth Boulevard; development has already occurred near the station and throughout the Arista Development south of US 36 (Figure 32). East of the rail line in the Broomfield Industrial Park, sidewalks are 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 connect both sides of US 36. The side streets north of US 36 and west of Wadsworth Boulevard do not have sidewalks. As development in this area continues, missing sidewalk links are likely to be completed.

Figure 31: Bicycle Facilities near Broomfield – 116th Station

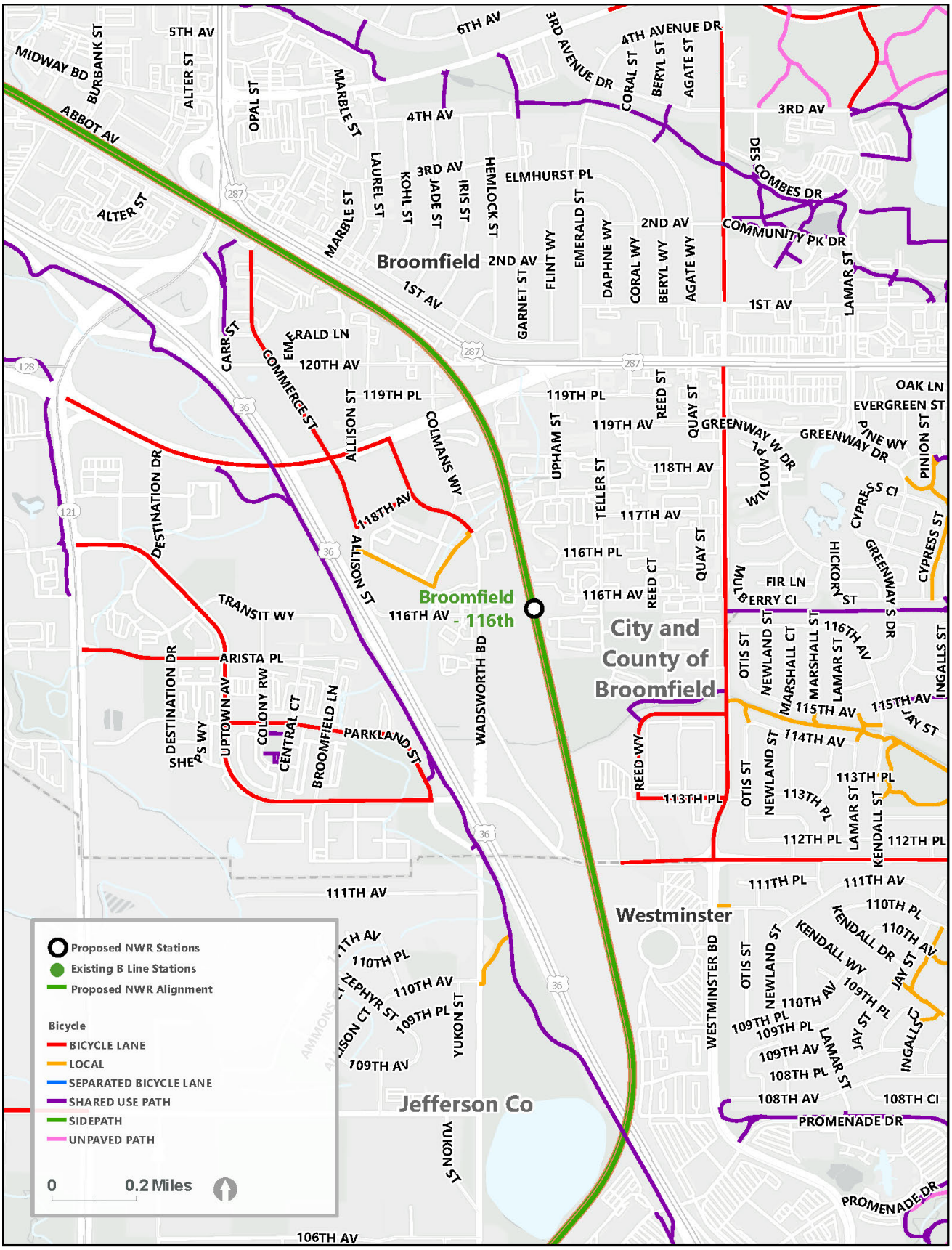
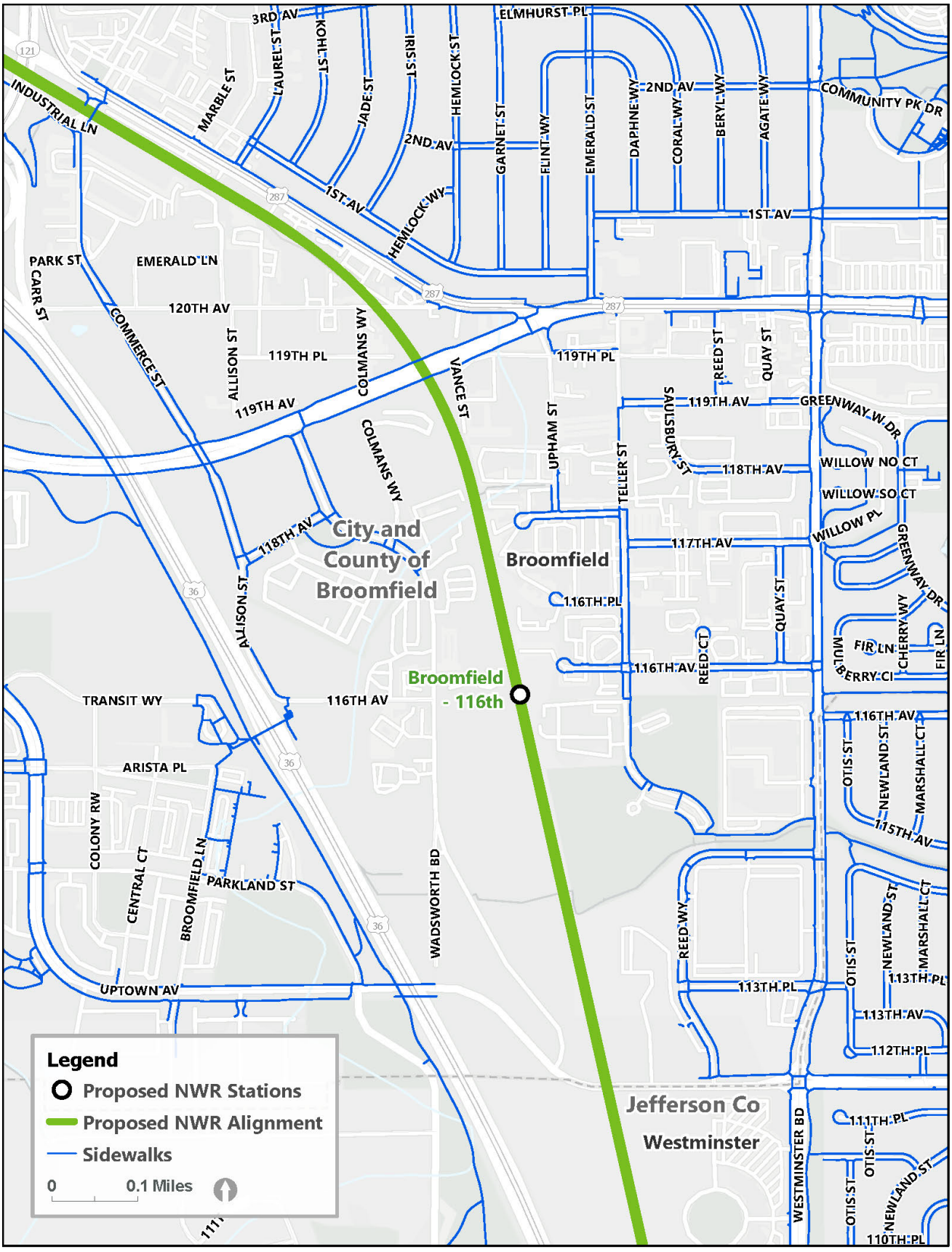


Figure 32: Existing Sidewalks near Broomfield – 116th Station



Flatiron Station

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.). Though the area is largely undeveloped to the northeast, the area west and south of the station and US 36 are not pedestrian friendly. Routes exist almost solely on the arterial networks with limited crossings in this area, and the internal neighborhoods (and parking aisles of the shopping center) are largely impenetrable to pedestrians. However, there is a new crossing under Northwest Parkway near Rock Creek. A pedestrian underpass under US 36 connects the east and west sides of the US 36 & Flatiron Station. Further, there are numerous recreational paths through the open space north of Midway Boulevard near the station. Additionally, the City and County of Broomfield have implemented a new bike path along Industrial Lane with a bicycle overpass that connects Midway Boulevard, Industrial Lane, and the Interlocken development south of US 36. As development in this area continues, missing sidewalk links are also likely to be completed.

Figure 33 shows the bicycle routes around the Flatiron Station. Additional routes are being planned by the City and County of Broomfield around this potential station.

There are sidewalks or multi-use paths along Flatiron Crossing Drive, Interlocken Boulevard, Interlocken Loop/ 96th Street, and most local roads throughout the Interlocken area and Flatiron Crossing Mall and Flatiron Marketplace (Figure 34). Though the area is largely undeveloped to the northeast, the area west and south of the station and US 36 are not pedestrian friendly. Routes exist almost solely on the arterial networks with limited crossings in this area, and the internal neighborhoods (and parking aisles of the shopping center) are largely impenetrable to pedestrians. However, there is a new crossing under Northwest Parkway near Rock Creek. A pedestrian underpass under US 36 connects the east and west sides of the US 36 & Flatiron Station. Further, there are numerous recreational paths through the open space north of Midway Boulevard near the station. Additionally, the City and County of Broomfield have implemented a new bike path along Industrial Lane with a bicycle overpass that connects Midway Boulevard, Industrial Lane, and the Interlocken development south of US 36. As development in this area continues, missing sidewalk links are also likely to be completed.

Figure 33: Bicycle Facilities near Flatiron Station

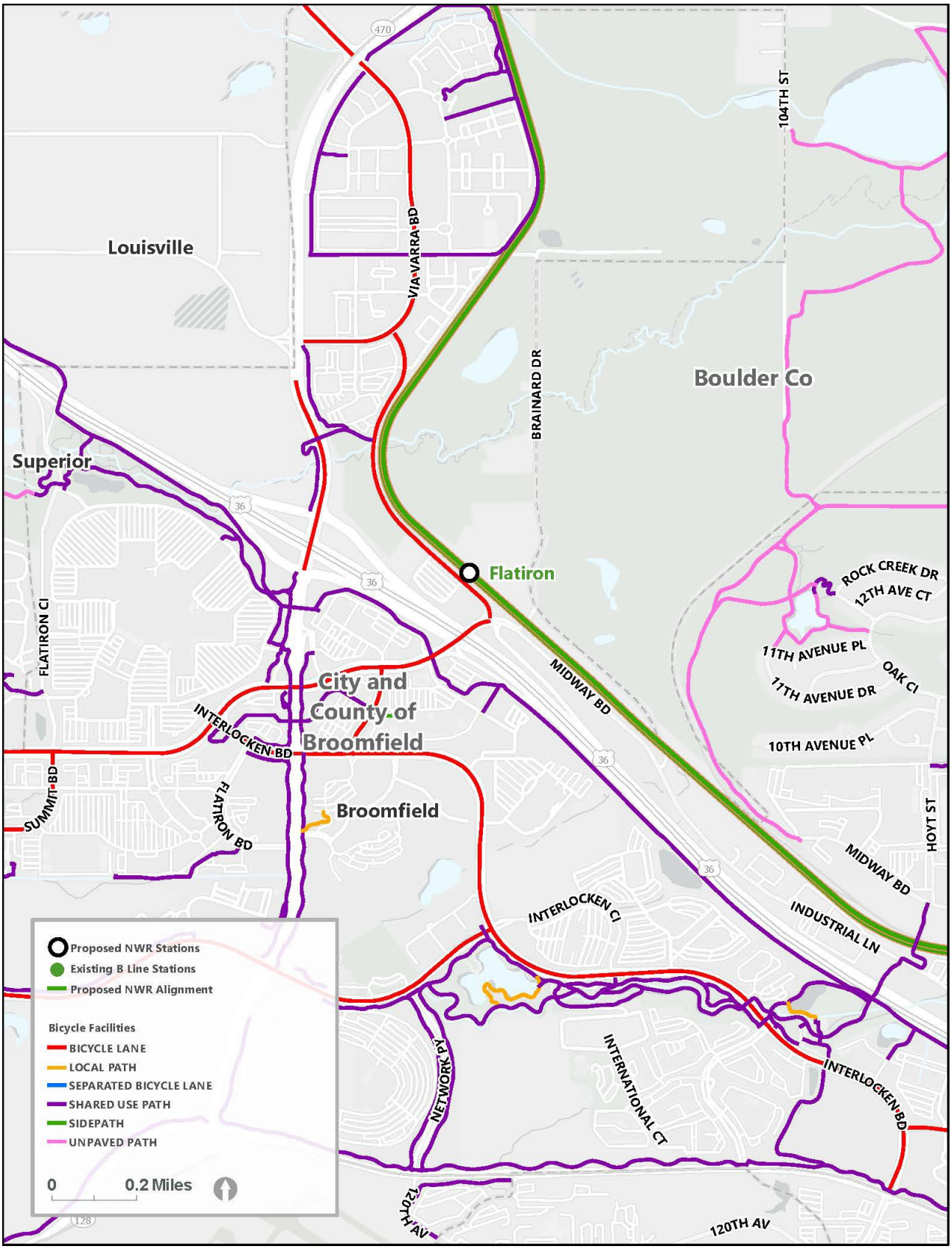
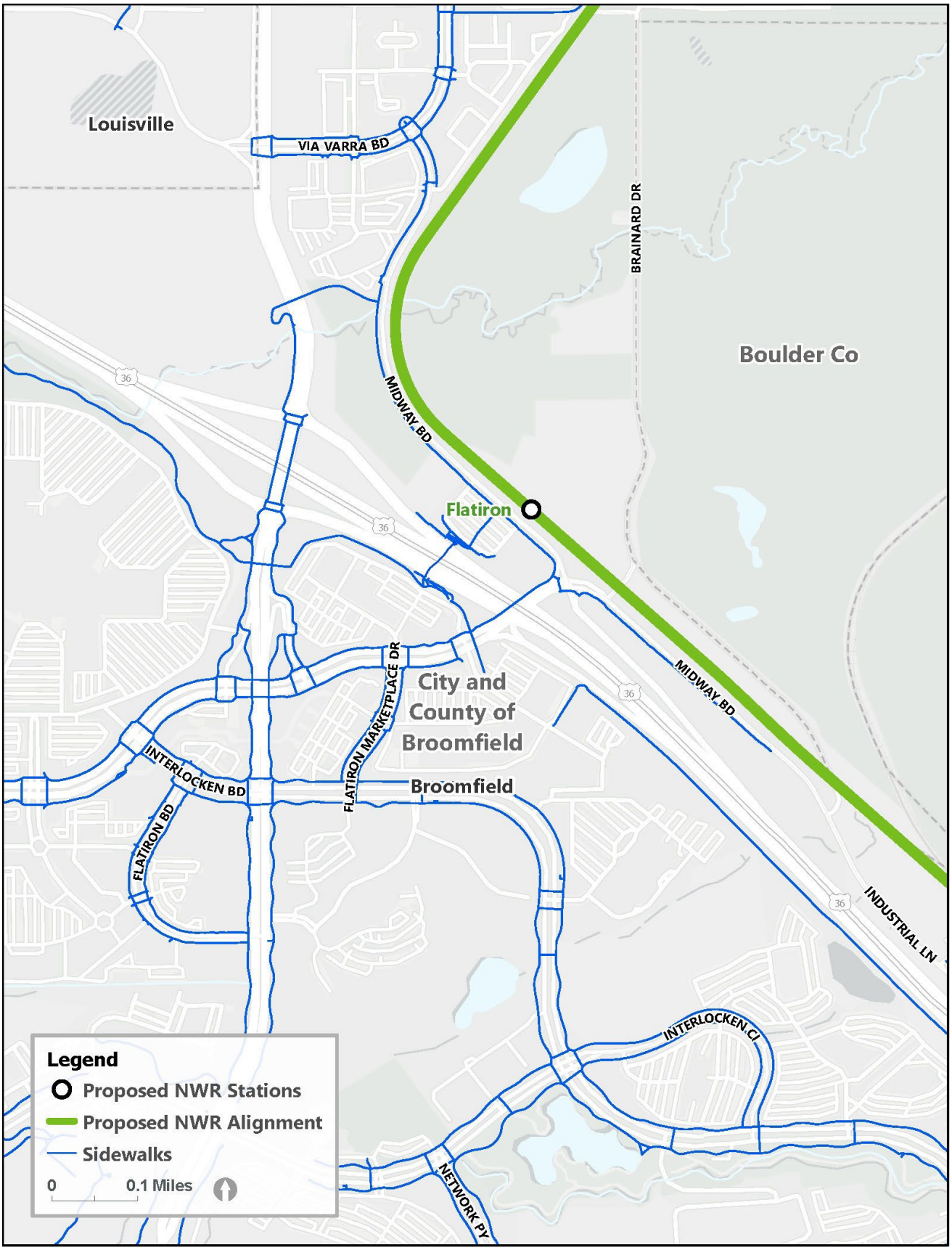


Figure 34: Existing Sidewalks near Flatiron Station



Downtown Louisville Station

There are north-south bike routes on 96th Street/Courtesy Road east of the station and Main Street west of the station. There are east-west bike routes along South Street and Griffith Street and bike lanes on Pike Street and South Boulder Road. Figure 35 shows the bicycle routes around the Downtown Louisville Station. Other connections would be recommended for the City of Louisville to complete the implementation of the Downtown Louisville Station as part of the NWR Corridor project.

The area to the west of the station offers a very high-quality and permeable network that provides good access to the station. The area to the east is largely undeveloped, but the developed sliver along the railroad right of way has a partial network with gaps. There are sidewalks on both sides of the local roadways throughout most of the downtown Louisville area (Figure 36). However, no sidewalks are near the station along 96th Street/Courtesy Road. Louisville constructed a pedestrian underpass under the rail line in 2015 at South Street.

Figure 35: Bicycle Facilities near Downtown Louisville Station

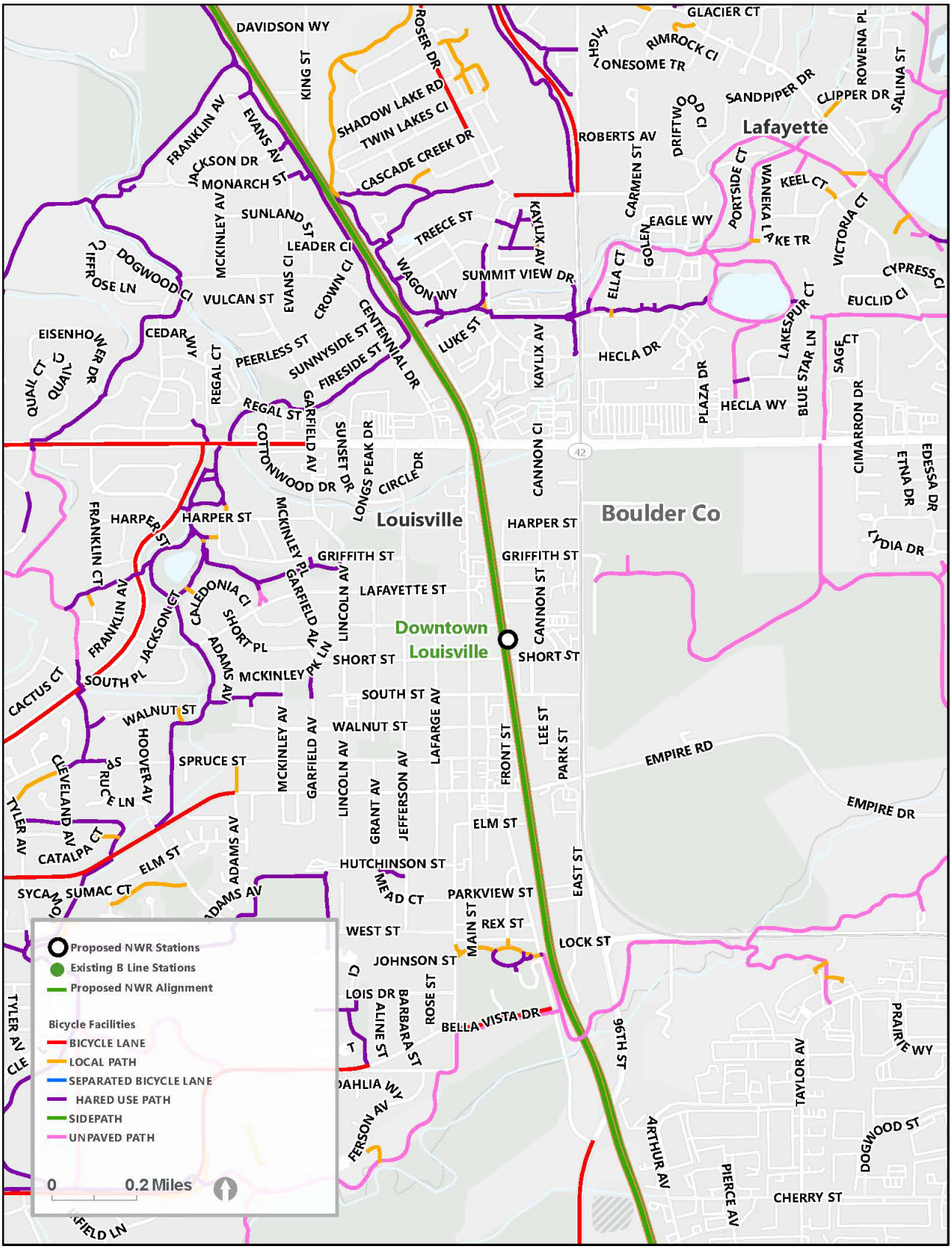
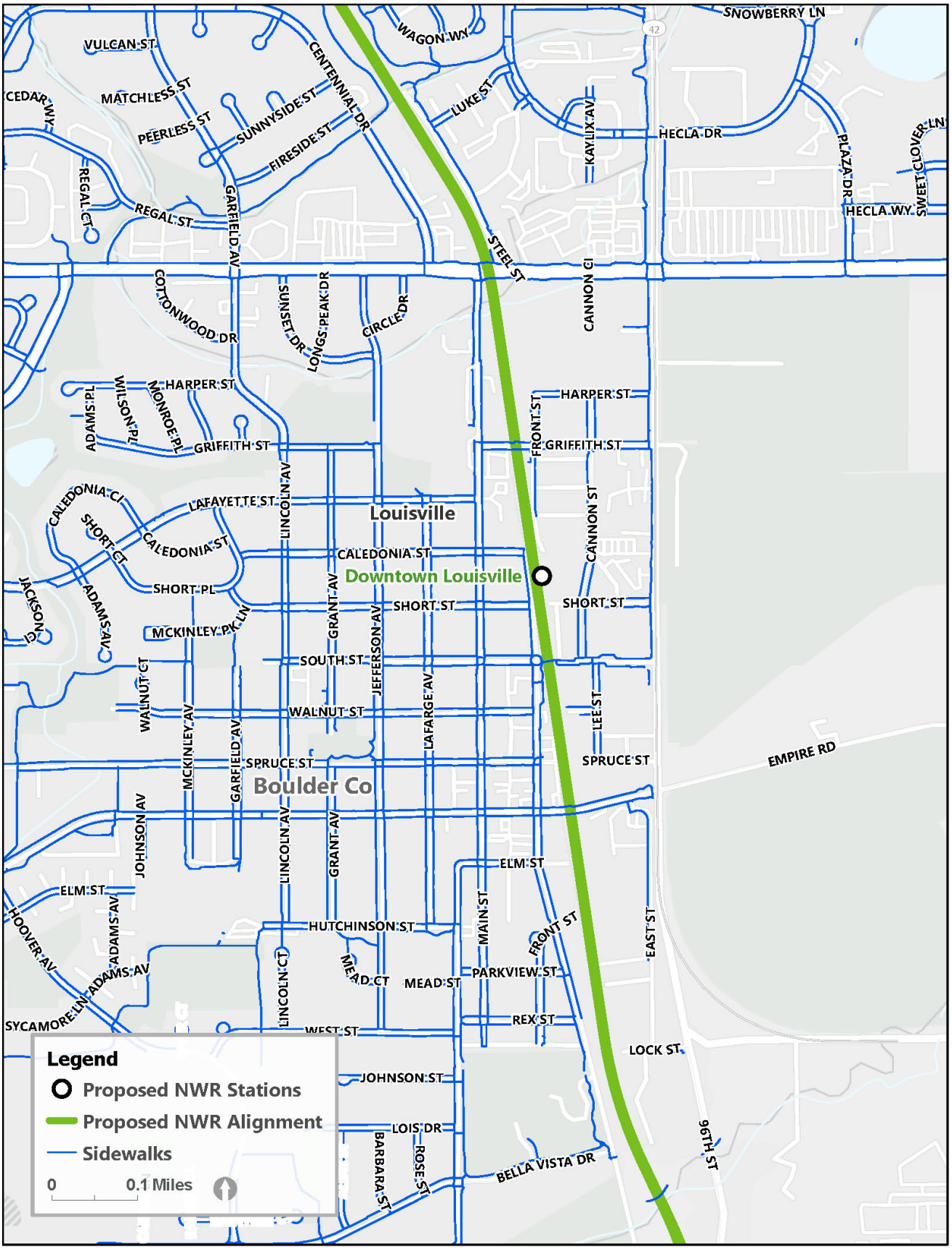


Figure 36: Existing Sidewalks near Downtown Louisville Station



Boulder Junction at Depot Square Station

Along Valmont Road, Walnut Street, and Pearl Street, west of 30th Street, are east-west bicycle lanes. Along 30th Street, north-south bicycle lanes are near the Boulder Junction at Depot Square Station. There are also multi-use paths along Foothills Parkway, Pearl Parkway, and Goose Creek. Figure 37 shows the bicycle routes around the 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; however, these are not shown in Figure 38. This area is made up of shared-use streets where pedestrians have priority. Two longer east-west routes connect downtown to the station area, but the north-south routes that flank the station east and west are further away. This creates obstacles and indirect routing for pedestrians to and from the station. The figure does show sidewalks along most of the roadways in the area of the Boulder Junction at Depot Square Station.

Figure 37: Bicycle Facilities near Boulder Junction at Depot Square Station

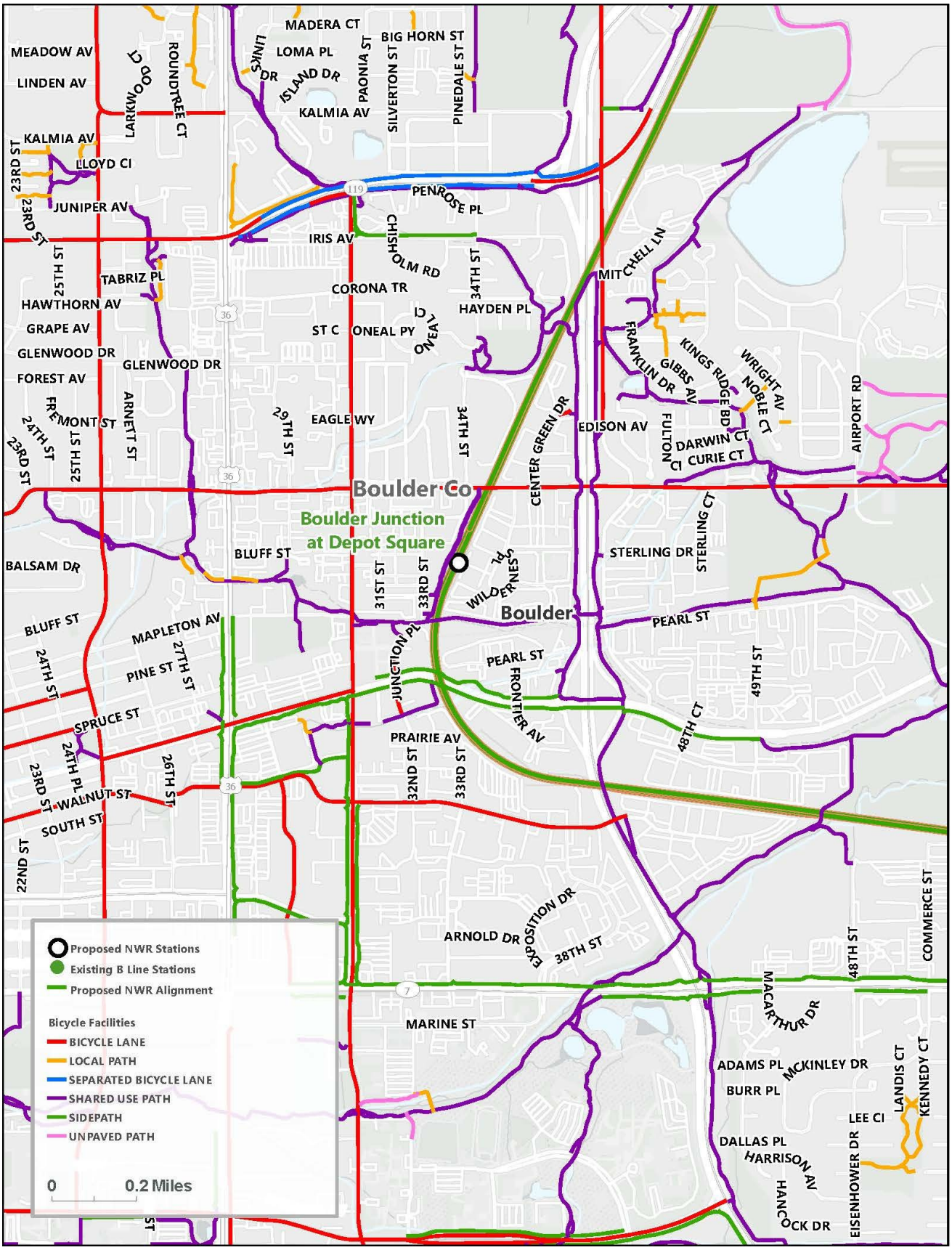
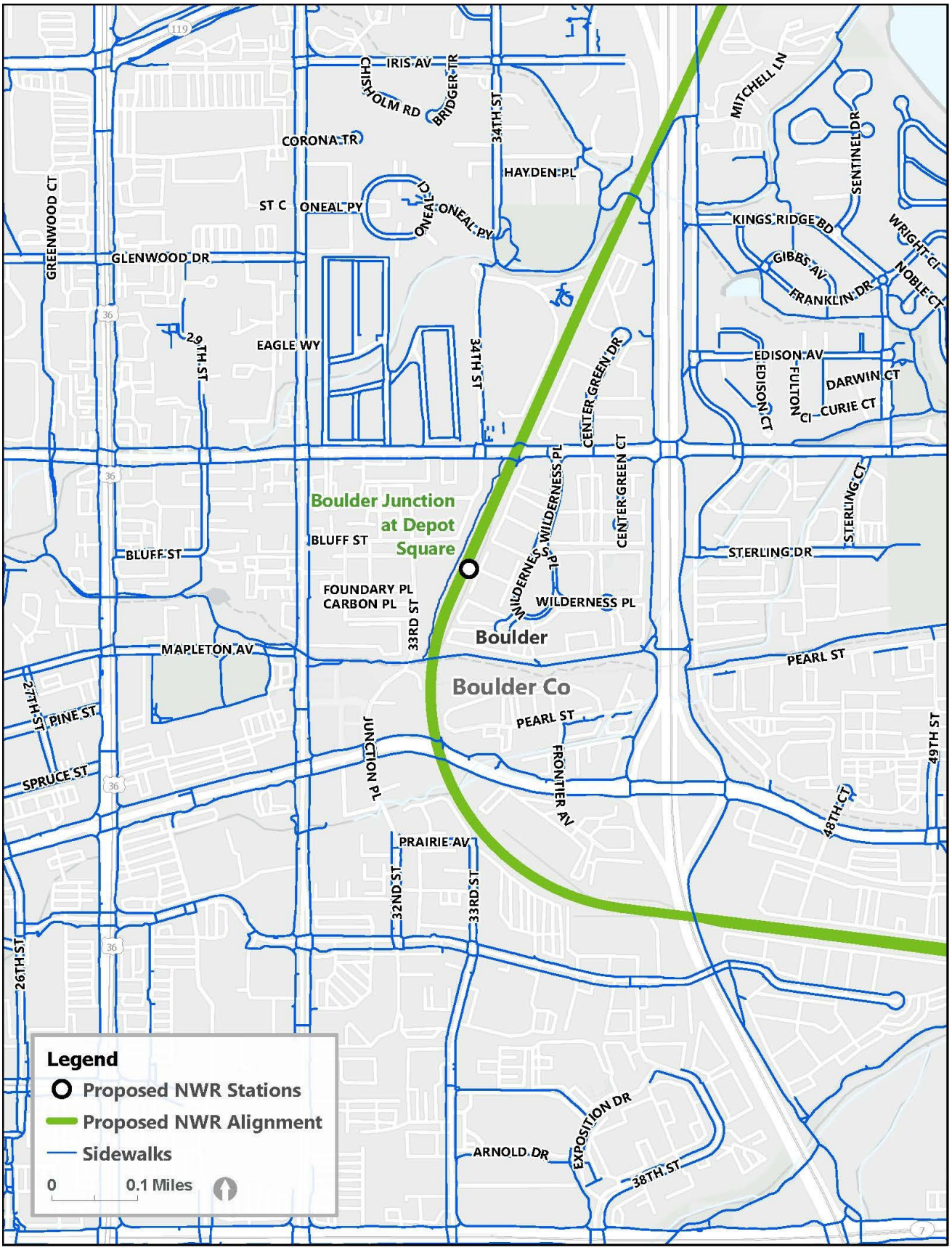


Figure 38: Existing Sidewalks near Boulder Junction at Depot Square Station



Downtown Longmont Station

There are north-south bicycle lanes along Main Street, Terry Street, and Lashley Avenue north of Third Avenue. There are east-west bicycle lanes along Boston Avenue and Fourth Avenue. There is also a multi-use path on Third Avenue east of Main Street. Existing bicycle routes do not connect directly to the station area, but the Coffman Street reconstruction project will add bicycle and improved pedestrian accessibility. Figure 39 shows bicycle routes around the Downtown Longmont Station. Other connections are also being planned by the City of Longmont to connect multi-use paths and bike lanes to the Downtown Longmont Station as part of the NWR project.

The downtown core has a high degree of permeability and a relatively continuous pedestrian network. Connections will need to be made from the station. The area to the south of the rail corridor has several core main routes and a network of trails, but local streets largely lack sidewalks, and significant gaps are present. Redevelopment in the immediate station area may resolve the access challenges to the south of the railroad right of way. There are sidewalks on both sides of Main Street, Boston Avenue, Second Avenue, and Third Avenue in the immediate area surrounding the Downtown Longmont Station (Figure 40). However, there are currently no sidewalks along First Avenue. Again, this area is expected to see a great deal of redevelopment in the coming years, with sidewalks expected to be provided throughout the new development areas.

Figure 39: Bicycle Facilities near Downtown Longmont Station

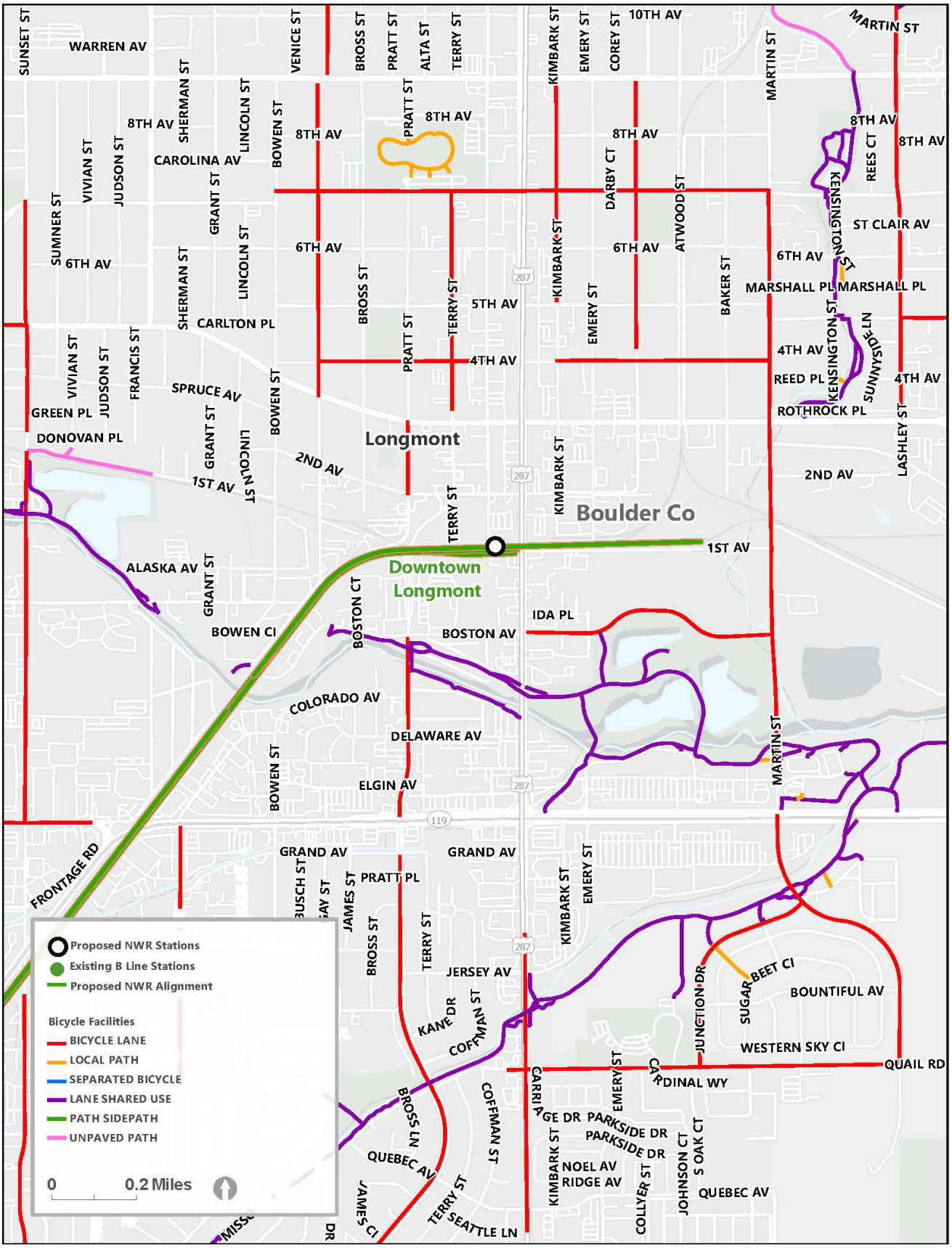
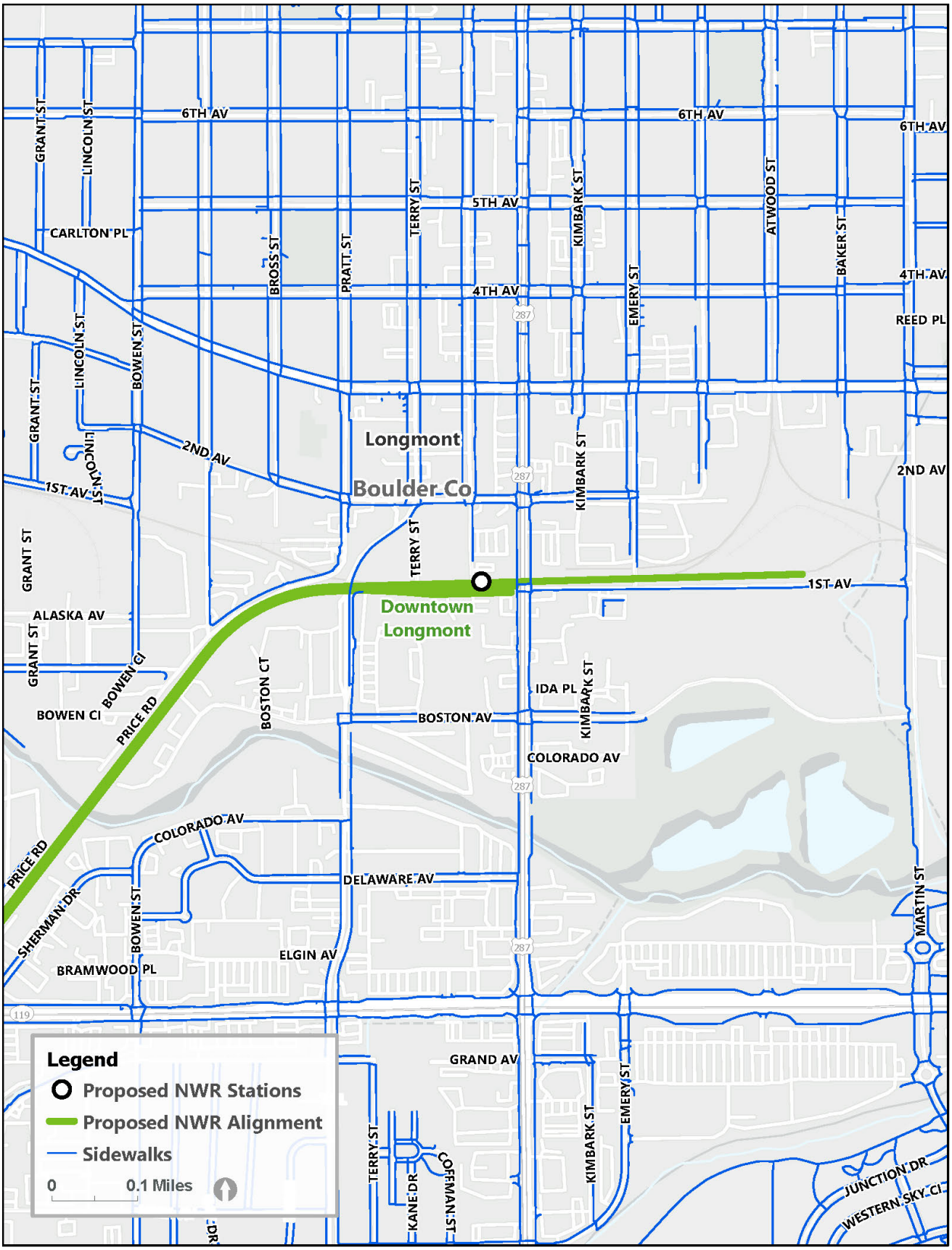


Figure 40: Existing Sidewalks near Downtown Longmont Station



Future Bicycle and Pedestrian Network

DRCOG includes transit projects in the 2050 RTP; two DRCOG-administered projects and several regional BRT projects are included. Under a no action determination, the NWR Corridor would not be constructed. There is a line item for the project in the 2050 RTP, but it is not included in Table 33 below.

Table 33: Regionally Funded Alternative Transportation Projects in 2050 RTP

Project Name/Corridor	Location/Limits	Project Description
McCaslin Regional Trail	Rock Creek Parkway to SH 128	Regional Trail
RTD Rail Trail	Boulder to Erie	Regional Trail

Source: DRCOG 2050 RTP, 2021

The 2022-2025 TIP includes several Alternative Transportation projects in the NWR Corridor, as listed in Table 34.

Table 34: Funded Alternative Transportation Projects in 2022-2025 TIP

TIP ID	Title	Type	Description
2020-019	Industrial Lane Bikeway Phase 2: Design Only	Bike/Ped.	Design Phase 2 of the Industrial Lane bikeway, from US 36 at the Midway Multi-use Bridge over BNSF to the US 36 & Flatiron Station.
2020-044	Midway Boulevard Multimodal Corridor Action Plan	Bike/Ped.	Develop concept corridor and intersection plans to improve multimodal access and safety. Develop an action plan and preliminary cost estimates for key–segments.
2020-013	SH 119 Bikeway: Boulder to Longmont - Preconstruction Activities	Bike/Ped.	Complete design and environmental clearances for a bikeway along SH 119 from Boulder to Longmont.
2020-041	SH 7 Multimodal Improvements: 38th Street/Marine Street to Cherryvale Road	Bike/Ped.	Construct multi-use paths, enhanced bus stops, and new pedestrian facilities on Arapahoe Avenue (SH 7).
2020-039	Sheridan Boulevard Multimodal Improvements	Bike/Ped.	Construct a multimodal underpass to provide a first and final mile connection between US 36 & Sheridan Station Park-n-Ride, US 36 Bikeway, and Downtown Westminster. Improves Sheridan Boulevard to a six-lane roadway with appropriate turn lanes from the US 36 bridge to Turnpike Drive.
2020-043	South Boulder Road At-Grade Crossing Improvements	Bike/Ped.	Improve non-motorized safety by constructing five crossing treatments across South Boulder Road.
2020-018	US 36 Bike-n-Ride shelters, Amenities, Operations, and Marketing	Bike/Ped.	Construct three remaining Bike-n-Ride shelters for US 36 BRT stations in Broomfield. Commuting Solutions provides funding support for marketing and operations.
2020-017	US 36 Bikeway Extension: Superior to Broomfield	Bike/Ped.	Construct a new regional multi-use path connecting Superior and Broomfield on the west side of US 36.

Source: DRCOG 2022-2025 Transportation Improvement Program, April 21, 2021

Existing First and Final Mile Options

The *US 36 First and Final Mile Study* (Commuting Solutions, 2013) identifies suitable modal options to begin and complete transit trips without using single-occupant travel vehicles. The Study began by identifying cost-effective options to better connect RTD riders to and from the US 36 Park-n-Rides and the surrounding activity centers utilizing such Transportation Demand Management options as electric bikes, shuttle circulators, taxis, scooters, golf carts, and bicycles. The Study aimed to increase the convenience of accessing public transit and reduce single-occupant vehicle travel.

Recommendations are prepared to utilize a collaborative decision-making process. The Study concluded with corridor recommendations to strategically implement cost-effective multimodal connectivity projects and programs between employment locations, activity centers, residences, and future US 36 BRT stations.

The corridor strategies sought to identify ways to enhance transit accessibility in the US 36 corridor. The top three identified corridor strategies included Bike-n-Ride secure bike parking, First and Final Mile wayfinding signage, and First and Final Mile EcoPasses. The station area strategies focused on infrastructure improvements to increase the safety and comfort of people biking or walking to and from the Park-n-Rides. The strategies included grade-separated crossings of major roadways, connections to the future US 36 Bikeway, enhanced on-street bike facilities, trail extensions or conversions, intersection and midblock crossing enhancements, and various programmatic and policy strategies.

The Study concluded by providing corridor-wide recommendations, several of which have already been implemented:

- Bike-n-Ride shelters – To date, secure Bike-n-Ride shelters have been implemented at:
  - US 36 & Table Mesa Station
  - US 36 & McCaslin Station
  - US 36 & Broomfield Station
  - US 36 & Sheridan Station
- Branded wayfinding signage along the US 36 corridor
  - In partnership with Boulder, Boulder County, Broomfield, Louisville, Superior, and Westminster, Commuting Solutions developed a branded identity for consistent wayfinding signage for the northwest metro region – wayfinding signage was installed throughout the corridor in 2018
- EcoPasses for individuals and businesses near one of the six US 36 RTD stations
  - Commuting Solutions has been actively working with partner agencies and employers throughout the northwest region to help increase EcoPass distribution

Station-Specific recommendations were also made, some of which have already been implemented at future shared bus/rail stations, including:

- US 36 & Flatiron Station
  - City and county of Broomfield – Provide trail connection from West Midway south across BNSF and US 36 to connect to the US 36 Bikeway

  - City and county of Broomfield – Provide trail connections to and from US 36 Bikeway and Interlocken Business Park
  - City and county of Broomfield – Provide enhanced wayfinding through the path at East Flatirons/Multi-purposes trails and US 36 Bikeway
- US 36 & Broomfield – 116th Station
  - CDOT – Construct a new sidewalk to connect to the future sidewalk built on Commerce and 116th Street on the east side of the bridge
  - CDOT – Off-Street Trail connection along Commerce Street that extends between Rockies Field trail connection and Midway
  - City and county of Broomfield – As station details are established, ensure good pedestrian bike accommodations are provided to and from the Broomfield – 116th Station and existing street network
  - Broomfield Capital Improvements Projects – On-street bike facility to connect with residential areas north of Park-n-Ride
  - Trails and Open Space – Trail connection under BNSF tracks to Rockies Field and Big Dry Creek Trail
- Downtown Westminster Station
  - City of Westminster – Provide grade-separated crossing of Sheridan Boulevard between downtown Westminster redevelopment and the south side of US 36 & Sheridan Station
  - City of Westminster – Provide on-street bike lanes along Harlan Street/Westminster Boulevard between 88th and 104th avenues
  - City of Westminster – Construct multi-use trail as part of Sheridan construction/relocation to connect to Westminster side path terminus along Sheridan Boulevard at 92nd Avenue and terminus of bike lanes along Turnpike Drive at Sheridan Boulevard
  - City of Westminster – Provide upgraded multi-use trail along the east side of Yates Street/ west side of City Center Drive between 88th Avenue and Sheridan Boulevard

Next Steps

Each of the six new stations is expected to generate new transit demand and interest from bicyclists and pedestrians. Implementing the NWR Peak Period Service could impact existing transit use and bicycle and pedestrian patterns, particularly during commuting hours, when NWR Peak Period Service would be implemented. Potential impacts on the transit system include travel demand and geographic and temporal transit coverage. The Study Team has started considering how existing and future transit routes may connect to the new stations, and those recommendations are included in the *Transit Corridor Context Report* (Appendix B). The Study Team will also consider how the existing and future bicycle and pedestrian networks can connect to the stations as project development continues. 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.

During NEPA, impacts on existing and new services will be determined, and mitigation will be developed as part of the implementation.

Cultural Resources

Brief Description of Resource Studied

Historic resources include sites, buildings, structures, objects, and districts that are significant to local, state, or national history. The significance of historic resources is usually determined by its eligibility for or listing in the National Register of Historic Places (NRHP), in the Colorado State Register of Historic Properties, or as locally designated historic landmarks. Types of historic resources within the NWR Corridor include buildings (single-family homes, commercial storefronts), structures (bridges, culverts, roads), and districts (residential neighborhoods, commercial downtown areas). For the Study, sites such as building foundations, mines, pre-contact open camps, and refuse dumps, are discussed in the archaeological and paleontological resources sections.

Agencies Involved

Multiple federal, state, and local agencies have management or regulatory responsibilities regarding historic resources. Additional potential stakeholders, including community organizations and descendant groups, retain an interest in the stewardship of these resources and contribute to the agency's decision-making process. Potential agency and community stakeholders for historic resources within the planning area include:

- U.S. Department of Transportation
- Colorado Department of Transportation
- Colorado Office of Archaeology and Historic Preservation (OAHP)
- Colorado State Historic Preservation Officer (SHPO)
- Tribes with an identified interest in the area
- U.S. Army Corps of Engineers (USACE)
- Boulder County Historic Preservation Advisory Board
- City of Longmont Historic Preservation Commission
- City of Boulder Landmarks Board
- City of Louisville Historic Preservation Commission
- City and County of Broomfield Historic Landmark Board
- Jefferson County Historical Commission
- City of Westminster Historic Landmark Board

Relevant Regulations, Guidance, Studies, and Plans

Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires federal agencies to consider the effects on NRHP-listed or NRHP-eligible properties when funding or permitting a project. Under Section 106 of the NHPA, the lead federal agency determines whether a proposed activity or project constitutes an undertaking. An undertaking is defined as any action requiring 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 agency determines that a project constitutes an undertaking, the agency defines an Area of Potential Effects (APE) or the area where an undertaking may directly or indirectly cause changes in the character or use of historic resources in consultation with the SHPO and identified consulting parties. Once the APE has been defined, the agency then consults with the SHPO and consulting parties on identifying and evaluating resources in the APE and potential effects on NRHP-listed or NRHP-eligible resources within the APE.

Section 4(f) of the CDOT Act (DOT, 1966) prohibits the USDOT from using parks, recreation areas, wildlife and waterfowl refuges, and historic properties unless there is no feasible and prudent alternative to that use and the action, includes all possible planning to minimize harm to the property resulting from such use. A use under Section 4(f) for historic properties is typically triggered by an adverse effect determination under Section 106 of the NHPA or occupancy of a historic property for a transportation purpose.

NWR Corridor EE in 2010 identified known historic sites and preliminary effects along the corridor. This assessment provides an updated database of known historic sites within the study area. A file search of site and resource records at OAHP indicated that there are 116 previous historic resource inventories within the planning area, mostly comprised of archaeological and architectural surveys. Many of the previous inventories identified in the OAHP database are over 10 years old and may not meet current OAHP standards for the recency of cultural resource surveys or did not include properties that may have reached 50 years of age since then. Correspondence with local landmark commissions identified additional municipal historic resource surveys that may not be included in OAHP records and site files database. In addition to federal requirements for managing historic resources, local historic preservation ordinances are an important consideration in the planning process. While the NHPA is procedural and does not impose substantive legal requirements on federal agencies beyond considering means to avoid, minimize, or mitigate adverse effects on historic properties, many local historic preservation ordinances impose more explicit preservation mandates for locally designated landmarks.

Municipal or county studies and plans relevant to historic resources within the study area include:

- Boulder County Comprehensive Plan (Boulder County, 2020)
- Boulder Valley Comprehensive Plan (City of Boulder, 2021)
- Longmont Multimodal & Comprehensive Plan (City of Longmont, 2016)
- Louisville Preservation Master Plan (City of Louisville, 2015)
- Broomfield Comprehensive Plan (City and County of Broomfield, 2016)
- Westminster Comprehensive Plan (City of Westminster, 2015)

Municipal or county ordinances relevant to historic resources within the study area include:

- City of Boulder, Municipal Code, Title 9 – Land Use Code, Ch. 11 – Historic Preservation
- City of Longmont, Code of Ordinances, Title 2 – Administration, Ch. 2.56 - Historic Preservation Commission
- City of Louisville, Code of Ordinances, Title 15 – Buildings and Construction, Ch. 15.36 - Historic Preservation
- City and County of Broomfield, Municipal Code, Title 17 – Zoning, Ch. 17-72 Historic Preservation
- City of Westminster, Code of Ordinances, Title XI. – Land Development and Growth Procedures, Ch. 13 - Historic Preservation

Data Collection/Methodology

A file search was conducted of records on file with the Colorado OAHP in October 2022 to collect information on previous surveys and identify historic resources in the study area. Those data were used to identify existing historic resources, related prior surveys, and NRHP eligibility status. Because the OAHP database can be incomplete regarding 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 area. 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.

The Study identifies cultural resources that may be within an Area of Potential Effect that would be determined as part of the subsequent Section 106 compliance process. The study area for this analysis includes a 1,000-foot buffer from the existing BNSF corridor centerline and a 0.5-mile buffer from each new station platform. This study area captures cultural resources the new rail line would most influence.

Findings/Results

The OAHP file search identified 1,607 known historic resources in the study area. Local landmark data from municipal historic preservation commissions contributed an additional 92 properties to the known historic resources within the study area. These local landmarks are often recorded within OAHP records, but this is not always the case. When a historic resource has been issued a Smithsonian number, documented in OAHP records, but is also a designated landmark, both designations are counted in Table 35 to reflect the multiple regulatory contexts (NHPA, local ordinance) under which the resource may be managed.

These historic resources include districts, residential and commercial buildings, roads, railroads, bridges, transmission lines, culverts, ditches, and public spaces. Table 35 summarizes the NRHP eligibility statuses of historic resources previously identified and documented in the planning area. Note that "Officially Eligible" properties have been determined eligible with SHPO concurrence and require the same effects analysis under Section 106 of the NHPA as NRHP-listed properties. Contributing and non-contributing apply to properties within an NRHP-listed or Officially Eligible historic district. Field assessments without SHPO concurrence typically require reevaluation, as do Officially Needs Data properties. Linear resources are treated as NRHP-eligible unless the entire resource has been documented and evaluated. Segments of linear resources are recorded in place of the entire resource and evaluated as supporting or not supporting the eligibility of the overall linear resource. Historic resources and their relation to the study area are shown in Figure 44 through Figure 48. Detail maps showing all historic resources within the planning area at 1:24,000 resolution are available in Appendix C.

The planning area includes NRHP-listed, NRHP-eligible, and potentially eligible properties, in addition to previously identified properties but with no official determination. Several linear historic resources, including the Burlington Northern Railroad and Colorado & Southern Railroad, run the length of the planning area. Concentrations of known historic properties are found in the downtown areas of Longmont, Niwot, Louisville, Broomfield, and Westminster.

