Regional Active Transportation Plan

Adopted July 1, 2021













Regional Active Transportation Plan (ATP)

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Adopted: July 1, 2021

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RESOLUTION NO. 2021-16 OF THE NORTH FRONT RANGE TRANSPORTATION & AIR QUALITY PLANNING COUNCIL ADOPTING THE ACTIVE TRANSPORTATION PLAN (ATP)

WHEREAS, the North Front Range Transportation and Air Quality Planning Council (dba NFRMPO), is the Metropolitan Planning Organization for the North Front Range of Colorado and receives both Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) in the work programs of the agency; and

WHEREAS, the NFRMPO is federally required to address bicycle and pedestrian (active transportation) planning as a component of the *Regional Transportation Plan* (RTP) according to Code of Federal Regulations (CFR) §450.324; and

WHEREAS, the Value Statement of the NFRMPO's 2045 RTP Goals, Objectives, Performance Measures, and Targets (GOPMT) Framework are guided by the following Value Statement: "We seek to provide a multi-modal transportation system that is safe, as well as socially and environmentally sensitive for all users that protects and enhances the region's quality of life and economic vitality".

NOW, THEREFORE, BE IT RESOLVED the North Front Range Transportation & Air Quality Planning Council approves the *Active Transportation Plan* (ATP).

Passed and approved at the regular meeting of the North Front Range Transportation & Air Quality Planning Council held this 1st day of July 2021.

William Karspeck (Jul 12, 2021 15:32 MDT)

William Karspeck, Chair

ATTEST:

Suzette Mallette (Jul 12, 2021 16:03 MDT)

Suzette Mallette, Executive Director

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Executive Summary

The *Regional Active Transportation Plan* (ATP) a consolidated summary of existing active transportation (bicycle and pedestrian) infrastructure in the North Front Range Metropolitan Planning (NFRMPO) region, provides the 15 member agencies and other planning partners with tools to support their active transportation planning activities, positions the NFRMPO and its partners to various funding opportunities, and fulfills federal requirements to address bicycle and pedestrian planning as a component of the *Regional Transportation Plan* (RTP).

Chapter 1 of the ATP introduces provides regional context; introduces the concept of active transportation, including the benefits of investing in active transportation; establishes the purpose of the ATP; and summarizes how the ATP was developed. **Chapter 2** builds on this introduction by providing a consolidated summary of the existing conditions across the NFRMPO region, including infrastructure, travel patterns, demand, and select figures from a crash analysis.

Chapter 3 identifies many of the strategies, emerging trends, and approaches currently shaping the active transportation regionally, statewide, or nationally. This Chapter covers considerations and standards for the design, development, maintenance, and implementation of active transportation infrastructure, policies, and programs. Many of these topics are accompanied by best practices and guidance within the same section or within one of the ATP's nine Appendices.

Chapter 4 contains a detailed update of the Regional Active Transportation Corridor (RATC) visions first adopted with the *2013 Regional Bicycle Plan* and reaffirmed within the *2016 Non-Motorized Plan*. This Chapter includes narratives, tables and maps of the existing and projected conditions, segment-level needs, planning considerations, and other important notes related to the development of the RATC Network.

The main document concludes with **Chapter 5**, consisting of various Action Steps identified for the NFRMPO, its member agencies, and/or other planning partners to improve active transportation across the region. These Action Steps focus on initiatives that can begin within the four-year cycle of the ATP.

The ATP is supplemented with nine **Appendices** comprised of additional resources that can inform local and regional planning efforts, as well as detailed analysis, guidance, standards, and best practices on topics of interest to Northern Colorado. Together, the Appendices serve work as a toolkit; however, each Appendix can stand alone as its own guiding document on a particular topic.



Chapter 1: Introduction

The North Front Range Metropolitan Planning Organization (NFRMPO) is the state-designated agency responsible for the long-range regional transportation planning efforts in Northern Colorado. Through this role, the NFRMPO is federally required to address bicycle and pedestrian (active transportation) planning as a component of the Regional Transportation Plan (RTP). The NFRMPO is uniquely positioned to offer guidance and support in active transportation planning to its 15 local member agencies, see **Figure 1-1**, and support policies and strategies endorsed by state and federal partners such as the Colorado Department of Transportation (CDOT) and the United States Department of Transportation (USDOT).

CDOT's Policy Directive (Bike and Pedestrian Policy 1602) in 2009 and subsequent State Statute 43-1-120, make clear the Colorado Transportation Commission's (TC) directive for CDOT to promote mode choice and provide for the needs of bicyclists and pedestrians. Through this policy the TC has directed the safe and reliable accommodation of bicyclists and pedestrians in all of CDOT's planning, design, and operation of transportation facilities. The USDOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects.²

Every transportation agency has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. The *Active Transportation Plan (ATP)* reinforces the NFRMPO's commitment in working with all Northern Colorado partners to ensure safe, accessible, and reliable active transportation accommodations are part of the transportation planning process.

Regional Context

The NFRMPO's 15 local member agencies include the communities of Berthoud, Eaton, Evans, Fort Collins, Garden City, Greeley, Johnstown, LaSalle, Loveland, Milliken, Severance, Timnath, and Windsor, as well as Larimer and Weld counties. CDOT and the Colorado Department of Public Health and Environment's (CDPHE) Air Pollution Control Division (APCD) are also represented on the NFRMPO Planning Council. The area shown in **Figure 1-1** encompasses roughly 675 square miles and is home to 526,402 residents and 309,928 jobs. Rapid population growth is expected to continue, with an additional 426,000 residents and 163,000 jobs forecasted by 2045.

¹ 23 CFR § 450.324

² https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/policy_accom.cfm

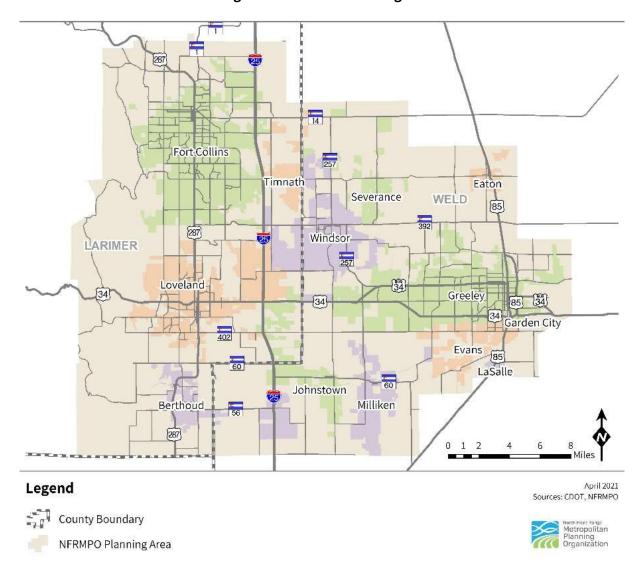


Figure 1-1: The NFRMPO Region

What is Active Transportation

For the purposes of this plan, and subsequent planning efforts, the NFRMPO is defining active transportation as human-powered and human-scaled modes of transportation, including:

- pedestrian (walk or wheelchair)
- bicycle
- scooter
- skateboard
- other personal mobility devices



Above: Image credit: City of Fort Collins

The term active transportation acknowledges the emerging trends in personal- or micro-mobility solutions. For instance, it is more inclusive of electric assist technologies than the term 'non-motorized.' Additionally, active transportation acknowledges the fluidity in the way public space is used, more so than the term 'bicycle and pedestrian.' For instance, many jurisdictions define electric-assist scooter (e-scooter) users as pedestrians, but limit e-scooter use exclusively to operation on roadways. Additionally, the term is consistent with changes within the Association of Metropolitan Planning Organizations (AMPO) and its Active Transportation working group. Where appropriate, the *ATP* will use the terms 'active transportation' and 'active modes.'

Purpose of the Active Transportation Plan (ATP)

The *ATP* is an update to the NFRMPO's *2013 Regional Bicycle Plan* (RBP) and 2016 *Non-Motorized Plan*. The primary purposes of the *ATP* are to:

- Fulfill the federal requirement to address bicycle and pedestrian planning as a component of the *Regional Transportation Plan (RTP)*;
- Present a consolidated summary of the existing bicycle and pedestrian infrastructure, data, policies, programs, and standards throughout the region;
- Summarize best practices for topics such as equity and emerging micromobility solutions (electric bikes, scooters, and skateboards, etc.);
- Identify opportunities to connect and enhance the local and regional active transportation system with an action plan;
- Provide updated tools, analysis, and guidance supporting local and regional planning, funding, and implementation efforts; and
- Position the NFRMPO and its planning partners to pursue state, federal, and other funding opportunities.

Benefits of Investing in Active Transportation

Accommodating bicyclists and pedestrians for transportation and recreation has numerous benefits in health, safety, social equity, air quality and climate, economy, congestion, and community resiliency. The full range of benefits is too extensive to be listed in this plan, but this section highlights several benefits within these seven categories. The Northern Colorado (NoCo) Bike & Ped Collaborative has developed a more comprehensive Why Invest in Active Transportation? document to underscore the value that thoughtfully planned, designed, and implemented active transportation infrastructure can bring to a community. Research and data on benefits is everchanging along with our ability to quantify them. The NFRMPO and its planning partners should stay updated on the latest findings.

Health

According to the 2016 report, Economic and Health Benefits of Bicycling and Walking, a 10 percent increase in bicycling and walking in Colorado would prevent an additional 30-40 deaths per year and lead to \$258-\$387M in additional annual health savings to the state. A 30 percent increase could equal up to \$2B in additional health savings. Bicycling currently contributes \$511M in health benefits to the State annually and prevents an

estimated 50 deaths. Walking currently contributes \$2.7B in health benefits to the State of Colorado annually and prevents an estimated 285 deaths.

Safety

Improvements such a road diets, defined as removing travel lanes from a roadway and utilizing the space for other uses and travel modes, can lead to fewer and less severe pedestrian- and bicycle-involved crashes. This is due to pedestrians spending less time crossing travel lanes, bicyclists having new or better dedicated facilities, and vehicle speeds being reduced. The FHWA <u>2014 Road Diet Informational Guide</u> suggests roads under 20,000 vehicles per day (vpd) may be good road diet candidates.

Lower speed limits, designs that discourage high speeds, and/or physical separation between vehicle traffic and bicyclists or pedestrians lower the risk of serious injury or death. According to an Institute of Traffic Engineers study on crashes between a vehicle and pedestrian, fatality rates are 10 percent at 20 mph, 40 percent at 30 mph, and 80 percent at 40 mph or faster.

Social Equity

A 2013 League of American Bicyclists report, <u>The New Majority: Pedaling Towards Equity</u>, found that compared to White bicyclists, the fatality rate is 23 percent higher for Hispanic bicyclists and 30 percent higher for African American bicyclists. On average, families with an annual income below \$50,000 spend 30 percent of their income on transportation, with the average annual operating cost for a bicycle at \$308 and \$8,200 for a motor vehicle. Investing in safe active transportation infrastructure can reduce these safety disparities.

According to <u>Building Equity</u> by PeopleForBikes, people of color are more likely to ride bicycles (for recreation or transportation), be regular riders, want to bike more than they currently do, and say protected bike lanes would make them ride more. Additionally, people in the lowest income quartile are more likely to commute by bike.

Air Quality and Climate

Replacing two vehicle trips each week by walking, riding a bike, or taking public transportation can keep 14 pounds of ozone-causing emissions out of the air each year, according to the <u>Regional Air Quality Council</u>.

Six percent of total urban miles traveled are currently by bike/e-bike. If this grew to 14 percent by 2050, there would be an 11 percent reduction in carbon emissions worldwide, according to <u>A Global High Shift Scenario</u> by the Institute for Transportation and Development Policy.

Economy

Bicycling has a \$1.1B annual economic impact on the Colorado economy, including \$484M from out-of-state visitors (excluding health benefits). Walking has a \$497M annual economic impact on the Colorado economy (excluding health benefits), according to the 2016 Colorado-specific report, 2016 Economic and Health Benefits of Bicycling and Walking.

Replacing a car trip with a bike trip saves individuals and society \$2.73 per mile in costs related to congestion reduction, roadway cost savings, vehicle cost savings, parking cost savings, air pollution reduction, energy conservation, and traffic safety improvements, according to Biking, On-Street Parking, and Business by Clean Air Partnership.

Congestion

According to the Texas A&M Transportation Institute's (TTI) <u>2019 Urban Mobility Report</u>, congestion costs the Fort Collins-Loveland Urbanized Area \$119M annually, or \$414 and 21 hours of delay per commuter. Congestion costs the Greeley Urbanized Area \$58M annually, or \$485 and 23 hours of delay per commuter. The capacity of a 10-foot lane (or equivalent width) at peak conditions with normal operations is 600-1,600 persons/hour for private motor vehicles only, 1,000-2,800 persons/hour for mixed traffic with frequent buses, 7,500 persons/hour for a two-way protected cycleway, and 9,000 persons/hour for a sidewalk, according to the <u>Transit Street Design Guide</u> by the National Association of City Transportation Officials (NACTO).

Community Resiliency

Active transportation facilities across Northern Colorado experienced an average 28 percent increase in usage compared with 2019, mostly due to the COVID-19 pandemic. Some facilities saw usage increase over 200 percent in the early months of the pandemic. Built environment attributes such as the presence of active transportation facilities are associated with a favorable net effect on infectious diseases, according to James Sallis, Ph.D.

According to <u>Gas Prices and Bicycling</u> by Bikes Belong, when gas prices peaked to \$4.11/gallon in 2008, bike commuting increased 15 percent nationally and 23 percent in the 31 largest bicycle-friendly cities (BFCs) compared to 2007.

Development of the ATP

NFRMPO staff worked on the *ATP* over the course of 2020 and early- to mid-2021. Staff relied heavily on the input and support of the NFRMPO TAC and Planning Council, the NoCo Bike & Ped Collaborative, other local agency and partner staff, stakeholder groups comprised of NFRMPO residents and experts working in the areas of transportation and mobility, and the general public. Collected feedback is summarized in **Appendix I: Outreach and Engagement Summary**. Feedback highlights are also spread throughout the document in relevant areas.

Northern Colorado (NoCo) Bike and Pedestrian Collaborative

Several members of the NoCo Bike & Ped Collaborative (NoCo) served as part of the informal steering committee that guided the early stages of the ATP. NoCo is composed of staff and elected officials from the NFRMPO's member agencies, NFRMPO staff, state partners, and other partners, regardless of affiliation or location, who are interested in helping achieve the vision of a safe, convenient, and cost-effective bicycle and pedestrian network for people of all ages and abilities. NoCo typically meets monthly to discuss current initiatives, best practices, and approaches for improving active transportation in the region. Throughout development of the ATP, NoCo provided feedback on various components of the Plan. Although NoCo is independent from the NFRMPO, the group advises NFRMPO Staff and the Technical Advisory Committee (TAC) on a variety of plans, programs, and projects. NoCo has been directly or indirectly responsible for the awarding of several million dollars of federal funding to active transportation project across the region.





Above: NoCo members update regional maps with project information. Credit: NFRMPO Staff

NoCo played an instrumental role in the implementation of the NFRMPO's 2013 Regional Bicycle Plan and the 2016 Non-Motorized Plan (NMP), and has created a goal to continue this work with the ATP and successive plans. NoCo is referenced throughout the ATP as a leader or partner on various initiatives. Learn more about NoCo's values and operating procedures at https://nfrmpo.org/bike-ped/noco/.

Public and Stakeholder Engagement

Many elements of the *ATP* were guided by NoCo, as well as community members and planning partners who provided feedback through various media. Formal dialogue about the *ATP* between NFRMPO staff and the community began in January 2020 and carried into early 2021; however, conversations have been ongoing since the adoption of the *2016 NMP* through the NoCo Bike & Ped Collaborative, NFRMPO Technical Advisory Committee (TAC) meetings, and NFRMPO staff outreach efforts across the region. With help from local partners, NFRMPO staff relied on an *ATP* project webpage, an interactive <u>Community Remarks</u> webpage, an online survey, targeted social media outreach, newsletters, group email lists, and other means to reach individuals across the region.



Above: NFRMPO Staff discuss the ATP with the public at the 2020 Fort Collins Transportation Projects Fair

Chapter 2: Existing Conditions

The 2013 Regional Bicycle Plan and 2016 Non-Motorized Plan each contained a review and non-exhaustive inventory of NFRMPO member community plans, programs, and policies related to active transportation. Several of these are referenced within **Appendix C: Additional Best Practices**.

Regional Infrastructure Inventory

An ongoing task at the NFRMPO is updating and improving the geographic information systems (GIS) inventory of existing active transportation facilities. Accurately mapping the existing infrastructure involves combining datasets from various agencies and drawing new features based on aerial imagery, development plans, and other available information. Currently, the inventory only indicates the presence of facilities and does not consistently identify characteristics of the facilities such as width or surface condition.

Definitions

- ➤ **Sidewalk** Hard-surface paths providing space intended for pedestrian travel within the public right-of-way and separated from motor vehicle traffic by a curb, buffer, or curb with buffer. Sidewalks often also serve bicyclists.
- Shared-Use Path Typically distinguished from sidewalks by having a consistent width of eight feet or greater that allows for two-way travel or passing by different types of users (foot traffic, wheelchair users, bicyclists, roller skaters, etc.). Shared-use paths (often referred to as trails or multi-use paths) are sometimes characterized by more separation from traffic than sidewalks. Shared-use paths can be paved (hard surface) or unpaved (soft surface). The NFRMPO inventory only includes all hard-surface paths and some soft-surface paths where information is available.
- ➤ **Bicycle Lane** A portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes enable bicyclists to ride at their preferred speed without interference from prevailing traffic conditions and facilitate predictable behavior and movements between bicyclists and motorists. Bike lanes can have physical barriers (bollards, medians, raised curbs, etc.) that restrict the encroachment of vehicle traffic.
- ➤ **Bicycle Route** Streets with low motorized traffic volumes and speeds, designated and designed for bicycle safety, comfort, and connectivity. Bicycle routes typically use signs, pavement markings, speed and volume management measures, and enhanced bicycle crossings of busy arterial streets. Although the NFRMPO has some information on local bicycle routes, they are not currently included in the inventory because definitions currently vary widely by community.

Chapter 3 and **Appendix F: Crossing Countermeasure Matrices** include high-level guidance for identifying appropriate active transportation treatments based on state and federal guidance. A more comprehensive list of guides and selection tools is listed in **Appendix A: Resource Library**.

Active Modes Facility Miles per Capita

Table 2-1 summarizes the expansion of active transportation infrastructure between the first comprehensive inventory in 2016 and the updated inventory for 2020. Over the course of four years, the NFRMPO region has

added 699.7 miles of active transportation infrastructure, which equates to an additional ¾ mile of facilities per 1,000 residents.

Table 2-1: Non-Motorized Facilities per Capita (Sidewalks, Bike Lanes/Bikeable Shoulders, Shared-Use Paths)			
Year	Total Miles Total Population		Miles per 1,000 residents
2016	3,313	482,144	6.87
2020	4,013	526,402	7.62

Active Mode Facilities by Community

Table 2-2 summarizes the 2020 active transportation facility mileage by jurisdiction.

Table 2-2: 2020 Active Transportation Facilities Mileage by Jurisdiction				
Jurisdiction	Sidewalks	Shared-Use Paths / Trails	Bike Lanes / Bikeable Shoulders	
Berthoud	54.3	1.9	1.1	
Eaton	42.1	2.2	0	
Evans	105.5	8	3.8	
Fort Collins	913.2	83.3	324.5	
Garden City	2.9	0	0	
Greeley	534.5	41.2	123.5	
Johnstown	112.2	7.3	0.5	
LaSalle	14.4	0	0	
Loveland	576	19	158.2	
Milliken	48.9	2.7	0	
Severance	51	5.7	0.6	
Timnath	55.2	5.1	14.9	
Windsor	280.9	35.5	60.6	
Unincorporated Larimer County (NFRMPO portion)	51.2	24	93.7	
Unincorporated Weld County (NFRMPO portion)	3	14.7	1.9	
Total	2,845.3	250.6	783.3	

Note: Figures in this table may differ from local estimates. Bicycle routes were omitted because they are defined differently across communities. 2020 data should not be compared with regional estimates for 2016 due to changes in methodology.

A temporal comparison with the 2016 inventory has been omitted due to reclassification and other improvements within the original inventory and difficulty identifying when recent construction was completed across the region. Moving forward, the 2020 inventory may represent a reliable baseline upon which to measure growth over time.

Presence of a bike infrastructure does not always signify a low-stress facility for people on bikes. For example, properly designed bike routes can play an integral role in creating connectivity and filling gaps in a local or regional bike network at a low cost. Bike route designations are most appropriate where traffic volumes and speeds are low, a road connects to other bike facilities or destination, and/or there is not space for more intensive infrastructure. For future inventories, baseline qualifications for bike routes will be agreed upon and the mileage will be quantified.

This inventory also does not consistently distinguish sidewalks from shared-use paths or classify bikes lanes into categories such as striped bike lanes, buffered bikes lanes, protected bikes lanes, bikeable shoulders, and cycletracks. Future NFRMPO inventory updates will include more robust information on the varying levels of bicycle infrastructure. These efforts should focus on classifications that are meaningful and informative for users trying to choose a route and understand active transportation options in their area.

Soft-Surface Trails

The NFRMPO does not currently maintain a complete inventory of current or proposed soft-surface trails. Data about these facilities are not consistently maintained across communities and limited NFRMPO has focused on updating and maintaining the hard-surface path inventory due to time constraints. Although the regional inventory is lacking, soft-surface trails play a critical role in the multimodal connectivity for all types of trips. Within the NFRMPO, the Great Western Trail and Little Thompson Trail are great examples of regional soft-surface facilities that can be used as much for transportation as for recreation. Less formalized trail spurs can provide crucial connections to neighborhoods, business districts, schools, natural areas, and more. A prime example of the potential impact soft-surface trails is the 240-mile Katy Trail across Missouri. The Katy Trail connect over 34 communities, attracts over 400,000 annual visitors, and has an annual economic impact of \$18.5M.³

With a firm and stable surface, soft-surface trails can be accessible for individuals with disabilities and are eligible for federal funding through the NFRMPO and other recipients. They may also provide a great interim trail surface if full funding is not yet available for a hard surface. Soft-surface trails paralleling hard-surface trails also help minimize conflicts between users, such a cyclists and equestrians, and is the preferrable surface for many runners. Future local and regional active transportation planning efforts should better incorporate and consider soft-surface trails.

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 $^{^3\} https://mostateparks.com/sites/mostateparks/files/Katy_Trail_Economic_Impact_Report_Final.pdf$

Travel Patterns

Commuting, or Journey to Work, data from the US Census Bureau is the most reliable and readily available source of information about how people get to work and how long it takes to get there. For the *ATP*, 2015-2019 American Community Survey (ACS) 5-year estimates were used. **Table 2-3** shows the primary mode share for workers commuting by city and town.

Table 2-3: Commuting Patterns by City or Town (Workers Age 16 and Over)							
	Percent of Workers						
City or Town	Drive Alone	Carpool	Public Transportation	Walk	Bicycle	Taxicab, Motorcycle or Other	Work From Home
Berthoud	81.4	7.8	1.3	0	0	0.7	8.7
Eaton	90	3.7	0	3.7	0	0.5	2.1
Evans	81.4	11.3	0.9	0.6	0.6	0.6	4.6
Fort Collins	71.9	7.2	2.3	4.2	5.4	1	8
Garden City	77.2	7.9	0.8	7.9	0.8	5.5	0
Greeley	79.5	11.3	0.6	2.8	0.7	1.2	3.9
Johnstown	77.3	8	0.5	2.7	0.6	2.7	8.2
LaSalle	88.4	7.3	0	1.1	0	0.9	2.2
Loveland	81.1	7.3	0.6	1.4	0.7	1.6	7.3
Milliken	82.9	10.6	0.4	2.9	0	0.5	2.5
Severance	77.6	11.7	0	0.8	0.4	1.2	8.3
Timnath	77	9.6	0	0	0	5.3	8
Windsor	82.5	6.9	0.2	0.5	0.2	1	8.9

Note: Respondents only report the mode they use to get to or from work "most of the time." To fully understand travel patterns, bike and pedestrian counts and travel surveys are recommended.

Source: 2015-2019 American Community Survey (ACS) 5-year estimates

Regionwide, an estimated 5,628 workers typically bike to work and 6,701 workers typically walk to work. Of those who walk to work, 13.9 percent travel 25 minutes or longer one way. For many of these workers, improved bicycle infrastructure could result in significant travel time savings. Additionally, some workers bike or walk to work on an occasional or less frequent basis, and therefore not be captured in the survey results shown above.

An analysis of these patterns by sex show that female workers age 16 and over are 5.9 percent more likely to walk to work and 25.6 percent more likely to take public transportation to work, but 37.9 percent less likely to bike to work. This a common trend across the nation. Studies of bike commuting barriers indicate that women are more concerned than men about safety issues associated with biking, being able to carry daily items while biking, and with the need to fix their physical appearance upon arrival at work.⁴ Additionally, women make

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⁴ Twaddle H, Hall F, Bracic B. Latent Bicycle Commuting Demand and Effects of Gender on Commuter Cycling and Accident Rates. Transportation Research Record. 2010;2190(1):28-36. doi:10.3141/2190-04

more household related stops than men on their commute to or from work for household-sustaining activities or family errands.⁵

Looking at the travel patterns of those who do not currently use active modes can help the NFRMPO quantify the portion of the population who might be interested in choosing an active mode under the right circumstances. This section summarizes some of the data about trips that could be taken by active modes, either under current conditions or with some improvements or incentives.

Regionwide, 222,235 workers age 16 or older report car, truck, or van as their primary commute mode, and 90 percent of these workers drive alone as their primary commute mode. **Table 2-4** shows average commute time (one-way) for these workers. Commutes under 10 minutes are likely to be very bikeable (and potentially walkable) some of the time, assuming safe infrastructure exists. Commutes between 10-15 minutes or 15-19 minutes may also be somewhat bikeable, especially as electric assist (e-bike) popularity grows (discussed more in **Chapter 3**).

Table 2-4: Travel Times for Workers Commuting by Car, Truck, or Van				
Commute Travel Time	Number of	Percent of all workers commuting		
	Workers	by car, truck, or van		
Less than 10 minutes	28,631	12.9%		
10-14 minutes	37,608	16.9%		
15-19 minutes	42,460	19.1%		
TOTAL UNDER 20 MINUTES	108,699	48.9%		

Source: 2015-2019 American Community Survey (ACS) 5-year estimates

An additional 3,082 workers commute via public transportation as their primary mode. Of these workers, 1,838 (59.6 percent) have travel times of 30 minutes or longer. Many of these trips have longer times due to long walks or bike rides to (access) and from (egress) transit stops. Active transportation system improvements could shorten these access and egress times, improve safety, and/or provide access where there previously was none. Studies suggest the average person is willing to walk five to ten minutes to access transit but is willing to bike significantly longer. The lack of bike storage accommodations on-board transit vehicles and at transit stops or transit centers may also create a barrier for bike access to transit (discussed more in **Chapter 3**). Additional guidance can be found in the FTA's Manual on Pedestrian and Bicycle Connections to Transit.

For the 1,244 workers with shorter public transportation commutes (less than 30 minutes), active transportation system improvements could provide a reliable alternative mode in instances when public transportation service does not meet their schedule or needs.

Figure 2-1 shows the connectivity of Transfort, City of Loveland Transit (COLT), Greeley Evans Transit (GET), and Bustang bus stops to the regional sidewalk network. Bus stops are represented as <u>connected to the sidewalk network</u>, have sidewalk infrastructure at the bus stop, but are disconnected from the larger sidewalk network, or <u>have no sidewalk infrastructure</u>. Connected bus stops connect into the municipal network at

⁵ McGuckin N, Nakamoto Y, Difference in Trip Chaining by Men and Women. Transportation Research Board. 2004

⁶ 2015-2019 American Community Survey (ACS) 5-year estimates

⁷ Federal Highway Administration (FHWA). <u>Pedestrian Safety Guide for Transit Agencies</u>. 2013.

multiple points, while disconnected bus stops may have a portion of a sidewalk but it does not connect into the larger network. Based on the map, areas in need of sidewalk upgrades include northwest Fort Collins, northeast Fort Collins, and along US287 between Fort Collins and Loveland. Some of these stops will be addressed by the Transfort ADA Bus Stop Upgrade program. Data included in this map is available from NFRMPO staff upon request.

Overall, there were 893 bus stops in the NFRMPO region as of December 2020. A further analysis finds:

- 824 (92.3percent) are connected; 14 (1.6 percent) have sidewalk infrastructure at the bus stop but are disconnected; and 55 (6.2 percent) have no sidewalk infrastructure.
 - Of Transfort's 476 bus stops, 425 (89.3 percent) are connected, seven (1.5 percent) have sidewalk infrastructure at the bus stop, but are disconnected, and 44 (9.2 percent) have no sidewalk infrastructure.
 - Of GET's 303 bus stops, 293 (96.7 percent) are connected, five (1.7 percent) have sidewalk infrastructure at the bus stop, but are disconnected, and five (1.7 percent) have no sidewalk infrastructure.
 - Of COLT's 103 bus stops, 100 (97.1 percent) are connected, one (1.0 percent) has sidewalk infrastructure at the bus stop, but is disconnected, and two (1.9 percent) have no sidewalk infrastructure.

