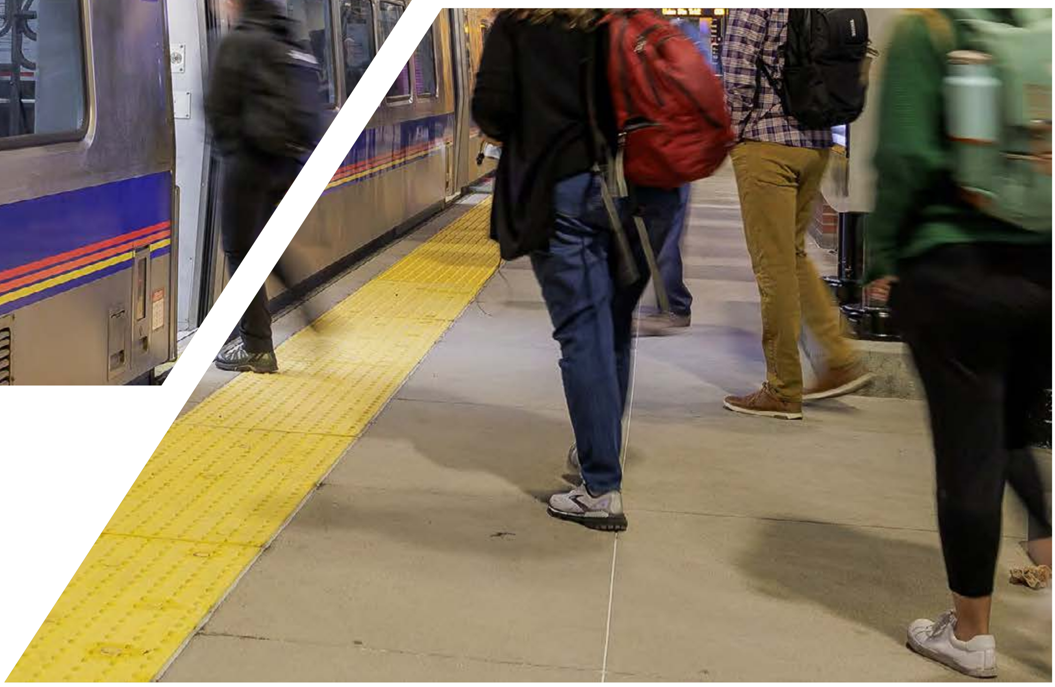
NORTHWEST RAIL PEAK SERVICE FEASIBILITY STUDY



August 2024

CONTENTS

01 WHAT IS NORTHWEST RAIL?

In 2004, Denver area voters approved the FasTracks regional transit system. Since that time, The Regional Transportation District (RTD) has completed much, but not all, of the FasTracks plan. Northwest Rail represents approximately two-thirds of the unfinished mileage from the FasTracks Plan. RTD refers to the four remaining projects as "unfinished corridors" in the FasTracks plan. This study evaluates the feasibility of completing the Northwest Rail Project with a reduced level of service from the original proposal. Previous studies of Northwest Rail identified high costs, low ridership and modest benefits as obstacles to receiving Federal project funding.

The Northwest Rail corridor is a 45-mile corridor from Denver Union Station (DUS) to Longmont. Six miles of Northwest Rail were completed in 2016 and now operate as the B Line between DUS and Westminster Station as seen in **Figure 1**. Due to a lack of sufficient funding, the remaining portion of the corridor has not been completed. Since the passing of FasTracks by voters, RTD has continued to evaluate options for completing the Northwest Rail project. As originally envisioned, RTD has focused primarily on options that would operate on existing BNSF-owned freight tracks. This contrasts with other RTD commuter rail corridors, including the current B Line, which operate on new tracks built exclusively for passenger service. Although this option is lower in cost, operating on the freight railroad system, especially as a continuation of an existing RTD commuter rail corridor, introduces complex operational issues.

The proposed service would use existing freight tracks, which is unique to RTD; however, many commuter rail services operate on freight tracks throughout the country. Another unique aspect to RTD is that this proposal would extend existing passenger service on an electrified rail line to a non-electrified rail line where passenger service is not currently offered. This scenario adds both safety and regulatory challenges in assessing the feasibility of Northwest Rail passenger service.

ABOUT RTD

RTD provides public transportation in the Denver metropolitan area. As a public agency, RTD is dedicated to serving the public and providing for the transportation needs of over 3.08 million people located within 2,342 square miles. Services include bus, rail, shuttles, ADA paratransit services, demand responsive services like FlexRide, special event services, vanpools, and many more.

RTD Mission

We make lives better through connections.

RTD Vision

To be the trusted leader in mobility, delivering excellence and value to our customers and community.

Working with local stakeholders, RTD developed a Peak Service Concept for initial service in the corridor. The Peak Service Concept provides rail service between Longmont and Denver serving six new stations and all existing B Line stations.

RTD engaged extensively with two additional stakeholders in this study: BNSF Railway and the Front Range Passenger Rail District (FRPRD), a new entity created to develop intercity rail along the Front Range. Working closely with BNSF allowed this study to address costs and regulatory requirements. CDOT and FRPRD are concurrently developing an intercity rail plan for service between Fort Collins and Pueblo that will share the same Northwest Corridor between Denver and Longmont. The Peak Service Feasibility Study (the Study) focuses on the Peak Service Concept, while the intercity rail plan has other objectives. RTD and FRPRD have been working closely together on these two separate studies. The information revealed in the Study and intercity rail plan will help inform ongoing discussions for rail service in the corridor and help inform decisions for broader passenger rail service along the Front Range.

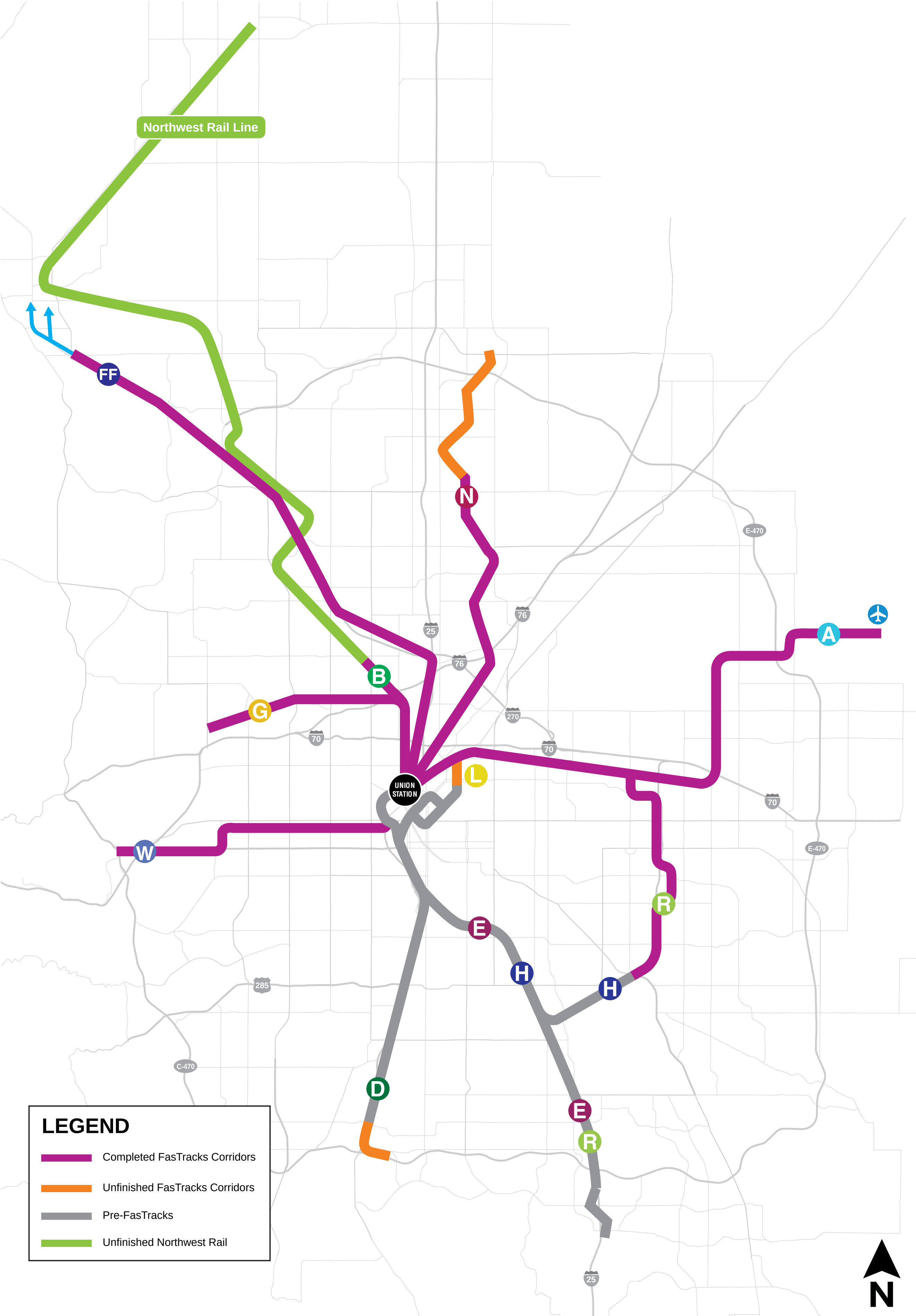
PEAK SERVICE CONCEPT

The Peak Service Concept assessed in this study consists of three southbound morning peak trips from Longmont to Denver Union Station and three northbound trips on the same route during the evening peak period each weekday.

THE STUDY OBJECTIVE

The objective of the Study is to establish a baseline, or Common Set of Facts, that informs the RTD Board of Directors in its decision to provide commuter rail service in the Northwest Corridor.

Figure 1: Regional Location for Northwest Corridor



02 WHAT IS THE PEAK SERVICE FEASIBILITY STUDY?

In 2022, the RTD Board of Directors authorized the Study to respond to stakeholder input on how RTD might complete its 2004 FasTracks Plan by assessing an initial commuter rail service in the Northwest Corridor. The Study advances the concept brought forward from local stakeholders and RTD staff with a specific focus on developing a Common Set of Facts to inform the RTD Board of possible next steps.

The Project Team, composed of RTD staff and a consulting team, engaged local jurisdictions, stakeholders and the public along the corridor to define and resolve key issues, including station configurations and concept designs as well as the impacts that new rail service would have on the local environment and community. The Project Team also engaged with BNSF to identify initial design requirements and address how RTD and BNSF would operate service on the same tracks.

The Peak Service Feasibility Study was completed in five stages, each with a major report:

- **Milestone 1:** Confirm and refine the Peak Service Concept with stakeholders
- **Milestone 2:** Identify local, state, federal, and BNSF requirements for the operation of service (the “Base Configuration”)
- **Milestone 3:** Conduct initial planning and develop preliminary engineering design and costs required to build and operate the Base Configuration service
- **Milestone 4:** Identify likely service expansion scenarios to avoid precluding expanded RTD or FRPRD passenger service
- **Milestone 5:** Identify potential project implementation strategies

What is the Peak Service Concept?

The Project Team began the Study with the basic service concept defined by stakeholders and the Board. The Peak Service Concept is illustrated in **Figure 2**. The next step for the Project Team was to identify corridor challenges, regulatory constraints, infrastructure requirements, fleet options, station site plans, platform configurations, concept designs, costs, benefits, and impacts of providing the service.




Major Challenges and Constraints

- Level boarding at new high platform stations on a freight corridor must match RTD's existing station configuration and meet accessibility requirements.
- The existing BNSF corridor lacks sufficient clearance for overhead electrification, precluding service using RTD's existing fleet.
- RTD must obtain agreement from BNSF on operating conditions and infrastructure required to operate passenger service on tracks shared with freight trains.

Track Improvements

- Tracks must be upgraded to allow for passenger service to operate with a competitive travel time.

Fleet Maintenance and Storage

- A new commuter rail maintenance and storage facility is required near the northern end of the line.
- A layover yard for storing and light maintenance of trains during the midday period is required when they are not in service.

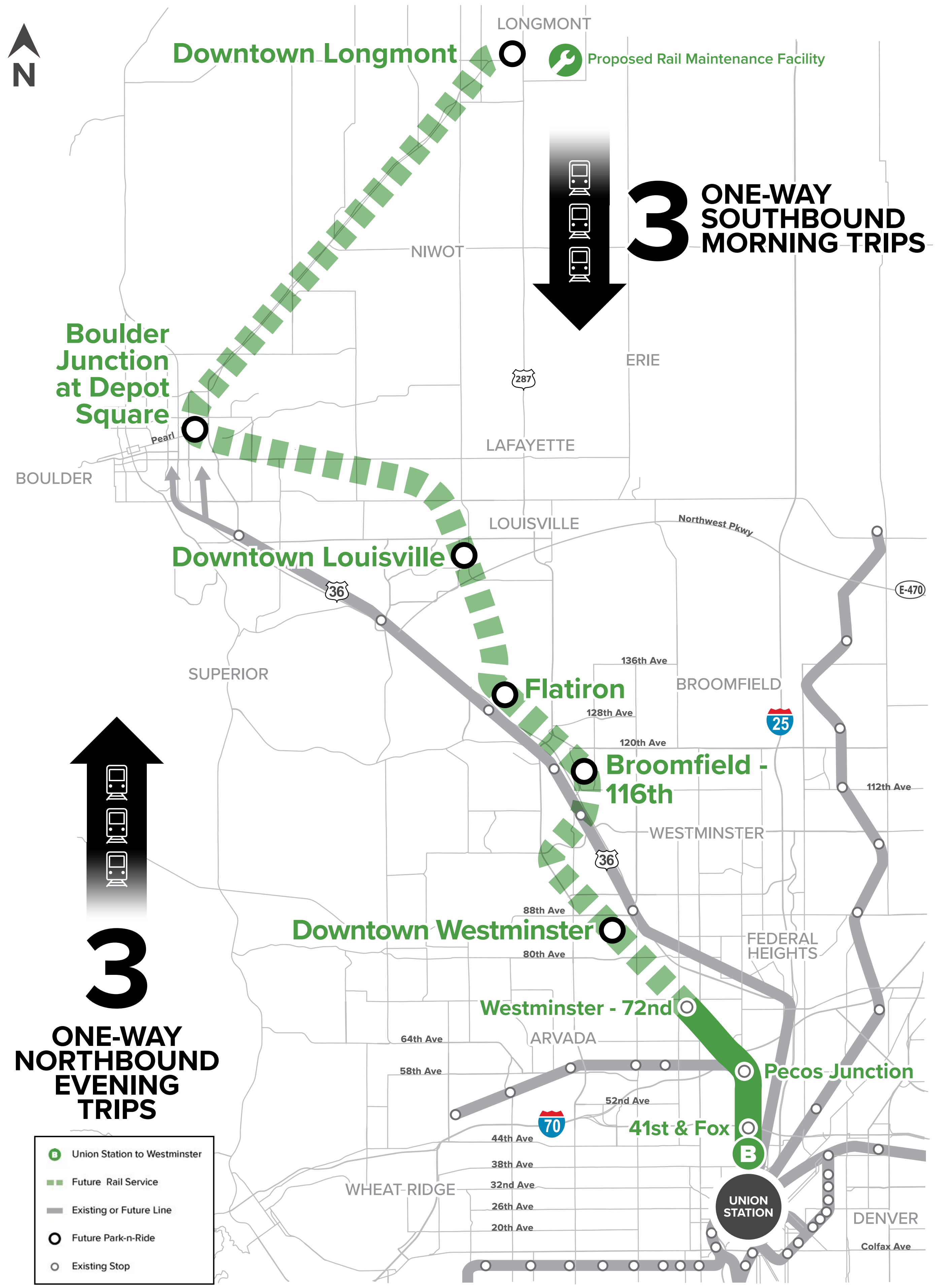
Fleet Requirements

- A train that can operate on both RTD and BNSF territory results in a small fleet size unique to this corridor.
- A high floor train is required for accessibile level boarding at high platforms.
- A commonly available fleet type used by another transit agency is strongly preferred to reduce purchase and long-term maintenance costs.

Station Locations

- The general station locations were established for the Study. The Study Team worked with stakeholders to define the preferred location and configuration of proposed stations.
- The exact location and configuration of stations in Boulder and Louisville will be addressed in future phases to resolve a conflict between planned locations and platform accessibility with BNSF operations.

Figure 2: Peak Service Concept Configuration



What is BNSF's role?

The BNSF Railway owns the tracks within the Northwest Corridor as part of its Front Range Subdivision and operates approximately five daily freight trains on this route. As part of this study, the Study Team and BNSF worked together to identify the requirements to operate passenger service on the freight tracks.

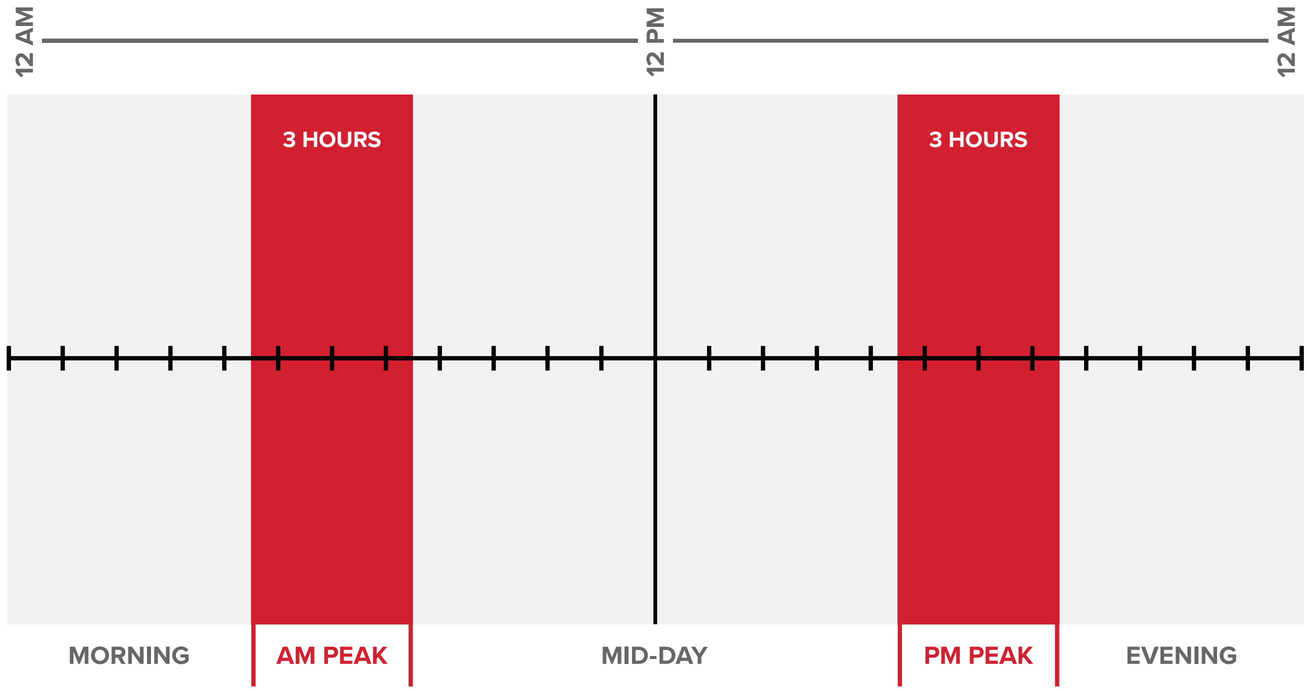
Through this cooperative process between the Study Team and BNSF staff, but subject to approval by higher-level decisionmakers at both RTD and BNSF, general agreement was reached on most major service and infrastructure issues:

- Generalized service schedule, including the number of train trips
- Track improvements and connections, including those improvements required to achieve RTD's travel time goals and sidings to meet BNSF's freight needs
- Station locations and configurations, including station sidings
- Safety, signaling, dispatch, and other operational and regulatory requirements
- General cost of improvements based on preliminary engineering plans
- BNSF to adjust freight operations to be outside of the corridor or on the freight sidings during the peak service time blocks
- The set of agreements required for RTD to provide passenger service on the BNSF corridor
- RTD to provide or contract to a third party other than BNSF for fleet maintenance
- Final service and infrastructure requirements to be negotiated with BNSF if RTD decides to implement Northwest Rail

How would Peak Service operate?

RTD specified 65 minutes, plus or minus two minutes, as the desired travel time between DUS and Longmont to be competitive with private vehicle commute times in the corridor. The three peak period trains would operate on 30-minute intervals and would require just under two hours of dedicated passenger service time to operate in each peak direction on the BNSF portion of the track. For simplicity, RTD identified a three-hour time block during each peak period that would provide operational separation and potentially allow for a modest expansion of passenger service within the time block. **Figure 3** illustrates the time block concept.

Figure 3: Peak Service Time Blocks for Commuter Rail Operations



Although key decisions remain open about which entity will operate and maintain trains, BNSF, as track owner, will provide rail maintenance, communications, train dispatch, and rail-related safety systems within its corridor. RTD's rail operator, Denver Transit Operators (DTO), already provides those functions on the existing B Line, and the transition between the two track sections will require a well-defined procedure as trains move between the BNSF- and DTO-operated portions of the corridor.

03 WHAT IS THE COMMON SET OF FACTS REGARDING IMPLEMENTATION OF THE PEAK SERVICE CONCEPT?

The Common Set of Facts describes the mutual understanding reached in the Study between RTD, BNSF, and local stakeholders on what it would take to implement the Peak Service plan. As the FRPRD intercity rail requirements are identified, the Common Set of Facts will provide foundational information that will inform ongoing coordination between RTD and FRPRD in a potential joint operations scenario.

THE COMMON SET OF FACTS

The Common Set of Facts focuses on five key components to implement the Northwest Rail Peak Service plan:

1. BNSF Requirements
2. Operating Specifications
3. Infrastructure Requirements
4. Ridership
5. Capital and Operating Costs

1. BNSF Requirements

BNSF utilizes a standard set of agreements for transit agencies to operate commuter rail on its tracks. The four fundamental agreements are:

Access Easement

- RTD Acquisition of a long-term or permanent real property interest for track access
- Provides dedicated passenger-only use of the corridor during defined operating time blocks
- One-time RTD capital cost

Track Improvements

- Improvements required to meet commuter rail travel time and speed specifications
- Freight sidings required by BNSF to allow RTD dedicated use of the track during operating time blocks (see example in **Figure 4**)
- Any additional work required to support the track improvements (drainage, bridges, walls, crossings, etc.)
- One-time RTD capital cost

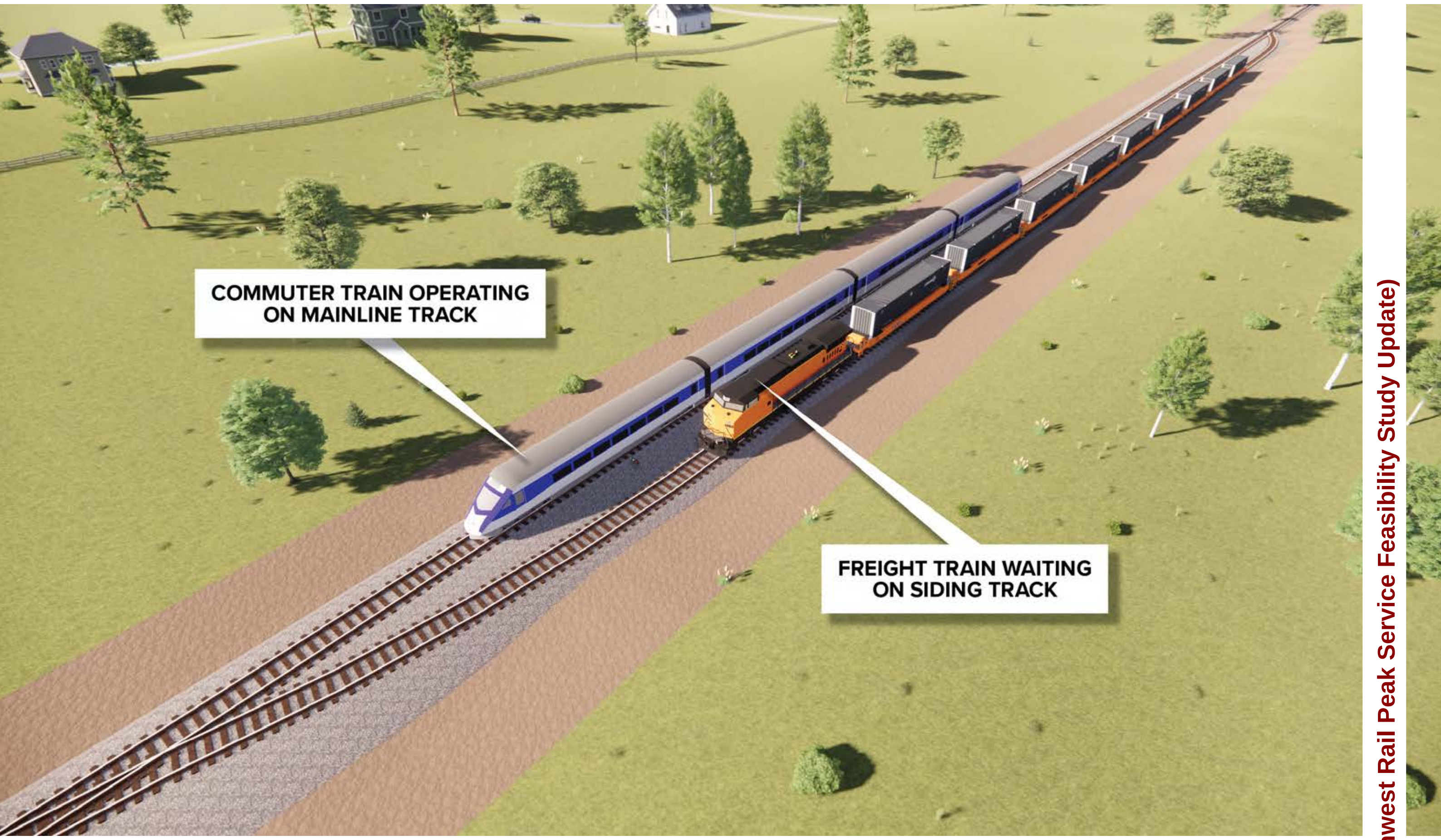
Maintenance of Way

- Defines the allocation of the costs of routine maintenance and asset refurbishment between RTD and BNSF
- Recurring operating cost pro-rated between RTD and BNSF

Dispatch and coordination of train operations

- Dispatch and coordination of train operations to ensure safety, reliability, and operational performance
- Recurring operating cost pro-rated between RTD and BNSF

Figure 4: Example of a freight siding



2. Operating Specifications

BNSF completed train simulation modeling of the Peak Service operating concept and determined the infrastructure improvements necessary to meet both RTD's requirements and its own freight needs.

The route follows the BNSF Front Range Subdivision freight tracks and includes six new stations. The route continues on the existing RTD B Line to serve four existing stations. RTD refined the operating requirements in the following ways throughout the Study:

- **Mid-day storage location requirement:** RTD determined that a location near Westminster/72nd Station was the preferred option for a mid-day storage location.
- **Replacing existing peak period B Line trips:** With the selection of Westminster/72nd mid-day storage location, RTD determined that replacing existing B Line trips with Northwest Rail Peak Service trains during the peak periods would minimize operating conflicts.
- **Travel time specification:** RTD sought to offer competitive travel time and determined that a 65-minute travel time between Longmont and DUS would be achievable. BNSF used this travel time (+/- 2 minutes) as the design basis for track improvements.
- **Operational hand-offs:** Since the Northwest Rail Peak Service will operate partly on BNSF track and partly on RTD track, trains will require a transfer of dispatching and Positive Train Control (PTC) at the BNSF and RTD track connection.

Fleet Characteristics

RTD will require five trainsets consisting of a locomotive, coach, and cab car to operate the service. Three trains will run the service for the day, with one train reserved in case of breakdown and one train undergoing periodic and required maintenance.

RTD evaluated different fleet options and determined that locomotive-hauled trains could operate on both the RTD and BNSF tracks at high platform stations. The Project Team could not identify a Buy America-compliant, high platform compatible, self-propelled train (e.g. diesel multiple unit, or DMU) in current production for lease or purchase.

Locomotive-hauled passenger train configurations are readily available in the market, meet all of the unique needs of the corridor, and are likely compatible with intercity rail service. For these reasons, this fleet configuration formed the basis for the Study cost estimate.

3. Infrastructure Requirements

The Base Configuration includes the infrastructure requirements identified in **Table 1**. BNSF will be responsible for all track-related work, communications and signaling, structures, and drainage. RTD will be responsible for obtaining the fleet, building the rail maintenance and storage facilities and the remaining off-track improvements, including stations and their associated amenities.

Table 1: Infrastructure Improvements Required for Peak Service Plan

Description	Technical Assumptions
Trackway	• Three Freight Sidings required totaling approximately 8.2 miles of new track and switches • Station Sidings for platform level boarding and switches • Mainline track adjustment to allow 65-minute runtime • Upgrades to drainage, bridges, and retaining walls along the alignment • Modifications (varying in type/level of improvement) to 41 roadway crossings along the corridor
Stations	Six new stations will be provided at the following locations: • Downtown Westminster • Broomfield/116th Avenue • Flatiron • Downtown Louisville • Boulder Junction at Depot Square • Downtown Longmont
Support Facilities	• Full-service Rail Maintenance Facility in Longmont • Mid-day Layover Facility located adjacent to the existing Westminster Station (light cleaning, crew check-in, etc.)
Site Work and Special Conditions	• Utility relocation • General site work • Environmental mitigation, including any hazardous waste remediation
Systems	• Positive Train Control (PTC) signaling • Communications Transmission System (CTS) • Other Communications/Supervisory Control and Data Acquisition (SCADA) • Central Control at RTD existing site
Right-of-Way, Relocation	Additional right-of-way required at stations
Vehicles	Five locomotives, five cab cars, and five coaches

Source: HDR; July 2024

4. Ridership

Ridership forecasts were prepared for the year 2030 and found to be consistent with previous forecasts. The 2030 forecast from DRCOG Regional Travel Demand Model (2019) is 1,100 boardings per weekday with the total evenly divided between the morning and the afternoon peak periods. For comparison, the ***Unfinished Corridors Report***; RTD, June 2019, estimated 1,400 boardings per day for 2040.

DRCOG is in the process of updating the regional travel demand model from 2019 to incorporate land use and travel behavior changes. The updated DRCOG model and transit-oriented development planning by communities may further change the future ridership forecast for Northwest Rail. Additionally, Colorado House Bill 24-1313 requires a minimum density near transit-oriented communities intended to expand housing opportunity and transit ridership.

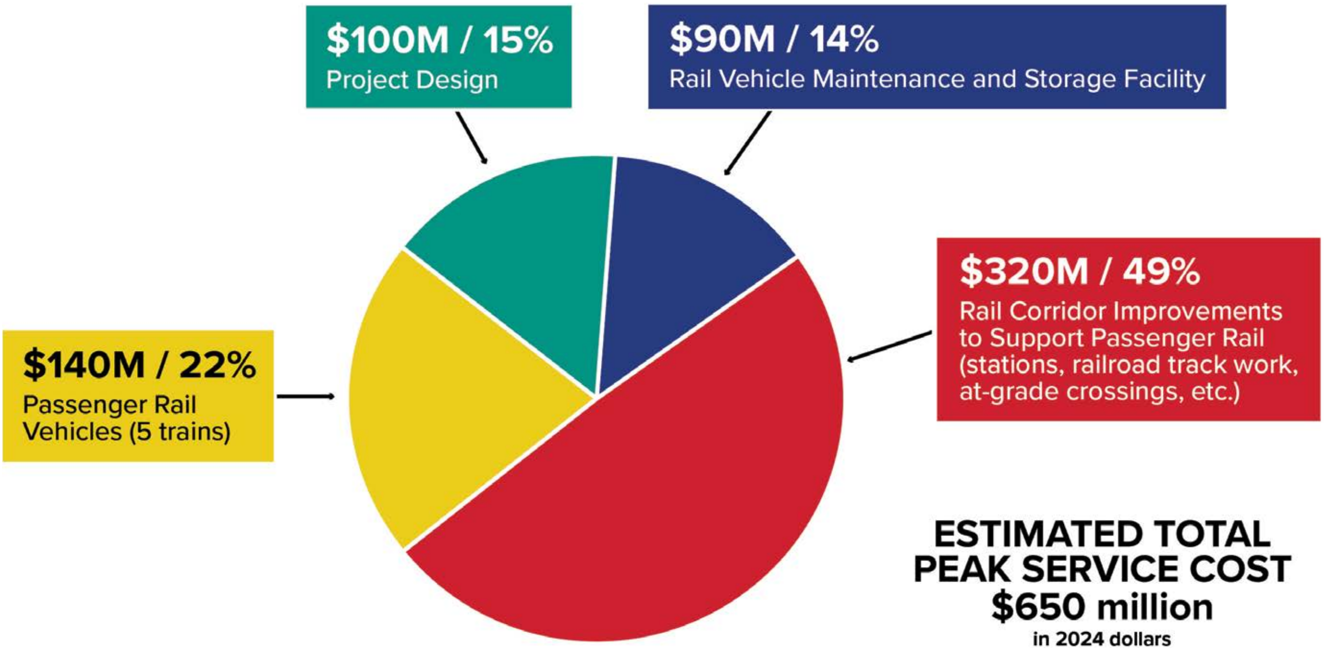
5. Capital and Operating Costs

The total estimated capital cost for the Peak Service Base Configuration is $650 million (in 2024 dollars). The cost for infrastructure improvements required to operate Peak Service in the Base Configuration on the corridor are summarized in **Figure 5**.

Operating costs include train operations, vehicle maintenance, and cost reimbursed to BNSF for train control, dispatch, and track maintenance. Total estimated operating and maintenance costs for Peak Service is $12-16 million (in 2024 dollars) per year.

Both capital and operating costs in this report represent the current snapshot in time in 2024 dollars and are based on RTD's current understanding of the likely terms of its agreement with BNSF. Costs for rail corridor improvements to support passenger rail service are based on 30% engineering plans and cost estimates developed by BNSF. Cost estimates for the Access Easement with BNSF were developed by the Project Team using experience with similar programs where BNSF is the host railroad. Estimates for train control, dispatch, and track maintenance were developed using the FTA's National Transit Database (NTD).

Figure 5: Total Estimated Peak Service Costs



04 WHAT DID WE LEARN FROM STAKEHOLDERS AND PUBLIC ENGAGEMENT?

RTD developed a two-part strategy for seeking input into the feasibility study.

Agency and Stakeholder Engagement

RTD formed a Study Advisory Team (SAT) with members of local agencies along the proposed project corridor, as well as members from regional transportation agencies and public interest organizations. The SAT supported the overall direction of the Study and gave RTD both general and technical feedback. Several of the SAT members were involved in earlier studies of commuter rail in the corridor, giving them an important historical perspective, background, and understanding of the project.

Proposed station design concepts incorporate improvements the cities have made to station area roadways, corridor grade crossings, and active transportation connections since the passage of FasTracks. **Figure 6** illustrates the various engagement activities during the Study.

Public Engagement

Over the approximately two-year Peak Service Study, there were two primary public engagement periods:

- **Study Understanding (January and February 2023):** Two in-person open house public meetings and an online self-guided online meeting.
- **Confirmation of Base Configuration (November and December 2023):** Two in-person open house public meetings and an online self-guided online meeting.

Takeaways from these outreach periods

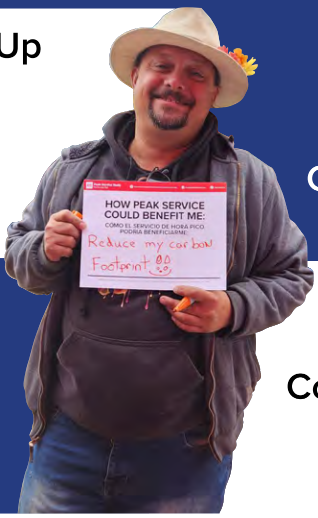
- Desire for a reverse commute
- Potential Partnerships with FRPR
- Potential for infill stations
- Lack of service for customers with non-traditional commute times
- Interest in transit-oriented development "growth" around stations
- What the next steps or outcomes would be if peak service is deemed "cost prohibitive"
- Appreciation that RTD is working to fulfill the FasTracks commitments
- Need for integrated service options to help with first- and last-mile connections
- Benefits of Peak Service: Avoid traffic, be productive during commute (read, work, rest, etc.), reduce vehicle emissions
- Freight siding-track concerns: Noise and air quality, idling, derailing, neighborhood interference

The majority of participants were in favor of peak service and are ready to see it implemented.

Figure 6: Public Engagement At-A-Glance

IN-PERSON ENGAGEMENT

14 Local Pop-Up Events



2 Board Committee Updates

1 Full Board Update

4 Corridor-Wide Open House Events

Monthly Study Advisory Team Meetings

Recurring One-on-One Concept Design Meetings with Stakeholders

195 Public Open House Attendees

DIGITAL ENGAGEMENT

1,120 Email Sign-Ups and Comments

3,839 Online Meeting Engaged Sessions

9,309 Self-Guided Online Meeting Views

15,184 Total RTD Project Website Views (April 2022 – Aug 2024)

919 Survey Responses

05 HOW IS PEAK SERVICE DIFFERENT FROM THE FRONT RANGE PASSENGER RAIL PROPOSAL?

In 2019, the State of Colorado delegated to CDOT the responsibility to plan an intercity passenger rail service along the Front Range between Fort Collins and Pueblo. This work led to the formation of the FRPRD in 2022, just before RTD began this Study.

The Differences Between Commuter and Intercity Rail

Throughout the US, commuter and intercity rail services operate on the same tracks.

Commuter Rail		Inter-City Rail
Serves one metropolitan area connecting suburbs to an urban core.		Connects cities across the state.
2-4 Miles	**Station Distance**	20-30+ Miles
35-45 Miles Per Hour	**Average Speed**	45-55+ Miles Per Hour*
20-75 Miles	**Service length**	50-300+ Miles / < 750 Miles

* Average running speed between stops is 65-90 Miles Per Hour

CDOT began planning for intercity rail under the federal process in early 2022 and expects to complete its intercity rail plan at the end of 2024. The RTD and CDOT studies will provide the requirements for each respective service and inform the next steps toward implementation of broader passenger rail on the Northwest Corridor. CDOT's study includes:

- An analysis of alternative routes, fleet type, and service options
- Conceptual design to permit definition of station areas, track improvements, environmental screening and cost estimates
- Travel forecasts, rail operations planning, and a financial plan
- Ongoing public engagement

Front Range Passenger Rail has been approved for federal funding to support the CDOT study, which is a required step toward being eligible for federal project funding.

The CDOT study identified the BNSF Front Range subdivision as the preferred route for service between Denver and Fort Collins, creating a shared corridor with RTD between Denver and Longmont. As soon as the preferred route was identified, FRPRD and RTD began cooperating to determine how the two services could operate together. **Figure 7** shows the potential for the overlay of the two services with several shared stations.

Figure 7: Commuter and Intercity Rail in the Same Corridor

Opportunities between Northwest Rail Peak Service and FRPR Passenger Rail – Economies of scale are possible:

- Probable joint operational efficiencies
- Potential synergies arising from a common fleet type
- Possible to share and reduce operations and maintenance costs
- Potential to share track improvement costs
- Potential to share in cost of safety systems and crossing upgrades

Legend

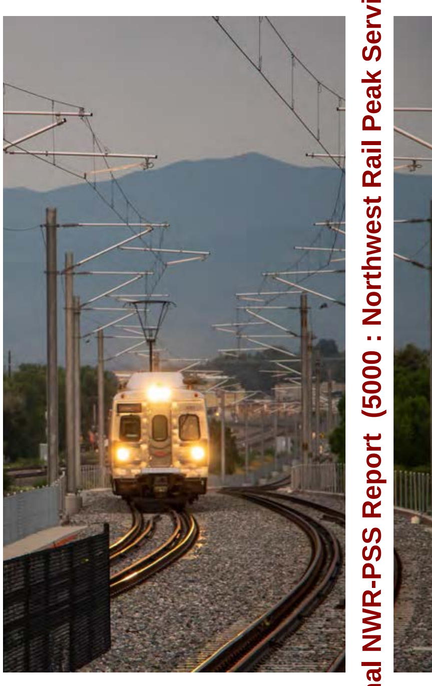
- FRPR Rail Line
- Northwest Rail Line
- FRPR Station
- FRPR and Northwest Shared Station
- Northwest Rail Rail Only Station

06 HOW WOULD RTD PROCEED WITH PROJECT DEVELOPMENT AND IMPLEMENTATION?

While the purpose of the Study was to identify the facts associated with an RTD peak service operation, the Project Team identified a potential opportunity for RTD and FRPRD to coordinate efforts for a rail solution in the Northwest area. Consistent with the FasTracks plan, RTD could deliver the peak service on its own. RTD could continue to explore the emerging opportunity to deliver the project in partnership with FRPRD.

RTD FasTracks Implementation with Commuter Rail Peak Service Only

RTD does not currently have sufficient funding to implement Peak Service with an expected capital cost for the Peak Service plan of $650 million. The findings of the Study reinforce the prior corridor studies and the 2019 ***FasTracks Unfinished Corridors Report.*** RTD has estimated a completion date for Northwest Rail between 2042 and 2048 based on its financial forecast. RTD should continue to monitor federal grant programs for potential funding of the project while continuing to work with BNSF to maintain the possibility to use the corridor for passenger service. Demonstrating a strong, integrated program with FRPRD and other local partners enhances the probability of being awarded grant funding. RTD will collaborate with the statewide effort to advance the statewide effort to advance passenger rail service and coordinate the Peak Service Concept with that process.



Joint Implementation of RTD Commuter Rail and Intercity Passenger Rail

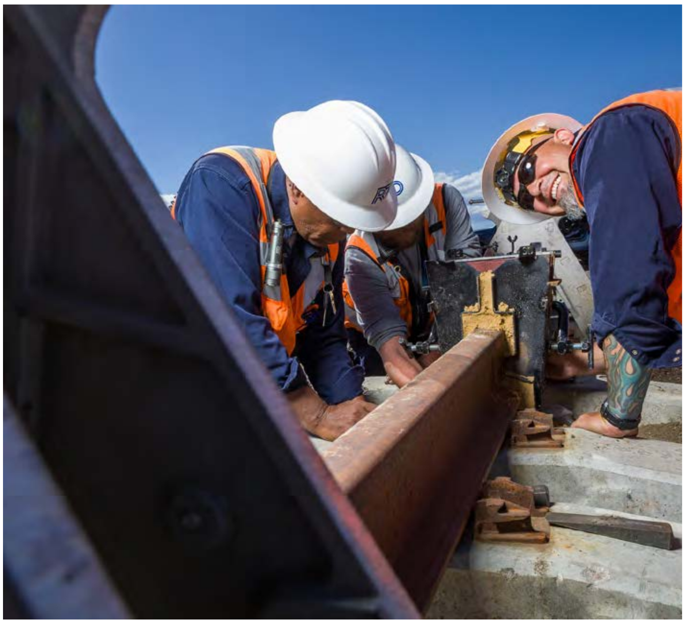
Legislation passed in 2024 requires RTD and FRPRD to work together to determine how the two programs could be delivered together. Completion of the RTD and CDOT studies would enable RTD and FRPRD to develop a combined approach for improving infrastructure on the corridor and provide service, either jointly or separately, while sharing the common infrastructure. Included in that effort would be an allocation of costs and responsibilities. Opportunities to share economies of scale could be realized between RTD and FRPRD that include joint operational efficiencies, shared fleet, and shared improvement costs. It is reasonable to expect that cost sharing of common elements would result in a lower cost for each agency.

Would Peak Service be Eligible for Federal Funding Through Bipartisan Infrastructure Law (BIL)?

Commuter and intercity passenger rail programs are eligible for federal grant awards, but the application process would require coordination with local partners, including BNSF. Depending upon the type of discretionary grant that would be pursued, RTD may be competitive to receive some federal funding.

Originally, the FasTracks Northwest Rail project considered the possibility of using federal funds from the FTA Capital Investment Grant (CIG) program in addition to RTD FasTracks funds. The discretionary award of CIG funding requires the project to be cost-effective compared to other projects in the country; the key measure is “total cost per new rider”. The calculations for the Northwest Rail project showed that the project would be far below the threshold of consideration for CIG funding.

Recently, however, the current BIL program began offering several funding programs some of which the Northwest Rail Peak Service would qualify. These programs are project-specific as opposed to the CIG program that covers the entire investment. One approach would be using a more targeted process focused on individual elements that could be assembled. The BIL is entering its fourth year of the five-year program where awarded funding and balances are narrowing for remaining available dollars. With development of a funding and implementation plan, a systematic approach could result in the award of some grants for specific improvements. Major funding for all or most of the Peak Service Plan is not likely. The BIL contains more funding for intercity rail than commuter rail; a partnership with FRPRD could leverage more federal funds for both projects.



CONCLUSION

The Northwest Rail Peak Service Study defines the infrastructure required to operate the Peak Service Concept – the Base Configuration – and allowed the Project Team to develop a Common Set of Facts to inform future RTD Board decisions about providing commuter rail between Longmont and Denver. The Common Set of Facts addresses capital costs, operating and maintenance costs, and ridership required to operate the Peak Service Concept, but any decision on project feasibility rests with the RTD Board.

Since 2004 it has been RTD's sole responsibility to plan, finance, and deliver commuter rail between Longmont and Denver. Early in the Study, the State of Colorado began evaluating .intercity passenger rail between Fort Collins and Pueblo that overlaps RTD's planned Northwest Rail route creating the possibility for a joint passenger service. RTD and its partner agencies, FRPRD and CDOT, began evaluating coordination opportunities while completing the separate studies for commuter and intercity rail. The intercity rail study for the Front Range corridor is currently in progress, but there is an opportunity for coordinated rail service.

Before implementation of Northwest Rail Peak Service, RTD staff will need to work with Northwest area stakeholders to identify:

- Final locations and design configurations for stations in Louisville and Boulder
- Financial plan and strategy to implement the Peak Service Concept by RTD alone or jointly with intercity rail
- Changes in BNSF operations that may reduce the feasibility of passenger rail in the corridor
- Potential cost allocation between commuter rail and intercity rail to leverage cost efficiencies for joint construction, operations, fleet, and maintenance

The Northwest Rail Peak Service Study and FRPRD's intercity rail plan will form the foundation for a potential joint path forward. The intercity rail plan presents a new opportunity for RTD to work with state and regional partners to deliver passenger rail service to the Northwest area communities earlier than RTD could complete the Northwest Rail Peak Service without partners.

DEFINITIONS

Buy America: USDOT requirement that Federal agencies and the funding they provide be used to procure domestic materials and products; two conditions must be present for the Buy American Act to apply: (1) the procurement must be intended for public use within the United States; and (2) the items to be procured or the materials from which they are manufactured must be present in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

Front Range Passenger Rail (FRPR): Intercity passenger rail proposal to connect Fort Collins with Pueblo along existing and new railway alignments

Front Range Passenger Rail District (FRPRD): Agency established by the Colorado Legislature in 2021 incorporating 13 counties, charged with the Study and possible implementation of passenger rail service along the Front Range of the state, connecting the cities of Fort Collins south to Pueblo

Peak Service Concept: Consists of three southbound morning peak trips from Longmont to Denver's Union Station and three northbound trips on the same route during the evening peak period

Peak Service Study (Study): Evaluates the feasibility of completing the Northwest Rail Project with a reduced level of service from the original proposal to establish a baseline, or Common Set of Facts, that informs RTD Board of Directors in its decision to provide commuter rail service in the Northwest Corridor

Project Team: The Project Team was composed of RTD study staff members and the HDR consulting team consisting of HDR as the prime consultant, AECOM in engineering and station design, Peak Consulting in environmental/cost/implementation support, Triunity Engineering in cost estimates/safety and security/PTC and communications; CDR Associates in coordination with the Study Advisory Team, ZANN Associates supporting public engagement; and, SurvWest for ground control surveying and aerial mapping.

RTD Board of Directors (Board): The currently seated Board of Directors that directed RTD staff to evaluate the Peak Service Concept

Service Concept: The commuter rail train service proposed to operate in the morning and evening weekday peak periods as directed by the RTD Board that forms the Base Configuration

Study Advisory Team (SAT): Corridor agencies and jurisdictions to meet frequently (approximately monthly) to provide input, comment and suggested direction regarding study findings and results; composed of Arvada, Broomfield, Boulder, Boulder County, Longmont, Louisville, Westminster, CDOT, FRPRD, DRCOG, Commuting Solutions, Boulder Transportation Coalition.

Time block: A specific window(s) of time in the day to be purchased from BNSF reserved for commuter rail service that provides operational separation between the commuter rail passenger train service and freight train service.

APPENDICES

Milestone 1:
Peak Service Concept Technical Report

Milestone 2:
Corridor Conditions Report

Milestone 3:
Base Configuration Confirmation Report

Milestone 4:
Peak Service Expansion Concepts Technical Report

Milestone 5:
Project Delivery and Implementation Concepts Technical Report

Peak Service Study
Northwest Rail

We make lives better through connections.

Milestone 1: Peak Service Concept Technical Report

August 27, 2024

Contents

Figures

Acronyms & Abbreviations

ADA	Americans with Disabilities Act
BEMU	Battery-Electric multiple unit
CAPEX	capital costs
DMU	diesel multiple unit
DTO	Denver Transit Operators
EE	Environmental Evaluation
EMU	electric multiple unit
FRA	Federal Railroad Administration
FRPR	Front Range Passenger Rail
FTA	Federal Transit Administration’s
GDP	gross domestic product
NWR	Northwest Rail
O&M	Operations and Maintenance
OCS	overhead catenary system
OPEX	operating costs
RMF	Rail Maintenance Facility
RTD	Regional Transportation District
SCC	Standard Cost Categories
TOD	Transit oriented development

Introduction

Background and Purpose of Report

RTD is conducting the Northwest Rail Peak Service Study (Study) for a 39-mile extension of the B Line commuter rail service along the existing BNSF Railway tracks 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 the requirements to provide commuter rail passenger service during the peak periods consisting of three weekday morning trips from Longmont to Denver and three weekday evening trips from Denver to Longmont.

The Peak Service Feasibility Study will be conducted in five stages, each with a major report:

- **Milestone 1:** Confirm and refine the Peak Service Concept with stakeholders
- **Milestone 2:** Identify local, state, federal, and BNSF requirements for the operation of service (the "Base Configuration")
- **Milestone 3:** Conduct initial planning and develop preliminary engineering design and costs required to build and operate the Base Configuration service
- **Milestone 4:** Identify likely service expansion scenarios to avoid precluding expanded RTD or FRPRD passenger service
- **Milestone 5:** Identify potential project implementation concepts

This report contains the work completed to accomplish Milestone 1. This report is a compilation of the following:

- Past Planning and Alternatives Methodology
- Purpose of the Project and Project Goals
- Local Jurisdiction Plans and Commitments - Study Advisory Team Workshop

Peak Service Study
Northwest Rail

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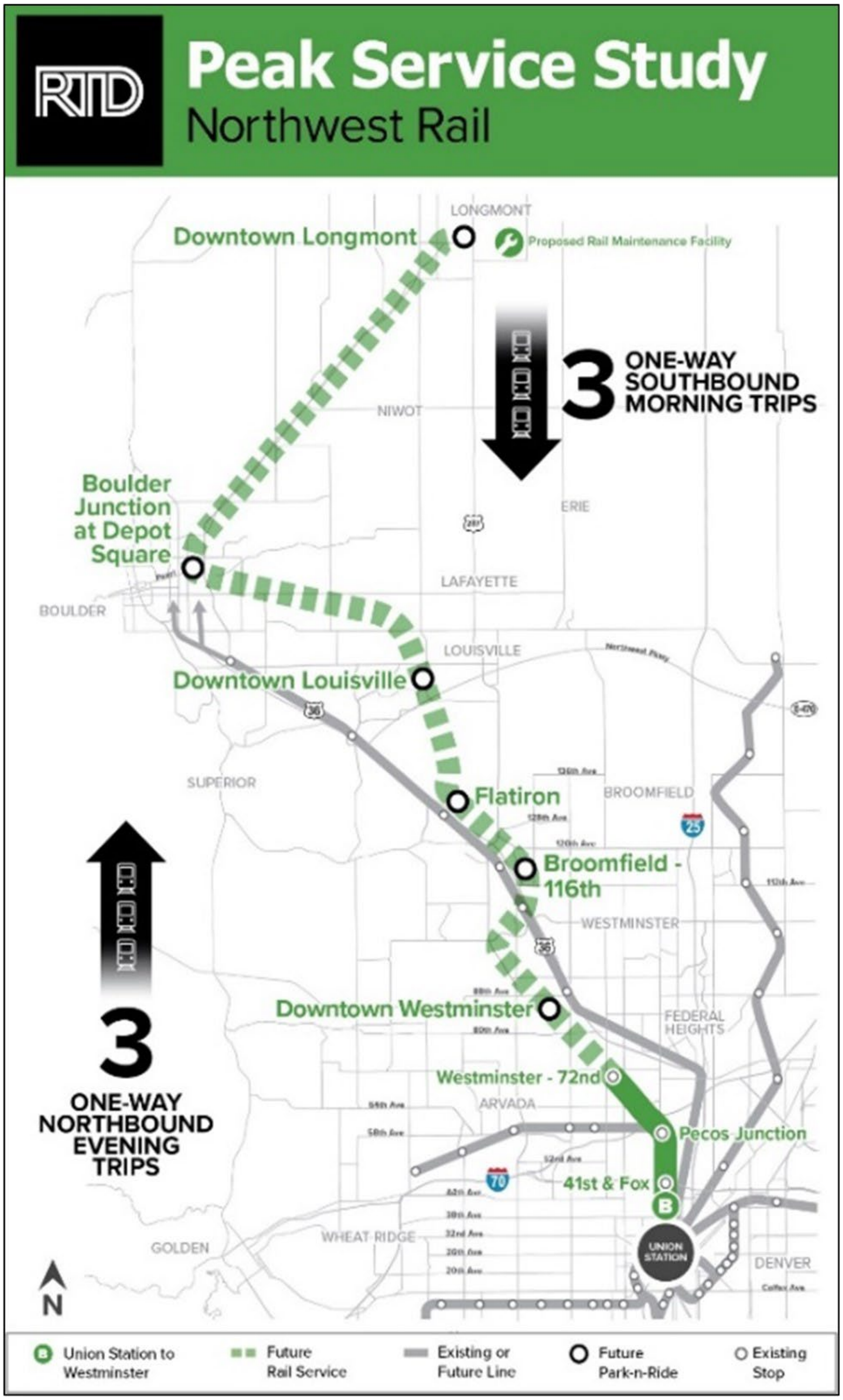
Figure 1. Peak Service Concept



Milestone 1

Peak Service Concept Technical Report

Appendix

Project Definition Memoranda

- Past Planning and Alternatives Methodology
- Purpose of the Project and Project Goals
- Workshop Summary (SAT)

Memorandum

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Peak Service Study
Northwest Rail

To: HDR and RTD

From: Peak Consulting Group

Date: September 19, 2022; Updated November 4, 2022

Re: **Past Planning and Alternatives Methodology**

Introduction and Purpose

The RTD Board directed staff to conduct the Northwest Rail Peak Service Study (Study) to analyze various factors for implementing Northwest Rail. As summarized in Figure 1, planning studies for the Northwest Rail Corridor have been conducted over the past two decades, and RTD has continued efforts to enable Northwest Rail development.

Figure 1. Timeline of Northwest Rail Corridor Past Planning Studies

2001: US 36 Major Investment Study (MIS)
This study, conducted from 1998-2001, was the first major planning consideration of commuter rail between Denver and Boulder along the BNSF Railway in the US 36 Corridor.

2004: RTD's FasTracks Initiative
Identified the BNSF Railway in the US 36 Corridor as one of RTD's priorities for commuter rail service; committed to funding new and upgraded tracks, new stations, and rail extension to Longmont.

2005-2006: Longmont Diagonal Rail Feasibility Study and Environmental Evaluation (EE)
Determined that Longmont extension of the proposed commuter rail along US 36 was feasible and would generate ridership; recommended locations for intermediate and end-of-line stations.

2009: US 36 Corridor Environmental Impact Statement (EIS)
Identified the US 36 Corridor as one of RTD's priorities for commuter rail service, committed to funding new and upgraded tracks, new stations, and rail extension to Longmont. Ultimately, the commuter rail service concept was removed from study in the EIS and combined with the Boulder-Longmont extension into one - Northwest Rail - to be studied separately from the highway improvements planned for US 36.

2010: Northwest Rail Corridor Environmental Evaluation (EE)
Evaluated eight rail alternatives for the NWR line and recommended double-tracking from Denver to Longmont within BNSF Railway right of way using diesel technology; proposed full-service with 55 trains per day, and operational plans for 2015 and 2035.

2013: Northwest Area Mobility Study (NAMS)
Studied best mobility improvement options for RTD's northwest service area, including feasibility of phased implementation for NWR and providing arterial bus rapid transit; recommended that RTD see full-service NWR as a long-term goal while focusing on improvements that will show more benefits in the near-term; encouraged consideration of alternative starter service operations for NWR.

2017: Northwest Rail Peak Service Plan
Released modeling and outlined several options for a NWR Peak Service Plan as a starter service for the rail; options included between six to ten one-way daily trips at peak periods (6:00-9:30AM, 2:30-7:00PM); recommended current proposed service option (Option 1A).

2021: Northwest Rail Peak Service Study
RTD Board directs staff to consult with local communities and stakeholders and solidify NWRL Peak Period Service scope, impacts, and costs.

This memorandum provides background for the Study's peak service rail concept and preferred design option, including its service and operational characteristics. This memorandum details past planning studies of the FasTracks Northwest Rail Corridor that have led to the need for the current Study.

I. Alignment

The Northwest Rail Corridor was originally studied in a *US 36 Major Investment Study* (MIS) (2001), which recommended a set of multimodal transportation improvements along the US 36 Corridor, including extension of lanes, implementation of Bus Rapid Transit (BRT) service with on-line stations, widened portions of US 36, a bikeway along US 36, upgrades to existing rail track, and construction of a new rail track along railroad right of way to support commuter rail. Subsequent planning by RTD and communities resulted in a recommendation to extend the commuter rail line to the City of Longmont along BNSF right of way.

In November 2004, voters in the Denver area voted to approve RTD's *FasTracks Plan* (2004) through a sales tax increase. This initiative was proposed as a twelve-year comprehensive plan to construct and operate new rail lines and improve elements of BRT, bus service, and Park-n-Rides, increasing transportation options and connectivity throughout the rapidly growing Denver metro region. In addition to these direct transportation and mobility improvements, the initiative pursued goals to provide broad-reaching benefits to economic growth and environmental quality. As proposed in 2004, FasTracks identified nine conceptual corridors including 119 miles of rail and 18 miles of BRT construction. One such corridor was the US 36 Corridor, now known as the Northwest Rail Corridor.

The FasTracks initiative committed to fund the recommendations from the US 36 MIS, including upgrades to existing tracks, construction of a new adjacent track for commuter rail to Boulder, extension of the commuter rail line to Longmont in a single-track configuration, and the addition of seven new rail stations.

The feasibility of extending the rail alignment beyond the Denver-Boulder US 36 Corridor was evaluated in two studies, the *Longmont Diagonal Rail Feasibility Study* (2005), and the *Longmont Diagonal Rail Final Environmental Evaluation* (2006), both of which found the proposed Longmont extension from Boulder feasible and recommended locations for an intermediate station in Gunbarrel and an end-of-line station in downtown Longmont. In 2006, RTD combined the commuter rail portions of the US 36 Corridor and the Boulder-Longmont Corridor into one – Northwest Rail – to be studied and implemented separately from the highway improvements planned for US 36.

RTD issued a *Northwest Rail Corridor Final Environmental Evaluation* (NWR EE) in 2010, which evaluated eight alternatives for the commuter rail service, including single and double track options, options within and outside of BNSF Railway 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 the project team to a single preferred design option: A double-track rail from Union Station in downtown Denver to downtown Longmont on existing BNSF Railway right of way. This was found to be the most viable option for commuter rail in RTD's northwest service area, as other options had characteristics that failed to meet the project's stated purpose and needs of providing consistent and reliable travel times or providing an affordable transit investment. Since the release of the NWR EE in 2010, the proposed alignment of the NWR line has remained consistent and supported by regional stakeholders.

In 2016, RTD completed the construction of the first segment of the NWR line and the Westminster Station at 71st Avenue as part of its FasTracks *Eagle P3* Project. This 6.2-mile segment currently operates as RTD's B Line from Union Station to Westminster Station. RTD has since added two station stops between Denver and Westminster, at Pecos Junction and 41st Avenue and Fox Street in Denver, as part of RTD's Gold Line service.

II. Stations

Previous planning studies have considered a wide range of locations for stations to support the 41-mile NWR line. RTD's 2004 *FasTracks Plan* built off recommendations from the 2001 US 36 MIS to propose seven total stations along the corridor, including Union Station. The US 36 EIS then used modeling projections, community plans, discussions with local jurisdictions, public input, and assessment of impacts to appropriately evaluate candidate station locations and develop conceptual design plans. In the 2010 NWR EE, the preferred alternative included eleven stations between Denver and Longmont, located at:

- South Westminster - 71st Avenue
- **Westminster - 88th Avenue**
- Walnut Creek
- **Broomfield - 116th Avenue**
- Flatiron
- Downtown Louisville
- **East Boulder**
- Boulder Transit Village
- Gunbarrel
- **Twin Peaks**
- Downtown Longmont

Four of the eleven stations (indicated in bold) were identified as candidate station locations during the public and agency involvement component of the 2009 US 36 EIS prior to the decision to study BRT and commuter rail separately. These stations were not included in the FasTracks funding commitments but were included in the evaluation in case funding sources outside of FasTracks became available.

2035 station boarding projections from the EE identified Westminster/71st Avenue, Westminster/88th Avenue, Boulder Transit Village, and Downtown Longmont as the stations forecasted to generate the highest average weekday ridership activity in the Corridor. When ridership from special events was considered, the analysis suggested that the Broomfield - 116th Station had potential to generate substantial special event ridership due to its proximity to the 1st Bank Events Center (the largest event space in the Corridor). Conceptual site layouts for each of the stations carried forward were provided in the EE document.

In 2013, RTD conducted the *Northwest Area Mobility Study* (NAMS), 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 RTD's NWR service area. The study evaluated transit options in the northwest area, including the feasibility of extending RTD's North Metro Rail Line to Longmont, adding new and confirming existing plans for BRT lines, as well as service, operational, construction, and phasing options for a full-service NWR with nine stations along the Corridor.

Recently, RTD has recommended six stations between Westminster and Downtown Longmont to support its *Peak Service Plan* (2017). This brings the total proposed stations for the NWR Peak Service Plan to ten stations: Four stations already in service at Union Station, 41st & Fox, Pecos Junction, and Westminster; Downtown Westminster; Broomfield - 116th (partially constructed and in operation with BRT); Flatiron (partially constructed and in operation with BRT and Park-n-Ride services); Downtown Louisville; Boulder Junction at Depot Square (partially constructed and in service with local routes); and Downtown Longmont. All stations would include bus drop-off lanes, multimodal connections, and parking areas for Park-n-Rides that serve NWR, bus service, and BRT. In June 2021, RTD confirmed these station locations with local jurisdictions.

III. Operations

A conceptual operating plan for the NWR service was first established in the 2010 NWR EE, which envisioned opening day service in 2015 with 30-minute peak-period service and 60-minute off-peak period service between Denver and Longmont. By 2035, the service would run in 15-minute intervals between Denver and Boulder and 30-minute intervals between Boulder and Longmont during peak morning and evening commuting periods and 30-minute intervals at most other times. The peak periods were identified as weekday mornings from 6:00 AM-9:30 AM and weekday evenings from 2:30 PM-7:00 PM.

The 2013 NAMS also assumed the rail would begin opening day service with both peak and off-peak service plans. Operational assumptions from this study were 55 one-way trips during the week at the same 30-minute peak period and 60-minute off-peak period intervals identified in the EE, and 36 one-way trips on the weekends, no more than hourly. As part of the NAMS process, BNSF provided cost estimates for this service plan, as well as a less frequent operating service that would run nine one-way trips in both the morning and afternoon peaks. The NAMS report identified several issues with the full-service operation plan, including BNSF cost estimates that were higher than anticipated by RTD, insufficient FasTrack funds, low ridership projections, BNSF's infrastructure conditions, and other challenges within the Corridor. Given the difficulties and timing of implementing full-service operations, the report recommended that RTD consider the completion of NWR as a long-term goal, while emphasizing near-term improvements, such as bus and arterial BRT expansion, with mobility benefits that would be seen sooner for northwest area stakeholders.

From 2013-2016, RTD considered options for feasibly advancing the project in the near-term by implementing a partial level of NWR service. RTD's *Peak Service Plan,* proposed in 2017, would provide three one-way trips from Downtown Longmont to Union Station on weekday mornings, and three one-way trips from Union Station to Downtown Longmont on weekday evenings. RTD determined that it would be feasible to implement NWR Peak Service and allow for future full-service build-out of NWR, while capitalizing 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.

Implementation/Phasing

Since the EE, RTD explored alternative implementation strategies to phase NWR implementation and address funding constraints. The 2013 NAMS Report first considered phased implementation by constructing the rail line and stations in five distinct segments. Phase 1, from Union Station to Westminster Station, was completed in 2016 as the first section of RTD's B Line during the *Eagle P3* Project. The remaining four phases would include construction of rail segments between proposed stations as well as the stations themselves.

While segmented implementation is not being considered for peak service, the peak period rail concept would be developed to not preclude expanded service in the future as ridership and demand warrant. If higher levels of service are proposed in the future, RTD will draw on examples of rail services around the country that have shown success with phased build out approaches, such as Sound Transit's "Sounder" commuter rail between Tacoma and Seattle; the combined service of Amtrak's Pacific Surfliner, the LAMTA Metrolink, and the SANDAG Coaster commuter rail in Southern California; the regionwide Metra commuter rail system in Chicago; and Colorado's own Winter Park Express ski train. RTD also plans to monitor the progression of Colorado's Front Range Passenger Rail project, with goals to collaborate with the service as either part of base peak period or expanded service.

Technology

The existing 6.2-mile Phase 1 segment of the NWR line is operated with electric multiple unit (EMU) technology. While the NWR EE evaluated the feasibility of electrification for the remaining phases of the NWR Line, it was found that there would be numerous issues with an extension of EMU technology, including highly increased costs and longer construction times required for implementing electric rail in BNSF's right of way. In addition, because BNSF Railway operates double-stack and possible triple-stack container trains on this line, overhead electrical lines are not permitted where the tracks would be shared. Therefore, in 2010, RTD proposed that the remaining 35.3 miles of rail operate using diesel multiple unit (DMU) technology. The potential partnership with Front Range Passenger Rail likely reinforces that DMU technology is more feasible for the longer-distance routes, especially shared freight corridor routes. While DMU remains the strong candidate, RTD will consider a range of technologies, including hydrogen and battery electric.

Maintenance

The NWR service would require a new rail maintenance facility (RMF) for storage, service, and maintenance of the new trainsets. RTD recently constructed the FasTracks Commuter Rail Maintenance Facility near the junction of I-70 and I-25, but this facility was designed to serve EMU operating cars and would require expansion or modification to accommodate a DMU fleet. The current site is also fully built out. While the Commuter Rail Maintenance Facility could potentially provide daytime storage or maintenance, the preferred design option from the 2017 Peak Service Plan would ultimately require NWR trains to be stored overnight at a new DMU RMF, where they can be serviced and stored between evening and morning peak periods. Prior to recent service refinements, the 2013 NAMS Report recommended an RMF to be located near the Broomfield - 116th Station between US 36 and BNSF tracks on a parcel of land which the City of Westminster offered to donate to RTD for this purpose. RTD is now considering various RMF locations for maintenance and train storage in Longmont.

Ridership and Service Options

The 2004 FasTracks Plan conducted ridership projections for the entire FasTracks system, including Northwest Rail. The 2010 NWR EE subsequently conducted ridership projections based on operational assumptions of 15-minute train intervals for the Denver to Boulder segment and 30-minute intervals for the Boulder to Longmont segment in the morning and evening peak periods and 30-minute intervals at most other times. Ridership projections under these operations estimated average weekday rail ridership of 8,400 riders per day with the FasTracks-only stations and 12,100 with all stations in the year 2035. Stakeholders requested a sensitivity analysis and revised distribution of ridership projections during the 2013 NAMS. These projections forecast between 9,300 and 10,700 trips per day in 2035.

Both the 2010 EE and 2013 NAMS noted that operations would need to be optimized to minimize operational costs and maximize ridership. Due to this goal, the studies suggested that reducing train frequencies would be the most likely operational change to be considered as the project progressed. Projections from both studies represent residents of the northwest area would utilize the NWR service, but ridership levels may not justify the high cost of a full-service build out of NWR.

RTD's most recent operations plan, the 2017 *Peak Service Plan*, considered several rail service options that would operate only during morning and evening weekday peak periods when regional commuter travel is highest. Options included one-way only trips and bi-directional trips in mornings and evenings, as well as combined and separate operations options for the Boulder-Longmont segment of the NWR Line. Option 1A, the preferred option from the plan, would provide three trips from Downtown Longmont to Union Station on weekday mornings, and three trips from Union Station to Downtown Longmont on weekday evenings. In comparison to other options considered in this exercise, this service option would have the highest ridership, with a forecasted average of 4,100 riders per weekday in 2035. Travel forecasting and station boarding projections show that the majority of commuters in the northwest area travel east into Denver in the mornings and back home to cities such as Westminster, Broomfield, Louisville, Boulder, and Longmont in the evenings. As an initial phase, this proposed service option has the greatest opportunity to replace trips that are frequently traveled by single-occupancy vehicles, fulfilling Study goals to maximize ridership and improve mobility through the corridor.

IV. Additional Considerations and Next Steps

In June 2021, RTD confirmed the alignment and supplementary station locations of NWR with local jurisdictions. However, development near the proposed station locations, including high-density residential and commercial development, will require reconsideration of the original (2010) conceptual design plans for the six stations that are not yet built. Previous conceptual designs for station platforms, parking lots, bus lanes, and multimodal features at each of the stations will need to be re-configured in most situations to accommodate this recent development.

Other items to consider moving forward will be decisions about potential locations for a RMF in Longmont, which is necessary to serve the rail, as well as the feasibility of daytime train storage near Union Station between the service’s operating hours.

In 2021, RTD signed a Memorandum of Understanding with CDOT to cooperate and coordinate on the development of Colorado’s Front Range Passenger Rail Project. As that project continues to evolve, RTD will need to coordinate with the Front Range Passenger Rail District, of which RTD is a non-voting member, about cooperability between the two regional passenger rail services.

The Study will also inform the RTD Board of Directors considerations regarding the needs and roles of the NWR service as part of its regional transit system. Stakeholder engagement and consensus building are planned at each step of the Peak Service Study to ensure that RTD’s vision for overall transit investment moves forward consistently with the desires and expectations of stakeholders and residents in the northwest area.

V. Conclusions

Studies and decision-making regarding Northwest Rail over the past two decades have informed RTD and led to the current Peak Service Study to add detail and assess updated operating plans, preliminary design, capital and operating costs, impact analysis, ridership forecasts, and other factors in the Study according to the service and operations of the Peak Service Plan Option 1A, as outlined above. This memorandum, summarizing relevant Project history, provides background and context for the peak service concept being carried forward in this Study, fulfilling Milestone 1 of RTD’s Incremental Decision-Making Process.

Memorandum

We make lives better through connections.

Peak Service Study
Northwest Rail

To: HDR and RTD

From: AECOM

Date: December 2022

Re: **Purpose of the Proposed Project and Project Goals**

Introduction and Purpose

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

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

The RTD Board directed staff to conduct the Northwest Rail Peak Service Study (NWR PSS) to analyze various factors for implementing NWR. As summarized in **Figure 1**, planning studies for the NWR Corridor have been conducted over the past two decades, and RTD has continued efforts to enable NWR development.

Figure 1: Timeline of Northwest Rail Corridor Past Planning Studies

2001: US 36 Major Investment Study (MIS)
This study, conducted from 1998-2001, was the first major planning consideration of commuter rail between Denver and Boulder along the BNSF Rail Line in the US 36 Corridor.

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Evaluated eight rail alternatives for the NWRL and recommended double-tracking from Denver to Longmont within BNSF Railway's existing right-of-way using diesel technology; Proposed full-service and operational plans for 2015 and 2035.

2013: Northwest Area Mobility Study (NAMS)
Studied best mobility improvement options for RTD's northwest area, including feasibility of phased implementation for the NWRL and providing arterial bus rapid transit; Recommended that RTD see full-service NWR as a long-term goal while focusing on improvements that will show more benefits in the near-term; Encouraged consideration of alternative starting service operations for the NWRL.

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2021: Northwest Rail Peak Service Study
RTD Board directs staff to consult with local communities and stakeholders and solidify NWRL Peak Period Service scope, impacts, and costs.

This memorandum provides a summary of the previous Purpose and Need/Consensus Statements and outlines the Purpose of the Proposed Project and Project Goals for the NWR PSS.

The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act of 1969 (NEPA) require every environmental impact statement (EIS) to "briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action" (40 CFR 1502.13). The Purpose and Need Statement is a critical first step in a planning project, as it lays the foundation for what the study will do by providing the rationale and justification for undertaking a major Federal action and forms the basis for the range of alternatives to be studied in the environmental document. CEQ regulations require an Environmental Assessment (EA) to include a brief discussion of the "need for the proposal" (40 CFR 1508.9) and most EAs include language similar to a purpose and need statement and may be titled as such.

The Federal Transit Administration's (FTA) Standard Operating Procedures (SOP) reference the CEQ regulations and goes on to state, "Purpose and need development ordinarily starts early, such as during transportation planning, and is refined during the environmental review process in response to agency and public comments and incorporated into the EIS. A project's purpose and need should exhibit continuity from planning, through each project development phase, to project approval."

Planning for the Northwest Rail (NWR) corridor began with the US 36 Major Investment Study (MIS) in 2001. Planning continued with the 2004 RTD FasTracks Plan and the 2010 RTD Northwest Rail Corridor Environmental Evaluation (NWR Corridor EE). In 2014 the RTD Northwest Area Mobility Study (NAMS) was completed to develop a prioritized list of mobility improvements for the Northwest area of the RTD service area. The subsections below summarize the Purpose and Need Statement from the 2010 NWR Corridor EE and the Consensus Statement from the 2014 NAMS project. While the Consensus Statement of the NAMS project would not constitute a Purpose and Need Statement, they did help focus the outcome of the project, similar to why a Purpose and Need Statement is developed.

I. 2010 RTD Northwest Rail Corridor Environmental Evaluation Purpose and Need

RTD initiated the *NWR Corridor EE*[1] to identify and evaluate impacts of implementing a fixed-guideway, commuter rail transit service between Denver, Boulder, and Longmont. The United States Army Corps of Engineers (USACE) was the lead federal agency for the project, rather than the Federal Transit Administration (FTA), because the project anticipated potentially significant impacts to wetlands and waters of the US under USACE Section 404 permitting jurisdiction, including an alternatives analysis under Section 404(b)(1) of the Clean Water Act but did not seek federal transportation funding. RTD developed the EE document following NEPA processes and procedures. The following was taken directly from the *NWR Corridor EE* document.

Purpose of this Project

The purpose of the NWR Corridor Project is to implement fixed guideway, commuter rail, mass transit service between Denver, Boulder and Longmont.

Need for this Project

Need 1: Improve mobility *– Mobility improvements are needed to provide alternatives to congested single occupant vehicle (SOV) travel for project study area residents, employees, and visitors. Per the 2035 Metro Vision Regional Transportation Plan (MVRTP) (Denver Regional Council of Governments [DRCOG] 2007):*

- *By 2035, population in the project study area is forecast to increase by 43 percent and employment is forecast to increase by 58 percent.*
- *Programmed roadway improvements are not expected to keep pace with projected demand, as: (1) regional personal trips will increase by 59 percent, (2) regional vehicle miles traveled (VMT) will increase by 72 percent, (3) regional roadway lane miles with more than three hours per day of severe congestion will increase by 203 percent, and (4) regional vehicles hours of delay will increase by 353 percent.*

[1] 2010 RTD Northwest Rail Corridor Environmental Evaluation (https://www.rtd-denver.com/sites/default/files/files/2019-06/Eagle-P3_EE_Summary.pdf)

__Need 2: Provide consistent and reliable transit travel times__ – Unreliable automobile travel times are anticipated both from day to day and throughout the day (peak versus off-peak) in 2035. Travelers will also experience unexpected delays due to accidents or inclement weather. An option such as rail transit would provide more consistent, reliable, safe, and congestion-free travel on its own dedicated and protected right-of-way (ROW).

__Need 3: Enhance regional connectivity__ – The Denver metropolitan region currently has gaps in multi-modal regional transit connectivity. FasTracks is primarily a plan to fill in major gaps with fixed guideway transit (rail) and bus rapid transit. The NWR Corridor would link with seven other RTD rail corridors at DUS (see Figure ES-2).

__Need 4: Provide an affordable transit investment__ – Any transit improvements must be affordable within the FasTracks budget. In addition, the associated operating costs must be realistic and reasonable for RTD to assume the service. In 2004, the FasTracks Plan allocated $565.1 million (in year of expenditure dollars) for NWR Corridor capital costs out of the overall $4.7 billion system-wide budget. The 2009 RTD Annual Program forecasts the NWR Corridor Project capital costs at $641.1 million (in 2008 dollars).

__Need 5: Reinforce local and regional transportation and land use plans__ – The NWR Corridor is part of the 122-mile system of new rail transit facilities proposed within the regional FasTracks Program. To assess potential local community acceptance of the NWR Corridor Project, regional and local plans were reviewed. Local plans for communities along the proposed rail alignments were found to be in support of commuter rail serving their jurisdiction.

II. 2014 RTD Northwest Area Mobility Study Final Consensus Statement

The 2014 RTD Northwest Area Mobility Study (NAMS)[2] project used a Final Consensus Statement to guide the discussion about how to implement bus and rail service in the Northwest area of the RTD service area. It began with an overarching theme, a discussion of how projects were prioritized, and concluded with a discussion of each proposed transit investment. The rail elements are shown below.

An overarching theme serves as a basis from which consensus on the priorities is grounded:

- *The Northwest area remains committed to Northwest Rail as envisioned in FasTracks. Given the projected timing of Northwest Rail's implementation, Northwest stakeholders want to see mobility benefits sooner.*

Projects on the prioritized list should not be considered absolutely sequential:

- *Nothing should preclude the pursuit or acceleration of any of these priorities should viable opportunities or partners become available.*
- *More than one priority can be pursued simultaneously.*

[2] 2014 RTD Northwest Area Mobility Study (https://www.rtd-denver.com/sites/default/files/files/2020-07/NAMS-Final-Report-508.pdf)

- *RTD should be proactive, aggressive and creative in monitoring these projects for any significant developments that help a project move forward (e.g. public or P3 funding opportunities, BNSF plans).*

North Metro Rail Extension (SH 7 to Longmont)

- *Estimated cost combined with projected low ridership yields an annual cost per boarding almost six higher than Northwest Rail.*
- *It is recommended by the Study Team and accepted by the NAMS PAC not to proceed with any action on this corridor at this time. The corridor should be re-evaluated in the future if population densities or other conditions change.*

Northwest Rail (FasTracks):

- *Given present funding challenges and accompanying near-term inability to secure a railroad agreement, completion of Northwest Rail is a longer term goal.*
- *On an annual basis, RTD will explore and update Northwest Rail implementation strategies and report to stakeholders and the public.*

The outcome was that NWR would be a longer term priority and that construction would likely be done in phases, with geographic extensions of a double tracked rail line, as proposed in the FasTracks plan.

III. Northwest Rail Peak Service Study Purpose of the Proposed Project and Project Goals

In recent years RTD has been coordinating with BNSF Railway (BNSF) to develop an operating plan that could provide rail service to the NWR Corridor, while maintaining BNSF's flexibility to continue to operate freight service. By developing an operating plan that focuses on peak commuting times, there may be opportunities to provide passenger rail service in the NWR Corridor 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 implementation approach has been used successfully in other major urban regions, particularly in the western US over the past 40 years.

Purpose of the Proposed Project

The purpose of the Northwest Rail Peak Service Study (NWR PSS) is to identify the necessary infrastructure requirements and operational considerations to allow peak period commuter rail service between Denver, Boulder, and Longmont within the operating BNSF freight corridor. The peak period service must be planned in such a way as to not preclude the full buildout of infrastructure that would allow for all day commuter rail service as presented in the FasTracks Plan, and envisioned in the EE and NAMS studies, or as a part of a Front Range Passenger Rail (FRPR) service along the Colorado Front Range between Fort Collins and Pueblo, including the Denver-Boulder-Longmont areas.

<u>Project Goals</u>

Because this study is not being conducted as part of a NEPA process, a Purpose and Need statement is not required at this time. However, in an effort to allow a potential project to move into NEPA, Project Goals have been developed to guide this study. If a specific project moves into the NEPA process, these Project Goals would be refined as part of an official Purpose and Need Statement. Five Project Goals have been identified for the NWR PSS.

- **Project Goal 1: Advance RTD's commitment to complete the FasTracks Program.** The 2004 voter approved FasTracks Plan included commuter rail in the NWR Corridor from Denver to Boulder and Longmont. Subsequently, DRCOG, the Metropolitan Planning Organization (MPO), adopted the *2050 Metro Vision Regional Transportation Plan*, which includes implementation of the Peak Period Service Plan in the NWR Corridor from Westminster Station to downtown Longmont, on April 21, 2021. Since station planning was initiated in earnest during the *NWR Corridor EE*, the communities along the rail line have invested in infrastructure and advanced planning to support the future rail line. Communities have implemented policies that support transit and expected changes in commuting behaviors in the corridor, such as encouraging compact, mixed-use development; updating comprehensive land use, and transportation plans and policies; further refining station area plans; and investing capital funds around proposed station sites throughout the corridor, in an attempt to change commuting behaviors by developing housing project near transit investments. Many new Transit Oriented Developments (TODs) have already been built around the proposed NWR stations. Other examples include that in October of 2021, Boulder City Council adopted new climate goals for the community to reduce emissions 70% by 2030 against a 2018 baseline; become a net-zero city by 2035; and become a carbon-positive city by 2040. In Boulder, transportation accounts for nearly one-third of all emissions. Further, in 2019 the Colorado General Assembly passed a greenhouse gas reduction bill, HB19-1261, which set a goal to reduce statewide greenhouse gas emissions from all sources by 26% by 2025, 50% by 2030, and 90% by 2050, compared to a 2005 baseline. Further, in 2021 SB21-260 was passed and signed into law, which among other things established three new state enterprises focused on transportation electrification. At the state level, transportation accounts for about one-quarter of all emissions. Further, communities along the rail line have also worked with the Federal Railroad Administration (FRA) and BNSF to implement quiet zones (railroad crossings that include physical infrastructure and warning systems, so train engineers are not required to sound the train horn at the crossing). Quiet zones have already been implemented along the NWR Corridor at the following locations:

Municipality	Cross Street	
Broomfield	112th Avenue (to be completed by December 2022)	Brainard Drive (to be completed by December 2022)
	120th Avenue	Nickel Street
Louisville	Dillon Road	Griffith Street
	Pine Street	South Boulder Road
Boulder	63rd Street	Valmont Road
	55th Street	47th Street
	Pearl Parkway	

Boulder County	Independence Road	Monarch Road
	Jay Road	Niwot Road
	55th Street	2nd Avenue (Niwot)
	63rd Street	

Quiet zones are also in the planning and/or design phase within the city limits of Longmont, a portion of the alignment in Westminster, and in Boulder County. The communities along the NWR Corridor have provided the densely developed housing and other uses around the station areas, most of which are served by local bus routes. Connection to additional transit modes at these stations is expected as part of the Peak Period Service plan.

- **Project Goal 2: Expand connectivity in the region short term and potentially beyond the region long term**. The Denver-Boulder travel market is served by the existing Flatiron Flyer bus network, specifically for communities adjacent to the US 36 corridor (including Westminster, Broomfield, southern Louisville, Superior and Boulder). However, the NWR Corridor serves additional markets in the Denver-Boulder travel market including Louisville-Denver and Louisville-Boulder, which are not as well served with transit. The Boulder-Longmont travel market is currently served by hourly bus service being provided on the BOLT line. While transit service for this segment is expected to be improved with the implementation of the SH 119 BRT Project, the Longmont-Boulder-Denver travel market will continue to require a transfer in Boulder, making transit less convenient for commuters. Therefore, the Longmont-Boulder-Denver travel market would be better served with the addition of rail service along the NWR Corridor. In the longer term, the NWR Corridor may become more financially feasible as one segment of the full FRPR program, which is being planned to operate intercity passenger rail along the Colorado Front Range between Fort Collins and Pueblo. The NWR Corridor could provide a route for both the commuter rail service and the intercity service along the Front Range into and out of the highly congested downtown Denver part of the region.

- **Project Goal 3: Provide a more affordable transit investment to serve communities in the northwest region of the RTD District**. To reflect the objectives of the FasTracks program, the 2010 *NWR Corridor Final EE* presented capital and operating costs for an 11-station, 55-one-way trains per day service plan for the Northwest Rail line. These costs were $1.0 billion for capital and $20.7 million annually for operations in 2008 dollars. The 2013 *Northwest Area Mobility Study* (NAMS) re-evaluated projects in the Northwest area and updated costs for the NWR plan in 2013 dollars of capital costs between $1.16 and $1.41 billion and $23.2 million annual operations. Given present funding challenges and accompanying near-term inability to secure a railroad agreement, completion of Northwest Rail is a longer term goal. Working with BNSF and corridor stakeholders in recent years, RTD recognizes that there continues to be a strong desire for passenger rail service such that a reduced service plan that can be implemented in phases, focused initially on peak period, peak direction travel may now provide an opportunity to start limited service in the short term, with the potential to expand the schedule as ridership warrants, at a substantially lower cost than the full build-out.

- **Project Goal 4: Provide consistent and reliable transit travel times**. Even with improvements to US 36 and the addition of managed lanes, auto travel times continue to be less reliable in the US 36 corridor compared to those of transit service. RTD provides commuter transit service in the Northwest portion of the region through its Flatiron Flyer Bus Rapid Transit (BRT) program. According to RTD's *2020 Quality of Life* report[3], in 2019, the average automobile travel time between the Table Mesa Park-n-Ride in Boulder to downtown Denver was 39 minutes with a potential variability of 24 minutes (up to 63 minutes total). For Flatiron Flyer buses (FF2 express service), the average travel time was 26 minutes with a potential variability of 8 minutes (up to 34 minutes total). By comparison, FF1 all stop service is scheduled for a 37 minute travel time. In the US 36 Corridor, FF2 express service uses the managed lanes, which is largely responsible for the limited variability that it experiences. However, the FF1 all stop service does not utilize the managed lanes to the same extent, as these buses enter and exit the freeway at most of the interchanges to serve stations along the corridor. In other corridors in the Denver region where the transit service is light rail or commuter rail, the travel time variability is much less than in the US 36 Corridor where the bus service is subject to roadway congestion, weather, or incidents. Because rail transit operates in its own guideway, it is far less often affected by traffic congestion or weather events that make roadway modes less predictable both now and in the future.

- **Goal 5: Investigate Partnerships for service growth in the future.** There are several options for who might operate passenger rail service in the NWR Corridor, including RTD, FRPR, or BNSF. The Peak Service Study will allow for some of these discussions to be had, and in turn to provide more clarity about necessary action to advance toward implementation. While RTD has commuter rail operators, it may be advantageous to contract operations to BNSF Railway, as they currently operate the freight service in the NWR Corridor. Nationwide, there are several examples where the owner of the railroad operates freight trains as well as passenger trains on the same line on behalf of the transit agency. Sound Transit (in Seattle) and Northstar Corridor Development Authority (in Minnesota) both contract with BNSF to operate Sounder and Northstar commuter rail service, respectively. Further, determining an operating arrangement also plays a role for other operating agreements like the number of passenger trains that may operate on the line and the continued provision of service if the line is ever sold by the railroad. These arrangements could also clarify operating agreements for the broader FRPR service.

[3] 2020 RTD Quality of Life Report (https://www.rtd-denver.com/sites/default/files/files/2020-10/Quality-of-Life-Report_2020.pdf)

Summary

We make lives better through connections.

RTD Peak Service Study
Northwest Rail

Project:	Study Advisory Team Plans and Commitments Workshop
Subject:	Workshop Summary
Date:	Wednesday, July 27, 2022
Location:	Broomfield Community Center 280 Spader Way, Broomfield, CO 80020 Crawford Room, 2nd floor 8:30 – 11:30 am
Attendees:	SAT Members and Study Team (See below.)

WORKSHOP PURPOSE:

- Convene Study Advisory Team (SAT) and develop common understanding across the corridor regarding existing plans and commitments
- Identify synergies between plans and commitments and areas to explore further
- Begin to assemble how plans and commitments fit into Initial Configuration
- Discuss next steps to engage a broader public

PROJECT BACKGROUND:

- Peak service would include three morning trips from Longmont to Denver and three evening trips from Denver to Longmont.

- **Peak Service Study Goals:**
    - Provide updates to engineering plans, cost estimates to determine Peak Service recommendations.
    - Design in a manner to not preclude future build-out of added service by RTD or others.
    - Align RTD strategically with the agency's stated goals of partnering with external stakeholders and constituents.

- **Key Listening Session Themes:**
    - **Service Plan** — Questions about ridership and interest in not precluding further opportunities
    - **Technology Considerations** — Questions about capital operating costs and technological compatibility
    - **Station Area Planning** — Seeking clarity on specific locations for future planning
    - **Implementation** — Support for moving quickly
    - **Partnerships** — Important to coordinate with BNSF and FRPR

KEY TAKEAWAYS:

- There has been significant progress with **Quiet Zone implementation**, but challenges and expectations from BNSF have made it a difficult process. Quiet Zones are being implemented across the corridor.
- Stations are being placed in **downtown areas** or new **"transit village" cores**.
    - There is significant private and public development in downtown cores and near station locations. Some station locations may need reconsideration or further discussion from previous plans because location options have seen the implementation of other types of development.
- **Technological decisions** should enable the use of existing tracks and infrastructure.
- **Collaboration and engagement** between municipalities is important (e.g. Westminster and Arvada, Broomfield and Louisville, etc.).
- There has been significant consideration of **cross-modal connectivity**: encouraging active transportation for first and last mile connections, bike/ped infrastructure improvements around stations, local bus network services, recognition of connections between existing Flatiron Flyer (and other existing and planned BRT) service and future rail service.

- **Parking and Ridership:**
    - There are outstanding questions about parking: how to allocate parking capacity and how much parking is necessary at each location. RTD's typical approach is to estimate total parking for the corridor and then work with jurisdictions to find sites to accommodate appropriate spaces.
    - How will updated ridership numbers from forecasts impact parking requirements?
        - The Peak Service Study will focus on the parking capacity needed for three trains per day, but the study will have to consider the parking needs of other services (e.g. FRPR and BRT lines).
        - RTD will gather input on parking needs from each municipality.
        - The travel model cannot be relied upon for station-specific parking predictions, so the spots needed for corridor-wide projections will be divided among all stations.
        - Longmont will likely have a large catchment area (and thus high demand) because it is at the end of the line.
    - Land acquisition and parking are being factored into RTD's study costs.
    - Phases of parking capacity build-out should be timed to match the development of rail service.
    - **Action:** Patrick Stanley (RTD) to follow up with Phil Greenwald and Tony Chacon (Longmont) regarding ridership projections by segment.

NEXT STEPS:

- **Technical Data Request:** HDR will distribute a formal data request to SAT members via email. The request outlines the plans, data, and studies needed by the study team.
    - **Action:** SAT members to upload requested materials to https://bit.ly/NWR_PSS.

- **Technical Representatives Group:** As the study advances, Steve Long (HDR) and the study team will host an introductory kick-off call for all jurisdictions' Technical Representatives in areas of drainage, utilities, roadway and traffic engineering, transportation planning (including multimodal), and land use/community development. The study team will then meet as needed on a one-on-one basis with representatives from each jurisdiction to advance station design and integration with community infrastructure.
    - **Action:** SAT members to provide contact information for each jurisdiction's Technical Representatives to Chrissy Breit (HDR) at Chrissy.Breit@hdrinc.com by August 12.

- **Public Outreach:** In late summer/early fall, an in-person open house and self-guided online meeting will be held.

- **Future Workshops:** This workshop aligns with Milestones 1 and 2. It is anticipated that a workshop like this will be held at each forthcoming milestone (3-5).

PLANS AND COMMITMENT SHARING:

SAT members from each jurisdiction or organization delivered short PowerPoint presentations (5-7 minutes each) describing the relevant plans and commitments made by each jurisdiction or organization since 2010. Following each presentation, SAT members and study team members had the opportunity to ask questions about or share comments on the information presented.

<table>
<tr>
<td>Westminster

Debra Baskett, John Burke, &
Sean McCartney</td>
<td>Westminster-72nd Station/B Line

Existing station with overhead catenary
The assumption has always been that NWR would be diesel
Working with private landowners
Mixed-use redevelopment of private property in progress
37-acre regional park nearby
Parking structure shared with RTD and soon to have mixed-use wrap (residential and commercial)

Downtown Westminster Station

Private investment ($450M) to redevelop 100-acre site of former Westminster Mall (now owned by the City)
Station location identified for just south of 88th Avenue with parking

Located on two parcels
Initial northwest corridor plan had surface lot but will instead be hotel
Phase 1: 280 spots on surface lot for rail itself
Phase 2: 550+ spots in structure with wrap

Collaboration between Westminster and Arvada because of Arvada neighborhoods' proximity to station location
The cities did not collaborate on the station location.
Station location initially proposed by FasTracks to be near Church Ranch, but Westminster advocated for it to be moved to downtown because of investment in that area.
Development at Walnut Creek (at US 36 & Church Ranch Station) could inspire future rail station at Church Ranch, but this is outside the scope of the Peak Service Study.

Multi-Modal Connectivity

Hard to switch modes because US 36 & Sheridan Station (with Flatiron Flyer BRT) is a quarter mile from proposed rail service

Bike/Ped underpass beneath Sheridan Blvd currently under construction (and would connect to US 36 Bikeway)
May deploy micro-transit (e.g. scooters) to connect between FF and rail
Exploring first/final mile connectivity between neighborhoods, FF, and rail
US 36 & Sheridan parking garage was often full pre-COVID

</td>
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</table>

	• Improvements being made to US 36 and Sheridan Station to improve accessibility • Flatiron Flyer and rail service have two separate travel sheds; crossover occurs at local buses ***SAT Questions***: • *Determination of parking spaces* • *Including cost of parking in study costs* • *Engagement with Arvada* • *Extension from 72nd & Lowell to Downtown Westminster*
City of Arvada	*Not in attendance.*

City and County of Broomfield
 	
Sarah Grant
	NWR/B Line Inclusion
	• Support development to maximize use of transportation corridors
	• Multi-model transportation and limit GHG emission
	• Completed 5 crossings with quiet zones
	Broomfield - 116th Ave Station
	• Broomfield Urban Transit Village
	  o Home to UC Health hospital, apartments, offices, retail development, etc.
	  o Area only halfway built-out; more room for development
	  o Diverse mix of workforce, affordable, and senior housing being developed
	• Proposed rail station about 1,000 feet from existing US 36 & Broomfield Station (FF1 and FF5)
	  o Reimagining connection between stations to encourage walking/biking
	• No property has been acquired or set aside for parking at the moment
	US 36 & Flatiron Station
	• Significant development
	  o Existing development includes Parkway Circle, Flatiron Marketplace, Flatiron Crossing, Interlocken areas
	  o Future development will focus on residential infill (e.g. replacing some Flatiron Crossing surface parking)
	  o Would serve South Louisville and South Superior
	• Parking has been well used—no excess parking pre-COVID
	Multi-Modal Connectivity
	• First and final mile improvements at US 36 & Broomfield:
	  o Bike shelters
	  o Wayfinding
	  o Active transportation connectivity projects (e.g. bikeways, underpasses)
	• Looking towards TDM programs to encourage multi-modal transportation
	
	SAT Questions:
	• *Parking at 116th Ave Station*
	•

City of Louisville
 	
Rob Zuccaro
	Downtown Louisville
	• 2003: Highway 42 Privatization Area Framework Plan and Comprehensive Plan Amendment
	    o Goal to integrate area with historic downtown
	• 2007: Mixed-use rezoning and design standards
	• Redeveloping industrial area on east side of historic downtown—Downtown East Louisville (DELO)
	    o 2015: Underpass beneath tracks to DELO completed
	    o 190 residential units & 2400 sq ft of commercial space
	    o Promoting mixed-use redevelopment (max. 3 stories)
	    o Drainage and streetscape improvements
	• 2019: City's first-ever Transportation Master Plan
	    o Connectivity to DELO sports facility highlighted as priority
	    o Potentially expanding parking across HWY 42
	Current Plans
	• Exploring potential station location options (still within downtown core)
	    o Not much room for a station near DELO
	    o Potential for station near historic grain elevator south of DELO
	    o Depending upon train platform location, joint use of recreational field parking east of Highway 42 may be possible
	• Flatiron Station will serve south Louisville in addition to Broomfield—worth coordinating with Broomfield
	• Future 42 Plan:
	    o Goal to improve multimodal access to mixed-use district
	    o Currently a NAMS corridor with no fixed-route transit in operation
	
	SAT Questions:
	• *Siting of station location*
	• *Collaboration between Louisville and Broomfield*

City of Boulder
 	
Kathleen King
Danny O'Connor
Jean Sanson
	Boulder Junction
	• Density and "weight" shifting from downtown to Boulder Junction
	    o Public plaza, art installations, multi-modal transit
	• 2007 Transit Village Area Plan prompted new development
	    o $11M invested
	    o Activating multi-modal connections and activating TOD
	• 2015: Boulder Junction Station opened with 6 below-ground bus bays
	    o Parking structure shared with RTD and hotel guests
	    o Key role in connecting three regional centers—downtown, BVRC, and CU
	    o Services include 82 to Airport, FLEX to Longmont, and some FF lines
	• Approaching build-out
	    o 1,400 residential units (including 300 affordable units)
	    o 1.8 million square feet of commercial
	    o Exploring a post-occupancy study to understand successes in TDM
	Transportation Demand Management (TDM)
	• TDM is core component of Boulder Junction's goal to enable car-free/car-light living

	• Considered first and final mile (e.g. through Goose Creek greenway) • Access Management District with RTD EcoPasses and BCycle memberships • Parking Management District with parking caps for commercial development and one parking space per housing unit **Looking Ahead to 2023+** • Transit Village Area Plan Phase 2 will focus on building out industrial and office spaces east side of railroad tracks • Need to reactivate transit with the return of RTD service (Flatiron Flyer lines) o Reduced service has undermined the City's TDM strategies • Expansion of form-based code • Rail plaza at underpass at Bluff St. ***SAT Questions:*** • *Vision for footprint of rail station* • *Timing for return of local/express/regional bus services*

City of Longmont
 	
Tony Chacon
Phil Greenwald
	1st & Main Development
	• Preparation for downtown development
	    o 2012: 1st & Main Transit & Revitalization Plan
	    o 2012-13: rezoning around 1st and Main to shift from industrial past
	    o 2014: NAMS
	    o 2017: 1st & Main TOD Strategies market study
	    o 2022: RTD's Longmont 1st and Main Transit Area Study
	• Identifies need for density and affordable housing near stations
	    o Mixed-used development to densify near transit hub
	    o Land acquisition is underway
	    o Goal to finish by 2025
	    o Raising maximum building heights
	• Planning new streets to build out the existing grid pattern downtown
	• Flood improvements being completed to remove floodplain designation
	• Mixed-used development at South Main Street
	    o Redevelopment complete
	    o Surface parking and 300+ residential units
	1st & Main Transit Hub
	• City currently looking for private developer partner to build parking garage and mixed-use sites
	• RTD has committed $16.2M, and City will pick up excess costs—likely $10M
	• Parking garage would be owned and operated by the city
	Coffman Street Busway Project
	• Coffman Street (parallel to and just west of Main Street) will help development of BRT and bike networks in Longmont
	• Corridor will shift transit over from Main Street
	Possible Maintenance Facility
	• Longmont working with RTD to identify a suitable site for the end-of-line Commuter Rail Maintenance Facility
	SAT Questions:
	• *RTD's commitment to parking structure*

Boulder County Kathleen Bracke	**County's Role** • NWR Peak Service is in Boulder County Transportation Master Plan • Support local jurisdictions and County plans • Concerned about impacts of rail of Boulder County crossings or on County-owned land • County's Quiet Zones have all been implemented

Commuting Solutions
 	
Audrey DeBarros
	Progress since 2010
	• Advocacy for Peak Service Rail
	• Collaboration, commitment, tenacity
	• Northwest Mayors and Commissioners Coalition commitment to NWR
	Quiet Zones
	• 46 railroad crossings along full length of corridor
	    o Longmont will have to close some crossings (per CRISI grant)
	• Funding agreement with DRCOG
	• Most crossings already completed; construction of others underway soon
	• Difficulties earning quiet zone designation:
	    o Louisville is facing legal battles
	    o Westminster facing pushback from BNSF (e.g. requests for improvements that feel unnecessary/beyond scope)
	
	SAT Questions:
	• *Hurdles to Quiet Zone designation*

Boulder Transportation Connections	*Not in attendance.*
Colorado Department of Transportation (CDOT) David Singer	**Related Efforts** • RTD NWR PSS • Burnham Yard (Denver) • Colorado Springs station area planning • Pueblo station area planning • Southwest Chief Thru-Car Study (Colorado Springs to La Junta) **Southwest Chief and Front Range Passenger Rail Commission** • Pueblo to Fort Collins • Commission looked at three FRPR corridor alignments • Commission's Recommendation: develop a starter service along the Front Range Sub • CRISI grant to develop reasonable alternatives • Transition from Commission to District effective July 1, 2022 **NWR PSS and FRPR** • Pain points for PSS and FRPR:

	o Commuter rail and intercity rail are different types of services for patrons—recognizing those differences will be important in moving forward o Different assumptions around operators, markets, station locations • FRPR must still study range of alternatives for alignment, route, and operating service efore moving forward on engineering and planning **Federal Resources** • FRA's Corridor Identification Development Program: provides FRA resources and tools, and offers prioritization queue • Infrastructure Investment and Jobs Act (IIJA) can provide funding for each step of development (including through CRISI) ***SAT Questions:*** • *Federal funding opportunities* • *Preferred alignment of FRPR: including ridership projections for each and general timeline of decision-making*
Denver Regional Council of Governments Matthew Helfant	**2050 Metro Vision Regional Transportation Plan** • Includes $700 million for NWT during 2040-2050 staging period

ATTENDANCE:

Kathleen King	City of Boulder
Danny O'Connor	City of Boulder
Jean Sanson	City of Boulder
Kathleen Bracke	Boulder County
Sarah Grant	City and County of Broomfield
Phil Greenwald	City of Longmont
Tony Chacon	City of Longmont
Rob Zuccaro	City of Louisville
Debra Baskett	City of Westminster
John Burke	City of Westminster
Sean McCartney	City of Westminster
Jeffrey Dawson	Colorado Department of Transportation
David Singer	Colorado Department of Transportation
Matthew Helfant	Denver Regional Council of Governments
Audrey DeBarros	Commuting Solutions
Aprajit (Jeet) Desai	Regional Transportation District
Pauline Haberman	Regional Transportation District
Patrick Stanley	Regional Transportation District
Kirk Strand	Regional Transportation District

Brian Welch	Regional Transportation District
Susan Wood	Regional Transportation District
Chrissy Breit	HDR, Inc.
Steve Long	HDR, Inc.
Makenzie Mowat	HDR, Inc.
Carla Perez	HDR, Inc.
Rick Pilgrim	HDR, Inc.
Wendy Wallach	HDR, Inc.
Melissa Bade	CDR Associates
Jonathan Bartsch	CDR Associates
Patrick Teese	CDR Associates
Madeline Head	Peak Consulting
Colleen Roberts	Peak Consulting

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

rtd-denver.com

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Corridor Conditions Report

Corridor Conditions Report

Appendices

Appendix A. Northwest Rail Peak Service Study Traffic Corridor Context Report

Appendix B. Northwest Rail Peak Service Study Transit Corridor Context Report

Appendix C. Historic Resources Detail Maps

Appendix D. Visual Inventory by Study Section

Appendix E. Table of Recognized Environmental Conditions (REC) and Potential Environmental Concerns (PEC)

Figures

Corridor Conditions Report

Tables

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

Corridor Conditions Report

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

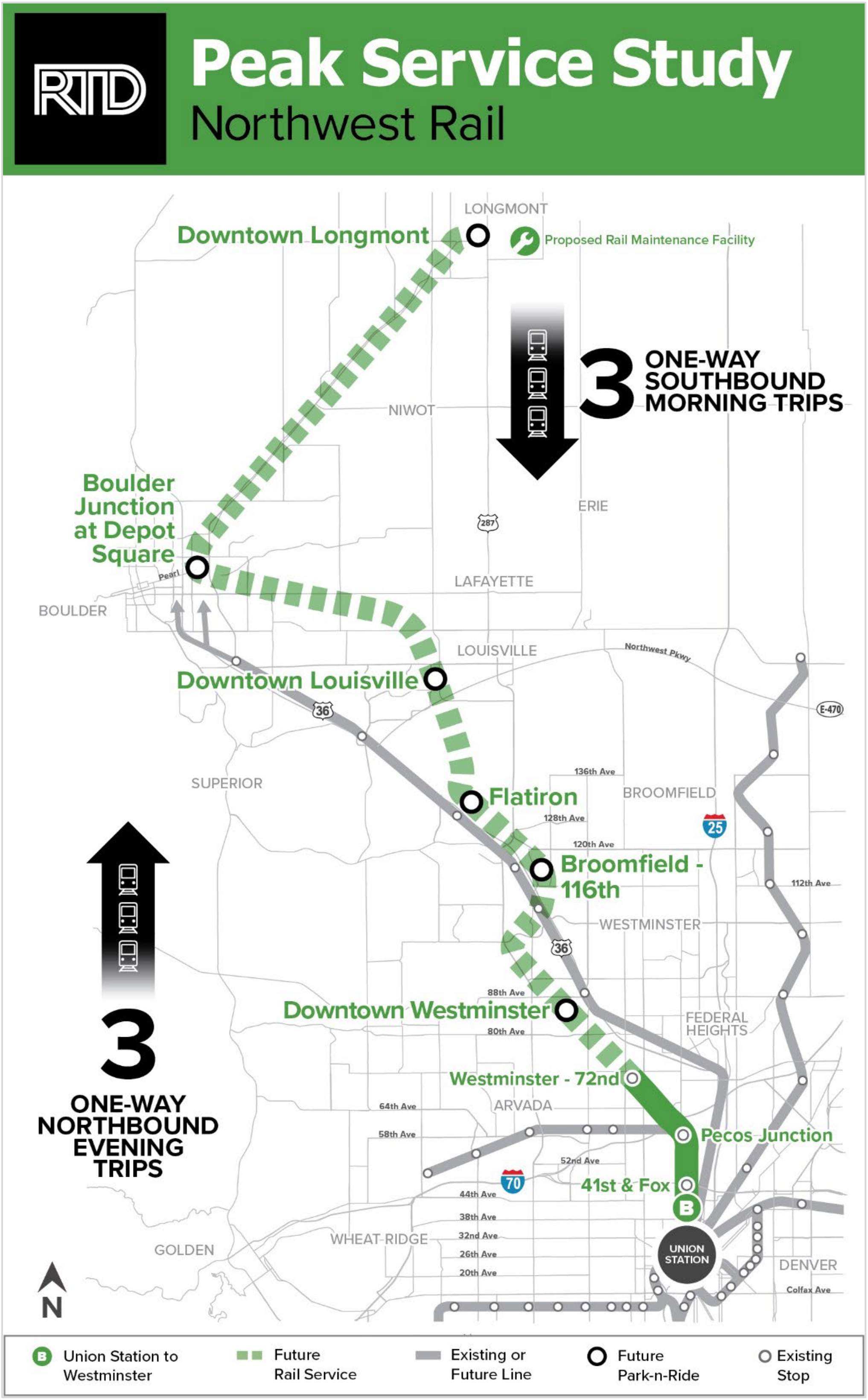
Introduction

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.

Corridor Conditions Report

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

2001: US 36 Major Investment Study (MIS)
This study, conducted from 1998-2001, was the first major planning consideration of commuter rail between Denver and Boulder along the BNSF Railway in the US 36 Corridor.

2004: RTD's FasTracks Initiative
Identified the BNSF Railway in the US 36 Corridor as one of RTD's priorities for commuter rail service; committed to funding new and upgraded tracks, new stations, and rail extension to Longmont.

2005-2006: Longmont Diagonal Rail Feasibility Study and Environmental Evaluation (EE)
Determined that Longmont extension of the proposed commuter rail along US 36 was feasible and would generate ridership; recommended locations for intermediate and end-of-line stations.

2009: US 36 Corridor Environmental Impact Statement (EIS)
Identified the US 36 Corridor as one of RTD's priorities for commuter rail service, committed to funding new and upgraded tracks, new stations, and rail extension to Longmont. Ultimately, the commuter rail service concept was removed from study in the EIS and combined with the Boulder-Longmont extension into one - Northwest Rail - to be studied separately from the highway improvements planned for US 36.

2010: Northwest Rail Corridor Environmental Evaluation (EE)
Evaluated eight rail alternatives for the NWR line and recommended double-tracking from Denver to Longmont within BNSF Railway right of way using diesel technology; proposed full-service with 55 trains per day, and operational plans for 2015 and 2035.

2013: Northwest Area Mobility Study (NAMS)
Studied best mobility improvement options for RTD's northwest service area, including feasibility of phased implementation for NWR and providing arterial bus rapid transit; recommended that RTD see full-service NWR as a long-term goal while focusing on improvements that will show more benefits in the near-term; encouraged consideration of alternative starter service operations for NWR.

2017: Northwest Rail Peak Service Plan
Released modeling and outlined several options for a NWR Peak Service Plan as a starter service for the rail; options included between six to ten one-way daily trips at peak periods (6:00-9:30AM, 2:30-7:00PM); recommended current proposed service option (Option 1A).

2021: Northwest Rail Peak Service Study
RTD Board directs staff to consult with local communities and stakeholders and solidify NWRL Peak Period Service scope, impacts, and costs.

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).

Corridor Conditions Report

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

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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

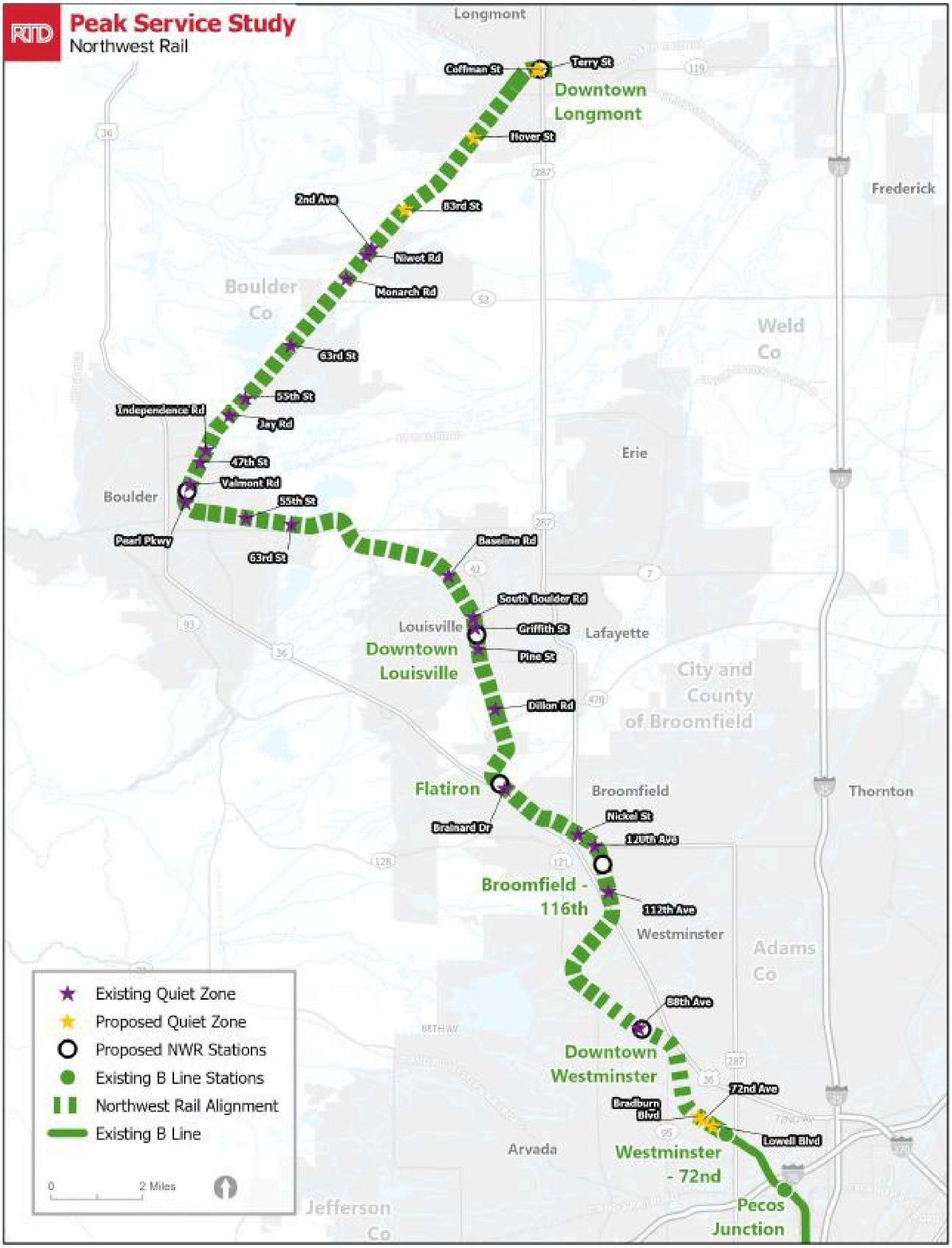
City of Westminster:

- 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.

Corridor Conditions Report

Figure 3: Existing and Proposed Quiet Zones Locations



Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

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.