Table 35: Summary of National Register Status and Designated Local Landmarks

Status	Number of Properties
Historic Properties: Listed, Officially Eligible, Supporting Eligibility, or Contributing to Eligible District	313
Officially Not Eligible	395
Locally Designated Landmark	92
Potential Historic Properties: Field Eligible, Needs Data, or No Assessment	509
Field Not Eligible, Non-Contributing, or Not Supporting	342
National Register Historic Districts	4

Figure 41: Cultural Resources by NRHP Status and Landmark Designation (South to North)

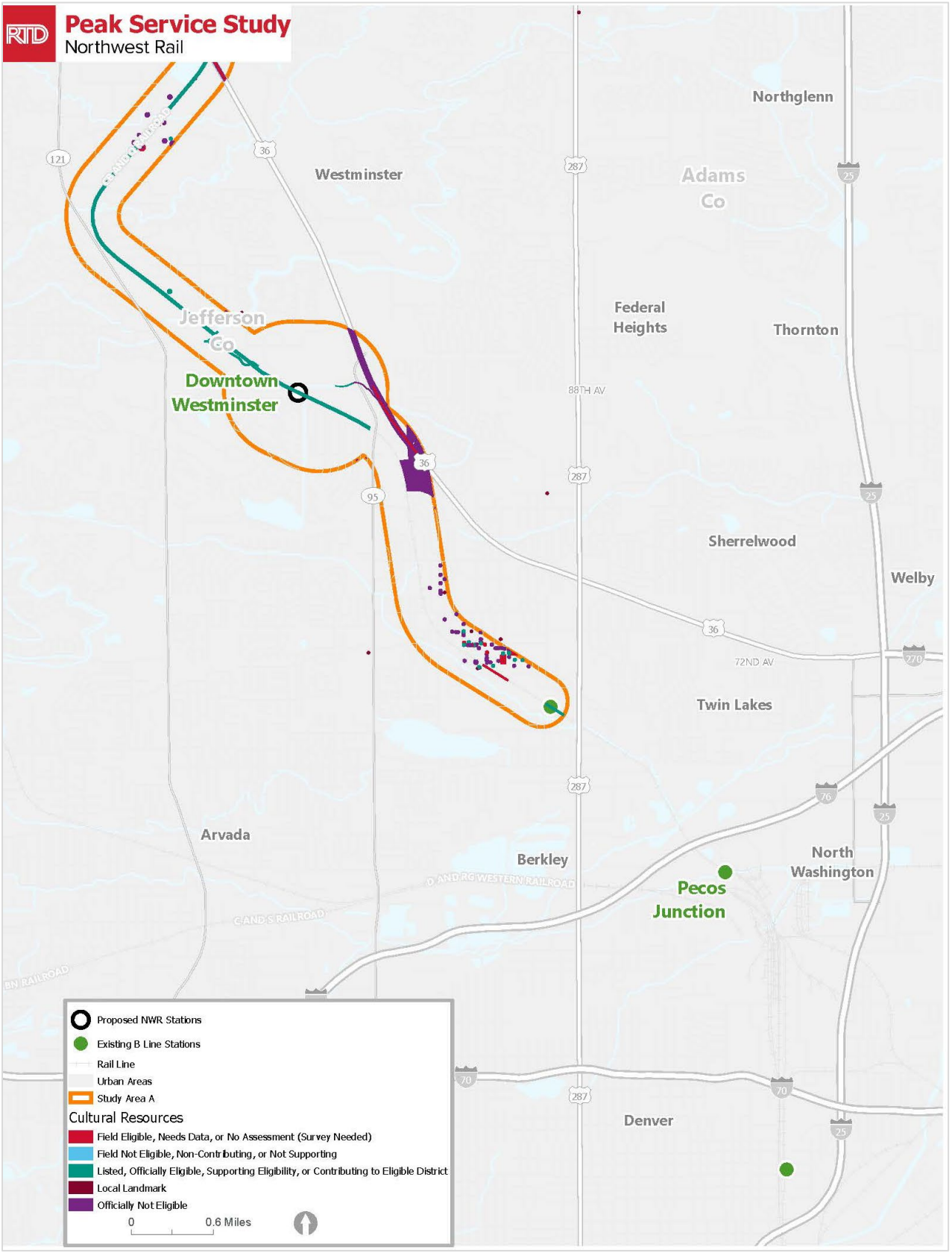


Figure 42: Cultural Resources by NRHP Status and Landmark Designation (South to North)

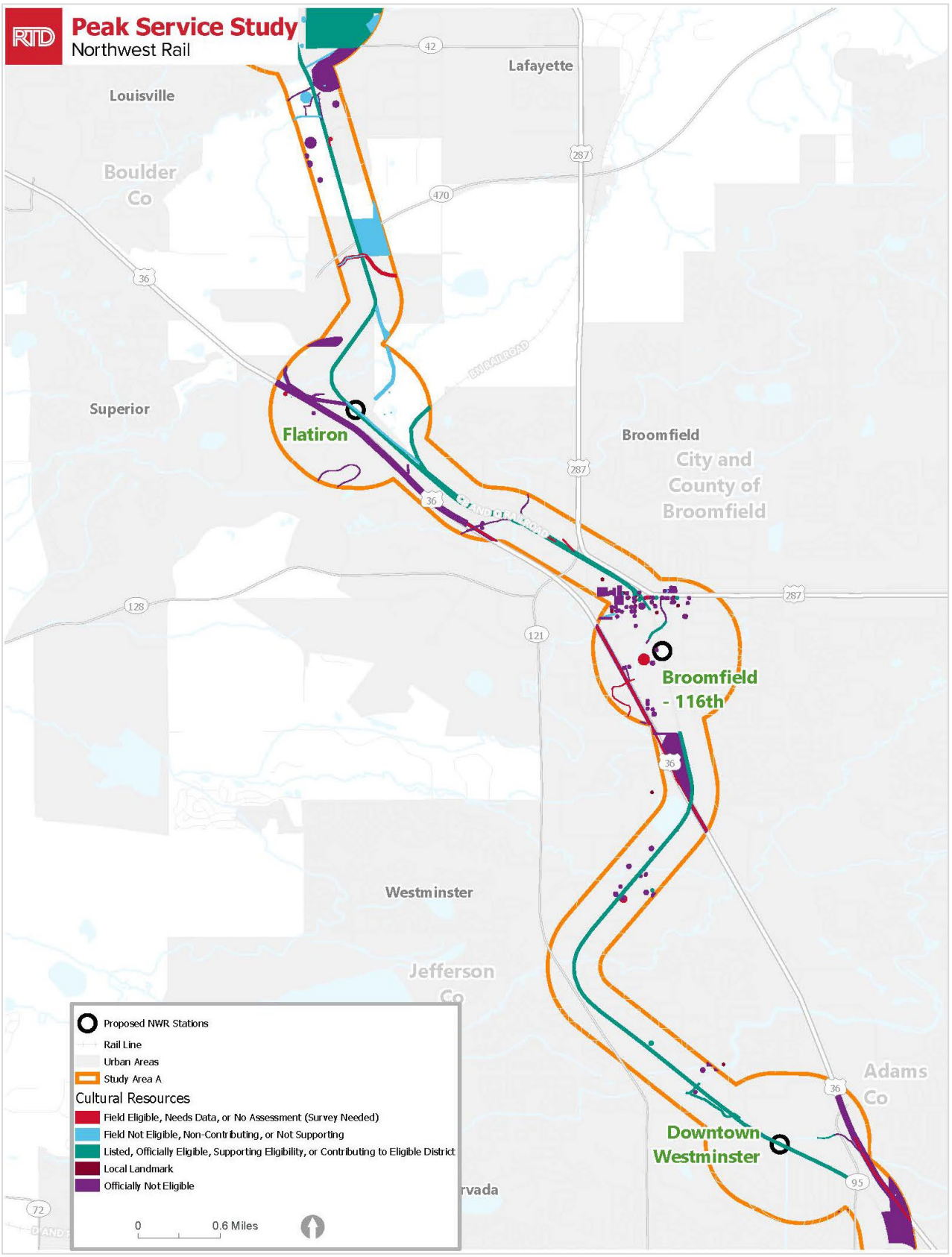


Figure 43: Cultural Resources by NRHP Status and Landmark Designation (South to North)

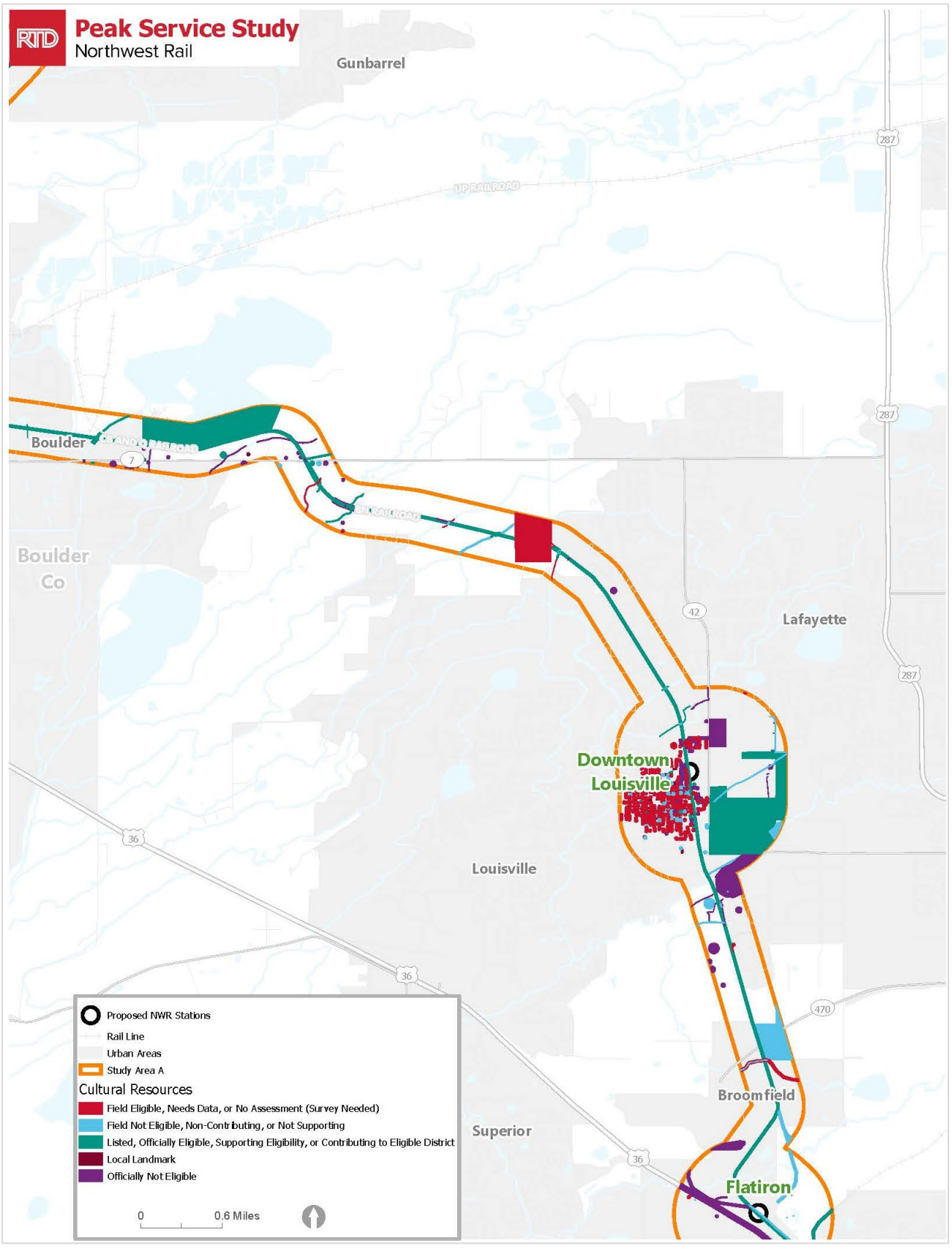


Figure 44: Cultural Resources by NRHP Status and Landmark Designation (South to North)

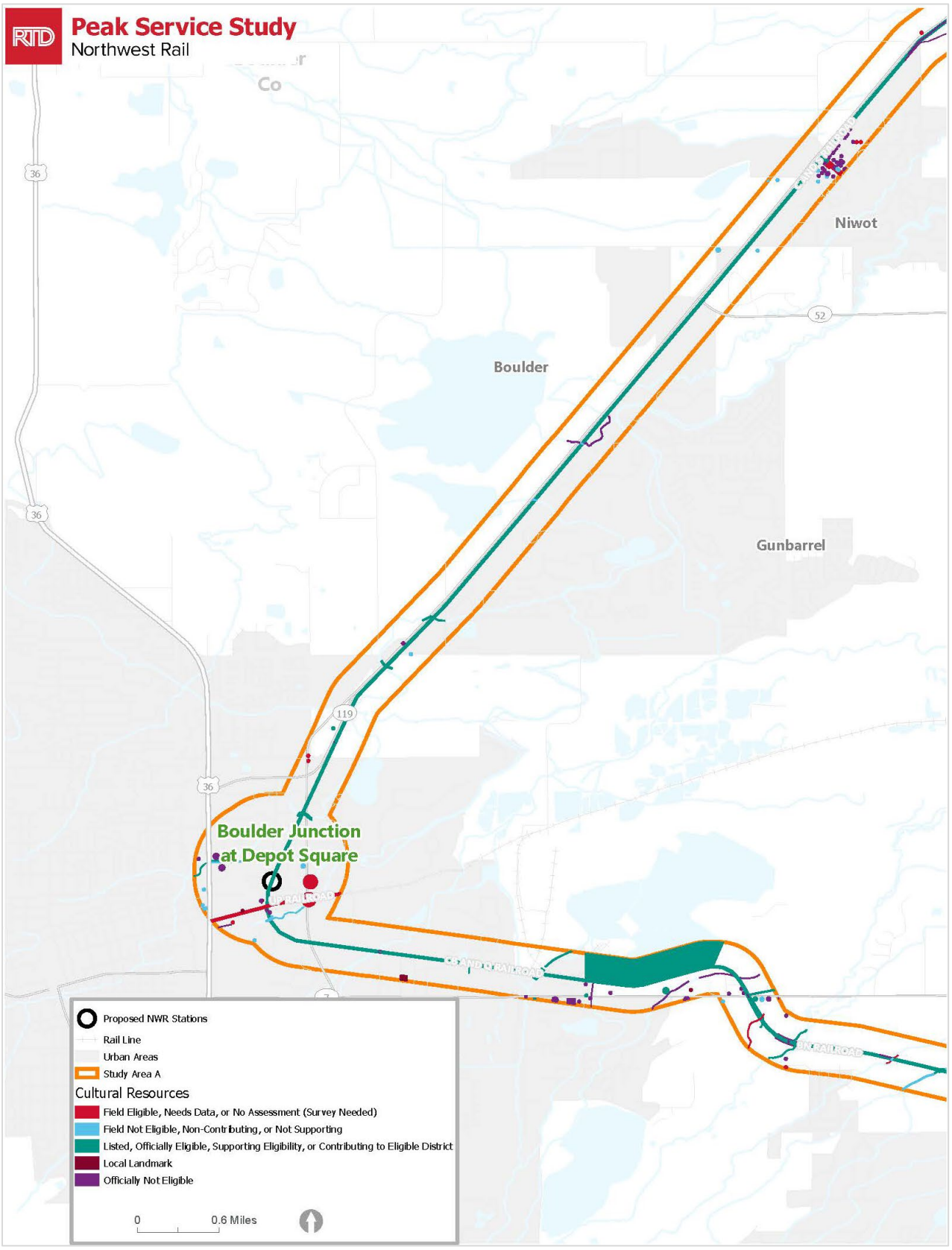
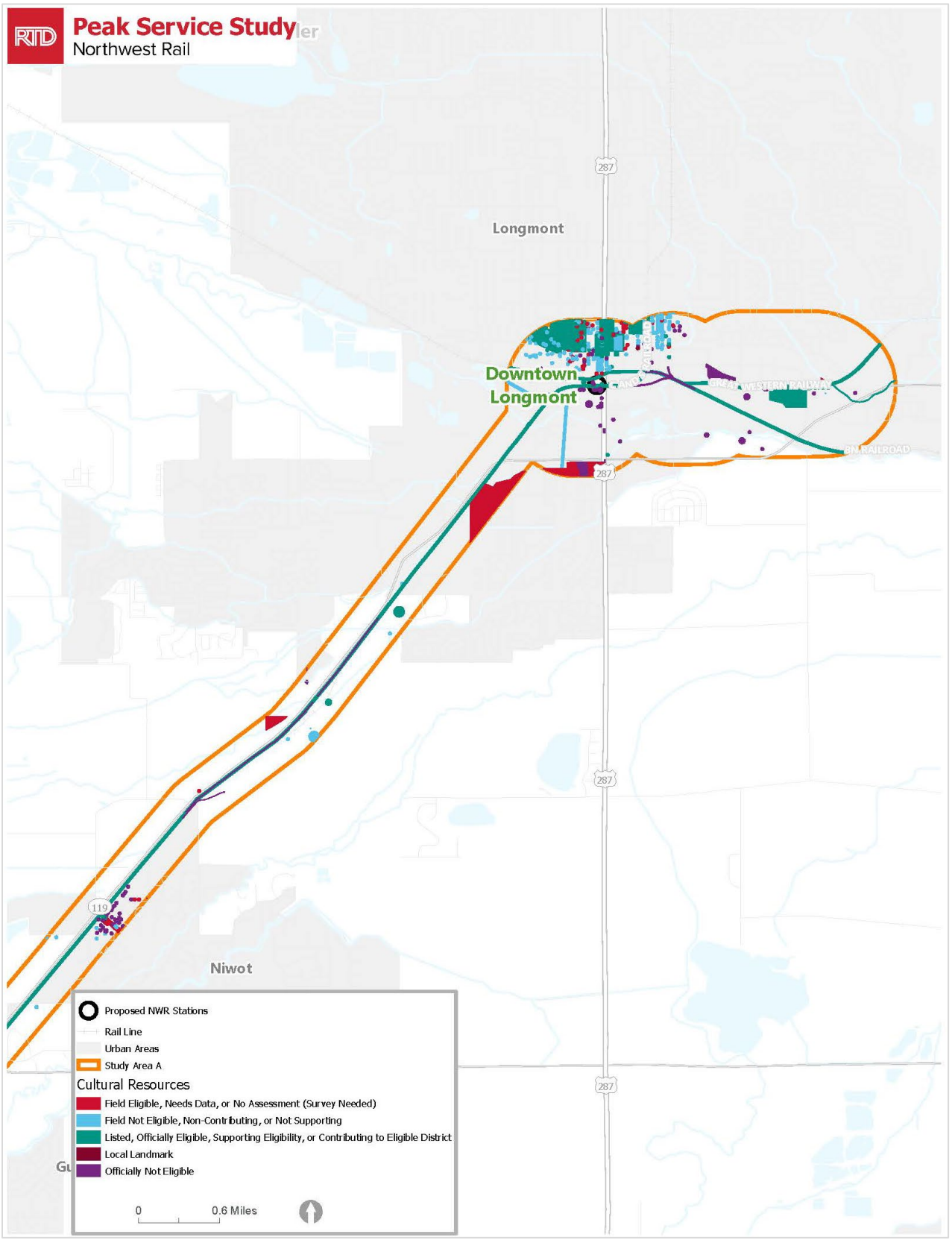


Figure 45: Cultural Resources by NRHP Status and Landmark Designation (South to North)



Next Steps

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.

During NEPA, the project would also require compliance with Section 106 of the NHPA and Section 4(f) of the CDOT Act, all of which consider effects on historic resources. If the lead federal agency determines a project is an undertaking under Section 106 of the NHPA, an 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 determine what historic resources may be potentially affected by the project. If adverse effects are determined during Section 106 of the NHPA, the lead agency, in consultation with stakeholders, will work to avoid, minimize, or mitigate effects.

In addition to federal and state laws and regulations, local agencies have additional ordinances and regulations that may require compliance or consideration. If possible, design solutions will seek ways to avoid or minimize impacts on historic properties and designated local landmarks. For alternatives with significant impacts, the lead agency will discuss practicable alternatives or mitigation. Where avoidance is not possible, effects on historic resources could delay NEPA clearance and add time to a specific project schedule during and subsequent to NEPA.

Archaeological and Paleontological Resources

Archaeological

Archaeological resources are defined as material evidence of human activity. They range in time from the pre-contact period to the modern day. Under current regulations, archaeological resources can be treated as historic properties if they meet one of the four criteria needed for listing in the NRHP (36 CFR 60.4). For the current Study, linear resources and their associated features, such as roads, bridges, culverts, and railroads, are excluded from archaeological resources and discussed alongside historic resources. NWR Corridor EE in 2010 did not note any archaeological resources.

A file search was conducted of archaeological site records on file at OAHP in October 2022. The file search identified nine known pre-contact archaeological resources and 33 historical archaeological resources within the planning area. Six of the nine pre-contact resources are classified as isolated finds, and three are documented as open-camp archaeological sites. Isolated finds are discrete occurrences representing a single event or activity, typically consisting of individual artifacts or small quantities of artifacts, and are considered not eligible for inclusion in the NRHP by its definition. Of the remaining three archaeological sites, two are officially not eligible, and one site is unevaluated. The 33 historical archaeological resources include mines, refuse dumps, artifact scatters, and building foundations. Historic isolated finds and features considered not eligible for inclusion in the NRHP comprise 10 of these resources. Of the remaining historical archaeological sites, 12 are officially not eligible for the NRHP, and 11 are unevaluated. The need and extent of archaeology surveys will be determined in the future and based on the scope and design of future projects during compliance with NEPA and Section 106 of the NHPA. Work will need to stop if an archaeological resource is discovered during construction, and coordination with the state archaeologist will occur. This could delay the construction schedule.

Paleontological

Paleontological resources include fossils (the remains and traces of once-living organisms preserved in the rock record) and the rocks surrounding those fossils that provide context. Because fossil organisms are mostly extinct, no further fossils of those organisms will ever be formed; therefore, fossils are considered non-renewable resources protected under various state and federal laws and regulations. NWR Corridor EE in 2010 did not note any paleontological resources.

A paleontological records search specific to this study area was not conducted. However, OAHP records contain some paleontological records, and the records search conducted in October 2022 identified one fossil locality (5BF129) within the planning area. Fossils at the locality comprise Cretaceous-aged plant remains, including leaves, wood, and stem fragments. No paleontological surveys were completed as part of this assessment. During NEPA, the need and extent of paleontological surveys will be determined by the project-specific scope and a review of the Potential Fossil Yield Classification, which classifies geological units based on the likelihood of finding scientifically important fossils in each unit.

If scientifically important fossils are discovered, they need to be removed from the work site to a repository museum for further study. Any discovery of a fossil may cause a delay to the schedule and additional consideration of mitigation requirements.

Parklands, Recreation Resources, Section 4(f), and Section 6(f)

Brief Description 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.

Agencies Involved

Recreational resources within the corridor are generally owned and operated by local agencies. The USDOT is responsible for implementing Section 4(f) and Section 6(f) regulations and coordinating with the applicable local, state, or federal agencies if impacts occur. For Section 6(f) properties, the lead agency would coordinate with Colorado Parks and Wildlife (CPW), which administers Section 6(f) coordination on behalf of the National Parks Service.

Relevant Regulations, Guidance, Studies, and Plans

Section 4(f) was created when the USDOT was formed in 1966. It is codified in Title 49 United States Code (U.S.C.) Section 303 (Section 4(f) of the USDOT Act of 1966) and Title 23 U.S.C. Section 138, and in implementing regulations 23 CFR 774. It states:

"The Secretary shall not approve any program or project ……which requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance as determined by the federal, state, or local officials having jurisdiction thereof, or any land from an historic site of national, state, or local significance as so determined by such officials unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use."

Section 6(f)(3) of the Land and Water Conservation Fund Act of 1965 contains provisions to protect properties purchased or improved with grants from the Land and Water Conservation Fund. Section 6(f) applies to all transportation projects that could involve the potential conversion of the use of these public outdoor recreational properties (CDOT, 2017).

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 36. Figure 46 through Figure 50 show the locations of these resources.

Table 36: Existing and New Parks, Trails, and Recreational Areas

Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership
Adams County				
P1[C]	New Trail[A]	New trail runs parallel to the track (on the west side) and connects to more open space further north (near 104th Avenue). Lastly, there is a body of water, open space, and more new trails where the tracks intersect with US 36. This area is nestled between Wadsworth Avenue and the tracks/highway.	NA	City of Westminster

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Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership
1	Westminster Station Nature Play Park[A]	Nature Playground, pond access, water and sand play areas, and outdoor performance center	12.8	City of Westminster
2	Future Park Site[A]	Open Space	1.8	City of Westminster
3	Little Dry Creek Open Space[A]	Open space and dog park	64.7	City of Westminster
4	Little Dry Creek Trail[A]	Trail	NA	City of Westminster
5	Lowell Boulevard Trail[A]	Trail	NA	City of Westminster
6	England Park[A]	Basketball court, pavilion, restroom facility, picnic tables, BBQ grills, and play equipment	11.5	City of Westminster
7	Bradburn Boulevard Trail[A]	Trail	NA	City of Westminster
8	Firemans Park[A]	Community Park	0.6	City of Westminster
9	Future Park Site[A]	Open Space	5.8	City of Westminster
10	Wolff Run Park[A]	Basketball, tennis, baseball, volleyball, and picnic facilities; lake/stream; turf field; and playground	12.6	City of Westminster
11	Wolf Run Trailhead[A]	Trailhead	NA	City of Westminster
12	Wolff Run Trail[A]	Trail	NA	City of Westminster
13	Sunset Park[A]	Picnic tables and playground	3.5	City of Westminster
14	Sunset Park Trail[A]	Trail	NA	City of Westminster
Jefferson County				
15	Discovery Trail Open Space	Open space	8.9	City of Arvada
16	Discovery Trail[A]	Trail	NA	City of Arvada
17	Allen Ditch Trail[A]	Trail	NA	City of Westminster
18	Farmers' High Line Canal	Greenway	NA	City of Westminster
19	Open Space	Open space	3.6	City of Westminster
20	Farmers' High Line Canal Trail[A]	Trail	NA	City of Westminster
21	Nivers Canal	Community separator and open space	NA	City of Westminster
22	Open Space	Open space	0.8	City of Westminster
23	Wadsworth Wetlands Open Space[A]	Open space and preserve	19.3	City of Westminster

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Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership
24	Big Dry Creek Open Space[A]	Open space, preserve, and trails	243.9	City of Westminster
25	Big Dry Creek Trail[A]	Trail	NA	City of Westminster
26	Open Space	Community separator and open space	0.8	City of Westminster
27	Church Stage Stop[A]	Historic Park	1.6	City of Westminster
28	Walnut Creek Open Space[A]	Open space and preserve	108	City of Westminster
29	Walnut Creek Trail[A]	Trail	NA	City of Westminster
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
Broomfield County				
P2[C]	New Trail[A]	New 8-foot detached sidewalk at the rail intersection at 112th Avenue. Further north on the tracks is a new bike/ped underpass/overpass that would connect an existing multi-use path on the east side of the tracks to a new multi-use path on the west side of the tracks near Jim Clapper field (approximately 113th Street).	NA	City and County of Broomfield
P3[C]	New Trail[A]	New 8-foot sidewalk intersects the tracks at approximately 116th Street. Both an existing and new 8ft detached sidewalk intersects the railway at Highway 128. The new sidewalk would then run parallel to the tracks on the east side until Nickel Street, where there is a new bike/ped underpass/overpass that would allow the new sidewalk to cross to the west side of the tracks, where it would then run parallel to the tracks until Compton Street. The railway intersection and Compton Street would have another new bike/ped underpass/overpass. An existing soft-surface trail runs along, then intersects the tracks at 10th Avenue.	NA	City and County of Broomfield
P4[C]	New Trail[A]	There is an existing multi-use path near the Northwest Parkway on/off ramp for US 36. Further north, a new multi-use path would intersect the railway at Northwest Parkway.	NA	City and County of Broomfield

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Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership
P5[C]	New Trail[A]	There is an existing bike/ped underpass/overpass at the railway intersection near Bella Vista Drive. A new on-street bike lane intersects the tracks at 112th Avenue and similarly where the railway intersects SH 128. A new on-street bike lane runs parallel to the tracks east of 287. It intersects the railway where 287 and SH 121 meet near US 36. Another new bike lane touches the tracks just south of 10th Avenue. Further north along the tracks, a new bike lane intersects the tracks at US 287, and an existing on-street bike lane intersects shortly after on 144th Avenue.	NA	City and County of Broomfield
32	School Park[A]	Track and field facilities	3.2	City and County of Broomfield
33	Broomfield Industrial Park[A]	Fields, basketball, multi-purpose courts, inline hockey rinks, playground, picnic tables, and shelter	25.9	City and County of Broomfield
34	Nickel Street Park[A]	Open space, preserve, and farms	0.5	City and County of Broomfield
35	Trail	Trail	NA	City and County of Broomfield
36	County Open Space	Open Space	1.1	City and County of Broomfield
37	Broomfield Trail[A]	Trail	NA	City and County of Broomfield
39	Lac Amora Open Space	Open Space, pond, and trails	109.2	City and County of Broomfield
40	Lake Link Trail[A]	Trail	NA	City and County of Broomfield
41	Parkway Circle	Conservation easement, preserve, and farms	29.9	Private/City and County of Broomfield
42	Varra South Conservation Easement	Open space, preserve, and farms	51.7	Private/City and County of Broomfield
43	Rock Creek Trail[A]	Trail	NA	City and County of Broomfield
44	Trail	Trail	NA	City and County of Broomfield
45	Terracina	Greenway	0.3	City and County of Broomfield

Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership
46	Anderson Triangle	Conservation easement	1	Private/City and County of Broomfield
47	Shirk Conservation Easement	Open space, preserve, and farms	77.1	Private/City and County of Broomfield
48	Broomfield Business Center	Conservation easement and preserve	5.4	City and County of Broomfield
49	Del Corso Park[A]	Playground, dog park, parking, picnic facilities, and shelter	4.5	City and County of Broomfield
51	Varra North Conservation Easement	Conservation easement and preserve	49.2	Private/City and County of Broomfield
111	North Midway Park[A, B]	Playground, picnic facilities, restroom facilities, open space	12.8	City and County of Broomfield
112	South Midway Park[A, B]	Open space and ballpark	12.8	City and County of Broomfield
Boulder County				
P6[C]	New Trail[A]	New trail wraps around Louisville middle school to the west and then back to Main Street. From there, it moves north and intersects with South Boulder Road, which splits west and east. Following the trail to the east, it crosses the tracks at a new underpass.	NA	City of Louisville
P7[C]	New Trail[A]	New trail would run parallel to the west of the tracks on Centennial Drive	NA	City of Louisville
P8[C]	New Trail[A]	Potential off-street trail halfway between, and running parallel to, S Pratt Parkway and Main Street from First Avenue to an existing trail running alongside St Vrain Creek	NA	City of Longmont
P9[C]	New Trail[A]	New trail would follow the tracks from the moment it enters Boulder County until it passes just north of Independence Road near Diagonal Highway. Further along, it would intersect another new trail slightly east of 55th Avenue. The tracks would intersect with an existing and new trail near Foothills Parkway and Pearl Parkway. There is an underpass that connects new trails near Mitchell Lane. An underpass connects an existing multi-use trail to the west of the tracks and an existing soft-surface multi-use trail to the east of the tracks north of Independence Road near the creek. Slightly north of Jay Road, the tracks would touch a new trail.	NA	City of Boulder

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Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership
P10[C]	New Trail[A]	Near Spire Road, a new trail would cross the tracks. Another new trail would run parallel to the east side of the tracks from Spire Road to approximately Boulder and Left Hand Ditch. It would cross the tracks to the west side and run parallel to the tracks for a short while to a service road.	NA	City of Boulder
38	Carolyn Holmberg Preserve at Rock Creek Farm[A]	Open space, preserve, and farms	6	Boulder County
50	Trillium Open Space[A]	Open space, preserve, and farms	145.5	City of Louisville
52	Open Space	Open space	10.8	City of Louisville
53	County Road Open Space[A]	Open space park and preserve	18.6	City of Louisville
54	Coal Creek Trail[A]	Trail	NA	City of Louisville
55	Louisville Community Park[A]	Pavilion with stage and picnic shelter, dog park, basketball, bocce ball, horseshoe pits, dirt bike hill, playground, and water spray ground	15.7	City of Louisville
56	Mayhoffer Farm[A]	Conservation easement, preserve, and farms	201.9	Boulder County
57	Miners Field[A]	Athletic Park	3.1	City of Louisville
58	Harney Lastoka Open Space[A]	Open space, preserve, and farms	113.3	Boulder County
59	Louisville Sports Complex[A]	Ballfields, restrooms, and playground	24.3	City of Louisville
60	Harney Lastoka Trailhead[A]	Trailhead	NA	Boulder County
61	Harney Lastoka Trail[A]	Trail	NA	Boulder County
62	Bullhead Gulch Open Space Trail[A]	Trail	NA	City of Louisville
63	Centennial Corridor Open Space Trail[A]	Trail	NA	City of Louisville
64	Callahan Open Space[A]	Open space, preserve, and farms	45.1	Boulder County
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
67	Webb Open Space[A]	Open space park and preserve	18.1	City of Boulder
68	Watt Open Space[A]	Open space park and preserve	20.4	City of Boulder
69	Autrey Open Space[A]	Open space park and preserve	176.1	City of Boulder

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Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership
70	Western Meadows Park	Conservation easement, preserve, and farms	32.8	Private/Boulder County
71	Spicer Open Space[A]	Open space park and preserve	44.5	City of Boulder
72	Swartz Open Space[A]	Open space park and preserve	42.7	City of Boulder
73	Rosenblatt/Ryan Open Space[A]	Open space park and preserve	49.5	City of Boulder
74	Lewis Open Space[A]	Open space park and preserve	58.9	City of Boulder
75	Merle Smith Open Space[A]	Open space park and preserve	44.8	City of Boulder
76	Legion Park [A]	Tribute and trails	23.1	Boulder County
77	Legion Park Trail [A]	Trail	NA	Boulder County
78	Flatirons Industrial Park[A]	Open space and preserve	36.6	City of Boulder
79	Copper Door North[A]	Open space and preserve	2.7	City of Boulder
80	South Boulder Creek Path [A]	Trail	NA	City of Boulder
81	Cottonwood Grove Open Space[A]	Open space park and preserve	37.2	City of Boulder
82	Boulder Community Health Hospital Easement	Conservation easement and preserve	38.8	Private/Boulder County
83	Boulder Creek Path [A]	Trail	NA	City of Boulder
84	Foothills Parkway Path[A]	Trail	NA	City of Boulder
85	Pearl Parkway Path [A]	Trail	NA	City of Boulder
86	Goose Creek Path[A]	Trail	NA	City of Boulder
87	Howard Heuston Park [A]	Picnic facilities, dog park, and basketball	7.8	City of Boulder
88	Reynold's Open Space[A]	Open space, preserve, and farms	17.1	City of Boulder
89	McKenzie Conservation Easement[A]	Conservation easement, preserve, and farms	231.6	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
92	The Greens Industrial Park Callahan Hollenbeck[A]	Open space park and preserve	8.1	City of Boulder
93	63rd St Path[A]	Trail	NA	City of Boulder

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Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership
94	IBM Open Space[A]	Open space, preserve, and farms	160.2	City of Boulder
95	IBM Connector Trail[A]	Trail	NA	Boulder County
96	Boulder Tech Center	Conservation easement and preserve	33.6	Private/Boulder County
97	Monarch Park[A]	Open space and preserve	138.3	Boulder County
98	Whistle Stop Park[A]	Playground, pavilion, and picnic tables	1.9	Boulder County
99	Freedman Douthit Open Space[A]	Open space park and preserve	32.4	Boulder County
100	Fitzgerald Open Space[A]	Open space, preserve, and farms	27.8	Boulder County
101	Fitzgerald Conservation Easement	Conservation easement, preserve, and farms	5.1	Private/Boulder County
102	Nelson (Bert) Open Space	Conservation easement, preserve, and farms	193.4	Private/Boulder County
103	LoBo Trail[A]	Trail	NA	Boulder County
104	Bielins Conservation Easement	Conservation easement, preserve, and farms	6.7	Boulder County
105	Bielins/Hock Open Space	Conservation easement, preserve, and farms	34.1	Private/Boulder County
106	Russell Anderson Schmidt Open Space[A]	Open space park and preserve	14	Boulder County
107	Peck Open Space[A]	Open space, preserve, and farms	44.8	Boulder County
108	St. Vrain Greenway[A]	Greenway	104.1	City of Longmont
109	St. Vrain Greenway[A, B]	Trail	NA	City of Longmont
110	Martin St Trail[A]	Trail	NA	City of Longmont
113	Boulder Junction Park[A]	Open space park	0.2	City of Boulder

[A] Assumed to be eligible for protection under Section 4(f)

[B] Eligible for protection under Section 6(f)

[C] New trails are identified as Proposed (P) but are not shown in Figures 41 through 45 due to unknown exact locations.

Figure 46: Recreation Resources (South to North)

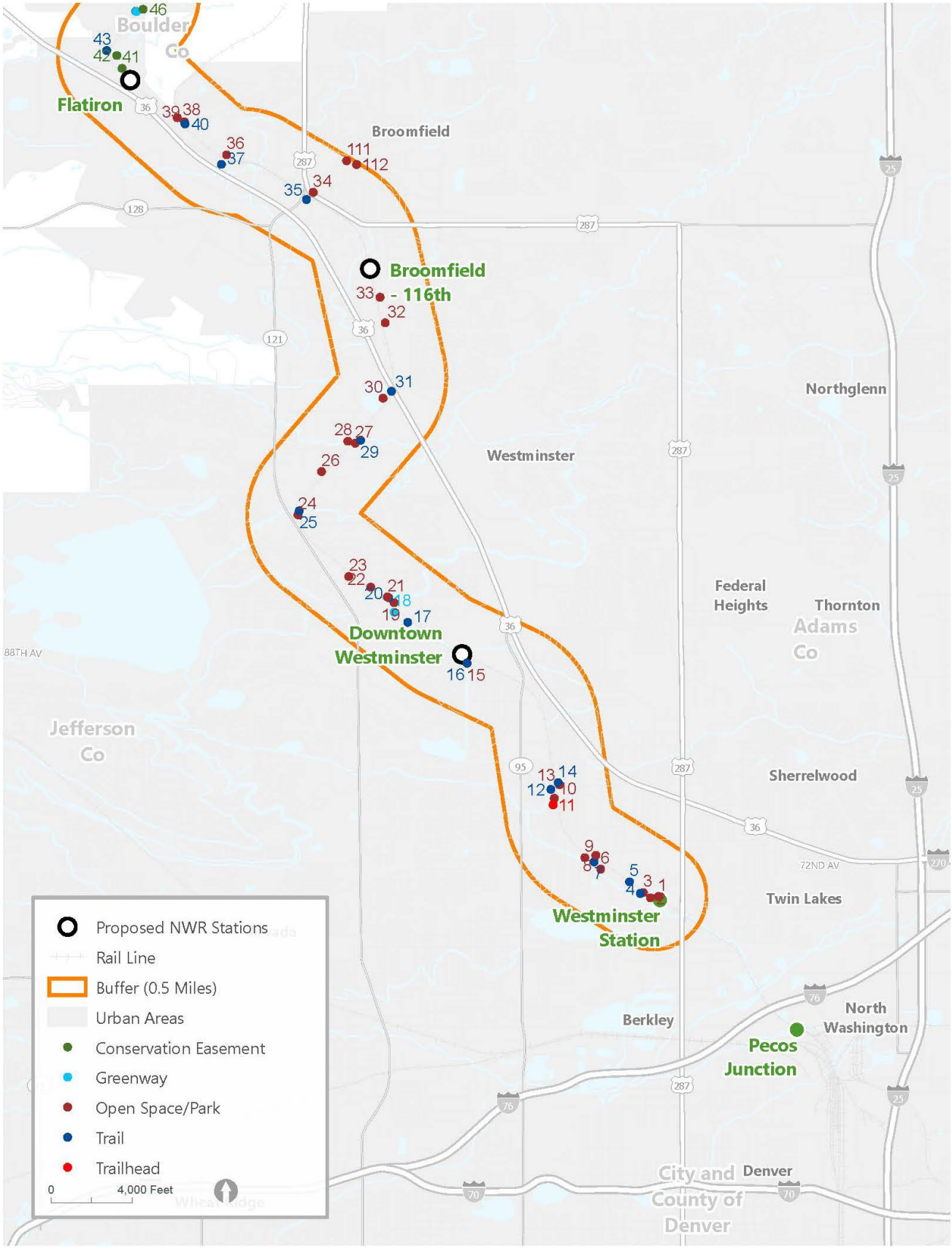


Figure 47: Recreation Resources (South to North)

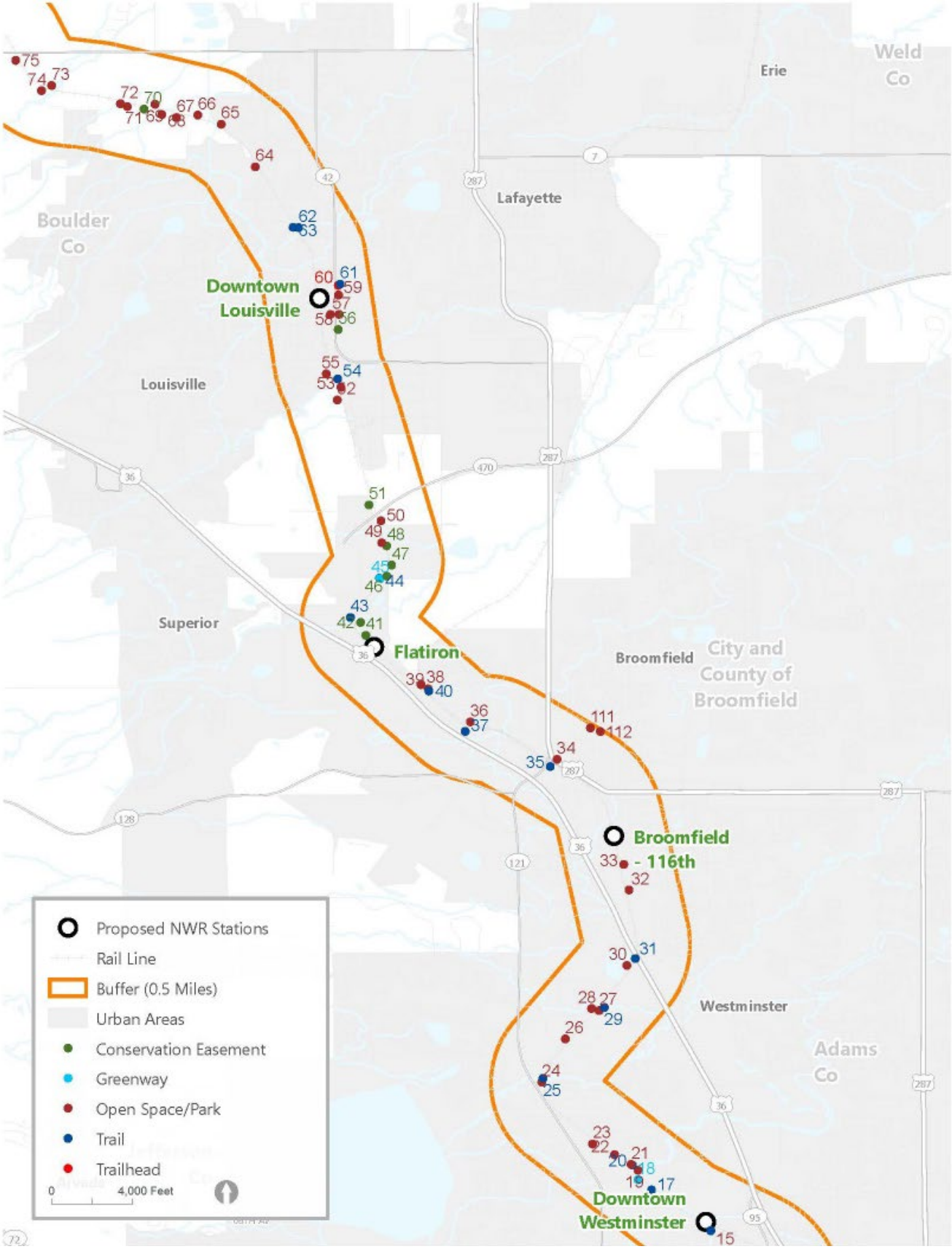


Figure 48: Recreation Resources (South to North)

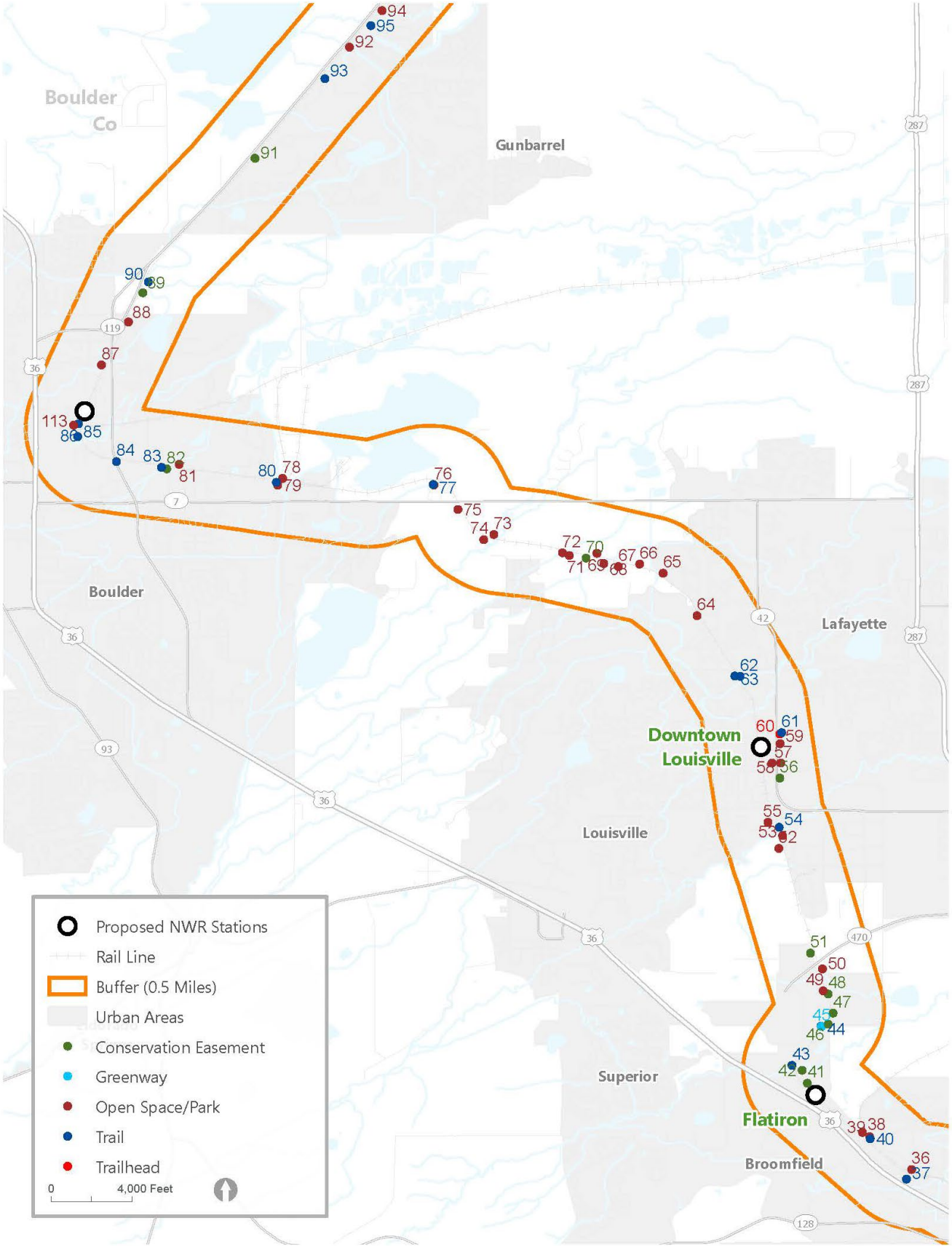


Figure 49: Recreation Resources (South to North)

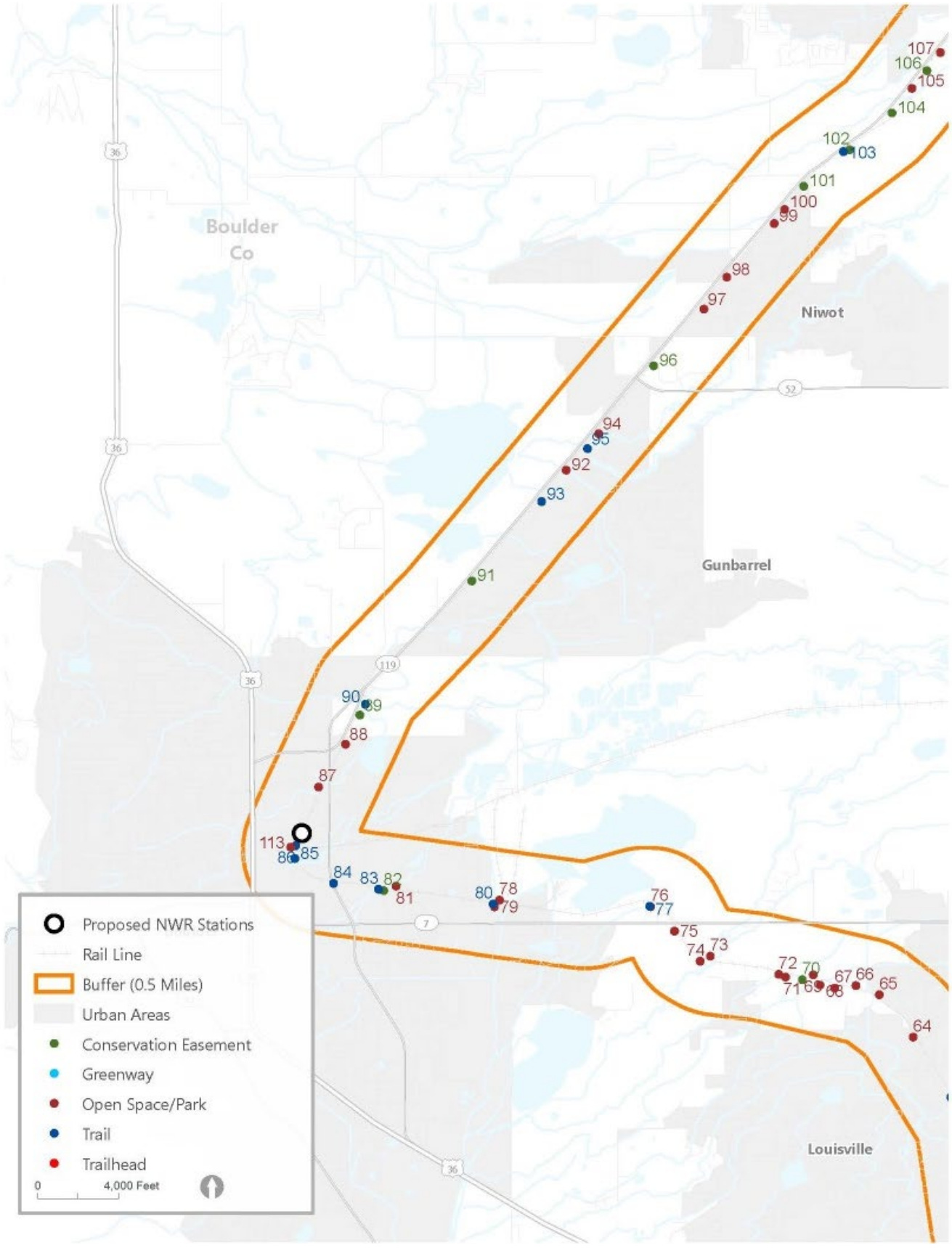
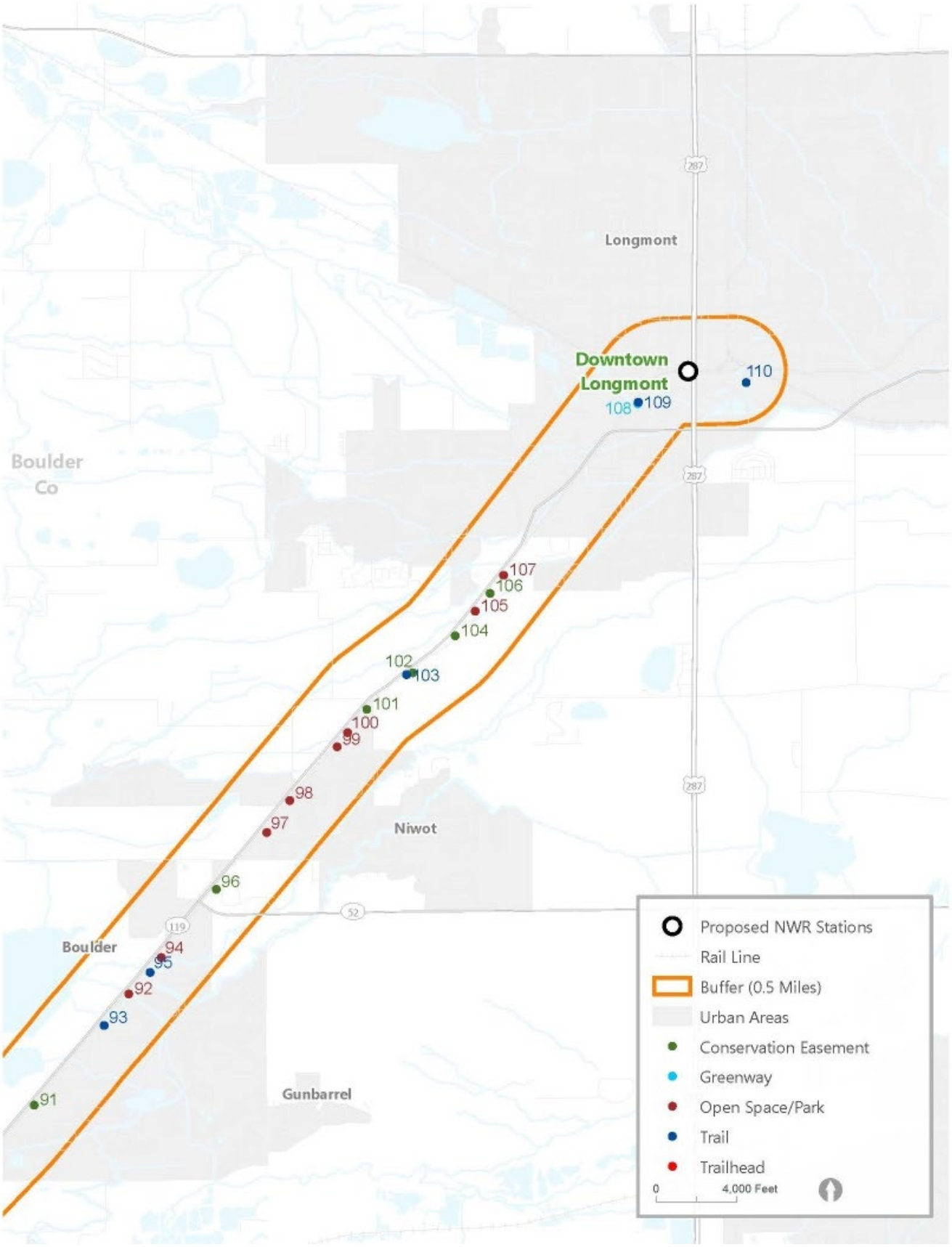


Figure 50: Recreation Resources (South to North)



Next Steps

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 practicable 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.

Visual and Aesthetic Resources

Brief Description of Resource Studied

Visual resources are components of the visible natural or built environment with aesthetic value. They may be formally identified by federal, state, or local agencies or be elements that contribute to a memorable or distinct landscape. Aesthetics are considered in developing new infrastructure projects because they can result in temporary and permanent changes to visual resources and influence the character of the communities in which they exist.

Agencies Involved

As the lead agency, RTD coordinates with local and land management agencies to ensure consistency with visual regulations and requirements applicable to the study area. During the pre-planning stage, RTD coordinated with these agencies to confirm station locations and identify environmental concerns and opportunities in the corridor; its engagement would continue throughout the development of the NWR Corridor.

Relevant Regulations, Guidance, Studies, and Plans

The following regulations and guidelines govern the assessment and consideration of visual quality and aesthetic character in the study area:

- NEPA: Identifies aesthetics as one of the elements or factors in the human environment that would be considered in determining the effects of a project. In its implementation of NEPA (23, U.S.C. 109(h)), FTA

directs that final decisions regarding projects are to be made in the best overall public interest, considering adverse environmental impacts, including the destruction or disruption of aesthetic values.

- FTA Circular 9400.1A, Design and Art in Transit Projects: Encourages the uses of design and artistic considerations in transit projects. The FTA recognizes that specific types of transit projects require an assessment of visual effects. The Circular guides opportunities for incorporating art and design into transit projects.
- The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (PL 109-59), Sections 6002-6009: Places additional emphasis on environmental considerations such as mitigation, enhancement activities, context-sensitive solutions, and Section 4(f). It also advances the idea of coordinating public and agency involvement and promoting visualization techniques to improve stakeholder understanding of the alternatives.
- RTD's *Environmental Policies and Procedures Manual Volume I* (RTD, 2021): Guides environmental work on FasTracks projects. Section 3.0, Visual and Aesthetic Resources, informs the methodology for this analysis.
- The FHWA *Visual Impact Assessment Guidelines* (FHWA, 2015): Although developed for highway projects, these guidelines are easily adaptable for transit and are the widely accepted approach to analyzing visual impacts for transportation projects.

Local agencies regulate aesthetics through comprehensive plans, municipal codes, and zoning ordinances. Comprehensive planning documents frequently address aesthetics through policies designed to protect and promote community character. In turn, municipal code and zoning ordinances address infrastructure, landscaping, fencing, and screening details, which are likely relevant for station design. Relevant, comprehensive planning documents include:

- *2040 City of Westminster Comprehensive Plan* (City of Westminster, 2021): Chapter 6, *Identity and Design,* emphasizes a quality-built environment and strong identity that highlights views and amenities.
- *Boulder Valley Comprehensive Plan* (Boulder County, 2021): Includes site design specifications to protect views and contribute to community character; emphasizes views of open space and the Rocky Mountains.
- *Boulder County Comprehensive Plan* (Boulder County, 2020): Emphasizes the protection of prominent natural landmarks and other scenic, visual, and aesthetic resources. Establishes context-sensitive design as a policy for the design of transportation facilities. A View Protection Overlay District protects views of the Front Range, although the study area does not currently overlap with the district.
- *Comprehensive Plan 2016* City of Broomfield (City of Broomfield, 2016): Establishes goals for community aesthetics as a priority in planning and siting infrastructure. The study area passes through several planning areas with goals related to the transit system, landscaping, and the aesthetics of new development (US 36 Sub-Area Plan, Broomfield Interchange Sub-Area Plan, and 96th Street/NW Parkway Sub-Area Plan).
- *City of Louisville Comprehensive Plan* (City of Louisville, 2013): Addresses visual resources and aesthetics by protecting community character.

- *Envision Longmont Multimodal & Comprehensive Plan* (City of Longmont, 2016): Includes planning to accommodate and avoid land use or visual conflicts with the future NWR Corridor and sets goals for considering aesthetics in site design of transportation and related projects.

Data Collection/Methodology

The study area for visual and aesthetic resources follows the existing BNSF corridor from Westminster to Longmont. It extends to areas visible to and from the trackway or stations. Existing visual conditions in the study area are characterized in terms of the built and natural environment, including land use, scenic features, vegetation types, landforms, open spaces, and historically and culturally significant resources. The types of viewers, users, and sensitive receptors in the study area are also defined. A desktop review informs the analysis of readily available comprehensive planning documents from local agencies, aerial photography, GIS data, Google Earth, and site visits to identify changes to viewsheds throughout the study area since the Final NWR Corridor EE. The visual inventory of the study area documents existing conditions through photos and written descriptions. The results are summarized in this section; details and photos are provided in Appendix D.

Visual quality is scored as low to high according to the visual harmony and vividness within the landscape. Areas with high visual quality are associated with harmonious landscapes with a strong sense of unity, order, and integrity. Areas with moderate visual quality are associated with moderately harmonious landscapes. These areas include features that are out of scale, relative to each other, and the overall landscape composition. Areas with low visual quality are associated with inharmonious landscapes reflecting disorderly composition. Vividness in the landscape is created by visually distinctive or unique focal points and features of interest that attract attention and create a memorable experience for the viewer.

Findings/Results

The visual character within the study area is variable and defined by industrial and railroad-related uses, established and newly constructed residential and commercial developments, open space and natural areas, recreational facilities, transportation infrastructure, and rural/agricultural landscapes and associated development. The most prominent visual feature in the study area is the Rocky Mountains. In undeveloped portions of Boulder and Longmont, views of the Rocky Mountains are highly intact. Visual quality ranges from moderate in Westminster Section to high in portions of the Louisville, Boulder, and Longmont Sections. Viewer types throughout the study area include workers, residents, recreational users, commuters, and visitors. Viewer sensitivity is highest in more undeveloped areas between stations and lowest near stations in urban areas. The analysis results are summarized in the Study section in Table 37. Detailed visual inventory and representative photographs are provided in Appendix D.

Table 37: NWR Peak Period Service Visual Quality Summary

Section	Visual Quality Score	Summary of Visual Elements	Viewer Types
Westminster	Moderate	Westminster Mall; Historic Westminster; residential and commercial developments; hotels; Big Dry Creek; intermittent views of the Rocky Mountains	Workers, commuters, residents, mall patrons, visitors
Broomfield	Moderate	Residential developments; intermittent views of the Rocky Mountains; agriculture; open space; office complexes; sports facilities	Workers, commuters, residents, recreational users

Section	Visual Quality Score	Summary of Visual Elements	Viewer Types
Louisville	High	Historic downtown Louisville; South Street Pedestrian Gateway; new residential and commercial development; intact, high-quality views of the Rocky Mountains; sports facilities; open space; agriculture	Workers, residents, recreational users
Boulder	Moderate and High	Undeveloped lands; open space; agriculture; intact, high-quality views of the Rocky Mountains and Flatirons in unurbanized areas; Boulder Transit Village with high-density residential and commercial development	Workers, residents, recreational users, mall patrons, visitors
Longmont	Moderate and High	Open space; large undeveloped parcels; agriculture; downtown Niwot; downtown Longmont; intact views of the Rocky Mountains; industrial, commercial, and high-density residential uses near the station	Workers, commuters, residents, recreational users

Source: RTD, 2010 and NWR Corridor Study Team, 2022.

Aesthetic features and visual quality along the BNSF corridor are generally consistent with what is presented in the Final NWR Corridor EE. Notable changes in development occurred at several station locations where high-density residential and commercial developments have been recently constructed. Local agencies may modify station area plans in these areas.

Next Steps

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.

During NEPA, the impact analysis will assess the degree of visual impact on existing visual quality based on an evaluation of visual contrast. The focus will be on station areas where new infrastructure has the greatest potential for visual change. The visual impact of improvements within the NWR Corridor, particularly surrounding stations, is identified as a community concern through past studies. Continued stakeholder involvement is recommended as station design evolves.

Air Quality

Brief Description 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.

Agencies Involved

The agencies involved with air quality regulation within the Denver Region are the following:

- Federal Transit Administration
- Federal Railroad Administration
- U.S. Environmental Protection Agency (EPA)
- Colorado Department of Transportation

- Air Pollution Control Division of the Colorado Department of Public Health and Environment (CDPHE)
- Denver Regional Council of Governments
- Regional Transportation District
- Colorado Energy Office
- Other local cities/counties that have jurisdiction

Relevant Regulations, Guidance, Studies, and Plans

The current attainment / nonattainment / maintenance status of air quality in the study area was assessed by National Ambient Air Quality Standards (NAAQS). Per the transportation conformity rules in 40 CFR 51 and 93, Subpart A, air quality would be considered in project development activities. Those requirements apply to any highway or transit project funded or approved by the USDOT, metropolitan planning organizations, or by other recipients of funds under Title 23 U.S.C. or the Federal Transit Laws (49 U.S.C. Chapter 53), including regionally significant projects.

Other applicable laws, regulations, guidance documents, and plans for air quality include:

- Clean Air Act
- NAAQS under 40 Code of Federal Regulations 50
- Transportation Conformity Guidance for Quantitative Hot Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas, EPA Publication EPA-420-B-15-084 (EPA, October 2021)
- Guideline for Modeling Carbon Monoxide from Roadway Intersections, EPA Publication EPA-454/R-92-005 (EPA, November 1992)
- FHWA Memorandum: Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents (FWA, October 18, 2016)
- Air Quality Project-Level Analysis Guidance (CDOT, 2019)
- Colorado Air Quality Control Commission Regulation No. 10, Criteria for Analysis of Transportation Conformity (February 18, 2016)
- Carbon monoxide and particulate matter less than 10 microns in diameter (PM_{10}) August 2019 Conformity Determination for the DRCOG Fiscally Constrained Element of the 2050 RTP and the 2022-2025 TIP (Adopted April 20, 2021) (DRCOG, 2021)
- EPA online Green Book website (based on updates through October 31, 2022) (EPA, 2022)

CDOT is also implementing a *Clean Transportation* Strategic Policy Initiative as part of its *Performance Plan FY 2021-2022* to accomplish this goal: *Annually reduce pollution in our air and congestion on our roads by reducing vehicle miles traveled by one percent per capita from the fiscal year 2019 baseline and annually reduce greenhouse gas and ozone causing emissions from the transportation sector from the fiscal year 2019 baseline in line with the Greenhouse Gas Pollution Reduction Roadmap targets by June 30, 2022, continuing through June 30, 2024.*

Major strategies for achieving this goal are to:

- Implement revised NEPA processes that include clean transportation goals and climate change impacts

- Encourage alternative commuting options through CDOT and partnership programs, increasing the usage of multimodal options for commuting to work (including telecommuting) to 35% by 2030
- CDOT Greenhouse Gas Reduction Roadmap

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 DRCOG's planning area.

Information on the latest NAAQS nonattainment, maintenance, and attainment designations for the study area was obtained from the 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

The status of the area within the study area concerning the attainment of current NAAQS for transportation-related pollutants is summarized in Table 38. The air pollutants listed are those for which there are requirements under the transportation conformity rules in 40 CFR 93, Subpart A.

Table 38: NAAQS Attainment Status (Adams, Boulder, Broomfield, Denver, and Jefferson Counties)

Pollutant/Standard	Status Designation
Carbon Monoxide 1971 NAAQS	Maintenance[A]
Ozone 2008 NAAQS[B]	Nonattainment (Severe)
Ozone 2015 NAAQS[B]	Nonattainment (Moderate)
$PM_{2.5}$ 2006 & 2012 NAAQS	Attainment
PM_{10} 1987 NAAQS	Maintenance[A]

[A]Maintenance status refers to an area that was in nonattainment at any point in the last 20 years but is currently in attainment or is unclassified

[B]2008 Ozone NAAQS was modified to Severe Nonattainment, and 2015 Ozone NAAQS was modified to Moderate Nonattainment (EPA, Oct 7, 2022).

PM_{10} = particulate matter less than 10 microns in diameter

$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter

Next Steps

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 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 existing conditions in the study area. 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.

Agencies Involved

As the lead agency, RTD coordinates with federal agencies such as FTA and FRA, and state and local agencies to ensure noise and vibration impacts are properly assessed, disclosed, and appropriate mitigation is considered.

Relevant Regulations, Guidance, Studies, and Plans

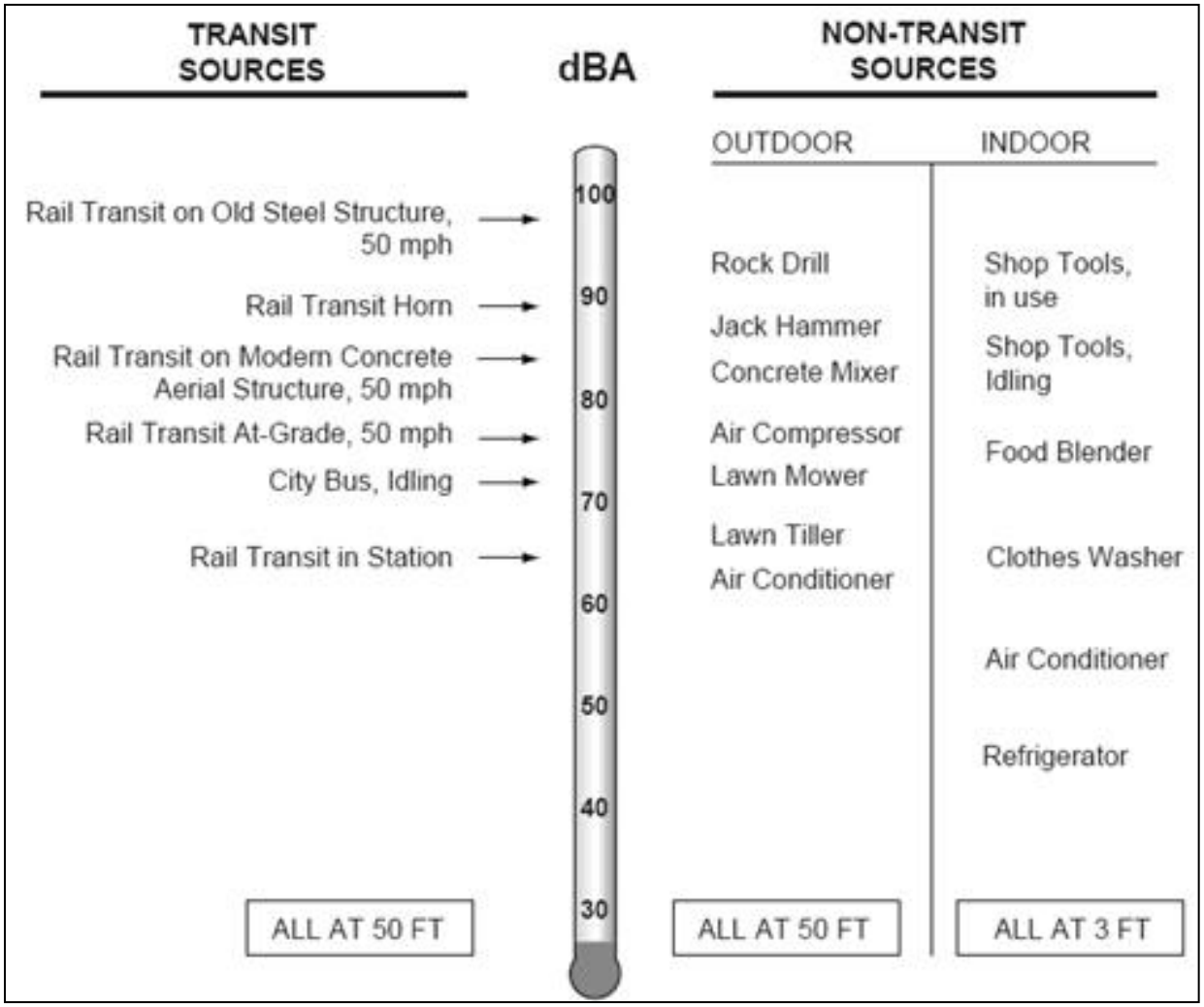
Although the NWR Corridor is not in a formal environmental review phase, this analysis uses FTA's *Transit Noise and Vibration Impact Assessment Manual* (FTA, 2018) methodology to evaluate noise and vibration.