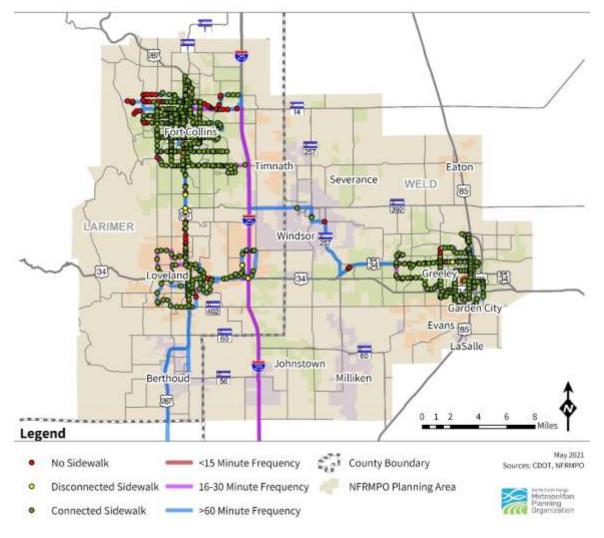


Figure 2-1: Transit Stop to Sidewalk Connectivity Analysis

The NFRMPO's Regional Travel Demand Model (RTDM) is another tool for estimating current travel patterns and forecasting them into the future. The RTDM can be used to identify trips that are likely to be bikeable and somewhat likely to be walkable, based on distance. For short trips, a threshold of four miles was chosen. Biking four miles takes approximately 20 minutes on average, assuming a pace of 12 mph. Using the four-mile threshold is consistent with the approach used in **Table 2-4**, which summarizes mode choice for commute trips under 20 minutes. Additionally, 53 percent of all trips are four miles or less according to the 2017 National Household Travel Survey. **Figure 2-2** shows graduated line sizes representing the number of average daily "short trips," trips of four miles or less, on RTDM segments in 2020. These results do not include recreation-based trips. Many of these short trips are highly concentrated in in the most urban settings, such as the downtown areas of Fort Collins, Loveland, and Greeley; however, many short trips also take place in suburban, small town, and rural settings. For instance, on SH60 between Johnstown and Milliken, there are between 1,160 and 2,760 daily short trips. Between Loveland and Berthoud on LCR17, there are approximately 1,150 daily short trips. Just south of US34 on 35th Avenue near the Greeley-Evans boundary, there are 3,900-9,500

daily short trips. On US85, north of LaSalle, there are approximately 3,000 short trips towards Evans. Each of these segments is parallel to, or part of a proposed Regional Active Transportation Corridor (RATC) segment (more on RATCs in **Chapter 4**). These figures suggest there may be a latent demand for more active mode facilities between communities, especially the RATCs.

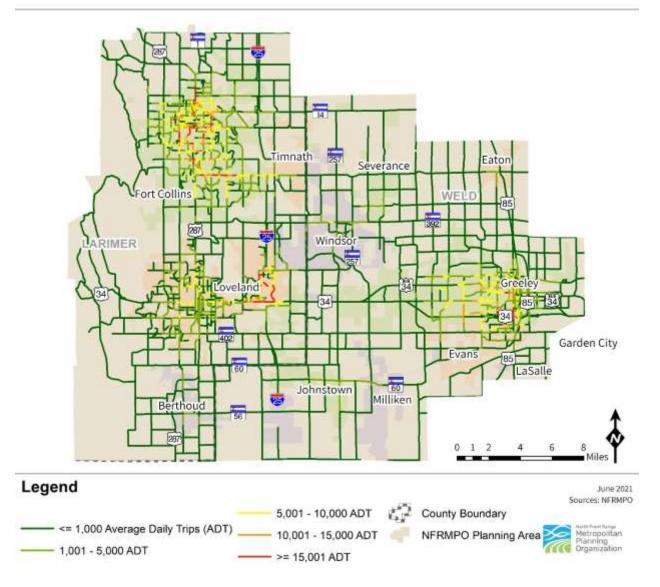


Figure 2-2: Average Daily Short Trips (Four Miles or Less), 2020

Source: NFRMPO Regional Travel Demand Model (RTDM). Note: Outputs for certain areas of the Regional Travel Demand Model (RTDM) should be reviewed more closely before applying findings due to population adjustments.

Figure 2-3 shows the number of daily short trips that begin or end in each traffic analysis zone (TAZ). TAZs generally represent neighborhoods, districts, or subdistricts consisting of relatively homogenous land uses. Like **Figure 2-2**, many of the short trip origins or destinations occur in the most densely populated areas with wide-

ranging land uses; however, there are several exceptions, such as the town cores of Berthoud, Eaton, Johnstown, Severance, and Timnath. One criterion for prioritizing active transportation infrastructure investments could be the existing demand for short trips in a geographic area and/or along the roadway network. Observed travel times data sources such as INRIX and Streetlight can supplement the RTDM.

Timnath Eaton Severance Fort Collins WELD 85 LARIMER Greeley Loveland 85 34 34 Garden City Evans LaSalle 60 Milliken Johnstown Berthoud Legend May 2021 Sources: NFRMPO 478 - 1,683 O-Ds County Boundary > 4,204 Origins or Destinations (O-Ds) NFRMPO Planning Area 52 - 477 O-Ds 1,684 - 4,203 O-Ds < 51 O-Ds

Figure 2-3: Number of Origin and Destinations for Trips Four Miles or Less by TAZ, 2020

Demand

On any given day, nearly everyone is a pedestrian at some point. Anyone who parks their car or bike, or gets off a bus still needs to be able to safely walk or roll to and from their destination, no matter the distance. Although active transportation affects everyone regardless of their main transportation mode, quantifying the demand for active transportation is a difficult task. It can be approached through tools such as surveys; however, if safe

walking and biking options do not exist in an area and community members are unaware of the possibilities for safer active transportation options, survey respondents in that area may not report demand even when asked what would help them to walk or bike more often. This is a form of latent demand, in which the option either is not available, or the user does not know the option exists, so the user does not report their demand. The phenomenon in which more people suddenly want to walk or bike because they see infrastructure improvements is called induced demand. With induced demand for active transportation, the provision of safe infrastructure reveals pent-up latent demand, or previously suppressed trips. Local agencies should consider the possibilities of latent and induced demand within their communities when planning for active transportation.

Responses to the 2020 Active Transportation Challenge survey allude to possible latent demand for walking and/or biking across the region. Of the respondents, 60 percent walk or bike 1-3 times per month or less. In response to the question, "What would help you bike, walk, or take transit more often?," 31 percent of responses cited infrastructure and maintenance improvements. Additionally, 60 percent of responses cited programs, events, education, or improved personal habits, equipment, and/or knowledge. To some extent, each of these factors can be addressed through educational, promotional, and/or incentive programs. It is unlikely this demand would have been captured without a survey. These surveys are a good first step to identifying cost-effective improvements that would encourage the most mode shift.

Community Health Assessments

Periodically, the Health District of Northern Larimer County (HDNLC) and the Weld County Department of Public Health and Environment (WCDPHE) conduct community health assessments (CHAs) in which they survey a sample of residents on various topics related to health and quality of life. Increasingly, these CHAs have included questions related to active transportation. The collected data is useful in assessing overall perceptions on the ease of walking or biking, infrastructure deficiencies and barriers, individual habits, and latent demand for improved infrastructure. Moving forward, NFRMPO Staff and its partners should work more closely with HDNLC and WCDPHE to analyze geographic and socioeconomic disparities in the CHA results related to active transportation. Such an analysis, combined with other tools, such as the Multimodal Index (MMI, discussed further in **Appendix C: Additional Best Practices**) can help inform decision-making through processes such as the NFRMPO Call for Projects.

According to the 2019 HDNLC CHA, 65 percent of Fort Collins respondents and 49 percent of Loveland respondents agree they can get where they need to go by walking or biking. Outside of Fort Collins or Loveland, typically characterized by lower built environment density, only 24 percent agree with that statement.

According to the WCDPHE CHA, 59 percent of respondents in the Johnstown-Milliken area, 47 percent of respondents in the Greeley-Evans area, and 34 percent of respondents in the Severance-Windsor area see lack of trails or sidewalks as a major or minor problem. Thirty-two percent of all respondents report it is not possible to get to many of the places they need to go by walking or biking.

"[We need a] Better biking system. In no way is it safe to bike on city or county roads with no bike lane. The bike lanes that are provided connect to nowhere." – Weld County resident, 2019

Count Program

In 2016, the NFRMPO began a regional active transportation counting and monitoring program. Through this program, the NFRMPO has purchased five permanent electronic counting devices (counters) and four mobile/temporary counters for use on trails or roadways. In addition to the five permanent counters purchased by the NFRMPO, there are 23 permanent counters purchased by member agencies located on the regional corridors at the locations shown in **Figure 2-4**. The five mobile/temporary counters are available to any NFRMPO member agency. To date, they have been loaned out to Eaton, Loveland, Timnath, and Windsor for various purposes. The counters help highlight travel patterns, quantify facility usage, evaluate investment effectiveness, identify areas of need, and develop maintenance schedules that avoid the periods of highest usage. The data is often used to support grant applications and other investment decisions. There are currently 28 permanent counters on the regional corridors, with another 17 spread across additional facilities, and several mobile/temporary counters deployed at any given time.

Some counters on the Regional Active Transportation Corridor (RATC) network did not have reliable data for 2020 and are simply labeled as "Other Permanent Counter." **Figure 2-4** also highlights priority locations for conducting temporary counts on the RATC network. NFRMPO and local agency staff should coordinate temporary (minimum two weeks) counts at these locations within the next two years. The NoCo Bike & Ped Collaborative should continue to identify priority count locations on existing segments that were recently constructed/improved and adjacent to upcoming construction projects.

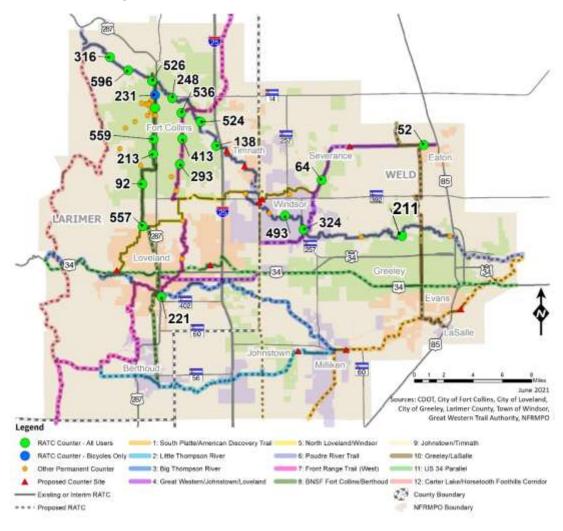


Figure 2-4: 2020 Average Daily Traffic (ADT) at Permanent Count Sites across the RATC Network

In 2020, counts across the region rose dramatically due to the COVID-19 pandemic. With changes in perceptions of transit service, transit service reductions, and gym and recreation facility closures, Northern Colorado turned to active transportation and outdoor recreation more than ever before. Across 2020, regional trail usage throughout Northern Colorado increased 28 percent, compared with 2019. Early in the pandemic, March through June 2020, certain trails experienced usage increases as high as 200 percent compared with the same period in 2019. The 2020 trends foreshadow the likely long-term rise in demand for active transportation and recreation as Northern Colorado continues its rapid population growth.

Local agencies are encouraged to take advantage of the NFRMPO count program and invest in their own equipment. **Appendix H: Count Program Guidance** includes considerations for starting and managing a count program. The City of Fort Collins operates a volunteer-based manual count program, with data collected annually.

Safety

With the adoption of the 2045 Regional Transportation Plan (RTP) in September 2019, the NFRMPO chose to support CDOT's statewide target of reducing the number of non-motorized fatalities and serious injuries to 514. The NFRMPO does not currently have region-specific targets related to pedestrian and bicycle safety. In September 2020, the NFRMPO Planning Council took a step towards a safer transportation system by adopting an organizational safety vision called the Towards Zero Deaths Policy. This vision was developed out of a desire to eliminate deaths and serious injuries on the region's roadways. The Towards Zero Deaths Policy commits the NFRMPO to:

- Continue prioritizing safety in future NFRMPO Calls for Projects;
- Analyze all available crash data to make more informed decisions for safety related projects;
- Integrate the Towards Zero Deaths framework in future planning initiatives, including the Environmental Justice (EJ) Plan, Active Transportation Plan (ATP), Congestion Mitigation Process (CMP), and Regional Transportation Plan (RTP);
- Provide regionally specific crash data to compare to statewide crash data when possible; and
- Identify crash types and characteristics which are most prevalent in the region as well as best practices to mitigate those specific crash types.

Other NFRMPO partner agencies have been leaders in visionary safety initiatives. In 2015, CDOT announced a Moving Towards Zero Deaths program of goals. Shortly thereafter, in 2016, the City of Fort Collins became the first local agency to join CDOT's initiative.

Regionwide Crash Trends

Figures 2-5 and **2-6** show the number of pedestrian- and bicycle-involved crashes and serious injuries or fatalities in the NFRMPO between 2015 and 2019. Over the five-year period, pedestrian-involved crashes trended slightly upward while bike-involved crashes trended slightly downward. For fatalities and serious injuries (FSI), the numbers fluctuated, but generally trended downward for both pedestrian- and bike-involved crashes. Most regions across the nation have seen the crash and FSI trends increase over the same period. Although the NFRMPO's year-over-year crash trends are promising, analysis of crash characteristics still identifies troubling trends. Pedestrian- and bike-involved crashes between 2015-2019 are analyzed in further detail in **Appendix D: Crash Analysis**. Many of these trends warrant further analysis.

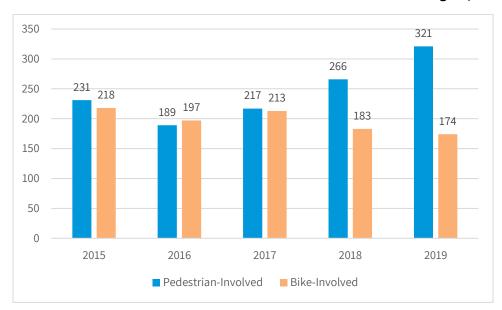
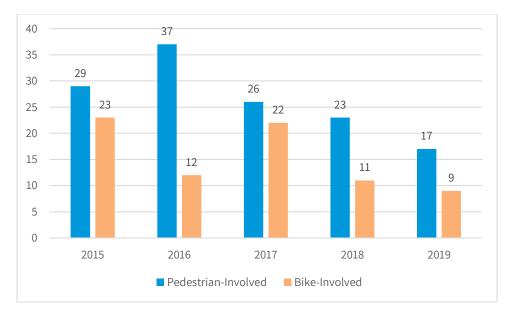


Figure 2-5: Total Pedestrian- and Bike-Involved Crashes in the NFRMPO Region, 2015-2019

Figure 2-6: Total Pedestrian- and Bike-Involved Fatalities or Serious Injuries in the NFRMPO Region, 2015-19



National Crash Trends

A nationwide analysis of 60 pedestrian crash "hot spots" with six or more pedestrian deaths over eight years found consistent characteristics, including:

- 97 percent were multilane roadways (70 percent required pedestrians to cross five or more traffic lanes);
- Over three-quarters had speed limits of 30 mph or higher;

- 62 percent had volumes over 25,000 vehicles per day;
- All had adjacent commercial retail and service land uses;
- 72 percent had billboards; and
- 75 percent were bordered by low-income neighborhoods.8

Reducing bicycle and pedestrian crashes can also have significant direct economic impacts. According to a 2010 National Highway Traffic Safety Administration (NHTSA) report⁹, pedestrian-involved crashes resulted in \$65B in comprehensive costs (includes economic costs and quality-of-life valuations) annually, a cost of \$258,094 per crash. Likewise, bike-involved crashes results in \$21.7B in comprehensive costs, or \$118,938 per crash.

Motor vehicle design is also a major factor in bicycle and pedestrian safety. According to a 2020 study by the Insurance Institute for Highway Safety, sport utility vehicles (SUVs) are disproportionately likely to injure and kill pedestrians compared with cars, primarily at crashes of intermediate speed (20-39 mph). This raises concerns for walkability in communities across the nation given the rising consumer preference for SUVs. In 2010, 27 percent of total car sales in the United States were SUVs. In 2018, that number was up to 48 percent. Over the past decade, pedestrian fatalities involving SUVs have increased 69 percent, compared with just a 46 percent increase for pedestrian fatalities involving passenger cars. As the motor vehicle size continues to trend upward, additional infrastructure, traffic control, and enforcement that promote safe driving practices will become increasingly important.

2020 regionwide crash data was not available when the *ATP* was adopted, but an analysis will be important in understanding how the COVID-19 pandemic impacted traffic safety. Nationwide between January and June 2020, pedestrian deaths remained consistent with the same period in 2019 despite a 16.5 percent reduction in vehicle miles travelled. Drivers also struck and killed pedestrians at a rate of 2.2 per billion VMT in 2020. This was a significant increase from the rate of 1.8 per billion VMT over the same period in 2019. ¹³ Analysis of select metropolitan areas found a median 22 percent increase in speeds between 2019 and 2020. ¹⁴ Research suggests a 10 percent change in speeds is likely to have a greater impact than a 10 percent change in traffic volume. ¹⁵

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⁸ Schneider, R. J., Sanders, R., Proulx, F., & Moayyed, H. (2021). United States fatal pedestrian crash hot spot locations and characteristics. Journal of Transport and Land Use, 14(1), 1-23. https://doi.org/10.5198/jtlu.2021.1825

⁹ https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812013

¹⁰ https://www.iihs.org/topics/bibliography/ref/2203

¹¹ https://www.iea.org/commentaries/growing-preference-for-suvs-challenges-emissions-reductions-in-passenger-carmarket

¹² "Projected 2020 U.S. Pedestrian Death Rate on Pace for Record High Despite Significant Drop in Driving.: Governors Highway Safety Association (GHSA). https://www.ghsa.org/resources/news-releases/pedestrians21

¹⁴ Pishue, B. (2020, December). COVID-19 effect on collisions on interstates and highways in the US. INRIX Research.

¹⁵ Elvik, R. (2005). Speed and road safety: Synthesis of evidence from evaluation studies. Transportation Research Record, 1908(1), 59–69. https://doi.org/10.1177/0361198105190800108

Highways through Community Cores

The Towns of Severance and Timnath are the only NFRMPO member communities without a state highway bisecting its main street or a primary commercial corridor. Across the NFRMPO region, heavily traveled highway corridors pass directly through centers of commerce and dense downtown areas that are important to community character. In most instances, these highways can inhibit safe biking and walking. Often, they isolate neighborhoods where household access to motor vehicles is already low. Although these corridors may not be appropriate for on-street biking, destinations along them should be accessible via parallel alternatives and safe intersections or access points. Multi-agency coordination is important to facilitate mobility for all user types. The NFRMPO and its partners should work closely with CDOT Region 4 on upcoming safety initiatives and needs assessments.

The corridors listed below should be analyzed in further detail as part of the NFRMPO's update to the Regionally Significant Corridor (RSC) visions with the next Regional Transportation Plan (RTP) update. Potential strategies to increase safety for active modes should be identified from resources such as the Colorado Downtown Streets Guide. Figure 2-4 highlights the portions of the State Highway System that pass through the core of an NFRMPO community.

- US287 downtown Loveland and downtown Fort Collins, North Fort Collins
- US85 downtown LaSalle, Evans, Garden City, and Greeley
- US85 Business Garden City, downtown Greeley
- US34 Loveland, Greeley, and Evans
- US34 Business Greeley
- SH392 downtown Windsor
- SH257 downtown Milliken and downtown Windsor
- SH60 downtown Milliken and downtown Johnstown
- SH56 downtown Berthoud
- SH14 downtown and east Fort Collins

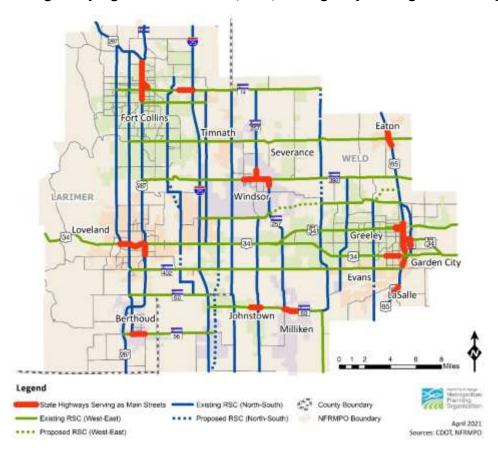


Figure 2-4: Regionally Significant Corridors (RSCs) and Highways through Community Cores

Additional off-system RSCs such as Shields Street and Harmony Road in Fort Collins, Wilson and Taft Avenues in Loveland, and WCR74 in Severance often act as highways through commercial districts and residential areas.

Chapter 3: Strategies, Approaches, and Emerging Trends

This Chapter summarizes strategies, approaches, and emerging trends in active transportation that may be well established in the NFRMPO region, relatively new, or somewhere in between. The topics that are highlighted are important for local, regional, and state agencies to consider in the transportation planning process. As much as possible, the principles in these topic areas should be applied consistently across the region.

Infrastructure

Basic types of active transportation infrastructure were introduced in **Chapter 2**. This section highlights some of the nuances and standards that, in the right context, can contribute to a safer, more reliable, and more resilient transportation network.

Facility Design Standards

The NFRMPO encourages local agencies to strive for active transportation facility design consistent with or above the minimum acceptable standards outlined in the <u>Larimer County Urban Area Street Standards (LCUASS)</u>. The LCUASS (undergoing updates to be effective by August 1, 2021) apply to all development within the jurisdiction of the Cities of Fort Collins and Loveland and their Growth Management Areas (GMA). The LCUASS encourages consistent design across jurisdictions and contains specific sections for pedestrian facilities (Chapter 16) and bicycle facilities

What would help you walk or bike more? Safer routes, pedestrian underpasses, bridges, [traffic] signal cyclist recognition, skinnier streets, more bike lanes offered throughout the city, better driver behavior and slower vehicle speeds

-NFRMPO Residents. 2020

(Chapter 17), with additional bike/ped design guidance scattered throughout other sections. The LCUASS is considered a best practice in intergovernmental coordination. Per guidance within LCUASS, for design or construction methods and materials not specified within the LCUASS, the following resources should be considered:

- AASHTO A Policy on Geometric Design of Highways and Streets, Guide for the Development of Bicycle Facilities
- ADA 2004 ADA Accessibility Guidelines
- <u>APWA</u> *Manual of Standard Plans*
- <u>ASTM</u> American Society for Testing and Materials
- <u>CDOT</u> Standard Specifications for Road and Bridge Construction; Standard Plans (M&S Standards); Roadway Design Manual
- FHWA Standard Plans (M&S Standards); Roundabouts: An Informational Guide.
- ITE Trip Generation Volumes 1 through 3; other appropriate design publications
- NACTO Urban Street Design Guide
- NCHRP Report 279, Intersection Channelization Design Guide
- <u>USDOT</u> Manual on Uniform Traffic Control Devices (M.U.T.C.D.)

It is increasingly important to consider how micromobility solutions (e-scooters, e-bikes, skateboards, etc.) are accommodated in the active transportation network. People will choose to use these devices whether they are accommodated or not, so design standards and policies should be adjusted to facilitate and encourage safe use.

Additional Resources and Considerations

The following resources may provide supplemental support for decision-making when weighing design and facility selection. The guidance and examples can accompany the information found in the resources listed in the previous section. Additional resources can be found in **Appendix A: Resource Library**, such as the Pedestrian and Bicycle Safety Guides and Countermeasure Selection Systems (<u>PEDSAFE</u> and <u>BIKESAFE</u>). NFRMPO staff are available to assist local agencies in identifying appropriate strategies and countermeasures.

Sidewalks

Sidewalks are essential infrastructure for pedestrian movement, and often serve bicyclists and other active modes. Although LCUASS defines sidewalk standards for various street classifications, local context should determine whether the minimum acceptable standard meets the needs of common users. For instance, the LCUASS specifies a minimum width of 4.5-5 feet for sidewalks along residential local streets, but this may not be adequate in areas with higher-than-average concentrations of older adults and individuals with disabilities. Five feet is the minimum width needed for circular wheelchair turns or for two wheelchairs to safely pass one another, and six feet is the minimum width needed for two people using walking aids or service animals to pass one another. Many sidewalks across the region do not currently meet ADA standards and are unusable or unsafe for many community members. The full extent to which the sidewalk network meet current ADA standards is not full known across the NFRMPO region. Documenting and quantifying this information could allow the NFRMPO and its partners to better analyze disparities across communities and prioritize limited federal funding based on a project's accessibility impacts.

Other considerations such as vertical versus rollover curbs, see **Figure 3-1**, can have significant impacts on user experience and safety. Although a rollover curb may be cheaper to build than a vertical curb, rollover curbs more easily allow vehicles to park on the sidewalk, errant vehicles to enter the sidewalk, or plowed snow to be stored on the sidewalk.

Sidewalk buffers (or parkways, according to LCUASS) provide increased separation from motor vehicle traffic, generally increasing the comfort of the facility and increase space for shade trees and other pedestrian amenities. **Figure 3-1** illustrates attached (no buffer) and detached (buffer) sidewalks.

Figure 3-1: Basic sidewalk Characteristics: Buffers and Curb Types







Above: Attached (no buffer), Rollover Curb

Above: Attached (no buffer), Vertical Curb

Above: Detached (buffer)

Shared-Use Paths

Shared-use paths (often referred to as trails or multiuse paths) are typically distinguished from sidewalks by having a consistent width that allows for two-way travel and safe passage of different types of users (foot traffic, wheelchair users, bicyclists, roller skaters, etc.). Shared-use paths are often characterized by more separation from traffic than sidewalks. Shared-use paths can be paved (hard surface) or unpaved (soft surface). The NFRMPO maintains a database of all paved shared-use paths, and some unpaved paths, such as the Great Western Trail, that meet the accessibility standards of the Americans with Disabilities Act (ADA). Future efforts will be made to identify and inventory other



Above: A participant in the Poudre River Trail Challenge runs with a fire hose. Image credit: City of Greeley.

accessible unpaved paths. Generally, provision of shared-use paths should be a requirement for all new residential developments. Provision of active transportation facilities through development is typically more cost-effective than adding facilities at a later time and ensures consistency within and across communities as the region continues its rapid growth.

The Regional Active Transportation Corridor (RATC) Network consists mainly of shared-use paths. **Table 3-1** includes high-level design guidance for shared-use paths that serve regional traffic or see very heavy local usage.

Table 3-1: Basi	c Design Guidance for Regional and/or High-Usage Shared-Use Paths
Design	Guidance
Consideration	
Uses	Connects several community destinations such as residential, commercial,
	and recreation areas, and other active transportation facilities; Used by
	bicyclist, pedestrians, and other mobility devices, including electric assist;
	Used for transportation and recreation
Preferred Location	Through residential, commercial, and recreation areas; along right-of-way
	corridors such as irrigation canals, drainage corridors, railroads, utilities, or
	roads; separated from hazards to provide a safe and pleasurable experience
Corridor Width	50-feet preferred; 30-feet minimum
Trail Width	12-feet preferred; 10-feet minimum
Trail Surface	Concrete (preferred) or asphalt; crusher fines acceptable for interim surface
Vertical Clearance	10-feet preferred; 8-feet minimum
Horizontal	Minimum 3-feet clear on both sides of trail, minimum bridge width of 10-feet
Clearance	
Lighting	At trailheads, access points, underpasses, at-grade road or trail crossings,
	intersections
Trail Waysides/Rest	1 major wayside/rest are per mile, or as available; combine amenities with
Areas	trailheads; preferred amenities (as appropriate/feasible) include shelter,
	benches/seating, picnic areas, potable water, informational kiosks,
	wayfinding, restrooms, trash/recycling receptacles
Wayfinding	Consistent with guidance in Appendix E: Wayfinding Guidance . Basic
	principles to follow include providing clear wayfinding at major access
	points, trailheads, and ½-mile marker and/or confirmation sign ½-1 mile and
	after major decision points; turn or decision signs in advance of and at major
	decision points, intersections, network gaps, major destinations, or hazards
Grade	Consistent with the U.S. Access Board's ADA Accessibility Guidelines (ADAAG)
Trailheads	At major access points, in parks, open spaces, or other parking areas where
	possible; preferred amenities (as appropriate/feasible) include shelter,
	benches/seating, picnic areas, potable water, informational kiosks,
	restrooms, trash/recycling, entry signs, wayfinding, regulatory information
Connecting path	8-foot minimum wherever possible
width	

On-Road Bicycle Facilities

The appropriateness of on-road bike facility types depends largely on the land use context and nearby destinations, available space, vehicle volumes, vehicle speeds, anticipated user type, intuitiveness of the area, and more. On-road bicycle infrastructure should be designed with a specific user type in mind. Three bicycle

user types are referenced by FHWA in their guidance on bikeway design. These user types include Interested but Concerned, Somewhat Confident, and Highly Confident.¹⁶ These three user types are shown in **Figure 3-2** and generally correspond to the roadway profiles shown in **Figure 3-3**.



Figure 3-2: Bicyclist Design User Profiles

According to the FHWA Bikeway Selection Guide, the three most important principles in bikeway selections are safety, comfort, and connectivity. **Figure 3-3** illustrates how safety and comfort translate into level of traffic stress (LTS) for different types of bicyclists, where "LTS 1" represents the lowest stress and "LTS 4" represents the highest stress. As traffic volumes increase and separation between bicyclists and motorists decrease, the LTS goes up. Connectivity can be addressed by ensuring low LTS facilities are connected to one another without significant gaps or pinch points of high LTS.

¹⁶ A fourth bicyclist user type of "No Way, No How" is often referenced as the portion of the population that will not ride a bicycle under any circumstances.

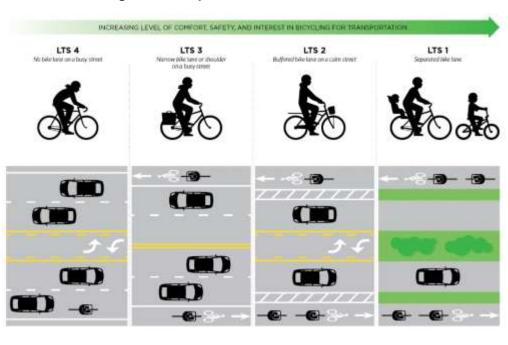


Figure 3-3: Bicycle Level of Traffic Stress (LTS)

Image credit: Alta Planning

Future efforts should be made to assign LTS across the entire NFRMPO roadway and active transportation networks. This could be used as a tool to identify and prioritize improvements in areas of low safety, comfort, and connectivity, as well as those with high rates of crashes and/or near misses.