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

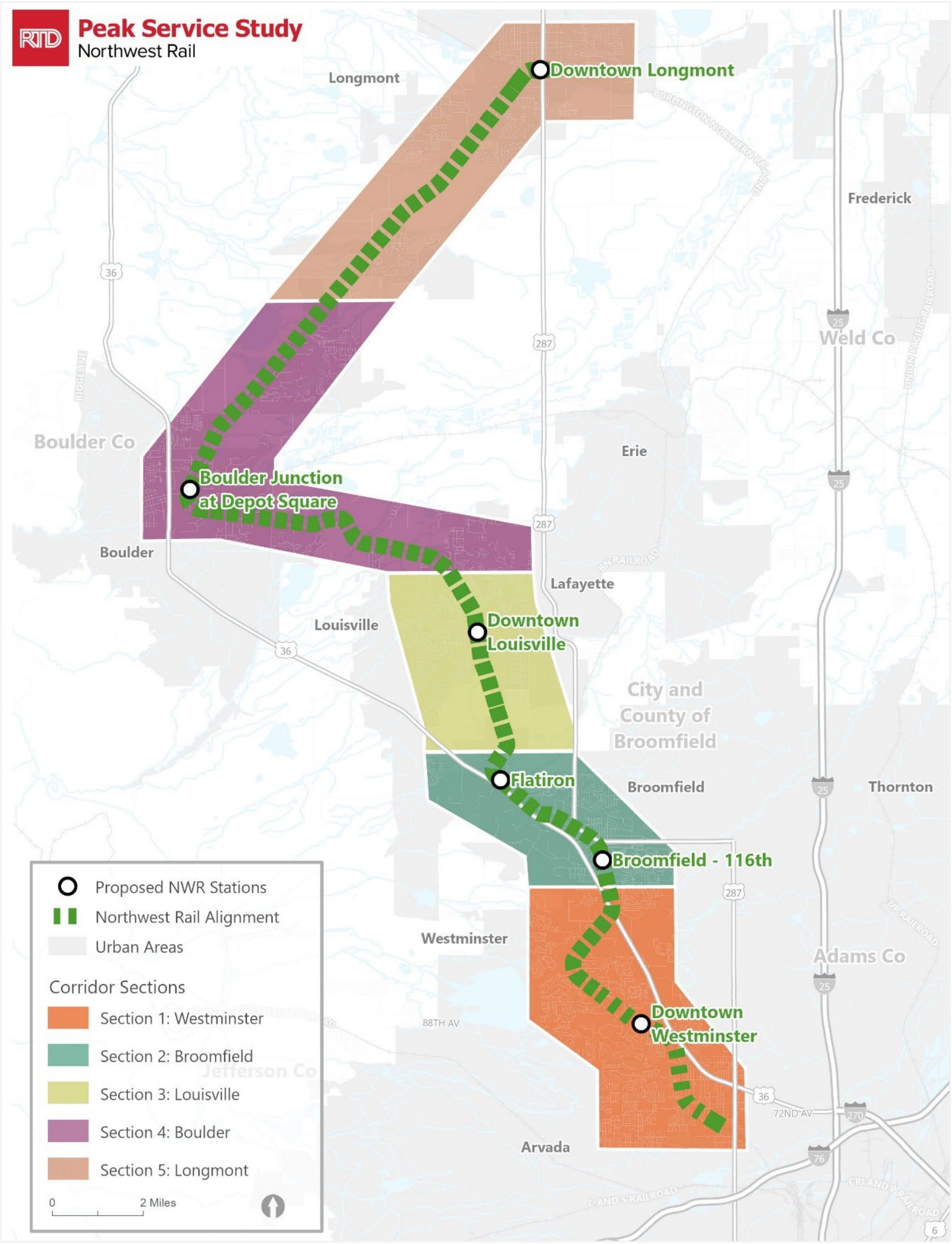
This station area is located in Longmont, south of First Street, between South Pratt Parkway and Coffman Street. There has been some new development around this station site, including the northeast corner of the US 287/Main Street and First Avenue intersection. Additionally, the area on the northwest 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

Corridor Conditions Report

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.

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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.

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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.

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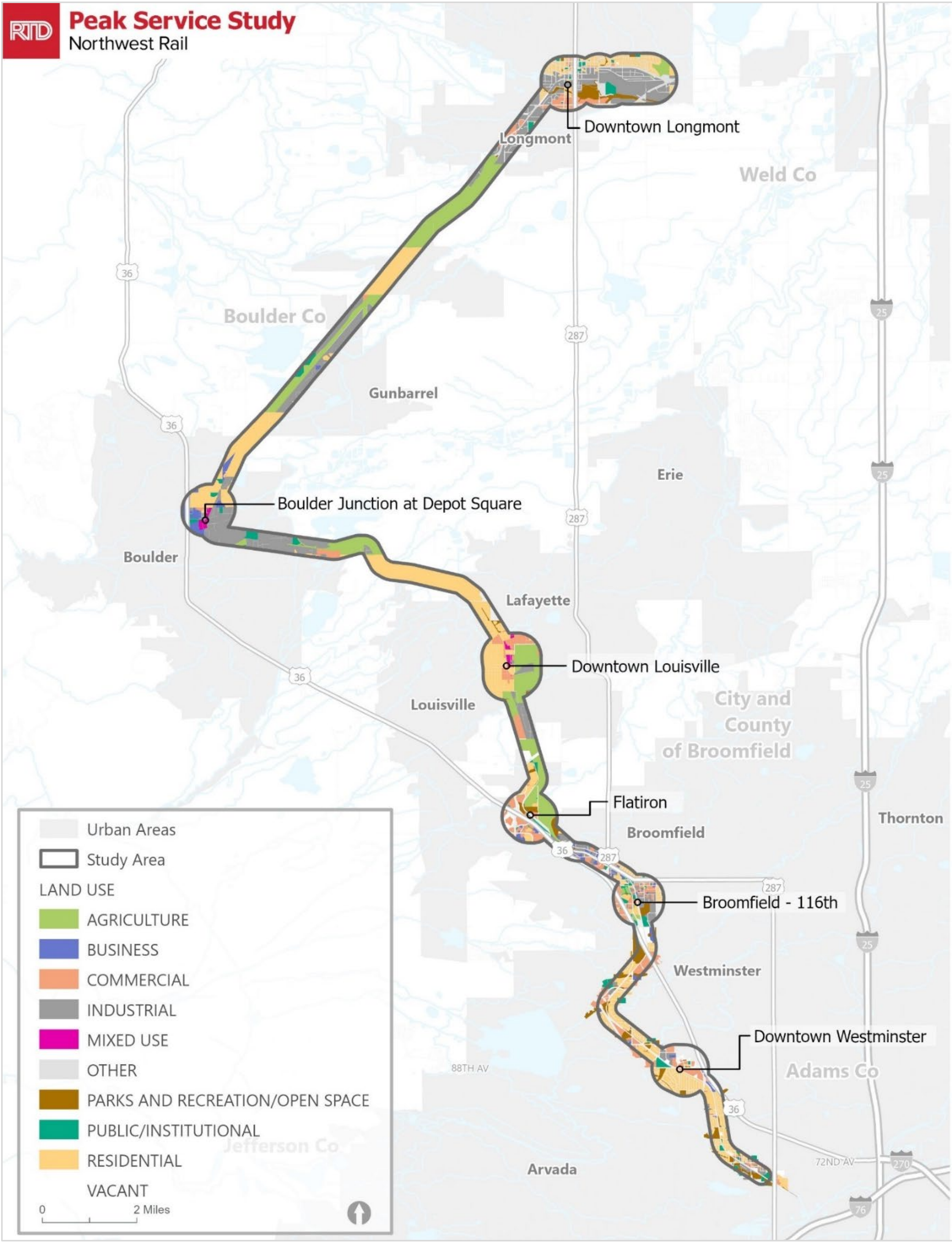
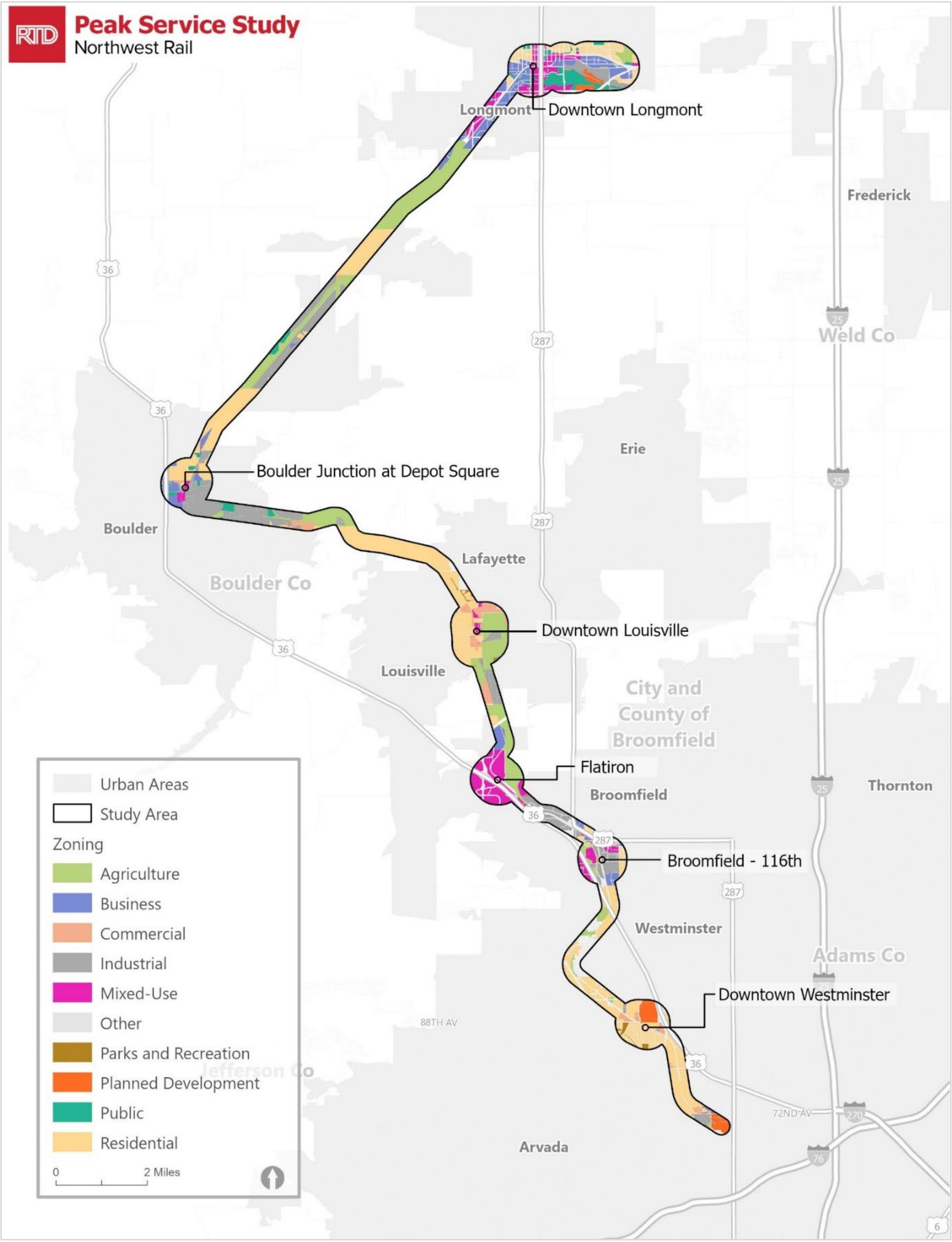
Figure 5: Existing Land Use in the Study Area



Corridor Conditions Report

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

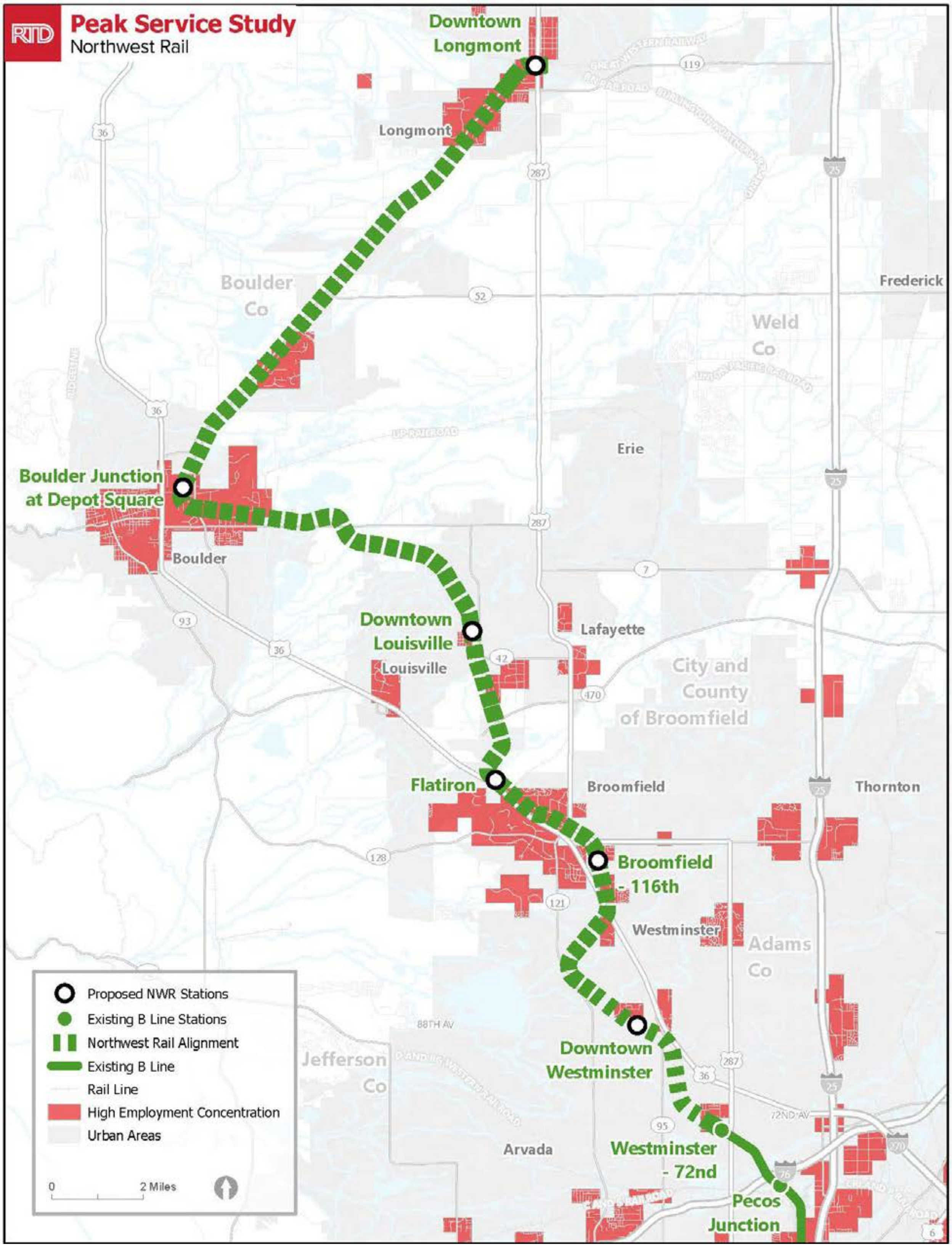
Economic Cluster

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

Corridor Conditions Report

Figure 7: Economic Clusters



Corridor Conditions Report

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.

Corridor Conditions Report

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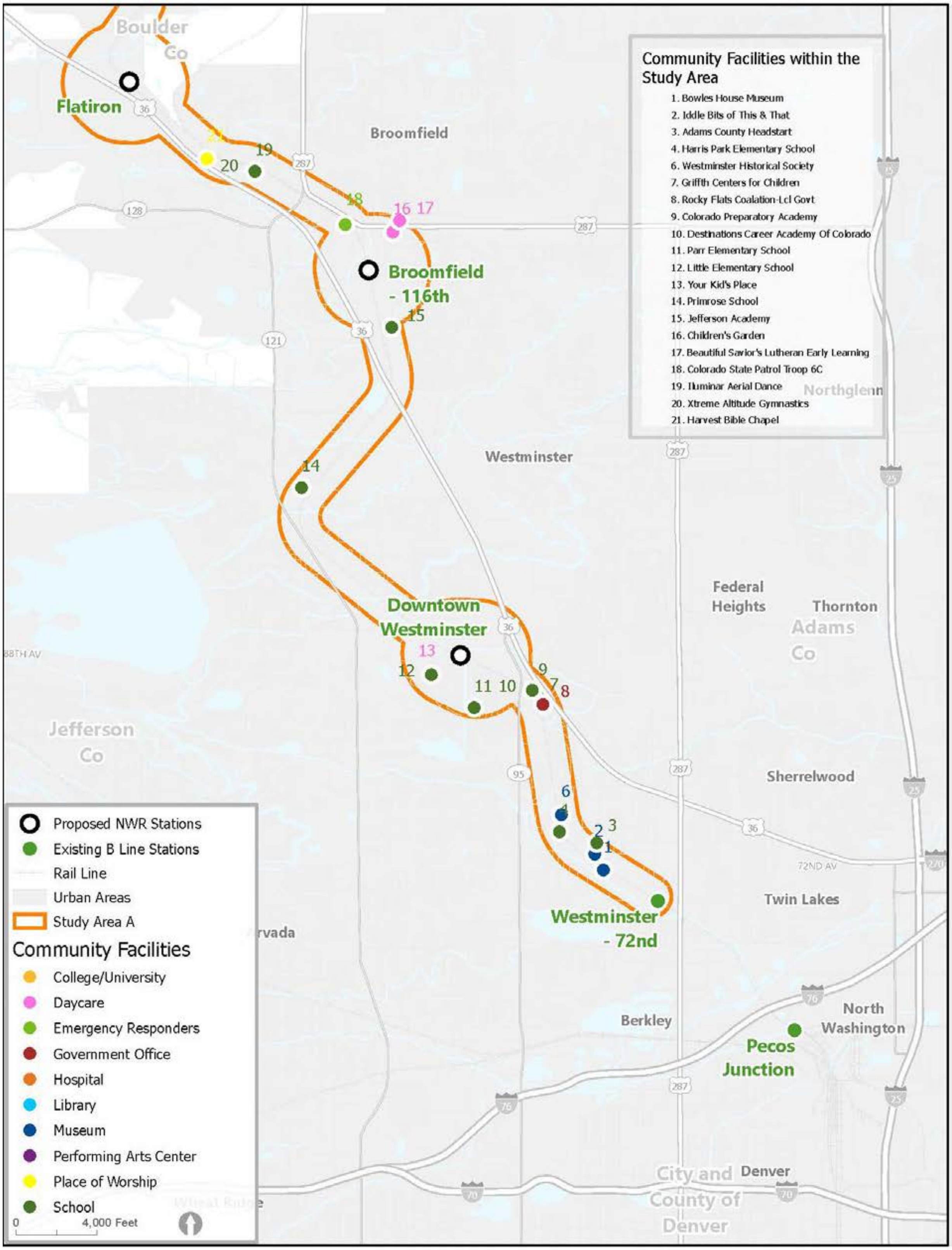
Resource Name	Resource Description
Twin Peaks Charter Academy	School
Apex Home Enrichment Program	School
Flagstaff Charter Academy	School
Grace Fellowship Church	Church
UC Health Longs Peak Hospital	Hospital
YMCA of Longmont at Twin Peaks	Daycare
Longmont Wastewater Treatment	Government Office
Saint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

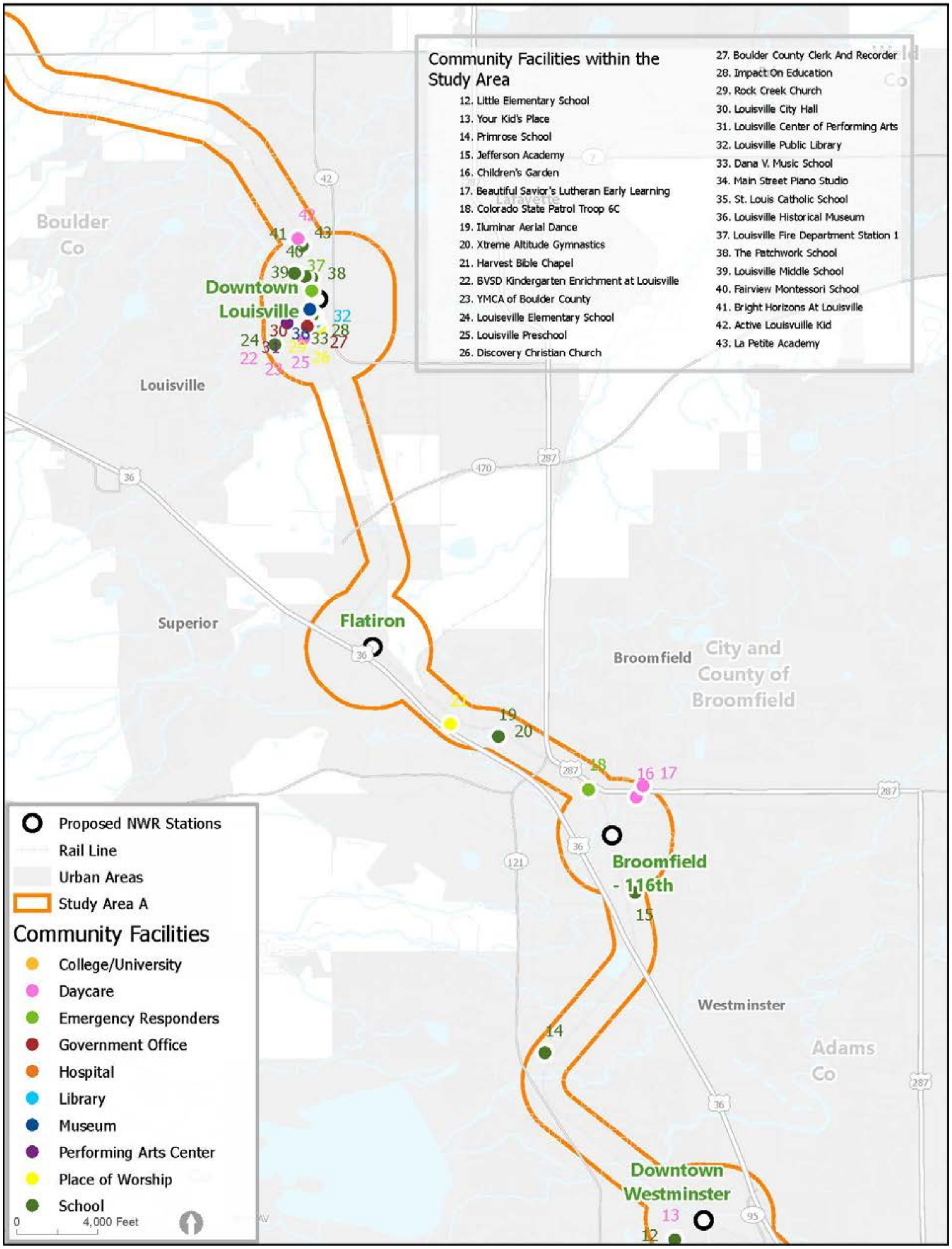
Corridor Conditions Report

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



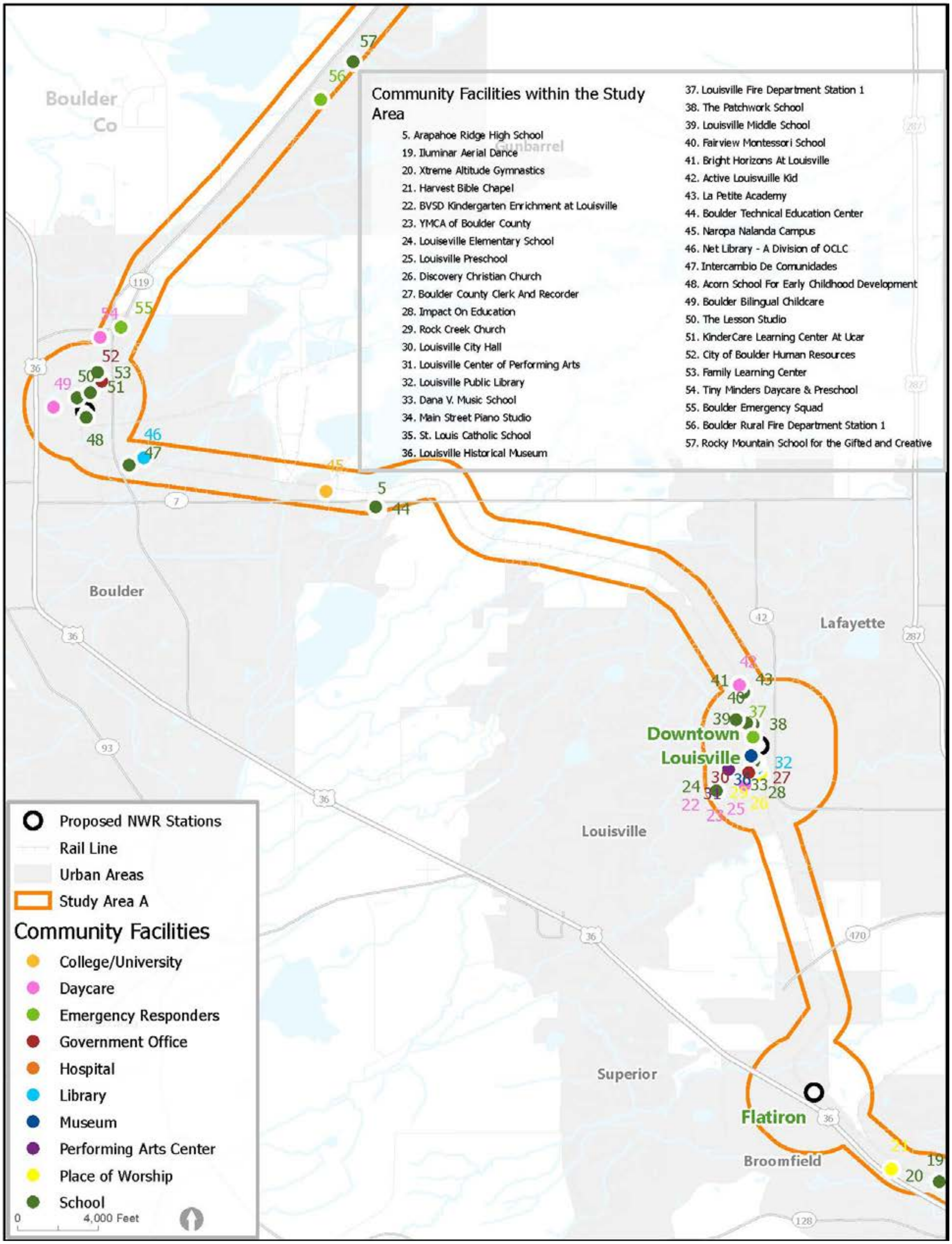
Corridor Conditions Report

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



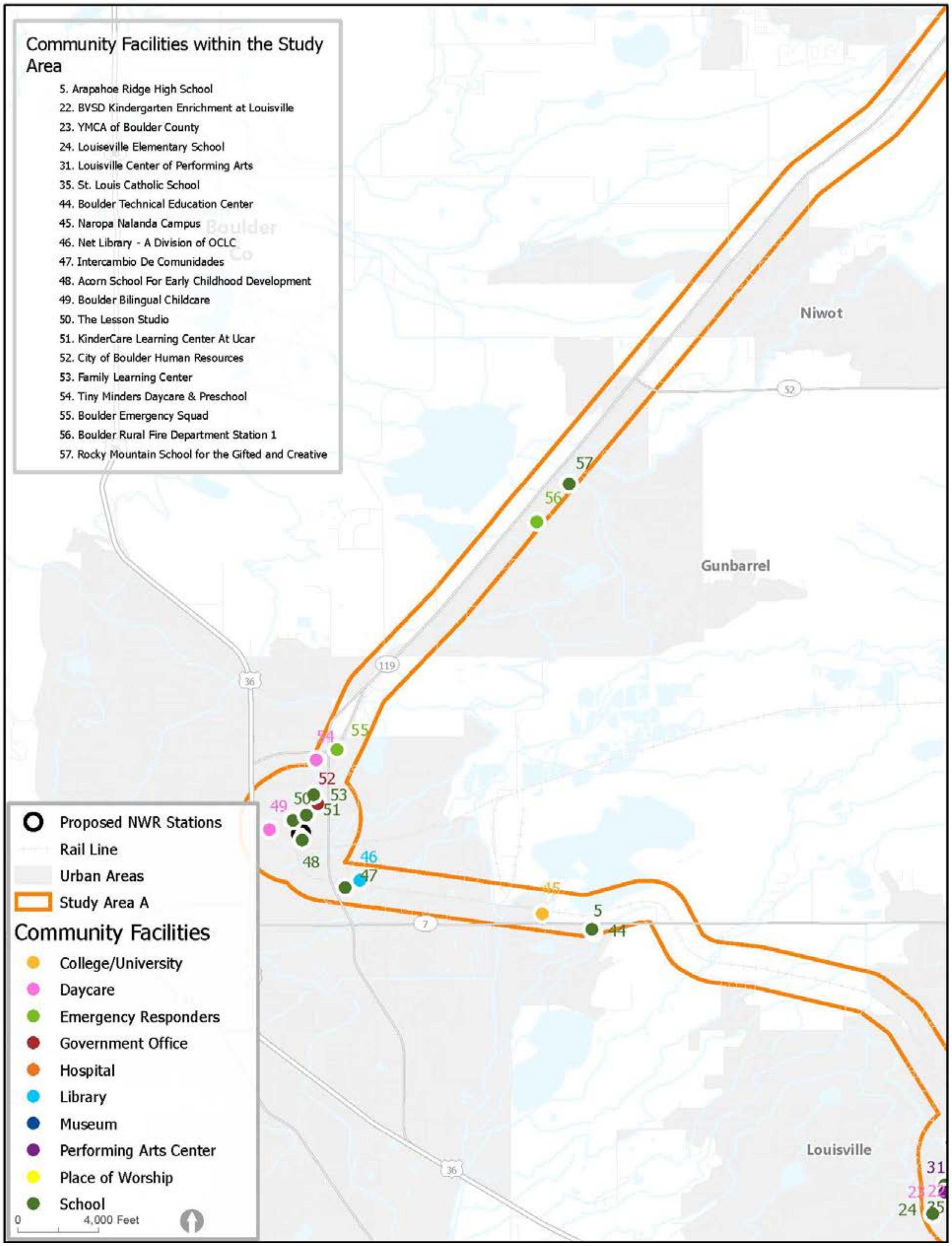
Corridor Conditions Report

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



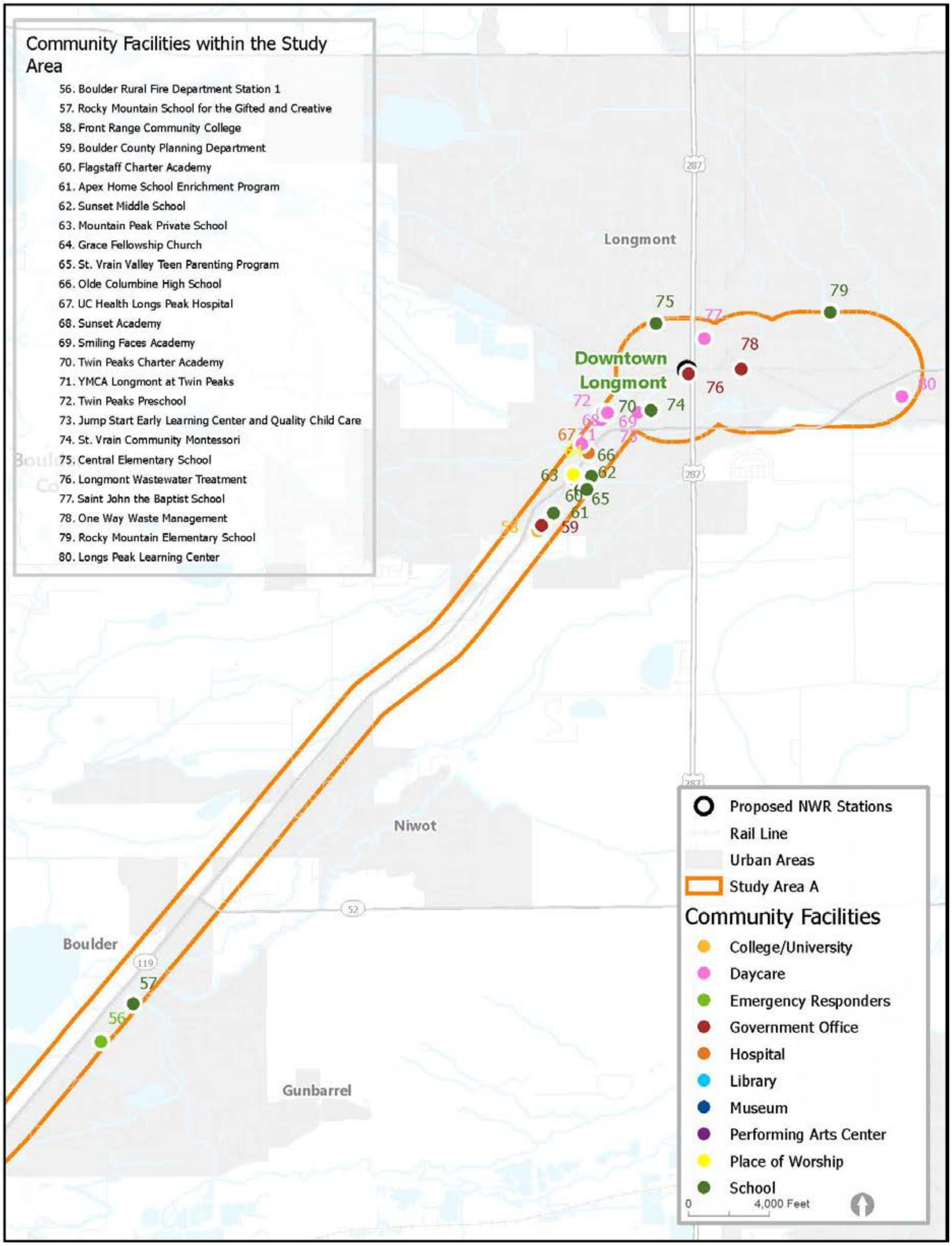
Corridor Conditions Report

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



Corridor Conditions Report

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



Corridor Conditions Report

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.

Corridor Conditions Report

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

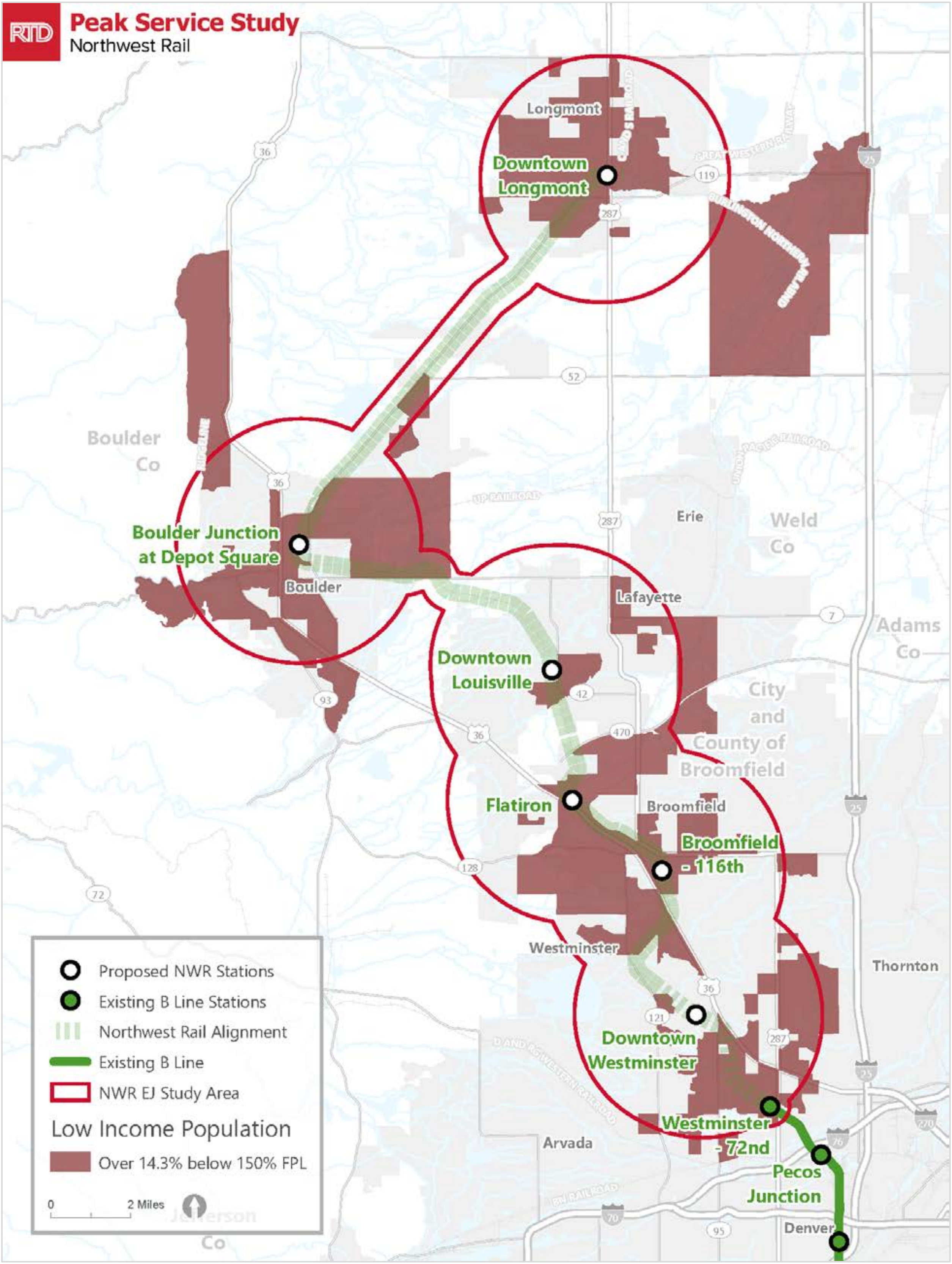
RTD is partnering with community leaders and organizations to understand the community beyond what can be learned from U.S. Census data. A survey and invitation for an interview were sent to community-based organizations and community leaders. The survey asks questions to help understand environmental 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



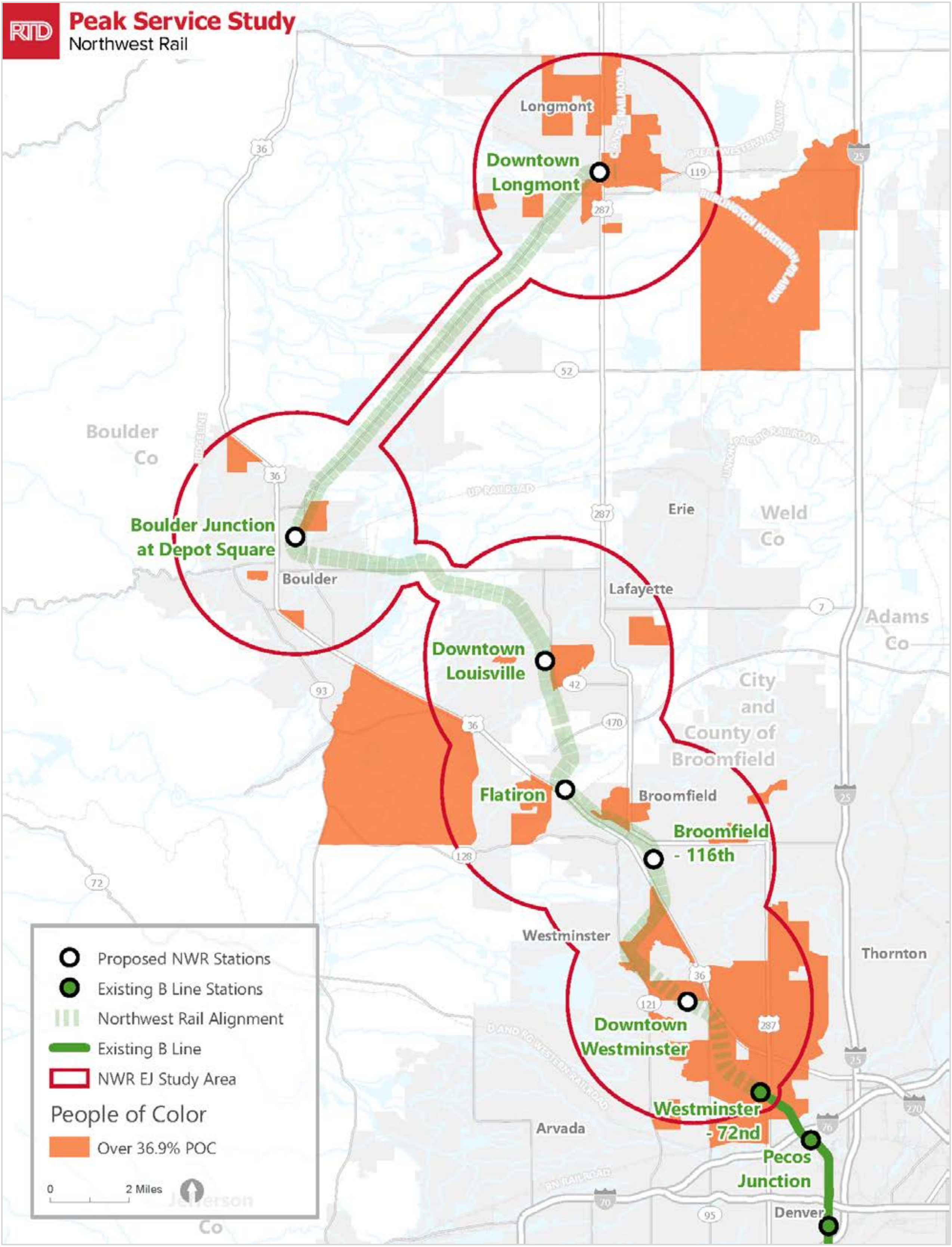
Corridor Conditions Report

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.

Corridor Conditions Report

Figure 14: Minority Communities in the Study Area



Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

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

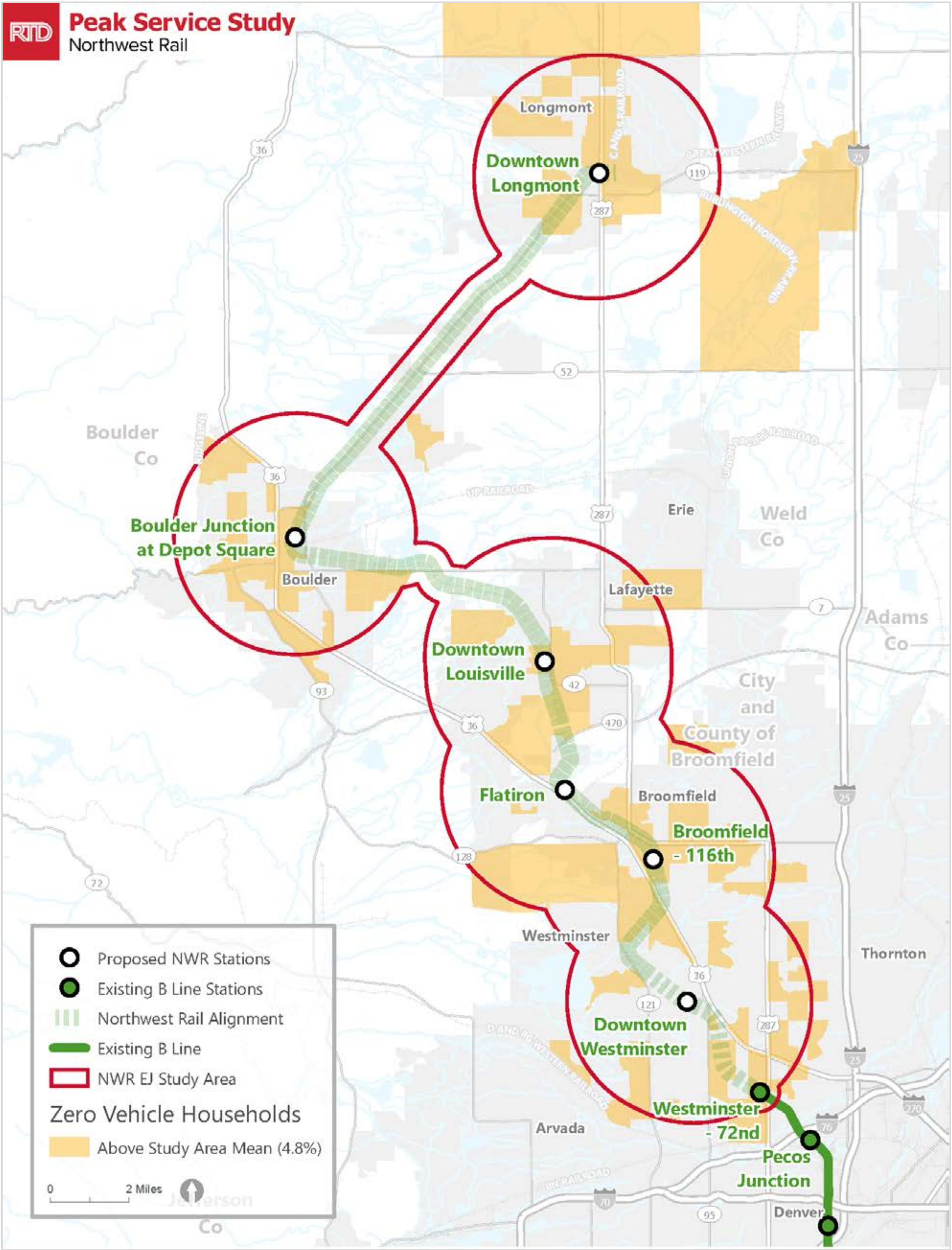
Community	Description
Adams County	Between Federal and Sheridan boulevards and 66th to 84th avenues, many residents live below 150% of the federal poverty line and identify as Hispanic/Latino. The area includes mostly single-family homes and apartments.
Boulder	Due to the large student population, areas 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.

Corridor Conditions Report

Figure 15: Zero-Vehicle Households



Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

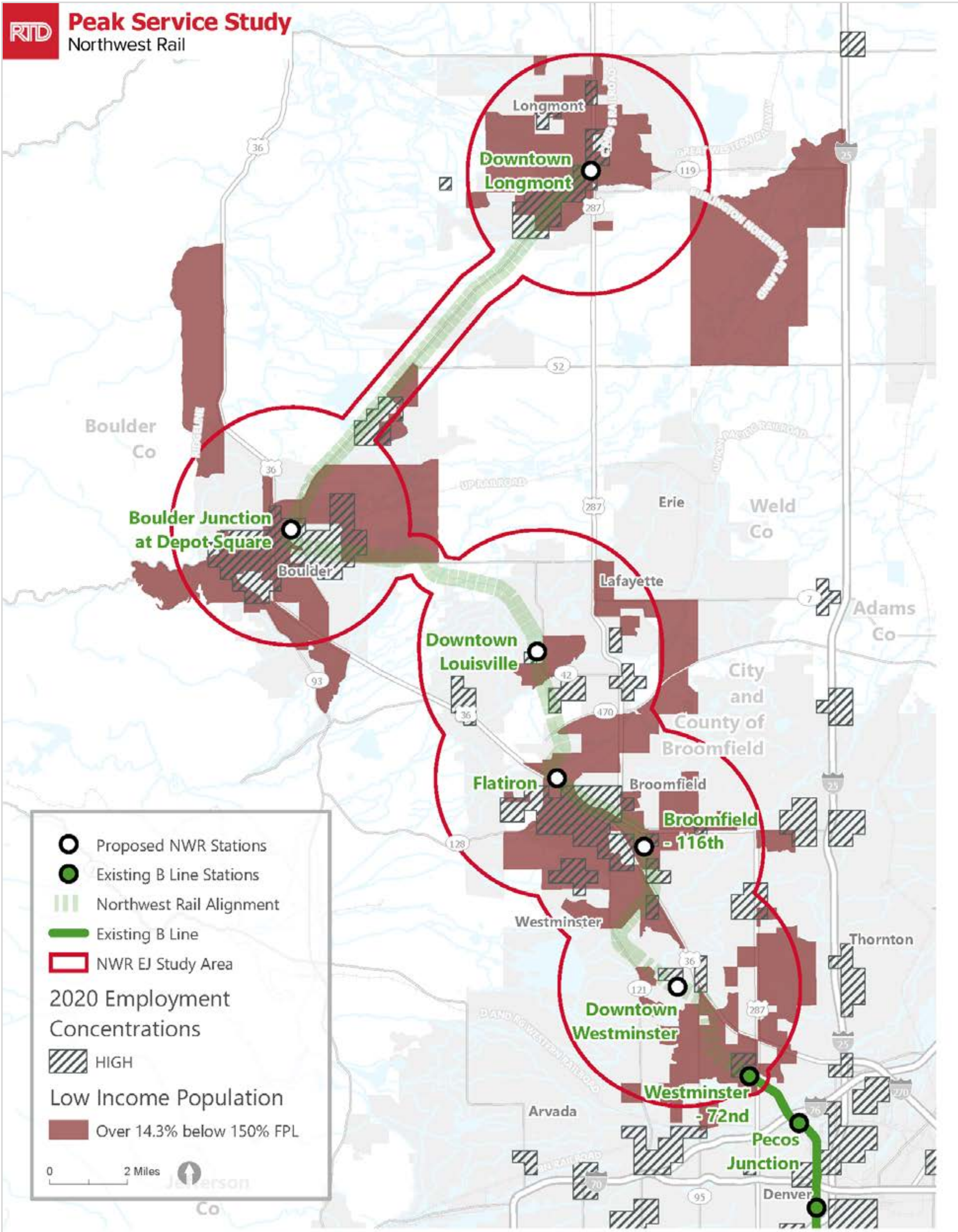
Minority-Owned/Businesses that Employ Minorities/Minority Customers

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

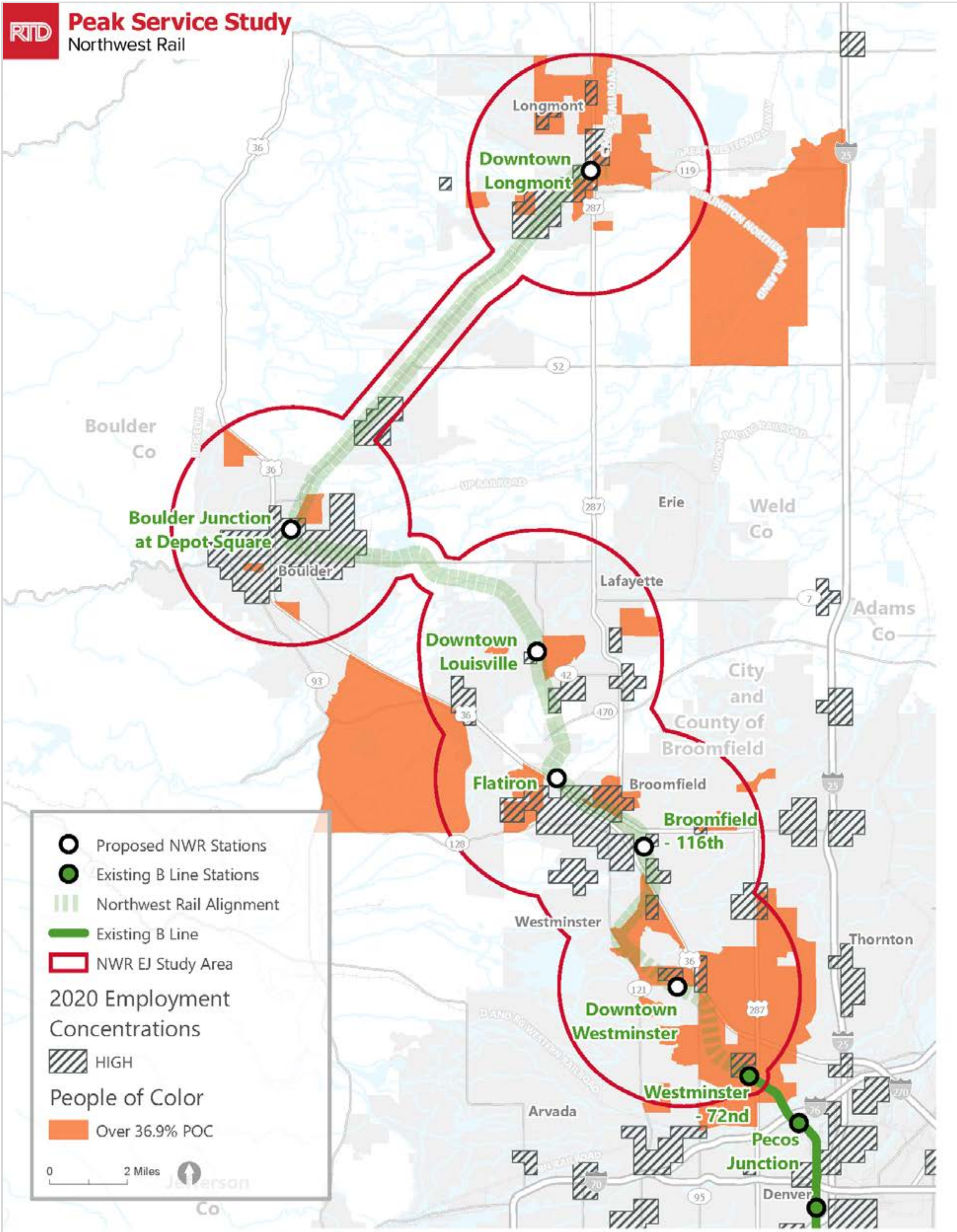
Corridor Conditions Report

Figure 16: Low-Income Populations and High Economic Concentrations



Corridor Conditions Report

Figure 17: Minority Communities and High Employment Concentrations



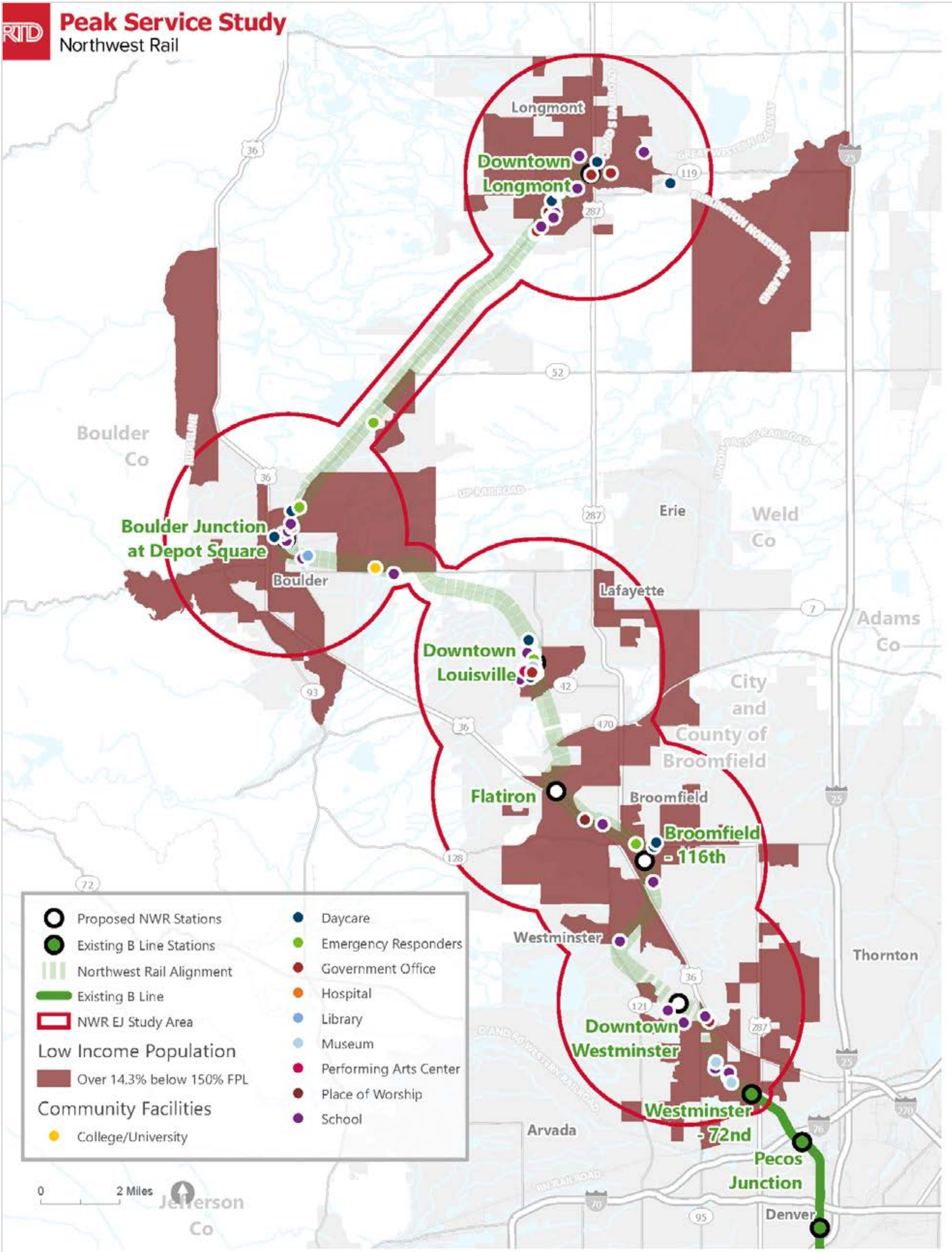
Corridor Conditions Report

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.

Corridor Conditions Report

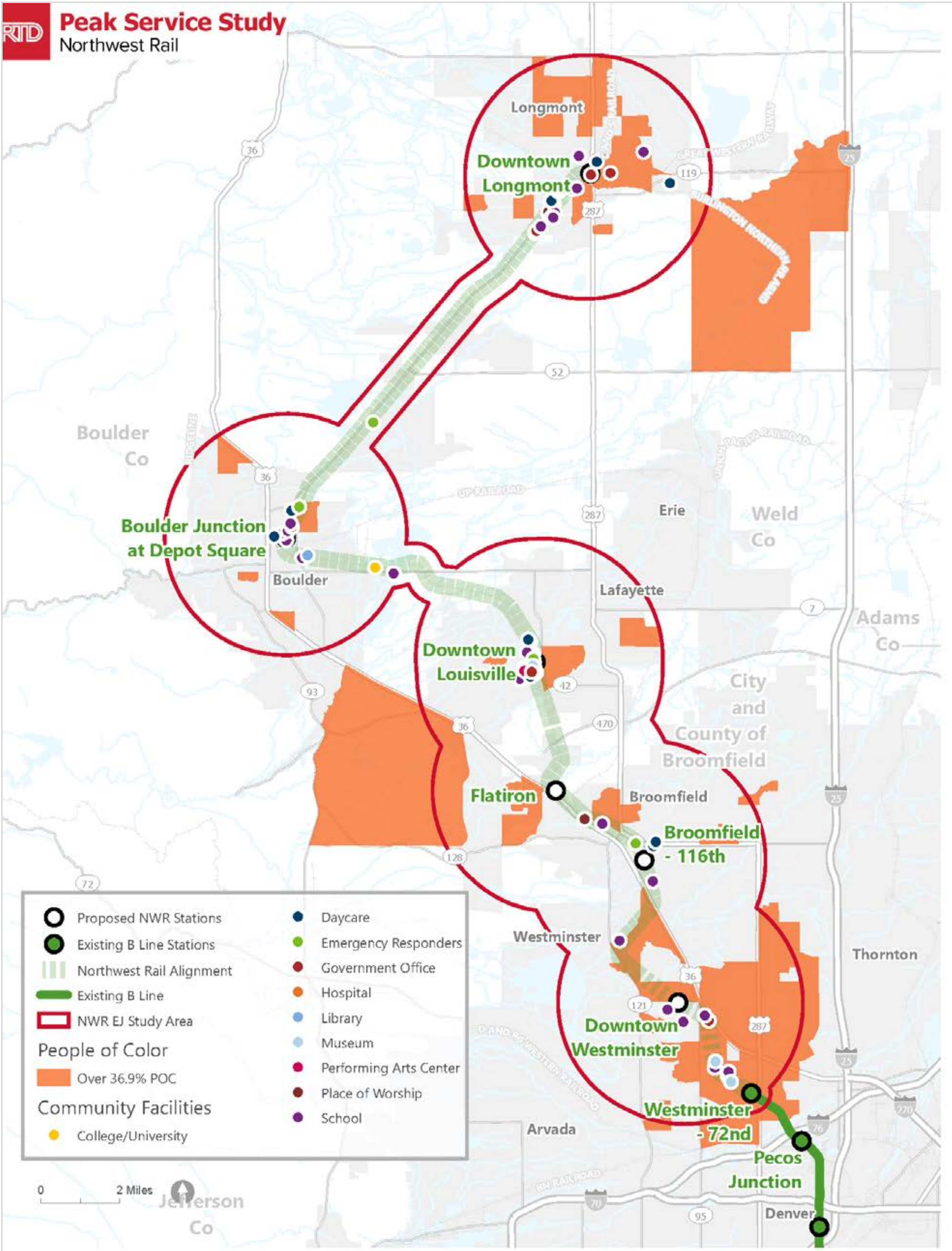
Figure 18: Low-Income Populations and Community Resources



Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

Corridor Conditions Report

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.

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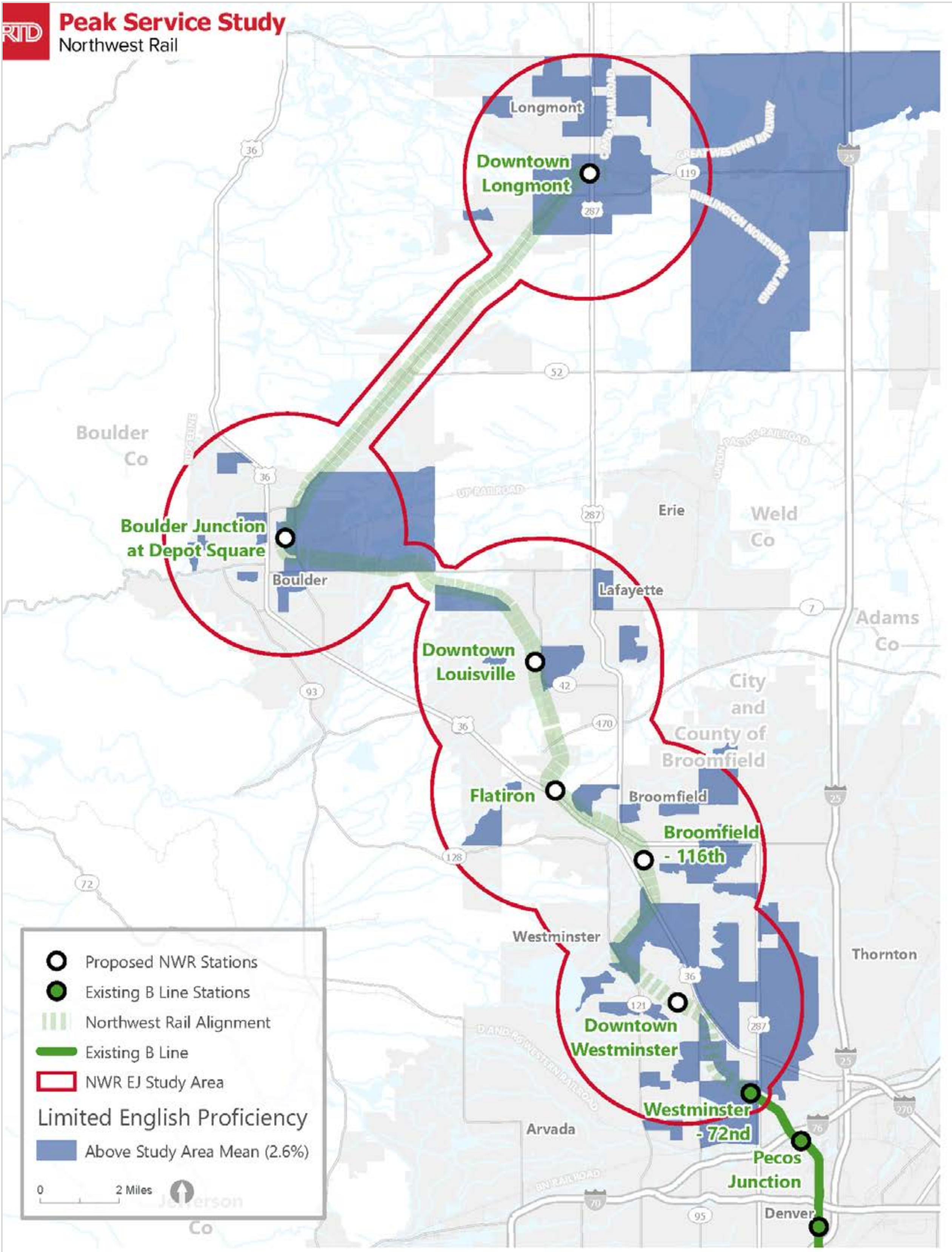
Figure 20: Populations with Limited-English Proficiency



Corridor Conditions Report

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.

Corridor Conditions Report

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.

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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

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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.

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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.

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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

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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/)

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.

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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

Corridor Conditions Report

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

Corridor Conditions Report

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

Corridor Conditions Report

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

Corridor Conditions Report

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

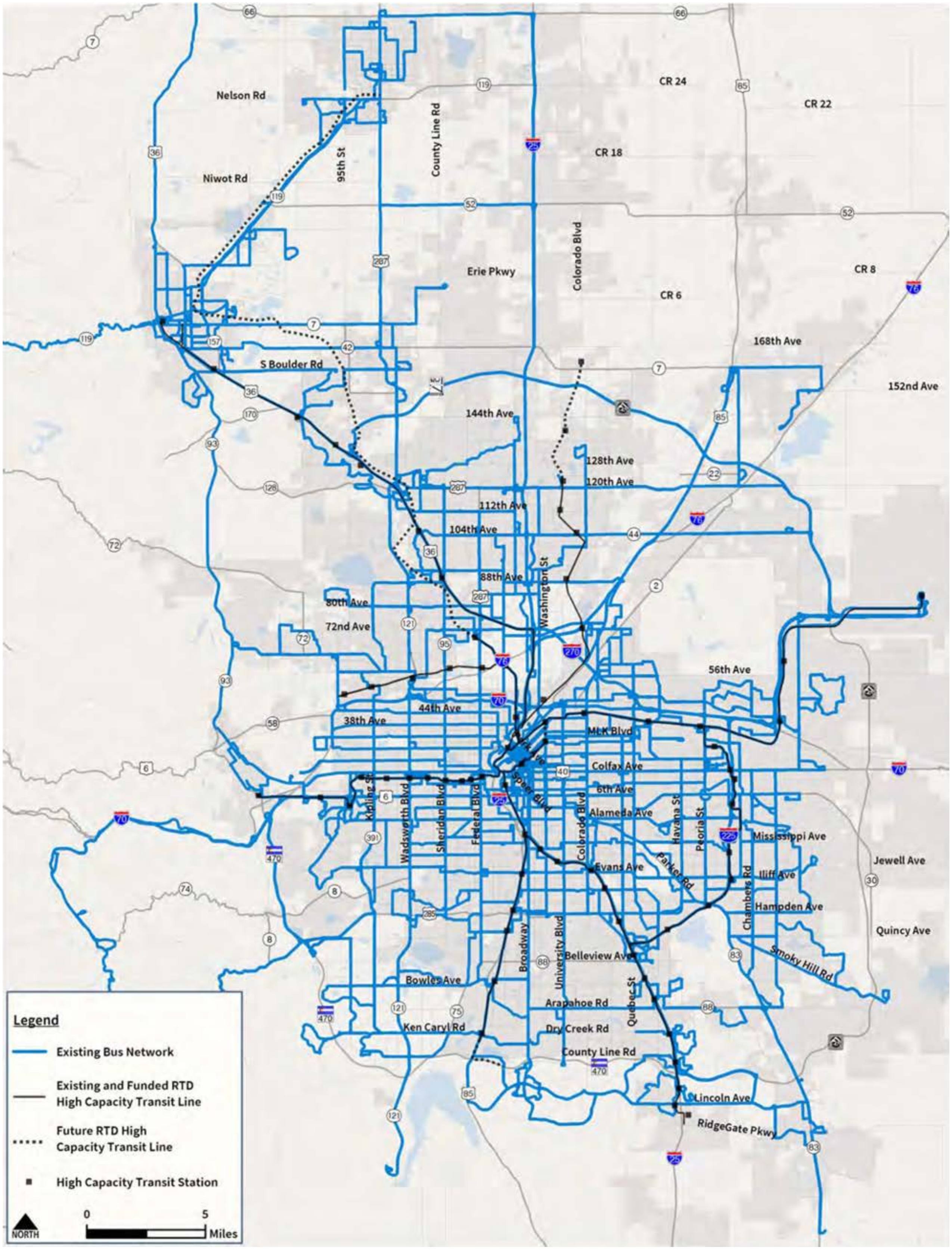
Regionally, the greater Denver, Boulder, and Longmont areas have amateur grid-based transit systems (

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.

Corridor Conditions Report

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.

Corridor Conditions Report

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

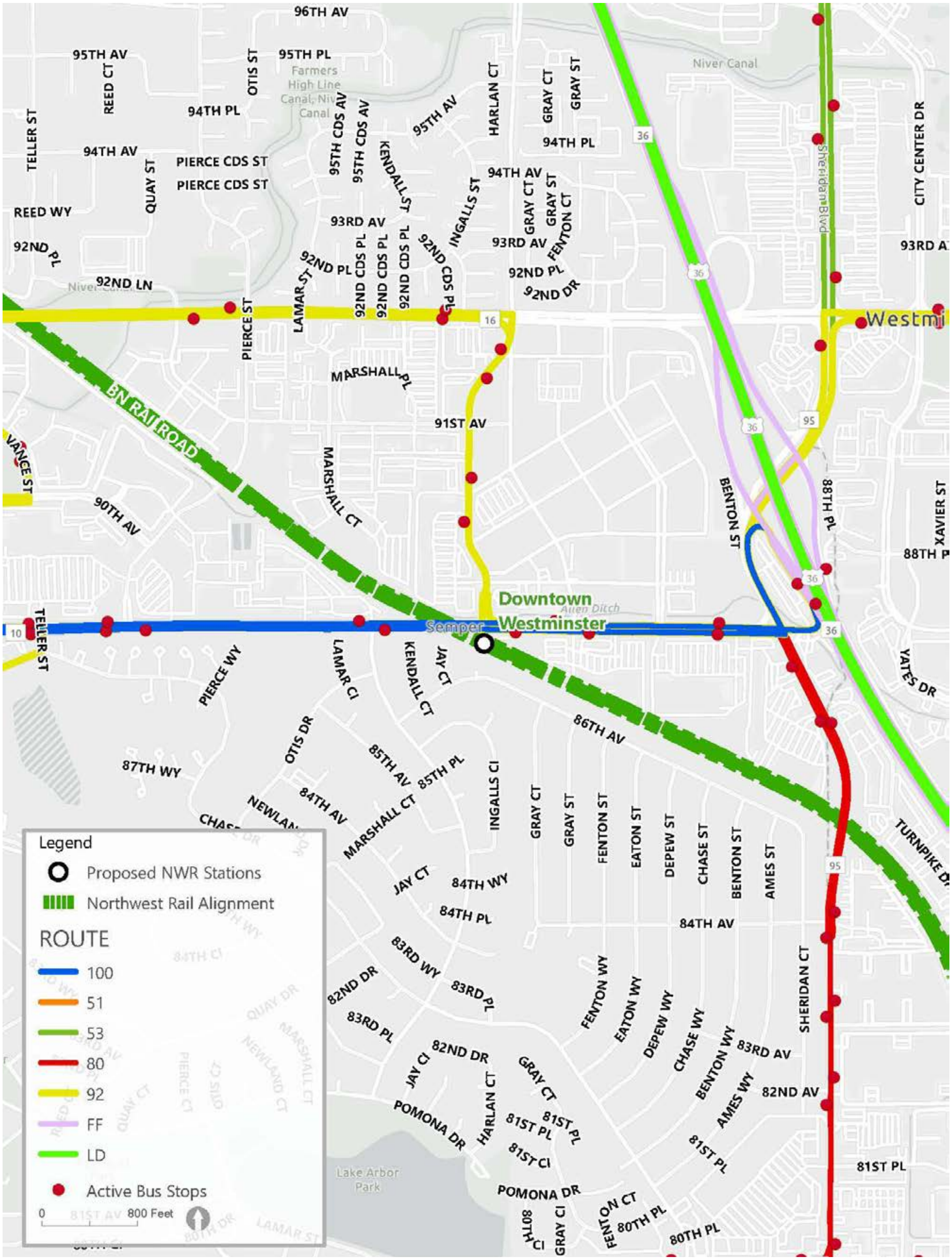


Table 21: Existing Transit Service in Area Near Downtown Westminster Station

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

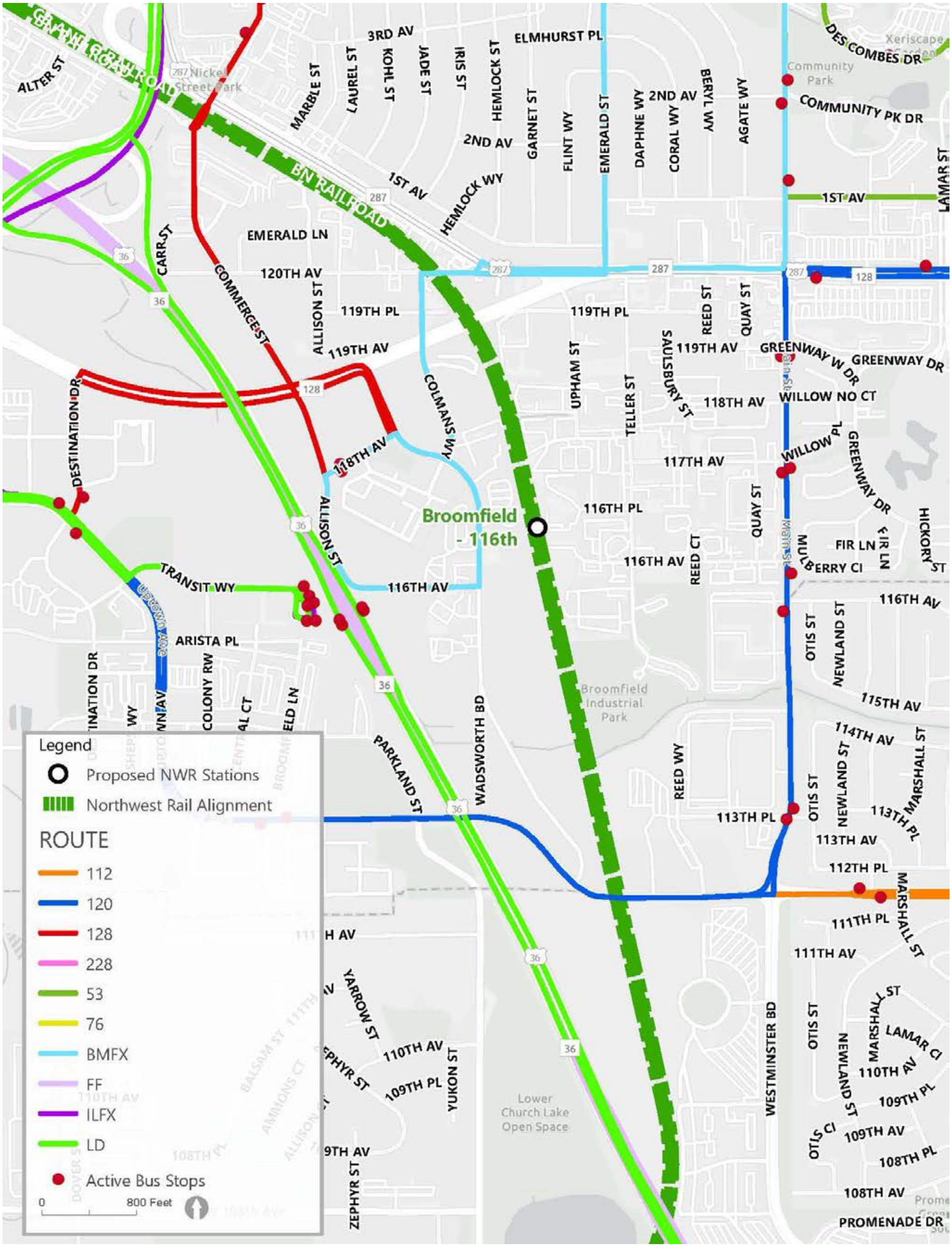


Table 22: Existing Transit Service in Area Near Broomfield – 116th Station

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.

Corridor Conditions Report

Figure 24: Existing Transit Service in Area Near Flatiron Station

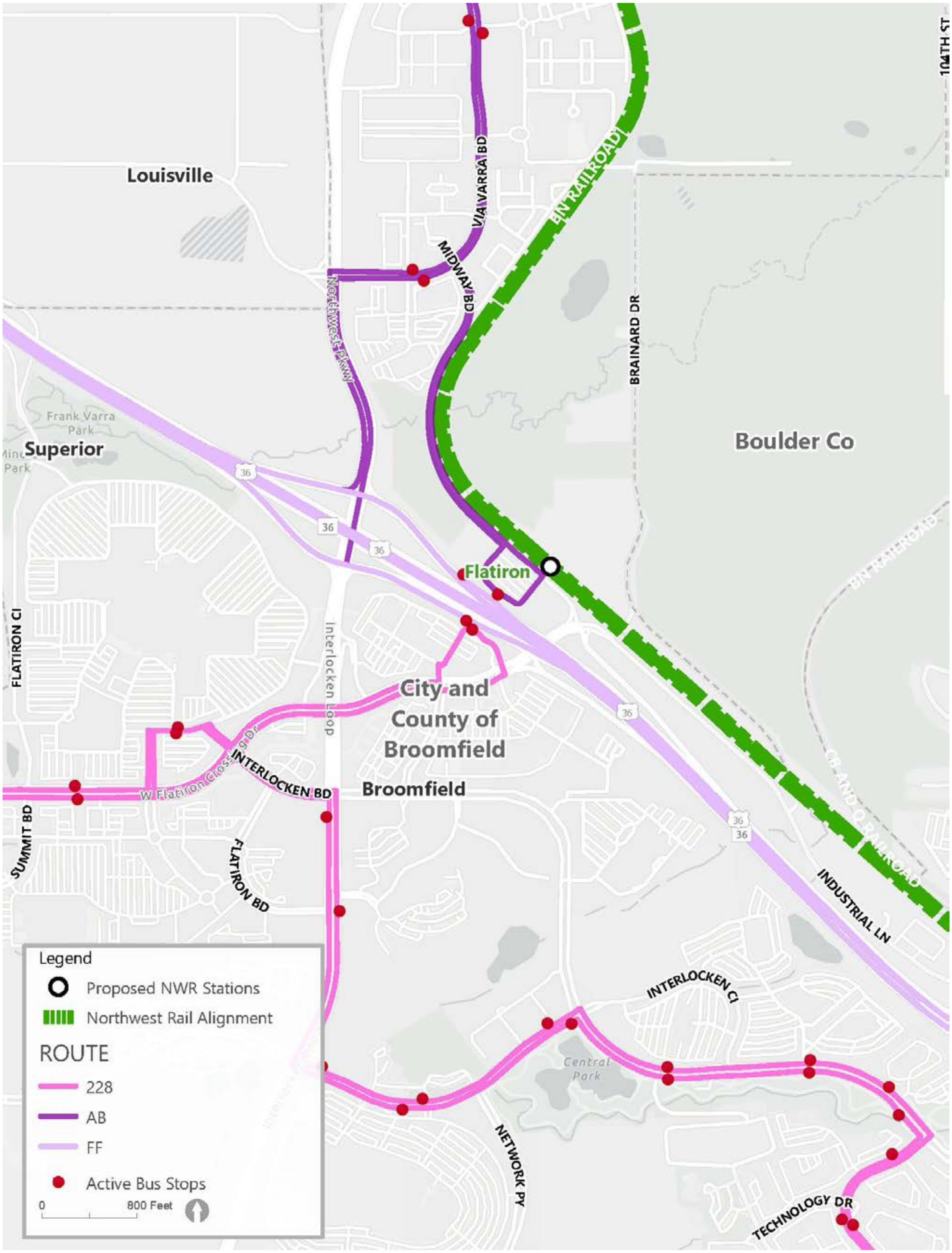


Table 23: Existing Transit Service in Area Near Flatiron Station

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.

Corridor Conditions Report

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

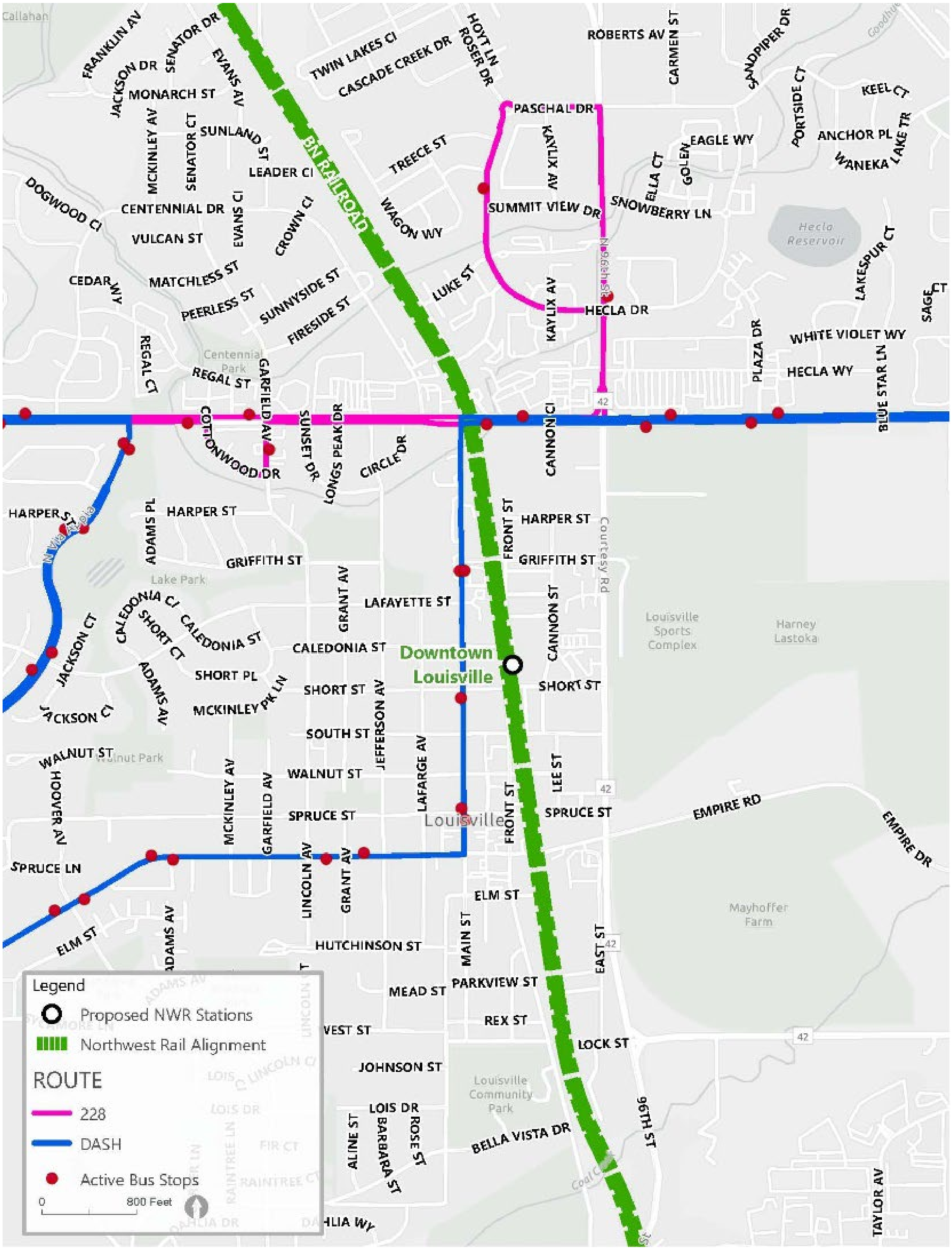


Table 24: Existing Transit Service in Area Near Downtown Louisville Station

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.

Corridor Conditions Report

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

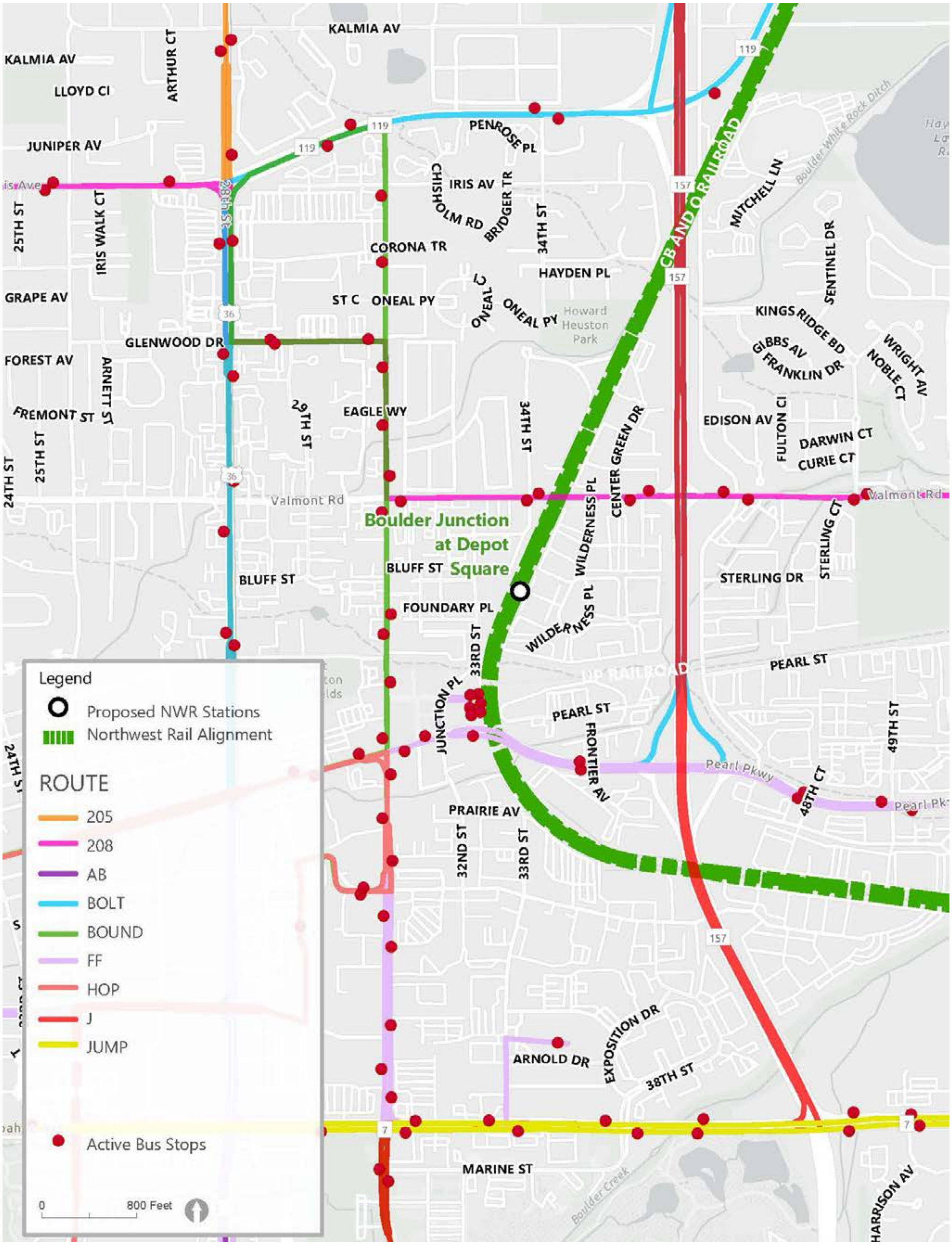


Table 25: Existing Transit Service in Area Near Boulder Junction at Depot Square Station

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

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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	60 minutes	60 minutes	60 minutes	N/A
	3rd & Coffman				
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.

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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

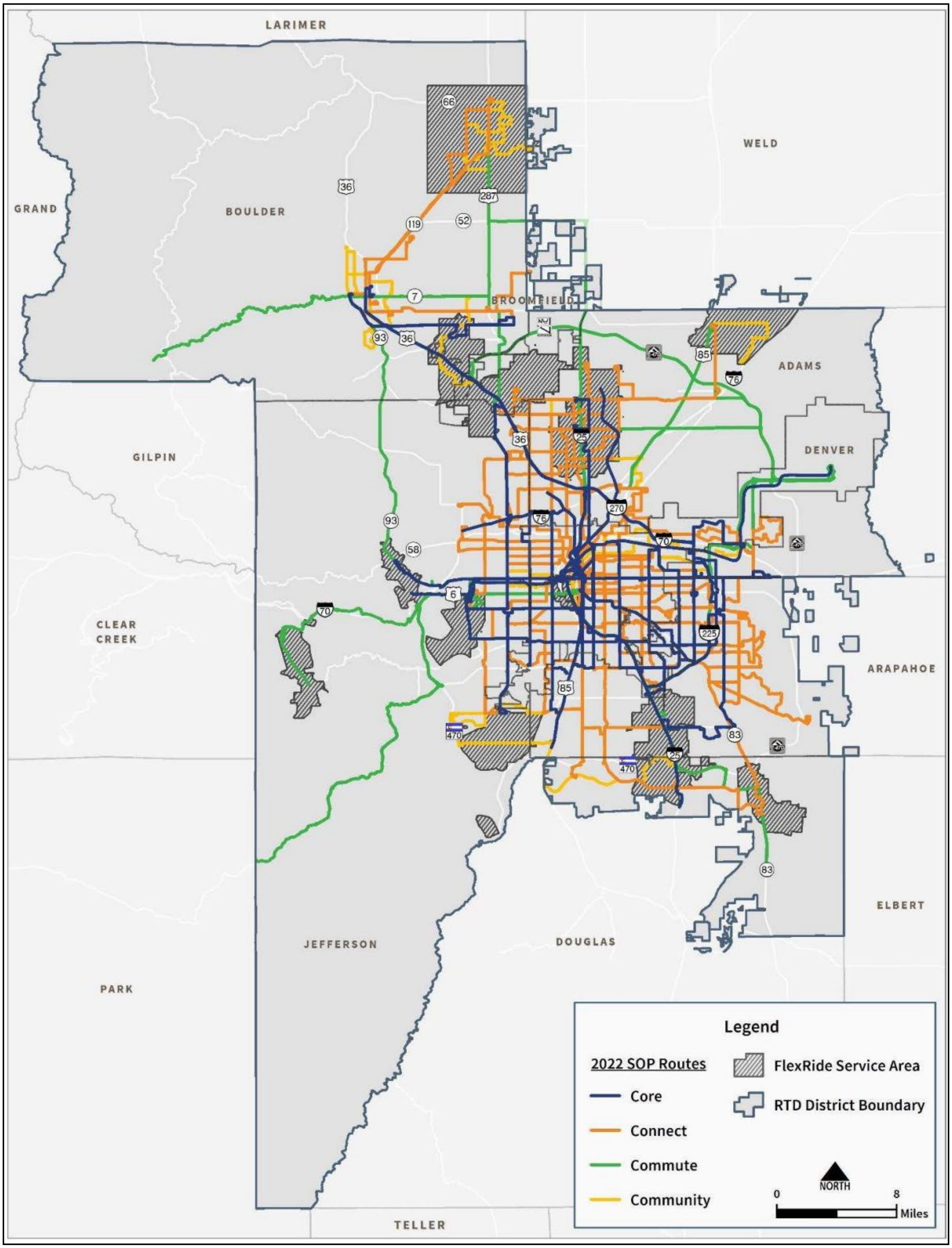
The Reimagine RTD effort includes the development of a SOP that the RTD Board of Directors adopted on July 26, 2022. The SOP outlines improvements to RTD service within the Denver Metropolitan Area, including the northwest area.

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 1st & Main	30 minutes	60 minutes	60 minutes	Community
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 1st & Main	30 minutes	60 minutes	60 minutes	Connect
Future US 287 BRT	Downtown Longmont Station 8th & Coffman Future US 287/SH 66	30 minutes	60 minutes	N/A	Commute
LBr	1st & Coffman 1st & Main	60 minutes	60 minutes	N/A	Commute

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,

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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.

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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

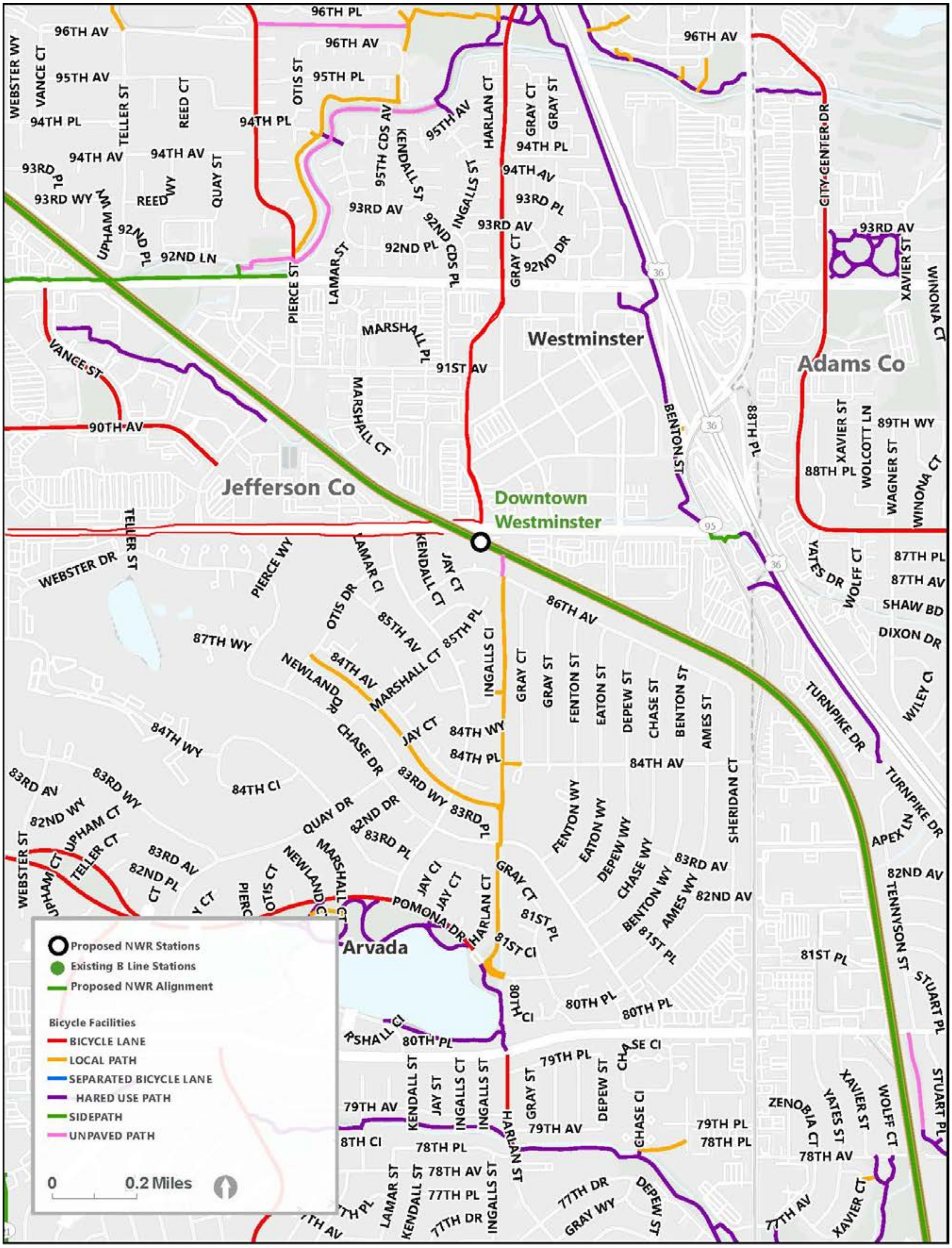

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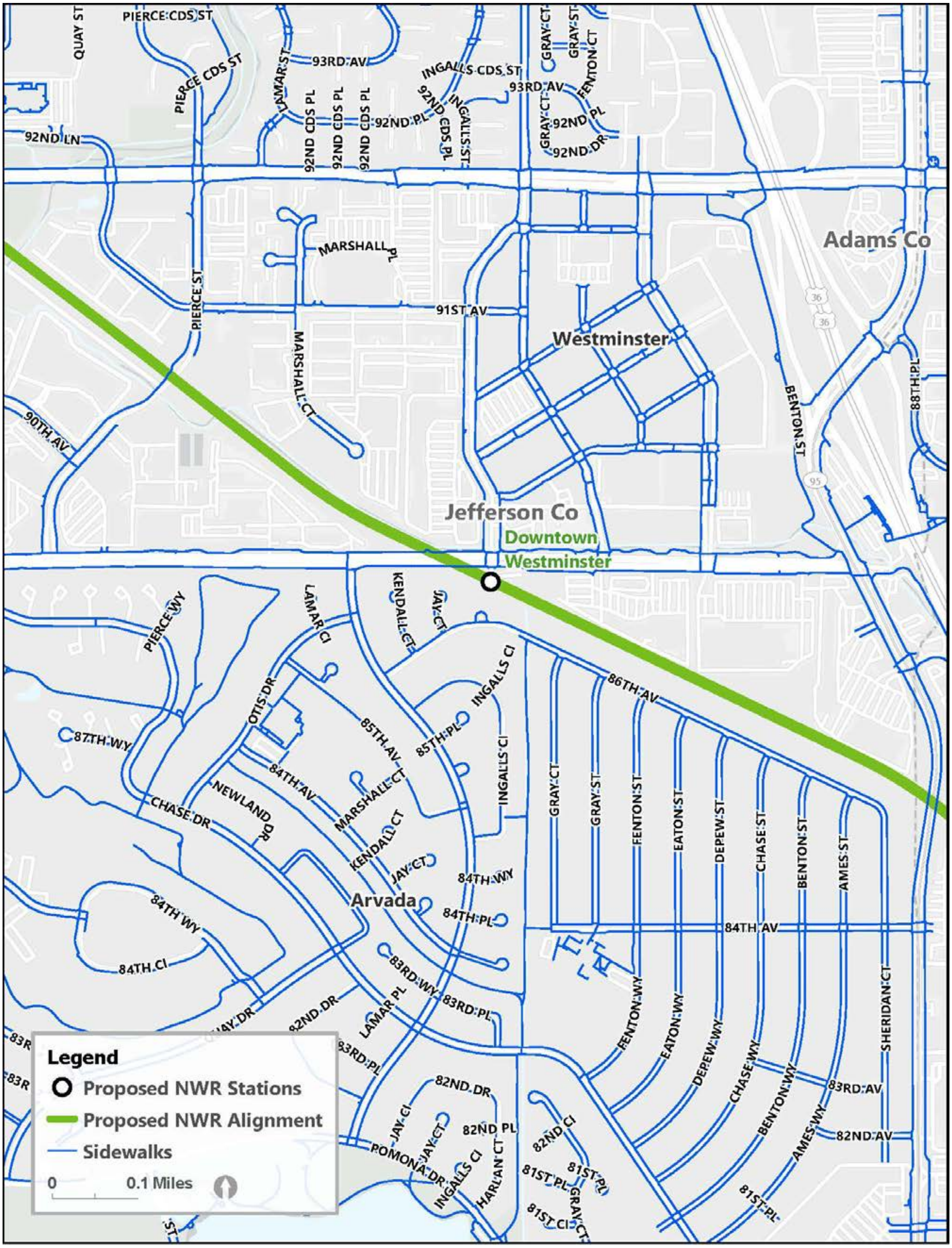
Figure 30: Existing Sidewalks near Downtown Westminster Station



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.

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Figure 31: Bicycle Facilities near Broomfield – 116th Station

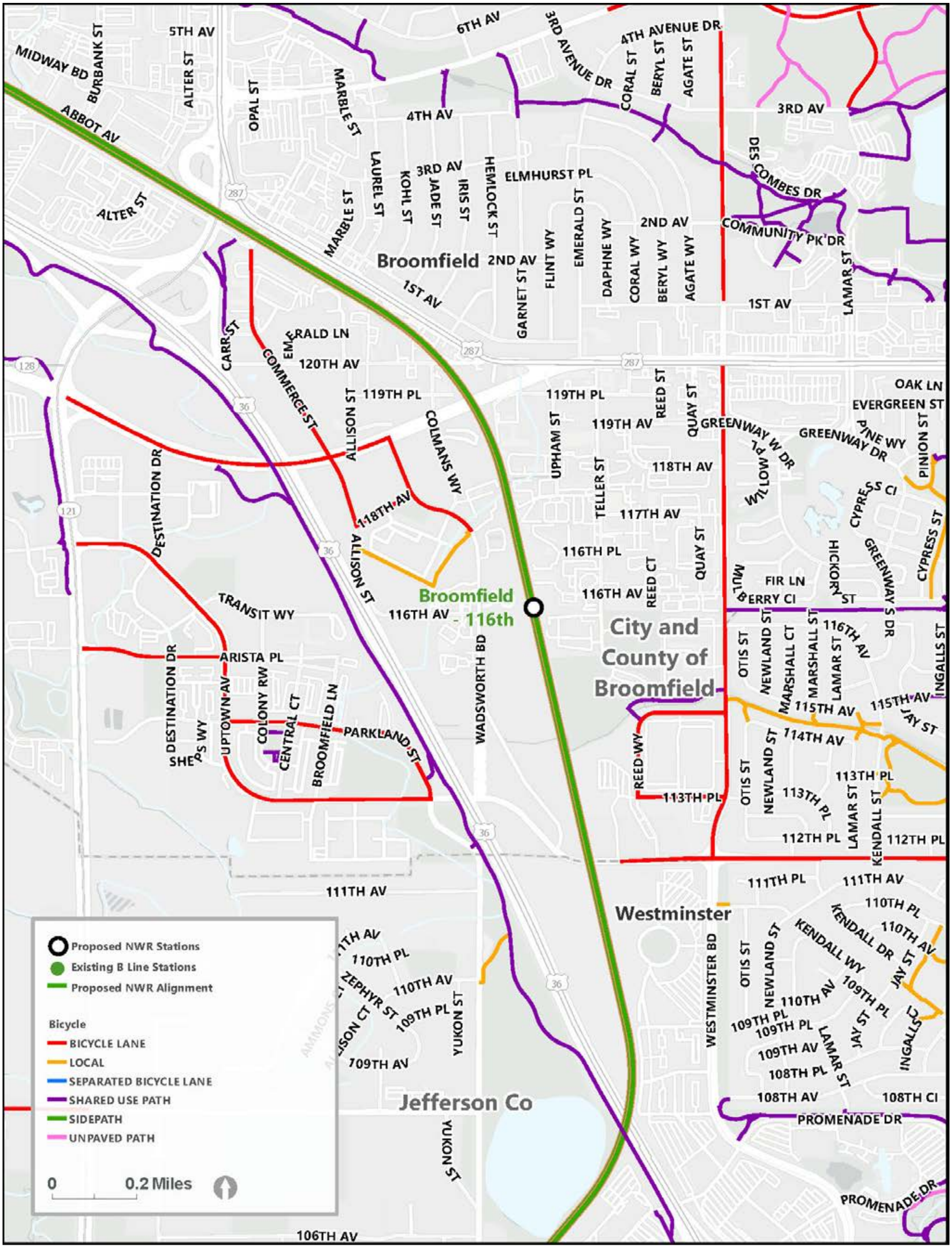

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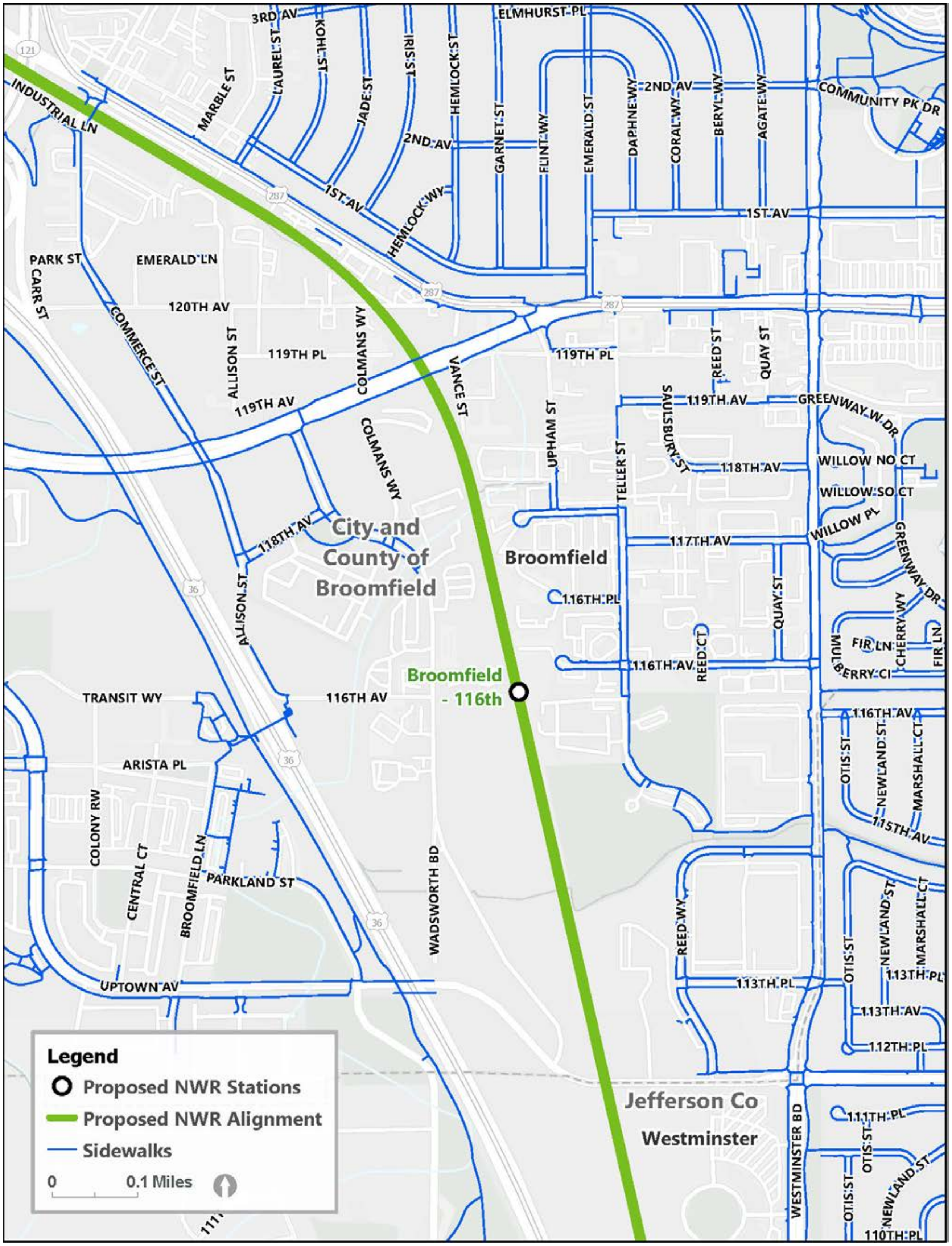
Figure 32: Existing Sidewalks near Broomfield – 116th Station



Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

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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

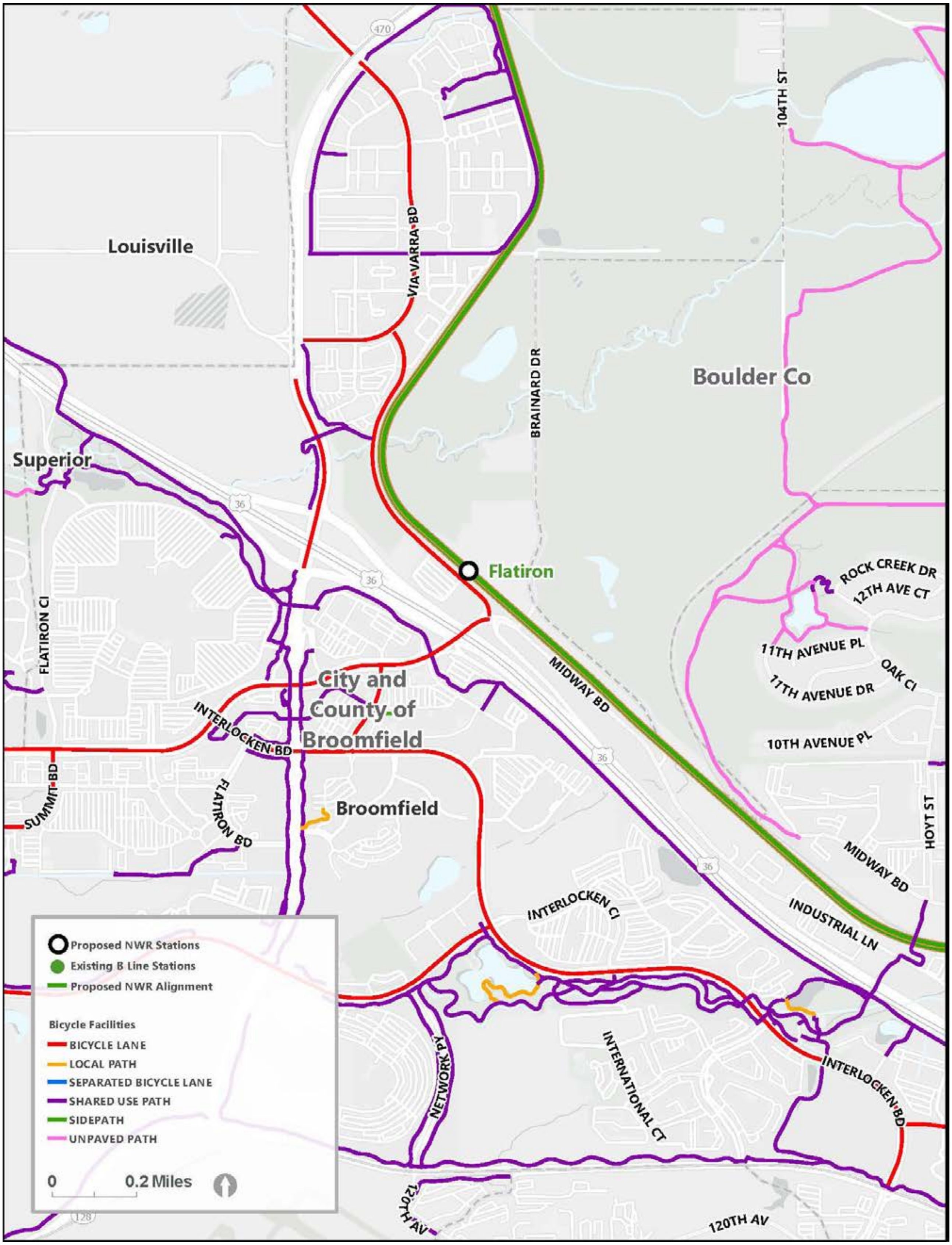

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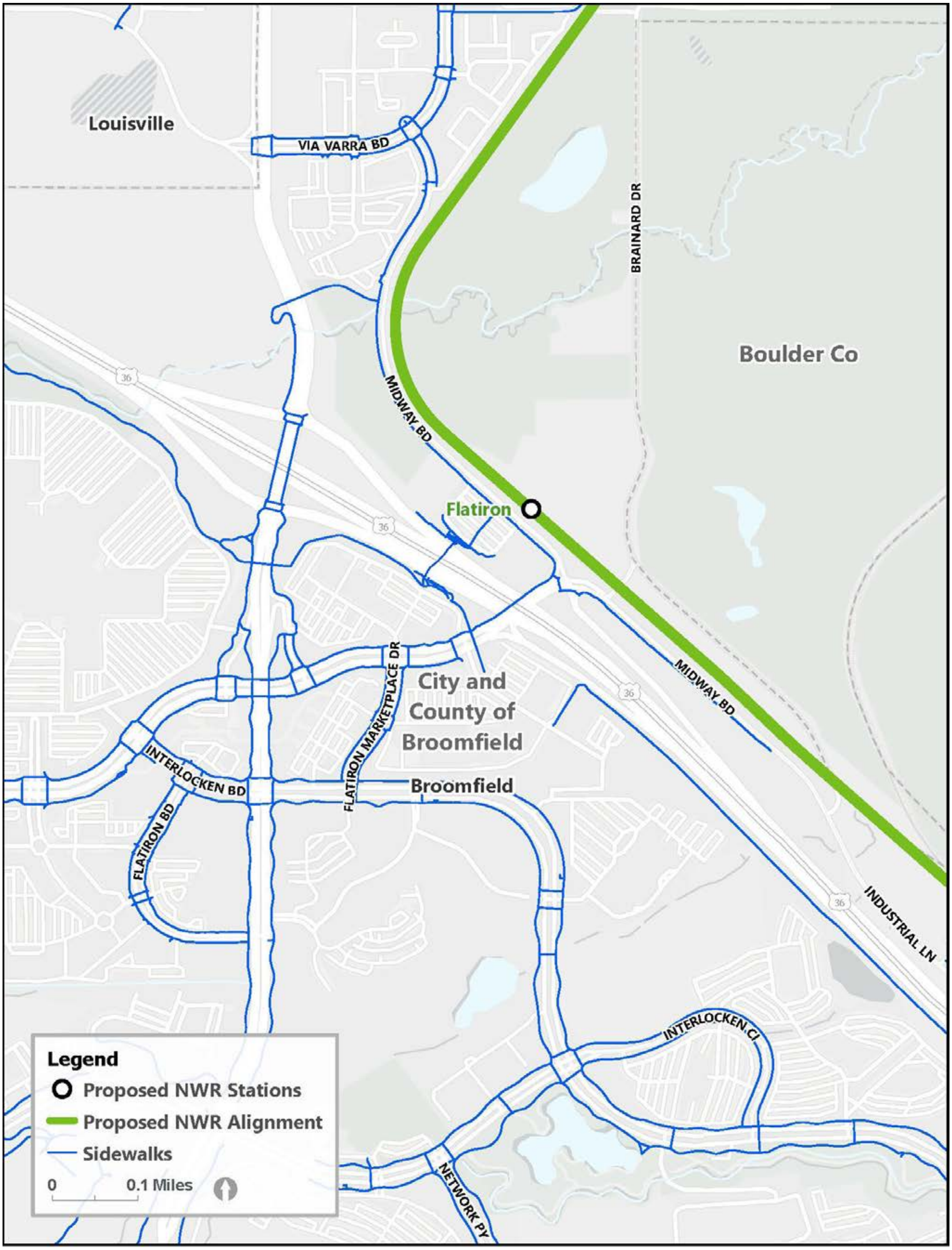
Figure 34: Existing Sidewalks near Flatiron Station



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.