Noise Assessment Overview

Sound pressure level is expressed in decibels on a logarithmic scale. Typical sound levels generally fall between 20 and 120 decibels, similar to the range of human hearing. A three-decibel change in sound level is widely considered barely noticeable in outdoor environments. A 10-decibel change in sound level is perceived as a doubling (or halving) of the loudness.

The frequency of sound is the rate at which fluctuations in air pressure occur and is expressed in cycles per second or hertz. Most sounds consist of a broad range of sound frequencies. The average human ear does not perceive all frequencies equally. The A-weighted decibel (dBA) scale was developed to approximate how the human ear responds to sound levels; it mathematically applies less "weight" to frequencies we do not hear well and more weight to frequencies we do hear well. Typical A-weighted noise levels for various types of sound sources are summarized in Figure 51:.

Figure 51: Typical Noise Levels



Source: FTA 2018.

Human reaction to environmental noise depends on the number of noise events, how long they last, and whether they occur during the daytime or nighttime. While the maximum noise level provides information about the amplitude of noise generated by a source, it does not explain how long the noise event lasted. The sound exposure level is a noise metric that considers how loud a noise source is and how long the event occurs. The sound exposure level of a noise event is also used to determine cumulative noise exposure over a one-hour or 24-hour long period.

Analysts use two primary noise descriptors to assess noise impacts from transit projects. They are the equivalent sound level (L_{eq}) and the day-night sound level (L_{dn}). The L_{eq} is a mean average noise level often used to describe sound levels that vary over time, typically for one hour. It is possible to calculate daily cumulative noise exposure using 24 consecutive one-hour L_{eq} values. The L_{dn} is a 24-hour cumulative A-weighted noise level that includes all noise that occurs throughout 24 hours, with a 10 dBA penalty on noise during nighttime (between 10 p.m. and 7 a.m.), where sleep interference might be an issue. The 10 dBA penalty makes the L_{dn} useful when assessing noise in residential areas, or other land uses where overnight sleep occurs. The noise analysis performed for this phase of the Study uses the L_{dn} descriptor.

FTA Transit Noise Impact Criteria

The FTA noise impact criteria are based on well-documented studies regarding community response to noise. These thresholds are based on the land use of the noise-sensitive receptor and the existing noise level. The L_{dn} assesses transit-related noise for residential areas and land uses where overnight sleep occurs (Land Use Category 2). The one-hour L_{eq} ($L_{eq}(h)$) assesses impacts at locations with daytime and/or evening use (Land Use Category 1 or 3), as shown in Table 39.

Table 39: FTA Noise Land Use Categories

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq(h)}$[a]	Tracts of land where quiet is an essential element in its intended purpose. This category includes lands set aside for serenity and quiet, such land uses as outdoor amphitheaters and concert pavilions, and National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where nighttime sensitivity to noise is assumed to be of utmost importance
3	Outdoor $L_{eq(h)}$	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches, where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities can also be considered in this category. Certain historical sites and parks are also included

Source: FTA 2018.

Notes: Outdoor $L_{eq(h)}$ uses the noisiest hour of transit-related activity during hours of noise sensitivity

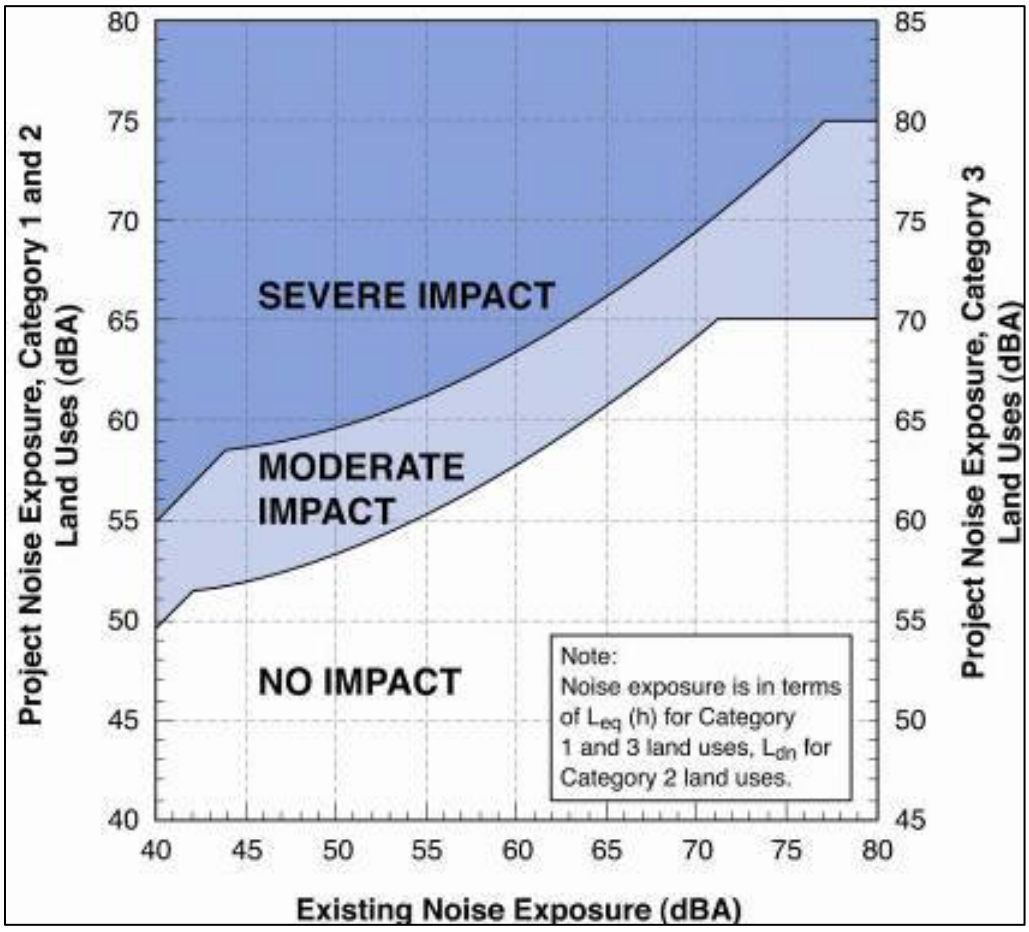
[a] 1-hour L_{eq}

The FTA noise impact criteria are defined by two curves that allow a varying amount of noise based on the existing noise level, as shown in Figure 52. Below the lower curve, a project is considered to have no impact because introducing project noise would result in an insignificant increase in noise level and the number of people highly annoyed. The two degrees of noise impact defined by the FTA criteria are defined as follows:

Severe Impact: In the severe impact range, many people would be highly annoyed by the project noise. Noise mitigation would normally be specified for severe impact areas unless it is not feasible or reasonable (meaning there is no practical method of mitigating the impact or mitigation measures are cost-prohibitive).

Moderate Impact: In the moderate impact range, changes in the cumulative noise level are noticeable but may not be sufficient to cause strong, adverse reactions from the community. In this range, other project-specific factors are considered to determine the magnitude of the impact and the need for mitigation. Other factors include the predicted increase over existing noise levels, the types and the number of noise-sensitive land use affected, existing outdoor-indoor sound insulation, and the cost-effectiveness of mitigating noise to more acceptable levels.

Figure 52: FTA Noise Impact Criteria



Source: FTA 2018.

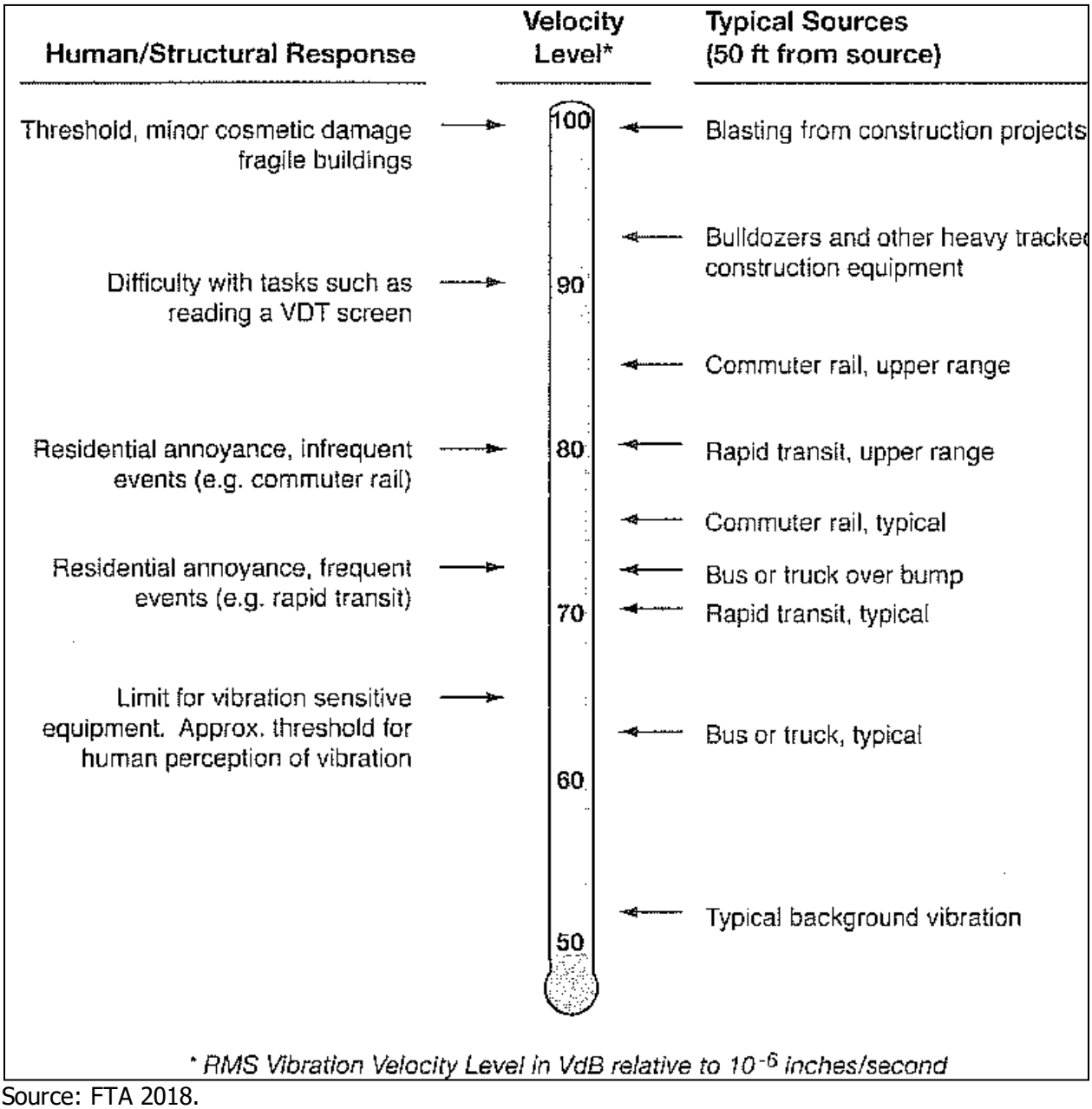
Vibration Assessment Overview

The root mean square amplitude of a motion over one second is commonly used to predict human response to vibration. The vibration velocity level is expressed in vibration decibels (VdB) relative to a reference quantity of

one micro-inch per second. The level of vibration represents how much the ground is moving. The background vibration level in residential areas is usually 50 VdB or lower—well below the threshold of perception for humans, around 65 VdB. Annoyance occurs for frequent transit events at vibration levels over 70 VdB.

Vibration frequency is also expressed in hertz, and the human response to vibration generally falls between six and 200 hertz. Human response to vibration is a function of the average motion over a period of time, such as one second. Human response to vibration also roughly correlates to the number of daytime vibration events. The more events that occur, the more sensitive humans are to vibration. Figure 53 illustrates common vibration sources and associated human and structural responses to ground-borne vibration.

Figure 53: Typical Vibration Levels



Source: FTA 2018.

FTA Vibration Impact Criteria

FTA identifies separate criteria for both ground-borne vibration and ground-borne noise. Ground-borne noise is often masked by airborne noise; therefore, criteria are primarily applied to subway operations where airborne noise is negligible (and would not be evaluated in this assessment). FTA differentiates vibration-sensitive land uses into three distinct categories—similar but not identical to the noise-sensitive land use categories, as shown in Table 40. The vibration thresholds vary based on land use and the frequency of the vibration events.

Table 40: FTA Vibration Impact Criteria

Land Use Category	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
	Ground-borne vibration impact level (VdB re 1 micro-inch/second)		
Category 1[d] (highly sensitive, where vibration would interfere with operations)	65	65	65
Category 2 (where overnight sleep occurs)	72	75	80
Category 3 (institutional with primarily daytime use)	75	78	83
Ground-borne noise impact level (dBA re 20 micropascals)			
Category 2 (where overnight sleep occurs)	35	38	43
Category 3 (institutional with primarily daytime use)	40	43	48

Source: FTA 2018.

[a] Frequent events are defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall in this category.

[b] Occasional events are defined as between 30 and 70 vibration events of the same source per day. Most commuter rail trunk lines have this many operations.

[c] Infrequent events are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

[d] The Category 1 criteria limits are based on acceptable levels for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define acceptable vibration levels. Vibration-sensitive equipment is generally not sensitive to ground-borne noise.

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.

In the screening assessments, FTA directs analysts to select noise and vibration screening distances corresponding to the type of transit vehicle a project proposes to implement. The noise screening distances represent the distance at which each type of transit vehicle would result in a noise level of 50 dBA, so louder diesel-electric locomotives have larger screening distances than quieter streetcars. This project has not yet selected the transit vehicle type. The Study Team selected conservative screening distances and determined that noise- and vibration-sensitive land uses exist close to the project corridor (the only goal of the screening

steps). Therefore, when project-related effects are evaluated, FTA's general noise and vibration impact assessments will be performed.

For this report, estimated existing noise levels using two FTA methods are reported. The Study Team also calculated existing ground-borne vibration levels associated with freight train activity, plotted vibration contours, and identified where existing ground-borne vibration levels are likely to exceed FTA thresholds for residential land uses. That vibration assessment aims to provide project planners with a high-level review of where project-related vibration impacts are most likely to occur. The analysis of project-related noise and vibration will be reported in the next phase of this Study.

Noise Assessment

RTD has not finalized the type of transit vehicle likely to be procured. Therefore, the Study Team selected the FTA default noise screening distance of 750 feet for a commuter rail mainline. Noise screening results determined that there are Category 2 noise-sensitive land uses within that distance. On that basis, existing noise levels are estimated for later comparison with project-related noise levels.

Within the study area, existing noise sources include the BNSF rail traffic along the existing railway and traffic noise from major roads and highways, including US 36 and SH 119, which run parallel to the railway through much of the NWR Corridor. Additional noise sources include general community noise (lawn mowing, conversations between neighbors) and natural sounds (birds, insects, wind).

The Study Team estimated existing noise levels using two methods: noise exposure assessment according to methodology from Table 4-17 of the FTA "Transit Noise and Vibration Impact Assessment" manual, and an analysis of freight rail noise using the FTA/FRA module in the Cadna-A three-dimensional noise modeling software.

Table 4-17 of the FTA guidance document estimates existing L_{dn} at a receptor based on the receptor's distance from four-lane highways, other major roadways, and railways; and based on the area's population density. The Study Team used Esri ArcMap GIS software to determine the distance to the nearest major road or highway and railway for all locations within two miles of the NWR Corridor. Additionally, the Study Team identified population density in the area using 2020 Census data from the United States Census Bureau. The Study Team used this information to develop an existing noise estimate for each source category (roads, railways, and population) for the entire study area, as well as an overall estimate that is the maximum resulting estimated L_{dn} from the three sources.

The Study Team modeled existing freight rail traffic using Cadna-A. Cadna-A is a three-dimensional noise modeling software that incorporates equations from ISO 9613-2 "Acoustics – Attenuation of Sound during Propagation Outdoors" and equations for train noise from FTA's Transit Noise and Vibration Impact Assessment Manual (2018). The Study Team used Cadna-A to calculate sound propagation from the railway and resulting noise levels throughout a Cartesian coordinate grid in the noise study area.

The FTA equations built into Cadna-A use the number of locomotives and railcars, train speed, train type, and track construction to calculate a noise level associated with a passing train. The assumed values for each parameter are as follows:

- Train Type: Conventional Freight

- Number of Locomotives: 3
- Number of Railcars: 100
- Train Speed: Varies (20-49 mph)
- Track Construction: Jointed Rail

Locomotive horn use at public at-grade crossings is a major source of noise associated with rail traffic. To accurately reflect the existing noise levels, the Study Team added horn noise to the modeled train at locations where trains are within 20 seconds of an at-grade crossing, based on the train speed. The Study Team did not model horn noise at crossings denoted as quiet zones by local jurisdictions and in the FRA's *Highway/Rail Crossing Database* (FRA, 2020).

After defining the train parameters, the Study Team input the number of trains per hour to account for the fact that train noise is only audible intermittently when a train passes by a receptor. Six freight trains are expected per day to pass through the NWR Corridor, or an average of 0.25 trains per hour.

Cadna-A can account for the acoustic characteristics of the ground cover and terrain shielding in the noise propagation path. The Study Team configured the model to treat the ground as 60% acoustically absorptive and imported a digital terrain model for this analysis. Based on the described inputs, Cadna-A calculated existing freight rail traffic-related day-night noise levels at each intersection on a Cartesian coordinate grid and then created noise contour lines representing the existing L_{dn}.

Finally, the Study Team overlayed the two existing L_{dn} maps created using the above methods and created a new map showing the maximum estimated L_{dn} from the two data sets.

Vibration Assessment

Both locomotives and passenger vehicles create vibration. For commuter trains, the highest vibration levels are typically created by the locomotives. Electric commuter rail vehicles create ground-borne vibration levels comparable to electric rapid transit vehicles. The Study Team selected FTA's default screening distance of 200 feet for a conventional commuter railroad and confirmed there is Category 2 vibration-sensitive land use within that screening distance.

Therefore, the Study Team performed FTA's general vibration assessment to evaluate existing ground-borne vibration conditions associated with BNSF freight trains (the dominant source of ground-borne vibration) in the NWR Corridor. The first step is determining the frequency of events and corresponding category, and locomotives and railcars are evaluated separately. This analysis assumed there are six BNSF trains per day, and each train has three locomotives and 100 railcars; therefore, there are 18 locomotives and 600 railcars daily. Table 41 presents FTA's event frequency definitions for Category 2 land uses.

Table 41: Event Frequency Definitions for Category 2 Land Uses

Category	Definition
Frequent Events	> 70 events/day
Occasional Events	30 to 70 events/day
Infrequent Events	< 30 events/day

Source: FTA, 2018

Based on the information in the table above, locomotives are infrequent events, and railcars are frequent events. These definitions are then used to identify the corresponding vibration impact thresholds for each frequency of event category and land use category. FTA's general vibration assessment methodology uses the following three land use categories.

- Category 1, buildings where vibration would interfere with interior operations
- Category 2, residences and buildings where overnight sleep occurs
- Category 3, institutional land uses with primarily daytime uses

To simplify the vibration analysis for this development phase, the Study Team only evaluated ground-borne vibration for Category 2 land uses. Table 42 shows vibration impact thresholds for Land Use Category 2.

Table 42: Vibration Impact Thresholds for Land Use Category 2

Vibration Impact Thresholds (VdB) for Category 2 Land Uses	
Frequent Events	Infrequent Events
72 VdB	80 VdB

Source: FTA, 2018

The Study Team calculated ground-borne vibration velocities using FTA equations for freight locomotives and railcars. Per FTA guidance, the Study Team adjusted the vibration levels from a reference speed of 50 mph to the four freight train speeds in this corridor (20, 25, 30, and 49 mph). The Study Team applied a 5 VdB adjustment accounting for jointed rail throughout the corridor. The Study Team applied a 10 VdB adjustment where crossovers or turnouts (special trackwork) exist and limited the resulting contour to 200 feet per FTA guidance. Analysis results determined that the distance to the vibration impact contour was greater for locomotives with and without special trackwork than for railcars under either track condition. Table 43 shows the resulting distances to the vibration impact contour for each speed regime for Category 2 land uses.

Table 43: Vibration Impact Contour Distances.

Speed	Rail Condition	Distance (ft.)
20	Jointed Rail	60
20	Special Trackwork	105
25	Jointed Rail	75
25	Special Trackwork	130
30	Jointed Rail	90
30	Special Trackwork	150
49	Jointed Rail	140
49	Special Trackwork	225

Source: HDR Engineering, Inc. 2022

Using GIS technology, the Study Team plotted vibration contours based on the distances shown above. Where special trackwork exists, the Study Team plotted a circular contour (i.e., a point source) and merged it with the other contours. Using GIS technology, the Study Team created figures that used color shading to indicate where these contours overlapped residential parcels.

Findings/Results

Figure 54 shows existing noise levels in the study area. The figure shows how surface transportation corridors influence existing noise levels and how ambient noise levels decline in areas farther away from major transportation corridors.

Under FTA guidelines, as existing noise levels increase, the incremental amount of noise that projects can make (before noise impact occurs) decreases. FTA's noise impact thresholds utilize a sliding scale to limit overall noise levels (existing plus project-related). Under FTA guidelines, if a project exceeds its allowable incremental increase, noise impacts occur and are categorized as either moderate or severe depending upon the overall level of project-related noise relative to the noise impact thresholds.

In the next phase of this Study, parcels where overnight sleep occurs are identified and project-related noise is determined at those locations. Project-related noise is compared with existing noise levels, and potential noise impacts are identified and categorized as moderate or severe per FTA. FTA guidance requires mitigation to be considered for moderate noise impacts and implemented for severe noise impacts. Projects can define cost-effectiveness thresholds or other performance criteria for noise mitigation. It is not uncommon for noise impacts in the lower range of moderate noise impacts are not mitigated. This could occur if the margin of noise impact is quite small, and the cost of mitigation per decibel reduced is determined to be unsatisfactory or cost-prohibitive. Often the upper range of moderate noise impacts are mitigated. Figure 55 through Figure 59 show the existing vibration contours and where Category 2 land uses occur within those contours. In the next phase of this Study, project-related vibration velocities are determined and used to evaluate the potential increase above existing vibration levels. That information is then compared with FTA vibration impact thresholds. The analysis would determine where vibration impacts, as defined by FTA, have the most potential to occur when the NWR Corridor is implemented. The analysis would include discussing potential mitigation measures for projected vibration impacts.

If the project advances into an environmental assessment phase, the noise and vibration analyses would evaluate noise and vibration at parcels in all three FTA land use categories and at "special buildings" locations like recording and broadcast studios. This analysis focused 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.

Figure 54: Existing Day-Night Noise Level (dBA)

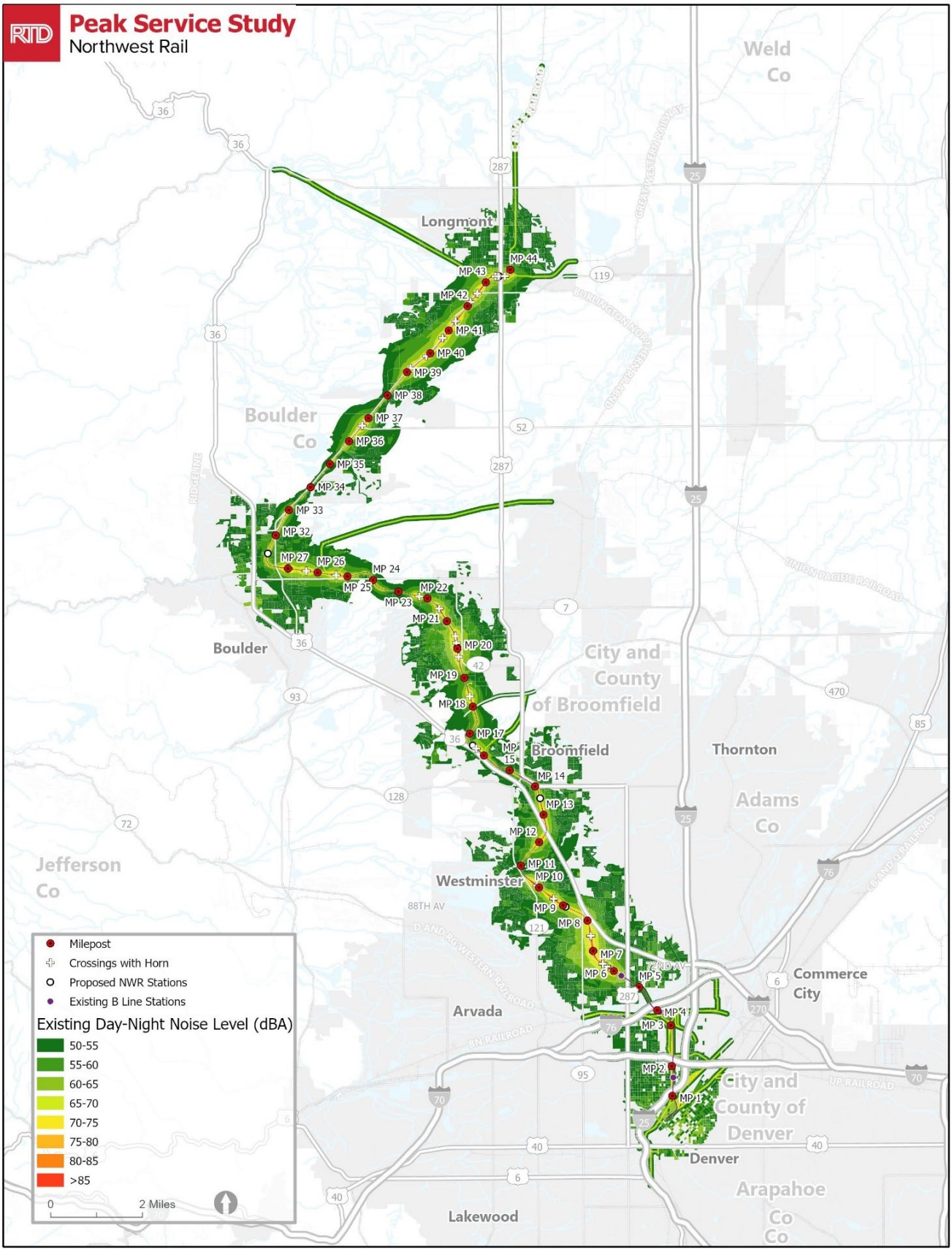


Figure 55: Existing Vibration Levels and Category 2 Land Uses (South to North)

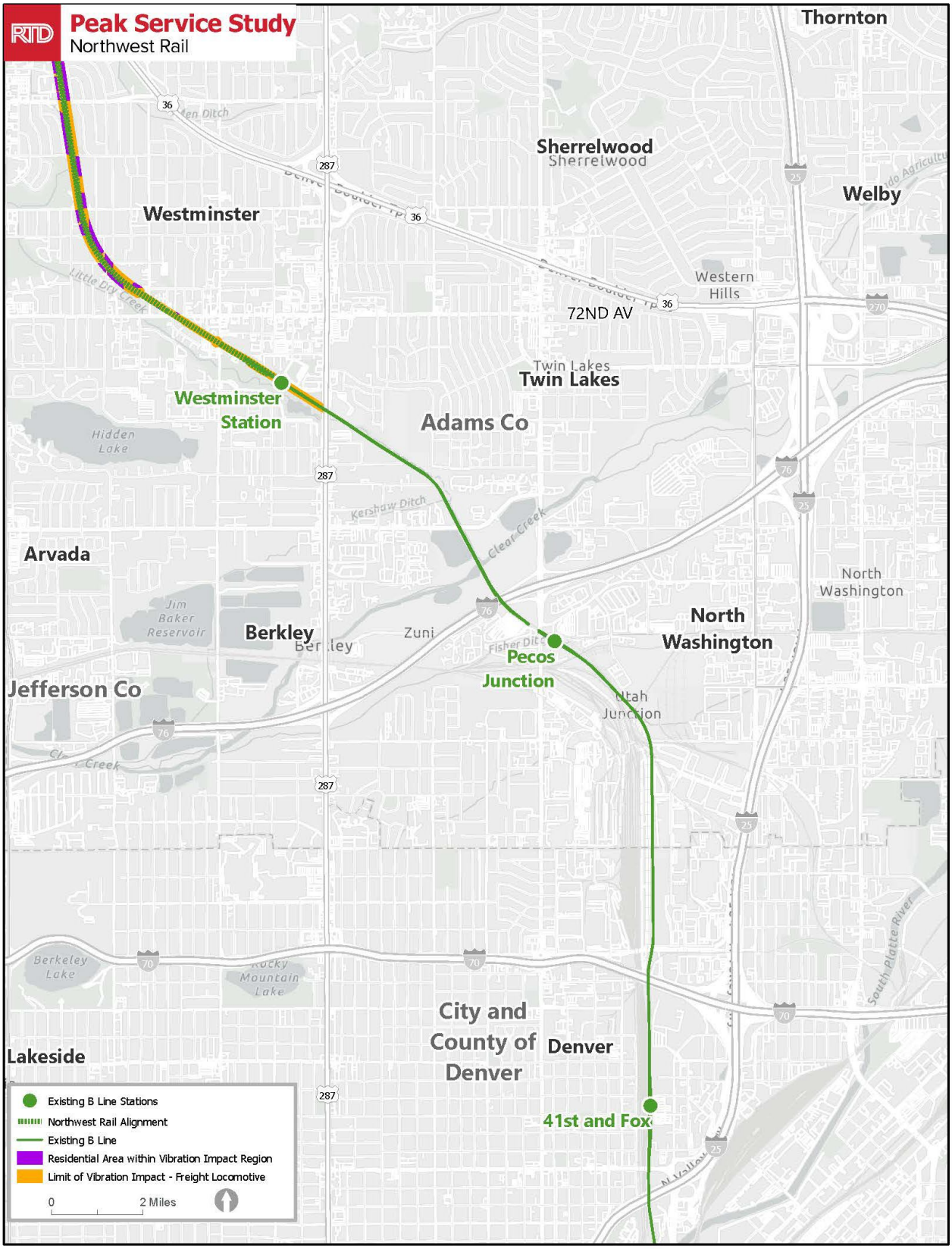


Figure 56: Existing Vibration Levels and Category 2 Land Uses (South to North)

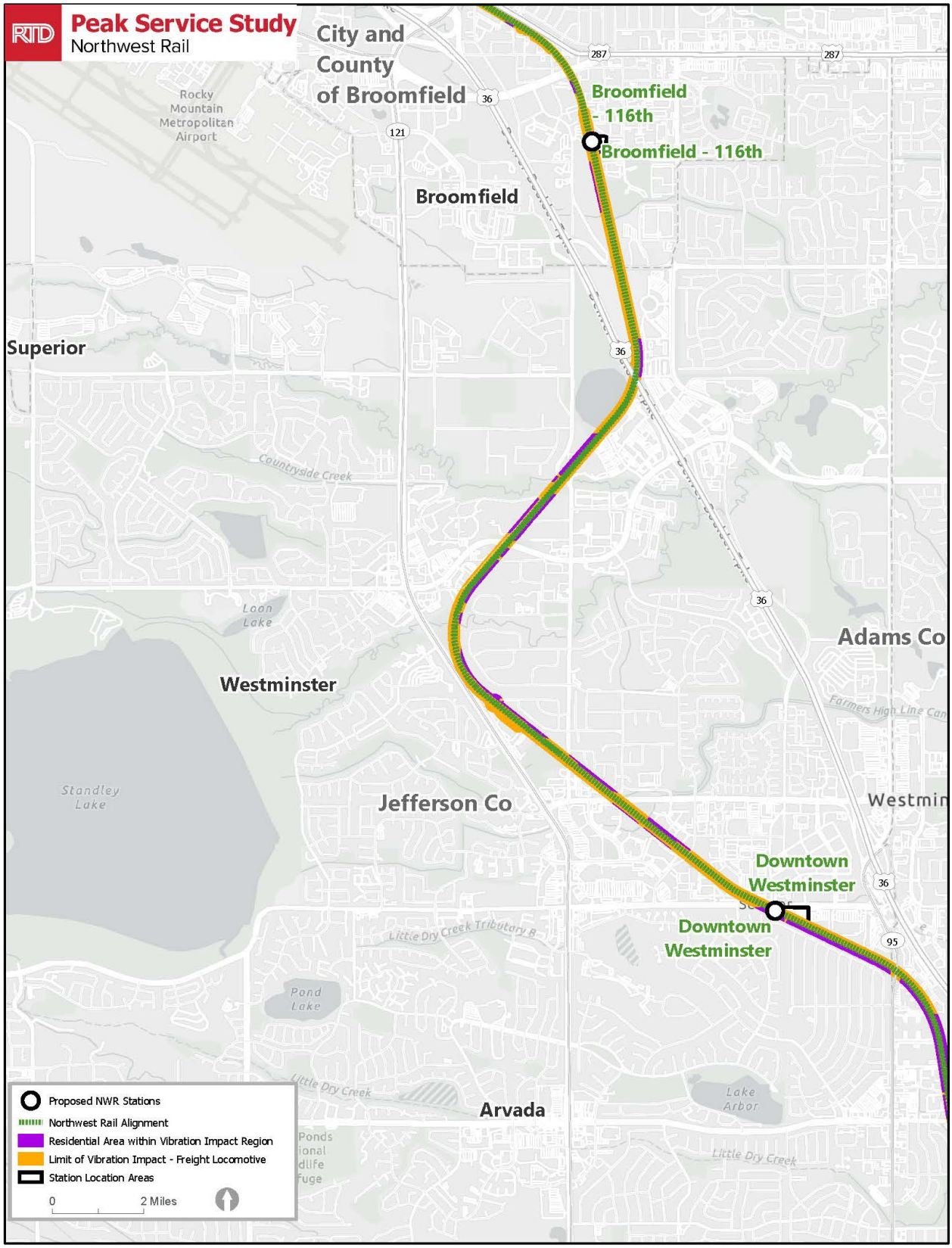


Figure 57: Existing Vibration Levels and Category 2 Land Uses (South to North)

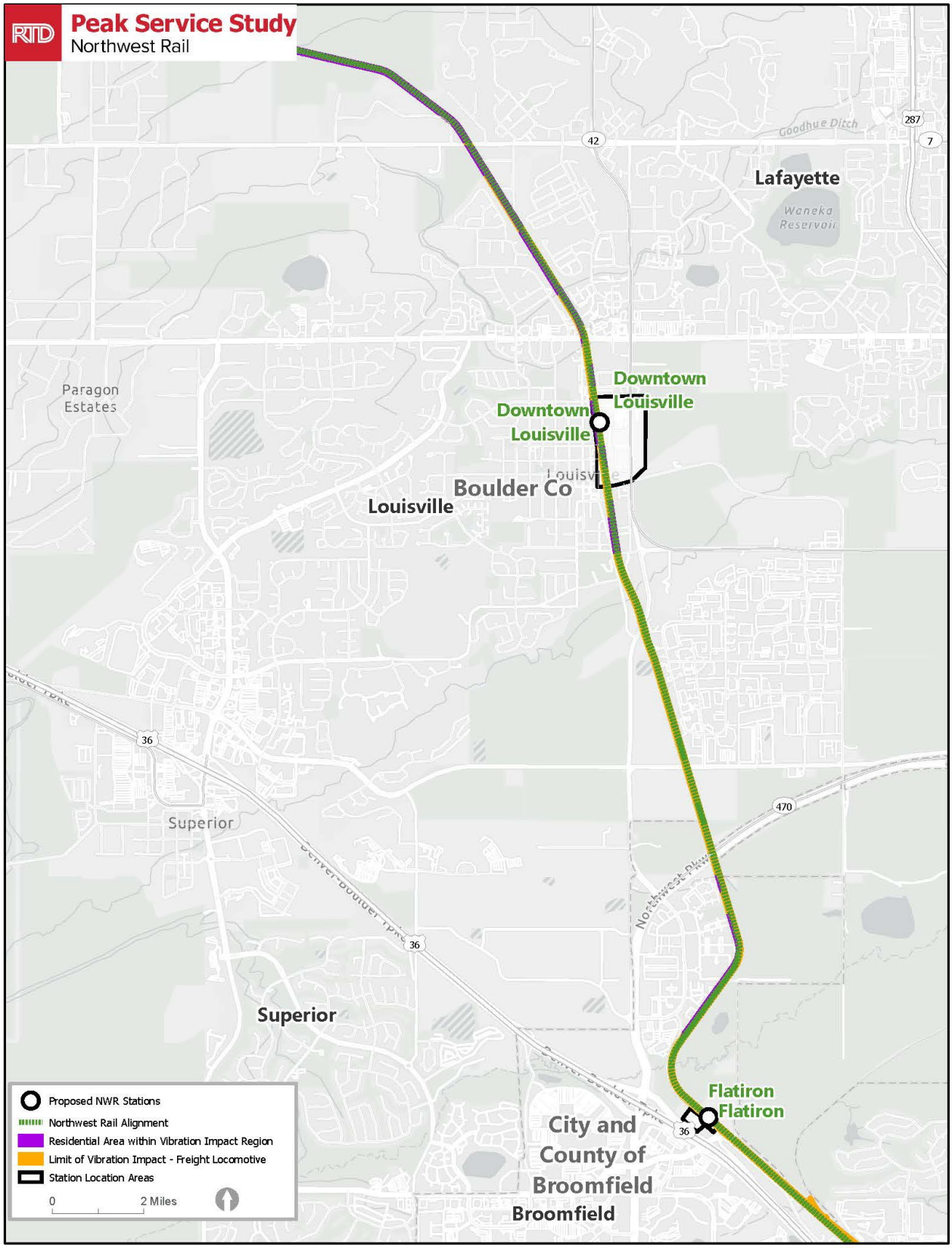


Figure 58: Existing Vibration Levels and Category 2 Land Uses (South to North)

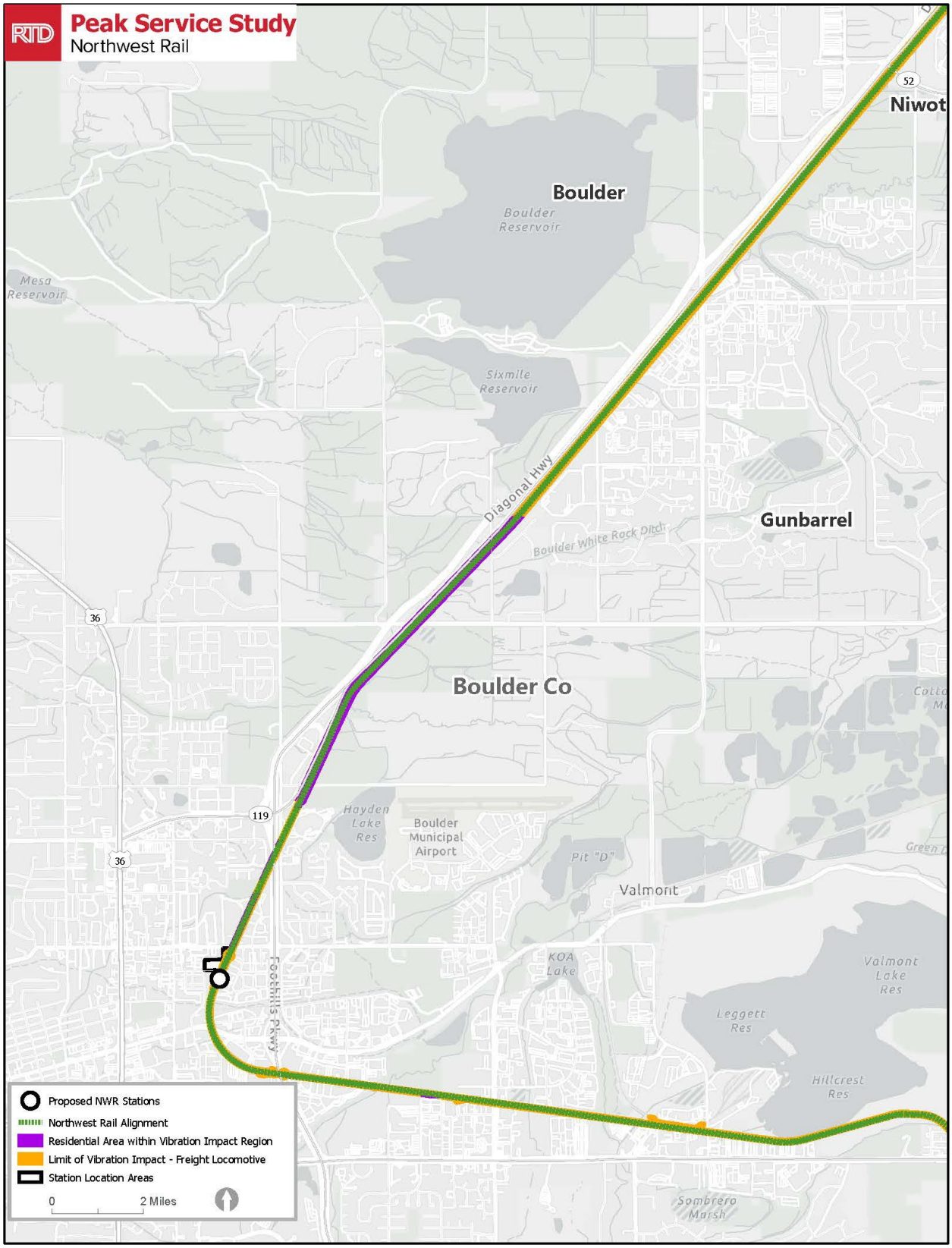
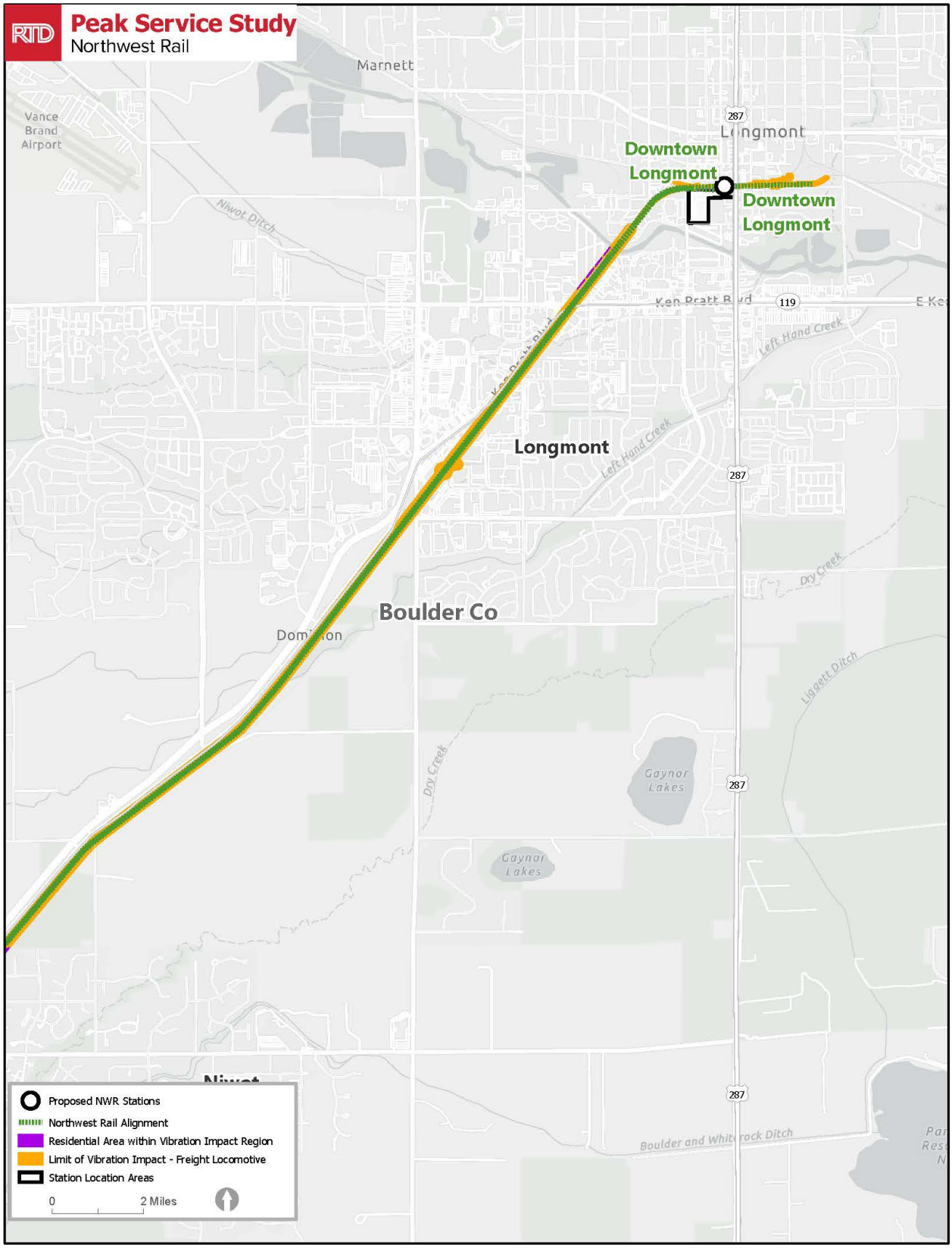


Figure 59: Existing Vibration Levels and Category 2 Land Uses (South to North)



Next Steps

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. 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.

Mineral Resources, Geology, and Soils

Brief Description of Resource Studied

Geologic resources are evaluated with a focus on the ability to withstand and support the NWR Corridor during construction and operations. This section describes the existing soils, geologic resources, and seismicity within the NWR Corridor.

Agencies Involved

RTD and BNSF are the two organizations with authority over the construction, operation, and maintenance of new infrastructure within the existing soil and geology for all trackwork. Each of the local municipalities would have similar authority for the station areas.

Relevant Regulations, Guidance, Studies, and Plans

Geotechnical investigations and design recommendations for the NWR Corridor would be completed in accordance with the CDOT Geotechnical Design Manual (CDOT, 2021), FHWA Geotechnical Technical Guidance Manual (FHWA, 2007), *BNSF Standard Specifications* (BNSF, 2019), and *RTD Commuter Rail Design Criteria* (RTD, 2009).

Data Collection/Methodology

The study area for this analysis is a 1,000-foot buffer from the existing BNSF corridor centerline and a 0.5-mile buffer from each new station platform. The assessment identifies known and potential mineral, soil, and geology resources within the NWR Corridor, such as oil, gas, coal, aggregate, and other mineral commodities.

Findings/Results

The study area consists of broad mesas, linear ridges, and gently rolling hills interspersed with swales, ravines, and flat terrain. The underlying bedrock varies from thick silty shale to interbedded and lenticular sandstone, siltstone, claystone, shale, and lesser amounts of conglomerate. Depth to bedrock is variable, but areas of shallow bedrock are common across the study area. The water table may occur in unconsolidated deposits or bedrock. Groundwater seeps may occur in bedrock that is close to the ground surface. Depth to the water table is highly variable across the study area, but it is generally shallow in the Louisville, Boulder, and Longmont Sections.

The study area's soil is dominated by sandy and clay loams, locally with gravel or cobbles. Thin sandy deposits are common in significant drainages. Thicker sand and gravel deposits line major drainages and cap mesas

across the area. Widely occurring soil problems include moderate to high shrink-swell potential (Figure 60), moderate to high corrosivity to untreated steel (Figure 61), low to moderate corrosivity to concrete (Figure 62), shallow bedrock, susceptibility to differential settlement, susceptibility to piping, and low to moderate erosion potential (Figure 63). Some soils are affected by very shallow seasonal water tables and flooding.

Seismic risk in the study area is consistent with the moderate seismic risk found in the Denver Metropolitan Area.

The risk of subsidence over shallow abandoned coal mines is limited to the western margin of the Broomfield and Louisville Sections because the other areas are not undermined. Oil and gas resources are widely distributed in the Broomfield, Louisville, Boulder, and Longmont Sections.

Colorado recognizes separate ownership of surface and mineral estates, meaning that owners of mineral rights can exercise its option to develop mineral resources, even where others own the surface land.

Figure 60: Shrink-Swell Soils in Study Area

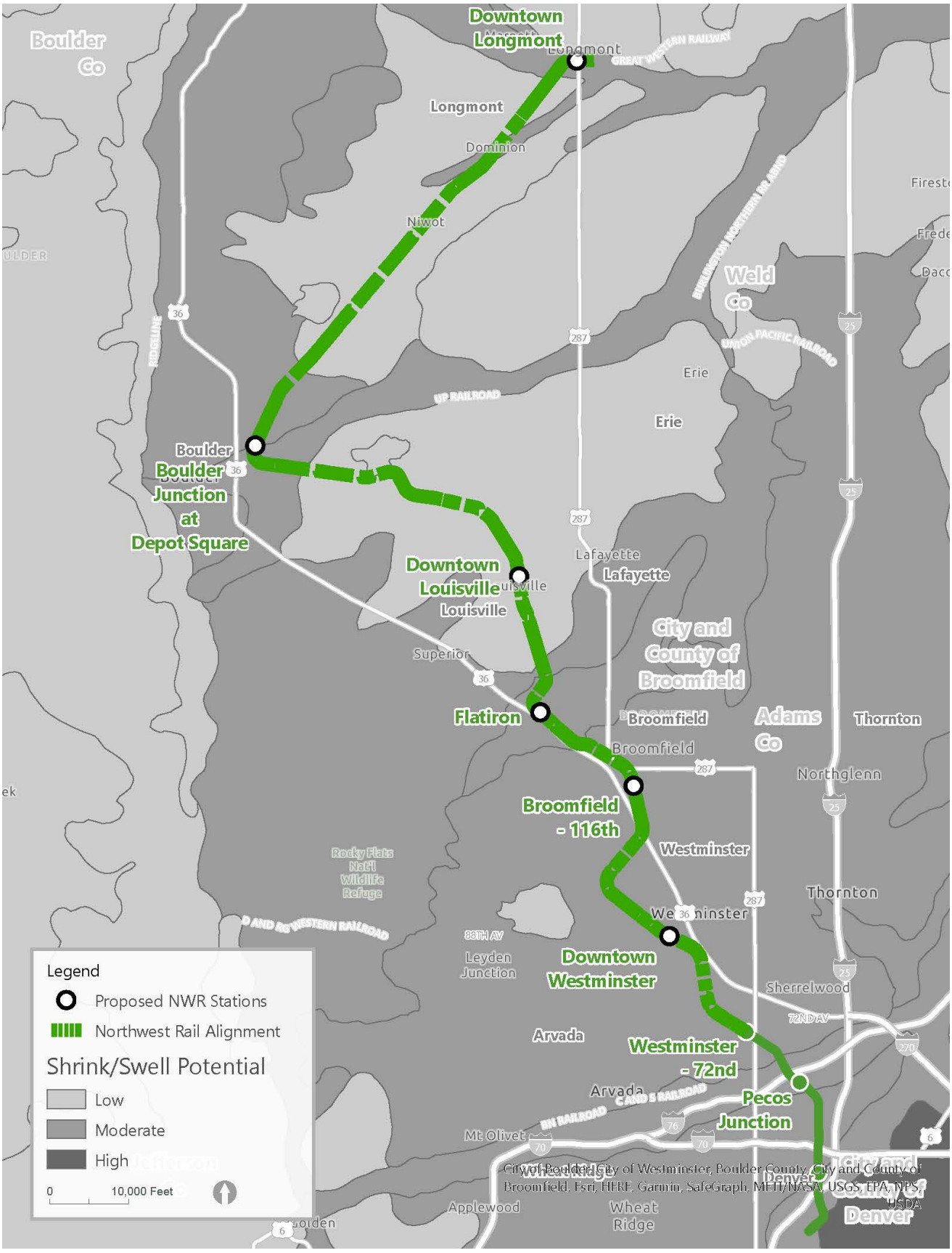


Figure 61: Corrosivity to Untreated Steel

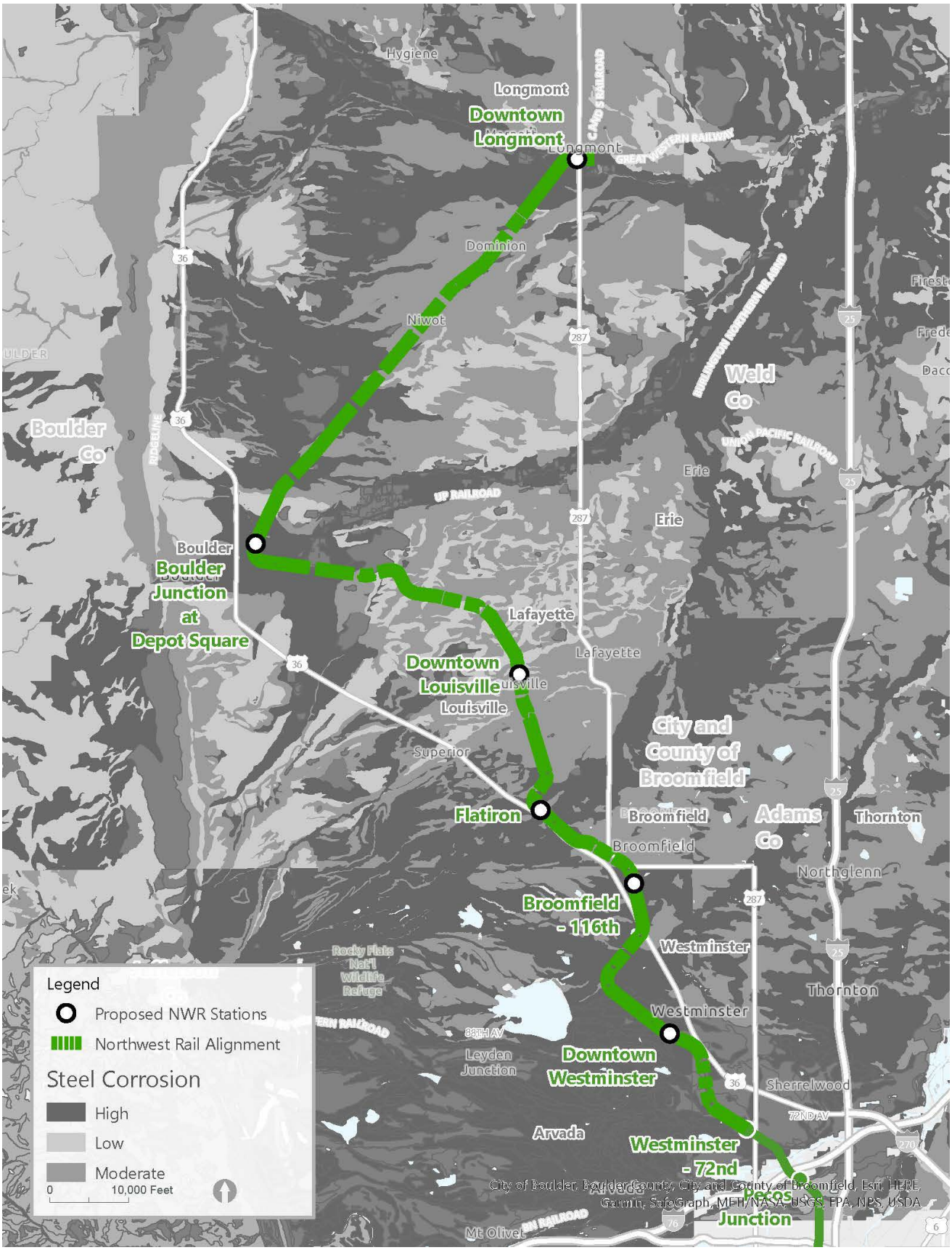


Figure 62: Corrosivity to Concrete

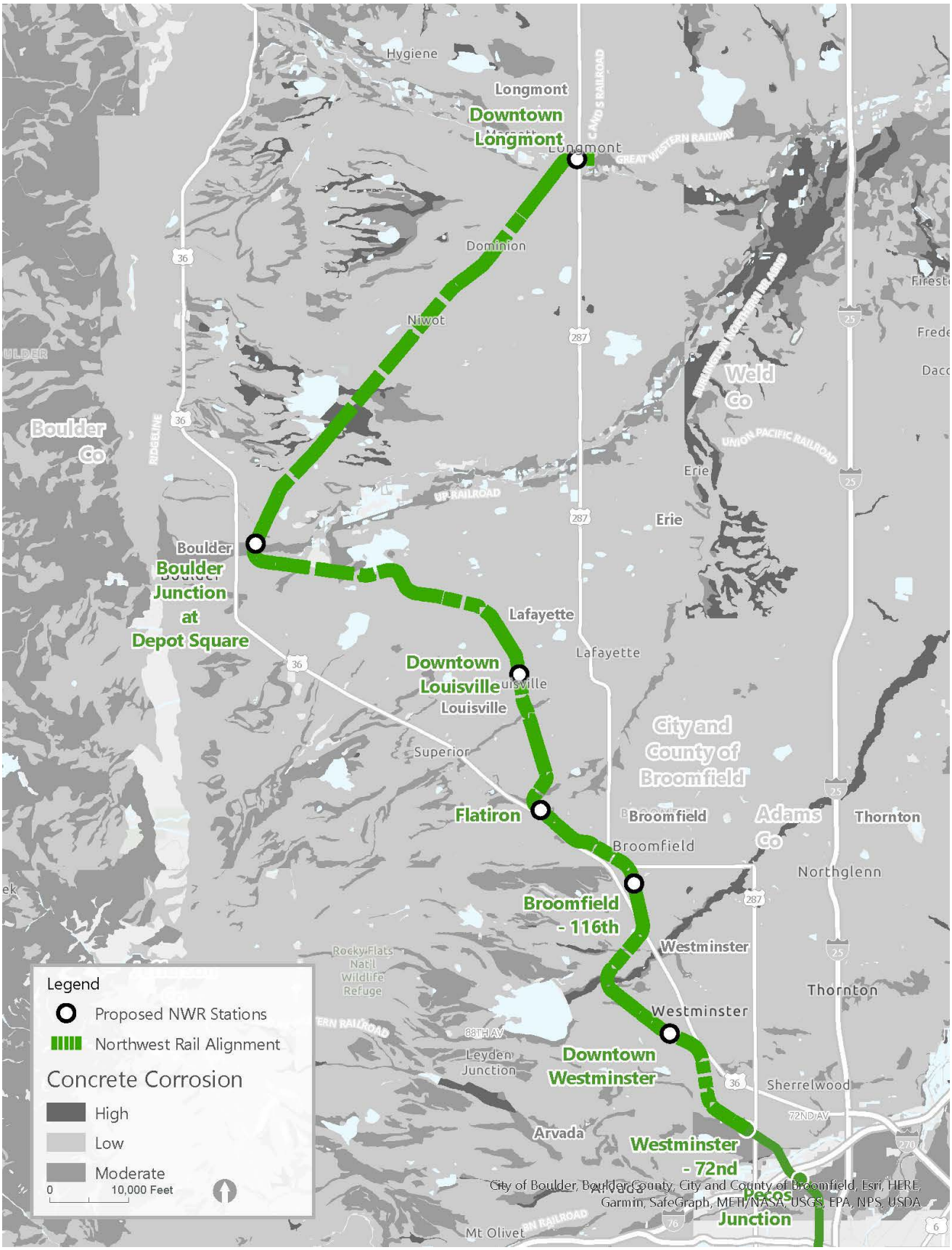
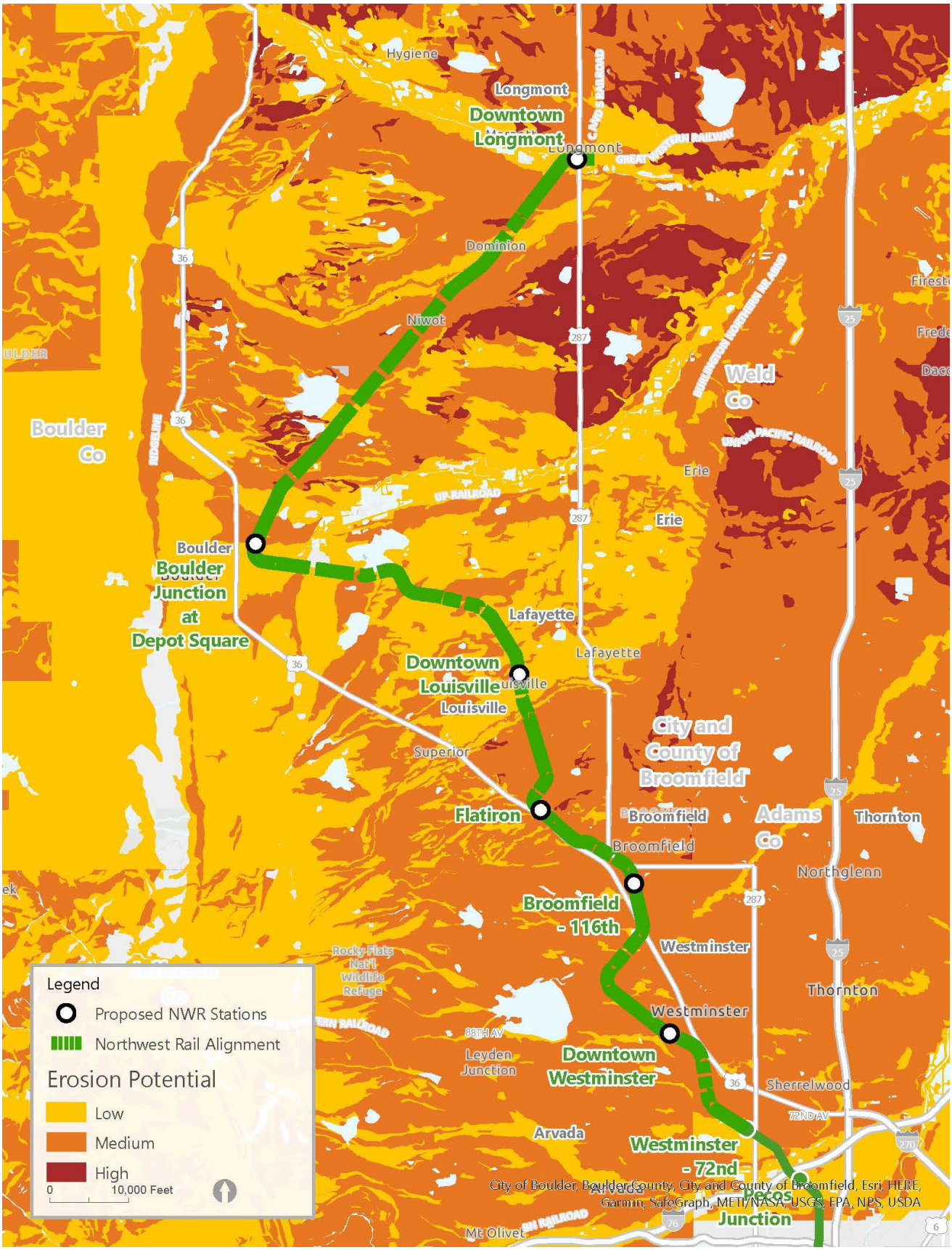


Figure 63: Erosion Potential



Next Steps

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. In subsequent development phases, including during NEPA, soil or mineral impacts will be evaluated if soil or mineral impacts that could require mitigation could occur. The impacts evaluated will include total acres of soil disturbance, impacts to prime farmland, and effects that could prevent future access to mineral deposits. The assessment will focus on conditions that are notable for consideration during subsequent environmental and design steps. Geologic and soil resources will be evaluated with a focus on their susceptibility to erosion and ability to withstand and support the infrastructure during construction and operations.