Figures 3-4 and **3-5** highlight high-level guidance from FHWA on the types of facilities that align best with the safety and comfort principles in urban and rural settings. Generally, the higher the speed and volume of a road, the more protective the recommended bikeway. Shared lanes or bicycle boulevards are recommended for the lowest speeds and volumes; bike lanes for low speeds and low to moderate volumes; and separated bike lanes or shared use paths for moderate to high speeds and high volumes. When the design user is the Interested but Concerned cyclist, the most appropriate recommendation may be a more protective facility than necessary for a Highly Confident or Somewhat Confident design user. The preferred bikeway types and shoulder widths in **Figures 3-4** and **3-5** should be considered the standard minimums for sections of roadway designated as part of the Regional Active Transportation Corridor (RATC) Network. Additional guidance on RATC design considerations can be found in **Chapter 4.**

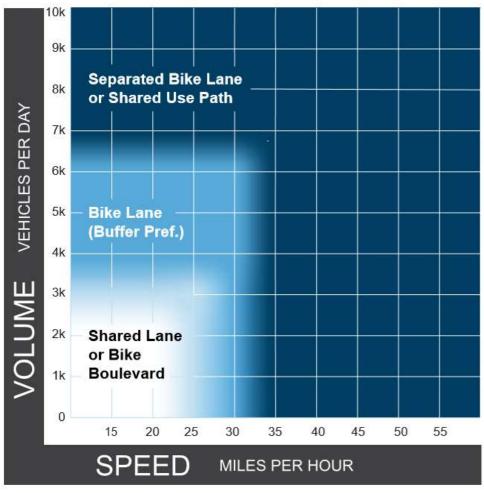


Figure 3-4: Preferred Bikeway Types for Urban Core, Suburban, and Rural Town Contexts

Notes

- 1 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.
- 2 $\,$ Advisory bike lanes may be an option where traffic volume is <3K ADT.

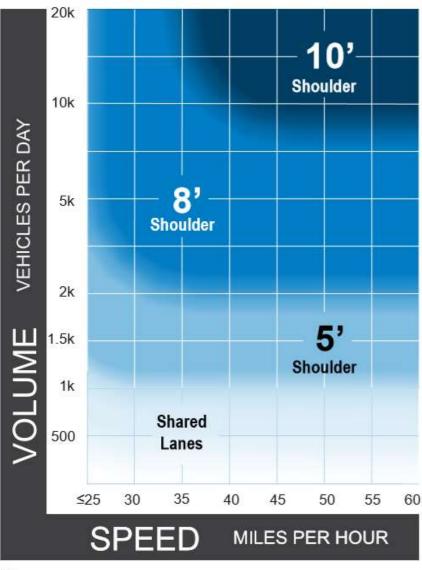


Figure 3-5: Preferred Shoulder Widths for Rural Roadways

Notes

- 1 This chart assumes the project involves reconstruction or retrofit in constrained conditions. For new construction, follow recommended shoulder widths in the AASHTO Green Book.
- 2 A separated shared use pathway is a suitable alternative to providing paved shoulders.
- 3 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.
- 4 If the percentage of heavy vehicles is greater than 5%, consider providing a wider shoulder or a separated pathway.

Narrowing and Removing Travel Lanes

Providing on-road bicycle facilities requires a reallocation of space among the various modes that will use a given roadway. This may mean narrower or reduced number of travel lanes for motor vehicles. Lanes as narrow as 10 feet do not result in an increase in crashes or reduce vehicle capacity on roads with speeds of 45 mph or less. ¹⁷ Narrowing lane widths can result in slower vehicle speeds and improved safety for all users with only negligible impacts on travel times. Additionally, travel lanes are not required to be of equal width. For example, some agencies use an 11-foot-wide outer lane to accommodate buses and trucks, with inner travel lanes at 10 feet wide. ¹⁸

Removing lanes and reconfiguring the space to accommodate all users is commonly known as a "road diet." Many roads have excess capacity and encourage fast speeds. Road diets can often have operational benefits if a new center turn lane is provided, keeping left turning vehicles from impeding through traffic. The FHWA Road Diet Informational Guide should be referenced across the region to identify opportunities to better accommodate all users. Although many factors other than volumes



Above: Maximum implementation thresholds for road diets across three cities. Image credit: FHWA Road Diet Informational Guide

should be considered, road diets in major metropolitan areas have been implemented successfully on roadways with relatively high volumes. These reconfigurations can be achieved using paint as part of a regularly scheduled resurfacing project. More intensive treatments such as physical barriers can also be used. Narrower roadways can also reduce the right-of-way needed and the costs associated with land acquisition.

Crossings

Design considerations can become complicated quickly for active transportation crossing facilities at controlled and uncontrolled intersections with the roadway and railroad networks, or with other active transportation facilities. Lack of safe crossings for active modes can represent the shortest but most significant gaps in the network. They are often overlooked due to the complexity of turning movements and signalization. **Appendix F: Crossing Countermeasure Matrices** includes detailed considerations from the <u>NCHRP Research Report 926: Guidance to Improve Pedestrian and Bicyclist Safety at Intersections</u> for reference in the decision-making process. These matrices can be used as tools to narrow down the range of appropriate crossing treatments. The need for a safe crossing where one does not already exist should not be determined based solely on observed demand for active mode crossings at that location via a simple count. "In many situations, a latent demand for places that feel safe to walk and bike is revealed after pedestrian- and bicyclist-focused

¹⁷ Potts, I. B., D.W., Harwood, and K.R., Richard. Relationship of Lane Width to Safety on Urban and Suburban Arterials. Presented at the 86th Annual Meeting of the Transportation Research Board, Washington DC, 2007. 18 FHWA Bikeway Selection Guide page 26

improvements are made."¹⁹ For a more simplified approach, FHWA promotes their "Spectacular Seven" proven pedestrian safety countermeasures at uncontrolled crossings. The Spectacular Seven include Crosswalk Visibility Enhancements, Leading Pedestrian Interval (LPI), Pedestrian Hybrid Beacon (PHB), Pedestrian Refuge Island, Raised Crosswalk, Road Diet, and Rectangular Rapid-Flashing Beacon.

At-Grade Crossings

Appropriate at-grade crossing treatments or countermeasures along the active transportation network can vary widely in character. Available countermeasures include traffic signs, pavement markings, traffic signals, lighting, signal timing changes, and bicycle or pedestrian recognition/detection treatments. The appropriateness of the various available treatments depends on a combination of the traffic speeds, traffic volumes, number of travel lanes, presence of street lighting, observed and latent pedestrian/bike demand, and other factors.



Above: A pedestrian waits for the signal along the Pitkin Bikeway in Fort Collins. Image credit: City of Fort Collins.

Grade-Separated Crossings

Grade-separated crossings (overpasses / bridges or underpasses / tunnels) are often the safest treatment but are usually the costliest and may not be the most convenient treatment for active modes if careful consideration is not given to the distance it may add compared with another treatment. Bridges or tunnels which are perceived as less convenient or less secure to use will often result in people crossing a roadway or railroad at grade, even if at-grade crossing is prohibited.

Chapter 4 identifies existing crossings and highlevel crossing improvement needs along the RATC Network. CDOT Region 4's upcoming bicycle and



Above: Poudre River Trail users pass under a county road. Image credit: Larimer County

pedestrian study will present an opportunity to identify these improvements in more detail. The NFRMPO also maintains an inventory of existing crossing types on the RATC Network. CDOT Headquarters will also be developing statewide bicycle and pedestrian crossing guidance.

¹⁹ Associates, Inc., William W. Hunter, and Peter Koonce; National Cooperative Highway Research Program; Transportation Research Board; National Academies of Sciences, Engineering, and Medicine National Academies of Sciences, Engineering, and Medicine 2020. Guidance to Improve Pedestrian and Bicyclist Safety at Intersections. Washington, DC: The National Academies Press. https://www.nap.edu/catalog/25808/guidance-to-improve-pedestrian-and-bicyclist-safety-at-intersections.

Wayfinding and Other Signage

Wayfinding and other signage are crucial infrastructure elements to direct and inform active mode users and alert other road users to the presence and/or rights of pedestrians and cyclists. Bicycle and pedestrian wayfinding guidance is included in **Appendix E: Wayfinding Guidance.** Signage related to active transportation must be compliant with the Manual on Uniform Traffic Control Devices (MUTCD) and should be designed to meet the needs of older adults and individuals with visual disabilities.

There are two ongoing initiatives related to wayfinding and other signage currently underway in the NFRMPO region. Partners along the Poudre River Trail and Great Western Trail, with assistance from NFRMPO Staff and the NoCo Bike & Ped Collaborative, are working to identify locations for various wayfinding element needs along each corridor. The goal is to create a seamless wayfinding experience across jurisdictions with consistent messaging across each corridor. The partners are using the NFRMPO's Community Remarks webpage to identify the needs and will be conducting workshops to refine the recommendations and further develop an implementation plan for the signage. **Figure 3-6** shows locations identified on these two trails as of May 2021.



Figure 3-6: Preliminary Wayfinding Needs along two Regional Corridors

Northern Colorado partners have also been working together to improve bicycle safety through signage. Larimer County and CDOT Region 4 are in the process of identifying priority locations to install "State Law: Motorists Must Give 3-FT Clearance" signs across the region. The agencies have worked closely with Bike Fort Collins, Your Group Ride, the Scott Ellis Memorial Fund, and other leaders to identify high-priority locations, including locations that currently have "Share the Road" signage that is often interpreted as a message to cyclists rather than motorists. The effort will culminate in 80 new signs on state highways and



Above: Bicycle safety signage installed in 2021 in rural Larimer County. Image credit: Your Group Ride.

county roads by summer 2022, and in part has inspired Bicycle Colorado's 2021 legislative agenda. Other local agencies have joined the discussion. Many of the signs may be installed as a permanent solution where topography or other physical constraints limit other improvements. Some signs will be installed temporarily as a short-term solution until other infrastructure improvements can be made. Other signs will simply replace existing "Share the Road" signage. **Figure 3-7** is a map of the locations that have been identified as of May 2021. Additional locations will be identified in Weld County as conversations progress. A 2015 study found respondents to an online survey who saw a "Bicycle May Use Full Lane" sign were twice as likely to conclude that cyclists are allowed to ride in the center of the lane than those who saw a "Share the Road" sign on a fourlane road. There was no significant difference between those who saw a "Share the Road" sign and those who saw no sign.²⁰

²⁰ "Bicycles May Use Full Lane" Signage Communicates U.S. Roadway Rules and Increases Perception of Safety Hess G, Peterson MN (2015) "Bicycles May Use Full Lane" Signage Communicates U.S. Roadway Rules and Increases Perception of Safety. PLOS ONE 10(8): e0136973. https://doi.org/10.1371/journal.pone.0136973

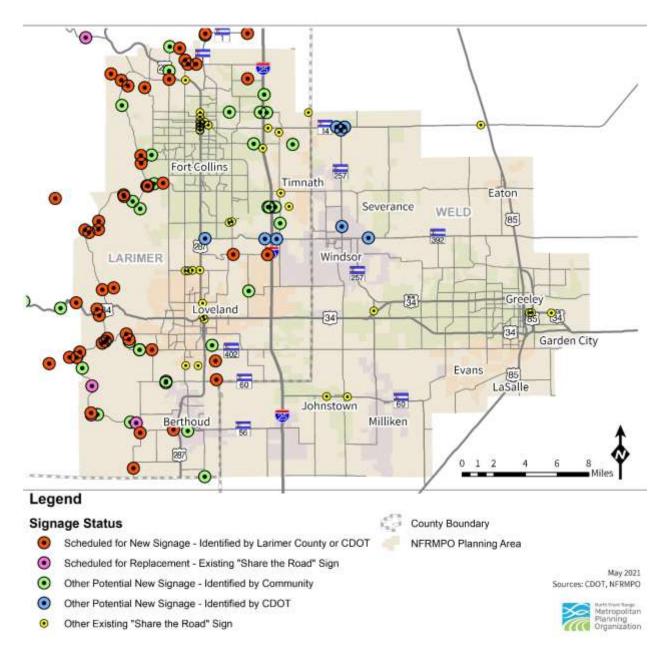


Figure 3-7: Priority Locations for "State Law: Motorists Must Give 3-FT Clearance" Signs

Transit-Oriented Walkability

Accessibility to the active transportation network can have a major impact on mobility, specifically for use of transit. The <u>NACTO Transit Street Design Guide</u> highlights a transit trip is door-to-door, not stop-to-stop, meaning the entire trip goes beyond just riding the bus. ²¹ People must be able to connect from their origin to the bus stop and from the bus stop to their destination. A safe and connected sidewalk network improves access to transit, providing an alternative to single-occupant vehicle travel (SOV).

NFRMPO member communities are investing in making streets more multimodal. For example, Transfort continues to invest in its <u>American with Disabilities (ADA) Bus Stops Upgrade program</u>, acknowledging transit and walkability are mutually beneficial in improving the mobility of people of all abilities and ages. In 2020, Transfort upgraded 72 bus stops in Fort Collins.²² Bus stop upgrades are funded through a Federal Transit Administration (FTA) grant and the City's Community Capital Improvement Program (CCIP).

The National Aging and Disability Transportation Center (NADTC)²³ identifies architectural and environmental factors that can prevent travel as being one component of paratransit eligibility. According to 2019 National Transit Database data, the average paratransit trip costs \$39, while the average fixed-route trip costs \$4 in the North Front Range. Converting some paratransit trips to fixed-route trips can save communities and transit agencies funding, and can be accomplished by addressing some of the following issues:

- Lack of curb ramps or a reasonable alternative accessible path of travel
- Lack of sidewalks or alternative safe accessible path of travel
- Snow and/or ice
- Major intersections or other difficult-to-negotiate street crossings
- Temporary construction projects

Some transit funds may be used to support the buildout of sidewalk networks, including FTA Section 5310 funds.²⁴ According to FTA, "building an accessible path to a bus stop, including curb-cuts, sidewalks, accessible pedestrian signals, or other accessible features...[and] improving signage, or way-finding technology" are nontraditional eligible projects. Additionally, the Coordinating Council on Access and Mobility (CCAM) identified 130 federal programs which can be used to improve mobility.²⁵ Combining multiple federal funding programs with local funds, or "braiding," can expand the reach of a program and bring in more funding for projects.

For example, combining Recreational Trails Program funds, FTA Section 5310 funds, and local funding could help connect a Regional Active Transportation Corridor (RATC) to the sidewalk network and the transit network. In doing so, a person could ride their bicycle along the Poudre River Trail, then connect to a Poudre

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²¹ https://nacto.org/publication/transit-street-design-guide/transit-system-strategies/network-strategies/pedestrian-access-networks/

²² http://www.ridetransfort.com/img/site specific/uploads/Planned Bus Stop Upgrades 5.28.20.pdf

²³ https://www.nadtc.org/wp-content/uploads/NADTC-Determining-ADA-Paratransit-Eligibility.pdf

²⁴ https://www.transit.dot.gov/funding/grants/enhanced-mobility-seniors-individuals-disabilities-section-5310

²⁵ https://www.transit.dot.gov/regulations-and-guidance/ccam/about/ccam-program-inventory

Express stop, and take their bicycle on the bus back to their trip origin. This can expand the reach of the trail and create a more seamless regional multimodal network.

Quick Win Projects

"Quick win" active transportation projects involve elements requiring small financial investments that can be implemented relatively quickly to make immediate improvements for active modes. Potential quick win improvements include strategies such as, but not limited to:

• Parklets and pedlets – parklets are public platforms or designated spaces that convert curbside parking spaces into spaces that can be used in a variety of ways by community members. They may incorporate design elements such as seating, greenery, or bike racks and can help meet demand for public space in certain high-use areas. Pedlets are a similar reallocation of curbside space to expand the sidewalk or walking area, allowing more maneuverability in high-use areas.

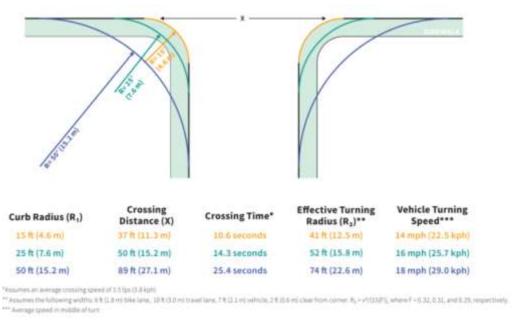


Above: A parklet in Old Town Fort Collins provides additional outdoor seating while preserving sidewalk space. Image credit: <u>The</u> Coloradoan

Curb extensions – a visual and physical
narrowing of the roadway for safer and shorter pedestrian crossings, increasing the available space for
street furniture, benches, plantings, street trees, public art, etc. Low-cost curb extensions can require
minimal materials such as paint and bollards. Curb extensions can serve as a visual cue to drivers that
they are entering a neighborhood street or area.



Above: An example of a painted curb extension with bollards in a residential area in Portland, OR. Image Credit: BikePortland



Above: This image illustrates the decreased crossing distance and time for pedestrians as well as the reduced vehicle speed that can be associated with curb extensions that decrease the curb radius. Decreased curb radius can be achieved through low-cost improvements such as planters, bollards, tires, and other low-cost barriers accompanied by paint. Image credit: Global Designing Cities Initiative.

• **Pop-up protected bike lanes** – low-cost reallocation of space to create a dedicated bike lane with a physical separator, such as bollards, planters, or jersey barriers, or other readily available materials. Pop-up bike lanes can encourage mode shift by creating safer alternatives where space is currently underutilized.



Above: A pop-up bike lane in Downtown Denver. Image credit:

Downtown Denver Partnership

• **Street furniture** – Where there is adequate sidewalk space, amenities such as lighting, benches, newspaper kiosks, utility poles, tree pits, and bicycle parking can be provided to enhance the pedestrian experience and create a more welcoming environment.



Above: Street furniture in Downtown Greeley includes information kiosks, benches, planters, trees, trash cans, street lighting, and more. Image credit: Colorado Public Radio.

Various other types of infrastructure, some of which are mentioned throughout the *ATP*, can also be great candidates for quick-win projects. Some additional elements that have proven successful in the NFRMPO region include bike and pedestrian wayfinding, trail access improvements, bicycle parking or repair stations, on-street bollards or warning signs for traffic channelization, and more. Local agencies are encouraged to reach out to NFRMPO staff and/or the NoCo Bike & Ped Collaborative to seek assistance with walk audits or workshops to brainstorm quick win (as well as long-term) solutions with community members and leaders. Communities that identify potential projects through exercises such walk audits are often more competitive than other communities for grant opportunities. Additional resources on topics such as walk audits can be found in **Appendix A: Resource Library.**

Trail Accessibility Information

Ensuring information is available on the accessibility of trail facilities can help individuals with disabilities and older adults determine if the facility is navigable for them.

Certain users are unlikely to explore these facilities if they are not confident the experience will be safe and comfortable. Information that can be helpful includes the availability of accessible restrooms, trail surface type, the grade/steepness along various sections of the trail.

Information should be available in various media such on a landing webpage for the trail, digital interactive map, printable map, and/or postings at trailheads.

The City of Fort Collins maintains a <u>"Natural Areas Finder"</u> webpage that allows visitors to filter down the list of



Above: An informative trail sign at Fort Ross State Historic Park in California informs users of trail accessibility. Image credit: <u>Dal Leite</u>

natural areas based on characteristics such as accessibility, presence of restrooms, dogs on leash, and presence of picnic facilities.

Winter Maintenance Plans

Snow and ice can add significant barriers to travel. The Americans with Disabilities Act (ADA) requires public entities to maintain in operable working conditions those features of facilities and equipment that are required to be readily accessible and usable by persons with disabilities. In some instances, proper winter maintenance of pedestrian and bicycle facilities requires additional time and resources; however, there are various low- or no-cost solutions that can help keep facilities clear and usable following snow and/or ice events. These solutions include developing priority routes, reminders to property owners regarding their sidewalk maintenance responsibilities, additional or modified training for maintenance crews on techniques to keep crosswalks, bus stops, and other important access points clear of obstruction. The Minnesota Department of Health published the Sidewalk Snow Clearing Guide in 2018 to identify options for keeping sidewalks and crosswalks clear year-round, along with case studies on how communities around have turned these options into public policy. Additional resources on maintenance can be found in Appendix A: Resource Library.

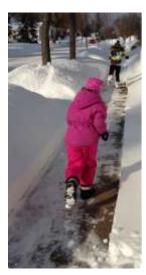


Image credit: MDH

Best Practices

In 2019, members of the NoCo Bike & Ped Collaborative held a walking audit workshop with Town of Berthoud staff, elected leaders, and community members. The participants identified quick win priorities to immediately improve walkability in the Old Town Berthoud area.

Due in part to these efforts, the Colorado Department of Public Health and Environment (CDPHE) identified Northern Colorado as a 2020 focus area for implementing quick win bikeability and walkability projects under \$5,000. Staff from CDPHE, Weld County Department of Public Health and Environment (WCDPHE), and Larimer County Department of Health and Environment worked together to identify projects across seven communities that could



Above: Berthoud walk audit participant attempts to navigate inaccessible sidewalk in Old Town.

Credit: NFRMPO Staff

create "quick win" improvements for active modes. The recipients included Berthoud, Greeley, the Great Western Trail Authority (GWTA), Loveland, Milliken, Severance, and Wellington. The projects included fencing for better defined trail access, wayfinding to parks, painted curb extensions, bicycle repair stations, "Bike May Use Full Lane" signage, trailhead enhancements, and trail surface improvements.

Pilot Projects

Active transportation pilot projects allow communities to conduct a small-scale implementation of a concept or strategy to estimate and analyze the feasibility, cost, drawbacks, and benefits of that treatment. In 2005,

funding from a one-time \$25M federal transportation bill was awarded to four communities nationwide to monitor the impact of active transportation improvements on travel choices. Projects included bikeways, pedestrian walkways, sidewalks, education and outreach programs, and bike parking. All projects were focused on equitable access in demographically diverse areas. The year following completion, the improvements resulted in a 22.8 percent increase in walking trips and a 48.3 percent increase in bicycling trips; avoided 85.1M vehicle miles traveled (VMT), saving an estimated 3.6M gallons of gasoline and avoiding approximately 34,629 tons of carbon dioxide emissions. They also expanded quarter-mile access to the bicycle network for approximately 240,000 people, 106,000 housing units, and 102,000 jobs. The projects were followed by a 20 percent decline in the number of pedestrian fatalities, despite increases in walking and bicycling, and improved public health including a reduced economic cost of mortality (death) of \$46.3M from increased bicycling in 2013.²⁶

Pilot projects have also been employed across Northern Colorado. In 2018, the City of Fort Collins installed various protected bike lane treatments and a new signal along a 1.8-mile section of West Mulberry Street. An evaluation one year after the improvements demonstrated a 15-20 percent reduction in total crashes, a 4-11 percent reduction in vehicle speeds, minimal to negligible travel time increases for motor vehicles (10-12 seconds westbound, no change for eastbound), a 50 percent increase in on-street bike traffic, and an 81 percent decrease in sidewalk bike traffic where pedestrian conflicts were a major concern. A survey of the public indicated 61-65 percent believe the project improved travel conditions along the corridor. Although initial annual maintenance costs are estimated at \$5,000 (winter operation, sweeping, replacing damaged rail), these costs are anticipated to drop as design treatments and maintenance methods are improved.





Above: Before (left) and after (right) on a section of West Mulberry Street in Fort Collins, where buffers and bollards were chosen as the treatment. Other section received concrete curbs, steel rails, and green paint. Image credit: City of Fort Collins.

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²⁶ Nonmotorized Transportation Pilot Program Yields Striking Results. Volpe. United States Department of Transportation. December 16, 2014. https://www.volpe.dot.gov/policy-planning-environment/transportation-planning/nonmotorized-transportation-pilot-program-yields

Maintenance

What would help you walk or bike more? Clean roads, street sweeping/repairs, better maintenance of bike lanes. -Johnstown and Greeley Residents, 2020

A simple approach to encouraging active transportation is maintaining existing facilities. Facilities that are not well maintained can create a safety hazard and a barrier to many users, particularly those with limited physical mobility, older adults, or individuals with disabilities. Uncleared sidewalks, patches of ice, or other obstacles can force people with limited mobility to take unnecessary risks or remain inside. Heaving or

uneven sidewalks, flooded or muddy curb ramps, unplowed bike lanes, paths, or shoulders, and broken glass

or other roadway debris all pose barriers to safe and reliable active transportation. Studies suggest maintenance is a larger barrier to biking in cold weather months than the cold weather itself. Improved winter surface maintenance of bike facilities (plowing, sweeping, etc.) can help retain an additional 12 to 24 percent of commuters who bike to work in warmer months.²⁷

Maintenance also includes code enforcement. Cars can commonly be parked across the sidewalk at driveway access or in areas with rollover curbs, or in dedicated bikes lanes. Trash and recycling bins may also be placed on sidewalks on collection day. When these barriers force bicyclists and pedestrians into busy traffic lanes, it creates unnecessary danger and may be enough to deter people from biking and walking for various trips.

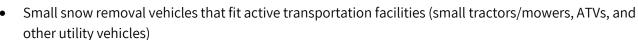


Above: Sidewalk Prioritization Criteria for the City of Fort Collins

Best Practices

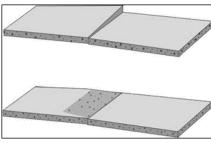
Maintenance best practices include:

- Routine maintenance plans that prioritize demand, health, equity, and safety
- Streamlined maintenance reporting and request tools for community members, such as the <u>Greeley Problem Reporting</u> webpage and <u>Access Fort Collins</u>
- Grinding heaving sidewalk segments and patching gaps
- Snow plowing route prioritization and scheduling (school zones and business districts first)



- Recessed thermoplastics pavement markings to better withstand snowplow activity
- Designing bike lanes, sidewalks, and other facilities with buffers for adequate snow and/or debris storage





Above: Uneven sidewalk slabs can be ground to provide a smoother transition.

Credit: FHWA

Additional maintenance best practices can be found in documents such as FHWA's <u>Guide for Maintaining</u>
<u>Pedestrian Facilities for Enhanced Safety</u> and Alta Planning and Design's <u>Winter Bike Lane Maintenance: A</u>
<u>Review of National and International Best Practices</u> report. Additional resources can be found in **Appendix A: Resource Library**.







Above: More than two days following a snow event, an unplowed bike lane on a major bike route (left), unplowed crosswalk (middle), and a sidewalk obstruction (right) all pose barriers to active transportation. Image credit: NFRMPO Staff.

Programming

Programming focused on active transportation can refer to a wide variety of educational workshops, promotional initiatives or events, data and information sharing practices, and more. Active transportation programs are often coordinated on a local level to respond to the specific needs of the community. Other programs may be coordinated at a regional, state, or national level for local implementation. Some of the best-known active transportation programs in the NFRMPO region include the City of Fort Collins' Safe Routes to School (SRTS) Program, the City of Greeley's Full Moon Bike Rides, and Loveland's Bike and Walk Month. Programs the NFRMPO has most recently been involved with include the 2020 Active Transportation Challenge, Bike to Work Day events, walking audits, educational workshops, the regional bike/ped counting program, and the 2015 NoCo Bike & Walk Conference. Due to the wide array of program types, these programs

What would help you walk or bike more? Awareness campaigns. Challenges like these are great reminders. -Greeley Resident, 2020



Above: Regional Stakeholders participate in a workshop in Loveland focused on conducting infrastructure assessments.

and many others are highlighted in more detail in **Appendix C: Additional Best Practices**. In collaboration with local partners, NFRMPO Staff should continue to assess opportunities to support and expand local programs for the benefit of the entire region through coordination, facilitation, and/or financial means.

Policy

Emerging Micromobility Solutions

New variations of electric-powered transportation devices, whether personal or shared, are rapidly coming to market, bringing with them opportunities and challenges for communities to consider. This section does not address all forms of micromobility devices and places more emphasis on devices with electric assist capabilities. The micromobility devices referenced in this section all share three common characteristics:

- **Human- or Electric-Powered** Fully capable of movement without human power, or motor-assisted (the rider provides some sort of propulsion)
- **Low speed** Top travel speed of 30 mph, according to definitions by the Society of Automotive Engineers (SAE). Many operate below 20 mph and are regulated down to 8 mph
- Small size a typical width of three feet or less and weight of less than 100 pounds

Such devices include electric bikes (e-bikes), standing or sitting e-scooters, and other technologies such as e-skateboards, hoverboards, Onewheel®, Solowheel®. In urban areas, e-bikes and e-scooters can commonly be rented as part of a private, shared-use system. All types of micromobility devices can be personally owned. Learn more about the various technologies through the Pedestrian and Bicycle Information Center's (PBIC) Brief on Micromobility Typology. Motorized wheelchairs and personal mobility devices, or Electric Personal Assistance Mobility Devices (EPAMD), used by people with disabilities can also fall under the micromobility device term. These solutions can increase mobility, equity, and sustainability, especially when combined with quality public transit.



Image credit: Pedestrian and Bicycle Information Center (PBIC)

The following sections describe these solutions, with reference to some of the best practices in managing their use and for establishing successful share programs. Best practices are constantly evolving and should be analyzed further over next several years. The City of Fort Collins is the only Northern Colorado community with a shared e-bike/e-scooter system in place. The City's new program will focus on refining dismount zone

polygons, hours of operation, reestablishing the community bike library, intersection treatment, sufficient stock/density, increasing low-income user ridership by decreasing cost, encouraging longer trips to encourage vehicle trip replacement, mobile app integration with Transfort app, improved adaptive program, and establishment of mobility hubs/downtown designated parking areas.

Electric Assist Bicycles (E-Bikes)

Under Colorado law, e-bikes are defined as bicycles with two or three wheels, fully operable pedals, and an electric motor.
Currently, local laws and regulations around e-bikes vary across Northern Colorado. Although e-bikes represent a small percentage of bicyclists today (1.15 percent in Fort Collins in 2020), their use is likely to increase as price points drop and as aging baby boomers look for ways to stay active. As the technology evolves, it will be increasingly difficult to distinguish some e-bikes from conventional bikes.
Although there are three distinct classifications



Above: An e-bike and e-trike demonstration at CSU in Fort Collins. Image credit: PeopleForBikes.

of e-bikes, they do not have outwardly defining characteristics. Furthermore, roughly half of e-bike owners do not know what class of e-bike they own.²⁸ **Table 3-2** summarizes e-bike classification definitions according to the State of Colorado.

Table 3-2: E-Bike Classification Definitions				
Class 1 E-bike	Class 2 E-bike	Class 3 E-bike		
Provides electrical	Provides electrical	Provides electrical assistance while the rider is		
assistance only while	assistance regardless	pedaling, up to 28 mph. Class 3 e-bikes must be		
the rider is	if the rider is	equipped with a speedometer and may not be		
pedaling, up to 20	pedaling or not, up	ridden by people under 16 (unless as a		
mph	to 20 mph	passenger). People under 18 must wear a helmet.		