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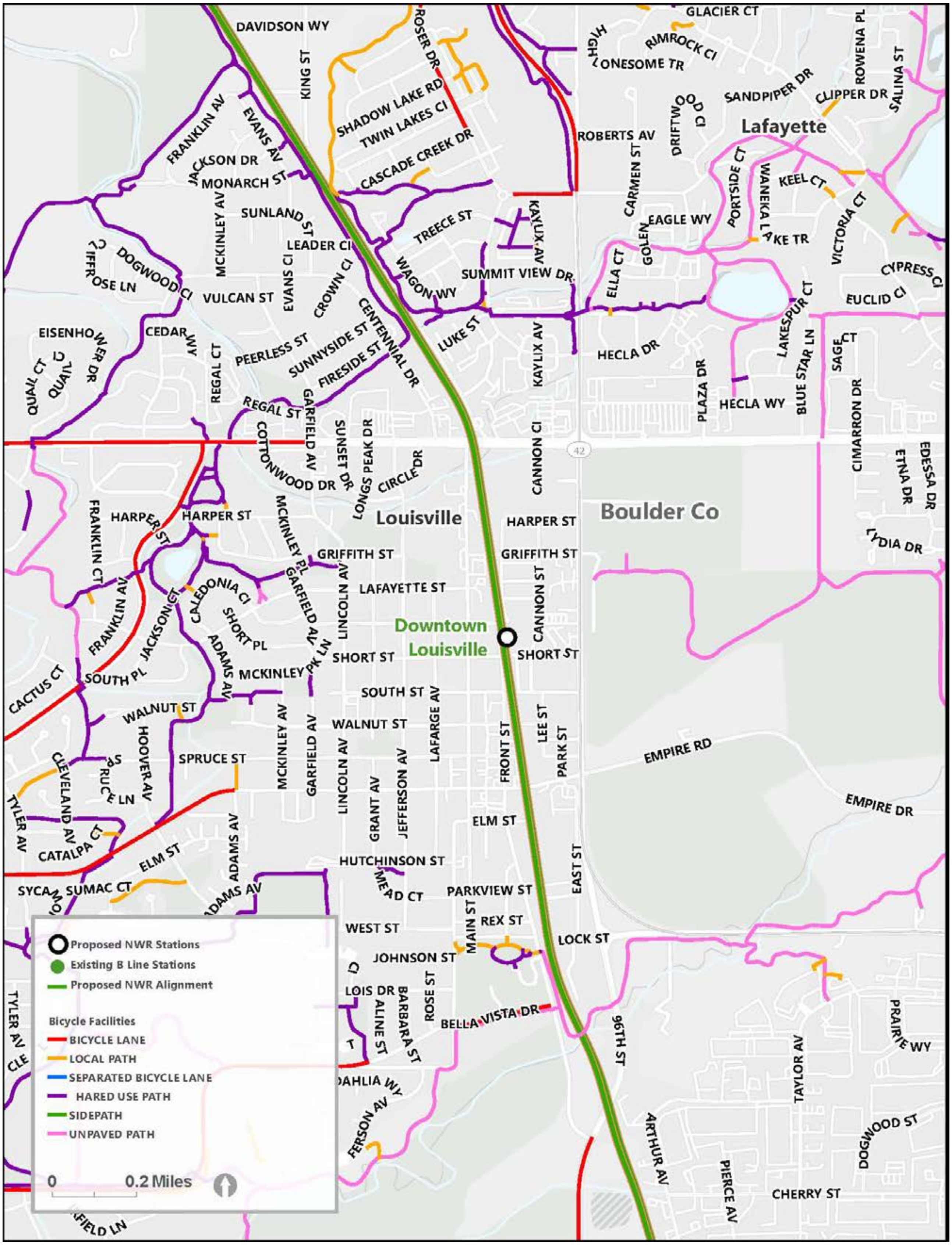
Figure 35: Bicycle Facilities near Downtown Louisville Station



Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

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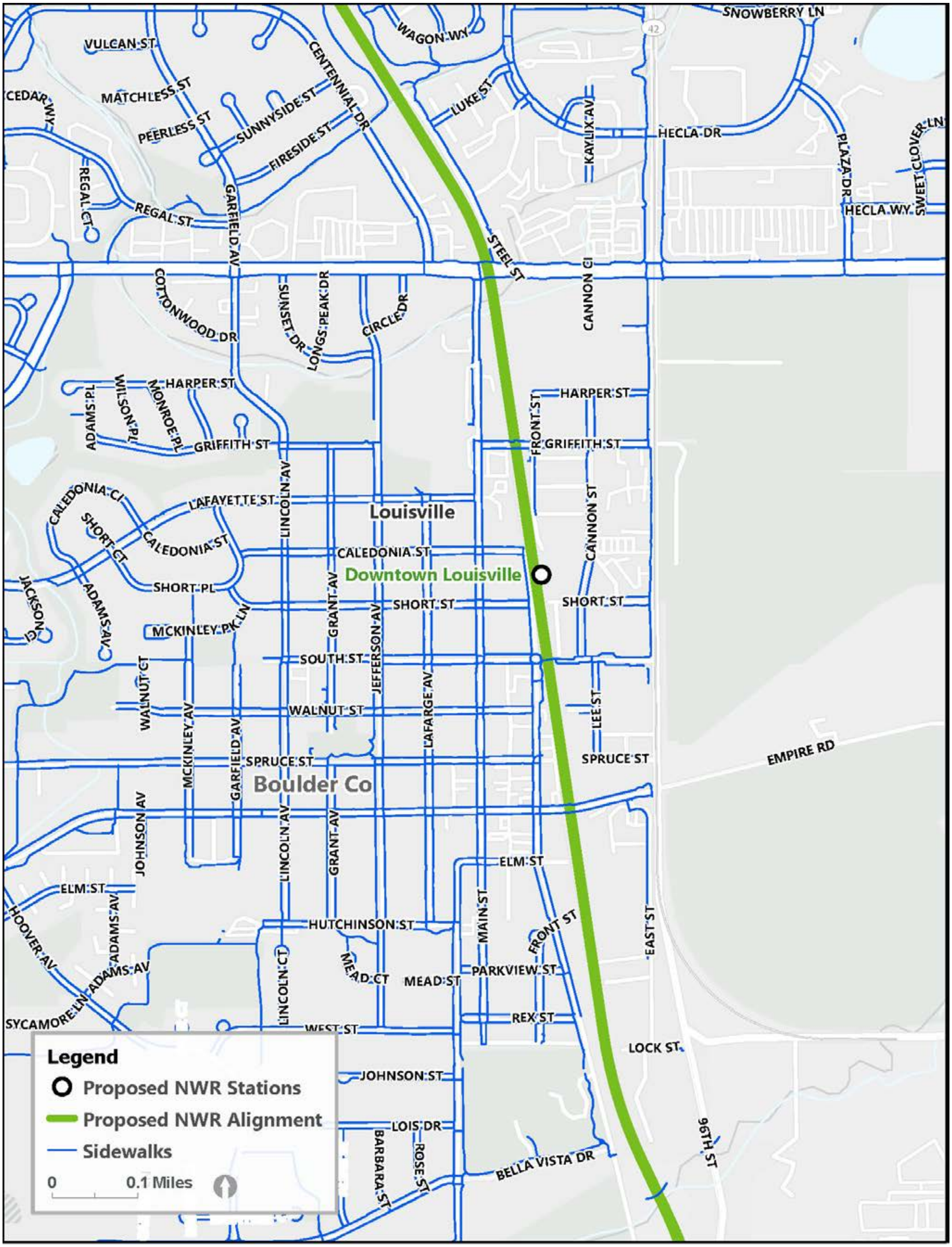
Figure 36: Existing Sidewalks near Downtown Louisville Station



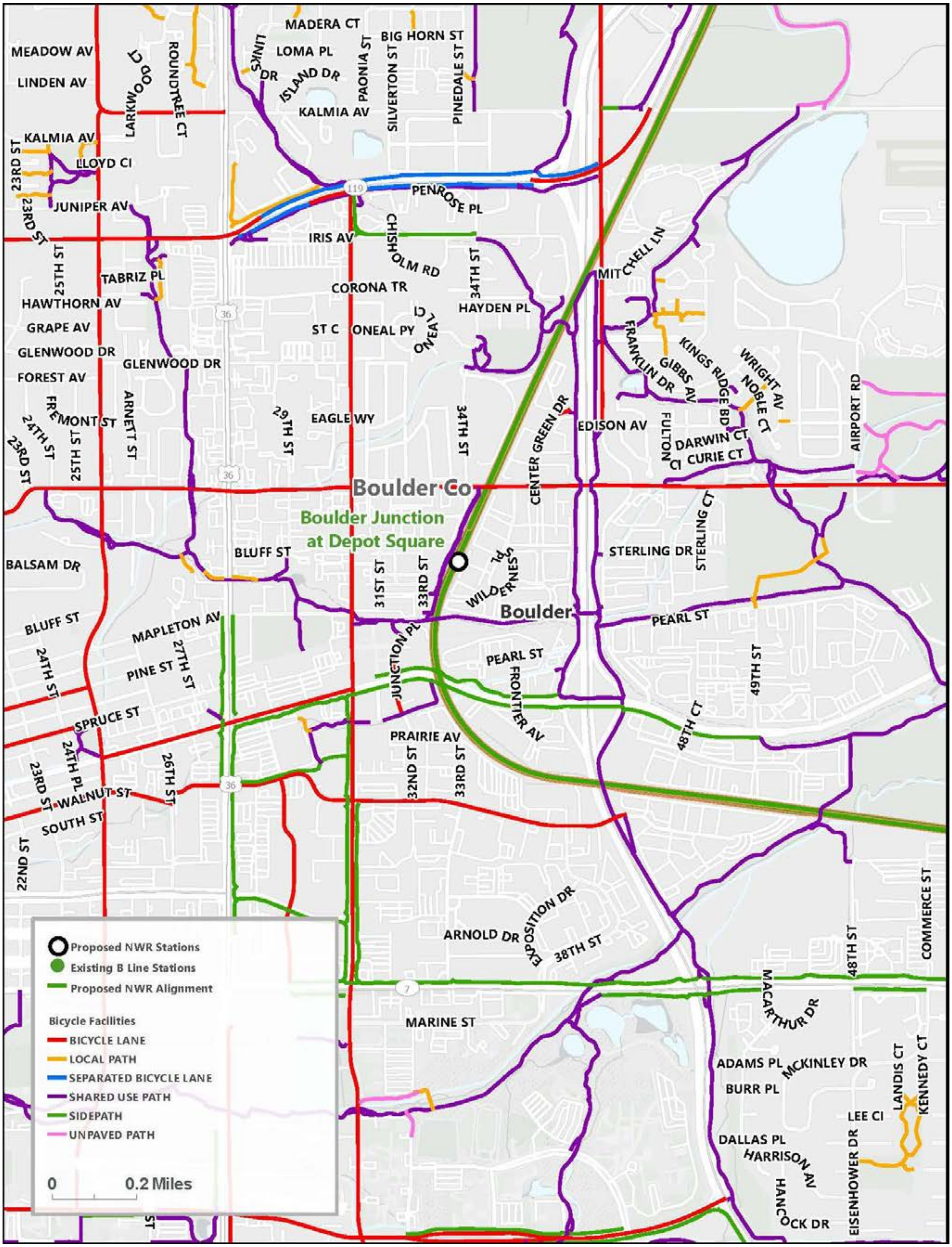
Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

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.

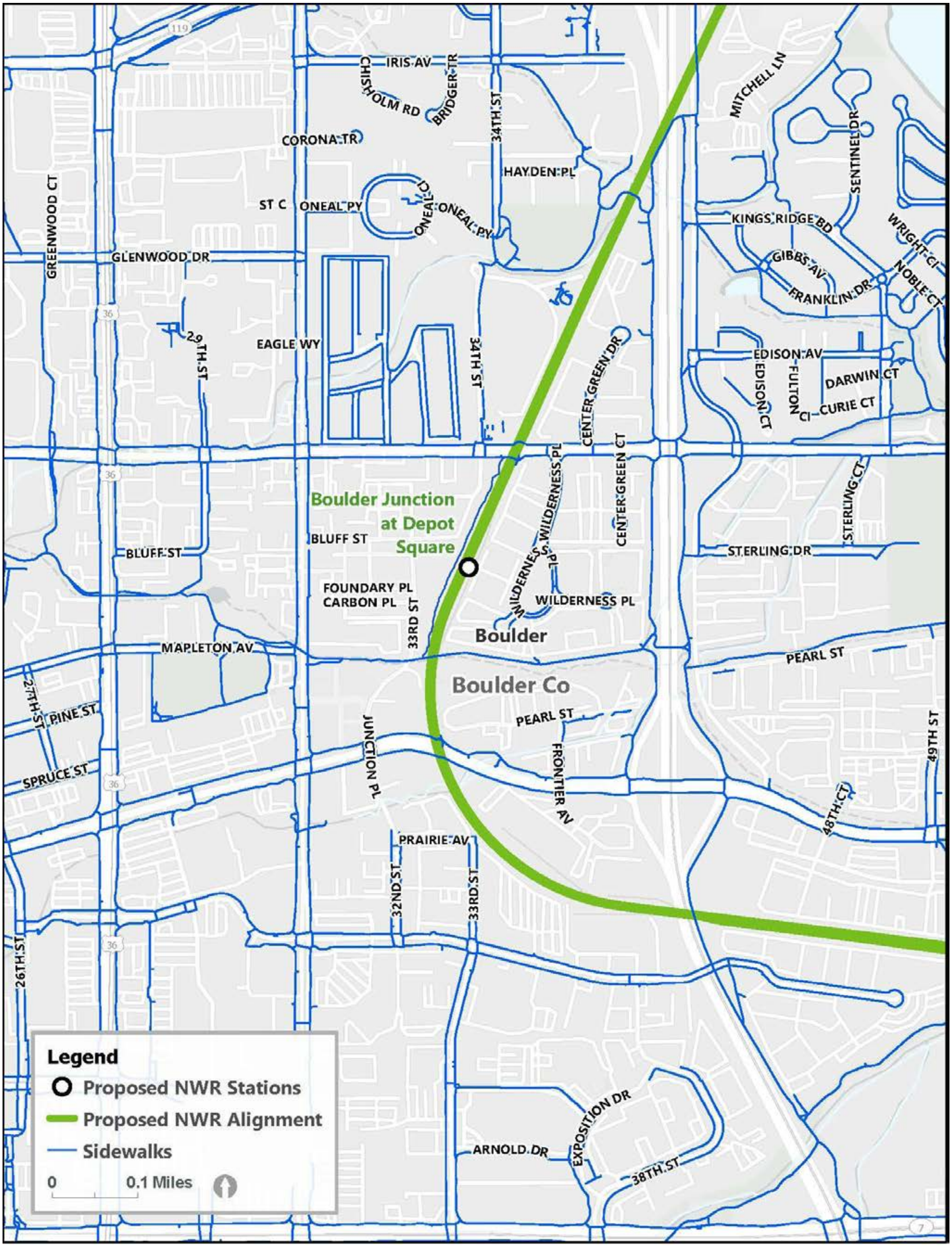
Figure 37: Bicycle Facilities near Boulder Junction at Depot Square Station



Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

Corridor Conditions Report

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.

Corridor Conditions Report

Figure 39: Bicycle Facilities near Downtown Longmont Station

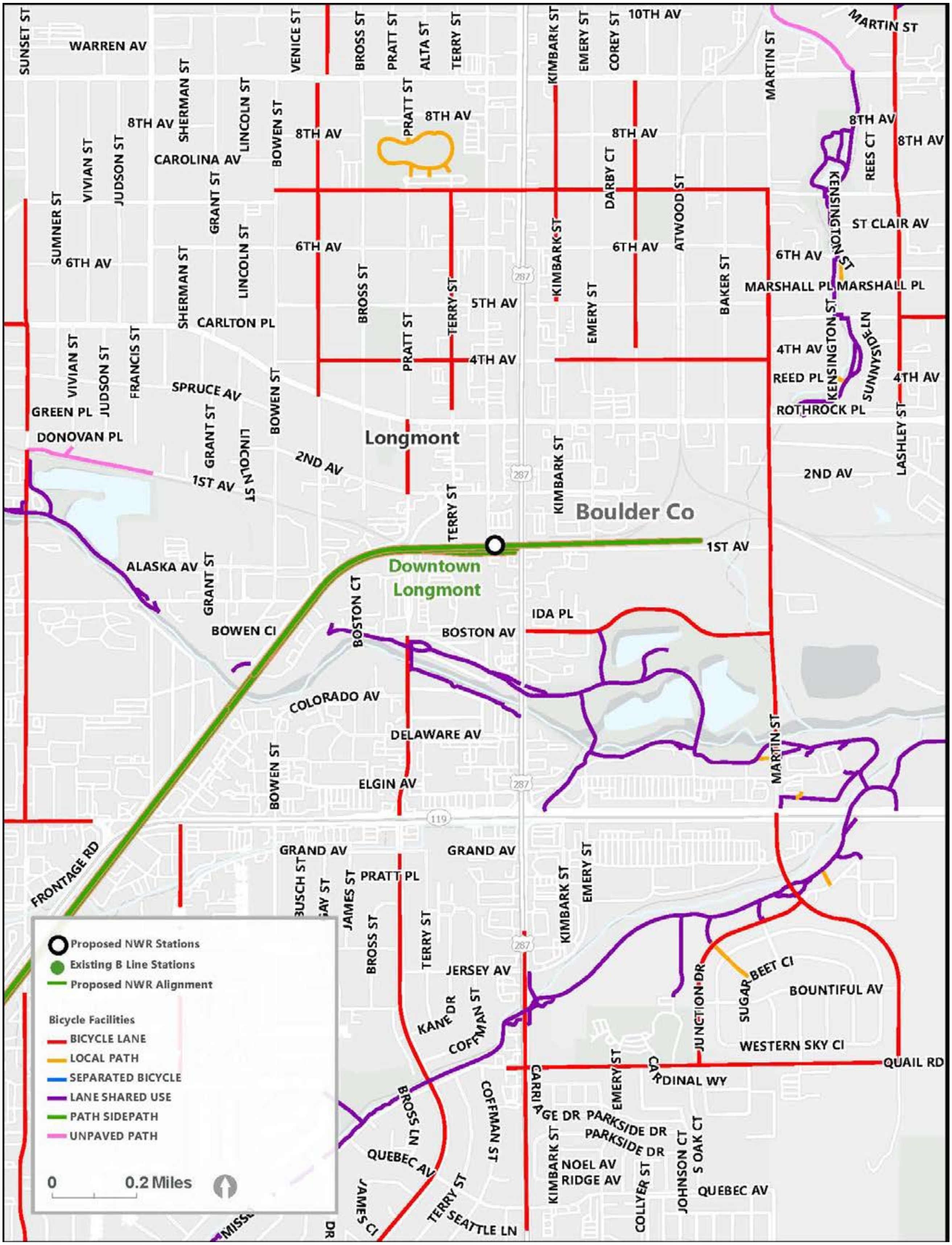
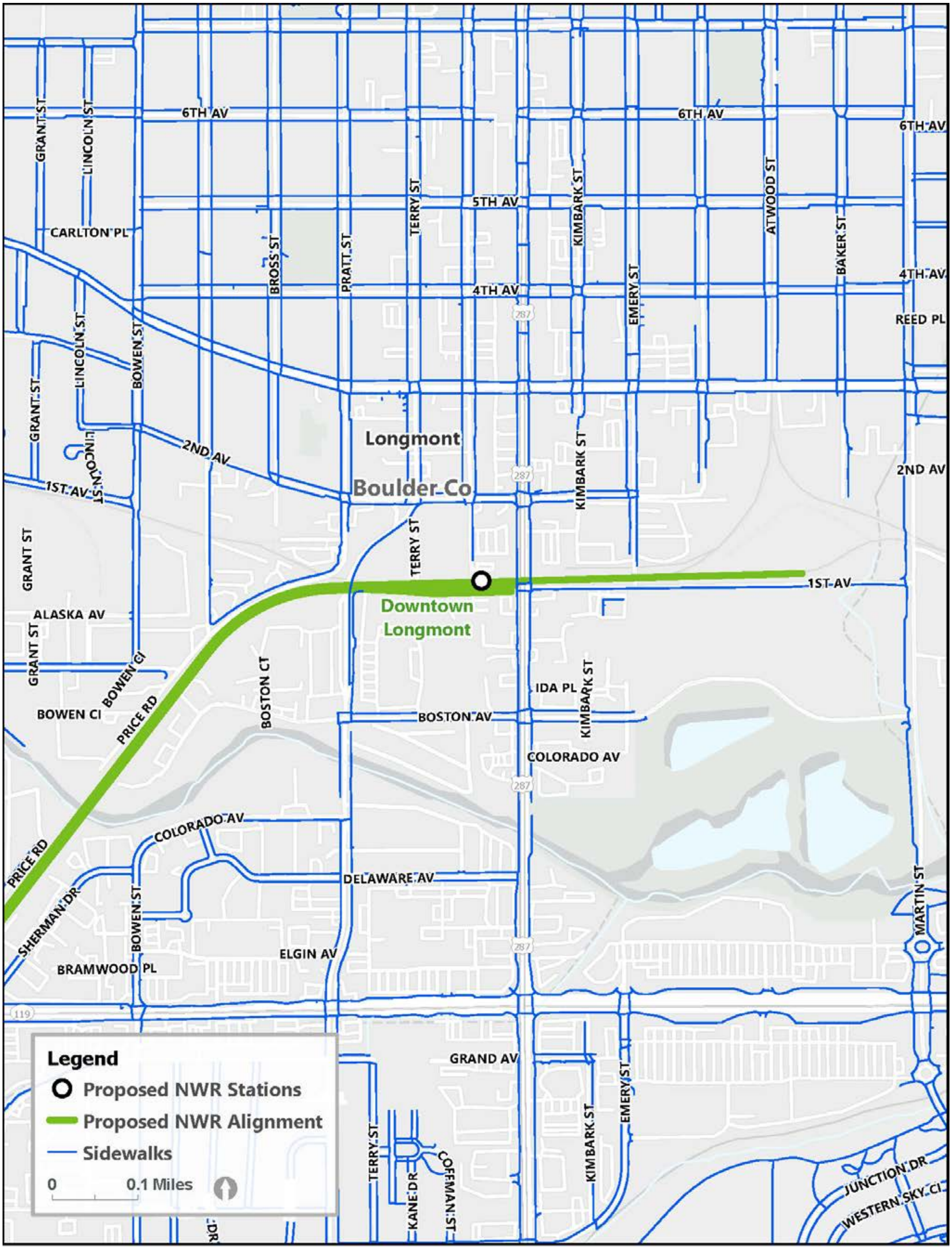


Figure 40: Existing Sidewalks near Downtown Longmont Station



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

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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

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  - 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.

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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.

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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

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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

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

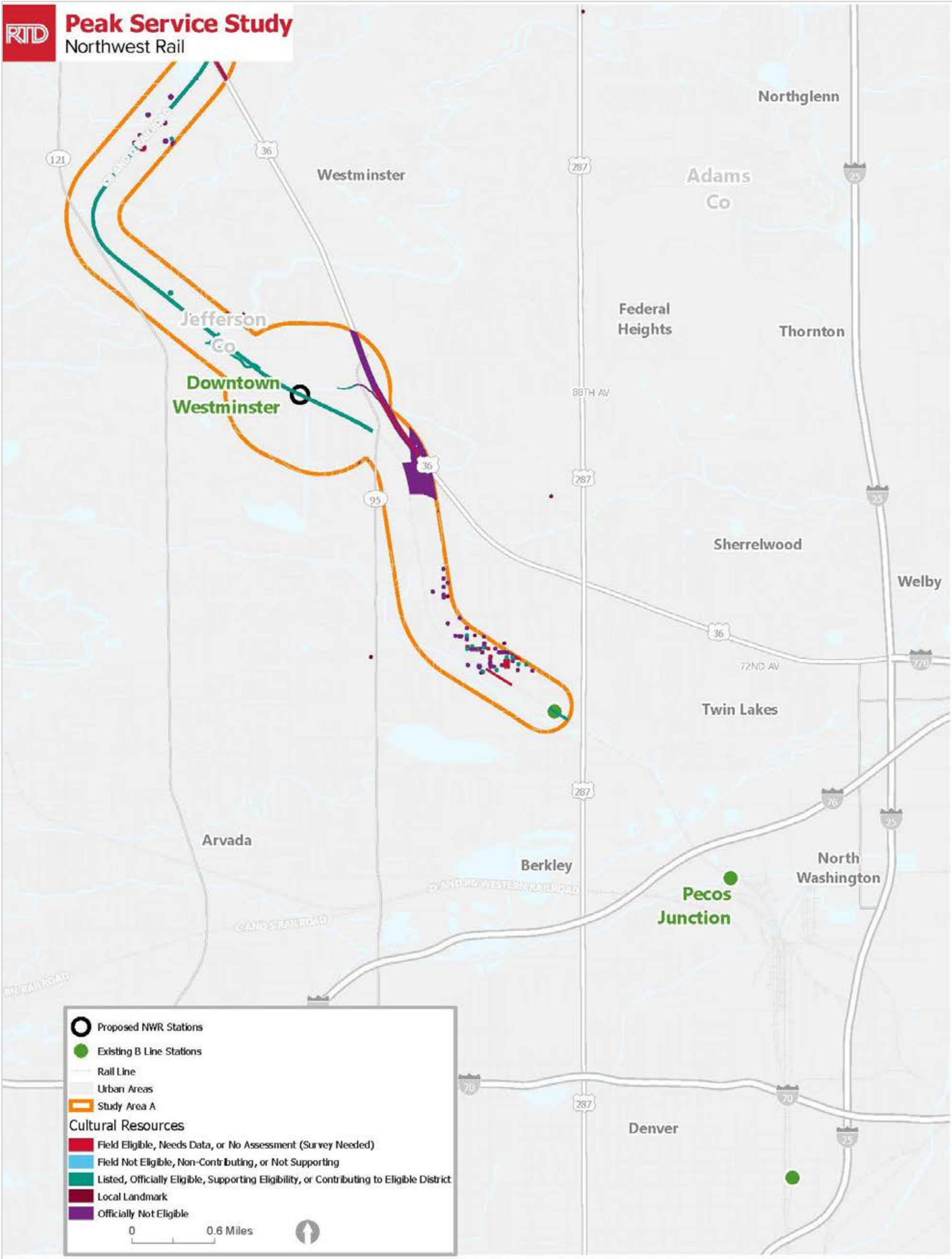

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Figure 42: Cultural Resources by NRHP Status and Landmark Designation (South to North)

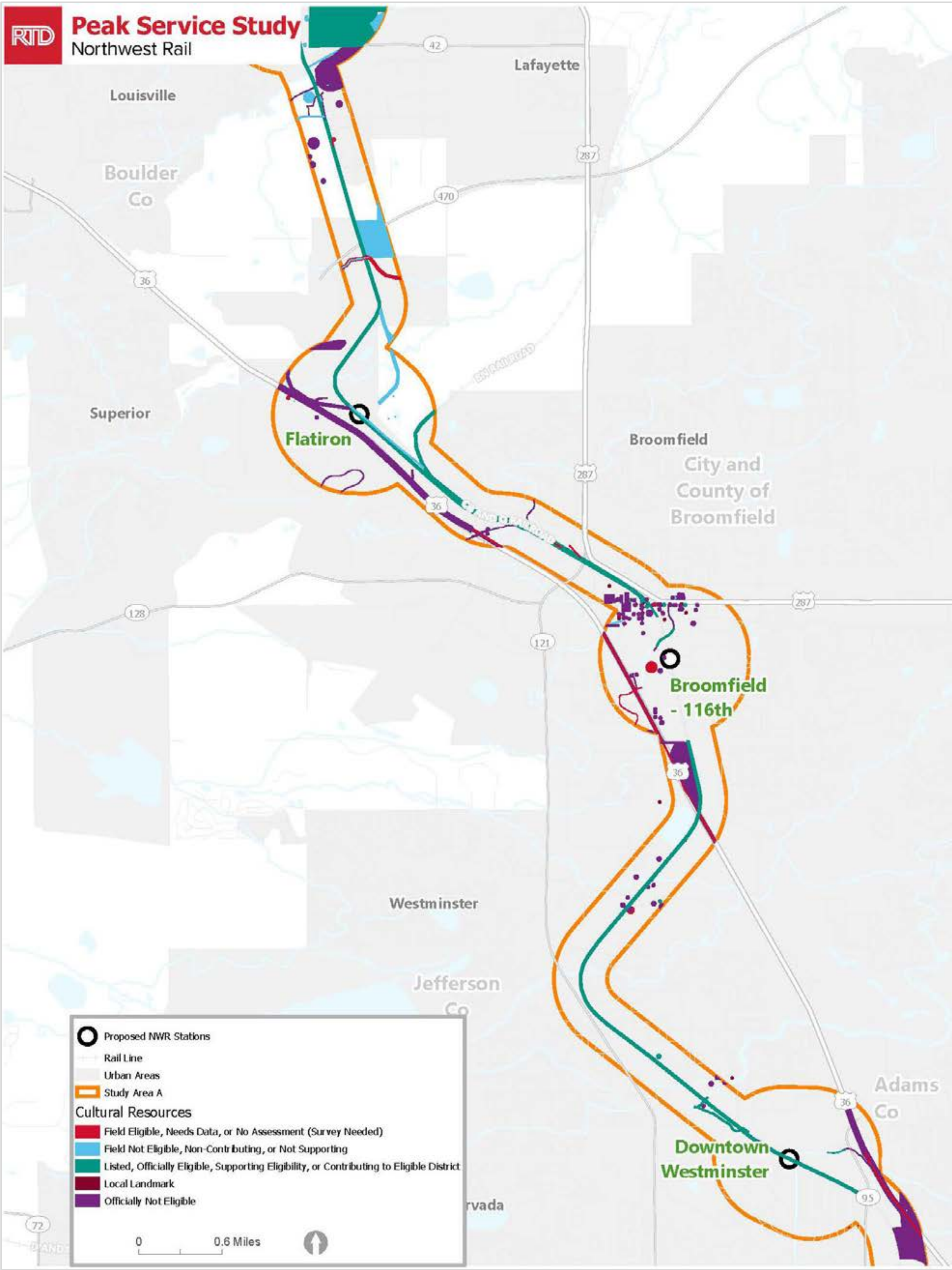

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Figure 43: Cultural Resources by NRHP Status and Landmark Designation (South to North)

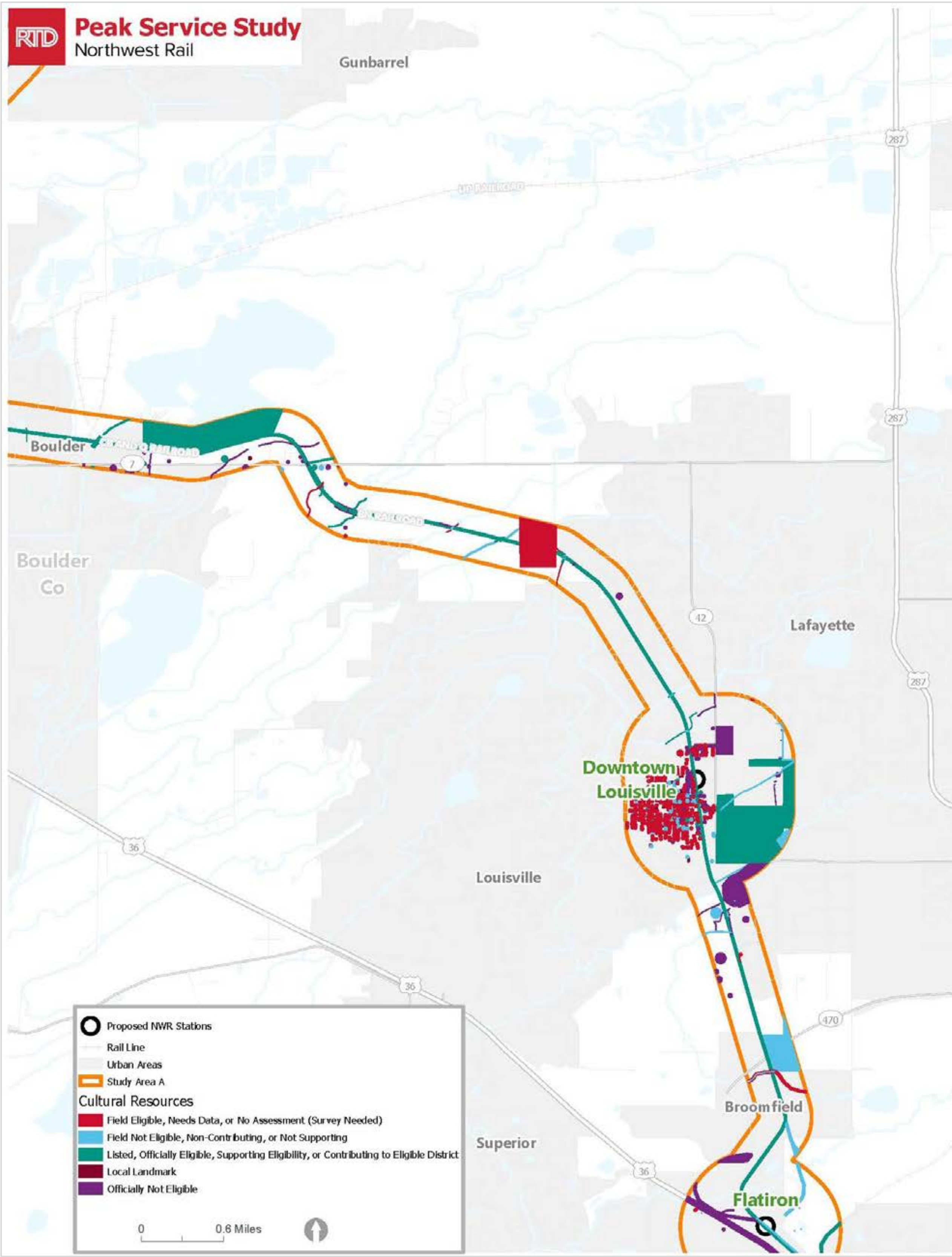
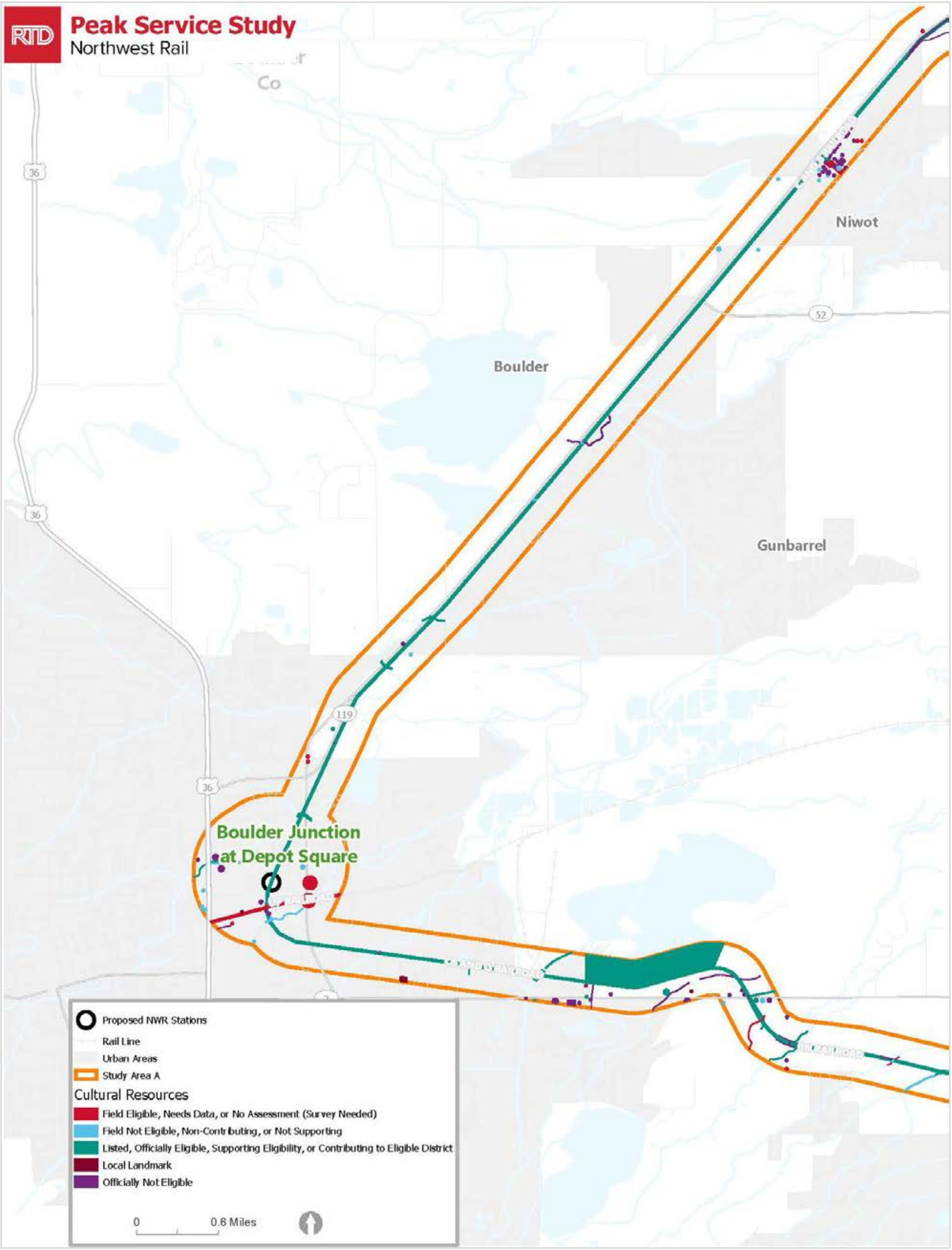
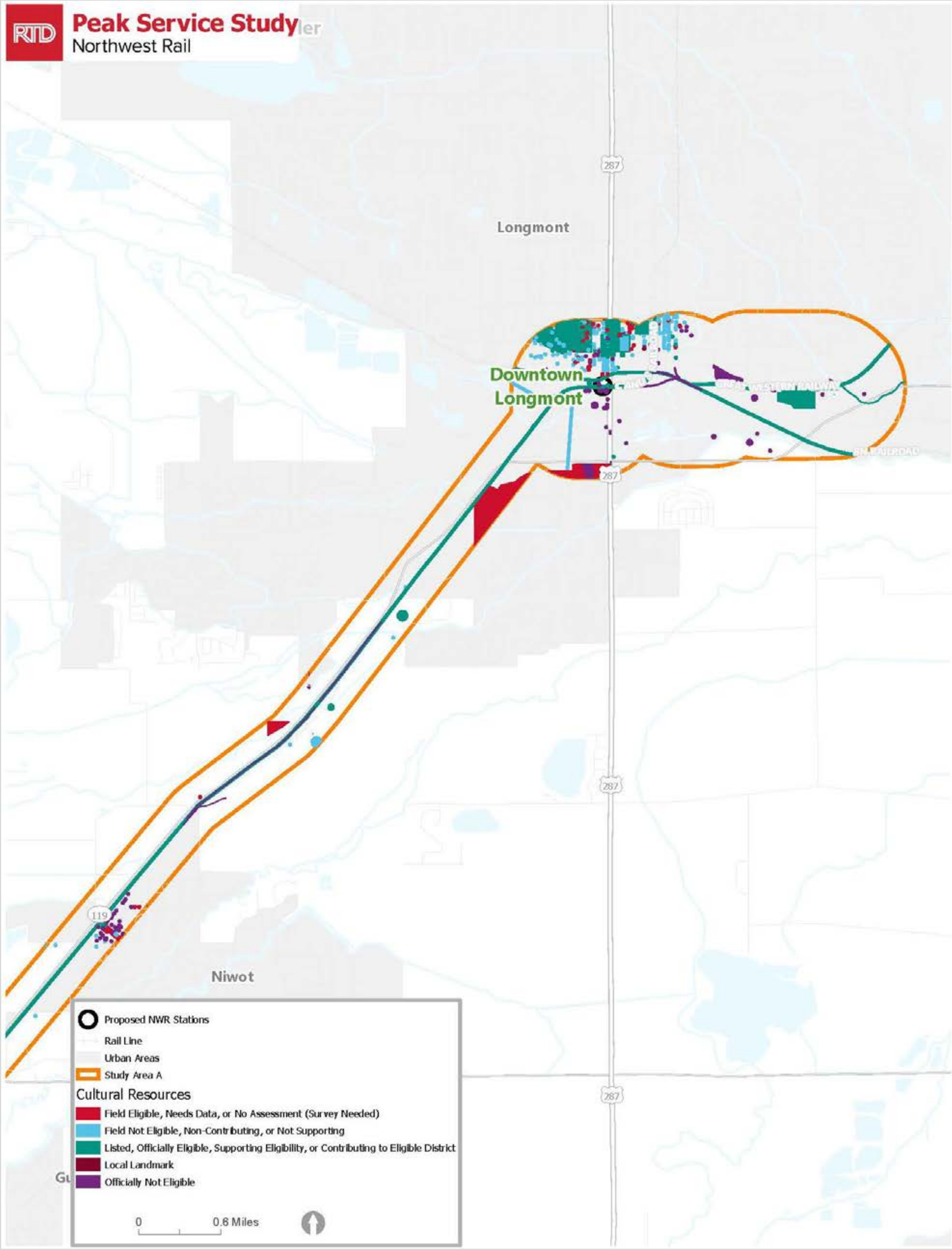


Figure 44: Cultural Resources by NRHP Status and Landmark Designation (South to North)



Corridor Conditions Report

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



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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:

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"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

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

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

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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)

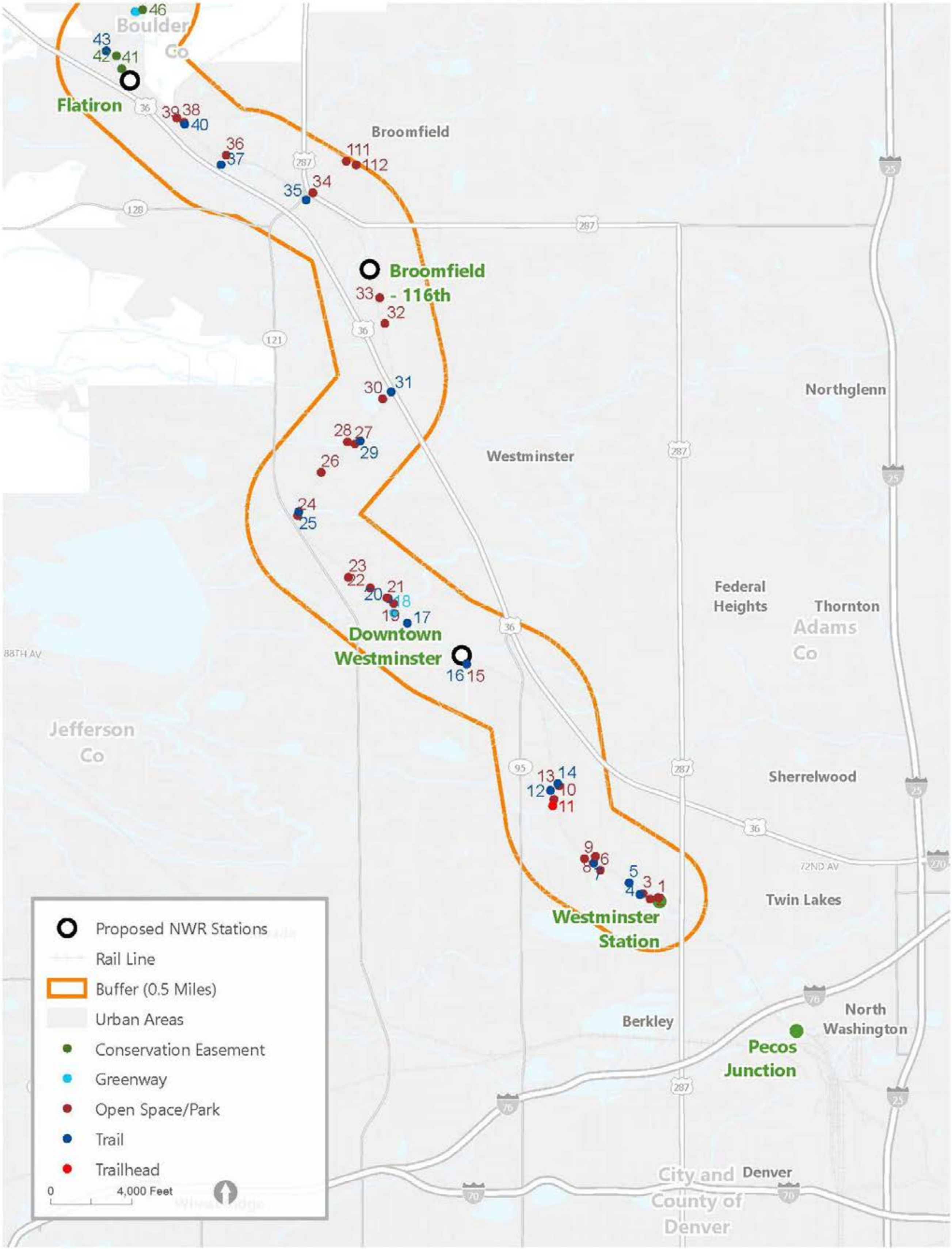

Figure 47: Recreation Resources (South to North)

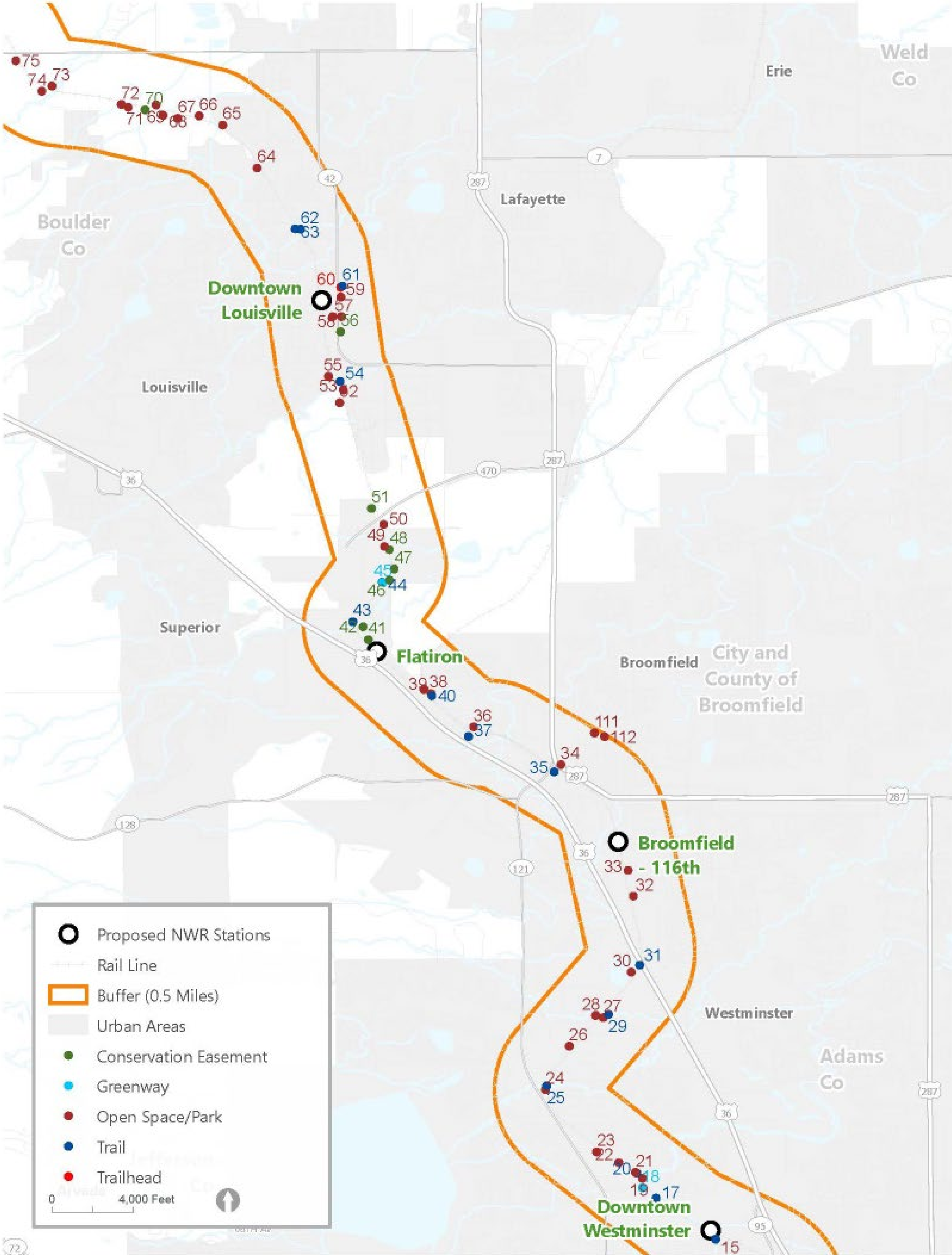

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Figure 48: Recreation Resources (South to North)

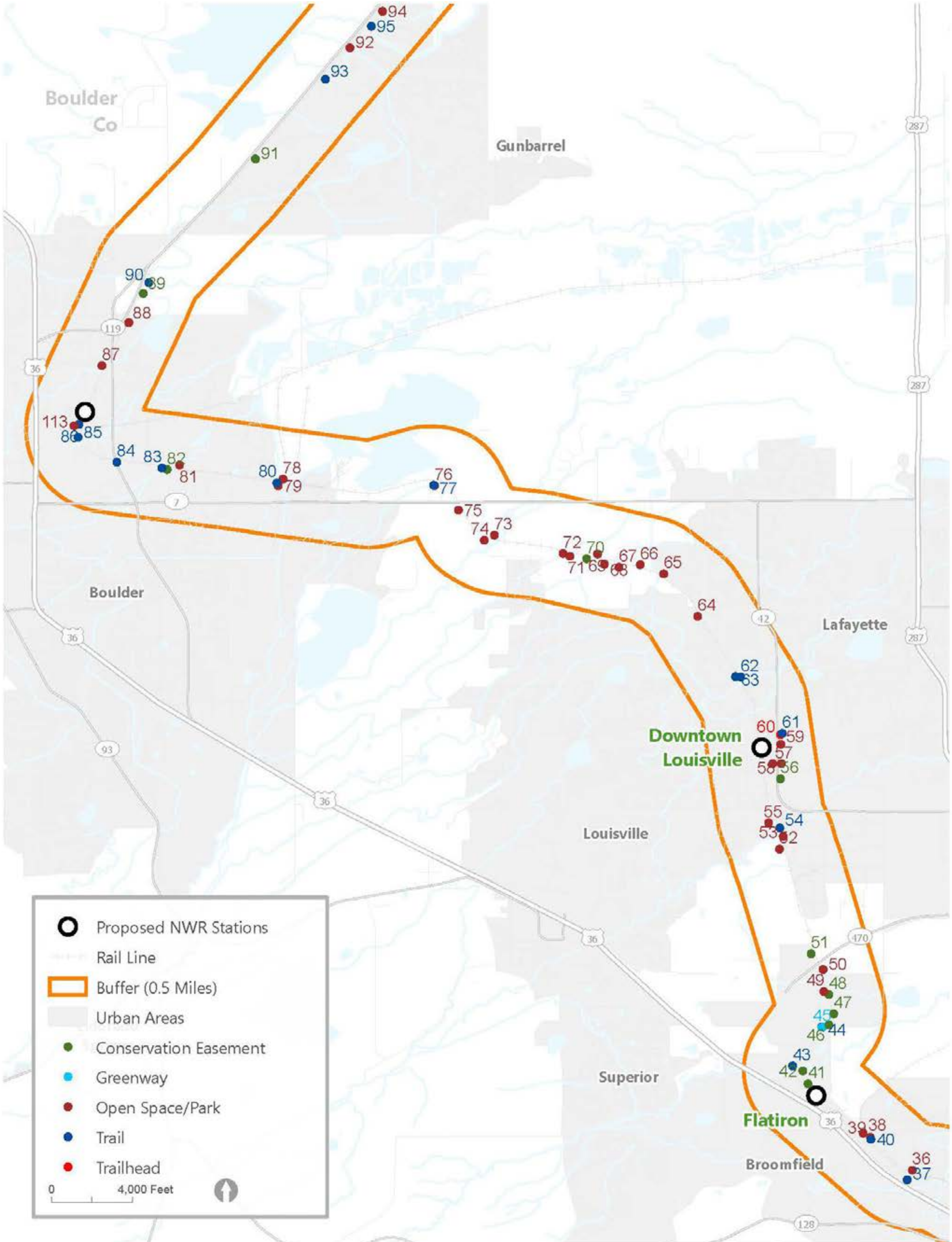


Figure 49: Recreation Resources (South to North)

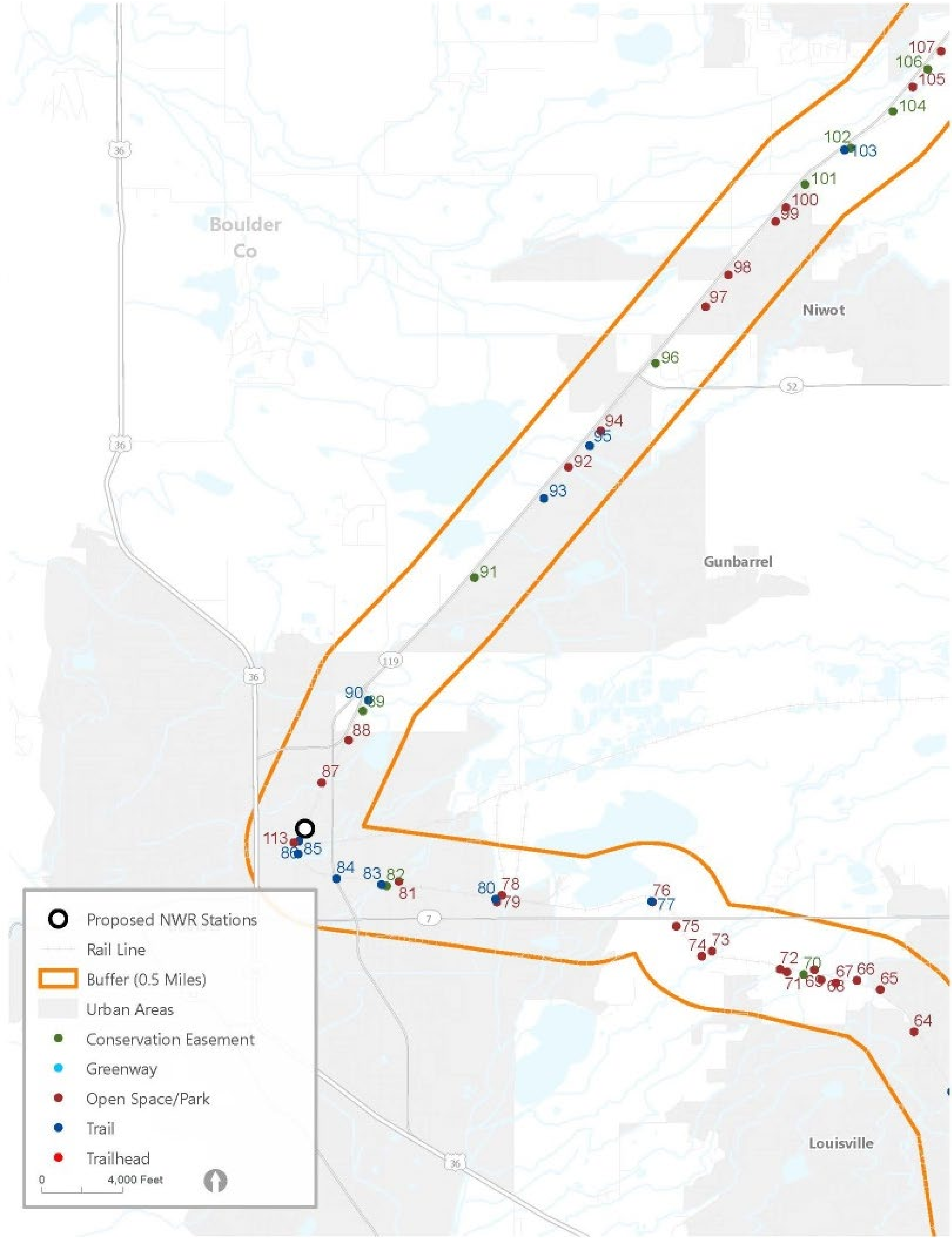
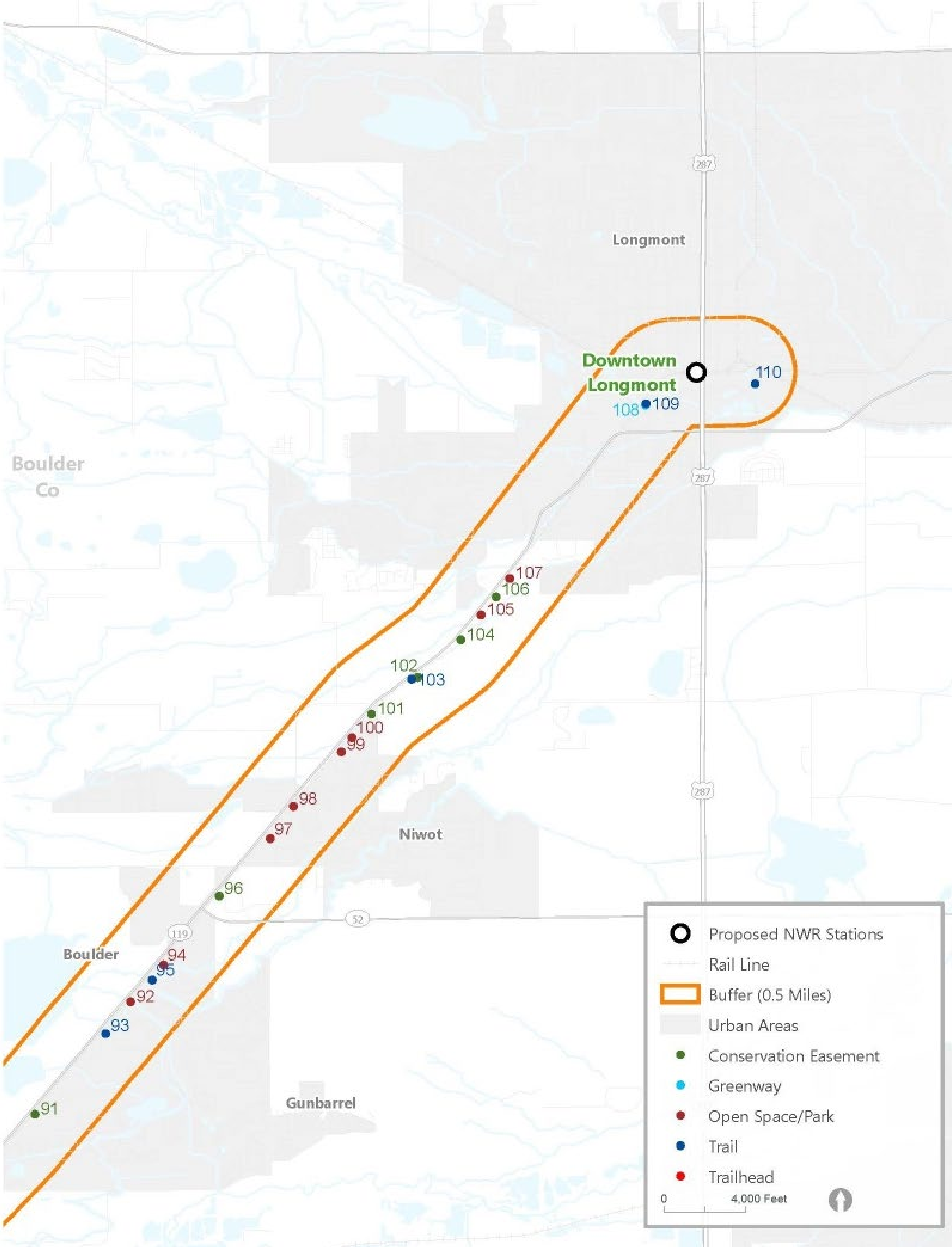


Figure 50: Recreation Resources (South to North)



Corridor Conditions Report

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.

Corridor Conditions Report

Relevant Regulations, Guidance, Studies, and Plans

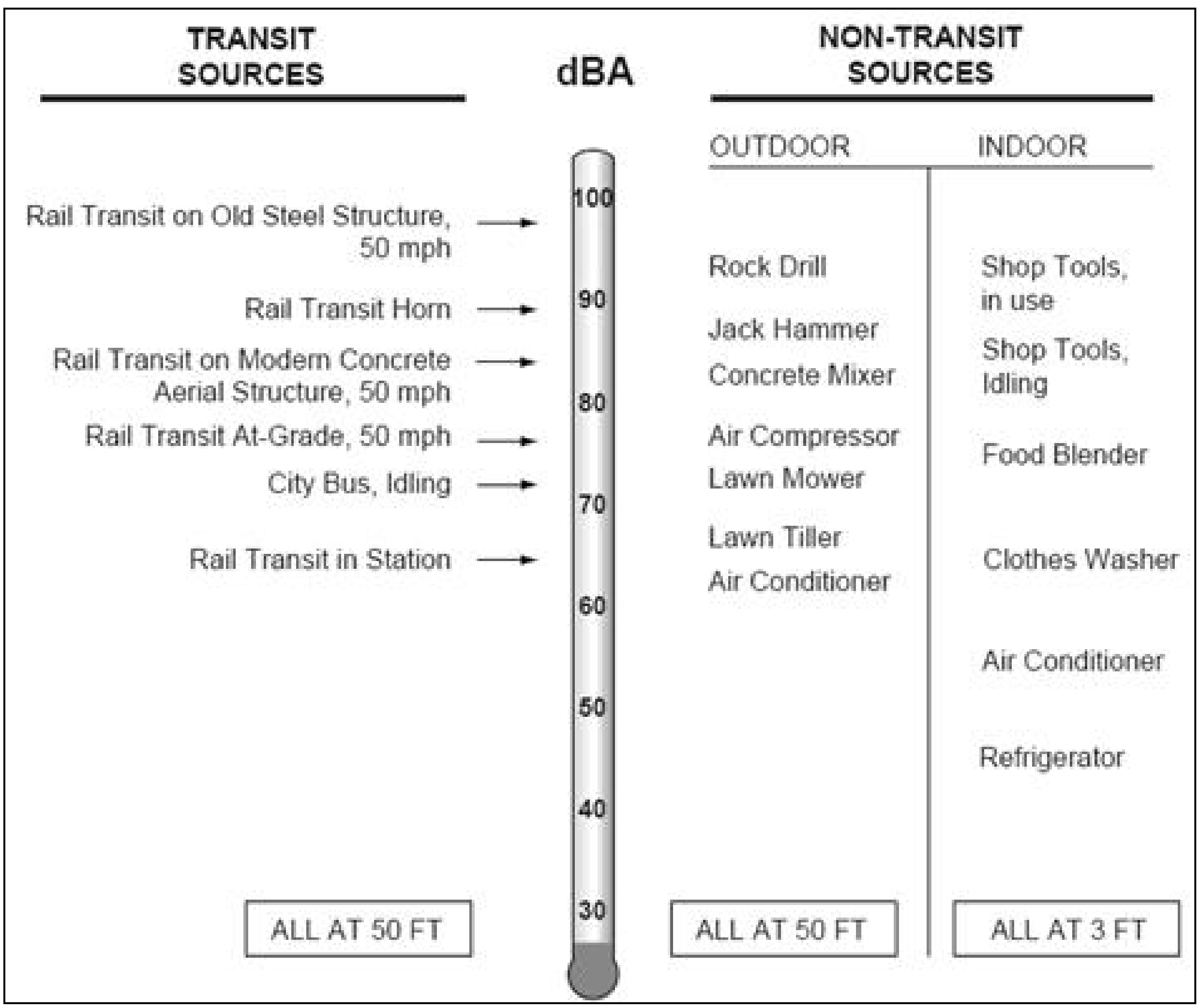
Although the NWR Corridor is not in a formal environmental review phase, this analysis uses FTA's *Transit Noise and Vibration Impact Assessment Manual* (FTA, 2018) methodology to evaluate noise and vibration.

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

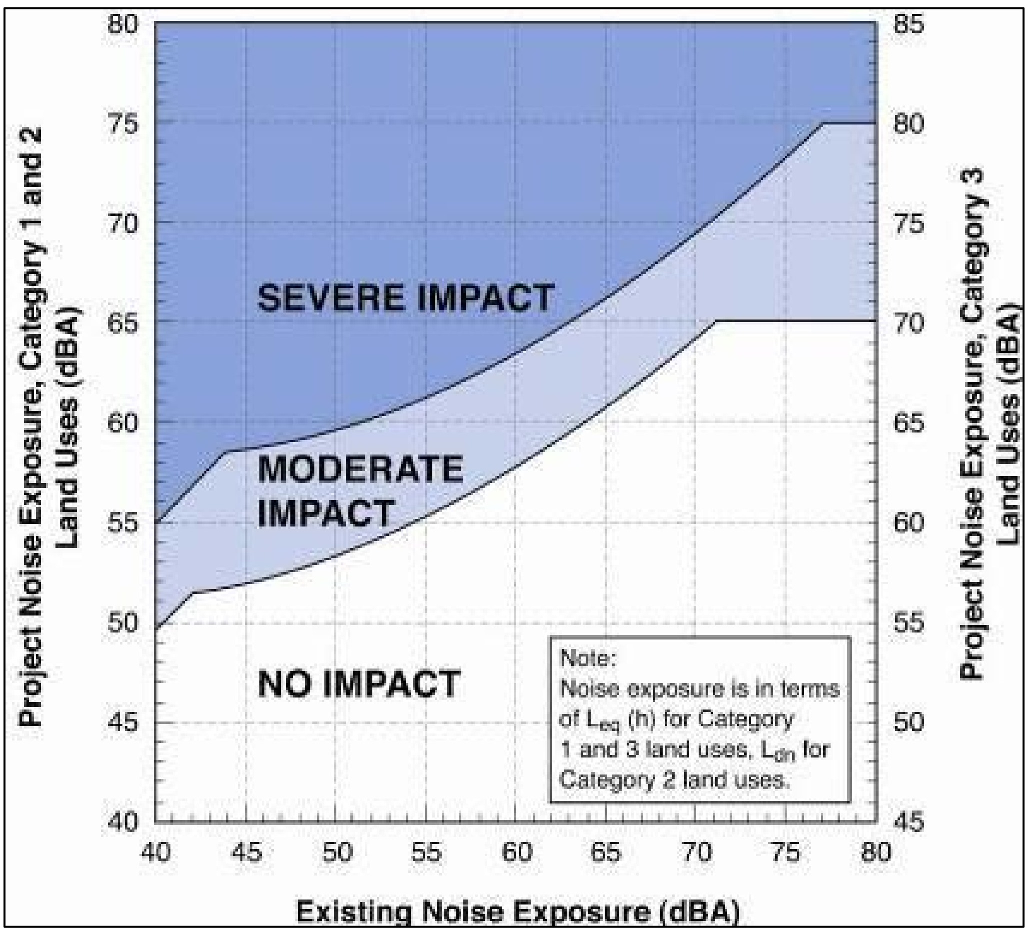
[a] 1-hour L_{eq}

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



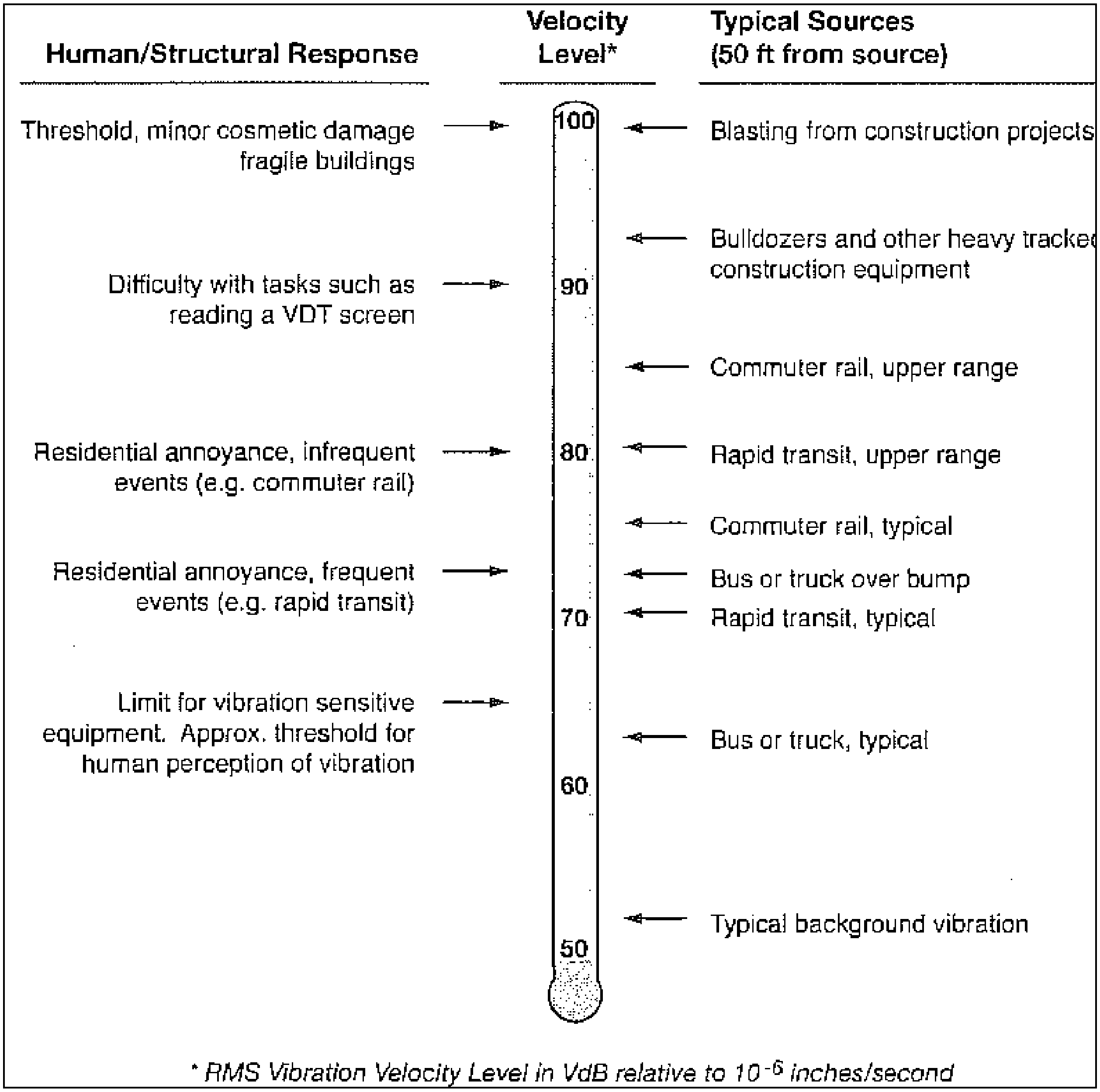
Source: FTA 2018.

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.

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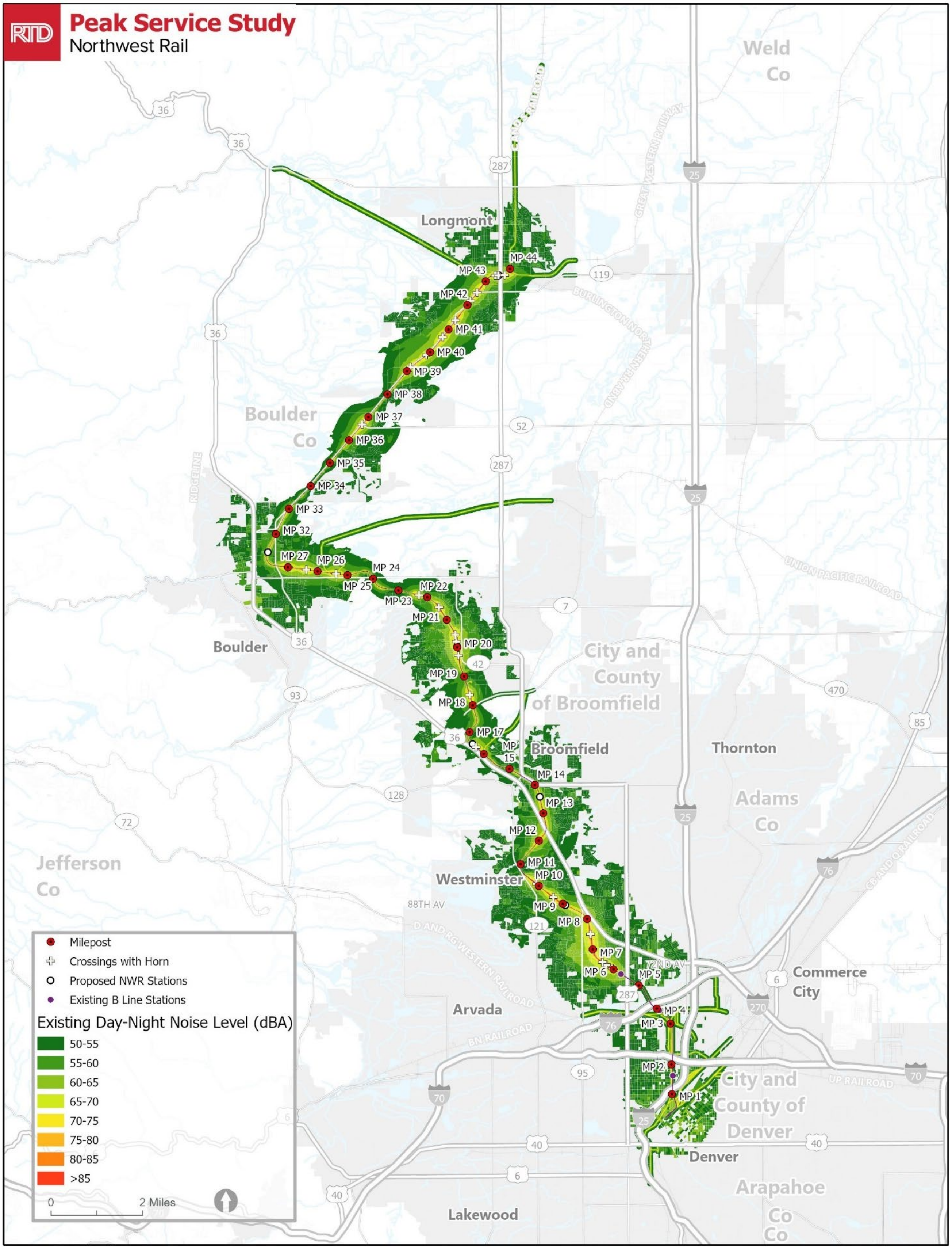
Figure 54: Existing Day-Night Noise Level (dBA)



Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

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

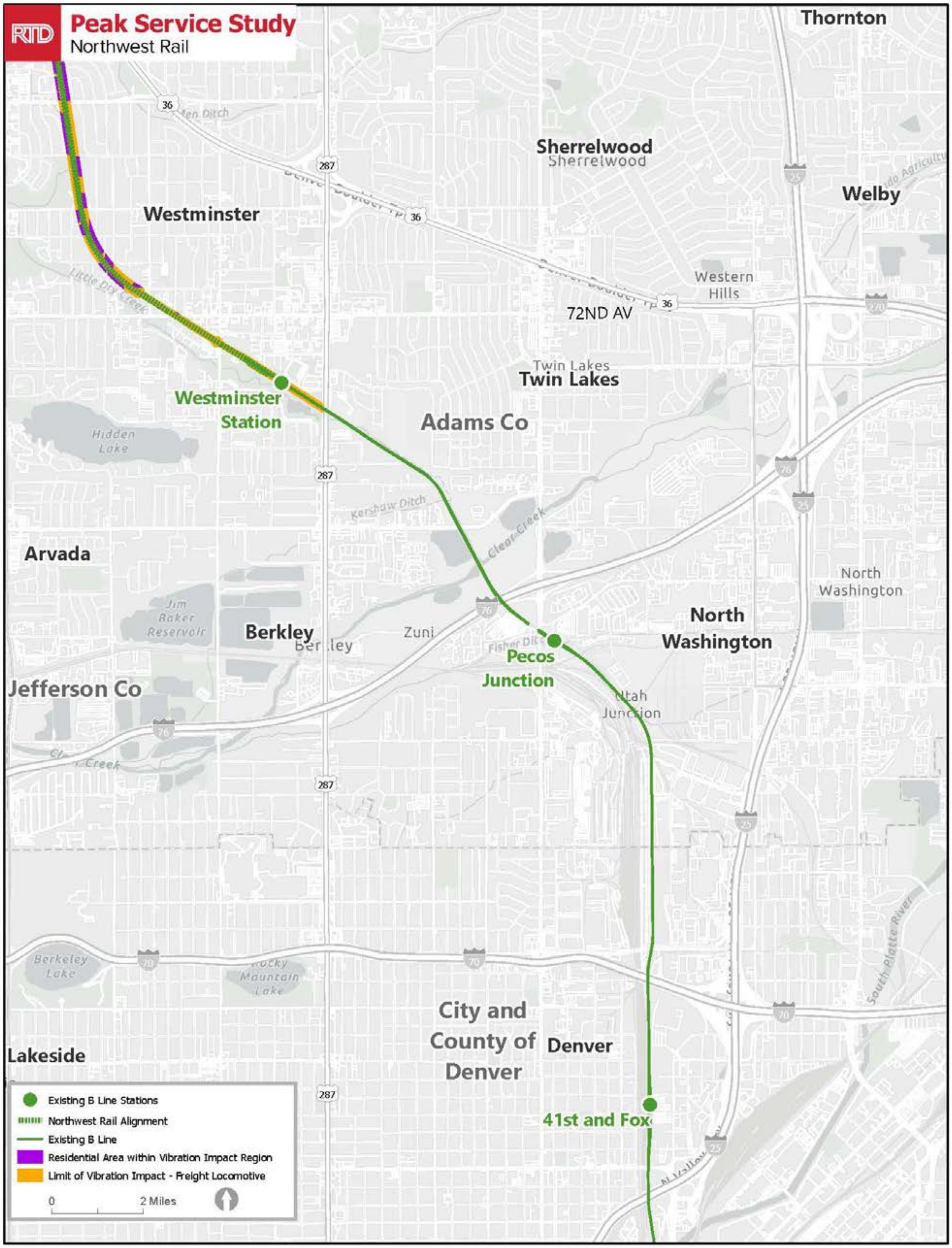


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Figure 56: Existing Vibration Levels and Category 2 Land Uses (South to North)

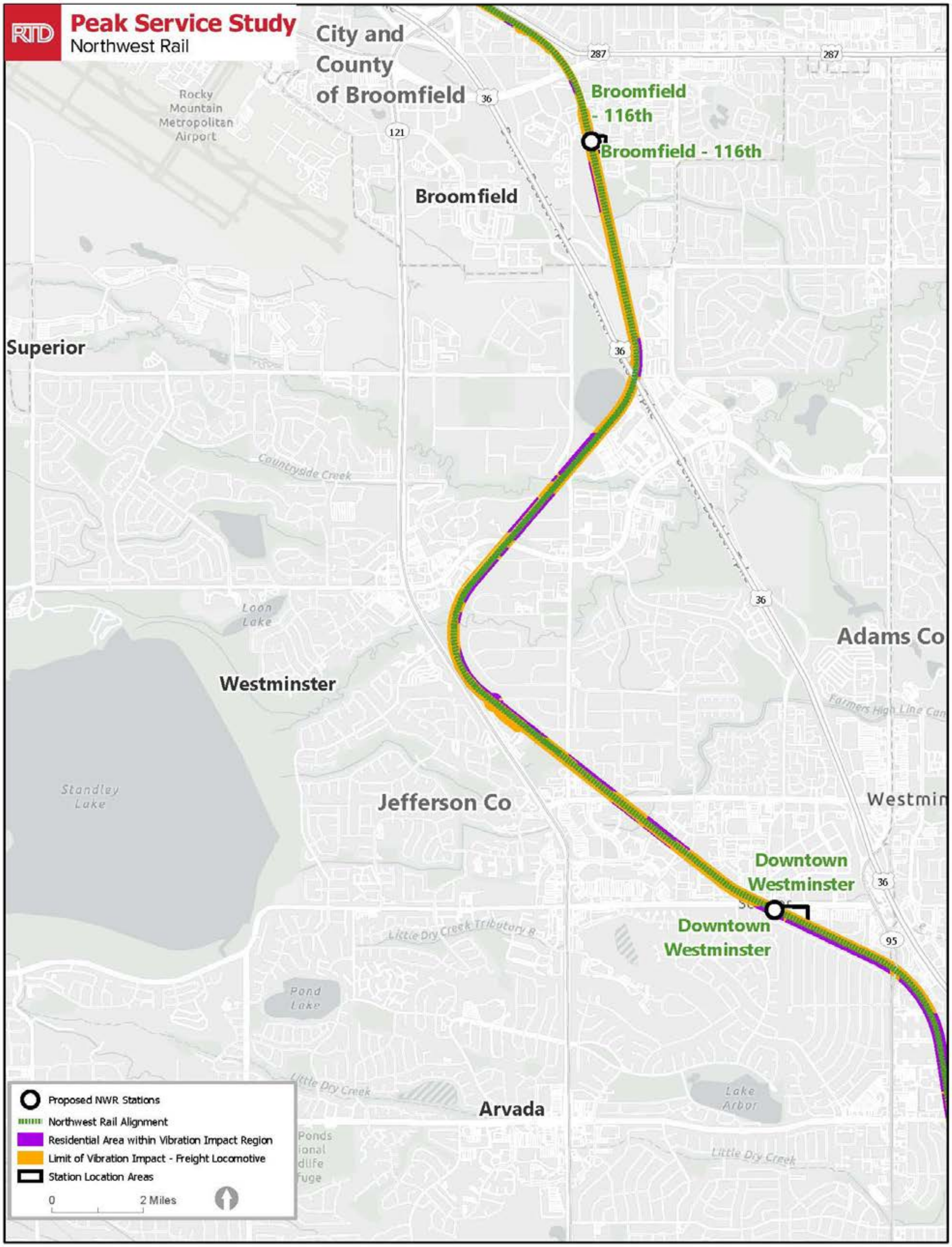

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Figure 57: Existing Vibration Levels and Category 2 Land Uses (South to North)

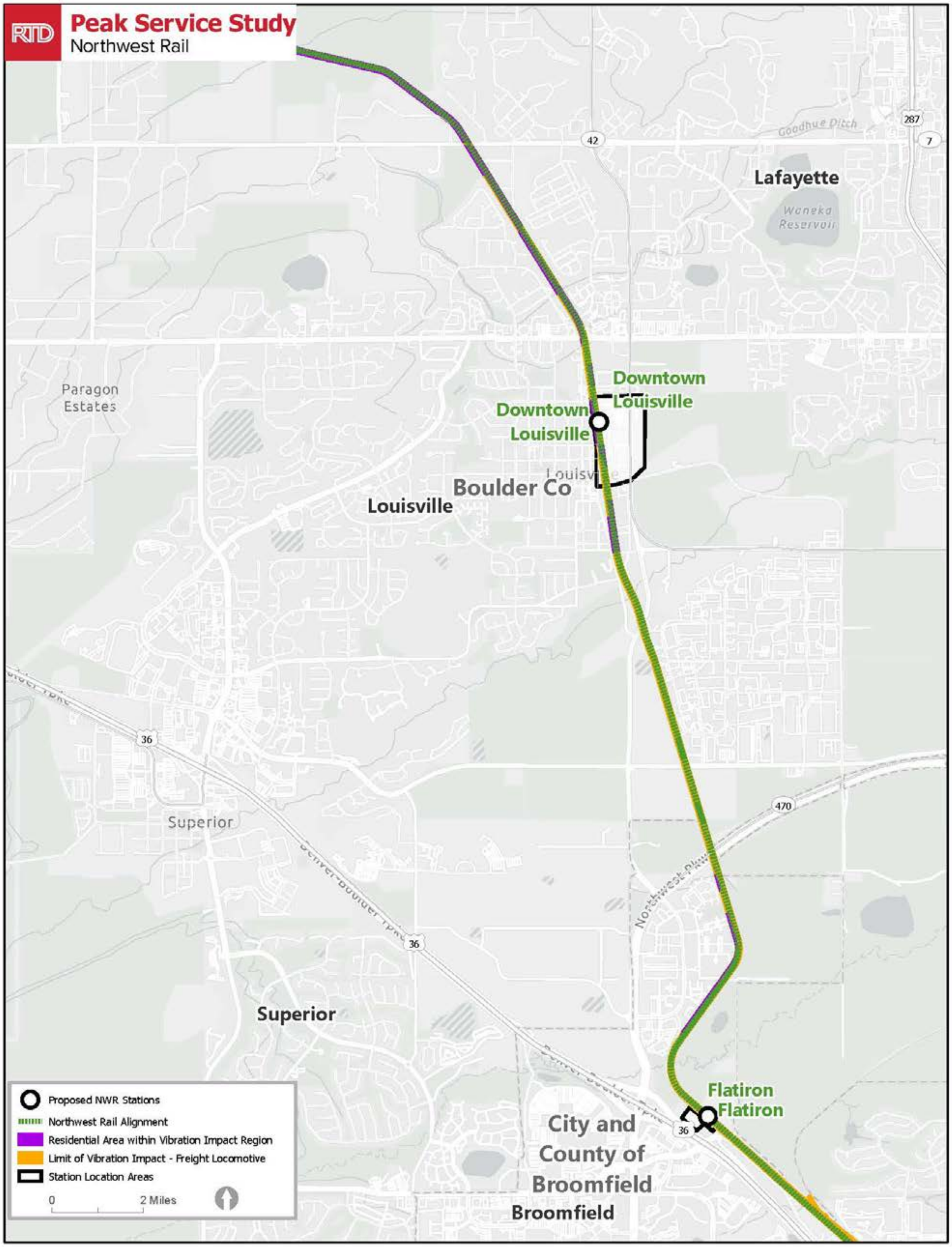
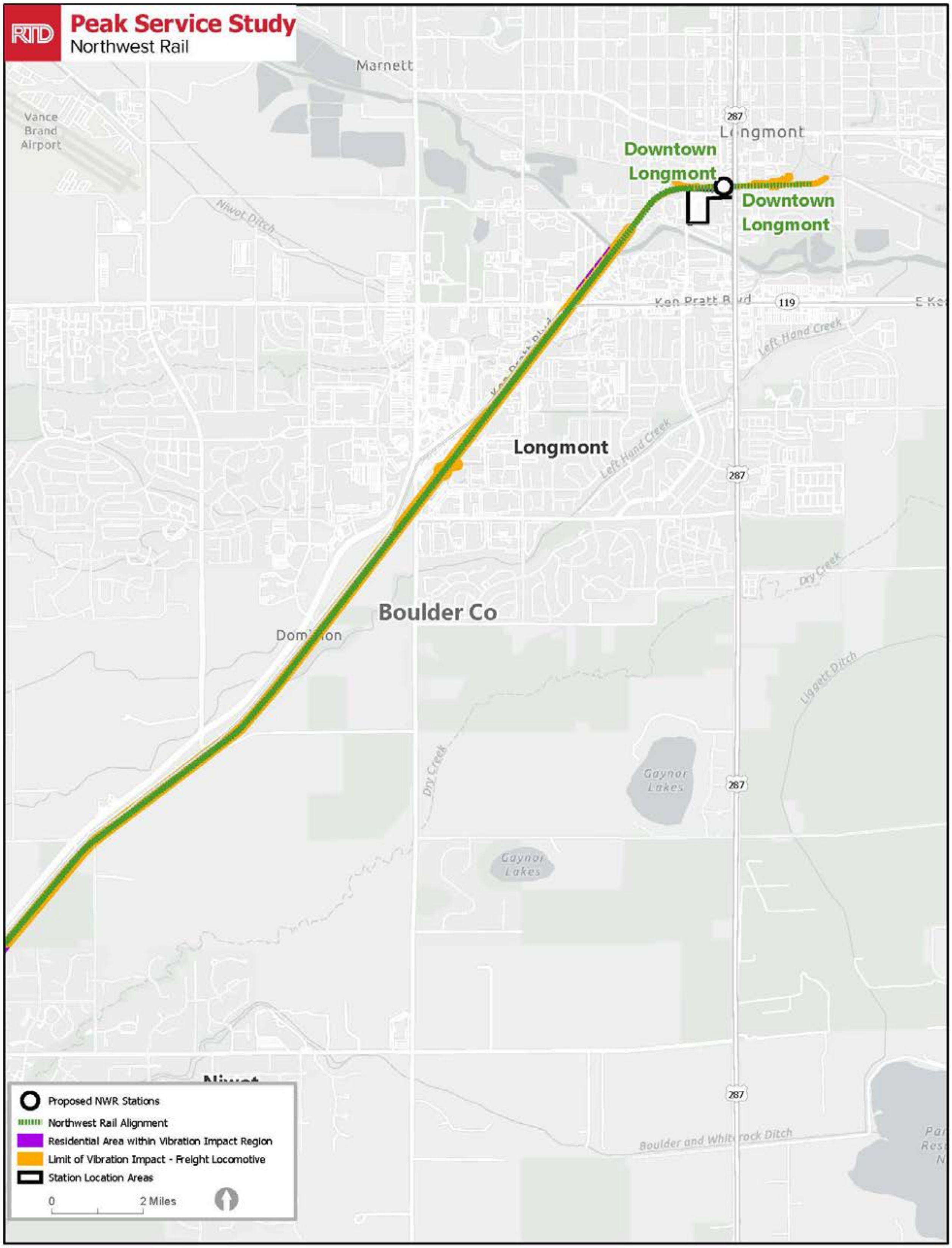


Figure 58: Existing Vibration Levels and Category 2 Land Uses (South to North)

Corridor Conditions Report

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

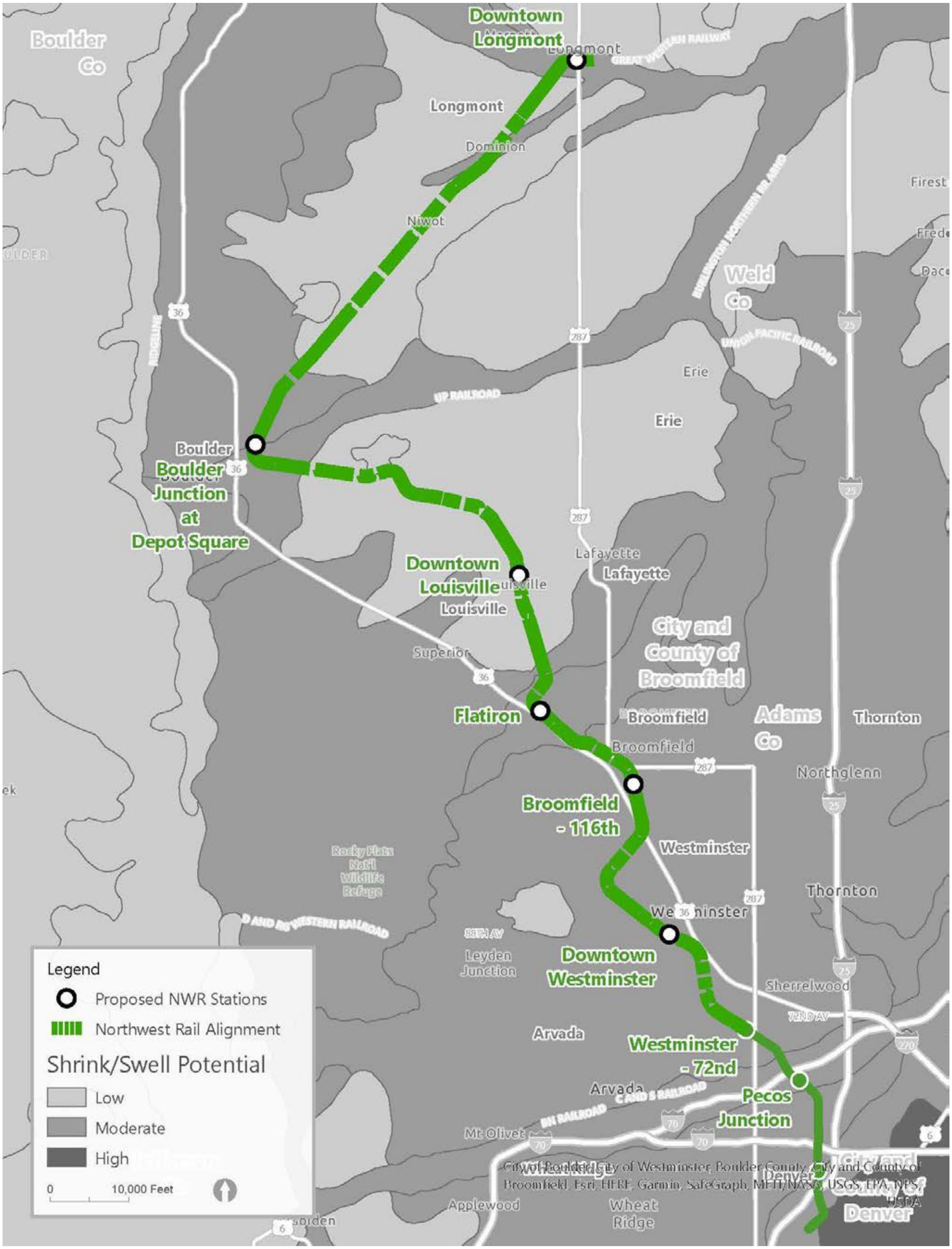


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Figure 61: Corrosivity to Untreated Steel

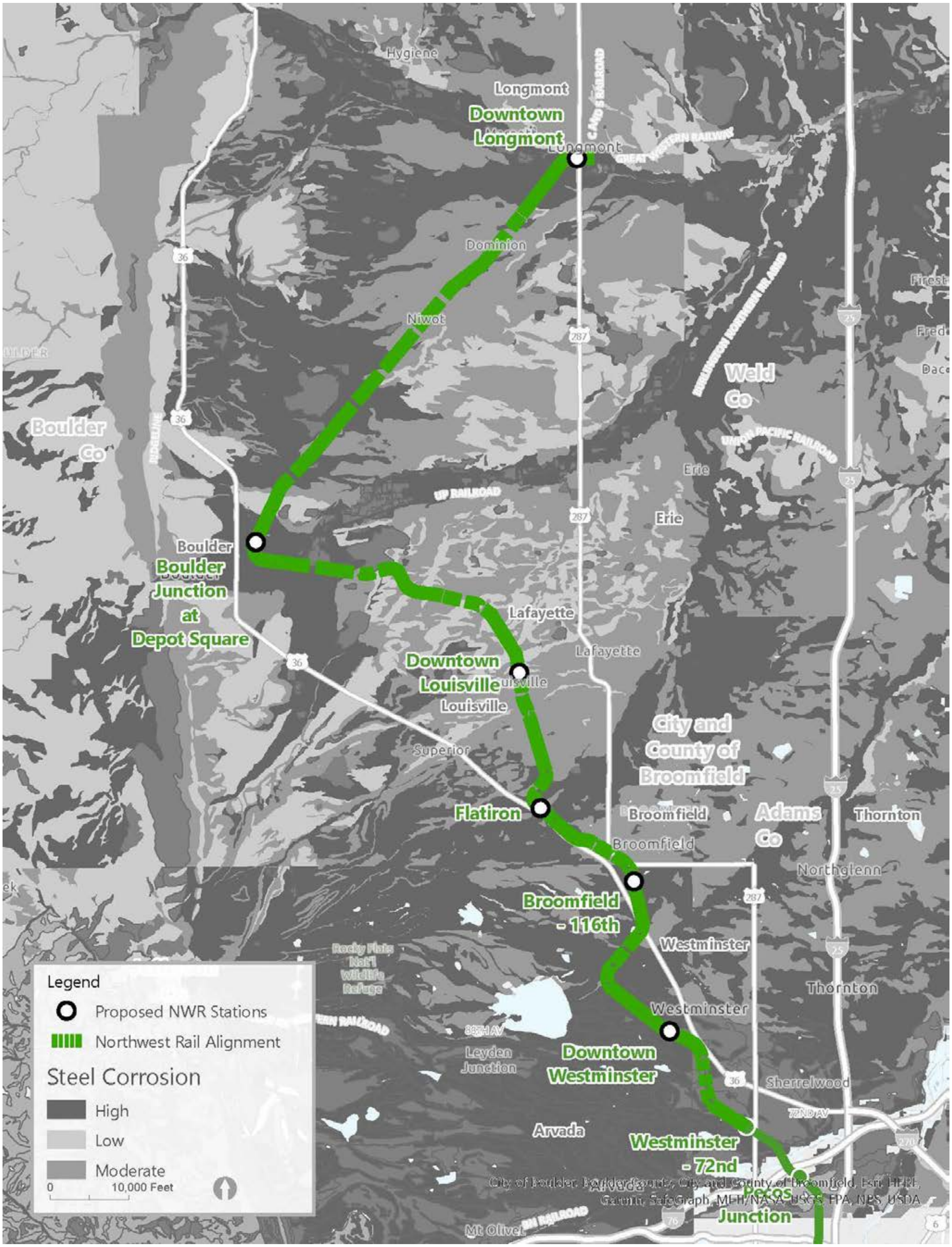

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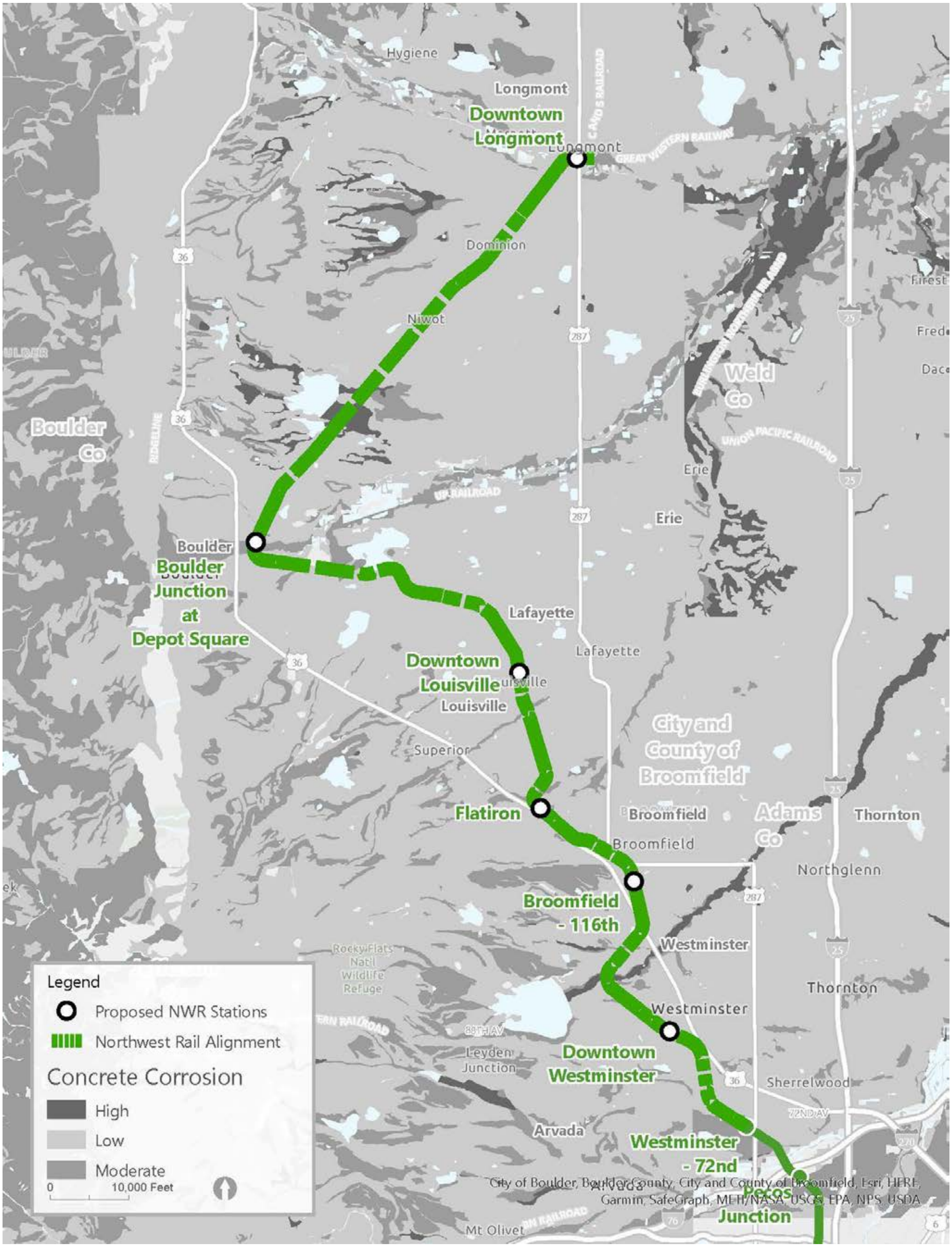
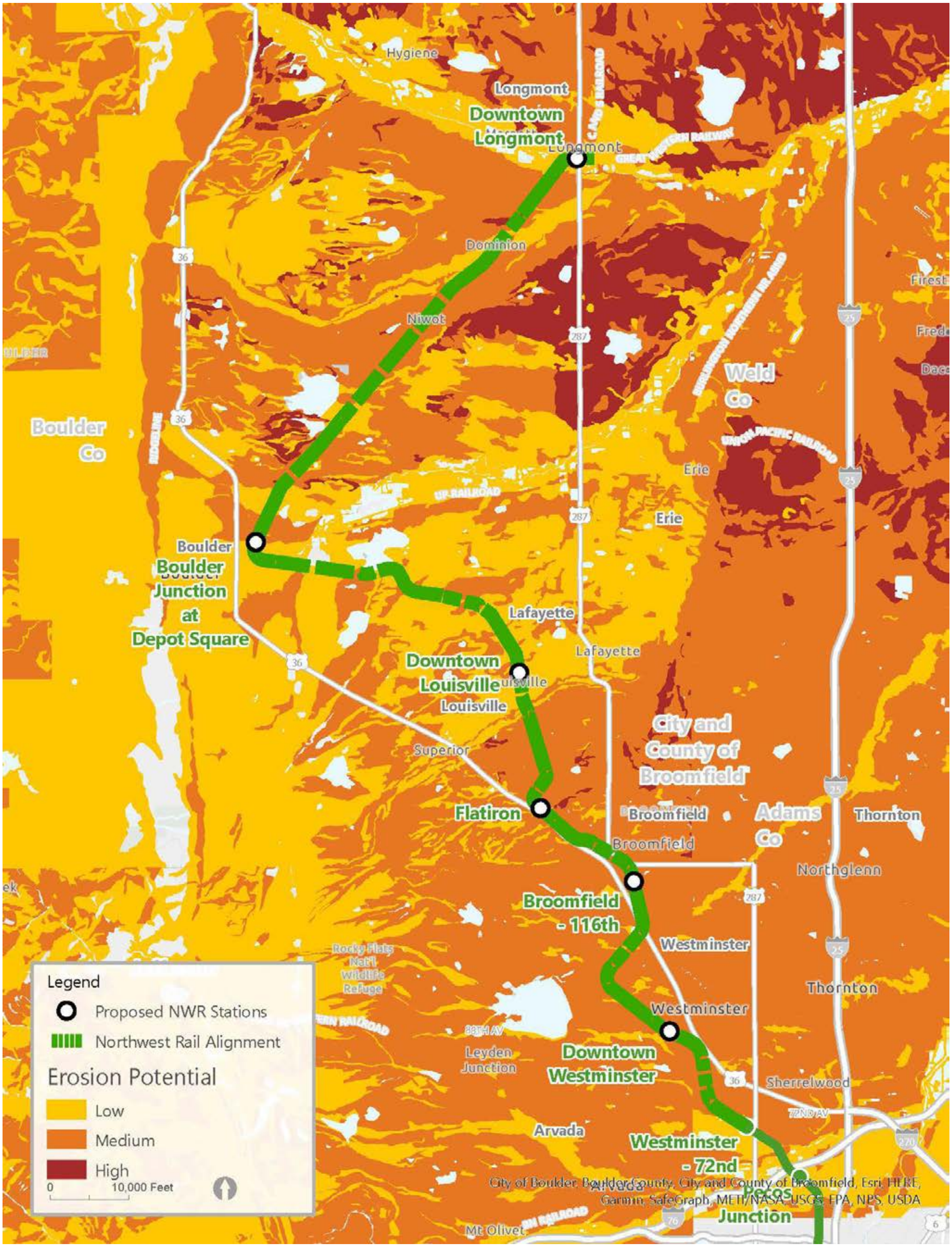
Figure 62: Corrosivity to Concrete



Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

Corridor Conditions Report

Figure 63: Erosion Potential



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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

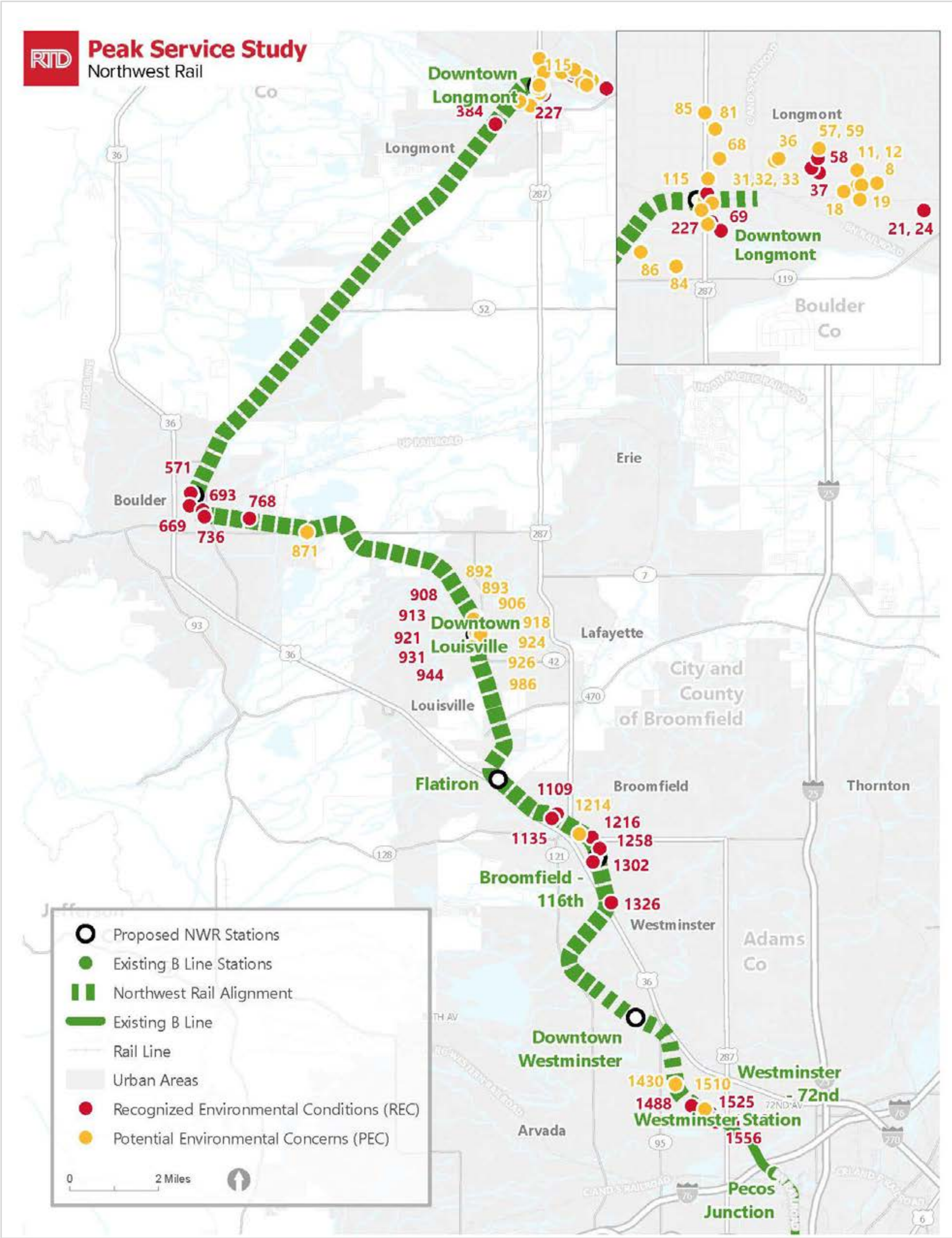
Map ID	Site Name
21, 24	Transportation Service Center Cleaning 11939 Sugar Mill Road, Longmont
37	Loaf N Jug 200 Lashley Street, Longmont
39, 40, 41, 42	Diamond Shamrock/Total Station 303 Lashley Street, Longmont
58	Rainbow Laundromat & Dry Cleaners 310 Lashley Street, Longmont
69	Taylor Equipment Rental 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.

Corridor Conditions Report

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.

Corridor Conditions Report

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.

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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.

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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 cunicularia, 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).

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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.

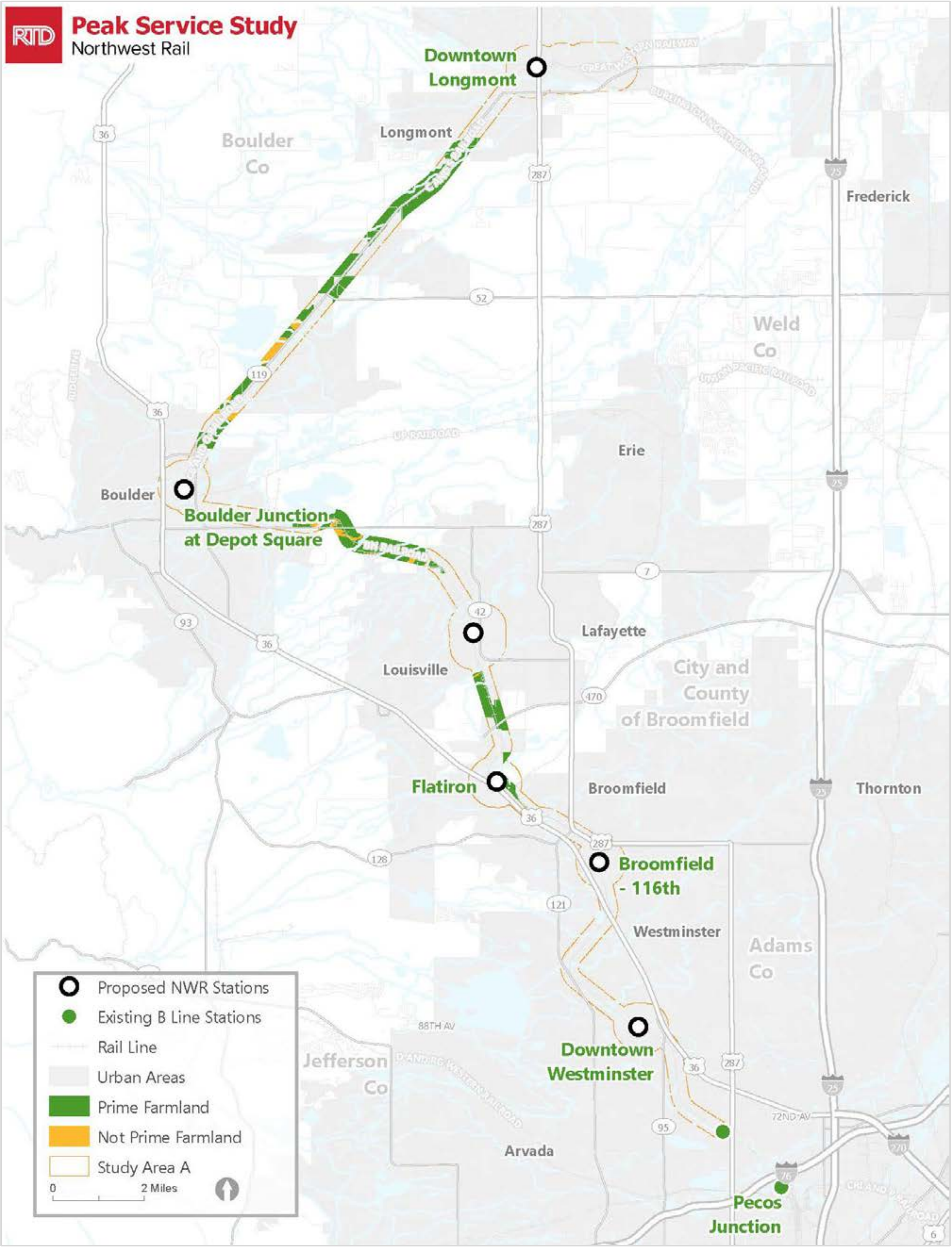
Findings/Results

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.