Hazardous Materials

Brief Description 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.

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.

Agencies Involved

Agencies involved with the regulation of hazardous materials are:

- United States EPA
- CDPHE, Hazardous Materials and Waste Management Division
- Local agencies such as cities and counties that own right of way or sites

Relevant Regulations, Guidance, Studies, and Plans

- Comprehensive Environmental Response, Compensation, and Liability Act of 1980
- Resource Conservation and Recovery Act of 1976
- Title XIV of the Public Health Service Act ("Safe Drinking Water Act") of 1974
- American Society for Testing and Materials Standard E1527-21 (ASTM, 2021) and E1528-22 (ASTM, 2022)

Data Collected/Methodology

The study area includes a 500-foot-wide buffer on each side of the centerline of the existing BNSF corridor and a 1,000-foot-wide buffer from each new station and the potential maintenance facility sites. The primary resource used to determine hazardous material recognized environmental conditions (REC) and potential environmental concerns (PEC) sites was an Environmental Data Resources, Inc. (EDR) regulatory database

search conducted in October 2022 (EDR, 2022). The database report provided links to the following government agency websites that were reviewed for applicable sites:

- EPA Superfund Search Tool: https://cumulis.epa.gov/supercpad/cursites
- EPA Enforcement and Compliance History: https://echo.epa.gov
- CDPHE Brownfields Program: https://cdphe.colorado.gov/brownfields
- Colorado Oil & Gas Conservation Commission: https://cogcc.state.co.us/data.html#/cogis
- CDPHE Voluntary Cleanup and Redevelopment Program (VCRP): https://www.colorado.gov/pacific/cdphe/voluntary-cleanup

Various federal, state, local, and tribal databases were researched according to the American Society for Testing and Materials Practice E1527-21 standard search radii, which vary from the target property.

This assessment of existing conditions is focused on major hazardous material sites that may influence alternative development or have major cost ramifications. Therefore, the following sites were not considered an environmental concern:

- Underground storage tank sites
- Aboveground storage tank sites
- Leaking underground storage tank sites
- Resource Conservation and Recovery Act hazardous material generator sites
- CDPHE VCRP no action determination sites
- Dry cleaners
- Railroad tracks
- Electrical transformers
- Asbestos and lead-based paint sites
- Spill sites

A no action determination is given when the property owner indicates the existence of contamination that does not exceed state standards or contamination that does not pose an unacceptable risk to human health and the environment. A no action determination also indicates contamination originates from a source on, adjacent, or nearby, and the entity responsible would take necessary action to address the contamination. For purposes of the Study, these sites are not considered major sites.

The major hazardous materials sites evaluated included large federally listed sites, corrective action sites, brownfield sites, designated VCRP sites, and historic landfills. Evaluation of these sites included site location within the study area, type of database listing, present or historical status of the site, and professional judgment.

The EDR database listed 2,545 mapped site identification locations with 3,537 separate database listings, as sites may have more than one database listing. Each mapped site identification location may also contain multiple site names and addresses due to historical name and address changes and address overlapping. Because of the high number of sites, only the sites within the study area were evaluated. This resulted in evaluating 1,642 mapped site identification locations to determine if they contained REC or PEC sites.

Findings/Results

The Study Team determined from the evaluation that 59 of the 1,642 mapped site identification locations are considered major REC or PEC sites. The major sites with the most potential to influence transportation planning or implementation are listed in Table 44.

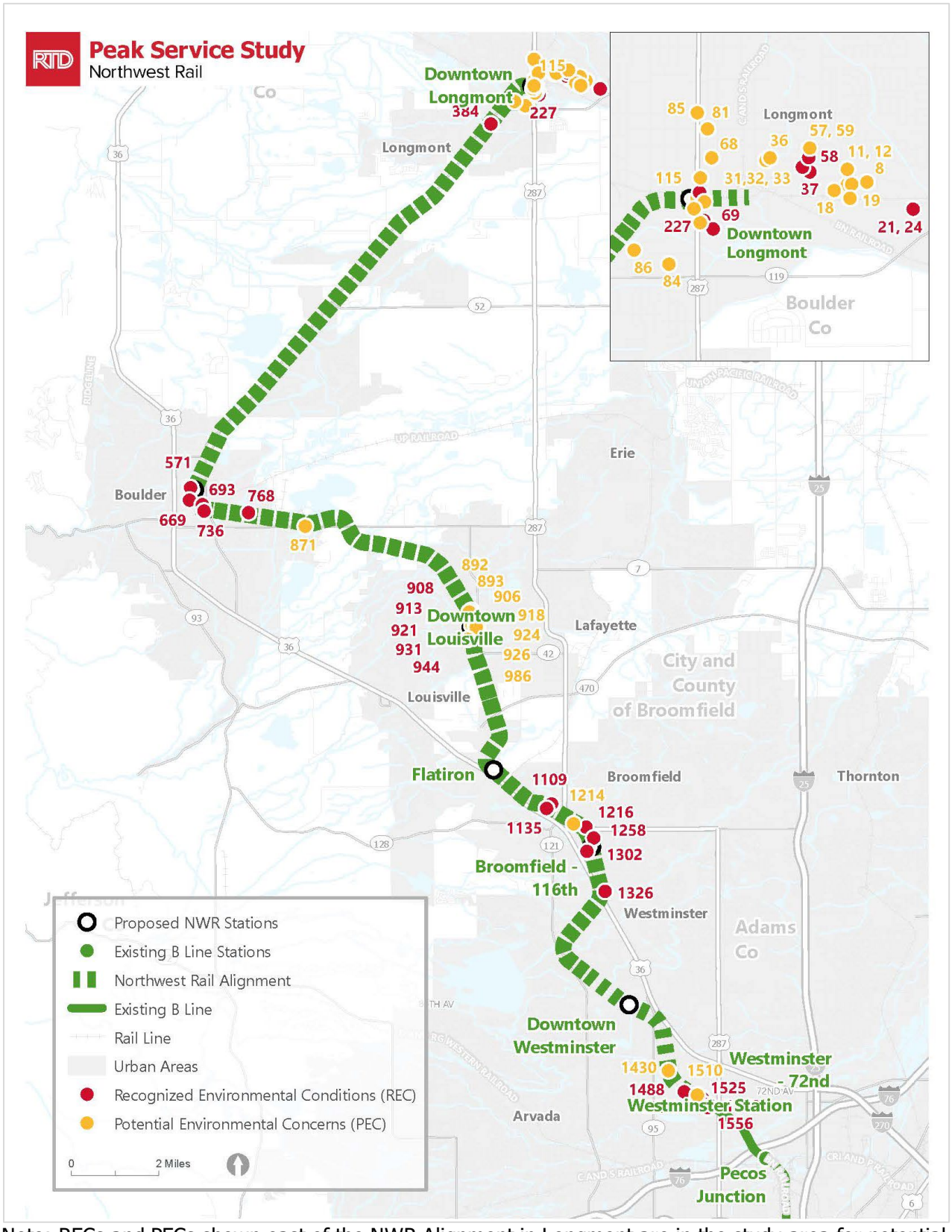
Table 44: Major Sites with Most Potential to Influence Transportation Planning

Map ID	Site Name
21, 24	Transportation Service Center Cleaning 11939 Sugar Mill Road, Longmont
37	Loaf N Jug 200 Lashley Street, Longmont
39, 40, 41, 42	Diamond Shamrock/Total Station 303 Lashley Street, Longmont
58	Rainbow Laundromat & Dry Cleaners 310 Lashley Street, Longmont
69	Taylor Equipment Rental LLC 130 South Main Street, Longmont
67, 115, 227, 1553, 1556	Approved VCRP sites
384	Longco & Co, 900 S Sunset, Longmont
571	Circuit Images, Inc, 3155 Bluff St, Boulder
669	Boulder Radiator, 3100 Pearl St, Boulder
693	United Parcel Service Boulder, 3795 Frontier Ave., Boulder
736	Graphic Packaging International Corporation, 3825 Walnut St, Boulder
768	Western Avenue Intersection 55th Street and Colorado & Southern Railroad, Boulder
871	Scandinavian Automotive Inc., 6519 Arapahoe Road #5, Boulder
892	Eastpark 2, 1110 S. Boulder Road, Louisville
893	1000, 1003, and 1034 S. Boulder Road, Louisville
906	Residence 1055 Griffith St, 1004 Griffith St, Louisville
908	Louisville Tire And Auto Center, 1190 Griffith St, Louisville
913	Former Explosive Fabricators Property, 1301 and 1309 Courtesy Road, Louisville
918	Comcast Cable Vision of Colorado, 1055 Lafayette St, Louisville
921	PDI Trust Property, 1301, 1313, 13331, 1341 Cannon St, and 1000 Griffith St, Louisville
924	Old Sausage and Louisville Store and Lock, 1219 Courtesy Road, Louisville
926	Coal Creek Collision Center, 1100 Courtesy Road, Louisville
931	Aggregate Industries Louisville Plant, 1125 Short Street, Louisville
944	Alpine Lumber Property, 1055 Courtesy Road, Louisville
986	Highway 42 Revitalization Area, Unknown, Louisville
1109	Sun Chemical Corp – GPI Division, 2135 Abbott Ave., Broomfield
1135	Storage Technology Corporation, 2400 Industrial Lane, Broomfield
1214	Broomfield Duplex Indoor Air, 12125 Emerald Lane, Broomfield
1216	Farmers Reservoir and Irrigation, 136th Avenue and Silverton Street, Broomfield
1258	Chemical Handling Corp, 11811 Upham Street, Broomfield
1302	Generic Storage, 7620 W 116th St, Westminster
1326	Ten Eyck Property, 108th Avenue and Federal Boulevard, Westminster
1430	Pousky 4690 W. 76th Ave., Westminster

Map ID	Site Name
1488	PCA3 Park Shops, 3950 W. 72nd Ave., Westminster
1510	Westminster Tod, Lowell Boulevard and West 71st Place, Westminster
1525	Heffley And Guildner Properties, 3435 and 3381 W. 69th Ave., Westminster
1551	Guildner Property, Western Third of PCA 1, 7000 King Street, Westminster

The major REC or PEC sites may have contaminated soils or groundwater; Appendix E includes a table with general study area conditions that may pose a hazardous material risk and summaries of environmental findings for each major site REC and PEC. Figure 64 shows the major sites listed in Table 44.

Figure 64: Major Sites with Most Potential to Influence Transportation Planning



Note: RECs and PECs shown east of the NWR Alignment in Longmont are in the study area for potential maintenance facility locations.

Next Steps

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.

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.

Energy

Brief Description of Resource Studied

This section describes the existing energy consumption by RTD throughout its service area and provides the basis for later determining the NWR Corridor's long-term effects on energy consumption.

Agencies Involved

Information was gathered from RTD to determine the amount of energy expended by the existing bus and rail service in the RTD Region.

Relevant Regulations, Guidance, Studies, and Plans

At the federal level, the Council on Environmental Quality regulations at 40 CFR 1502.16(e) requires the consideration of "energy requirements and conservation potential of various alternatives and mitigation measures" of the proposed action.

Data Collection/Methodology

Transportation energy is generally discussed in terms of direct energy used to operate the NWR Corridor. Direct energy involves the energy consumed by transit vehicles for propulsion (including trains and buses) and automobiles in the corridor. This energy is a function of operating characteristics such as distance traveled or operating hours and the fuel's thermal value. Data collection efforts focused on documenting the existing energy needs in the corridor. Energy outputs in terms of fuel usage would be calculated in British Thermal Units (BTUs). The study area for energy would begin at the RTD service area, including all bus and rail routes.

The Study Team assessed the existing energy conditions via a review of readily available documents and utilized applicable information from RTD's previous studies on the NWR Corridor. The information reviewed included annual light rail, commuter rail, and bus operating miles calculated from RTD's Quality of Life report (2020) (Table 45), the National Transit Database, (and modeled output will be used for the year 2030 for the Planning and Environmental Study). For comparison, it takes 3,906 BTUs to move a car one mile, assuming 32 miles per gallon.

Miles of operation for trains and buses were converted to BTU using standard conversion factors. The assessment focused on conditions that are notable for consideration during subsequent environmental and design steps.

Table 45: RTD Annual Operating Statistics by Operating Type (2019)

Mode	Annual Passenger Boardings	Annual Passenger Miles	Annual Vehicle Miles	Annual Vehicle Hours	Trips per Vehicle Mile	Trips per Vehicle Hour
Commuter Rail	4,954,167	56,550,543	6,246,272	229,094	0.8	21.6
Demand Response	537,078	4,100,442	5,929,705	412,763	0.1	1.3
Light Rail	10,464,678	72,910,951	9,063,803	526,960	1.2	19.9
Bus	36,358,764	157,181,317	26,897,789	2,196,318	1.4	16.6
Total	**52,314,687**	**290,743,253**	**48,137,569**	**3,365,135**	**1.1**	**15.5**

Source: 2020 National Transit Database RTD 2020 Quality of Life Report ((https://www.rtd-denver.com/sites/default/files/files/2020-10/Quality-of-Life-Report_2020.pdf)

Findings/Results

The RTD transit vehicles include light and commuter rail, powered by electricity, and bus and demand response (FlexRide), powered by diesel and gasoline. Bus service makes up the bulk of the service hours and miles regionally and accounts for 67% of the energy used by RTD to transport customers.

Table 46 shows the amount of energy used to transport riders on all modes of transit in 2019. It took 1.8 trillion BTUs of energy to carry the 52 million riders to their destinations.

Table 46: BTUs of Energy for Transit Vehicles in RTD Region (2019)

Mode	Fuel (units)	Fuel Use	Heat Content of Fuel in BTUs	Annual BTUs of Energy	BTUs of Energy per Passenger Mile
Commuter Rail	Electricity (kWh)	40,059,292	3,413	136,722,363,596	2,418
Demand Response	Gasoline (gal)	1,678,627	125,000	209,828,375,000	51,172
Light Rail	Electricity (kWh)	76,829,593	3,413	262,219,400,909	3,596
Bus	Diesel (gal)	8,988,040	138,700	1,246,641,148,000	7,931
			Total	**1,855,411,287,505**	**6,382**

Source: RTD Quality of Life: Sustainability Report, 2020 (https://www.rtd-denver.com/sites/default/files/files/2020-10/Quality-of-Life_Sustainability-Report_2020_0.pdf)

Next Steps

RTD would likely use diesel multiple unit or electric multiple unit vehicles for commuter rail service in the NWR Corridor. This decision has not been finalized, and diesel and electric would be evaluated for cost, operational considerations, and other potential impacts and benefits. Once ridership modeling is completed and an operating plan is determined, the energy requirements for the system will be developed during NEPA.

Biological Resources

Brief Description of Resource Studied

Biological resources include wildlife and vegetation that reside or use the study area and wildlife habitats. Though largely under the direct or indirect influence of development, the study area includes rural and urban wildlife habitats and natural and disturbed vegetation. This section presents the general habitat types and common and special-status species that may occur. For the Study, habitat would serve to evaluate wildlife presence and vegetation composition.

Agencies Involved

The U.S. Fish and Wildlife Service (USFWS) and CPW are the primary regulatory agencies involved with biological resources. The agencies guide special-status species, reviewing and authorizing impacts if applicable, and administer federal and state policies. Some municipalities have wildlife management plans specific to that local area administered at that level, e.g., Boulder County prairie dog management plan (Boulder County, 2022), so local agencies may also be involved in biological resources.

Relevant Regulations, Guidance, Studies, and Plans

The following regulations and guidance are specific to special-status plants and wildlife and its habitats in the study area:

- Migratory Bird Treaty Act (16 U.S.C. 703-712)
- Federal Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds
- Endangered Species Act (16 U.S.C. 1531-1543)
- Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
- Fish and Wildlife Coordination Act (16 U.S.C. 661-667d)
- Colorado Noxious Weed Management Act
- Federal Executive Order 13112 – Invasive Species
- Colorado Revised Statues 35-5.5-101-119- Colorado Noxious Weed Act
- State of Colorado Executive Order D00699 – Development and Implementation of Noxious Weed Management Programs

Local agencies have wildlife-related policies related to specific species or areas that may apply if those resources become known within the study area.

Data Collection/Methodology

Wildlife and vegetation were evaluated in the Final NWR Corridor EE. This report updates and builds upon that prior effort. For this analysis, the study area includes a 300-foot-wide buffer on each side of the centerline of the existing rail and station locations.

Biological resource data were collected from publicly available maps, aerial photographs, databases, publications, and agency information. Field surveys in 2004, 2006, 2008, and 2009 supported the Final NWR

Corridor EE. General habitat types are not expected to differ greatly from those findings; however, updating that dataset is recommended.

The USFWS provides the *Information for Planning and Consultation* tool (IPaC) to assess Federally-managed wildlife resources (e.g., listed species, critical habitats) that may be affected by a proposed activity. An IPaC report was generated for those resources within the study area, and the species were evaluated for the potential to occur (USFWS, 2022).

CPW maintains a list of special-status species tracked by the agency (CPW, 2022a) and makes a distribution of select species available for review (CPW, 2022b). The data were reviewed for those species potentially present within the habitats of the study area.

Findings/Results

Federally Listed Species

The IPaC report finds six federally listed species with the potential to occur within the study area (Table 47). Preble's Meadow Jumping Mouse is not known to occur within the study area south of Baseline Road (USFWS, 2004); however, suitable habitat is present to the north. Recent trapping data are not publicly available.

The study area contains watersheds known to contain Greenback Cutthroat Trout. The presence of the species within the actual study area is unlikely. Ongoing efforts to restore Greenback Cutthroat Trout may include waters within the study area; additional consultation with wildlife agencies would identify potential conflicts.

The Monarch Butterfly was proposed as a candidate species for listing under the Endangered Species Act in May 2022 (Department of the Interior, 2022). This species or its habitat (host plants) would likely occur within the study area. Though not afforded the same full protection of the Endangered Species Act, Candidate species are often treated as such for planning purposes. Additional consultation with the USFWS regarding the Monarch Butterfly would be necessary.

Ute Ladies'-tresses and Western Prairie Fringed Orchid may occupy the study area's moist meadows, floodplains, and habitats. Further habitat evaluation is necessary to determine the potential presence, followed by targeted surveys if warranted.

There are no designated critical habitats within the study area.

Table 47: Federally Listed Species

Species	Scientific Name	Status	Potential to Occur
Preble's Meadow Jumping Mouse	*Zapus hudsonius preblei*	Threatened	Unlikely, only potential is a portion of Boulder Section
Whooping Crane	*Grus americana*	Endangered	Highly Unlikely
Greenback Cutthroat Trout	*Oncorhynchus clarkii stomias*	Threatened	Known within study area watersheds
Monarch Butterfly	*Danaus plexippus*	Candidate	Likely to occur
Ute Ladies'-tresses	*Spiranthes diluvialis*	Threatened	Possible habitat along streams, floodplains
Western Prairie Fringed Orchid	*Platanthera praeclara*	Threatened	Possible habitat in moist meadows and grasslands

State-Listed Species

CPW list tracks state-sensitive species with some overlap of the Endangered Species Act-listed species. Public distribution data for all state-listed species is incomplete. Available fish data indicate Common Shiner (*Luxilus cornutus*, Threatened) and Iowa Darter (*Etheostoma exile*, Concern) may occur in study area watersheds. Amphibian data show Northern Leopard Frog (*Rana pipiens*, Concern) is known within the Boulder Creek and Left Hand Creek drainages.

Other state-listed species have the potential to occur, e.g., Burrowing Owl (Athene cuniculalria, Threatened; Black-tailed Prairie Dog, Cynomys ludovicianus, Concern), but lack data to confirm. Additional consultation with CPW is necessary to ensure the study tracks species or habitats of state concern.

Migratory Birds

The Migratory Bird Treaty Act protects most avian species from disturbance, including nesting. All but the most developed industrialized areas of the study area offer some nesting, foraging, or resting habitats. Riparian and shrub habitats are expected to support nesting birds, including raptors. Active nests would be protected from disturbance, and active raptor nests have established avoidance buffers (CPW, 2020).

Habitat and Vegetation

The study area is dominated by developed lands (industrial/commercial and residential) and grasslands. Smaller areas of aquatic habitats (wetlands and open water) are present throughout, as shown in Table 48. No native prairie is present; all habitats have been modified by human activity to some degree. Several habitats are primarily derived from human activities and lack quality wildlife habitat. The most natural areas occur along streams, rivers, and other wet areas, including riparian shrub, riparian woodland, and marsh habitat. Linear corridors of riparian vegetation that provide habitat and movement opportunities are relatively uncommon in the overall developed setting of the study area and are considered sensitive.

Table 48: Habitat and Vegetation

Habitat	Description	Location	Percent of Study Area
Industrial and Commercial	Developed areas with buildings, pavement, disturbed areas dominated by weedy vegetation, some lawns, and horticultural vegetation	Throughout the corridor	44
Grassland	Areas dominated by grasses and other herbaceous vegetation, dominated by non-native grass species	Occurs in all Sections, most abundant in Westminster, Broomfield, Louisville, Boulder, and Longmont	29
Residential and Parks	A mixture of buildings, pavement, and irrigated landscape vegetation	Mostly in Adams, Westminster, Louisville, and Boulder Sections	13
Disturbed	Disturbed and waste areas dominated by weedy vegetation	Throughout the corridor	7
Agriculture	Irrigated and non-irrigated croplands, pastures, and fallow fields	Small areas throughout, with the largest in Boulder and Longmont	2.5
Riparian woodland	Mesic areas dominated by trees and shrubs along streams, ponds, and ditches	Found throughout: South Platte River, Clear Creek, Big Dry Creek, Walnut Creek, Community Ditch in Broomfield Section, Rock Creek, Coal Creek, Downtown Louisville, South Boulder Creek, Boulder Creek, Fourmile Canyon Creek, Lefthand Creek, St. Vrain Creek	2
Marsh	Wetlands dominated by emergent herbaceous vegetation	Found throughout, common as ditches along the existing railroad and other infrastructure	1
Aquatic habitat	Streams and Ponds	Occurs in all Sections, notably Clear Creek, Little Dry Creek, Lower Church Lake, and Lefthand Creek	1
Riparian shrub	Areas dominated by shrubs and other species along the edges of streams, ponds, and ditches	Small areas found in all Sections: South Platte River, Clear Creek, Big Dry Creek, Walnut Creek, Rock Creek, Coal Creek, South Boulder Creek, Boulder Creek, Fourmile Canyon Creek, several ditches in the Boulder Section, Lefthand Creek, and St. Vrain Creek	0.5

Common wildlife includes resident mule deer (*Odocoileus hemionus*) inhabiting undeveloped areas throughout Broomfield, Louisville, and Boulder. White-tailed deer (*Odocoileus virginianus*) are concentrated along Boulder Creek, South Boulder Creek, Coal Creek, and Rock Creek. The riparian and agricultural habitats along the South Platte River are considered high-priority habitat for white-tailed deer and moderate-priority habitat for mule deer (URS, 2010). Mountain lion (*Felis concolor*) and black bear (*Ursus americanus*) may occasionally travel through riparian corridors in the Boulder and Longmont Sections. Medium-sized mammals present in the study area include American badger (*Taxidea taxus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), long-tailed weasel (*Mustela frenata*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*) and common porcupine (*Erethizon dorsatum*) (URS, 2010).

Next Steps

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.

During NEPA, habitats will be confirmed with field verification; no substantial changes in the overall habitat composition are expected. Additionally, sensitive resources such as prairie dog colonies and raptor nests will be documented.

Consultation with the USFWS and CPW is necessary to determine those species and habitats likely to occur within or be impacted by activities in the study area. Specifically, the need for further Preble's Meadow Jumping Mouse analysis (habitat assessment, trapping surveys) and the Monarch Butterfly assessment approach will be determined.

Potential habitats for Ute Ladies'- tresses and Western Prairie Fringed Orchid would be documented during that survey. Consultation with USFWS may indicate the need for species-specific surveys for these species during the July through August flowering period.

Effects on wildlife and its habitats would be assessed by overlaying impacts with documented resources. Impacts, depending on its nature and extent, may require mitigation.

Farmlands

Brief Description of Resource Studied

Prime and unique farmland and farmland of statewide or local importance are protected under the Farmland Protection Policy Act of 1981 to minimize the extent that federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. The three categories of protected farmland include:

- **Prime Farmland.** Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops can economically produce sustained high yields of these crops when treated and managed according to acceptable farming practices
- **Unique Farmland.** Land other than prime farmland used to produce specific high-value food and fiber crops; it can economically produce sustained high yields of these specialized crops when treated and managed according to acceptable farming practices
- **Farmland of Statewide or Local Importance.** Land that has either been identified as having statewide importance according to criteria determined by the Colorado State Experiment Station, the Colorado State Department of Agriculture, or the Colorado State Soil Conservation Board, or land that may have local significance based on the goals of the community and of the various agricultural enterprises that maintain a viable agricultural community

Developed land or land already committed to development and land within the existing right of way is excluded from protection under the Farmland Protection Policy Act because these lands are developed and considered unavailable for agricultural production.

Corridor Conditions Report

Agencies Involved

The following agencies are involved in the evaluation of farmland within the study area:

- U.S. Department of Agriculture, Natural Resources Conservation Service, Colorado State Office
- U.S. Department of Agriculture, Longmont Field Office

Relevant Regulations, Guidance, Studies, and Plans

Farmland resources are governed by the following:

- **NEPA, 23 CFR 771, and 40 CFR 1500-1508):** NEPA (42 U.S.C. Section 4231) requires that all actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations, such as impacts to farmland, are given due weight in decision-making. The federal implementing regulations are 23 CFR 771 (FHWA) and 40 CFR 1500-1508 (Council on Environmental Quality).
- **Farmland Protection Policy Act of 1981 (7 U.S.C. 4201-4209):** The purpose of the Farmland Protection Policy Act is to minimize impacts on farmlands and maximize compatibility with state and local farmland programs. Farmlands are classified as prime, unique, or of statewide or local importance. Projects completed by a federal agency or with assistance from a federal agency are subject to Farmland Protection Policy Act requirements if they may irreversibly convert farmland (directly or indirectly) to non-agricultural use.
- **7 CFR § 658: Guidelines for Implementing the Final Rule of the Farmland Protection Policy Act for Utility Line, Highway, Railroad, Stream Improvement, and Flood Control System Projects:** The guidelines were developed by the Secretary of Agriculture in cooperation with other federal agencies, pursuant to Section 1541(a) of the Farmland Protection Policy Act 7 U.S.C. 4202(a). As required by Section 1541(b) of the Farmland Protection Policy Act and 7 U.S.C. 4202(b), federal agencies are (a) to use the criteria to identify and take into account the adverse effects of its programs on the preservation of farmland, (b) to consider alternative actions, as appropriate, that could lessen adverse effects, and (c) to ensure that its programs, to the extent practicable, are compatible with state and units of local agencies and private programs and policies to protect farmland.

Data Collection/Methodology

The study area to calculate farmland impacts is a 1,000-foot buffer from the centerline of the corridor and a 1,000-foot buffer from stations.

Before farmlands are used for a federal project, an assessment would be completed to determine if prime, unique, statewide, or locally important farmlands would be converted to non-agricultural uses. If the assessment determines that farmland use exceeds the parameters set by the Natural Resources Conservation Service, then the federal agency would take measures to minimize the impacts on these farmlands.

Lands committed to urban development are not considered farmland under the Farmland Protection Policy Act because they are generally developed with impermeable (paved) surfaces unavailable for agricultural production. These lands are identified in the Census 2020 "urbanized areas" (United States Census Bureau, 2020). In addition, local plans were reviewed to determine the areas in the study area that are considered

urban based on land use and zoning ordinances. Land identified in the plan as commercial, high-density residential, or industrial land use was considered urban.

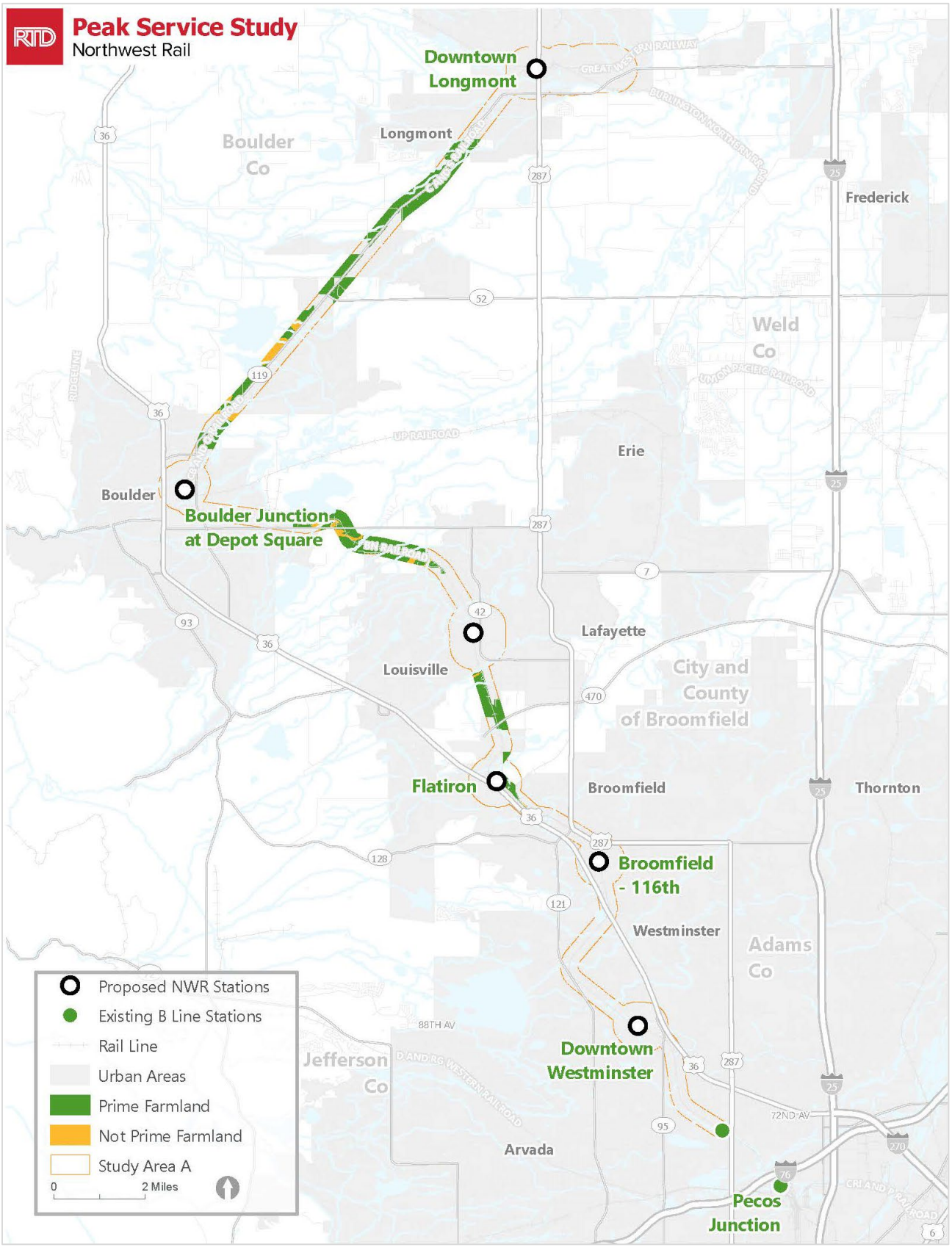
The data used to calculate the potentially impacted farmland was the US Soil Survey Geographic Database from the National Cooperative Soil Survey, completed by the Natural Resources Conservation Service.

Findings/Results

Natural Resources Conservation Service soil data is used to identify protected farmland within the study area. As shown in Figure 65, the Denver, Adams, and Westminster Sections are highly urbanized, with no prime, unique, or statewide or locally important farmland. There is farmland in the remaining four Sections considered either prime if certain conditions are met (i.e., are irrigated, drained, or protected from flooding) or farmland of statewide importance.

There are approximately 1,000 acres of prime farmland within the study area and approximately 150 acres of farmland of statewide importance. There is no unique farmland or farmland of local importance within the study area.

Figure 65: Prime Farmland



Next Steps

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.

During NEPA, a Form CPA-106 will be completed and submitted to the Natural Resources Conservation Service field offices that serve the study area. This form calculates impacts on farmlands under two methods. The first identifies the total amount of prime, unique, or statewide or locally important farmland within the study area; it compares the converted amount of farmland to the total available farmland. The second method addresses the type of farmland impacts that could occur. The result is a score of up to 260 points representing the value of the impacted farmland. If the score is less than 160, no further action is required. For projects where the total points are equal to or exceed 160, the Farmland Protection Policy Act suggests the agency consider alternative actions, as appropriate, that could reduce impacts.

Wetlands and Waters of the United States

Brief Description of Resource Studied

Aquatic resources are surface waterbodies and wetlands, both constructed and natural. These include streams, ponds, and roadside ditches, as well as any adjacent wetlands, and are collectively referred to as 'waters.' Within the largely urbanized study area, waters provide stormwater conveyance and retention, recreation, ecological functions, agricultural use, and wildlife habitat.

Wetlands are defined by the USACE (33 CFR 328.3, 1986) and EPA (40 CFR 230.3, 1980) as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." State and federal agencies regulate wetlands and other waters of the U.S.

Agencies Involved

The primary regulatory agencies involved with aquatic resources are the USACE, in cooperation with the EPA. CDPHE oversees state water quality concerns. CPW advises on the ecological and wildlife habitat aspects of waters.

Relevant Regulations, Guidance, Studies, and Plans

The following regulations and guidelines govern the assessment and consideration of aquatic resources in the study area:

- Section 404 Clean Water Act – Administered by the EPA and USACE, the Clean Water Act regulates the discharge and dredging of materials within waters of the U.S.; impacts to waters would be authorized pursuant to the Clean Water Act
- Section 401 Clean Water Act – Administered by CDPHE, Section 401 provides a state review of actions proposed under Section 404 of the Clean Water Act

Data Collection/Methodology

The study area for wetlands and other water features is a 300-foot-wide buffer on each side of the edge of the existing BNSF right of way and new station locations. The study area was surveyed in 2006 and 2008 for wetlands and waters (URS, 2010) used for the Final NWR Corridor EE. The National Wetland Inventory (USFWS, 2022) was reviewed relative to the 2010 data and current aerial images; however, it is ineffective at the required scale. Though dated, the 2010 survey remains the most current inventory of waters. The 2010 evaluation did not survey the NWR maintenance facility sites. These areas likely contain wetlands. A field survey would be required to confirm wetlands at the NWR maintenance facility sites.

Findings/Results

The results of the 2010 survey are shown in Figure 66 through Figure 70 and summarized in Table 49 and Table 50 (URS, 2010). Current National Wetland Inventory data locate larger waterbodies and its adjacent wetlands (e.g., Dry Creek and Boulder Creek); however, smaller features captured by the survey are absent and would underrepresent the resource. Therefore, the 2010 data is carried forward for this Study. A comparison of this data to current aerial imagery suggests that a few small wetlands have been impacted in the intervening years. Several small wetlands around Louisville, Broomfield, and Longmont appear to have been filled, totaling about half an acre.

Table 49: Wetland Survey Results

Study Area Section [1]	PEM [2] Wetlands (ac)	Jurisdictional PEM Wetlands (ac)	PEM/PSS [1] Wetlands (ac)	Jurisdictional PEM/PSS Wetlands (ac)	Total (ac)	Total Jurisdictional (ac)
Westminster	4.55	2.55	1.41	1.31	5.96	3.86
Broomfield	2.70	0.93	1.33	1.19	4.03	2.12
Louisville	1.49	0.61	0.21	0.13	1.70	0.74
Boulder	6.34	5.03	13.89	10.49	20.23	15.52
Longmont	0.12	0.04	1.46	0.88	1.58	0.92
Total	15.2	9.16	18.3	14	33.5	23.16

[1] The 2010 study area included areas south of Westminster. Those are not part of the current study area and are not presented

[2] PEM = Palustrine Emergent, PSS = Palustrine Scrub-Shrub (Cowardin et al., 1979). ac = acres

Table 50: Non-Wetland Waters Survey Results

Study Area Section [1]	Streams (ac)	Jurisdictional Streams (ac)	Ponds (ac)	Jurisdictional Ponds (ac)	Total (ac)	Total Jurisdictional (ac)
Westminster	1.14	1.08	6.53	0	7.67	1.08
Broomfield	0.64	0.60	0	0	0.64	0.60
Louisville	1.05	0.81	2.46	1.63	3.51	2.44
Boulder	5.53	4.31	3.54	3.38	9.07	7.69
Longmont	1.88	1.46	0	0	1.88	1.46
Total	10.11	8.26	12.53	5.02	22.77	12.87

[1] The 2010 study area included areas south of Westminster. Those are not part of the current study area, and are not presented

Figure 66: 2010 Wetland Survey Results (South to North)

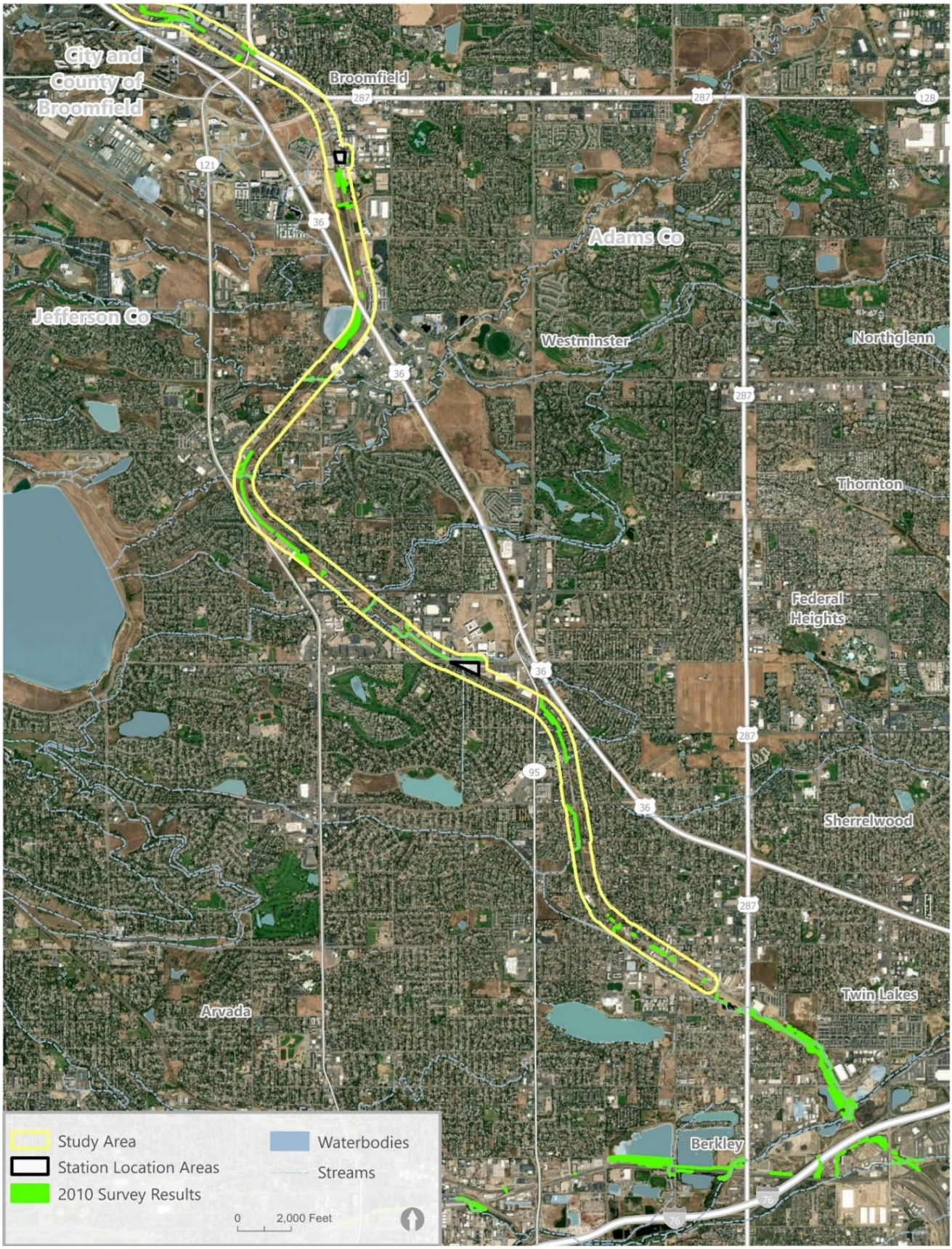


Figure 67: 2010 Wetland Survey Results (South to North)

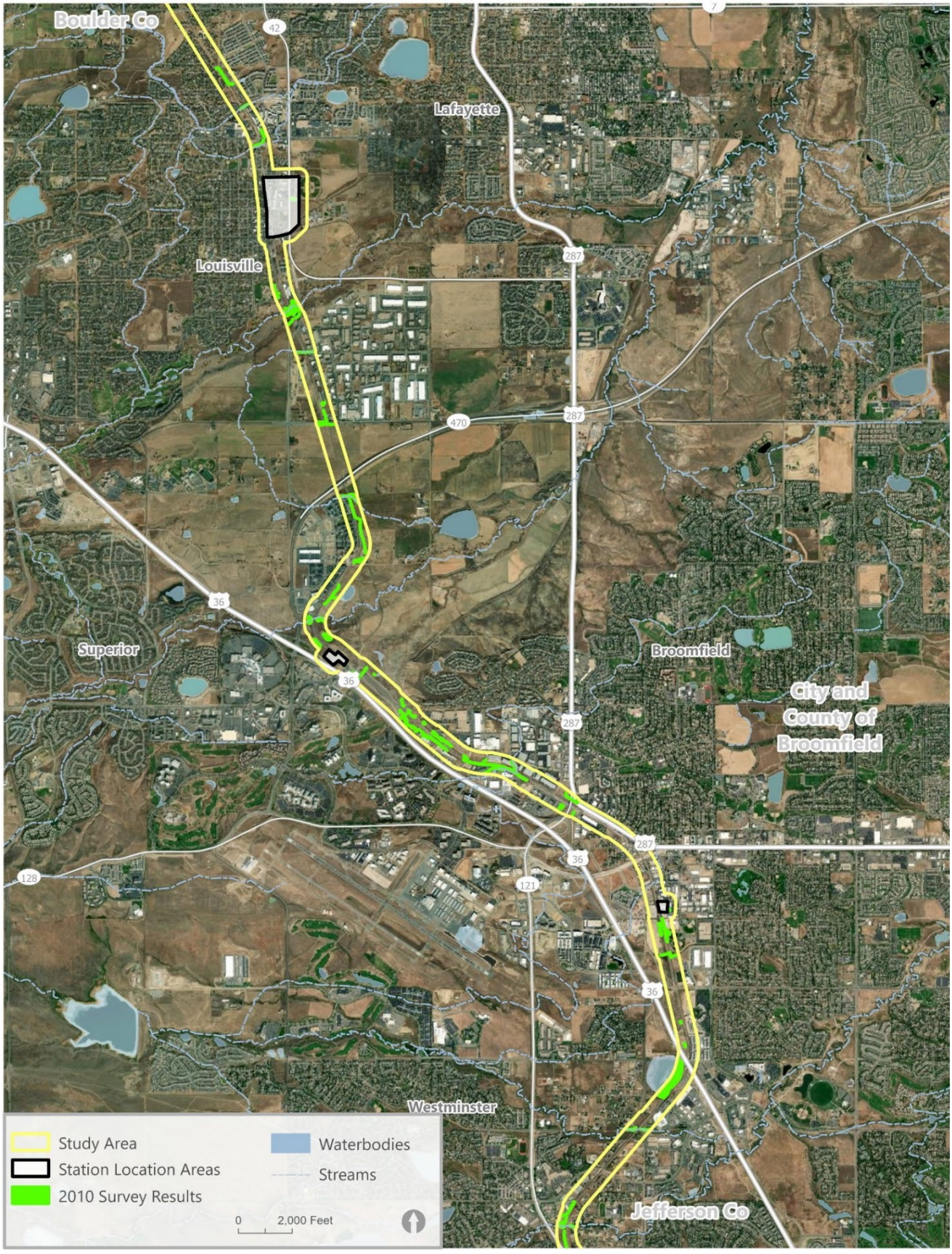


Figure 68: 2010 Wetland Survey Results (South to North)

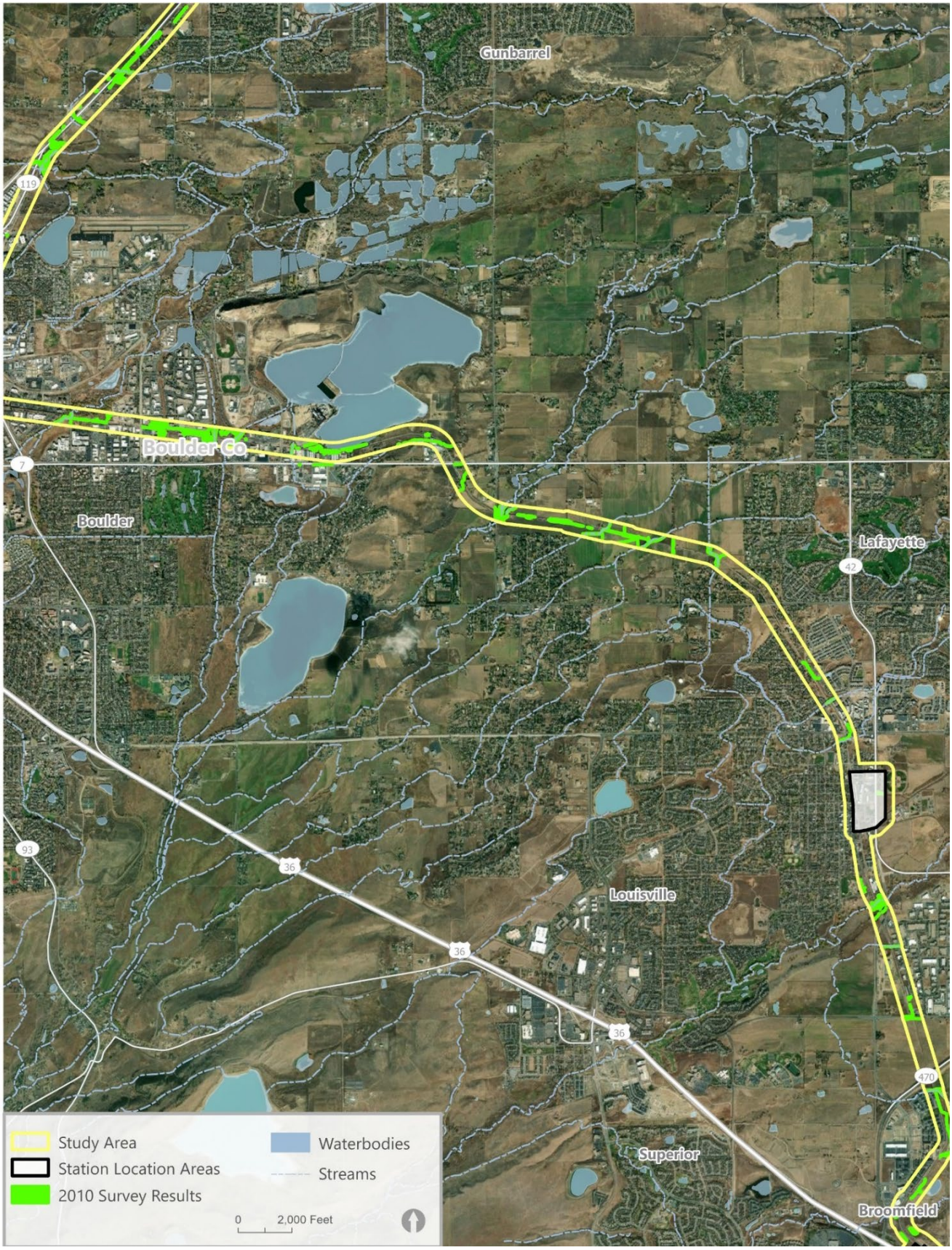


Figure 69: 2010 Wetland Survey Results (South to North)

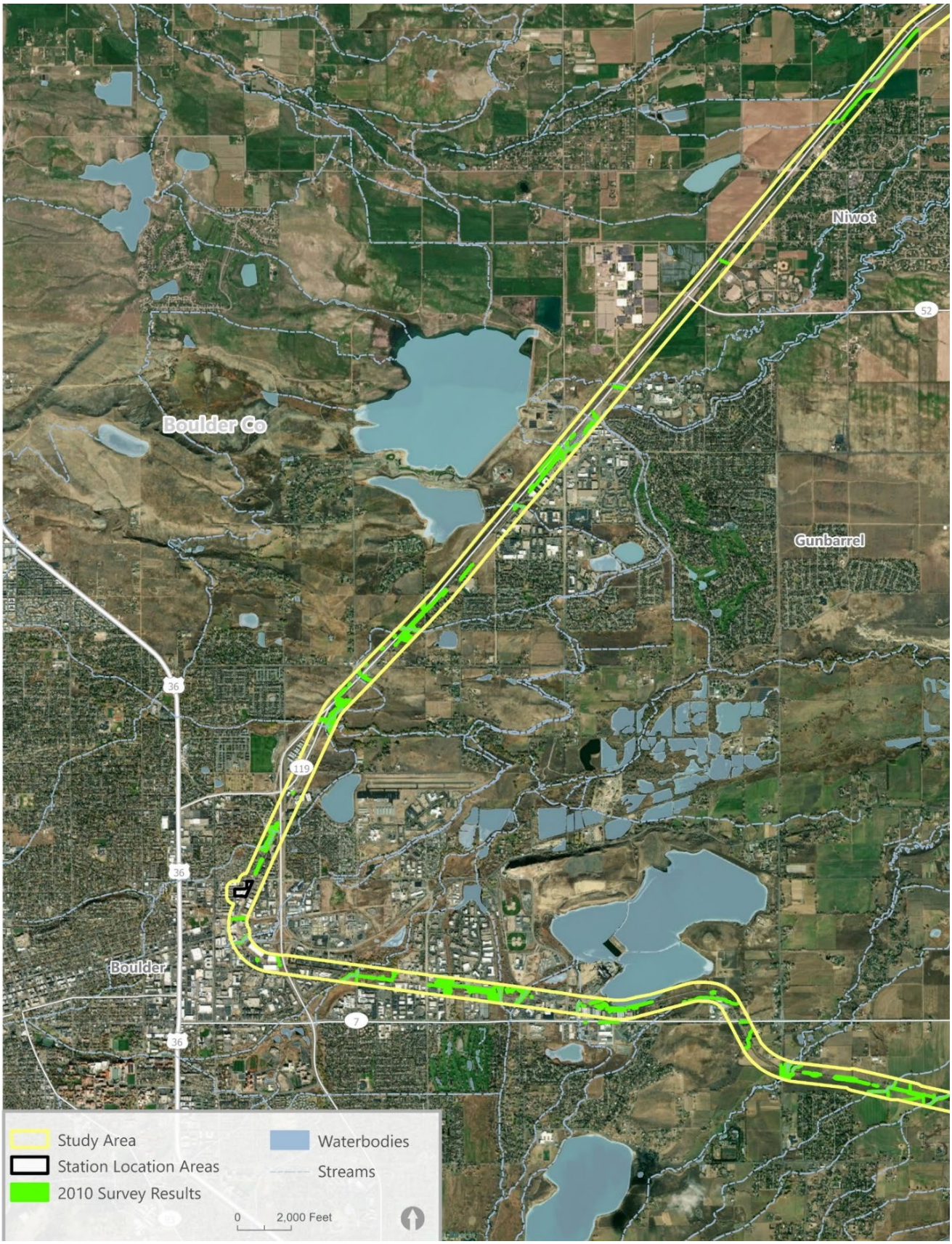


Figure 70: 2010 Wetland Survey Results (South to North)

Next Steps

During the completion of the Planning and Environmental Study, an aquatic resources survey will be conducted to bring the 2010 baseline data to current delineation standards and provide data for the NWR maintenance facility sites. Methods will follow the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Great Plains Supplement* (USACE, 2010a). A portion of the study area around Boulder lies within the *Western Mountains, Valleys, and Coast Region* (USACE, 2010b). The USACE will be consulted regarding the appropriate survey methodology. Wetlands are identified by field indicators (hydrophytic vegetation, hydric soils, and wetland hydrology). Wetlands meeting the criteria will be documented on wetland determination data forms and mapped with sub-meter GPS. Non-wetland waters will be mapped using ordinary high watermark guidance applicable to the region, e.g., Mersel and Lichvar 2014, or similar as directed by the USACE. Consultation with the USACE will direct methodologies, including the application of Functional Assessment of Colorado Wetlands to some wetlands. An Approved Jurisdictional Determination may be prepared following the aquatic resources survey, depending on USACE consultation.

In 2010, the USACE requested a wetland functional assessment of a subset of wetlands in the study area. The Functional Assessment of Colorado Wetlands Methodology was applied to 11 wetlands (Johnson et al., 2013). The USACE will be consulted to confirm if wetland analysis will be required for the aquatic resources survey and subsequent impact assessment.

During NEPA, the assessment will rely on the overlay of potential impacts on the aquatic survey results. Early collaboration with design will enable the identification of opportunities for avoidance and minimization of impacts. Any remaining impacts will require Clean Water Act compliance with the USACE.

Water Resources and Water Quality

Brief Description of Resource Studied

Water resources include surface water and groundwater features such as rivers, lakes, streams, creeks, wells, and aquifers. Transit and transportation projects have the potential to impact drainage, water quality, and water resources used for drinking, recreation, agriculture, and habitat. These impacts can occur during both the construction and maintenance/operation phases. Although wetlands and floodplains are also considered water resources, they are discussed separately in the Wetlands and Waters of the United States and Floodplains Sections, respectively.

Agencies Involved

The primary agency involved in assessing water resources and quality is the CDPHE Water Quality Control Division, which oversees state water quality concerns in cooperation with federal standards, including the Clean Water Act and Safe Drinking Water Act established by the EPA. Local agencies also regulate water quality resources through permitting and development reviews.

Relevant Regulations, Guidance, Studies, and Plans

The following regulations and guidelines govern the assessment and consideration of water resources and water quality within the study area:

- Section 303(d) of the Clean Water Act: Administered by the CDPHE Water Quality Control Division and the EPA, the Clean Water Act requires states to maintain a list of waters that are considered impaired for pollutants including total suspended solids, arsenic, cadmium, chromium, copper, magnesium, manganese, zinc, ammonia nitrogen, total phosphorus, chloride, sodium, oil, and grease; these require treatment prior to discharge if certain conditions are met
- Section 401 of the Clean Water Act: Administered by the CDPHE Water Quality Control Division and the EPA, Section 401 requires state review of federally permitted actions to ensure compliance with state water quality standards
- Section 402 of the Clean Water Act: Administered by the CDPHE Water Quality Control Division and the EPA, Section 402 requires that a discharge of any pollutant to surface waters that are deemed Waters of the United States be regulated by a National Pollutant Discharge Elimination System permit (implemented in Colorado as the Colorado Discharge Permit System)
- Safe Drinking Water Act (Parts 141-143): Administered by the CDPHE Water Quality Control Division and the EPA, the Safe Drinking Water Act protects public health by regulating the nation's public drinking water supply and protecting drinking water and its sources
- Colorado Water Quality Control Act: Protects and maximizes the beneficial uses of state waters and regulates water quality; specifies classifications and numeric standards for surface water in Colorado in compliance with the Clean Water Act
- FTA Water Resources Guidance (2019): Provides guidance on the analysis required for projects or actions affecting water resources to comply with the Clean Water Act, Safe Drinking Water Act, and other federal regulations related to wetlands and floodplains
- Local Agency Guidance: Each local agency has its drainage design criteria and Municipal Separate Storm Sewer System program documents

Data Collection/Methodology

The study area for this analysis includes a 300-foot-wide buffer on each side of the edge of the existing BNSF right of way and new station locations. Water resources were assessed within the study area using CDOT Online Transportation Information System, U.S. Geological Survey (USGS) National Hydrographic Dataset, CDPHE Clean Water GIS Maps, and Colorado Division of Water Resources GIS data. Surface water bodies and its water quality classifications and groundwater features, including aquifers and wells/wellhead protection areas, were identified within the watersheds in the study area.

Findings/Results

Surface Water

The study area is located in the South Platte River Basin (USGS, 2022). This basin's drainage flows east or northeast to the South Platte River. There are 11 creeks, two lakes, and numerous ditches, canals, stormwater sewer systems, and open water features within the study area (Figure 71). The Colorado Water Quality Control Commission has classified streams for various uses, including agriculture, aquatic life, recreation, and water supply. Classifications are established for any state surface water except in ditches and other manufactured conveyance structures. Although ditches are considered state waters, they are not classified,

and numeric water quality standards do not apply. In addition, the Water Quality Control Commission has developed a list of stream segments included in the Clean Water Act 303(d) list of impaired waters for various physical, biological, inorganic, and metal contaminants. This information is included in Table 51.

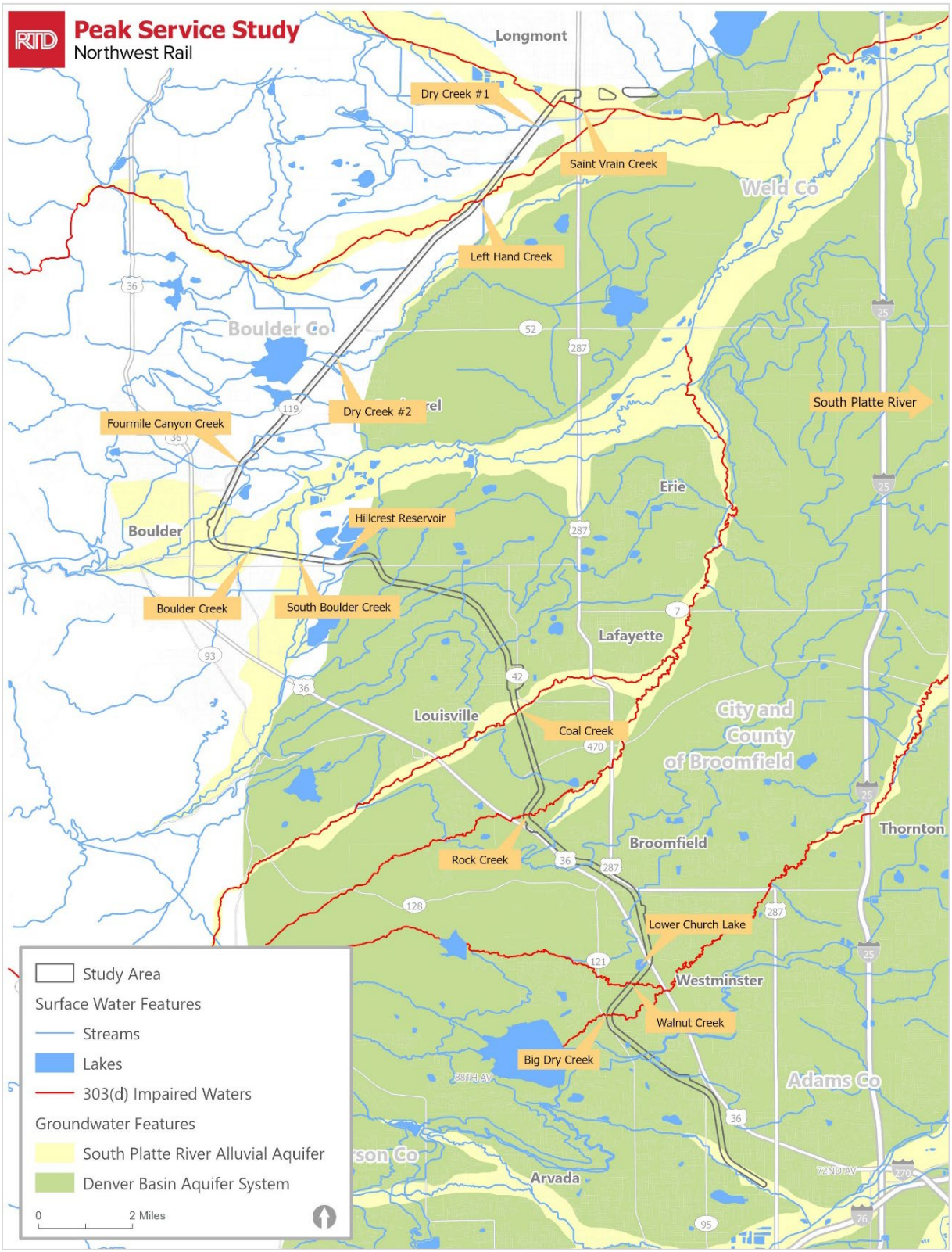
Table 51: Surface Water Quality Classifications

Surface Water Name	Designated Uses[1]	303(d) List Impairment
Big Dry Creek	Group A	Escherichia Coli (E. coli)
Walnut Creek	Group A	Escherichia Coli (E. coli)
Lower Church Lake	Group B	Not listed; Condition unknown
Rock Creek	Group A	Escherichia Coli (E. coli), Selenium
Coal Creek	Group B	Escherichia Coli (E. coli)
Hillcrest Reservoir	Group B	Not listed; Condition unknown
South Boulder Creek	Group A	Not listed
Boulder Creek	Group B	Not listed
Fourmile Canyon Creek	Group B	Not listed
Left Hand Creek	Group B	Copper Manganese
Dry Creek (#1 and #2)	Group B	Not listed
St. Vrain Creek	Group A	Escherichia Coli (E. coli)

Sources: USGS National Hydrographic Dataset (2022); EPA Section 303(d) Impaired Waters (2022)

[1] Designated Uses included in Group A include Agriculture, Aquatic Life Warm Water-Class 2, and Recreation; Designated uses included in Group B include all the uses defined in Group A and Water Supply.

Figure 71: Surface Water and Groundwater Features within the Study Area



Sources: CDOT Online Transportation Information System (2022); United States EPA Section 303(d) Impaired Waters (2022); USGS National Hydrography Database (2022); Colorado Division of Water Resources Groundwater Data (2014, 2020)

The study area contains approximately eight Municipal Separate Storm Sewer System permittees: Westminster, Adams County, City and County of Broomfield, Louisville, CDOT, Boulder, Boulder County, and Longmont. The Municipal Separate Storm Sewer System permit holders convey runoff directly to state waters and therefore are responsible for water quality and maintenance of its system under CDPHE.