Equity

At their current price point, many e-bike models are cost prohibitive for some community members. In early 2021, the Colorado Energy Office (CEO) released a Request for Applications to solicit proposals to develop and implement e-bike deployment projects. The program sought to increase e-bike access for low-income essential workers while maximizing air quality benefits. Additional program objectives include piloting a variety of e-bike distribution models including individual ownership and shared deployment and laying a foundation for future

²⁸ https://assets.bouldercounty.org/wp-content/uploads/2019/11/e-bikes-recommendation-bocc-11-13-2019.pdf

scalability and replicability. Localized assistance programs like these should be considered within the NFRMPO region.

Mobility

Requiring less effort than standard bikes, e-bikes effectively flatten hills, reduce energy needed to start and stop, and increase the amount of cargo a bicyclist can carry. For older adults and individuals with disabilities or other factors limiting their mobility, e-bikes can provide a mobility and independence option that standard bikes cannot. E-bikes can extend the riding range of all cyclists, making key destinations more accessible. A 2018 nationwide study of e-bike owners in the U.S. found that 28.7 percent had physical limitations that make riding a standard bicycle difficult and 67.2 percent of owners were over the age of 45. The top three barriers to cycling identified by the respondents were hills, lengthy distances to desired destinations, and not wanting to arrive at destinations sweaty. Physical limitations, physical ability, and weather conditions were also common barriers. E-bike designs that are adaptive to a variety of mobility needs are becoming more available. Providing adaptive e-bike options should be an essential part of any shared e-bike program.

Research suggests the average e-bike trip length is 50-60 percent longer than a conventional bike. In some European cities, e-bikes are facilitating average trip lengths of 9 miles for commute trips, 18 miles for trips on shared systems, and 18.6 miles trips for tourism trips.²⁹

Safety

A 2019 pilot study of e-bikes in Boulder County found that average e-bike speeds (13.8 mph) are typically lower than standard bikes (14.5), which may be attributed to the demographic of e-bike riders and the information presented to them. E-bike riders tend to be older than standard bike riders and many are presented with their speed via a speedometer on the e-bike. The study found that e-bike speeds were typically faster than standard bikes when going uphill, while standard bikes were faster going downhill.³⁰ A 2019-2020 pilot study of e-bikes in Fort Collins found a negligible difference in speeds between e-bikes and standard bikes. Although e-bikes are typically perceived as less safe than standard bikes, observed behaviors of e-bicyclists are often better than those of standard cyclists.³¹ Nationally, a vast majority (80 percent) of e-bike owners have not experienced crashes while on their e-bikes. Of those who have, only 19 percent believe the e-bike contributed in a significant way.³² Literature also suggests e-bikes have no greater impacts on trail condition or wildlife than standard bikes.

Best Practices

The best practices highlighted in **Table 3-3** may refer to either or both personal or shared e-bike ownership models. These practices may be helpful for local agencies when considering their individual approach to micromobility and serve as a basis for achieving consistency across the region.

²⁹ S. Cairns, F. Behrendt, D. Raffo, C. Beaumont, C. Kiefer, Electrically-assisted bikes: Potential impacts on travel behaviour, Transportation Research Part A: Policy and Practice, Volume 103, 2017, Pages 327-342, ISSN 0965-8564, https://doi.org/10.1016/j.tra.2017.03.007.

³⁰ https://assets.bouldercounty.org/wp-content/uploads/2019/11/e-bikes-recommendation-bocc-11-13-2019.pdf

³¹ https://www.fcgov.com/bicycling/files/fort-collins-e-bike-pilot-program-draft-report march-2020.pdf?1586191761

³²https://ppms.trec.pdx.edu/media/project_files/NITC_RR_1041_North_American_Survey_Electric_Bicycle_Owners.pdf

	Table 3-3: E-Bike Best Practices				
Consideration	Practice	Source			
Pilot study	Allowing e-bikes on certain facilities during a trial period while collecting data to assess safety, trail experience impacts, public opinion, and trail etiquette awareness.	Larimer County Natural Resources City of Fort Collins			
Trail access	Class 1 and 2 e-bikes are allowed on all shared-use trails (hard or soft surface) that are open to non-motorized biking on state lands.	Colorado Parks and Wildlife			
Regulating speeds	15 mph trail speed limit for all trail users, with "High Traffic Bicycle Slow Zones" on certain trail segments. E-bike motors shall cease to provide assistance when the bike reaches a speed of 20 mph.	City of Fort Collins City of Aurora, CO			
Incentives	Austin Energy offers qualifying rebates up to \$300 per e-ride vehicle (e-bike, e-scooter, e-moped, e-motorcycle) for individuals and \$400 per e-ride fleet vehicles. The Can Do Colorado eBike Pilot Program sought proposals to increase access to e-bikes for low-income essential workers while maximizing air quality benefits, pilot a variety of eBike distribution models including individual ownership and shared deployment, and lay a foundation for future scalability and replicability.	Austin Energy – City of Austin, TX Colorado Energy Office (CEO)			

CDOT is currently working with federal land managers to identify consistent e-bike regulation across jurisdictions, specifically along the I-70 corridor. Lessons learned from these conversations should be referenced and incorporated into similar regulatory discussions conversations in the NFRMPO region, beginning with the NoCo Bike & Ped Collaborative.

Electric Scooters (E-Scooters)

E-scooters are most common as part of a shared system. Other micromobility devices such as e-skateboards are most commonly owned individually. How these devices are classified by law varies by place. As of 2019, e-scooters were excluded from the State of Colorado's definition of a "toy vehicle," authorizing their use on roadways and affording them the same rights as e-bikes.

Equity

In shared systems, scooters typically are more expensive on a per ride basis than a standard bike; however, some companies offer reduced fares based on income (more information in **Table 3-4**). When priced and distributed equitably, scooters can provide a transportation option that fills crucial gaps, especially for those without the ability to drive or without access to a vehicle. NFRMPO partners should factor equity considerations into any future decisions related to shared e-scooter programs.



Above: An e-scooter user begins a ride in Old Town Fort Collins. Image credit: City of Fort Collins

Mobility

E-scooter designs that are adaptive to a variety of mobility needs are becoming more and more popular (wider tires, three wheels, and/or a seat for stability, etc.). Providing adaptive e-scooter options should be an essential part of any shared e-scooter program. For older adults and individuals with certain disabilities or other mobility difficulties, e-scooters may provide a mobility and independence option that e-bikes cannot. E-scooters can extend the travel range of pedestrians, effectively making key destinations, such as grocery stores or bus stops, more accessible.



Above: An example of an adaptive escooter. Image credit: SFMTA, Spin.

Safety

The technology and geometry of e-scooters is ever-changing, impacting their safety. Studies have found that the majority of e-scooter crashes occur on sidewalks and e-scooter injuries are most likely to occur due to potholes, cracks, or other infrastructure such as signposts or curbs. E-scooter riders suffer more injuries per mile than bike riders, but bike riders are three times more likely to be hit by a motor vehicle.³³ Planning partners in the region should continue to monitor the safety considerations associated with e-scooters and make decisions that promote safe use.

³³ https://www.iihs.org/news/detail/most-e-scooter-rider-injuries-happen-on-sidewalk-study-finds

Best Practices

The best practices highlighted in **Table 3-4** may refer to either or both personal and shared e-scooter ownership models. These practices may be helpful for local agencies when considering their individual approach to micromobility and may serve as a basis for achieving consistency across the region.

	Table 3-4: E-Scooter Best Practices				
Consideration	Practice Pra	Source			
Deployment in	The City of Portland, OR requires a minimum of 100	Portland Bureau			
underserved	shared scooters, or 20 percent of the fleet (whichever is	of Transportation			
areas (shared-	less) to be deployed in historically underserved	(PBOT)			
system only)	neighborhoods each day.				
Pricing and	Through its permit applications, Washington D.C requires	Washington D.C.			
payment (shared-	dockless scooter and bike providers to offer a cash	DOT			
system only)	payment option, and the ability to be located and				
	unlocked without a smartphone.				
	The Lime Access program gives any rider who is qualified	<u>Lime</u>			
	for a federally run assistance program, a 50 percent				
	discount on e-scooter or e-bike rental. Qualified riders				
	can also unlock a bike or scooter via text and pay through				
	a system called PayNearMe®, eliminating the need for a				
	smartphone or credit card.				
	Bird Access program provides anyone who is qualified for	<u>Bird</u>			
	a federally run assistance program the first 50 rides per				
	month (of 30 minutes or less) free of charge after a \$5				
	monthly fee, and allows riders to pay with cash at CVS				
	and 7-11 retailers.				
Regulating	E-scooters are required to be slowed to 8 mph in	<u>Colorado State</u>			
speeds	designated Slow Zones and walked through Dismount	University (CSU)			
	Zones on CSU's main campus. Using geofencing				
	technology ³⁴ , the scooters will slow or stop themselves				
	safely when entering these zones.				
	If operated on the sidewalk, it shall be the rider's	City of Aurora, CO			
	responsibility to operate at the maximum speed limit of 6				
	mph.				
	E-scooter motors shall cease to provide assistance when	City of Aurora, CO			
	it reaches a speed of 15.5 mph.				
Parking	Parking is permitted upright on the sidewalk against the	<u>City of Fort Collins</u>			
requirements	curb, beside bike parking, and other designated areas.				
	Parking is not permitted if it blocks or impedes the				
	pedestrian zone, fire hydrants, bus benches, use of				
	window/sign displays or building access, use of a bike				
	rack or news rack, or access to transit/loading/disabled				

³⁴ Geofencing technology triggers a pre-programmed action when a device or tag enters or exits a virtual boundary.

	parking zone, street furniture, curb ramps, entryways, or driveways	
Riding on	Treat e-scooters the same as bicycles. Riding is permitted	City of Fort Collins
roadways	in bike lanes and on roadways as far to the right as practicable.	
	Authorized shared mobility devices may operate in the roadway if the maximum speed limit of the roadway does not exceed 30 mph. They may operate where speed limits exceed 30 mph if a bike lane is present.	City of Aurora, CO
Riding on	Riding on sidewalks is permitted outside of Dismount	City of Fort Collins
sidewalks and	Zones. Riding on Natural Area or Parks trails is not	
trails	permitted.	
Data reporting	Operators are required to report detailed data with the City on a quarterly basis related to usage, theft, crashes, origins, destinations, complaints, downloads, payment method, discount program utilization, and more.	City of Aurora, CO

Other Micromobility Devices

Most other micromobility devices are still classified by the state as toy vehicles and cannot be operated on public roadways, restricting their use to sidewalks, trails and shared-use paths, depending on local regulations. This "catch-all" category of micromobility devices is rapidly changing, with categories blending into one another. Communities should evaluate many of the equity, mobility, and safety considerations laid out for e-bikes and e-scooter in this chapter.

These devices may be commonly referred to as Electric Personal Assistance Mobility Devices (EPAMD), Personal Mobility Devices, or Portable Mobility Devices. These terms often refer to a self-balancing, two- to four-wheeled device, that is not greater than 25 inches wide, designed to transport only one person, with an electric propulsion system averaging less than 750 watts (1 horsepower), the



Figure 1Above: Individuals practicing riding motorized -eboards. Image credit: Park City SUP

maximum speed of which, when powered solely by a propulsion system on a paved level surface, is no more than 12.5 miles per hour.

Best Practices

The best practices highlighted in **Table 3-5** may refer to either or both personal or shared ownership models. These practices may be helpful for local agencies when considering their individual approach to micromobility and may serve as a basis for achieving consistency across the region.

Table 3-5: Best Practices for Other Micromobility Devices				
Consideration	Practice	Source		
Riding on roadways	Treat e-skateboards as e-scooters and e-bikes. Riders shall be granted all the rights and shall be subject to all the duties and responsibilities applicable to the driver of a motor vehicle under the laws of the state and the traffic ordinances of the city.	City of Norfolk, VA		
Riding on sidewalks or trails	Any person riding a skateboard, toy vehicle, or similar device shall yield right-of-way to pedestrians.	City of Denver		
Facility design	Where possible, a minimum sidewalk/path width of 60" allow to wheelchairs space to pass one another.	2010 ADA Standards for Accessible Design (ADAG)		
Dismount zones	Riding skateboards is prohibited on sidewalks in designated dismount zones in the Old Town area using thermoplastic pavement signage.	City of Fort Collins		

Land Use and Urban Form

Land use and transportation are inseparably intertwined. The number and types of destinations within a walkable or bikeable distance are a major factor in choosing to walk or bike. **Figure 3-8** illustrates how districts with homogenous zoning or land uses can increase the average trip length, while districts with a mix of land uses can decrease trip lengths by putting more destinations within a walkable or bikeable distance of more people. While a certain area may have comfortable walking or biking facilities, there may be no destinations within walking or biking distance. NFRMPO Staff plan to develop a white paper describing and analyzing the land use/transportation nexus and how it impacts Northern Colorado.

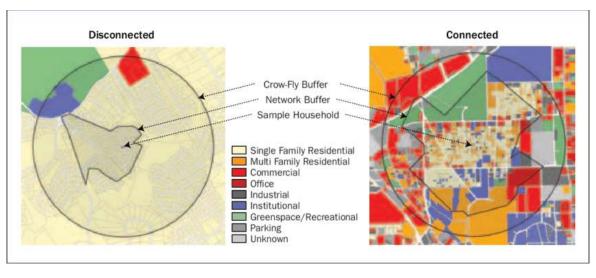


Figure 3-8: Land Use and Network Connectivity Comparison

Above: With a combination of mixed land uses and connected transportation networks, more destinations become accessible via a short walk or bike ride. Image credit: Patrick M Condon.

Land use patterns also influence the pattern and form of the transportation network. For instance, many older districts were developed with connectivity and walkability front of mind. These are often characterized by a grid-like street layout, with many access points and redundancy in the route a driver, bicyclist, or pedestrian can take to access a destination. In contrast, many newer residential districts are more car oriented; often characterized by winding, "loop and lollipop," or cul-de-sac patterns that may inhibit direct access to destinations. **Figure 3-9** below illustrates how these different street layouts impact travel distance.

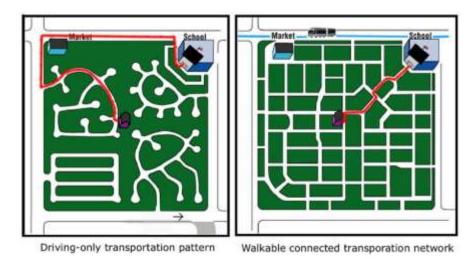


Figure 3-9: Street Network Layout Comparison

Above: The red lines demonstrate the shortest walking or biking distance from a home to a school given different street layouts. Image credit: Center for New Urbanism (CNU).

Figure 3-10 demonstrates how improvements can be made within an existing winding street pattern to improve bikeability and walkability. Short connector trails can dramatically reduce walking distances and can often be accommodated in narrow and/or otherwise undevelopable tracts of land.

School Sc

Figure 3-10: Active Mode Connections within a Disconnected Roadway Network

Driving-only transportation pattern

Above: Dashed red lines demonstrate active transportation connections to improve connectivity and access in an otherwise disconnected transportation network. Image credit: CNU.

Complete Streets

Complete Streets are streets designed to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. The adoption of a Complete Streets policy by communities encourages the routine design and operation of the entire right of way to enable safe access for all users. **Appendix A: Resource Library** includes various resources for local agencies to learn more when considering complete street policies, development standards, or individual project design.



Above: Complete Streets Cross Section ³⁵ demonstrates how space can be allocated in high-use areas where various travel modes interact on a regular basis.

Within the North Front Range region, Berthoud, Fort Collins, Greeley, Loveland, and CDOT have adopted Complete Streets policies. Other communities have referenced the concept of Complete Streets in a local plan and may have a variation or components of Complete Streets policies in local standards. NFRMPO staff are available to discuss how Complete Streets policies or principles can be incorporated in local processes.

Health in All Policies (HiAP)

Health in All Policies is a collaborative approach to improving the health of all people by incorporating health considerations into decision-making across sectors and policy areas. Due to the complex nature of the current health challenges in the US, five key elements are included: promoting health and equity, supporting intersectoral collaboration, creating co-benefits for multiple partners, engaging stakeholders, and creating structural or process change. Active transportation offers individuals an opportunity to use physical activity as a mode for reaching their destination. The Weld County Department of Public Health and Environment (WCDPHE), Larimer County Department of Health and Environment (LCDHE), and Colorado Department of

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³⁵ The City of Elizabeth Releases a Complete Streets Concept Plan for Morris Avenue. Alan M. Voorhees Transportation Center. Rutgers Edward J. Bloustein School of Planning and Public Policy. http://vtc.rutgers.edu/

Public Health and Environment (CDPHE) have incorporated *HiAP* into their planning and outreach.³⁶ These agencies should be consulted for a better understanding of how health and the built environment are related.

Vehicle Automation

There are various levels of vehicle automation, or autonomy, as summarized in **Figure 3-11**. Many vehicles on the road today already include driver assistance technologies and partially automated features, such as lane keeping, forward collision warning, adaptive cruise control, automatic emergency braking, and rudimentary pedestrian detection features.³⁷ Although promising new safety technology is becoming available, pedestrian deaths continue to rise at alarming rates nationwide. According to Angie Schmitt, Owner/Principal of 3MPH Planning and Consulting, "In 2019, AAA tested the pedestrian detection systems in four midsized sedans with dummy pedestrians. The systems performed respectably at 20 miles per hour in daylight conditions, stopping about 40 percent of the time. But at 30 miles per hour, they were practically useless. AAA called them 'completely ineffective at night,' when 'none of the systems detected or reacted to the adult pedestrian.'"³⁸

Thus far, complete automation, the autonomous vehicle (AV), has proven inadequate at detecting pedestrians, especially outside of marked crosswalks. The failsafe human drivers in the vehicles to stop or correct the vehicle have been unreliable. The National Transportation Safety Board (NTSB) has coined the term "automation complacency" as the typical inability of the human brain to remain vigilant and alert for an extended amount of time in the back-up driver role.³⁹

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³⁶ Health in All Policies: A Guide for State and Local Governments. American Public Health Association. 2013. http://www.phi.org/resources/?resource=hiapguide

³⁷ Schmitt, Angie. (2020). *Right of Way: Race, Class, and the Silent Epidemic of Pedestrian Deaths in America* (p. 120). Island Press.

³⁸ Schmitt, Angie. (2020). *Right of Way: Race, Class, and the Silent Epidemic of Pedestrian Deaths in America* (p. 121). Island Press.

³⁹ Schmitt, Angie. (2020). *Right of Way: Race, Class, and the Silent Epidemic of Pedestrian Deaths in America* (p. 116-118). Island Press.

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) AUTOMATION LEVELS Driver Conditional **Partial** Full No High Automation Automation Assistance Automation Automation Automation Vehicle is controlled by The vehicle is capable of The vehicle is capable of Zero autonomy; the Vehicle has combined Driver is a necessity, but mated functions a not required to m performing all driving performing all driving driving tasks. may have the option to control the vehicle. vehicle design. nay have the option to control the vehicle. h the driving task and icle at all times

Figure 3-11: Levels of Vehicle Automation / Autonomy

Image credit: NHTSA

Local, regional, and state agencies should consider their role in determining how autonomous vehicles will interact with their right-of-way and surrounding land uses. These agencies should proactively plan for full automation in a way that prioritizes quality of life, requiring new transportation technologies to adapt to community desires for safer, more efficient, and better places to live and work. The National Association of City Transportation Officials (NACTO) has urged stakeholders at all levels to adopt the following five recommendations to AV manufacturers:

- 1. Plan for fully automated vehicles, not half-measures;
- Rethink our streets and expressways;
- 3. Ensure safe operation on city streets, including limiting automated vehicles to a maximum speed of 25 miles per hour;
- 4. Create data-sharing requirements for automated vehicles; and,
- 5. Change planning models to incorporate the expected disruptive impact of this technology.

If safely implemented on a large scale, AVs could create benefits to active modes through optimized traffic signalization and more efficient use of limited public right-of-way.

Chapter 4: Regional Active Transportation Corridors (RATC)

The RATC network was originally adopted in the NFRMPO's 2013 Regional Bicycle Plan as the 'Regional Bicycle Corridors,' and have been carried forward and reaffirmed through several subsequent planning efforts, including the 2040 RTP. Collectively, these corridors were conceived to one day serve as the spine for bicycle travel between and through the local communities. The corridors were identified based on a series of selection criteria focused on consistency with local/regional/state planning efforts, multimodal connectivity, economy and tourism, access to key destinations, obstacles to implementation, and public input.

Following the 2040 RTP, the importance of these corridors was validated and their visions carried forward in the 2016 Non-Motorized Plan. They were referred to as the 'Regional Non-Motorized Corridors' for their capacity to accommodate pedestrian travel. Again, these corridors were adopted in the 2045 RTP.

A major component of *ATP* development focused on engagement around these corridors. Through various tools and meetings, feedback from the public and updates from local agencies were collected to refine preferred and alternative alignments, key local connections and critical gaps, and major barriers and opportunities for completion. These efforts largely reinforced the importance of these regional corridors, but also highlighted the need for more localized considerations that maximize safe and equitable access to them. These needs and considerations are identified in the individual corridor-level maps and segment-level narratives later in this section. The updated RATC Network is shown in **Figure 4-1.**

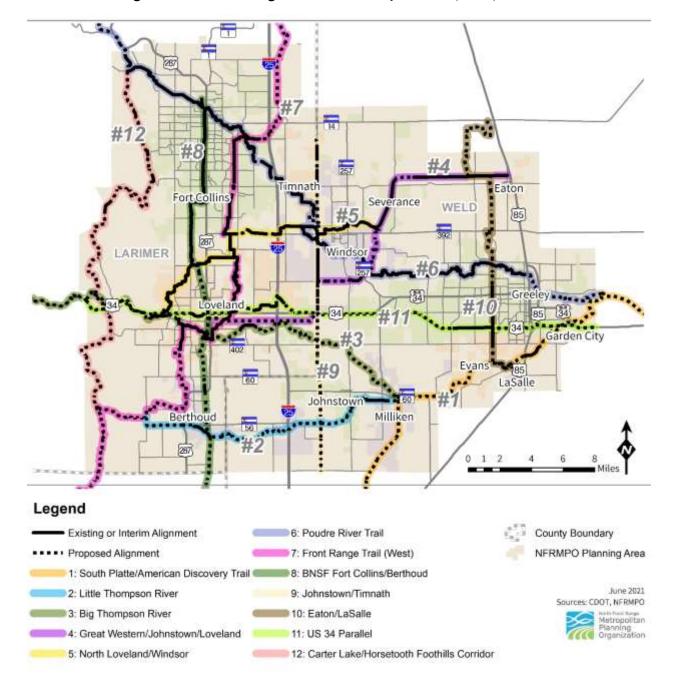


Figure 4-1: NFRMPO Regional Active Transportation (RATC) Network

The corridors are not labeled or categorized as recreation-, school-, or commuter-oriented due to the complex and everchanging nature of how trips are made and how these facilities are used. Part of any trip, regardless of purpose, that can be converted to an active mode helps the region achieve its transportation and air quality targets. Each of these corridors has the capacity to serve a variety of trip types, especially as population growth continues, local connections are built out, and emerging micromobility solutions extend active mode trip lengths.

Throughout this section, interim and alternative alignments are identified for many proposed segments. Identification and development of one alignment does not preclude development of an alternative. Parallel alignments are encouraged and can complement one another in their ability to connect more community members to equitable transportation and recreation opportunities.

The RATC Network consists of sections that are envisioned to have separated facilities (shared-use path or trail), roadway/on-road facilities (bike lanes or bikeable shoulders), and combined facilities (both on-road and separated). **Figure 4-2** shows the vision for facility types across the RATC Network, including facility types on alternative alignments. Chapter 3 summarizes more detailed guidance on what regional and/or high-use facilities like the RATC Network should ultimately look like. Upon build-out the preferred RATC Network will consist of 275.2 miles with separated facilities, 45.5 miles with roadway facilities, and an additional 24.1 miles with combined facilities. Many RATC segments may have existing combined facilities that do not meet a standard for carrying regional bike and pedestrian traffic.

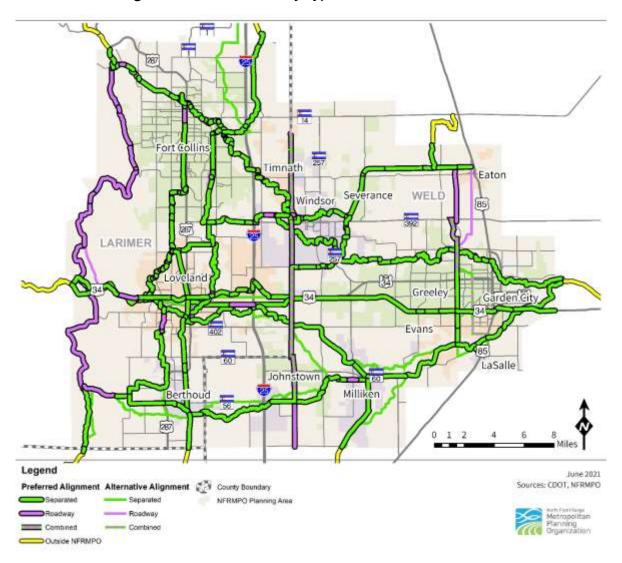


Figure 4-2 Build-Out Facility Type across the RATC Network

RATC 10-Year Project Pipeline

NFRMPO member agencies and other partners have identified 67 projects on or connecting to the RATC network that could reasonably be completed within the next 10 years. **Figure 4-3** and corresponding **Table 4-1** identify these projects. The projects included in this 10-Year Project Pipeline do not necessarily have funding allocated and may be heavily reliant on grants. The projects in this list may serve as the priorities among active modes projects for the NFRMPO region's allocations of STBG, CMAQ, TA, and SB-260 funds. The list is based on local assumptions of funding availability, community support, and several other factors. The list is non-exhaustive and there are many additional projects that may be possible within this timeline. The NoCo Bike & Ped Collaborative has created this list over several years through periodic workshops and will continue to maintain the list.