Corridor Conditions Report

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

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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

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

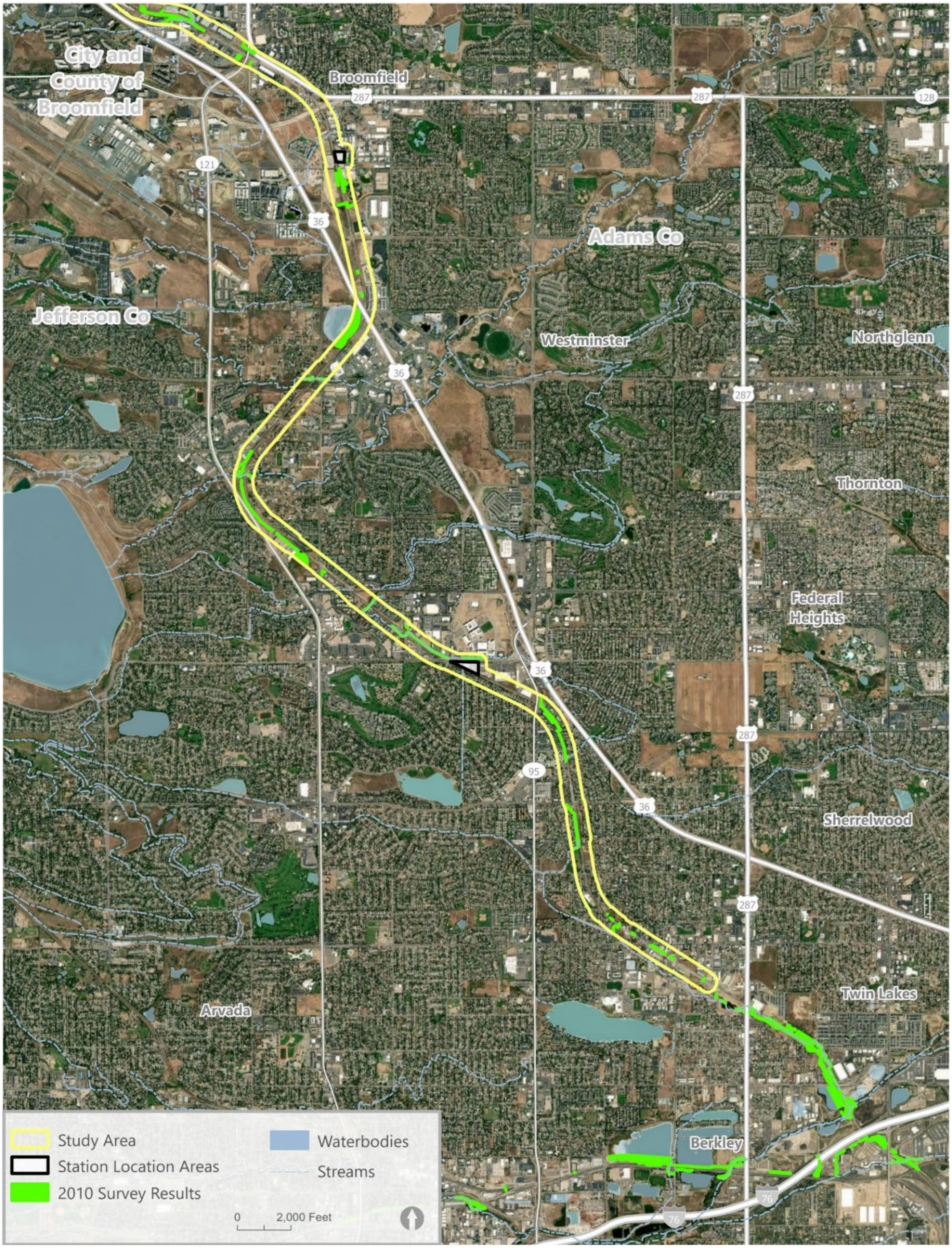

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Figure 67: 2010 Wetland Survey Results (South to North)

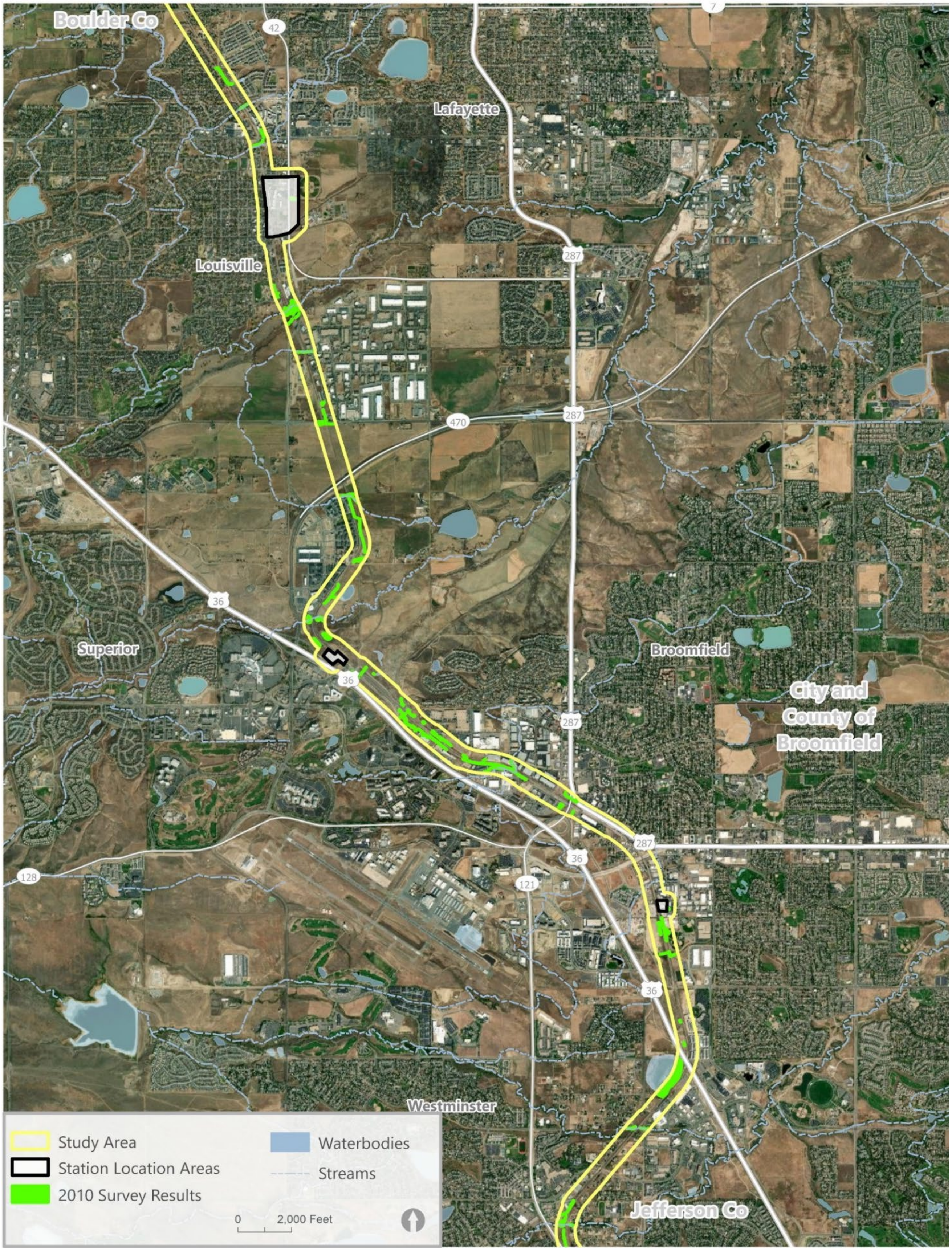

Figure 68: 2010 Wetland Survey Results (South to North)

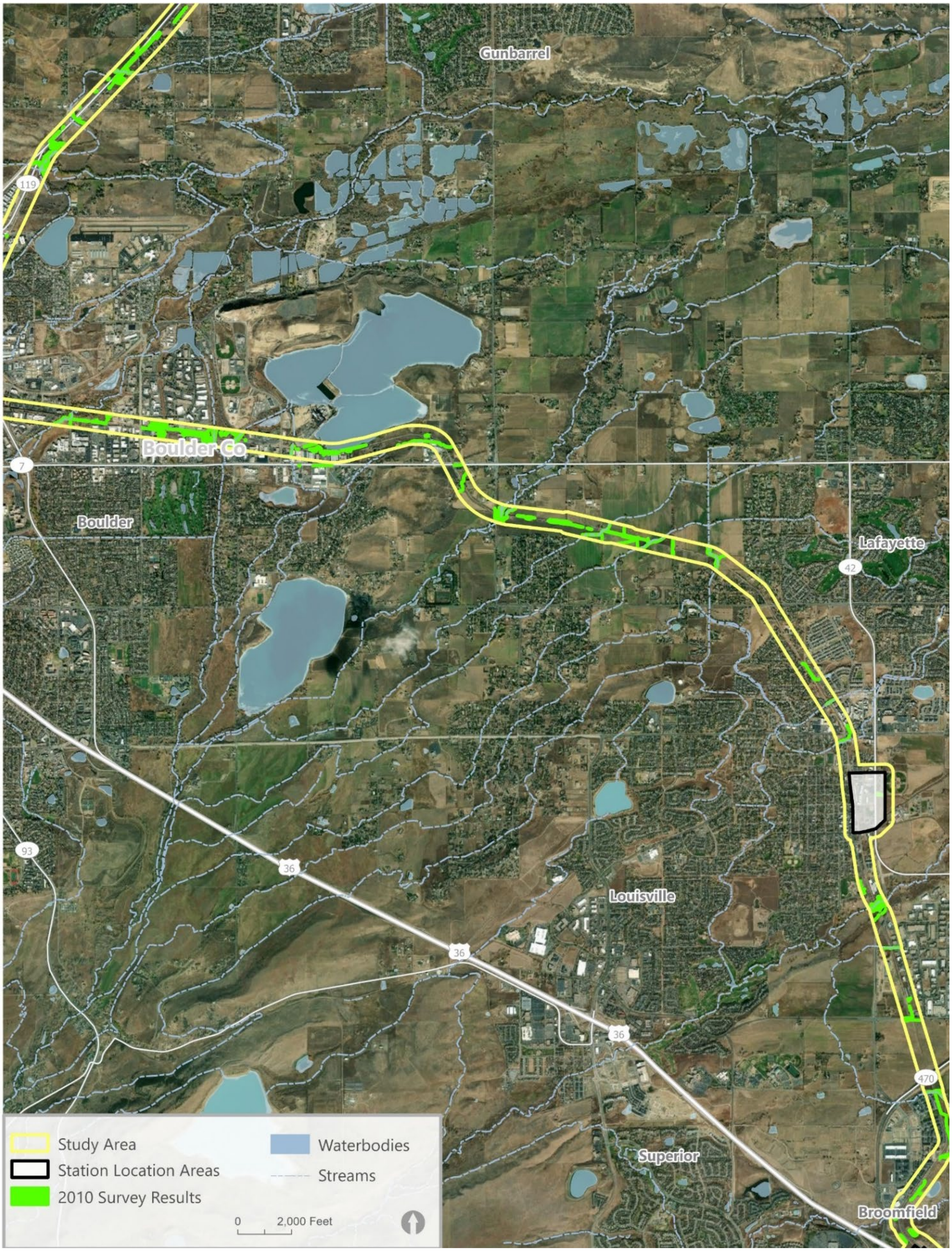

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Figure 69: 2010 Wetland Survey Results (South to North)

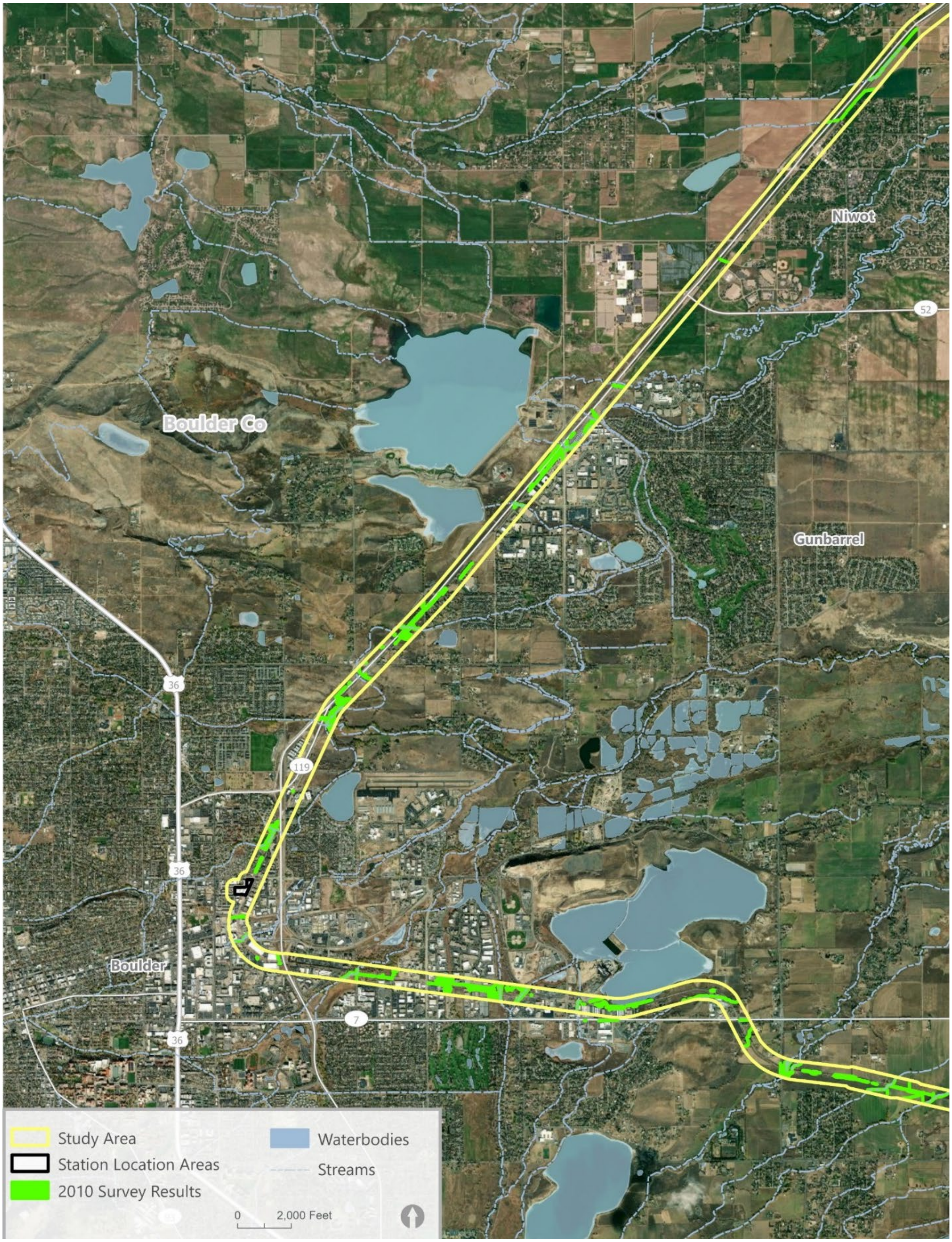

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Figure 70: 2010 Wetland Survey Results (South to North)

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.

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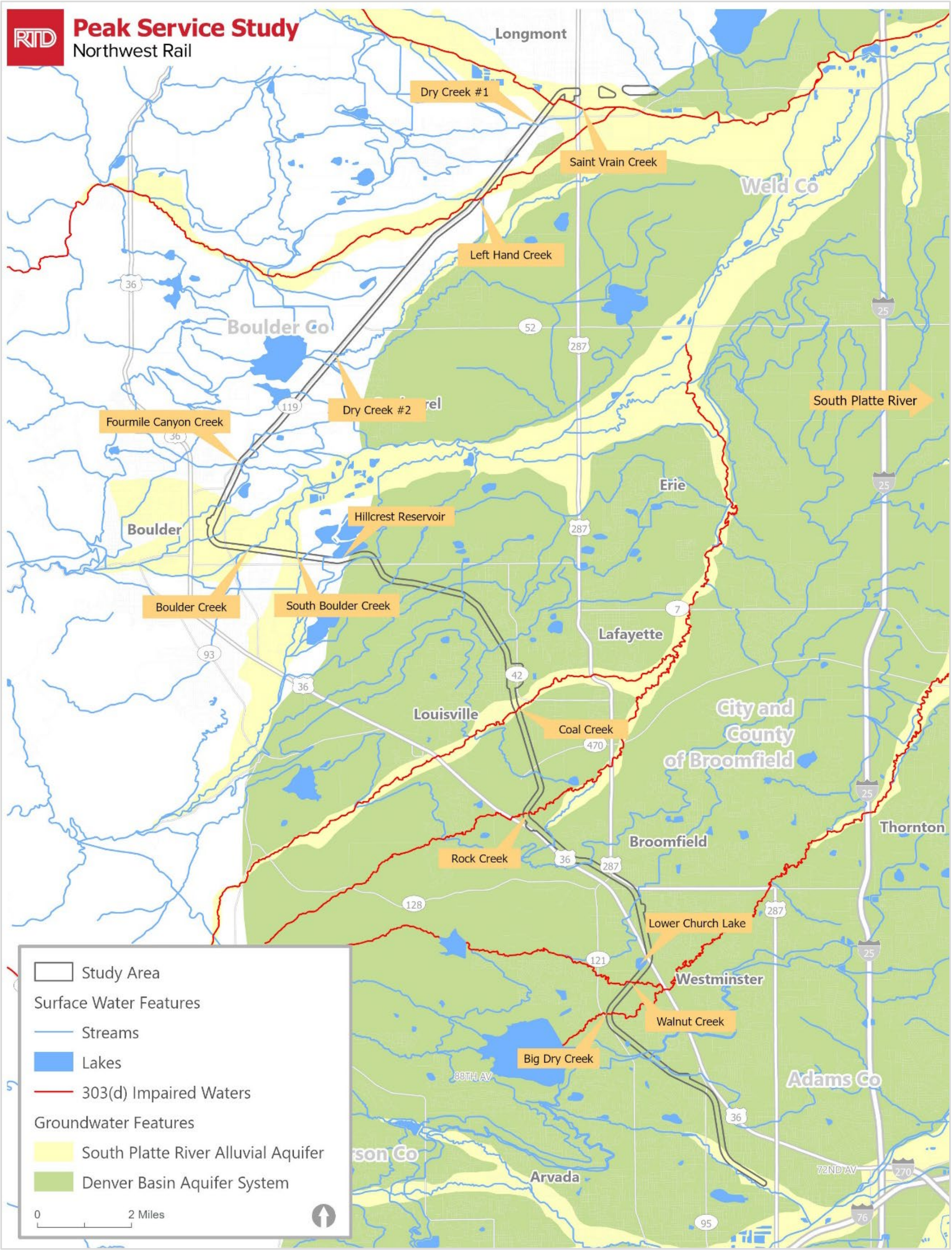
Figure 71: Surface Water and Groundwater Features within the Study Area



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.

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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.

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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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Milestone 2

Corridor Conditions Report

Appendix A

Northwest Rail Peak Service Study

Traffic Corridor Context Report

Peak Service Study
Northwest Rail

We make lives better through connections.

Traffic
Corridor Context Report

December 2022

Regional Transportation District
1660 Blake Street, Denver CO 80202

Traffic Corridor Context Report

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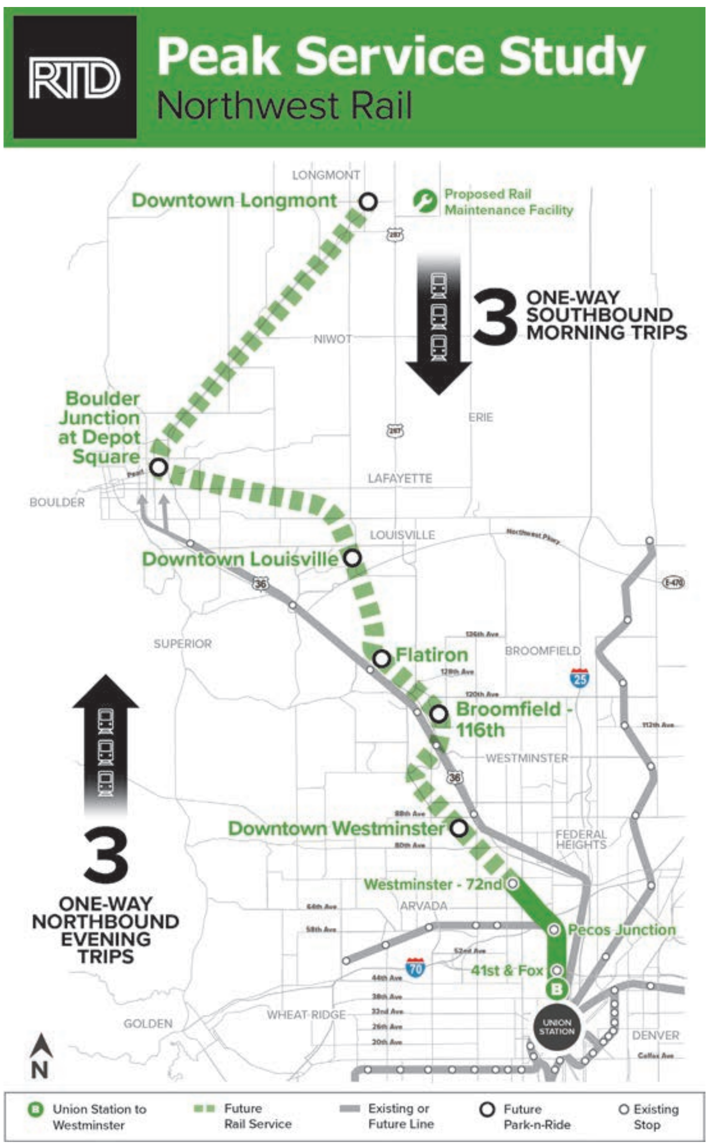
Introduction

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

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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

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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

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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.

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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

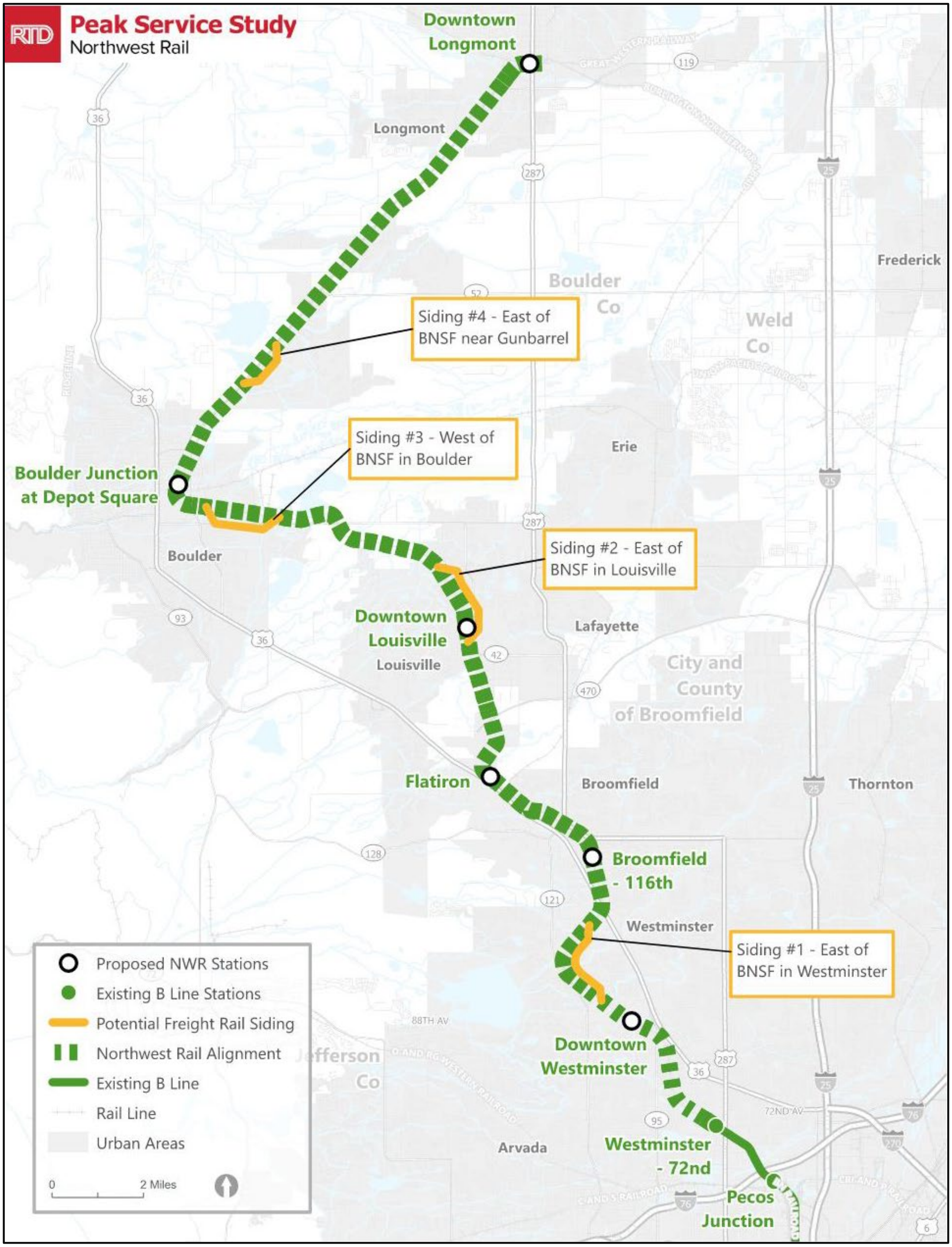
The sidings would impact the following at-grade crossings:

- 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.

Traffic Corridor Context Report

Figure 2: Proposed Freight Siding Locations



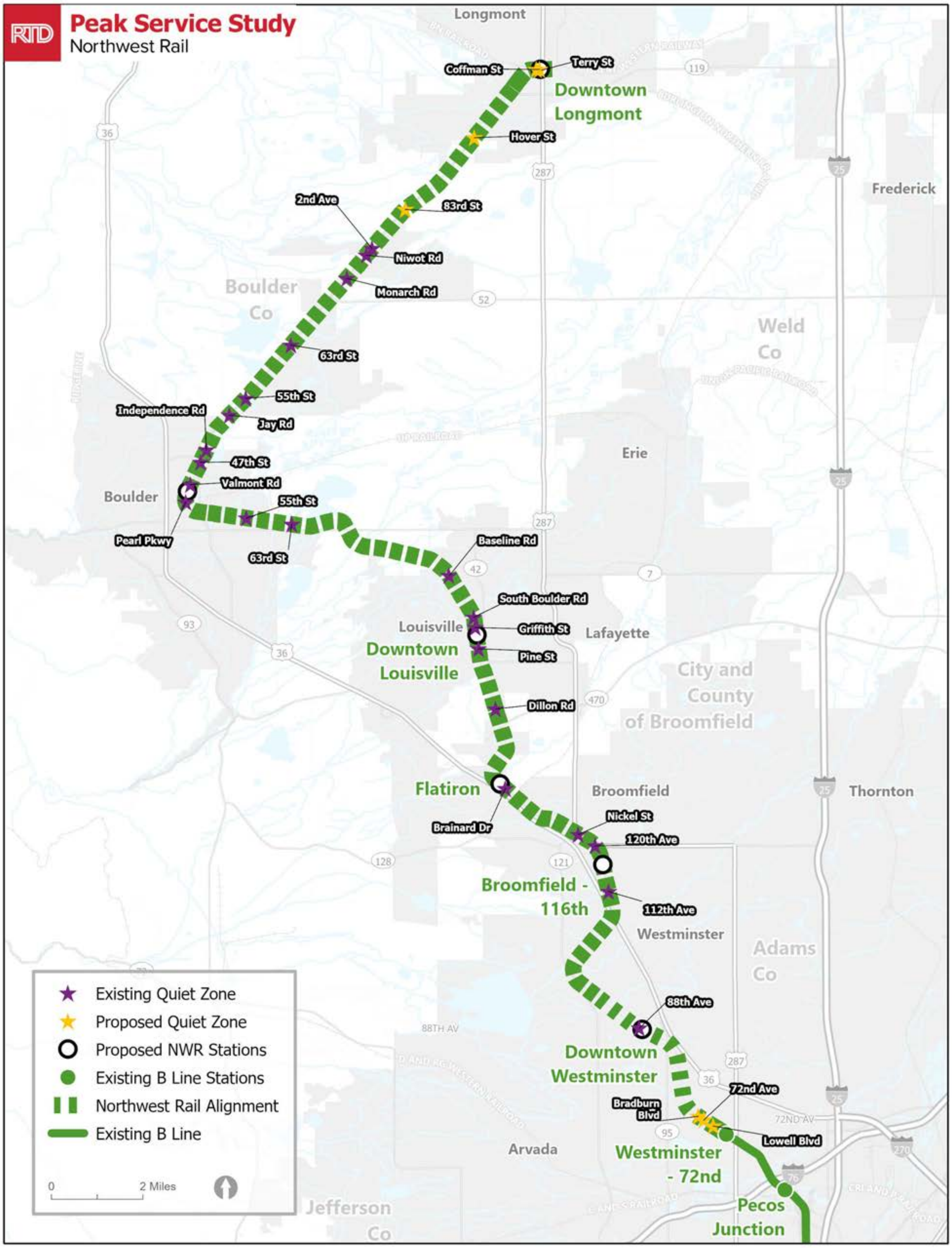
Quiet Zones

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.

Traffic Corridor Context Report

Figure 3: Existing and Proposed Quiet Zones Locations



Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

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

Traffic Corridor Context Report

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.

Traffic Corridor Context Report

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

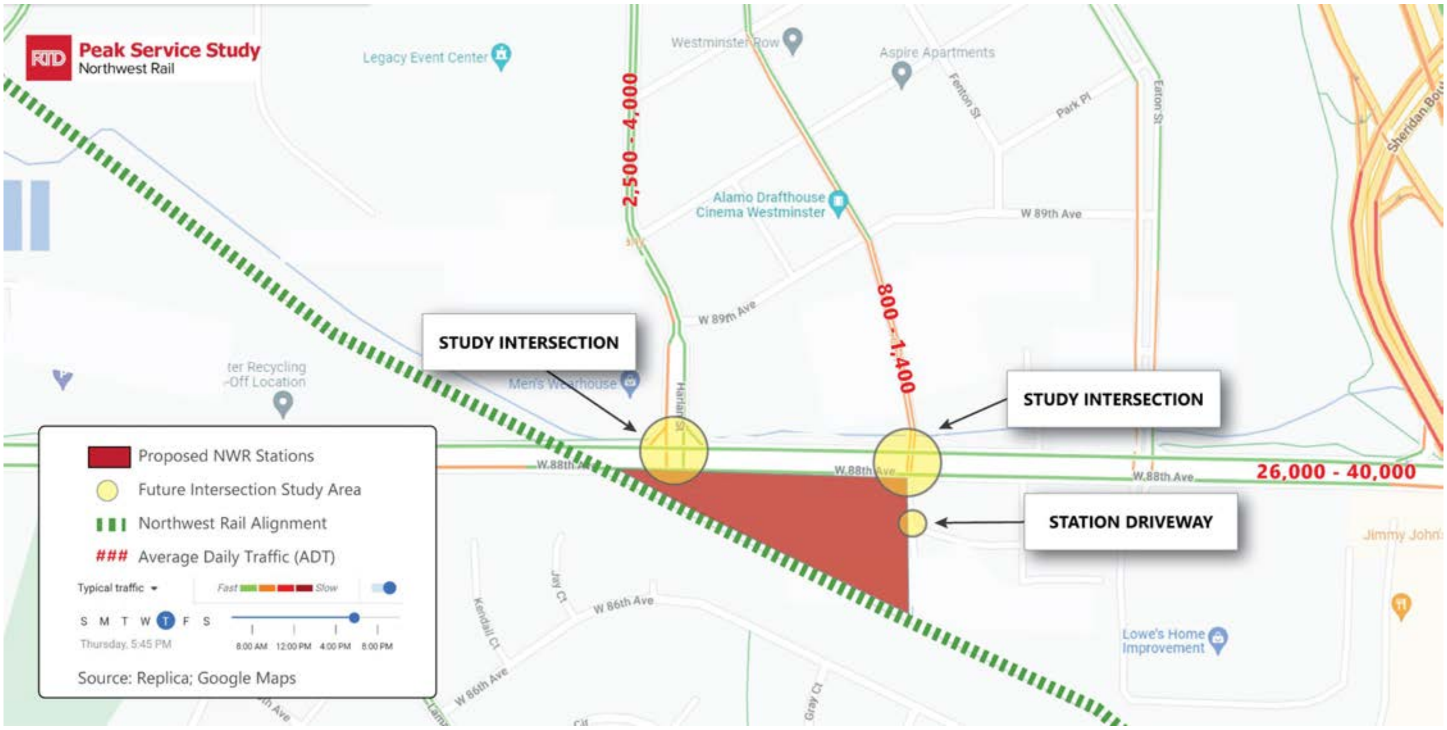


Figure 5: Broomfield – 116th Station Study Area

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

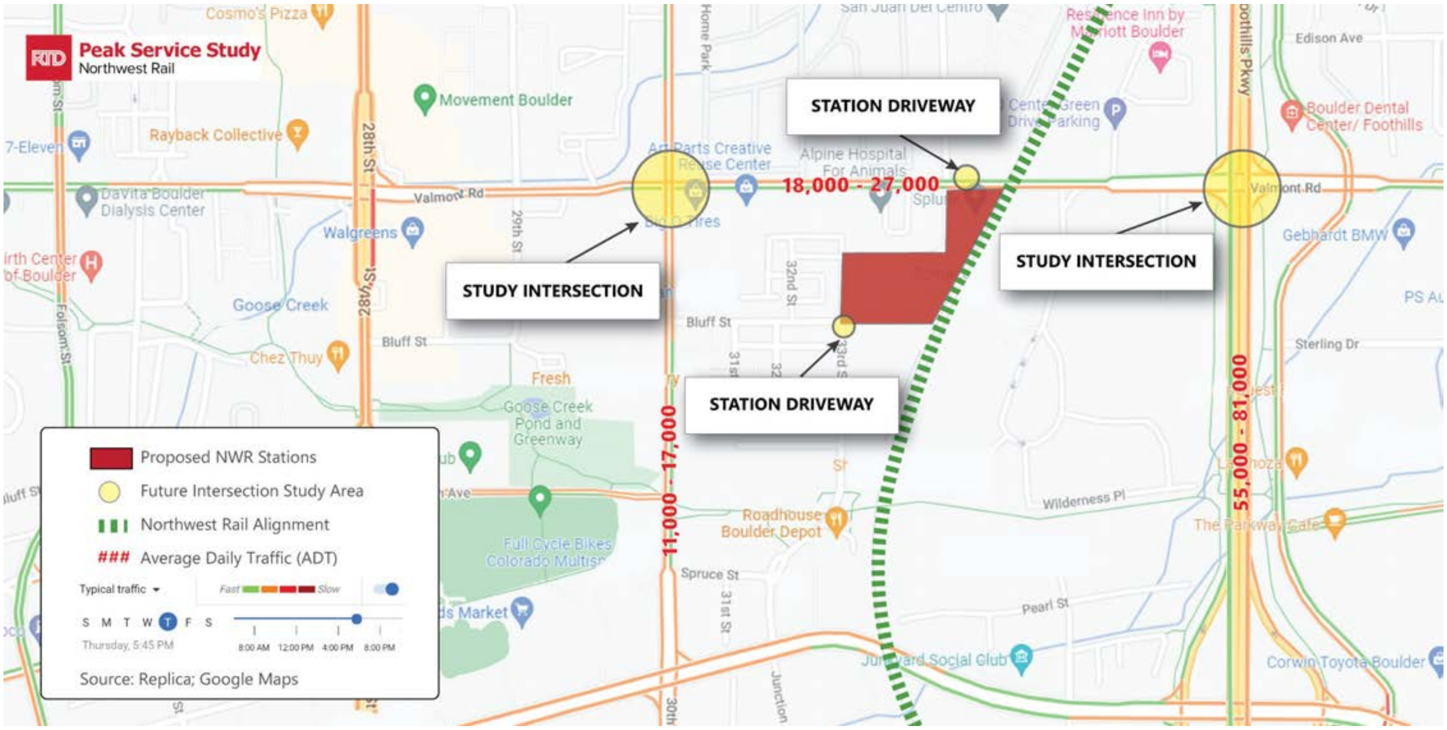
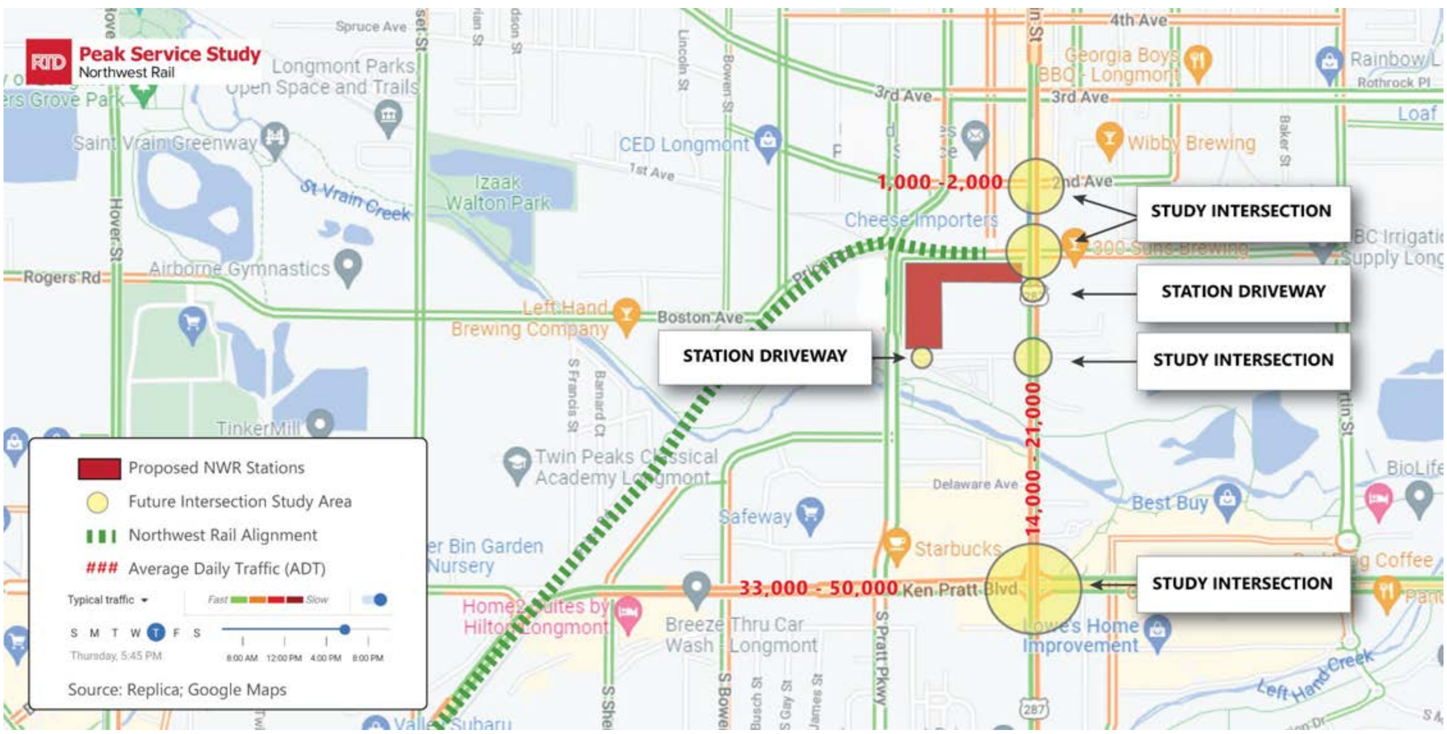


Figure 9: Downtown Longmont Station Study Area



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

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.

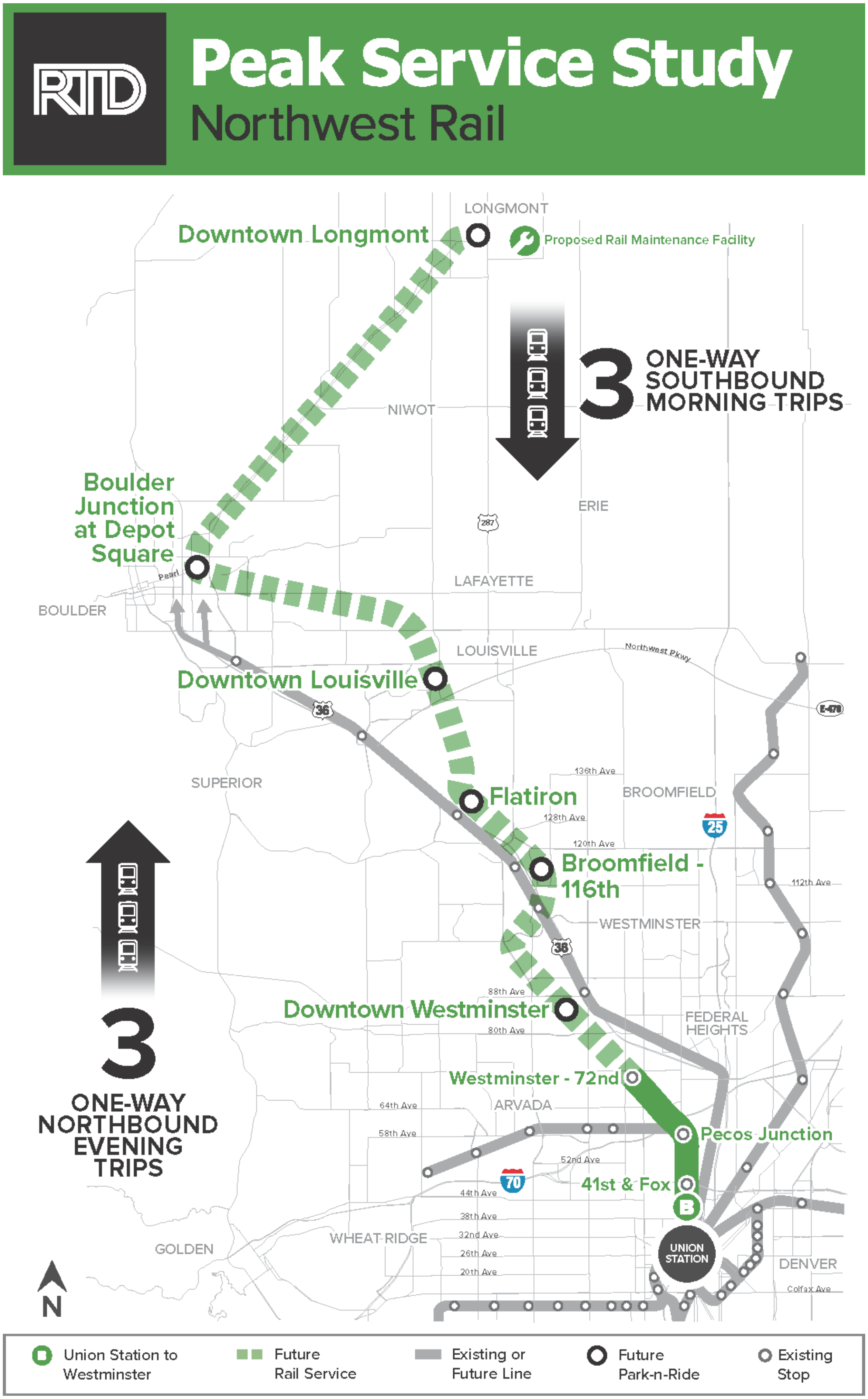
Even with increased traffic congestion and worsening environmental conditions, travel demands are not decreasing. RTD's Quality of Life State of the System report states that in 2018, 21% of lane miles on major roadways in the Denver metropolitan area (1,489 miles) were congested for three or more hours 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

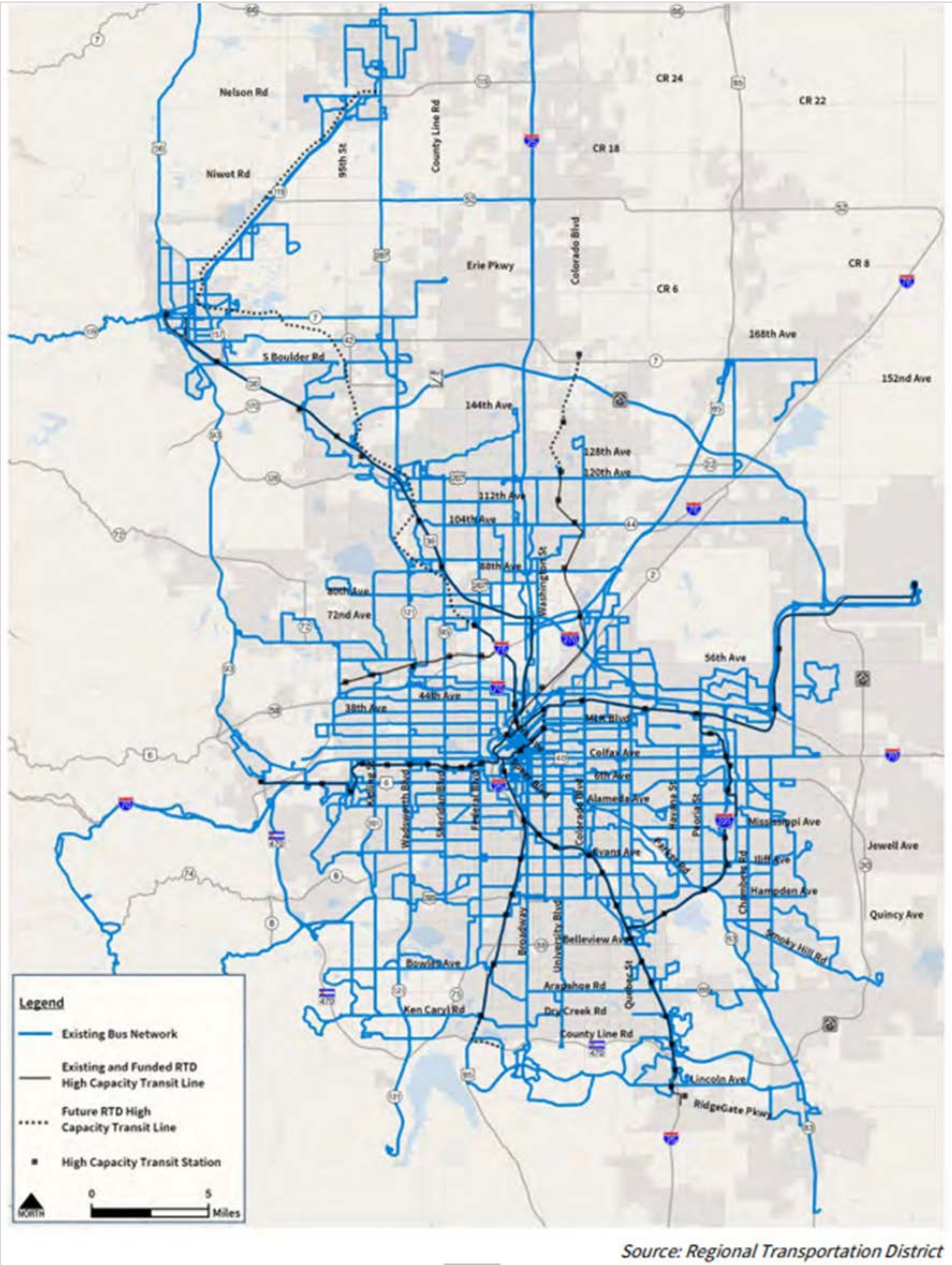
Overview of Transit Network

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

Transit Corridor Context Report

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

Transit Corridor Context Report

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]

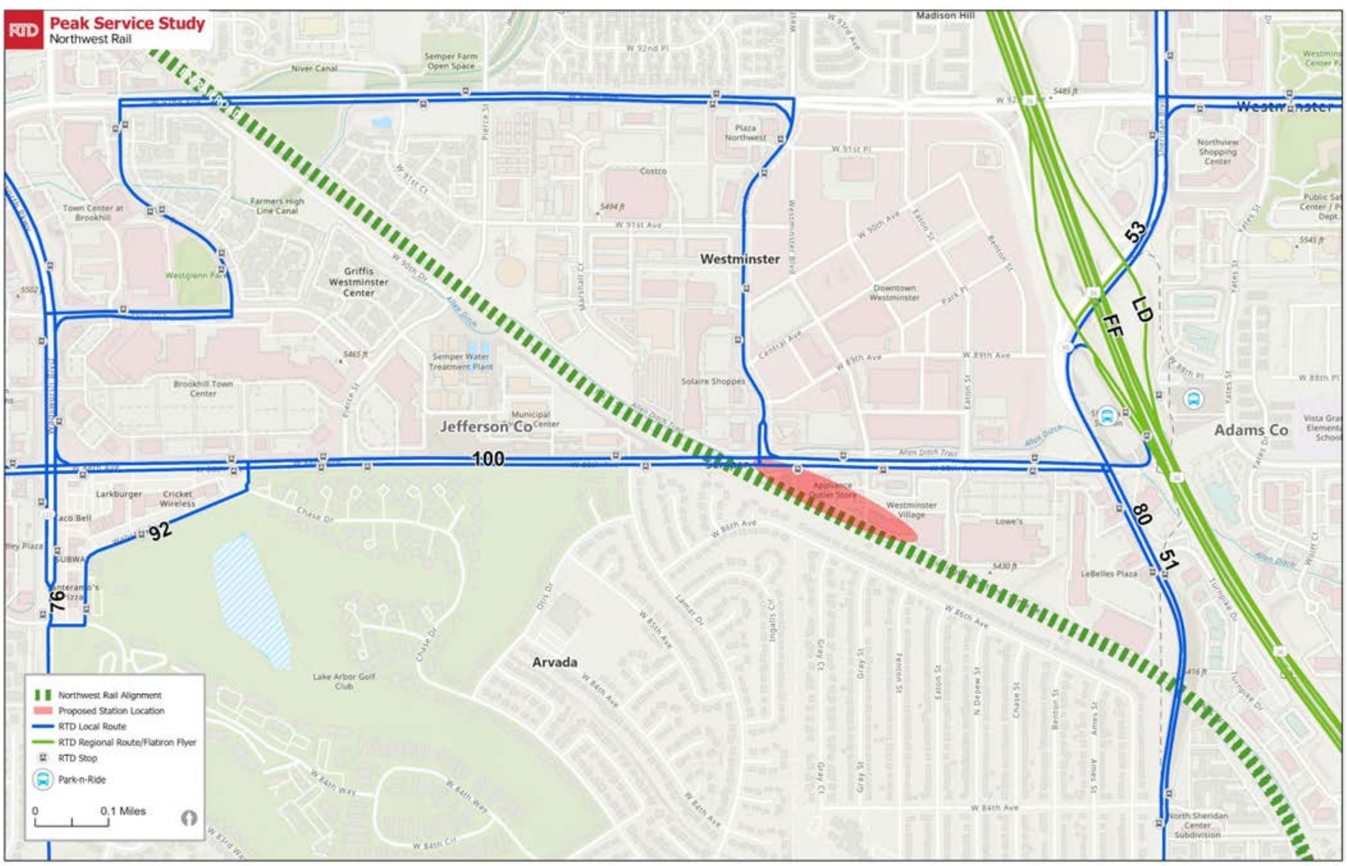
Existing Bus Service to Proposed NWR Stations/Connecting and Surrounding Routes and Service

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



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

Transit Corridor Context Report

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)	Every 30 minutes	Every 30 minutes	Every 60 minutes
	US 36 & Sheridan			
100	Wadsworth --88th (Rail Station)	Every 60 minutes	Every 60 minutes	N/A (does not serve these stations)
	US 36 & Sheridan			
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

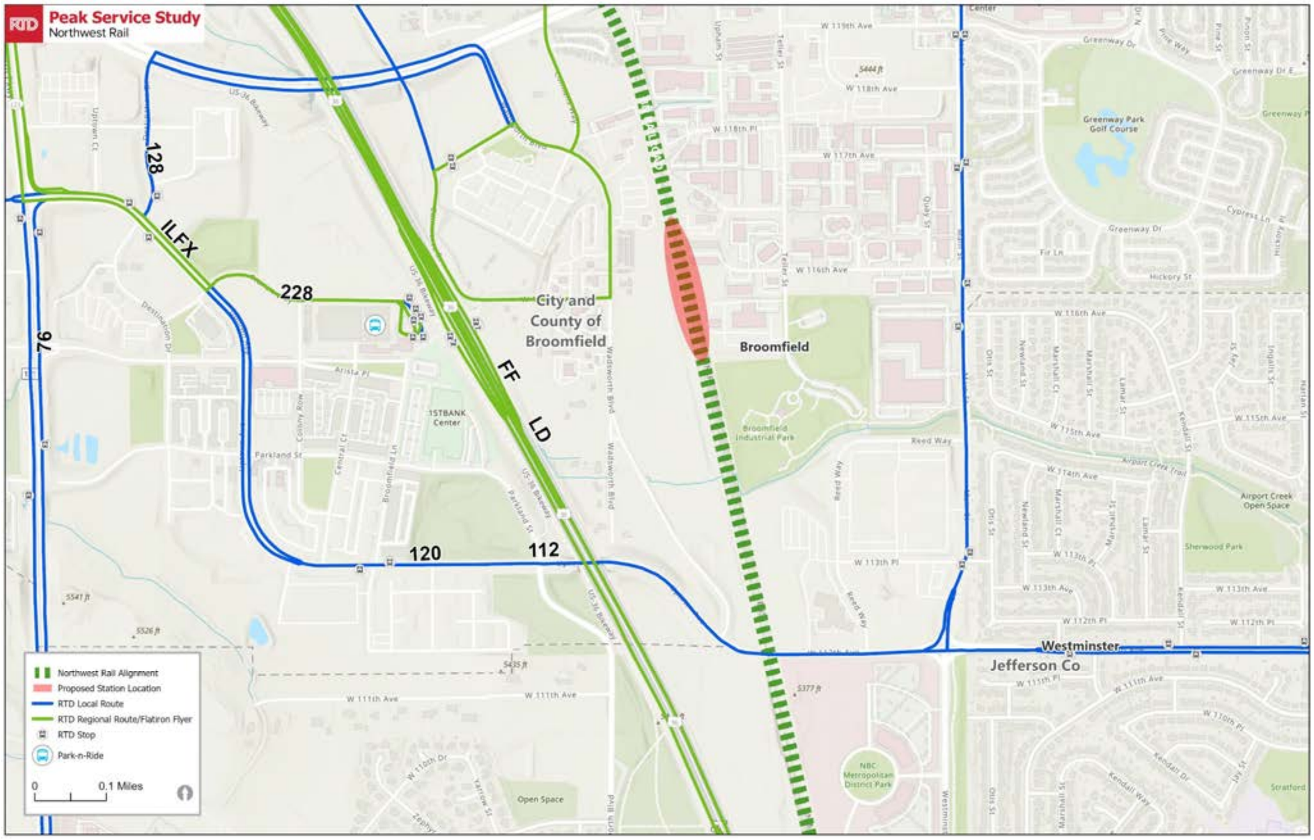


Table 6: Existing Service in Area Near Broomfield – 116th Station

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

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

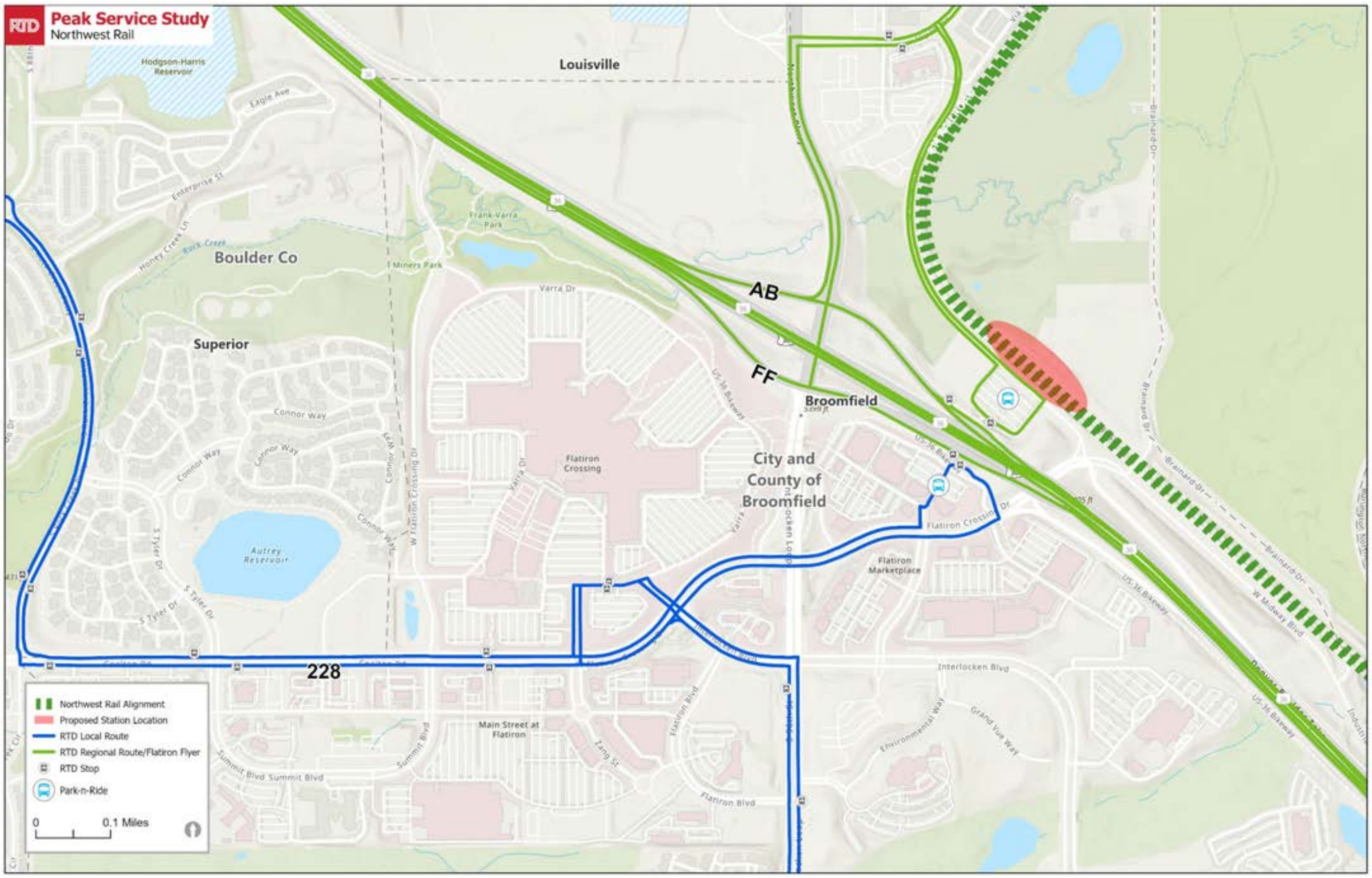


Table 7: Existing Service in Area Near Flatiron Station

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

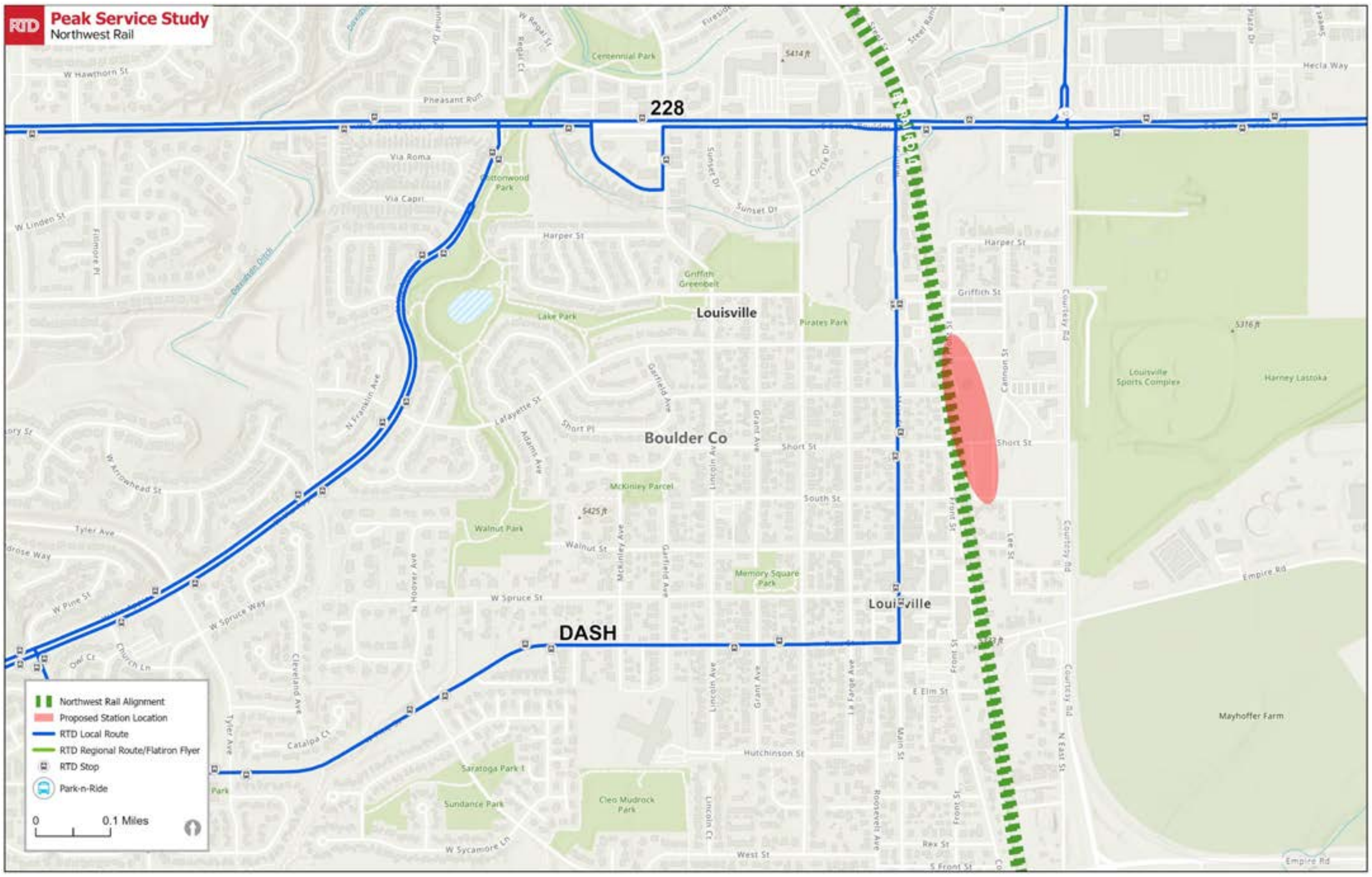


Table 8: Existing Service in Area Near Downtown Louisville Station

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

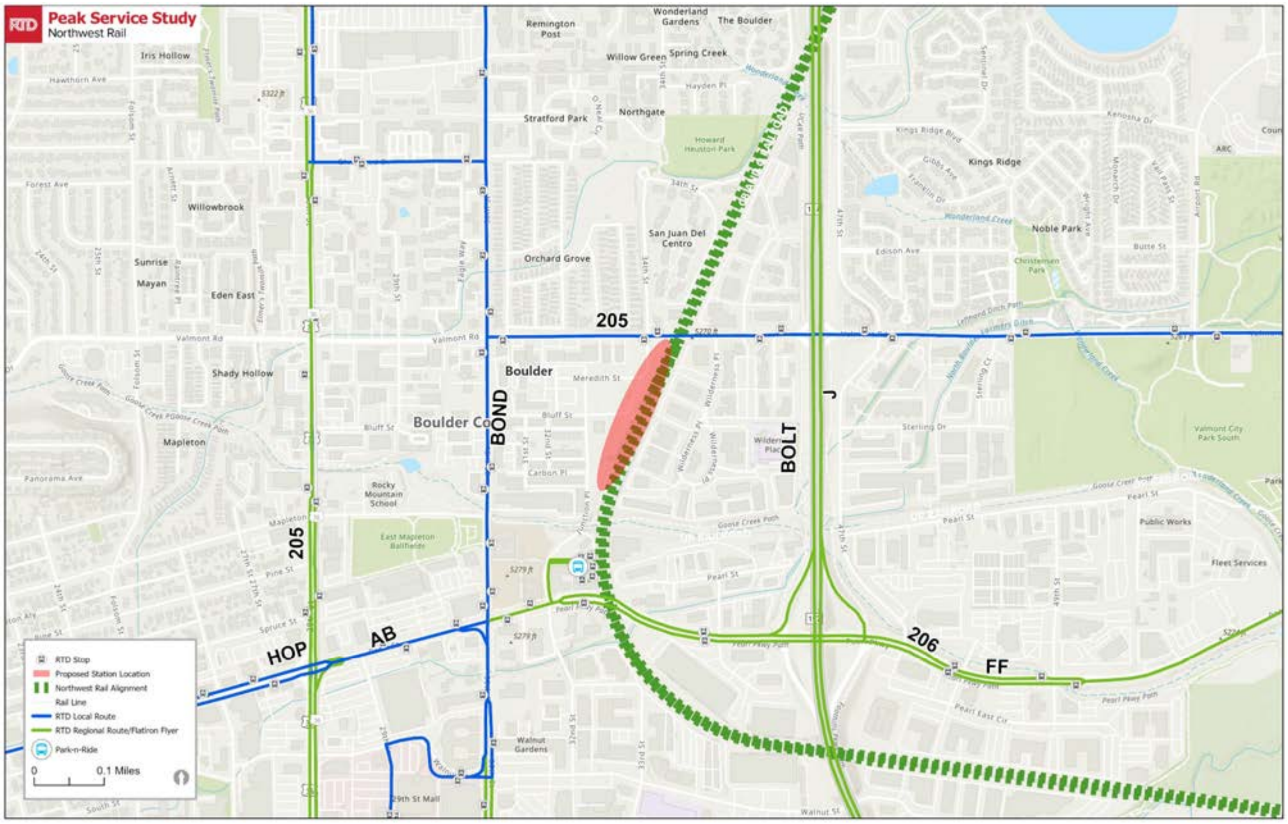


Table 9: Existing Service in Area Near Boulder Junction at Depot Square Station

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* https://www.rtd-denver.com/sites/default/files/files/2020-03/north-team-service-analysis-SH119.pdf

Transit Corridor Context Report

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

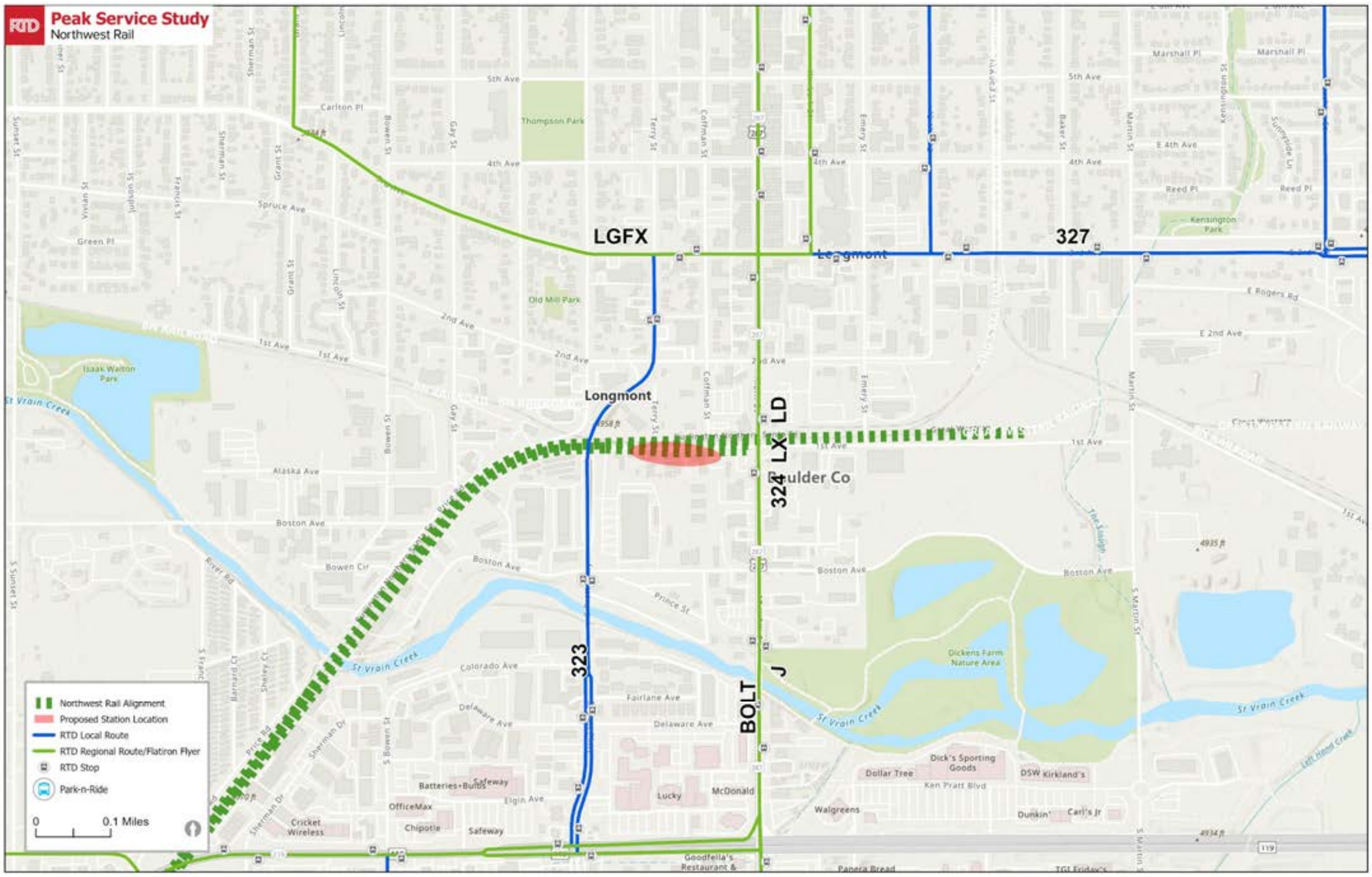


Table 10: Existing Service in Area Near the Downtown Longmont Station

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

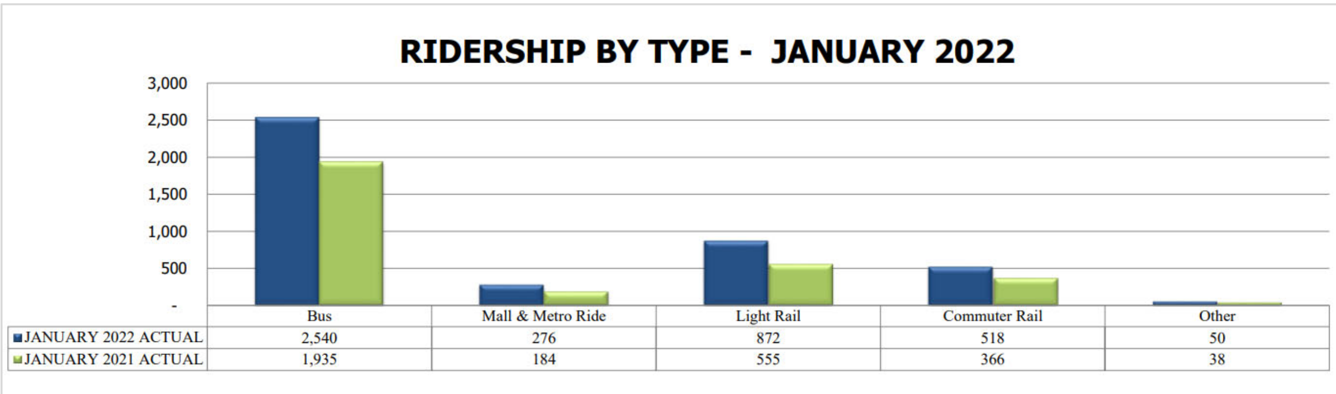
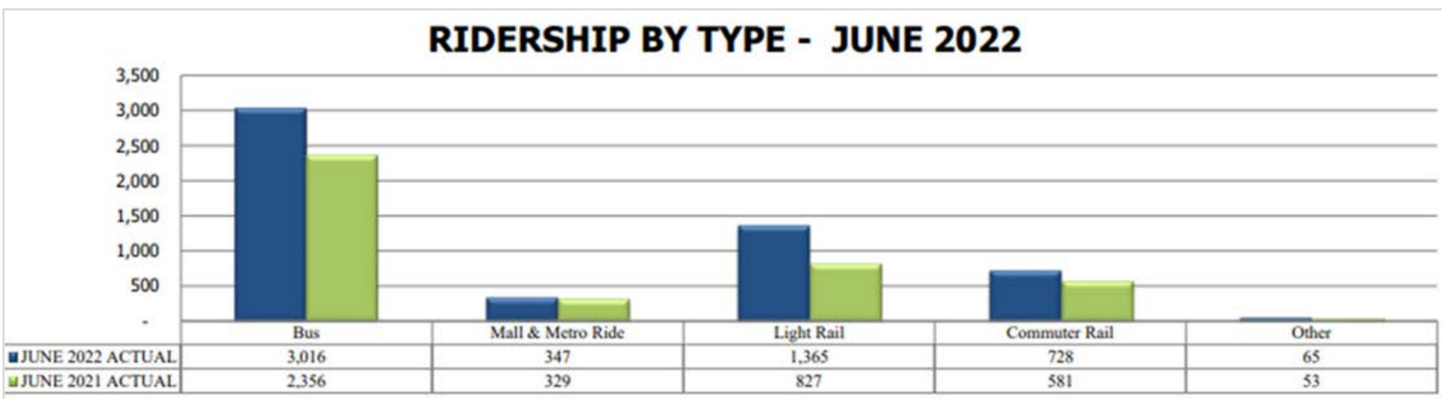


Figure 10: June 2022 Monthly RTD Ridership in Thousands



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)

Transit Corridor Context Report

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:

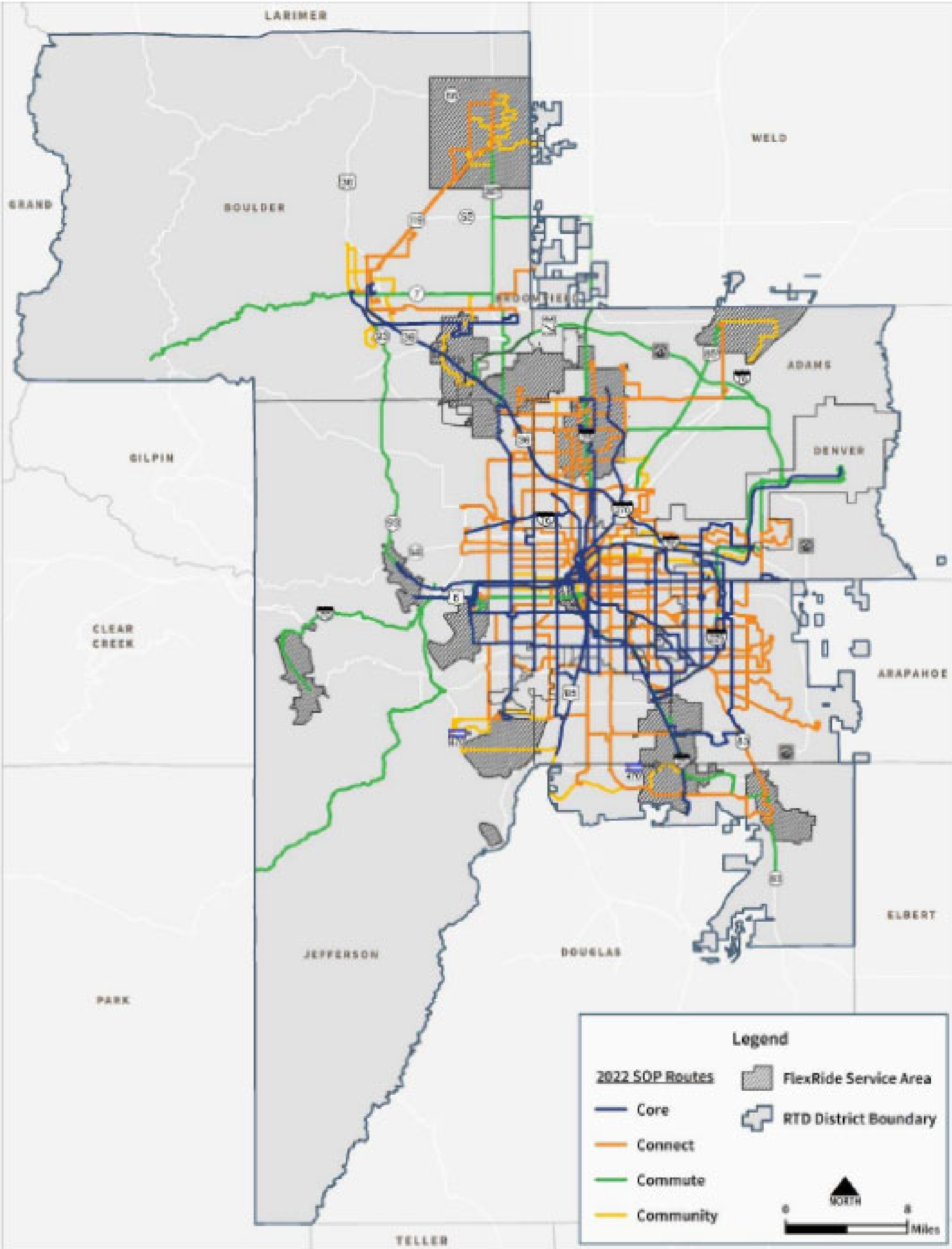
- **Core** routes. Regional routes serving prominent employment centers, high density housing, that are major trip generators with a demonstrated demand for frequent and extensive service hours; Routes 0 and 15 are examples of Core Routes.
- **Connect** routes. Local bus routes with a minimum 14-hour 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

Transit Corridor Context Report

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]

Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

[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 Rout 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.

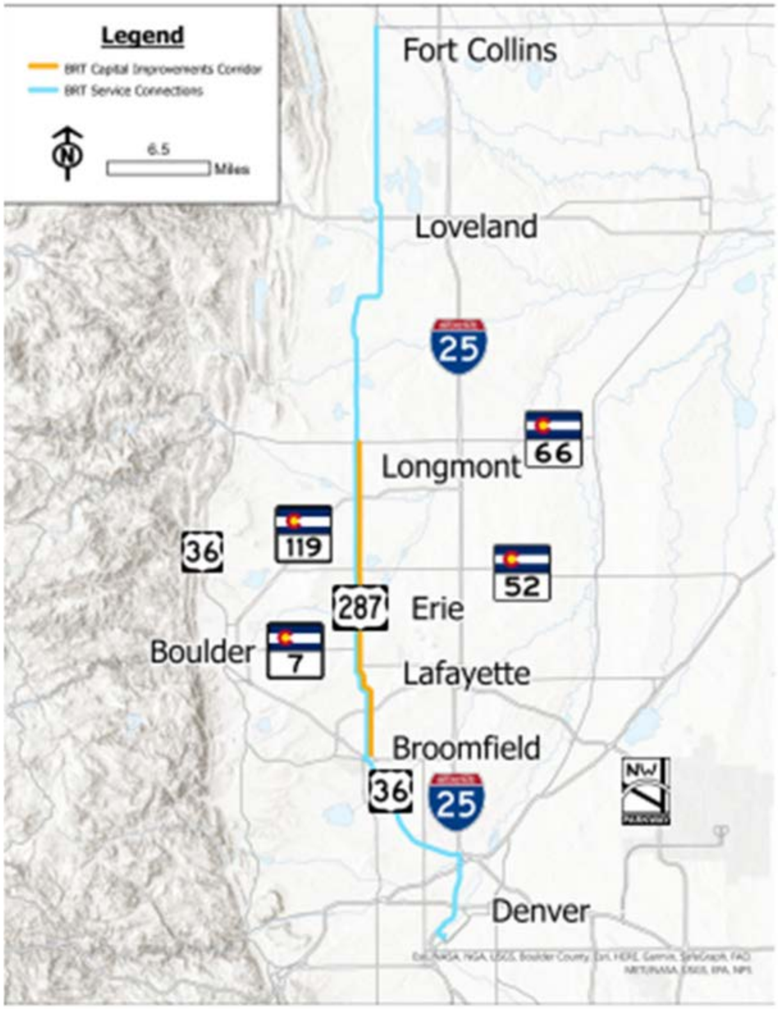
The **US 287** BRT corridor study area is from Fort Collins to Denver, with capital recommendations focused between CO 66 in north Longmont to US 36 in Broomfield (Figure 14). Boulder County led the US 287 Bus

[27] https://www.rtd-denver.com/sites/default/files/files/2020-03/north-team-service-analysis-SH119.pdf
[28] https://www.codot.gov/projects/co119-mobility-design

Transit Corridor Context Report

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.

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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 Lafyette 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

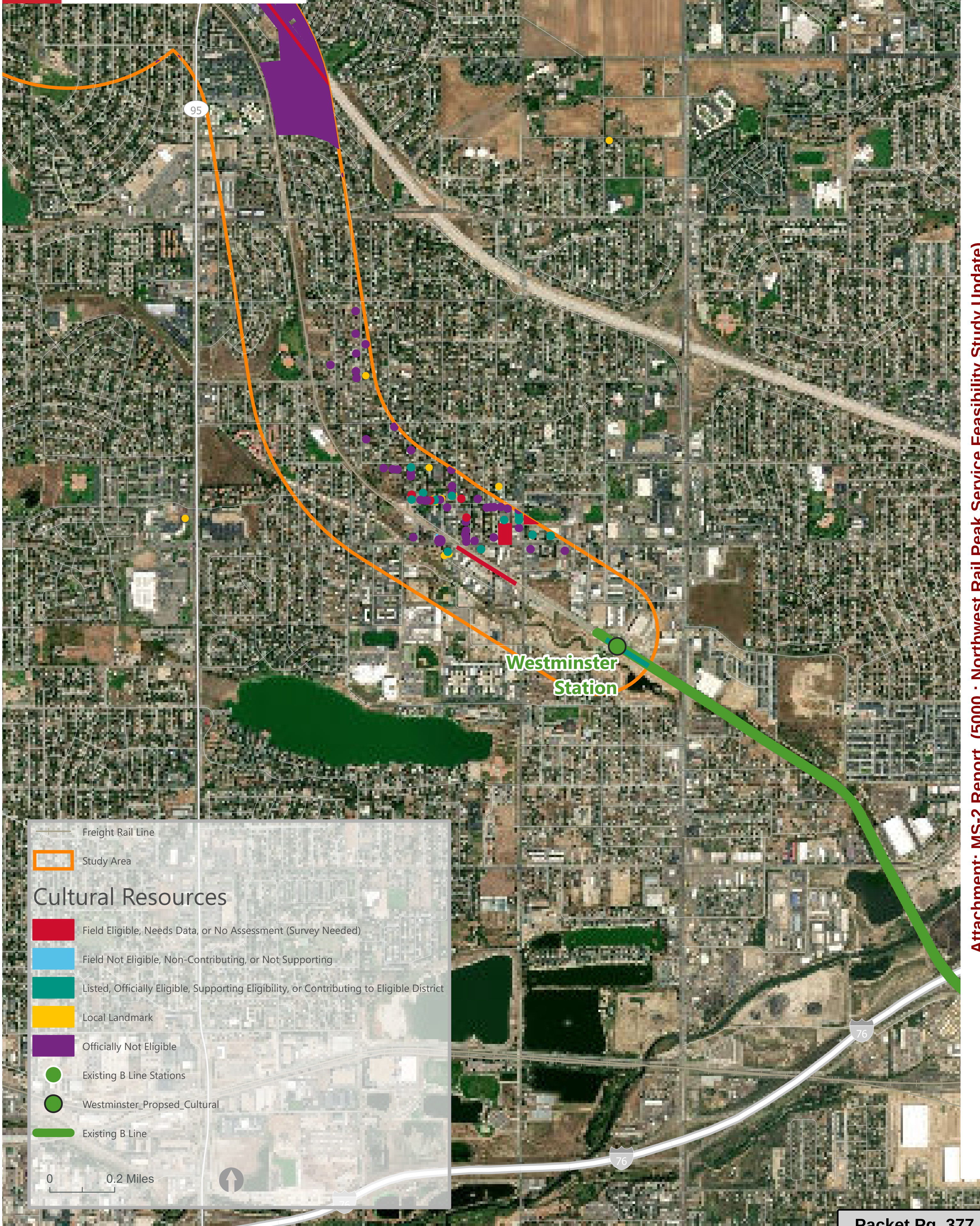
[36] https://www.rtd-denver.com/sites/default/files/files/2020-03/north-team-service-analysis-SH119.pdf

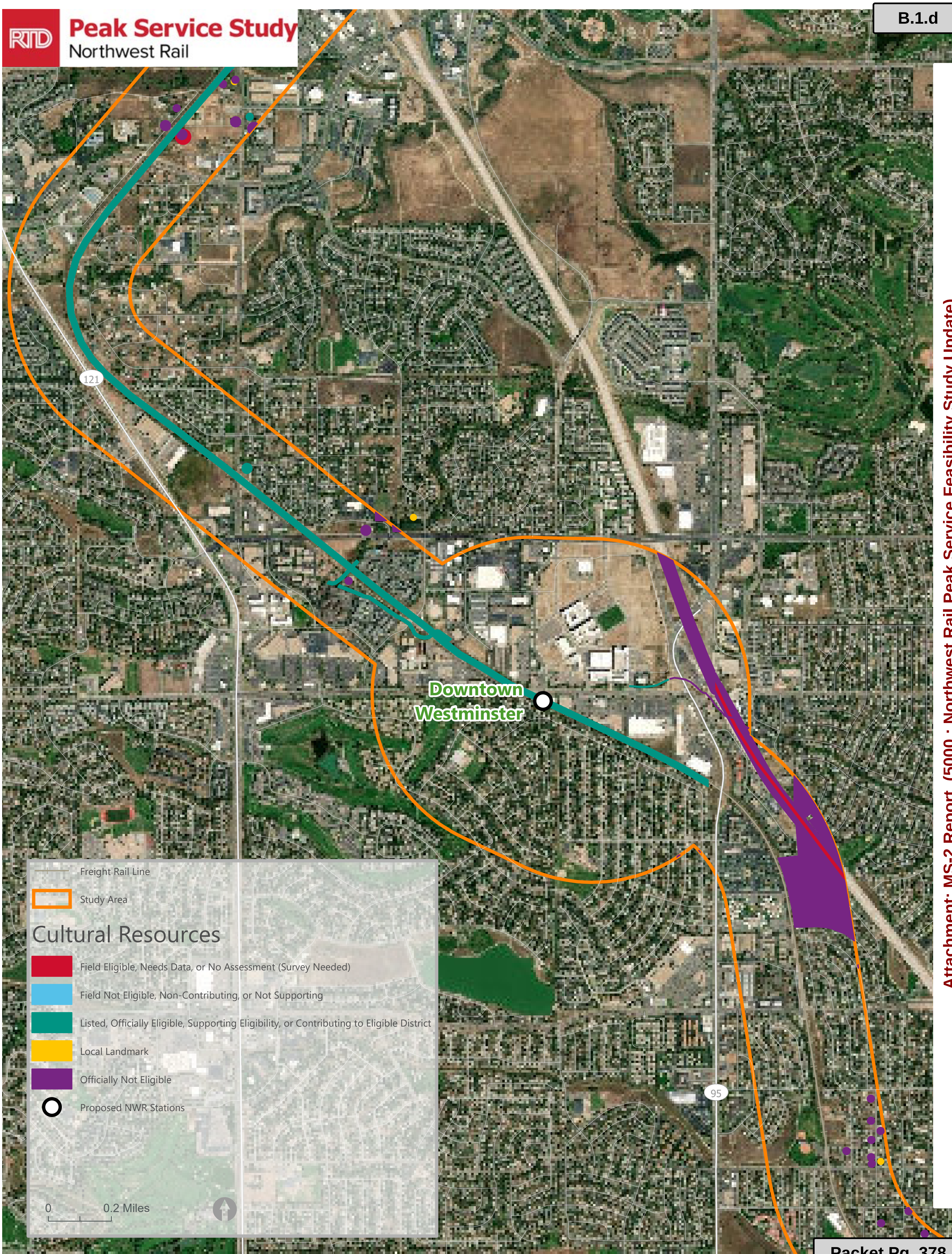
the Downtown Longmont Station. Furthermore, the US 287 BRT would connect to the Downtown Longmont Station and should be considered a connecting transit route. RTD has identified all routing options for how to access the Downtown Longmont Station in the North Team Service Analysis & State Highway 119 BRT Feeder Plan.

Milestone 2
Corridor Conditions Report

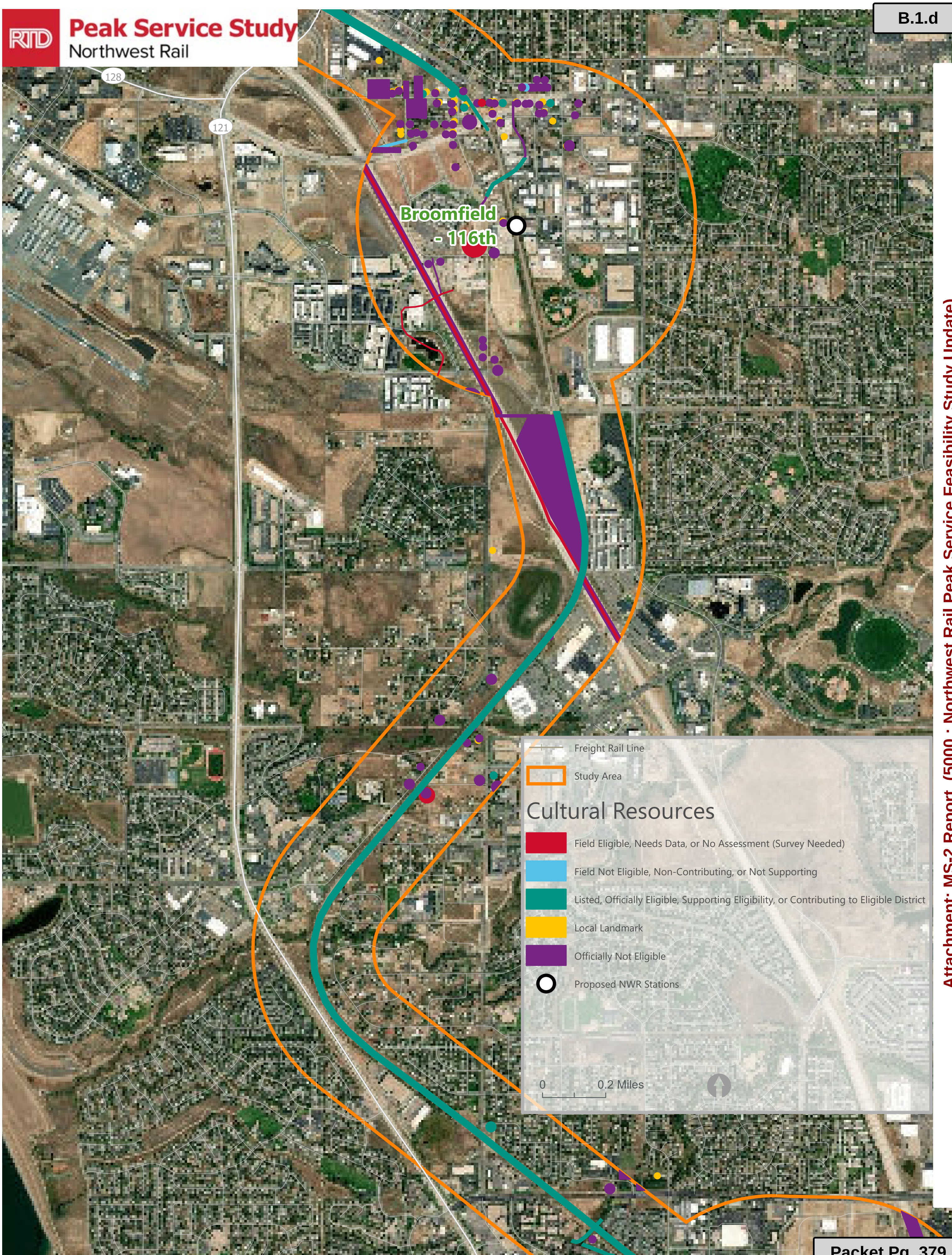
Appendix C
Historic Resources Detail Maps

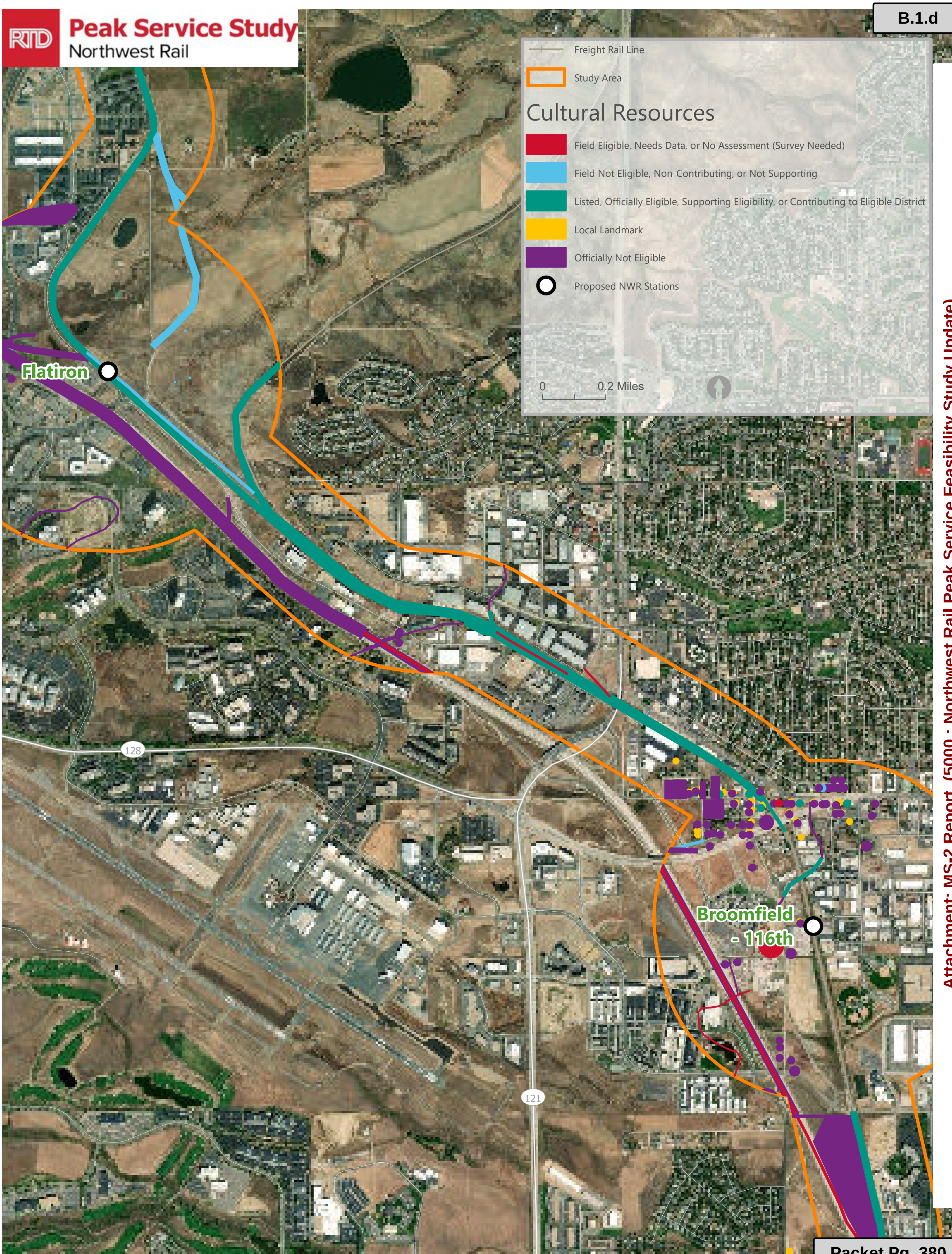
Peak Service Study
Northwest Rail





Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)


Peak Service Study
Northwest Rail
128
121
Broomfield - 116th
Freight Rail Line
Study Area
Cultural Resources
Field Eligible, Needs Data, or No Assessment (Survey Needed)
Field Not Eligible, Non-Contributing, or Not Supporting
Listed, Officially Eligible, Supporting Eligibility, or Contributing to Eligible District
Local Landmark
Officially Not Eligible
Proposed NWR Stations
0
0.2 Miles


Peak Service Study
Northwest Rail
Freight Rail Line
Study Area
Cultural Resources
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Field Not Eligible, Non-Contributing, or Not Supporting
Listed, Officially Eligible, Supporting Eligibility, or Contributing to Eligible District
Local Landmark
Officially Not Eligible
Proposed NWR Stations
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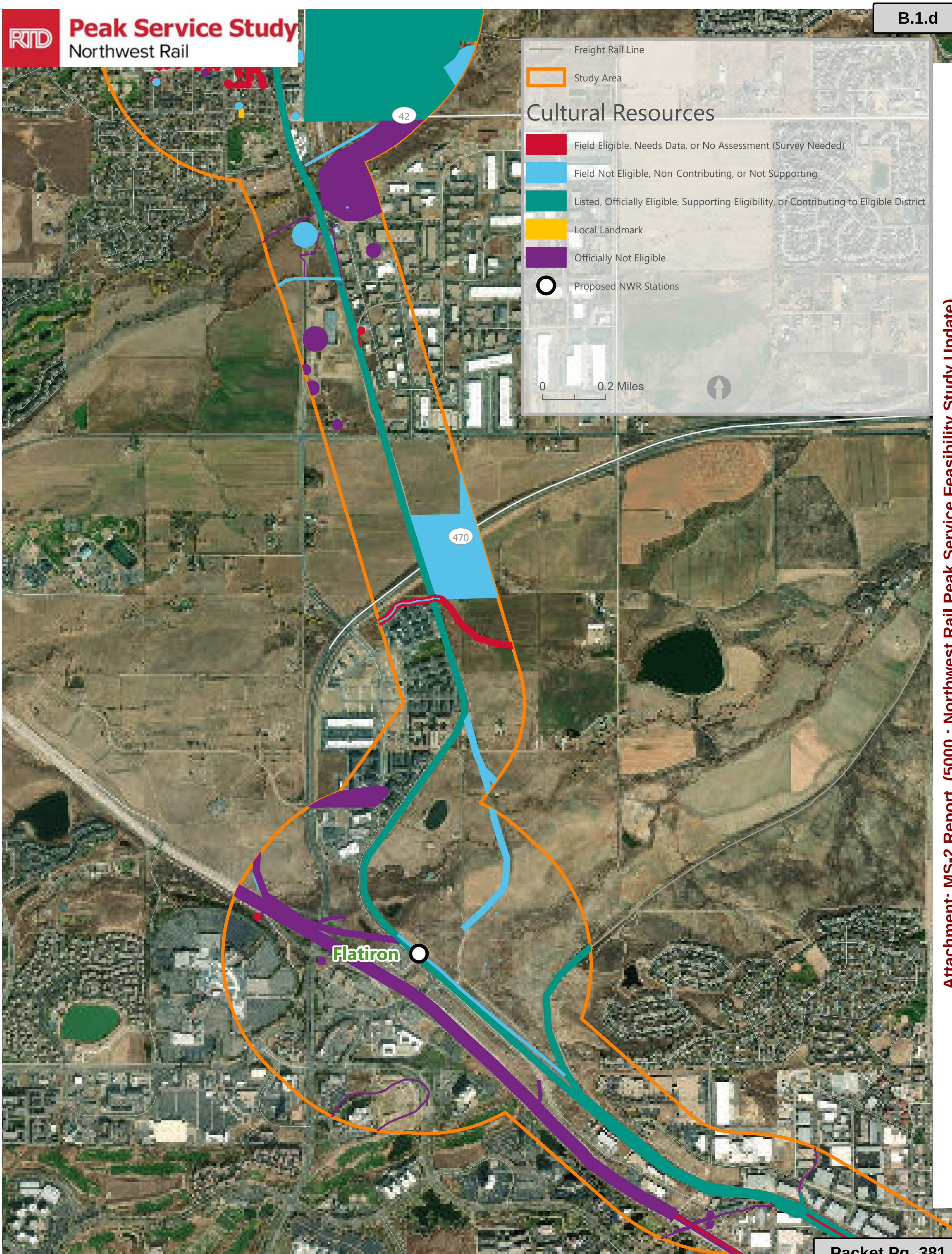
0.2 Miles
Flatiron
128
Broomfield - 116th
121



Peak Service Study
Northwest Rail
Freight Rail Line
Study Area
Cultural Resources
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Listed, Officially Eligible, Supporting Eligibility, or Contributing to Eligible District
Local Landmark
Officially Not Eligible
Proposed NWR Stations
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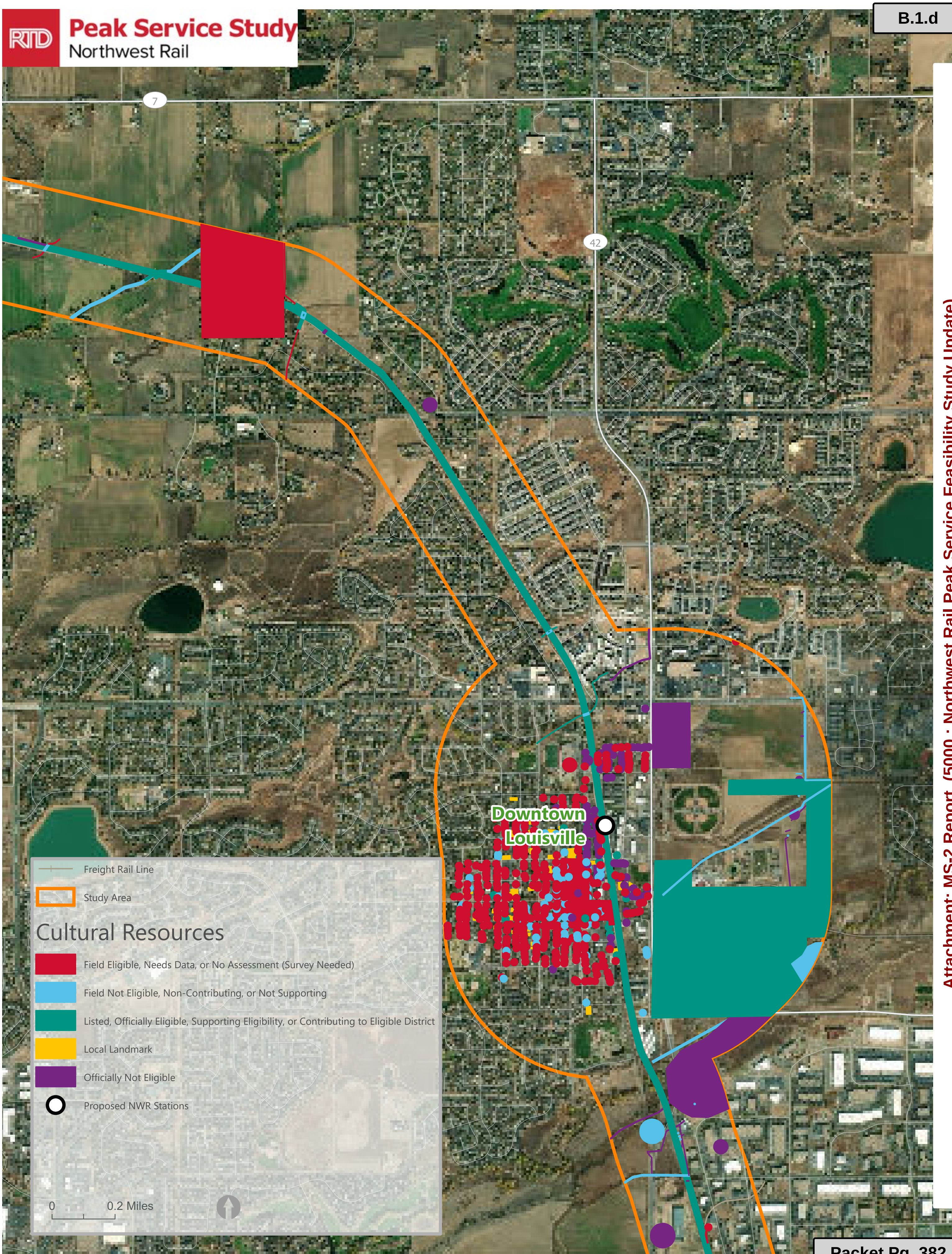
42
470
Flatiron



Peak Service Study
Northwest Rail
7
42
Downtown Louisville
Freight Rail Line
Study Area
Cultural Resources
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Local Landmark
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Proposed NWR Stations
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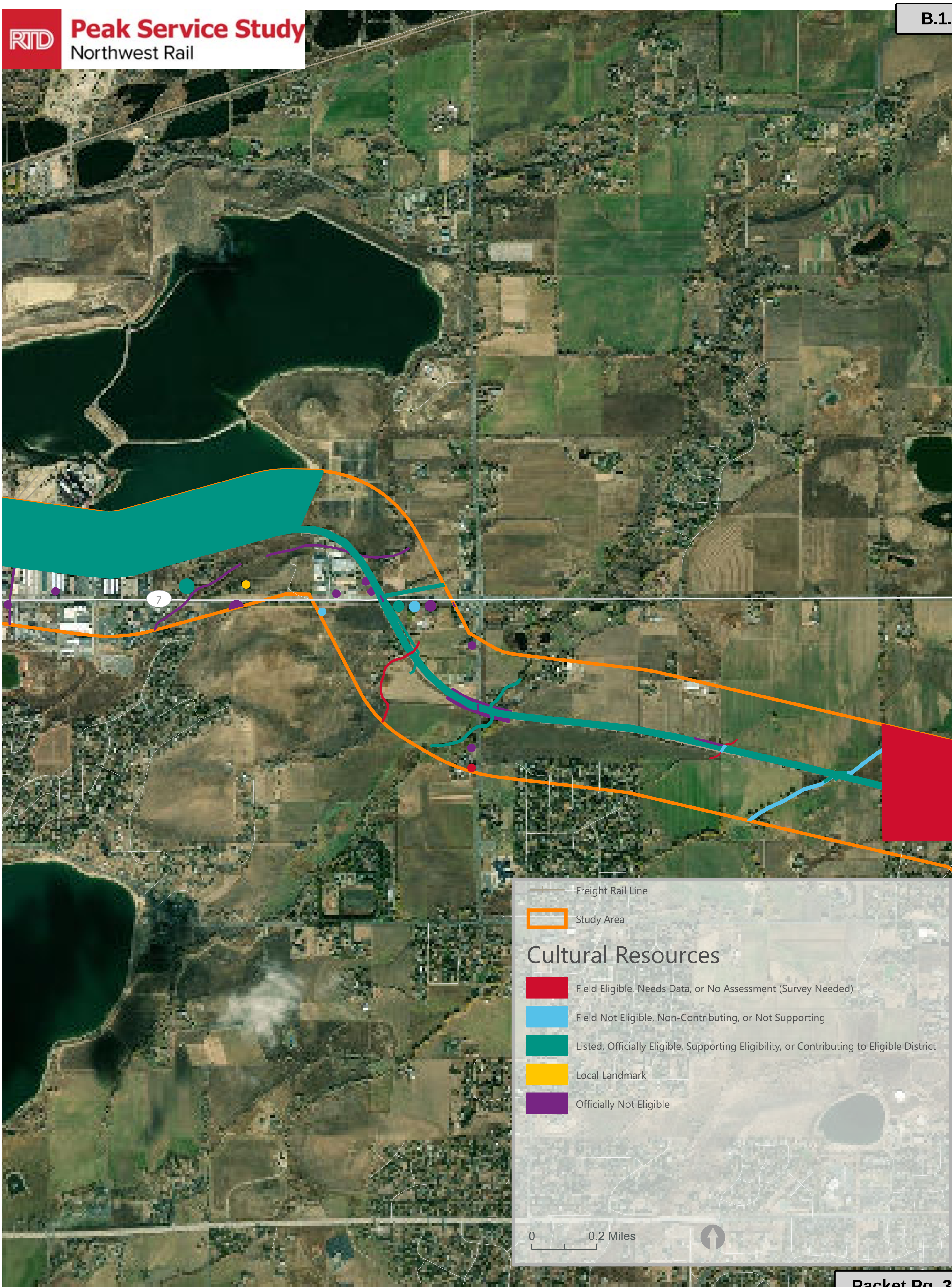
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Northwest Rail
7
Freight Rail Line
Study Area
Cultural Resources
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Local Landmark
Officially Not Eligible
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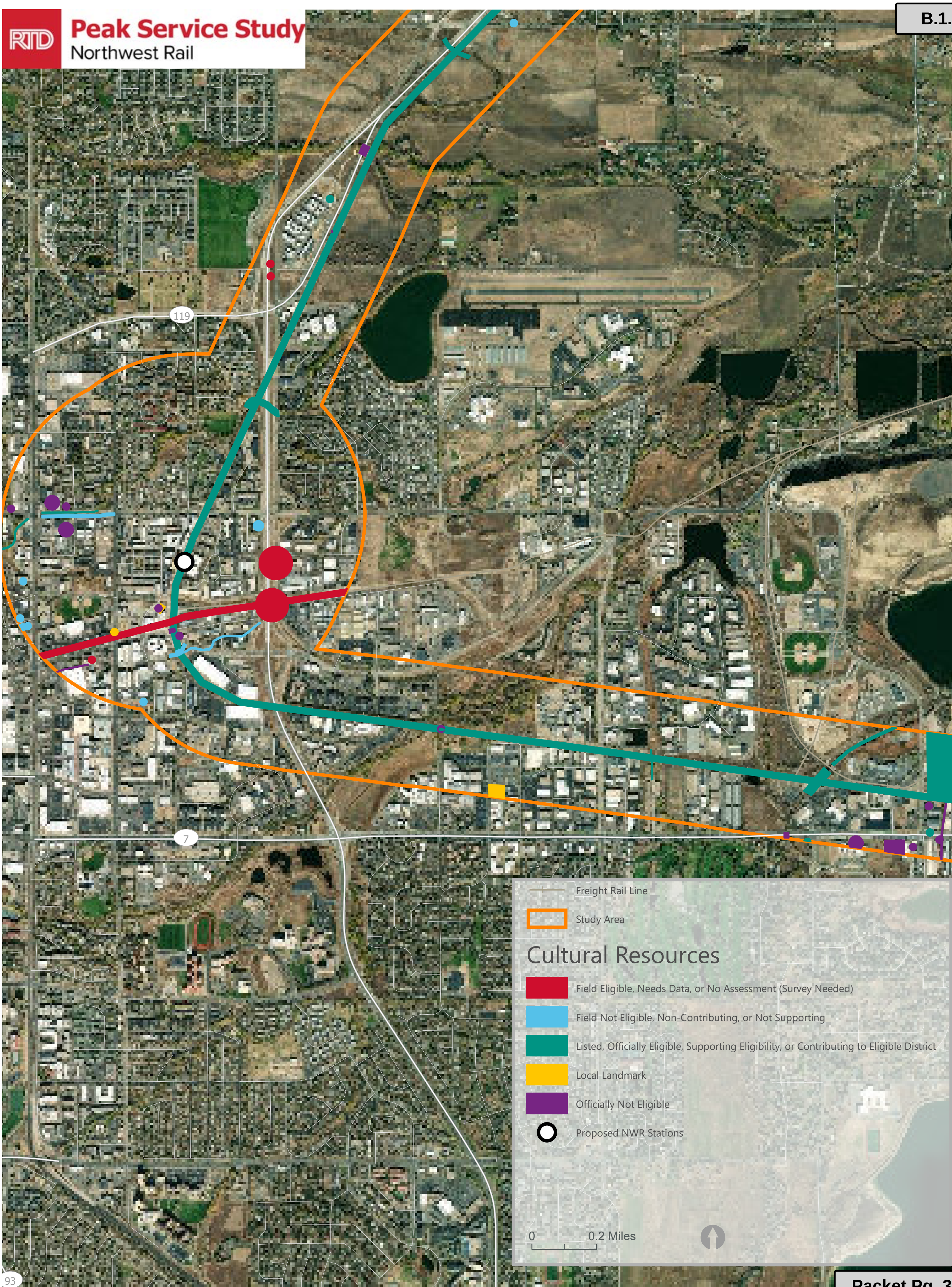
Peak Service Study
Northwest Rail
119
7
93
Freight Rail Line
Study Area
Cultural Resources
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Proposed NWR Stations
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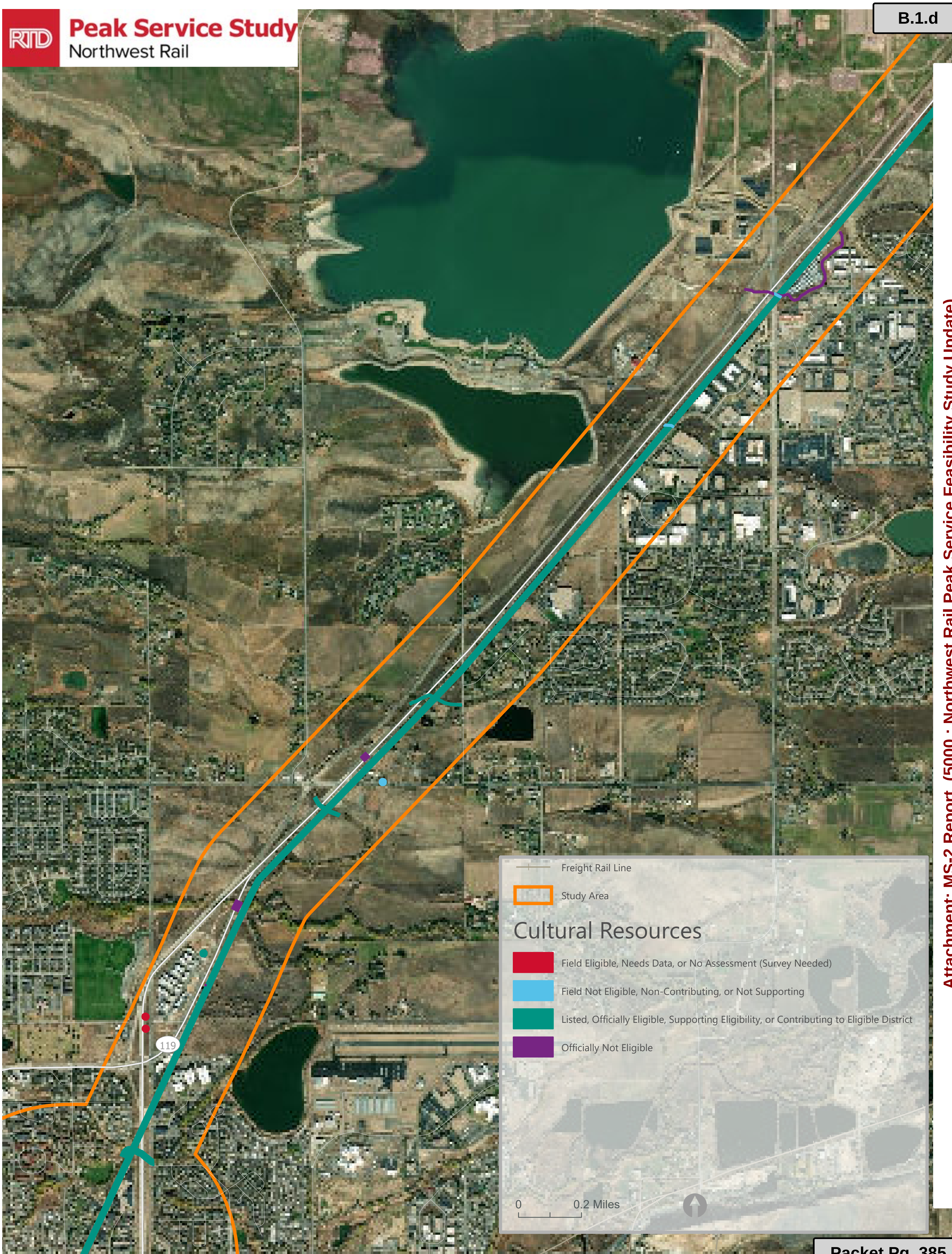
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Northwest Rail
RTD
119
Freight Rail Line
Study Area
Cultural Resources
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Officially Not Eligible
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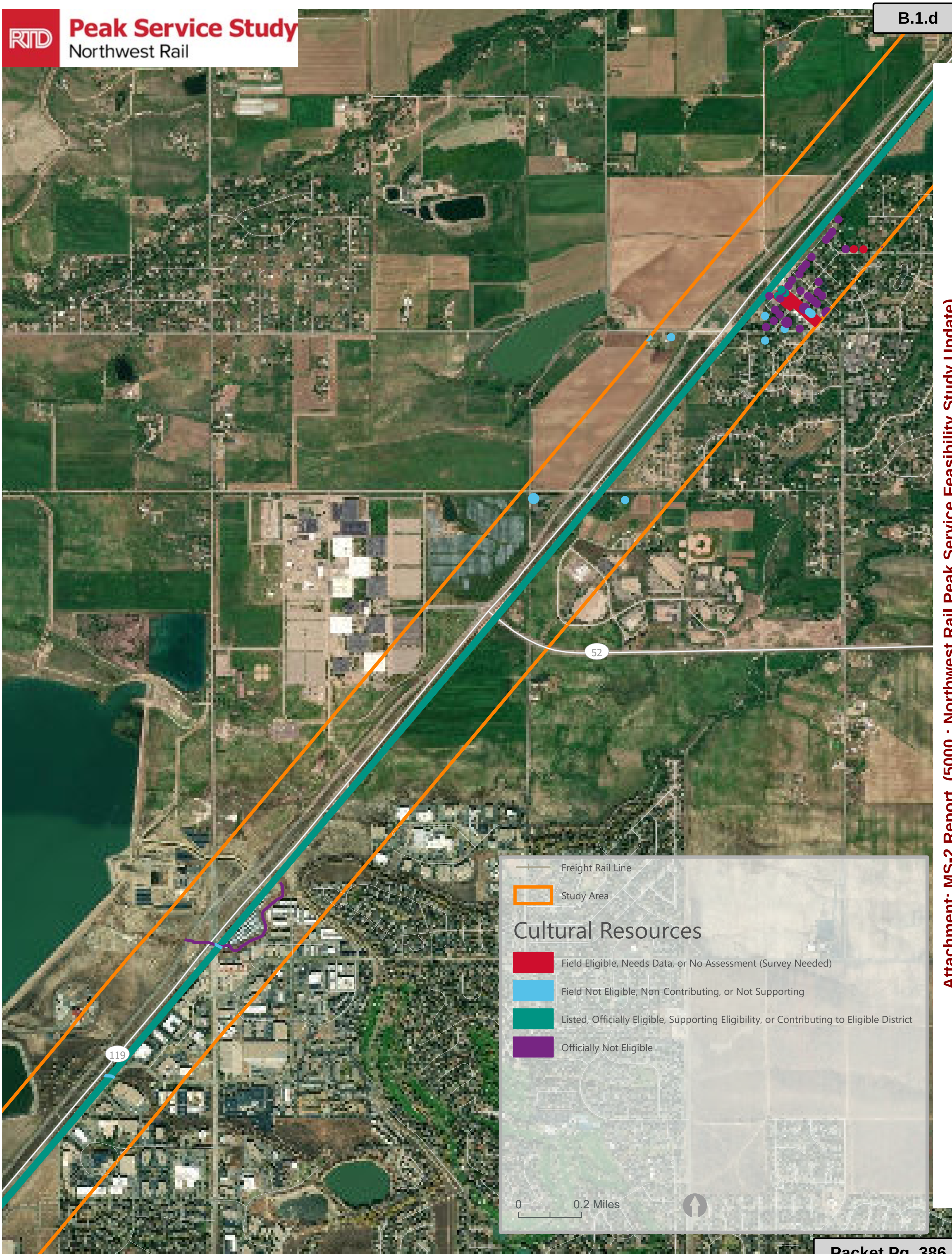
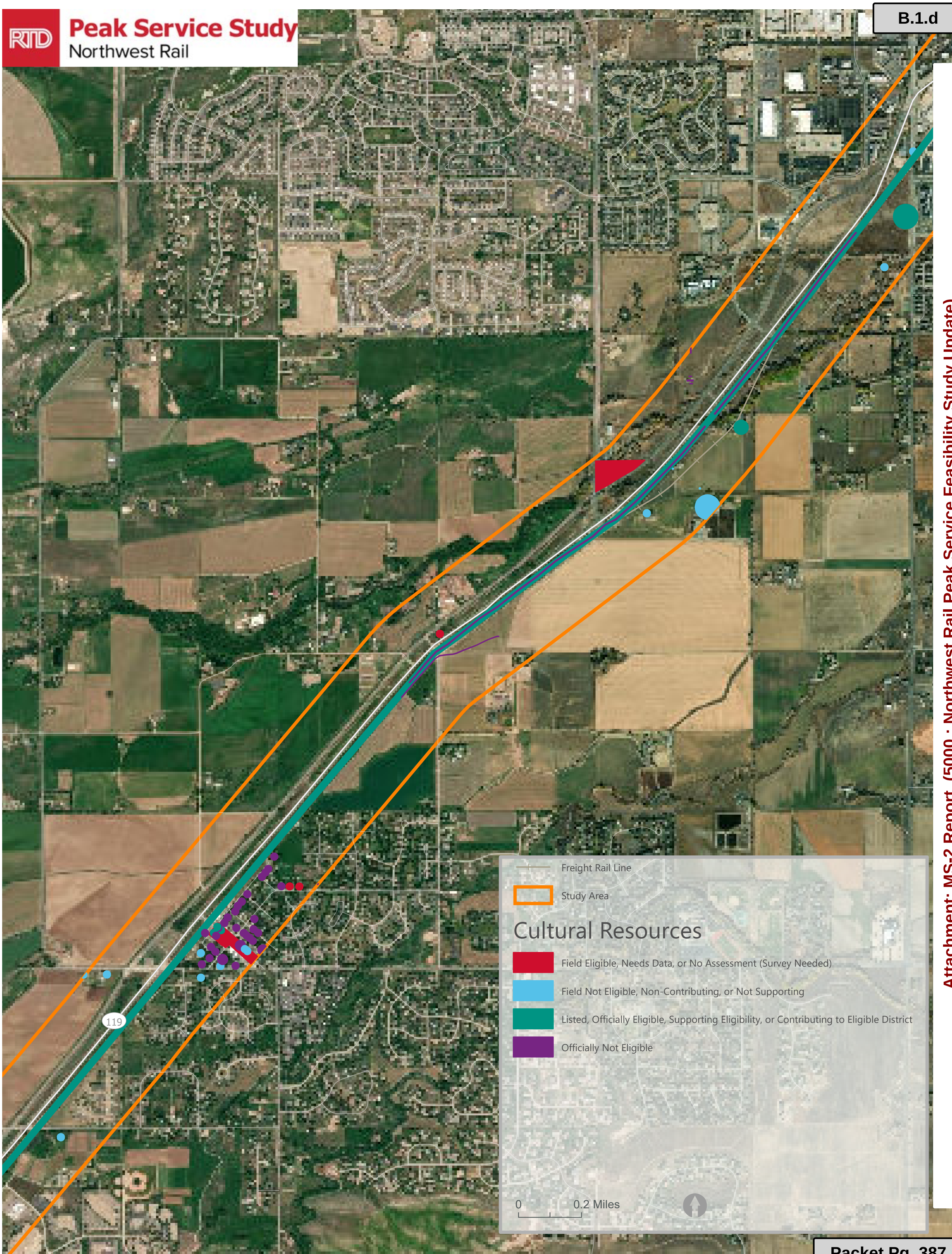
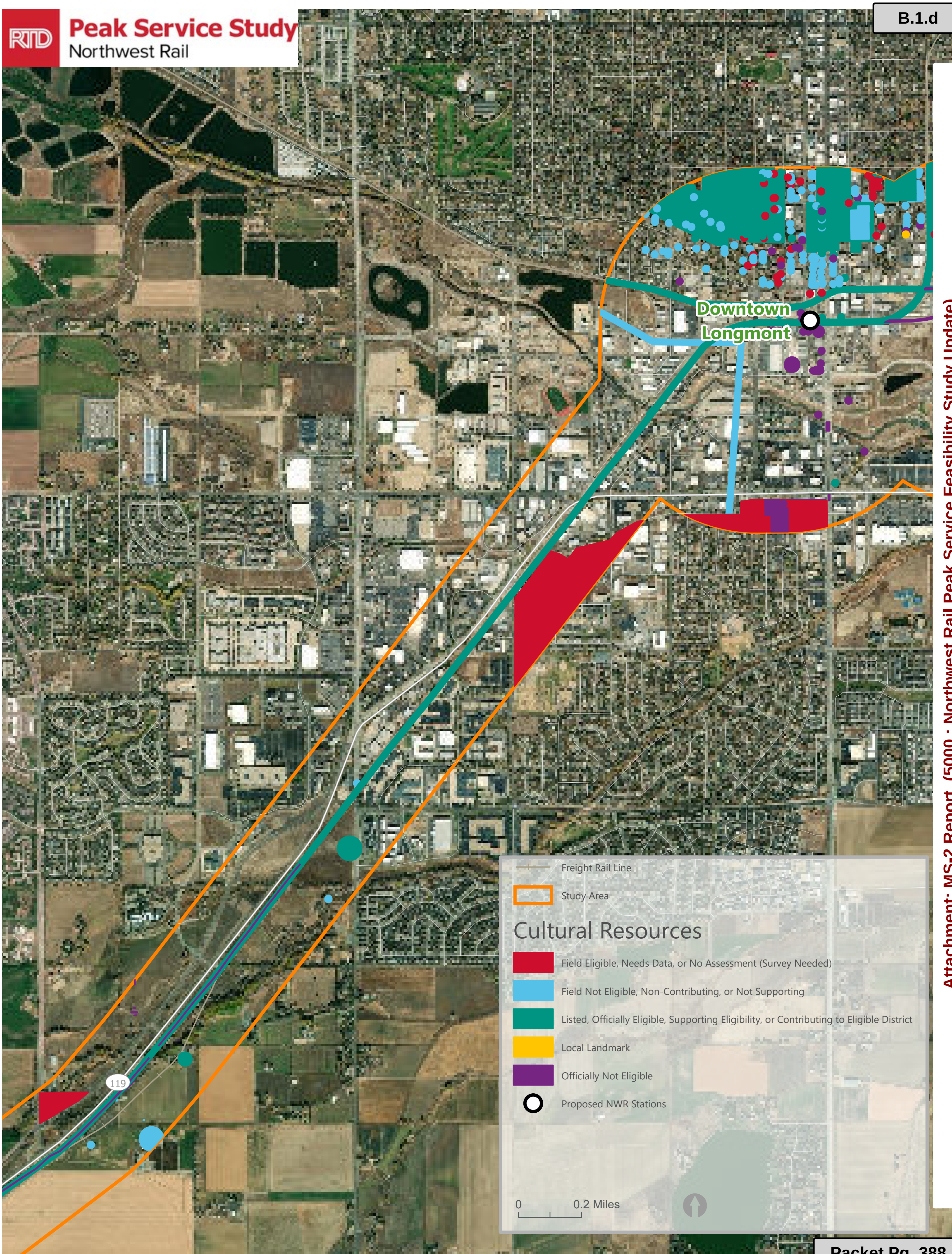
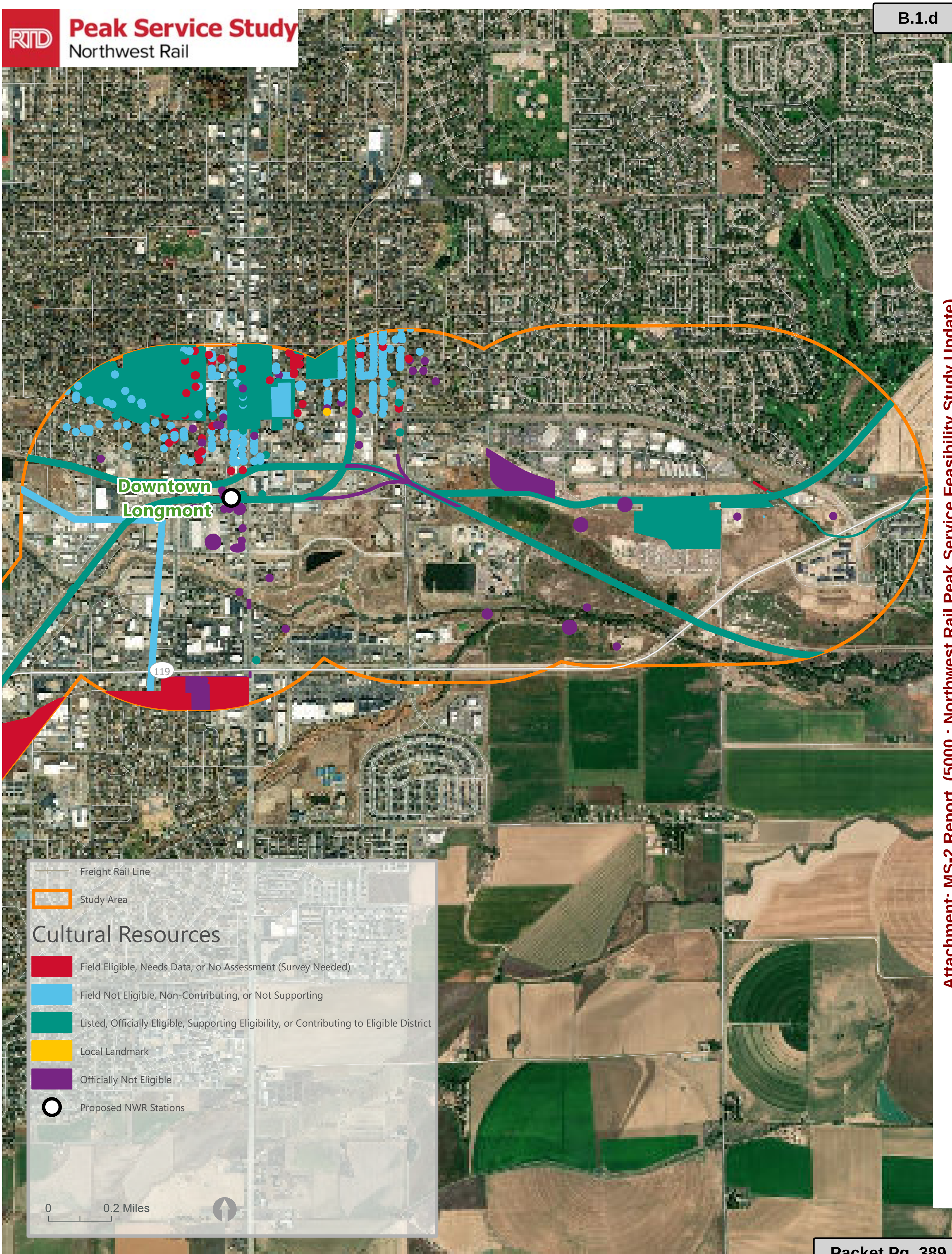
0.2 Miles