Drainage-related Structures

The BNSF corridor utilizes existing structures to cross natural drainages, such as creeks, streams, and manufactured drainages, such as ditches. The BNSF corridor crosses 13 natural drainages with bridges or large concrete box culverts and 17 major ditches with concrete box culverts. Along with the open channel features within the NWR Corridor, there are closed or storm sewer systems near the at-grade crossings and stations. The drainage at the at-grade crossings are collected and conveyed away from the track in storm sewer systems. Most station locations are currently within developed areas with existing drainage systems. Additional resource-specific information regarding surface water crossings and drainage patterns is located in the Water Resources and Water Quality section.

Groundwater

The study area has two main aquifers: the South Platte River alluvial aquifer and the Denver Basin aquifer system. The South Platte River alluvial aquifer is associated with the major streams in the study area and generally ranges from 20 to 100 feet below ground surface level. The Denver Basin aquifer system consists of five separate aquifers, the Denver Aquifer, Arapahoe Aquifer, the Laramie Formation, the Laramie Fox-Hills Aquifer, and the Boulder Complex-Area. These aquifers lie beneath the southern portion of the study area and have depths of up to 2,000 feet. There is no main aquifer in the northwestern portion of the study area. Regional groundwater flow is generally to the east toward the South Platte River (Colorado Division of Water Resources, 2022). Groundwater resources in the study area are shown in Figure 71.

A total of 221 wells are mapped within the study area; of these, 80 are classified as abandoned (Colorado Division of Water Resources, 2022). Half of the remaining wells (70) are used for domestic supply, with the remaining 71 wells divided between other uses, such as commercial, industrial, irrigation, and monitoring wells associated with contaminated properties throughout the study area. Well records do not indicate whether these wells are in use.

Next Steps

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. During NEPA, an impact assessment will focus on areas where station locations intersect with surface and ground waters in the study area, especially those which are 303(d) listed as impaired waters for one or more items. Any temporary, construction-related impacts to surface water and runoff will also be considered. Any changes in impervious surface area, such as the construction of concrete parking lots or structures, will be calculated. Once design files are available, groundwater well data will be analyzed to understand the proximity of new infrastructure and construction to active or inactive wells within the study area.

Floodplains

Brief Description of Resource Studied

The Federal Emergency Management Agency (FEMA) defines a flood as a temporary condition of partial or complete inundation of two or more acres of normally dry land area or two or more properties, at least one of which is the policyholder's property, from an overflow of inland or tidal waters, unusual and rapid accumulation or runoff of surface waters from any source, or mudflow (FEMA, 2022). FEMA defines a base flood as a 100-year flood or flood event with a one-percent chance of occurring or being exceeded during a given year. Special Flood Hazard Areas, Regulatory Floodplains, or locally designated floodplains that FEMA does not map are the designated areas subject to inundation during the base flood.

Agencies Involved

The following agencies are responsible for regulating floodplains within the NWR Corridor:

- FEMA
- USACE District Office, Denver Regulatory Office
- Colorado Department of Natural Resources, Colorado Water Conservation Board
- Mile High Flood District
- Adams County, Engineering Department
- City and County of Boulder, Planning and Development Department
- City and County of Broomfield, Engineering Department
- Jefferson County, Planning and Zoning Department
- City of Arvada, Engineering Department
- City of Lafayette, Planning and Building Department
- City of Longmont, Public Works & Natural Resources Department
- City of Louisville, Planning Department
- City of Westminster, Engineering Department

Relevant Regulations, Guidance, Studies, and Plans

FEMA regulates floodplains and floodways at the federal level under the National Flood Insurance Program. Executive Order 11988, Floodplain Management, established standards for designing highways. Floodplains are regulated at the local level by floodplain ordinances of cities or counties for both FEMA and non-FEMA floodplains.

Floodplains are also regulated at the federal level by the USDOT Order DOT 5650.2, which prescribes policies and procedures for ensuring proper consideration to avoid and mitigate adverse floodplain impacts in agency actions, planning programs, and budget requests.

The Colorado Water Conservation Board *Rules and Regulations for Regulatory Floodplains in Colorado* (CWCB, 2022) provides uniform standards for regulatory floodplains (or floodplains) in Colorado, standards for activities that may impact regulatory floodplains, and stipulates the process by which floodplains would be designated and approved.

Corridor Conditions Report

Data Collection/Methodology

The study area for this floodplain analysis includes a 300-foot buffer from the edge of the right of way of the BNSF corridor and a 300-foot buffer around each station. Several streams and other water features identified within the study area were obtained from the National Wetlands Inventory, FEMA National Flood Hazard Layer, and the USGS Watershed Boundary Data. County and other local floodplain administrator's offices were obtained from the county's or municipality's website.

Finding/Results

The study area crosses Boulder, Broomfield, Jefferson, and Adams counties. Within those counties, the study area passes through Westminster, Broomfield, Louisville, Boulder, Longmont, Lafayette, and Arvada. The NWR Corridor crosses over the 100-year floodplain in approximately 17 locations and over regulated floodways in approximately seven locations, as shown in Figure 72. Table 52 describes the number of floodplains and regulated floodways crossings associated with each county and the corresponding sub-watershed boundary and major waterways.

Figure 72: Existing Floodplains

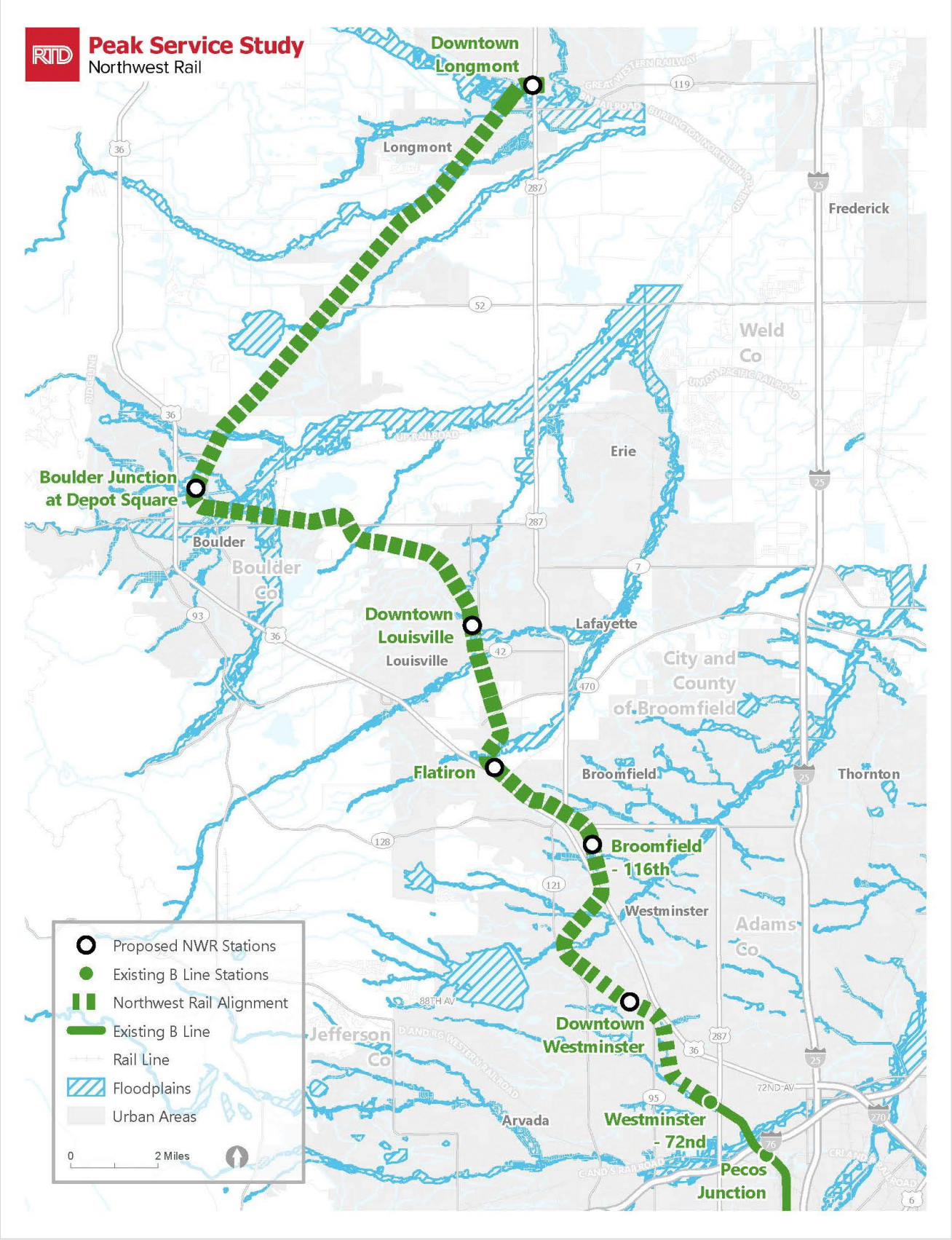


Table 52: Number of Floodplains and Regulated Floodway Crossings

County	Sub-Watershed Boundary	Major Waterways	Number of Floodplain Crossings	Number of Regulated Floodway Crossings
Adams	• Middle Big Dry Creek (HUC12 101900030407) Outlet Clear Creek (HUC12 101900040404)	• Big Dry Creek	2	0
Boulder	• Boulder Reservoir (HUC12 101900050704) Dry Creek-Boulder Creek (HUC12 101900050601) Fourmile Canyon Creek (HUC12 101900050405) • Bear Canyon Creek-Boulder Creek (HUC12 101900050406) Lower South Boulder Creek (HUC12 101900050504) Bullhead Gulch-Boulder Creek (HUC12 101900050605) Middle Coal Creek (HUC12 101900050603) • Calkins Lake-Saint Vrain Creek (HUC12 101900050706) McIntosh Lake-Saint Vrain Creek (HUC12 101900050703) Dry Creek (HUC12 101900050702) • Lower Left Hand Creek (HUC12 101900050304)	• Boulder Creek Bullhead Gulch Coal Creek • Dry Creek (No. 1) Dry Creek (No. 2) Dry Creek (No. 3) • Fourmile Canyon Creek Goose Creek • Left Hand Creek • Left Hand Creek - Overflow Channel Rock Creek • South Boulder Creek • South Boulder Creek – Overflow Channel St. Vrain Creek • Wonderland Creek	12	6
Broomfield	• Middle Coal Creek (HUC12 101900050603) Middle Big Dry Creek (HUC12 101900030407) Upper Dry Creek (HUC12 101900030406)	• Airport Creek	0	0
Jefferson	• Upper Dry Creek (HUC12 101900030406) Outlet Clear Creek (HUC12 101900040404)	• Big Dry Creek Walnut Creek	3	1

Next Steps

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. Encroachment of any floodplains in the study area will be subject to the requirements of federal and local agencies. Correspondence with local agencies and FEMA will be required to ensure that the NWR Corridor is developed consistent with local floodway plans and floodplain management programs. This coordination effort will be documented in subsequent documents, including NEPA. An additional requirement is coordination with the appropriate USACE district regulatory office. A resource specialist will need to contact the local floodplain authority early in the planning process to enable USACE's floodplain management concerns to be addressed and incorporated into the initial design.

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Corridor Conditions Report

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Milestone 2

Corridor Conditions Report

Appendix A

Northwest Rail Peak Service Study

Traffic Corridor Context Report

We make lives better through connections.

Traffic Corridor Context Report

December 2022

Regional Transportation District
1660 Blake Street, Denver CO 80202

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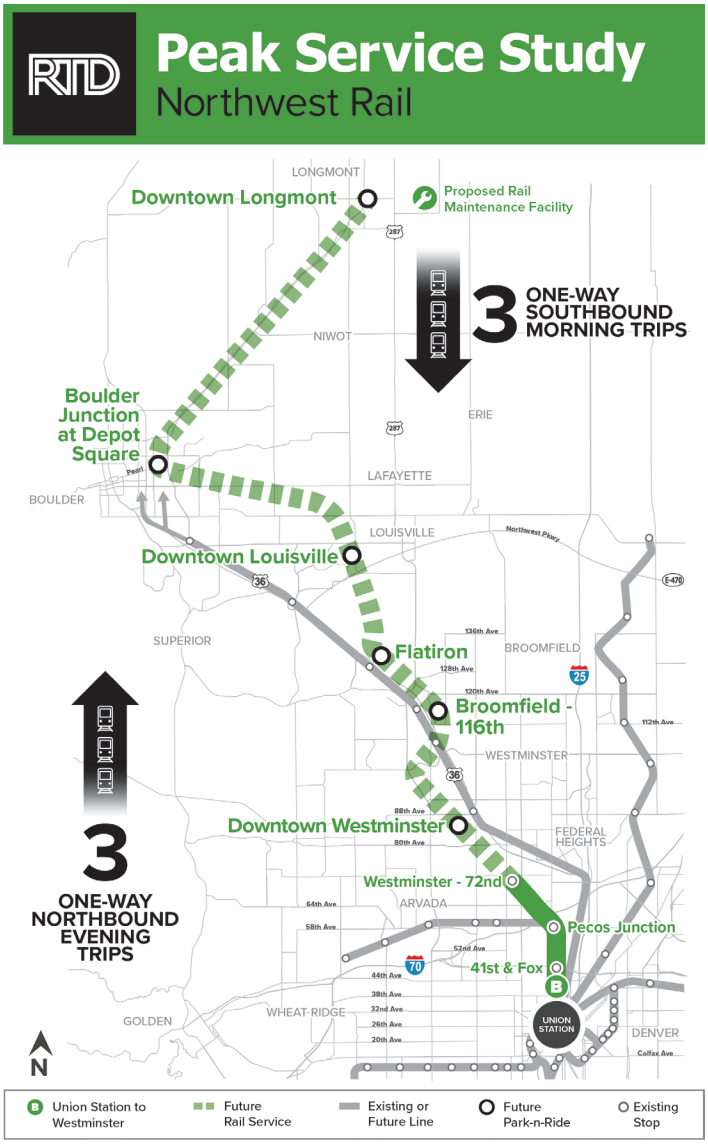
Introduction

RTD is conducting the Northwest Rail Peak Service Study (Study) for a 35-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 best provide 'rush-hour' service (Peak Service) on the existing BNSF Railway (BNSF) tracks: three weekday morning trips from Longmont to Denver and three weekday evening trips from Denver to Longmont. The Study will update capital, operations, and maintenance costs to implement the Peak Service on the Northwest Rail Corridor (NWR Corridor) in a manner to not preclude a future buildout.

Figure 1: NWR Corridor



Traffic Corridor Context Report

This Traffic Corridor Context Report summarizes existing traffic conditions at points where the BNSF tracks cross the roadway network (railway crossings) along the NWR Corridor and in the areas surrounding the new stations. The study area for the existing traffic conditions includes the six new stations, 14 existing grade-separated crossings, 37 existing at-grade crossings, and four new sidings. For purposes of this report, Peak Service weekday morning trips are assumed to run three times departing between 6 a.m. and 7 a.m., and three times in the afternoon departing between 4:15 p.m. and 5:15 p.m. This report provides the foundation for a future Traffic Operations Analysis Report to be prepared as part of the Northwest Rail Peak Service Study.

Methodology/Data Sources

Data for the existing traffic conditions was derived from online sources, including Google Maps, Google Earth, and Replica HQ. Google Earth satellite imagery was used to identify at-grade crossings, then the crossing locations were mapped with the most current NWR Corridor alignment.

Google Streetview images were reviewed at the at-grade crossing locations to assess the number of lanes, crossing control arms, pedestrian crossing conditions, and lighting at the crossing. Next, the roadway classification at the crossing was noted. Traffic volume estimates at the crossings come from Replica HQ, a big data software that provides regional volume data similar to a travel demand model. Replica HQ simulates the movements and trips of a 'synthetic population' and uses this data to predict traffic volumes over the region's roadway network. This study used data from Replica HQ's fall 2019 Thursday model run, which was chosen to represent typical weekday traffic. The volumes were used to give an approximate estimate of expected traffic on the railway crossings.

Google Earth was used to identify the nearest signalized and unsignalized intersections in both directions from the at-grade crossing. Locations where the tracks cross in close proximity to a signalized intersection have the greatest potential to cause wider traffic disruptions to the surrounding network. Adjacent cross streets also have the potential to be affected by backups caused by rail crossing activity. This work lays the foundation for a future traffic impact analysis, where these potential impacts will be studied in more detail.

At-Grade Crossing Characteristics

Railway crossings were categorized by at-grade crossings and grade-separated crossings.

At-grade crossings have the potential to impact traffic along the NWR Corridor. Basic information was collected for each at-grade crossing. The existing conditions at each of the at-grade crossings are shown in Table 1.

Traffic Corridor Context Report

Table 1: At-Grade Crossing Characteristics

Street	Functional Classification*	Replica HQ Volume (ADT)	# Lanes	Crossing Control Type	Median (Y/N)	Pedestrian Crossing Condition	Lighting Location
Lowell Blvd.	Minor Arterial	2,200 - 3,400	2	Dual Gates	N	Fair	Both sides
72nd Ave.	Principal Arterial	14,300 - 21,500	4	Dual Gates	N	Good	East side only
Bradburn Blvd.	Collector	800 - 1,250	2	Dual Gates	N	Good	South Side Only
76th Ave.	Minor Arterial	2,700 - 4,100	2	Dual Gates	N	Good	East side only
80th Ave.	Principal Arterial	13,000 - 19,500	4	Dual Gates	N	Good	None
88th Ave.	Principal Arterial	26,500 - 39,500	5	Quad Gates	Y	Good	Both sides
Pierce St.	Collector	3,700 - 5,640	2	Dual Gates	Y	Poor	Both sides
Old Wadsworth Blvd.	Minor Arterial	8,000 - 12,000	2	Dual Gates	N	None	None
112th Ave.	Minor Arterial	6,100 - 9,000	2	Dual Gates	Y	None	West Side Only
120th Ave.	Collector	650 - 1,000	2	Dual Gates	Y	None	West Side Only
Nickel St.	Collector	4,000 - 6,000	5 Turn Lanes	Quad Gates	Y	Fair	None
Brainard Dr.	Local	50 - 500	2	Quad Gates	N	None	None
Dillon Rd.	Minor Arterial	2,400 - 3,700	2	Dual Gates	Y	None	Both sides
Pine St.	Minor Arterial	8,600 - 13,000	2	Dual Gates	N	Good	Both sides
Griffith St.	Collector	200 - 1000	2	Dual Gates	N	Fair	None
S Boulder Rd.	Principal Arterial	16,600 - 25,000	4	Quad Gates	Y	Good	Both sides
Baseline Rd.	Minor Arterial	14,000 - 21,500	2	Dual Gates	Y	None	None
63rd St.	Collector	890 - 1,300	2	Dual Gates	Y	None	North side only
55th St.	Collector	8,200 - 12,000	2	Dual Gates	Y	None	South side Only
Pearl Pkwy.	Principal Arterial	16,700 - 25,000	4	Quad Gates	Y	High	Both Sides
Valmont Rd.	Minor Arterial	18,000 - 27,000	4	Quad Gates	Y	Fair	Both Sides
47th St.	Local	2,400 - 3,600	2	Dual Gates	Y	None	None
Independence Rd.	Local	200–1,000	2	Quad Gates	N	None	None
Jay Rd.	Local	6,600 - 9,900	2	Dual Gates	Y	Medium	Both sides
55th St.	Local	200–1,100	2	Dual Gates	Y	None	None
63rd St.	Minor Arterial	13,100 - 20,000	5	Quad Gates	Y	Good	Both Sides
Mineral Rd.	Minor Arterial	13,000 - 19,500	3	Dual Gates	N	None	Both Sides
Monarch Rd.	Local	300–1,000	2	Dual Gates	N	None	West Side Only
Niwot Rd.	Minor Arterial	6,000 - 9,100	2	Quad Gates	Y	High	Both Sides
2nd Ave.	Local	650–1,500	2	Dual Gates	N	medium	East Side Only
83rd St.	Local	300–1,000	2	Dual Gates	N	None	East side only
Ogallala Rd.	Local	50 - 500	2	Dual Gates	N	None	None
Hover St.	Collector	11,000 - 16,800	4	Quad Gates	Y	Medium	Both Sides
Sunset St.	Collector	3,200 - 4,800	3	Dual Gates	N	Low	Both Sides
Ken Pratt Blvd.	Minor Arterial	42,000 - 63,000	4	Dual Gates	Y	Low	Both Sides
Terry St.	Local	10 - 50	2	None	N	None	None
Coffman St.	Local/Collector	300–1,000	2	Yield Sign	N	None	South Side Only

*Roadway Classification is a preliminary determination.

Grade-separated crossings do not have an impact on local traffic and are therefore not described further in this report. The grade-separated crossings are:

- Sheridan Boulevard
- 92nd Avenue
- Church Ranch Parkway
- Wadsworth Boulevard
- US 36
- SH 128
- Wadsworth Parkway
- Northwest Parkway
- Courtesy Road
- 75th Street
- Arapahoe Road
- Foothills Parkway (South of Pearl Parkway)
- Foothills Parkway (North of Valmont Road)
- Pratt Parkway

Cross Streets and Signalized Intersections Near At-Grade Crossings

Turning movements on streets that cross the roads impacted by at-grade crossings have the potential to be disrupted by the queue of vehicles backed up by the at-grade crossing. Existing conditions for these cross streets near the at-grade crossings were identified because these streets have the highest potential for disruption due to the traffic caused by the at-grade crossing. Two sets of data are listed: the nearest cross streets of any kind in both directions from the crossing, and the two nearest signalized intersections in both directions from the crossing. The control type and the classification of the nearest cross street are also listed. Types of control include signalized intersections, one-way stop control (OWSC), two-way stop control (TWSC), all-way stop control (AWSC), and yield signs. This data is summarized in Table 2 and Table 3.

Traffic Corridor Context Report

Table 2: Cross Streets Near At-Grade Crossings

At-Grade Crossing	Nearest Cross Street 1* (Functional Class)	Cross Street 1 Distance (ft)	Cross Street 1 Control	Nearest Signal 1	Nearest Signal Distance (ft)	Nearest Cross Street 2* (Functional Class)	Cross Street 2 Distance (ft)	Cross Street 2 Control
Lowell Blvd.	71st Pl. (N) (Local)	250	OWSC	72nd Ave.	500	Creekside Dr. (S) (Local)	1000	TWSC
72nd Ave.	72nd Way (E) (Local)	80	Yield	Bradburn Blvd.	500	Newton St. (W) (Local)	75	OWSC
Bradburn Blvd.	72nd Way (N) (Local)	70	OWSC	N/A	N/A	72nd Ave. (S) (Arterial)	400	OWSC
76th Ave.	Stuart St. (E) (Local)	300	TWSC	Lowell Blvd.	3400	Winona Ct. (W) (Local)	250	TWSC
80th Ave.	Tennyson St. (E) (Local)	200	OWSC	US 36	2300	Wolff St. (W) (Local)	70	OWSC
88th Ave.	Harlan St. (E) (Collector)	300	Signal	Harlan St.	300	Lamar Dr. (W) (Collector)	620	Signal
Pierce St.	91st Ave. (N) (Local)	550	TWSC	92nd Ave.	1400	Unnamed Driveway (S)	550	TWSC
Old Wadsworth Blvd.	93rd Pl. (N) (Local)	250	TWSC	96th Ave.	2000	Unnamed Driveway (S)	400	TWSC
112th Ave.	Reed Wy. (E) (Local)	700	Signal	Reed Wy.	700	Wadsworth (W) (Collector)	400	Signal
120th Ave.	US 287 (E) (Arterial)	500	OWSC	N/A	N/A	Colemans Wy. (W) (Local)	100	OWSC
Nickel St.	US 287 (N) (Arterial)	100	Signal	US 287	100	Industrial Ln/Commerce St (Arterial)	100	Stop/Yield
Brainard Dr.	Midway Blvd. (N) (Collector)	40	OWSC	N/A	N/A	N/A	N/A	N/A
Dillon Rd.	Pierce Ave. (E) (Collector)	430	Signal	Pierce Ave.	430	96th St. (W) (Collector)	1400	Signal
Pine St.	East St. (E) (Local)	400	OWSC	Courtesy Rd.	600	Front St. (W) (Local)	200	AWSC
Griffith St.	Front St. (E) (Local)	130	TWSC	N/A	N/A	Main St. (W) (Local)	230	OWSC
S Boulder Rd.	Cannon Cir. (E) (Local)	680	TWSC	Courtesy Rd.	1100	Main St. (W) (Local)	50	Signal
Baseline Rd.	Applewood Dr. (E) (Local)	430	OWSC	Courtesy Rd.	3000	Elgin Dr. (W) (Local)	450	OWSC
63rd St.	Power plant driveway (N) (Local)	100	OWSC	Valmont Rd.	6000	Arapahoe Ave. (S) (Arterial)	650	Signal
55th St.	Central Ave. (N) (Collector)	380	TWSC	Central Ave.	380	Western Ave. (S) (Local)	200	OWSC
Pearl Pkwy.	Frontier Ave. (E) (Local)	900	TWSC	N. Bound 157 Ramp	1300	Junction Pl. (W) (Collector)	470	Signal

Traffic Corridor Context Report

At-Grade Crossing	Nearest Cross Street 1* (Functional Class)	Cross Street 1 Distance (ft)	Cross Street 1 Control	Nearest Signal 1	Nearest Signal Distance (ft)	Nearest Cross Street 2* (Functional Class)	Cross Street 2 Distance (ft)	Cross Street 2 Control
Valmont Rd.	Wilderness Pl. (E) (Collector)	250	Signal	Wildernes s Pl.	250	34th St. (W) (Collector)	250	Signal
47th St.	Diagonal Highway (N) (Arterial)	780	Signal	SH 119	780	Mitchell Ln. (E) (Local)	350	TWSC
Independence Rd.	N/A	N/A	N/A	N/A	N/A	SH 119 (W) (Arterial)	130	TWSC
Jay Rd.	55th St. (E) (Local)	1900	N/A	Spine Rd.	4500	SH 119 (W) (Arterial)	150	Signal
55th St.	SH 119 (N) (Arterial)	160	TWSC	N/A	N/A	Pioneer Rd. (S) (Local)	350	N/A
63rd St.	SH 119 (N) (Arterial)	180	Signal	N/A	N/A	Lookout Rd. (S) (Arterial)	760	Signal
Mineral Rd.	SH 119 (N) (Arterial)	125	Signal	N/A	N/A	71st St. (S) (Local)	700	OWSC
Monarch Rd.	Secretariat Dr (E) (Local)	1200	N/A	N/A		SH 119 (W) (Arterial)	160	TWSC
Niwot Rd.	Peppertree Dr (E) (Local)	250	OWSC	N/A		SH 119 (W) (Arterial)	155	Signal
2nd Ave.	Murray St. (E) (Local)	1200	OWSC	N/A		SH 119 (W) (Arterial)	170	OWSC
83rd St.	Unnamed Driveway (N)	720	OWSC	N/A		SH 119 (W) (Arterial)	130	OWSC
Ogallala Rd.	LOBO Regional Trail (N)	300	N/A	N/A		SH 119 (W) (Arterial)	130	OWSC
Hover St.	Unnamed driveway (N)	300	N/A	Ken Pratt Blvd.	1000	Pike Rd. (S) (Arterial)	300	Signal
Sunset St.	Ken Pratt Blvd. (N) (Arterial)	120	Signal	N/A	N/A	Kansas Ave. (S) (Collector)	250	OWSC
Ken Pratt Blvd.	Sherman St. (E) (Collector)	450	TWSC	Bowen St.	1475	Nelson Rd. (W) (Collector)	240	Signal
Terry St.	N/A	N/A	N/A	N/A	N/A	1st Ave. (S) (Local)	30	OWSC
Coffman St.	2nd Ave. (N) (Arterial)	560	TWSC	3rd Ave.	1325	1st Ave. (S) (Local)	30	OWSC

*Cross Street 1 is either North (N) or East (E) of the crossing, while Cross Street 2 is either South (S) or West (W) of the crossing

Traffic Corridor Context Report

Table 3: Signals Nearest the At-Grade Crossings

At-Grade Crossing	Nearest Signal 1*	Distance (ft)	Nearest Signal 2*	Distance (ft)
Lowell Blvd.	72nd Ave.	500	68th Ave.	1800
72nd Ave.	Bradburn Blvd.	500	Raleigh St.	800
Bradburn Blvd.	N/A	N/A	N/A	N/A
76th Ave.	Lowell Blvd.	3400	Sheridan Blvd.	1900
80th Ave.	US 36.	2300	Sheridan Blvd.	1500
88th Ave.	Harlan St.	300	Lamar Dr.	620
Pierce St.	92nd Ave.	1400	88th Ave.	1800
Old Wadsworth Blvd.	96th Ave.	2000	92nd Ave.	920
112th Ave.	Reed Wy.	700	Wadsworth	400
120th Ave.	N/A	N/A	N/A	N/A
Nickel St.	US 287	100	N/A	N/A
Brainard Dr.	N/A	N/A	N/A	N/A
Dillon Rd.	Pierce Ave.	430	96th St.	1400
Pine St.	Courtesy Rd.	600	N/A	N/A
Griffith St.	N/A	N/A	N/A	N/A
S Boulder Rd.	Courtesy Rd.	1100	Main St.	50
Baseline Rd.	Courtesy Rd.	3000	76th St.	9000
63rd St.	Valmont Rd.	6000	Arapahoe Ave.	650
55th St.	Central Ave.	380	Arapahoe Ave.	1400
Pearl Pkwy.	N. Bound 157 Ramp	1300	Junction Pl.	900
Valmont Rd.	Wilderness Pl.	250	34th St	250
47th St.	SH 119	780	Valmont Rd.	2,700
Independence Rd.	N/A	N/A	N/A	N/A
Jay Rd.	Spine Rd.	4500	SH 119	150
55th St.	N/A	N/A	N/A	N/A
63rd St.	N/A	N/A	Lookout Rd.	760
Mineral Rd.	N/A	N/A	79th St.	6800
Monarch Rd.	N/A	N/A	N/A	N/A
Niwot Rd.	N/A	N/A	SH 119	155
2nd Ave.	N/A	N/A	N/A	N/A
83rd St.	N/A	N/A	N/A	N/A
Ogallala Rd.	N/A	N/A	SH 119 SB	550
Hover St.	Ken Pratt Blvd.	1000	Pike Rd.	300
Sunset St.	N/A	N/A	N/A	N/A
Ken Pratt Blvd.	Bowen St.	1475	N/A	N/A
Terry St.	N/A	N/A	N/A	N/A
Coffman St.	3rd Ave.	1325	N/A	N/A

*Cross Street 1 is either North (N) or East (E) of the crossing, while Cross Street 2 is either South (S) or West (W) of the crossing.

Existing Congestion Levels

Existing traffic congestion levels for the areas near at-grade crossings were approximated using Google Maps typical traffic data for a typical weekday, in this case a Thursday, during the times the train is projected to pass. These congestion levels have not been verified by a field visit. A field visit to the at-grade crossings where there are higher levels of congestion is advised and could be conducted as part of the future traffic operations analysis.

Google Maps uses a color scheme to indicate levels of traffic congestion—green represents little traffic congestion, orange represents mild traffic congestion, red represents heavy traffic congestion, and dark red represents extremely heavy traffic congestion. Typical traffic conditions at all at-grade crossings fell under either green or orange conditions, suggesting little to mild traffic congestion exists currently on the typical weekday.

Traffic conditions at the nearest cross streets to the at-grade crossings were observed using Google Maps traffic data. Congestion at an intersection near an at-grade crossing has the potential to be indirectly worsened by traffic conditions at the at-grade crossing and may contribute to the need for further study. The conditions at the nearest intersections to the crossings are included in the generalized congestion levels listed for each crossing.

Business activity can be potentially affected by traffic impacts at the crossings, and business activity can also contribute to the congestion at the crossings. Satellite imagery and Google Street views of areas surrounding the at-grade crossings were used to rate the level of business activity surrounding the crossings. Each crossing was subjectively assigned a Commerce Index rating based on observed land use, ranging from 1 to 5. A rating of 1 signifies a crossing in a low-density, rural setting with no surrounding business activity; a rating of 3 signifies a low-to-medium density of businesses served by low-volume driveways and parking lots; and a rating of 5 signifies a dense, urban business landscape. The ratings are meant only to indicate where further investigation may be necessary.

Table 4 lists the observed Google Maps traffic congestion levels at the at-grade crossings and the Commerce Index ratings.

Table 4: Existing Congestion Levels and Commerce Index Ratings

At-Grade Crossing	Google Maps Congestion Level AM	Google Maps Congestion Level PM	Commerce Index Rating (1-5)
Lowell Blvd.	Green	Orange	3
72nd Ave.	Orange	Orange	2
Bradburn Blvd.	Orange	Orange	2
76th Ave.	Green	Green	1
80th Ave.	Green	Green	1
88th Ave.	Green	Orange	1
Pierce St.	Green	Green	1
Old Wadsworth Blvd.	Green	Orange	1

Traffic Corridor Context Report

At-Grade Crossing	Google Maps Congestion Level AM	Google Maps Congestion Level PM	Commerce Index Rating (1-5)
112th Ave.	Orange	Green	1
120th Ave.	Orange	Orange	2
Nickel St.	Orange	Orange	2
Brainard Dr.	Green	Green	1
Dillon Rd.	Orange	Orange	1
Pine St.	Orange	Orange	3
Griffith St.	Green	Green	1
S Boulder Rd.	Orange	Orange	4
Baseline Rd.	Orange	Green	1
63rd St.	Orange	Orange	1
55th St.	Orange	Orange	1
Pearl Pkwy.	Green	Orange	3
Valmont Rd.	Green	Orange	2
47th St.	Orange	Green	1
Independence Rd.	Green	Red	1
Jay Rd.	Orange	Orange	1
55th St.	Green	Green	1
63rd St.	Green	Orange	3
Mineral Rd.	Orange	Orange	1
Monarch Rd.	Orange	Orange	1
Niwot Rd.	Orange	Orange	1
2nd Ave.	Green	Green	3
83rd St.	Green	Orange	1
Ogallala Rd.	Green	Green	1
Hover St.	Green	Orange	3
Sunset St.	Orange	Orange	4
Ken Pratt Blvd.	Orange	Orange	4
Terry St.	Green	Green	2
Coffman St.	Green	Orange	3

Gate closure times at the at-grade crossings impact traffic flow and congestion levels. Currently, gate closures occur when the BNSF freight trains pass. Current gate closure times for the freight trains are uncertain because the BNSF schedule is not readily available or routinely predictable. Estimated gate closure time for three-car passenger trains is approximately 30 to 60 seconds. Gate closure times for freight trains are substantially longer because the trains are significantly longer than passenger trains and travel at slower speeds. RTD estimates that there are between eight and ten freight trains per day, and some of these trains may operate during peak times, including the Peak Service timeframes.

It is possible that traffic impacts at the at-grade crossings would be reduced with the regularity of the passenger train schedule and because freight trains are not planned to operate when passenger trains are

running during Peak Service times. The comparison between existing gate closure times and projected gate closure times during the Peak Service periods will be made in future traffic operations analysis.

At-Grade Crossings Potential for Concern

The approximate existing traffic volumes and congestion levels at the at-grade crossings and at nearby cross streets and signalized intersections paints a picture of which at-grade crossings may have an impact on surrounding roadway operations under future conditions. High-volume, congested at-grade crossings that are close to other high-volume cross streets may see increased congestion due to increased train traffic. Other factors that may cause traffic impacts include high speeds approaching stopped traffic, complex intersection geometry, and low roadway storage in advance of crossings.

One factor alone will not significantly impact traffic congestion in the area surrounding the at-grade crossings because the crossing arm closure time is relatively short for the passenger trains. It is combinations of existing conditions that would cause potential traffic concerns at crossings. For example, a crossing being in proximity to a nearby intersection is not enough on its own to cause significant impacts. If the volume is low at the at-grade crossing or on the cross street near the at-grade crossing, it is unlikely that there would be traffic impacts due to a short gate closure. However, if this proximity is combined with high traffic volumes or complex intersection geometry, then the at-grade crossing warrants further study to identify potential traffic impacts.

Existing conditions features for the at-grade crossings were compiled to help determine what combination of factors could potentially contribute to traffic impacts from the NWR and their relative level of concern. Concern levels were assigned to the at-grade crossings, as follows:

- At-grade crossings that have no concerning existing conditions were given a concern level of 0.
- At-grade crossings that have one concerning existing factor, such as high volume or nearby cross streets, were given a concern score of 1; these intersections are not expected to be impacted by the new Peak Service.
- At-grade crossings given a concern score of 2 may have combinations of factors, such as high volumes and existing congestion, but generally have enough storage or distance from other cross streets to not anticipate major impacts.
- The most complex and crowded at-grade crossings that are in close proximity to other cross streets are given a concern score of 3, and potential traffic impacts due to the Peak Service will be studied in more depth in a traffic operations analysis.

The existing conditions factors that were considered and the concern levels assigned for each at-grade crossing are shown in Table 5.

Traffic Corridor Context Report

Table 5: Concern Levels Based on Existing Conditions

At-Grade Crossing	Low Volume? (<2000)	Medium Volume?	High Volume? (>10,000)	High Speed?	Complex Geometry?	Impacts Parallel Road?	Low Storage?	Nearby Intersections? (<200 feet)	Typical Congestion?	Concern Level
Lowell Blvd.		✓								1
72nd Ave.			✓	✓				✓	✓	1
Bradburn Blvd.	✓							✓	✓	1
76th Ave.		✓								0
80th Ave.			✓	✓				✓		2
88th Ave.			✓	✓						2
Pierce St.		✓								0
Old Wadsworth Blvd.			✓						✓	2
112th Ave.		✓								1
120th Ave.	✓							✓	✓	2
Nickel St.		✓		✓	✓	✓	✓	✓	✓	3
Brainard Dr.	✓						✓	✓		0
Dillon Rd.		✓		✓					✓	2
Pine St.			✓				✓	✓	✓	3
Griffith St.	✓							✓		1
S Boulder Rd.			✓	✓	✓		✓	✓	✓	3
Baseline Rd.			✓	✓					✓	1
63rd St.	✓							✓	✓	1
55th St.			✓	✓				✓	✓	1
Pearl Pkwy.			✓							1
Valmont Rd.			✓						✓	2
47th St.		✓								0
Independence Rd.	✓			✓		✓	✓	✓	✓	3
Jay Rd.		✓		✓	✓	✓	✓	✓	✓	3
55th St.	✓			✓	✓	✓	✓	✓		2
63rd St.			✓	✓	✓	✓		✓		2
Mineral Rd.			✓	✓	✓	✓		✓	✓	2
Monarch Rd.	✓			✓	✓	✓	✓	✓	✓	2
Niwot Rd.		✓		✓	✓	✓	✓	✓	✓	3
2nd Ave.	✓			✓	✓	✓	✓	✓		1
83rd St.	✓					✓		✓		1
Ogallala Rd.	✓			✓		✓		✓		0
Hover St.			✓							1

Traffic Corridor Context Report

At-Grade Crossing	Low Volume? (<2000)	Medium Volume?	High Volume? (>10,000)	High Speed?	Complex Geometry?	Impacts Parallel Road?	Low Storage?	Nearby Intersections? (<200 feet)	Typical Congestion?	Concern Level
Sunset St.		✓				✓	✓	✓	✓	2
Ken Pratt Blvd.			✓	✓	✓	✓	✓		✓	3
Terry St.	✓							✓		1
Coffman St.	✓					✓		✓		1

New Freight Sidings

RTD is planning to construct four new sidings to park BNSF freight trains during Peak Service operating periods so that the passenger trains can operate unimpeded on the Corridor. The four siding locations are illustrated in Figure 2 and listed below:

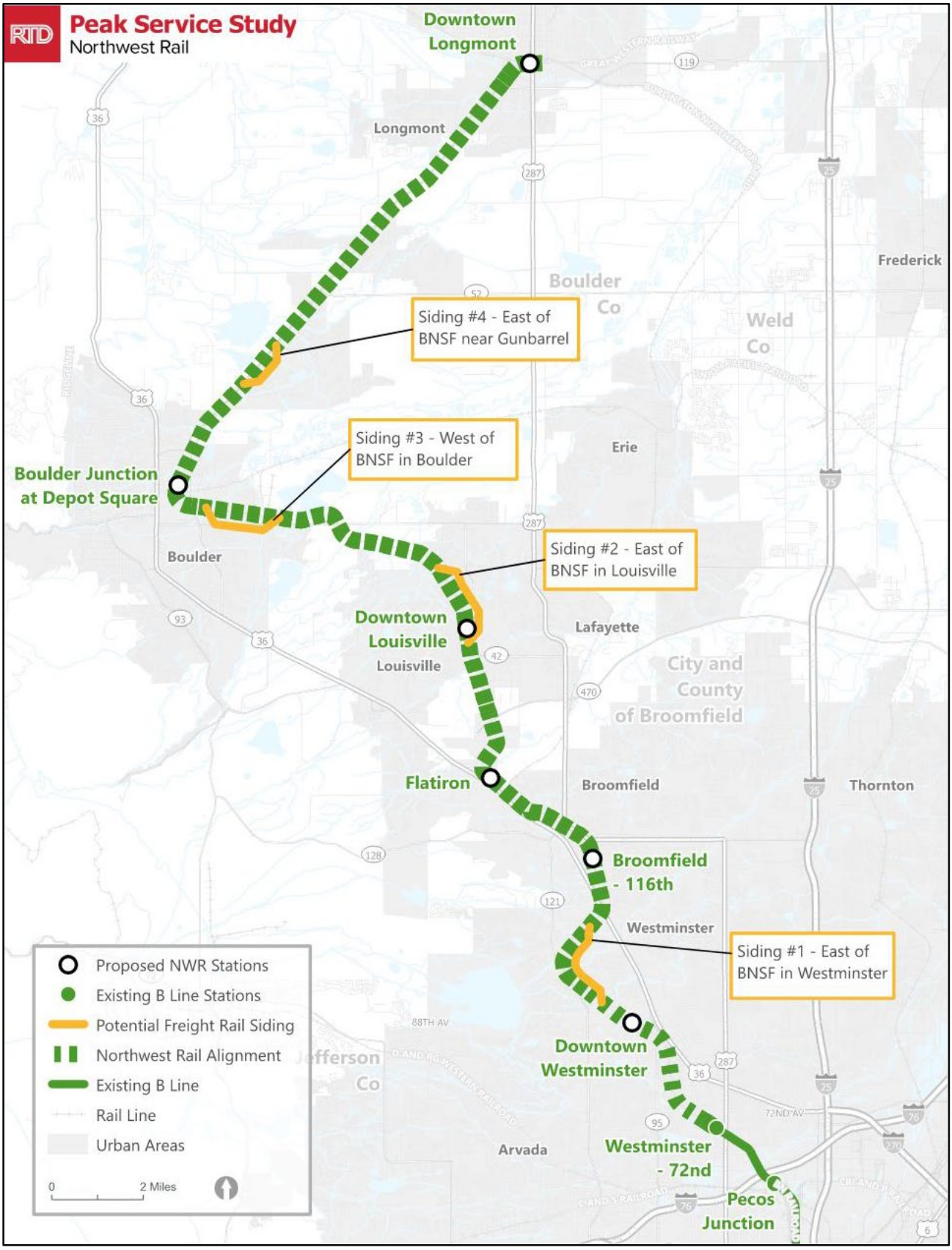
- Siding 1: South of the Old Wadsworth Road crossing in Westminster to just south of the grade-separated Wadsworth Road crossing
- Siding 2: North of Pine Street in Louisville to just north of Baseline Road
- Siding 3: Existing Valmont Power Plant spur to the bridge over Boulder Creek east of Foothills Parkway
- Siding 4: Near Gunbarrel between the northern 55th Street and 63rd Street crossings

The sidings would impact the following at-grade crossings:

- Old Wadsworth Boulevard
- Griffith Street
- South Boulder Road
- Baseline Road
- 55th Street (Southern Crossing)

Traffic at each of these at-grade crossings would be severely impacted when a freight train is parked on the siding while a passenger train passes. Vehicles would need to detour around the parked freight train to avoid an hour or more of delay. The impacts of at-grade sidings will be evaluated in a future traffic operations analysis.

Figure 2: Proposed Freight Siding Locations

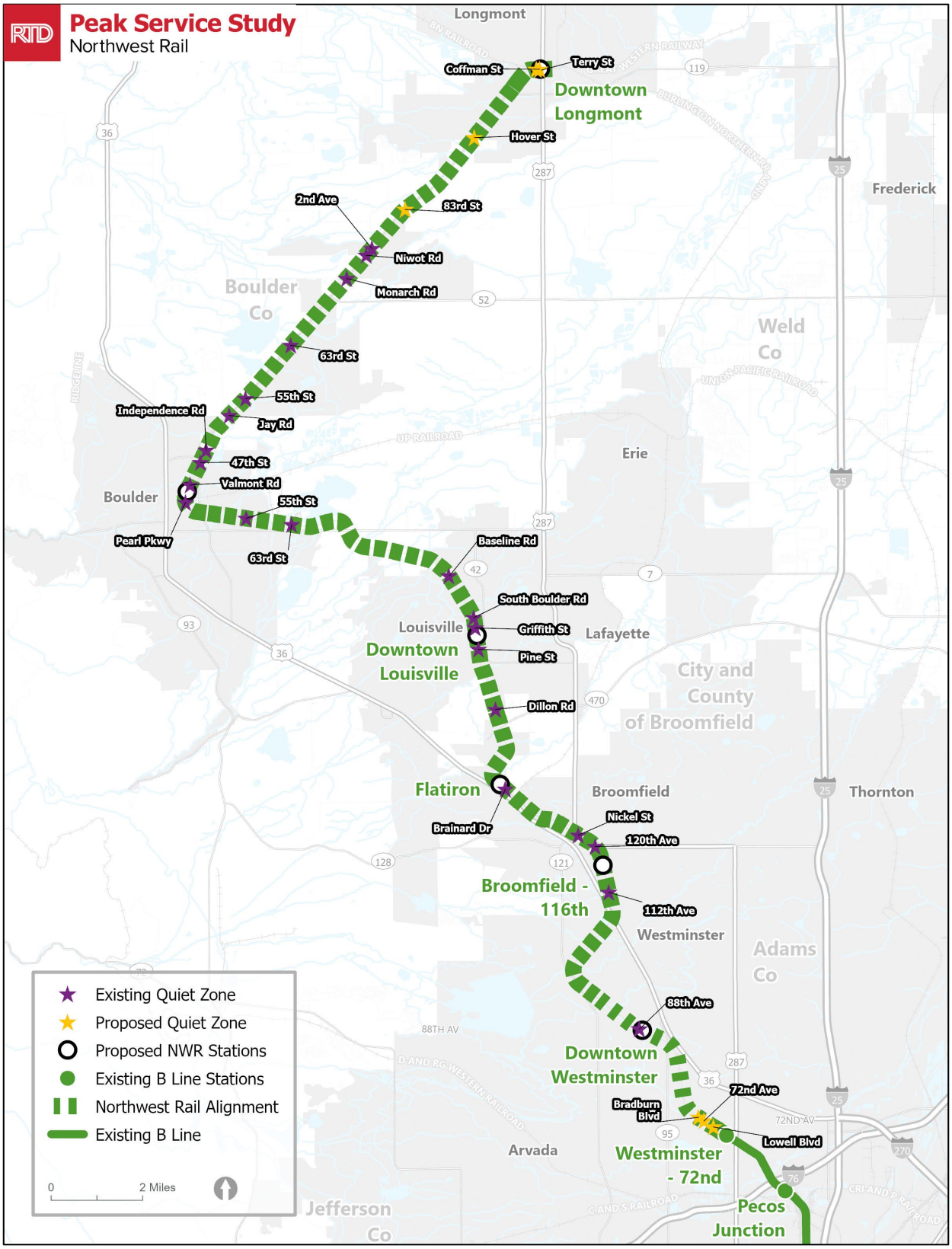


Quiet Zones

Federal Railroad Administration (FRA) guidelines require trains to blow locomotive horns in advance of all at-grade rail crossings for between 15 and 20 seconds. A local municipality can apply for a quiet zone, which removes the requirement for conductors to sound the horn at the crossing. Roadway improvements at crossings, such as quad gates, median extensions, and additional signage, are required in order for the crossing to be eligible for a quiet zone. Municipalities along the NWR Corridor have recently made improvements to crossings or planned projects in order for their at-grade crossings to become quiet zones. Much of this improved crossing infrastructure is documented in previous sections in this report, as municipalities are required to have safety features such as quad gates and medians in place before applying for a quiet zone from the FRA. Figure 3 illustrates designated quiet zones as of October 2022.

The Northwest Rail alignment includes an approximately 19-mile stretch of continuous quiet zones between 112th Avenue in Broomfield/Westminster and 63rd Street north of Boulder. Every at-grade crossing in this part of the alignment is designated as a quiet zone, leading to a continuous zone where no train horns are required to be sounded.

Figure 3: Existing and Proposed Quiet Zones Locations



Traffic Corridor Context Report

The following crossings, listed by municipality, are designated as quiet zones:

Boulder County–Existing Quiet Zones:[1]

- 2nd Avenue in Niwot
- Niwot Road
- Monarch Road
- 63rd Street (South of Diagonal Highway)
- 55th Street (South of Diagonal Highway)
- Jay Road
- Independence Road

City of Boulder–Existing Quiet Zones:[2]

- 47th Street
- 55th Street (North of Arapahoe Avenue)
- 63rd Street (North of Arapahoe Avenue)
- Pearl Parkway
- Valmont Road

Broomfield–Existing Quiet Zones:[3]

- Brainard Drive
- Nickel Street
- W. 120th Avenue
- W. 112th Avenue

Louisville–Existing Quiet Zones:[4]

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

Lafayette–Existing Quiet Zones:[5]

- Baseline Road

Westminster–Existing Quiet Zones:[6]

- 88th Avenue

[1] https://bouldercounty.gov/transportation/plans-and-projects/railroad-crossing-quiet-zones/
[2] https://bouldercolorado.gov/projects/railroad-quiet-zones
[3] https://www.broomfield.org/3244/Quiet-Zone-Improvements, Email communications with Sarah Grant on December 7, 2022
[4] https://www.louisvilleco.gov/living-in-louisville/residents/transportation/railroad-quiet-zone
[5] https://www.lafayetteco.gov/DocumentCenter/View/14508/R-17-10?bidId=
[6] https://safetydata.fra.dot.gov/OfficeofSafety/PublicSite/Crossing/Crossing.aspx

Several municipalities along the route have proposed or begun planning for future quiet zones. Expected dates for implementation were available for Longmont quiet zones, and are noted below. The following proposed quiet zones, shown in Figure 3, are listed by municipality:

Boulder County–Proposed Quiet Zones:[7]

- 83rd Street

Longmont–Future Quiet Zones:[7]

- Coffman Street (Expected 2024)
- Terry Street (Expected 2024)
- Hover Street (Expected 2025)

Westminster–Future Quiet Zones:[8]

- W. 72nd Avenue
- Lowell Boulevard
- Bradburn Boulevard

The following crossings are not designated as quiet zones, and are not currently listed as being planned for quiet zones by the municipalities:

Longmont:

- Sunset Street
- Ken Pratt Boulevard

Boulder County:

- Ogallala Road

City of Boulder:

- Mineral Road

Westminster:

- Old Wadsworth Road
- Pierce Street
- 80th Avenue
- 76th Avenue

Quiet zones do not impact railroad operation or speeds at the crossings, and therefore would not impact roadway traffic. All proposed quiet zones listed above are expected to be in place before the operation of the Peak Service plan.

[7] https://bouldercounty.gov/transportation/plans-and-projects/railroad-crossing-quiet-zones
[7] https://www.timescall.com/2022/09/13/longmont-gets-rolling-on-railroad-quiet-zones/
[8] https://www.cityofwestminster.us/News/city-seeking-input-for-railroad-quiet-zones-in-historic-westminster-1

Planned Station Areas

RTD is planning to construct six new stations on the NWR Corridor. Existing traffic conditions near the planned stations were reviewed using Google Maps traffic data for a study area that encompassed intersections in the vicinity of a new station.

Study areas for the stations include the station access driveway and surrounding intersections expected to experience traffic increases due to parking demand and Kiss-n-Ride drop-off trips. The study area defined in this report is based on expected daily parking demand forecasts. Parking demand is one indicator of potential trips to the stations, and trips generated by the new stations are expected to be somewhat proportional to parking demand. In a future traffic operations analysis, the expected new trips due to the NWR station will be distributed over intersections in the study area to determine the traffic impacts of building the new station. Study areas will encompass larger areas at stations with higher parking demand because the demand will take more intersections to dissipate.

The Downtown Longmont Station would experience the highest parking demand as the terminal station. The Downtown Louisville Station is projected to have the next highest parking demand.

Alternate modes are accounted for in the parking demand forecasts, such as transit service, cyclists, pedestrian trips, and Kiss-n-Ride drop-offs. While transit, bicycle, and pedestrian trips are expected to have little to no impact on trip generation, Kiss-n-Ride trips would because they generate two AM and two PM trips per rider, rather than one AM and one PM trip for those who park at the station. These Kiss-n-Ride trips will be accounted for in trip generation estimates in addition to the parking demand projections.

More refined estimates of trip generation will be provided in a future traffic operations analysis using Peak Service ridership estimates. The most recent parking demand estimates used to predict study area size for this report are listed in Table 6.

Table 6: Projected Parking Demand by Station

Station	Daily Increased Parking Demand
Downtown Westminster	30
Broomfield – 116th	10
Flatiron	20
Downtown Louisville	70
Boulder Junction	20
Downtown Longmont	110

Both the AM and PM service periods were reviewed for each station location. Traffic congestion patterns were more severe during the Thursday PM peak period at all locations. The time is selected to illustrate existing congestion levels was based on when the second PM train is planned to arrive at each station, according to the most recent anticipated service schedule.

The new stations and suggested study intersections are as follows:

Downtown Westminster Station:

- Harlan Street & W 88th Avenue
- Westminster Boulevard & W 88th Avenue

Broomfield – 116th Station:

- Teller Street & 116th Avenue
- Teller Street & 120th Avenue

Flatiron Station:

- Midway Boulevard & E Flatiron Crossing Road

Downtown Louisville Station:

- Pine Street/Empire Road & Courtesy Road
- E South Boulder Road & Courtesy Road

Boulder Junction at Depot Square Station:

- 30th Street & Valmont Road
- Foothills Parkway & Valmont Road

Downtown Longmont Station:

- Ken Pratt Boulevard & US 287
- Boston Avenue & US 287
- 1st Avenue & US 287
- 2nd Avenue & US 287

Figure 4 through Figure 9 show the existing congestion in the station areas, as well as approximate average daily traffic (ADT) volumes and chosen study area intersections.

Traffic Corridor Context Report

Figure 4: Downtown Westminster Station Study Area

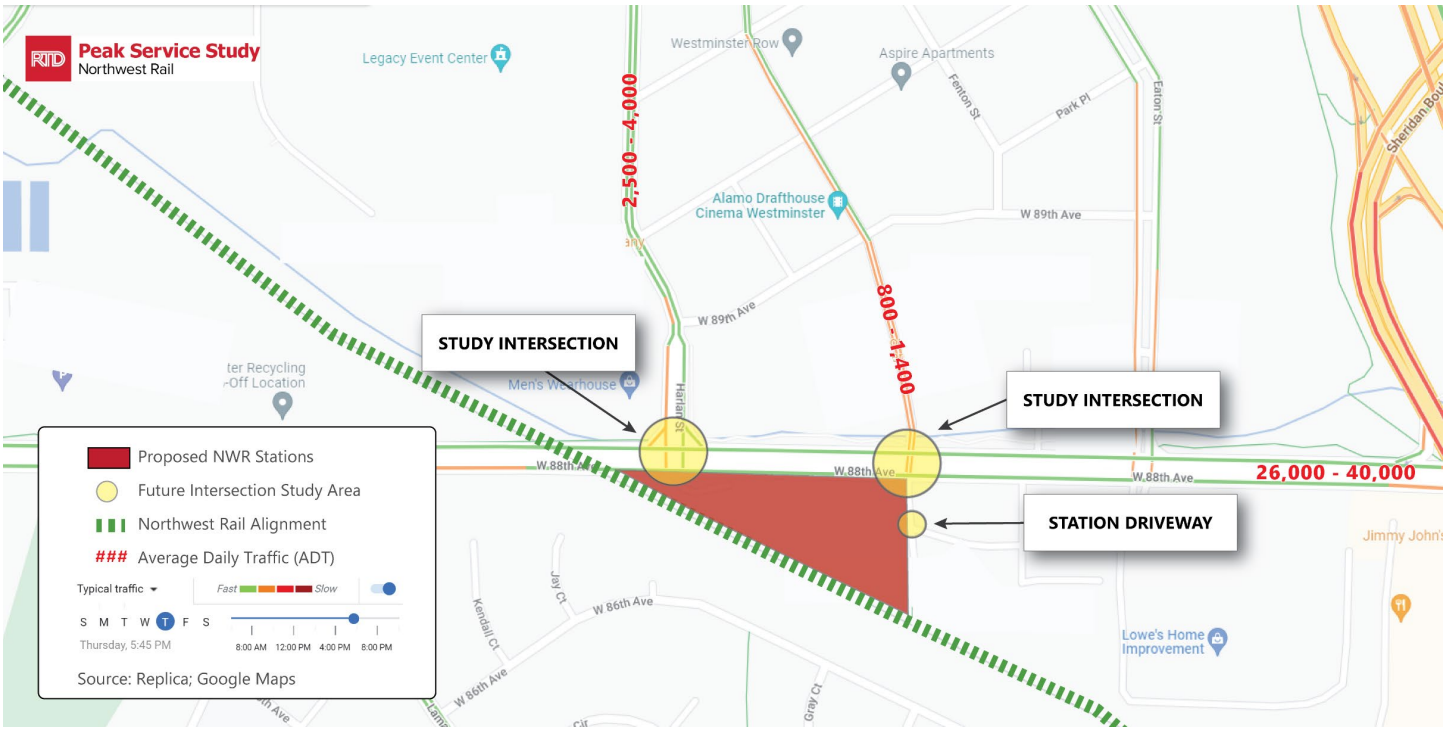
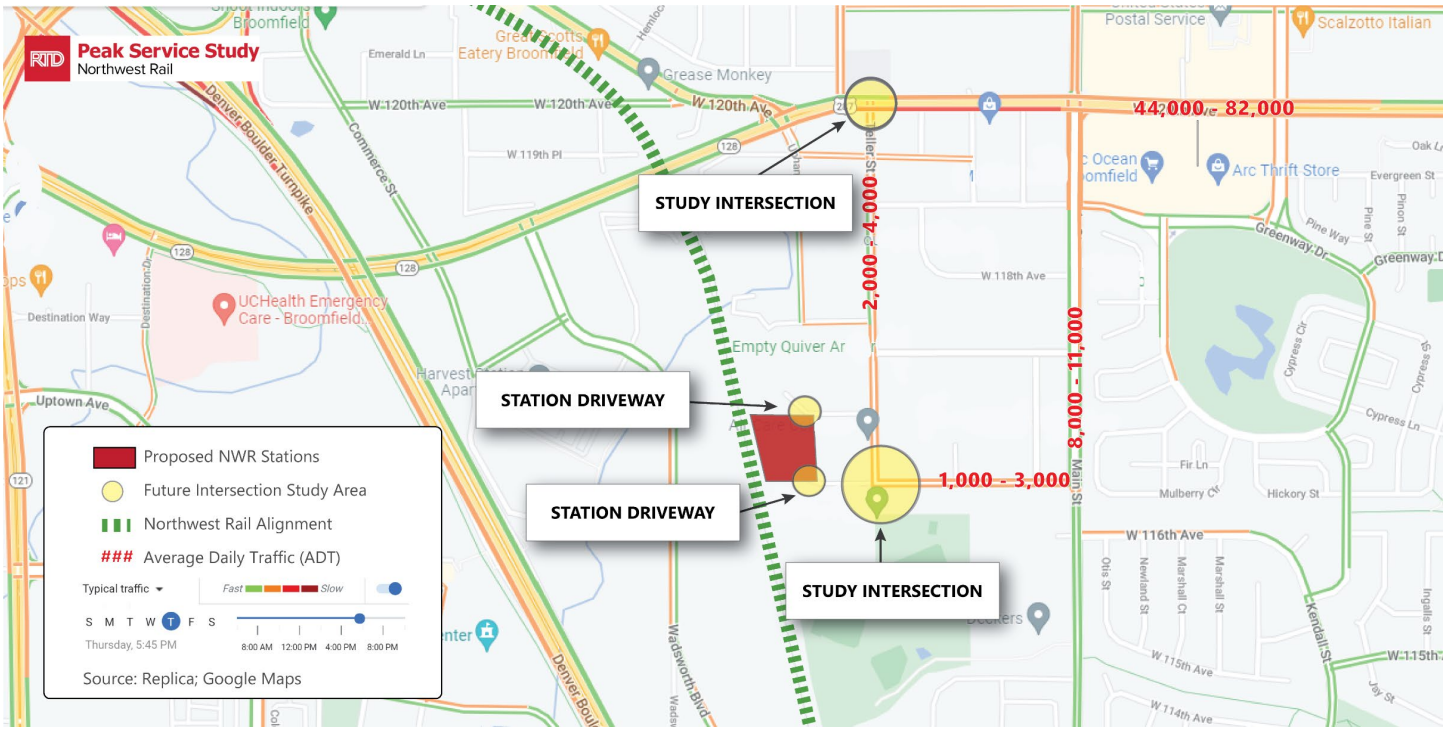


Figure 5: Broomfield – 116th Station Study Area



Traffic Corridor Context Report

Figure 6: Flatiron Station Study Area

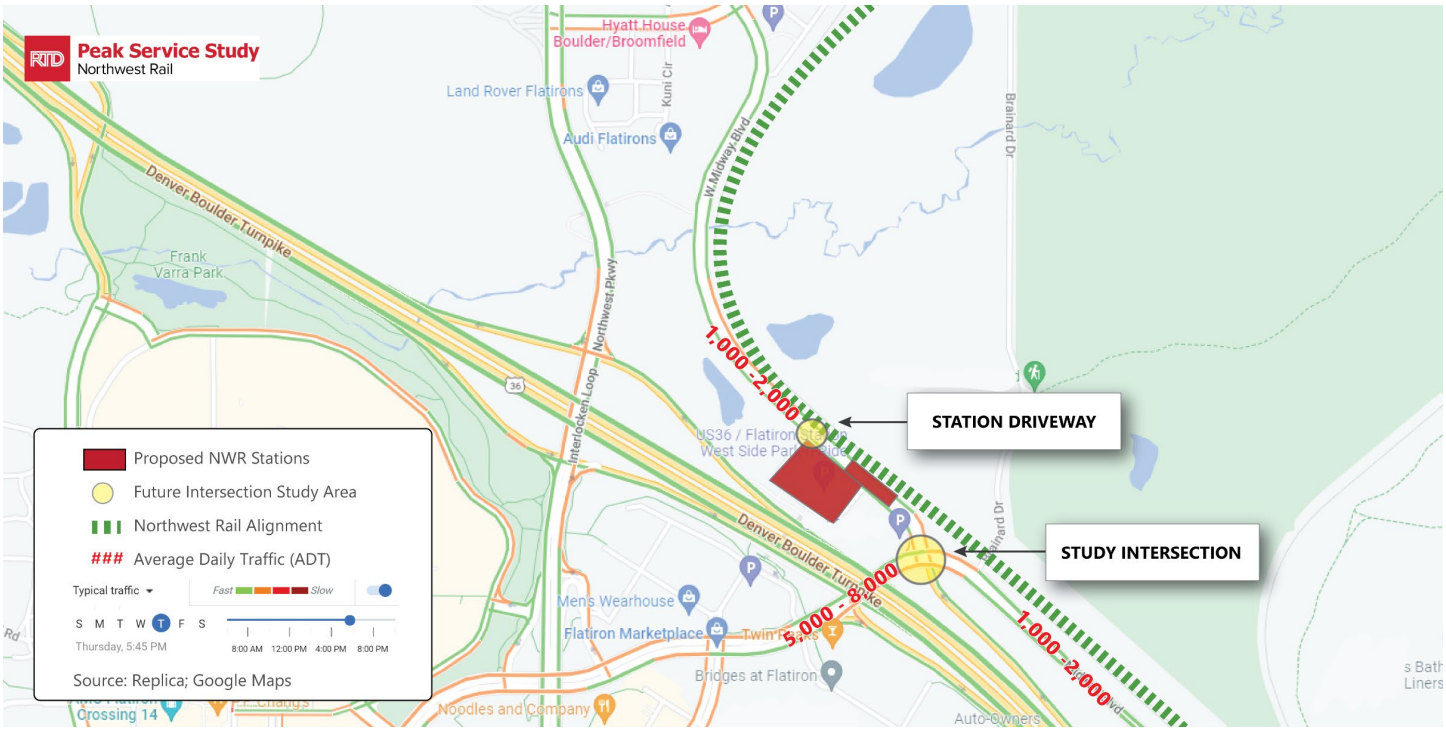
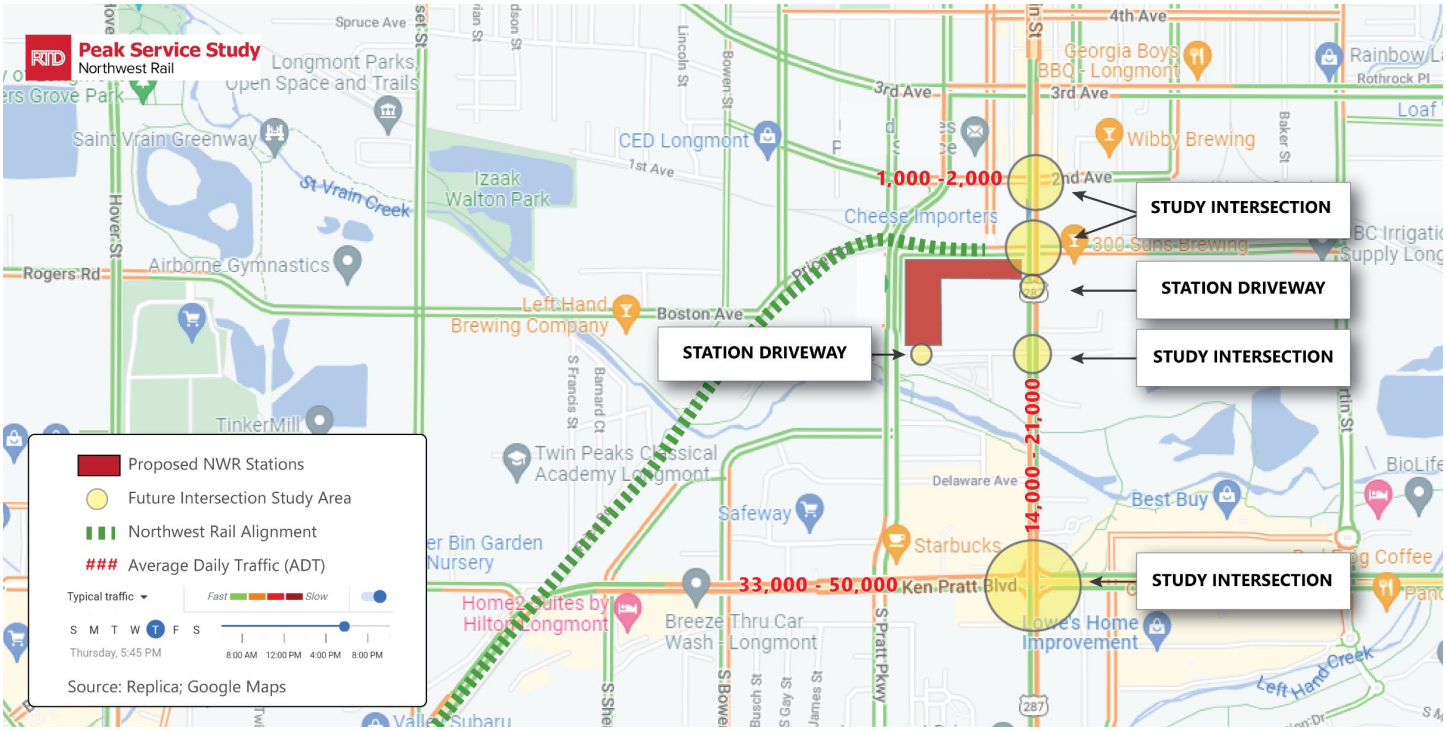


Figure 7: Downtown Louisville Station Study Area

Traffic Corridor Context Report

Figure 8: Boulder Junction at Depot Square Station Study Area

Figure 9: Downtown Longmont Station Study Area



Traffic Corridor Context Report

The areas surrounding all the stations currently experience mild to moderate traffic congestion on a typical weekday during the peak periods. Existing conditions can be further quantified by peak hour turning movement counts at key intersections. The project team has requested nearby existing turning movement counts from the municipalities where the stations are planned. If turning movement counts are made available at the suggested study area intersections, or at intersections near the study area, the project team will review this data and use it to quantify existing traffic conditions. In the absence of existing counts, the project team may order counts or use big data software, such as Replica HQ or Streetlight, to generate approximate turning movement counts at the study area intersections as part of the future conditions analysis.