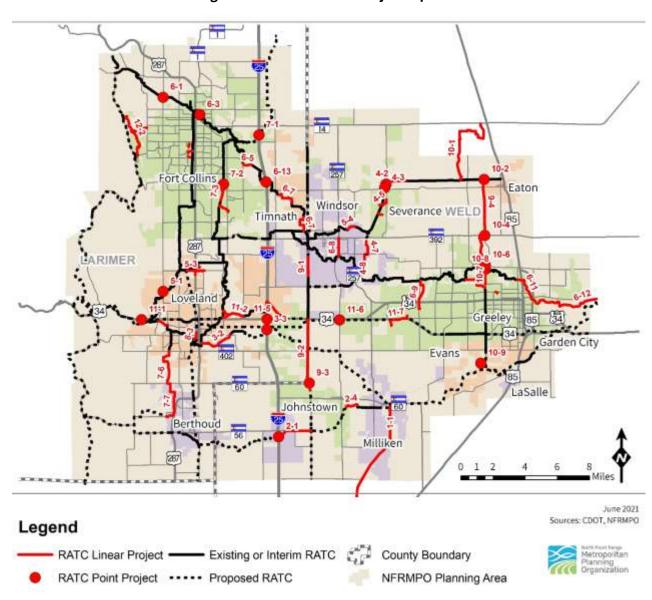


Figure 4-3: RATC 10-Year Project Pipeline

	Table 4-1: RATC 10-Year Project Pipeline Project RATC				
ID	#	Project Description	Type	Phase of Project	
1-1	1	Wildcat Trail Environmental Impact Mitigation and Design	RATC Segment	Pre-Construction	
2-1	2	Little Thompson Trail I-25 Trail Crossing	RATC Segment	Construction	
2-2	2	Little Thompson Trail - Development @ SE Corner of I-25 and SH56	RATC Segment	Construction	
2-3	2	WCR44 Trail Construction - w/ Development	RATC Segment	Construction	
2-4	2	Little Thompson Trail Phase 1 Construction	RATC Segment	Construction	
3-1	3	Big Barnes Ditch Trail Paving	RATC Segment	Construction	
3-2	3	East Big Thompson Trail: Phase 1	RATC Segment	Construction	
3-3	3	I-25 Trail Underpass at Big Thompson River Bridge	RATC Segment	Construction	
4-1	4	WCR23 to Roulard Lake	RATC Segment	Construction	
4-2	4	GWT Trailhead Design and Construction - WCR23	Local Connection	Construction	
4-3	4	GWT Trailhead and Pocket Park	Connection	Construction	
4-5	4	WCR23 Safe Routes to School (SRTS) Connections to GWT Construction	Local Connection	Construction	
4-6	4	Additional Safe Routes to School (SRTS) Connections to GWT Construction	Local Connection	Construction	
4-7	4	Future Legends Trail System	RATC Segment	Construction	
4-8	4	Eastman Park Trail System	RATC Segment	Construction	
5-1	5	Wilson Avenue Trail Underpass Construction	RATC Segment	Construction	
5-2	5	57th St and US287 Shared-Use Path Construction: Phase 1	Local Connection	Construction	
5-3	5	57th St and US287 Shared-Use Path Construction: Phase 2	Local Connection	Construction	
5-4	5	Windsor Lake to WCR19 Trail Construction	RATC Segment	Construction	
6-1	6	Taft Hill Road Underpass	RATC Segment	Construction	
6-2	6	Poudre Trail Realignment - UPRR crossing	RATC Segment	Construction	
6-3	6	Poudre Trail Linden Street Crossing - Enhanced or Underpass	RATC Segment	Construction	
6-4	6	CSU ELC to Ziegler Road	RATC Segment	Construction	
6-5	6	Ziegler Road to Rigden Reservoir	RATC Segment	Construction	
6-6	6	CSU Environmental Learning Center (ELC) to I-25 Trail Construction	RATC Segment	Construction	
6-7	6	Timnath to Windsor Trail Construction	RATC Segment	Construction	
6-8	6	7th Street Bikeway Construction	Local Connection	Construction	
6-9	6	Greeley #3 Canal Trail Phases 2 and 3 Construction	Local Connection	Construction	
6-10	6	83rd Avenue Trail Construction: 10th St to Poudre Trail	Local Connection	Construction	
6-11	6	Larson Trail to Poudre River Trail Land Acquisition (and Construction)	Local Connection	Construction	
6-12	6	83rd Avenue Trail Construction: 83rd Ave Underpass and Sheep Draw to 10th St	Local Connection	Construction	
6-13	6	East Poudre Trail Phase 1 Construction	RATC Segment	Construction	
6-14	6	East Poudre Trail Phase 2 and Beyond Construction	RATC Segment	Construction	

	Table 4-1: RATC 10-Year Project Pipeline				
Project ID	RATC #	Project Description	Туре	Phase of Project	
6-15	6	Poudre Trail Underpass at I-25 Construction	RATC Segment	Construction	
7-1	7	Feasibility and Alternatives Study of Boxelder Creek Grade- Separated Crossing	RATC Segment	Pre-Construction	
7-2	7	Grade-Separated Railroad Crossing Construction near Golden Meadows Park	Local Connection	Construction	
7-3	7	Power Trail Grade-Separated Crossing Construction at Harmony Road	RATC Segment	Construction	
7-4	7	Mail Creek Trail Overpass Connection to Power Trail Construction	Local Connection	Construction	
7-5	7	Mail Creek Trail Underpass of Timberline Road	Local Connection	Construction	
7-6	7	Berthoud to Loveland Front Range Trail Land Acquisition (and Construction)	RATC Segment	Construction	
7-7	7	Heron Lakes Trail Construction	RATC Segment	Construction	
8-1	8	Phemister Trail with Pedestrian Bridge	Local Connection	Construction	
8-2	8	CSU South Campus Spur Trails	Local Connection	Construction	
8-3	8	Alternatives Study to connect Fairgrounds Park to Downtown Loveland	RATC Segment	Pre-Construction	
9-1	9	Trail Construction from Poudre Trail to Raindance Development	RATC Segment	Construction	
9-2	9	WCR13 Widen to 3 Lane Collector Standard (Weld TMP)	RATC Segment	Construction	
9-3	9	WCR13/WCR50 Intersection Improvement (Auxiliary Turn Lanes)	RATC Segment	Construction	
9-4	9	WCR35 - Widen to 3 Lane Collector Standard (Weld TMP)	RATC Segment		
10-1	10	Loop to Gateway Trail - Deisgn and ROW Acquisition	RATC Segment	Pre-Construction	
10-2	10	GWT Trailhead Design and Construction - Eaton Rec Center	Local Connection	Construction	
10-4	10	SH392 and WCR35 Intersection Improvement (Auxiliary Turn Lanes) (Weld TMP)	RATC Segment	Construction	
10-5	10	35th Ave/WCR 35 from O Street to SH 392 Widen Roadway to 4 Lanes (Weld TMP)	RATC Segment	Construction	
10-6	10	WCR64 (O St.) and WCR35 (35th Ave.) Intersection	RATC Segment	Construction	
10-7	10	Bike Lane Construction from C Street to Poudre Trail and O Street	RATC Segment	Construction	
10-8	10	Poudre Trail Underpass at 35th Ave	RATC Segment	Construction	
10-9	10	Ashcroft Trail Trailhead Land Acquisition	Local Connection	Pre-Construction	
10-10	10	Greeley #3 Canal Trail Phases 2 and 3 Construction	Local Connection	Construction	
11-1	11	US34 Underpass east of Rossum Drive (US34 PEL)	RATC Segment	Construction	
11-2	11	South Boyd Lake Trail	RATC Segment	Construction	
11-3	11	South Boyd Lake Trail - Spur	Local Connection	Construction	
11-4	11	Kendall Parkway Trail Construction	RATC Segment	Construction	
11-5	11	Bike/Ped Improvements across I-25 on US34 bridge	RATC Segment	Construction	
11-6	11	US34 and WCR17 Interchange Construction	RATC Segment	Construction	

Table 4-1: RATC 10-Year Project Pipeline				
Project ID	RATC #	Project Description	Туре	Phase of Project
11-7	11	Southwest Trail Construction	RATC Segment	Construction
11-8	11	Sheep Draw Trail Construction from Pebble Brook Development to 95th Ave	RATC Segment	Construction
12-1	12	CSU Foothills Trail	Local Connection	Construction
12-2	12	Dixon Canal Trail Spur	Local Connection	Construction

RATC Crossing Considerations

There are dozens of crossing treatments that can be applied and combined to improve safety and mobility for bicycles and pedestrians where off-street facilities cross the roadway network or at on-street intersections. For the RATC network, a non-exhaustive list of treatments have been divided into four generalized levels based on the intensity and investment required (Level 1 being low and Level 4 being high). These categories were devised based on guidance from the Federal Highway Administration (FHWA), National Cooperative Highway Research Program (NCHRP), and National Association of City Transportation Officials (NACTO).

Many of these treatments can and should be used in combination with other, potentially unlisted, strategies. Final design should be appropriate for the design user based on engineering judgment and local context. The design user should be chosen assuming continued growth in trends such as electric bikes (e-bikes). Design users are discussed further in **Chapter 3**. The lowest acceptable level of crossing treatment that would be acceptable upon build-out of the various crossings along the RATC network is identified in **Figure 4-4**. In some locations, crossings are identified for facilities that do not yet exist. For others, higher level treatments are identified than what currently exists on that facility. Some facilities are already built to their final design, which is indicated on the map. Treatments levels are assigned based on a combination of factors including traffic volumes, posted speed limit, number of travel lanes, local agency plans, and other local context. If a crossing type is not identified at a location (local roads, alleys, driveway access, etc.), it can be assumed a Level 1 crossing would be appropriate until further study is done. Although unlabeled, these crossings may still pose significant barriers to mobility along or across an RATC.

Level 1 (Low)

Pavement markings, signage, and basic improvements to existing signalized infrastructure. This can include standard signal infrastructure at signalized and unsignalized intersections.

- Crosswalk markings
- Advanced Yield Here To (Stop Here For)
 Pedestrians sign and yield (stop) line
- Crossing warning signs
- In-streets pedestrian crossing signs (State Law: Stop for Pedestrians in Crosswalk Sign) / "Gateway Treatment"
- No turn on red sign
- All-way stop signs





Above: Level 1 Crossing Examples - (Top) A marked crosswalk for the Poudre River Trail along 71st Street in Greeley; (Bottom) An in-street crosswalk sign in downtown Wellington. Credit: Google, North Forty News

Level 2 (Medium)

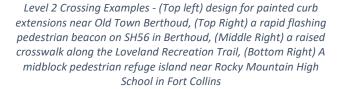
More advanced warning systems, pavement treatments, physical features, detection technology, and flashing beacons. These can include midblock crossing infrastructure, such as beacons and flashing lights that are not considered traffic signals.

- Active warning beacon / Rapid flashing beacon
- Internally illuminated crosswalk signs
- Median refuge island
- Raised crosswalk
- Leading or protected bike/ped signal phase
- Bike or pedestrian scramble
- Bike box
- Two-stage bicycle turn queue box
- Curb extensions
- Curb radius reduction
- Nighttime lighting
- Bike lane extension through intersection
- Passive bicycle signal detection
- Hardened centerline











Level 3 (High)

Major infrastructure that separates and protects active modes, including bike/ped specific signals. Level 3 improvements are often classified as such if they are located at a midblock location. Some of these treatments may equate to Level 1 treatments if they are already incorporated and not specifically focused on active modes.

- Protected intersection
- Dedicated Intersection
- Pedestrian Hybrid Beacon (PHB) or Signal
- Roundabout







Above: Level 3 Crossing Examples - (Top) A Pedestrian Hybrid Beacon along Mulberry Street in Fort Collins, (Middle) a protected bicycle intersection courtesy of Alta Planning, (Bottom) A dedicated bicycle signal along Clearview Avenue in Fort Collins

Level 4 (Separation)

Level 4 is reserved exclusively for grade-separated crossings. Underpasses and overpasses are typically the highest-intensity treatment, but often the only treatment that will eliminate modal conflicts at intersections and across interchanges.

Grade-separated crossing (underpass or overpass)







Left: Level 4
Crossing
Examples - Three
grade-separated
trail crossings of
roadways and
railroads in Fort
Collins along the
Front Range Trail
(Top Left), Fossil
Creek Trail (Top
Right), and
Mason Trail
(Bottom)

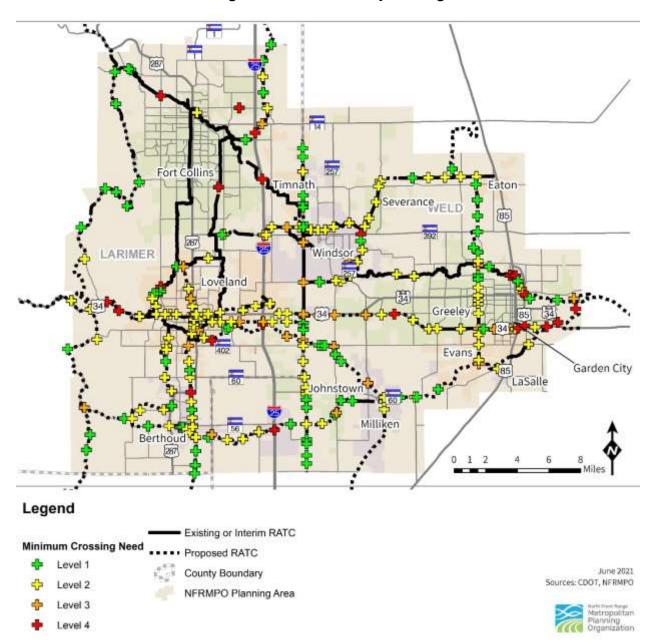


Figure 4-4: RATC-Roadway Crossing Needs

RATC Corridor Profiles

The following section describes each of the 12 corridors with a map and several corresponding tables detailing the individual segments. Each segment in the corridor map is described as:

- **Existing** The segment exists and adequately serves regional usage. Only minimal improvements are necessary.
- **Interim** The segment exists and is usable for some user types but would benefit from moderate to significant improvements to improve accessibility. These improvements may include facility widening, increased separation or protection from vehicle traffic, upgrading from on-street to off-street facilities, paving, or improved access agreements with managers of the facility.
- **Proposed** The segment does not exist but has been identified in at least one local planning document. The status of these segments within the local planning process range widely from conceptual to prioritized with local funding allocated.

Each corridor map is supported with relevant data about current and forecasted conditions. The accompanying tables include:

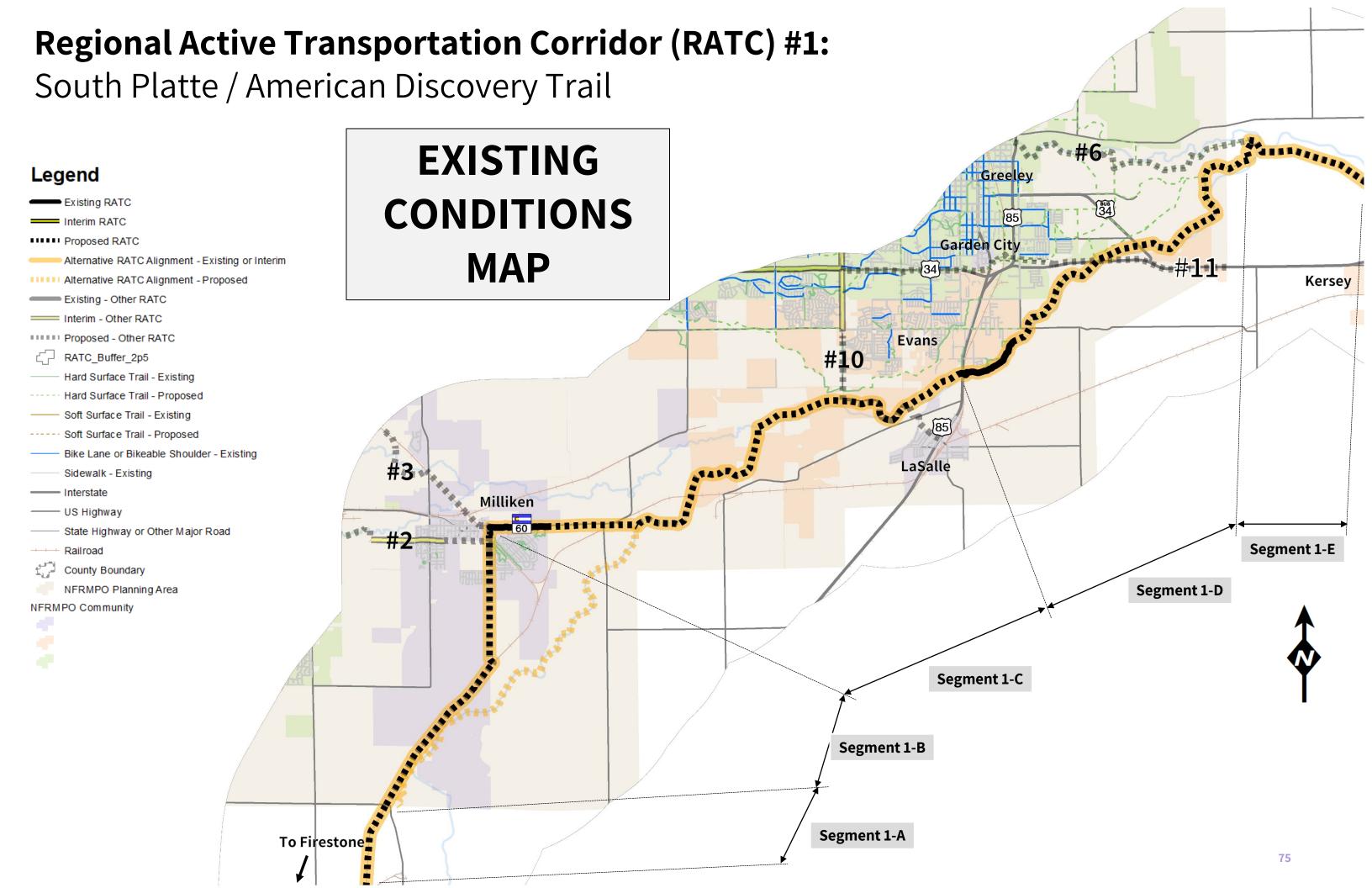
Corridor-Level Information

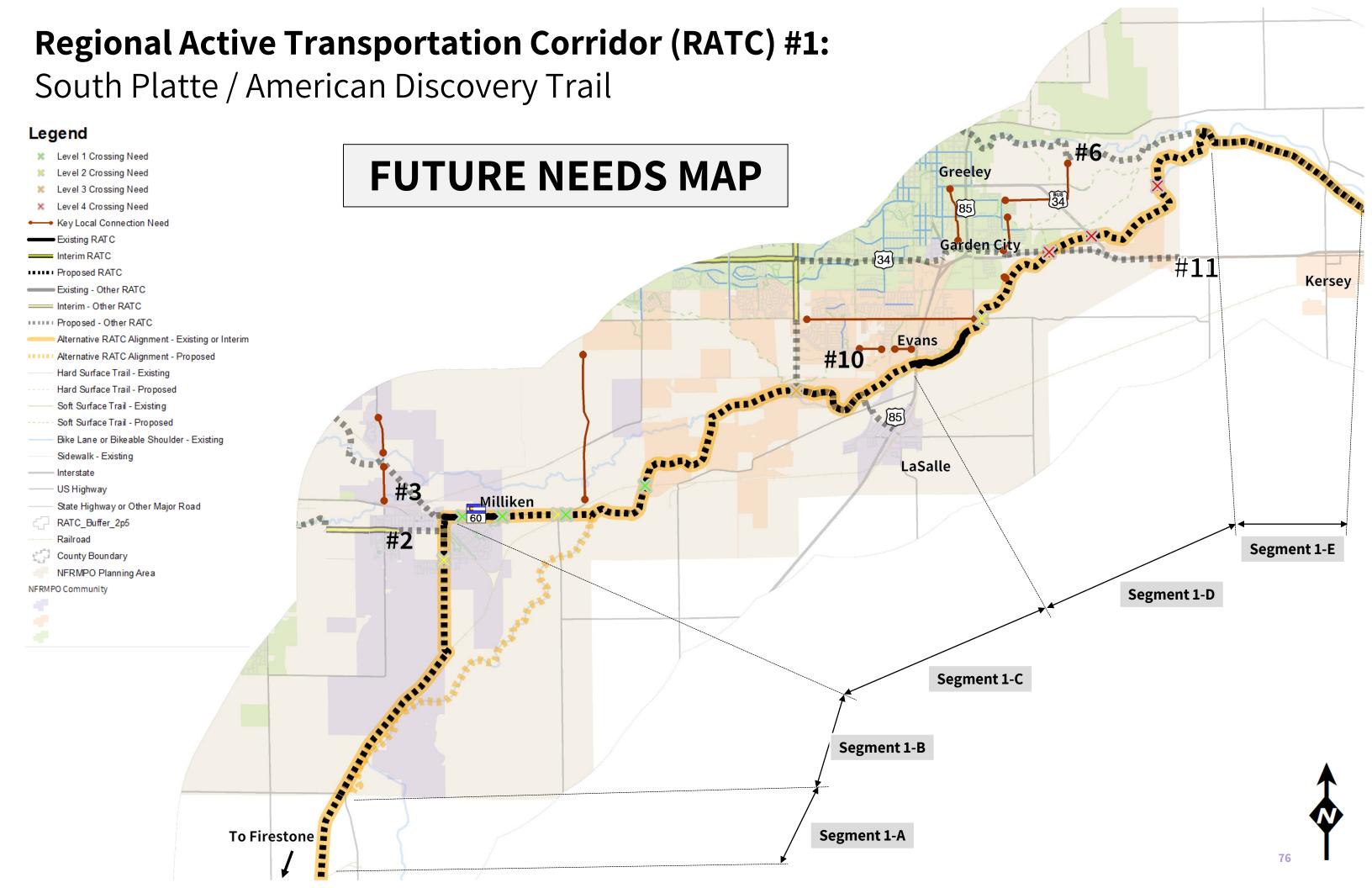
- **Corridor narrative** A descriptive vision for the entire corridor, including highlights of its relevance regionally, statewide, and/or nationally.
- Current and forecasted conditions
 - o Total length (miles) Existing or Interim (2020) and Build-Out (2045)
 - o Miles on-street Existing (2020) and Build-Out (2045)
 - Miles off-street Existing (2020) and Build-Out (2045)
 - Population within a ½ mile: Existing (2020) and Build-Out (2045)
 Source: NFRMPO Land Use Allocation Model
 - Jobs within a ½ mile: Existing (2020) and Build-Out (2045)
 Source: NFRMPO Land Use Allocation Model
 - Schools within a ½ mile: Existing (2020) and Build-Out (2045)
 - Source: 2020 CDOE School Locations
 - o Transit stops within a ½ mile: Existing (2020) and Build-Out (2045) Source: 2020 Transit Stops from various service providers
- **Planning references** A list of the most recent and/or relevant plan citations from impacted agencies referencing this corridor with a code (letter) for use in referencing each corridor segment. For agencies with multiple plans referencing the corridor, the most current and/or relevant plan is listed.

Segment-Level Information

- **Segment ID** Segment identifier corresponding to the corridor map.
- **Jurisdictions** The agencies with current or future (based on Growth Management Areas) jurisdiction over the area of the segment.
- **Description** A narrative overview of the segment with acknowledgement of local planning, projects, and opportunities.

- **Key local connection needs** Future infrastructure necessary for community members to access the corridor. Other RATC segments are excluded from this section, as well as areas with sufficient local infrastructure to important destinations.
- **Crossing Needs** –The minimum acceptable infrastructure needed for the segment to serve regional traffic upon build out, based on the four levels described in the previous section. If crossings are identified at locations with existing infrastructure are identified, it is to signify the minimum level of additional enhancements that will be necessary in the future.
- **Preferred alignment** The proposed alignment that maximizes connectivity, opportunities, and overall appeal.
- Alternative alignment Segment alignment that may prove more feasible.
- **Existing local facilities** This includes sidewalks, shared-use paths, bike lanes, and counters that support the corridor and/or "bridge the gap" as a temporary connection where a segment does not yet exist.





RATC #1: Corridor-Level Information

Corridor Description	Planning References
The South Platte River flows through the southeast portion of the NFRMPO region. This corridor will showcase and improve access to a river corridor of statewide	CPW – <u>Colorado Front Range Trail</u>
significance, opening recreation opportunities in areas with otherwise poor access to public open lands. The corridor not only represents a future connection	DOLA – <u>Wildcat Trail Conceptual Master Plan</u> (2015)
between NFRMPO communities and its neighbors to the south, but a statewide (Colorado Front Range Trail) and nationally recognized corridor (American	Firestone – Parks, Trails, & Open Space Master Plan (2019)
Discovery Trail). The corridor is widely referenced by our member governments as a shared-use trail along the river corridor ultimately connecting with the Poudre	Milliken – <u>Milliken Comprehensive Plan</u> (2015)
River Trail (Corridor #6) east of Greeley.	Evans – <u>South Platte River Corridor Master Plan</u> (2014)*
	Weld County – <u>2045 Weld County Transportation Plan</u> (2020)
Recent efforts on this corridor have focused on redeveloping the trail system in Riverside Park in Evans, which was destroyed in the floods of September 2013.	Greeley – <u>Greeley Bicycle Master Plan</u> (2015)*
Additional efforts to develop the Wildcat Trail between Milliken and Firestone have hit roadblocks related to wildlife habitat. Constructing, improving and/or	Kersey – <u>Kersey Comprehensive Plan</u> (2016)
extending these sections should be a priority, as they can serve as the cornerstones of RATC #1.	
	* this plan or related plan to be updated within two years

Total Len	Total Length (Miles) On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile		
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045
2.13	22.98	0	0	2.13	22.98	5,151	19,784	1,884	7,856	2	2	2	2

Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

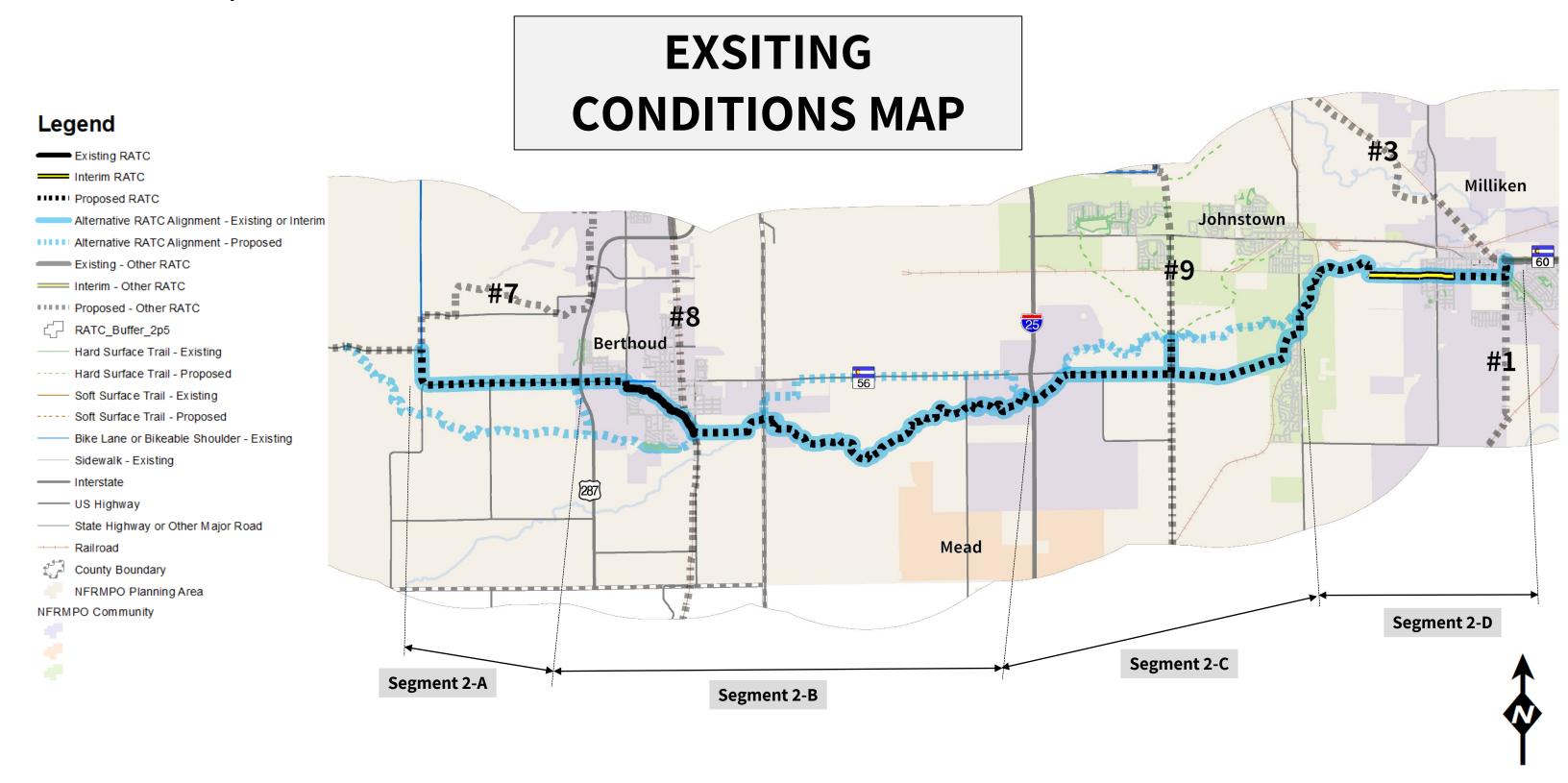
RATC #1: Segment-Level Information

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description
	Region	Proposed and Existing	Separated		Communities south of the NFRMPO region such as Firestone, Frederick, Dacono, and Brighton have contributed large segments of the Front Range Trail. As the trail extends north from its existing northern terminus at WCR24 to the NFRMPO, the trail will pass through two Transportation Planning Regions (DRCOG, Upper Front Range TPR). The major gaps to fill are SH60 in Millken to WCR24, Dacono to Fort Lupton, Fort Lupton to SH7 in Brighton, and SH7 to E-470. The 52-85 Trail Master Plan will guide trail development in these remaining gap areas. South of E-470, the trail exists all the way to Chatfield State Park in Littleton.
Key Local	Connection Needs	None Identi	fied – Outside	NFRMPO Planning Area	
Crossing	Needs	None Identi	fied – Outside	NFRMPO Planning Area	
	NFRMPO Boundary to SH60	Proposed	Separated	Parks and Recreation District (TRPR), Weld County, Xcel Energy	The trail will enter the NFRMPO region from the south near the confluence of the St. Vrain and South Platte Rivers. The southernmost part of this segment would follow an abandoned railway line and easement owned by Xcel Energy and other private property owners. The trail will then parallel WCR23 (Alice Avenue) northward towards east Milliken. The segment is known locally as the Wildcat Trail for its proximity to the Wildcat Mound river bluffs, which contain large deposits of shell fossils from roughly 80 million years ago. Trail development will need to consider eagle nesting habitat and wetlands. Accordingly, conversations between Thompson River Parks and Recreation District (TRPR), Weld County, the Town of Milliken, Colorado Parks and Wildlife (CPW), Xcel Energy, and additional landowners have been halted to evaluate alternatives. Stakeholder and community engagement is set to resume summer 2021. The Wildcat Trail Conceptual Trails Master Plan was completed in 2015 to assess opportunities and considerations along this segment.
Kev Local	Connection Needs	None Identi	fied	1	The final action of the product of the final action and completed in 2010 to assess opportunities and considerations along this segment.
			CR46 /Inez Blvc		

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description			
1-C	SH60 to US85	Proposed	Separated	Thompson River	East of the Thompson Recreation Parks and Recreation (TRPR) Center, this section will require significant intergovernmental cooperation as much of the section is			
		and Existing			currently unincorporated but lies with the Growth Management Area (GMA) of either Milliken or Evans. This section is the most critical to achieving regional connectivity in a part of the NFRMPO region without many existing options. There are several potential alignments that could take advantage of undevelopable land in the South			
					Platte River or Big Thompson River riparian areas, county road right-of-way, or Union Pacific Railroad righ-of-way. There was strong public support for this segment			
					during the public engagement portion of the <i>City of Evans Master Plan</i> update.			
Key Loca	Connection Needs	Along 77th Av	venue to West	Evans and West Greeley	y, 49 th Street			
Crossing	Needs	Level 1 – S T	raders Lane, W	/CR25, Union Pacific Ra	ilroad (x2); Level 2 – SH60; Level 3 – 35 th Avenue			
1-D	US85 to the Poudre				This segment contains Riverside Park in Evans, one of the region's premiere outdoor recreation areas with access to the South Platte River, a popular destination for			
	River				various river-related activities. Northeast of Riverside Park, this corridor could continue to follow the river, take advantage of existing public right-of-way along nearby			
					roads, or a combination of both. US34, US34 Business, and Weld County Parkway/WCR47, where adequate space for two trail underpasses may already exist. pose the			
					largest obstacles to connecting RATCs #1 and #6 near the confluence.			
Key Loca	Connection Needs	East Evans v	ia 37 th Street (\	WCR54), Southeast Gree	eley, East Memorial Neighborhood			
Crossing	Needs	Level 2 – E 3	7 th Street; Leve	el 4 – US34, US34 Busine	ess, Weld County Parkway/WCR47			
1-E	East of the NFRMPO				The Cities of Greeley and Evans and the Town of Kersey have recently been discussing possibilities for a trail connection, that could serve as a segment of either or both			
	Region				RATC #1 and RATC #11			
Key Loca	Connection Needs	None Identif	fied – Outside I	NFRMPO Planning Area				
Crossing	Needs	None Identif	fied – Outside I	NFRMPO Planning Area				