Peak Service Study
Northwest Rail




Peak Service Study
Northwest Rail
119
Freight Rail Line
Study Area
Cultural Resources
Field Eligible, Needs Data, or No Assessment (Survey Needed)
Field Not Eligible, Non-Contributing, or Not Supporting
Listed, Officially Eligible, Supporting Eligibility, or Contributing to Eligible District
Officially Not Eligible
0
0.2 Miles


RTD
Peak Service Study
Northwest Rail
Downtown Longmont
119
Freight Rail Line
Study Area
Cultural Resources
Field Eligible, Needs Data, or No Assessment (Survey Needed)
Field Not Eligible, Non-Contributing, or Not Supporting
Listed, Officially Eligible, Supporting Eligibility, or Contributing to Eligible District
Local Landmark
Officially Not Eligible
Proposed NWR Stations
0
0.2 Miles


Peak Service Study
Northwest Rail
Downtown
Longmont
119
Freight Rail Line
Study Area
Cultural Resources
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Field Not Eligible, Non-Contributing, or Not Supporting
Listed, Officially Eligible, Supporting Eligibility, or Contributing to Eligible District
Local Landmark
Officially Not Eligible
Proposed NWR Stations
0
0.2 Miles

Milestone 2

Corridor Conditions Report

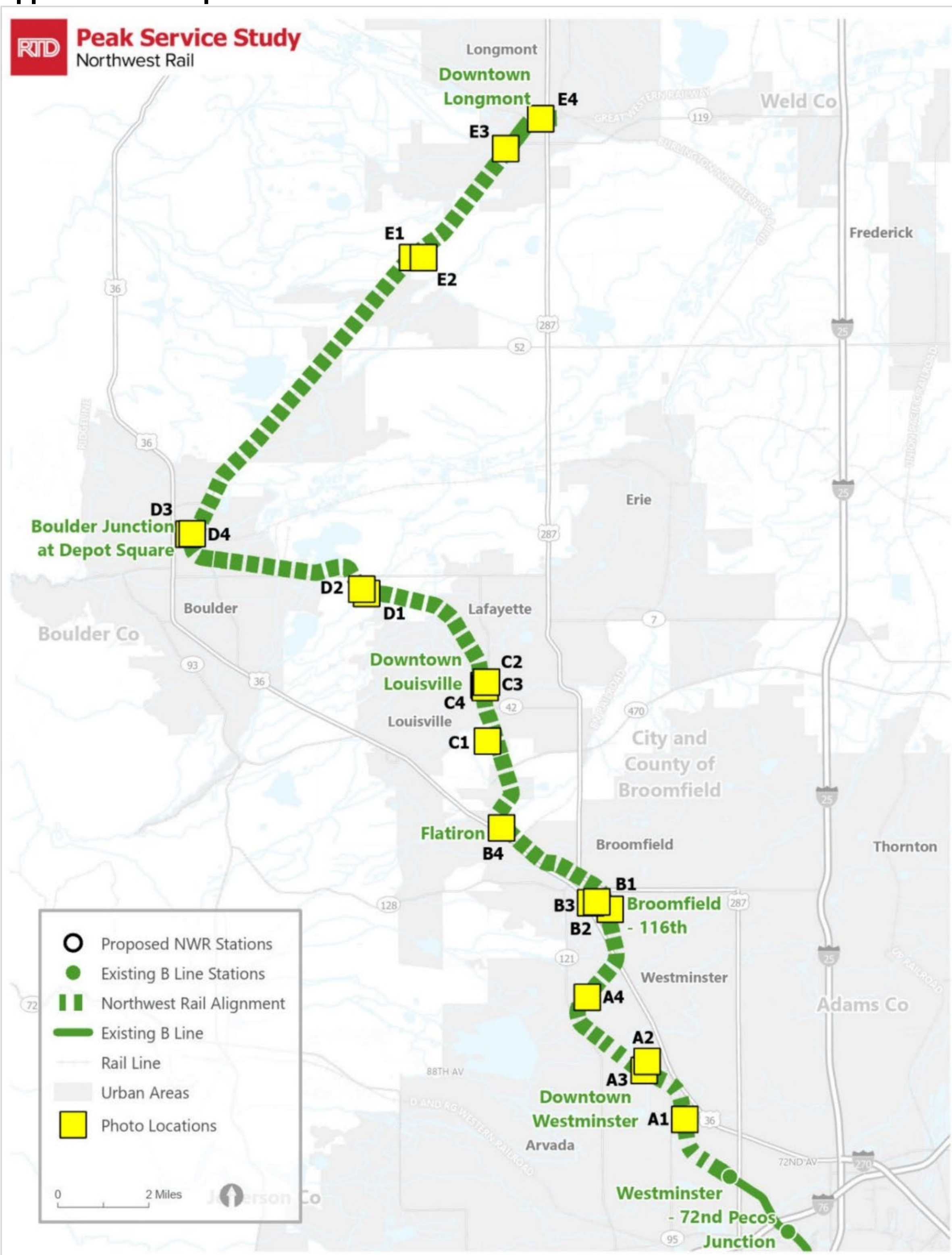
Appendix D

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

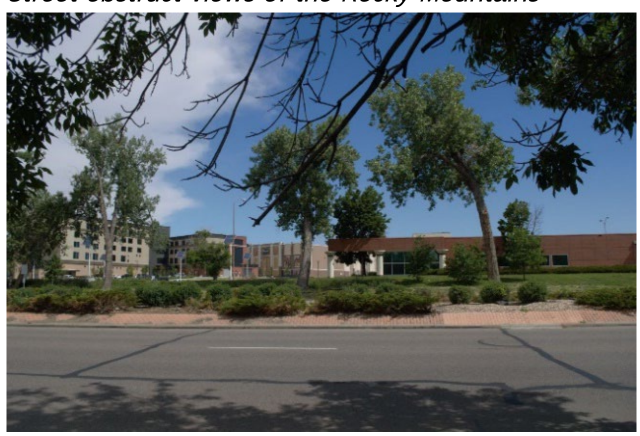


Photo A3:
Background views of the Rocky Mountains from 88th Avenue

Photo A4:
Views of natural landscape fragmented by development

Corridor Conditions Report

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

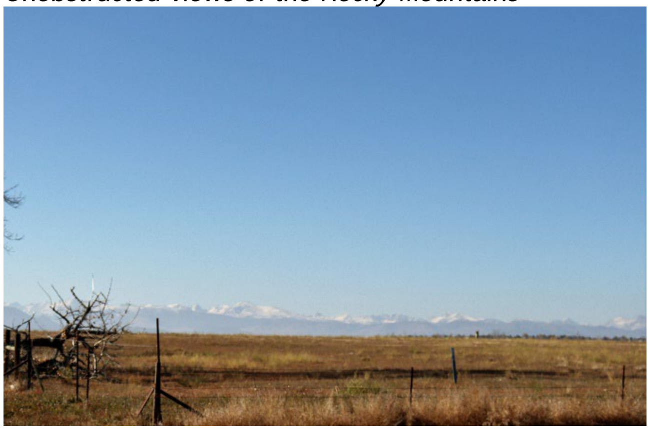


Photo C2:
Historic downtown Louisville

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.

Corridor Conditions Report

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.

Corridor Conditions Report

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

Milestone 2

Corridor Conditions Report

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.

Corridor Conditions Report

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.

Corridor Conditions Report

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.

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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.

Attachment: MS-2 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

Corridor Conditions Report

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.

Corridor Conditions Report

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.

Corridor Conditions Report

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.

Corridor Conditions Report

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.

Corridor Conditions Report

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.

Corridor Conditions Report

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.

Corridor Conditions Report

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.

Corridor Conditions Report

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.

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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, US**T – 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.

Corridor Conditions Report

17. **Asbestos –** Asbestos Abatement & Demolition Projects Database with information regarding cleanup conducted by a contractor.

Peak Service Study
Northwest Rail

We make lives better through connections.

Milestone 3 - Base Configuration Confirmation Report

August 2024

Regional Transportation District
1660 Blake Street, Denver CO 80202

Peak Service Study
Northwest Rail

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Milestone 3 - Base Configuration Confirmation Report

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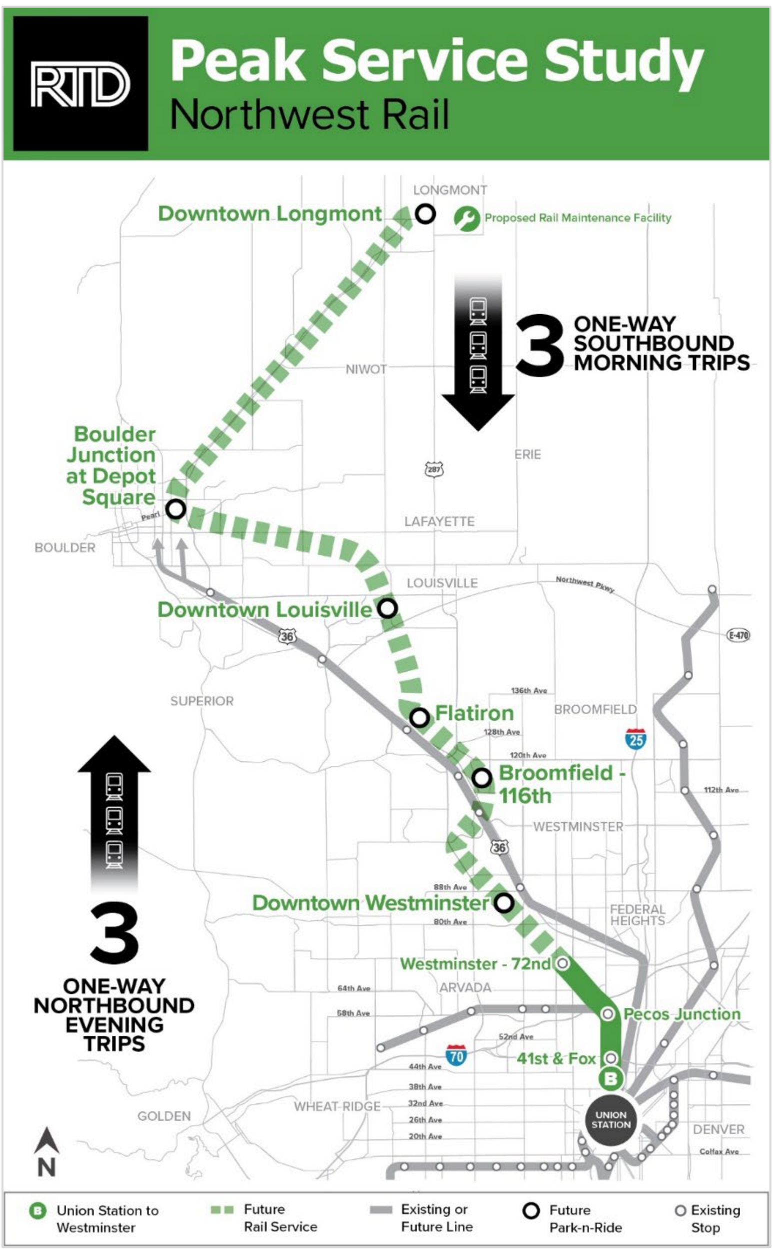
Acronyms and Abbreviations

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

Introduction

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

Figure 1. NWR Corridor



Milestone 3 - Base Configuration Confirmation Report

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

Purpose of Study

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

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

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

Peak Service Concept Definition

Peak Service Concept

The Peak Service Concept for the NWR Corridor consists of three southbound peak period trains in the morning and three northbound peak period trains in the afternoon each weekday. The morning trains will run from the NWR Rail Maintenance Facility (RMF) near Downtown Longmont to DUS, replacing the B Line service for those runs into and out of DUS operated by Denver Transit Operators (DTO). Due to train storage issues at DUS, trains operating peak service would return in revenue service to an expanded train storage location near the existing Westminster – 72nd Station where they would be stored during the day until they returned to service for the afternoon peak. Similarly, the afternoon trains would replace the B Line service run from Westminster – 72nd Station to Union Station and then return to the RMF in revenue service to Longmont. Once the trains return to the RMF site, the trains will be serviced, cleaned, and staged for use for the next weekday.

Alignment

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

Stations

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

Common Station Elements

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

Stations Served

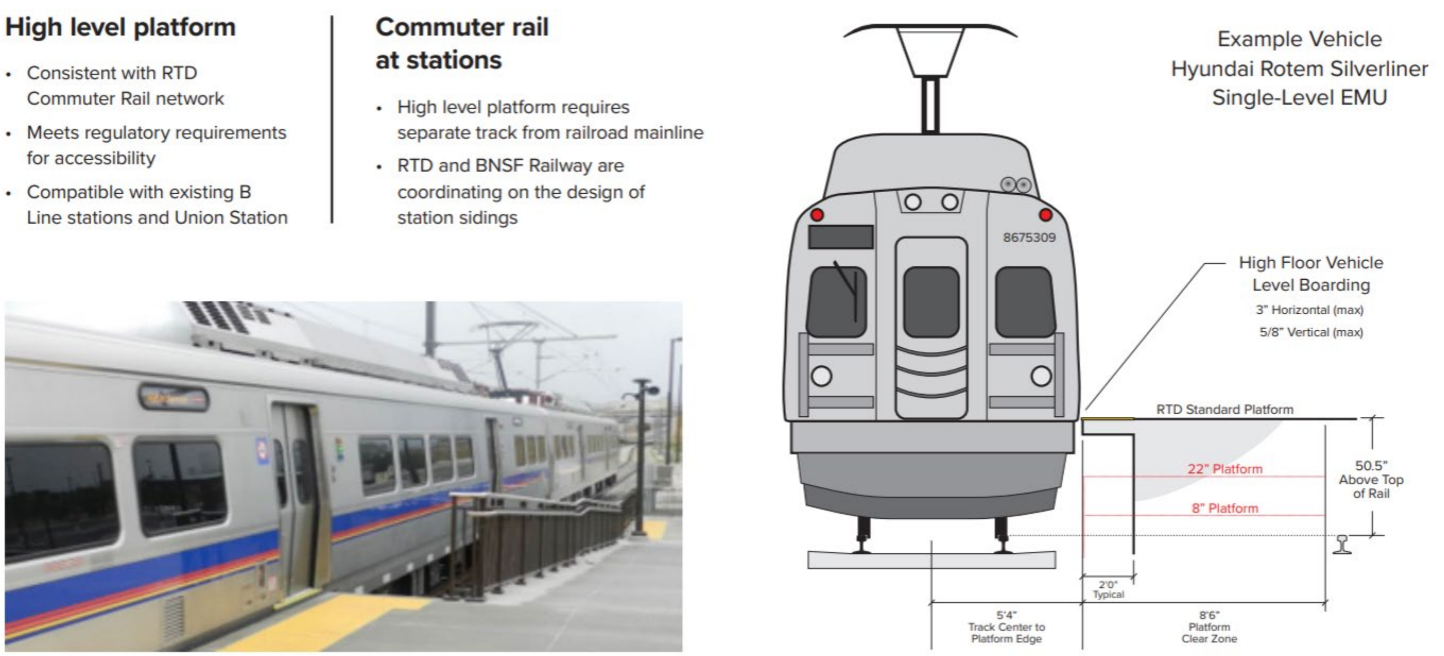
The Peak Service Concept includes service to ten stations, including four existing stations on the B Line (Westminster – 72nd, Pecos Junction, 41st & Fox, and the B Line Track 8 at DUS) and six new stations on the Northwest Rail extension (Downtown Longmont, Boulder Junction at Depot Square, Downtown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

Milestone 3 - Base Configuration Confirmation Report

Level Platform Boarding

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

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



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

Milestone 3 - Base Configuration Confirmation Report

Connecting to the Existing B Line

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

New Stations

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

Downtown Westminster Station

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

Milestone 3 - Base Configuration Confirmation Report

Figure 3. Downtown Westminster Station Area Plan

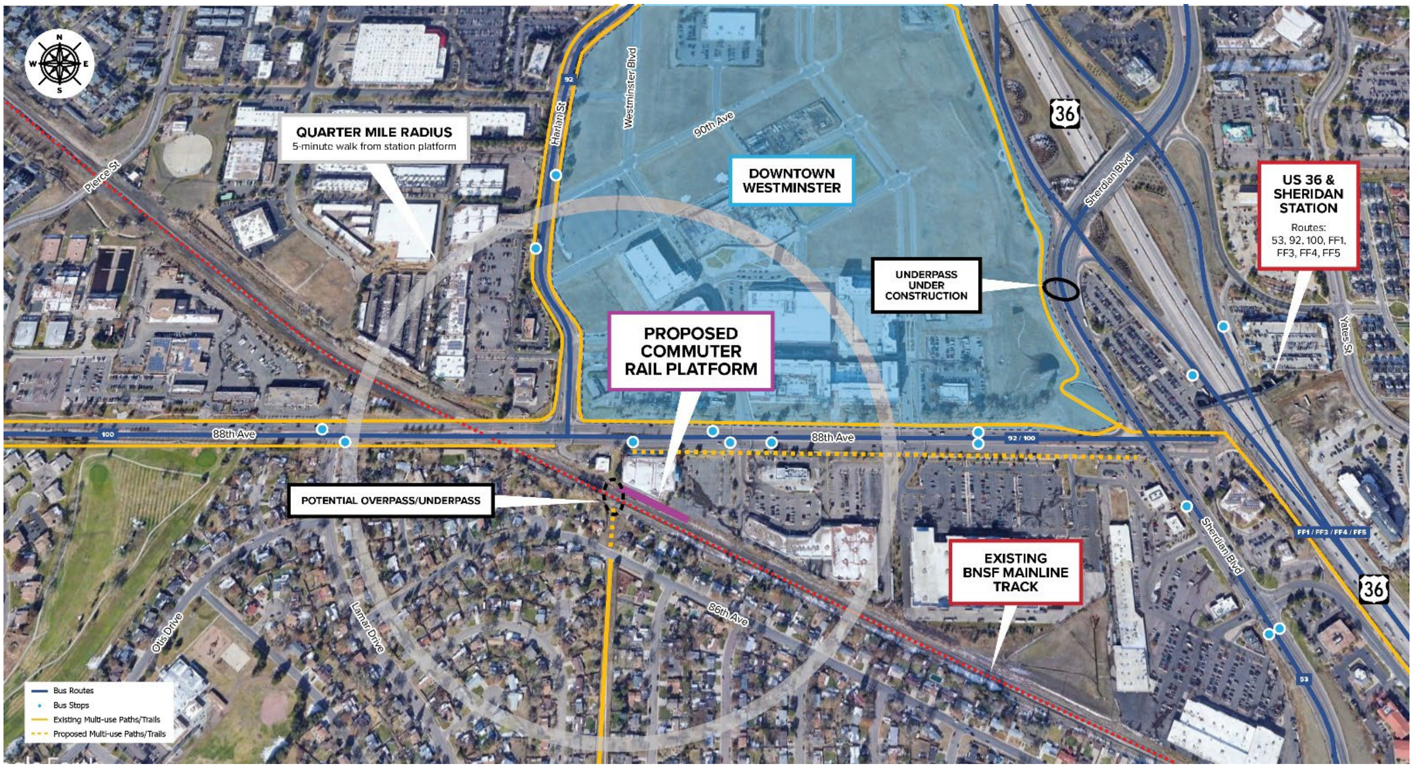
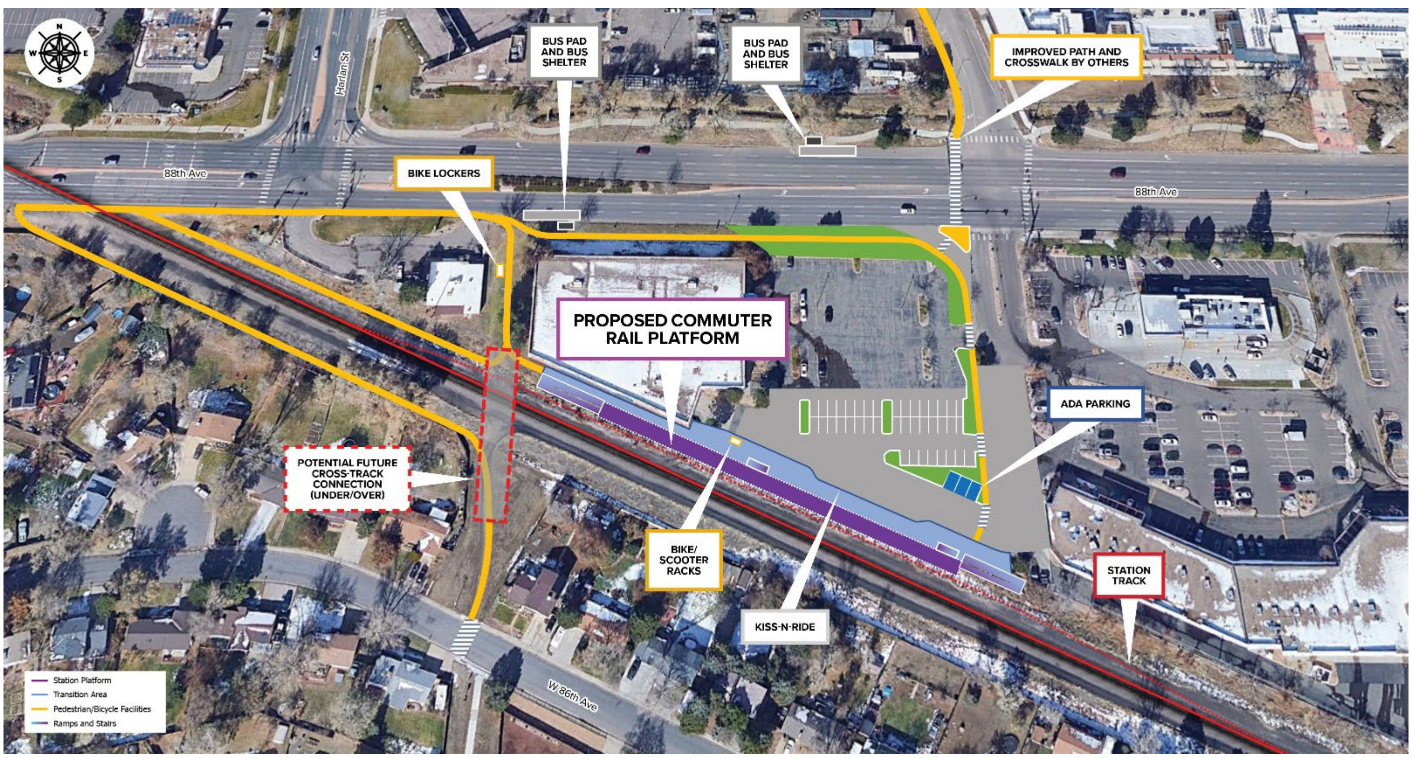


Figure 4. Downtown Westminster Station Concept Plan

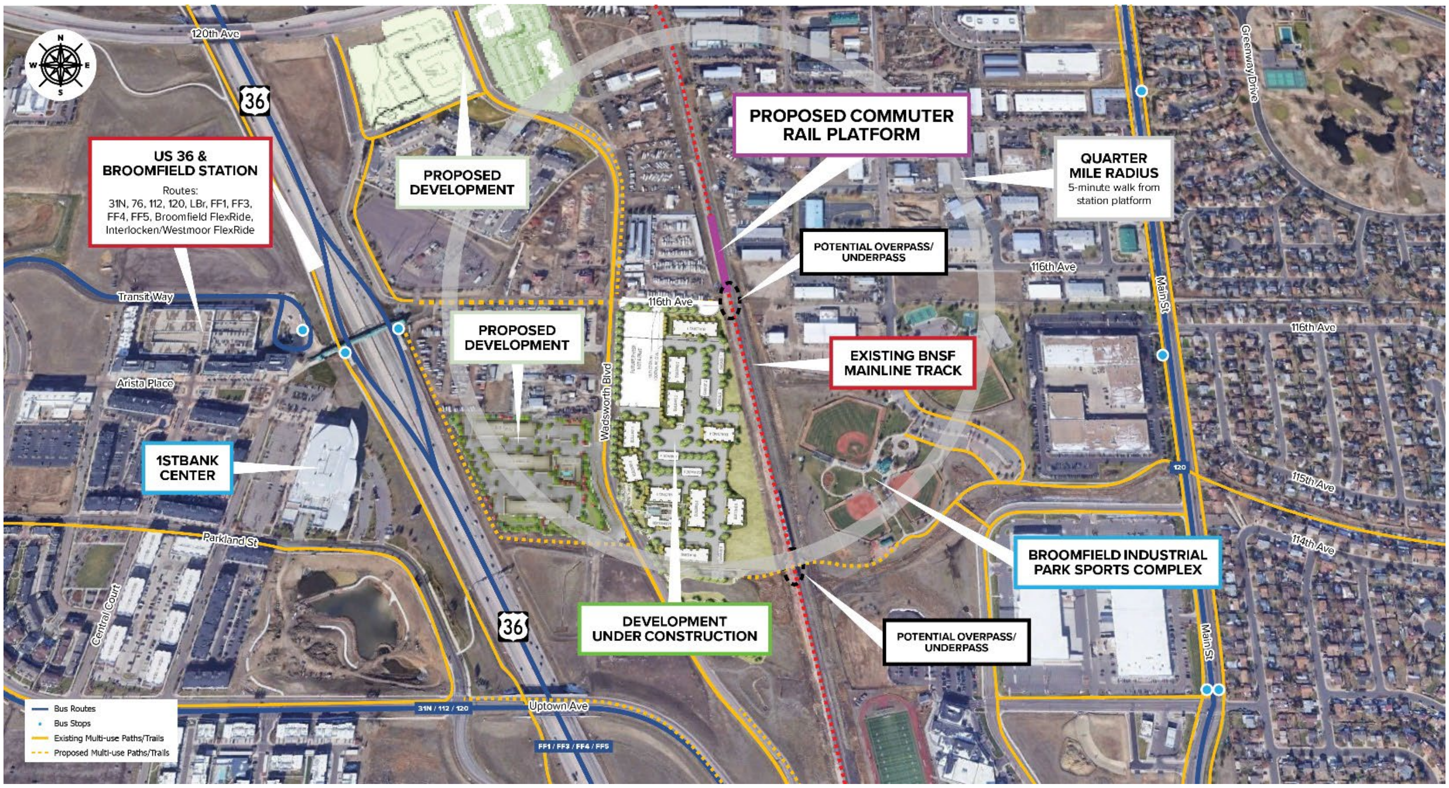


Milestone 3 - Base Configuration Confirmation Report

Broomfield – 116th Station

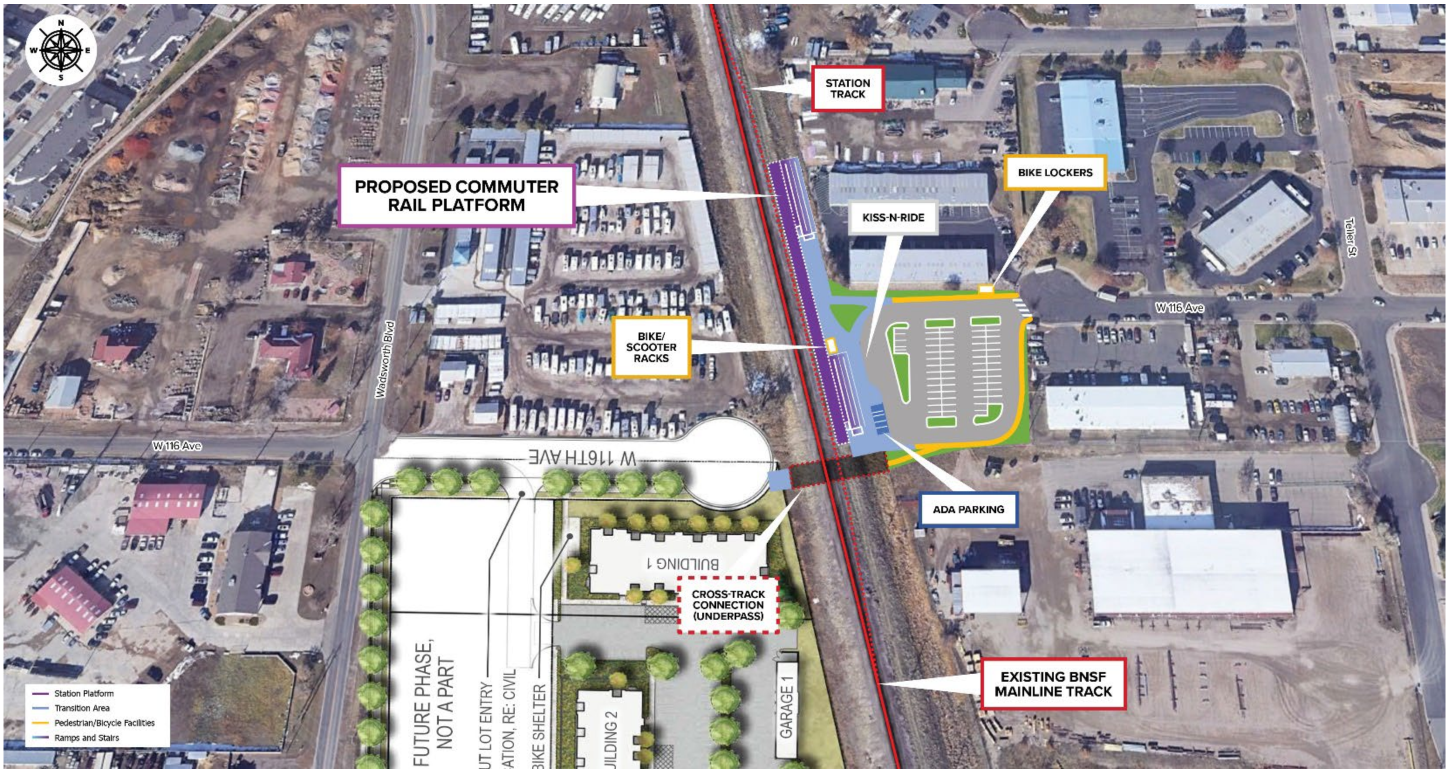
This station area is located in Broomfield on both sides of the BNSF trackway, approximately 600 feet north and south of 116th Avenue. The Broomfield – 116th Station is located approximately 0.25 miles east of the US 36 & Broomfield Station. The area has seen considerable recent development, with more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

Figure 5. Broomfield – 116th Station Area Plan



Milestone 3 - Base Configuration Confirmation Report

Figure 6. Broomfield – 116th Station Concept Plan



Flatiron Station

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

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

Milestone 3 - Base Configuration Confirmation Report

Figure 7. Flatiron Station Area Plan

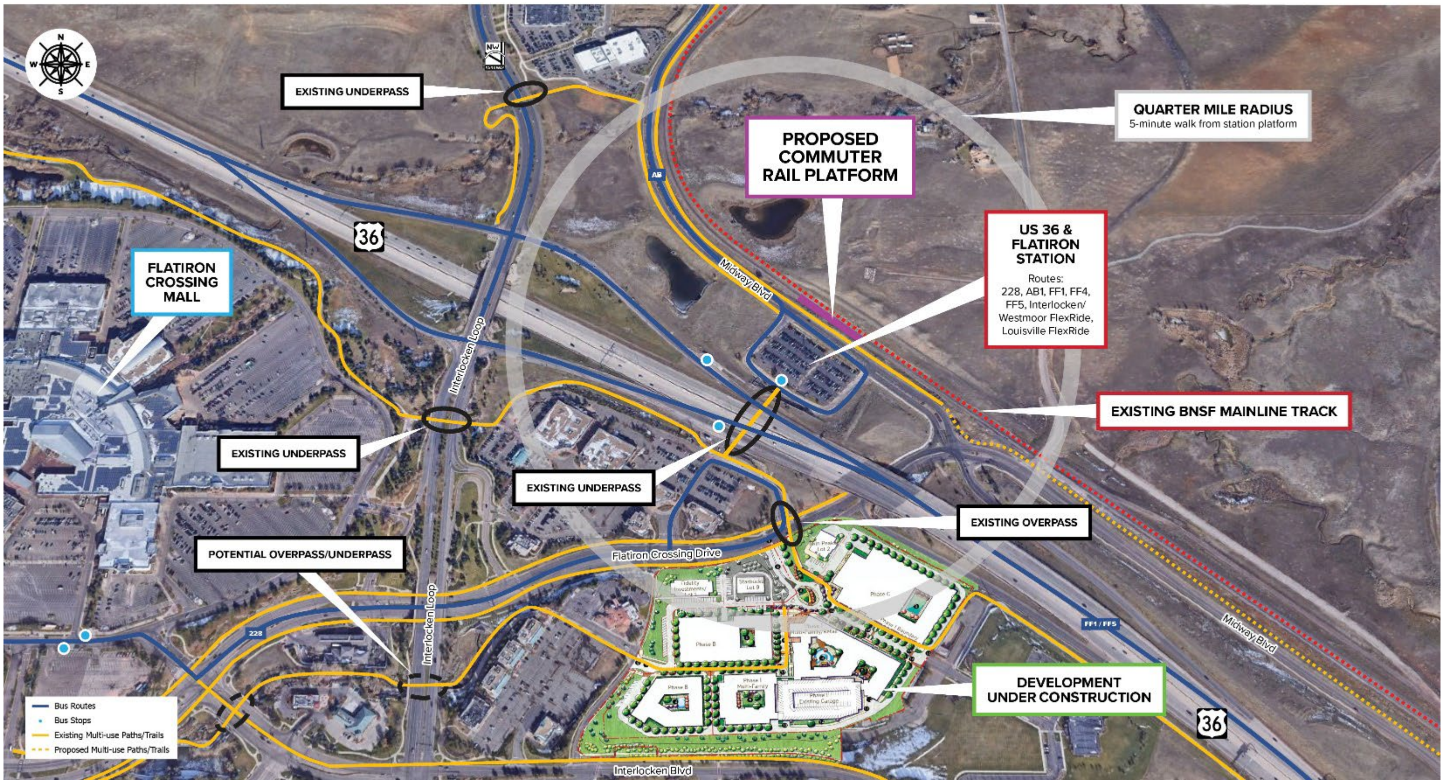
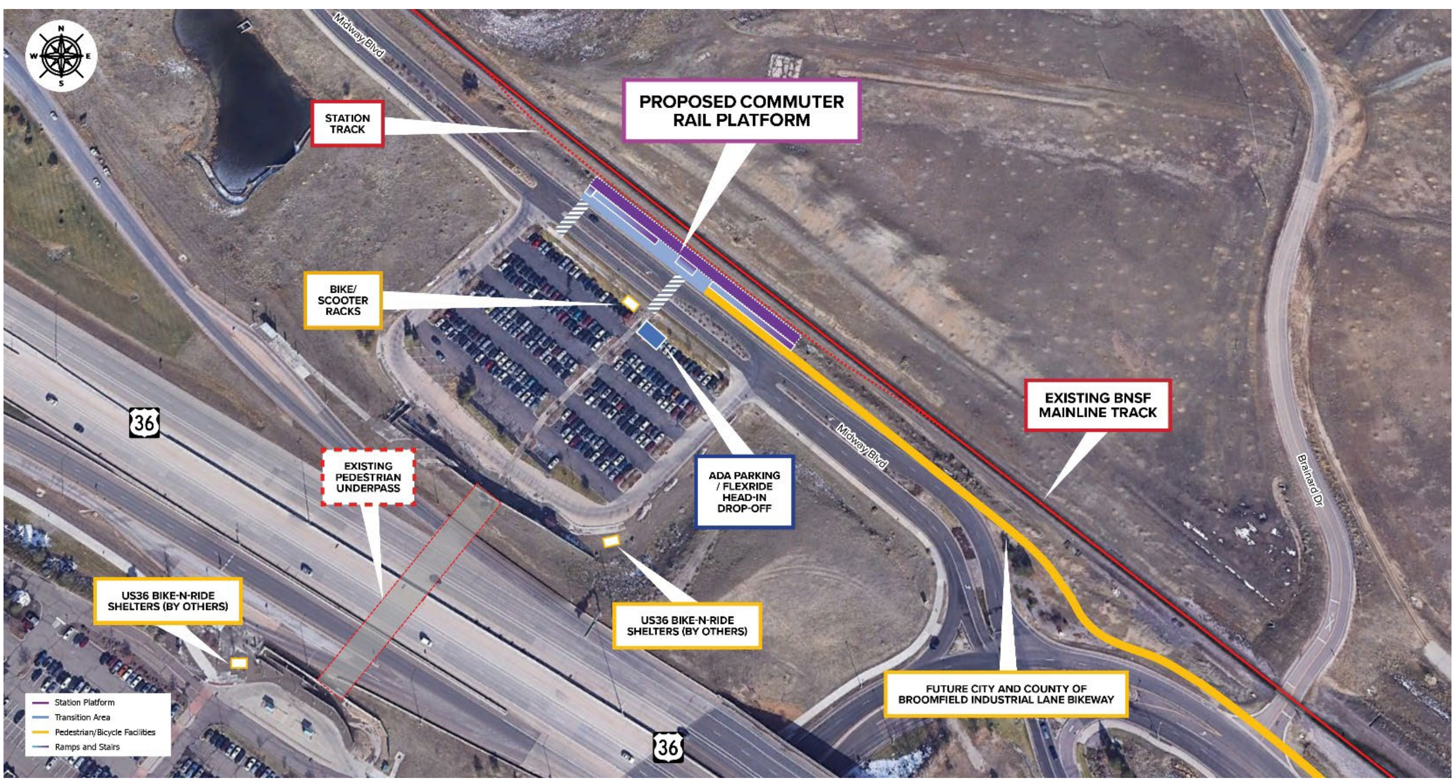


Figure 8. Flatiron Station Concept Plan



Milestone 3 - Base Configuration Confirmation Report

Downtown Louisville Station

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

Figure 9. Downtown Louisville Station Area Plan

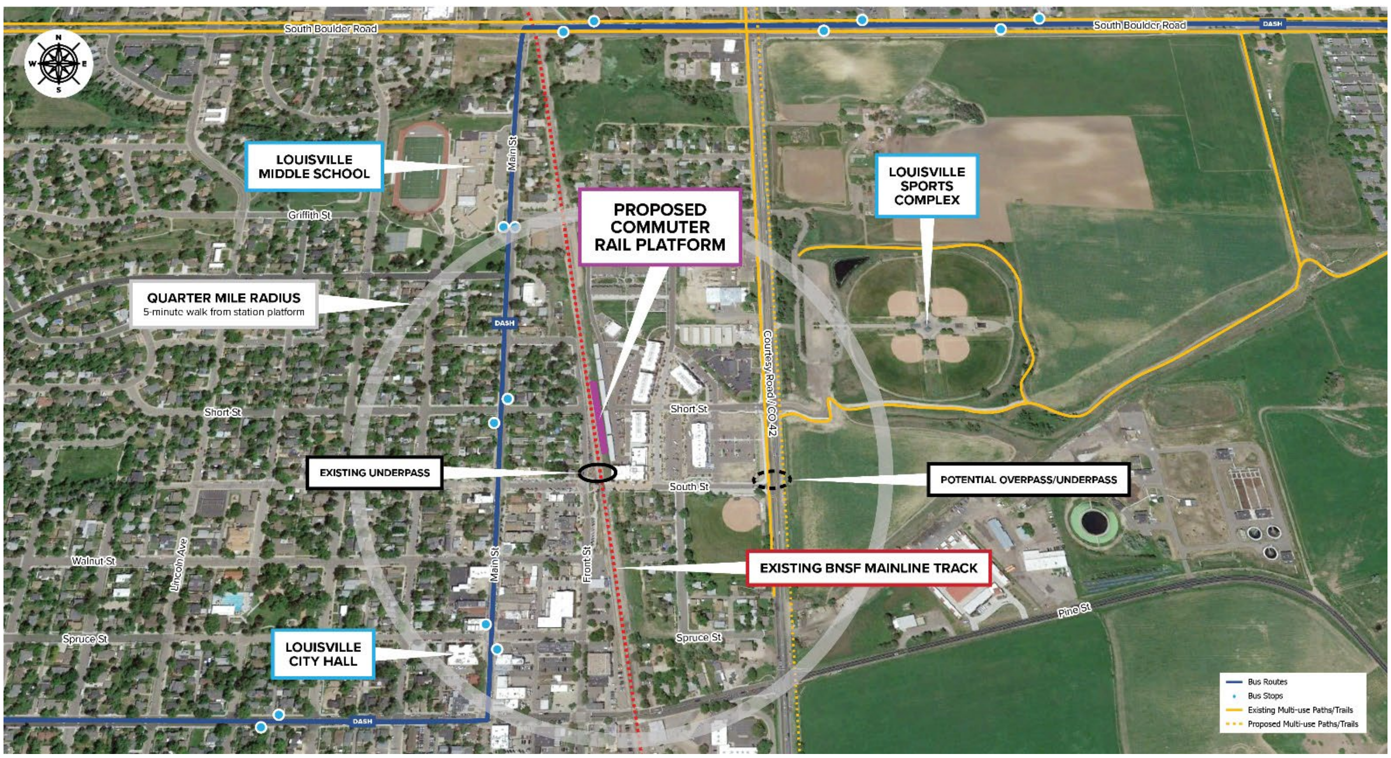


Figure 10. Downtown Louisville Station Concept Plan

Boulder Junction at Depot Square Station

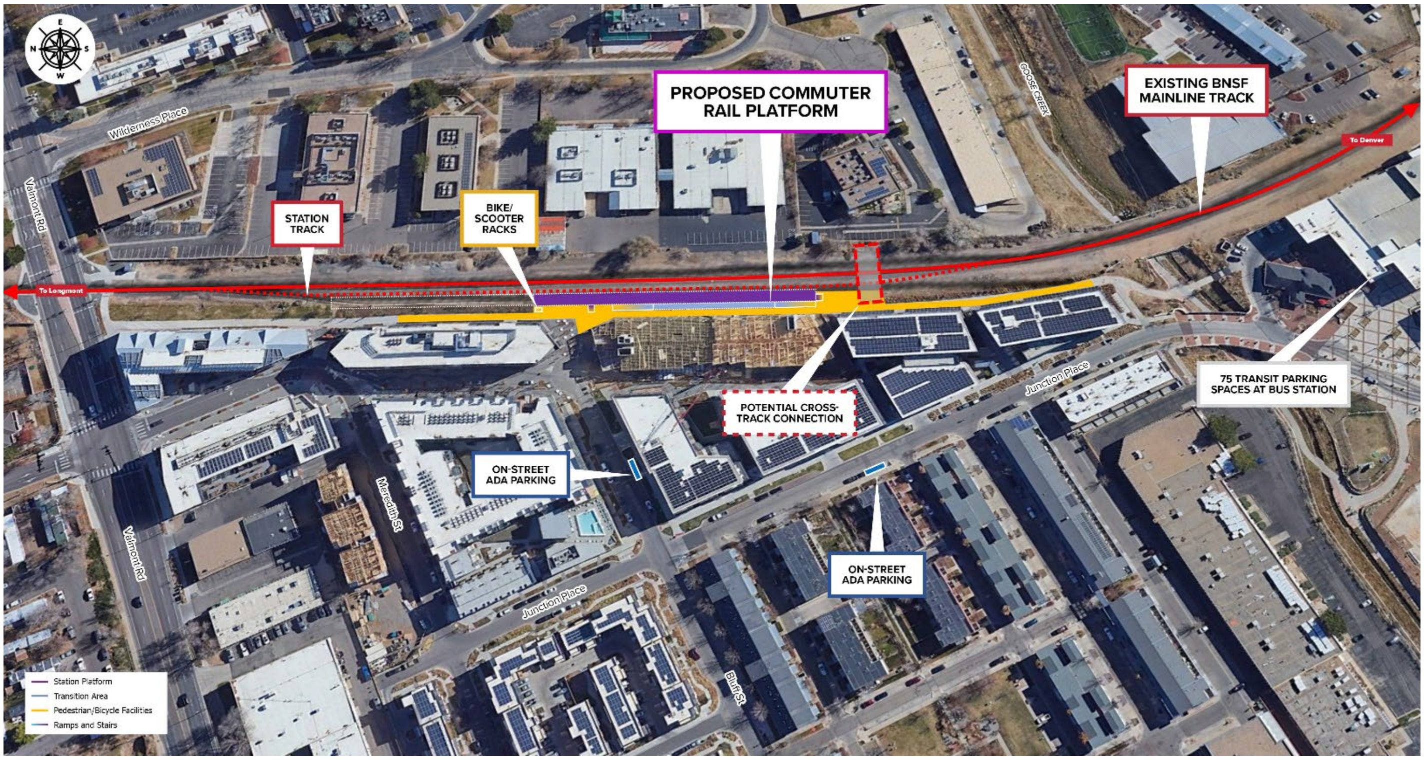
This station area is located in the City of Boulder, on the east side of the BNSF trackway, between Goose Creek Path and Valmont Road. The area west of the tracks and proposed platform has been redeveloped as a Transit Oriented Development (TOD) with residential, retail, and office development. Boulder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

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

Milestone 3 - Base Configuration Confirmation Report

Figure 11. Boulder Junction at Depot Square Station Area Plan

Figure 12. Boulder Junction at Depot Square Station Concept Plan



Milestone 3 - Base Configuration Confirmation Report

Downtown Longmont Station

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

Figure 13. Downtown Longmont Station Area Plan

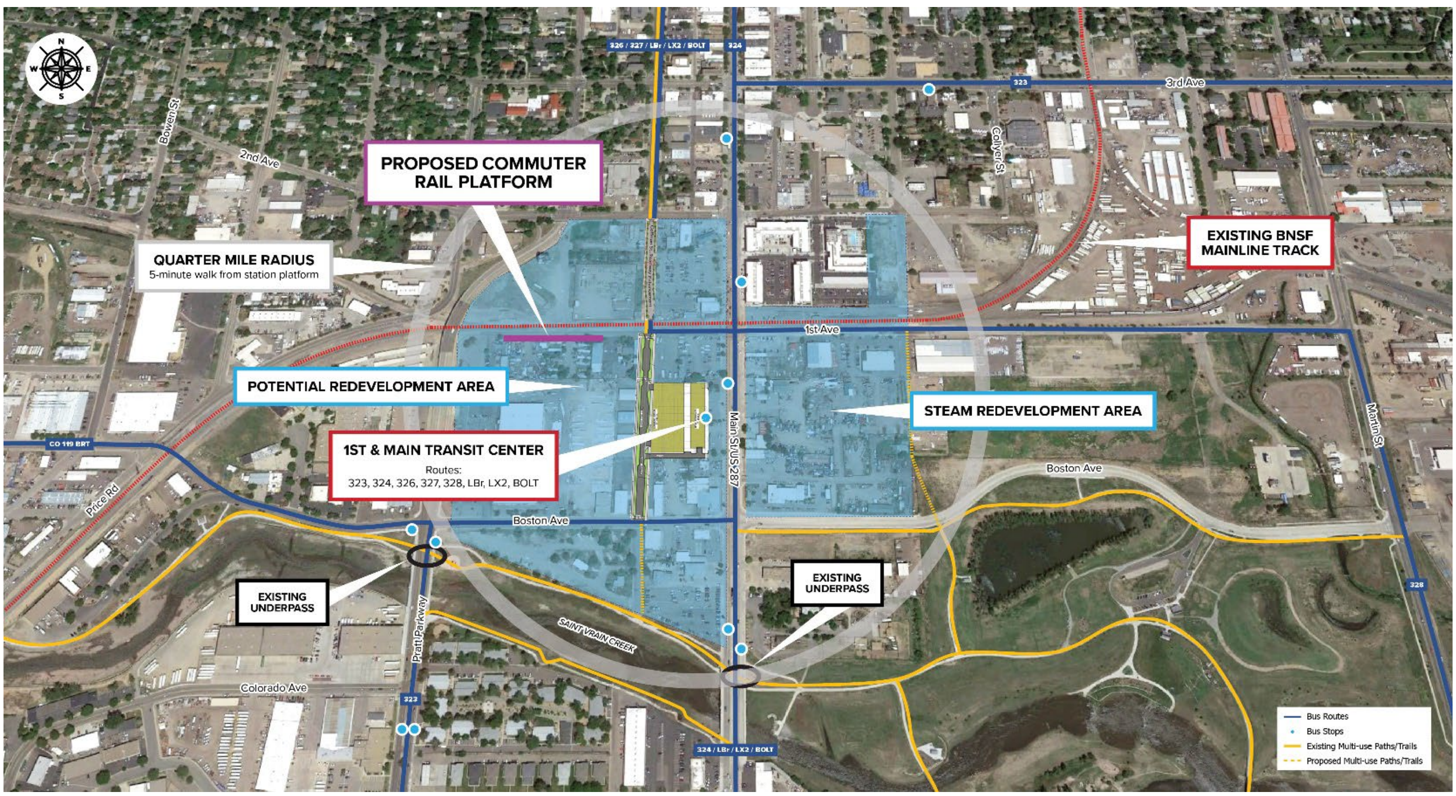
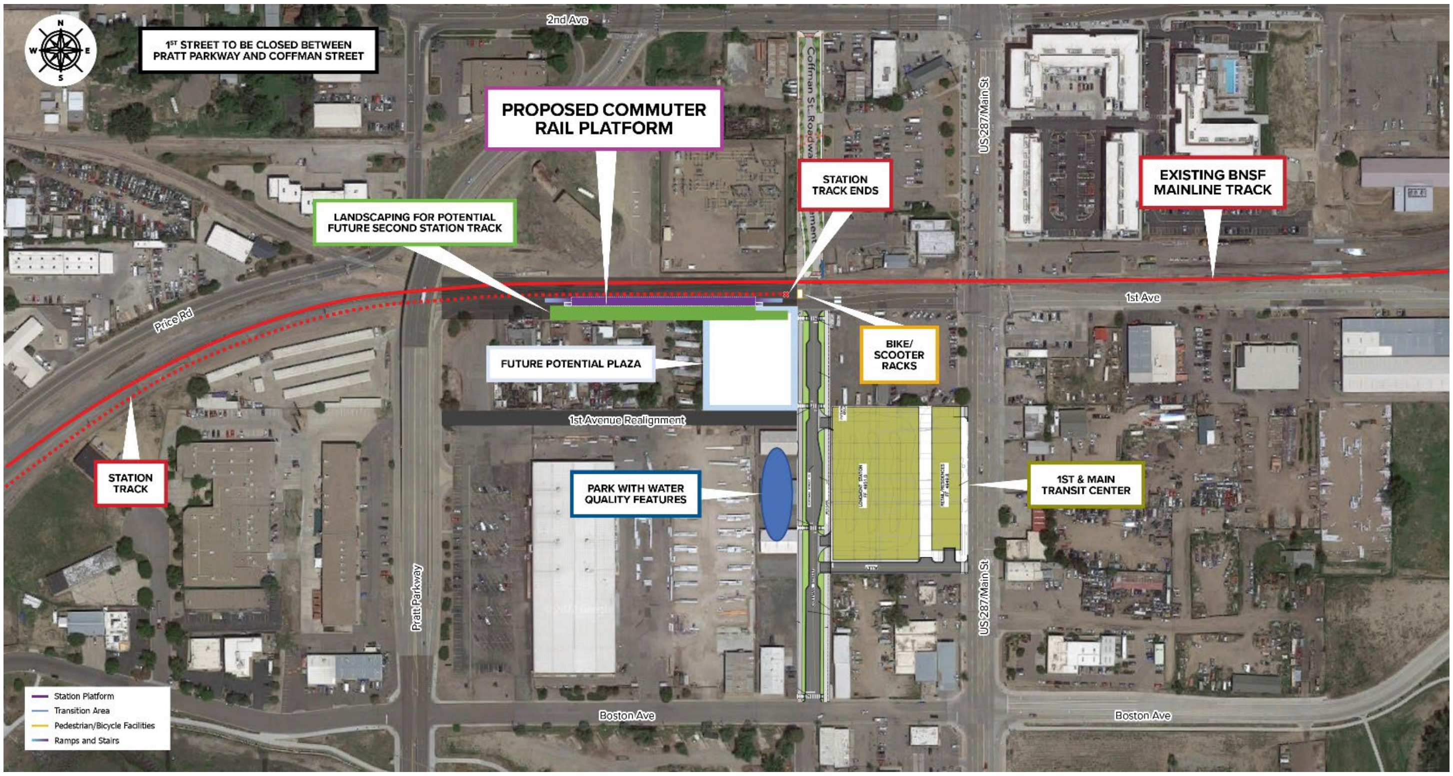


Figure 14. Downtown Longmont Station Concept Plan



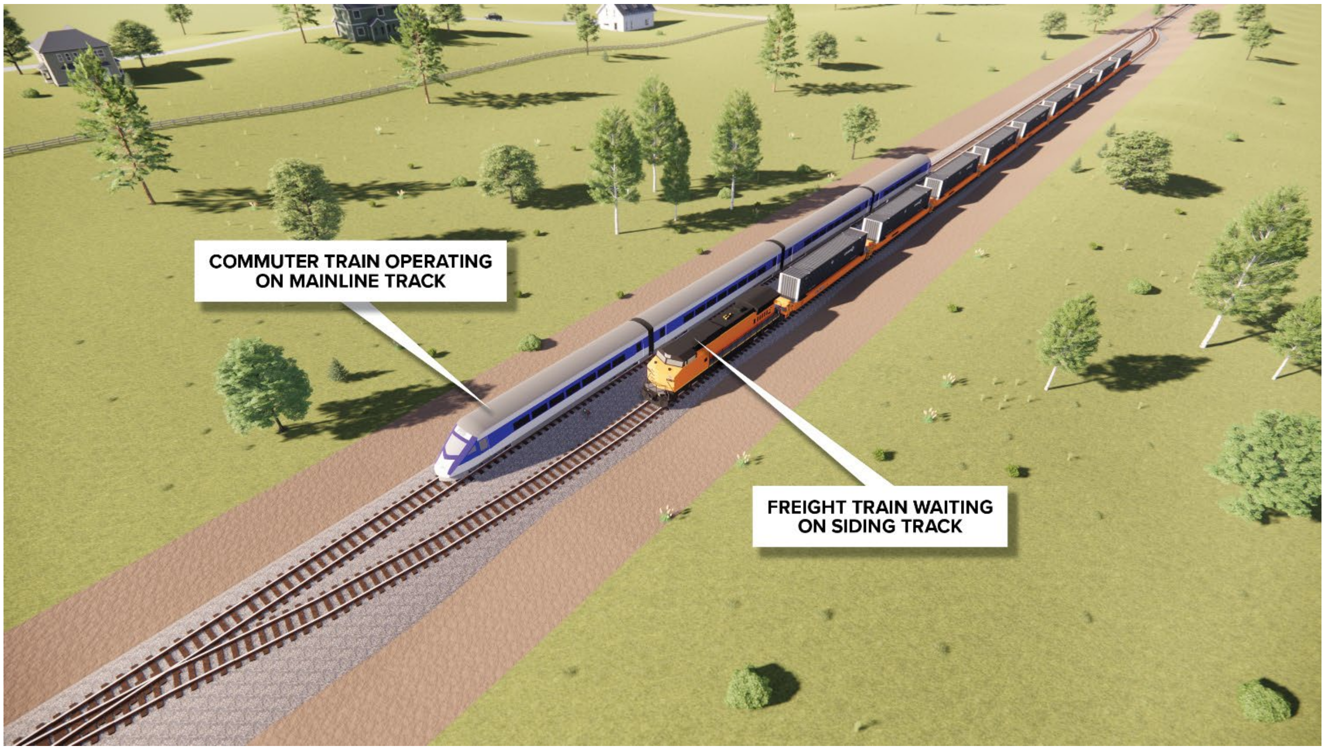
Freight Passing Sidings

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

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

Milestone 3 - Base Configuration Confirmation Report

Figure 15. Freight Siding Concept

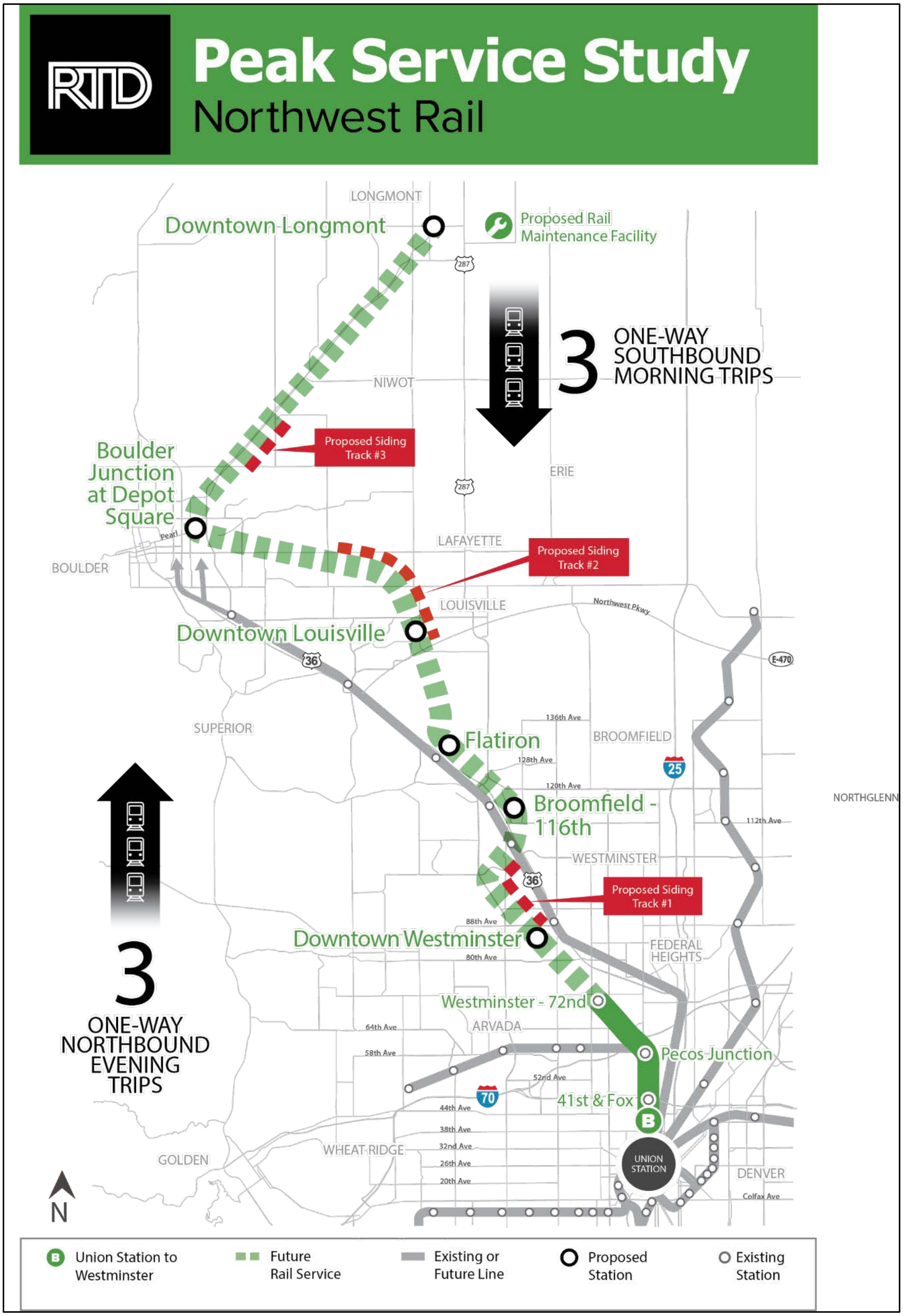


The general location of the three freight passing sidings proposed by BNSF is shown in Figure 16. Evaluation and analysis of these proposed siding locations identified potential impacts on the community and surrounding infrastructure. Surrounding communities also shared concerns regarding potential noise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

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

Milestone 3 - Base Configuration Confirmation Report

Figure 16. Proposed Sidings



Milestone 3 - Base Configuration Confirmation Report

Vehicle Selection

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

Vehicle Types and Propulsion

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

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

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

Constraints and Considerations

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

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

Milestone 3 - Base Configuration Confirmation Report

Rail Maintenance Facility

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

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

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

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

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

Roadway Crossings

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

Corridor Conditions

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

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

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

Identification of Proposed Crossing Improvements

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

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

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

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

Milestone 3 - Base Configuration Confirmation Report

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

Milestone 3 - Base Configuration Confirmation Report

Table 1. Required Roadway Crossing Improvements

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

Attachment: MS-3 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

Milestone 3 - Base Configuration Confirmation Report

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

Milestone 3 - Base Configuration Confirmation Report

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

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

Milestone 3 - Base Configuration Confirmation Report

Operations & Maintenance

Operating Concept

The NWR Peak Service operating concept has been defined as:

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

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

Transit System Changes

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

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

Table 2. Bus Service to NWR Stations

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

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

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

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

Midday Storage Facility

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

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

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

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

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

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

Operations staffing

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

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

Table 3. Preliminary Staffing Summary

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

Operations Control

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

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

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

Overview of Ridership Forecasts

Regional Travel Model Description

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

Current Ridership Forecast

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

Comparison of Travel Times Between NWR Station Pairs

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

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

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

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

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

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

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

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

Process Used to Define Concept

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

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Stakeholder Outreach

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

Activities

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

SAT Input

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

Public Outreach

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

Milestones 1, 2, and Initial Milestone 3 Activities

The Study team hosted several pop-up events to promote and inform members of the public about the upcoming public open houses and the self-guided online public meeting. Visual boards, handouts, comment cards, and coloring sheets were available at each event, and participants could ask questions about the Study and learn about additional opportunities to participate. The following pop-up events had approximately 110 people who visited the booths:

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

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

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

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

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

Milestone 3 Confirmation of Base Configuration Activities

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

- BrewHaHa – Broomfield, Saturday, June 17, 2023

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

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

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

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

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

Public Input for Milestone 3 Confirmation of Base Configuration

The results of survey responses and comment cards collected as part of the public outreach process for this Milestone were similar to that of the first outreach effort and expressed sentiments of overall excitement for the NWR conversation to continue and curiosity about how NWR will fit together with parallel efforts including FRPR. Responses also included concern regarding gentrification and equity of growth around stations, the desire for reverse commutes, midday service, evening service, and weekend service, and the need for clarification around construction and right of way acquisition and operations. Those who indicated their needs would not be met by the current concept expressed a need for additional service timing (i.e., weekend, midday, and evening). Although it did not fit their needs, these people saw the value and how it would serve others within the community. Non-traditional commuters (service industries and healthcare, for example) expressed a need for different services. With many details still unknown, more than 200 people signed up for email updates on the Study, which is expected to generate more public interest and participation during future milestone opportunities. Appendix E provides greater detail about outreach activities undertaken for this project.

Other Considerations

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

BNSF Railway Coordination

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

Front Range Passenger Rail District Service Development Plan Coordination

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

Denver Transit Partners (DTO) Coordination

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

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

Potential Impacts

Potential Traffic Impacts

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

Station Area Access

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

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

Traffic Delay for At-grade Crossings During Passenger Service

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

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

Environmental Scan Results

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

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Table 5. Screening Results for Differentiator Resources

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

Milestone 3 - Base Configuration Confirmation Report

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

Milestone 3 - Base Configuration Confirmation Report

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

Summary of the Base Configuration

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

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

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

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

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

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

Table 6. Existing B Line and Proposed NWR Corridor Stations

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

Milestone 3 - Base Configuration Confirmation Report

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

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

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

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

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

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

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

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

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

Vehicles:

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

References

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

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

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

Peak Service Study
Northwest Rail

We make lives better through connections.

Appendix A
Existing Conditions - Proposed Stations

Appendix B
Rail Maintenance Facility Programming and Space Needs Report

Appendix C
Existing Crossings Inventory

Appendix D
Environmental Scan

Appendix E
Consensus Building and Public Outreach Report

Regional Transportation District
1660 Blake Street, Denver CO 80202

Appendix A

Existing Conditions – Proposed Stations

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Introduction

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

Project Overview

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

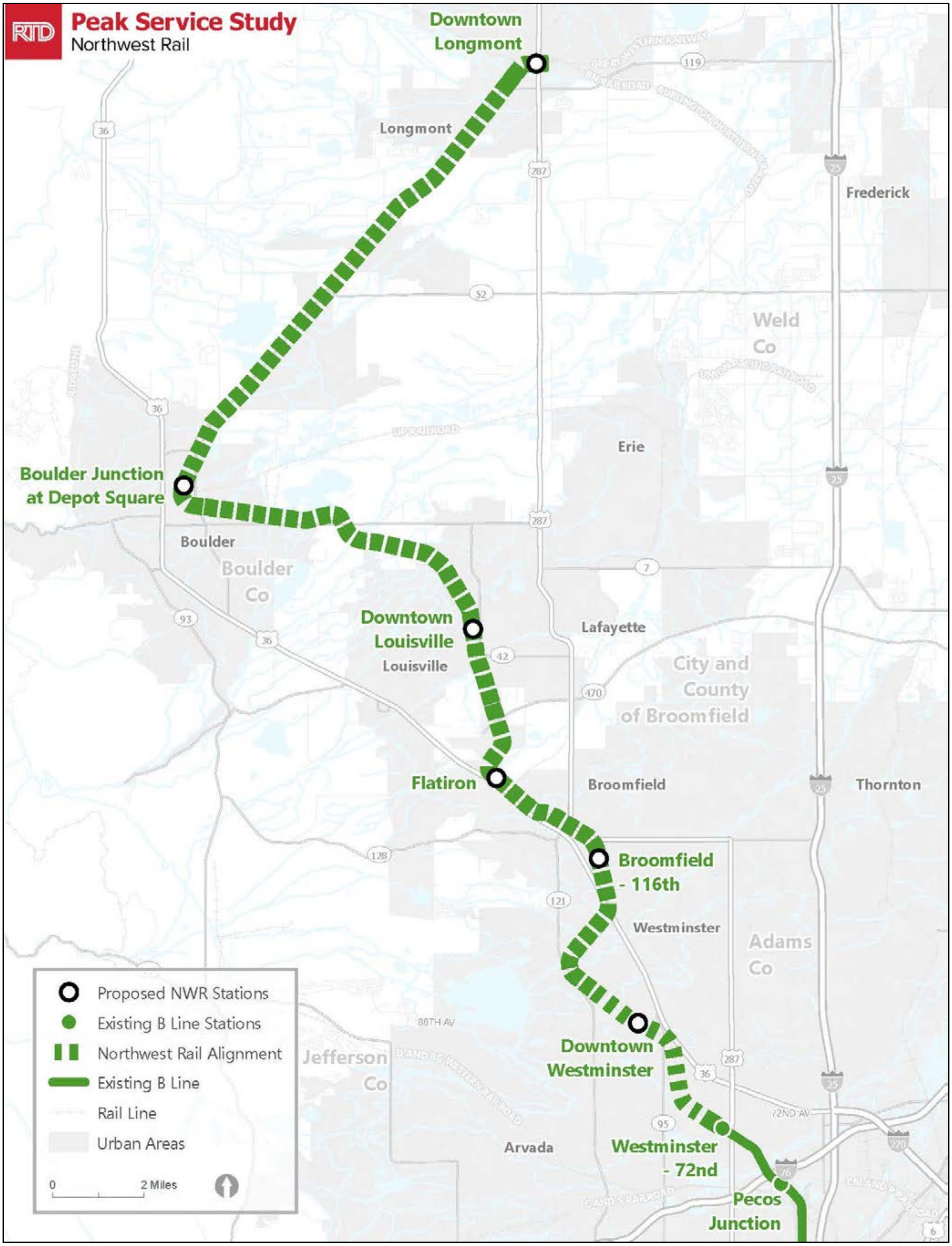
RTD completed an Environmental Evaluation Study of NWR in 2010 and the Northwest Area Mobility Study in 2014. Since then, conceptual details have changed. RTD developed an intermediate Peak Service Concept for NWR in 2016 and in 2021 the RTD Board of Directors authorized funding to conduct the Northwest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

Study Area

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

Existing Conditions – Proposed Stations

Figure 1: NWR Corridor Study Area



Existing Conditions – Proposed Stations

Roadway Network/Traffic

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

Transit Service and Bicycle and Pedestrian Facilities

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

Existing and Future Land Use

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

Station Planning History

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

Figure 2: Timeline of NWR Corridor Past Planning Studies

2001: US 36 Major Investment Study (MIS)
This study, conducted from 1998-2001, was the first major planning consideration of commuter rail between Denver and Boulder along the BNSF Rail Line in the US 36 Corridor.

2004: RTD's FasTracks Initiative
Identified the BNSF Rail Line in the US 36 Corridor as one of RTD's priorities for commuter rail service, committed to funding new and upgraded tracks, new stations, and rail extension to Longmont.

2005-2006: Longmont Diagonal Rail Feasibility Study and Environmental Evaluation (EE)
Determined that Longmont extension of the proposed commuter rail along US 36 was feasible and would generate ridership; recommended locations for intermediate and end-of-line stations.

2009: US 36 Corridor Environmental Impact Statement (EIS)
Identified the US 36 Corridor as one of RTD's priorities for commuter rail service, committed to funding new and upgraded tracks, new stations, and rail extension to Longmont. Ultimately, the commuter rail service concept was removed from study in the EIS and combined with the Boulder-Longmont extension into one - Northwest Rail - to be studied separately from the highway improvements planned for US 36.

2010: Northwest Rail Corridor Environmental Evaluation (EE)
Evaluated eight rail alternatives for the NWRL and recommended double-tracking from Denver to Longmont within BNSF Railway's existing right-of-way using diesel technology; Proposed full-service and operational plans for 2015 and 2035.

2013: Northwest Area Mobility Study (NAMS)
Studied best mobility improvement options for RTD's northwest area, including feasibility of phased implementation for the NWRL and providing arterial bus rapid transit; Recommended that RTD see full-service NWR as a long-term goal while focusing on improvements that will show more benefits in the near-term; Encouraged consideration of alternative starting service operations for the NWRL.

2017: Northwest Rail Peak Service Plan
Released modeling and outlined several options for a NWR Peak Service Plan as a starter service for the rail. Options included between six to ten one-way daily trips at peak periods (6:00-9:30AM, 2:30-7:00PM). Recommended current proposed service option (Option 1A).

2021: Northwest Rail Peak Service Study
RTD Board directs staff to consult with local communities and stakeholders and solidify NWRL Peak Period Service scope, impacts, and costs.

2001 Major Investment Study

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

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

Existing Conditions – Proposed Stations

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

2004 RTD FasTracks Initiative

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

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

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

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

2005-06 Longmont Diagonal Rail Feasibility Study

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

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

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

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[1] 2004 RTD FasTracks Plan (https://www3.drcog.org/documents/archive/2004_FasTracks_Plan.pdf)
[2] 2006 RTD Longmont Diagonal Rail Feasibility Study (https://www.gatewaycog.org/media/userfiles/subsite_9/files/rl/HSRReferenceMaterialsReportsMapsandOtherHSTSections/References-Longmont_Diagonal_Rail_Feasibility_Study-Final_Report_Executive_Summary_5-2-05.pdf)

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

2009 US 36 Corridor Environmental Impact Statement

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

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

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

Denver and Adams Segment

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

Westminster and Broomfield Segment

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

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

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

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

Louisville and Boulder Segment

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

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

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

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

2010 Northwest Rail Corridor Environmental Evaluation

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

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

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

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

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

Existing Conditions – Proposed Stations

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

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

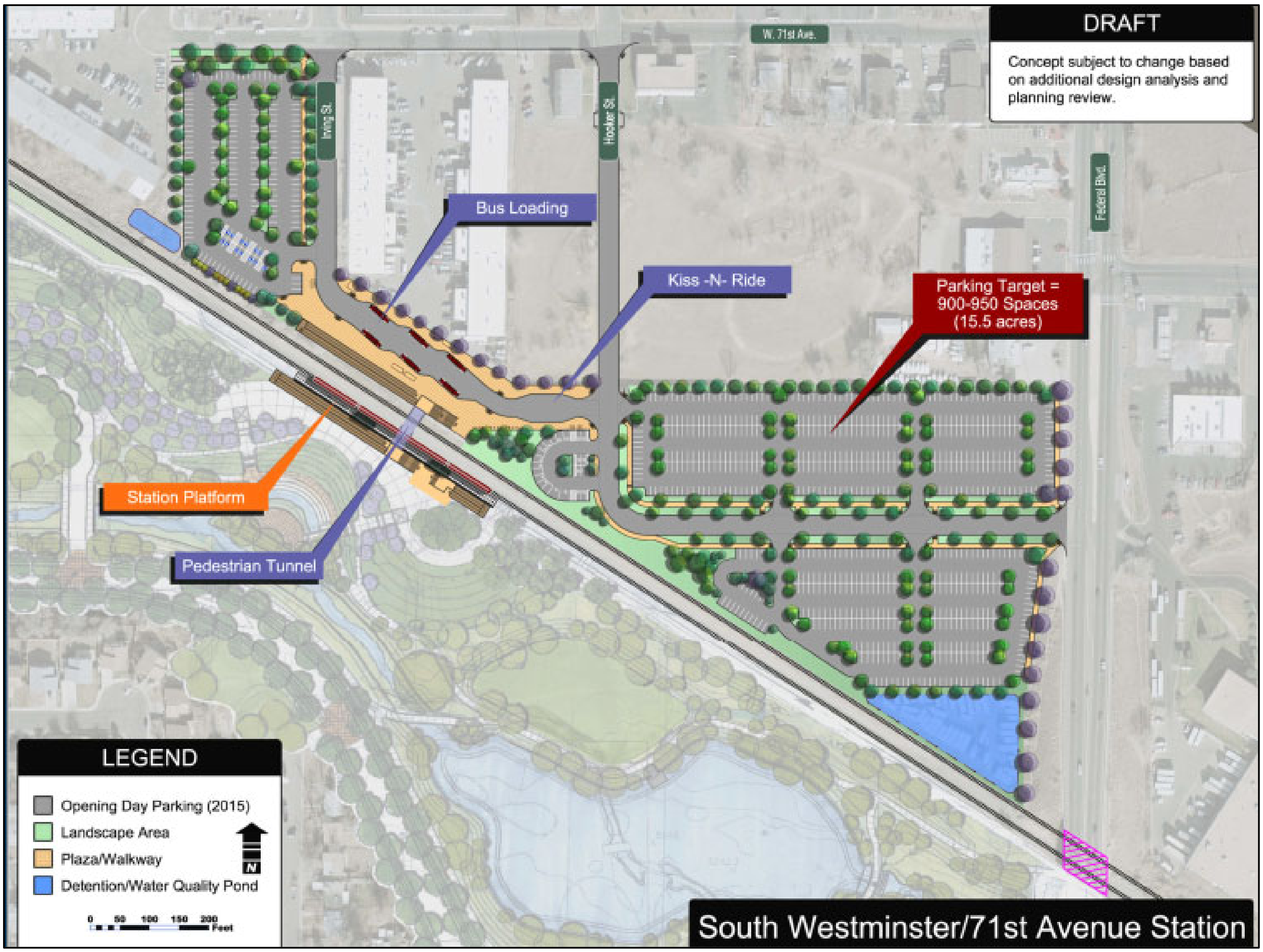
Figure 3 through **Figure 13** show the proposed station layouts from the NWR Corridor EE. Station descriptions were taken from Chapter 4 of the *NWR Corridor EE*.

Existing Conditions – Proposed Stations

South Westminster/71st Avenue Station (existing)

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

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



Source: RTD NWR Corridor EE, 2010

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

Existing Conditions – Proposed Stations

Westminster/88th Avenue Station (Downtown Westminster)

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

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

Source: RTD NWR Corridor EE, 2010

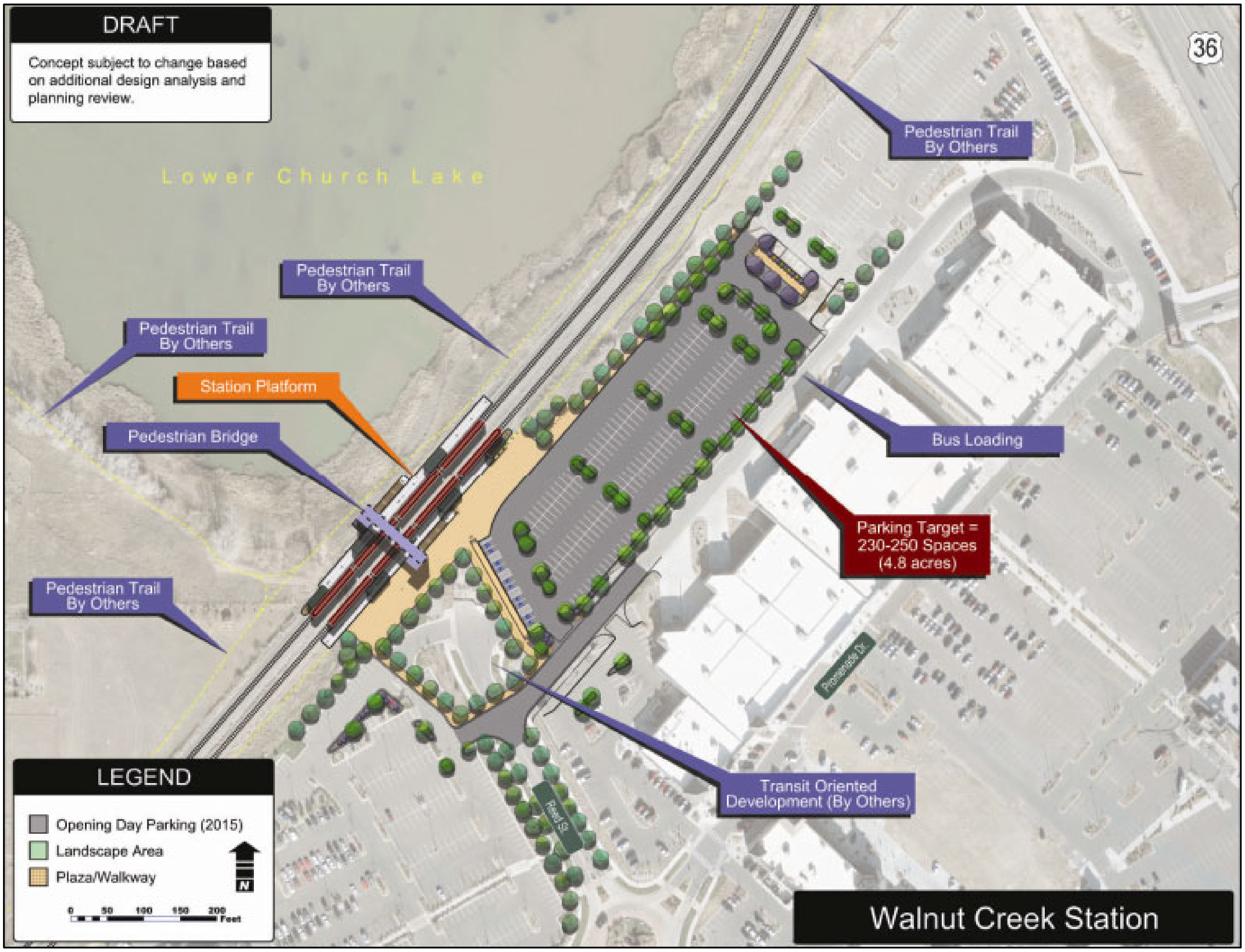
The Westminster/88th Avenue Station is now known as the Downtown Westminster Station and is being updated for the 2022 RTD NWR PSS.

Existing Conditions – Proposed Stations

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

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

Figure 5: Walnut Creek Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

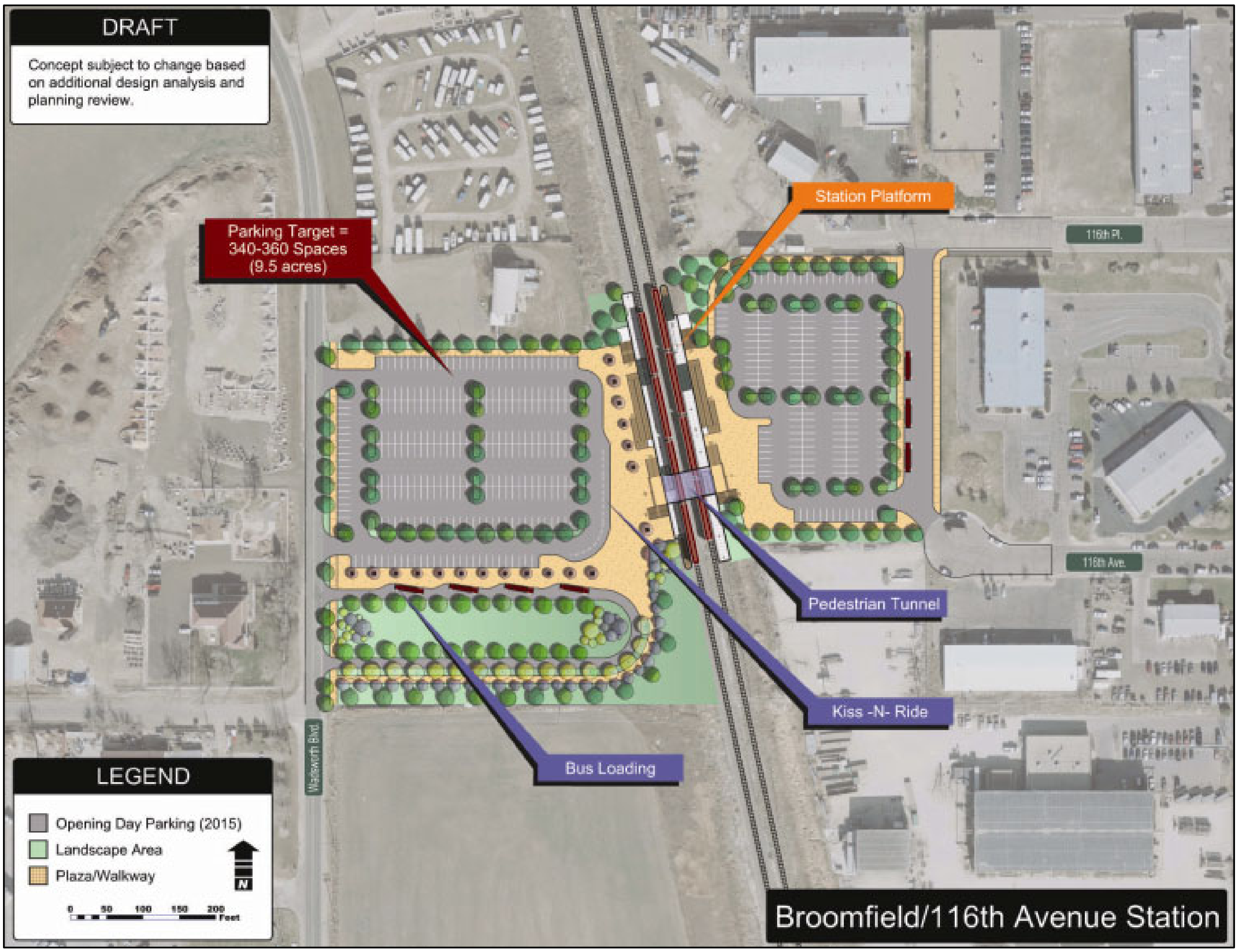
The Walnut Creek Station is no longer being studied for the 2022 RTD NWR PSS. It could become a future station.

Existing Conditions – Proposed Stations

Broomfield/116th Station

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

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



Source: RTD NWR Corridor EE, 2010

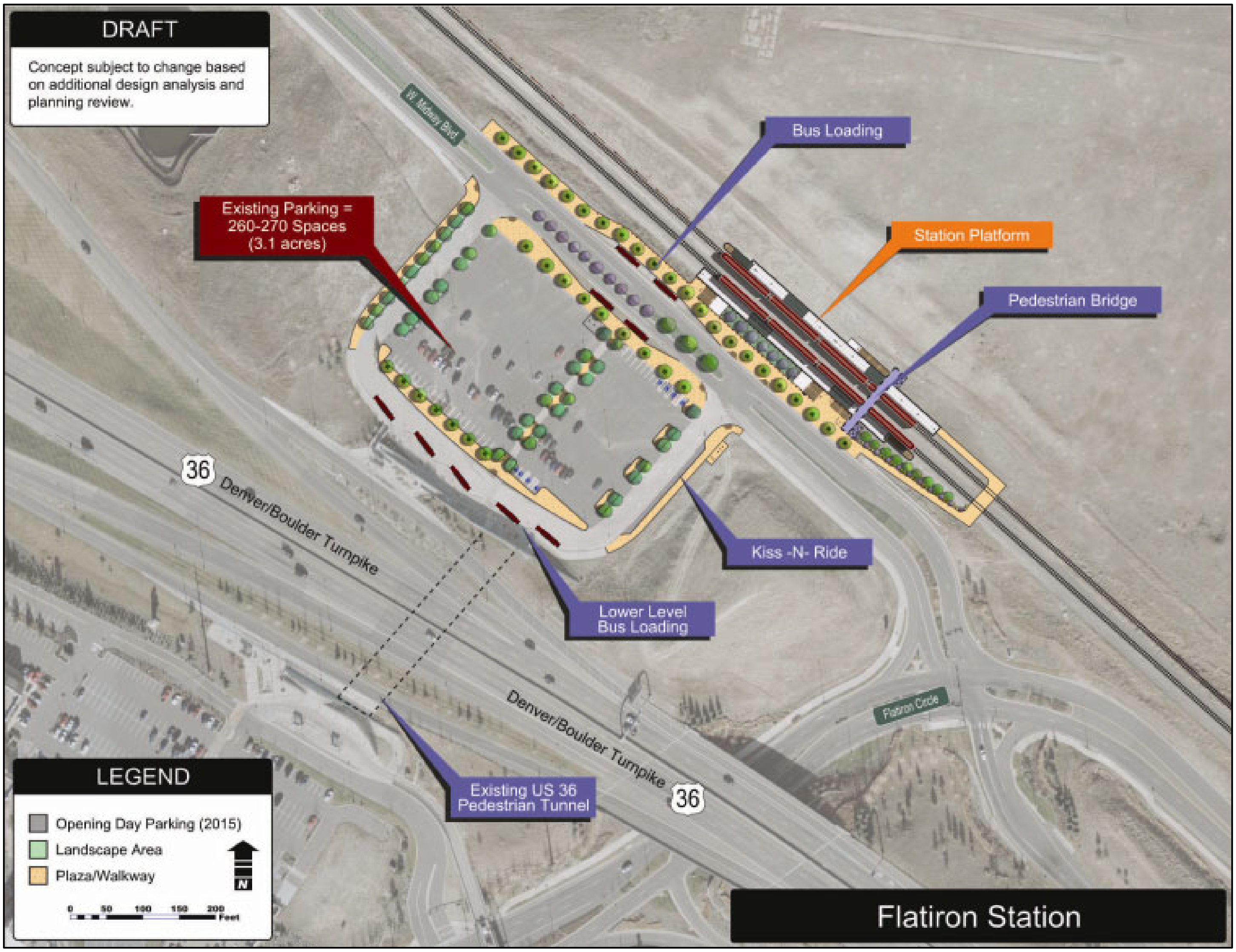
The Broomfield/116th Station is being updated for the 2022 RTD NWR PSS.

Existing Conditions – Proposed Stations

Flatiron Station

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

Figure 7: Flatiron Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

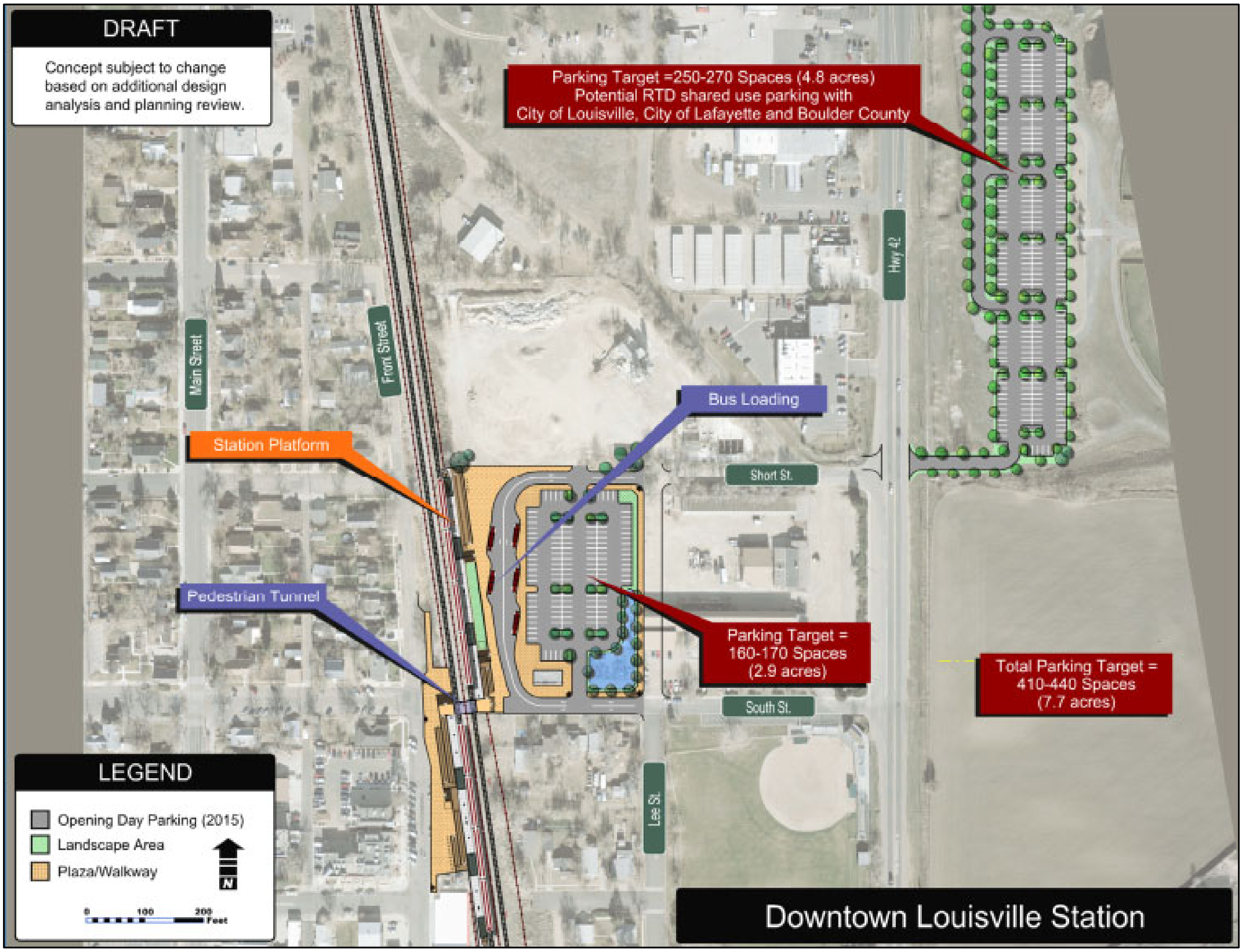
The Flatiron Station is being updated for the 2022 RTD NWR PSS.

Existing Conditions – Proposed Stations

Downtown Louisville Station

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

Figure 8: Downtown Louisville Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

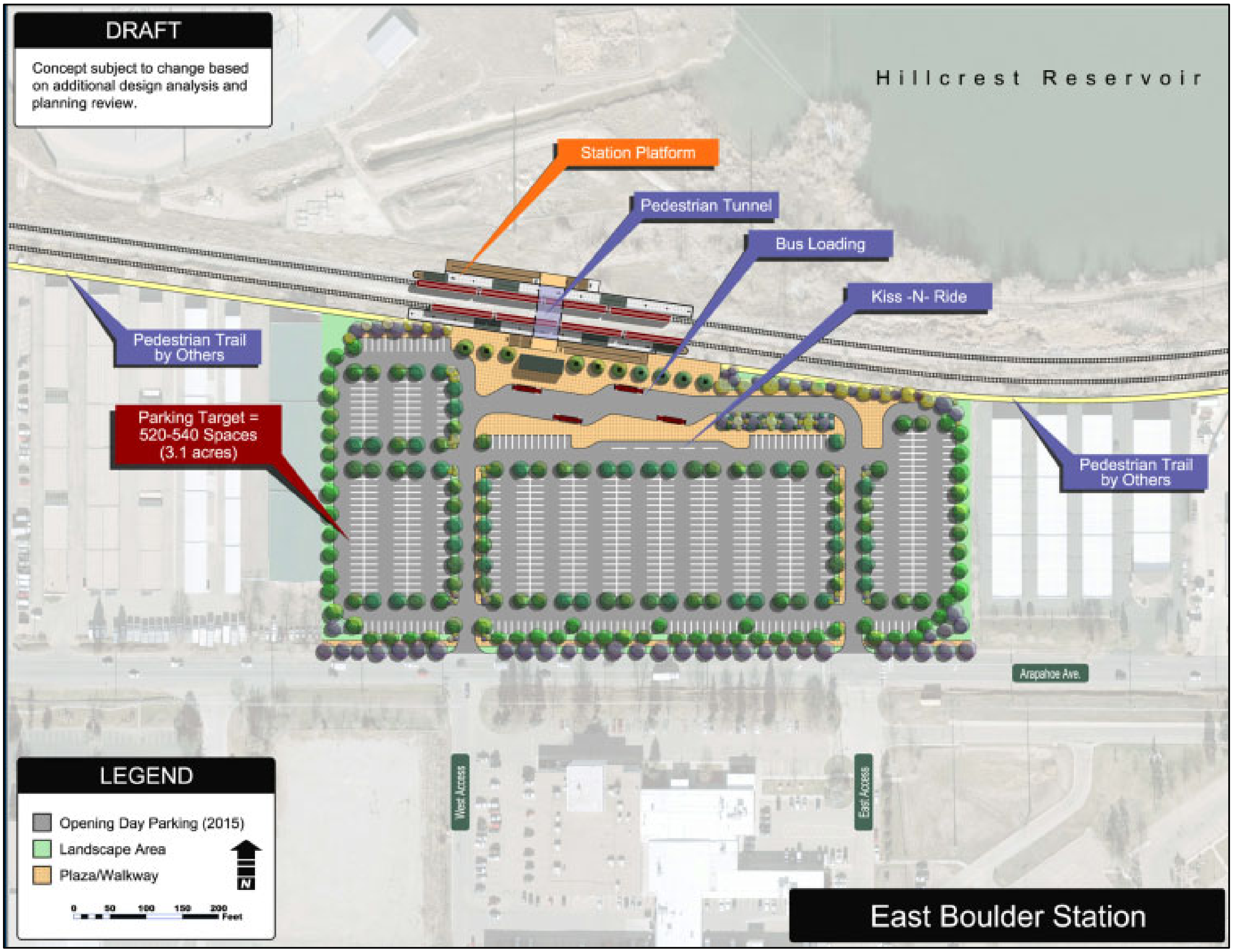
The Downtown Louisville Station is being updated for the 2022 RTD NWR PSS.

Existing Conditions – Proposed Stations

East Boulder Station

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

Figure 9: East Boulder Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

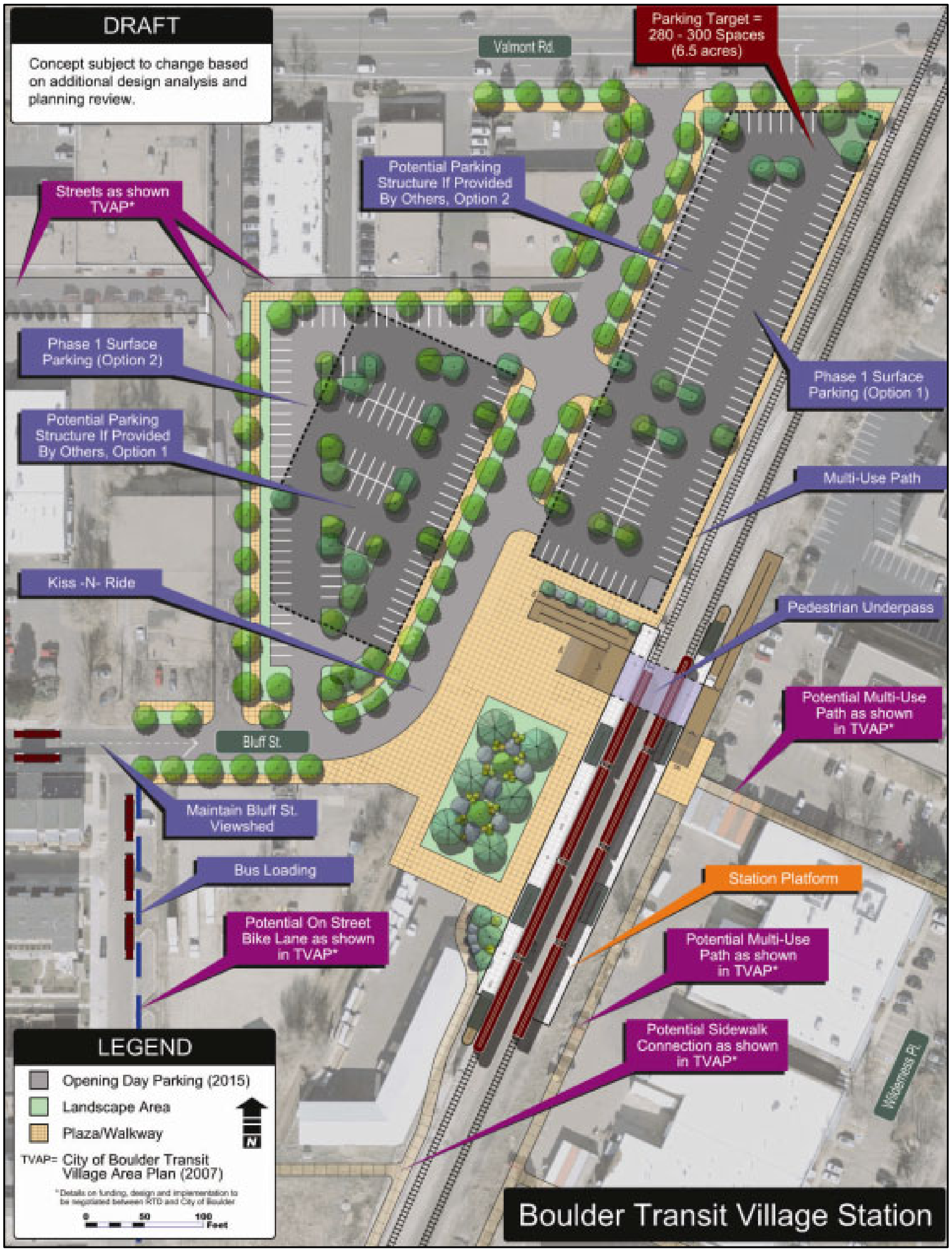
The East Boulder Station is no longer being studied for the 2022 RTD NWR PSS. It could become a future station.

Existing Conditions – Proposed Stations

Boulder Transit Village Station

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

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



Source: RTD NWR Corridor EE, 2010

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

Existing Conditions – Proposed Stations

Gunbarrel Station

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

Figure 11: Gunbarrel Station Plan from NWR Corridor EE

Source: RTD NWR Corridor EE, 2010

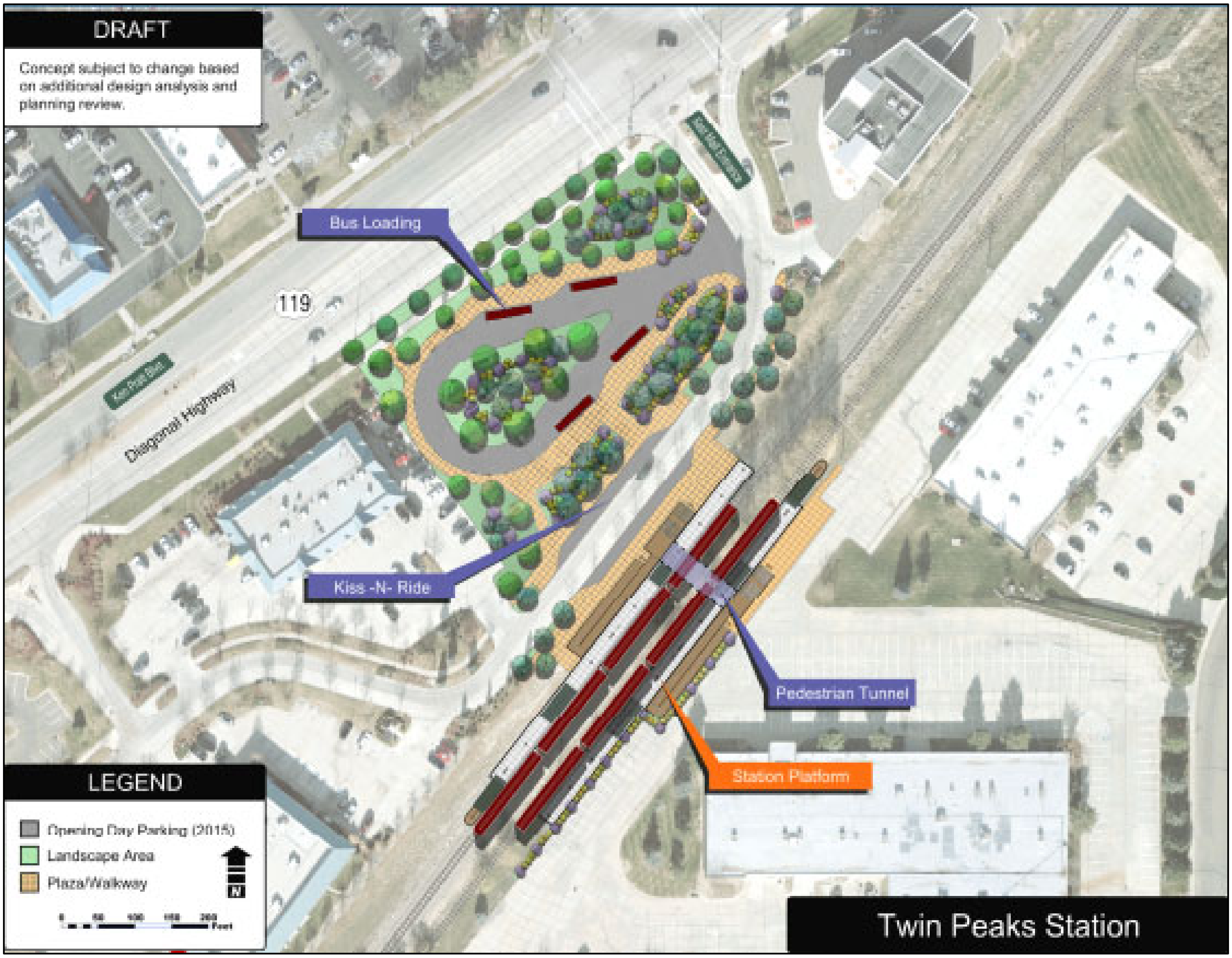
The Gunbarrel Station is no longer being studied for the 2022 RTD NWR PSS. It could become a future station.