Summary

The existing BNSF corridor to be used for the NWR Peak Service has 51 roadway crossings along its alignment—14 crossings are grade separated, and 37 are at-grade. Based on a review of the data collected, most of the at-grade crossings have existing conditions that do not give cause for concern about traffic impacts due to the Peak Service.

At-grade crossings that were assigned a concern level of 3 (At-Grade Crossings Potential for Concern) generally feature a combination of factors, such as high volume, low storage, and proximity to existing intersections, and will likely require further study in a future traffic operations analysis. These seven crossings are:

- Nickel Street
- Pine Street
- South Boulder Road
- Independence Road
- Jay Road
- Niwot Road
- Ken Pratt Boulevard

The 11 at-grade crossings with a concern level of 2 may need to be investigated further based on the findings of the future traffic operations analysis but are not expected to have traffic impacts as severe as those with a concern level of 3.

The remaining at-grade crossings have a concern level of 1 or less, meaning that they are unlikely to experience traffic impacts due to the Peak Service.

Each of the six new stations is expected to generate new roadway trips to and from the station. Exact trip generation numbers will be refined further in the future traffic operations analysis. The intersections suggested for further study listed in the Planned Station Areas Section are based on the existing congestion levels per Google Maps and the forecasted parking demand. Each station access driveway will be studied in more depth, along with nearby intersections based on congestion and expected trips.

All existing conditions in this report were derived from review of online sources, such as Google Maps, Google Earth, and Replica HQ. Field observation of the seven crossings at concern level 3 is suggested to verify the

existing conditions and may be included as part of the future traffic operations analysis. It is also suggested to conduct field visits at the identified intersections near the new stations. Existing turning movement counts and other data will be requested from municipalities, and, if there are still significant data gaps, the project team may order counts as part of the future traffic operations analysis.

Milestone 2

Corridor Conditions Report

Appendix B

Northwest Rail Peak Service Study

Transit Corridor Context Report

Peak Service Study
Northwest Rail

We make lives better through connections.

Transit Corridor Context Report

January 2023

Regional Transportation District
1660 Blake Street, Denver CO 80202

Transit Corridor Context Report

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Acronyms

a.m.	morning
BNSF	BNSF Railway
BRT	Bus Rapid Transit
FF	Flatiron Flyer
HAWK	High-Intensity Activated Crosswalk Beacon
NAMS	North Area Mobility Study report
NWR	Northwest Rail Corridor
p.m.	evening
RTD	Regional Transportation District
SOP	System Optimization Plan
Study	Northwest Rail Peak Service Study

Transit Corridor Context Report

Introduction

The Regional Transportation District (RTD) is conducting the Northwest Rail Peak Service Study (Study) for a 35-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 best provide 'rush-hour' service (Peak Service) on the existing BNSF Railway (BNSF) tracks: three weekday morning trips from Longmont to Denver and three weekday evening trips from Denver to Longmont. The Study will update capital, operations, and maintenance costs to implement the Peak Service on the Northwest Rail (NWR) Corridor in a manner to not preclude a future buildout configuration, which is future expansion of service beyond peak service.

It is reasonable to expect that transit services in RTD's northwest service area (northwest area) will see increased travel demands—RTD provides that "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."[1] Furthermore, the Regional Bus Rapid Transit Feasibility study states that transit demand within the region could double by 2040.[2] In a region that is experiencing rapid and significant population and economic growth, the worsening effects of climate change, along with federal and local governmental policy decisions that are driving programs to seek environmentally conscious decisions, promotion of transit will continue to be an increasing priority.

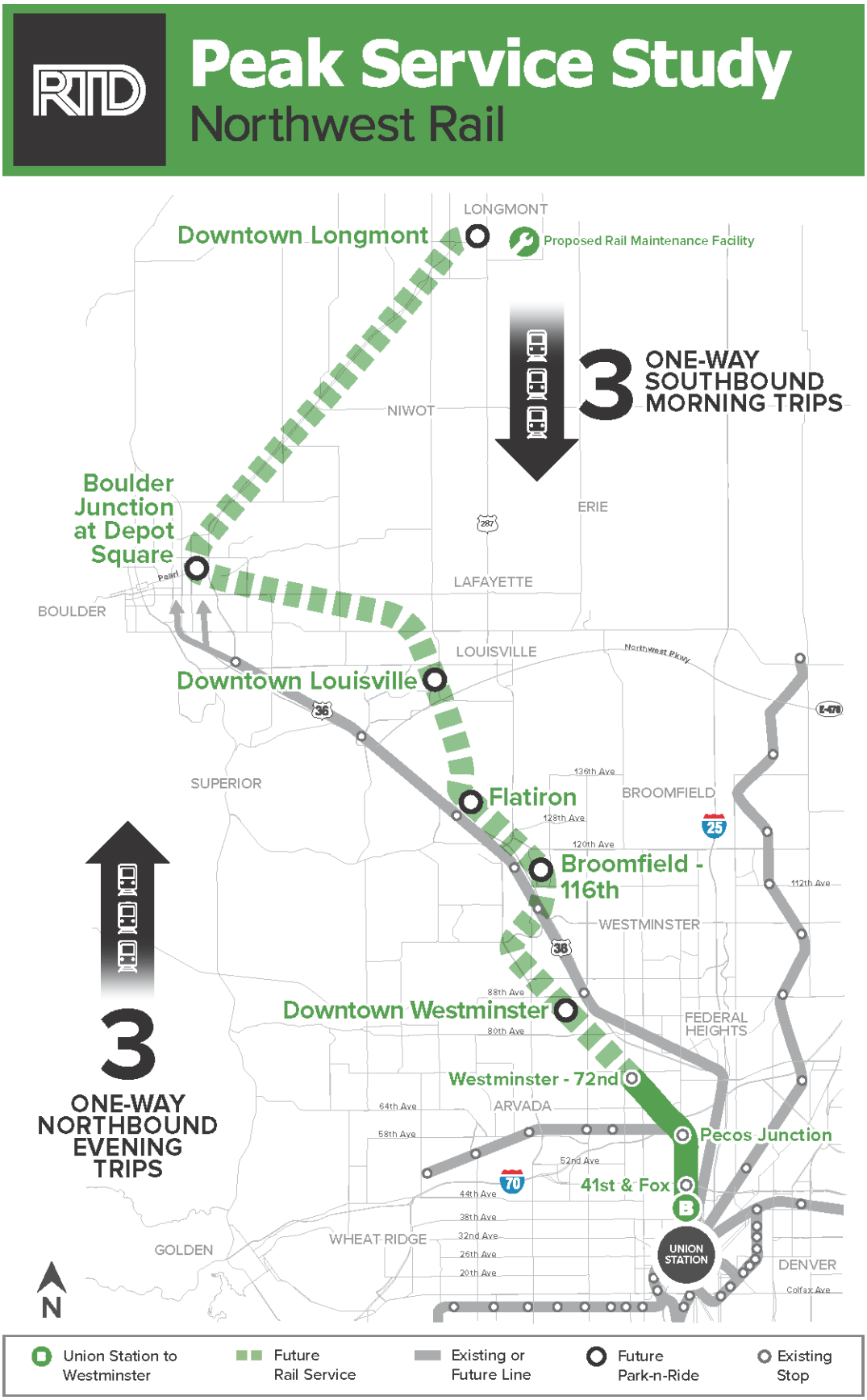
Even with increased traffic congestion and worsening environmental conditions, travel demands are not decreasing. RTD's Quality of Life State of the System report states that in 2018, 21% of lane miles on major roadways in the Denver metropolitan area (1,489 miles) were congested for three or more hours on an average weekday. A typical vehicle spent 16% of its travel time in delayed conditions, and in 2019, there were over 77 million vehicle hours of delay.[3] Transit investments such as Northwest Rail provide options for travelers and reduce trips along the roadway system.

This report outlines the past, current, and future conditions of transit service surrounding the six proposed NWR stations and how current and future transit conditions would interact with the NWR Peak Service.

[1] Reimagine | RTD - Denver
[2] https://www.rtd-denver.com/projects/regional-bus-rapid-transit-feasibility-study
[3] RTD Quality of Life Report (rtd-denver.com)

Transit Corridor Context Report

Figure 1: NWR Corridor



Northwest Rail Background

In recent years, RTD has been coordinating with BNSF to develop an operating plan for passenger rail service on the NWR Corridor, while maintaining BNSF's flexibility to continue to operate freight service. A NWR operating plan that focuses on peak commuting times may offer opportunities for passenger rail service that can be implemented in the near term and expanded over time as ridership grows and additional capital and operating funds are secured.

This phased approach has been used successfully in other major urban regions, particularly in the western United States over the past 40 years. Examples include Salt Lake City, Utah, with the Front Runner; Dallas/Fort Worth, Texas, with the Trinity Railway Expressway; San Diego, California, with the Coaster; and Everette/Seattle/Tacoma, Washington, with the Sounder. These services are examples of commuter rail that started with limited service and funding and then were expanded as ridership and funding grew. The NWR can be implemented with a phased approach similar to the cities mentioned, growing and adjusting as service demand changes, presumably increasing.

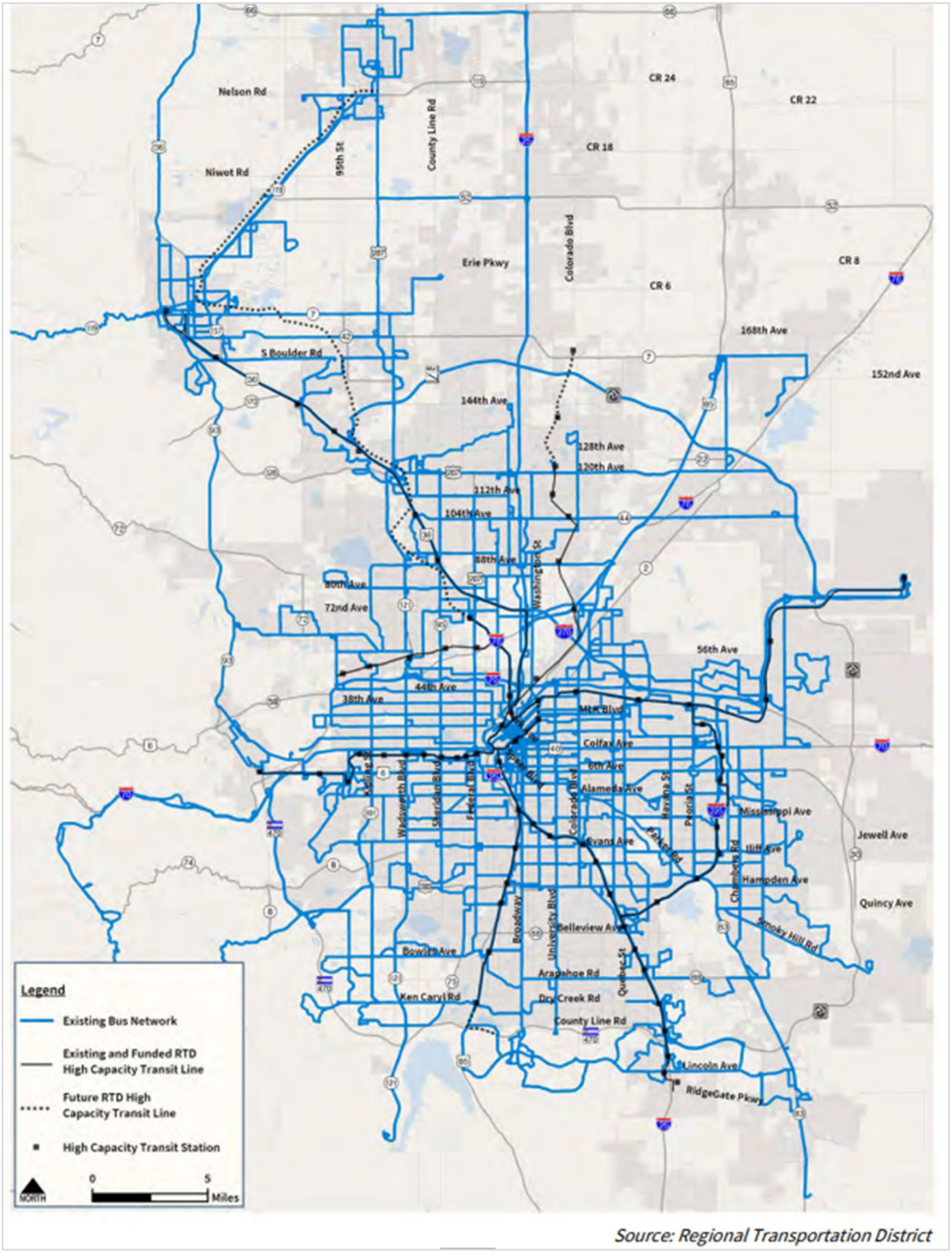
Existing Transit Services

Overview of Transit Network

Regionally, the greater Longmont, Boulder, and Denver areas have an extensive transit system (Figure 2). The areas along the NWR Corridor have experienced significant growth in the last decade, which is predicted to continue. The area also sees high levels of people commuting by car as people drive to work and home along US 36 and I-25, which contributes to undesirable traffic congestion in peak commuting times. With increased population and travel demand in the region, one of RTD's FasTracks program goals is to balance transit needs with regional growth.[4]

[4] https://www.rtd-denver.com/sites/default/files/files/2020-10/Quality-of-Life-Report_2020.pdf

Figure 2: RTD 2019 Regional Transit Network



Source: RTD Regional BRT Network Feasibility Study[5]

[5] RTD-regional-BRT-feasibility-study.pdf (rtd-denver.com)

Transit Corridor Context Report

First- and last-mile connections provide important links to transit. Electronic bikes and scooters have helped fill first- and last-mile gaps, and these services are expected to expand in the service area and the metropolitan Denver area. In addition, many communities along the NWR Corridor have FlexRide, which is a first- and last-mile RTD service that provides connections between RTD stations, medical centers, and business parks and is available on a first-come-first-served basis within specific FlexRide Zones.

The following sections outline the existing transit services and routes in the northwest area that would support the Northwest Rail Peak Service.

Regional Express Routes

The regional bus routes that parallel the NWR Corridor that can be considered comparable or competing services are described below. The stations highlighted in red in the tables below indicate that the station either directly connects to a NWR station or would provide potential transfer possibilities through a variety of modes.

Flatiron Flyer[6]

The RTD Flatiron Flyer (FF) is one of the most successful bus services in terms of regional connectivity and ridership in the northwest area and connects Boulder to Denver. The family of routes (Table 1) are in proximity to the NWR Corridor and could allow for connectivity via local service or other modes to several of the NWR stations (Downtown Westminster, Broomfield – 116th, and the existing Boulder Junction at Depot Square bus station). The Flatiron Flyer runs seven routes; however, four of those routes are currently suspended due to COVID with plans to restore some service in the immediate future, as will be outlined in later sections. The three routes currently in service are:

- **FF1.** Runs all stations all day every 15 minutes at peak periods and every 30 minutes at non-peak periods. FF1 also operates on Saturdays every 15 minutes mid-day, and on Sundays/Holidays every 30 minutes midday.
- **FF5.** Runs from Downtown Boulder Station to Anschutz at a.m. and p.m. peak periods.
- **FF3.** Suspended except for some limited Sunday and weekend service.

The FF currently serves three stations in close proximity to the NWR Corridor, the US 36 & Broomfield station which is within a half mile of the Broomfield – 116th, the US 36 & Sheridan station within a half mile of Downtown Westminster Station, and US 36 & Flatiron Station, which would serve as the Flatiron Station for NWR.

Table 1: Flatiron Flyer Routes

Route	Stops	Peak Headways	Non-Peak Headways
FF1	**Union Station** **US 36 & Sheridan** US 36 & Church Ranch **US 36 & Broomfield** **US 36 & Flatiron** US 36 & McCaslin US 36 & Table Mesa	15 minutes	30 minutes

[6] Flatiron Flyer | RTD - Denver

Route	Stops	Peak Headways	Non-Peak Headways
	39th & Table Mesa PnR / Broadway & Table Mesa (WB) Broadway & Dartmouth Broadway & Baseline Broadway & Euclid Downtown Boulder		
FF2	SUSPENDED	SUSPENDED	SUSPENDED
FF4*	SUSPENDED	SUSPENDED	SUSPENDED
FF5	Downtown Boulder Broadway & Euclid Broadway & Baseline Broadway & Dartmouth 39th & Table Mesa PnR / Broadway & Table Mesa (WB) US 36 & Table Mesa US 36 & McCaslin **US 36 & Broomfield** **US 36 & Flatiron Station** **US 36 & Sheridan** Fitzsimons Pkwy & Montview Blvd (EB only) Colfax & Fitzsimons Pkwy Colfax & Wheeling Colfax & Vaughn 17th Pl & Aurora Ct Aurora Ct & 17th Ave Aurora Ct & 16th Ave Quentin & 16th Ave Quentin & 17th Pl Quentin & 19th Pl	3 eastbound and 1 westbound trips in a.m. and 3 westbound trips in p.m.	
FF6	SUSPENDED INDEFINETLY	SUSPENDED	SUSPENDED
FF7**	SUSPENDED	SUSPENDED	SUSPENDED

Note: The red text indicates that a station either directly connects to a NWR station or would provide potential transfer possibilities via local routes such as FlexRide or other first and last mile options.

* Route FF4 will connect to Boulder Junction at Depot Square Station when service is restored.

** Route FF7 is officially currently suspended, however, based on travel demand, there is possibility of the restoration of this route as soon as resources allow.

BOLT

The BOLT runs from Boulder to Longmont (Table 2) and services seven stops along CO 119. The BOLT runs every 30 minutes in morning (a.m.) and evening (p.m.) peak periods and evey hour all other times of the day.

Table 2: BOLT Routes

Route	Stops	Peak Headways	Non-Peak Headways
BOLT	Downtown Boulder **Boulder Junction at Depot Square (currently suspended)*** 28th & Canyon 28th & Hwy 119 Hwy 119 & Niwot Park-n-Ride Diagonal Hwy & Village at the Peaks Mall Ken Pratt & Pratt 8th & Coffman Park-n-Ride	30 minutes	60 minutes

Notes: The red text indicates that a station either directly connects to a NWR station or would provide potential transfer possibilities via local routes such as FlexRide or other first and last mile options.

The southbound schedule includes stops at 23rd & Main and Main & 21st for limited routes.

* With the phase I of the CO119 BRT, the BOLT will serve the Boulder Junction at Depot Square Station again.

RTD LD (LD1/LD3)

Currently, RTD runs the LD (LD1/ LD3) route from Longmont to Denver with 12 stops. The LD provides north-south regional connectivity along US 287 and provides connectivity between Broomfield, Lafayette, and Erie. Route LD runs three route patterns with headways varying on station and branch. Peak headways, both northbound and southbound from the Downtown Longmont Station, run every 60 minutes on weekdays.

Table 3. RTD LD (LD1/LD3) Route

Route	Stops	Peak Headways	Non-Peak Headways
LD (LD1/LD3)	**Union Station** **US 36 & Broomfield** US 287 & W 5th Ave (Southbound Only) US 287 & Midway (Northbound Only US 287 & Empire Rd (Southbound Only) Exempla & Public US 287 & Campus Drive (Northbound Only) Public & Exempla Lafayette Park-n-Ride US 287 & Diamond Circle US 287 & Niwot Longmont Park-n-Ride 8th & Coffman Park-n-Ride Main & 21st (Southbound Only) 23rd & Main* Hover & Boston (Southbound Only)	Varies depending on station & branch.	Varies depending on station & branch

Note: The red text indicates that a station either directly connects to a NWR station or would provide potential transfer possibilities via local routes such as FlexRide or other first- and last-mile options.

* The 23rd & Main Station will be discontinued with the start of CO 119 BRT. The new location for this stop will be Highway 66 and the US 287 Park-n-Ride.

FLEX

FLEX [7] provides express transit between Boulder, Longmont, Loveland, and Fort Collins (Table 4). FLEX is operated by TransFort (City of Fort Collins) and would provide connections to the Boulder Junction at Depot Square and the Downtown Longmont Station. The FLEX Boulder Express services the following limited stops:

- Fort Collins—Downtown Transit Center, All MAX Stations, Colorado State University, and South Transit Center
- Loveland—8th Street
- Longmont—Downtown Longmont, 8th & Coffman Park-n-Ride, and Village at Peaks Mall. Depending on pattern/destination, FLEX will be connecting to Downtown Longmont once it is in service.
- Boulder—Boulder Junction at Deport Square Station, Downtown Boulder Station, and University of Colorado (Main Campus)

A one-way trip from Fort Collins to Boulder on this bus service takes approximately 1 hour and 30 minutes.

Table 4: FLEX Routes

Route	Stops	Peak Headways	Non-Peak Headways
FLEX Boulder Express	18th & Euclid Canyon & 15th (Downtown Boulder Station) **Pearl & 30th (Boulder Junction at Depot Square Station)** Hover & Village at the Peak's Mall **8th & Coffman Park-n-Ride** Lincoln & 8th South Transit Center Downtown Transit Center (Fort Collins)	7 a.m. and 8 a.m.	

Note: The red text indicates that a station either directly connects to a NWR station or would provide potential transfer possibilities via local routes such as FlexRide or other first- and last-mile options.

Commuter Rail Routes

The existing geographically relevant commuter rail network includes the RTD N Line and the RTD B Line. The B Line currently runs from Denver to South Westminster and would extend north as the NWR.

B Line

The B Line is the existing portion of the proposed NWR line and runs every hour with stops at Union Station, 41st & Fox Station, Pecos Junction Station, and Westminster-72nd Station both during the week and on weekends. The first portion of this line, which is the first portion of the NWR, opened in July of 2016 and is currently 5.7 miles long and serves the four stops listed above. In 2019, annual ridership on the B Line was 477,286[8].

[7] FLEX | RideTransfort
[8] FactBook_2021_final-web-March31_0.pdf (rtd-denver.com)

N Line

The N Line provides regional north-south connectivity. Currently, this line runs every 30 minutes both on weekdays and weekends all day with stops at Union Station, 48th & Brighton at NWC, Commerce City & 72nd, Original Thornton & 88th, Thornton Crossroads & 104th, Northglenn & 112th, and Eastlake & 124th. This is RTD's most recent commuter rail addition. The N Line opened in September of 2020 and is 13 miles long. The N Line utilizes electric commuter rail technology and connects Denver to Commerce City and Thornton. In 2021, this line had an annual ridership of 763,000, a 339.2% increase/change in ridership from 2020, which is the year it first opened.[9]

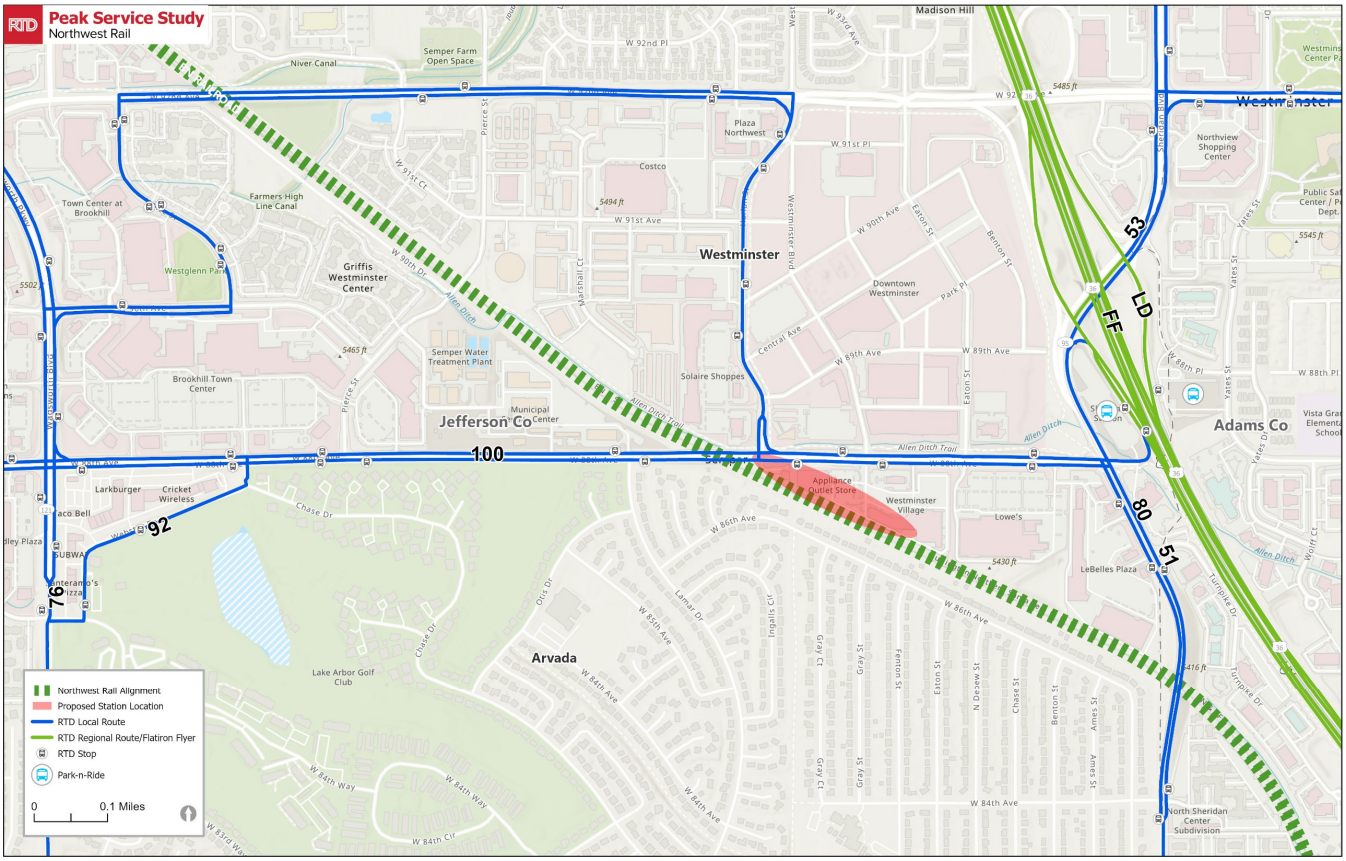
Existing Bus Service to Proposed NWR Stations/Connecting and Surrounding Routes and Service

This section outlines the routes that connect to each of the proposed NWR stations as well as the peak headways for each route. Only peak headways are described here because the NWR in its initial stages would run during peak periods.

Downtown Westminster Station

The Downtown Westminster Station is currently relatively well connected to transit, as there are six routes that service stops that are within a quarter mile of the Downtown Westminster Station. The routes near the Downtown Westminster Station are shown in Figure 3 and Table 5.

Figure 3: Existing Service in Area Near Downtown Westminster Station



[9] https://www.rtd-denver.com/sites/default/files/files/2022-02/February%202022%20Board%20Briefing.pdf

Table 5: Existing Service in Area Near Downtown Westminster Station

Route	Stops	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways
51	US 36 & Sheridan	Every 30 minutes	Every 30 minutes	Every 30 minutes
53	US 36 & Sheridan	CURRENTLY SUSPENDED	N/A	N/A
92	Wadsworth -- 88th (Rail Station) US 36 & Sheridan	Every 30 minutes	Every 30 minutes	Every 60 minutes
100	Wadsworth --88th (Rail Station) US 36 & Sheridan	Every 60 minutes	Every 60 minutes	N/A (does not serve these stations)
FF1	US 36 & Sheridan	Every 15 minutes	Every 15 minutes	Every 30 minutes
FF5	US 36 & Sheridan	3 Eastbound and 1 Westbound trip in AM & 3 westbound trips in PM	N/A	N/A
FF7	US 36 & Sheridan	CURRENTLY SUSPENDED	N/A	N/A

Note: Routes shown are RTD routes, unless otherwise noted.

Transit Corridor Context Report

Broomfield – 116th

The Broomfield – 116th Station is removed from many of the nearby transit stops, making it more difficult to access via transit. The routes near the Broomfield – 116th Station are shown in Figure 4 and Table 6.

Figure 4: Existing Service in Area Near Broomfield - 116th Station

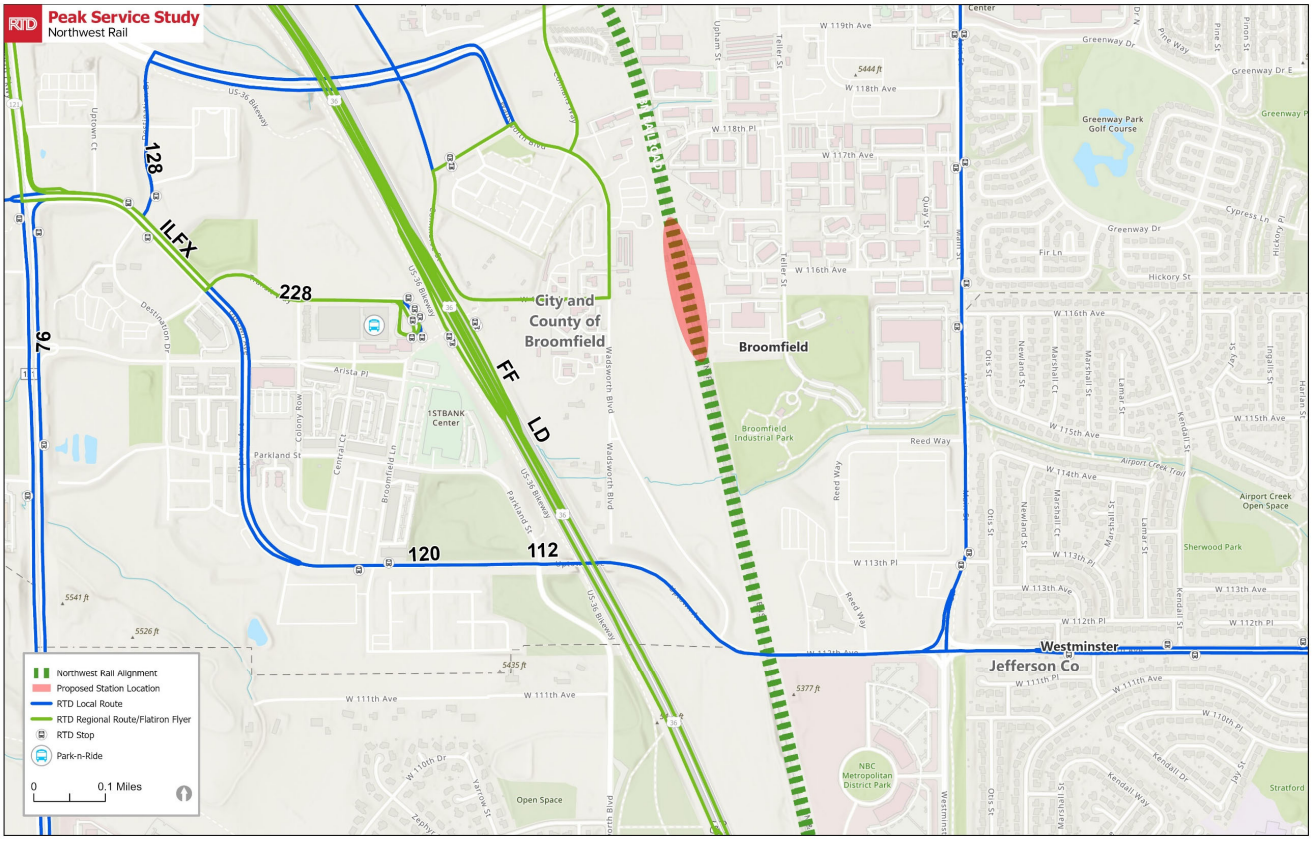


Table 6: Existing Service in Area Near Broomfield – 116th Station

Route	Stops	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways
76	US 36 & Broomfield	Every 30 minutes	Every 30 minutes	Every 60 minutes
112	US 36 & Broomfield	Every 60 minutes	Every 60 minutes	Every 60 minutes
120/120E/120W	US 36 & Broomfield	Every 30 minutes	Every 60 minutes	Every 60 minutes
LD	US 36 & Broomfield	2 Northbound trips in p.m. and 2 Southbound trips in a.m.	N/A	N/A
LD3	US 36 & Broomfield	Every 60 minutes	Every 120 minutes	N/A
FF1	US 36 & Broomfield	Every 15 minutes	Every 15 minutes	Every 30 minutes
FF3	US 36 & Broomfield	2 Eastbound and 2 Westbound Trips in p.m.		
FF4	US 36 & Broomfield	CURRENTLY SUSPENDED	N/A	N/A

Transit Corridor Context Report

Route	Stops	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways
FF5	US 36 & Broomfield	3 Eastbound and 1 Westbound trip in a.m. & 3 westbound trips in p.m.	N/A	N/A

Note: Routes shown are RTD routes, unless otherwise noted.

Transit Corridor Context Report

Flatiron Station

The Flatiron Station is relatively well connected to regional transit, as Routes AB, FF, and 228 all connect to the US 36 & Flatiron Station which is very close to Flatiron Station. The routes near Flatiron Station are shown in Figure 5 and Table 7.

Figure 5: Existing Service in Area Near Flatiron Station

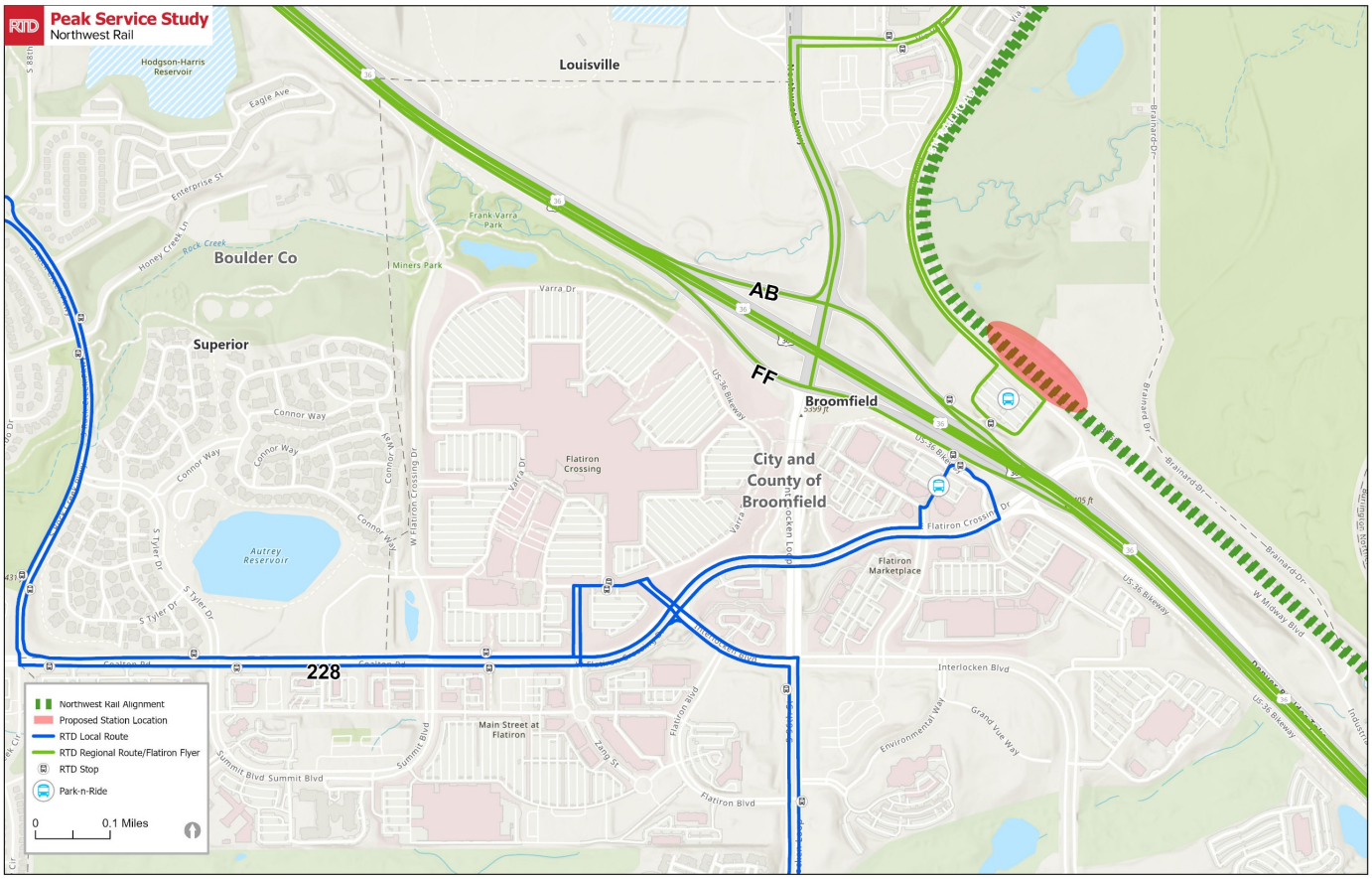


Table 7: Existing Service in Area Near Flatiron Station

Route	Stops	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways
FF1	US 36 & Flatiron	Every 15 minutes	Every 15 minutes	Every 30 minutes
FF4	US 36 & Flatiron	CURRENTLY SUSPENDED	N/A	N/A
AB	US 36 & Flatiron	Every 30 minutes	Every 30 minutes	Every 30 minutes
228	US 36 & Flatiron	Every 60 minutes	Every 60 minutes	Every 60 minutes

Note: Routes shown are RTD routes, unless otherwise noted.

Transit Corridor Context Report

Downtown Louisville Station

Downtown Louisville is served by Route DASH, which provides local connectivity and connection to Route 228. The DASH has several stops along Main Street which are within a short walking or biking distance from Downtown Louisville Station. The routes near Downtown Louisville Station are shown in Figure 6 and Table 8.

Figure 6: Existing Service in Area Near Downtown Louisville Station

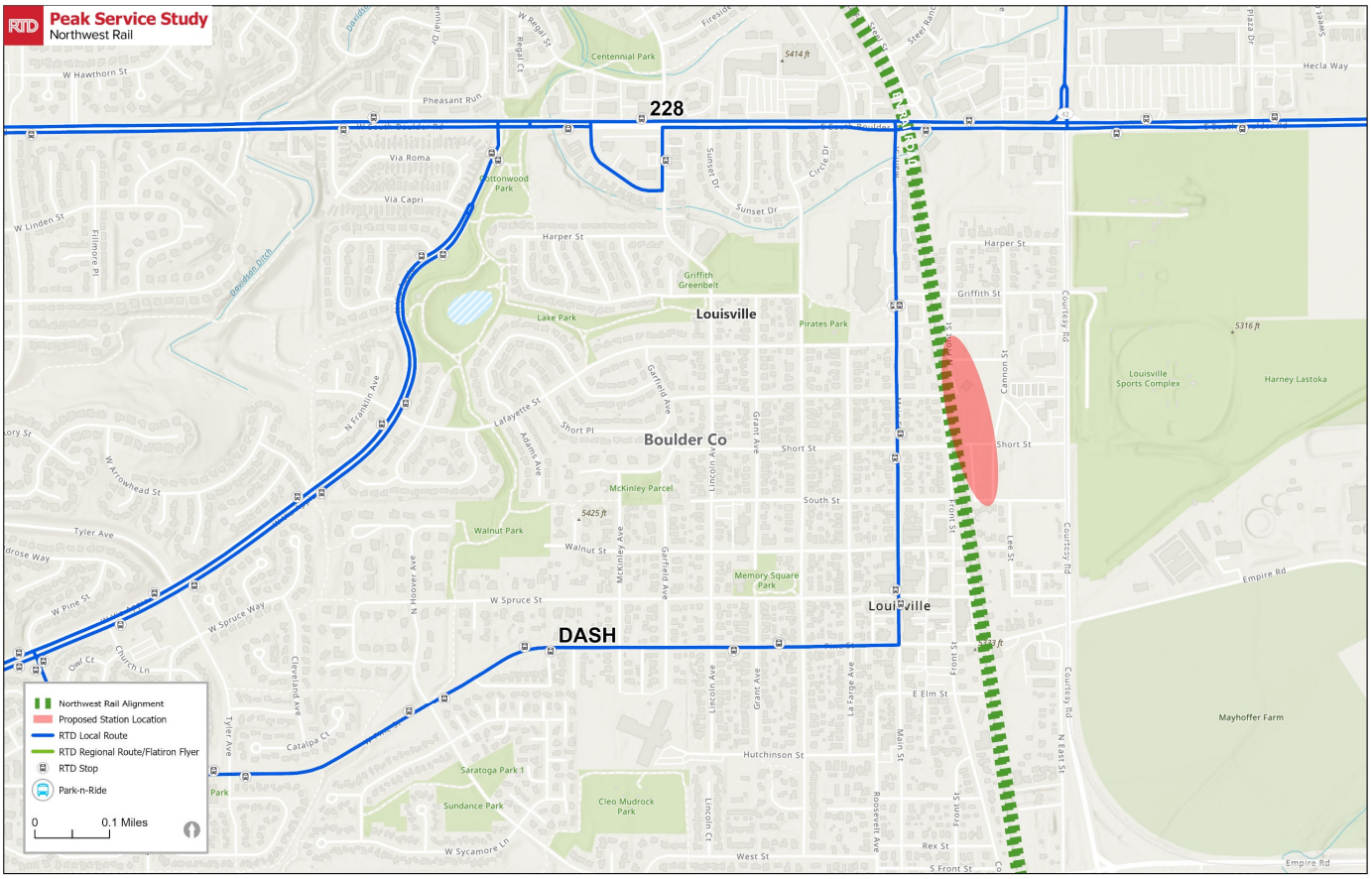


Table 8: Existing Service in Area Near Downtown Louisville Station

Route	Stations	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways
DASH	Main & Short	Every 30 minutes	Every 60 minutes	Every 60 minutes
	Main & Spruce			
228	S Boulder Rd & Main St (Northbound)	Every 60 minutes	Every 60 minutes	Every 60 minutes
	South Boulder Rd & Cannon (Southbound)			

Note: Routes shown are RTD routes, unless otherwise noted.

Transit Corridor Context Report

Boulder Junction at Depot Square Station

Boulder Junction at Depot Square is already well-connected to transit stops and routes. Currently, there is an underground bus concourse with six bus bays as well as four on-street stops (two on 30th street and two on Pearl Street) at the Boulder Junction at Depot Square Station. Pedestrians have access to the underground bus bays via the Paseo pedestrian breezeway and the Goose Creek Bridge. The routes which provide connectivity to Boulder Junction at Depot Square Station are shown in Figure 7 and Table 9.

Figure 7: Existing Service in Area Near Boulder Junction at Depot Square Station

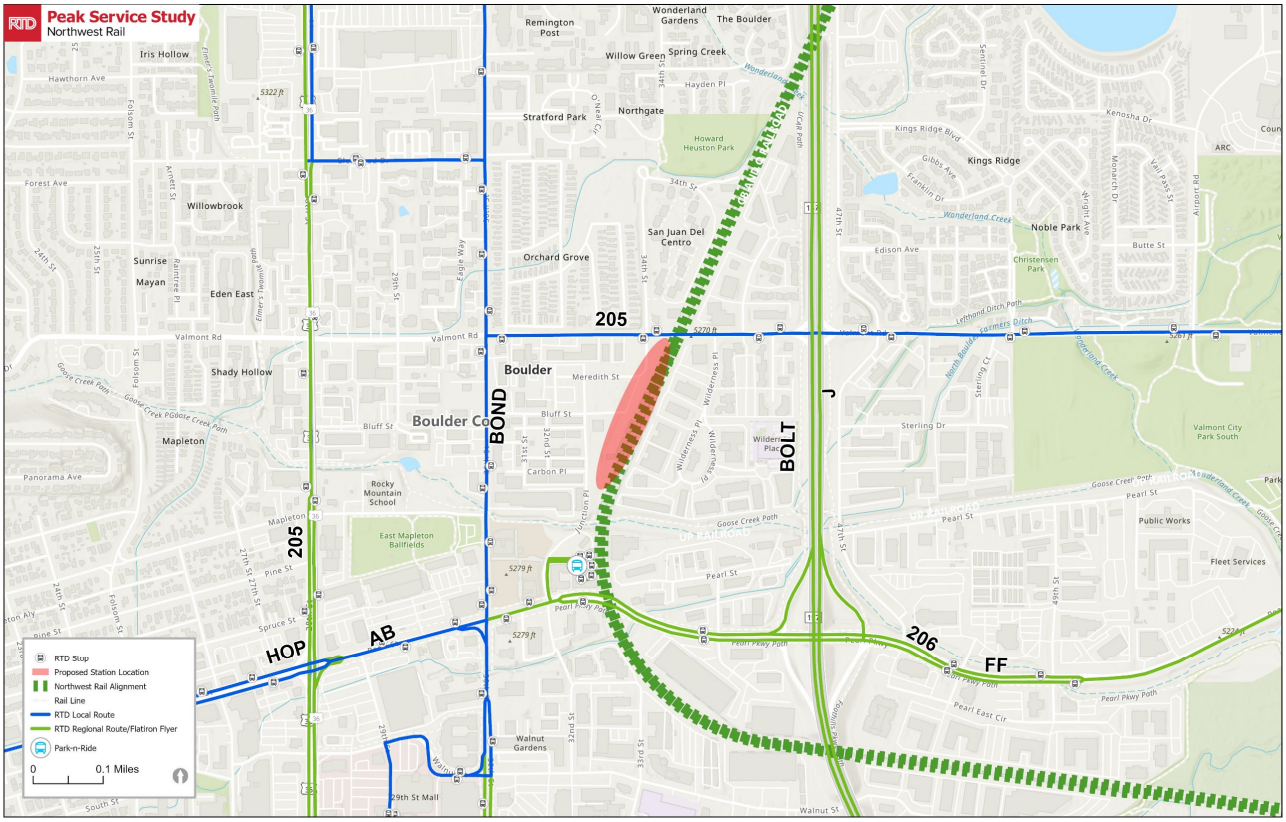


Table 9: Existing Service in Area Near Boulder Junction at Depot Square Station

Route	Stops	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways
205	28th & SH 119	Every 30 minutes	Every 30 minutes	Every 60 minutes
HOP (City of Boulder)	30th & Pearl (On-Street Stop)	Does not have set schedule - times are roughly every 12 minutes	Does not have set schedule - times are roughly every 15 minutes	Does not have set schedule – times are roughly every 20 minutes
FF4	Boulder Junction at Depot Square a (Underground Bus Concourse)	CURRENTLY SUSPENDED	N/A	N/A
BOUND	Boulder Junction at Depot Square Station (On-Street Stop)	Every 15 minutes	Every 30 minutes	Every 30 minutes

Route	Stops	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways
AB2	Boulder Junction at Depot Square (Underground Bus Concourse)	AB2 CURRENTLY SUSPENDED	AB2 CURRENTLY SUSPENDED	AB2 CURRENTLY SUSPENDED
BOLT*	Boulder Junction at Depot Square Station (On-Street Stop) - selected pattern only	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED	CURRENTLY SUSPENDED

Note: Routes shown are RTD routes, unless otherwise noted.
* With phase I of the CO 119 BRT which is anticipated to be complete in May of 2023, the BOLT will serve the Boulder Junction at Depot Square Station again

Downtown Longmont Station

Similar to the Boulder Junction at Depot Square Station, the land use surrounding Downtown Longmont Station is relatively dense with several established existing stops and routes. The proposed station in Longmont planned for Northwest Rail is called "Longmont Station" in accordance with past planning efforts. In more recent planning efforts, this station has been renamed "1st and Main Station". However, in this report and other Northwest Rail Peak Service Study documents, the station name "Downtown Longmont" will be retained.

Longmont is also served by RTD's FlexRide service, which provides on-demand transit service to customers within a 48-square-mile zone.[10] Route 324 does not officially go into the Longmont Park-n-Ride, and instead uses the on-street stop at Main & Jersey. The routes near the 1st & Main Station are shown in Figure 8 and Table 10.

[10] *North Team Service Analysis & State Highway 119 BRT Feeder Plan* myyux?44| | | 3wi2ijs{jw4htr 4xnyjx4ijkfzq4kmjx4kmjx475752584stwym2yjfr 2xjw{mhj2fsfq+xnx2XM66>3uik

Transit Corridor Context Report

Figure 8: Existing Service in Area Near the Downtown Longmont Station

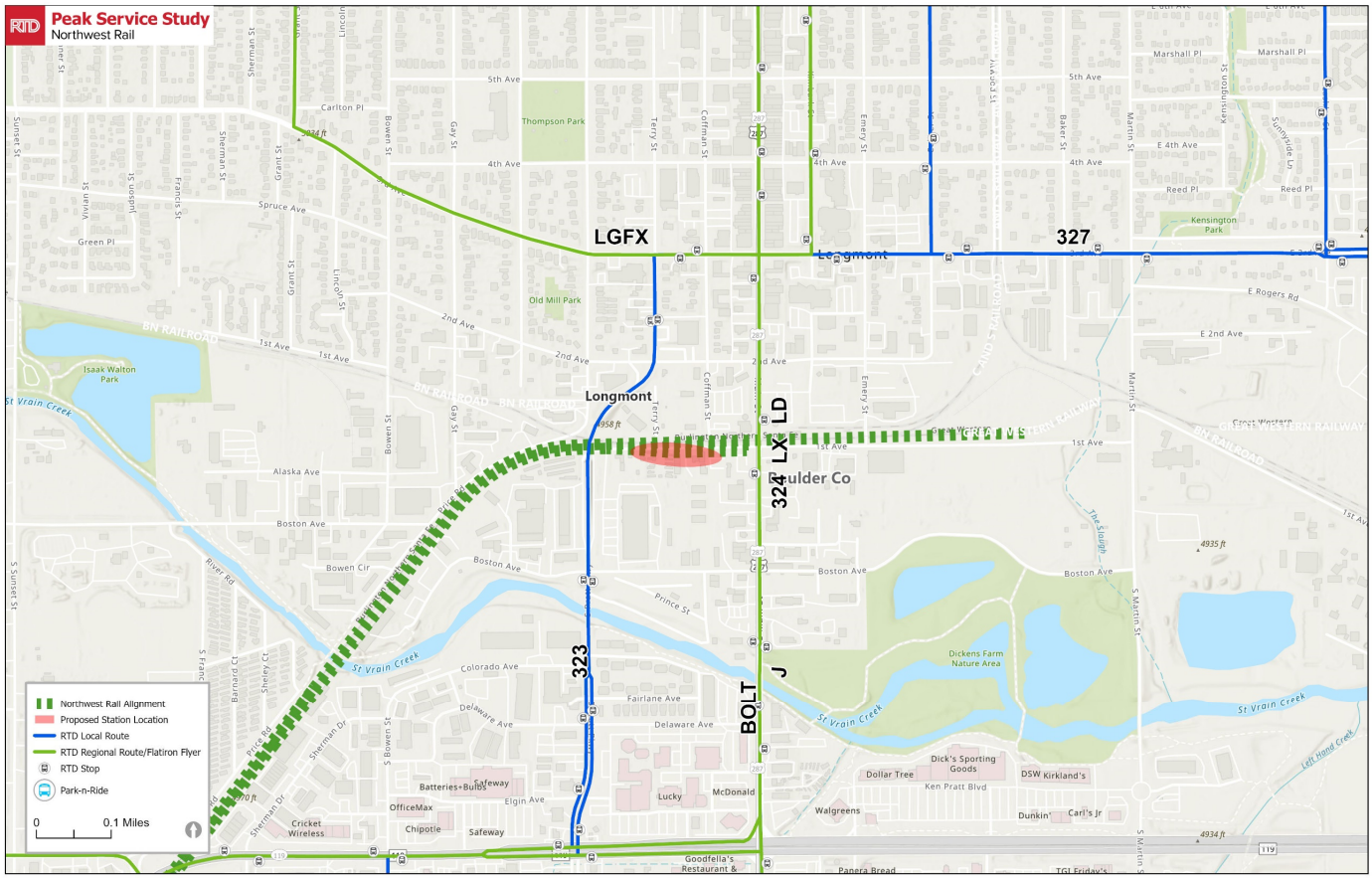


Table 10: Existing Service in Area Near the Downtown Longmont Station

Route	Stops	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways
323	Ken Pratt & Pratt 8th & Coffman Park-n-Ride	Every 60 minutes	Every 60 minutes	N/A
324	Longmont Park-n-Ride (Main & Jersey on-street stop) 8th & Coffman Park-n-Ride	Every 30 minutes	Every 60 minutes	Every 60 minutes
326	8th & Coffman Park-n-Ride	Every 30 minutes	Every 60 minutes	n/a
327	8th & Coffman Park-n-Ride	Every 60 minutes	Every 60 minutes	n/a
BOLT (Future CO 119 BRT)	8th & Coffman Park-n-Ride	Every 30 minutes	Every 60 minutes	Every 60 minutes

Route	Stops	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways
LD/LD1/LD2* (currently suspended)/LD3	Longmont Park-n-Ride	Combined headway every 30 minutes (Only in AM Southbound and in PM Northbound)	Combined headway every 120 minutes	N/A
	8th & Coffman Park-n-Ride			
LX1**/LX2	Longmont Park-n-Ride (LX2)	CURRENTLY SUSPENDED	N/A	N/A
	8th & Coffman Park-n-Ride (LX1/LX2)			

Note: Routes shown are RTD routes, unless otherwise noted.
* LD2 will be reinstated as soon as demand warrants and it can be provided equitably. It would serve the 1st & Main and 8th & Coffman Park-n-Ride Stations.
** LX1 will be discontinued as part of the SOP which will go into effect January 2023.

Ridership & Service Pre- & Post-COVID-19

Ridership Changes

Transit ridership for RTD was impacted by the COVID-19 pandemic. In 2019, pre-pandemic, RTD saw an annual total system transit ridership that was 105,824,000.[11] On April 19, 2020, service hours for all of RTD's services were reduced by approximately 40%, which was a result of a significant decline across all service types due to stay at home orders in response to the COVID-19 pandemic, resulting in a total annual transit system ridership of 52,617,000 in 2020.[12] RTD saw a negative 56% change in total annual light rail ridership from 2019 to 2020 and a negative 48% change in annual commuter rail ridership from 2019 to 2020.[13]

In 2022, ridership demonstrated signs of recovery. RTD reports that the ridership between 2021 (January to June) and 2022 (January to June) in all revenue service (Bus, Access-a-Ride, Light Rail, and Commuter Rail) rose by 39%. The Flatiron Flyer alone saw a positive 62% change in this same date range and combined commuter rail services saw a positive 40% change. This suggests a return to higher ridership for RTD services is likely and increase in demand for more regional connectivity could be expected.[14]

This section provides an overview of COVID-19 impacts on the RTD system overall and the northwest area specifically.

COVID-19 Impacts to the RTD System

RTD reports that in January of 2022 there were 518,000 monthly commuter rail boardings and in June of 2022, commuter rail had 728,000 monthly boardings. There were 3,016,000 monthly boardings for bus service in June 2022 and 2,540,000 monthly boardings in January 2022, as seen in Figure 9 and Figure 10. This analysis shows a slight increase in both rail and bus ridership just within the first six months of 2022, which is approximately the period when City and County of Denver lowered many of the mandates that had been in

[11] Board Briefing Docs - December 2021.pdf (rtd-denver.com)
[12] RTD Quality of Life Report (rtd-denver.com)
[13] January-2021-Briefing-Packet_1.pdf (rtd-denver.com)
[14] 08.26.22 August 2022 Board Briefing Document.pdf (rtd-denver.com)

place throughout the pandemic providing reasonable assumption that people's behaviors may continue to resemble those seen pre-pandemic.

Figure 9: January 2022 Monthly RTD Ridership in Thousands

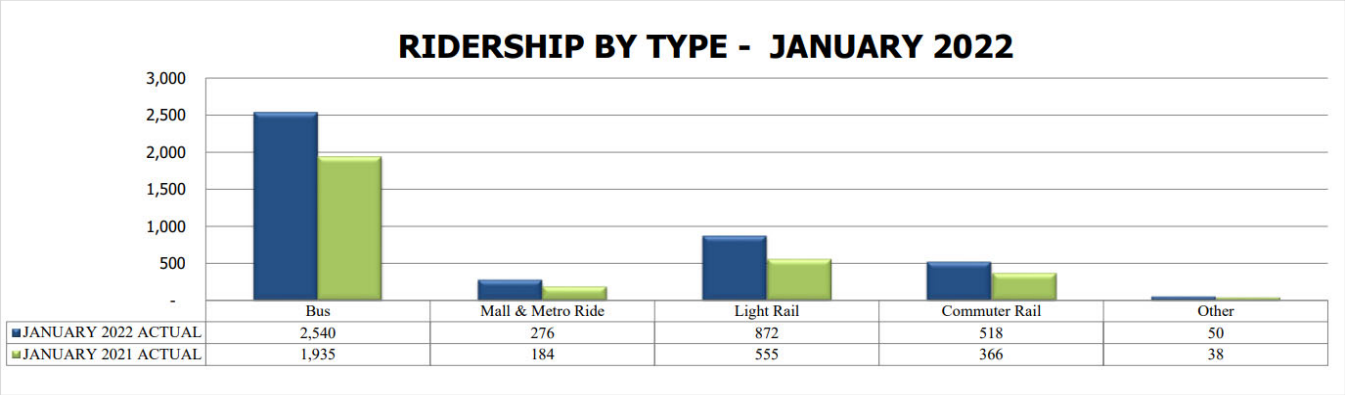
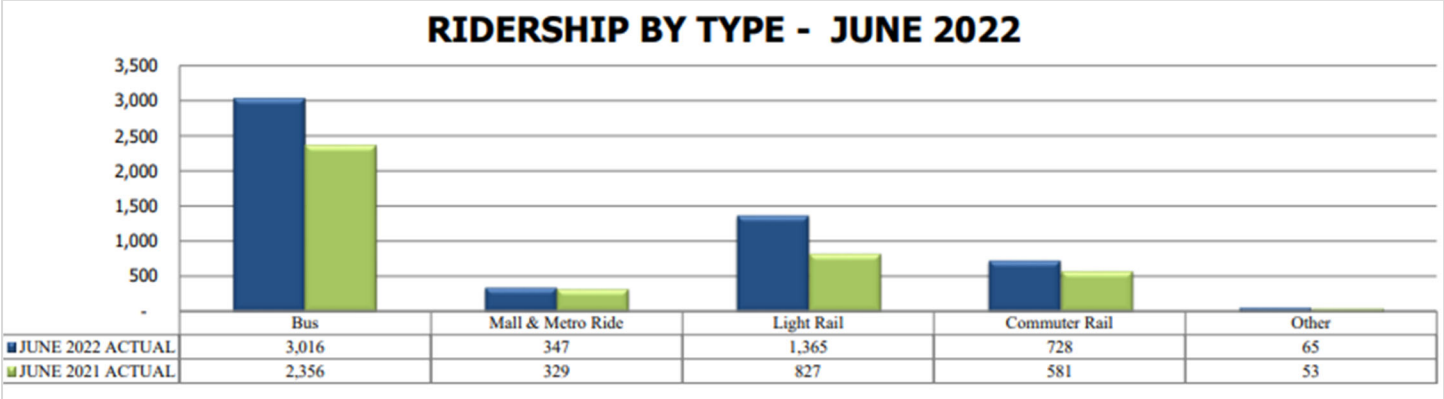


Figure 10: June 2022 Monthly RTD Ridership in Thousands



RTD ridership in 2019, 2020 and 2021 is presented in Table 11.[15]

Table 11: RTD Total Annual Ridership 2019-2022

Year	Total Annual Boardings
2019	105,823,892
2020	52,616,866
2021	49,029,218
2022 (January-June)	28,783,000

Source: Board Briefing Documents | RTD - Denver

As shown in Table 11, annual ridership in 2022 from January to June (6 months) is nearly 60% of the ridership in 2021, which puts 2022 ridership on track to surpass ridership in 2021, suggesting an upward trend and possible eventual return to pre-pandemic ridership levels.