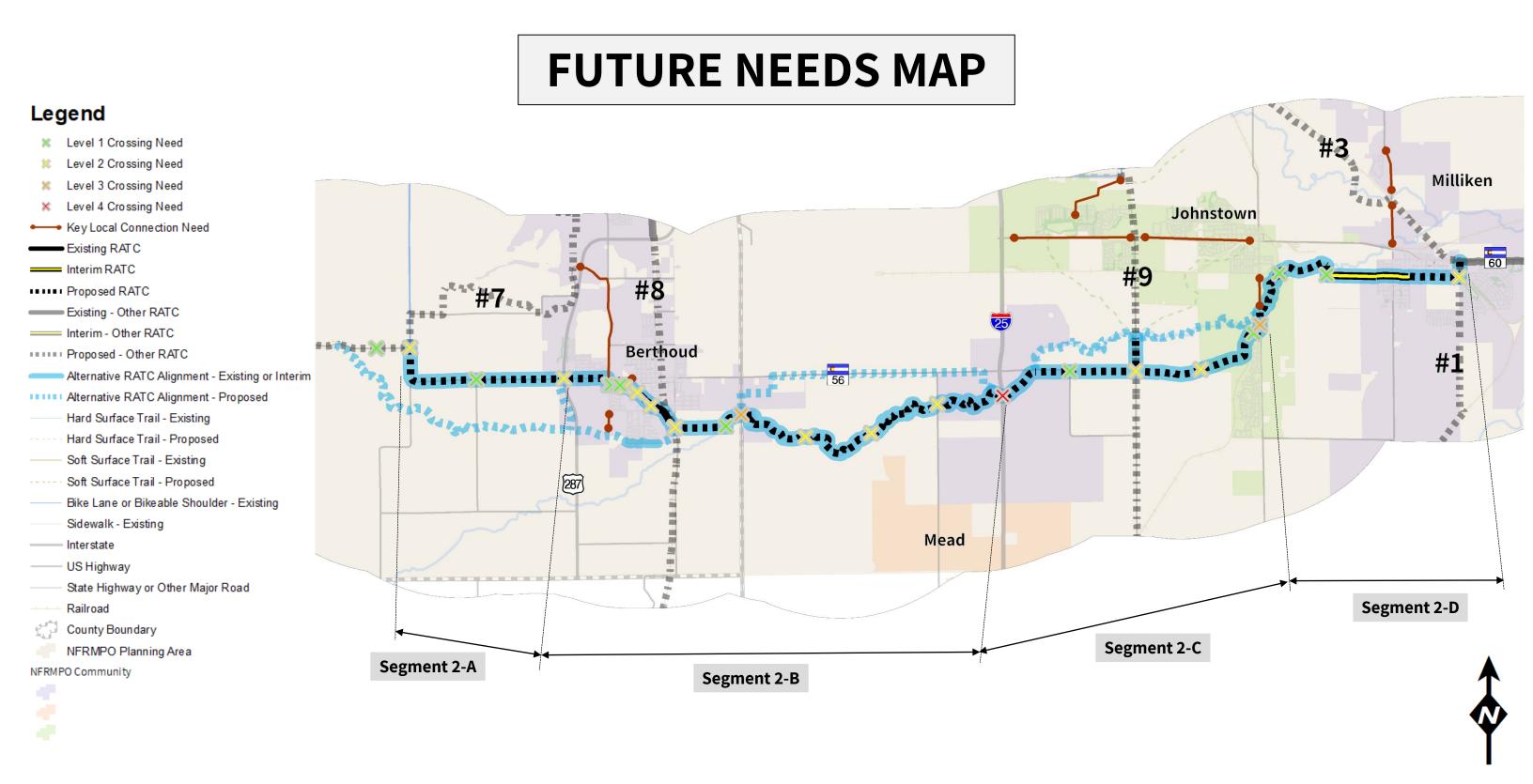
Regional Active Transportation Corridor (RATC) #2:

Little Thompson River Trail



Regional Active Transportation Corridor (RATC) #2:

Little Thompson River Trail



RATC #2: Corridor-Level Information

Corridor Description	Planning References
The Little Thompson River provides a regional connection across the southern portion of the NFRMPO region. This historically-identified corridor connects both	Larimer County – <u>Larimer County Open Lands Master Plan</u> (2015)*
Larimer and Weld County with access to popular destinations like Carter Lake, the Front Range Trail (West), I-25/SH60 Park-n-Ride, and Downtown Milliken. The	Berthoud – <u>Berthoud Unified Trail Master Plan</u> (2018)
preferred alignment for this corridor follows county road right-of-way east from Carter Lake, connects into Berthoud's existing trail system, and continues east	Johnstown – <u>Johnstown Updated Land Use Framework Plan</u> (2019)*
following the Little Thompson River corridor and county roads to Milliken, where it meets with RATCs #1 and #3. Alternatively, the westernmost segments of the	Milliken – <u>Milliken Comprehensive Plan</u> (2015)
corridor could follow a combination of Dry Creek and the Little Thompson River riparian areas; however, much of this alignment is privately owned.	
	* this plan or related plan to be updated within two years

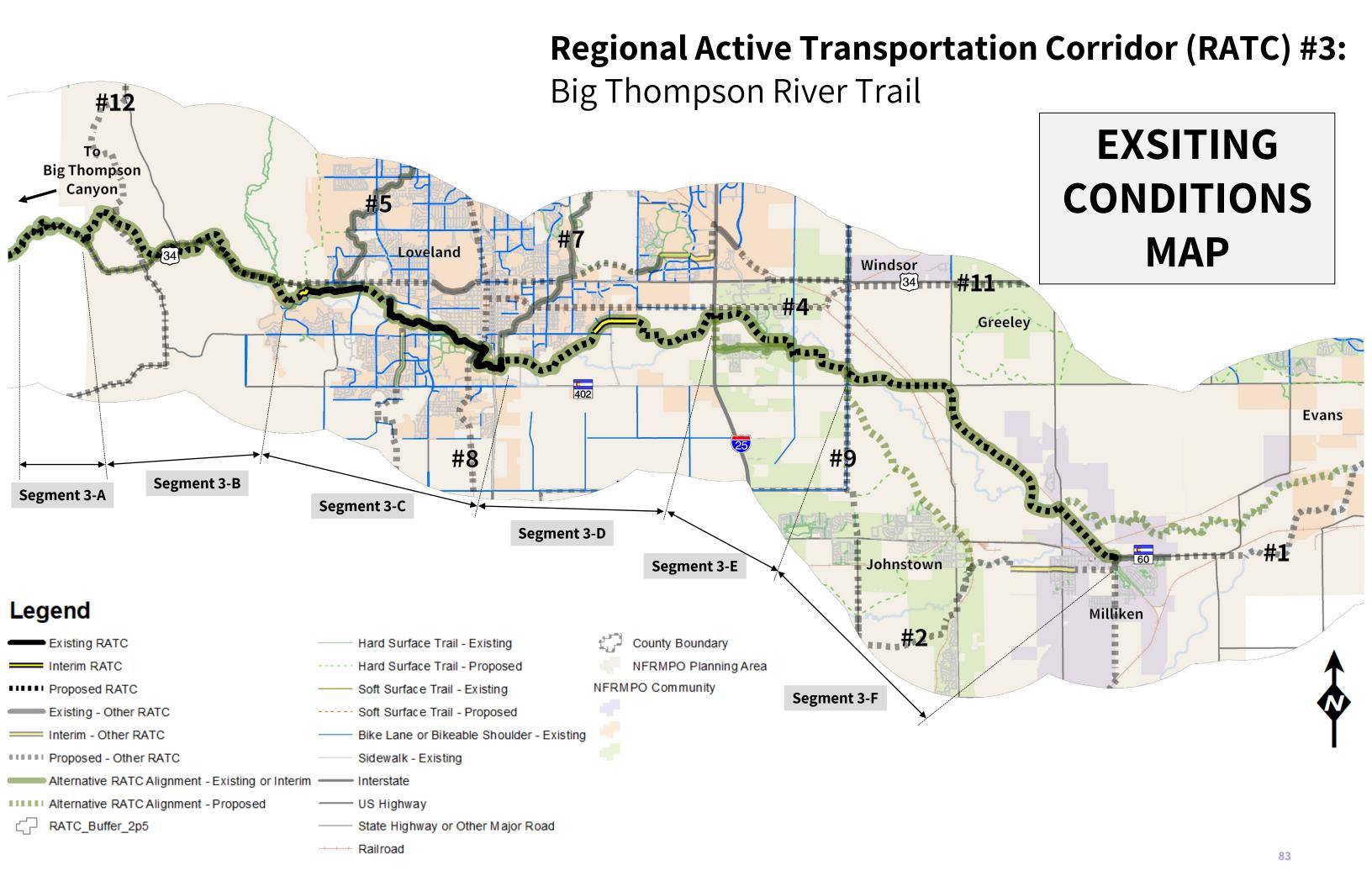
Total Len	al Length (Miles) On-Street		et Miles	s Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045
2.57	20.56	0.51	0	2.07	20.56	9,067	35,600	3,195	12,609	6	6	2	2

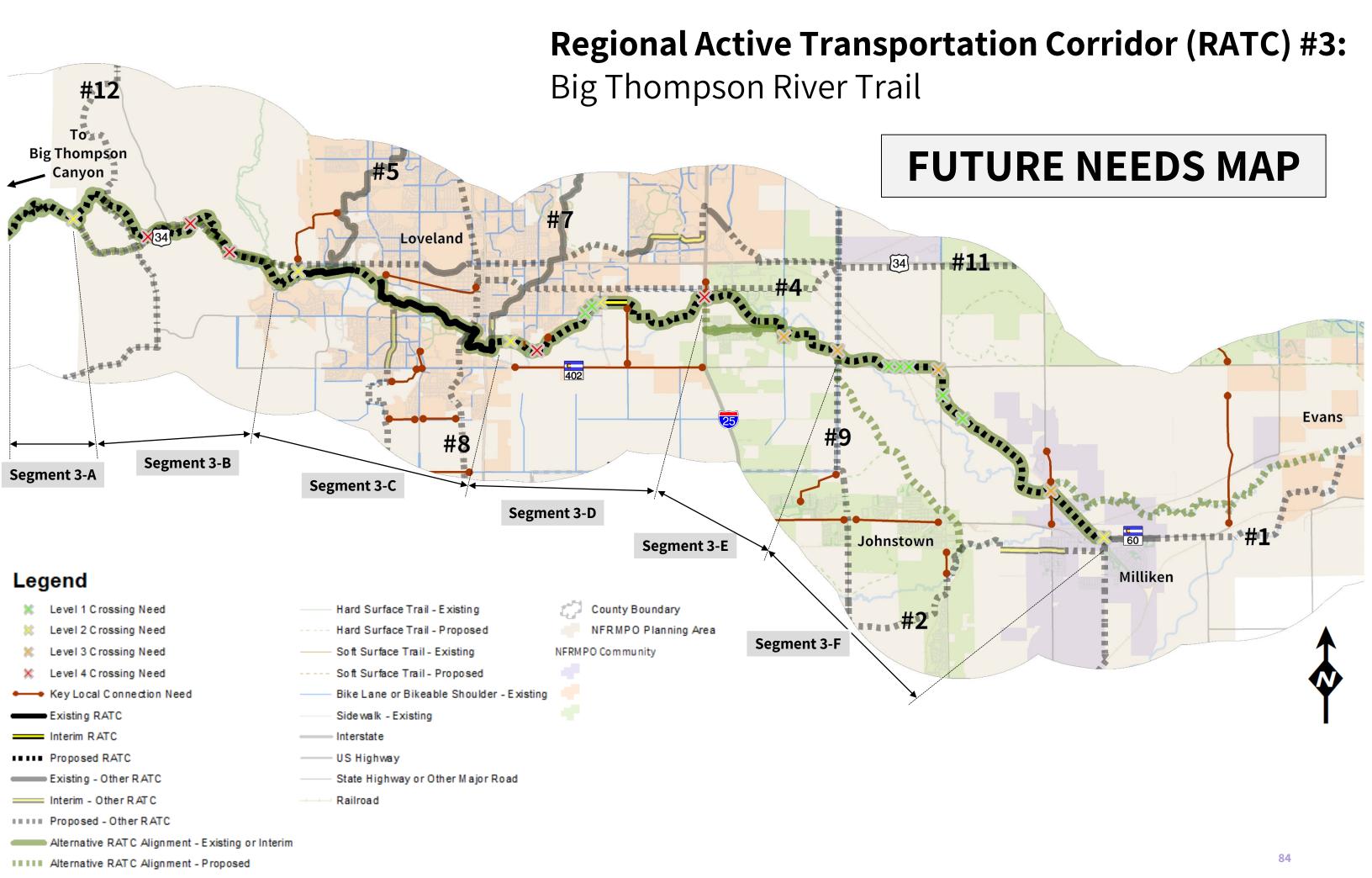
Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

RATC #2: Segment-Level Information

Segmer ID	t Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description					
2-A	LCR8E to US287	Proposed	Separated	Larimer County,	The westernmost segment would connect with RATC #7 near the intersection of LCR8E and LCR23. From this point, the corridor would follow LCR8 towards its					
				Berthoud	intersection with US287, where it would require an enhanced crossing to continue towards Berthoud's existing trail system. There are several alternative alignments in					
					this area, but their feasibility is still to be determined.					
Key Local Connection Needs										
Crossin	g Needs	Level 1 – S L	.CR21; Level 2 -	- US287						
2-B	US287 to I-25	Proposed	Separated	Berthoud, Larimer	From US287, this segment would follow SH56 before connecting into Berthoud's existing trail system, which will take users by several parks and schools, with local					
		and		County, Weld County	connections to Old Town Berthoud as well. The corridor will connect with RATC #8 and head east towards undeveloped areas near the Growth Management Area (GMA)					
		Existing			boundaries between Berthoud and Mead. The corridor will cross I-25 under the Little Thompson River bridge, where it will also make an important multimodal					
					connection with the future SH56 mobility hub.					
Key Loc	al Connection Needs	RATC #7 via	LCR17, Downt	own Berthoud via SH56						
Crossin	g Needs	Level 1 – Sic	Level 1 – Sioux Drive, Bein Street, Common Drive, BNSF Railroad, LCR6C; Level 2 – LCR17, 10th Street, 8th Street, 5th Street, First Street/LCR15, WCR3, WCR5, WCR7; Level 3 – County Line Road; Level 4 – I-25							
2-C	I-25 to WCR17	Proposed	Separated	Berthoud,	On the east side of the I-25 trail and wildlife underpass, the preferred alignment would continue east on the south side of WCR44, leveraging development plans in the					
				Johnstown, Weld	area and showcasing the rolling hills western Weld County. It would intersect RATC #9 before continuing northeast and paralleling the Great Western Railroad in the					
				County	scenic open lands west of the Pioneer Ridge neighborhood and eventually connecting to the Johnstown town core near the YMCA. Local enhancements to the street					
					network can better connect this corridor to downtown Johnstown. Alternatively, this segment could more closely follow the Little Thompson River corridor. This					
14		A.L. C.L.C.			alignment poses significant issues with trail grading, land ownership, habitat disruption, and flooding.					
	al Connection Needs	Along SH60								
Crossin	g Needs	Level 1 – WC	CR11, Great We	stern Railroad; Level 2 -	- WCR13, WCR15 ;Level 3 - WCR17					

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description						
2-D	WCR17 to S Alice	Proposed	Separated	Johnstown, Milliken	From the intersection of WCR17 and WCR46.5, cross the GWRR tracks and be constructed using TAP funding to the intersection of WCR19 and WCR46.5, where						
	Avenue	and Interim	and		intersection enhancements will be necessary. From there, it connects to an existing segment of crusher fine trail along the south side of WCR46.5, to Green Street.						
			Roadway		Along Green Street, a future trail could continue east to S Alice Avenue where it would connect with RATC #1. Local enhancements to the street network can better connect this corridor to downtown Milliken. Alternative alignments to Green Street should be considered as opportunities arise with proposed development to the south.						
Key Loca	Key Local Connection Needs Johnstown Town			stown Town Core							
Crossing Needs Level 1 – Great Western Railroad; Level 2 – WCR19 and WCR46.5, S Alice					and WCR46.5, S Alice Avenue (WCR23)						





RATC #3: Corridor-Level Information

Corridor Description	Planning References
Future considerations in developing this corridor should also consider the vision for RATC #11 in the area between the NFRMPO Boundary (The Dam Store /	Larimer County – <u>Larimer County Open Lands Master Plan</u> (2015)*
LCR31D) and Rossum Drive. There is opportunity for these two RATCs to be combined and/or serve as complementary alignments depending on engineering and	Loveland – Connect Loveland Transportation Master Plan (2021)
cost constraints.	CDOT – <u>US34 Planning and Environmental Linkages (PEL) Study</u> (2019)
	Johnstown – <u>Johnstown Updated Land Use Framework Plan</u> (2019)*
It should be noted the portion of the regional non-motorized route within Larimer County identified in the US34 PEL uses RATCs #3, #4, and #7. Between WCR13	Milliken – <u>Milliken Comprehensive Plan</u> (2015)
and Madison Avenue, development of this alignment is reliant on long-term easement, right-of-way, and infrastructure conversations that are yet to begin.	
Although this alignment could provide a safer, more scenic alternative to facilities on or adjacent to US34, it does not address the multimodal mobility issues that	* this plan or related plan to be updated within two years
exist along US34.	

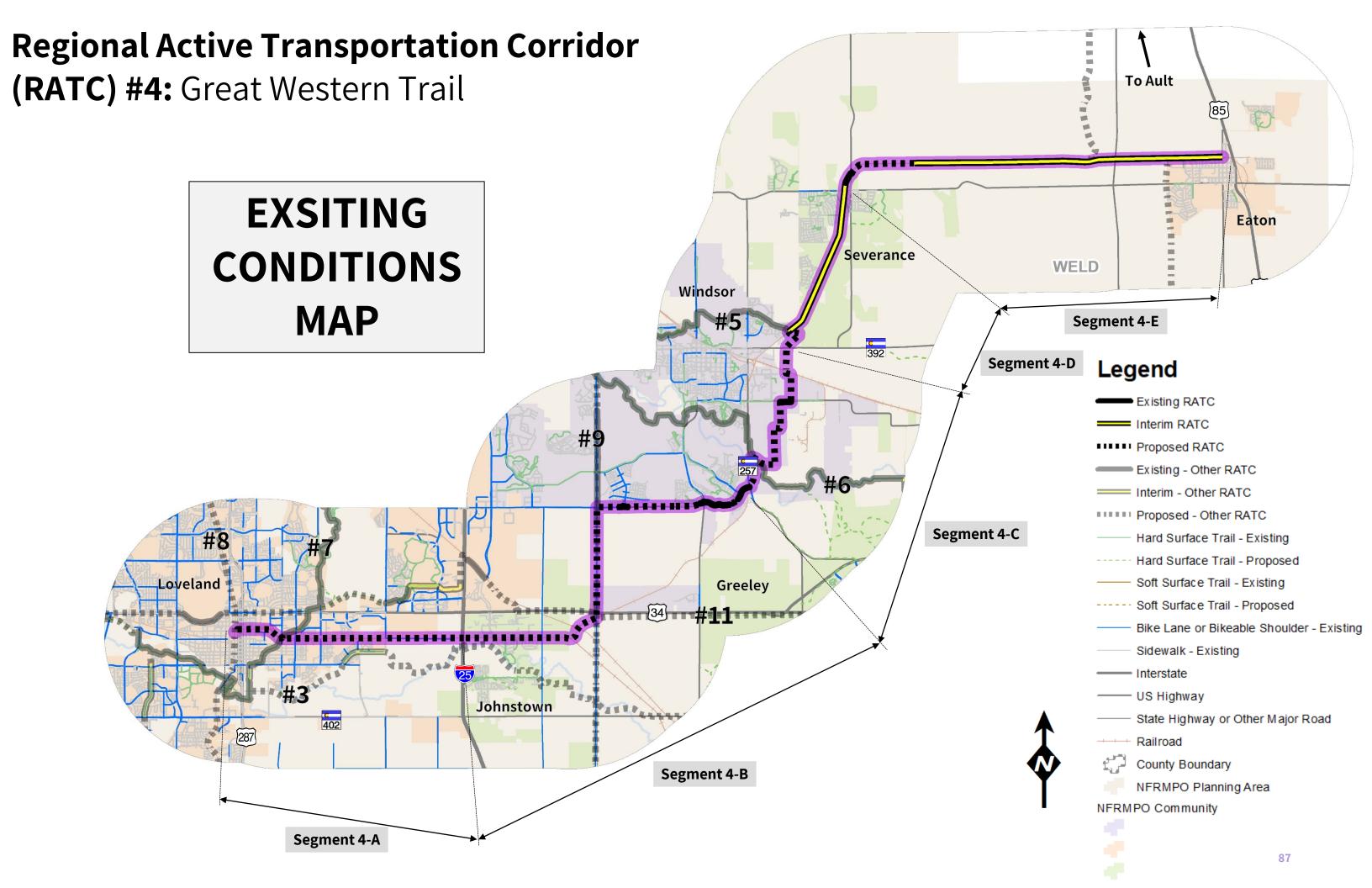
Total Len	Total Length (Miles) On-S		On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	
5.67	27.17	0	0	5.67	27.17	15,907	48,945	13,630	29,245	6	8	21	22	

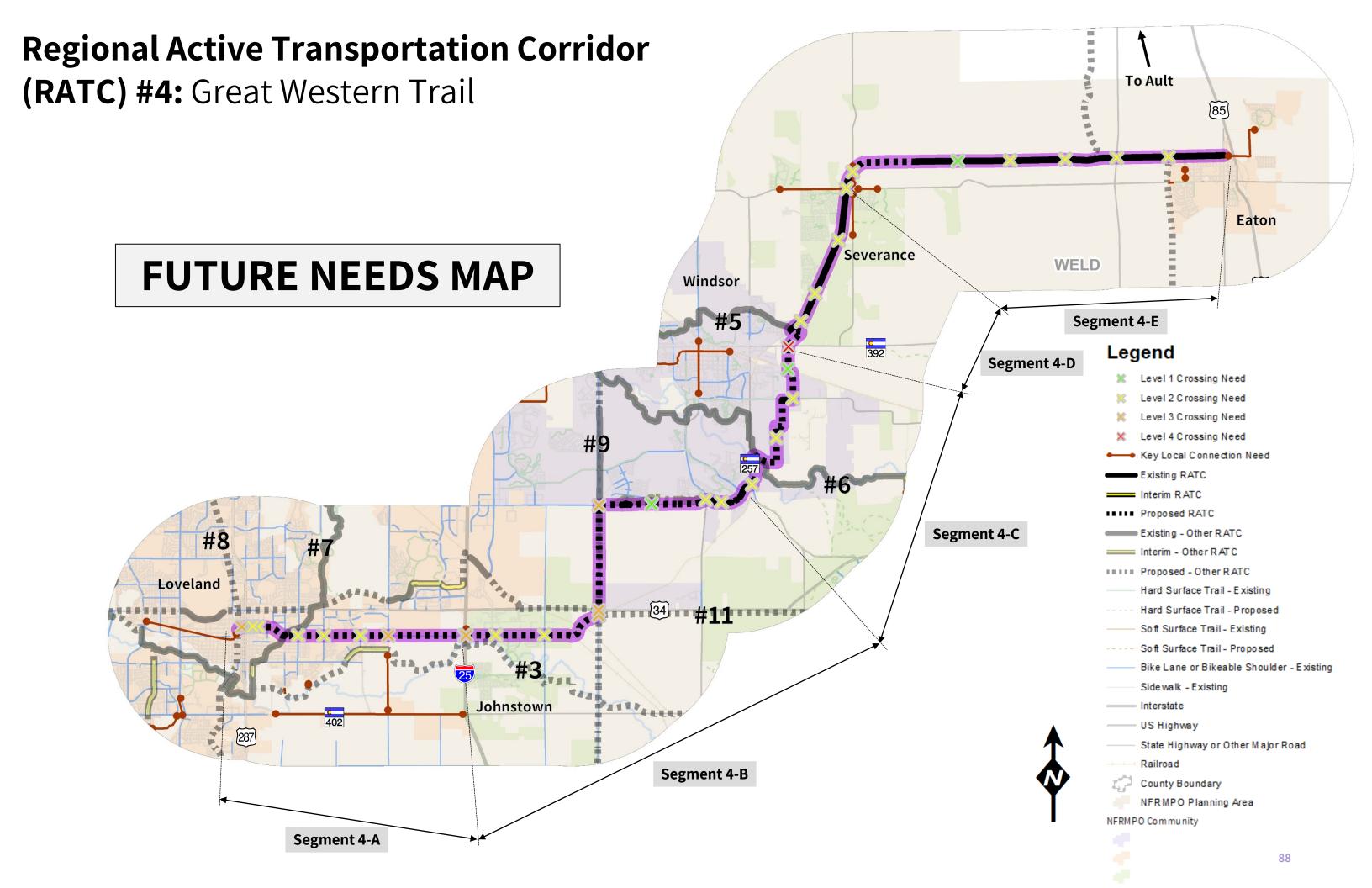
Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

RATC #3: Segment-Level Information

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description
3-A	West of the NFRMPO Region	Proposed	Combined	CDOT, Larimer County	Repairs and improvements to US34 following the historic Fall 2013 floods included wider shoulders for safer biking in the narrow Big Thompson canyon. Local groups, CDOT, and Larimer County have identified seven locations where enhanced signage can improve the cycling experience. Although the topography of the canyon limits
	Kegion			County	possibilities for a shared-use path, there is still interest from some planning partners and the public in pursuing opportunities to create an off-street corridor west of
					Loveland's current City boundary and in the canyon. In early 2021, CDOT installed enhanced signage at four locations alerting motorists and bicyclists to bicycle laws. Four additional locations have been identified.
Key Local	Connection Needs	None Identif	fied – Outside	NFRMPO Planning Are	a
Crossing	Needs	Level 2 – LCI	R22H		
3-B	NFRMPO Boundary to	Proposed	Separated	Larimer County,	If there is opportunity for this corridor to follow city- and county-owned land tracts, the trail would follow the Big Thompson River and take advantage of the various
	Rossum Drive	and Interim		Loveland, CDOT	bike/ped and wildlife crossings that would be accommodated within the US34 PEL Recommended Alternative where US 34 bridges cross the river. With help from a
					GOCO grant, the City of Loveland was able to purchase Skyline Natural Area north of US34 across from Rossum Drive. This segment of RATC#3 can support additional
					regional soft-surface trail development connecting the existing trail network at Devil's Backbone Open Space with future trails at Skyline Natural Area. This segment is a
					crucial link in completing a roughly 15-mile recreation loop between various open lands. Rossum Drive serves as the western terminus of Corridor #11.
Key Local	Connection Needs	Skyline Natu	ural Area		
Crossing	Needs	Level 2 – Ros	ssum Drive; Le	vel 4 – US34 near Faw	n Hollow Motel, US34 near Fireside Cabins RV Park, US34 near Wild Lane
3-C	Rossum Drive to 8 th	Existing	Separated	Loveland	This segment is complete and provides safe biking and walking access for the southwest side of Loveland. This segment intersects with Corridors #5 and #8 and shares
	Street SE	and Interim			part of its alignment with Corridor #7, The Colorado Front Range Trail.
Key Local	Connection Needs	Downtown L	Loveland		
Crossing	Needs	Level 2 – Na	maqua Avenue	e	

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description					
3-D	8 th Street SE to I-25	Proposed and Interim	Separated	Loveland, Larimer County, CPW, CDOT	This segment will extend east along 8th Street as Corridor #7 continues north. This segment will connect a growing part east Loveland and several parks, natural areas, and State Wildlife Areas (SWAs). Ultimately, this segment will include an underpass at Boise Ave and Boyd Lake Ave when it is extended south to SH402. This segment will cross I-25 using the underpass accommodated during reconstruction of the I-25 bridge over the Big Thompson River.					
Key Local Connection Needs S Madison Avenue, Wrybill Avenue, SH402 via S Boyd Lake Avenue (future)										
Crossing	Needs	Level 1 – E F	rst Street, Sair	nt John Place; Level 2 –	Saint Louis Avenue, S LCR9E; Level 4 – S Boise Avenue, I-25					
3-E	I-25 to County Line Road	Proposed	Separated	Johnstown, Larimer County	This segment will use a shared-use path on the east side of the NE Frontage Road bridge to get south of the Big Thompson River. Depending on future development in this area, the segment will either continue paralleling the NE Frontage Road to connect into existing trails in the Thompson River Ranch Development, or continue along the river corridor to LCR3. The trail will require crossing considerations at Riverwalk Circle and will continue to follow the northern edge of development until reaching County Line Road. A key local connection to Corridor #3 along this segment is the 35/25 district on the north side of the Great Western Railroad, where few multimodal connections currently exist. This could be facilitated via facilities along the SE/NE Frontage Road or via a conservation easement along a drainage easement on the western edge of 34/25. Note: Priority placed on one alignment does not necessarily preclude development of another alignment. In rapidly developing areas such as Northwest Johnstown, it					
					is important to connect as many residents as possible to high-quality multimodal facilities.					
Key Loca	l Connection Needs	2534 District								
Crossing	Needs	Level 3 – LCR3, County Line Road								
3-F	County Line Road to Little Thompson River Trail	Proposed	Separated	Johnstown, Weld County, Milliken	At County Line Road, this Corridor will intersect with Corridor #9, where significant infrastructure will be necessary, such as a grade-separated crossing with paths bringing connecting to County Line Road. From this point, the alignment will depends on a combination of development, road improvements, and working relationships with railroad and irrigation/ditch companies. One preferred alignment would involve paralleling the Hillsboro Ditch into downtown Johnstown and connecting to the Little Thompson Trail near the YMCA. The other preferred alignment would follow WCR52 and WCR17 before connecting to the Union Pacific Railroad and following its alignment into downtown Milliken or the confluence of the Big Thompson and Little Thompson Rivers. Although less feasible due to significant land acquisition, this corridor could continue east along the Big Thompson River towards its confluence with the South Platte River.					
Key Loca	l Connection Needs	Mad Russiar	Neighborhoo	d, Downtown Milliken						
Crossing		Level 1 - WC	R15, Great Wes	stern Railroad, Union P	acific Railroad (x2), WCR52; Level 2 – SH60; Level 3 – WCR17, SH257					