Existing Conditions – Proposed Stations

Twin Peaks Station

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

Figure 12: Twin Peaks Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

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

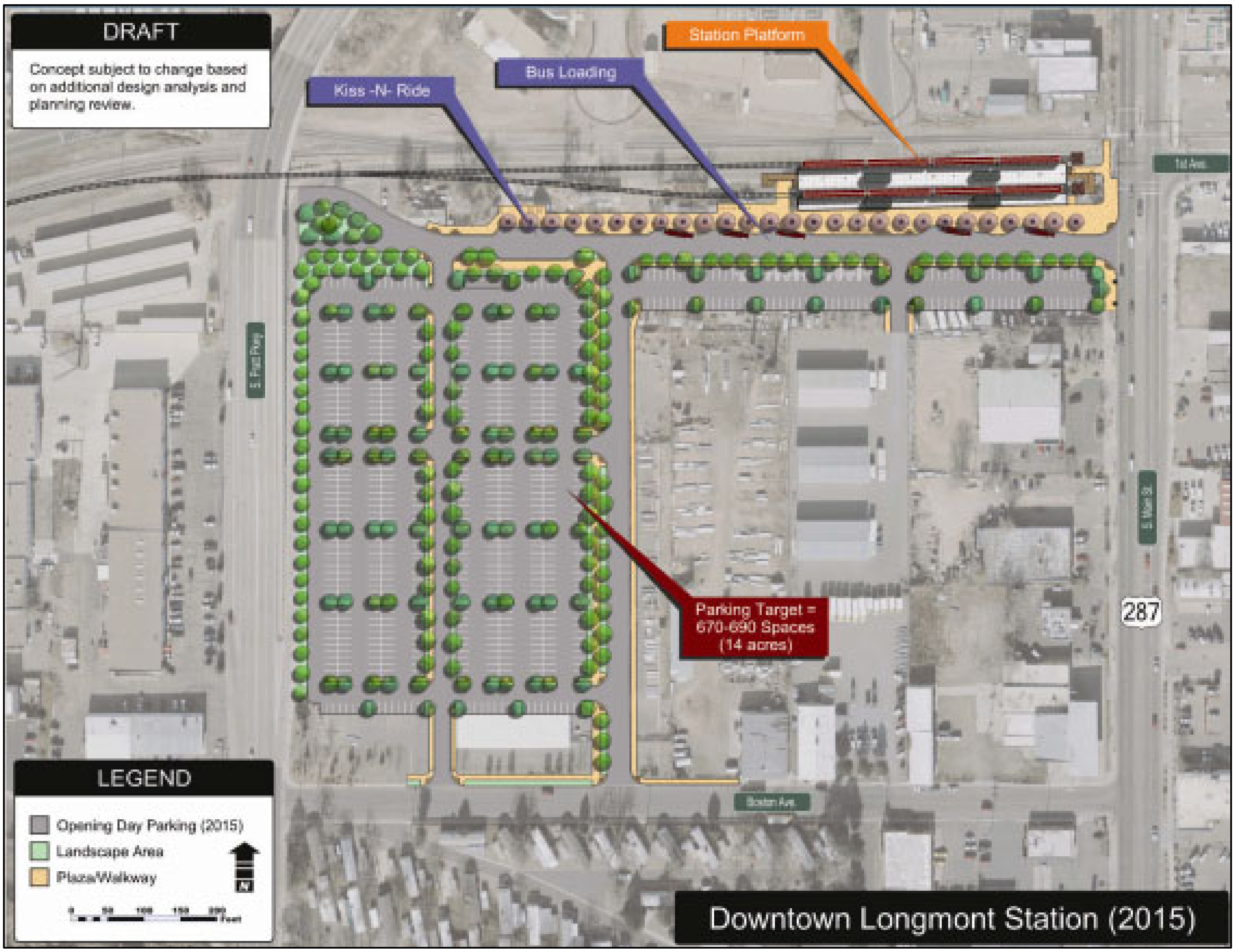
Existing Conditions – Proposed Stations

Downtown Longmont Station

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

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

Figure 13: Downtown Longmont Station Plan from NWR Corridor EE



Source: RTD NWR Corridor EE, 2010

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

Existing Conditions – Proposed Stations

2013 Northwest Area Mobility Study

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

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

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

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

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

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

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

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

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

Existing Conditions – Proposed Stations

Recommended Phasing Segments

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

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

Stations included in Northwest Area Mobility Study

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

Table 4: Proposed Station Phasing in NAMS

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

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

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

Considering the costs of the proposed project, RTD's current lack of FasTracks funds, ridership projections, BNSF's conditions, and other challenges within the corridor, the completion of NW Rail was considered to be a long-term goal. RTD and the stakeholders agreed to monitor the various future implementation strategies on an annual basis, as circumstances affecting costs, ridership, the status of BNSF's freight operations, etc., continue to evolve. This conclusion was reached with RTD and the Northwest Area Stakeholders as part of the Final Consensus Statement, dated May 1, 2014.

2017 Northwest Rail Peak Service Plan

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

2022 RTD Northwest Rail Peak Service Study

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

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

Reimagine RTD

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

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

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

Downtown Westminster Station

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

Existing Roadway Network

Highways

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

Figure 14: US 36 Relative to Proposed Downtown Westminster Station

Interchanges

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

Existing Conditions – Proposed Stations

Figure 15: US 36 at Sheridan Boulevard Interchange

Arterials

West 88th Avenue

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

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

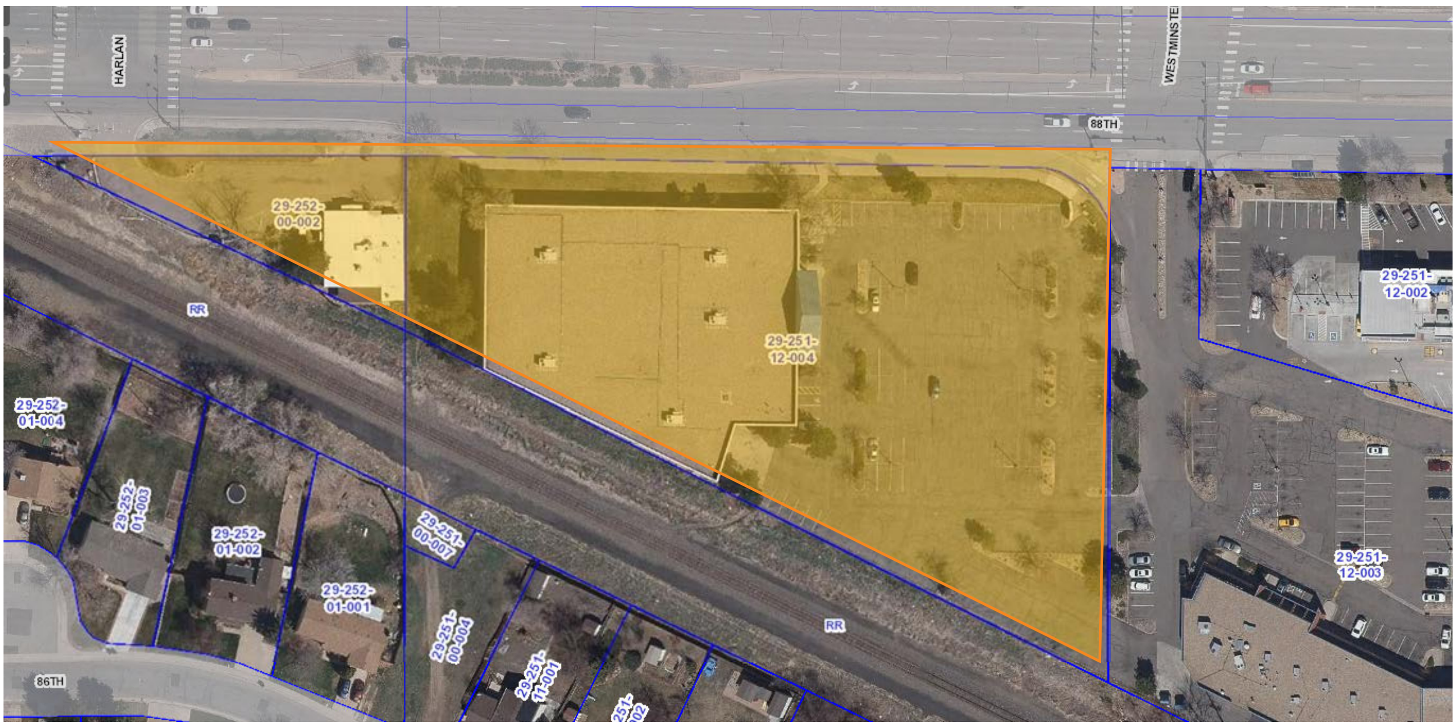
Sheridan Boulevard

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

Right-of-Way

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

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



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

Station Access

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

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

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

Major Utilities

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

Existing Transit Service

Bus Routes Serving Station

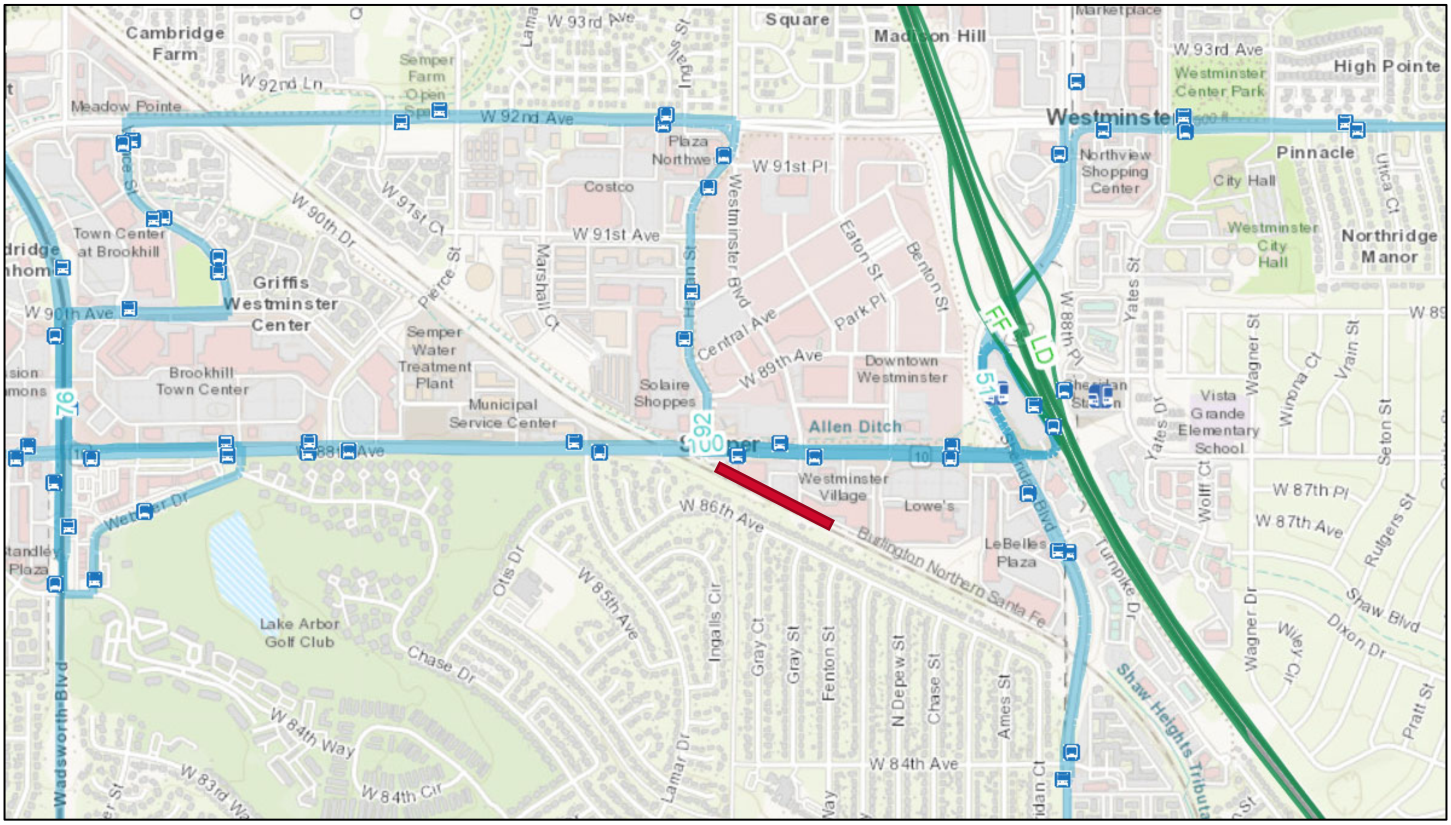
The Downtown Westminster Station would be located on the south side of the street at West 88th Avenue and Westminster Boulevard, approximately one-half mile west of the RTD US 36 & Sheridan Bus Station. The existing station serving US 36 commuters has 1,310 parking spaces (mostly on the east side of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

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

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

Existing Conditions – Proposed Stations

Figure 17: Bus Routes Serving Downtown Westminster Station



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

Transit Service Levels

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

Existing Bicycle and Pedestrian Facilities

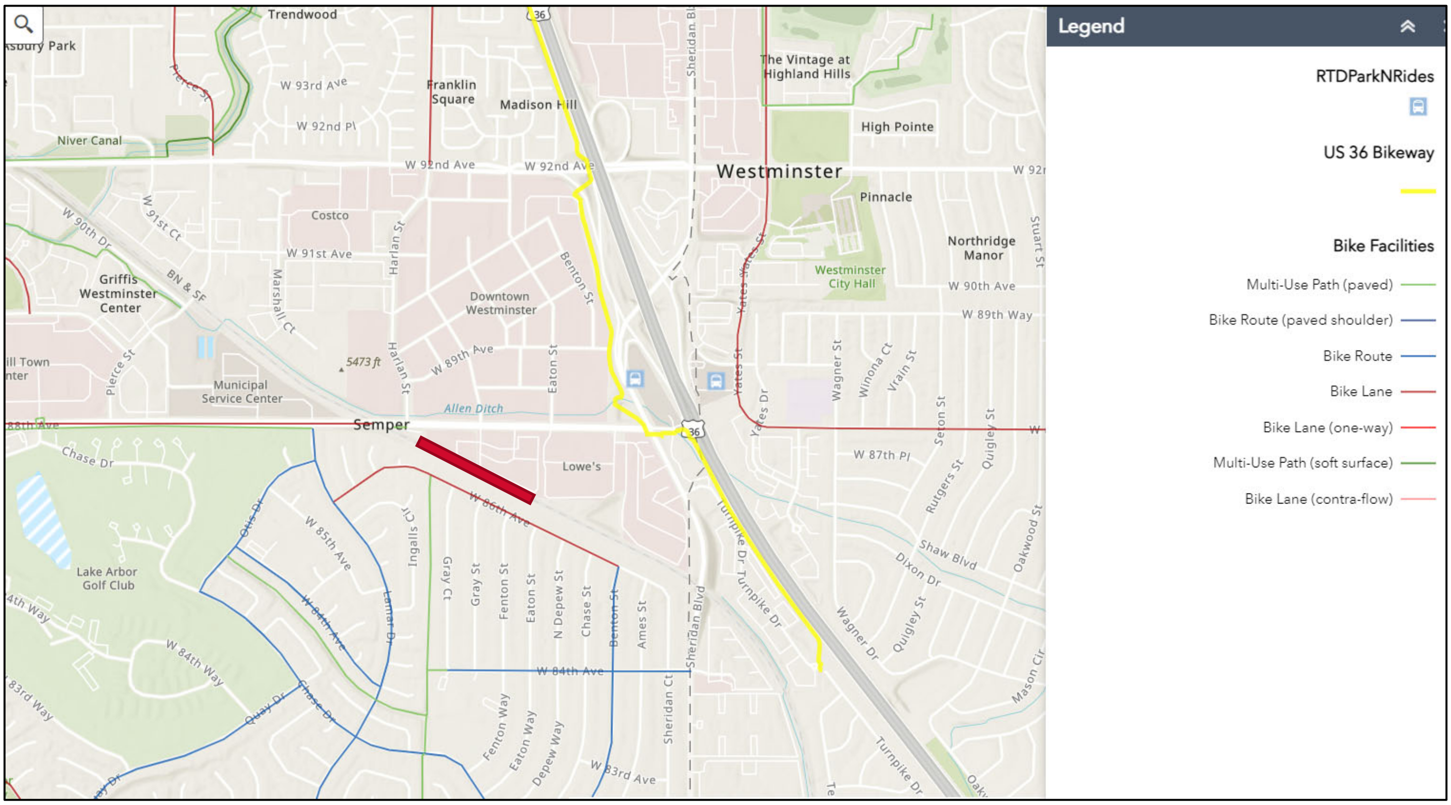
The US 36 Bikeway begins just south of West 88th Avenue at Turnpike Drive. South of the US 36 Bikeway, the bike route connects to other routes which lead to downtown Denver. North of this location, the US 36 Bikeway provides a direct route all the way to the Table Mesa Park-n-Ride in Boulder. The City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

Existing Conditions – Proposed Stations

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

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

Figure 18: Bicycle Facilities near Proposed Downtown Westminster Station



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

Existing and Future Land Use

Existing Land Use

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

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

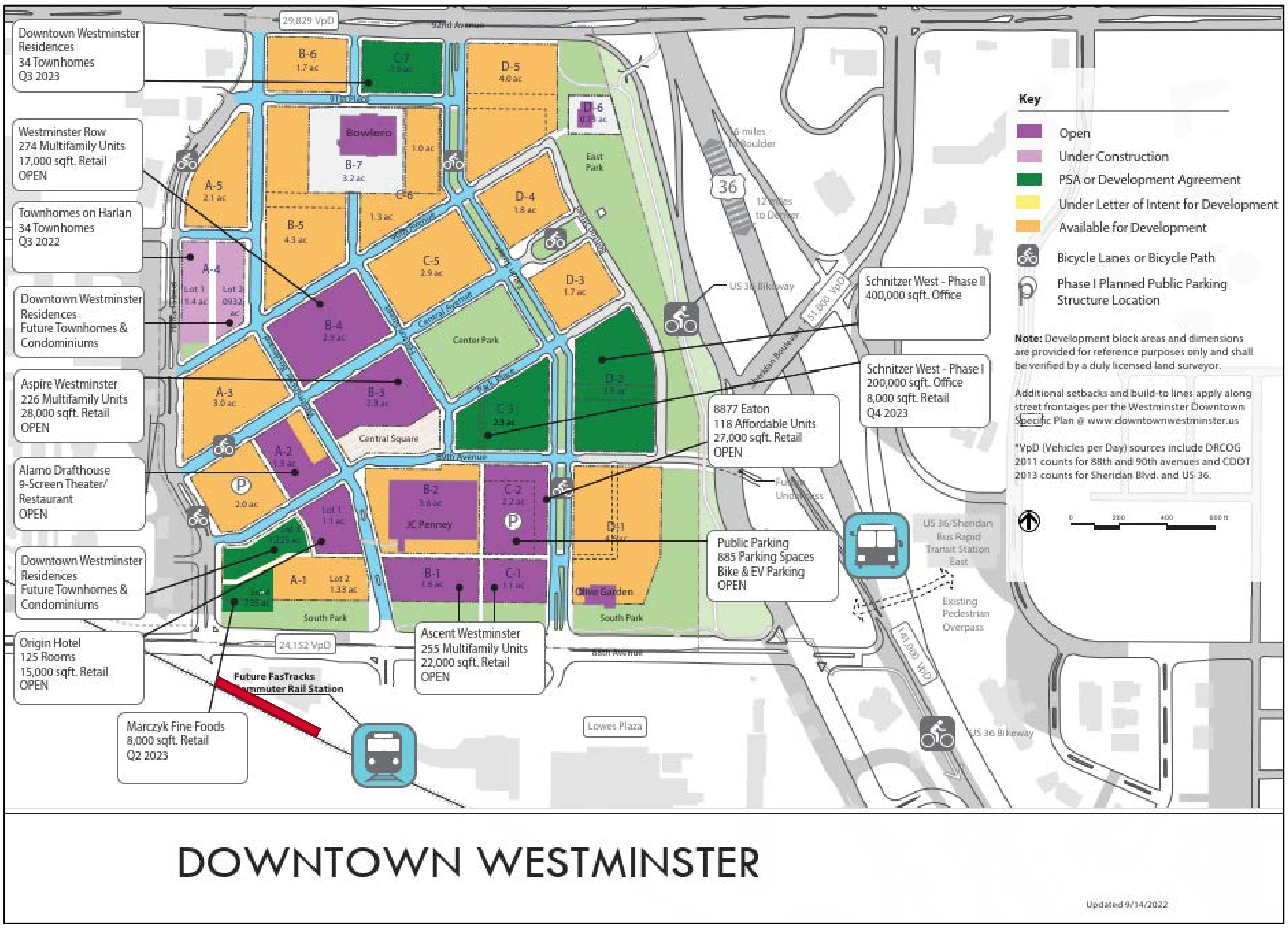
The Westminster *Downtown Specific Plan* then intended to realize the vision of a high-density, urban-scale, mixed-use development that will be a regional and community-wide center of economic, cultural, and social

Existing Conditions – Proposed Stations

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

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

Figure 19: Downtown Westminster Development at Potential Downtown Westminster Station



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

Existing Site Constraints

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

Existing Conditions – Proposed Stations

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

Adjacent Land Ownership

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

Table 5: Property Ownership at Proposed Downtown Westminster Station

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

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

Future Development

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

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

Broomfield / 116th Station

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

Existing Roadway Network

Highways

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

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

Existing Conditions – Proposed Stations

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

Interchanges

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

Existing Conditions – Proposed Stations

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

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

Existing Conditions – Proposed Stations

Figure 22: US 287 and SH 128 Intersection

Arterials

US 287/West 120th Avenue

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

Wadsworth Parkway

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

Main Street

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

Existing Conditions – Proposed Stations

Right-of-Way

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

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

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

Station Access

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

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

Major Utilities

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

Existing Conditions – Proposed Stations

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

Existing Transit Service

Bus Routes Serving Station

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

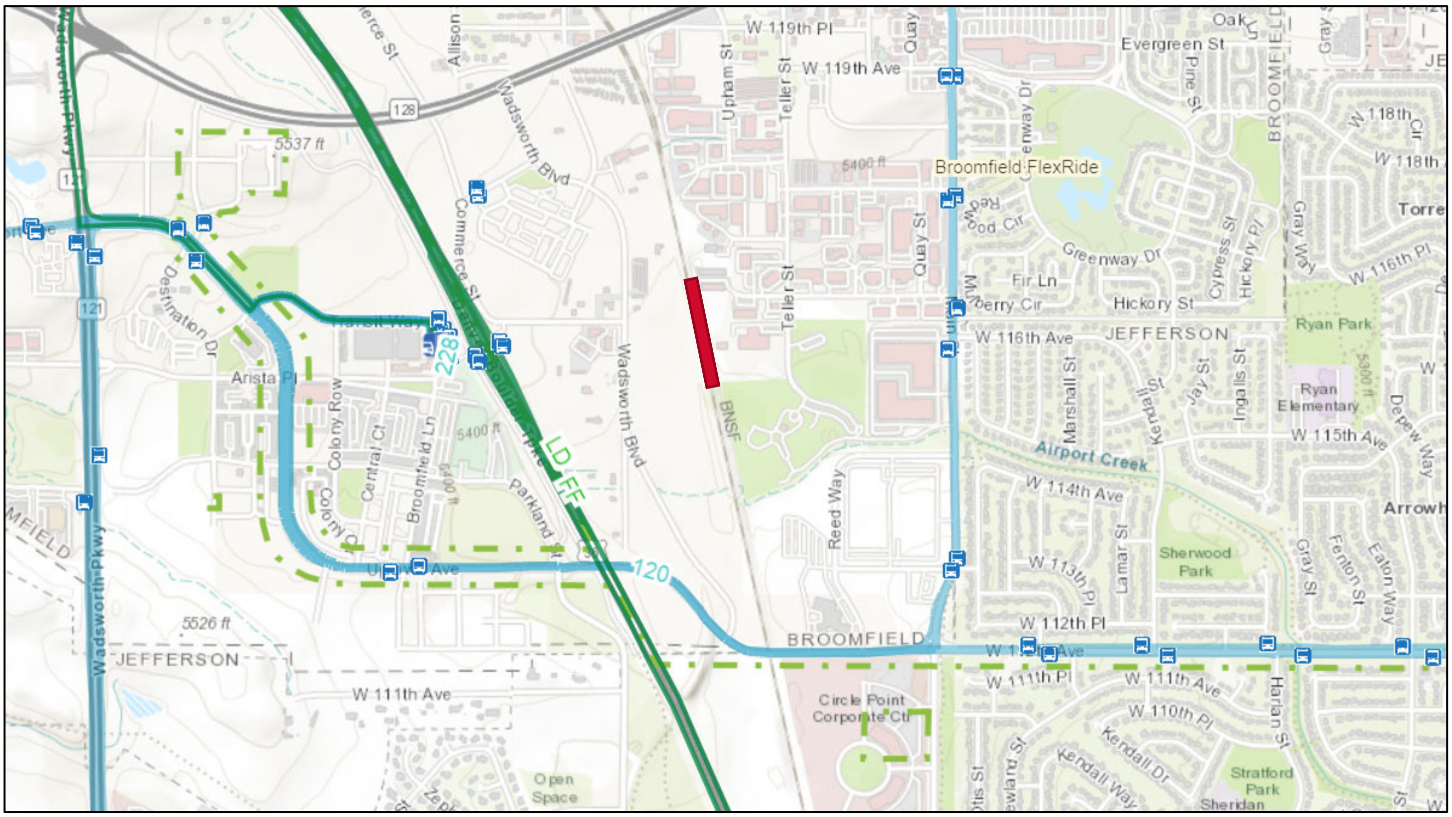
- **Route 112: West 112th Avenue** – Route 112 operates east-west service generally along 112th Avenue between the US 36 & Broomfield Station and the Northglenn/112th Avenue Station on the N Line. The route provides hourly service between 8:00 AM and 7:00 PM.
- **Route 120: 120th Avenue** – Route 120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

Existing Conditions – Proposed Stations

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

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

Figure 25: Bus Routes Serving Broomfield 116th Station



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

Transit Service Levels

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

Existing Bicycle and Pedestrian Facilities

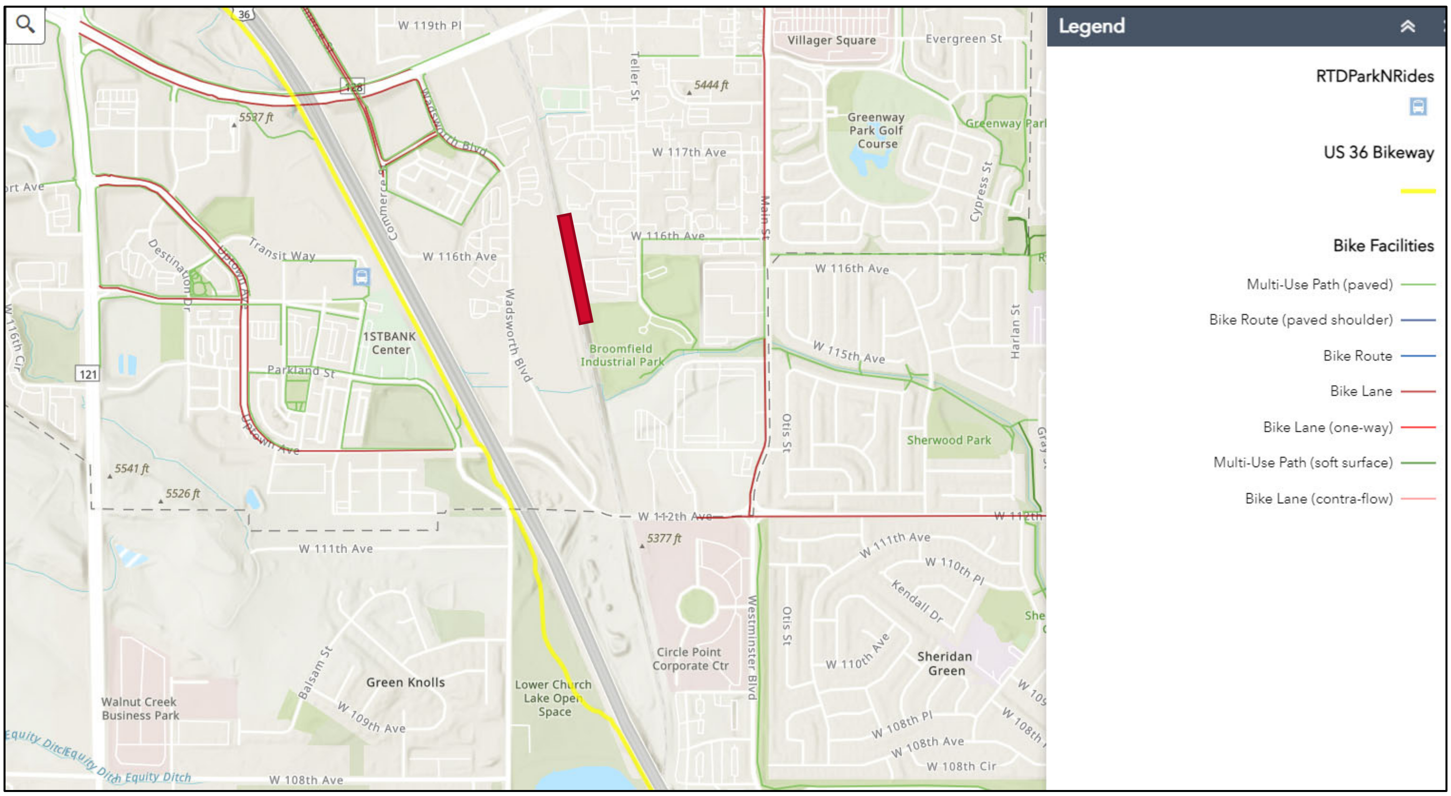
The US 36 Bikeway travels along the south side of US 36 near the Broomfield Event Center and the Arista Development. The bike route extends south to Westminster and north to the Table Mesa Park-n-Ride in Boulder. Uptown Avenue and Parkland Street in the Arista development south of US 36 have bike lanes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

Existing Conditions – Proposed Stations

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

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

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



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

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

Existing and Future Land Use

Existing Land Use

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

Existing Conditions – Proposed Stations

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

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

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

Existing Conditions – Proposed Stations

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

Existing Site Constraints

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

Adjacent Land Ownership

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

Existing Conditions – Proposed Stations

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

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

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

Future Development

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

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

Existing Conditions – Proposed Stations

Flatiron Station

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

Existing Roadway Network

Highways

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

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

Figure 29: US 36 Relative to Proposed Flatiron Station

Interchanges

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

Existing Conditions – Proposed Stations

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

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

Arterials

East Flatiron Crossing Drive

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

West Flatiron Crossing Drive

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

Interlocken Loop

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

Interlocken Boulevard

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

Existing Conditions – Proposed Stations

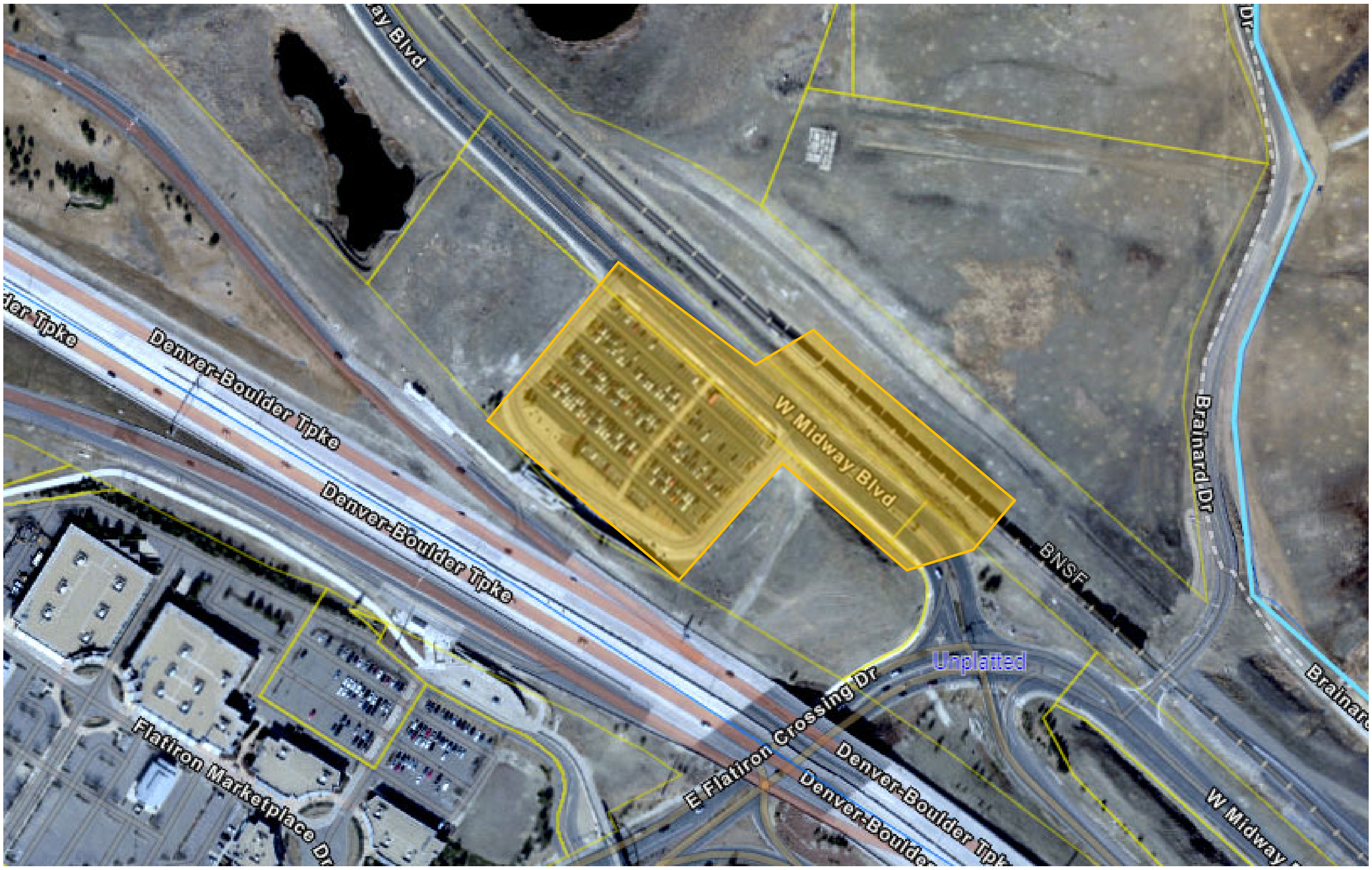
Figure 31: Extents of Interlocken Loop

Right-of-Way

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

Existing Conditions – Proposed Stations

Figure 32: Flatiron Station Area from 2010 NWR Corridor EE



Station Access

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

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

Major Utilities

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

Existing Transit Service

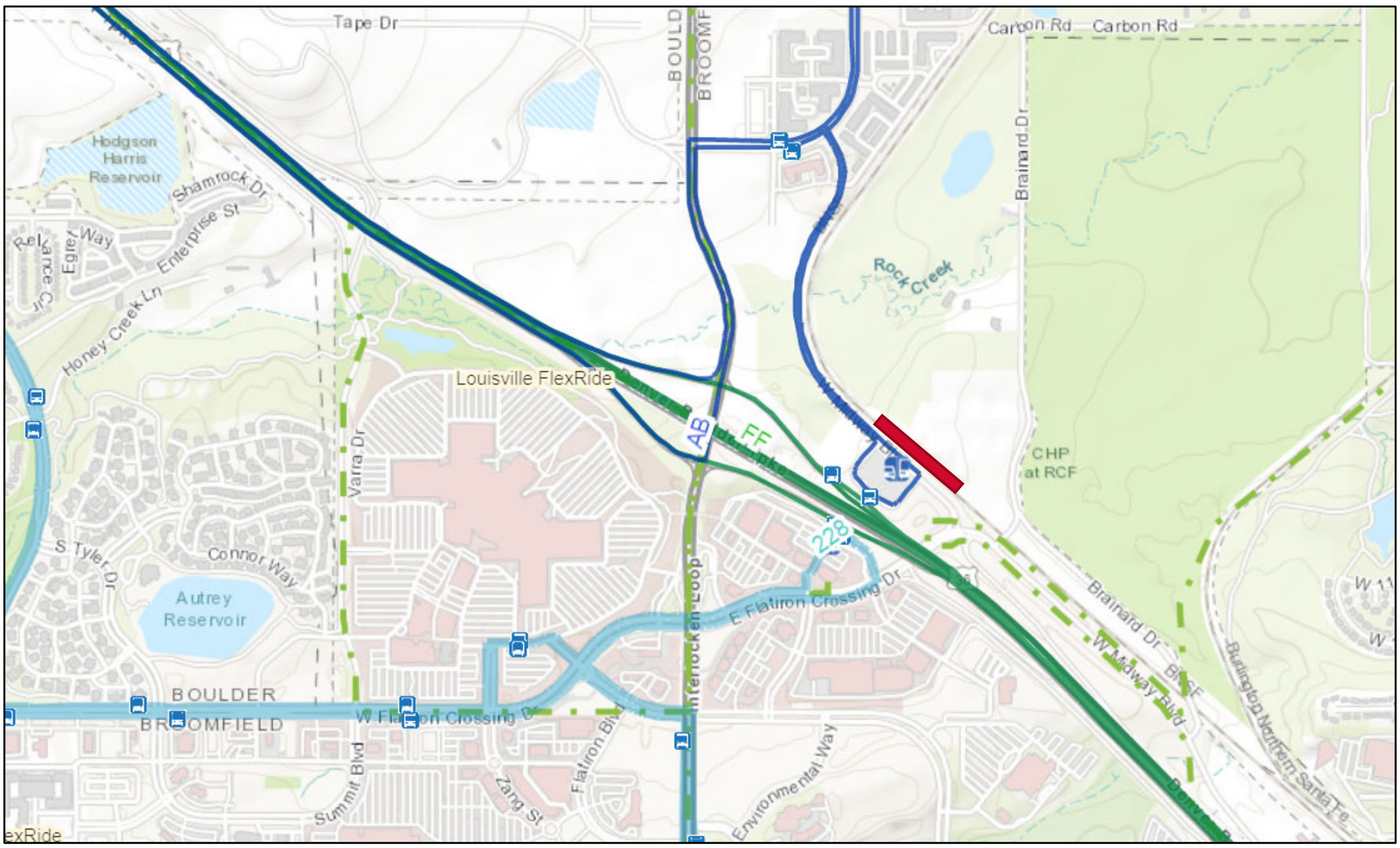
Bus Routes Serving Station

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

Existing Conditions – Proposed Stations

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

Figure 33: Bus Routes Serving Flatiron Station



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

Transit Service Levels

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

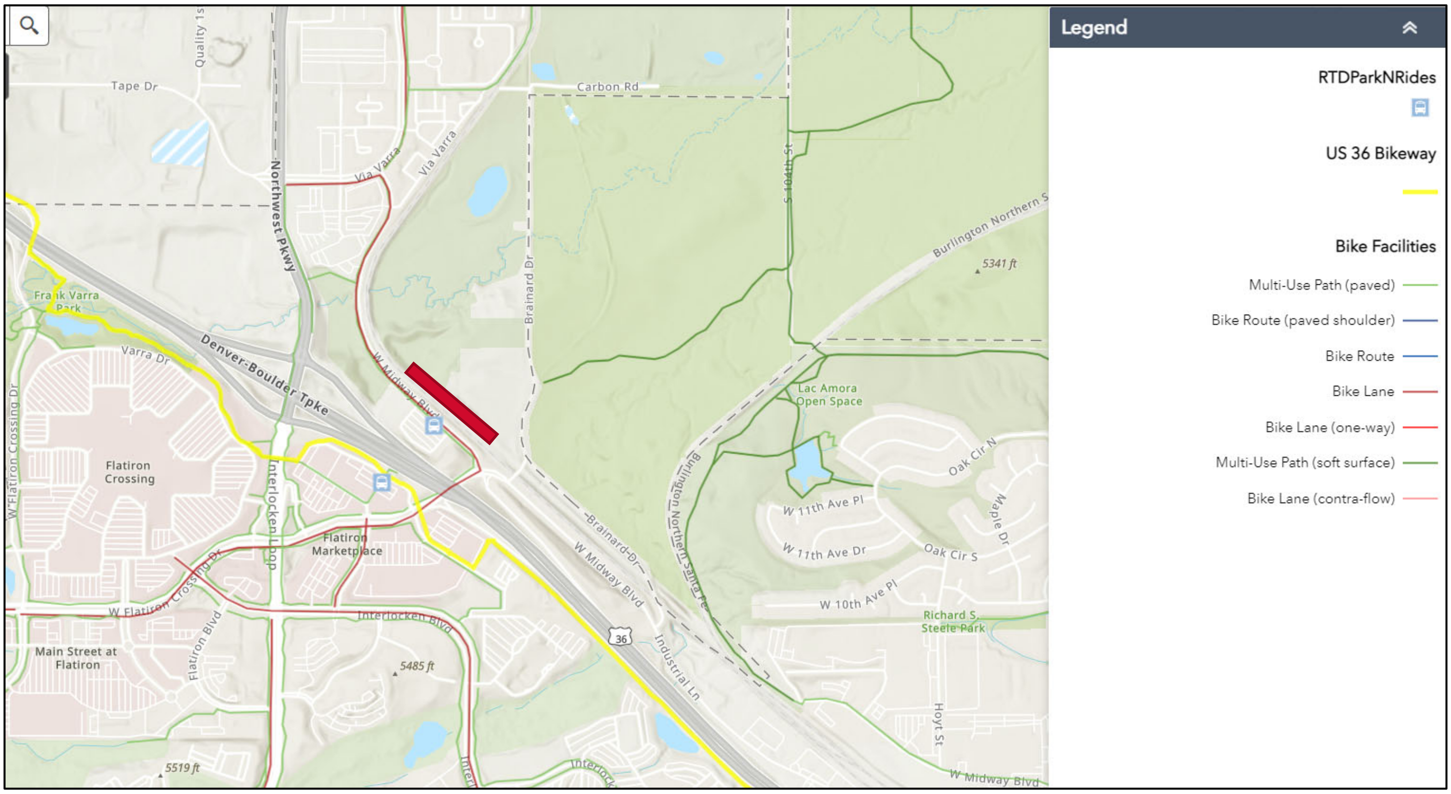
Existing Bicycle and Pedestrian Facilities

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

Existing Conditions – Proposed Stations

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

Figure 34: Bicycle Facilities near Proposed Flatiron Station



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

Existing and Future Land Use

Existing Land Use

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

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

Existing Conditions – Proposed Stations

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

Figure 35: Recent Development near Potential Flatiron Station

Existing Site Constraints

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

Adjacent Land Ownership

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

Table 7: Property Ownership at Proposed Flatiron Station

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

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

Existing Conditions – Proposed Stations

Future Development

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

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

Downtown Louisville Station

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

Existing Roadway Network

Highways

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

Interchanges

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

Arterials

East South Boulder Road

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

Courtesy Road (SH 42)

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

Existing Conditions – Proposed Stations

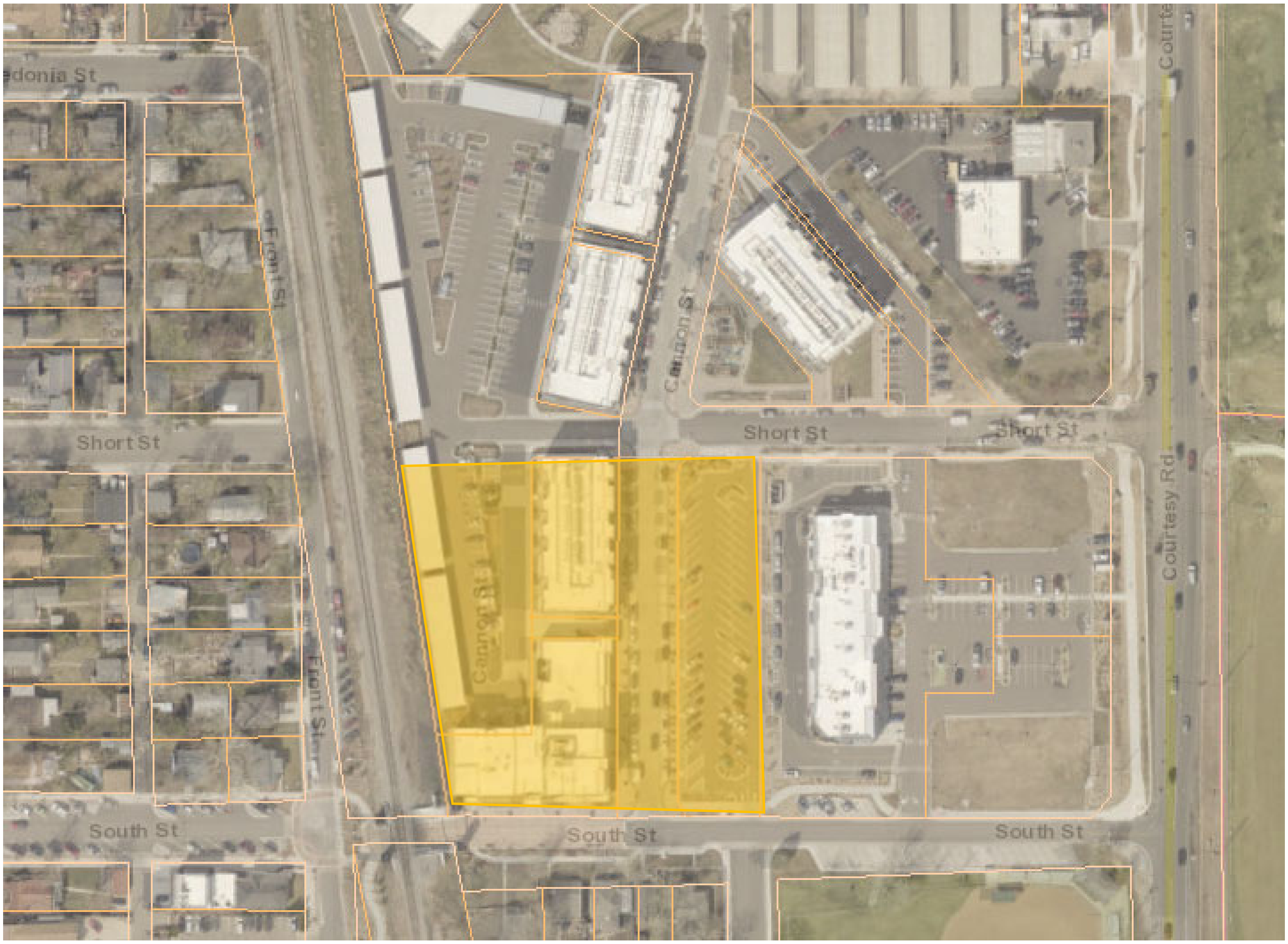
Figure 36: South Boulder Road and Courtesy Road Relative to Proposed Downtown Louisville Station

Right-of-Way

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

Existing Conditions – Proposed Stations

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



Station Access

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

Major Utilities

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

Existing Transit Service

Bus Routes Serving Station

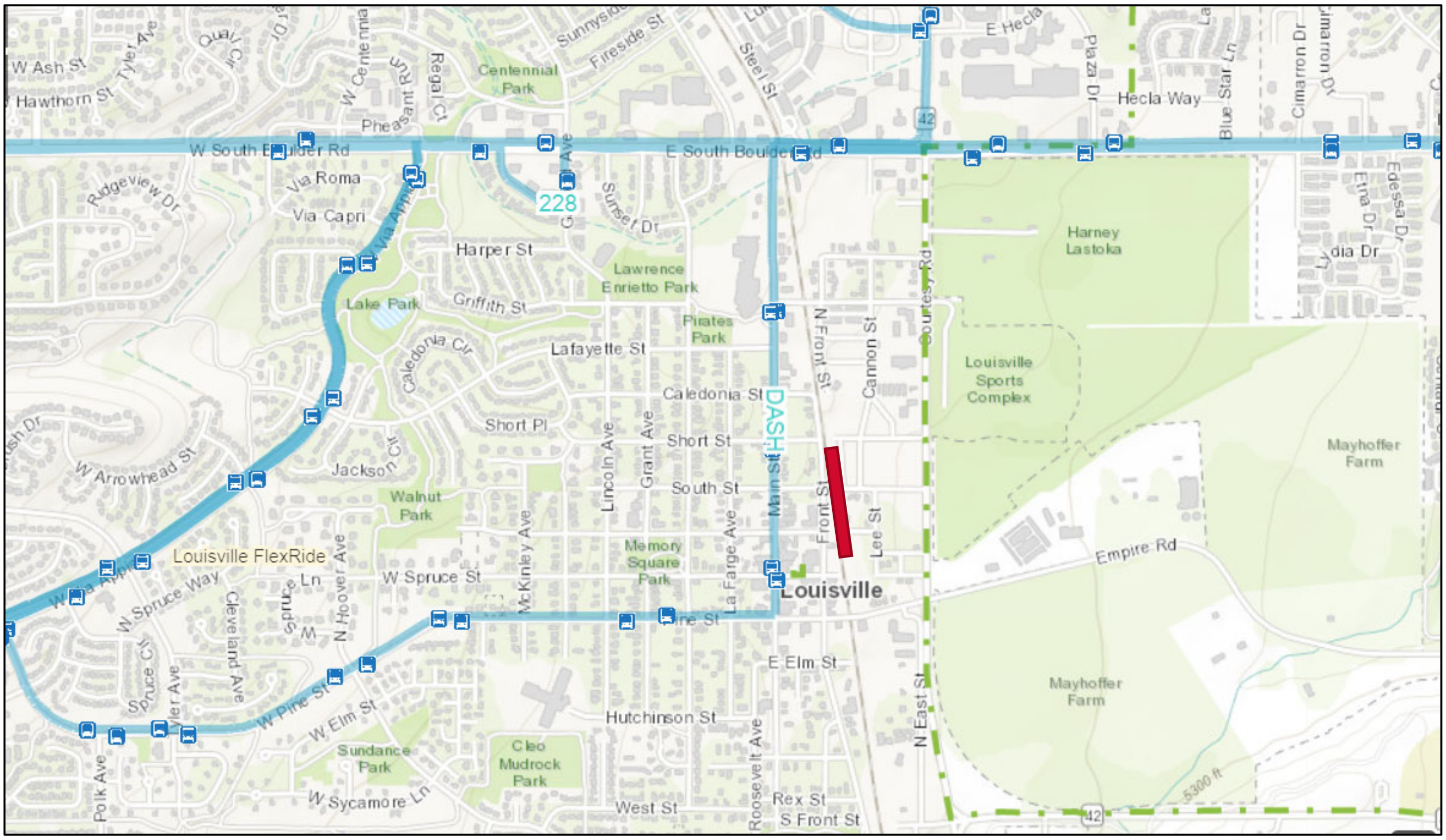
The Downtown Louisville Station would be located on the east side of the BNSF rail line near South Street. Much of the area around the proposed station has been developed with multi-family residential since previous planning activities have occurred. A new location for the platform will need to be selected.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

Existing Conditions – Proposed Stations

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

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

Figure 38: Bus Routes Serving the Downtown Louisville Station



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

Transit Service Levels

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

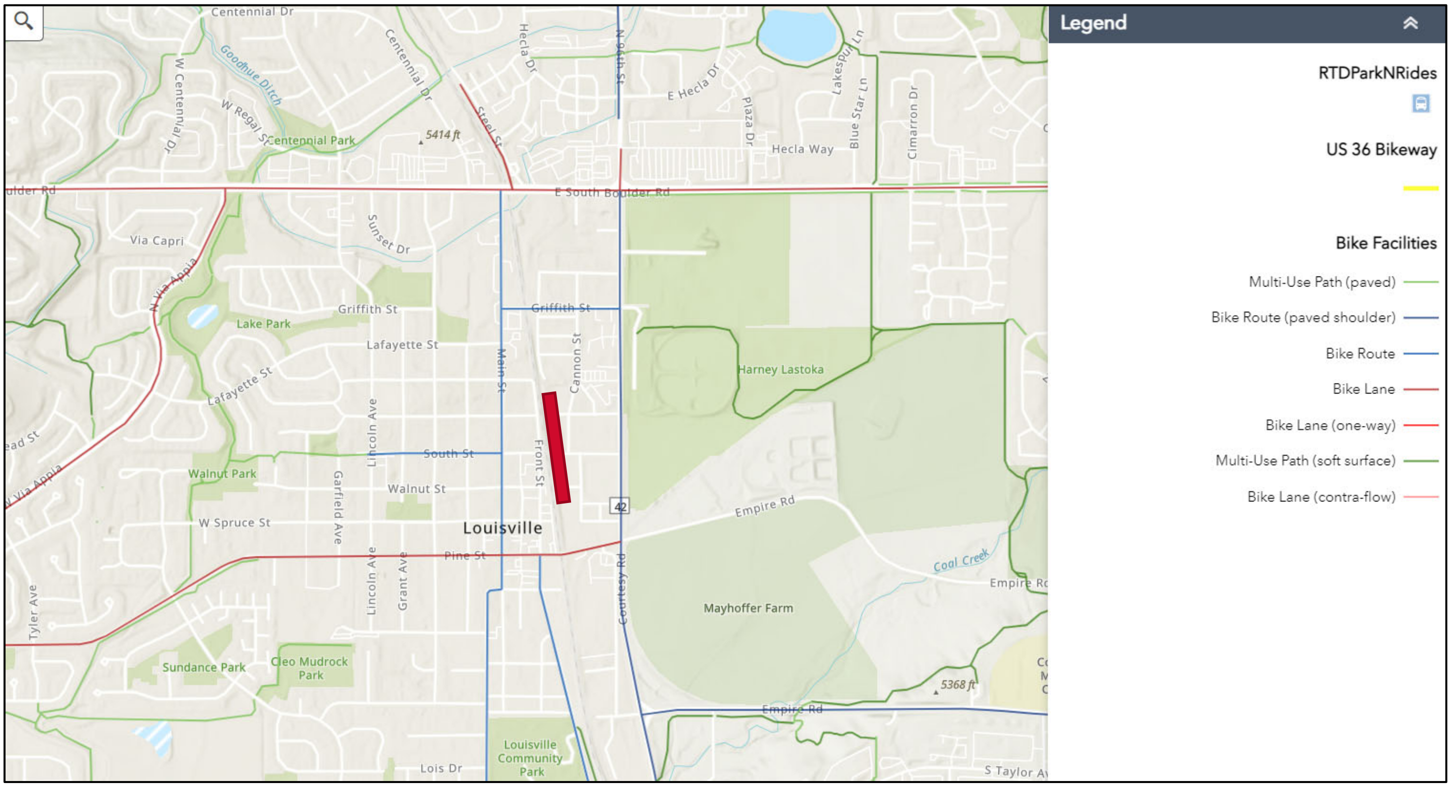
Existing Bicycle and Pedestrian Facilities

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

Existing Conditions – Proposed Stations

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

Figure 39: Bicycle Facilities near Proposed Downtown Louisville Station



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

Existing and Future Land Use

Existing Land Use

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

Existing Conditions – Proposed Stations

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

Figure 41: Recent Development near Potential Downtown Louisville Station

Existing Conditions – Proposed Stations

Existing Site Constraints

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

Adjacent Land Ownership

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

Table 8: Property Ownership at Proposed Downtown Louisville Station

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

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

Future Development

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

Boulder Junction at Depot Square Station

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

Existing Roadway Network

Highways

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

Interchanges

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

Existing Conditions – Proposed Stations

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

Arterials

Valmont Road

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

Existing Conditions – Proposed Stations

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

30th Street

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

Pearl Street

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

Pearl Parkway

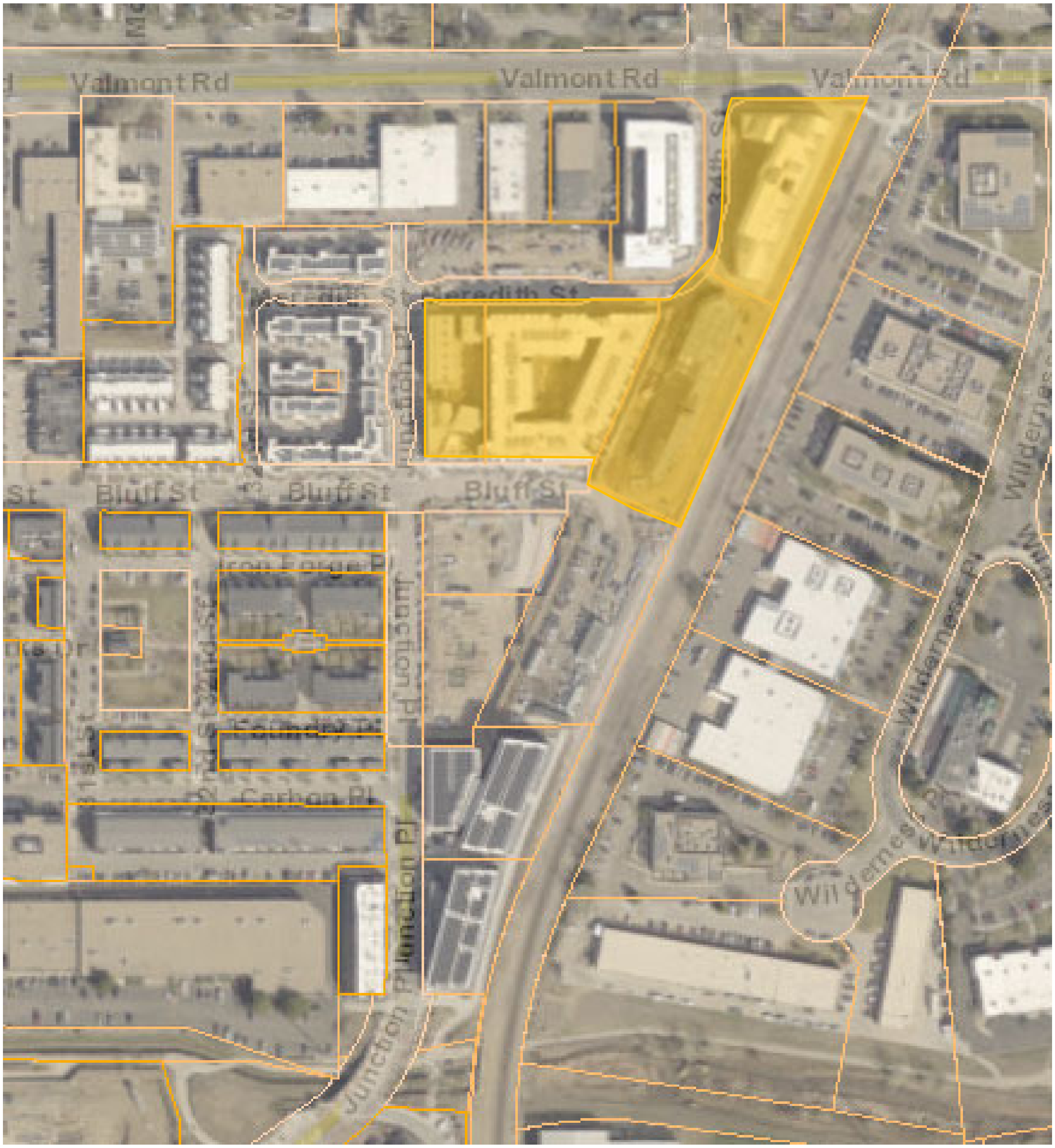
- Up to four-lane, 35 mph speed limit, east-west arterial with dedicated turn lanes and signalized intersections.
- Existing wayfinding signage for Boulder Junction at Depot Square Station is present along route.
- Pearl Parkway begins at 30th Street and ends at 55th Street.

Right-of-Way

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

Existing Conditions – Proposed Stations

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



Station Access

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

Existing Conditions – Proposed Stations

Major Utilities

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

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

Existing Transit Service

Bus Routes Serving Station

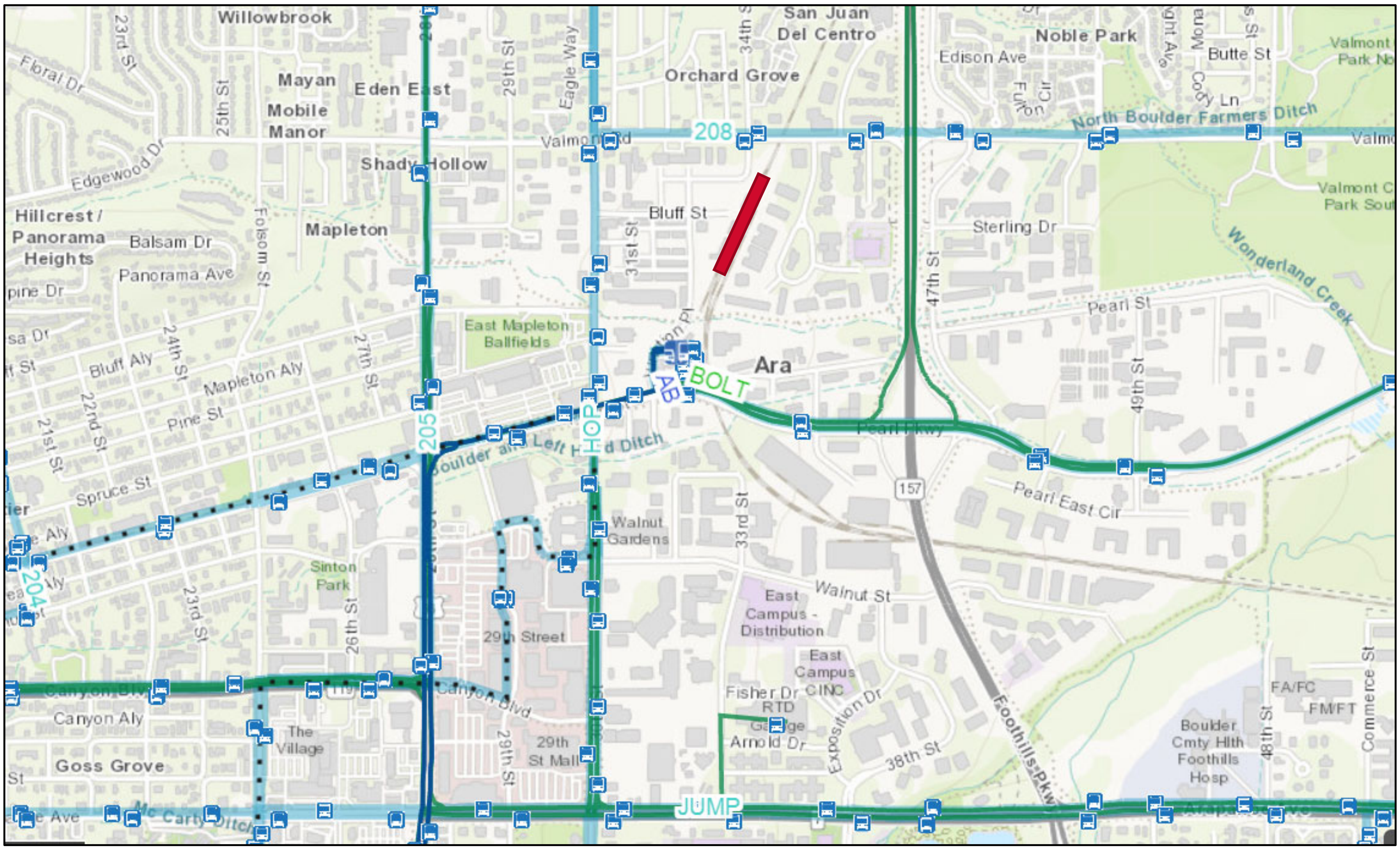
The Boulder Junction at Depot Square Station would be located between Valmont Road and Pearl Parkway on the west side of the BNSF Railway tracks. The existing Boulder Junction at Depot Square Station provides 75 parking spaces for transit patrons and six bus bays. The underground bus facility is located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

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

Existing Conditions – Proposed Stations

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

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



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

Transit Service Levels

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

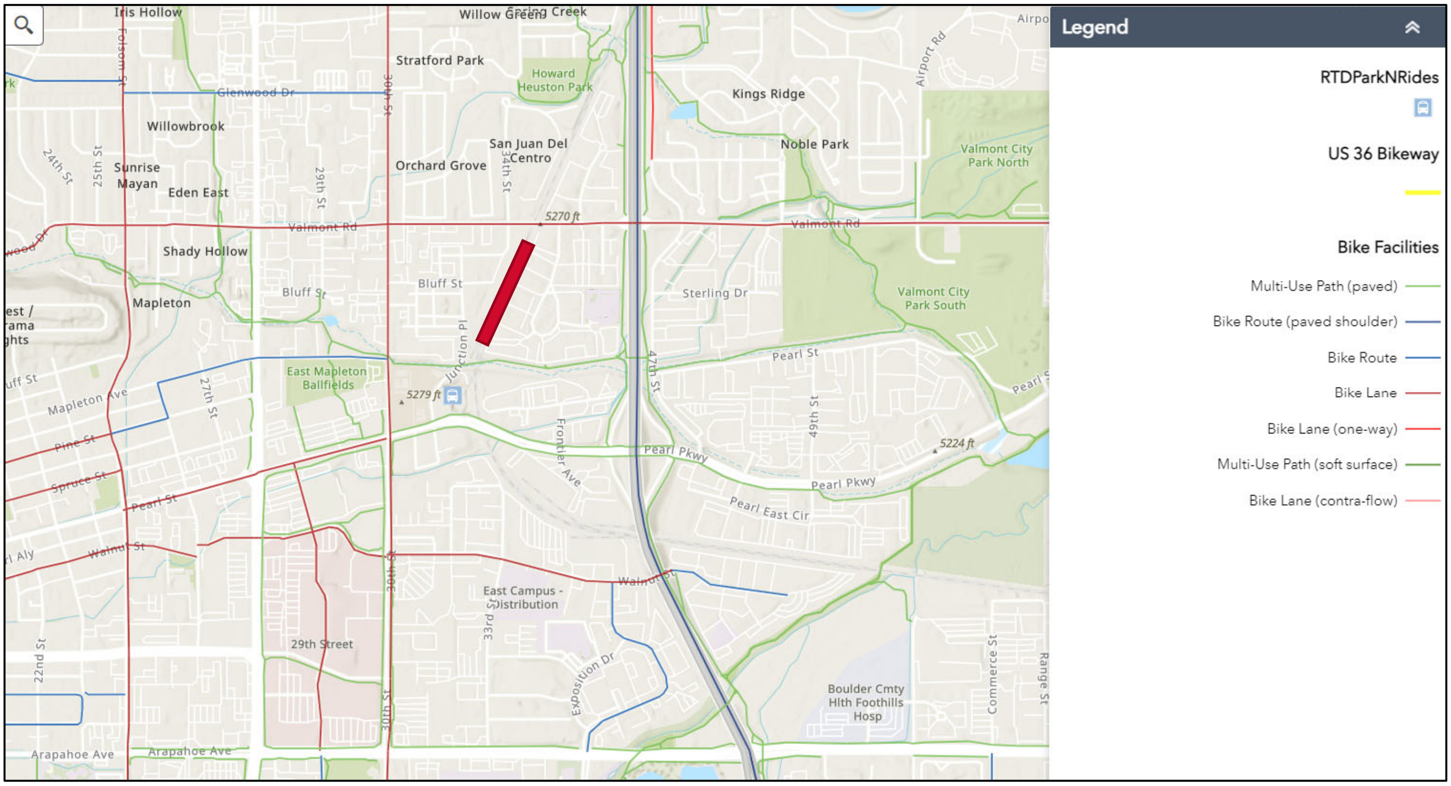
Existing Bicycle and Pedestrian Facilities

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

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

Existing Conditions – Proposed Stations

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



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

Existing and Future Land Use

Existing Land Use

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

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

Existing Conditions – Proposed Stations

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

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

Existing Conditions – Proposed Stations

Existing Site Constraints

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

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

Adjacent Land Ownership

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

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

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

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

Future Development

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

Existing Conditions – Proposed Stations

Downtown Longmont Station

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

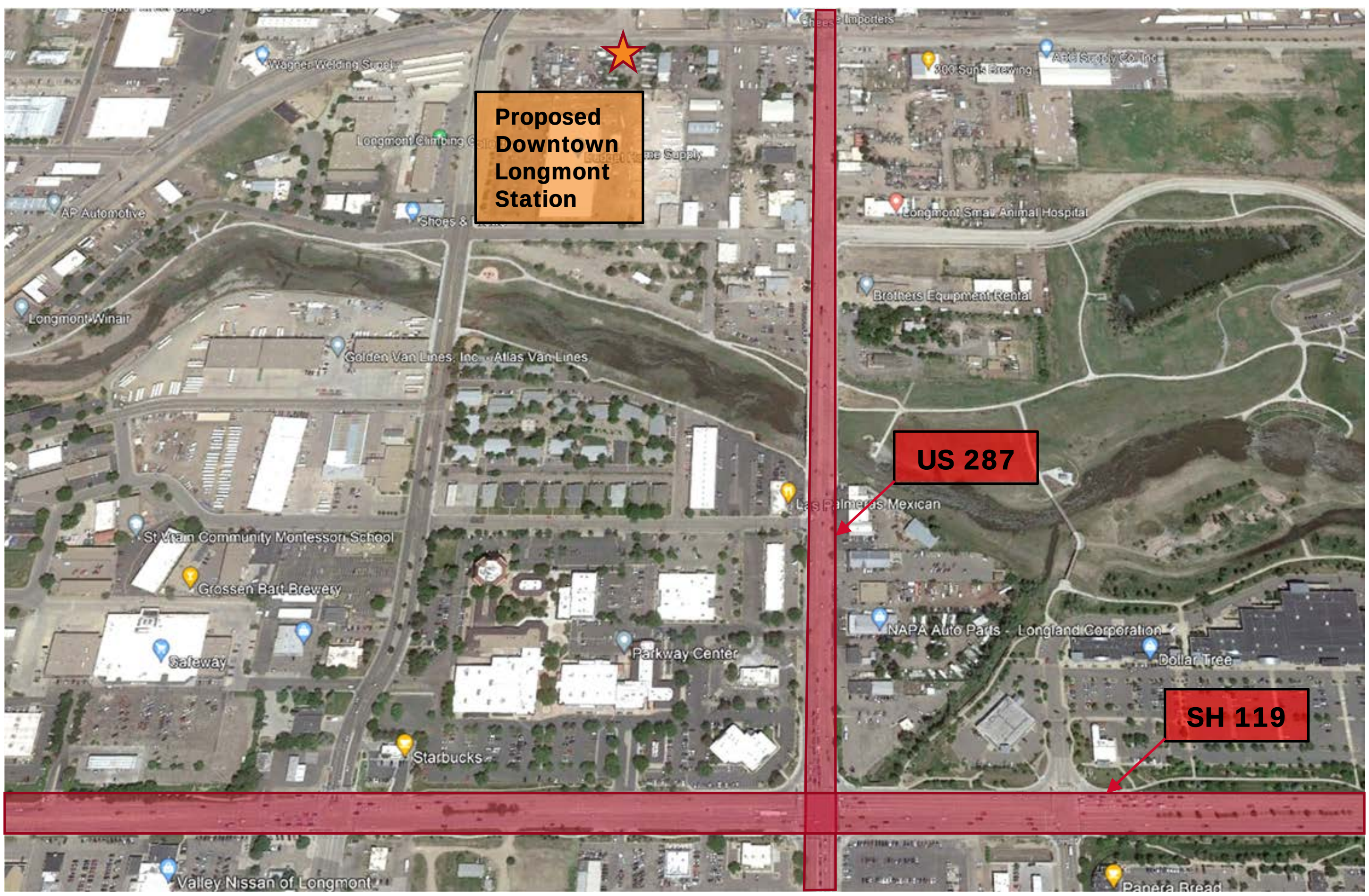
In addition, the construction of the commuter rail platform would require the closure of 1st Avenue between South Pratt Parkway and Main Street. An access to the station area would be provided just to the south of the Main Street/1st Avenue intersection.

Existing Roadway Network

Highways

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

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



Existing Conditions – Proposed Stations

Interchanges

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

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

Arterials

SH 119 (Ken Pratt Boulevard)

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

US 287 (Main Street)

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

Right-of-Way

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

Existing Conditions – Proposed Stations

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

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

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

Station Access

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

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

Major Utilities

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

Existing Conditions – Proposed Stations

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

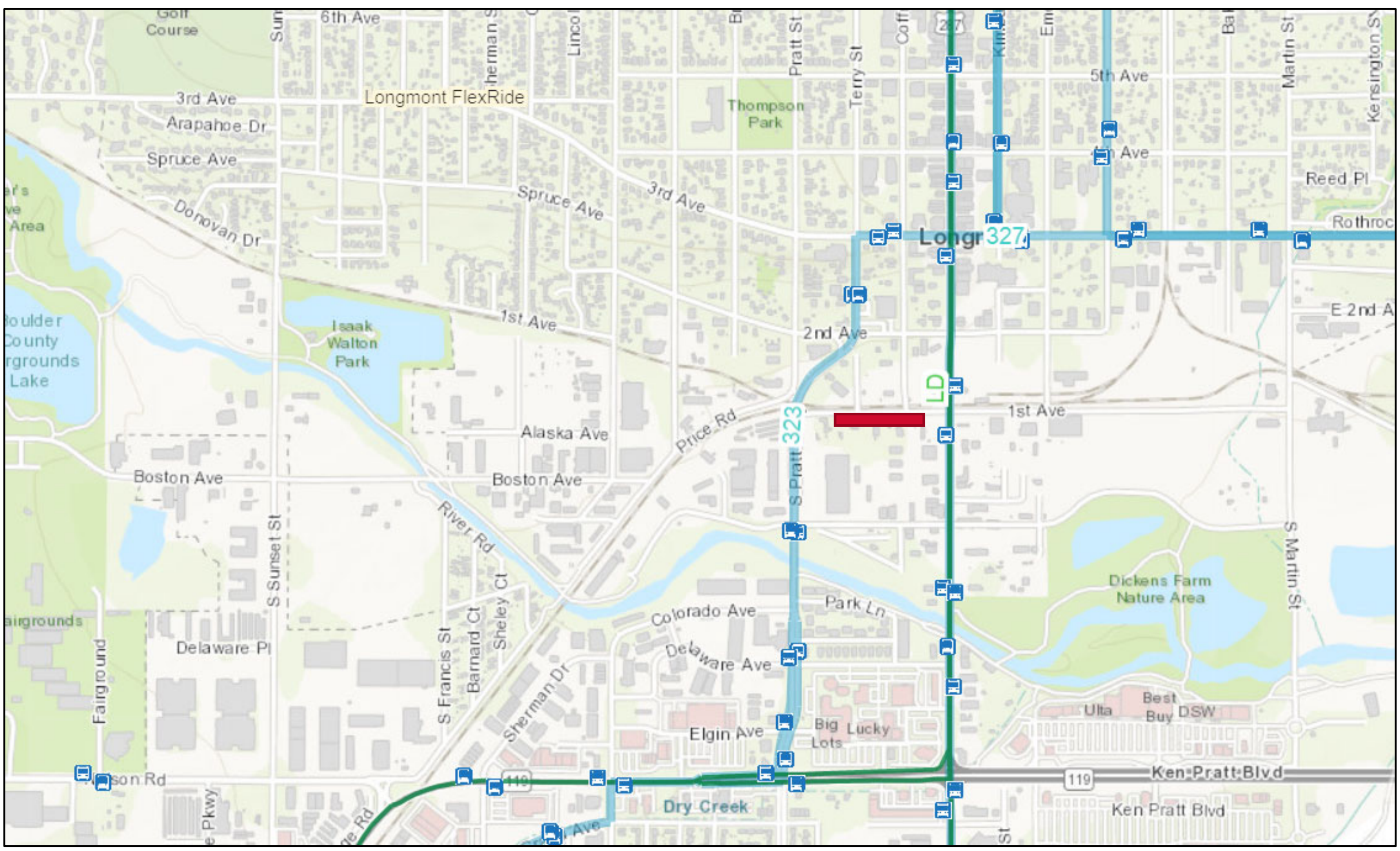
Existing Transit Service

Bus Routes Serving Station

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

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

Figure 52: Bus Routes Serving Downtown Longmont Station



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

Transit Service Levels

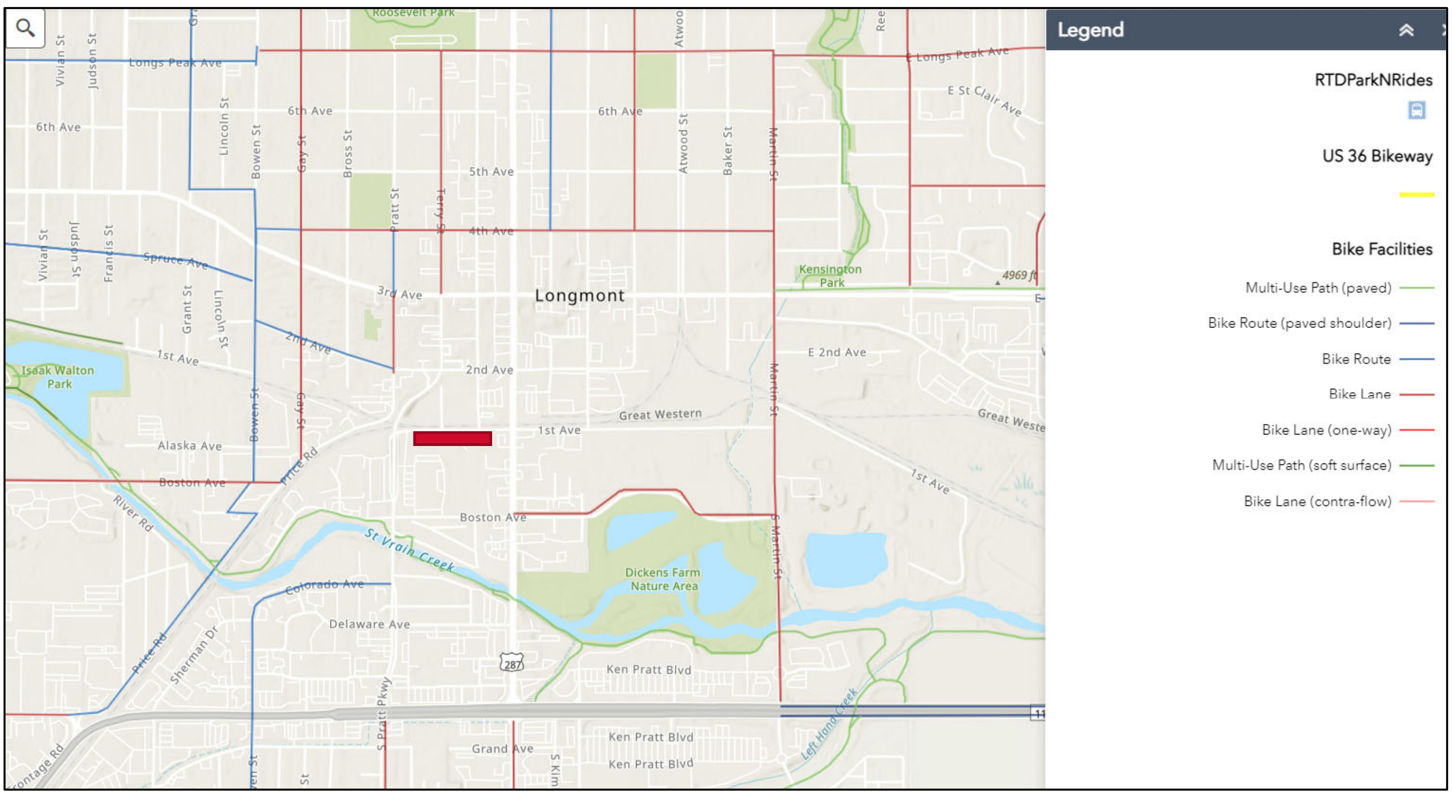
Under the Reimagine RTD plan, Route 323: Skyline Crosstown and Route 324: Main Street would be eliminated. The BOLT: Boulder/Longmont is classified as a connector route and would operate at 30-minute frequencies throughout the day and evening and 60-minute frequencies during late evening hours. The flex route would likely remain unchanged.

Existing Bicycle and Pedestrian Facilities

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

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

Figure 53: Bicycle Facilities near Proposed Downtown Longmont Station



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

Existing and Future Land Use

Existing Land Use

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

Existing Conditions – Proposed Stations

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

Figure 55: Recent Development near Potential Downtown Longmont Station

Existing Conditions – Proposed Stations

Existing Site Constraints

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

Adjacent Land Ownership

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

Table 10: Property Ownership at Proposed Downtown Longmont Station

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

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

Future Development

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

On the northwest corner of Main Street and 1st Avenue, the 121 Main Street mixed-use development with 183 multi-family units, 11,000 square feet of commercial space, and 310 space shared parking structure is also proposed. Land acquisition at the site is underway and construction is expected to begin in 2023. While there has not been a significant amount of redevelopment around the proposed Downtown Longmont Station to date, there likely will be in the years to come.

Observations / Conclusions

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

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

Existing Conditions – Proposed Stations

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

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

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

Milestone 3
Base Configuration Report

Appendix B

Rail Maintenance Facility Programming and Space Needs Report

Programming Report

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Programming Report

Appendix

Appendix A: Detailed Space Needs Program

Tables

Programming Report

Introduction

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

Purpose and Use

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

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

Report Overview

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

Methodology

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

Basis for Design

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

Space Needs Program Summary

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

Appendix A: Detailed Space Needs Program

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

Methodology

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

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

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

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

Basis for Design

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

Building Areas

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

Programming Report

Site Areas

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

Programming Workshop

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

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

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

The HDR Team members who participated in the workshop included:

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

Assumptions

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

Programming Report

Design Fleet

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

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

Service Plan

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

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

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

Site

There will be no run around track on the site.

Right-of-Way

BNSF will maintain the right-of-way.

Functional and Operational Design Data

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

Programming Report

Operations Administration

Function

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

Staffing

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

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

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

Table 1: Operations Administration Staffing

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

Vehicles

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

Key Planning Issues

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

Office Areas

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

Office Support Areas

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

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

Building Support Areas

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

Operations

Function

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

Staffing

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

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

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

Table 2: Operations Staffing

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

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

Vehicles

Table 3: Operations Non-Revenue Vehicles

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

Programming Report

Key Planning Issues

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

Crew Dispatch Areas

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

Contracted Security Office

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

Operators Support Areas

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

Training Areas

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

Building Support Areas

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

Vehicle Maintenance

Function

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

Staffing

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

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

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

Table 4: Vehicle Maintenance Staffing

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

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

Vehicle Parking

Table 5: Vehicle Maintenance Non-Revenue Vehicles

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

Vehicles Maintained

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

Key Planning Issues

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

Programming Report

Office Areas

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

Office Support Areas

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

Training Areas

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

Building Support Areas

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

Vehicle Maintenance

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

Programming Report

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

Tracks

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

Programming Report

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

Truck Shop

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

Shop Areas

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

Programming Report

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

Storage Areas

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

Shop Support Areas

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

Building Support Areas

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

Warehouse

Function

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

Staffing

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

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

Programming Report

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

Table 6: Warehouse Staffing

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

Vehicle Parking

Table 7: Warehouse Non-Revenue Vehicles

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

Key Planning Issues

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

Office Areas

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

Storage Areas

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

Programming Report

Building Storage Areas

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

Maintenance of Way

Function

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

Staffing

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

Key Planning Issues

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

Office Areas

- None

Shop Areas Storage Yard

- None

Storage Yard

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

Facility Maintenance

Function

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

Staffing

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

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

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

Table 8: Facility Maintenance Staffing

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

Programming Report

Vehicle Parking

Table 9: Facility Maintenance Non-Revenue Vehicles

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

Key Planning Issues

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

Shop Areas

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

Service and Clean

Function

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

Staffing

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

Table 10: Service and Clean Staffing

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

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

Vehicle Parking

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

Programming Report

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

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

Site Areas

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

Exterior Areas (Material Storage and Exterior Site Areas)

Fuel Tank Yard (if necessary)

Exterior Vehicle Parking

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

Table 11: Train Storage Yard

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

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

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

Exterior Areas (Material Storage and Exterior Site Areas):

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

Exterior Vehicle Parking

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

Space Needs Program

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

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

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

Space Needs Office Areas

Staffing Summary

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

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Table 12: Staffing Summary

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

Vehicle Summary

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

Table 13: Train Storage Yard

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

Table 14: Tracked Vehicle Storage Yard

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

Table 15: Non-Revenue Vehicle Summaries

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

Space Standards

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

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

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

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

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

Circulation Factors

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

Interior or Building Circulation

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

Table 18: Interior or Building Circulation Factors

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

Exterior and Exterior Parking Circulation

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

Table 19: Exterior and Exterior Parking Circulation

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

Site Circulation Factor

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

Space Needs Program Summary

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

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

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

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

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

Detailed Space Needs Program

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

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Table 20: Space Needs Program Summary

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

APPENDIX A.
DETAILED SPACE NEEDS PROGRAM

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

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

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

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

Space Needs Program April 4, 2023 Area/Space	Space Standards	PEAK SERVICE DMU - 15 CARS Qty. Staff	Space	PROGRAM Area (SF)	PEAK SERVICE EMU - 15 CARS Qty. Staff	Space	PROGRAM Area (SF)	FULL SERVICE DMU - 30 CARS Qty. Staff	Space	PROGRAM Area (SF)	FULL SERVICE EMU - 30 CARS Qty. Staff	Space	PROGRAM Area (SF)	Remarks
Building Support Areas														
Mechanical/Boiler Room	35 x 40		1	1,400		1	1,400		1	1,400		1	1,400	
Wastewater Treatment Room	35 x 25		1	875		1	875		1	875		1	875	
Main Electrical	35 x 30		1	1,050		1	1,050		1	1,050		1	1,050	
Water Entry Room	10 x 20		1	200		1	200		1	200		1	200	
Fire Entry Room	10 x 20		1	200		1	200		1	200		1	200	
Subtotal Storage Areas				3,725			3,725			3,725			3,725	
SUBTOTAL VEHICLE MAINTENANCE SHOP				**47,636**			**48,636**	**0**		**49,128**			**51,128**	
Circ/Struc (Net: Gross)														
Circulation/Struct	30%			14,291			14,600			14,740			15,340	
TOTAL VEHICLE MAINTENANCE SHOP				**61,927**			**63,236**			**63,868**			**66,468**	

WAREHOUSE	Space Standards	PEAK SERVICE DMU - 15 CARS Qty. Staff	Space	PROGRAM Area (SF)	PEAK SERVICE EMU - 15 CARS Qty. Staff	Space	PROGRAM Area (SF)	FULL SERVICE DMU - 30 CARS Qty. Staff	Space	PROGRAM Area (SF)	FULL SERVICE EMU - 30 CARS Qty. Staff	Space	PROGRAM Area (SF)	Remarks
Office Areas														
Parts Counter			1	250		1	250		1	250		1	250	
Supervisor	120	1		120	1		120	1		120	1		120	
Warehouse Workers	64	2		128	2		128	7		448	7		448	
Subtotal Office Areas		3	1	498	3	1	498	8	1	818	8	1	818	
Storage Areas														
Tool Crib			1	325		1	325		1	325		1	325	
VLM	15 x 15		1	225		1	225		2	450		2	450	
Large Item Storage (Pallet Rack)			1	3,500		1	3,500		1	3,500		1	3,500	CRMF (7,760 sf)
Parts Mezzanine			1	1,200		1	1,200		1	1,200		1	1,200	CRMF (3,500 sf)
Shipping/Receiving			1	1,500		1	1,500		1	1,500		1	1,500	
Forklift Charging	10 x 15		1	150		1	150		2	300		2	300	
Long Term (Overflow) Storage														
Subtotal Storage Areas			6	6,900		6	6,900		8	7,275		8	7,275	
Building Support Areas														
Electrical Room			1	150		1	150		1	150		1	150	
Mechanical			1	150		1	150		1	150		1	150	
Data/Comm Room			1	80		1	80		1	80		1	80	
Subtotal Building Support Areas			3	380		3	380		3	380		0	380	
SUBTOTAL WAREHOUSE		**3**	**10**	**7,778**	**3**	**10**	**7,778**	**8**	**12**	**8,473**	**8**	**9**	**8,473**	
Net: Gross														
Circulation/Struct	25%			1,945			1,945			2,118			2,118	
TOTAL WAREHOUSE		**3**		**9,723**	**3**		**9,723**	**8**		**10,591**	**8**		**10,591**	

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

Area/Space	Space Standards	DMU - 15 Staff	Space	Area (SF)	EMU - 15 Staff	Space	Area (SF)	DMU - 30 Staff	Space	Area (SF)	EMU - 30 Staff	Space	Area (SF)	Remarks
TRAIN WASH														
Wash Building														
Wash Lane	25 x 150		0	0		0	0		0	0		0	0	Assume at CRMF
Wash Equipment Room	15 x 120		0	0		0	0		0	0		0	0	Assume at CRMF
Storage Room			0	0		0	0		0	0		0	0	
Subtotal Wash Building				0			0			0			0	
Building Support Areas														
Electrical Room			1	0		1	0		1	0		1	0	
Water Entry Room			1	0		1	0		1	0		1	0	
Data/Comm Room			1	0		1	0		1	0		1	0	
Subtotal Building Support Areas				0			0			0			0	
SUBTOTAL TRAIN WASH				**0**			**0**			**0**			**0**	
Circ/Mech/Elec/Struc (Net: Gross)														
Circulation/Struct	20%			0			0			0			0	
TOTAL TRAIN WASH		**5**		**0**	**5**		**0**	**14**		**0**	**14**		**0**	

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

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

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

Milestone 3
Base Configuration Report

Appendix C
Existing Crossings Inventory

Peak Service Study
Northwest Rail

We make lives better through connections.

Contents

At-Grade Crossings Inventory

At-Grade Crossings Inventory

Tables

At-Grade Crossings Inventory

Acronyms and Abbreviations

ADT	Average Daily Traffic
FRA	Federal Railroad Administration

Introduction

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

Contents

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

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

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

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

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

At-Grade Crossings Inventory

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

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

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

Westminster Crossings

Westminster Crossings Overview

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

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

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

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

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

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

At-Grade Crossings Inventory

Westminster Crossing Elements and Conditions

Table 1: Westminster - Basic Roadway Information

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

Table 2: Westminster - Pedestrian Elements

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

Table 3: Westminster - Safety/Control Elements

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

Table 4: Westminster - Pavement/Crossing Condition

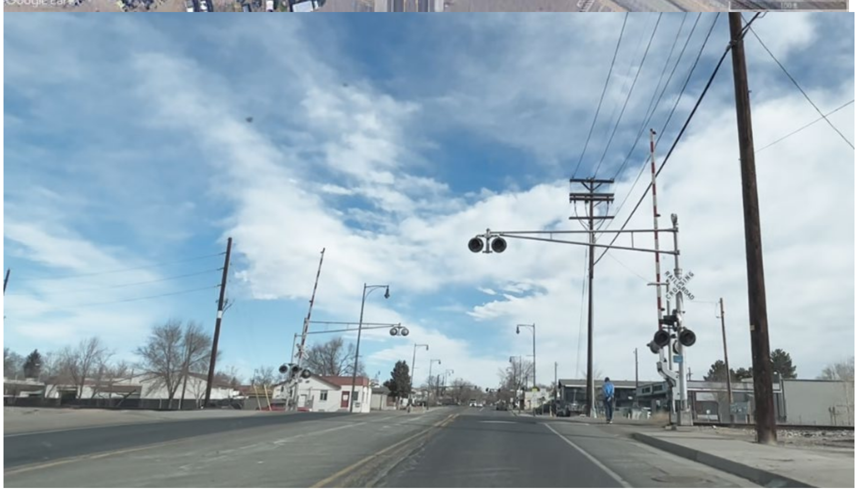
Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
Lowell Blvd.	FAIR	FAIR	S	N,S
72nd Ave.	POOR	FAIR	W	E
Bradburn Blvd	FAIR	FAIR	W	S
76th Ave	TBD	TBD	TBD	TBD
80th Ave	GOOD	GOOD	W	S
88th Ave	GOOD	GOOD	N,S	E,W
Pierce St	GOOD	GOOD	W	NONE
Old Wadsworth Blvd	POOR	FAIR	N,S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

At-Grade Crossings Inventory

Lowell Boulevard

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

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



Notes:

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

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

At-Grade Crossings Inventory

72nd Avenue

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

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

Notes:

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

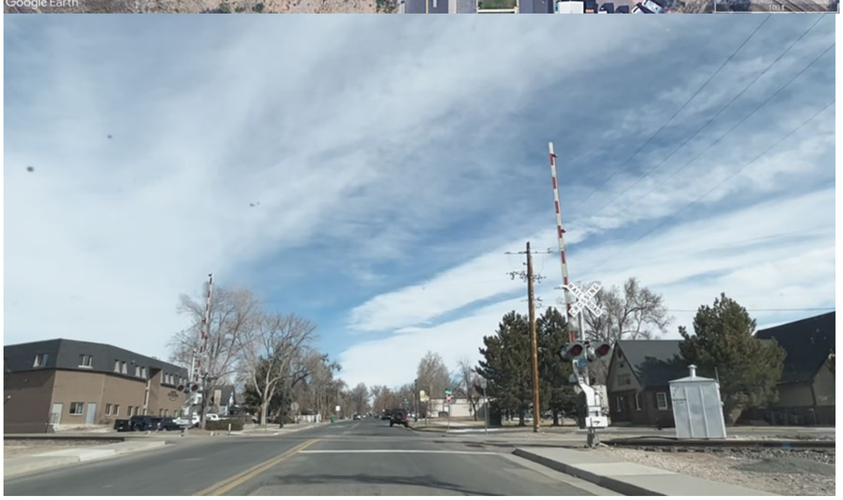
Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. Pedestrian activity is expected to be low relative to other crossings, while vehicle volumes are expected to be high compared to other crossings. Westminster plans to make this crossing a quiet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

At-Grade Crossings Inventory

Bradburn Boulevard

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

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



Notes:

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

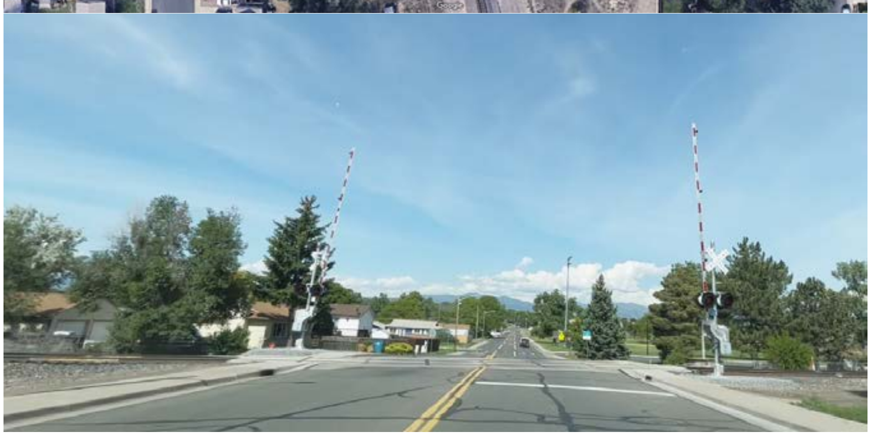
Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. Volumes of both vehicles and pedestrians are expected to be lower relative to other crossings along the Northwest Rail Corridor. Westminster plans to make this crossing a quiet zone in the future,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

At-Grade Crossings Inventory

76th Avenue

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

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



Notes:

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

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

At-Grade Crossings Inventory

80th Avenue

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

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

Notes:

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

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

At-Grade Crossings Inventory

88th Avenue

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

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

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

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

At-Grade Crossings Inventory

Pierce Street

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

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

Notes:

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

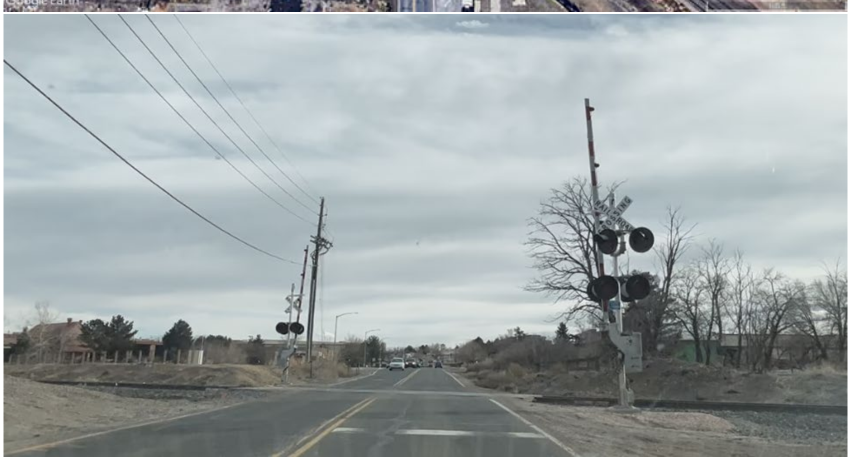
Summary: The crossing uses medians to prevent vehicles from crossing the road to drive around closing gates, but it is not designated as a quiet zone. The crossing is expected to have a low vehicle volume relative to other crossings along the Northwest Rail Corridor but is expected to have a medium pedestrian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

At-Grade Crossings Inventory

Old Wadsworth Boulevard

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

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



Notes:

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

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

Broomfield Crossings

Broomfield Crossings Overview

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

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

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

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

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

At-Grade Crossings Inventory

Broomfield Crossing Elements and Conditions

Table 5: Broomfield - Basic Roadway Information

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

Table 6: Broomfield - Pedestrian Elements

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

Table 7: Broomfield - Safety/Control Elements

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

Table 8: Broomfield - Pavement/Crossing Condition

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

At-Grade Crossings Inventory

112th Avenue

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

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

Notes:

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

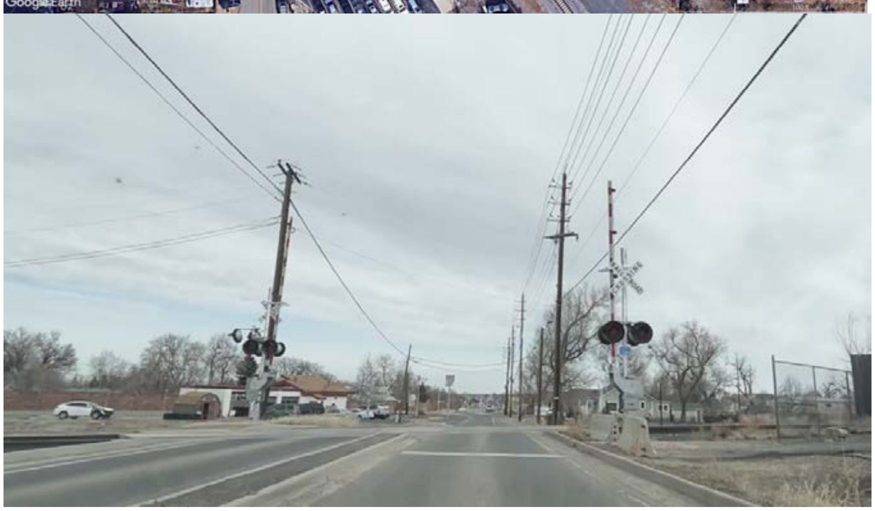
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing lacks any pedestrian or bicycle infrastructure. The crossing is expected to have medium vehicle and low pedestrian volumes relative to other crossings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

At-Grade Crossings Inventory

120th Avenue

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

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



Notes:

- Low pedestrian activity
  - Industrial area, no sidewalk

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

At-Grade Crossings Inventory

Nickel Street

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

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

Notes:

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

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

At-Grade Crossings Inventory

Brainard Drive

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

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

Notes:

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

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

Louisville Crossings

Louisville Crossings Overview

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

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

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

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

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

At-Grade Crossings Inventory

Louisville Crossing Elements and Conditions

Table 9: Louisville - Basic Roadway Information

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

Table 10: Louisville - Pedestrian Elements

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

Table 11: Louisville - Safety/Control Elements

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

Table 12: Louisville - Pavement/Crossing Condition

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

At-Grade Crossings Inventory

Dillon Road

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

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

Notes:

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

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

At-Grade Crossings Inventory

Pine Street

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

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

Notes:

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

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

At-Grade Crossings Inventory

Griffith Street

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

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

Notes:

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

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

At-Grade Crossings Inventory

South Boulder Road

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

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

Notes:

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

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

Lafayette Crossings

Lafayette Crossings Overview

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

- Baseline Road

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

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

At-Grade Crossings Inventory

Lafayette Crossing Elements and Conditions

Table 13: Lafayette - Basic Roadway Information

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

Table 14: Lafayette - Pedestrian Elements

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

Table 15: Lafayette - Safety/Control Elements

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

Table 16: Lafayette - Pavement/Crossing Condition

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

At-Grade Crossings Inventory

Baseline Road

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

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

Notes:

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

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

City of Boulder Crossings

Boulder Crossings Overview

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

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

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

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

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

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

At-Grade Crossings Inventory

City of Boulder Crossing Elements and Conditions

Table 17: City of Boulder - Basic Roadway Information

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

Table 18: City of Boulder - Pedestrian Elements

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

Table 19: City of Boulder - Safety/Control Elements

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

Table 20: City of Boulder - Pavement/Crossing Condition

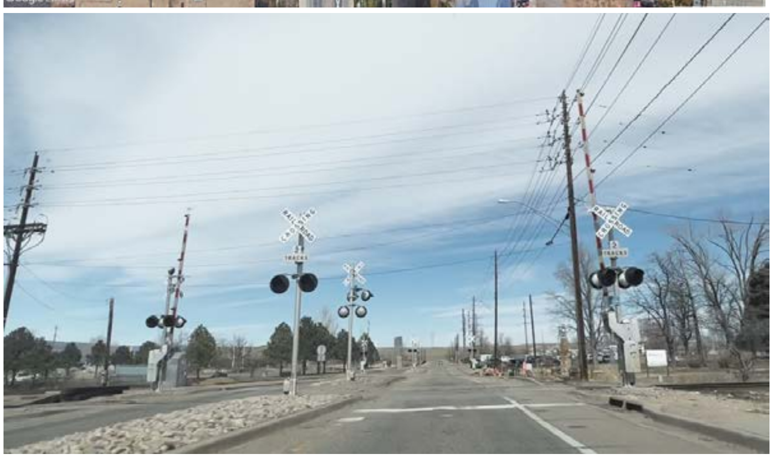
Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
63rd St	FAIR	POOR	W	NONE
55th St	GOOD	FAIR	E,W	N, S
Pearl Pkwy	GOOD	GOOD	N, S, E, W	N, S
Valmont Rd	FAIR	GOOD	E, W	N, S
Mineral Rd (SH 52)	FAIR	FAIR	N, S	N, S

At-Grade Crossings Inventory

63rd Street (North of Arapahoe Avenue)

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

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



Notes:

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

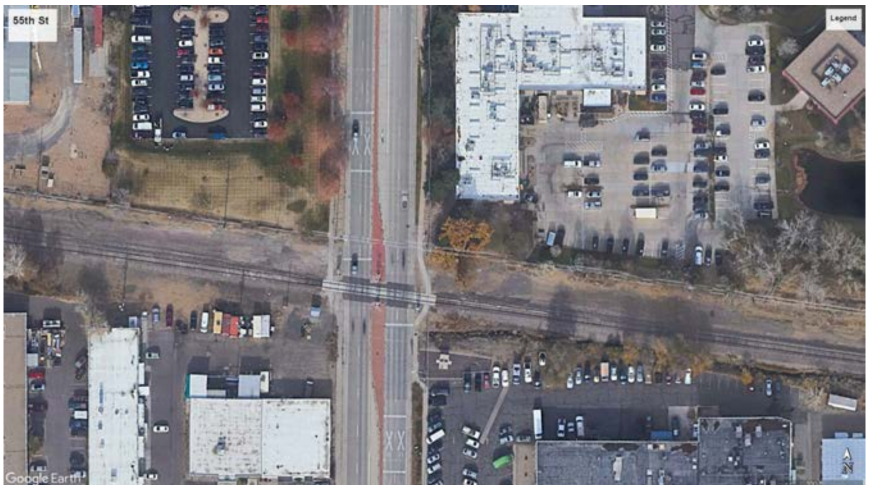
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing lacks pedestrian infrastructure as sidewalks terminate south of the crossing and continue north of the crossing. The crossing includes bicycle lanes along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

At-Grade Crossings Inventory

55th Street (North of Arapahoe Avenue)

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

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



Notes:

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

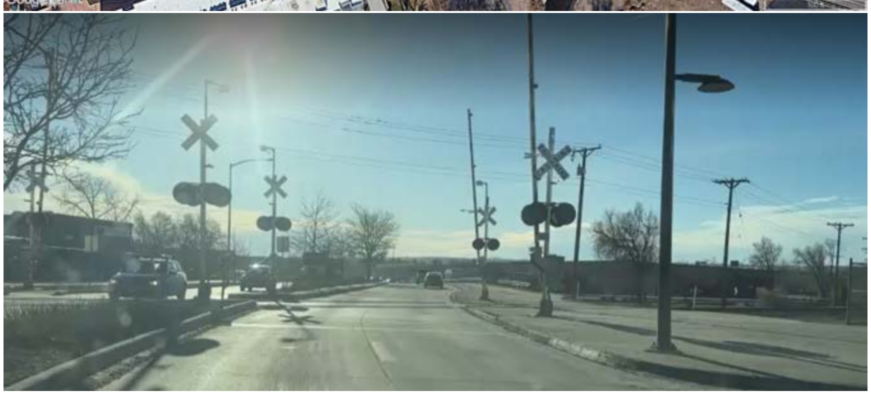
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has good pedestrian infrastructure and includes bicycle lanes. The crossing is expected to have medium vehicle and low pedestrian volumes relative to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

At-Grade Crossings Inventory

Pearl Parkway

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

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



Notes:

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

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

At-Grade Crossings Inventory

Valmont Road

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

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

Notes:

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

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

At-Grade Crossings Inventory

Mineral Road (SH 52)

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

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

Notes:

- Low pedestrian activity
  - Surrounded by open land and highway

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

Boulder County Crossings

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

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

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

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

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

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

At-Grade Crossings Inventory

Boulder County Crossing Elements and Conditions

Table 21: Boulder County - Basic Roadway Information

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

Table 22: Boulder County - Pedestrian Elements

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

Table 23: Boulder County - Safety/Control Elements

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

Table 24: Boulder County - Pavement/Crossing Condition

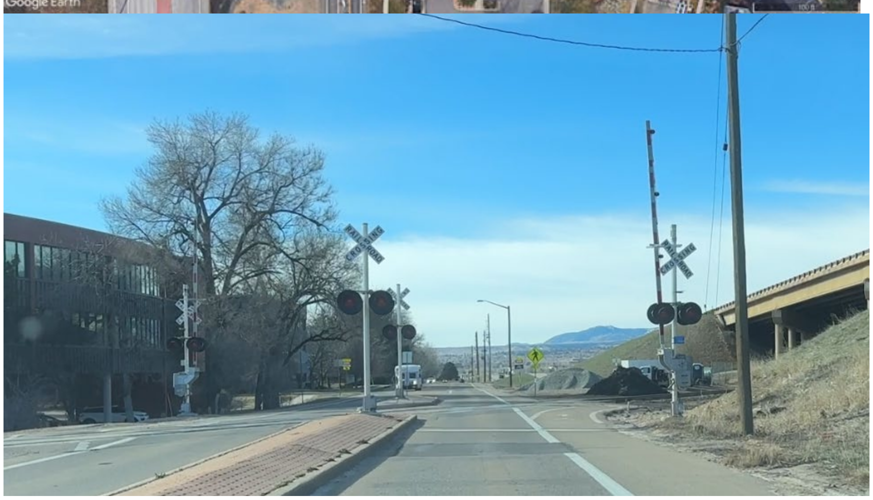
Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
47th St	FAIR	FAIR	E, W	NONE
Independence Rd	FAIR	POOR	N, S, E, W	NONE
Jay Rd	FAIR	FAIR	E, W	E, W
55th St	FAIR	FAIR	N	NONE
63rd St	FAIR	FAIR	N, S, E, W	N, S, E, W
Monarch Rd	GOOD	FAIR	E	W
Niwot Rd	FAIR	GOOD	N,S	N,S
2nd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

At-Grade Crossings Inventory

47th Street

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

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



Notes:

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

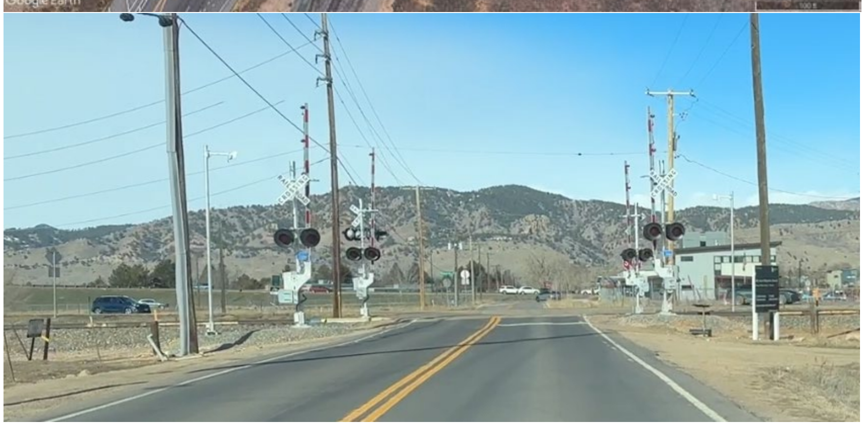
Summary: The crossing, designated as a quiet zone, includes medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has bicycle lanes but no sidewalks or pedestrian infrastructure. Medium pedestrian activity is expected due to nearby housing, business, and walking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

At-Grade Crossings Inventory

Independence Road

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

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



Notes:

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

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

At-Grade Crossings Inventory

Jay Road

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

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

Notes:

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

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

At-Grade Crossings Inventory

55th Street (N)

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

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

Notes:

- Low pedestrian activity in undeveloped area

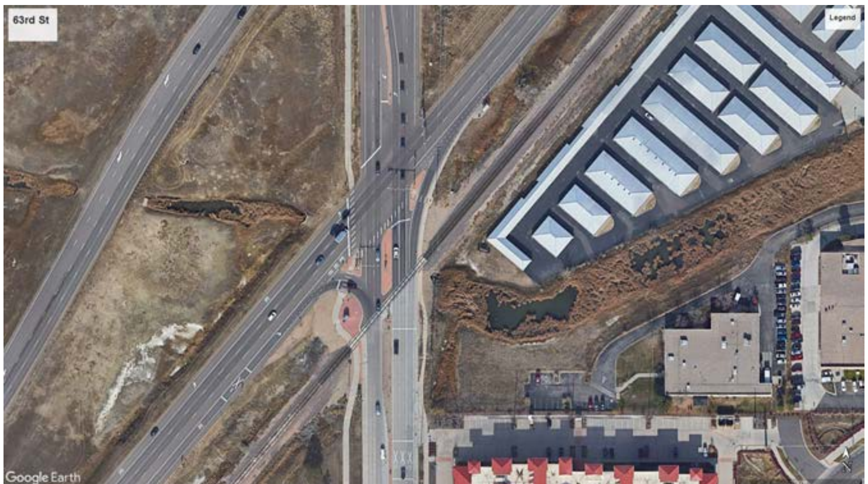
Summary: The crossing, designated as a quiet zone, uses flexible bollards at the roadway centerline to discourage vehicles from crossing the road to drive around closing gates. The crossing has no bicycle or pedestrian infrastructure. Low pedestrian activity is expected due to the rural surroundings,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

At-Grade Crossings Inventory

63rd Street (N)

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

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



Notes:

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

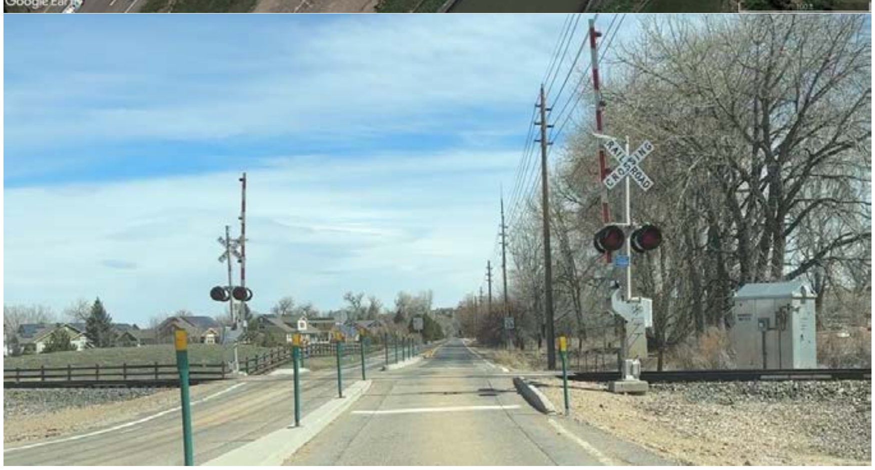
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has bicycle lanes, and sidewalks are in good condition. Pedestrian activity is expected to be low at this location while roadway volume is high.

At-Grade Crossings Inventory

Monarch Road

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

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



Notes:

- Low pedestrian activity, undeveloped area

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

At-Grade Crossings Inventory

Niwot Road

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

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

Notes:

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

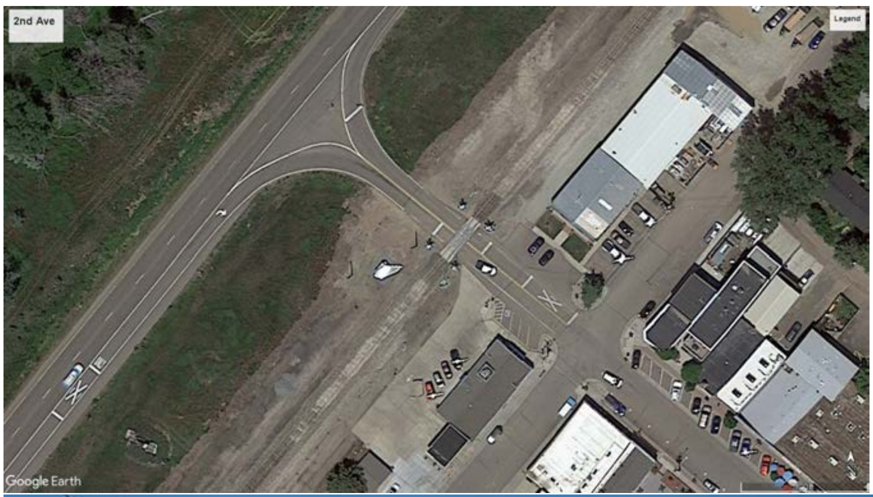
Summary: The crossing, designated as a quiet zone, uses medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has bicycle lanes and a sidewalk on the north side, with moderate pedestrian activity expected due to the connection between the RTD Park-n-Ride at Diagonal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

At-Grade Crossings Inventory

2nd Avenue

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

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



Notes:

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

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

At-Grade Crossings Inventory

83rd Street

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

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

Notes:

- Low pedestrian activity in undeveloped, rural area

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

At-Grade Crossings Inventory

Ogalalla Road

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

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

Notes:

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

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

Longmont Crossings

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

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

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

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

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

At-Grade Crossings Inventory

Longmont Crossing Elements and Conditions

Table 25: Longmont - Basic Roadway Information

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

Table 26: Longmont - Pedestrian Elements

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

Table 27: Longmont - Safety/Control Elements

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

Table 28: Longmont - Pavement/Crossing Condition

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

At-Grade Crossings Inventory

Hover Street

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Medium**
Pedestrian Activity:	**Medium**

Notes:

- No pedestrian-detectable warning panels at pedestrian crossings
- Medium pedestrian activity due to the presence of businesses near the crossing

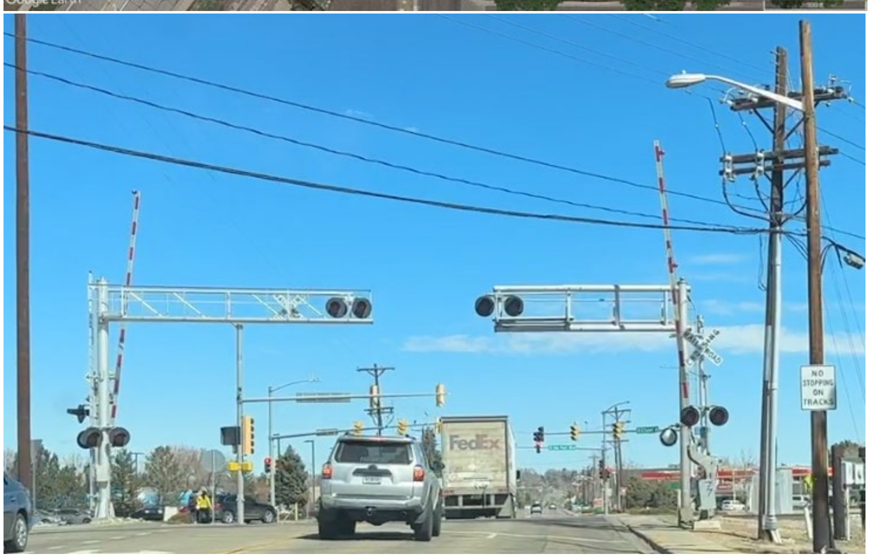
Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. Volumes of both vehicles and pedestrians fall in the medium range. Sidewalks are present, but there is no bicycle infrastructure at this crossing. Longmont plans to make this crossing a quiet zone in the future, but no specific improvements have been identified at this time.