[15] 2021_ACFR.pdf (rtd-denver.com)

Table 12 demonstrates a similar upward trend from 2021 to 2022 annual ridership for each of the transit/rail service types.

Table 12: RTD Annual Ridership by Service Type 2019-2022

Year	Bus	Access-a-Ride	Light Rail	Commuter Rail
2019	59,685,633	853,936	24,585,300	9,711,377
2020	32,932,508	332,758	10,464,678	4,954,167
2021	28,402,000	441,000	10,016,000	6,585,000
2022 (January-June)	16,472,000	253,000	6,390,000	3,759,000

Source: Board Briefing Documents | RTD - Denver

Ridership Changes in Northwest Area

Like many of the transit services in the region, the Flatiron Flyer saw a large decline in service hours and routes. As mentioned previously, four of the seven routes have been suspended. In 2019, pre-pandemic, the Flatiron Flyer had a total ridership of over 3 million, whereas in 2020 ridership was only just over 1 million.[16] In 2021, Flatiron Flyer annual ridership was 817,000,[17] and between January and June of 2021 it was 304,000.[18] Between January and June 2022, ridership on the Flatiron Flyer was 492,000, a 62% increase from 2021 in the same period.[19]

In its first year of service, pre-pandemic, the N Line was projected to carry over 2 million riders annually. In 2021, ridership was only 763,000 riders annually.[20] However, in the first half of 2022, ridership has increased. In 2021 and 2022, between January and June, the N Line had a ridership of 294,000 and 447,000 respectively, a 52% increase year over year from 2021 to 2022.[21]

In January of 2022, Flatiron Flyer had 63,000 monthly boardings, which was a 55% increase from 2021. The N Line had 62,000 monthly boardings, and the B Line had 10,000 monthly boardings in January of 2022. According to the RTD Regional Bus Rapid Transit Feasibility Study[22], the Flatiron Flyer had the second most annual boardings, surpassed only by transit on the East Colfax corridor.[23]

[16] FactBook_2021_final-web-March31_0.pdf (rtd-denver.com) Stations: 6 Parking: 4,200 spaces Service frequency: 15 min (peak) / 30 min (off peak) 2019 total ridership: 3,336,476 2020 total ridership: 1,122,890
[17] February 2022 Board Briefing.pdf (rtd-denver.com)
[18] 08.26.22 August 2022 Board Briefing Document.pdf (rtd-denver.com)
[19] 08.26.22 August 2022 Board Briefing Document.pdf (rtd-denver.com)
[20] February 2022 Board Briefing.pdf (rtd-denver.com)
[21] 08.26.22 August 2022 BoaRidrd Briefing Document.pdf (rtd-denver.com)
[22] RTD-regional-BRT-feasibility-study.pdf (rtd-denver.com)
[23] RTD-regional-BRT-feasibility-study.pdf (rtd-denver.com)

Future Conditions

Reimagine RTD System Optimization Plan

The Reimagine RTD effort included development of a System Optimization Plan (SOP)[24] that was adopted by the RTD Board of Directors on July 26, 2022 and will be gradually implemented through 2027. The SOP outlines improvements to RTD service within the Denver metropolitan area inclusive of the northwest area.

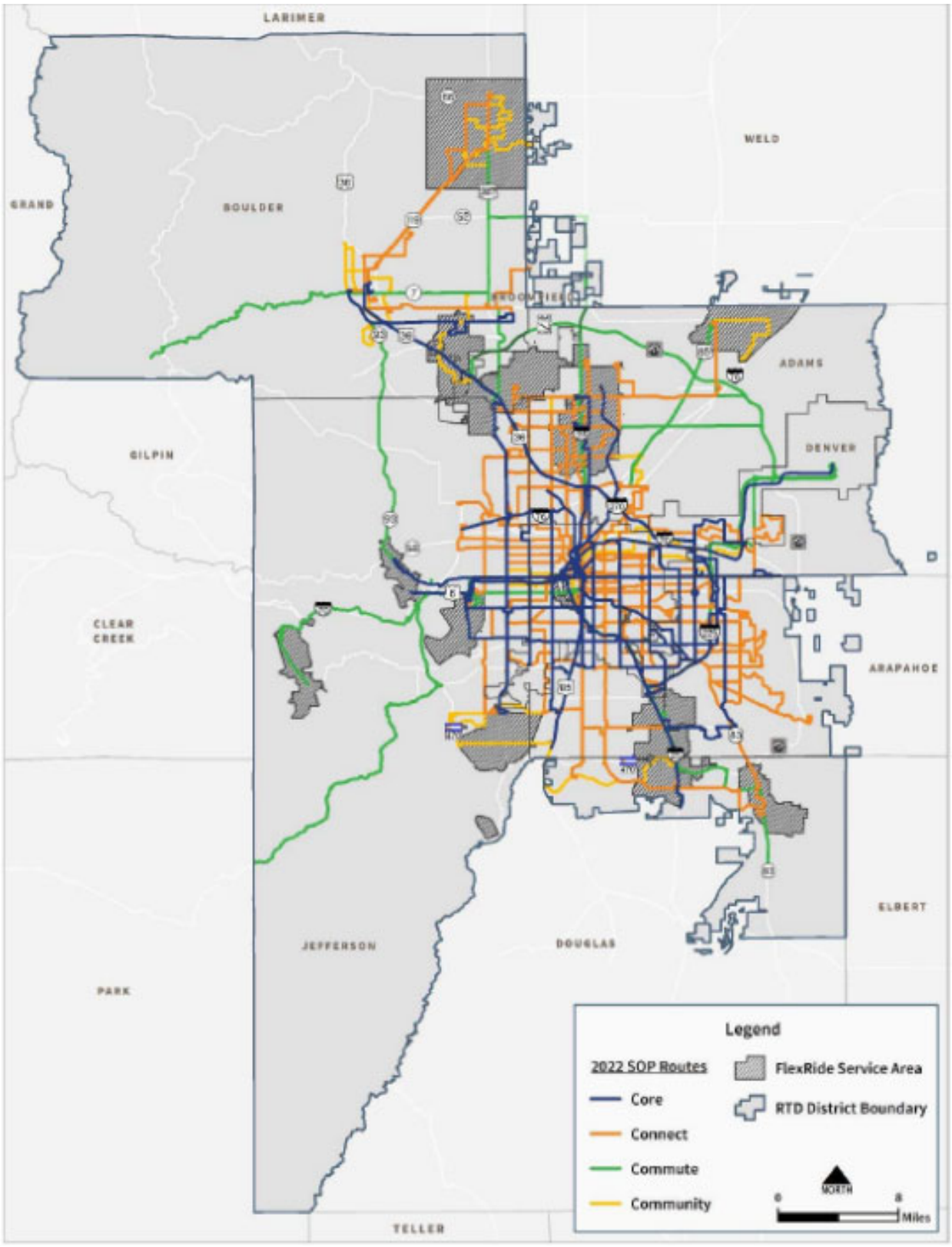
A key feature of the SOP is the categorization of routes into a new travel market-based network of services. The new service categories are as follows:

- **Core** routes. Regional routes serving prominent employment centers, high density housing, that are major trip generators with a demonstrated demand for frequent and extensive service hours; Routes 0 and 15 are examples of Core Routes.
- **Connect** routes. Local bus routes with a minimum 14-hour span of service (6:00 a.m. to 8:00 p.m.), such as Route 100.
- **Commute** routes. Regional routes with limited stops serving unique travel markets (SkyRide and Route LD are examples).
- **Community** routes. Community-focused local routes with custom-built span of service, frequency, and days of service to meet local needs. Examples of community routes are local routes, on-demand services, and other services, such as the 16th Street Mall Ride.

RTD's SOP network is shown in Figure 11.

[24] https://storymaps.arcgis.com/stories/50913e9081614ff69898f299cd84fbdc

Figure 11: RTD SOP Bus Network



Source: RTD System Optimization Plan

Transit Corridor Context Report

The following sections outline RTD SOP improvements that would potentially influence or impact the Northwest Rail Peak Service and connections to each of the NWR stations.

Downtown Westminster Station

The RTD SOP for routes connecting to this station are shown in Table 13.

Table 13: RTD SOP Bus Routes Serving the Area Near the Downtown Westminster Station

Route	Stops at/near NWR Station	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
100	Wadsworth & 88th (Rail Station)	Every 60 minutes	Every 60 Minutes	N/A	Connect
	US 36 & Sheridan				
92	88th & Harlan	Every 30 minutes	Every 30 minutes	Every 60 minutes	Connect
	US 36 & Sheridan				
53	US 36 & Sheridan	Every 60 minutes	Every 60 minutes	Every 60 minutes	Connect
FF1	US 36 & Sheridan	Every 15 minutes	Every 15 minutes	Every 30 minutes	Core
FF4	US 36 & Sheridan	Every 10 minutes	N/A	N/A	Core
FF5	US 36 & Sheridan	Every 30 minutes	N/A	N/A	Core

Note: Routes shown are RTD routes, unless otherwise noted.

Service to the existing US 36 & Sheridan Station, which is proximate to the Downtown Westminster Station and the NWR service, would be improved by:

- The restoration of Route 53
- Increased frequency to Route FF5, which would run every 30 minutes opposed to limited trips
- The restoration Route FF4

The SOP states that there would be no change to Routes 92 or FF1, both of which already provide frequent service to the future NWR Downtown Westminster Station. Route 51 would no longer serve the US 36 & Sheridan Station, and thus would not serve the NWR station. Route 51 will be replaced by Route 53.

Broomfield – 116th Station

The RTD SOP bus routes serving stations near the Broomfield – 116th Station are depicted in Table 14.

Table 14: RTD SOP Bus Routes Serving the Area Near the Broomfield – 116th Station

Route	Stops at/near NWR Station	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
120E/120W	Main & W 116th US 36 & Broomfield	Every 60 minutes (combined headway every 30 minutes)	Every 60 minutes (only 120E)	Every 60 minutes (only 120E)	Connect
112	US 36 & Broomfield	Every 60 minutes	Every 60 minutes	Every 60 minutes	Connect
76	US 36 & Broomfield	Every 30 minutes	Every 60 minutes	Every 60 minutes	Connect
31N	US 36 & Broomfield	Every 30 minutes	Every 60 minutes	Every 60 minutes	Connect
FF1	US 36 & Broomfield	Every 15 minutes	Every 15 minutes	Every 30 minutes	Core
FF3	US 36 & Broomfield	Every 10 minutes	N/A	N/A	Core
FF4	US 36 & Broomfield	Every 10 minutes	N/A	N/A	Core
FF5	US 36 & Broomfield	Every 30 minutes	N/A	N/A	Core
LBr	US 36 & Broomfield	Every 60 minutes	Every 60 minutes	N/A	Commute

Note: Routes shown are RTD routes, unless otherwise noted.

The Broomfield – 116th Station is in proximity to the existing US 36 & Broomfield Station and would benefit from the improved service as noted in the SOP recommendations. The US 36 & Broomfield Station future service improvements include Routes 112 and 120, as well as the restoration of Route FF3 and Route FF4.[25]

[25] RTD SOP

Flatiron Station

The RTD SOP bus routes serving stations near the Flatiron Station are depicted in Table 15.

Table 15: RTD SOP Bus Routes Serving the Area Near the Flatiron Station

Route	Stops at/near NWR Station	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
FF1	US 36 & Flatiron	Every 15 minutes	Every 15 minutes	Every 30 minutes	Core
FF4	US 36 & Flatiron	Every 10 minutes	N/A	N/A	Core
AB	US 36 & Flatiron	Every 30 minutes	Every 30 minutes	Every 30 minutes	Commute
228	US 36 & Flatiron	Every 30 minutes	Every 60 minutes	Every 60 minuutes	Community

Note: Routes shown are RTD routes, unless otherwise noted.

The existing US 36 & Flatiron Station and the NWR Flatiron Station would be generally service the same area. Service improvements stated in the SOP to restore the FF4 would directly enhance service to the Flatiron Station and provide connection to NWR. The improvements to Route AB, as indicated in the SOP, include restoring Route AB2's service to and from the Boulder Junction at Depot Square Station and suggests headway operating times to be 60 minutes in the peak periods all days of the week. Between both Routes AB1 and AB2 patterns, the Route AB from the existing Downtown Boulder Station would operate every 30 minutes all-day and would serve the US 36 & Flatiron Station. Improved service of Route 228 would also provide positive benefits to the Flatiron Station, including increased frequency to 30 minutes and better connections.

Downtown Louisville Station

The RTD SOP bus routes serving stations near the Downtown Louisville Station are depicted in Table 16.

Table 16: RTD SOP Bus Routes Serving the Area Near the Downtown Louisville Station

Route	Stops at/near NWR Station	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
DASH	Main & Short	Every 15 minutes	Every 30 minutes	Every 60 minutes	Core
228	South Boulder & Main	Every 60 minutes*	Every 60 minutes	Every 60 minutes	Community

Note: Routes shown are RTD routes, unless otherwise noted.

*Will operate at 30 minute frequencies as soon as resources allow.

The DASH currently serves the existing Main & Short Stop, which is just south on the same alignment as the Downtown Louisville Station. Future changes to Routes DASH and Route 228 will improve access to/from the station.

Boulder Junction at Depot Square Station

The RTD SOP bus routes serving stops near or at the Boulder Junction at Depot Square Bus Service Area, which is in proximity of the Boulder Junction at Depot Square Rail Station, are depicted in Table 17.

Table 17: RTD SOP Bus Routes Serving the Area Near the Boulder Junction at Depot Square Station

Route	Stops at/near NWR Station	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
HOP (City of Boulder)	Boulder Junction Bus at Depot Square (Underground Bus Concourse)	N/A	N/A	N/A	N/A
FF4	Boulder Junction Bus at Depot Square (Underground Bus Concourse)	Every 10 minutes	N/A	N/A	Core
BOUND	Boulder Junction Bus at Depot Square (Underground Bus Concourse)	Every 15 minutes	Every 30 minutes	Every 30 minutes	Community
AB/AB2	Boulder Junction Bus at Depot Square (Underground Bus Concourse)	Every 60 minutes	Every 60 minutes	Every 60 minutes	Commute
BOLT 2 (Future CO 119 BRT)	Boulder Junction Bus at Depot Square (Underground Bus Concourse)	Every 30 minutes	N/A	N/A	Connect

Note: Routes shown are RTD routes, unless otherwise noted.

FF = Flatiron Flyer

The Boulder Junction at Depot Square Station would see improved service as well with the improvements to transit as stated in the RTD SOP. Route BOUND would have improved service, with service running every 15 minutes at peak periods on weekdays and 30 minutes on Saturdays, Sundays, and Holidays. Restoration of the FF4 and AB2 would also provide additional connection to this station, as would improve frequency of the BOLT which will be the future CO 119 BRT.

Route BOLT is to be replaced by the CO 119 BRT in 2025/2026. Phase I of the implementation is to go into place in fall of 2023 or early 2024 with headways increasing to 15 minute peak service and 30 minute non-peak service on weekdays. Saturday, Sunday and holiday service will remain at hourly.

Downtown Longmont Station

The RTD SOP bus routes serving stops near the Downtown Longmont Station are depicted in Table 18.

Table 18: RTD SOP Bus Routes Serving the Area Near the Downtown Longmont Station

Route	Stops at/near NWR Station	Weekday Peak Headways	Saturday Peak Headways	Sunday Peak Headways	SOP Route Type
323	Downtown Longmont	Every 60 minutes	Every 60 minutes	Every 60 minutes	Community
324	1st & Coffman	Every 30 minutes	Every 60 minutes	Every 60 minutes	Community
	Downtown Longmont				
326	Downtown Longmont	Every 60 minutes	Every 60 minutes	n/a	Community
327	Downtown Longmont	Every 60 minutes	Every 60 minutes	n/a	Community
328	Downtown Longmont	Every 30 minutes	Every 60 minutes	Every 60 minutes	Community
BOLT 1 (Future SH 119 BRT)	Downtown Longmont	Every 15 minutes	Every 30 minutes	Every 30 minutes	Connect
	Downtown Longmont				
Future US 287 BRT	Downtown Longmont	Every 30 minutes	Every 60 minutes	N/A	Commute
LBr*	Downtown Longmont	Every 60 minutes	Every 60 minutes	N/A	Commute
	Downtown Longmont				

Note: Routes shown are RTD routes, unless otherwise noted.
*LBr will become US 287 in the future.

The SOP outlines service improvements for Routes 324 and BOLT (future CO 119 BRT) which both would provide a connection near the Downtown Longmont Station. The current LD routes will remain in service with rail operations in place as the LD serves a separate ridership shed and purpose than the proposed NWR. The LD provides connectivity between Longmont, Erie, Lafayette, and Broomfield while NWR connects Longmont, Boulder, Louisville, Broomfield, Westminster/Arvada, and Denver. The LD routes are slated to become the future US 287 BRT, as is indicated by the SOP. The CO 119 BRT will operate at 15-minute headways during peak weekday service hours and 30-minute headways on the weekends.

As part of the Longmont 'Fare-Buy-Up' program, Routes 324 and 323 are being bought up and will be paid for by the City of Longmont and will be included in the "Ride Free Longmont" program. This has increased boardings as stated in the North Team Service Analysis & State Highway 119 BRT Feeder Plan; however, it is unclear if this service will remain once CO 119 BRT is in place. Furthermore, the 'Fare-Buy-Up' program is reviewed on a bi-annual basis without guarantee to continue, based on funds available from the City of Longmont as well as outcomes of the fare study. It will remain in place as long as the city has adequate funds to pay for it; it is anticipated that there will be adequate funds, especially with the implementation of CO 119 BRT service.

The North Team Service Analysis & State Highway 119 BRT Feeder Plan suggests splitting the existing 323 route into two distinct services to establish a more grid-like network in Longmont. The northern route would

operate 30-minute peak headways and 60-minute non-peak headways while the southern route would operate 30-minute headways all day and would operate on Sundays whereas the northern route would not. Both the north and south routes would access the Downtown Longmont Station. This plan also suggests that Route 324 would be split near the Downtown Longmont Station into a north and south segment as well.

Future/Planned Routes

BRT is a growing service within the region and can be categorized into two main types. The RTD Regional Bus Rapid Transit Study[26] describes how BRT service is categorized according to the Federal Transit Administration (FTA). These two categories are corridor-based BRT and fixed guideway BRT, the latter of which is preferred by RTD because it has higher potential for travel time savings.

The RTD Regional Bus Rapid Transit Feasibility Study also outlines the minimum service frequency for Local, Regional to Central Business District, Rail and Enhanced Bus, and SkyRide, as shown in Figure 12.

Figure 12: RTD Minimum Service Frequency

Service Type	Span of Service	Minimum Frequency
Local – Peak period	Mon – Fri 6:00 AM to 9:00 AM and 3:00 PM to 6:00 PM	30 minutes
Local – Off peak below 25% boardings per hour	Weekday midday (9:00 AM to 3:00 PM)	60 minutes
Local – Off peak above 25% boardings per hour	Weekday midday (9:00 AM to 3:00 PM)	30 minutes
Local	Evenings and weekends	60 minutes
Regional to CBD	3 peak trips, Mon – Fri. Trips target 7:00, 7:30, 8:00 AM shift work start times and 4:00, 4:30, 5:00 PM shift end times.	
Rail & Enhanced Bus—Weekday	Weekday 6:00 AM to 6:00 PM	15 minutes
Rail & Enhanced Bus—Weekday evenings and Saturdays	Weekday evenings 6:00 PM to 11:00 PM and Saturday	30 minutes
Rail & Enhanced Bus—Late night	Night after 11:00 PM	60 minutes
Rail & Enhanced Bus—Sundays and holidays	Sunday and holidays	60 minutes
SkyRide	3:00 AM to 1:00 AM daily	60 minutes

Source: RTD Transit Service Policies and Standards, 2016

Source: RTD Regional BRT Network Feasibility Study.

The northwest area has been experiencing rapid growth, in terms of population, economy, and infrastructure. There are several commuter rail and BRT projects that are proposed and planned. The municipalities along the corridor have published several plans, many of which include assumptions about future development as it relates to the Northwest Rail.

[26] https://www.rtd-denver.com/sites/default/files/files/2020-06/SH-119-Multi-Modal-PEL-Study-Report%20Sept-24-2019-FINAL-2020.pdf

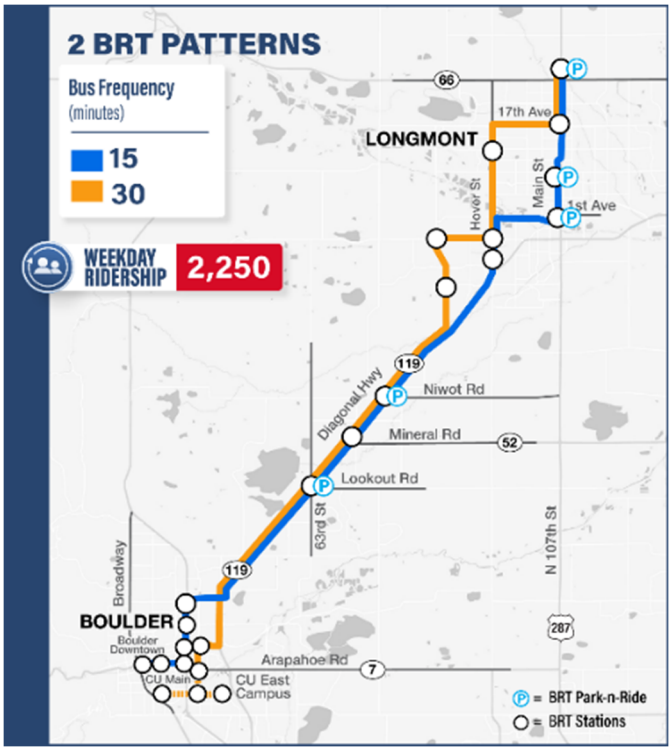
Transit Corridor Context Report

This section outlines key BRT and commuter rail projects that are being planned. The North Area Mobility Study (NAMS) report outlines several key BRT corridors including routes along CO 119, US 287, 120th Avenue, South Boulder Road, CO 7, and CO 42.

Downtown Longmont

Of the BRT routes proposed in the NAMS report, the **CO 119** corridor is most relevant to the NWR Downtown Longmont Station. The North Team Service Analysis & State Highway 119 BRT Feeder Plan [27] identified four options for this service, of which Option B is RTD's preferred option. Under Option B, CO 119 corridor would have two routes as shown in Figure 13—Blue and Orange—both of which would stop at the Downtown Longmont Station.

Figure 13: SH 119 Bus Rapid Transit (BRT) Proposed Option B



Source: https://www.rtd-denver.com/sites/default/files/files/2020-03/north-team-service-analysis-SH119.pdf

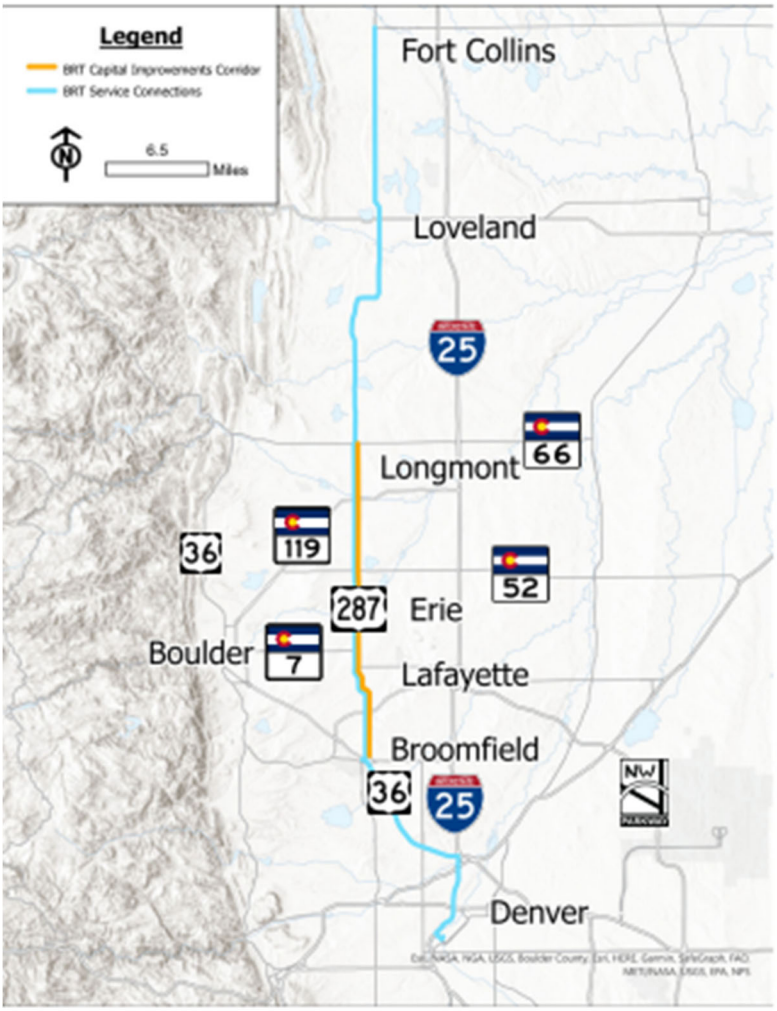
The CO 119 Safety and Mobility Improvements Project is a joint project between CDOT and RTD. The project entails operational improvements, signing and striping, geometric improvements at intersections, and BRT improvements. The preliminary design for this project began in late 2021. Final design began in mid-2022. The project is projected to be completed in mid-2023.[28] In its full implementation, the CO 119 Blue Route will run 15 minutes all day (weekday) in both directions and 15-to-30-minute (weekend) service in both directions, whereas the Orange Route will run at 30-minute frequencies all day during the week with no weekend service.

The **US 287** BRT corridor study area is from Fort Collins to Denver, with capital recommendations focused between CO 66 in north Longmont to US 36 in Broomfield (Figure 14). Boulder County led the US 287 Bus

[27] myyux?44| | | 3wyi2ijs{jw8htr 4xnyjx4ijkfzqy4kqjx4kqjx475752584stwym2yjfr 2xjw{rhj2fsfq-xnx2XM66>3uik
[28] https://www.codot.gov/projects/co119-mobility-design

Rapid Transit Feasibility Study. Rather than a dedicated travel lane for BRT along the entire corridor, the recommended improvements included queue jumps and intersection improvements, investments into stations, and business and transit lanes.

Figure 14: US 287 BRT Corridor



Source: US 287 Bus Rapid Transit Feasibility Study[29]

The forecasted daily boardings (2045) range from 3,800 for the most basic pattern with operational improvements, up to 5,100 for the scenario with intersection improvements, and 5,200 for the scenario with intersection improvements and business and transit lanes.[30] The analysis of commuting patterns for the study indicated most commuters travel south and southwest for work, and a one-seat ride from Longmont to Denver was a priority for the community. [31]

[29] us-287-brt-feasibility-study.pdf (bouldercounty.gov)
[30] us-287-brt-feasibility-study.pdf (bouldercounty.gov)
[31] us-287-brt-feasibility-study-existing-onditions.pdf (bouldercounty.gov)

The Boulder County Transportation Master Plan[32] outlines the importance of BRT in providing regional transit service and connectivity and the role it plays in connecting people to other bus services and to future rail services.

Both the CO 119 and US 287 BRT services would support the feeder system connecting to future rail stations.

Boulder Junction at Depot Square Station

The **CO 119** BRT corridor would also provide connection to the Boulder Junction at Depot Square Station via the Orange Route.

Downtown Louisville Station

The **CO 42** BRT corridor would provide connection between Louisville and Broomfield. This route would start at roughly Arapahoe (CO 7) and US 287 where it would use Arapahoe/SH7 and then head south on CO 42, connecting to major destinations in the areas and terminate at US 36 & Broomfield Station."[33] The route would be approximately 13 miles long, serve 27 stations, and would take 38 minutes from the US 287 & Arapahoe Station to the US 36 & Broomfield Station. The NAMS report estimates that daily boardings incorporating exclusive lanes for CO 42 in 2035 would be 900 for both BRT and local services.[34]

The NAMS report also outlines plans for BRT along **S. Boulder Road**, which would provide possible connection and transfer opportunities to the NWR at the Downtown Louisville Station.

Flatiron Station

The **SH 42** BRT corridor could provide connection to the Flatiron Station and allow connections to US 36 services and Routes AB, FF, and 228.

Broomfield – 116th Station

As stated earlier, the **US 287** BRT corridor could connect to the US 36 & Broomfield Station which is in proximity of the Broomfield – 116th Station, providing opportunity for transfers and for greater access to the NWR service.

The **SH 42** corridor's southernmost station could connect to the US 36 & Broomfield Station on the east side of US 36, opening up possible future connection to the Broomfield – 116th Station.

The **120th Avenue** BRT corridor would connect to the US 36 & Broomfield Station, similarly opening up a possible future connection to between the US 36 & Broomfield and Broomfield – 116th Stations.

Downtown Westminster Station

None of the BRT corridors in the NAMS report would connect to the Downtown Westminster Station. Connections would be available via routes along the US36 corridor, such as FF1, FF3, FF4, and FF5.

[32] transportation-master-plan-tmp-update-technical-document-final.pdf (bouldercounty.gov)
[33] NAMS
[34] NAMS

Other BRT Corridors Planned in Region

The **Arapahoe Road/CO 7** BRT corridor, being developed by Boulder County and its partners, does not connect to a NWR station. It is documented here to provide a complete understanding of concurrent transit planning in the region. The proposed route would be over 17 miles long providing a key east-west connection and a connection to the I-25 corridor, as well as connect to City of Brighton on the east and Downtown Boulder Station to the west. Depending on the operating scenario, BRT ridership forecasts vary from 8,500-9,800 daily boardings with a dedicated lane (bus on shoulder) and from 6,400 to 7,350 daily boardings in mixed traffic. The project is currently in the preliminary engineering phase and is expected to be completed in 2024.[35]

Conclusions & Recommendations

Efforts are underway to improve transit service in the northwest area. Boulder County is working to fill gaps in transit service and restore transit service using American Rescue Planning Act funds and other on demand services such as FreeRide Lafayette are being utilized to provide greater local and regional connectivity filling gaps where fixed route service is unavailable or unfeasible.

The following outlines the recommendations for connecting existing and planned bus routes to each of the six NWR stations.

Downtown Westminster Station

Routes 92 and 100 would service the Downtown Westminster Station. Recommendations include providing bicycle and pedestrian access to the station, as well as bike storage, to encourage people to bike, roll, or walk to the station instead of driving. The City of Westminster has already begun the construction of a tunnel and bike path extension to the park-n-ride. Emphasis should be put on multimodal connections between US 36 & Sheridan and Gold Strike Stations. Future recommendations could include branching Route 53, which will be flipped with the current Route 51, to serve the Downtown Westminster Station.

Broomfield – 116th Station

Focus should be given to providing safe and comfortable bike and pedestrian facilities to this station connecting the Broomfield – 116th Station to the US 36 & Broomfield Station and the US 36 Bikeway. Consideration should also be given to providing a fixed route on-demand service during peak periods to connect from the transit station to the rail station. It is not feasible to divert Routes 112 and 120. Both routes

[35] https://bouldercounty.gov/transportation/multimodal/bus/sh7-brt-study/

provide key connections, and diverting them would result in degraded service. Future consideration should be given to looking to Broomfield FlexRide to provide direct access to the Broomfield – 116th Station.

Flatiron Station

No recommendations are proposed for service to this station, as it is already well served by surrounding bus routes as well as the RTD FlexRide service, which is a first-come-first-served on-demand door-to-door bus service providing first-and last-mile connections and access to RTD stations, medical centers, and business parks. Other considerations for this station include the addition of a High-Intensity Activated Crosswalk Beacon (HAWK) signal, as there is a high traffic volume on Via Vara, which makes it an undesirable and unsafe crossing for bicyclists and pedestrians.

Downtown Louisville Station

Route 228 will have future increased frequency on weekdays and should not be diverted from its future route to directly serve the Downtown Louisville Station. The Downtown Louisville Station should be given high bike and pedestrian access priority. The DASH cannot be feasibly diverted to directly serve the Downtown Louisville Station, as Front Street is not wide enough to accommodate transit vehicles and thus transit cannot directly access the station. However, the DASH has two stops (Main St & Spruce St and Main St & Short) in proximity to the Downtown Louisville Station within a quarter mile. Focus should be given to improving bike and pedestrian facilities and looking to FlexRide to provide first- and last-mile connections when multimodal transportation is not possible between the existing DASH stops and the Downtown Louisville Station.

Boulder Junction at Depot Square Station

The City of Boulder could divert the HOP to serve the Boulder Junction at Depot Square Station. Diverting the 208 to the Boulder Junction at Depot Square Station has been deemed undesirable as it would take service away from low-income areas. Consideration could be given to branching Route 208 in the future; however, this would require finding an on-street/layover option for the routing of this bus service. Routes JUMP and DASH cannot be rerouted either, as both would require an entirely new routing and would change service to those routes.

Downtown Longmont Station

As noted earlier in the report, The proposed station in Longmont planned for Northwest Rail is called "Longmont Station" in accordance with past planning efforts. In more recent planning efforts, this station has been renamed "1st and Main Station". However, in this report and other Northwest Rail Peak Service Study documents, the station name "Downtown Longmont" will be retained.

The CO 119 BRT will directly serve the Downtown Longmont Station. The CO 119 BRT and Route LD will access the station via Coffman Bus Way, between 9th Ave and 1st Ave along Coffman. Route LX may have a few trips that provide access to the Downtown Longmont Station. The North Team Service Analysis & State Highway 119 BRT Feeder Plan[36] also identifies Route 328 as a new route in Longmont, which will serve the Downtown Longmont Station. This plan also proposes Route 329, which would stop at the Downtown Longmont. It also proposes to split Routes 323 and 324 into northern and southern routes which would access

[36] myyux?44|||3wi2ijs{jw3htr4xnyjx4ijkfzq4kmjx4kmjx475752584stwym2yjfr2xjw{mj2fsfq+xmx2XM66>3uik

the Downtown Longmont Station. Furthermore, the US 287 BRT would connect to the Downtown Longmont Station and should be considered a connecting transit route. RTD has identified all routing options for how to access the Downtown Longmont Station in the North Team Service Analysis & State Highway 119 BRT Feeder Plan.

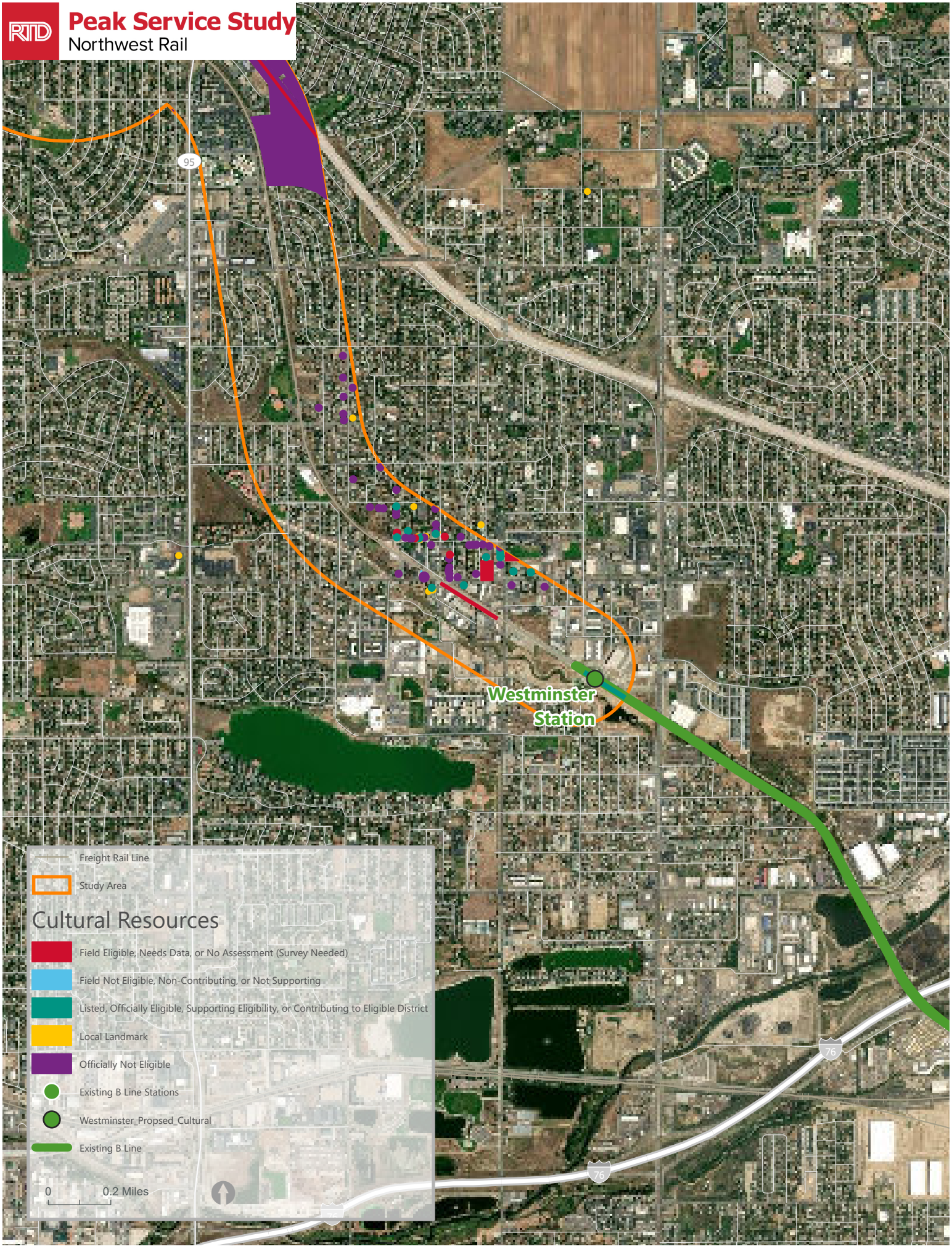
Milestone 2

Corridor Conditions Report

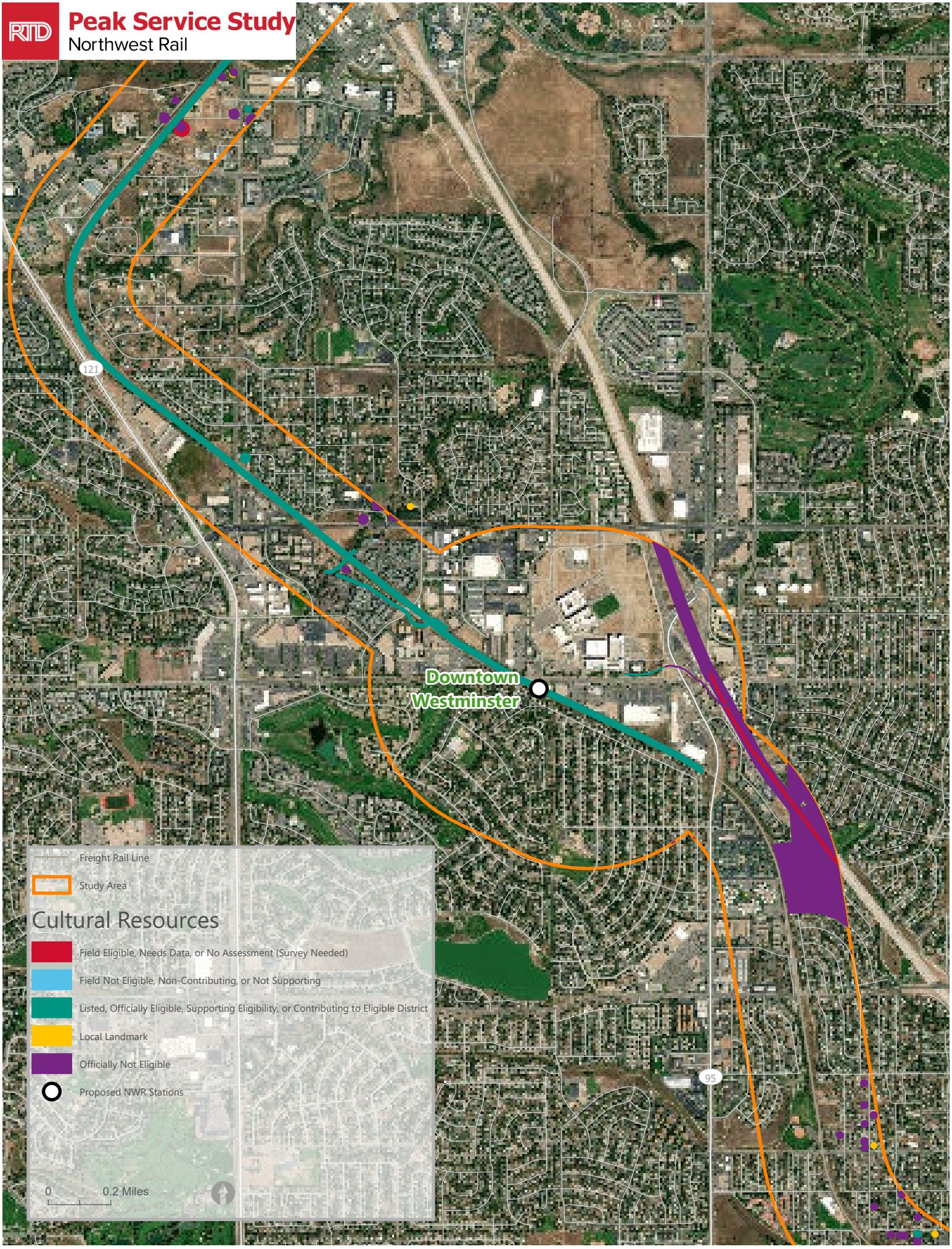
Appendix C

Historic Resources Detail Maps

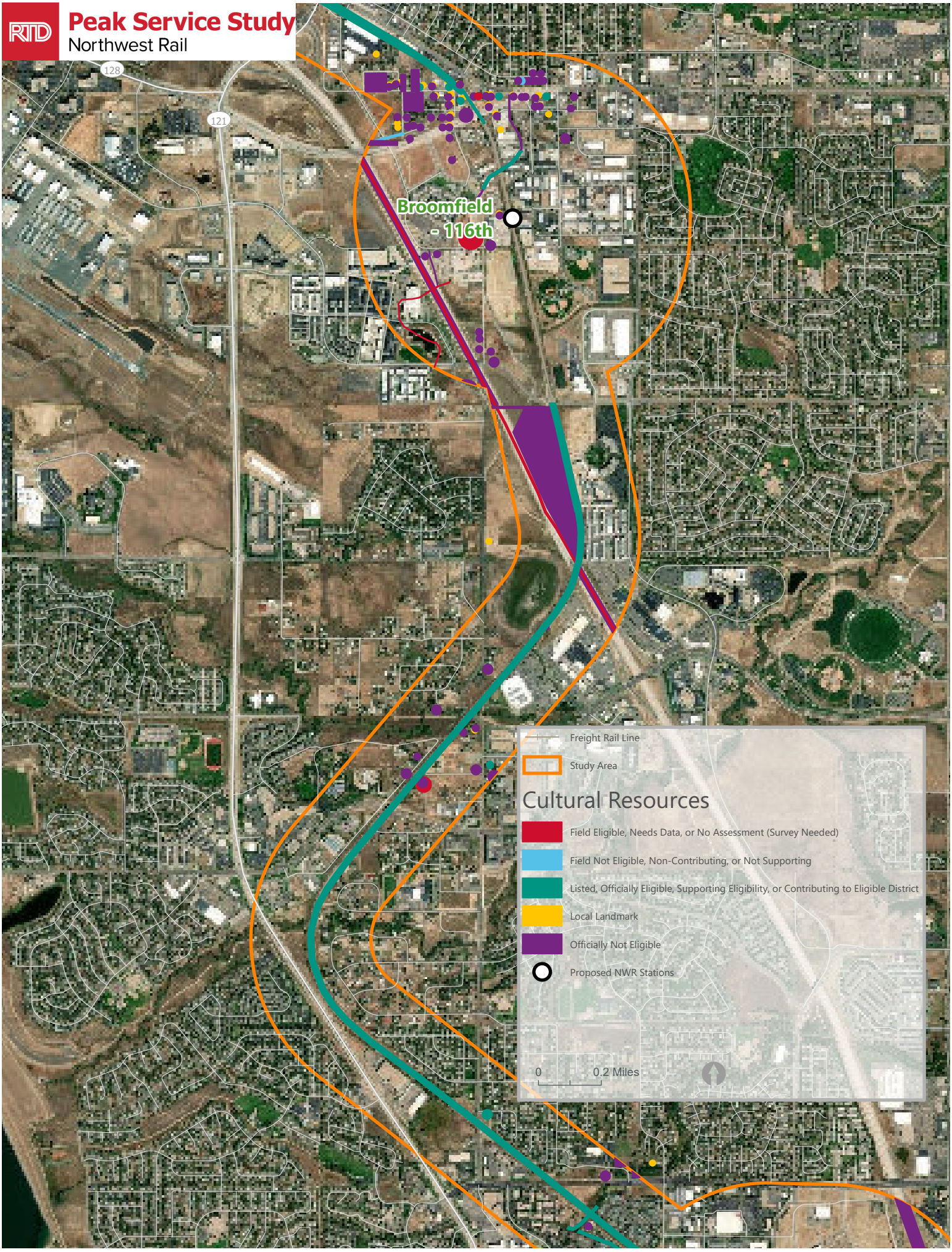
Peak Service Study
Northwest Rail



Peak Service Study
Northwest Rail



Peak Service Study
Northwest Rail



Peak Service Study
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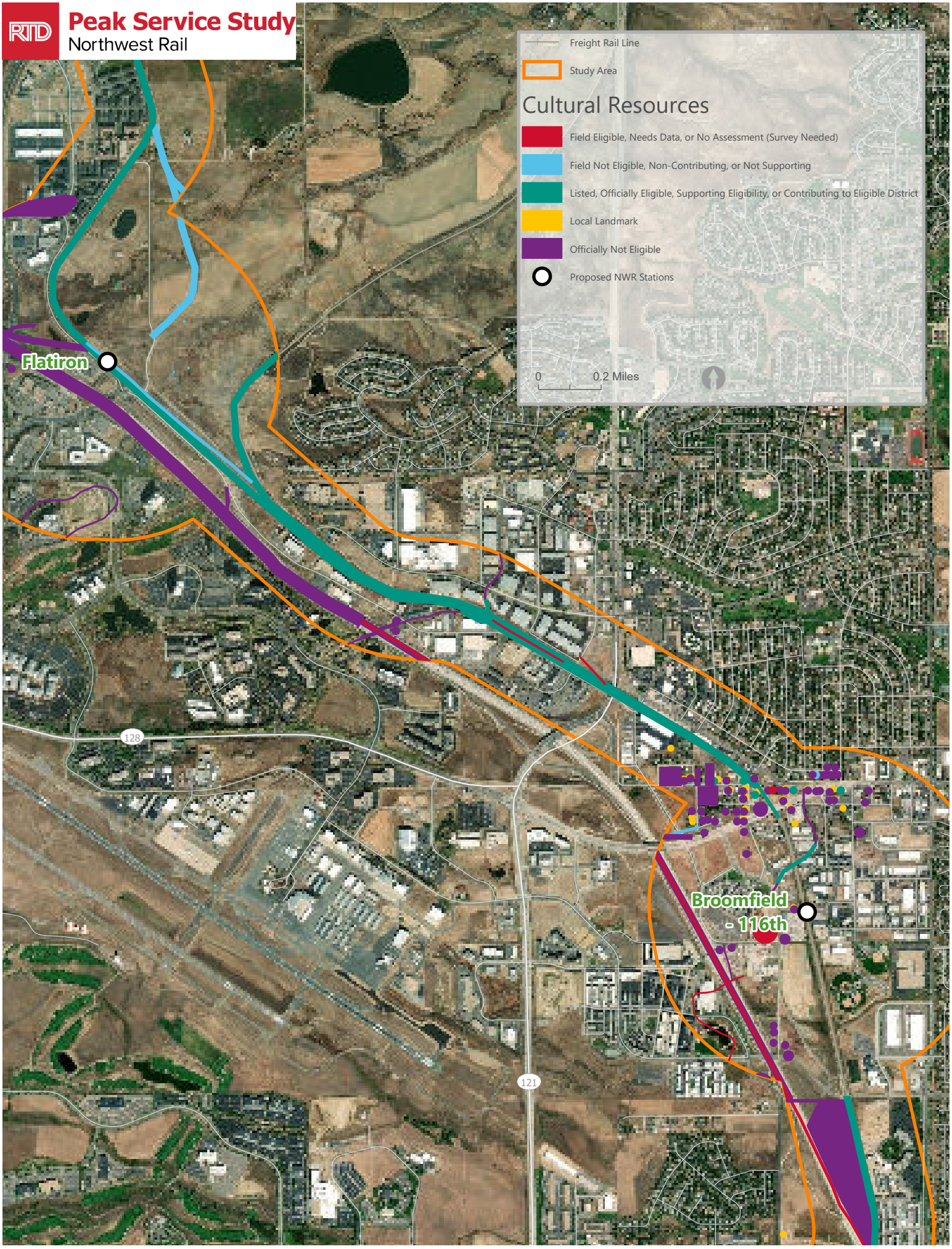

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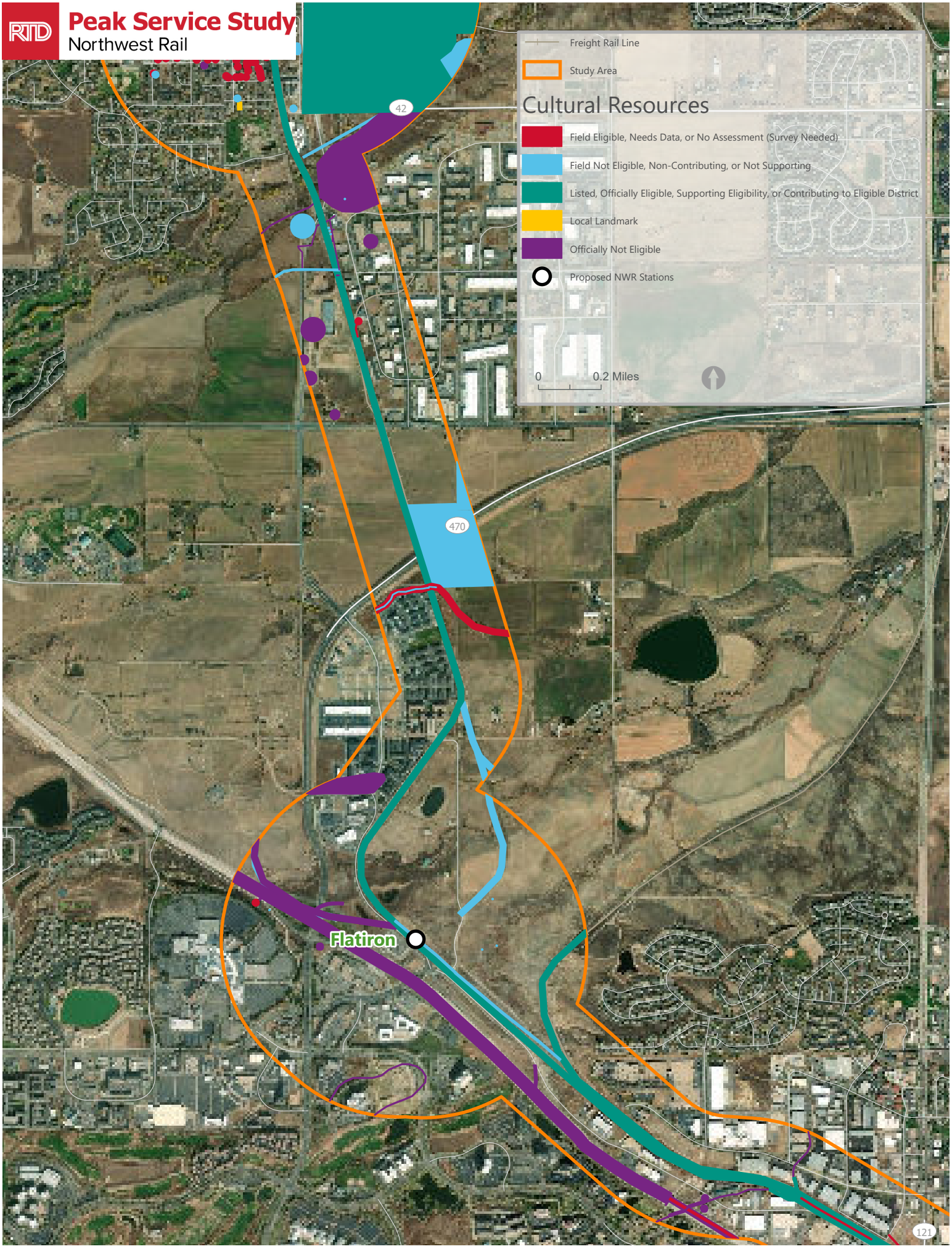

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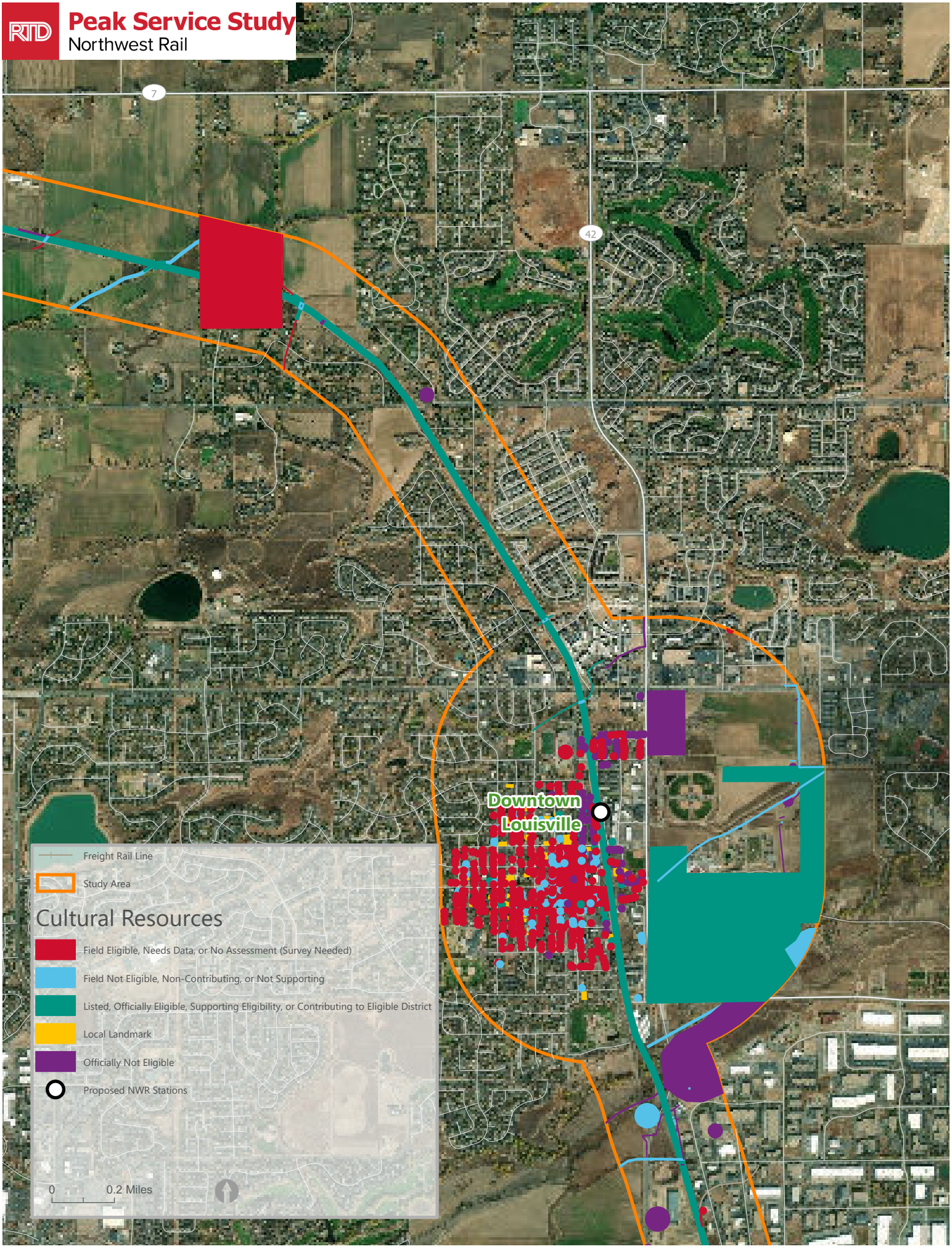

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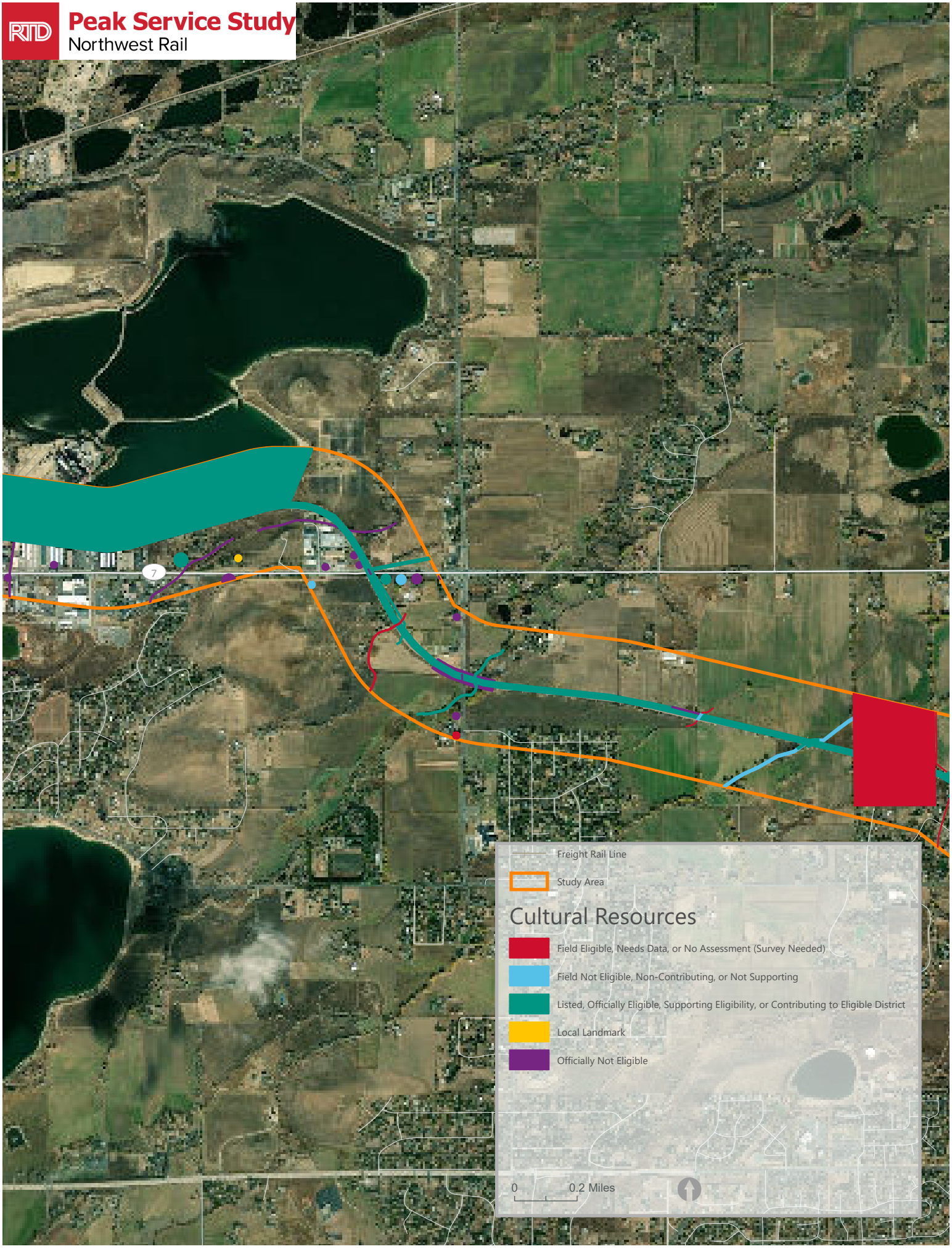
Northwest Rail