RATC #4: Corridor-Level Information

Corridor Description	Planning References
The Great Western Trail Corridor follows the alignment of the Great Western Railroad that once connected Loveland to Eaton. The backbone of the corridor is the	Loveland – Connect Loveland Transportation Master Plan (2021)
11.7-mile mixed-use recreational trail that connects the towns of Windsor, Severance and Eaton utilizing the abandoned rail bed of the Great Western Railroad	Windsor – Windsor Trail System Master Plan (2020)*
(preserved right-of-way through the provisions of the federal "Rails to Trails" legislation). The remainder of the corridor would connect to and cross the Poudre	Severance – <u>Severance Transportation Plan</u> (2021)
River Trail corridor (#6), Windsor's community tail network, and follow the remaining active railway (Rails-with-Trails) into Loveland's active transportation network.	Weld County – <u>2045 Weld County Transportation Plan</u> (2020)
This corridor provides critical rural access from the northeast portion of NFRMPO region into the region's core.	Eaton – <u>Eaton Comprehensive Plan</u> (2018)
The Great Western Trail preserves and celebrates a significant piece of Northern Colorado's history, the sugar beet industry that flourished for most of the 20 th Century and gave roots to the communities that are thriving across the region today.	* this plan or related plan to be updated within two years

Total Len	Total Length (Miles)		On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	
10.44	27.32	0	1.35	10.44	25.81	25,766	99,267	6,696	53,944	8	11	0	32	

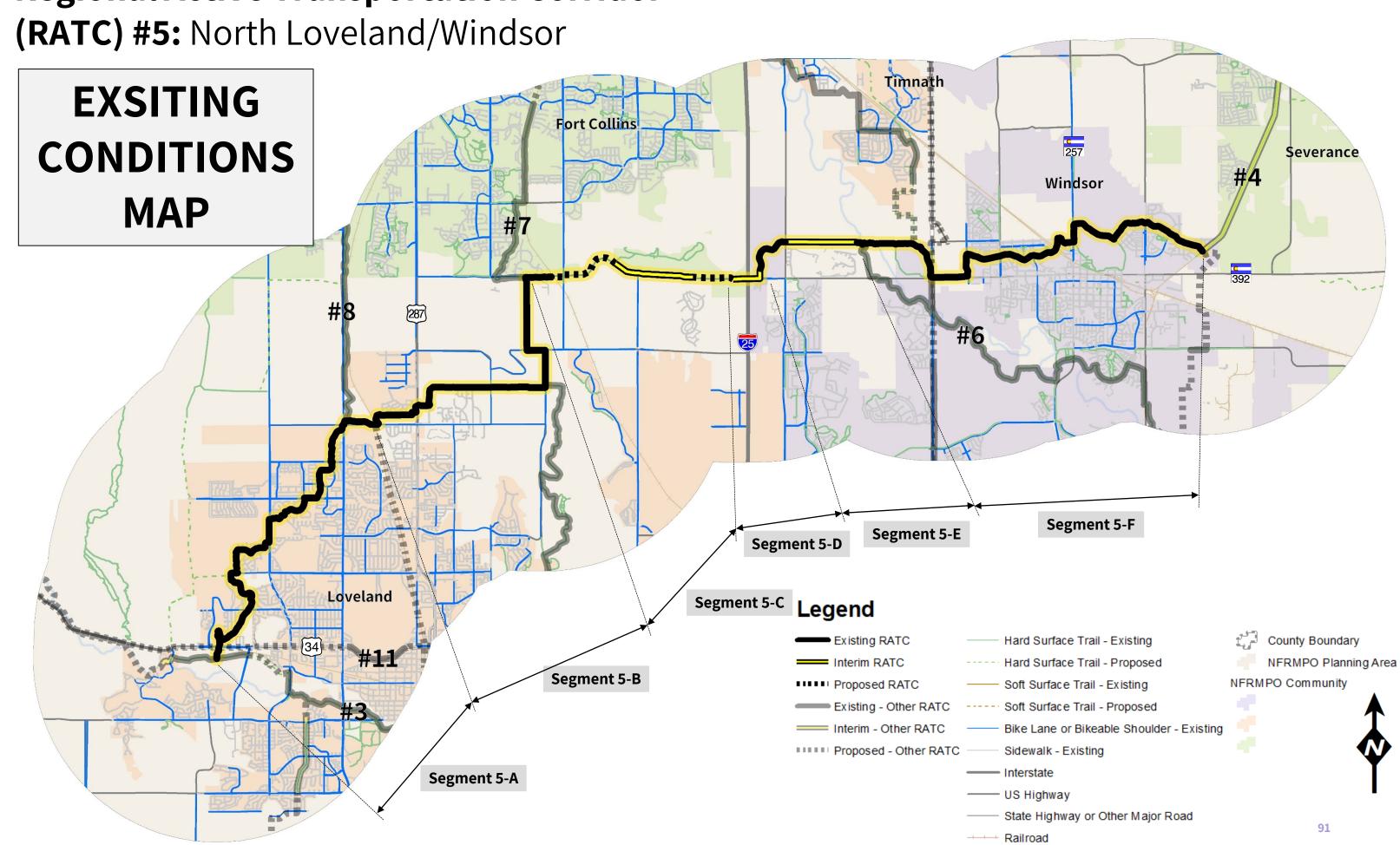
Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

RATC #4: Segment-Level Information

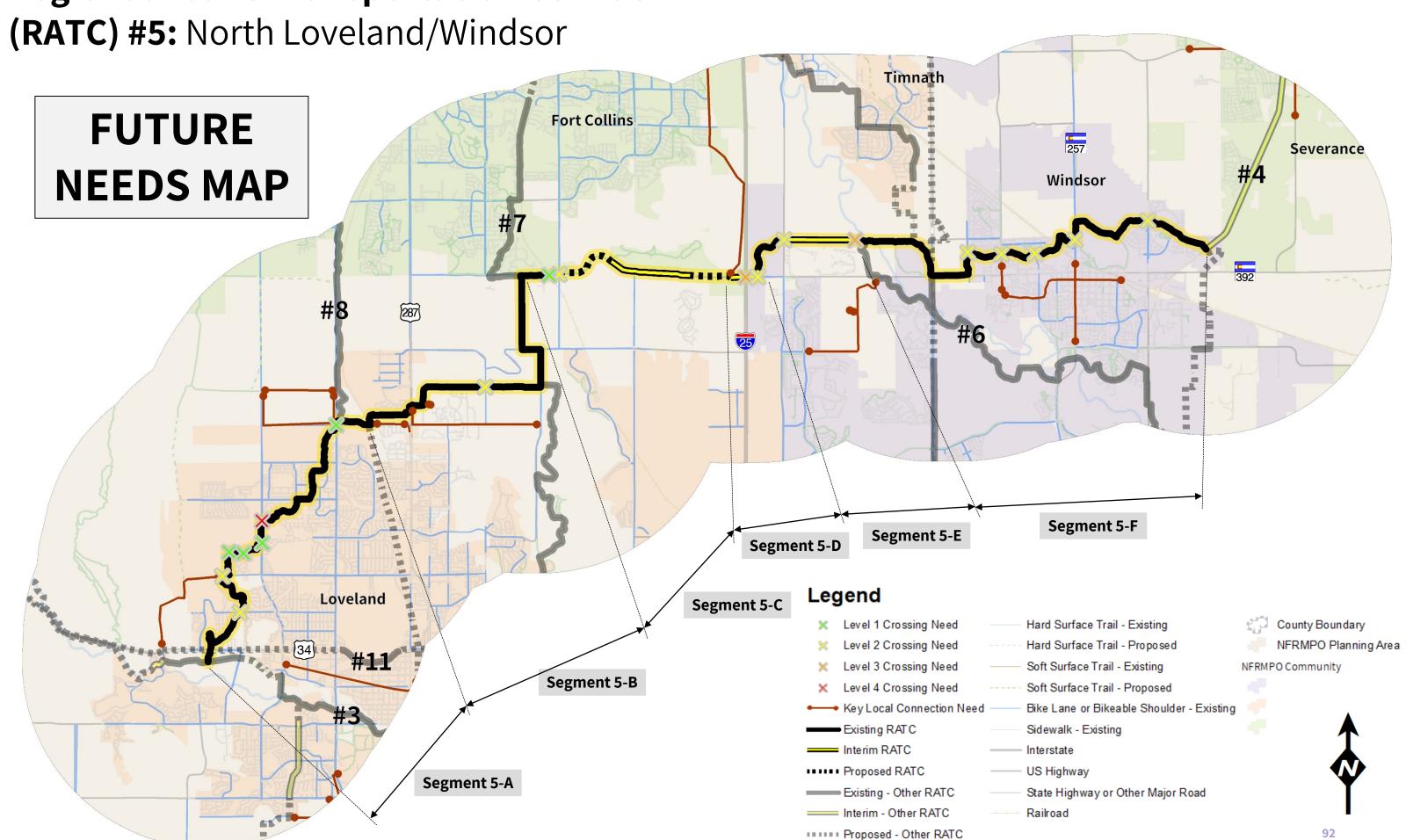
Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description							
4-A	Downtown Loveland to I-25	Proposed	Separated and Roadway	Loveland	This segment will connect downtown Loveland to I-25 via on- and off-street facilities parallel to the Great Western Railroad (Rails-with-Trails). This would connect community members and visitors to and from the 23/25 and Centerra districts. The western terminus of this corridor would be at the BNSF Railroad, Corridor #8. The segment would extend east, passing by the historic Great Western Railroad Depot. There is some publicly owned and private developable land along the corridor that could accommodate a shared-use path. Between Boyd Lake Avenue and I-25, it is likely this corridor would be facilitated by enhanced bike lanes or bikeable shoulders along LCR20E as development drives the improvement of the roadway. Bike lanes currently exist across I-25 on the LCR20E bridge.							
	l Community of November	NI II I	Note: Long-term, this corridor could continue to extend west to Wilson Avenue via the Arkins Branch, abandoned railroad right-of-way owned by the City of Lovelands									
	l Connection Needs		lone Identified									
Crossing	Needs	Level 2 – W	10 th Street, Was	shington Avenue, Monr	oe Avenue, Boise Avenue, Denver Avenue, Sculptor Drive; Level 3 – Boyd Lake Avenue; Level 4 – I-25							
4-B	I-25 to SH257	Proposed	Separated	Johnstown, Windsor	East of I-25, this segment will continue paralleling the Great Western Railroad until it reaches WCR13, where it will turn north to an enhanced intersection at US34 and WCR13. This intersection also serves as the junction of Corridors #4, #9, and #11. The US34 PEL Study Recommended Alternative calls for a protected crossing signal or underpass/overpass at WCR 13 and US34. Once across US34, this segment would share alignment with Corridor #9 north to Crossroads Boulevard. Along Crossroads Boulevard, this segment would utilize some existing path and future paths to be constructed as development in the area intensifies.							
Key Loca	l Connection Needs	2534 Distric	t									
Crossing		Level 2 – SH	257; Level 3 – N	NE Frontage Road								
			·	,								
4-C	SH257 to SH392	Existing and Proposed	Separated	Windsor	With an enhanced crossing at SH257, this segment will cross the Poudre River and continue north through the Great Western 2 nd Annexation property and Future Legends Baseball and Softball Complex where the trail will be constructed alongside development. The trail will then cross the Great Western Railroad and parallel the Consolidated Law Ditch to SH392, where it will pass under the roadway via an existing box culvert.							
Key Loca	l Connection Needs	None Identi	fied									
Crossing		Level 1 – Po	udre Trail Drive	e, Great Western Railro	ad; Level 2 – Kodak Drive, Eastman Park Drive; Level 4 – SH392							

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description
4-D	SH392 to WCR23	Proposed and Interim	Separated	Windsor, Weld County, Severance	Once across SH392, this segment will continue north paralleling the Consolidated Law Ditch and then west along the Greeley #2 Canal for a short stretch before meeting the existing termini of the Greeley #2 Canal Trail and Great Western Trail. This segment will then continue northeast along the existing, soft-surface alignment. This segment will be paved as funding becomes available and local connections will be created or enhanced as development occurs along the trail. Crossing enhancements have been made at all county roads, but additional considerations may be necessary as vehicle traffic increases. A trailhead will be constructed at the corner of Railroad Ave and 3rd Avenue. This segment will be paved in sections as development occurs along the corridor and other funding is identified in built out areas. This segment has received Colorado Safe Routes to School, GOCO, TAP, and MMOF funding.
Key Local	Connection Needs	Along 1st Stre	eet/WCR23, Ale	ong 4 th Avenue/WCR74	
Crossing	Needs	Level 2 – WC	R21, WCR70, V	VCR72, 4 th Avenue/WCF	R74, 1st Street/WCR23
4-E	1st Street/WCR23 to Cheyenne Ave	Proposed, Interim, and Existing	Separated	Severance, Weld County, Eaton	Roughly 1.3-miles between 1st Street/WCR23 and Roulard Lake is the last remaining unimproved section between Windsor and Eaton, and will be completed in 2021. This segment will continue northeast and cross Roulard Lake via a historic trestle bridge. This segment has also benefited from recent crossing enhancements at county roads but will likely need further safety considerations. This segment may also benefit from paving when funding becomes available. Additional enhancements could be made in Eaton to connect more community members to the corridor. At Cheyenne Ave, the trail will terminate at a future park and trailhead. This section has received TAP and CDPHE funding.
					With a 2018 Planning Grant from GOCO, the Town of Ault is trail planning the Loop to Gateway Trail that will connect the Great Western Trail with Ault. This trail would enter the NFRMPO region between WCR31 and WCR33.
Key Local	Connection Needs	To and acros	ss WCR74, Eato	on Country Club Neigh	borhood
Crossing	Needs	Level 1 – WC	R27; Level 2 –	WCR29, WCR31, WCR33	3, WCR25

Regional Active Transportation Corridor



Regional Active Transportation Corridor



RATC #5: Corridor-Level Information

Corridor Description	Planning References
The North Loveland to Windsor corridor will support bicycle travel from the Great Western Trail in Windsor, across the Larimer-Weld County line, into the southern	Loveland – Connect Loveland Transportation Master Plan (2021)
portion of Fort Collins, the Front Range Trail (West – #7) and the western arc of Loveland's Recreation Trail. This Corridor will provide a crucial connection across I-	Larimer County – <u>Larimer County Open Lands Master Plan</u> (2015)*
25 in an area where separated crossings are 7.5 miles apart (Poudre River Trail to Kendall Parkway – both to be completed by 2023). With few options for a grade-	Fort Collins - Fort Collins Bicycle Plan (2014)*
separated crossing of I-25 in this area, the I-25 and SH392 interchange is an important connection for all users in this rapidly growing part of the region. East-west	Windsor – Windsor Trail System Master Plan (2020)*
connectivity from North Loveland and South Fort Collins to Windsor is severely limited by lakes, reservoirs, I-25, and other topographic and built environment	
barriers. Kechter Road and Crossroads Boulevard are less direct routes and provide facilities for more confident cyclists.	* this plan or related plan to be updated within two years

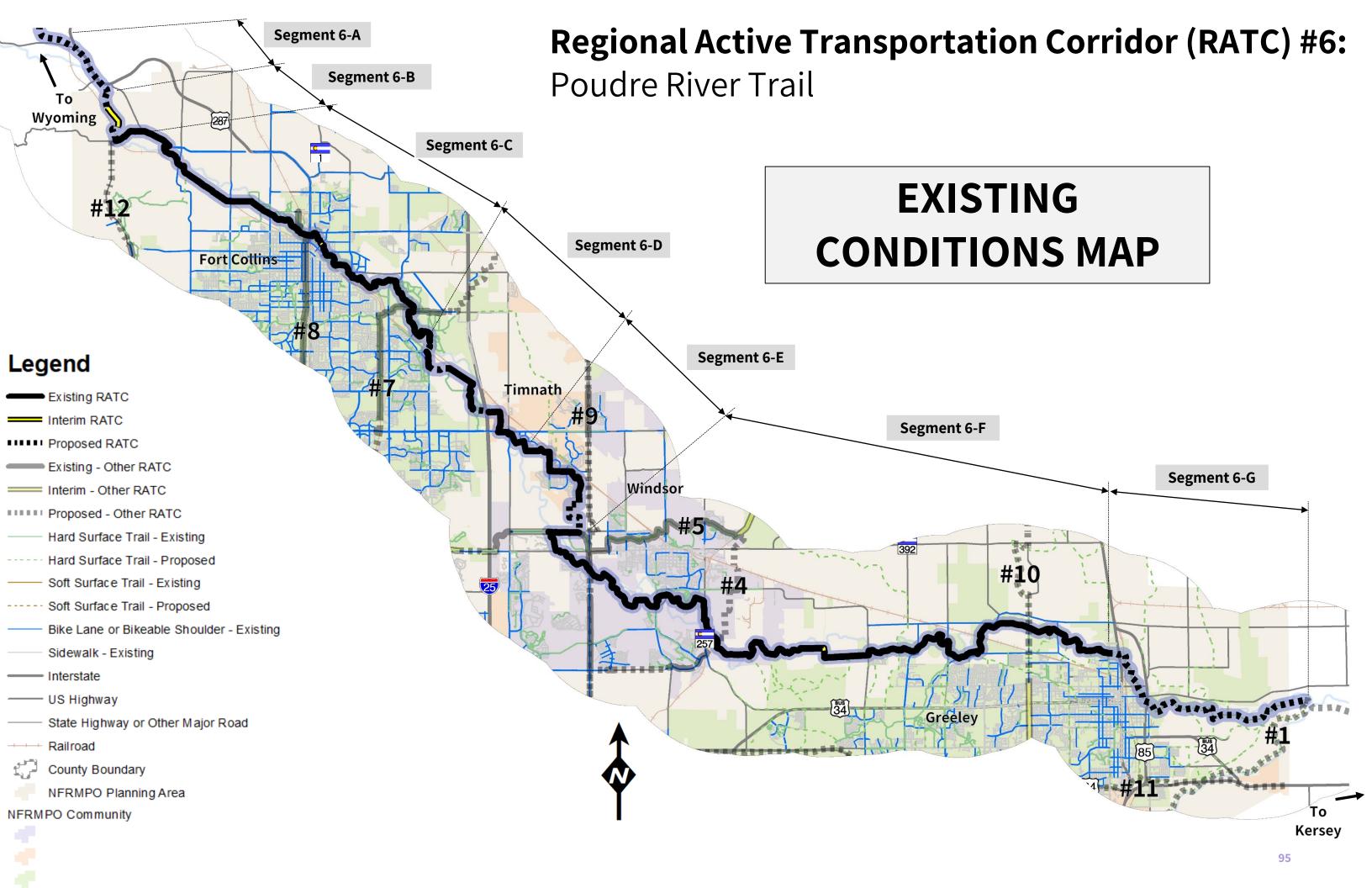
Total Len	Total Length (Miles)		On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	
Fix the numbers	20.01	21.59	1.69	1.69	18.53	20.11	32,454	62,619	11,154	25,311	9	9	14	

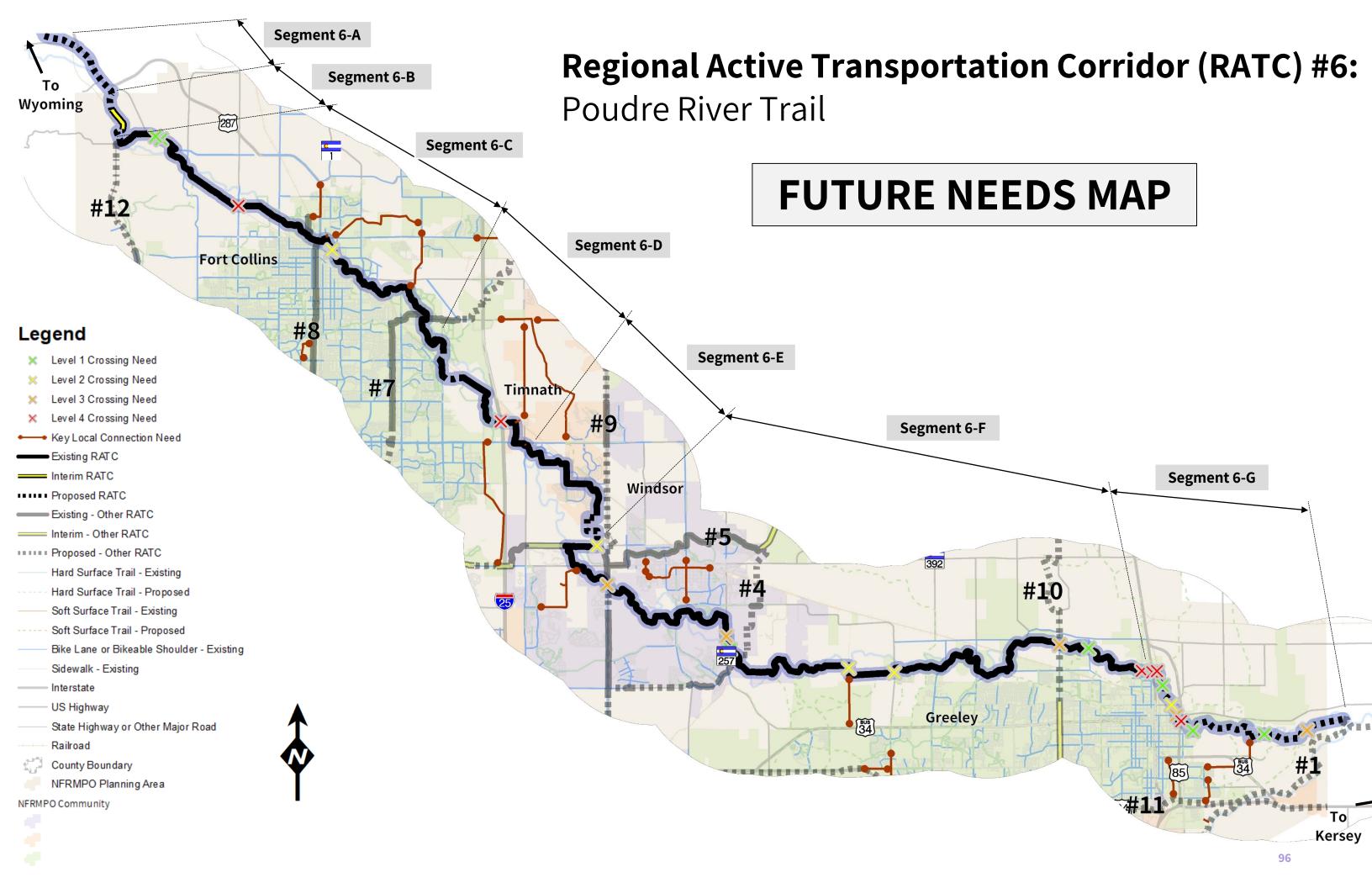
Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

RATC #5: Segment-Level Information

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description						
4-A	Big Thompson River to BNSF Railroad	Existing	Separated		This segment of the corridor is complete except for a trail underpass of Wilson Avenue. This underpass will create a safe, separated crossing in a high-speed area with a history of fatal crashes and will leverage a recent Colorado Safe Routes to School (SRTS) grant for a shared-use path west of Wilson Avenue between 35th Street and 43rd Street. Additional at-grade crossing improvements will be necessary at the intersection of Taft Avenue and 57th Street when the 57th Street is widened. This segment terminates at BNSF railroad, the conceptual alignment for Corridor #8.						
Key Loca	l Connection Needs	Skyline Natu	ıral Area								
Crossing	Needs	Level 1 – Atv	evel 1 – Atwood Drive, New Castle Drive, W 35 th Street, 57 th Street, Taft Avenue; Level 4 – Wilson Avenue								
4-B	BNSF Railroad to the Colorado Front Range Trail	Existing	Separated		Recent trail investments through the Copper Ridge residential development have close the only remaining gap in this segment. This segment plays an important role in connecting community members in the 57th Street/US287 area to retail, recreation, and local and regional transit opportunities. Upcoming local connections, to be completed through a 2020 CDOT TAP grant, will improve active mode access in the area. This will still leave prominent gaps in bike/ped connectivity along 57th Street, where improvements are a longtime and increasingly important need. These connections have gone unfunded in two CDOT TAP grant Calls for Projects.						
Key Loca	l Connection Needs	Along 57th St	treet, along US	287, Alpine Vista Village							
Crossing	Needs	Level 2 – E L	CR30								
4-C	Colorado Front Range Trail to Timberline Road	Existing and Interim	Separated		This segment was completed in 2019 between the Boyd Lake State Park entrance along LCR11C and the Union Pacific Railroad (UPRR) at SH392, in part with grant funding from CDOT and GOCO. Proposed development south and east of Donnath Lake/Dyekman Reservoir provides opportunity to further enhance this segment. Crossing enhancements will be needed at the intersection of SH392 and Timberline Road to provide a safe connection across these arterial roadways.						
Key Loca	l Connection Needs	None Identi	fied								
Crossing	Needs	Level 1 – Un	ion Pacific Rail	road; Level 2 – Carpent	er Road/SH392, Timberline Road						
4-D	Timberline Road to SW Frontage Road	Proposed	Separated	Fort Collins	According to the 2014 Fort Collins Bicycle Plan, build out of this segment will consist of a shared-use path along the north side of SH392/Carpenter Road east to the SW Frontage Roads, accompanied by buffered on-street bike lanes. The shared-use path will take advantage of large tracts of publicly owned land near Fossil Creek Reservoir.						
Key Loca	l Connection Needs	Harmony Tr	ansfer Center/	Poudre River Trail							

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description							
Crossing	Needs	None Identif	ied									
4-E	SW Frontage Road to Westgate Dr/SH392	Interim	Combined	Fort Collins, Windsor	This segment currently consists of striped bike lanes and sidewalks with automatic and pedestrian-activated crossing signals. The 2014 Fort Collins Bicycle Plan calls for a protect bike lane along this segment at full build. Ideally, the I-25/SH392 interchange will also include a shared-use path. These improvements should be considered as part of future work towards the full build of North I-25. Signal and intersection improvements will be needed at the SH392 and SW Frontage Road intersection to transition bicyclists and pedestrians between the facilities. Similar improvements will be necessary at Westgate Drive for multi-phased turns/crossings.							
Key Loca	l Connection Needs	None Identif	ied									
Crossing	Needs	Level 2 – We	Level 2 – Westgate Drive; Level 3 – I-25									
		_										
4-F	SH392 to the Poudre River Trail	Existing and Interim	Separated and Roadway	Windsor, Larimer County	Along Westgate Drive there are bike lanes and shared-use path between SH392 and LCR5. Users must navigate two roundabouts along Westgate Drive. Improved signage and/or pavement markings may be necessary at both roundabouts to improve legibility and awareness among all modes. Along LCR32E, 5-6 foot-wide bikeable shoulders exist between LCR5 and LCR3. East of LCR3, users transition to/from a shared-use path at the northwestern edge of River Bluffs Open Space. Signage, signal, and/or pavement marking improvements at the intersection of LCR3 and LCR32E would improve safety for all modes navigating the area. Within River Bluffs Open Space, this segment shares alignment with Corridor #6.							
Key Loca	Connection Needs	None Identif	ied									
Crossing	Needs	Level 2 – LCF	R5; Level 3 – LC	CR3								
4-G	Poudre River Trail to Great Western Trail	Existing	Separated	Larimer County, Windsor	This segment traces the eastern edge of Kyger Reservoir to the intersection of WCR13 and SH392, where users cross east-west via an activated signal. The trail exists east to the Great Western Trail 9 (Corridor #4) via the Greeley #2 Canal, Windsor Lake, and various neighborhoods. This segment relies on several at-grade crossings. These crossings should be assessed as area traffic increases to ensure they safely accommodate bicyclists and pedestrians. Until Corridor #4 is extended south, this segment provides the only shared-use path connecting community members in and around Eaton and Severance to other parts of the region.							
Key Loca	l Connection Needs	7 th Street acr	oss SH392/Ma	in Street, Along 15 th Str	reet, Along Walnut Street							
Crossing	Needs	Level 2 - N 17	7 th Street, N 15 ^t	th Street, SH257/7th Stre	et, Hollister Lake Road							





RATC #6: Corridor-Level Information

Corridor Description	Planning References
The Poudre River Trail Corridor is a nationally recognized bicycle and pedestrian corridor. Within the NFRMPO region, the vision for this corridor is a 51-mile	Larimer County – <u>Larimer County Open Lands Master Plan</u> (2015)*
continuous trail between Watson Lake State Wildlife Area (SWA) in Bellvue and the Poudre River's confluence with the South Platte River east of Greeley. By 2023,	Fort Collins - <u>Fort Collins Parks and Recreation Master Plan</u> (2021)*
44 contiguous miles will exist between Greeley and Watson Lake SWA. The interagency collaboration required to complete this corridor has built the model for all	Timnath – <u>Timnath Comprehensive Plan</u> (2020), <u>Timnath Transportation Plan</u> (2015)*
other Northern Colorado corridors. Consistent local investment has brought in millions of dollars in state and federal grants. Only three gaps remain between Fort	Windsor – <u>Windsor Trail System Master Plan</u> (2020)*
Collins and Windsor. These remaining gaps will be completed partially using state funding sources such as Get Outdoors Colorado (GOCO) and Multimodal	Weld County – <u>2045 Weld County Transportation Plan</u> (2020)
Options Funds (MMOF).	Greeley - <u>Greeley Bicycle Master Plan</u> (2015)*
The corridor traverses the Cache la Poudre National Heritage Area and is recognized as the backbone of the Colorado State Park's Front Range Trail through Northern Colorado. There is an extensive network of formal and informal soft-surface trails serving various purposes along this corridor. There is opportunity to expand and improve this network and to set an example for possible amenities along other RATCs such as mountain bike skills parks, formalized racing courses and soft-surface trail networks, riverfront parks, interpretive signage, and more.	* this plan or related plan to be updated within two years