At-Grade Crossings Inventory

Sunset Street

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**Shared Use Arrows**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Medium**



Notes:

- No pedestrian-detectable warning panels at pedestrian crossings
- Medium pedestrian activity due to the presence of businesses near the crossing

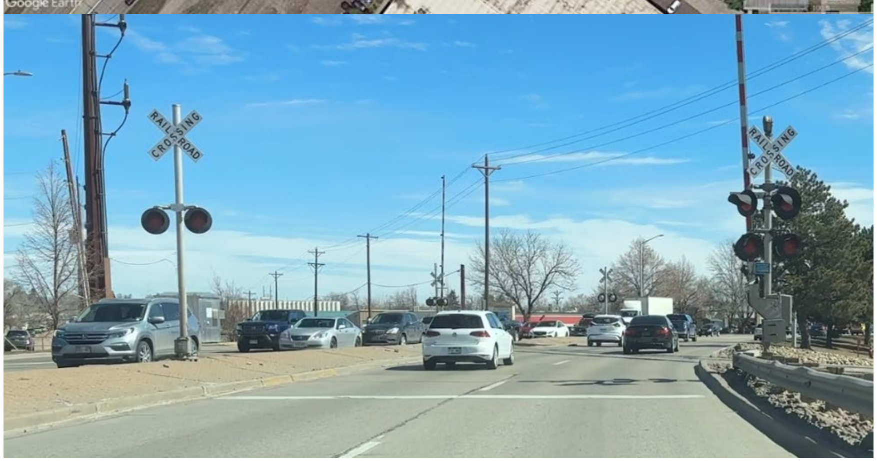
Summary: The crossing does not have safety features to prevent vehicles from driving around closing gates. Pedestrian activity falls in the medium range, but roadway volumes are low at this crossing. Sidewalks are present, and there are shared-use arrows striped on the roadway.

At-Grade Crossings Inventory

Ken Pratt Boulevard

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**High**



Notes:

- No pedestrian-detectable warning panels at pedestrian crossings
- High pedestrian activity
  - Busy area with lots of businesses
- Highest volume roadway crossing along the line

Summary: The crossing, designated as a quiet zone, includes medians to prevent vehicles from crossing the road to drive around closing gates. The crossing has the highest volume of vehicles along the Northwest Rail Corridor and has high pedestrian activity.

At-Grade Crossings Inventory

Terry Street

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**No**
Bicycle Infrastructure:	**No**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Crossing is not controlled by a railroad signal
- Proximity to the proposed terminal station will greatly increase pedestrian activity in future

Summary: This crossing is not controlled by any railroad signal and has no safety features for vehicles. Currently, vehicle and pedestrian traffic are very low, but both may increase due to the proximity of this crossing to the Downtown Longmont Station. The crossing is slated to become a quiet zone in the future, but improvements have yet to be determined.

At-Grade Crossings Inventory

Coffman Street

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**No**
Bicycle Infrastructure:	**No**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Crossing is not controlled by a railroad signal
- Proximity to the proposed terminal station will greatly increase pedestrian activity in future

Summary: This crossing is not controlled by any railroad signal and has no safety features for vehicles. Volumes at the crossing are very low for both vehicles and pedestrians currently but may be set to increase due to the proximity of this crossing to the Downtown Longmont Station. It is designated to become a quiet zone in the future, but improvements to the crossing have yet to be determined.

Longmont Crossings (Maintenance Facility)

Four at-grade crossings lie between the end of the passenger line at Downtown Longmont Station and the proposed commuter rail maintenance facility in Longmont. These crossings are:

- Main Street (US 287)
- Emery Street
- Martin Street
- Sugar Mill Road

These crossings are not part of the Northwest Rail passenger line that would be used by the peak service trains. Future planning work as part of this study will identify the exact location of the commuter rail maintenance facility in Longmont. The four crossings in this section would be used at different frequencies and intervals than the at-grade crossings on the passenger line, and the schedule of operations for RTD trains at these crossings have not been determined.

The Main Street crossing experiences high vehicular traffic and lies near the Downtown Longmont Station. It is also south of the business district in downtown Longmont but lies near some businesses and large apartment buildings. This crossing is the only one of the four crossings between he proposed station and proposed maintenance facility that is planned as a quiet zone in the future. Improvements made to the crossing as part of the quiet zone certification process are expected but have not yet been specifically determined yet. It has sidewalks on both sides, and runs immediately parallel to 1st Avenue, which means the crossing substantially influences signal operations at the 1st Avenue & Main Street intersection. The crossing is well illuminated by lighting from the adjacent signal.

The Emery Street crossing lies approximately a quarter mile east of the Main Street crossing. This crossing has been recently improved, with new signal equipment for both the roadway and the railroad as well as sidewalks, drainage infrastructure, a median north of the crossing, and other civil improvements. Google Street View imagery from July 2019 shows that the crossing was previously not signalized, nor was the nearby Emery Street & 1st Avenue intersection. Despite these improvements, the crossing is not designated as a quiet zone and is not planned to be in the future.

The Martin Street crossing is controlled by dual gates and medians, with the roadway and striping in fair condition. The median south of the crossing is approximately 15 feet long and is unlikely to be considered as a safety feature that would prevent vehicles from crossing over the tracks to avoid being stopped behind the crossing gates. The crossing has a wide sidewalk on the west side, and no pedestrian infrastructure on the east side.

The Sugar Mill Road crossing is on a very low-volume roadway and is in poor condition. The crossing is not controlled by railroad signals and is marked only by standard crossbuck signs which are also in poor condition.

At-Grade Crossings Inventory

Longmont (Maintenance Facility) Crossing Elements and Conditions

Table 29: Longmont (Maintenance Facility) – Basic Roadway Information

Crossing	FRA ID	Quiet Zone	Roadway Classification	Lanes	Approx. AADT*	Crossing Control Type	Median/ Channelizing?	Proposed Siding?
Main St	244849V	FUTURE	Principal Arterial	4	22,000 - 33,000	TWO-QUAD	NORTH SIDE	NO
Emery St	244850P	NO	Local	2	300 - 500	FOUR-QUAD	NORTH SIDE	NO
Martin St	057133C	NO	Minor Arterial	2	8,500 - 13,000	TWO-QUAD	MEDIAN	NO
Sugar Mill Rd	849313N	NO	Local	2	50 - 100	NONE	NO	NO

Table 30: Longmont (Maintenance Facility) - Pedestrian Elements

Crossing	Pedestrian Activity	Existing Ped Infrastructure	NWR Station Proximity?	Detectable Warning?
Main St	MEDIUM	E, W	YES	NONE
Emery St	LOW	E, W	NO	NONE
Martin St	LOW	W	NO	NONE
Sugar Mill Rd	LOW	NONE	NO	NONE

Table 31: Longmont (Maintenance Facility) - Safety/Control Elements

Crossing	Crossing Panel Condition	Crossing Arms	Signal Poles	Pole-Mounted Flashing Light Pairs	Cantilevered Flashing Light Pairs	Signal to Adjacent Road?
Main St	GOOD	3	3	5	0	NO
Emery St	GOOD	4	5	9	0	YES, BOTH DIR. OF 1ST AVE
Martin St	FAIR	4	5	8	0	1 TO EAST DWY, 3 TO WEST DWY
Sugar Mill Rd	POOR	NONE	0	0	0	NO

Table 32: Longmont (Maintenance Facility) - Pavement/Crossing Condition

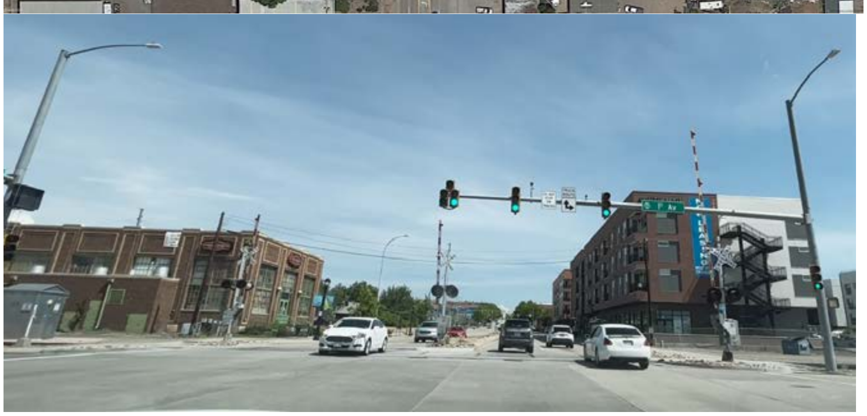
Crossing	Striping Conditions	Asphalt Condition	Audible Warning Location(s)	Luminaires
Main St	GOOD	GOOD	N	N, S, E, W
Emery St	GOOD	GOOD	N, S	N, S, E, W
Martin St	FAIR	FAIR	2 N, 2 S	N, S
Sugar Mill Rd	POOR	POOR	NONE	NONE

At-Grade Crossings Inventory

Main Street (US 287)

Crossing Features	
Quiet Zone:	**Future**
Quad Gates:	**No**
Median:	**North Side Only**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**High**
Pedestrian Activity:	**Medium**



Notes:

- Crossing is extremely close to the 1st & Main intersection
- Proximity to the proposed terminal station may increase pedestrian activity in future

Summary: This crossing is controlled by dual gates, with a median between travel directions on the north side but not the south side. Pedestrian activity is medium at this location due to proximity to the proposed terminal Downtown Longmont station and downtown Longmont businesses, however most of downtown Longmont lies north of the crossing. The crossing is slated to become a quiet zone in the future, but improvements have yet to be determined.

At-Grade Crossings Inventory

Emery Street

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**Yes**
Median:	**North Side Only**
Roadway Condition:	**Good**
Pedestrian Infrastructure:	**Good**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**

Notes:

- Aerial imagery is out of date, the crossing has been recently improved as of June 2023
- Quad gates have radar installed to detect pedestrians and bicyclists in crossing
- Low pedestrian activity in industrial area, but near large apartment complex
- Crossing lies in the middle of the signalized 1st & Emery Intersection
- Crossing includes three BNSF tracks, only one of which is proposed to be used for access to RTD maintenance facility

Summary: This crossing is controlled by quad gates and has a median on the north side of the crossing. Sidewalks are present and the roadway and crossing equipment is in excellent shape; the crossing was recently improved to include signalization and roadway rehabilitation. Vehicle and pedestrian volumes are low at this crossing. Although the crossing is in good condition and has added safety features, it is not designated as a quiet zone and is not planned to become a quiet zone.

At-Grade Crossings Inventory

Martin Street

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**Yes**
Roadway Condition:	**Fair**
Pedestrian Infrastructure:	**West Side Only**
Bicycle Infrastructure:	**Bike Lanes**

Traffic/Pedestrian Activity	
Road Volume:	**Medium**
Pedestrian Activity:	**Low**

Notes:

- Median at south end of crossing is short and not likely to prevent vehicles from driving around closing gates
- Crossing includes two BNSF tracks
- Low pedestrian activity in industrial area
- No sidewalk on east side, wide sidewalk with no pedestrian detectable warning on west side

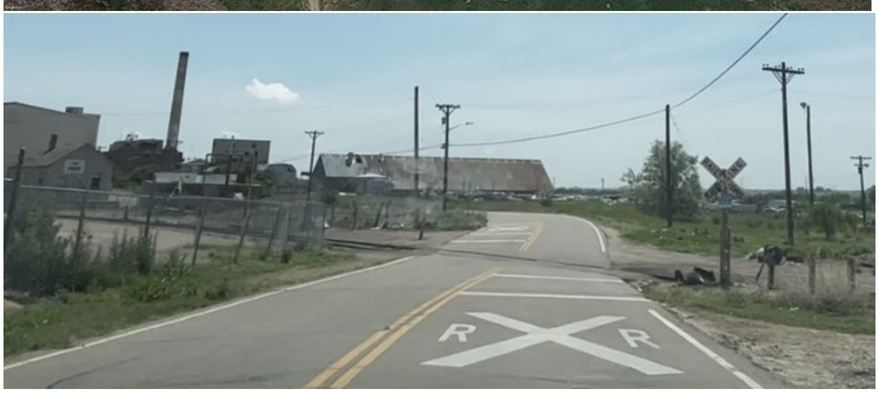
Summary: This crossing is controlled by dual gates and has medians on both sides of the crossing. The median on the south side of the crossing has a length of approximately 15 feet, which is shorter than other medians used to control potential crossover movements at other crossings. Vehicle and pedestrian volumes are low at this crossing.

At-Grade Crossings Inventory

Sugar Mill Road

Crossing Features	
Quiet Zone:	**No**
Quad Gates:	**No**
Median:	**No**
Roadway Condition:	**Poor**
Pedestrian Infrastructure:	**None**
Bicycle Infrastructure:	**None**

Traffic/Pedestrian Activity	
Road Volume:	**Low**
Pedestrian Activity:	**Low**



Notes:

- Crossing is unsignalized
- Low pedestrian activity in unpopulated industrial area
- No crossing panel present

Summary: This crossing is not controlled by any railroad signal and has no safety features for vehicles. The crossing also has no sidewalk. The roadway is in poor condition, and the tracks cross the asphalt with no crossing panel. Vehicle volumes and pedestrian volumes are very low at this crossing.

Next Steps

This document provides a planning-level inventory of existing conditions of at-grade crossings of the BNSF Railway along the proposed Northwest Rail alignment. The document details the existing safety features, quiet zone status, general vehicular and pedestrian activity, and the general condition of infrastructure at each of the 40 crossings.

Moving forward, this inventory will allow the project team to identify potential infrastructure needs at the various crossings to implement the Northwest Rail Peak Service along the proposed corridor. A follow-up document will be developed that includes a menu of improvement options designed to meet safety expectations for each crossing. Cost estimates will be developed based on the menu of options to provide an overall cost estimate/range for implementing the proposed Northwest Rail.

Menu of Improvement Options

Options used to achieve quiet zone status on other crossings in corridor:

- Quad gates + radar detection
- Raised medians
- Channelizing devices
- Pavement repairs
- Enhanced signing & striping
- Advance warning signs
- Constant warning time circuitry
- Detached sidewalks
- Improved crossing panels

Other improvement options:

- Add or improve pedestrian crossing
- Video cameras

Milestone 3
Base Configuration Report

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Northwest Rail

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Introduction

Differentiator resources were identified from the Existing Conditions report. Differentiator resources are those that can influence decisions during the planning process, require additional scoping ahead of NEPA, and potentially require a larger level of effort during NEPA to determine impacts and commit to mitigations. Please note, the Planning and Environmental Study is not a substitute for the NEPA process, and all resources would be considered during scoping for the NEPA phase, as appropriate.

The Base Configuration for the Project was confirmed during Milestone 3. The differentiator resources discussed below were assessed for impacts as part of the Peak Service Planning and Environmental Study. This methodology is based on a review of the Corridor Conditions Report. The Corridor Conditions Report Contains instructions for "Next Steps" for all resources.

Air Quality

Brief Discussion of Resource Studied

Air quality issues are considered in infrastructure planning to determine regional and local transportation conformity requirements and to be considered part of overall impacts on communities. Mobile and stationary sources of airborne pollution can affect natural resources and human health.

Data Collection/Methodology

Air quality was assessed within counties serviced by the NWR Corridor, including Adams, Boulder, Broomfield, Denver, and Jefferson counties. The study area is located within the Denver Regional Council of Governments (DRCOG) planning area.

Information on the latest National Ambient Air Quality Standards (NAAQS) nonattainment, maintenance, and attainment designations for the study area was obtained from the U.S. Environmental Protection Agency (EPA) online Green Book website (based on updates through October 31, 2022) (EPA, 2022), which provides listings of NAAQS compliance status by state and county (EPA, 2022).

Findings/Results

Utilization of an electric locomotive for operations on the NWR ensures no emissions are produced. However, if diesel locomotives or a Diesel Multiple Units (DMU) are employed, a minimal level of emissions would be expected during the operation. These emissions would primarily occur during two peak periods: morning peak hours from approximately 6:30am to 8:35am and afternoon peak hours from approximately 4:30pm to 6:35pm.

RTD's operations plan assumes that the train cars will be shut down overnight and during mid-day layovers, thereby avoiding extensive idling. As a result, even if a diesel locomotive is selected, air emissions from the train yards at Longmont and Westminster should be minimal.

The freight sidings, which would house BNSF idle freight trains during the aforementioned morning and afternoon peak periods, are expected produce air emissions to the surrounding neighborhood. The potential pollutants from diesel engine would include the criteria air pollutant such as Particulate Matters (PM), Nitrogen Oxides (NOx), Carbon Monoxide (CO), Sulfur Dioxide (SO2), and Volatile Organic Compounds (VOCs) and mobile source air toxics such as Benzene, 1,3-Butadiene, Formaldehyde, Acetaldehyde, Naphthalene, and Polycyclic Organic Matters. The idling would occur 2 hours at a time during the each of the peak operating periods.

Compliance Considerations

The study area is located in the Denver Metropolitan Area, designated a maintenance area for carbon monoxide and PM_{10}. Per 40 CFR 93.102(b)(4), transportation conformity applies to maintenance areas through the 20-year maintenance planning period unless the maintenance plan specifies that the transportation conformity requirements apply for a more extended period. According to the EPA Greenbook and the State Implementation Plan, the 20-year maintenance statuses for carbon monoxide and PM_{10} lapsed in 2022. As such, transportation conformity requirements for these pollutants will no longer apply. Therefore, quantitative carbon monoxide and PM_{10} hotspot analysis will not be required.

Transportation conformity still applies for ozone (precursor pollutants – nitrogen oxides and volatile organic compounds) in the study area, given that the region is currently in nonattainment status for the ozone National Ambient Air Quality Standard. However, a conformity demonstration for ozone does not require hot spot analysis. Rather, it can be demonstrated for a project by documenting that it is included in the latest approved long-range transportation plan and TIP. The interagency consultation process for NEPA will confirm the transportation conformity approaches.

The Northwest Rail Peak Service Study does not intend to select a specific vehicle technology for the proposed service. However, it is possible that Peak Service on the NWR Corridor could increase diesel trains in the region. At this time, no vehicle technology is being eliminated from consideration other than overhead catenary system (OCS) powered electric vehicles. If diesel trains are implemented, the increased mobile source air toxics (MSAT) emissions from diesel trains could be offset by the vehicle mile travel reduction in the region. Per the 2016 *FHWA's MSAT guidance*, NWR will be classified as Tier 1, Project with No Meaningful Potential MSAT Effects or exempt project because the NWR Corridor will likely reduce traffic volume in the region. The interagency consultation process for NEPA will confirm the MSAT analysis approaches.

Mitigation for long-term and construction-related air quality impacts will be developed on a project-to-project basis during NEPA, as applicable. Air quality mitigation measures for construction activities typically involve dust control measures and ensuring that equipment is properly maintained to eliminate any continuously visible exhaust emissions.

CDOT's Clean Transportation Strategic Policy Initiative (CDOT, 2022) will also be considered during the Planning and Environmental Study and NEPA. Updated CDOT-specific requirements during NEPA will be incorporated into projects and consistent with the future CDOT Performance Plan FY 2021-2022.

Finally, CDOT's Greenhouse Gas Reduction Roadmap pointed out that reducing vehicle miles traveled is essential to achieving the statewide greenhouse gas target. The NWR Corridor will introduce a viable way to change transportation from automobile to public transit. Therefore, the NEPA process can point out that the NWR Corridor can contribute to regional greenhouse gas reduction.

Noise and Vibration

Brief Description of Resource Studied

This section discusses the noise and ground-borne vibration assessments performed to evaluate noise and vibration conditions in the study area under the Build Alternative. These analyses focused on lands where overnight sleep occurs (FTA Land Use Category 2) to simplify the assessments and provide an initial order of magnitude estimate of potential noise and vibration effects on a level commensurate with the amount of engineering detail available to decision-makers. The *Noise and Vibration Technical Report* is attached (Attachment 1).

Noise is typically defined as unwanted or excessive sound. Sound becomes unwanted when it interferes with sleep, speech, or recreation activities. Sound is what we hear when fluctuations in air pressure occur above and below the standard atmospheric pressure. Three variables define noise characteristics: level (or amplitude), frequency, and time pattern. Ground-borne vibration consists of rapidly fluctuating ground motions transmitted into a receptor (building) from a vibration source, such as transit trains. FTA uses vibration velocity to describe vibration levels for transit projects.

Data Collection/Methodology

The noise and vibration analyses performed for this project are based on FTA noise and vibration impact assessment methods. FTA's methodologies consist of a screening assessment in which analysts determine if noise- or vibration-sensitive land uses are close enough to the new alignment to merit an impact assessment. If so, the next step in FTA's methodologies is a general noise and vibration analysis. There is also a third level of FTA impact assessments, which examines noise and vibration in detail, but those were not applied to this project.

The Corridor Conditions Report contains results of the screening assessments and the general assessments of existing noise and vibration. The *Noise and Vibration Technical Report* (Attachment 1) includes additional description of the methodology.

Findings/Results

Noise analysis results indicate that noise impacts as defined by FTA are not projected to occur at residential parcels in the study area. Noise levels associated with all three candidate transit vehicle types and freight train operations as described above remain below moderate and severe noise impact thresholds at all modeled parcels

Vibration analysis results indicate that vibration impacts as defined by FTA are not projected to occur at residential parcels in the study area. Vibration levels associated with all three candidate transit vehicle types and freight train operations as described above remain below FTA vibration impact thresholds at all modeled parcels in the study area.

Compliance Considerations

During NEPA, noise and vibration will be evaluated at parcels in all three FTA land use categories and at "special buildings" locations like recording and broadcast studios. This analysis will focus on lands where overnight sleep occurs to simplify the assessments and provide an initial order of magnitude estimate of potential noise and vibration impacts on a level commensurate with the amount of engineering detail available to decision-makers.

Cultural Resources

The purpose of this section is to identify conflicts between known cultural resources and proposed upgrades, developments, and improvements for Peak Service implementation for the NWR Corridor. The previous NWR Corridor Conditions Report included a study of existing conditions for cultural resources. This study queried databases for the Colorado Office of Archaeology and Historic Preservation (OAHP) and local landmark commissions and identified 1,607 known cultural resources within a 1,000-foot buffer from the existing BNSF corridor centerline and a 0.5-mile buffer from each new station platform. This section will supplement the previous report by identifying known cultural resources which are within the construction footprint of proposed design elements. This section frames discussions around potential future consultation or mitigation requirements for cultural resources which may be directly affected by project design.

Brief Description of Resource Studied

Cultural resources include both historical built environment resources and archaeological resources. Under the National Historic Preservation Act of 1966 (NHPA), the significance of a cultural resource is determined by its eligibility to be listed in the National Register of Historic Places (NRHP). Cultural resources which are eligible for, or listed on, the NRHP are considered historic properties. Under the NRHP eligibility guidelines, potential historic properties must be 50 years of age or more, meet at least one of four criteria for significance, and retain sufficient integrity to convey that significance. Historic properties can be classified as sites, buildings, structures, objects, or districts. For linear cultural resources, such as historical roads or railroads, segments of resources may be considered as supporting or non-supporting of the NRHP eligibility of the overall resource. Cultural resources may also be significant if they are designated as a local historic landmark or are listed on, or eligible for listing on, the Colorado State Register of Historic Properties. Historical built environment resources include building, structure, and district property-types. Historical built environment resources identified by the previous NWR Corridor Conditions Report include single-family homes, commercial storefronts, bridges, culverts, ditches, roads, residential neighborhoods, and commercial downtown areas. Archaeological resources may range in age from the arrival of Indigenous peoples in Colorado over 13,000 years ago to 50 years before present. Archaeological resources identified by the previous NWR Corridor Conditions Report include precontact camps, historical mines, historical refuse dumps, historical artifact scatters, and historical building foundations. As with historical built environment resources, archaeological resources have the potential to be historic properties if they meet one of the four criteria needed for listing in the NRHP (36 CFR 60.4). However, archaeological resources may be subject to additional statutory requirements, including laws such as the Archaeological Resources Protection Act (ARPA) and Native American Graves Protection and Repatriation Act (NAGPRA). Information on archaeological sites may also be subject to additional confidentiality and data sharing restrictions.

Data Collection/Methodology

The OAHP is the State Historic Preservation Office (SHPO) for the State of Colorado. As the SHPO, the OAHP enforces the procedural requirements of the NHPA and consults on projects which may cause adverse effects to historic properties. Adverse effects are defined as alterations to the character or use of the cultural resource

Base Configuration Environmental Scan

which limit its ability to convey its historical significance under the NRHP. To identify potential historic properties which may be adversely affected during future stages of the project, a file search of Colorado OAHP records was completed on October 25, 2022. File search results from the OAHP database also include NRHP eligibility status for each cultural resource. Because the OAHP database does not always include recent surveys or information on local landmarks, seven local landmark commissions with jurisdictions overlapping the planning area were identified and contacted for information on protected local landmarks within the study corridor. The identified landmark commissions include the Boulder County Historic Preservation Advisory Board, Longmont Historic Preservation Commission, Boulder Landmarks Board, Louisville Historic Preservation Commission, City and County of Broomfield Historic Landmark Board, Jefferson County Historical Commission, and Westminster Historic Landmark Board. Of these local historic preservation authorities, Boulder, Louisville, the City and County of Broomfield, and Westminster contributed data to supplement the historic resources recorded within the OAHP database.

To supplement this previous file search and identify potential conflicts between known cultural resources and Peak Service implementation for the NWR Corridor, geospatial data for cultural resource locations was compared to preliminary design plans. Documented cultural resources which are within, cross, or overlap the direct footprint of proposed developments were identified as potentially being affected by future development for the project. The OAHP documented NRHP eligibility or local landmark status for these cultural resources was assessed to identify resources which may require consultation, mitigation, or further study. This analysis accounts only for potential direct effects from the limit of construction (LOC) and does not consider indirect impacts to cultural resources, such as visual or auditory effects.

Findings/Results

The previous OAHP file search identified 1,607 known cultural resources within a 1,000-foot buffer from the existing BNSF corridor centerline and a 0.5-mile buffer from each new station platform. Of these, 46 previously documented cultural resources directly overlap the LOC for freight rail sidings, station locations, walls, bridges, maintenance sites (Figure 1 to Figure 6). One historical archaeological site and 45 historical resources are within these areas. No precontact archaeological resources are known within the direct project footprint. In addition, linear resources (e.g. railroads) intersect proposed project developments at multiple locations. Cultural resources which overlap the LOC for proposed stations are shown in Figure 1 to Figure 6. Known cultural resources which are within the footprint for proposed Longmont maintenance facility sites are shown in Figure 7. Existing cultural resources which intersect proposed improvements for rail sidings are shown in Figure 8 to Figure 11. (Note: Locations of sidings may continue to be revised and the project progresses). Table 1 identifies known cultural resources within the footprint of proposed project design elements.

Table 1: Summary of Proposed Design Elements and Known Cultural Resources

Design Element	Number of Known Cultural Resources within Footprint	Known Cultural Resources within Direct Footprint
Longmont Station LOC	10	5BL.10666; 5BL.10669; 5BL.10671; 5BL.10676; 5BL.10687; 5BL.10706; 5BL.400; 5BL.400.3; 5BL.400.36; 5BL.7885
Boulder Station LOC	1	5BL.400
Louisville Station LOC	9	5BL.12071; 5BL.12072; 5BL.12073; 5BL.12074; 5BL.12076; 5BL.12077; 5BL.12324; 5BL.12351; 5BL.400
Flatiron Station LOC	3	5BF.104.1; 5BF.70.2; 5BF.70.7

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Design Element	Number of Known Cultural Resources within Footprint	Known Cultural Resources within Direct Footprint
Broomfield Station LOC	2	5BF.98.2; 5BF.98.4
Westminster Station LOC	1	5JF.519
Maintenance Facility Site 1	2	5BL.10359.2; 5BL.514
Maintenance Facility Site 2	0	-
Maintenance Facility Site 3	1	5BL.514
Maintenance Facility Site 4	1	5BL.374
Maintenance Facility Site 5	1	5BL.374
Maintenance Facility Site 6	2	5BL.10370*; 5BL.513
Maintenance Facility Site 7	3	5BL.513; 5BL.514; 5BL.10355
Maintenance Facility Site 8	4	5BL.513; 5BL.514; 5BL.10355; 5BL.7606
Maintenance Facility Site 9	1	5BL.514
Maintenance Facility Site 8/9 West	2	5BL.11224; 5BL.514
Extension to BNSF Track	0	-
Proposed Siding 1	1	5JF.519
Proposed Siding 2	8	5BL.12080; 5BL.12324; 5BL.2719.40; 5BL.2719.47; 5BL.2730.16; 5BL.2730.17; 5BL.400; 5BL.400.21
Proposed Siding 3	8	5BL.1985.2; 5BL.374.9; 5BL.400; 5BL.400.27; 5BL.400.28; 5BL.400.29; 5BL.9576.1; 5BL.9576.2
Proposed Siding 4	2	5BL.400; 5BL.859.50

*Archaeological Resources

Of these 46 cultural resources, 26 have an official determination of eligibility for the NRHP. An official determination means that the Colorado OAHP has reviewed and concurred with the NRHP determination of eligibility for the cultural resource. Of these, 12 resources are officially eligible, and 14 resources are officially not eligible for inclusion in the NRHP. There are nine cultural resources which require additional data (“Needs Data”) for an NRHP determination. Of the remaining cultural resources, seven are linear segments which support the eligibility of an eligible linear resource, and four are linear segments which are non-supporting of the eligibility of a linear resource. There are no designated local landmarks within these areas. Table 2 shows the NRHP eligibility status of known cultural resources within the footprint of proposed project design elements.

Table 2: Summary of Known Cultural Resources by NRHP Eligibility Status

Design Element	Officially Eligible	Supporting of Eligibility	Officially Not Eligible	Non-Supporting of Eligibility	Needs Data
Longmont Station LOC	2	1	7	-	-
Boulder Station LOC	1	-	-	-	-
Louisville Station LOC	1	-	-	-	8
Flatiron Station LOC	-	1	1	1	-
Broomfield Station LOC	1	-	1	-	-
Westminster Station LOC	1	-	-	-	-
Maintenance Facility Site 1	1	-	1	-	-
Maintenance Facility Site 2	-	-	-	-	-
Maintenance Facility Site 3	1	-	-	-	-
Maintenance Facility Site 4	1	-	-	-	-
Maintenance Facility Site 5	1	-	-	-	-

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Design Element	Officially Eligible	Supporting of Eligibility	Officially Not Eligible	Non-Supporting of Eligibility	Needs Data
Maintenance Facility Site 6	1	-	1	-	-
Maintenance Facility Site 7	2	-	1	-	-
Maintenance Facility Site 8	3	-	1	-	-
Maintenance Facility Site 9	1	-	-	-	-
Maintenance Facility Site 8/9 West	1	-	1	-	-
Extension to BNSF Track	-	-	-	-	-
Proposed Siding 1	1	-	-	-	-
Proposed Siding 2	3	1	-	2	2
Proposed Siding 3	3	4	1	-	-
Proposed Siding 4	1	-	-	1	-

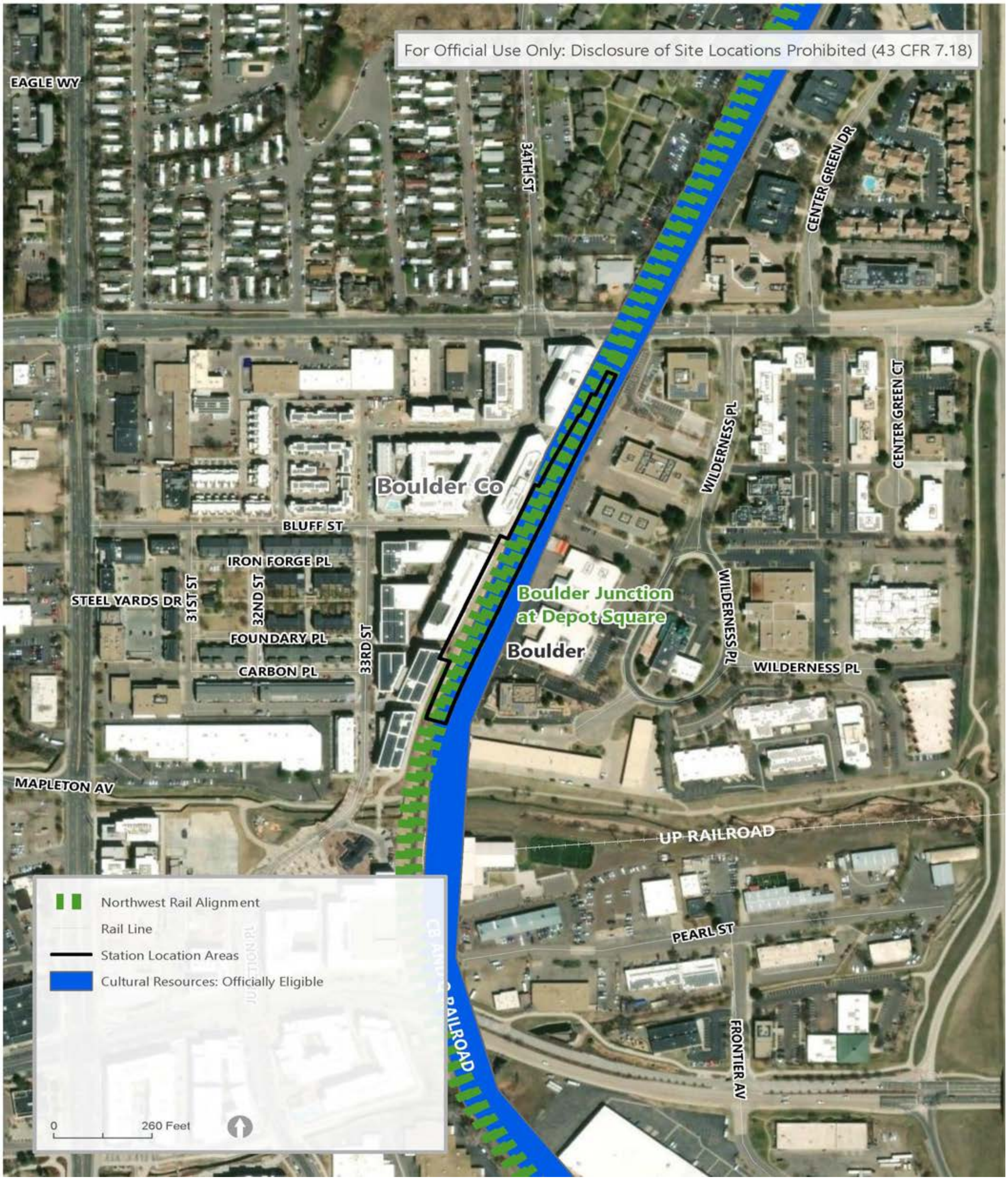
Compliance Considerations

Cultural resources reviews under Section 106 of the NHPA and Section 4(f) of the Department of Transportation (DOT) Act may be required alongside future compliance with the National Environmental Policy Act (NEPA). Each of these statutes require consideration of effects on cultural resources. Section 106 of the NHPA requires federal agencies to consider project effects on NRHP-listed or NRHP-eligible properties when a project is determined to constitute a federal undertaking. An undertaking is defined as any action which requires federal funds, permitting or licensure, or occurs on federal property and has the potential to affect properties listed in or eligible for listing in the NRHP. If the lead federal agency determines a project is an undertaking under Section 106 of the NHPA, an Area of Potential Effects (APE) will be delineated specific to the parameters and scope of that project. Identification and evaluation surveys of historic resources within a project-specific APE may be conducted to identify potential cultural resources which are not currently known. In contrast to the procedural requirements of the NHPA, Section 4(f) imposes substantive requirements on federal agencies. Section 4(f) prohibits the United States DOT from impacting parks, recreation areas, wildlife and waterfowl refuges, and historic properties unless there is no feasible and prudent alternative to that use. The action must also consider ways to minimize harm to the property resulting from such a use. An adverse effect determination under Section 106 of the NHPA will also typically constitute a use under Section 4(f).

Historic properties in the design footprint consist of 12 sites and seven linear segments. In addition, the nine cultural resources which are listed as “needs data” will require NRHP evaluation to determine if they are eligible for inclusion in the NRHP and constitute historic properties. If the Section 106 process is initiated for a future undertaking associated with the project, and historic properties are with the APE, consultation may be required with the OAHP to avoid, minimize, or mitigate adverse effects to these cultural resources. Analysis of indirect effects, such as visual or auditory impacts, may also be required for historic properties which are outside of the direct project footprint.

Base Configuration Environmental Scan

Figure 1: Known cultural resources in relation to the proposed Boulder Station footprint

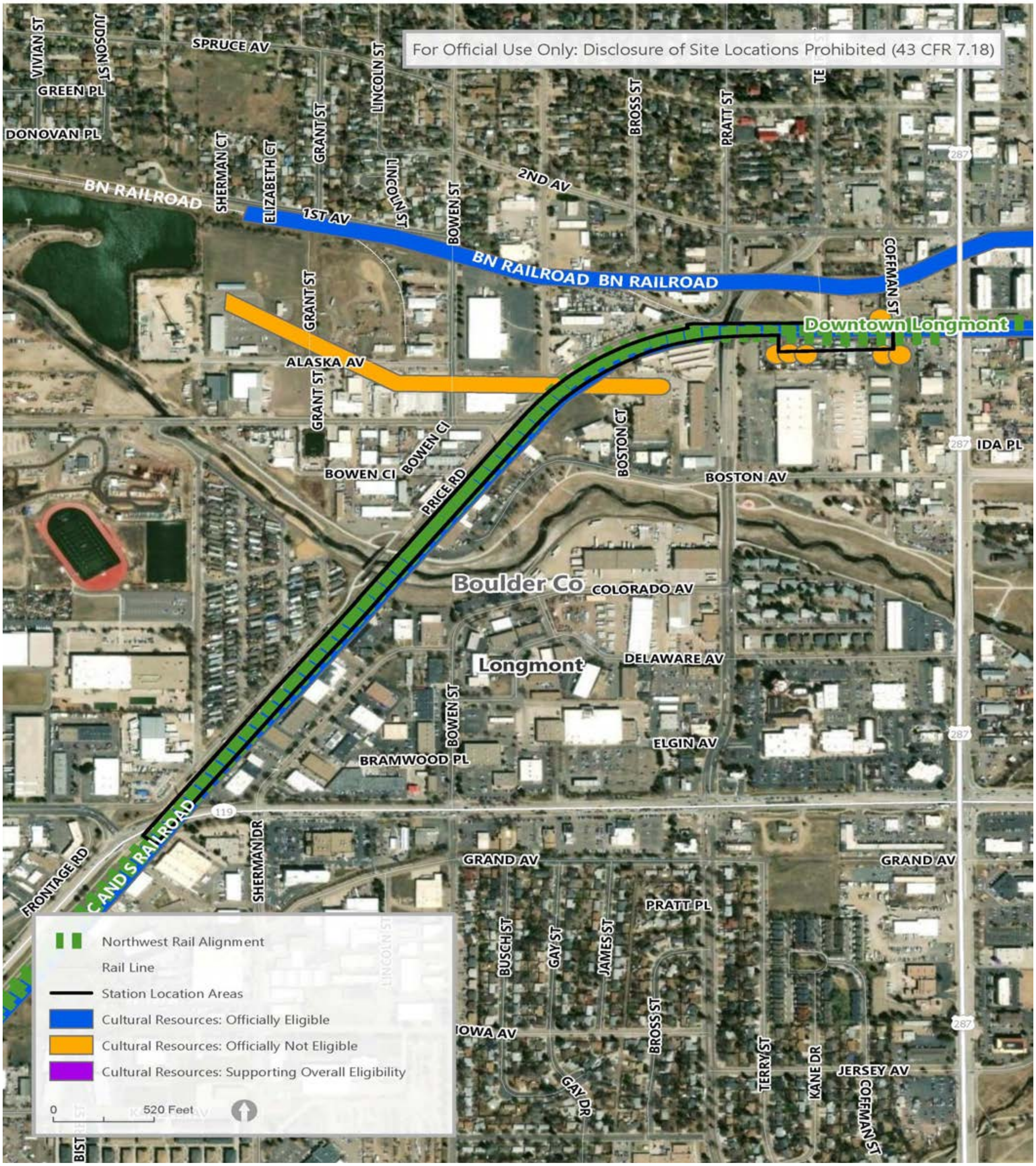


Base Configuration Environmental Scan

Figure 2: Known cultural resources in relation to the proposed Broomfield Station footprint

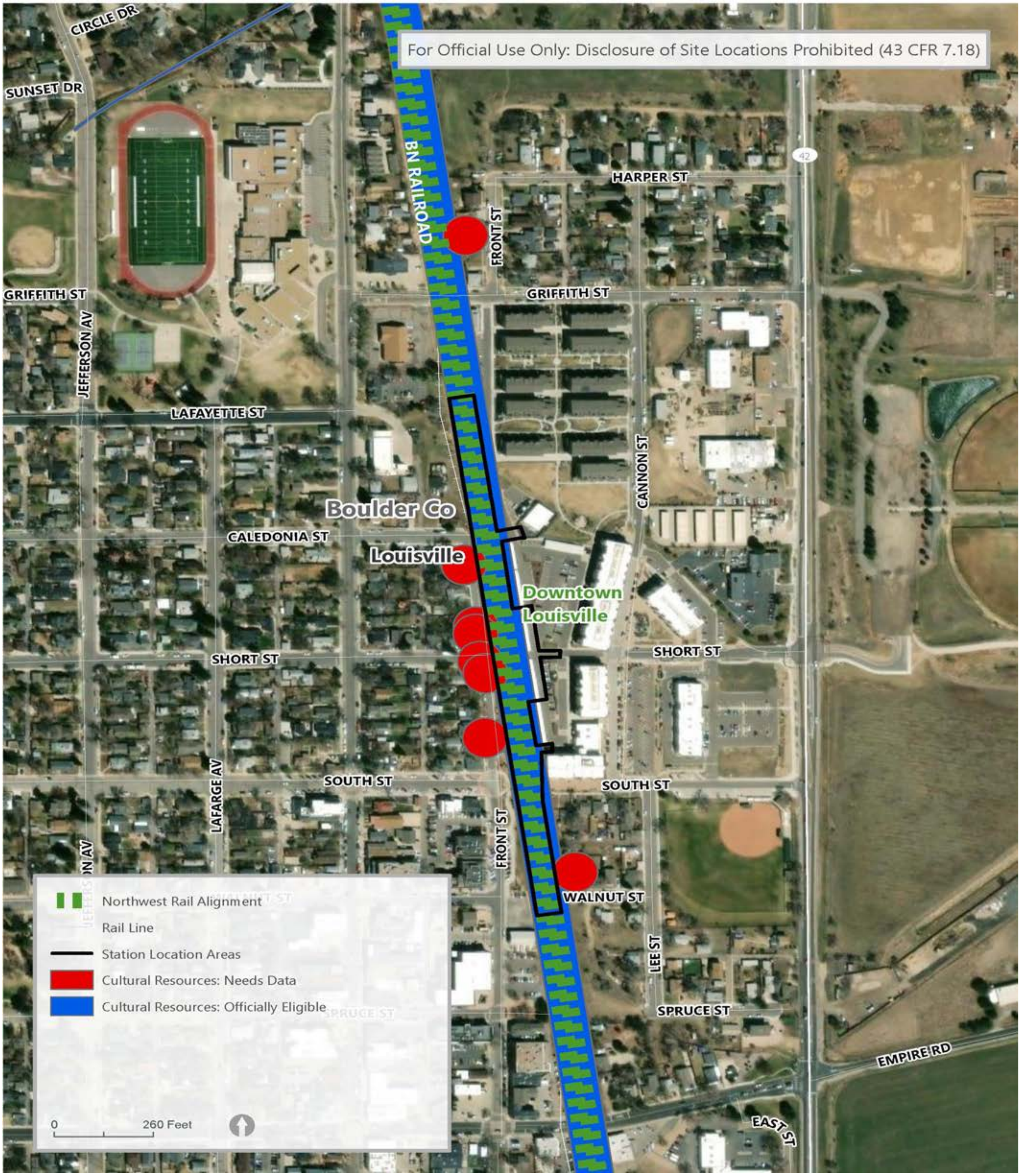
Base Configuration Environmental Scan

Figure 3: Known cultural resources in relation to the proposed Longmont Station footprint



Base Configuration Environmental Scan

Figure 4: Known cultural resources in relation to the proposed Louisville Station footprint

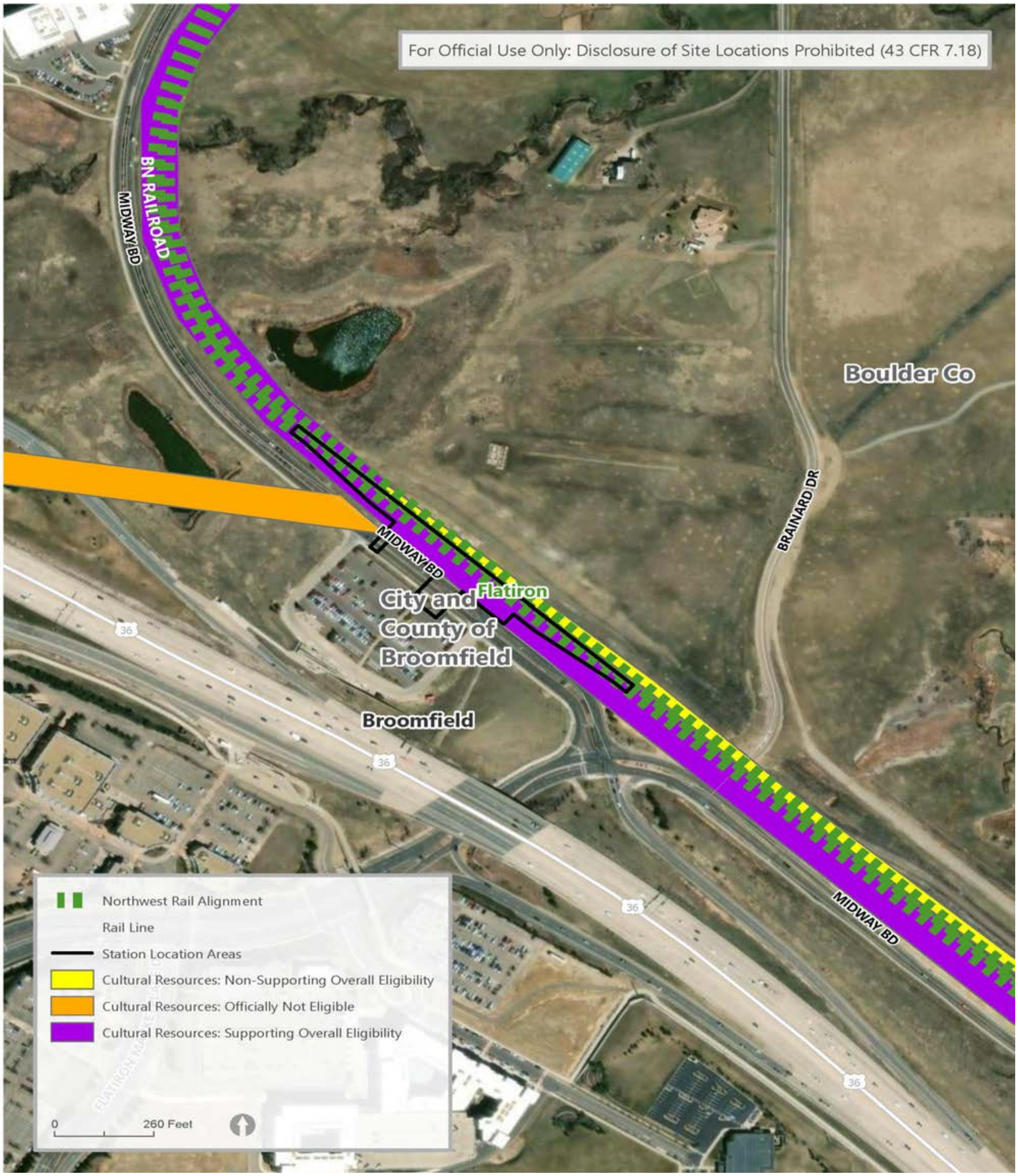


Base Configuration Environmental Scan

Figure 5: Known cultural resources in relation to the proposed Westminster Station footprint

Base Configuration Environmental Scan

Figure 6: Known cultural resources in relation to the proposed Flatiron Station footprint



Base Configuration Environmental Scan

Figure 7: Known cultural resources in relation to potential maintenance facility sites

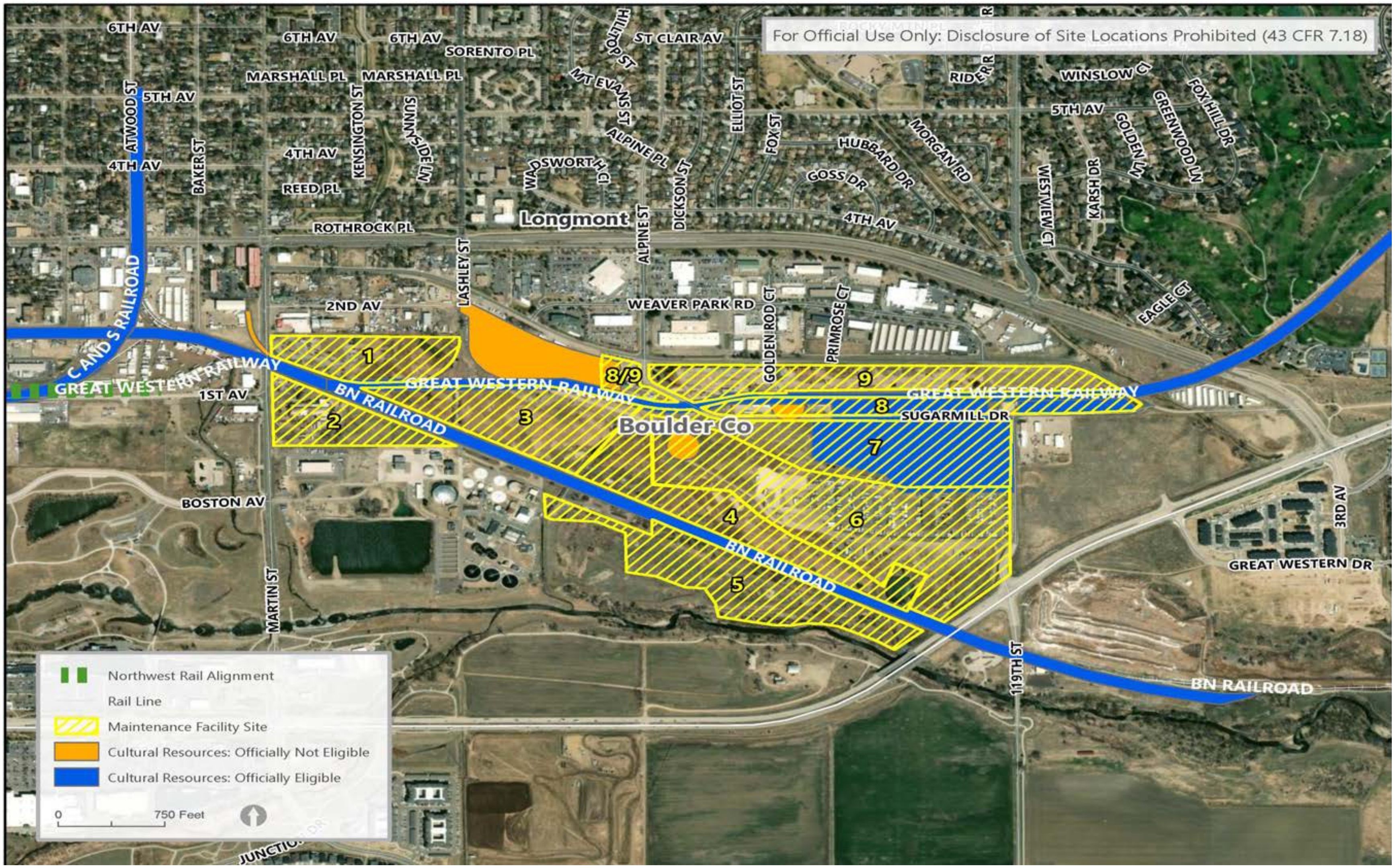


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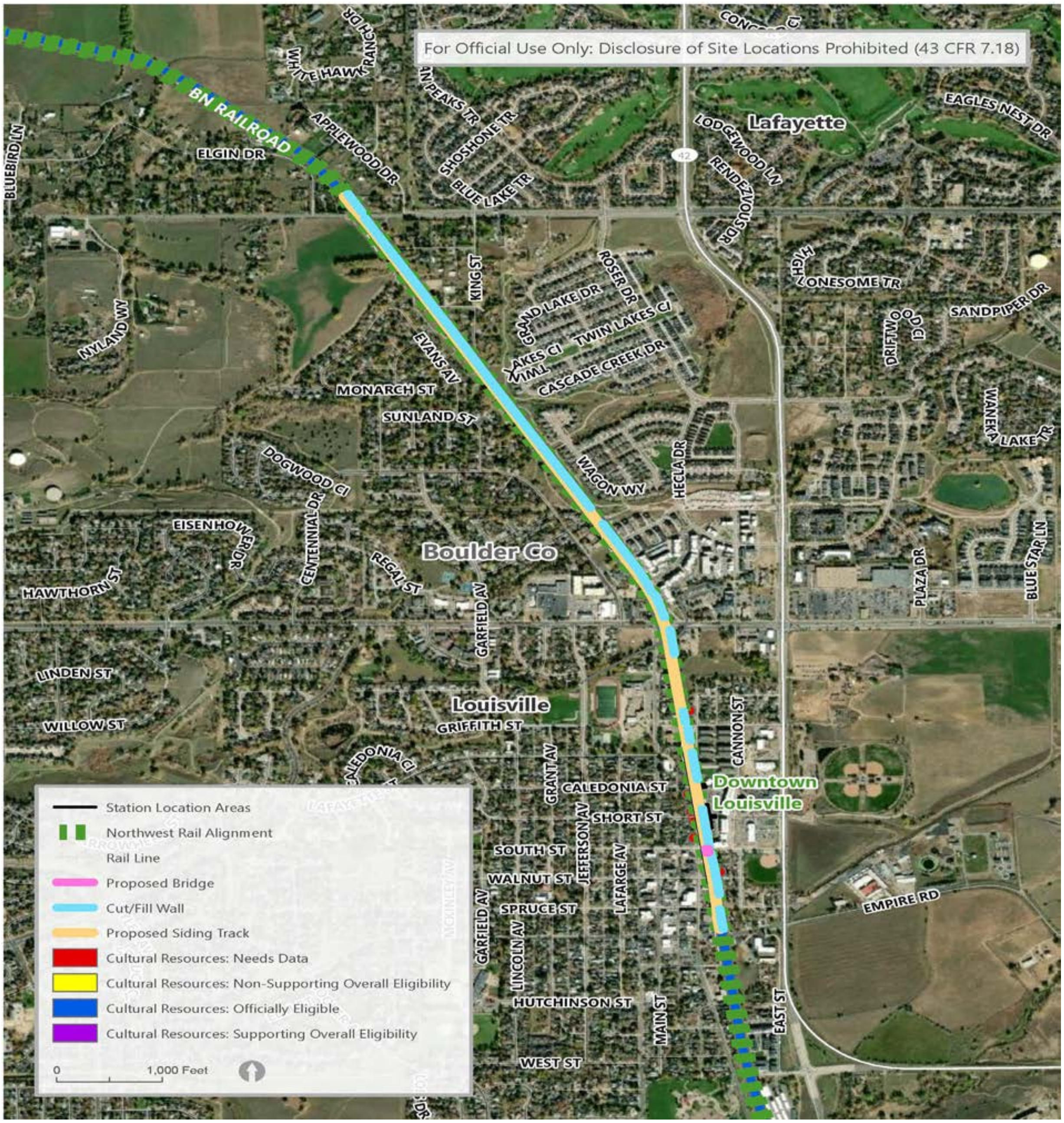
Figure 8: Known cultural resources in relation to proposed freight siding track #1

Attachment: MS-3 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)

Base Configuration Environmental Scan

Figure 9: Known cultural resources in relation to the proposed freight siding track #2



Base Configuration Environmental Scan

Figure 10: Known cultural resources in relation to the proposed freight siding track #3

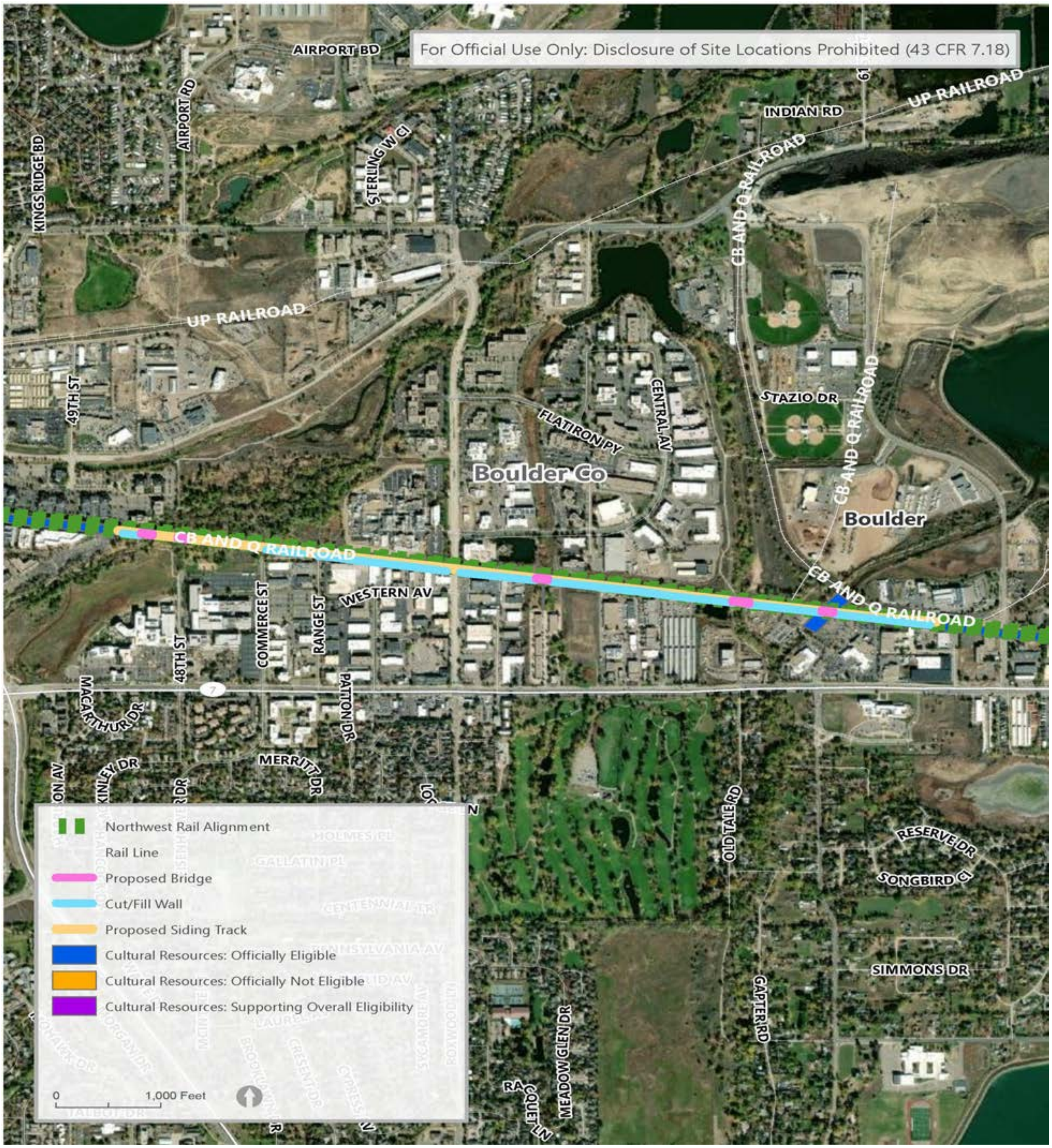


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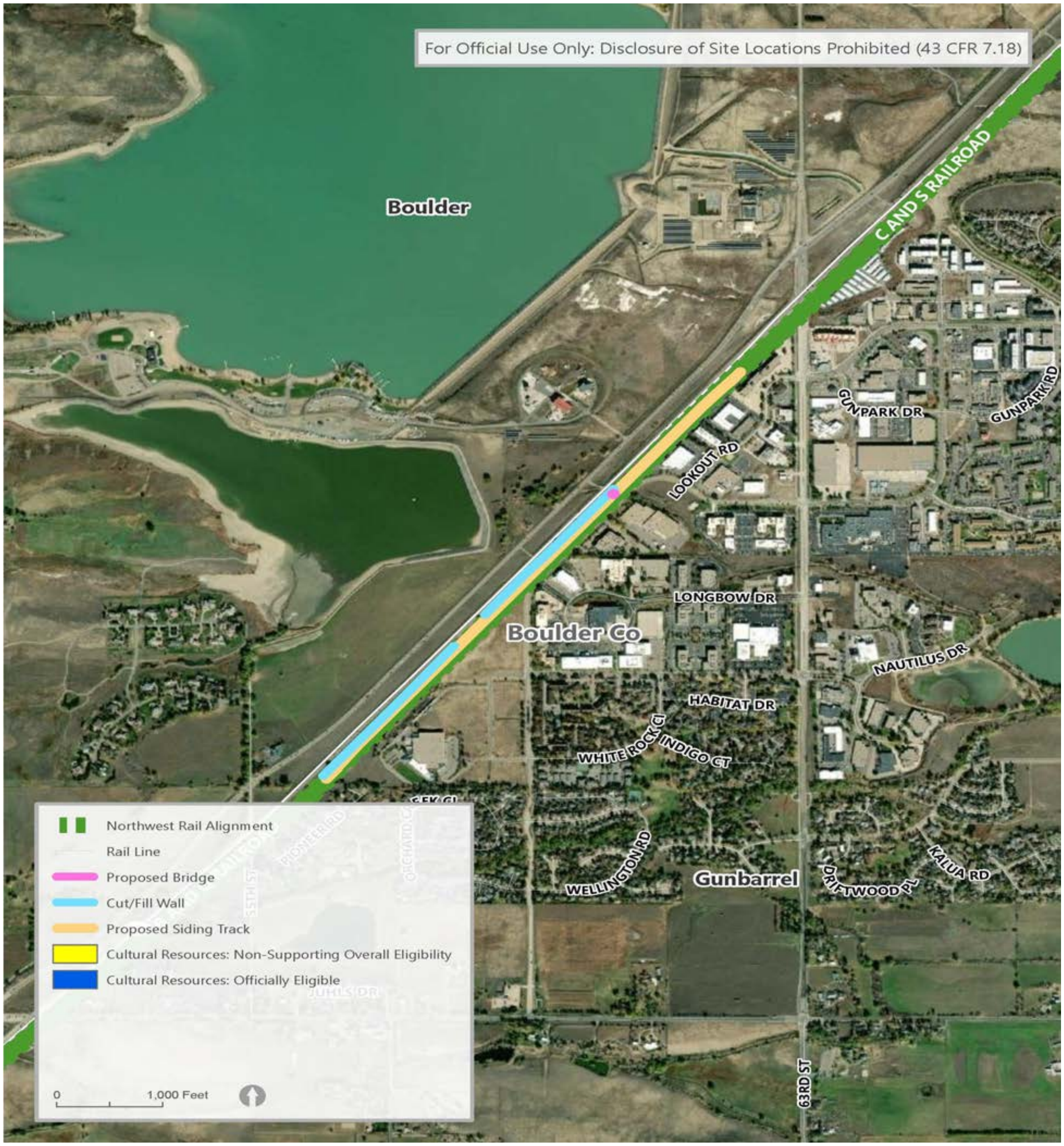
Figure 11: Known cultural resources in relation to the proposed freight siding track #4



Recreational Resources

Brief Discussion of Resource Studied

Recreational resources, including parks, trails, open space areas, and wildlife and waterfowl refuges are important community assets that provide environmental, aesthetic, and recreational benefits. Additionally, these recreational resources may be eligible for protection under Section 4(f) of the USDOT Act and Section 6(f) of the Land and Water Conservation Fund Act. Section 4(f) properties include publicly owned public parks, recreation areas, wildlife, or waterfowl refuges, or any publicly or privately owned historic site listed or eligible for listing on the NRHP. Although not explicitly mentioned in the regulation, trails/multi-use paths and open space areas qualify as Section 4(f) resources if they are publicly owned, and its purpose is for park, recreation, or refuge activities. Section 6(f) properties have been funded through Land and Water Conservation Funds, which provides them special protections against converting their use from that investment.

Data Collection/Methodology

The study area for this analysis encompasses a 300-foot buffer from the edge of the right of way of the BNSF corridor and a 300-foot buffer around each station. Colorado Trail Explorer (CoTrex, 2020) trails and trailheads were downloaded as shapefiles and uploaded into ArcGIS Pro to overlay with the study area. New trail information was obtained from city and county comprehensive and master plans (City of Westminster Comprehensive Plan, 2021; City of Louisville Transportation Master Plan, 2019; South Boulder Road Small Area Plan, 2016; Southeast Longmont Urban Renewal Plan, 2006; Boulder Valley Comprehensive Plan, 2020; City and County of Broomfield Comprehensive Plan, 2016). Parklands and open spaces, size, location, and ownership were obtained from DRCOG Parks and Open Space Layer (DRCOG, 2021). Parks and recreational resource descriptions were obtained using publicly available data from the respective county or city website. Section 6(f) data were obtained from CDOT's Online Transportation Information System database (CDOT, 2022), which tracks properties with Land and Water Conservation funding.

Findings/Results

Recreational resources, including parks, open space properties, conservation easements, trails, and assumed Section 4(f) and Section 6(f) properties within the study area, are included in Table 3. Figure 12 through Figure 15 show the locations of these resources.

Base Configuration Environmental Scan

Table 3: Existing and New Parks, Trails, and Recreational Areas

Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership	Impact Occurrence
Adams County					
3	Little Dry Creek Open Space[A]	Open space and dog park	64.7	City of Westminster	
5	Lowell Boulevard Trail[A]	Trail	NA	City of Westminster	**High**
7	Bradburn Boulevard Trail[A]	Trail	NA	City of Westminster	**High**
13	Sunset Park[A]	Picnic tables and playground	3.5	City of Westminster	
Jefferson County					
20	Farmers' High Line Canal Trail[A]	Trail	NA	City of Westminster	**High**
23	Wadsworth Wetlands Open Space[A]	Open space and preserve	19.3	City of Westminster	
24	Big Dry Creek Open Space[A]	Open space, preserve, and trails	243.9	City of Westminster	
25	Big Dry Creek Trail[A,B]	Trail	NA	City of Westminster	**High**
30	Lower Church Lake Open Space[A]	Open space, lake, fishing, and trails	77.3	City of Westminster	
31	US 36 Bikeway Trail[A]	Trail	NA	City of Westminster	**High**
Broomfield County					
39	Lac Amora Open Space[A]	Open Space, pond, and trails	109.2	City and County of Broomfield	
42	Varra South Conservation Easement	Open space, preserve, and farms	51.7	Private/City and County of Broomfield	
51	Varra North Conservation Easement	Conservation easement and preserve	49.2	Private/City and County of Broomfield	
Boulder County					
38	Carolyn Holmberg Preserve at Rock Creek Farm[A]	Open space, preserve, and farms	6	Boulder County	**High**
54	Coal Creek Trail[A]	Trail	NA	City of Louisville	**High**

Base Configuration Environmental Scan

Object ID	Resource Name	Resource Description	Approximate Size (acres)	Ownership	Impact Occurrence
63	Centennial Corridor Open Space Trail[A]	Trail	NA	City of Louisville	
65	Paclamar Farms Brooks[A]	Open space park and preserve	96.4	City of Boulder	
66	Anderson Open Space[A]	Open space, preserve, and farms	105.7	City of Boulder	
69	Autrey Open Space[A]	Open space park and preserve	176.1	City of Boulder	
72	Swartz Open Space[A]	Open space park and preserve	42.7	City of Boulder	
74	Lewis Open Space[A]	Open space park and preserve	58.9	City of Boulder	**High**
78	Flatirons Industrial Park[A]	Open space and preserve	36.6	City of Boulder	
80	South Boulder Creek Path [A]	Trail	NA	City of Boulder	**High**
83	Boulder Creek Path[A]	Trail	NA	City of Boulder	**High**
84	Foothills Parkway Path[A]	Trail	NA	City of Boulder	**High**
85	Pearl Parkway Path [A]	Trail	NA	City of Boulder	**High**
86	Goose Creek Path[A]	Trail	NA	City of Boulder	**High**
88	Reynold's Open Space[A]	Open space, preserve, and farms	17.1	City of Boulder	
90	Cottonwood Trail[A]	Trail	NA	City of Boulder	
91	Celestial Seasonings Easement[A]	Conservation easement and preserve	10	City of Boulder	
93	63rd St Path[A]	Trail	NA	City of Boulder	**High**
95	IBM Connector Trail[A]	Trail	NA	Boulder County	**High**
109	St. Vrain Greenway[A, B]	Trail	NA	City of Longmont	**High**

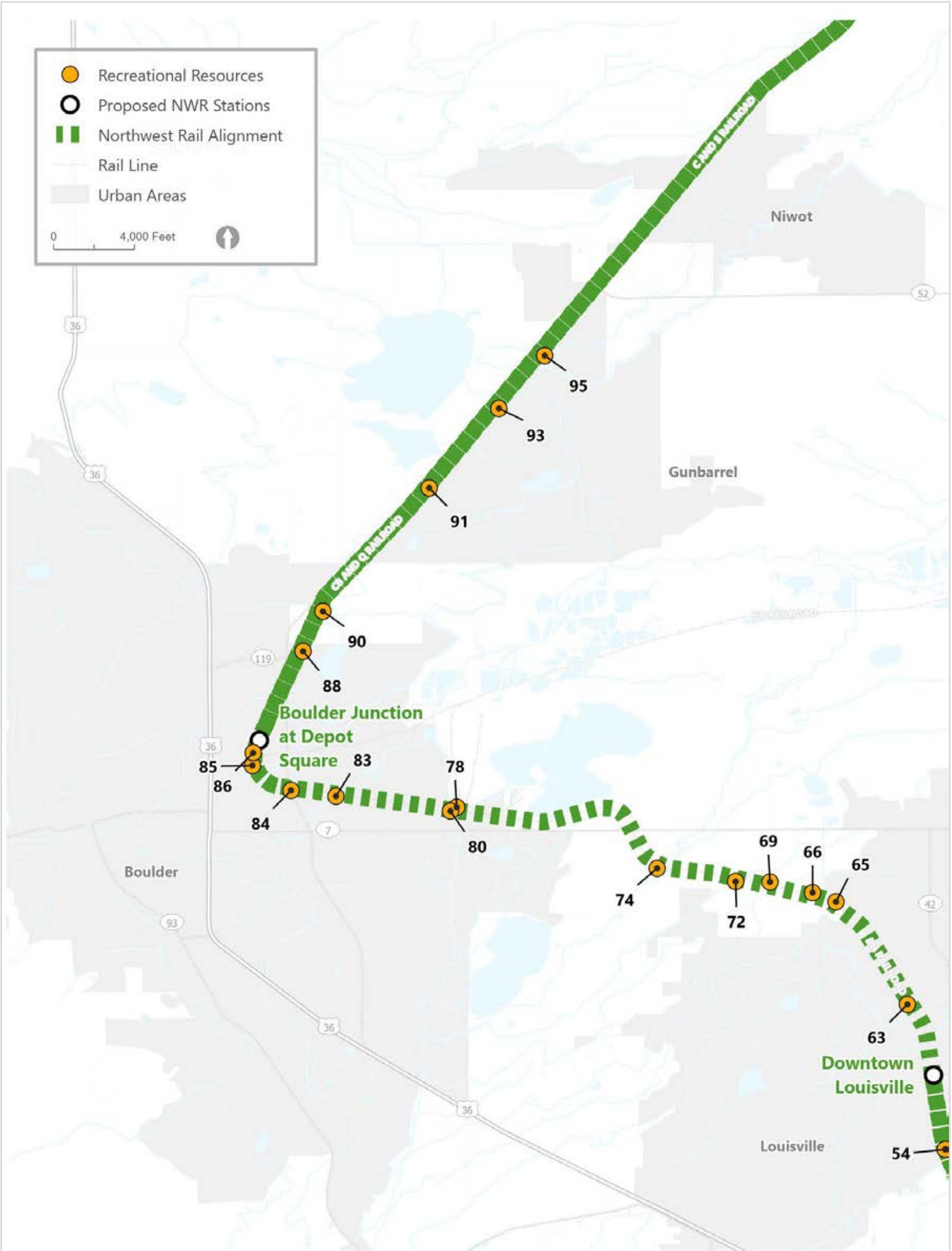
[A] Assumed to be eligible for protection under Section 4(f)
[B] Eligible for protection under Section 6(f). Boulder Reservoir not included as it's separated from the project alignment by CO 119.

Base Configuration Environmental Scan

Figure 12: Potential recreational resource conflicts (1 of 4)

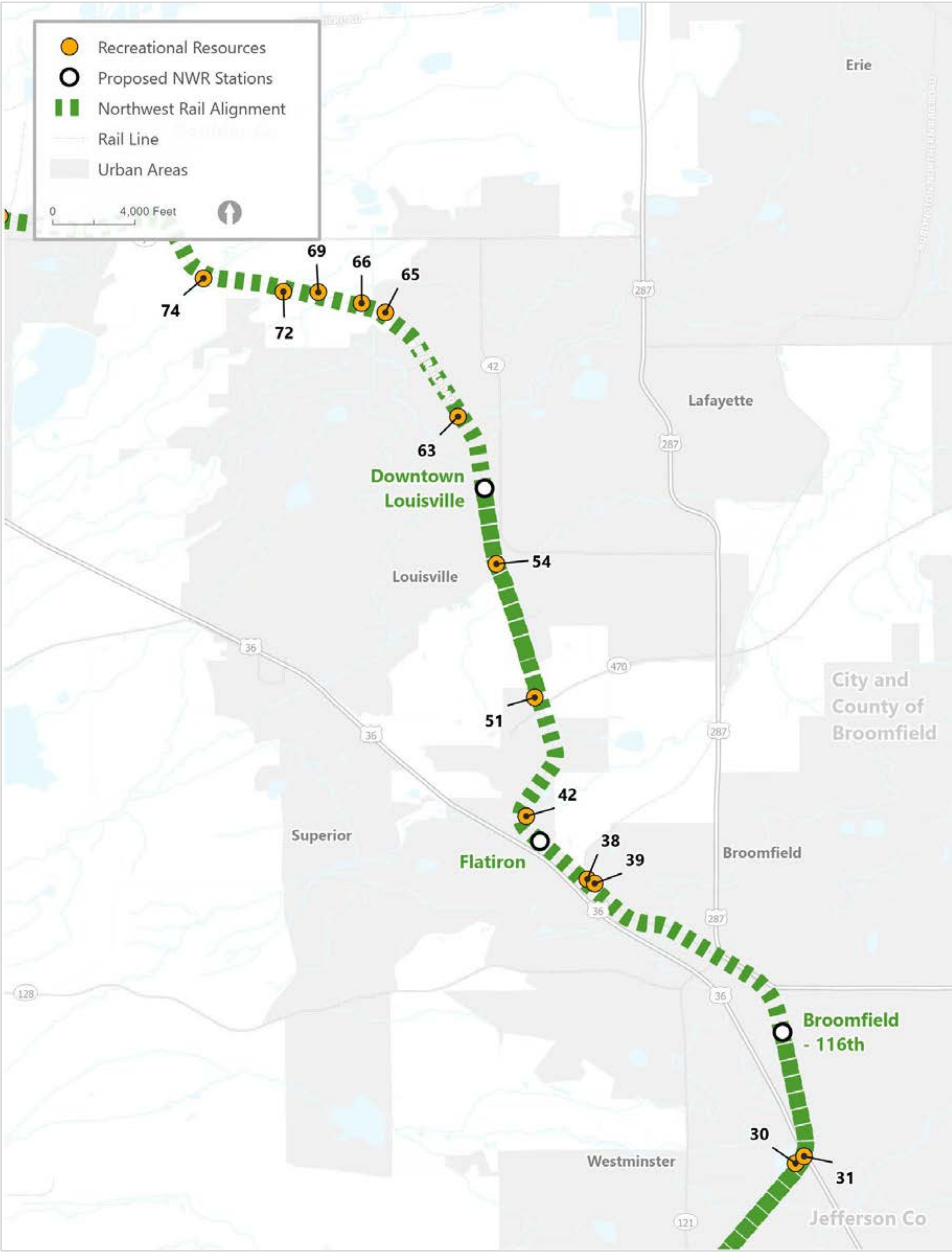
Base Configuration Environmental Scan

Figure 13: Potential recreational resource conflicts (2 of 4)



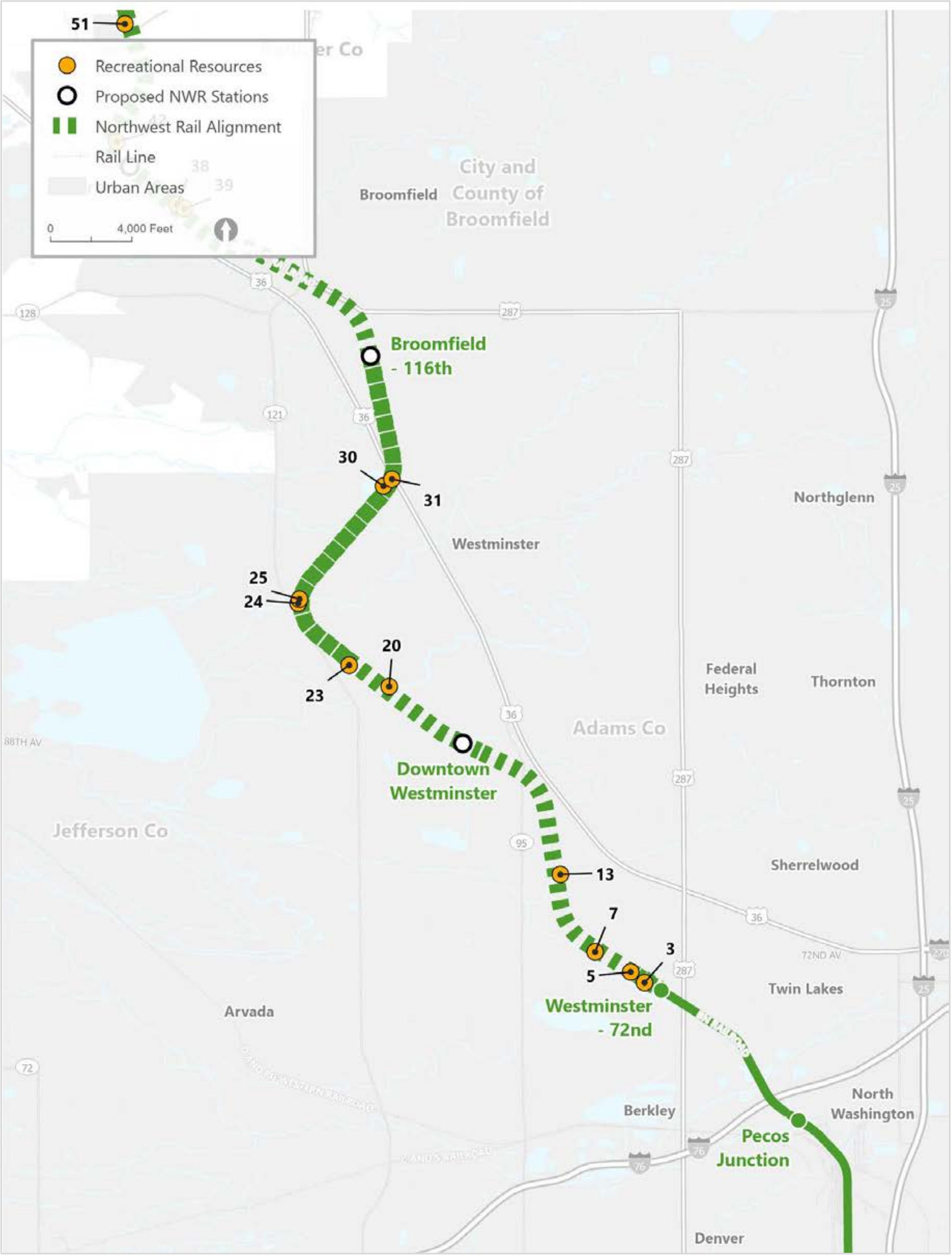
Base Configuration Environmental Scan

Figure 14: Potential recreational resource conflicts (3 of 4)



Base Configuration Environmental Scan

Figure 15: Potential recreational resource conflicts (4 of 4)



Base Configuration Environmental Scan

Compliance *Considerations*

Several recreational resources exist within the study area. The Planning and Environmental Study will include a high-level description of potential impacts and environmental constraints, with further recommendations on how to proceed during subsequent environmental and design project development steps, as applicable. For the FasTracks program, RTD has mitigated impacts considered high-moderate or above. During NEPA, additional study areas may be required to consider constructive use. Public parks and recreational facilities are protected by Section 4(f), which requires that these properties be avoided unless there are no feasible or prudent alternatives. As design advances, avoidance will be considered an initial option in the next development phase. If the project cannot avoid using a Section 4(f) property, a Section 4(f) Evaluation will be required, and concurrence on minimization and mitigation measures from the officials with jurisdiction over the affected properties will be necessary. Early coordination with officials with jurisdiction will be required.

If it is determined that the project may impact a property protected under Section 6(f), similarly to Section 4(f), design considerations to avoid the property are required. If a conversion of the parkland from a recreation to a transportation use is necessary, coordination between the CPW and the National Park Service / US Department of Interior will be required, and replacement parkland will be identified.

To avoid delays, early coordination with applicable agencies and stakeholders will occur at the onset of preliminary design and NEPA and continue through the alternatives selection process so that concurrence can be achieved through the Section 4(f) and Section 6(f) processes as efficiently as possible.

Hazardous Materials

Brief Discussion of Resource Studied

The acquisition of property right of way and potential construction disturbance requires the evaluation of hazardous material concerns to protect worker health and safety and public health, to provide liability due diligence for the purchasing entity, and improve the alternatives analysis based on potential hazardous material impacts. The *Environmental Liability Study* is attached (Attachment 2), and the results are discussed within this section.

Hazardous material sites are those properties that have been impacted by a current or previous use that could have resulted in a release of hazardous substances or petroleum products. These materials could include pesticides, volatile and semi-volatile organic compounds, heavy metals, petroleum products (gasoline, diesel fuel, lubricants), lead-based paint, and asbestos-containing building materials.

Base Configuration Environmental Scan

Data Collection/Methodology

The RECs identified in the CCR were further researched in this environmental liability review, to verify the presence of contaminated sites adjoining the Project alignment. Environmental liability refers to the potential environmental costs that a property and/or properties may require to remove contamination disturbed during construction. The properties listed as RECs along the Project alignment were screened by researching the past and present use and constituents of concern in soil and groundwater. The properties were reviewed in the Colorado Department of Public Health and Environment (CDPHE) online website to determine their potential to contaminate the Project, and the Boulder, Jefferson, and Adams County Assessor to review parcel information. The location of the properties with RECs were evaluated in relation to the railroad alignment, to assess impacts to the Project. The locations of proposed soil disturbance and construction along the railroad alignment were also reviewed against the CDPHE sites. The properties were identified as low or high risk for environmental hazards and environmental liability. Contamination can occur from past or current operations such as landfills, maintenance operation yards, industrial operations, automotive service businesses, dry cleaners, mine and mill sites, and unsanctioned activities.

Findings/Results

The proposed train stations, bridges, and sound wall locations were reviewed to evaluate potential impacts that would require mitigation. The train stations and most of the proposed construction areas did not have adjoining properties that were impacted and were found to be low risk. Along the Project alignment, only two adjoining properties were identified that would impact the proposed NWR construction, as most of the REC site locations were not adjoining the Project alignment. A table was prepared that listed the REC properties, previous and current land use, along with the surveyed station numbers along the Project alignment. Only two locations within the proposed construction area were identified as high risk and information for mitigation costs were estimated.

One property northeast of the Broomfield Station, located at 11811 Upham Street (REC site #1258 – Figure 2), is registered as an active Superfund site by the Environmental Protection Agency, however, it is not on the National Priorities List, and no further federal action is required. A partial right-of-way (ROW) take for the Project is shown along the western end of the site. Although no documentation was found identifying this area as being contaminated, an estimation of mitigation costs was completed for this portion of the property.

Another property, located at 11939 Sugar Mill Road (REC site #21, 24 – Figure 2), 1.5 miles east of the proposed Longmont Station, is the former Great Western Sugar Company Factory with 11 buildings and sugar silos, former diesel ASTs and landfill disposal on the property. The property is in disrepair with buildings crumbling and the sugar silos still intact on over 40 acres. This area is proposed for future additional transit-oriented development, as part of the NWR Project. Although no documentation was found identifying this area as being contaminated, it is an area of concern for future development east of the Project limits. The property is east of the

Base Configuration Environmental Scan

Project ROW and was not included in the estimation of mitigation costs for the NWR alignment. Table 4 summarizes the estimated costs for potential soil removal in the one site of concern northeast to the Project alignment.

Table 4: Preliminary Mitigation Estimates

Data	Potential Mitigation Sites	
Station #/Train Station	419/Broomfield - 116th	E of 1841/Boulder Junction at Depot Square
Subject Property	Chemical Handling Corp	Transportation Service Center Cleaning
APN	171702113018	131511000038
Address	11811 Upham Street, Broomfield	11939 Sugar Mill Road, Longmont
Owner	Broomfield Industrial Center Condos	Factory building still on site in poor condition, sugar silos remain.
Contaminant(s) of Concern	Metals and volatile organic materials in soil. Potential groundwater contamination	Nonhalogenated solvents, metals
Approximate Parcel Area (ft2)	113,108 SF	227,594 SF
Area of Soil Removal (ft2)	(389 x 65=) 25,285 SF	227,594 SF
Volume of Soil Removal (2.5 ft deep, ft3)	63,213 CF	568,985 CF
Tons of Soil Removal (0.025 tons/1 ft3)	1,580 tons	14,225 tons
Estimated Cost for Hazardous Waste, Excavation, Transport & Disposal ($300/ton)	$474,094	$4,267,388
-30% Estimated Cost for Hazardous Waste Excavation, Transport & Disposal	(-30% = $142,228) -> $331,866	(-30% = $1,280,216) -> $2,987,172
+50% Estimated Cost for Hazardous Waste, Excavation, Transport & Disposal	(+50% = $237,047) -> $711,141	(+50% = $2,133,694) -> $6,401,082

Compliance *Considerations*

The Planning and Environmental Study will include a high-level description of potential impacts and environmental constraints, with further recommendations on how to proceed during subsequent environmental and design project development steps, as applicable. RTD will complete a Phase I Environmental Site Assessment (ESA) during NEPA. Based on the Phase I ESA findings, if a Phase II ESA (i.e., materials testing) or remediation activities are required, there may be substantial delays for property acquisition or construction in the vicinity. Also, a Phase II ESA and remedial activities could require additional funding. These activities are associated with the acquisition of properties.

Base Configuration Environmental Scan

Hazardous materials concerns within the construction area will require specifications to guide contractors regarding safety precautions, protocols, and environmental commitments. A Materials Management Plan will be used if construction activities are anticipated to encounter hazardous materials.

ROW Assumptions

Right-of-way acquisitions are not expected along the mainline track alignment and freight siding alignments for the Base Configuration, as these are assumed to be within BNSF right-of-way and would be included in an agreement between BNSF and RTD. Station areas may require some right-of-way acquisition for constructing and operating the rail platforms and ancillary infrastructure.

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Milestone 3

Base Configuration Report

Appendix E

Consensus Building and Public Outreach Report

Executive Summary

The Northwest Rail Peak Service Study (the Study) was part of a continuing collaborative effort between the Regional Transportation District (RTD), local transportation partners, and community stakeholders to identify and address mobility solutions for peak period service along the Northwest Rail alignment, which extends from Denver Union Station to the existing Westminster Station and extending to Boulder and Longmont. The track alignment is owned by BNSF Railway who would continue to own the railroad if peak service is implemented.

The Study was part of RTD's ongoing commitment to the FasTracks plan, which includes commuter rail service from Denver Union Station to Boulder and terminating in Longmont. The Study advances the efforts toward this goal.

The Study was completed in five stages

- Milestone 1: Confirm and refine the Peak Service concept with stakeholders
- Milestone 2: Identify local, state, federal, and BNSF requirements for the operation of service (the "Base Configuration")
- Milestone 3: Conduct initial planning and develop preliminary engineering design and costs required to build and operate the Base Configuration service
- Milestone 4: Identify likely service expansion scenarios to avoid precluding expanded RTD or FRPRD passenger service
- Milestone 5: Identify potential project implementation strategies

The Study evaluated the feasibility of providing peak period service for the Northwest Rail. Over approximately two years, the Study identified the requirements, costs, and operational needs to upgrade existing track, develop rail stations, and provide peak service to northwestern metropolitan communities, which include Arvada, Westminster, Broomfield, Louisville, Boulder, and Longmont. As part of the feasibility study RTD engaged BNSF to conduct a preliminary engineering design to define the infrastructure improvements required to integrate commuter rail service with freight service on the BNSF tracks. The results of the BNSF design work were incorporated by the Project Team into the Base Configuration.

The Study included a public engagement to solicit public feedback regarding the peak service plan. The Study addressed Milestones 1-3 from Spring 2022 through Spring 2023 with extended focus on Milestone 3 through Winter 2023 and into early 2024. Milestone 4 took place from Fall 2023 to Spring 2024. The Study concluded with Milestone 5, which was the final Common Set of Facts and the final summary report.

Task 11: Consensus Building and Public Outreach Report

In addition to the major touchpoints noted above, the Project Team held meetings and workshops monthly with the Study Advisory Team (SAT). Milestone 1 (Spring 2022-Summer 2022) established an agreed-upon Peak Service Concept that presented the analysis of alternatives from previous and existing strategic plans, studies and commitments from local jurisdictional partners. This allowed the Study team to understand potential opportunities or gaps with station locations, service amenities, etc. along the corridor. The SAT convened for a Plans & Initial Commitments Workshop to begin discussions on the project and were provided progress updates via email throughout this milestone.

Milestone 2 began in Summer 2022 and finished in the Fall, focusing on revisiting and confirming commitments from the study area communities, agencies and other stakeholders, and integrating them into the Peak Service concept plan. Throughout this milestone, the SAT gathered three times for update meetings and an Initial Configuration workshop was held. The Project Team confirmed an initial “footprint” to assess environmental impacts and identify direct and indirect effects to the adjacent communities, including Environmental Justice (EJ) populations. The identification of EJ populations was used to assess and avoid potential impacts and is part of both the planning effort and the equity analysis that is required prior to the siting of facilities and modification to service under Title VI of the Civil Rights Act of 1964, which prohibits discrimination based on race, color, or national origin in programs or activities that receive federal financial assistance. These concept plans are location-based and were presented to the public.

The focus of Milestone 3 (Spring 2023-Winter 2023) was to refine both the operating plan, and the infrastructure requirements gathered through Milestones 1 and 2 by solicitation and input from agency partners, technical subject matter experts (SME), and the public. This included service options and vehicle alternatives. The first public touchpoint took place during this milestone in January/February 2023 when RTD and local agencies hosted pop-up events, two public open houses, and a self-guided online meeting. The SAT, in addition to five update meetings, convened for two in-person workshops to discuss base configuration and explore partnerships.

Another round of pop-up events, public open houses, and a self-guided online meeting were hosted in the latter half of 2023 near the end of Milestone 3, where the basic peak period service requirements, or Base Configuration, was shared with the public. During this period, the Project Team continued to meet monthly with the SAT to discuss updates on BNSF design and negotiations, local plan agreements, and public engagement.

During Milestone 4, the Study team reviewed and considered long-range rail service plans and determined how those programs might fit into the NWR PSS concept and next steps. The Study team also assessed the role that the Peak Service plan would play at a regional transit level.

Milestone 5 showcased final implementation strategies and next steps. A final summary report for the Peak Service Concept was made available to the public following a presentation of the study findings to the RTD Board of Directors.

More detailed public outreach summaries for Milestones 1-3 and Milestone 3.5, which include all promotional and marketing efforts, can be found in Appendix A and B. SAT workshop summaries can be found in Appendix C, followed by SAT meeting agendas, notes, and emails in Appendix D.

Milestone Summaries

Milestone 1 – Confirm Peak Service Concept

Goals and Outcomes

Milestone 1 set expectations and cultivated shared understanding between RTD, the SAT, and the consultant team on the background leading up to the Peak Service concept and the goals of the Study. RTD and BNSF worked together to develop a concept for peak service in the corridor, including service option modeling and engineering design. To provide consistency with previous work on the corridor, the Study documented the alternatives considered in the past that led to the Peak Service concept. Elements of this plan were vetted through a stakeholder engagement process to understand desired community objectives. In addition, the concept must not preclude any future passenger rail service options that would encompass a larger rail program along the Front Range.

Milestone Input

Input during this milestone included the analysis of alternatives from previous and existing strategic plans and studies and understanding of commitments from local jurisdictional partners to understand potential opportunities or gaps at station locations, service amenities, etc.

Milestone Output

An agreed-upon Peak Service concept to represent to the stakeholders and public.

Milestone 2 – Confirm Partner/Stakeholder Plans and Commitments

Goals and Outcomes

Through previous efforts, study area communities, agencies, and stakeholders have developed plans and committed resources to support progress and implementation of Northwest Rail Line/B Line service. Elements include secured rights-of-way, infrastructure investments in station areas, and identified grade crossings in anticipation of NWR implementation.

Throughout Milestone 2, these commitments will be revisited and integrated into the Peak Service Concept plan. These commitments must be confirmed prior to moving to Milestone 3.

Milestone Input

Through interviews and a SAT meeting, individual plans from each community will be presented by that stakeholder, discussed, and assessed.

Milestone Output

An initial "footprint" was confirmed to assess environmental impacts and identify direct and indirect effects to the communities, including Environmental Justice (EJ) populations.

The identification of EJ populations was used to assess impacts, as well as to complete both the preliminary environmental planning screening Planning Environmental Linkage (PEL) and equity analysis efforts required under Title IV.

These location-based concept plans were presented to the public. This was the first public touchpoint in the study.

Milestone 3 – Initial Footprint

Goals and Outcomes

Milestone 3 used input from agency partners, technical subject matter experts, and the public from Milestones 1 and 2 to refine both the operating plan and the infrastructure requirements, including any service options and vehicle alternatives.

Milestone Input

Continued to engage SAT, Technical Advisory Committee, and Subject Matter Expert to refine operating and infrastructure plans. The Study team utilized feedback from previous SAT workshops, meetings, and the initial public open house to present conceptual site plans and high-level operating plans during this milestone's SAT workshop and public open house.

Milestone Output

Refined conceptual site plans based on SAT and public input.

Milestones 1-3 Public Engagement Outcomes and Findings

Events, Open Houses, and Online Meeting

The Study Team hosted four pop-up events where approximately **110** people visited the booths.

Open Houses #1 and #2 had a combined total attendance of **195** participants with a total of **29** comment cards submitted.

Task 11: Consensus Building and Public Outreach Report

The Self-Guided Online Public Meeting saw **1,241** engaged sessions (viewer clicked a call-to-action, video, survey, etc.) and a total of **3,290** views. There were **116** total submissions to the surveys embedded in the meeting, **173** completed surveys, and **353** collected entries on the RTD Study Website.

Milestones 1-3 Study Advisory Team Outcomes and Findings

SAT Charter

During Milestone 1, a charter was developed to solidify the SAT's purpose in providing guidance to the Study team. The charter reaffirms the SAT's commitment to assist in identifying technical team members, key stakeholders, and community members; establishing coordinated communications and outreach plans; and providing insight and guidance during key study milestones. The charter also outlined guidelines for deliberation and decision making throughout the Study. The complete formal charter can be found in Appendix E.

In addition to hosting update meetings, the Study team held a total of four SAT workshops throughout the first three milestones. Summaries of each workshop are below.

Plans and Commitments Workshop

- Convened SAT and developed common understanding across the corridor regarding existing plans and commitments
- Identified synergies between plans and commitments and areas for further exploration
- Began to assemble how plans and commitments fit into Initial Configuration
- Discussed next steps to engage a broader public

Initial Configuration Workshop

- Developed a common understanding of Initial Configuration across the corridor
- Discussed next steps to engage the public to create awareness of the study
- Reviewed technical updates and next steps towards Base Configuration

Base Configuration Workshop

- Presented base configuration concept and initial draft "common set of facts"
- Discussed affordability and partnership opportunities
- Discussed possible paths for realizing NWR peak service
- Introduced elements of next public input opportunity (Milestone 4)

Partnership Workshop

- Reviewed Base Configuration concept and memos supporting "common set of facts"
- Discussed affordability and partnership opportunities
- Discussed possible paths for realizing NWR peak service

Final summaries for SAT workshops can be found in Appendix C.

Update Meetings

In addition to workshops, the SAT touched base frequently with the Study team through update meetings and email. Throughout Summer 2022, the RTD Study team provided status updates to the SAT via email covering project progress and upcoming SAT responsibilities during Milestone 1. During Milestone 2, the Study team convened with the SAT for two update meetings to gather feedback on engagement content, review SAT coordination and outreach approach, and provide technical updates on project progression. The SAT and Study team gathered for five update meetings during Milestone 3 to solidify the SAT's role in public engagement, prepare for open houses, determine the path moving forward regarding NWR partnership, and discuss outreach plans for upcoming milestones.

Further details on these meetings can be found in the agendas, notes, and email updates in Appendix D.

Milestone 3 – Confirmation of Base Configuration

Goals and Outcomes

The focus of Milestone 3.5 is to refine both the operating plan and the infrastructure requirements gathered through Milestones 1 and 2 through input from agency partners, technical SMEs, and the public. This includes track improvements, service options, and detailed station area schematics. The focus is also to determine siding locations and impacts or burdens of those locations, receive community feedback to determine the operations of peak service, and establish partnerships for operation by BNSF Railway and potentially Front Range Passenger Rail. This milestone included two public open houses, a self-guided online meeting and summer pop-up events.

Milestone Input

Throughout the year, the Project Team continued SAT and Technical Advisory Committee/Subject Matter Expert engagement to establish the final Base Configuration and refinements of operating and infrastructure plans. The Study team assessed the feedback from the SAT, the first public open houses, and summer pop-up events, and presented proposed station site plans, siding locations, potential partnerships, and high-level operating plans. Concurrently, RTD and BNSF were developing the 30% design to identify infrastructure needs to operate Peak service. The results of that work were compared to the conceptual design in the Base Configuration.

Milestone Output

Using this information, the Study Team progressed the "common set of facts," adjusted station areas, continued coordination with BNSF Railway, and explored operational opportunities with Front Range Passenger Rail. The efforts over winter 2023/2024 informed Milestones 4 and 5.

Milestone 3.5 Public Engagement Outcomes and Findings

Website

In total, **7,875** people viewed the Study website **from Jan. 1 to Nov. 30, 2023**.

Events, Open Houses, and Online Meeting

The Study Team hosted pop-up events with approximately **885** visitors to the booths. Between June 15 and Nov. 15, the team received **73** sign-ups and **50** completed surveys.

Open Houses #3 and #4 had a combined total attendance of **130** participants with a total of **14** comment cards submitted.

The Self-Guided Online Public Meeting generated **2,598** engaged sessions and a total of **6,019** views. There were **393** total submissions broken down to **253** completed service station surveys, **34** completed siding opinion forms, and **106** total online meeting comment forms.

Key Takeaways, Top Public Comments, and Feedback Received

- **Themes of Support:**
- General sentiment in support of rail along this corridor
    - Excitement for renewed NWR conversation
    - Potential Partnerships with FRPR and BNSF Railway
- Benefits of peak service
- Avoid traffic congestion
- Opportunity to read, work, rest, etc. on commute
        - Reduce vehicle emissions
- **Themes of Concern:**
- Service limitations and concerns

    - Lack of reverse commute options
    - Lack of service for customers with non-traditional commute times
  - Siding track concerns
    - Noise
    - Idling/derailing
    - Neighborhood interference (driving, biking, walking at crossings)

A majority of participants are in favor of peak service and a handful of comments mentioned the importance of FasTracks commitments, siding locations, land use, construction, and integrated service options. Many participants did not understand the difference between a siding track and station. That gap needs to be bridged for participants to fully understand the impacts.

General Outreach Takeaways

- The top station concerns were safety, pedestrian/ bike connections, and storage for cyclists. Many station locations face barriers that include safety issues, missing sidewalks, and lack of bus connections.
- Enhancement suggestions include weekend and evening service, improving the first/last mile connection, and offering a reverse direction train during the peak hour
- While rail along the corridor generally fits the community's needs, only serving in one direction in the morning and evening does not align with most community members' schedules
- The majority of those who participated do not consider themselves low-income

Milestone 3.5 Study Advisory Team Outcomes and Findings

Update Meetings

From Summer 2023 to Winter 2024, the Study team convened with the SAT for seven update meetings. Throughout the summer months, the SAT reviewed agreements between NWR, FRPR, and BNSF and assisted the Study team in preparing for a presentation to the RTD Board. Beginning in the later months of the year, the SAT reviewed BNSF preliminary design work and plan progression, discussing factors like platforms, vehicle options, rail maintenance facility, midday layover facility, and environmental justice analysis with the Study team. The SAT also assisted in open house planning and reviewed the CBO winter engagement plan during this time. In early 2024, the Study team and the SAT continued to examine public engagement efforts, in addition to discussing technical matters including station sidings, passing sidings, storage, maintenance (drainage, service roads, track modifications, bridges, turnouts), and local plan agreements regarding station-specific improvements.

Further details on these meetings can be found in the agendas, notes, and email updates in Appendix D.

Milestone 4 – Assess and Refine Preliminary Configuration Relative to Long-Range Plans

Goals and Outcomes

Public and stakeholder comments in the previous milestones led to the Study team assessing the addition of a reverse commute trips to the Peak Service concept. The Project Team developed an operating concept to define a "time block" during the morning and evening peak periods that RTD would lease from BNSF Railway to run reverse commutes. Milestone 4 considered the implications of using the time block for trips in each direction. The Project Team also considered the coordination required between the Peak Service plan and a possible intercity passenger rail. The Study team considered long-range rail service plans, including the Front Range Passenger Rail (FRPR), how those plans might fit into the Northwest Rail Peak Service concept, and potential next steps. The RTD Strategic Plan – that serves as the functional pillars by which RTD plans, develops, evaluates and measures overall performance – was also assessed for the role that the Peak Service plan would play at the regional transit level.

Milestone Input

RTD Study Team reviewed other long-range rail plans including the Denver Regional Council of Government's (DRCOG) Metro Vision Plan – which guides the region's investments in the multimodal transportation system – to evaluate the merits of NWR integration within a larger program.

Milestone Output

This milestone produced an program of improvements for the Northwest Rail corridor, including capital and operating costs, and comparisons to peer agencies with similar service. A phased approach for rail service in this corridor is currently unknown but will be determined based on funding.

Milestone 5 – Project Development and Implementation

Goals and Outcomes

The Project Development and Implementation work in this milestone developed a "Common Set of Facts" to inform the RTD Board of Directors of possible next steps. The "Common Set of

Task 11: Consensus Building and Public Outreach Report

Facts" uses the Base Configuration to address five key components to implement the NWR Peak Service Concept:

- BNSF requirements
- Operating specifications
- Infrastructure requirements
- Ridership
- Capital and operating costs

The Study team determined two potential options for RTD Board consideration. One option would be RTD moving ahead independently. A second option would consist of a partnership with FRPR.

Milestone Input

Outcomes from Milestones 1-4 were incorporated into the Project Development and Implementation technical report.

Milestone Output

Stakeholder and public comments related to the final summary report will be captured as part of the final project documentation.

Peak Service Study
Northwest Rail

We make lives better
through connections.

Milestone 4 – Peak Service Expansion Concepts Technical Report

August 2024

Regional Transportation District
1660 Blake Street, Denver CO 80202

Peak Service Study
Northwest Rail

We make lives better through connections.

Contents

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Tables

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Introduction

The objective of Milestone 4 (MS4) is to consider potential service expansion opportunities for the Base Configuration for Northwest Rail Peak Service. The Base Configuration is the service plan for commuter rail as defined by the RTD Board of Directors with input from stakeholders in the Northwest Corridor. RTD identified several potential service expansion opportunities that could be feasible and meet the needs identified during the public and stakeholder engagement process.

The Peak Service Base Configuration

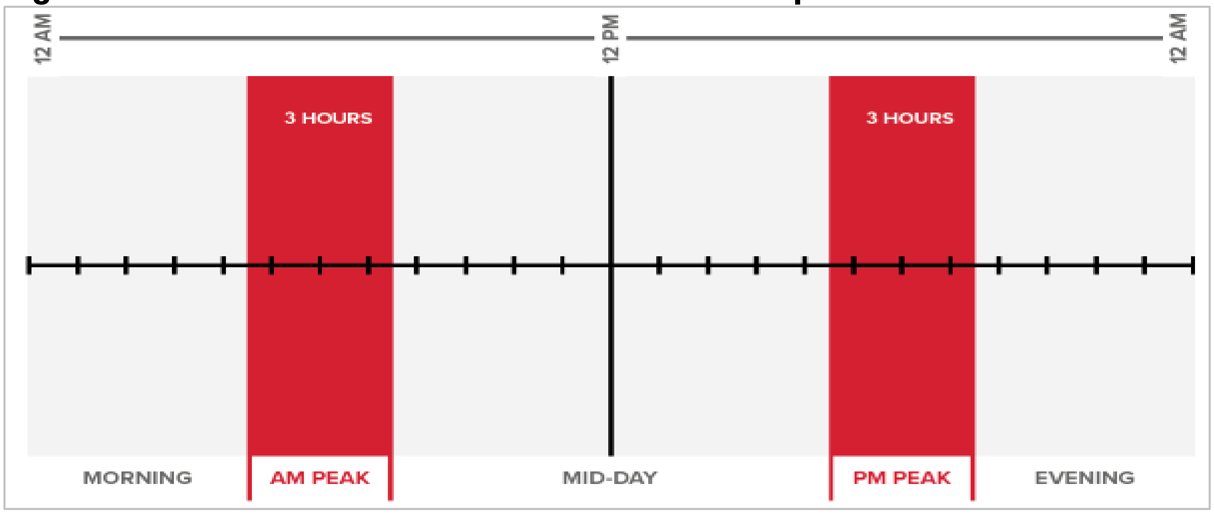
The Base Configuration service concept was defined by the RTD Board of Directors and stakeholders as three morning peak trips from Longmont to Denver and three evening peak trips from Denver to Longmont with six new stations and with service operating in place of the three trips morning and three evening peak trips on the existing B Line service. Since the Base Configuration Service Concept would include stops at existing B Line stations, existing B Line trains would be replaced by Northwest Rail trains operating three trains thirty minutes apart during each peak period and on a compatible schedule with the overall B Line service.

The Base Configuration was refined in Milestone 3 (MS3) to define the infrastructure required for the service concept to operate. The Project Team developed the infrastructure requirements based on track improvements required to achieve a travel time goal of 65 minutes (+/-2 minutes) between Longmont and Denver Union Station (DUS), including stops and dwell times at intermediate stations. In addition, MS3 defined land and infrastructure requirements for stations, midday storage and maintenance and storage facility requirements, freight passing sidings required by BNSF, and safety, signals, communications, and crossing improvements required to operate commuter rail on a freight rail line. The Project Team identified a midday storage facility north of Westminster/72nd Station, enabling the Northwest Rail peak service trains to replace the full roundtrips of existing B Line trains between Westminster/72nd and DUS during peak periods while avoiding additional conflicts into and out of Union Station.

In addition to service and infrastructure requirements, MS3 identified the design considerations under which RTD would acquire an easement from BNSF for the exclusive operations of commuter rail service during peak hours without potential conflicts with freight rail operations. BNSF has developed a standard format of multiple agreements through which it partners with regional transit agencies who provide commuter rail service on BNSF tracks. The Project Team considered the potential costs and cost effectiveness of operating additional service within time blocks that would be acquired from BNSF to operate the peak service versus additional service that would require negotiating and acquiring additional time blocks from BNSF.

Figure 1 illustrates the access easement time block concept required for peak period, peak direction Northwest Rail service. Red blocks illustrate service periods dedicated solely for RTD passenger rail use, while gray blocks represent the remaining periods for use by BNSF and potentially intercity rail services. Two time blocks of just over two hours each are required to operate Northwest Rail Peak Service; however, RTD has identified a three-hour time block to allow for any non-revenue movements to occur and to allow for a modest expansion of service.

Figure 1. Access Easement "Time Block" Concept



Source: RTD; HDR; June 2024

Factors Considered for Expanded Service

In evaluating options for expanded service, the Project Team considered what the community and stakeholders said in the engagement process, the potential for intercity rail service by Front Range Passenger Rail (FRPR) to complement peak service, and the potential cost and cost effectiveness of options for expanded service. The Project Team also considered that US 36 Flatiron Flyer service and the SH 119 Bus Rapid Transit service would provide parallel service to most communities and stations along the Northwest Rail corridor during congested peak periods as service during less-congested weekday off-peak periods and on weekends when Northwest Rail Peak Service is not operating.

Community Feedback

The Project Team led an extensive public and stakeholder engagement process that informed the development of the Base Configuration on a full range of service and infrastructure issues, as well as impacts and benefits of the service. Public meeting and online participants were also asked, "How can Peak Service be enhanced to better meet your needs and expectations?" Nearly 300 participants responded, and the summary of responses to this question are shown in Table 1.

Table 1. "How can Peak Service be enhanced to better meet your needs and expectations?"

Survey Responses	Percent	Potential Solution
Add weekend service	27%	Intercity Rail Service
Offer reverse direction train in the peak hour	20%	Expanded Peak Service Trains
Improve first/last mile connections	12%	Improved Bus Connections
Add service to major events	10%	Intercity Rail Service or Special Peak Service Trains
Add evening service	10%	Intercity Rail Service or Existing US 36/SH 119 Bus Service
Add midday service	10%	Intercity Rail Service
Other responses	11%	Varies

Source: HDR; April-July 2024

The addition of weekend service was the most desired service enhancement, followed by reverse commute service during peak periods. Assuming that RTD Northwest Rail Peak Service and FRPR Intercity Rail Service both operated in the corridor, the Project Team identified in Table 1 the service types that would likely meet the needs desired by potential users.

Any RTD service operated outside the weekday peak windows identified would require one or more additional easements with BNSF and would be more likely to interfere with both freight and intercity rail service. Therefore, expansion alternatives focused on providing one or two reverse commute trains during the three-hour time blocks in each peak period. Train operations modeling is required to identify exactly where the inbound and outbound trains would meet to provide a passenger siding track.

Expanded Service Options

Consistent with other freight corridors that host both commuter and intercity passenger rail service, weekend, midday, and evening service are often provided by the intercity rail service, while peak period service is primarily provided by commuter rail. For that reason, and because any additional reverse direction peak period commuter rail service would operate within the existing peak period times, the Project Team focused its Expanded Service Options on meeting the need for reverse commute trips.

Up to two trains could operate in the reverse peak direction within the two three-hour easement periods RTD would acquire from BNSF. This would permit each peak period to provide up to two round trips and one one-way trip. The Project Team evaluated two alternatives: Expansion Alternative One with one peak round trip and two one-way trips, and Expansion Alternative Two with two peak round trips and one one-way trip. The two expanded service options shown in Table 2 build modestly on the Base Configuration.

Table 2. Preliminary Conceptual Service Expansion Alternatives

Service Description	Base Configuration	Expansion Alternative One: One Reverse Commute Train	Expansion Alternative Two: Two Reverse Commute Trains	Weekend Service
Morning Peak Longmont to Denver	3 Train Trips	3 Train Trips	3 Train Trips	Intercity Rail
Morning Peak	3 Train Trips	2 Trains End 1 Train Continues	1 Train Ends 2 Trains Continue	Intercity Rail

Service Description	Base Configuration	Expansion Alternative One: One Reverse Commute Train	Expansion Alternative Two: Two Reverse Commute Trains	Weekend Service
Denver to Westminster/72nd				
Morning Peak Denver to Longmont	No Train Service	1 Train Trip	2 Train Trips	Intercity Rail
Midday Round Trips	Intercity Rail	Intercity Rail	Intercity Rail	Intercity Rail
Evening Peak Longmont to Denver	No Train Service	1 Train Trip	2 Train Trips	Intercity Rail
Evening Peak Westminster/72nd to Denver	3 Train Trips	2 Trains Start 1 Train Continues	1 Train Starts 2 Trains Continue	Intercity Rail
Evening Peak Denver to Longmont	3 Train Trips	3 Train Trips	3 Train Trips	Intercity Rail
Late Evening Round Trips	Intercity Rail	Intercity Rail	Intercity Rail	Intercity Rail

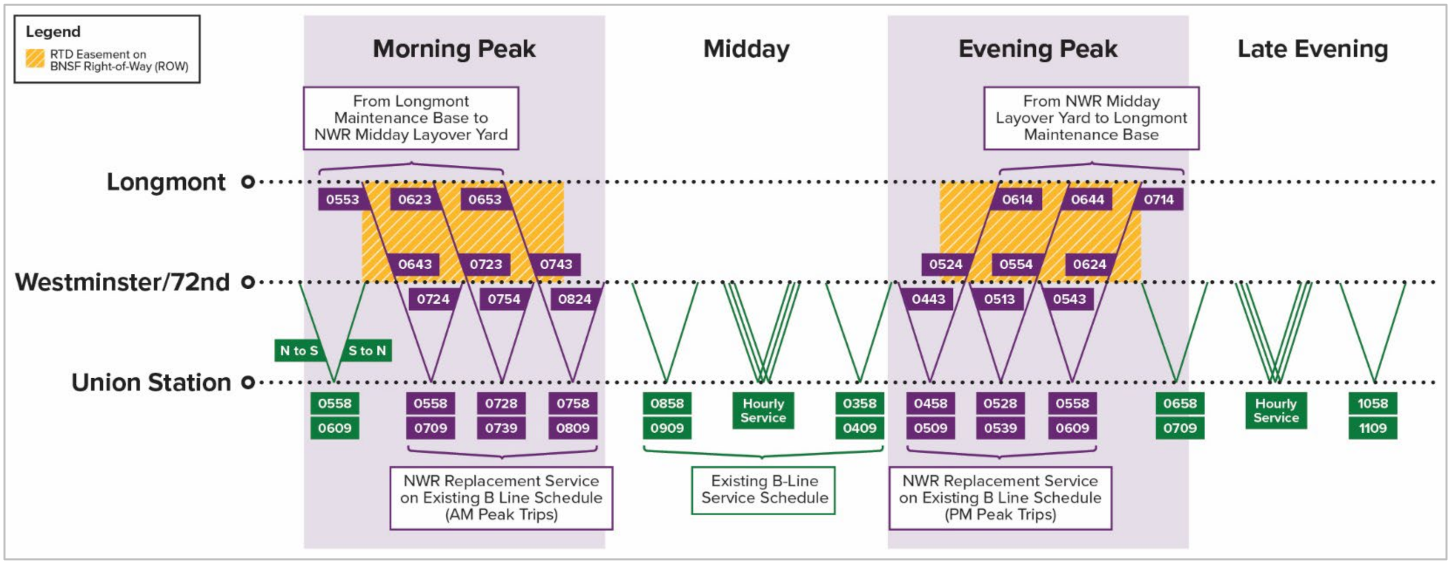
Source: RTD, HDR; June-July 2024 Note: Intercity rail service is contingent on implementation by other agencies.