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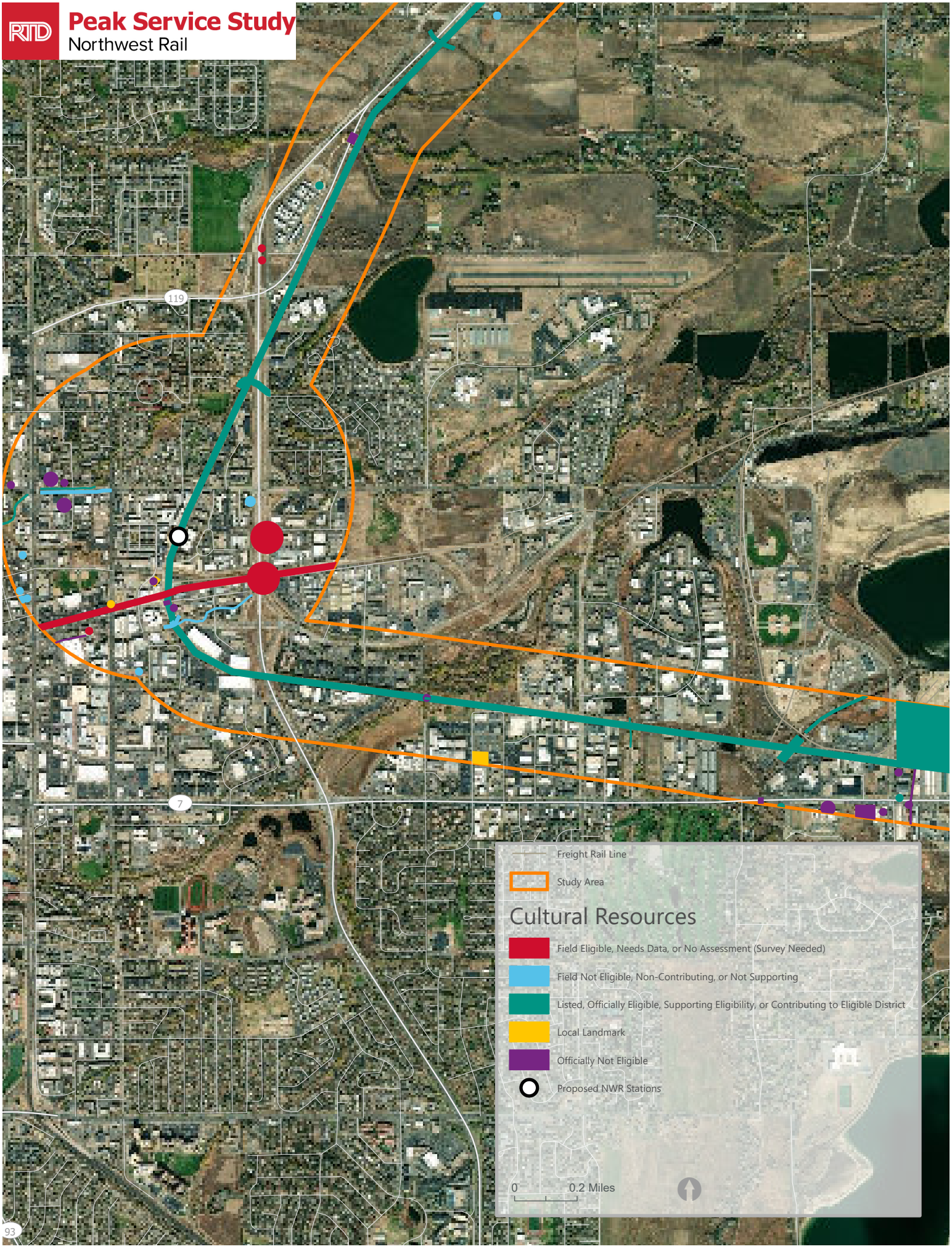
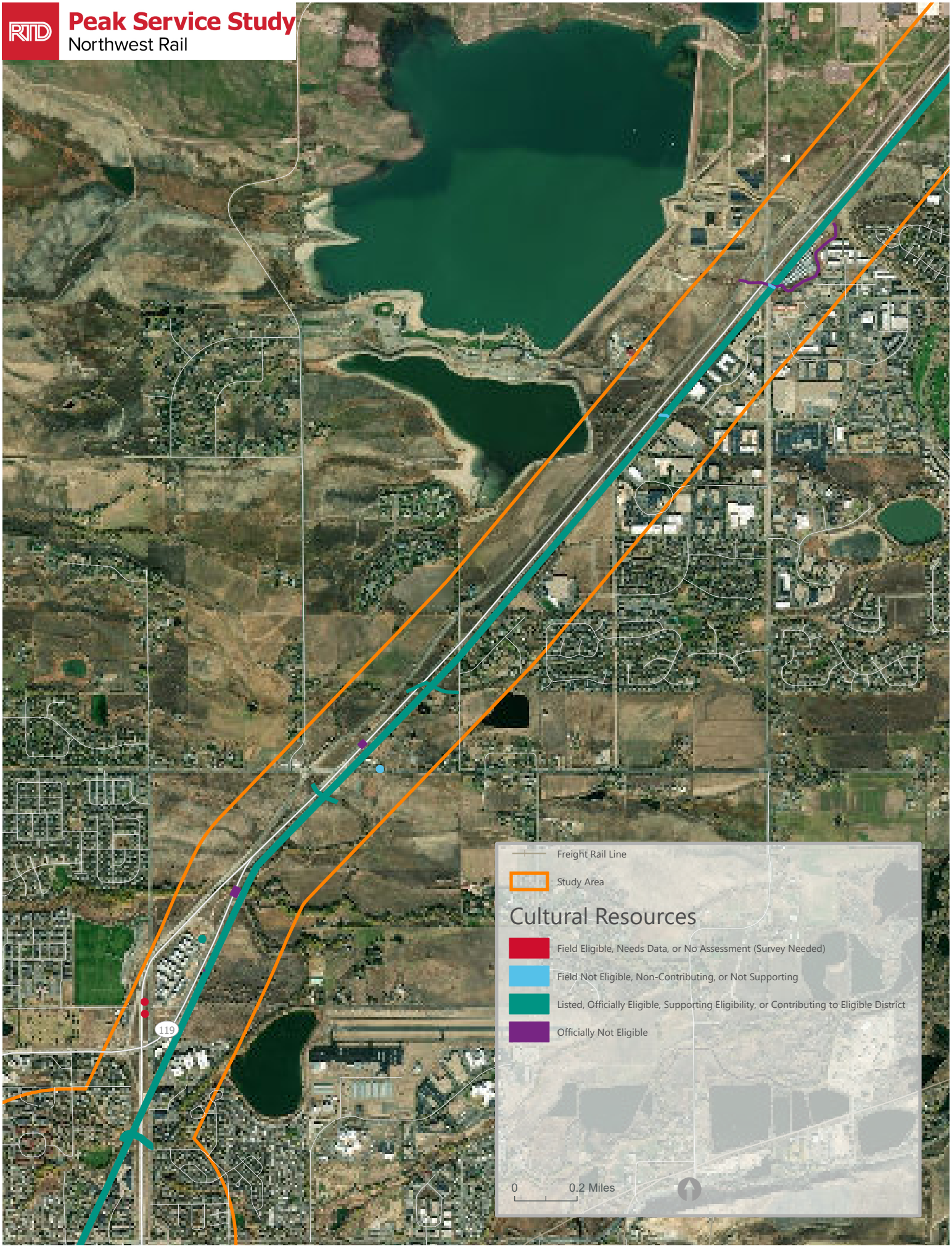
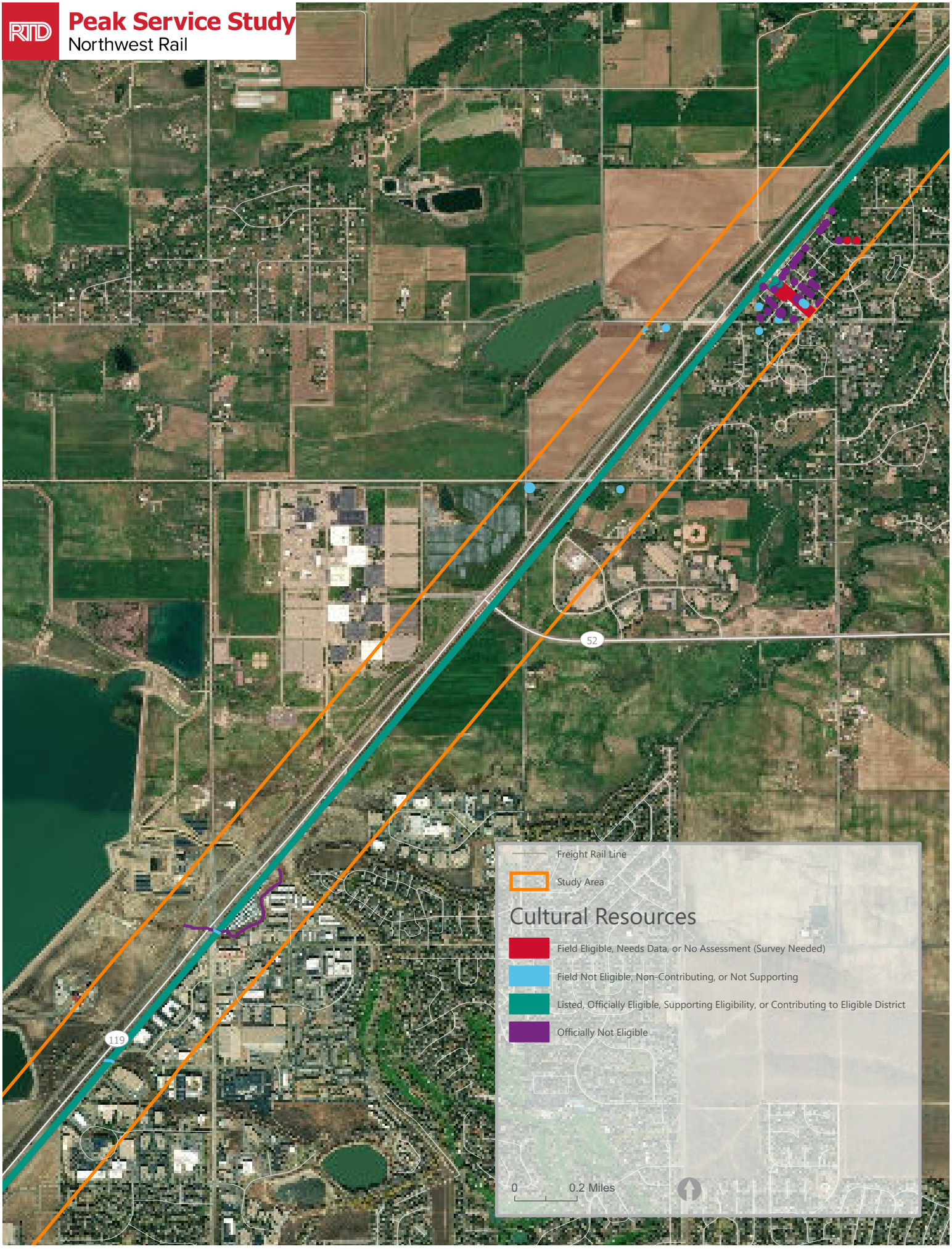
Northwest Rail



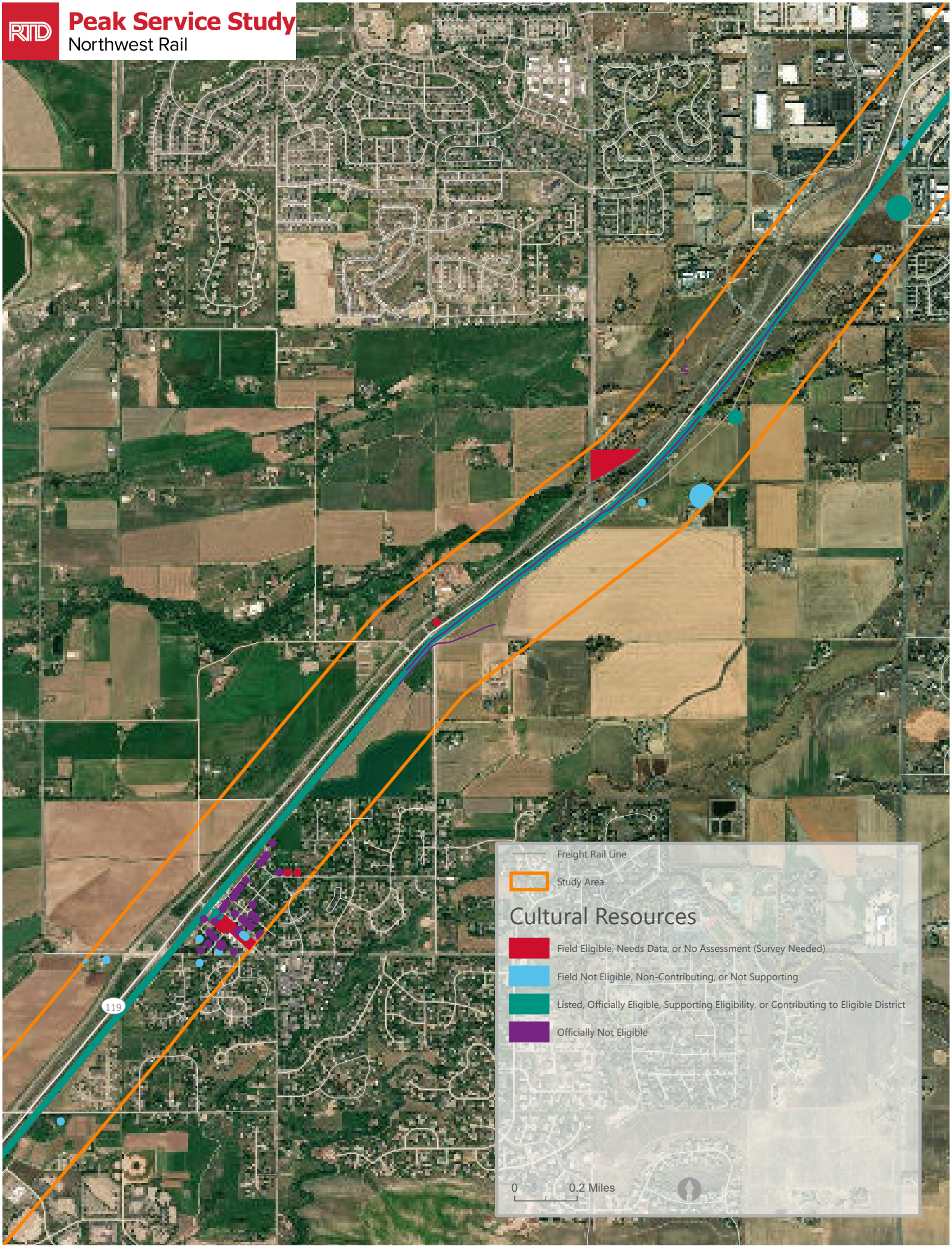
Peak Service Study
Northwest Rail



Peak Service Study
Northwest Rail



Peak Service Study
Northwest Rail



Peak Service Study
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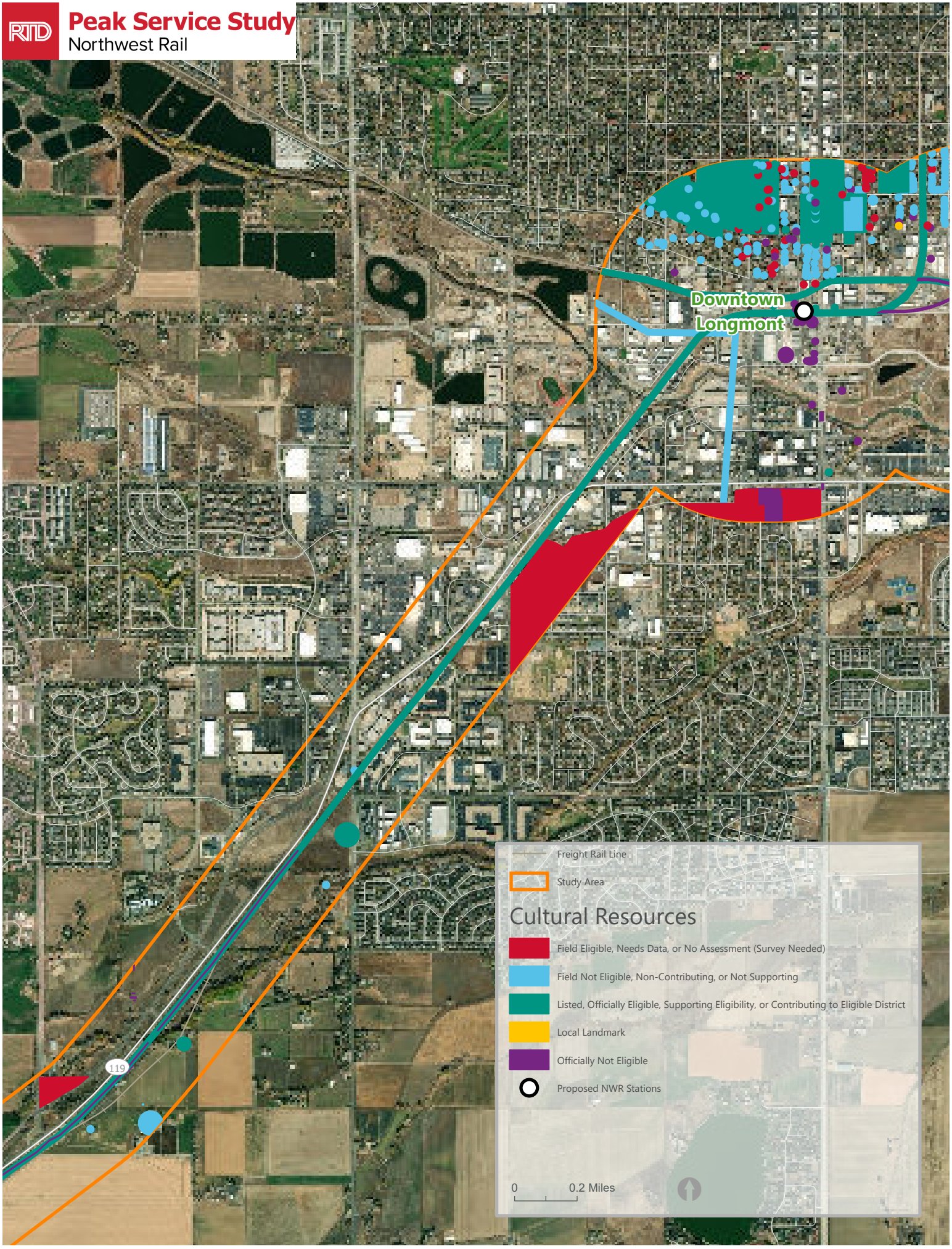
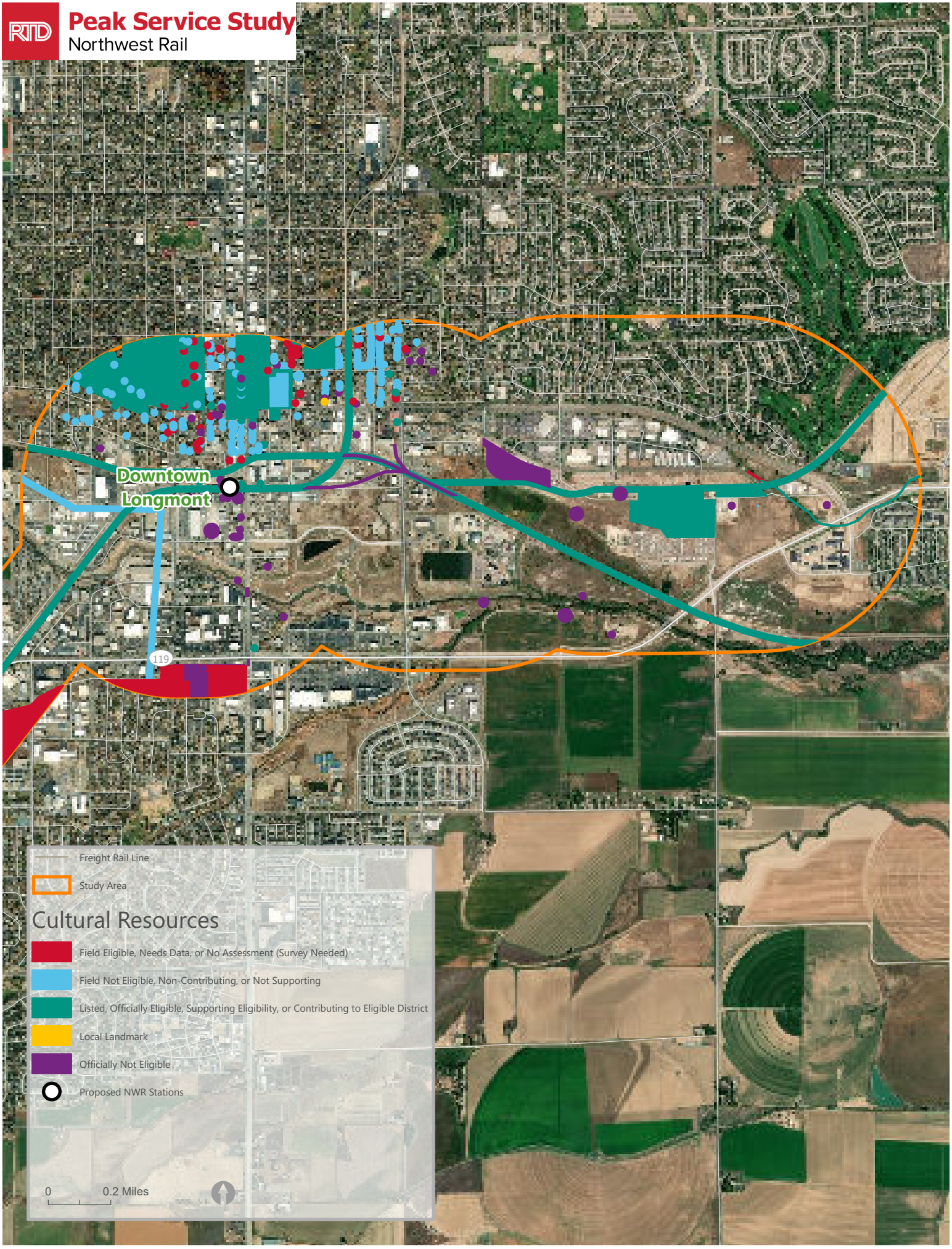


Peak Service Study
Northwest Rail



Milestone 2

Corridor Conditions Report

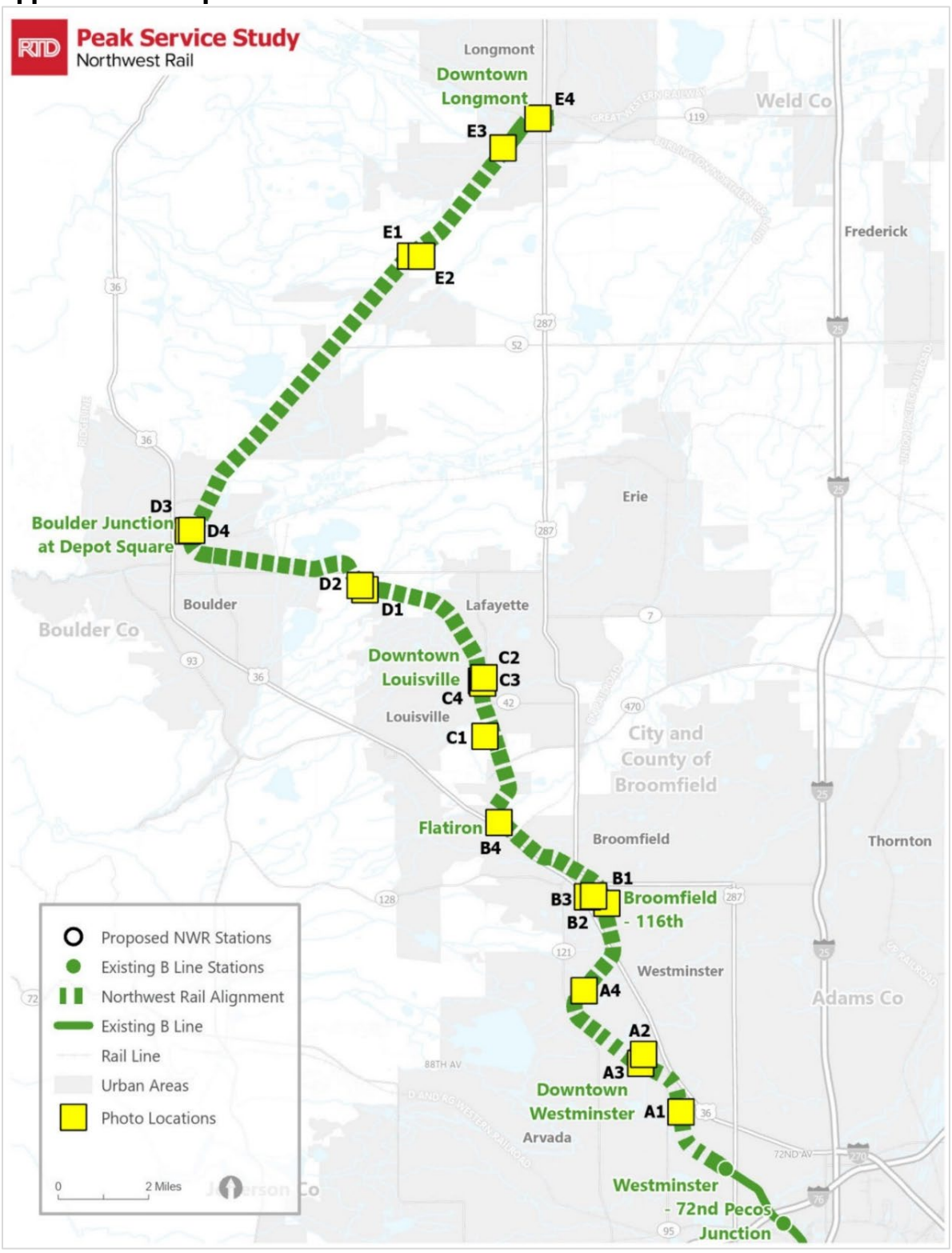
Appendix D

Visual Inventory by Study Section

Corridor Conditions Report

The Visual Inventory documents existing conditions throughout the Study Area. Appendix E-1 provides a key for representative photo locations, followed by a description of visual conditions by geographic section.

Appendix E-1. Representative Photo Locations



A. Westminster Section

The existing BNSF Corridor through the Westminster Section is surrounded by residences in the south (Photo A1), which transitions to open space and larger lot residential developments in the north. Near the Downtown Westminster Station at 88th and Harlan Street, residential and commercial uses dominate the foreground (Photo A2). Background views of the Rocky Mountains are available to westbound travelers along 88th Avenue, and large trees, cottonwoods, pines, and spruce line both sides of the roadway near the station area (Photo A3). Views of the Rocky Mountains and natural landscapes, for example Big Dry Creek, are generally fragmented by commercial and residential developments (Photo A4).

Viewers in this area include residents, workers/neighbors, visitors, and commuters/travelers along 88th Avenue. These viewers have low sensitivity to views as the area is highly developed, with natural features only visible in the background. Some views of the mountains remain, especially from 88th Avenue, as depicted in Photo A3.

Photo A1:
Residences adjacent to the existing BNSF track

Photo A2:
Commercial developments near 88th and Harlan Street obstruct views of the Rocky Mountains

Photo A3:
Background views of the Rocky Mountains from 88th Avenue

Photo A4:
Views of natural landscape fragmented by development

B. Broomfield Section

Throughout the Broomfield Section, views of the Rocky Mountains are interrupted by recently constructed residential developments. Land use at the Broomfield Station near West 116th Avenue and Main Street is discontinuous with various visual characteristics, including commercial, residential, industrial, agricultural, and vacant lots (Photo B1). To the west of the existing BNSF Corridor are low-density residential areas, several small offices, US 36, and a small agricultural lot. US 36 dominates the foreground in this area (Photo B2). Directly adjacent to the railway are large high-density apartment complexes currently under construction (Photo B3). Large industrial facilities dominate the area east of the railway. The Broomfield Industrial Park is located southeast of the station. This facility includes several baseball fields owned and managed by Broomfield Parks and Trails. While there are various land use types, the foreground and midground views indicate a typical mixed-use area.

The station at Flatiron Crossing has been partially constructed with the US 36 & Flatiron Station Westside Park-n-Ride (Photo B4). Most of the surrounding land use visible in the foreground is commercial (west of the station) and undeveloped or open space (east of the station). US 36 separates the station from the Flatiron Marketplace, with several commercial businesses. Views to the west include the Flatiron Crossing Mall in the middle ground and the Flatirons of the Rocky Mountains in the background. Views to the east are primarily open space, comprised of rolling hills with sparse vegetation typical of Front Range prairie landscapes.

Viewers in this area include residents, workers/neighbors, recreationists, and commuters/travelers who have a lower sensitivity to views in areas dominated by light industrial, commercial, and higher-density residential land uses. Neighbors and recreationists are moderately sensitive to foreground views, including open space. Transit-oriented development associated with the Flatiron Station affords limited open space views and the Rocky Mountains in the background.

Photo B1:
View to the west from the Broomfield Station Area

Photo B2:
US 36 infrastructure is dominant in the middle ground view

Photo B3:
High-density residential complexes under development

Photo B4:
US 36 & Flatiron Station Park-n-Ride

C. Louisville Section

The Louisville Section provides a variety of landforms, providing views of small-scale historic and cultural resources in the foreground and natural landscapes in the background. The Corridor passes through undeveloped lands and open space, with several sweeping, unobstructed views of the Rocky Mountains (Photo C1). The Downtown Louisville Station is located adjacent to historic downtown Louisville and newly constructed commercial development and high-density residential complexes that span the existing railway (Photos C2 and C3). Historic downtown Louisville is located west of the existing rail line and exhibits a mixture of recreation, commercial, and medium-density single-family residential uses. Walking paths, shops, restaurants, historic homes, a public library, and a pavilion for outdoor entertainment line Front Street and are clearly visible in the foreground. The South Street Pedestrian Gateway, constructed in 2017, travels underneath the existing tracks, connecting these two distinct areas. Other nearby features include recreation areas and large lots of agricultural land to the east (Photo C4).

Viewers in this area include residents, workers/neighbors, and recreationists on both sides of the BNSF railway, as well as visitors to the downtown Louisville area. Viewers in this area are moderately sensitive with views of the harmonious downtown character and historic district as well as the views of unique natural features.

Photo C1:
Unobstructed views of the Rocky Mountains

Photo C2:
Historic downtown Louisville

Photo C3:
High-density residential complexes

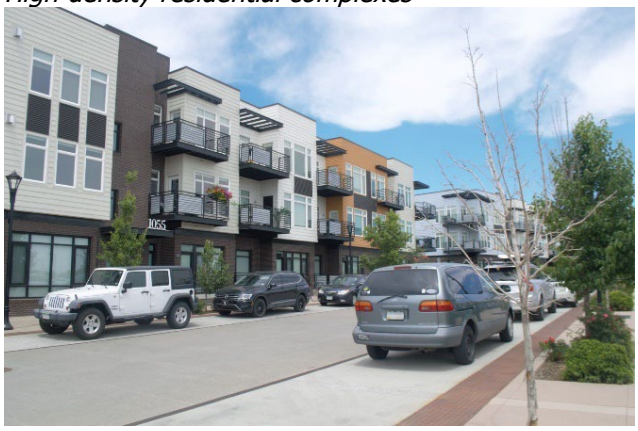


Photo C4:
Sports Complex with agricultural lands beyond

D. Boulder Section

The Corridor passes through both urban and rural settings in the Boulder Section. The easternmost and northernmost portions of the Boulder Section, which are also the most rural, provide sweeping views in the middle ground and background of the Flatirons and the greater Rocky Mountains (Photos D1 and D2). Within urbanized Boulder and Boulder County, views of the Flatirons are less dominant and blend with the more developed surrounding natural landscapes.

The station near Foothills Parkway and Valmont Road is predominantly surrounded by high-density residential, commercial, and industrial land uses. To the west of the existing BNSF corridor is a recently constructed high-density residential and commercial complex known as Transit Village (Photos D3 and D4). Directly adjacent to the rail tracks are large office complexes. A narrow multi-use pedestrian and cycling path runs between the buildings and the tracks. To the east of the tracks are large industrial buildings. The lack of vegetation or natural elements amplifies the foreground's high-density residential and industrial use and character.

Viewers, including workers/neighbors, residents, visitors, commuters/travelers, and recreationists in urbanized areas, have low sensitivity as background views of the mountains or other natural features are limited by the high-density residential and industrial development within the area. In the less developed areas between stations, viewer sensitivity is high as views of the open space and Flatirons remain intact.

Photo D1:
Unobstructed views of the Rocky Mountains

Photo D2:
Unobstructed views of the Flatirons

Photo D3:
View of Flatirons near Transit Village

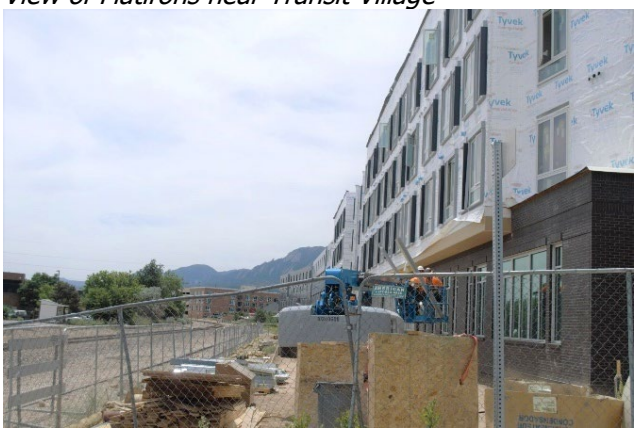
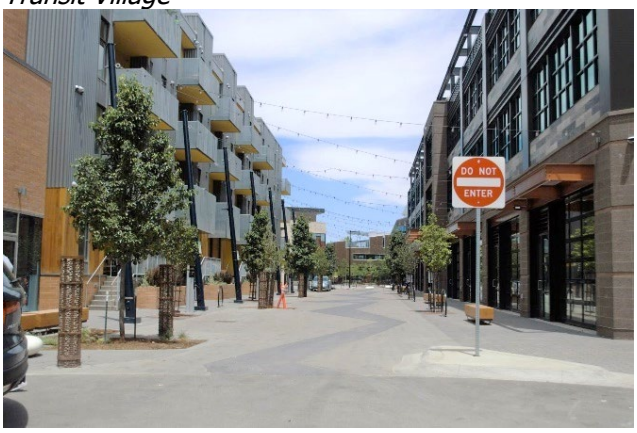


Photo D4:
Transit Village



E. Longmont Section

The Corridor passes through sparsely developed land between Boulder and Longmont along SH 119, where views of the agricultural lands and the Rocky Mountains are intact (Photos E1 and E2). Within Longmont, where larger-scale developments are present, foreground and middle ground views are limited (Photo E3).

The Downtown Longmont Station is located at First Street and Main Street and is surrounded by a mix of industrial, commercial, residential, transportation, and utility land uses. Directly adjacent to the station are several small businesses. West of the station is Longmont's utility plant. Views west include fragmented views of the Rocky Mountains in the background, which vary in quality based on viewer location and are partially obstructed by the Price Road Bridge structure (Photo E4).

Viewers in this area, including workers/neighbors, residents, commuters/travelers, and recreationists, have medium sensitivity to views of the Rocky Mountains, especially Long's Peak, contributing to a high-quality visual character. This area has been targeted for redevelopment, and improvements to industrial blight are important to local stakeholders.

Photo E1:
Unobstructed views of the Rocky Mountains between Boulder and Longmont

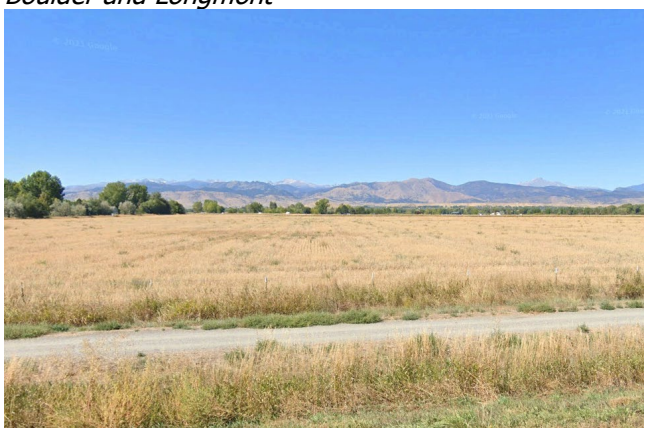
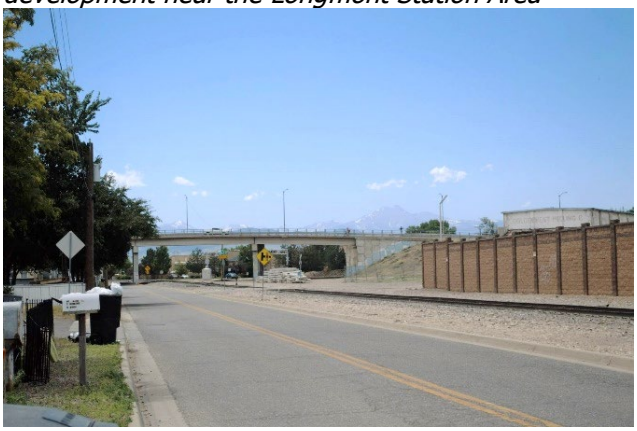


Photo E2:
Views of the agricultural lands between Boulder and Longmont

Photo E3:
Views of urban development within Longmont

Photo E4:
Views of the Rocky Mountains are limited by development near the Longmont Station Area



Appendix E

Table of Recognized Environmental Conditions (REC) and Potential Environmental Concerns (PEC)

Hazardous Materials Concerns

This table lists general hazardous material concerns, followed by sites evaluated in the database and found to be recognized environmental conditions (RECs) or potential environmental concerns (PECs) within the Environmental Study Area. The remaining listed sites in the database are either not located within the Environmental Study Area or are not considered hazardous material concerns. However, the remaining listed sites could potentially pose hazardous material concerns if the Environmental Study Area expands or significantly changes, if environmental conditions on the sites or in the adjoining area change, or if additional information is discovered. See Figure 64 for MAP identification (ID) locations and Appendix G for the EDR database.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Industrial and Commercial Properties	Entire Environmental Study Area	Not Applicable (N/A)	The majority of the Environmental Study Area contains industrial and commercial properties. These properties are generally known to use and dispose of hazardous materials.
Storage Tanks	Entire Environmental Study Area	AST, UST	Aboveground storage tanks (ASTs) and underground storage tanks (USTs) that have not been reported as having leaks are used on various properties within the Environmental Study Area. These tanks usually contain fuels or oil. Leaks, spills, and accumulation of drips over time could potentially create a hazardous material concern on these properties.
Leaking Underground Storage Tanks	Entire Environmental Study Area	LUST or LTANKS	Approximately 100 leaking underground storage tank (LUST) sites are located within the Environmental Study Area. Specific locations and information for each site can be found in the EDR database. Active LUST sites have known petroleum contamination of soil and/or groundwater, and closed LUST sites may have residual contamination.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Railroad tracks	Entire Environmental Study Area	N/A	Railroad tracks run through the center of the Environmental Study Area. Railroads are considered PECs due to the potential for undocumented events and an accumulation of drips, leaks, and spills over time. The railroad ties are also commonly made from treated wood containing creosote or heavy metals.
Asbestos Containing Materials (ACM) and Lead-based Paint (LBP)	Entire Environmental Study Area	CO Asbestos	There are 215 asbestos sites listed in the Environmental Study Area. Buildings and structures within the Environmental Study Area may contain ACM or LBP. ACM may also be found in utility corridors, and LBP may be found on signs and road markings.
Dry Cleaners	Entire Environmental Study Area	Drycleaners, CO Drycleaners, HIST Cleaner	Thirteen dry cleaners within the Environmental Study Area do not have reported spills. Dry cleaners are known to use hazardous solvents.
No Action Determination (NAD) Voluntary Cleanup (VCP) sites	Entire Environmental Study Area	VCP	Seven VCP sites with NADs are located within the Environmental Study Area. Sites indicate the existence of contamination that does not exceed state standards, contamination that does not pose an unacceptable risk to human health and the environment, or that contamination originates from a source on adjacent or nearby real property – the entity responsible will be taking necessary action, if any, to address the contamination. These sites were, therefore, granted a NAD.
Electrical Transformers	Entire Environmental Study Area	N/A	Power lines, pads, and pole-mounted electrical transformers may be found throughout the Environmental Study Area that may or may not contain polychlorinated biphenyls (PCBs). If utility relocation is required, the owner of the utility will be responsible.
Chrome Zone, INC 455 Weaver Park Road, Longmont	3	PFAS ECHO	PEC: This business is in the multiuse warehouse on the southeast corner of Weaver Park Road and Alpine Street. The business is listed in PFAS ECHO due to air quality emissions and particulates.

Corridor Conditions Report

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Reliant Manufacturing LLC 455 Weaver Park Road, Longmont	4	PFAS ECHO	PEC: This business is also in the multiuse warehouse on the southeast corner of Weaver Park Road and Alpine Street. The business is listed in PFAS ECHO due to air quality emissions and particulates.
KCI Construction INC 605 Weaver Park Road, Longmont	8	LTANKS LUST UST	PEC: The business is located on the corner of Weaver Park Road and Golden Rod Court. In 1993, an unauthorized release was discovered and remediated. No further information regarding the chemical of concern was found - remediation was completed in 1994.
Prestige Chrysler Dodge Jeep Inc 200 Alpine Street, Longmont	11 and 12	UST RCRA NonGen/NLR	PEC: The facility is located on the corner of East 3rd Avenue and Alpine Street. The facility had a closed-out UST with used oil as of 04/15/1981. They had failed inspection due to a lack of compliance. The EDR report indicated that the facility did not have a Federal Waste Generator code.
Panorama Coordinated Services LPG – Division of Oil and Public Safety 395 East Rogers Road, Longmont	18	AST	PEC: The site is on the corner of East Rogers Road and Sugar Mills Road and has a current 1000-gallon tank in use on the facility as of 5/14/2020.
CEPEX American INC 11559 Sugar Mill Road Longmont	19	RCRA NonGen/ NLR	PEC: The site is located on the corner of Sugar Mill Road and East Rogers Road. The property owner is American Fertilizer and Chemical CO and is not listed as a waste generator. However, they hold chemicals onsite for fertilizers, including ignitable waste, corrosive waste, and benzene. No violations found onsite, and no evaluations.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Transportation Service Center-Cleaning 11939 Sugar Mill Road, Longmont	21 and 24	RCRA-VSQG FINDS ECHO RCRA NonGen/NLR	REC: The business is located on the corner of Sugar Mill Road and North 119th Street. The waste report indicated the following spent nonhalogenated solvents: Xylene, Acetone, Ethyl Acetate, Ethyl Benzene, Ethyl Ether, Methyl Isobutyl Ketone, N-Butyl Alcohol, Cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent nonhalogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above-nonhalogenated solvents, and a total of 10% or more (by volume) as a conditionally exempt small quantity generator. Other waste codes include slop oil emulsion solids from the petroleum refining industry, Heat Exchanger bundle cleaning sludge from the petroleum refining industry, and API separator sludge from the petroleum refining industry. Multiple violations were found, but no information was reported from these violations.
Gasamat Oil Corporation 301 Martin Street, Longmont	31, 32, 33	LTANKS AIRS ASBESTOS	PEC: The site is located on the corner of Martin Street and 3rd Avenue. The local gas station has three Underground Storage Tanks, of which a recorded remediation report is available for the cleanup of benzene. The site has a new site assessment and, as of 2012, underwent asbestos treatment.
Vista Auto Sales 310 Martin Street, Longmont	36	RCRA-VSQG US AIRS FINDS ECHO	PEC: The auto-body shop is located on the corner of Martin Street and Rothrock Place. Waste summary at the business includes ignitable waste, lead, methyl ethyl ketone, tetrachloroethylene, and various spent nonhalogenated solvents, with benzene being one of them. Multiple violations have occurred onsite, including used oil, but no further information was provided.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Loaf N Jug 200 Lashley Street, Longmont	37	UST	REC: The gas station is located on the corner of Lashley Street and East Rogers Road. The gas station can hold 15,000 gallons of diesel and unleaded fuel. EDR provided no other records.
Diamond Shamrock/Total Station 303 Lashley Street, Longmont	39, 40, 41, and 42	LUST LTANKS EDR HIST AUTO LUST TRUST AIRS	REC: The previously operated gas station is located at the intersection of East 3rd Avenue, Lashley Street, and East Rogers Road. The current property is used as a local restaurant and a residential home. The previous USTs could hold 6,000, 8,000, and 15,000 gallons of retail gasoline.
P&S Food & Gas 400 Lashley Street, Longmont	57 and 59	UST	PEC: The market store with a gas station is located on the corner of Lashley Street and East 4th Avenue. The site has three USTs, all with fuel-holding capacities of 8,00 gallons. A confirmed fuel release was discovered on 6/28/2020 (the tanks were installed in 1985) with the tank closing and cleanup of ethylbenzene, volatile organic compounds, xylenes, toluene, and n-Hexane. The State reviewed the site in 2005.
Rainbow Laundromat & Dry cleaners 310 Lashley Street, Longmont	58	RCRA NonGen/NLR FINDS ECHO	REC: The laundromat is located in the business park at the corner of Lashley Street and East 3rd Avenue. The business has an ignitable waste description code in which the site disposes of halogenated solvents, tetrachloroethylene, methylene chloride, trichloroethylene (TCE), and other PCBs.
Ioerger Property 22 Main Street, Longmont	63	LTANKS	PEC: The site is located on 1st avenue, 250 feet from the intersection of Main Street and 1st Avenue. Release from former bulk stations identified on 7/8/91. LUST Trust thru 1995. State lead cleanup from 1997-1999. No reports were provided for baseline sampling, so this site poses a data gap.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Mazda of Longmont INC 116 South Main Street, Longmont	65	LUST LTANKS LUST TRUST UST RCRA NonGen/NLR	PEC: The site was located at the corner of Highway 287 and Boston Avenue before closing its doors. The site had failed inspections due to the type of generator waste they had onsite. Hazardous materials included corrosive and ignitable waste, halogenated solvents, and nonhalogenated solvents stored onsite with varying small quantity generators - conditionally exempt small quantity generator status.
Butterball Longmont 150 Main Street, Longmont	67	VCP SPILLS AIRS NPDES	REC: Located at the corner of Main Street and Second Avenue is the facility with a parking lot. This is a current VCP site since the previous 2016 renewal date. The soil consists of a coal fill with an NPDES permit for hazardous processed water discharge. Caustic or acid chemicals used in meat processing were released due to technical failure to the storm drain. 30-40 gallons of gasoline were released and drained into the storm drain from a truck fire in 1996. Volatile organic compounds are also present in processing turkeys at the facility.
Longmont Civic Center Complex 350 Kimbark Street, Longmont	68	LTANKS LUST UST SPILLS	PEC: The facility is located at Kimbark Street and Third Avenue. The facility discovered a leaking underground tank in 1992, and the status was closed. On July 1, 2015, a pump that puts plant fertilizer used for micronutrients for a biofilter tank leaked and released 10-15 gallons of "Total Grow" in the ground. The fertilizer contains urea nitrogen, nitrate nitrogen, ammoniacal nitrogen, water-soluble potash, boron, coppery, iron, magnesium, zinc, and phosphoric acid.
Taylor Equipment Rental LLC 130 South Main Street, Longmont	69	LTANKS LUST LUST TRUST UST AST	REC: The facility is located at the corner of Highway 287 and Boston Avenue. The site is currently under a monitoring program due to the release of diesel in February 2021. The release was caused by faulty piping.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Robert P Marx 210 Main Street, Longmont	73	LTANKS	PEC: The parking lot is located 240 feet from Main Street and Second Avenue intersection. A leaking tank was discovered in 1991 and the remediation process closed in 1998. The contaminants of concern were not disclosed when reviewing the EDR data.
Rexel Electrical Supply Store 11 South Main Street, Longmont	75	LTANKS	PEC: The warehouse is located 200 feet south of the intersection of First Avenue and Highway 287. A release was discovered in 2018, and documents were reviewed and closed in 2019. The contaminants of concern were not disclosed when reviewing the EDR data.
LUST Trust Site Fifth and Kimbark, Longmont	81	LTANKS	PEC: Located at the intersection of Kimbark Street and Fifth Avenue, a utility corridor was discovered with petroleum products. The release date was discovered in May 1993 and closed in May 1994.
Hitching Post Cleaners 700 Ken Pratt Boulevard, Longmont	84	CORRACTS RCRA NonGen/NLR FINDS ECHO	PEC: The shopping center is 500 feet north of Ken Pratt Boulevard and South Pratt Parkway. There was a need for a site investigation for ignitable waste, halogenated solvents, and multiple PCBs in 2015. An investigation was conducted, and the state approved the compliance reports.
REM Development INC 601 Main Street, Longmont	85	CORRACTS RCRA NonGen/NLR FINDS ECHO	PEC: The address was at the intersection of Sixth Avenue and Main Street. An investigation was imposed by the state and regulation agencies regarding used halogenated solvents used for degreasing and PCBs. The investigation was completed in 2005, and the stabilization/interim measures decision primary measure is source removal. The site was later in compliance.
Silver Recovery Associates 1110 Delaware Avenue Suite East, Longmont	86	CORRACTS RCRA NonGen/NLR FINDS ECHO	PEC: The facility is located on the corner of Delaware Avenue and Colorado Avenue. An investigation was imposed by the state and regulation agencies regarding the used corrosive waste. The investigation was completed in 2005, and the stabilization/interim measures decision primary measure is source removal.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Butterball Facility, 115 Main St., Longmont	115	VCP	PEC: The site is located on Main Street in Longmont between First and Second Avenue. This was a VCP site from 2015-2017 with coal-fill soils.
Aspen Mountain Vet Specialists II, 104 S. Main St., Longmont	227	VCP	REC: The site is located at the northeast corner of Main Street and Boston Avenue in Longmont. This was a VCP site from 2008-2010 with volatile organic compound (VOC) contamination of sediment, soil, groundwater, and surface water.
Westminster Wastewater Plant, 7000 King St., Westminster	1553	VCP	REC: This site is near the southeast corner of 69th Avenue and King Street in Westminster. This was a VCP site from 2004-2006 with petroleum contamination of sediment, soil, groundwater, and surface water.
Heffley Property, Irving & 69 Avenue, Westminster	1556	VCP	REC: This site is located at Creekside Drive and Irving Street in Westminster. This was a VCP site from 2005-2006 with petroleum contamination of sediment, soil, groundwater, and surface water.
Longco & Co, 900 S. Sunset, Longmont	384	SEMS-Archive, RCRA NonGen/NLR, FINDS, ECHO	REC: This site is located at the northeast corner of S. Sunset Street and Kansas Avenue in Longmont. Site discovery was in 1981, and the site was archived in 1989. This site does not qualify for the National Priorities List (NPL).
Circuit Images, Inc, 3155 Bluff St., Boulder	571	CORRACTS, RCRA NonGen/NLR	REC: This site is located at the southwest corner of Meredith and 33rd streets in Boulder. It appears this facility is no longer present. Its current status update was in 2009 as workplan received, operation, and maintenance.
Boulder Radiator, 3100 Pearl St., Boulder	669	CORRACTS, RCRA NonGen/NLR, FINDS, ECHO	REC: This site is located at the southeast corner of Pearl Parkway and Junction Place in Boulder. It appears this facility is no longer present. Its most current status was in 1999 as – workplan received.
United Parcel Service Boulder, 3795 Frontier Ave., Boulder	693	CORRACTS, RCRA-VSQG, FINDs, ECHO	REC: This site is located at the southwest corner of Pearl and Foothills parkways in Boulder. Its most current status was in 1996 – referred to a non-RCRA authority, corrective action process is terminated.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Graphic Packaging International Corporation, 3825 Walnut St., Boulder	736	CORRACTS, RCRA NonGen/NLR	REC: This site is located on the northwest corner of Walnut Street and Foothills Parkway in Boulder. Its most current status was in 2003 – other supplemental information received and adequate, investigation imposition.
Western Avenue Intersection 55th Street & Colorado & Southern Railroad, Boulder	768	SEMS-Archive	REC: Site discovery was in 1989, and the site was archived in 1995. This site does not qualify for the NPL.
Scandinavian Automotive Inc., 6519 Arapahoe Road #5, Boulder	871	CORRACTS, RCRA-VSQG, FINDs, ECHO	PEC: This site is located at the northwest corner of Arapahoe Road and 65th Street in Boulder. Its most current status was in 2015 – corrective action process is terminated, no further action.
Eastpark 2, 1110 S. Boulder Road, Louisville	892	US Brownfields, FINDS	PEC: This site is located at the southwest corner of E. South Boulder and Courtesy roads in Louisville. This site had a Phase I Environmental Site Assessment in 2005.
1000, 1003, & 1034 S. Boulder Road, Louisville	893	US Brownfields, FINDS	PEC: This site is located at the northeast corner of E. South Boulder Road and Steel Street and the southeast corner of E. South Boulder Road and Lafayette Street in Louisville. This site had a Phase I Environmental Site Assessment in 2005.
Residence 1055 and 1004 Griffith St., Louisville	906	US Brownfields, FINDS	PEC: This site is located at the southeast corner of Griffith and Front streets in Louisville. This site had a Phase I Environmental Site Assessment in 2005. No identified environmental conditions were found.
Louisville Tire And Auto Center, 1190 Griffith St., Louisville	908	US Brownfields, FINDS	REC: This site is located at the southwest corner of Courtesy Road and Griffith Street in Louisville. This site had a Phase I Environmental Site Assessment in 2005. There are possible residues on the property due to the tire, automotive, and other small businesses.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Former Explosive Fabricators Property, 1301 and 1309 Courtesy Road, Louisville	913	US Brownfields, FINDS, ECHO	REC: This site is located at the southwest corner of Courtesy Road and Griffith Street in Louisville. This site had a Phase I Environmental Site Assessment in 2005. Possible environmental concerns associated with explosive fabrication of metals in a 40-foot diameter chamber, which has now been filled. Possible concerns from businesses that have operated since the departure of explosive fabricators. Former Use: Location of former Explosive Fabricators plant. Explosive Fabricators operated from at least 1973 to 1994 at this property – currently the location of several businesses which rent space.
Comcast Cable Vision of Colorado, 1055 Lafayette St., Louisville	918	US Brownfields, FINDS	PEC: This site is located at the southeast corner of Front Street and Leonard Lane in Louisville. This site had a Phase I Environmental Site Assessment in 2005. No identified environmental conditions were found on the property.
PDI Trust Property, 1301, 1313, 1331, 1341 Cannon St. & 1000 Griffith St., Louisville	921	US Brownfields, FINDS	REC: This site is located at the southwest corner of Courtesy Road and Griffith Street in Louisville. This site had a Phase I Environmental Site Assessment in 2005 and a Phase II Site Assessment in 2007, where semi-volatile organic compounds (SVOCs) and pesticide contaminants were found in the soil. There are possible residues from a former "flare and rocket motor" manufacturer on the PDI Trust Property and possible residues from a reported UST in the vicinity of 1315 Griffith St. There are also possible residues from a former commercial nursery operation. There are two apparent test wells on the property that are not registered with the state engineer's office.
Old Sausage and Louisville Store and Lock, 1219 Courtesy Road, Louisville	924	US Brownfields	PEC: This site is located at the southwest corner of Courtesy Road and Griffith Street in Louisville. This site had a Phase I Environmental Site Assessment in 2005. No identified environmental conditions were found on the property.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Coal Creek Collision Center, 1100 Courtesy Road, Louisville	926	US Brownfields, FINDS, ECHO	PEC: This site is located in the southwest corner area of Courtesy Road and Griffith Street in Louisville. This site had a Phase I Environmental Site Assessment in 2005. The Coal Creek Collision Center property is the former location of USTs, which have been removed and closed, and the current location of an automotive repair business.
Aggregate Industries Louisville Plant, 1125 Short St., Louisville	931	US Brownfields	REC: This site is located at the northwest corner of Courtesy Road and South Street in Louisville. It appears this facility is no longer present. This site had a Phase I Environmental Site Assessment in 2005. The Aggregate Industries property is the location of a former shooting rod and gun club, which raised concerns about possible lead contamination in the surface and near-surface soils. The property is also the location of a closed fuel UST and at least one large, 10,000-gallon fuel AST. The property is the possible location of the former Caledonia Mine main shaft and air shaft.
Alpine Lumber Property, 1055 Courtesy Road, Louisville	944	US Brownfields, FINDS	REC: This site is located at the northwest corner of Courtesy Road and South Street in Louisville. This site had a Phase I Environmental Site Assessment in 2005 and a Phase II Site Assessment in 2007, where lead and other metals, VOCs, and SVOCs were found. This property is the location of the former Alpine Lumber and several small businesses. The property is the current location of a landscape business, including three small ASTs.
Highway 42 Revitalization Area, Unknown, Louisville	986	US Brownfields, FINDS	PEC: This site is plotted as located at Main and Pine streets in Louisville. No further information was found.
Sun Chemical Corp – GPI Division, 2135 Abbott Ave., Broomfield	1109	SEMS-Archive, RCRA NonGen/ NLR	REC: This site is located at the northwest corner of US 36 and Highway 287 and the northeast corner of Abbott Avenue and Burbank Street in Broomfield. Site discovery was in 1980, and the site was archived in 1984. This site does not qualify for the NPL.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Storage Technology Corporation, 2400 Industrial Lane, Broomfield	1135	CORRACTS, RCRA NonGen / NLR	REC: This site is located at the northwest corner of US 36 and Highway 287, south of Industrial Lane in Broomfield. The 2015 status – other report received and approved; 2014 status – determination of need for an investigation. Groundwater and soil releases indicated.
Broomfield Duplex Indoor Air, 12125 Emerald Lane, Broomfield	1214	SEMS -Archive	PEC: This site is located at the east side of the US 36 and Wadsworth interchange, specifically at the northwest corner of Emerald and Emerald lane just south of Highway 287 in Broomfield. This site was assessed in 2013 and archived in 2016. It is a removal-only site; no site assessment work is needed. This site does not qualify for the NPL.
Farmers Reservoir and Irrigation, 136 Ave. and Silverton Street, Broomfield	1216	SEMS -Archive	REC: This site is plotted at the southeast corner of Hemlock Way and West First Avenue just north of Highway 287 in Broomfield. This site was discovered in 1987 and archived in 1996. This site does not qualify for the NPL.
Chemical Handling Corp, 11811 Upham St., Broomfield	1258	SEMS-Archive, RCRA NonGen / NLR, CORRACTS, RCRA-TSDF, RCRA, ICIS, FINDs, ECHO	REC: This site is located in the vicinity of Highway 128 and the railroad tracks, specifically at the northwest corner of Upham Street and W. 188th Place in Broomfield. This site was discovered in 1992 and archived in 2015. This site does not qualify for the NPL. Investigation was completed in 2005; soil release was indicated.
Generic Storage, 7620 W. 116th Ave., Westminster	1302	SEMS-Archive, RCRA NonGen / NLR, FINDs, ECHO	REC: This site is located at the southwest corner of Wadsworth Boulevard and 116th Avenue in Westminster. This site was discovered in 1987 and archived in 1991. This site does not qualify for the NPL.
Ten Eyck Property, 108th Avenue and Federal Boulevard, Westminster	1326	CORRACTS, RCRA NonGen / NLR, FINDS, ECHO	REC: The corrective action process was terminated in 1997 and referred to a non-RCRA authority. Groundwater and soil releases were indicated.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Pousky 4690 W. 76th Ave., Westminster	1430	US Brownfields, FINDS	PEC: This site is located at the southwest corner of West 76th Avenue and railroad tracks in Westminster. The property's current owner discovered that previous owners were arrested for methamphetamine use and distribution.
PCA3 Park Shops, 3950 W. 72nd Ave., Westminster	1488	US Brownfields, Brownfield, FINDS	REC: This site is located at the southwest corner of West 72nd Avenue and Newton Street. The site is bounded by vacant land on the west, 72nd Avenue on the north, vacant land and Little Dry Creek on the south, and residential properties on the east. A Phase I Environmental Site Assessment was completed in 2001. The site is comprised of the former Parks Shop/Garage. According to the City of Westminster staff, solvents, gasoline, and used oil were routinely dumped along the property's southern border. In addition, three diesel and gasoline USTs associated with a former onsite filling station were removed from the central portion of the property in April 1992, with approximately 40 yards of impacted soil.
Westminster Tod, Lowell Boulevard and West 71st Place, Westminster	1510	US Brownfields	PEC: Phase I and II Environmental Site Assessments were performed in 2019. The property is currently a large vacant lot next to the new Westminster rail line. The assessment was performed for Urban Land Conservancy (ULC). ULC is considering acquiring the property and redeveloping it with affordable housing. No contamination was found during the environmental assessment.

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Heffley And Guildner Properties, 3435 and 3381 W. 69th Ave., Westminster	1525	Brownfields	REC: This site is located just west of the Westminster Rail Station and south of the railroad tracks. Soils were found to be contaminated with petroleum, and groundwater contaminated with heavy metals, tetrachlorethylene (PCE), and SVOCs. Guildner Property (3381 W. 69th Ave.): before the 1950s, the site was agricultural land. From the mid-1950s to 1971, the Westminster Sanitation District used the site as a wastewater treatment plant. From 1971 to June 1999, Guildner Pipeline Maintenance Inc. used the site for vehicle storage, maintenance, and materials storage. From 1996 to December 2001, Benson and Benson Metals used the site for vehicle storage and storage of roll-off bins. An onsite UST was decommissioned in 1999 with a No Further Action (NFA) status issued by the Colorado Department of Labor and Employment – Oil Protection Section (CDLE-OPS) on 3/17/1999. Potential for buried automobiles underground on the site. Heffley Property (3435 W 69th Ave – aka 7000 King Street): the site was reportedly used as an auto repair shop and junkyard. Numerous 55-gallon drums, ASTs, broken down automobiles, miscellaneous debris, and general improper disposal practices were previously observed and, in addition, previously used as a methamphetamine lab. Potential for buried automobiles underground on the site. This site has since been redeveloped into a park next to the Rail Station.

Corridor Conditions Report

Site Name/Address	Map ID	Listed Databases Applicable to REC or PEC	Site Description
Guildner Property, Western Third of PCA 1, 7000 King St., Westminster	1551	US Brownfields	REC: This site is located at the southeast corner of King Street and West 68th Avenue in Westminster. It is the location of a former wastewater treatment plant that was sold to private ownership in 1970. Private use as a pipeline maintenance facility, then as a junkyard, then resold back to the city. The property was formerly a scrap metal recycler and a meth lab - contamination of sediment, soil, groundwater, and surface water. See also Westminster Wastewater Plant, 7000 King Street, Westminster, Site # 1553.

Database Acronyms and Definitions (Listed in order of table appearance):

1. **AST, UST** – aboveground storage tanks and underground storage tanks.
2. **LUST, LTANKS** – leaking underground storage tanks.
3. **CO ASBESTOS** – sites with asbestos abatement or demolition.
4. **Drycleaners, CO Drycleaners, HIST Cleaner –** Drycleaners and historical dry cleaners.
5. **VCP** - Voluntary Cleanup Program sites. The Voluntary Cleanup and Redevelopment Act is intended to permit and encourage voluntary cleanups by providing a method to determine cleanup responsibilities in planning property reuse.
6. **SEMS-Archive -** Superfund Enterprise Management System Archive. Tracks sites with no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015.
7. **RCRA NonGen/NLR -** RCRA- Non-Generators / No Longer Regulated**.**
8. **FINDS -** Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail.
9. **ECHO –** Enforcement & Compliance History Information. Provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.
10. **CORRACTS –** Corrective Action Report. CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.
11. **RCRA-VSQG –** RCRA Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators).
12. **US Brownfields, Brownfield –** Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.
13. **RCRA-TSDF –** RCRA Treatment, Storage, and Disposal.
14. **RCRA –** Resource Conservation and Recovery Act (RCRA) of 1976. Sites that generate, transport, store, treat and/or dispose of hazardous waste.
15. **ICIS -** Integrated Compliance Information System (formerly DOCKETS). ICIS is a case activity tracking and management system for civil, judicial, and administrative federal EPA enforcement cases.
16. **PFAS ECHO** – Per- and polyfluoroalkyl Enforcement & Compliance History Information. Provides integrated compliance and enforcement information for PFAS-regulated sites.

17. **Asbestos –** Asbestos Abatement & Demolition Projects Database with information regarding cleanup conducted by a contractor.