Descriptions of Conceptual Service Expansion Alternatives

The Base Configuration shown in Figure 2 illustrates the three morning peak trips from Longmont to Denver with a reverse revenue movement along the existing B Line to a midday storage facility north of Westminster/72nd Station, and the evening peak service begins with a reverse commute revenue movement from Westminster/72nd Station to Denver and returning in the evening peak direction to Longmont.

Milestone 4 – Peak Service Expansion Concepts Technical Report

Figure 2. Schematic Schedule for Peak Service Base Configuration in Northwest Corridor

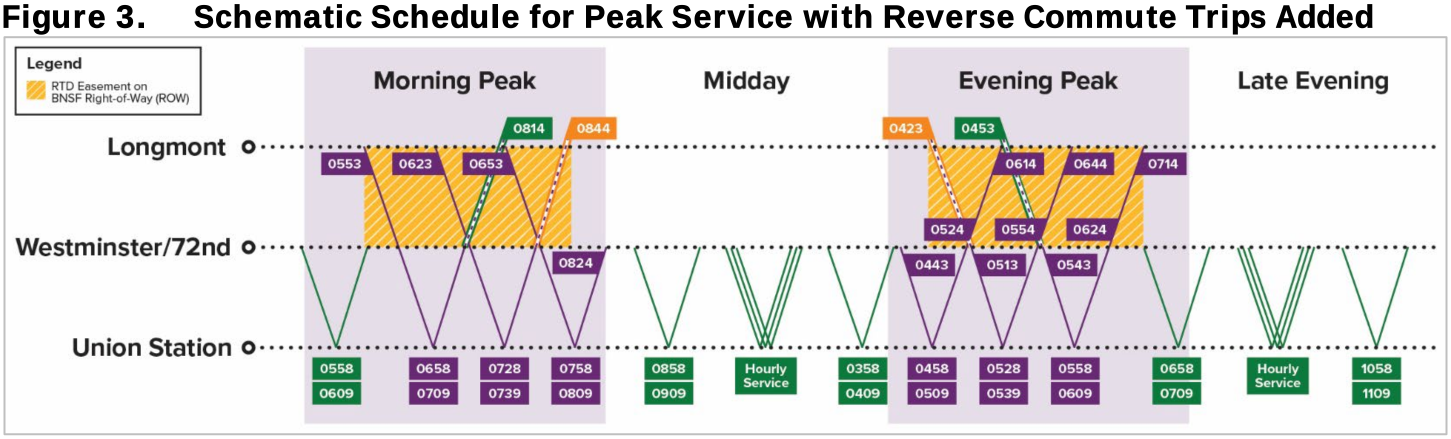


Source: RTD; HDR; May 2024

Expansion Alternative 1 extends one of the reverse commute trains from Westminster/72nd Station to Longmont and eliminates the need for midday storage of one train. This train may remain in the Longmont Station during the day, or it may return to the Northwest Rail Commuter Rail Maintenance Facility (RMF) before making its evening peak round trip from Longmont to Denver and back. To allow for both peak direction and reverse commute trains to operate, a passenger passing track would need to be constructed south of Broomfield/116th Station (this passing track would serve both Expansion Alternatives 1 and 2). Expansion Alternatives 1 and 2 are shown in Figure 3.

Expansion Alternative 2 extends two of the reverse commute trains from Westminster/72nd Station to Longmont and eliminates the need for midday storage of two trains. Trains would remain at the Longmont Station during the day before returning to make two evening peak round trips from Longmont to Denver and back. This option would eliminate the need to expand existing storage tracks at Westminster/72nd Station, since the existing storage tracks have the capacity to store one Northwest Rail Peak Service Train and leave a turnaround track for the B Line electric trains.

Figure 3. Schematic Schedule for Peak Service with Reverse Commute Trips Added

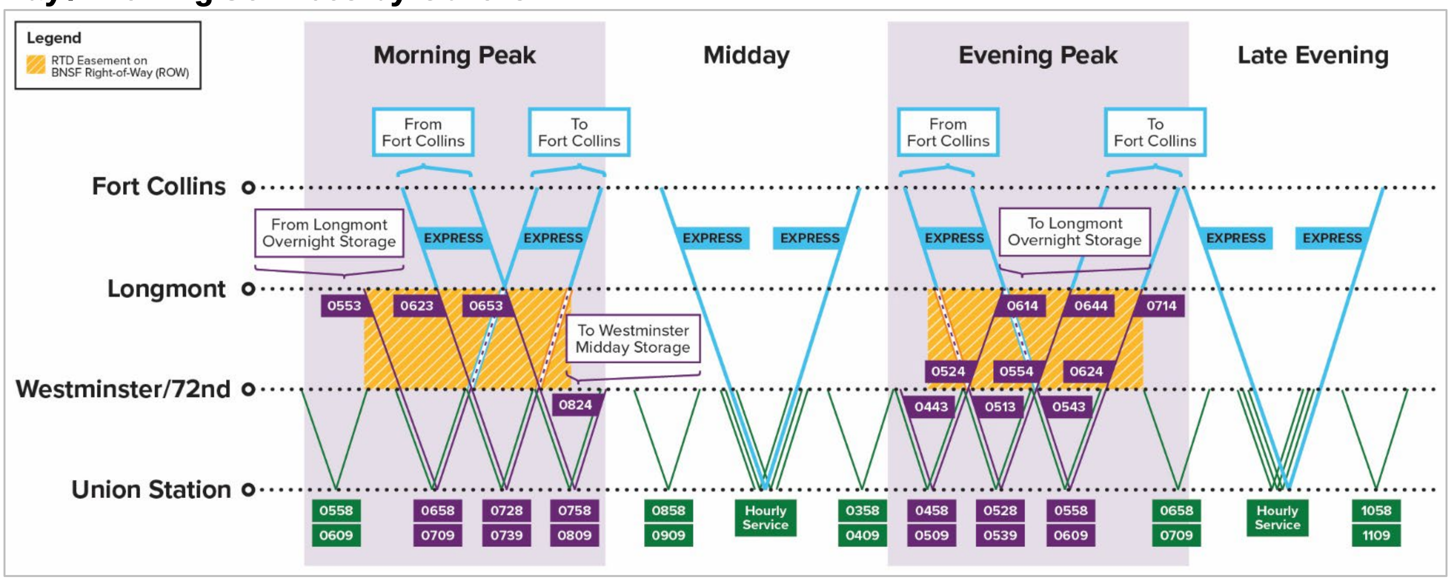


Source: RTD; HDR; May 2024

Additional train modeling, coupled with a bus schedule analysis, would be required to determine whether train schedules would meet typical commute schedules for employment destinations along the corridor. Providing an earlier departure from Denver to Longmont may be possible if a train can be stored overnight at Denver Union Station; however, both security and capacity concerns would need to be assessed.

Figure 4 illustrates how intercity rail alternatives shown in Table 2 might operate in the corridor to supplement RTD's Northwest Rail Peak Service trains. As of the time of this report, the Front Range Passenger Rail District (FRPRD) has not determined an operating schedule for its services.

Figure 4. Schematic Schedule for Peak Service with Reverse Commute and Mid-Day / Evening Services by Others



Source: RTD; HDR; May 2024

Analysis of Conceptual Service Expansion Alternatives

The technical analysis of possible expansion options was conducted using a train operations software model called Rail Traffic Controller (RTC). Train operations in the model were simulated on an infrastructure configuration based on the track layout and geometry of BNSF's Front Range Subdivision from Longmont, through Boulder that leads to a connection with the RTD B Line north of the Westminster – 72nd Street Station. From there, the model track infrastructure follows RTD's B Line from Westminster Station at 72nd Street to Denver Union Station.

RTD established a travel time goal from Longmont to Union Station of 65 minutes plus/minus 2 minutes. The planned train speeds along the route were then established by RTD and previous rail simulation modeling was performed to develop the run-time.

Plans for the existing rail infrastructure and the added improvements in the Base Configuration were provided to the modeling team to build the line's track infrastructure into the RTC model. The most recently developed

30% preliminary engineering level plans prepared by BNSF Railway for implementing the RTD Northwest Rail commuter service were used.

Components built into the model specifically for the Peak Service commuter rail project included:

- Locations and track work associated with new commuter rail stations along the BNSF Front Range Subdivision
- Locations and track work providing access to a Northwest Rail commuter Rail Maintenance Facility (RMF) in Longmont
- Locations and track work providing access to a RTD NWR Midday Layover facility at the Westminster Station
- Locations and track configurations for all three of the proposed new passing sidings along the BNSF Front Range Subdivision to support the implementation of Northwest Rail commuter service
- Location and track configuration of connecting track at Westminster Station between the BNSF Front Range Subdivision and the RTD B Line to be used by Northwest Rail commuter trains
- No signal-controlled sections were assumed in the model

The next steps began with building train files to simulate the movement of the proposed RTD Northwest Rail commuter trains in the model under the Base Configuration plan of three one-way weekday morning trips from Longmont to Union Station and three one-way weekday evening trips from Union Station to Longmont. Train files include a schedule for the train's trip, the equipment to be used, and associated characteristics (e.g., train length, train weight). The technical report *"RTD Northwest Rail Peak Service Study Vehicle, Travel Time & Operating Plan Support Task 4 – Simulation Results for Greenbox & Westminster Options"*; Hatch/LTK; April 17, 2023, was used to integrate the B Line operating plan and schedule from Westminster Station to and from Union Station.

This plan support work also included the G Line operations along the two-track segment from Pecos Junction to Union Station which is another component in the overall operating plan. The current B Line and G Line weekday train schedules were used with the Base Configuration service plan.

The Base Configuration proposes to replace six peak period B Line round trips operated by Denver Transit Operators (DTO) to preserve capacity at DUS platforms. With this replacement, no additional impacts to existing services would be incurred from the proposed Service Expansion Alternatives.

Nonrevenue train movement information was used detailing the proposed nonrevenue movement of Northwest Rail trainsets to and from storage/maintenance facilities. It was also necessary to build train files to simulate the movement of scheduled weekday RTD G Line and B Line commuter trains between Pecos Junction and Union Station in the model to harmonize Northwest Rail train operations with RTD commuter train operations on the RTD-owned segment of the Northwest Rail line.

Equipment characteristics for the B Line and G Line commuter trains was used from RTD data for the current Hyundai-Rotem fleet (vehicle type, number of cars, train length, train weight). For the Peak Service commuter rail service, Stadler DMU vehicles in three-car trainsets were used in this analysis.

The output was train schedules for Northwest Rail, B Line, and G Line (to and from Denver-Pecos Junction only) commuter trains. A train performance chart was output to show the operating profile for the commuter train. A third product was output of stringline diagrams depicting one typical weekday of Northwest Rail commuter, B Line, and G Line train operations along the Northwest Rail Line route.

The modeling team analyzed the following alternatives for adding service in two different service types:

- Base Configuration Commuter Rail by RTD
    - The Base Configuration requested by the RTD Board of Directors is the primary model run. It is composed of the three inbound peak runs in the morning and three outbound runs in the evening.
    - Expansion Alternative 1 is built from the Base Configuration but includes a reverse peak service run within the morning and evening "time block" windows allotted for Northwest Rail commuter trains on the BNSF Front Range Subdivision. The first train in each peak is the train that runs the reverse service.
    - Expansion Alternative 2 is the same as the previous two alternatives, but a second reverse peak service run was added to the time block window. In this case, the two earliest runs are those that reverse.
- In any model run, no freight trains were assumed to be in the segment. If freight trains happened to be in the segment, BNSF dispatch would shunt the freight train(s) into one of the three new passing sidings.

Additional assumptions for the conceptual analysis included:

- New Northwest Rail commuter trains would make the same station stops and have the same trip times as Base Configuration service Northwest Rail trains
- New Northwest Rail commuter trains were planned to operate in conformance with the established service patterns of existing B Line between Westminster and DUS
- New frequencies were planned that utilize the three trainsets proposed for the Northwest Rail base commuter service; no additional equipment should be required to implement the additional reverse commute service.
- For both Expansion Alternatives, the first train (Expansion Alternatives 1 and 2) or first two trains (Expansion Alternative 2) in each peak were assumed to provide the reverse commute service. The return time for these trains would coincide with the start of day/end of day in the Boulder and Longmont areas.

- If the reverse commute operations were implemented, the first inbound and first outbound trains would meet in the segment between the 116th/Broomfield and Downtown Westminster stations near a BNSF Milepost labeled “Homestead”. The second reverse commute in Expansion Alternative 2 would meet the last peak service train in the approximately six-mile B Line section between Union Station and Westminster. This is a double-track section so no layover in a siding would be needed for either direction.
- Minimum equipment-turn times of 11 minutes at Union Station and 20 minutes at the Longmont endpoint stations were assumed.

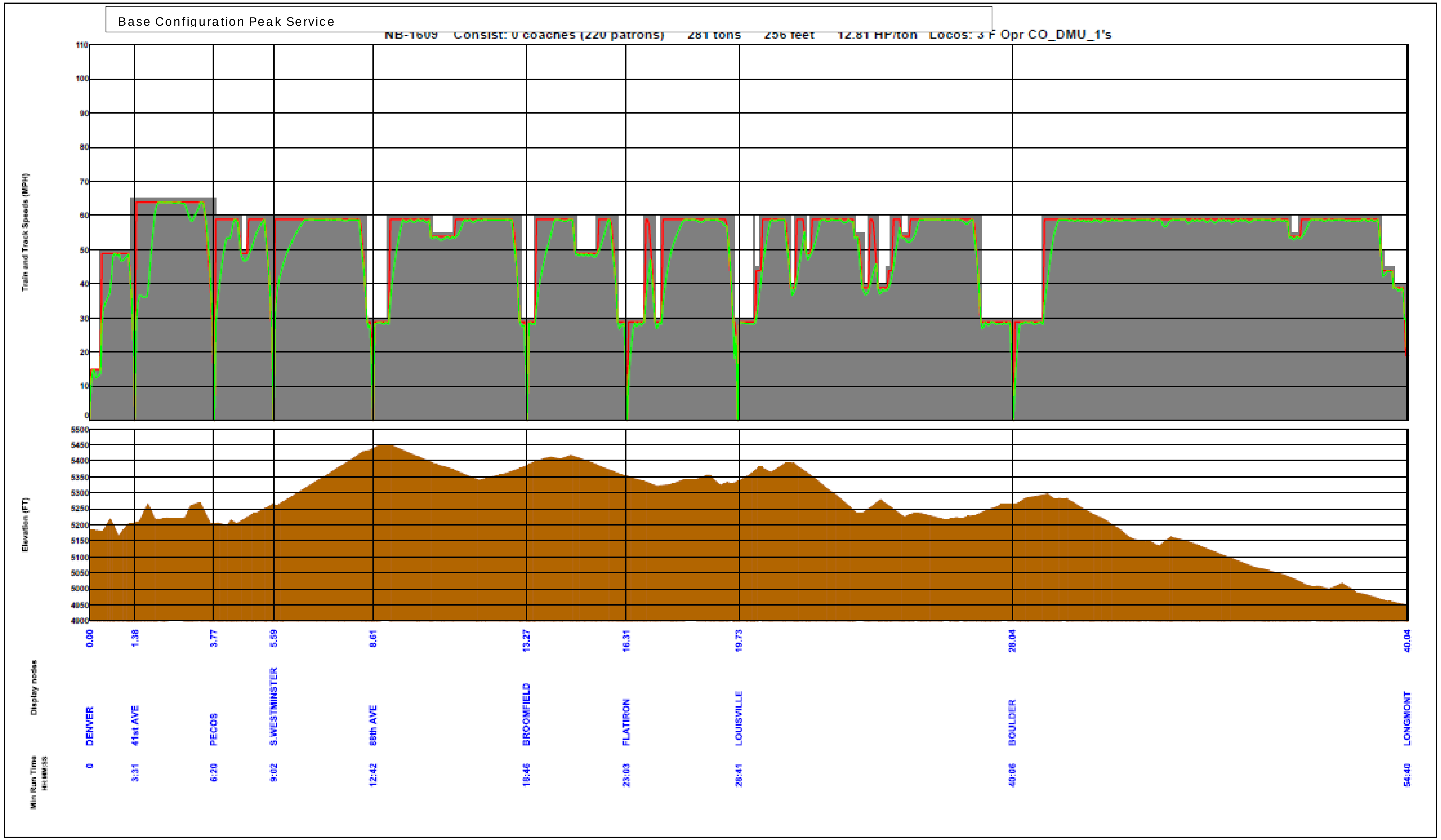
Run-time, Train Performance, and Stringline Results

Run-time tables using Excel were prepared for the Base Configuration and the two expansion alternative operating plans. The RTC model produced a train performance profile for Base Configuration as illustrated in Figure 5 and Figure 6 for Northbound (outbound) and Southbound (inbound) trips respectively. Dwell times and track speeds from the previous model runs by RTD were used in the simulation.

The run-time tables are presented in the Appendix followed by the associated stringline diagrams. The run-time tables show the departure times for each station, and the arrival time at the Westminster Station mid-day layover location. The reverse commute trains show the run-time for returning to Longmont as well.

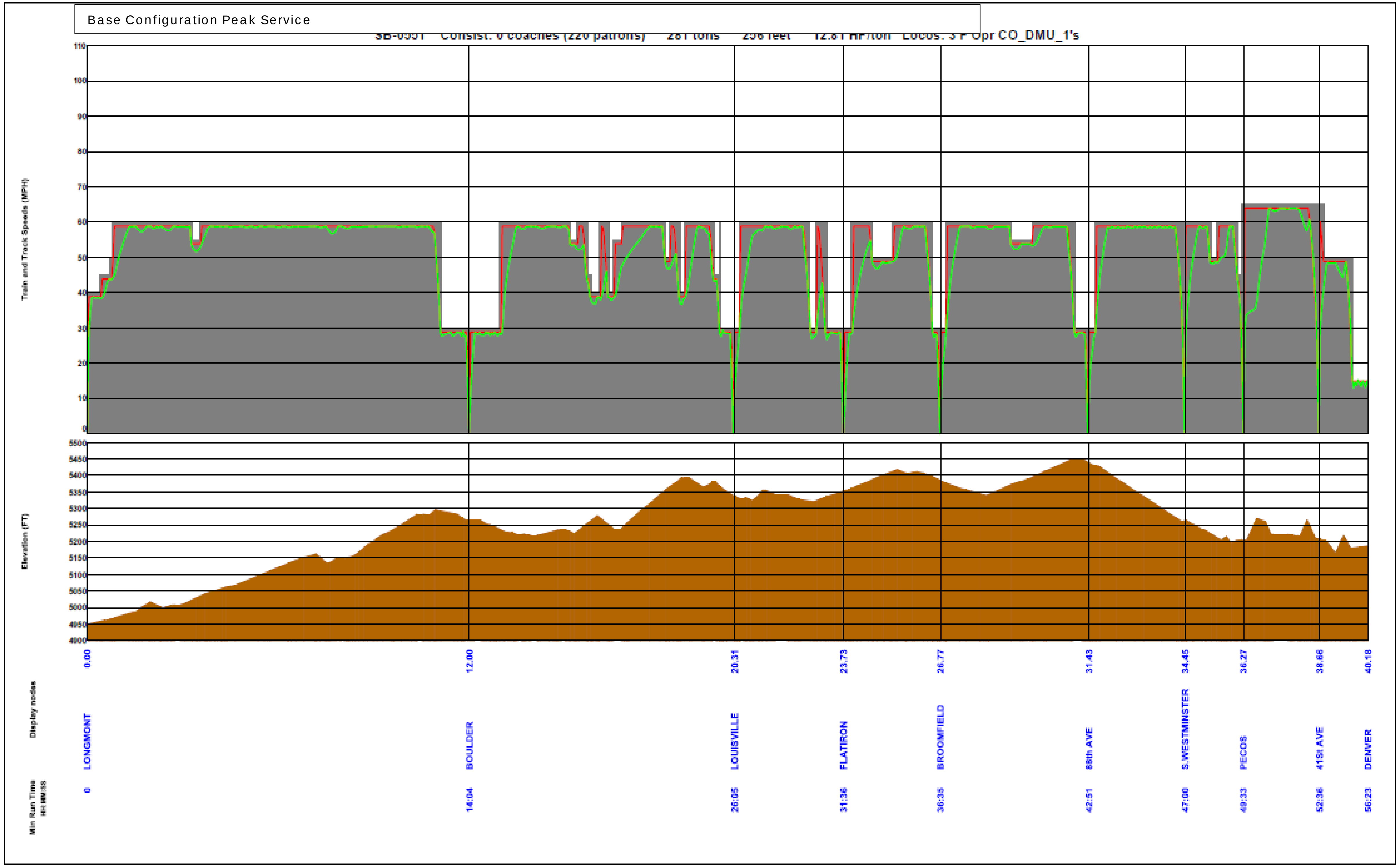
The simulation provides output of train track-miles and train-hours for use in estimating operating and maintenance costs. Those calculations are provided at the bottom of each run-time table. The tables also have listed trains by letter (A, B, C) or by departure time (e.g. SB-0550). In all three of the simulations for commuter rail, the service can be provided by three operating train sets, so no additional equipment is needed for any of the expansion commuter rail alternatives.

Figure 5. Train Performance Profile for Base Configuration - Northbound



Case: RTD_NW_EXT_ALT_1A RTC run: 11 June 2024 9:13:11 User: Glenn Millage of HDR

Figure 6. Train Performance Profile for Base Configuration – Southbound



Case: RTD_NW_EXT_ALT_1A RTC run: 11 June 2024 9:12:18 User: Glenn Millage of HDR

Observations of the run-times and the stringlines are summarized following:

- Commuter Rail Base Configuration
  - The base configuration operation is for 3 consecutive train runs from Longmont to DUS designed such that the train schedules on the RTD controlled segment between the existing Westminster Station and DUS would be the same as the current B-Line schedule. The timing of the Longmont to Westminster Station commuter rail trip is set to meet the established B Line schedules to complete the run to DUS.
- Commuter Rail Expansion Alternative 1
  - Alternative 1 includes one reverse train in the AM and PM time blocks.
  - The first morning southbound train, Train A, is the train that reverses to reach Boulder at 8:00 AM and Longmont at 8:15 AM
  - This schedule results in one additional train-meet of the northbound train, northbound Train A with the third southbound train, Train C at the segment between Downtown Westminster and 116th/Broomfield Stations. The meeting could be timed to occur at the 116th/Broomfield station and that section built with a double track segment for the passenger trains.
  - Because the reverse commute used the first morning train “A” equipment, it arrives in Longmont at 8:15. The total window of morning commuter rail operations on the BNSF freight line would be slightly more than two and a half hours, during which time freight trains would either not be scheduled to operate within the NWR segment or would be held in a siding.
  - The morning and the afternoon Peak Service Base Configuration schedules could be run in a three-hour block of time to allow for any variability setting the basis for the Access Easement from BNSF Railway
- Commuter Rail Expansion Alternative 2
  - In this alternative the first northbound train, Train A, and the third southbound train, Train C meet at the same point as Expansion Alternative 1 between Downtown Westminster and 116th/Broomfield.
  - The second northbound train, “B” would not have a meet with southbound trains and would not require any additional infrastructure than would be required in Alternative 1.
  - In the sketch plan-level train modeling, this operating pattern is shown to take up just over three full hours for the morning and afternoon peak periods. Refinement of the run times, dwell times and other assumptions in the model can tighten up the operating window in future planning work.

Cost Estimates

Capital costs and operating and maintenance (OPEX) estimates were calculated using the stringline diagrams as inputs. The O&M costs are expressed as a range from the least amount of service in the Base Configuration to the highest levels of commuter rail service for Expansion Alternative 2.

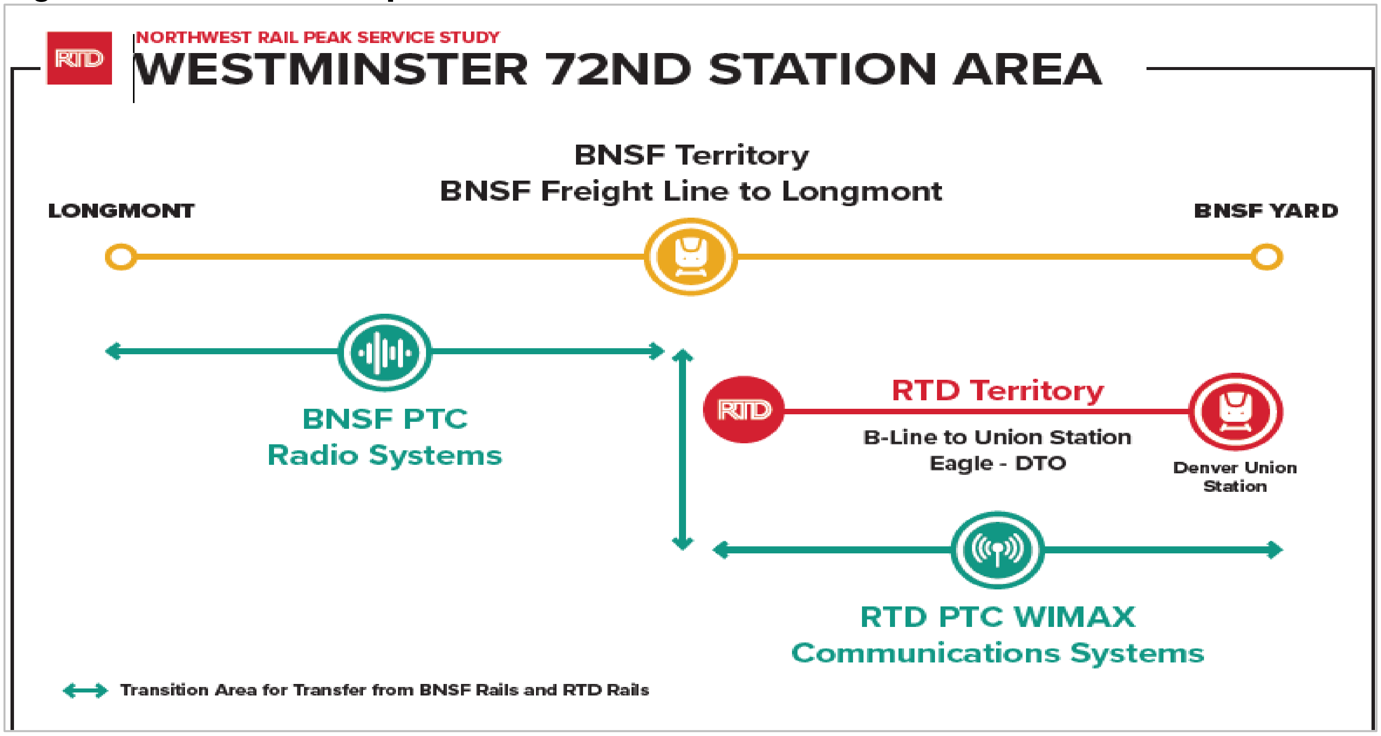
- RTD Staff Operates Service (OPEX cost model based on 2022 NTD data using annual vehicle-car hours)
  - Base Configuration: $12 M – $14 M
  - Expansion Alternative 1: $15 M - $18 M
  - Expansion Alternative 2: $18 M - $21 M
- Contracted estimate based on NorthStar commuter rail system in Minneapolis region that is operated by BNSF (based on annual vehicle-car hours)
  - Base Configuration: $16 M - $18 M
  - Expansion Alternative 1: $18 M - $20 M
  - Expansion Alternative 2: $20 M - $22 M

Operations and Dispatch Coordination

The PTC technology in use by RTD and BNSF will require a concept of operations implementation plan. For the Northwest Rail commuter rail trains, the PTC and voice communication system for inbound trains will need to transition from BNSF territory to the RTD territory. Similarly, the PTC and voice communication system for outbound trains will need to transition from RTD to the BNSF territory.

Both the respective RTD and BNSF PTC systems will need to be installed in parallel and potentially activated simultaneously in each territory. The overlap area shown in Figure 7 would be a transition area that must be implemented for continuous PTC coverage. The details and implementation of this transition area will be dependent on who is selected to operate the railroad, i.e., RTD, a third-party contractor or BNSF. The PTC transition area is at the end of RTD track and beginning of a staging or transition area at the Westminster–72nd Station Tail Track.

Figure 7. PTC and Dispatch Transition Area



Source: HDR; April 2024 Done

Because commuter rail would run only during the peak periods, those time blocks provide clear delineation of which party is responsible for the dispatch and control requirements. When defining the Peak Service concept of operations, it will be important to not preclude consideration of midday, evening and weekend RTD and/or intercity service.

Conclusions

The Base Configuration would need to add a new commuter rail siding to allow up to two reverse commute peak period train trips to operate within the proposed time block acquired from BNSF. Infrastructure changes include a passenger passing track south of Broomfield/116th Station and a possible reduction or elimination of required improvements for the midday train storage area at Westminster/72nd.

Initial sketch planning suggests that up to two round trips can be operated within the 3-hour time block that would be acquired from BNSF. This would allow three peak period, peak direction trains and two peak period, reverse peak trains to operate each peak period. Moreover, the added service can be operated with the same fleet that operates peak direction trains; thus, no additional trains would need to be acquired.

A more detailed analysis of train operations, including detailed modeling, is required to validate findings. Updated travel demand forecasts are also needed to assess the reverse commute ridership potential for expanded service options.

The actual cost to operate reverse peak commuter rail service may be slightly lower than the estimate, depending on minimum paid time guaranteed to operators (e.g. the minimum time guarantee may be sufficient for the operator to make a full round trip without impacting the labor costs required to operate a one-way service). For this analysis, average overall operating cost per train hour reported to the National Transit Database (NTD) have been used.

Milestone 4

Peak Service Expansion Concepts Technical Report

Appendix 1

Base Configuration

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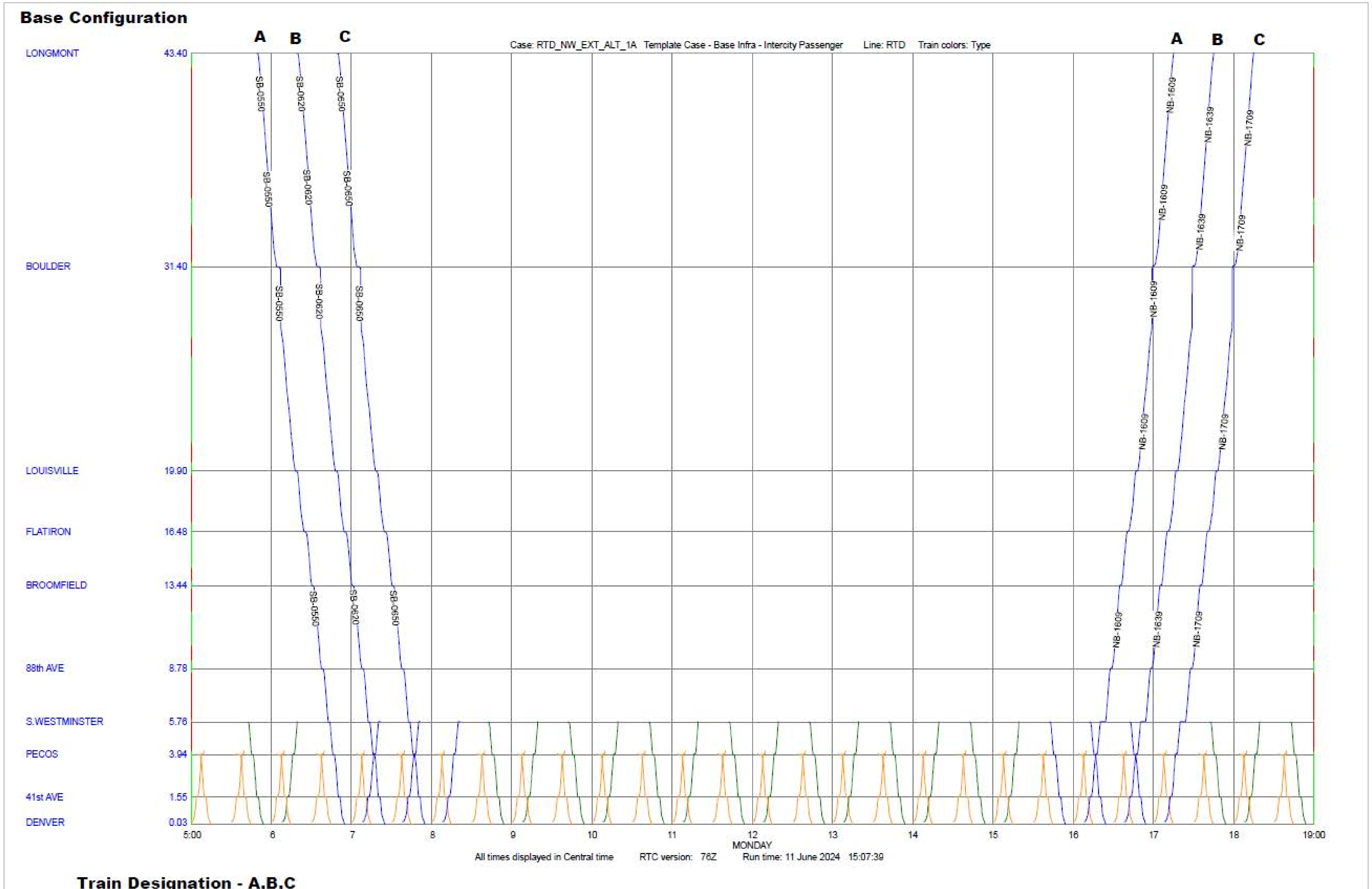
LONGMONT to DENVER UNION STATION								
		Total Runtime	01:08	01:08	01:08			
Base	**Configuration**	Equipment ⇨	A	B	C	A	B	C
mi			SB 0550	SB 0620	SB 0650	SB 1543	SB 1613	SB 1643
43.4	LONGMONT	dep	05:50	06:20	06:50	-	-	-
31.4	BOULDER	dep	06:06	06:36	07:06	-	-	-
19.9	LOUISVILLE	dep	06:19	06:49	07:19	-	-	-
16.5	FLATIRON	dep	06:25	06:55	07:25	-	-	-
16.5	BROOMFIELD	dep	06:31	07:01	07:31	-	-	-
8.8	88th AVE	dep	06:38	07:08	07:38	-	-	-
5.8	WESTMINSTER	dep	06:43	07:13	07:43	15:43	16:13	16:43
3.9	PECOS	dep	06:45	07:15	07:45	15:45	16:15	16:45
1.6	41st AVE	dep	06:49	07:19	07:49	15:49	16:19	16:49
0.0	UNION STATION	arrv	06:58	07:28	07:58	15:58	16:28	16:58
			↓	↓	↓	↓	↓	↓
		Layover	00:11	00:11	00:11	00:11	00:11	00:11
			↓	↓	↓	↓	↓	↓
			NB 0709	NB 0739	NB 0809	NB 1609	NB 1639	NB 1709
0.0	UNION STATION	dep	07:09	07:39	08:09	16:09	16:39	17:09
1.6	41st AVE	dep	07:13	07:43	08:13	16:13	16:43	17:13
3.9	PECOS	dep	07:17	07:47	08:17	16:17	16:47	17:17
5.8	WESTMINSTER	arrv	07:24	07:54	08:24	-	-	-
5.8	WESTMINSTER	dep	-	-	-	16:24	16:54	17:24
8.8	88th AVE	dep	-	-	-	16:29	16:59	17:29
16.5	FLATIRON	dep	-	-	-	16:36	17:06	17:36
16.5	BROOMFIELD	dep	-	-	-	16:41	17:11	17:41
19.9	LOUISVILLE	dep	-	-	-	16:48	17:18	17:48
31.4	BOULDER	dep	-	-	-	17:00	17:30	18:00
43.4	LONGMONT	arrv	-	-	-	17:15	17:45	18:15
			↓	↓	↓			
			SB 1543	SB 1613	SB 1643			
		Road Miles	49.2	49.2	49.2	49.2	49.2	49.2
			A	98.4				
			B	98.4				
			C	98.4				
			Total	295.2				


Base Configuration
A
B
C
Case: RTD_NW_EXT_ALT_1A Template Case - Base Infra - Intercity Passenger Line: RTD Train colors: Type
LONGMONT 43.40
BOULDER 31.40
LOUISVILLE 19.90
FLATIRON 16.48
BROOMFIELD 13.44
88th AVE 8.78
S.WESTMINSTER 5.76
PECOS 3.94
41st AVE 1.55
DENVER 0.03
SB-0550
SB-0620
SB-0650
NB-1609
NB-1639
NB-1709
5:00
6
7
8
9
10
11
12
MONDAY
13
14
15
16
17
18
19:00
All times displayed in Central time RTC version: 76Z Run time: 11 June 2024 15:07:39
Train Designation - A,B,C

Milestone 4

Peak Service Expansion Concepts Technical Report

Appendix 2

Expansion Alternative 1

Peak Service Study
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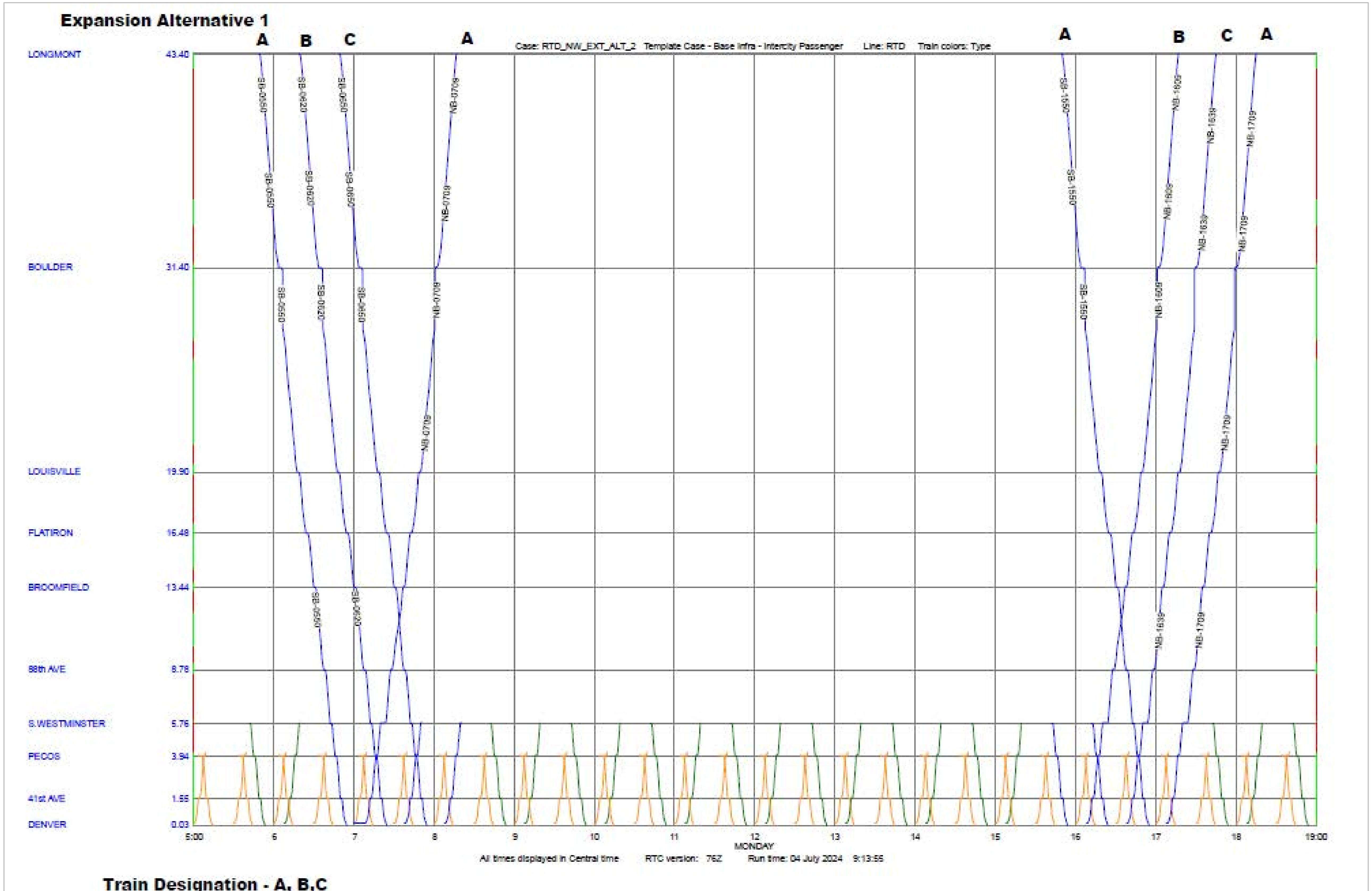
LONGMONT to UNION STATION

mi	Expansion Alternative 1	Equipment ⇨	A	B	C	B	C	A
mi			SB 0550	SB 0620	SB 0650	SB 1543	SB 1613	SB 1550
43.4	LONGMONT	dep	05:50	06:20	06:50	-	-	15:50
31.4	BOULDER	dep	06:06	06:36	07:06	-	-	16:06
19.9	LOUISVILLE	dep	06:19	06:49	07:19	-	-	19:19
16.5	FLATIRON	dep	06:25	06:55	07:25	-	-	16:25
16.5	BROOMFIELD	dep	06:31	07:01	07:31	-	-	16:31
8.8	88th AVE	dep	06:38	07:08	07:38	-	-	16:38
5.8	WESTMINSTER	dep	06:43	07:13	07:43	15:43	16:13	16:43
3.9	PECOS	dep	06:45	07:15	07:45	15:45	16:15	16:45
1.6	41st AVE	dep	06:49	07:19	07:49	15:49	16:19	16:49
0.0	UNION STATION	arrv	06:58	07:28	07:58	15:58	16:28	16:58
			↓	↓	↓	↓	↓	↓
		Layover	00:11	00:11	00:11	00:11	00:11	00:11
			↓	↓	↓	↓	↓	↓
			NB 0709	NB 0739	NB 0809	NB 1609	NB 1639	NB 1709
0.0	UNION STATION	dep	07:09	07:39	08:09	16:09	16:39	17:09
1.6	41st AVE	dep	07:13	07:43	08:13	16:13	16:43	17:13
3.9	PECOS	dep	07:17	07:47	08:17	16:17	16:47	17:17
5.8	WESTMINSTER	arrv	-	07:54	08:24	-	-	-
5.8	WESTMINSTER	dep	07:24	-	-	16:24	16:54	17:24
8.8	88th AVE	dep	07:29	-	-	16:29	16:59	17:29
16.5	FLATIRON	dep	07:36	-	-	16:36	17:06	17:36
16.5	BROOMFIELD	dep	07:41	-	-	16:41	17:11	17:41
19.9	LOUISVILLE	dep	07:48	-	-	16:48	17:18	17:48
31.4	BOULDER	dep	08:00	-	-	17:00	17:30	18:00
43.4	LONGMONT	arrv	08:15	-	-	17:15	17:45	18:15
			↓	↓	↓	↓	↓	↓
			SB 1550	SB 1613	SB 1550			
	Road Miles	Road Miles	86.8	49.2	49.2	49.2	49.2	86.8
			A	173.6				
			B	98.4				
			C	98.4				
			Total	370.4				

Attachment: MS-4 Report (5000 : Northwest Rail Peak Service Feasibility Study Update)



Expansion Alternative 1
A
B
C
A
Case: RTD_NW_EXT_ALT_2 Template Case - Base Infra - Intercity Passenger Line: RTD Train colors: Type
A
B
C
A
LONGMONT 43.40
BOULDER 31.40
LOUISVILLE 19.90
FLATIRON 16.48
BROOMFIELD 13.44
88th AVE 8.78
S.WESTMINSTER 5.76
PECOS 3.94
41st AVE 1.55
DENVER 0.03
5:00
6
7
8
9
10
11
12
MONDAY
13
14
15
16
17
18
19:00
All times displayed in Central time RTC version: 76Z Run time: 04 July 2024 9:13:55
Train Designation - A, B,C

Milestone 4

Peak Service Expansion Concepts Technical Report

Appendix 3

Expansion Alternative 2

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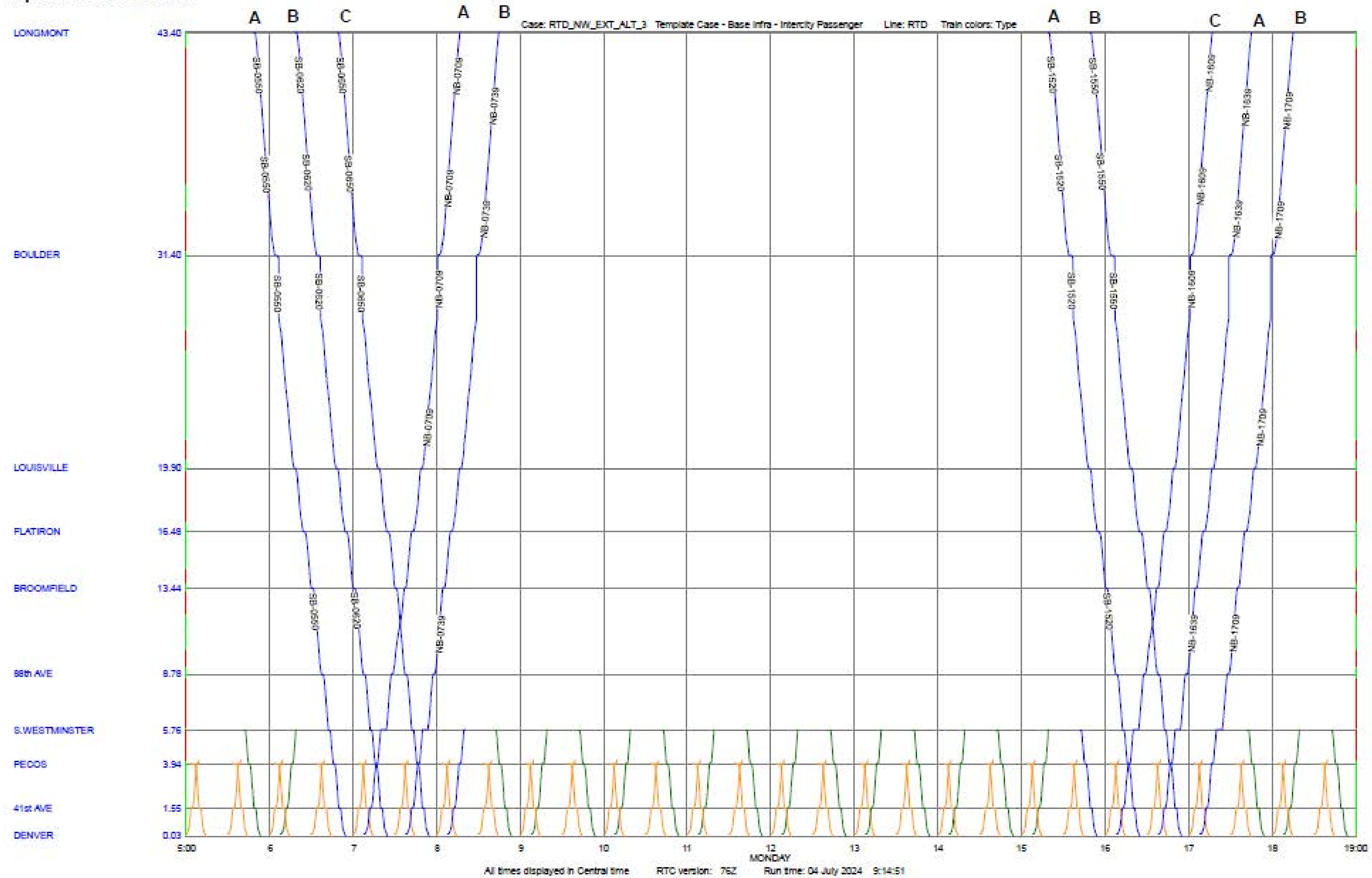
LONGMONT to DENVER STATION

Expansion	**Alternative 2**	Equipment ⇨	A	B	C	C	A	B
mi			SB 0550	SB 0620	SB 0650	SB 1543	SB 1520	SB 1550
43.4	LONGMONT	dep	05:50	06:20	06:50	-	15:20	15:50
31.4	BOULDER	dep	06:06	06:36	07:06	-	15:36	16:06
19.9	LOUISVILLE	dep	06:19	06:49	07:19	-	15:49	16:19
16.5	FLATIRON	dep	06:25	06:55	07:25	-	15:55	16:25
16.5	BROOMFIELD	dep	06:31	07:01	07:31	-	16:01	16:31
8.8	88th AVE	dep	06:38	07:08	07:38	-	16:08	16:38
5.8	WESTMINSTER	dep	06:43	07:13	07:43	15:43	16:13	16:43
3.9	PECOS	dep	06:45	07:15	07:45	15:45	16:15	16:45
1.6	41st AVE	dep	06:49	07:19	07:49	15:49	16:19	16:49
0.0	UNION STATION	arrv	06:58	07:28	07:58	15:58	16:28	16:58
			↓	↓	↓	↓	↓	↓
		Layover	00:11	00:11	00:11	00:11	00:11	00:11
			↓	↓	↓	↓	↓	↓
			NB 0709	NB 0739	NB 0809	NB 1609	NB 1639	NB 1709
0.0	UNION STATION	dep	07:09	07:39	08:09	16:09	16:39	17:09
1.6	41st AVE	dep	07:13	07:43	08:13	16:13	16:43	17:13
3.9	PECOS	dep	07:17	07:47	08:17	16:17	16:47	17:17
5.8	WESTMINSTER	arrv	-	-	08:24	-	-	-
5.8	WESTMINSTER	dep	07:24	07:54	-	16:24	16:54	17:24
8.8	88th AVE	dep	07:29	07:59	-	16:29	16:59	17:29
16.5	FLATIRON	dep	07:36	08:06	-	16:36	17:06	17:36
16.5	BROOMFIELD	dep	08:41	08:11	-	16:41	17:11	17:41
19.9	LOUISVILLE	dep	07:48	08:18	-	16:48	17:18	17:48
31.4	BOULDER	dep	08:00	08:30	-	17:00	17:30	18:00
43.4	LONGMONT	arrv	08:15	08:45	-	17:15	17:45	18:15
			↓	↓	↓	↓	↓	↓
			SB 1520	SB 1550	SB 1543			
		Road Miles	86.8	86.8	49.2	49.2	86.8	86.8
			A	173.6				
			B	173.6				
			C	98.4				
			Total	445.6				

Expansion Alternative 2



Train Designation - A,B,C

Peak Service Study
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Milestone 5 – Project Delivery and Implementation Concepts Technical Report

August 26, 2024

Regional Transportation District
1660 Blake Street, Denver CO 80202

Peak Service Study
Northwest Rail

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Contents

Regional Transportation District
1660 Blake Street, Denver CO 80202

Milestone 5 – Project Delivery and Implementation Concepts Technical Report

Appendix

Figures

Tables

Introduction

Milestone 5 outlines the steps that RTD would need to move the Peak Service plan forward. Project delivery considerations and implementation strategies use the Base Configuration that embodies the initial service plan for commuter rail as requested by the RTD Board of Directors.

There are several basic considerations relative to implementation of the Base Configuration for commuter service across the Northwest Rail corridor consisting of:

- Developing an overall long-term rail service strategy for the corridor that includes freight and passenger services
- Establishing a business relationship with BNSF Railway (BNSF) to utilize and share the trackway
- Understanding the costs and potential funding opportunities
- Outlining implementation opportunities for RTD to consider

This Technical Report is organized into the following sections:

- Service Implementation Strategy
- BNSF Agreements and Associated Costs
- Capital and O&M Costs
- Funding Opportunities
- Implementation Opportunities

Service Implementation Strategy

The Peak Service plan would introduce commuter rail passenger service into a key segment of the BNSF Front Range Subdivision for the first time in more than 60 years. During that time, freight operations have evolved to use more technology to support safe and efficient operations that could allow joint operations with passenger trains. However, as economic, business, and regulatory policy conditions continue to change, BNSF must consider these types of factors to remain profitable.

Returning passenger trains to the Northwest Rail corridor could help BNSF to increase usage of the railway asset to generate revenue. The current freight service is reported to be four to five trains per day, which leaves substantial room in the operating schedule to add trains to increase revenues. An overall service implementation strategy should be developed that would set out the requirements and the responsibilities of the entities that would operate trains on the alignment.

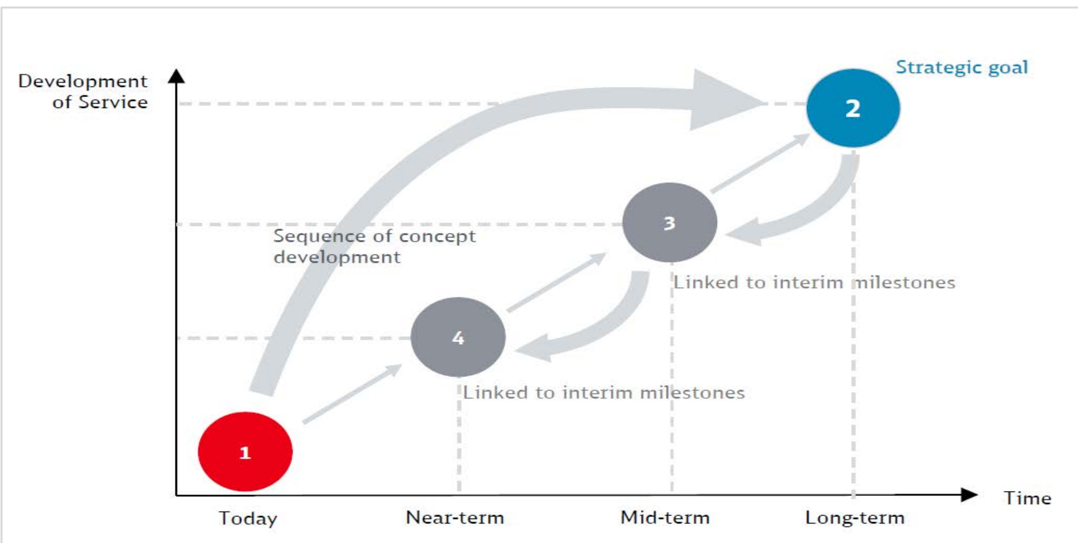
Milestone 5 – Project Delivery and Implementation Concepts Technical Report

A service implementation strategy would be composed of three parts:

- Service - set goals and objectives for freight and passenger service to be jointly operated safely and efficiently
- Operations – develop plans to separate passenger and freight trains by time and space
- Infrastructure – plan, design, build, and use freight sidings and control/communication systems to separate by time

These components will probably change over time as the services are added or changed. An iterative process should be used that shares the long-term objectives of each entity. To achieve the long-term goals and objectives, incremental steps in the near-term and mid-term should be defined among the entities. Such an approach is represented in Figure 1. This approach was used recently to assist the BNSF, North County Transit District (commuter rail operator in San Diego County, California) and Amtrak to create the strategy for the Oceanside to San Diego portion of the Los Angeles – San Diego (LOSSAN) Corridor.

Figure 1: Service Implementation Strategy Approach



Source: "San Diego Pathing Study"; Deutsch-Bahn; September 22, 2020

Implementation Strategy: Service Level Objectives

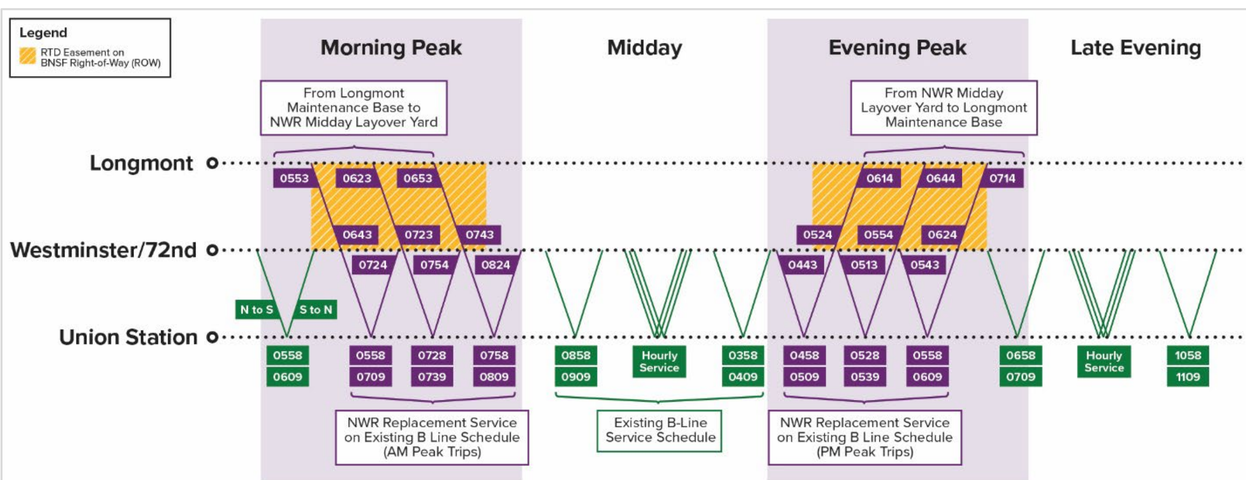
As a first step for commuter rail in the Northwest Corridor, general operating plans for the Near-Term have been defined by RTD as the Peak Service Base Configuration. BNSF is studying the infrastructure requirements for this initial step. It is also important to outline an overall "strategic goal" for both parties in the long-term and iteratively work back to the Near-Term for implementation as depicted in Figure 1. A strategic goal for RTD is to fulfill the commitments in the FasTracks Plan. A strategic goal for BNSF could be to increase usage of the tracks to generate revenue. And finally, a future strategic goal could be to incorporate an intercity passenger service plan such as the Front Range Passenger Rail proposal.

Implementation Strategy: Time Separated Operating Plans

The Peak Service Feasibility Study (the Study) outlines the commuter rail operating plans which now must be compared to the freight operations. Windows of track time or blocks of time have been defined in the Study where RTD could operate commuter service. Figure 2 illustrates the blocks of time concept in yellow bands for the AM and PM peak periods. In order to implement the Peak Service Schedule, RTD would need to acquire the right to operate during these blocks while BNSF freight traffic was idled or scheduled to operate outside these windows.

BNSF must now consider the initial introduction of commuter service in the Northwest segment of the Front Range Subdivision with their current and future freight operations. The two operating plans must be merged, evaluated and fine-tuned to produce a “management plan” that would serve as the basis for partnership agreements.

Figure 2: Schematic Schedule for Peak Service in the Northwest Corridor



Source: RTD, HDR; July 2024

Implementation Strategy: Trackway Infrastructure Needs

For more than 15 years, RTD and BNSF have been coordinating planning studies to define the trackway infrastructure needs for the joint operation of freight and commuter rail service in the corridor. The most recent efforts consist of the Study by RTD and the corresponding preliminary engineering design work by BNSF and their engineering contractor, Wilson & Company.

The result is definition of the Base Configuration that would support the Peak Service plan. BNSF prepared plan drawings and a cost estimate at the 30% design level for the trackway infrastructure improvements. These improvements were based on train operation simulations modeled by BNSF that called for freight sidings at different points in the corridor into which they could shunt freight trains while the commuter rail trains were operating.

The resulting plans identified three sidings totaling more than 8.2 miles of siding tracks. The BNSF design also included the station sidings for all six stations along with the necessary drainage, structures, signaling, roadway crossings, communications, and ancillary improvements within the trackway envelope. These improvements would be designed and built by BNSF. All features outside the right-of-way such as station platforms and passenger areas would be designed and built by RTD.

The information generated through these studies and design plans provide a "common set of facts" from which the RTD Board of Directors (Board) could make a determination regarding implementation. If that determination is made, the overall Implementation Strategy to address the service types, the operations of those services and required infrastructure will need to be developed.

Once RTD and BNSF agree to the Implementation Strategy parameters, the two parties will reach initial alignment with regards to the respective interim and long-term service plans. These corridor plans will support the refinement of regional plans to define the service and infrastructure investment milestones. Following the Implementation Strategy agreement, the next step is to negotiate the formal partnership agreements that must be executed between BNSF and RTD to move forward with implementing the Peak Period Service Plan.

BNSF Agreements and Associated Costs

Joint use of the BNSF trackway along the Front Range Subdivision is the only path for RTD to operate a commuter rail service in this corridor. A partnership between RTD and BNSF is needed to implement the commuter rail service. This partnership will require a foundation built on shared goals and outcomes defined by the two entities. For example, a key goal and outcome will be building and operating a commuter rail service at the same time a freight rail service is running. This goal must focus on safety and security of both operations. Another goal may be to limit impacts to existing and future land uses while increasing usage of the tracks. BNSF could have an objective related to increasing the use of the trackway asset to generate new revenues.

The Study defined the Base Configuration to meet the service implementation strategy objectives by:

- Defining both the commuter rail and the freight service plan objectives
- Planning for near-term service to not preclude possible mid-term and long-range operations
- Identification of the additional infrastructure needed for successful commuter rail and freight service

The RTD/BNSF relationship will require a legal and financial basis to go forward. For other commuter rail systems, BNSF has used a straightforward series of steps that lead to the formal agreements, defining the initial access and capital costs and subsequent transactions as well as the on-going operating and maintenance framework. These steps consist of:

1. Access easement
2. Capital improvements to the BNSF infrastructure that enable joint commuter rail and freight rail service.

3. Non-BNSF capital costs for stations and similar commuter rail related infrastructure
4. Trackway and other on-going asset maintenance.
5. Mandatory operating costs
6. Other operating costs, both mandatory and optional

Access Easement

RTD will need to acquire an interest in the existing BNSF Front Range Subdivision with a one-time payment for an easement in the real property. BNSF will define a value of the easement that would accommodate RTD's peak service operations. The cost of the access easement would be prorated based on the number of hours RTD intends to use the BNSF infrastructure or based on the proportional share of the RTD passenger trips as a percent of total train (commuter and freight rail) trips. It is important to note that RTD's acquisition of the Access Easement will need to be done pursuant to all requirements of the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended.

For the purposes of this analysis, the estimated cost for an easement to utilize the Front Range Subdivision was derived from limited sources, primarily the access easement that the Twin Cities Metro transit agency negotiated with BNSF Railway. In that case the ROW width was assumed to be 100 feet. An alternative for the NWR alignment would be the width of the trackway envelope of 37.5 feet. These two dimensions are used to develop a range of acquisition costs. Examples of alternate methods to cover these costs are presented in the *Costs Summary Technical Report* for the Peak Service plan.

BNSF Capital Improvements

Capital improvements are the RTD share of infrastructure improvements BNSF will implement to accommodate both freight and commuter rail services. As listed above, these will include tracks, positive train control (PTC), pedestrian tunnels, and other improvements to support commuter rail service to address RTD specifications. These improvements would reflect an initial capital expense but would also be subject to asset maintenance requirements including ongoing track replacement and replacement of PTC, switches, technology, etc. at the end of the respective lifecycles.

For the Peak Service project, the improvements will include freight passing sidings and passenger station sidings and track improvements that will enable RTD to provide speed and travel time expectations. Nearly all track improvements are expected to be charged to RTD, since BNSF would not be making the improvements "but for the implementation of commuter rail service".

Track and Other Asset Maintenance

Maintenance of Way (MOW) costs will be defined in an agreement and will reflect a calculated allocation of train miles and weight (ton-miles) to apportion the share of maintenance between BNSF and RTD. This will be an ongoing payment from the RTD that is likely subject to annual inflation or Consumer Price Index (CPI) adjustments. The allocation approach will likely leave RTD with a smaller portion of track maintenance costs because of less annual ton-miles over the segment compared to BNSF. One unique consideration is that RTD's addition of station sidings and switches will likely create an additional factor in track maintenance costs that may be less common in commuter rail systems that lack level platform boarding. Further, RTD will probably be charged 100% for PTC maintenance, unless the cost can be allocated jointly to RTD and a second passenger rail service.

A key issue will be how to structure funding responsibility for asset maintenance activities to address State of Good Repair (SOGR) objectives or replacement of the various assets at the end of their useful lives in 20 or 30 years. While the "but for" test will put funding onus on RTD for the initial improvements, both RTD and BNSF will benefit from the new infrastructure going forward. The SOGR or replacement cost allocation approach should be negotiated at the time of the initial agreement. An important component of the cost allocation approach will be an asset depreciation schedule to establish parameters for each entity.

Finally, infrastructure refurbishment for commuter rail are likely to be charged at the time of replacement rather than with an ongoing use fee. One approach in the agreements would be to consider asset replacement to be included in the capital improvement category above and included in the asset depreciation schedule. The method of cost/use allocation would be computed in train miles in the corridor or the cumulative weight of train cars. Passenger trains will be hundreds of feet in length as either three DMU vehicles coupled together or with two to five coaches and a locomotive. Freight trains can be thousands of feet long with hundreds of cars and multiple locomotives.

Mandatory Operational Costs

Specific operational costs that RTD must pay to BNSF will primarily be train dispatching and passenger operations management from BNSF's Ft. Worth Headquarters. RTD will also likely be responsible for a BNSF Passenger Operations Superintendent for the Northwest Rail portion of the Front Range Subdivision. In addition, RTD will be responsible for PTC operation along the corridor, and any handover operation that occurs between RTD territory and BNSF's Front Range Subdivision. This will be an ongoing operating cost and associated payment, subject to inflation or CPI adjustments.

It will be important to develop a cost model to specify how these direct costs will be calculated. Because the BNSF Front Range subdivision stretches for more than 100 miles, RTD would negotiate its share of the subdivision dispatch desk in Fort Worth for less than 39 miles of the Northwest Rail line.

Other expenses such as operation and maintenance responsibility of at-grade crossing equipment is a sensitive issue. The O&M costs at roadway crossings can be allocated among the local jurisdictions and the commuter and freight rail services based on reasonable allocation models.

Optional Operational Costs

RTD will be required to pay for the commuter train operations and maintenance. RTD has two options for operations:

- RTD would directly operate the commuter rail service as they do now on the N Line; or,
- RTD would contract with an operator to provide the service as they do now with the A, B and G Lines.

For any operator, there will be a need for a handoff between RTD and BNSF train operators at Westminster/72nd Station. For any outside contractor serving as the commuter service operator, RTD would be responsible for the negotiated contract terms, if performed by BNSF or qualified third party for RTD. Similarly, the operating costs would be an ongoing internalized expense if RTD operates the service. There are multiple variables to consider in making a decision about the operating approach.

Non-BNSF Capital Improvements (by RTD)

BNSF will not construct stations and other commuter rail infrastructure; therefore, these RTD-specific costs will be in addition to the previously described BNSF capital costs. RTD will have shared infrastructure with local municipalities at certain stations. A standard RTD policy for FasTracks projects is to obtain a cost participation contribution from the local jurisdiction that constitutes 2.5% of the overall cost of the infrastructure improvements.

Additionally, RTD may be required to maintain certain crossing improvements required by the Colorado Public Utilities Commission unless these costs are allocated to a local jurisdiction. RTD as the commuter rail program implementer will be responsible for all capital, maintenance, and operating costs of station infrastructure, some of which may be contributed from other sources such as the 2.5% local jurisdiction participation. In the situation where FRPRD shares a station, costs would be allocated based on some reasonable measure.

Potential Costs Associated with BNSF Agreements

RTD will need to negotiate the capital and operating and maintenance (OPEX) costs that will be assigned to the Peak Service commuter rail service by BNSF to operate within the BNSF Front Range Subdivision Corridor.

The negotiations will include the use of some basis to apportion the costs between the commuter operations and the freight operations. These can vary from using a “time” basis or using a “train-event” basis. In the “time” basis, the entities that share the track would calculate the proportionate share of time throughout the “day” during which each would be operating. The “train-event” basis would follow the number of trains in a day for each entity. The basis could be as simple as trains per day or could consider the proportionate amount of wear-and-tear related to the weight of each train across the segment.

A source that outlines and documents the expected costs that RTD would incur is not publicly available. Therefore, previous agreements between BNSF and other commuter rail systems were used to indicate possible costs.

As an example, the **Joint Use Agreement** between BNSF and the Metropolitan Council in the Twin Cities (MN) for the NorthStar commuter rail (Exhibit E of the Joint Use agreement) documents the agreed upon cost to implement the commuter service. For the purposes of this study, these costs were inflated to provide a general idea of the potential costs that RTD would incur for the Peak Service plan. The costs are allocated based on a series of methods not stated in the agreement, so they were made using standard industry means to allocate responsibilities among parties.

Milestone 5 – Project Delivery and Implementation Concepts Technical Report

Capital and O&M Costs

This section summarizes the capital (CAPEX) and operating and maintenance (OPEX) cost for Peak Service. Estimates are also made for the agreements that are anticipated with BNSF using standard industry means to allocate responsibilities among parties. Details of the calculations are contained in the "*Cost Summary Technical Report*", HDR/Peak Consulting, August 2024. Table 1 summarizes the potential range of the combined CAPEX and OPEX cost estimates. Additional details on the capital and O&M costs are provided after the table. The range of costs employs the different scenarios from the Cost Estimate Summary and then takes an average of the high and the low values for the mid-range estimate.

Table 1: Total Estimated Costs Summary (2024 $, in millions)

CAPEX	$(millions)	% of Estimate
Vehicles	$ 136.50	21%
Guideway Track/Passing Sidings	$ 18.67	3%
Stations	$ 61.01	9%
At Grade Crossings	$ 4.53	1%
PTC	$ 40.04	6%
Communications and Ductbank	$ 32.75	5%
RMF	$ 89.11	14%
Other Capital Improvements	$ 81.84	13%
ROW and Access Easement	$ 82.42	13%
Professional Services	$ 102.46	16%
	$ 649.34	100%

Source: "*Cost Summary*" Technical Report; HDR/Peak Consulting, BNSF/Wilson & Co.; July 31, 2024

CAPEX Costs

As noted earlier, there are two categories of rail infrastructure capital costs:

- BNSF Capital Investments: Cost estimates for the trackway portion of the infrastructure improvements were developed based on 30% preliminary engineering design plans provided by BNSF
- Non-BNSF Capital Investments: RTD developed the non-BNSF capital costs for stations and other commuter rail related infrastructure, including the Maintenance Facility and Professional Services

The other primary capital cost is rail car vehicles.

Details on these cost categories are contained in the CAPEX portion of the "*Cost Summary Technical Report*".

OPEX Costs

Costs Resulting from BNSF Agreements

Table 2 summarizes the range of operating costs that RTD could incur as a result of the agreements that are needed with BNSF to provide commuter service on the NWR alignment.

Table 2: Possible Operating Costs for BNSF Agreements

BNSF Agreement	Period	Costs	Notes
Access Easement	One Time	$62 M	Term is length of agreement (30-50 years)
Mandatory Operating Costs – Dispatch and BNSF Management	Annual	$475,000 to $770,000	Subject to Annual CPI
MOW / Asset Management	Annual	$558,600	Subject to Annual CPI
Total Annual Costs	Annual	$1,033,600 to $1,386,000	Subject to Annual CPI

Source: HDR, 2024; NorthStar Joint Use Agreement May 2007

Optional Operating Costs

Although RTD intends to operate the trains for Peak Service, RTD could outsource the commuter rail operations to a third party. BNSF operates commuter service in other cities such as Seattle. It is estimated that a contract like that would be in the range of $16-$18 M annually. This compares to the estimated OPEX cost in the range of $12-14 M annually if RTD were to self-perform train operations.

Peak Service with Additional Operations

The Milestone 4 assessment of possible service expansion identified one or two reverse commute trips that could be operated within time block windows in both the morning and evening peak periods. Adding the reverse commute runs would require more operating expenses annually and would require an additional passing siding and associated infrastructure for the commuter trains. Additional vehicles would not be needed for the reverse trips.

The commuter rail reverse commute trips could be made within the three-hour time block so technically could be covered by the access easement terms. That point will be subject to the negotiations with BNSF since the initiation of the Peak Service study was based on the three trips in the same direction for each peak period. If the reverse trip(s) are permitted, a new commuter rail passing siding would be needed and the annual operating costs such as the Mandatory Operating Costs and the MOW Costs would increase along with the RTD service O&M costs.

Supplemental Federal Funding Opportunities

A key component of any future funding strategy is pursuing federal grant programs that were expanded or created in the 2021 Bipartisan Infrastructure Law (BIL). The BIL includes $102 billion in new federal funding for transportation projects. Of this, $66 billion is dedicated to rail infrastructure.

Table 3 compares the federal funding categories available for commuter rail such as the Peak Service plan and the intercity passenger rail such as the FRPR plan. The combination of the two programs would be attractive in the competitive grant programs because of the wider range of benefits that would result from the federal dollars.

These grant opportunities could be pursued for individual investment categories or a bundle of multiple investment categories. Table 4 provides additional information for each of these opportunities and Appendix A provides detailed descriptions and examples of similar projects from around the country that have received grant funding. Finally, the FTA Capital Investment Grant (CIG) Program could provide federal funding for all infrastructure investment categories. However, the Peak Service project would not qualify for the CIG funds because the criteria are highly dependent on ridership estimates compared to the total capital costs. With low ridership and high costs, the Peak Service project would not qualify for this type of federal funding.

Table 3: Potential Federal Funding Opportunities for Commuter Rail and Intercity Rail Projects

Infrastructure Investment Category	Federal Funding Opportunities: Commuter Rail Service	Federal Funding Opportunities: Intercity Passenger Rail Service
Guideway/Track: Passing Sidings	USDOT INFRA* USDOT RAISE DRCOG – Call for Projects	USDOT INFRA* USDOT RAISE FRA CRISI
Stations	USDOT RAISE DRCOG – Call for Projects	USDOT RAISE DRCOG – Call for Projects
Systems: At-Grade Crossings	USDOT INFRA* USDOT RAISE FRA Rail Crossing Elimination FRA CRISI DRCOG – Call for Projects	USDOT INFRA* USDOT RAISE FRA Rail Crossing Elimination FRA CRISI DRCOG – Call for Projects
Systems: Positive Train Control (PTC)	FRA CRISI	FRA CRISI
Systems: Ductwork	USDOT INFRA* USDOT RAISE FRA CRISI	USDOT INFRA* USDOT RAISE FRA CRISI

Note: *INFRA grant opportunities must reflect a benefit to freight movement.

Acronyms: USDOT = U.S. Department of Transportation; INFRA = Nationally Significant Multimodal Freight & Highway Projects); RAISE = Rebuilding American Infrastructure with Sustainability and Equity; DRCOG = Denver Regional Counsil of Governments; FRA = Federal Railroad Administration; CRISI = Consolidated Rail Infrastructure and Safety Improvements

Table 4: Potential Federal Funding Opportunities Summary

Grant Program	Implementing Agency	Program Priorities	Eligible Projects	Selection/Merit Criteria	Benefit Cost Analysis (BCA) Required	Grant Funding Request	Federal Contribution
RAISE	USDOT Office of the Secretary	Helps communities build transportation projects that have significant local or regional impact and improve safety and equity.	• Capital projects: o Highway, bridge, or other road o Public transit including commuter rail o Intermodal • Planning projects (planning, design, environmental): o Comprehensive or corridor plans o Equity, community engagement	• Safety • Environmental sustainability • Quality of life • Improve mobility and community connectivity • Economic competitiveness • State of good repair • Partnership and collaboration • Innovation (technology, project delivery, financing)	• Capital Projects: Yes • Planning Projects: No	Minimum Grant Request: $5M· Maximum Grant Request: $25M	Up to 80% future eligible costs
INFRA	USDOT Office of the Secretary	Multimodal freight and highway projects of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people. Grant awards are available under two categories • Large Projects: costs >$100M • Small Projects: cost <$100M	• Highway/bridge projects on the NHFN • Highway/bridge projects on the NHS • Freight intermodal, freight rail, or freight projects; intermodal facilities • Highway-railway grade crossing or separation • Wildlife crossing • Transportation project connected to an international border crossing • Highway/bridge projects on the NMFN	• Safety • State of good repair • Economic impacts, freight movement and job creation • Climate change, resiliency, and the environment • Equity, multimodal options, and quality of life • Innovation (technology, project delivery, financing)	Yes	No award size restrictions	• Up to 60% future eligible costs • Other federal assistance may be used for an 80% total federal share
Railroad Crossing Elimination Program	FRA	Fund highway-rail or pathway-rail grade crossing improvement projects that focus on improving the safety and mobility of people and goods.	• Grade separation or closure including through-use of a bridge, embankment, tunnel or combination. • Track relocation. • Improvement or installation of protective devices, signals, signs, or other measures to improve safety, provided such activities are related to a separation or relocation project. • Other means to improve the safety and mobility of people and goods at highway-rail grade crossings (including technological solutions). • A group of related projects that would collectively improve the mobility of people and goods. • Planning, environmental review, and design	• Safety • Equitable economic strength and improvement core assets • Equity and barriers to opportunity • Climate change and sustainability • Transportation of our nation's infrastructure	No	Minimum grant request is $1M	Up to 80% future eligible costs
Consolidated Rail Infrastructure and Safety Improvements (CRISI)	FRA	To fund projects that improve the safety, efficiency and/or reliability of intercity passenger and freight rail systems.	Wide range of capital improvement projects including Projects to enhance multimodal connection or facilitate service integration between rail service and other modes: • Rail safety technology • Grade crossing improvements • Regional corridor service planning and environmental analysis • Emergency plans for hazardous materials • Rehabilitation of locomotives	• System service and performance • Safety, economic competitiveness, reliability, trip time, resiliency • Efficiency from improved integration with other modes • Ability to meet existing and anticipated demand	Yes	No award size restrictions	Up to 80% future eligible costs

Implementation Opportunities

Over the almost 20 years following approval of the FasTracks program, RTD has studied the requirements several times for implementing commuter rail service in the Northwest corridor. The key findings in previous studies and in this Peak Service Study are that costs are high compared to the level of benefits primarily low ridership levels that would be served.

The question of affordability comes up each time RTD studies the project. Findings from each study indicate that actions to improve affordability could increase the chances for implementation.

Implementation of the Peak Service plan requires the following considerations:

- Assessment of affordability options
- Acquiring new sources of funds
- Forming partnerships

Affordability Options

Affordability options that RTD may consider consist of phasing improvements and/or outsourcing certain functions. As general approaches to implementation, these options would require significant study and analysis to be included in an implementation strategy.

The phasing of improvements is dependent on the agreement that would be negotiated with the BNSF. If agreeable with the BNSF, portions of the Base Configuration infrastructure could be phased out over a period of years, lessening the demand on RTD for capital payments.

Phasing of improvements could consider several approaches which would reflect:

- Deferring one or more stations from the initial construction until a future point in time may be timed with land development and/or ridership demands
- More detailed modeling of train operations may indicate that one or more freight sidings could be built in a later phase

One advantage of phasing would be to coordinate the type of improvement with the opportunity to receive federal funding grants to make that improvement. As shown previously in Table 3, there are several categories of federal funding that could be aligned with the components of the Base Configuration over a period of several years.

RTD could also consider outsourcing some of the capital improvements and/or operating functions to a third party. This option would reduce the initial/one-time capital expense in return for an additional annual operating expense. For either option, RTD could better align cash flow requirements for Peak Service with available or anticipated revenues.

Table 5 presents different options that could be achieved depending on the alignment of required capital and/or operating expenses across the timespan for implementation.

Table 5: Implementation Options with Change in Affordability

Option for Implementation	Change in Affordability
Implement incrementally to be more affordable over time.	CAPEX savings could be possible if improvements can be phased in agreements with BNSF
Align with funding partners – BIL grant programs cover many NWR elements	Jointly pursue grant funds with BNSF, FRPRD, State and local agencies
Outsource certain elements to save capital costs, shift to annual O&M costs	Shifting to OPEX could reduce CAPEX but significantly increase OPEX
Forge partnerships with the State, FRPRD and BNSF to share costs and responsibilities	Cost sharing could leverage RTD FISA funds through bonding.

Source: HDR; June 2024

New Sources of Funds

As detailed in the previous section, RTD could develop a coordinated program of matching the infrastructure improvements needed with the availability of federal or other funds. Table 6 illustrates the potential opportunities and level of federal funding that could be targeted for the conceptual incremental investment categories.

Table 6: Potential Federal Funding Opportunities for Conceptual Incremental Investment Categories

Infrastructure Investment Category	Applicable Federal Funding Opportunities	Amount (Magnitude)	Probability of Funding
Full Project	FTA Capital Investment Grant Program (New Starts)	Minimum $400M total cost Minimum grant request $150M	○
Full Project	FTA CIG (Small Starts)	Maximum $320M Total Cost Maximum grant request $120M	◔
Guideway / Track Passing Sidings	USDOT INFRA* USDOT	Up to 60%	◑
	RAISE	Up to 100%	◑
Stations	USDOT RAISE	From 15 - 20%	◑
Systems: At-Grade Crossings	USDOT INFRA*	Up to 60%	◑
	USDOT RAISE	Up to 30%	◑
	FRA Rail Crossing Elimination	Up to 80%	●
	FRA CRISI	Up to 80%	●
Systems: Positive Train Control	FRA CRISI	Up to 75%	◑
Systems: Ductwork	USDOT INFRA*	Up to 60%	◑
	USDOT RAISE	Up to 25 %	◑
	FRA CRISI	Up to 80%	◑
Total	**Combined Sources**	**Between 40 and 75%**	

Source: HDR; July 2024

Note: *INFRA grant opportunities must reflect a benefit to freight movement.

Acronyms: USDOT = U.S. Department of Transportation; INFRA = Nationally Significant Multimodal Freight & Highway Projects); RAISE = Rebuilding American Infrastructure with Sustainability and Equity; DRCOG = Denver Regional Counsil of Governments; FRA = Federal Railroad Administration; CRISI = Consolidated Rail Infrastructure and Safety Improvements

LEGEND:

- ○ Zero Probability
- ◔ Low Probability
- ◑ Moderate Probability
- ● High Probability

Forming Partnerships

RTD could enlist new partners to help with implementation. Sharing roles, responsibilities and costs could provide added leverage to the ability to implement Peak Service.

Local agencies already have been working with RTD by planning for development and making infrastructure improvements anticipating the transit access. In each of the commuter rail stations in the Base Configuration, local jurisdictions have established guidelines and development requirements to result in Transit Oriented Development (TOD) that will be supportive of the commuter rail service.

Jurisdictions have also made capital improvements such as linkages to future station sites and continued improvement of the at-grade rail crossings along the corridor. Further, an existing RTD policy requires at least a 2.5% infrastructure cost participation by local cities that will further the partnership with local entities.

In the 2024 Colorado legislative session, there was significant work done to define how the state might help with rail transit funding. Options that would include additional funding for RTD could provide further connection to the state with the FasTrack programs. Work in future years may bring this concept to fruition.

One of the requirements of the various federal funding sources is that the local agency (in this case RTD) and the host railroad (BSNF) would need to cooperatively prepare the grant request and then implement the award together. Coupled with the other business agreements described previously, RTD and BNSF would form a sort of “working partnership” that would enhance implementation.

Finally, several entities including RTD are presently engaged in defining the ways in which the FRPR concept could be implemented. The preferred route of the FRPR north segment adopted by that Board is along the BSNF Front Range Subdivision between Fort Collins and Union Station. A portion of this alignment is the same segment over which the Peak Service would operate between Longmont and DUS. Sharing implementation responsibilities between the two programs in partnership with BNSF Railway is a key opportunity for these rail programs.

There are several opportunities in which the two programs could benefit from shared economies of scale that include:

- Probable joint operational efficiencies, especially with regard to the requirements of BNSF as the host railroad
- Potential synergies arising from a common fleet type where spare vehicles could be shared reducing overall fleet costs; sharing portions of a common fleet could save a trainset for RTD which would reduce costs in the range of $15-20 M
- Possibility to share and reduce operations and maintenance costs with a shared maintenance facility or perhaps outsourcing the O&M tasks; with a shared RMF, RTD could save in the range of $40-45 M for half of that facility cost
- Potential to share track improvement costs that benefit both entities

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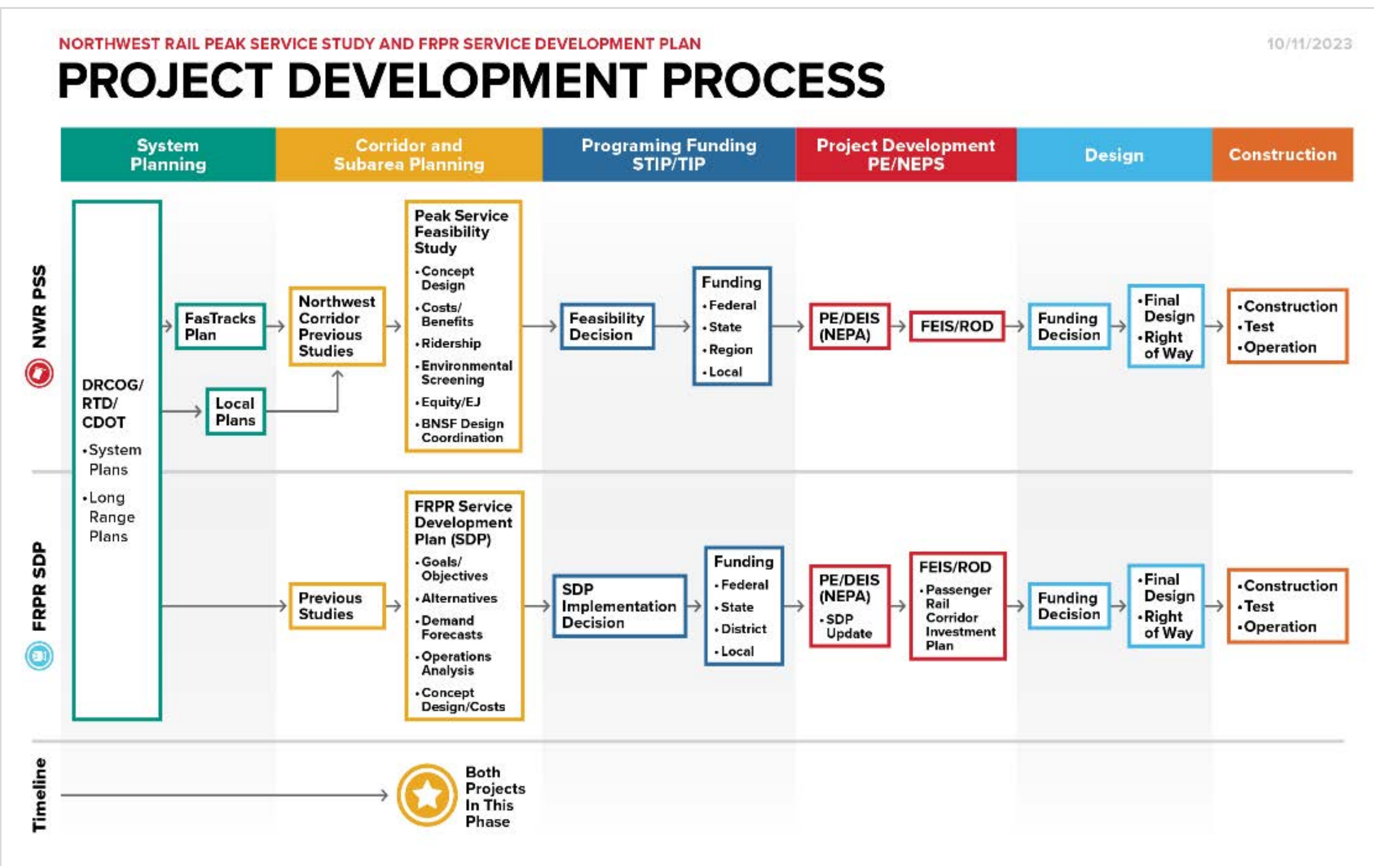
- Potential to share station CAPEX and OPEX expenses at the common stations in Boulder and Longmont
- Potential to share in costs of safety systems like PTC/communications and crossing upgrades
- Potential to submit stronger grant requests to state and federal programs to more effectively use awarded funds

Figure 3 illustrates the two processes and the current stage for the Peak Service Plan and the FRPR program. The two projects are in the "Corridor and Subarea Planning" stage that would be followed by Programming Funding and then Project Development for preliminary engineering and environmental clearance. The environmental studies would be subject to the RTD FasTracks Environmental Resource Guidance (FERG) that is based on the National Environmental Policy Act (NEPA). Regardless of funding source, the Peak Service plan would fall under these requirements because of the various features that interface with resources and facilities in which federal, state and local governments have an interest in protecting and/or mitigating impacts with implementation of either project.

Figure 3: Project Development Process for Peak Service Commuter Rail and FRPR Intercity Rail



Source: HDR; January 2024

Project Development and Implementation Opportunities

While the purpose of the Study was to identify the facts associated with an RTD peak service operations, the Project Team identified a potential opportunity for RTD and FRPR to coordinate efforts for a rail solution in the Northwest area. Consistent with the FasTracks plan, RTD could deliver peak service on its own. RTD could also continue to explore the emerging opportunity to deliver the project in partnership with FRPRD.

RTD FasTracks Implementation with Commuter Rail Peak Service Only

RTD could move forward but challenges remain with a funding gap. RTD does not currently have sufficient funding to implement Peak Service with an expected capital cost of $650 million. The *FasTracks Unfinished Corridors Report*, June 2019 shows a completion date for the Peak Service concept in the 2042-2048 range with current and anticipated funding. A key component of the available funding is the current round of federal grant programs.

Design issues remain to be resolved at some locations. Continuing work with BNSF to keep open the option of access to the line is important. Demonstrating a strong, integrated program with multiple local partners could enhance the probability of being awarded grant funding. RTD will continue to monitor the statewide effort to advance passenger rail service and coordinate the Peak Service concept with that process. A detailed plan could be used to start the commuter rail service and, at the same time, be ready to expand the service, while ensuring not to preclude FRPR. Demonstrating a strong, integrated program with multiple local partners could enhance the probability of being awarded grant funding

Joint Implementation of RTD Commuter Rail and Intercity Passenger Rail

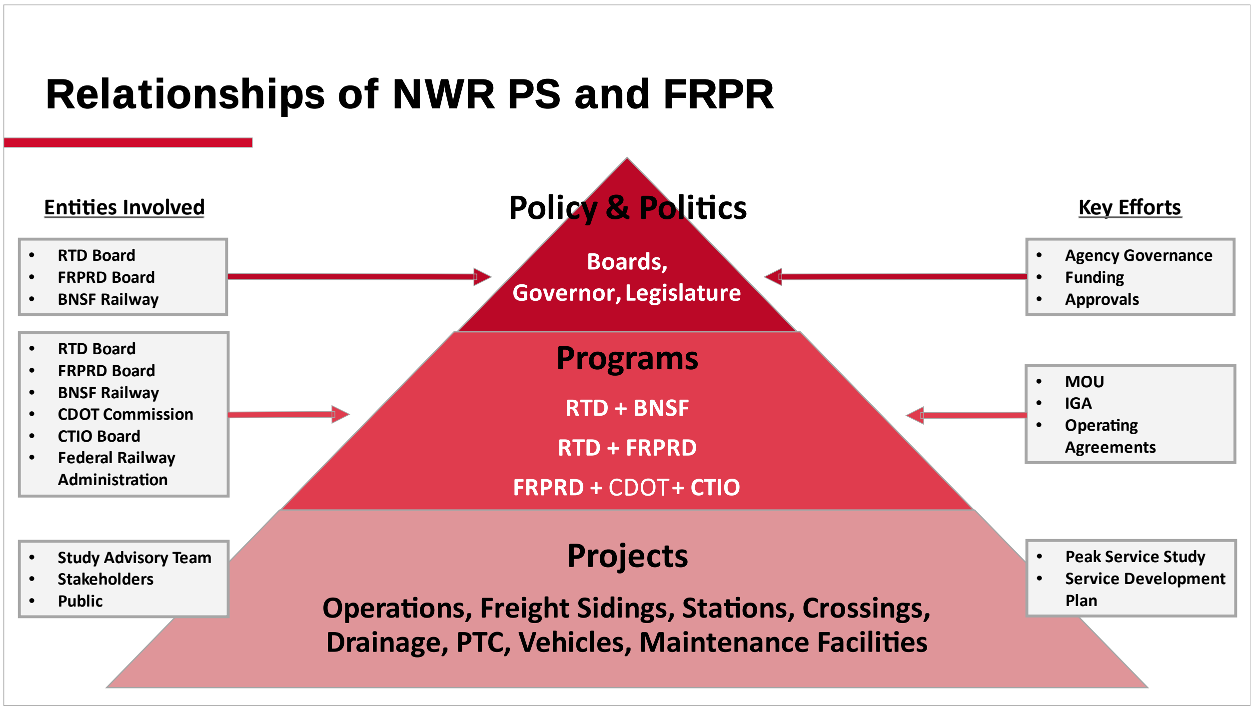
Legislation passed in 2024 requires RTD and FRPRD to work together to determine whether and how the two programs could be done together. Completion of the RTD and CDOT studies would enable RTD and FRPRD to develop a combined approach for improving infrastructure on the corridor and provide service, either jointly or separately while sharing the common infrastructure. Included in that effort would be an allocation of costs and responsibilities. Opportunities to share economies of scale could be realized between RTD and FRPRD that include joint operational efficiencies, shared fleet, and shared costs of improvements. It is reasonable to expect that cost sharing of common elements would result in a lower cost to each agency.

The first step would outline service and operating plans for each program, and how to integrate with the BNSF freight service plans. Next, the required infrastructure to start initial operations would be agreed upon, as well as shared costs and implementation responsibilities. A funding and financing plan would be aligned with the improvements. RTD and FRPRD would participate jointly in seeking grants and other funding over near-term and long-range horizons.

Implicit in joining with significant partners is working closely with CDOT, RTD's long-time partner in the region. Figure 4 depicts the various entities involved in the discussions related to the Peak Service plan for NWR and the FRPR proposal. The State of Colorado is moving forward with several programs that lead to the implementation of intercity passenger rail. CDOT is the lead agency for the State.

The RTD system is in the center of those connections. The Northwest Corridor is currently the first segment where RTD and FRPRD are working together. In the future, planning operations and improvements at DUS, and along the Central and the Southwest Corridors will possibly be brought forward for planning together as partners in those segments. Those other locations will need to be studied together regardless of the option chosen by RTD for NWR.

Figure 4: Relationships Among Entities Involved with NWR Peak Service and FRPR Proposal



Source: HDR; April 2024

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Appendix

Potential Federal Funding and Financing Opportunities

The following provides an overview of the potential federal grant programs identified previously in Table 4. If the decision is made to pursue one or more of these grant programs in the future, it is important to remember that all federal grant awards and federal loans carry substantial regulatory requirements for award, obligation, and compliance reporting. The Uniform Guidance detailed in *2 C.F.R. Part 200* details overarching administrative requirements, cost principles, and audit requirements for federal awards.

As part of any future decision to pursue federal funding or financing, RTD's and potential regional partners' implementation strategy should reflect the potential schedule and cost impacts associated with administrative and project development requirements tied to the pursuit and use of awarded federal funds. While RTD may be well-versed in these requirements, if applications are led by regional partners or reflect a joint application, it will be important to educate the regional partners on the requirements summarized below.

Additionally, for each grant and financing program, the federal department that oversees these programs has its own requirements. These requirements could result in longer project implementation schedules, delays in the start of construction, and increased costs. Consideration of these potential impacts on an implementation schedule should be incorporated as part of federal funding and financing pursuit efforts. Further, each program carries specific requirements for meeting obligation deadlines (agreement execution), monitoring and reporting performance measurements, and expending grant funds within a specific time period.

Requirements that should be considered in the context of the current implementation strategy discussions include:

- Compliance with the National Environmental Policy Act, which includes preparation and approval of an environmental clearance document for the infrastructure project that receives federal funding.
- Use of local prevailing wage rates as required by the Davis-Bacon and Related Acts Plan.
- Adherence to the Uniform Relocation Assistance and Real Property Acquisition Policies for Federal and Federally Assisted Programs for all real-estate acquisition activity.
- Compliance with Disadvantaged Business Enterprise (DBE) requirements of Title 49, Code of Federal Regulations Part 26 https://www.transportation.gov/osdbu/disadvantaged-business-enterprise/49-cfr-part-26-sample-disadvantaged-business including establishing a DBE participation goal and regular monitoring and compliance reporting.
- Adherence to the USDOT's Made in America policies and Build America, Buy America Act which directs Federal agencies to maximize the use of goods, products, and materials produced in, and services offered in, the United States through their financial assistance awards and procurements.

Grant Funding Programs for Specific Project Elements

Nationally Significant Multimodal Freight and Highway Projects (INFRA)

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Appendix 1. Potential Federal Funding and Financing Opportunities

Description: This program awards competitive grants for multimodal freight and highway projects of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas. As noted earlier, while funding from this program could support some of the incremental investments needed for the NWR Peak Service, the primary element of the application would be demonstrating how the project would benefit freight service.

Eligible Project Categories: Eligible projects are those that improve safety, generate economic benefits, reduce congestion, enhance resiliency, and hold the greatest promise to eliminate freight bottlenecks and improve critical freight movements.

Potential NWR Peak Service elements that could be funded by an INFRA grant: These include sidings, highway-rail crossing improvements and similar trackway improvements.

Revenue Potential: Grant awards can fund up to 60 percent of project costs. Under the BIL, the INFRA program is authorized for $1.5 billion annually through FY 2026. Additionally, 30 percent of annual funding is allocated to projects between $5 million and $100 million and 70 percent is allocated to projects over $100 million.

The INFRA program includes categories for large and small projects. For a large project, the minimum INFRA grant must be at least $25 million. For a small project, including both construction awards and project development awards, the grant must be at least $5 million. For each fiscal year of INFRA funds, 10 percent of available funds are reserved for small projects and 90 percent are reserved for large projects.

In the FY 2022 application cycle, 26 transportation projects in 23 states were awarded grants ranging from $10 million to $150 million and averaged $37.7 million. Examples of recent rail projects that received awards reflect the following:

- FY 2022: The Illinois Department of Transportation received $70 million to rehabilitate railroad track, upgrade signaling, and replace, remove, or rehabilitate 18 viaduct structures on an approximately 1.9-mile-long rail segment.
- FY 2021: The Palmetto Railways, a division of the South Carolina Department of Commerce, received $25 million to build approximately 22.7 miles of new track and related facilities to connect the Camp Hall Commerce Park to the CSX rail network.

Most Recent Application Cycle: The application cycle for FY 2025 and FY2026 funding ended on May 4, 2024. Future funding of the INFRA program is contingent upon additional funding approved by Congress.

Rebuilding American Infrastructure with Sustainability and Equity (RAISE)

Description: The RAISE program, formerly known as the Better Utilizing Investments to Leverage Development (BUILD) program, and before that, the Transportation Investment Generating Economic Recovery (TIGER) program, is one of USDOT's largest multimodal discretionary grant programs and supports innovative multi-modal projects that would be otherwise difficult to fund through traditional federal programs. Competitive projects prove the ability to catalyze long-lasting, positive changes in safety, economic competitiveness, quality of life, environmental sustainability, innovation, and partnerships with a broad range of stakeholders.

Eligible Project Categories: Eligible projects include surface transportation infrastructure improvements that will have a significant local or regional impact. This includes projects that support roads, bridges, transit, rail, ports, or intermodal transportation.

Potential NWR Peak Service elements that could be funded by a RAISE grant: Sidings, stations, highway-rail crossing improvements.

Revenue Potential: The largest grant award is $25 million. Under the BIL, the RAISE program is authorized for $2 billion annually through FY 2026, and the allocation of grant awards must be split 50 percent to urban areas and 50 percent to rural areas. Additionally, the RAISE program includes a Planning Grant category and a Construction Grant category.

In 2022, RAISE funded 166 projects in all 50 states, the District of Columbia, Puerto Rico, the Northern Mariana Islands, and the US Virgin Islands. The Construction Grant category awards ranged from $1.1 million to $25.0 million. Colorado received three RAISE Grants: the Westward Three Project that funded the construction of three mobility hubs in Grand Junction, Rifle, and Glenwood Springs; the Rio Grande Intermodal Transportation facility in Alamosa; and the West Side Connector in Pueblo connecting the West Side of the city with downtown.

Examples of other recent grant awards that were similar to elements of the NWR Peak Service infrastructure needs include:

- FY 2022: Downtown Baton Rouge and Gonzales Train Station Project in the City of Gonzales, Louisiana. The award was for $20 million to acquire right-of-way, design, and construct the two train stations along the planned Baton Rouge-New Orleans Inter-City Rail Service.
- FY 2022: The Town of Wake Forest, North Carolina received a $3.4 million grant to fund the planning of mobility hubs in seven communities along the S-Line passenger rail project. The planning activities include feasibility and site assessments for all the partner communities, NEPA compliance, and preliminary engineering for four of the seven communities.
- FY 2021: The Derby-Shelton Multimodal Transportation Center in Connecticut was awarded $12.6 million to construct a multimodal transportation center. Improvements to the existing Derby-Shelton Train Station include construction of a high-level rail platform and new bus and rail passenger amenities, improvements to station safety, rehabilitation of the existing train station building, bus waiting/loading areas, electric vehicle charging infrastructure, sidewalks and crosswalks throughout the station site, and improved vehicle parking and bus access.
- FY 2021: The City of Springfield, Illinois received a $13.5 million award to implement new underpasses, grading and trackwork, and new grade crossing/pedestrian signals.

- FY 2021: The Michigan Department of Transportation received a $10 million award to construct an intermodal facility, which includes a combined rail and bus station; ticketing, waiting, baggage handling, and amenities; a 12-berth intercity bus boarding and alighting area covered by a multi-level parking garage; a lengthened and widened passenger rail platform; and a passenger tunnel connecting the combined passenger station and rail platform to the bus.

Next Application Cycle: The FY 2025 RAISE Grant cycle will open in October 2024 and applications will be due in January 2025.

Railroad Crossing Elimination (RCE) Program

Description: This is a new competitive grant program that provides funding for highway-rail or pedestrian/ bicycle pathway-rail grade crossing improvement projects that focus on improving the safety and mobility of people and goods. The program is intended to eliminate highway-rail grade crossings that are often blocked by trains; improve the health and safety of communities; reduce the impacts that freight movement and railroad operations may have on underserved communities; and to improve the mobility of people and goods.

Eligible Project Categories: Eligible projects include the following:

- Grade separation or closure, including through the use of a bridge, embankment, tunnel, or combination thereof
- Track relocation
- Improvement or installation of protective devices, signals, signs, or other measures to improve safety
- Other means to improve the safety and mobility of people and goods at highway-rail grade crossings
- A group of related projects described above
- The planning, environmental review, and design of a project described above

Potential NWR Peak Service elements that could be funded by the RCE Program: Highway-rail crossing improvements

Revenue Potential: The BIL appropriates $300 million annually through FY 2026 for this program. Each grant must be at least $1 million, and there is no statutory maximum. Additionally, the RCE program includes a Planning Grant category and a Construction Grant category.

FY 2022 was the first round of applications for this program and to date, grant awards have not been announced.

Most Recent Application Cycle: The FY 2023 and 2024 NOFO was released on July 9, 2024, and applications are due on September 23, 2024.

Consolidated Rail Infrastructure and Safety Improvements (CRISI)

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Appendix 1. Potential Federal Funding and Financing Opportunities

Description: The goal of this competitive grant program is to support safety enhancements and general improvements to infrastructure for both intercity passenger and freight railroads by leveraging private, state, and local funding. The CRISI program is administered by the FRA and invests in a wide range of construction projects to improve railroad safety, efficiency, and reliability; mitigate congestion at both intercity passenger and freight rail chokepoints; enhance multi-modal connections; and lead to new or substantially improved intercity passenger rail transportation corridors. Although this grant program is generally intended for intercity passenger rail rather than commuter rail, commuter rail projects that implement or sustain PTC systems can be awarded CRISI grant funding. In these instances, the grant award would be administered by FTA rather than FRA.

Eligible Project Categories: There are five grant categories (called "tracks") within the CRISI program, of which the following three would be relevant to the NWR Peak Service investments: Track 1 - Systems Planning, Track 2 - Project Development, and Track 3 – Final Design and Construction.

Potential NWR Peak Service elements that could be funded by the CRISI program: Sidings, PTC, highway-rail crossing improvements, ductwork.

Revenue Potential: Grant awards can fund up to 60 percent of project costs. Under the BIL, the CRISI program is authorized for $1.4 billion annually through FY 2026. Additionally, 25 percent of annual funding is allocated to rural projects, $150 million is allocated for Intercity Passenger Rail Projects, $25 million for implementing anti-trespassing measures, and $2 million for MagLev projects. Example of recent relevant grant awards include:

- FY 2021: The North Carolina DOT received a $57.9 million award to perform surveys and complete preliminary engineering for the Raleigh to Richmond (R2R) Corridor Program improvements between Raleigh, NC, and Richmond, VA. The project will advance the next phase of the R2R corridor development, which will eventually result in new intercity passenger rail service on a state-owned route that will access currently underserved and minority rural communities with rail service, as well as improve travel times on the existing Amtrak Silver Meteor service.
- FY 2021: The City of San Jose received $7.5 million to fund preliminary engineering and environmental reviews necessary for grade separations at three existing at-grade crossings in a high-fatality corridor. Additionally, the preliminary engineering and environmental work will allow the project to be built concurrently with the California High Speed Rail Project that will use the grade separations.
- FY 2021: $8 million was awarded to the San Diego Association of Governments to replace the Pacific Surfliner Bridge with a new concrete bridge constructed above the flood zone to ensure safe and efficient operations. This corridor sees significant daily train traffic for intercity, freight, and commuter services.
- FY 2020: $31.8 million was awarded to the Wisconsin DOT for six infrastructure improvements in Wisconsin and Minnesota on Canadian Pacific's Soo Line to increase service frequency on the first state-supported intercity passenger rail between the Twin Cities and Milwaukee. Upgrades include

communication and signaling, extending rail sidings, improving at-grade crossings, extending yard lead track, and reconstructing and modifying turnouts and mainline track.

- FY 2020: The City of Boca Raton, Florida received a $16.35 million award to construct a new passenger rail station and parking garage. This project consists of a new station on Brightline's existing train corridor, track improvement work, and construction of a parking garage, which will provide an intermodal connection between vehicles and rail.

Most Recent Application Cycle: The FY 2023 and 2024 NOFO was published on March 29, 2024, and grant applications were due on May 28, 2024.

Regional Transportation Improvement Program (TIP) Call for Projects

Description: Every year the Denver Regional Council of Governments (DRCOG) solicits transportation projects to be included in the Regional Transportation Plan through the Transportation Improvement Program (TIP). Local governments within the DRCOG boundaries decide on a process and criteria for including projects in the TIP and awarding DRCOG-controlled federal and state funds, which allows the region to set and agree upon its transportation priorities. All program projects must meet current air quality standards.

In addition, RTD is also invited to participate in the Subregional Forums which are responsible for submitting projects, programs, or studies for consideration by the DRCOG Board. In addition to the main Regional and Subregional Calls for Projects, DRCOG also develops and maintains a group of regional set-aside programs, each having their own funding amount and call for projects. RTD is also included in this set of programs.

Eligible Project Categories: Projects that are eligible for inclusion in the TIP and for funding include those that reduce congestion, improve air quality, maintain a state of good repair on the existing system, capital costs for transit projects, fringe and corridor parking facilities, highway and transit safety infrastructure improvements and programs, transportation alternatives activities, and bicycle and pedestrian facilities.

Potential NWR Peak Service Elements that could be funded through the TIP: passing sidings, stations, at-grade crossings.

Revenue Potential: The amount available per Call varies from year to year. In general, the maximum grant award is $20 million. The Federal share can cover up to 80 percent of total costs. Examples of recently awarded projects include:

- The Federal BRT Corridor received $15 million in the 2024-2027 TIP Regional Share Call #3 for design, environmental, and early action projects associated with side-running bus rapid transit (BRT). The final project will include enhanced bus stops, sidewalk improvements, transit lane striping, and operational improvements including transit signal priority.

- The East Colfax BRT project received $12 million from the 2022-2025 TIP Regional share and $3 million from the 2022-2025 TIP Subregional Share for a total funding of $15 million. The awards will fund preconstruction activity, including design for the center-running bus rapid transit from Civic Center Station to Yosemite.

- Boulder County received $8.2 million in the 2020-2023 Regional Share TIP funding allocation to enhance the BRT system along State Highway (SH) 119, including centering the busway in Longmont, creating transit bypass lanes on SH 119, and providing Bus Access Transit lanes in Boulder. The project received an additional $11.2 million in the 2022-2025 TIP First Call.
- In the 2022-2025 TIP Regional Share – First Call, the City and County of Broomfield received $7.3 million for design and environmental studies for the passenger vehicle, transit, and active transportation components at six locations along the SH 7 corridor.

Most Recent Application Cycle: In 2022, DRCOG held two Calls for Projects (Regional and Subregional Share call to program the fiscal year 2022-2025 TIP) that began programming anticipated funding available for fiscal year 2022 through FY2027. Then, to begin programming a new TIP covering FY2024-2027, DRCOG held a Regional Share call from late August until early October, and a Subregional Share call from November 2022 until January 2023. At this point, no TIP funding has been identified for the NWR Project.

Grant Funding Programs for the Entire NWR Peak Service Project

The following provides an overview of two potential federal grant programs that could provide funding support for all infrastructure investments needed for the NWR Peak Service Project.

FTA Capital Investment Grant Program (CIG)

Description: If the project is classified as a Commuter Rail System, the FTA Capital Investment Grant Program could provide full funding for the project. Within the CIG program there are three funding categories: New Starts (project costs greater than $450 M); Small Starts (project costs <$450 M); and Core Capacity (increase capacity of existing fixed guideway systems by at least 10 percent). The NWR Peak Service Project could potentially pursue funds under the New Starts category. As noted earlier, a key factor to being competitive for this grant program is the ridership forecast. Based on the FTA's Project Justification rating process, the ridership forecast is an input to four of six Project Justification criteria: Mobility Improvements, Cost Effectiveness, Environmental Benefits, and Congestion Relief.

Revenue Potential: Historically, New Starts grants have provided between 40 and 50 percent of total project costs. The BIL significantly increases funding for the CIG program with approximately $23 billion authorized over the FY 2022 to FY 2026 period.

Most Recent Application Cycle: Unlike other federal discretionary grant programs that have a defined application schedule and submittal date, the CIG program is a multi-year process that can start at any point during a calendar year

FRA Federal-State Partnership Grant Program

Description: If the project is classified as an Intercity Passenger Rail System, it would be eligible for the FRA Federal-State Partnership Grant Program. This program was revised in BIL to include broader eligibility in terms of project types and selection criteria. More specifically, the BIL provides funding for projects that replace, rehabilitate, or repair infrastructure, equipment, or a facility used for providing intercity passenger rail service to bring such assets into a state of good repair; or improve intercity passenger rail service performance, including reduced trip times, increased train frequencies, higher operating speeds, improved reliability, expanded capacity, reduced congestion, and electrification; or to expand or establish new intercity passenger rail service. The program additionally provides funds to complete planning, environmental review, and final design of an eligible project or group of projects described above.

Revenue Potential: Funding from this program can cover up to 80 percent of total project costs. As enacted, the BIL appropriated $36 billion over the FY 2022 to FY 2026 period for the program, of which no more than $24 billion may be awarded to projects on the Northeast Corridor (NEC) and $12 billion would be available for off-NEC network expansion (National Network).

In addition to the $36 billion appropriated under the BIL, the law also authorizes an additional $7.5 billion contingent on future Congressional appropriations, of which $3.4 billion to $4.1 billion would be available for network expansion, with the remainder reserved for projects on the NEC.

Most Recent Application Cycle: The first round of applications for the National Network were submitted on April 5, 2023. Grant award announcements are expected by the end of 2023.

Federal Financing Programs

The following programs assist local grantees with the financing of major CAPEX projects. To qualify for these programs the project sponsor needs to demonstrate a reliable revenue stream. These programs provide low interest loans and not grants.

Transportation Infrastructure Financing and Innovation Act of 1998 (TIFIA)

TIFIA is an established federal credit assistance program for eligible transportation projects of national or regional significance. The goal is to leverage public resources with low interest credit. Under TIFIA, the USDOT can provide three forms of credit assistance to eligible projects. These means of assistance include secured (or direct) loans, loan guarantees, and standby lines of credit. Principal amounts of credit assistance provided by TIFIA are limited to no more than 49 percent of eligible project costs. Additionally, interest rates for TIFIA loans generally reflect the government’s borrowing costs, and the terms of repayment are generally favorable to project sponsors. Current Colorado state law for public-private partnerships (§43-1-1202) has no express provision against the use of TIFIA in the support of financing projects.

Major requirements:

- **Minimum Anticipated Project Costs:**
    - $10 million for Transit-Oriented Development, Local, and Rural Projects
    - $15 million for Intelligent Transportation System Projects
    - $50 million for all other eligible Surface Transportation Projects

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- **TIFIA Credit Assistance Limit**. Credit assistance is limited to 33 percent of reasonably anticipated eligible project costs (unless the sponsor provides a compelling justification for up to 49 percent, the project meets certain rural, transit, or transit-oriented development eligibility, or is part of the Rural/INFRA/Mega grant Extra programs).
- **Investment Grade Rating**. Senior debt and TIFIA loan must receive investment grade ratings from at least two nationally recognized credit rating agencies (only one rating required if less than $75 million).
- **Dedicated Repayment Source**. The project must have a dedicated revenue source pledged to secure both the TIFIA and senior debt financing.

Railroad Rehabilitation and Improvement Financing Program (RRIF)

The RRIF program is a revolving loan and loan guarantee program administered by the FRA. It is legislatively enabled to issue up to $35 billion in loans. Not less than $7 billion is reserved for projects benefiting freight railroads other than Class I carriers. The program was established by the Transportation Equity Act for the 21st Century (TEA-21) and amended by the Safe Accountable, Flexible and Efficient Transportation Act: A Legacy for Users (SAFETEA-LU).

The funding may be used to:

- Acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings and shops, and including the installation of positive train control systems
- Develop or establish new intermodal or railroad facilities
- Reimburse planning and design expenses relating to activities listed above
- Refinance outstanding debt incurred for the purposes listed above
- Finance transit-oriented development

Attractive interest rates, similar to those available under TIFIA, also exist under RRIF. This program can fund up to 100 percent of a project's costs, allows for a five-year grace period, and requires an up-front risk premium. As RRIF is typically senior debt, a RRIF loan could be combined with a TIFIA subordinate loan. It is important to note that these sources are loans and will need to be repaid. Eligible borrowers include railroads, state and local governments, government-sponsored authorities and corporations, limited option freight shippers that intend to construct a new rail connection, and joint ventures that include at least one of the preceding.

Private Activity bonds

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Private Activity Bonds (PABs) are tax-exempt bonds issued by the state or local government on behalf of a private entity. Their purpose is to facilitate private investment for projects that generate public benefit. PABs allow for the private sector to borrow at tax-exempt rates resulting in lower overall financing costs.

PABs are highly attractive to private investors in conjunction with a public-private partnership program that includes equity investment, design-build, and operations involvement and could be used in conjunction with TIFIA/RRIF. For instance, PABs were recently used by RTD in the financing of $398 M for the A, B, and L lines.

Passage of the private activity bond legislation reflects the federal government's desire to increase private sector investment in U.S. transportation infrastructure. Providing private developers and operators with access to tax-exempt interest rates lowers the cost of capital significantly, enhancing investment prospects. Increasing the involvement of private investors in highway and freight projects generates new sources of money, ideas, and efficiency. The $30 billion in exempt facility bonds is not subject to the state volume caps.