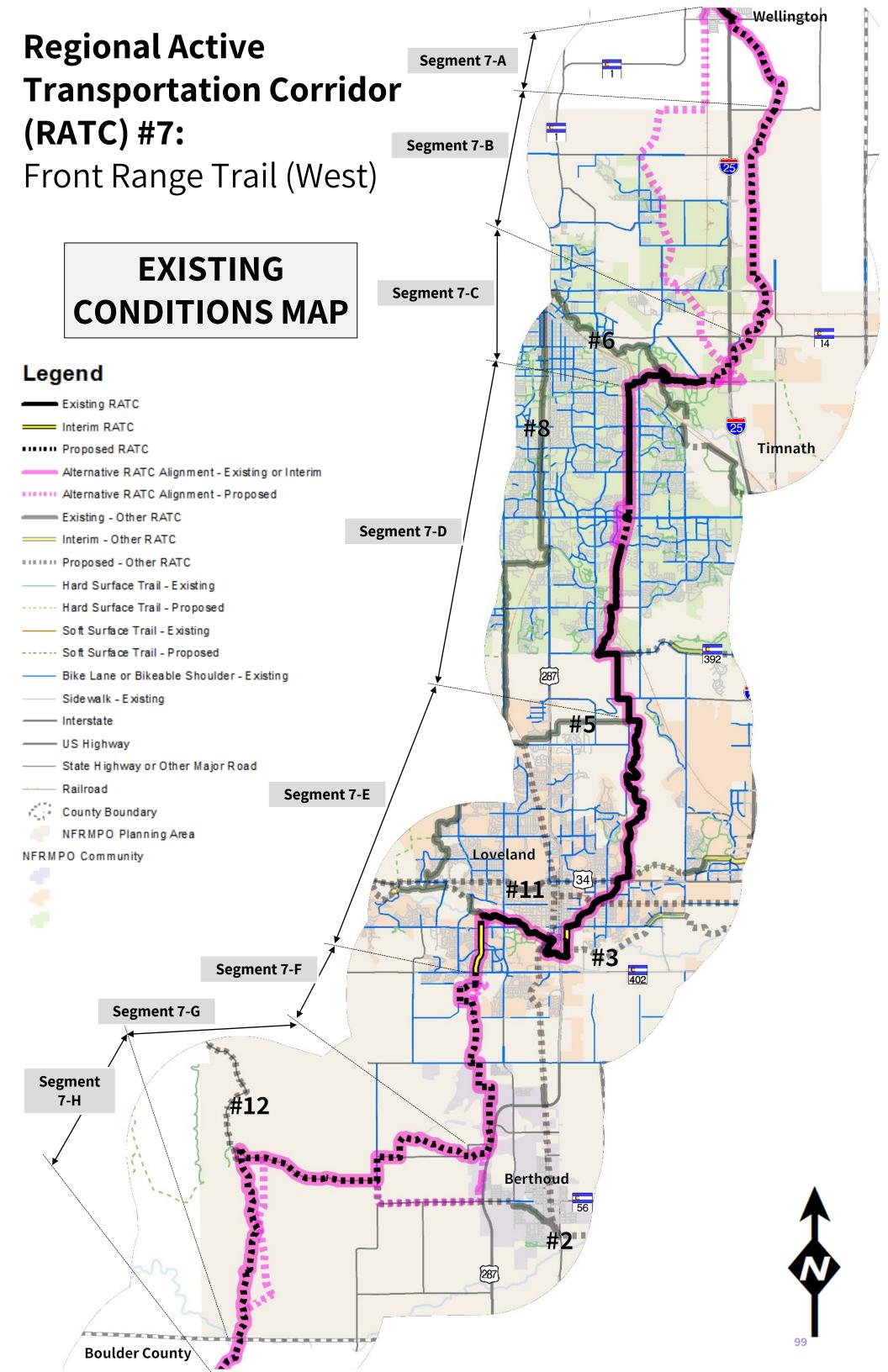
Total Len	Total Length (Miles)		On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	
41.34	51.19	0.22	0	41.12	51.19	51,883	101,768	47,124	82,407	12	14	82	92	

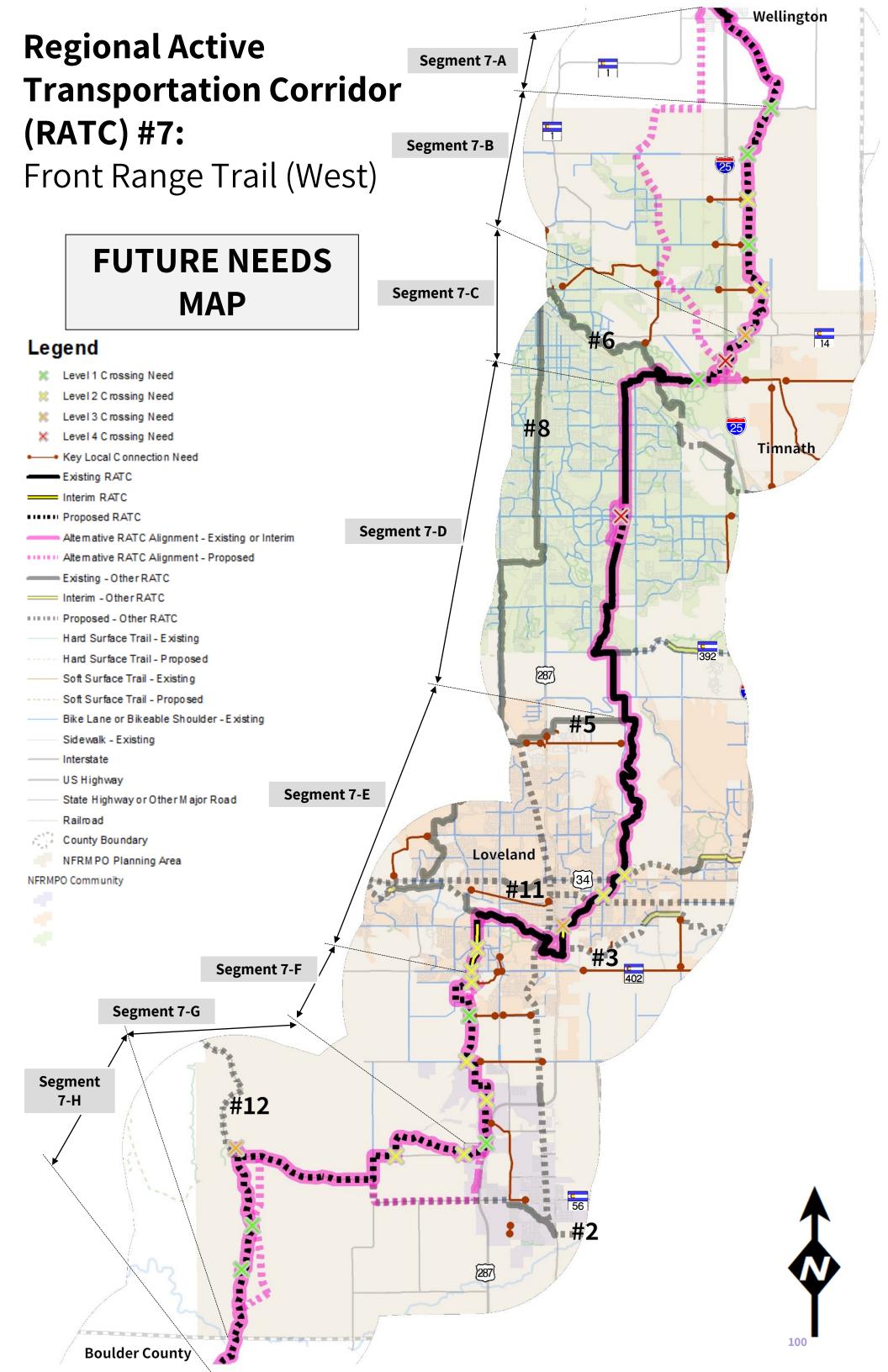
Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

RATC #6: Segment-Level Information

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description					
	North of the NFRMPO Region	Proposed	Separated	Larimer County, CDOT	According to the 2015 Larimer County Open Lands Master Plan, this segment will leave the NFRMPO region north of Watson Lake SWA and head towards the intersection of US287 and SH14 (Ted's Place), near the mouth of the Poudre River Canyon. Construction timing for this segment is dependent on the future of the Glade Reservoir (NISP) project.					
Key Local	cal Connection Needs None Identified – Outside NFRMPO Planning Area									
Crossing	Needs	None Identi	fied – Outside	NFRMPO Planning Area						
6-B	NFRMPO Boundary to	Proposed	Separated	Larimer County,	A 0.5-mile trail gap currently exists between the Watson Lake SWA entrance, and the riverside trail segment east of Watson Lake. To accommodate regional trail usage,					
	Rist Canyon Road and Interim Colorado State Parks				he 0.6-mile existing trail segment would need to be widened.					
Key Local	l Connection Needs	Along Rist C	anyon Road to	Bellvue						
Crossing	Needs	None Identified								
6-C	Rist Canyon Road to CSU Environmental Learning Center (ELC)	and	Separated	Larimer County, Fort Collins	This 12.1-mile segment is completed, with at-grade road and driveway crossings only existing near LaPorte, Bellvue, Taft Hill Road, and Linden Street. All other roadway crossings are grade separated. The Taft Hill Road and Linden Street crossings may need to be separated in the future. This is the most heavily used segment of the Poudre River Trail with 2020 Average Daily Traffic (ADT) around 600 per hour. This segment of trail has dozens of local connections to neighborhoods, schools, natural areas and parks, business districts, and other destinations.					
Key Local	l Connection Needs	Northeast Fo	ort Collins, Noi	th College Avenue						
Crossing	Needs	Level 1 – Ga	lway Drive, Mc	Connell Drive; Level 2 –	Linden Street; Level 4 – Taft Hill Road					

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description							
6-D	CSU ELC to Signal Tree Drive	Existing and Proposed	Separated	Fort Collins, CDOT, Timnath	This segment contains two of the four remaining gaps in the corridor. Construction of a new I-25 bridge over the Poudre River will include a trail underpass within CDOT's right of way by 2023. In anticipation of this crucial link, the City of Fort Collins is working to finalize an alignment between the ELC and I-25, and construct by 2023. On the east side, the trail currently terminates behind Walmart within a few hundred feet of I-25, and will be connected to the underpass at the same time. Local connections to this segment are critical to safe active transportation access for current and future members of the Timnath community.							
Key Local	Connection Needs	North Timna	North Timnath via LCR5, Downtown Timnath									
Crossing I	Needs	Level 4 – I-25	5									
6-E	Signal Tree Drive to LCR32E/Jacoby Road	Existing and Proposed	Separated	Timnath, Windsor	This segment contains two of the four remaining gaps in the corridor. Between Signal Tree Drive and Three Bell Parkway, the trail will be constructed within the Trailside development. The corridor will then utilize existing trail through The Timnath Ranch neighborhood, terminating just north of the Greeley #2 Canal and Timnath Reservoir Outlet confluence. To the south, the trail will cross Greeley #2 Canal, continue through unincorporated Larimer County, and meet County Road 32E/Jacoby Road in Windsor at a pedestrian crossing with a traffic signal.							
Key Local	Connection Needs	None Identif	ne Identified									
Crossing I	Needs	Level 2 – Jac	coby Road/LCR	32E								
6-F	LCR32E/Jacoby Road to Island Grove Regional Park	_	Separated	Windsor, Weld County, Greeley	With the exception of bike lanes for a short stretch along 95th Ave in Greeley, this 21.7-mile segment exists entirely as a shared-use path with a combination of at-grade and grade-separated roadway and railroad crossings. Recent investments in this segment include a newly constructed section north of Kyger Reservoir, repaired trail damage from riverbank erosion, and a new trailhead at Island Grove Regional Park. As roadway traffic increases, crossing enhancements (including grade separation where appropriate) will improve the trail user experience when crossing County Line Road, SH257, 95th Ave, 83rd Ave, 71st Ave, 35th Ave, and 25th Ave. The trail may be realigned near SH257 and the Kodak Trailhead as development around Eastman Park intensifies. This segment will benefit from improvements creating important local connections along County Line Road, Walnut Street, and 7th Street in Windsor, and F Street, 35th Avenue, and 83rd Avenue in Greeley.							
Key Local	Connection Needs		•	. •	neighborhoods; 7th Street (accompanied by 15th Street and Walnut Street improvements); SH 257 (Poudre Trail Rd to south side of Poudre River Bridge); Larson Trail provements along 83rd Ave; improvements along 71st Ave (bike lanes exist, varied widths); improvements along 35th Ave, improvements along 25th Ave							
Crossing I	Needs	Level 1 – Poi	udre Trail Drive	e; Level 2 – WCR25, 83 rd	Avenue; Level 3 – County Line Road, SH257, 35 th Avenue, 25 th Avenue; Level 4 – Taft Hill Road							
6-G	Island Grove Regional Park to South Platte River	Proposed	Separated	Greeley, Weld County	East of Island Grove Regional Park, significant infrastructure is needed for grade-separated crossings of two 8th Avenue (US85 Business) bridges, Union Pacific Railroad (UPRR), and US85. Landowner conversations are ongoing on both sides of the river. East of US85, there is little publicly owned land.							
	Connection Needs		East Memorial Neighborhood									
Crossing I	Needs	Level 1 – N 6	th Avenue, Ash	Avenue, Fern Avenue;	Level 2 – 5 th Street; Level 3 – E 8 th Street, WCR47/Weld County Parkway ; Level 4 – 11 th Avenue, US85 Business, UPRR, US85							





RATC #7: Corridor-Level Information

Corridor Description	Planning References
Colorado State Parks recognizes the majority of this corridor as the western leg of the Colorado Front Range Trail in the NFRMPO region. This RATC is already	CPW – <u>Colorado Front Range Trail</u>
constructed in Fort Collins and Loveland from the Poudre River Corridor (#6) to Big Thompson Corridor (#3), with the exception of one gap near Harmony Road in	Boulder County – <u>Boulder County Comprehensive Plan (Updated)</u> – 2018
Fort Collins. The completed corridor would connect Wellington, Fort Collins, Loveland, and Berthoud to Boulder County. The alignment between the Poudre Trail	Larimer County – <u>Larimer County Open Lands Master Plan</u> (2015)*
and Wellington (segments 7-A, 7-B, and part of 7-C) is recognized by Colorado State Parks as an alternative Front Range Trail alignment to ultimately terminate in	Berthoud – <u>Berthoud Unified Trail Master Plan</u> (2018)
Cheyenne, Wyoming.	Loveland – Connect Loveland Transportation Master Plan (2021)
	CDOT – <u>US34 Planning and Environmental Linkages (PEL) Study</u> (2019)
	Fort Collins - <u>Fort Collins Parks and Recreation Master Plan</u> (2021)*
	Timnath – <u>Timnath Comprehensive Plan</u> (2020), <u>Timnath Transportation Plan</u> (2015)*
	Wellington – <u>Wellington Comprehensive Plan</u> (2021)
	* this plan or related plan to be updated within two years

Total Length (Miles)		On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045
20.89	47.06	1.47	2.38	19.42	43.21	49,638	89,464	32,613	50,230	18	19	81	82

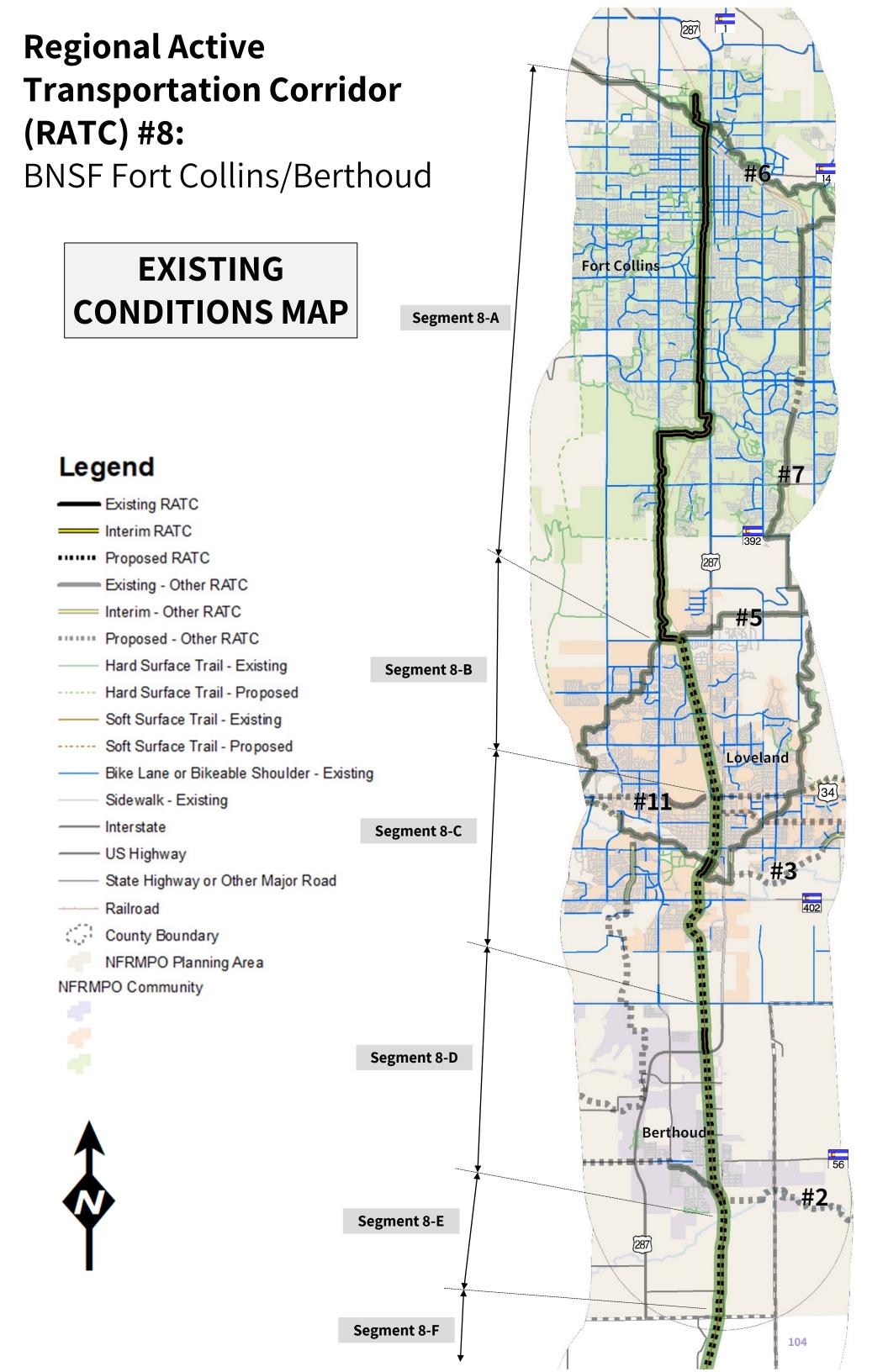
Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

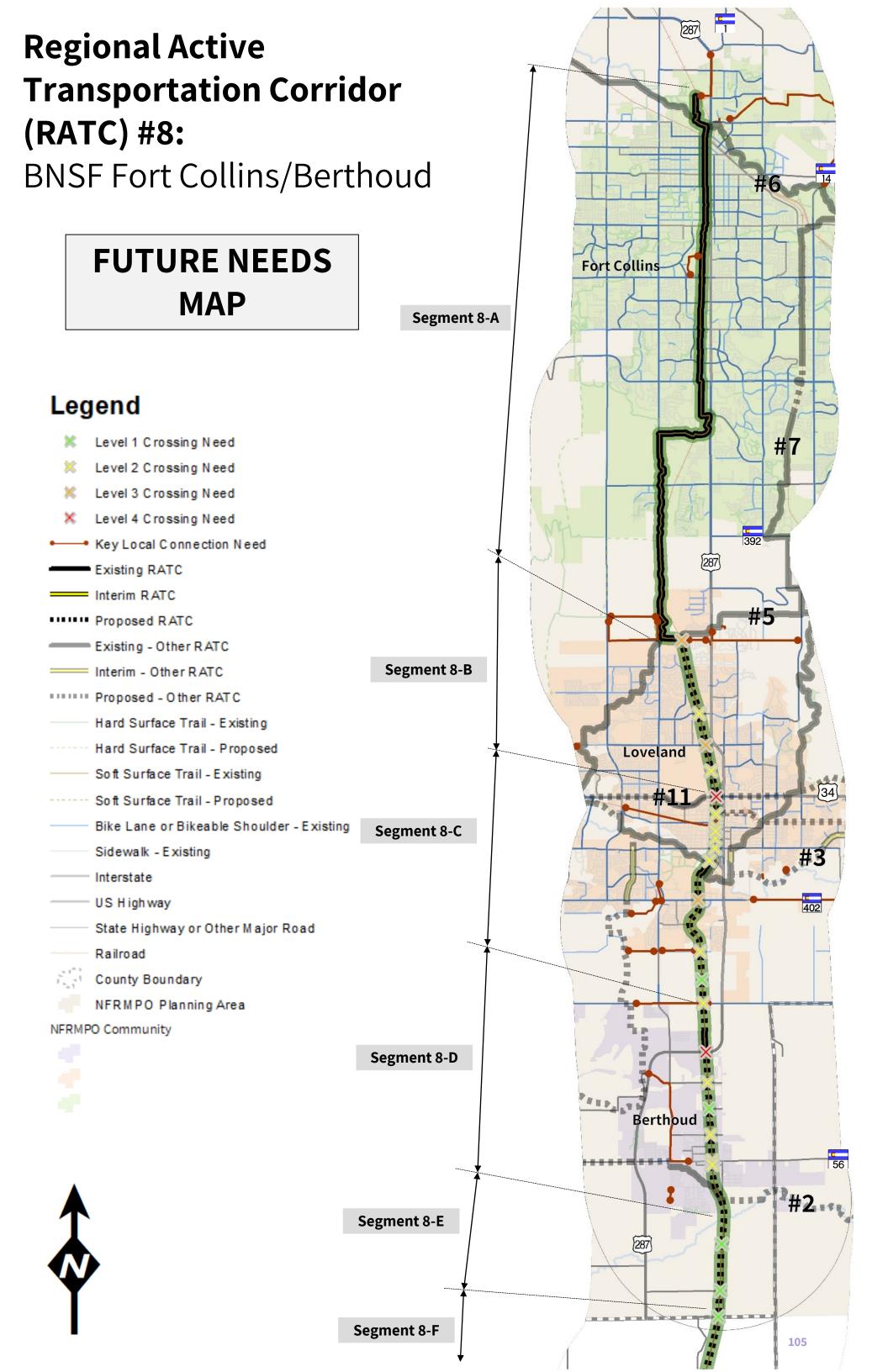
RATC #7: Segment-Level Information

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description					
7-A	North of NFRMPO Region	Existing and Proposed	Separated	Wellington, Larimer County, CSU, City of Thornton	This segment would enter/leave the NFRMPO region at LCR 56 on the east side of I-25. Much of the land in this area is publicly owned by the State of Colorado, the CSU Agricultural Research, Development, and Education Center (ARDEC). Through this section, trail development will need to consider potential conflicts with livestock, irrigation pivot systems, spraying operations, and irrigation ditch maintenance activity. The trail would be constructed to connect with the existing trail in Meadows Open Space in Wellington and continue under I-25 via an existing trail underpass passing					
					through the Wellington Town Core on nearly two miles of existing shared-use path. From Wellington, the ultimate vision for this corridor is to connect to Cheyenne, WY. With a metro population of 80,000, Cheyenne is located 30 miles to the north. As the capital of Wyoming and northern capstone of the Front Range, it is an important destination for regional and cross-country touring cyclists. The corridor would create a viable complement and alternative to the Transamerica Route that opts for the western slope.					
Key Loca	Key Local Connection Needs None Identified – Outside NFRMPO Planning Area									
Crossing	Crossing Needs		None Identified – Outside NFRMPO Planning Area							
7-B	NFRMPO Boundary to SH14	Proposed	Separated	-	This segment would roughly follow Box Elder Creek and the Larimer and Weld Canal with enhanced crossings necessary at SH14 and five county roads. Some land in this section is publicly owned by the City of Thornton. East-West connections in along county roads and along I-25 overpasses will be important to ensure residents and visitors in the vicinity will have safe access to the corridor.					
Key Loca	l Connection Needs	Across I-25 a	cross I-25 along Richards Lake Road, Mountain Vista Drive, and Vine Drive							
Crossing Needs Level 1 – LCR56, Douglas Road/LCR54, Mour					/ista Drive/LCR50; Level 2 – Richards Lake Road/LCR52, Vine Drive/LCR48; Level 3 – SH14					

					NERIOR REGIONAL ACTIVE TRAISPORTATION FIRM							
Segment			Facility									
ID	Extents	Status	Type	Jurisdictions	Segment Description							
10			(Build Out)									
7-C	SH14/East Mulberry	Proposed	Separated	Fort Collins	This segment requires significant crossing infrastructure at I-25 and a minimum of crossing signal enhancements at SH14 and Prospect Road. The next and best							
	Street to the Power	•			opportunity to create a crossing of I-25 near Box Elder Creek will be with I-25 Segment 8 work between Prospect Road and SH14, including the SH14 interchange.							
	Trail											
	l Tun				In Fort Collins, the trail will connect to the Poudre River Trail near its existing terminus at the CSU Environmental Learning Center, and follow the existing Poudre Trail							
					and Spring Creek Trail alignments to the northern terminus of the Power Trail at Edora Park. Part of this segment shares alignment with RATC #6.							
16 a	l Cammantian Nasala	OLD Taxas Ti		F								
	l Connection Needs				RATC #9/County Line Road							
Crossing	Needs	Level 1 – Pro	evel 1 – Prospect Road; Level 4 – I-25									
7-D	Power Trail to Boyd	Existing	Separated	Fort Collins, Larimer	This segment of the trail is complete aside from a one-mile section on either side of Harmony Road, including an underpass (A temporary alignments exists in this							
	Lake State Park	and Interim		County, Loveland,	section). This gap is a high priority for the City of Fort Collins and has received a federal TAP grant award through CDOT. Crossing enhancements could improve safety							
				CPW	at Drake Road and Horsetooth Road. A local connection to this corridor is needed to safely cross the BNSF Railroad near Mail Creek, another high priority project for							
					Fort Collins. Part of this segment shares alignment with RATC #5.							
Key Loca	l Connection Needs	None Identif	i fied									
Crossing		Level 4 – Ha										
Crossing	Neeus	Level 4 - Ha	illiony Roau									
	D 11 1 Ct 1	le · . ·		CDW I								
7-E	Boyd Lake State	Existing,	Separated	CPW, Loveland	This segment of trail is complete between Boyd Lake State Park and Dotsero Avenue, with the exception of a few short on-road sections that could be improved with							
	Park to Ryan Gulch	Interim,	and		enhancement signage, additional pavement markings, or increased separation from vehicle traffic. Although bike lanes exist along Dotsero Drive, additional signage							
	Reservoir	and	Combined		and wayfinding, crossing improvements, speed humps, and/or increased separation from vehicle traffic and parking are desirable. Part of this segment shares							
		Proposed			alignment with RATC #3.							
		-										
					A long-term vision for the southernmost piece of this segment is to avoid Dotsero Avenue and Dotsero Drive by utilizing the existing soft-surface trail network within							
					River's Edge Natural Area and constructing underpasses of 14th Street SW and Taft Avenue to reach Ryan Gulch Reservoir.							
Key Loca	l Connection Needs	Intersection	of 11th Street 9	I SW and S Taft Avenue F								
		Intersection of 14 th Street SW and S Taft Avenue, River's Edge Natural Area Level 2 – Denver Avenue, Level 2- Boise Avenue, Carlisle Drive, 14 th Street SW, W LCR16H; Level 3 – 1 st Street										
Crossing	Crossing Needs Level 2 – Denver Avenue, Level 2- Boise Avenue, Carlisle Drive, 14 th Street SW, W LCR16H; Level 3 – 1 st Street											
	D C I I			1 1 1 5 11 1								
7-F	Ryan Gulch	Proposed	Separated	Loveland, Berthoud	South of Dotsero Drive, this segment of trail will travel between Ryan Gulch Reservoir and Bud Mielke Reservoir and continue south via a trail easement as part of the							
	Reservoir to LCR10				Water's Edge addition to Loveland. From Water's Edge, the trail will pass through Eagle Vista Natural Area (currently closed to the public) and across a stream into the							
					Fancher conservation easement before reaching LCR14. Crossing improvements will be necessary at LCR14 before the trail enters the Heron Lakes Development, where							
					it will be constructed by the developer south to Bridgeport Road. The trail will then enter land owned by the Town of Berthoud that is designated for a future park.							
					This segment will need local connections and/or crossing enhancements at LCR1E and LCR8 (just south of this segment) to create connectivity with Berthoud							
					community members east of US287.							
Key Loca	l Connection Needs	RATC #8 via	WICR16 RATO	1#8/Campion via LCR14								
Crossing Needs		RATC #8 via W LCR16, RATC#8/Campion via LCR14, Downtown Berthoud via LCR10E Level 1 – W LCR16, LCR10E; Level 2 – LCR14, Heron Lake Parkway, LCR19E										
Crossing	Neeus	TLEVELT - W.L	CRIO, ECRIOL,	, Level 2 - LCN14, Helol	T Lake Falkway, LCN13L							
7.6	LCD104 NEDVICO	Dur	C 1 1	Doubles 11 1	The compact through Control of The Compact Control of The Control of Control							
7-G	LCR10 to NFRMPO	Proposed	Separated	Berthoud, Larimer	The segment turns west towards Carter Lake. The alignment will generally follow LCR10, pass near Hertha Reservoir, and continue along LCR 8E, sharing alignment							
	boundary			County	with RATC #2 to Carter Lake. At Carter Lake, the segment will turn south a follow the St. Vrain Canal and through the site of the Red-Tail Ridge Open Space (currently							
					closed to the public). According to the Resource Management Plan for the Red-Tail Open Space, until an agreement is negotiated between Boulder and Larimer							
					counties to connect the Rabbit Mountain Open Space (Boulder County) to Red-tail Ridge Open Space (Larimer County) via the Front Range Trail, Red-Tail Open Space							
					will remain under a natural resource management designation rather than outdoor recreational management.							
Key Loca	Key Local Connection Needs None Identified			•								
	Crossing Needs			tt Road. Lakota Ridge R	Road; Level 2 – LCR10, LCR23; Level 3 – Saint Vrain Canal Road							
J. 5551118			5. (202, Definite	terroua, Lanota Mage I								

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description		
7-H	LCR10 to NFRMPO boundary				From the Larimer-Boulder County Line, the trail could continue to SH66, where a local trail segment will head west into Lyons, a regional trail segment will head south towards the City of Boulder (Lyons-to-Boulder Trail), and another regional trail segment will southeast towards Longmont (St. Vrain Greenway), according to the Boulder County Regional Trails Program.		
					This corridor could also connect to the envisioned Rocky Mountain Greenway, which would link the State's four National Wildlife Refuges (NWRs): Rocky Mountain Arsenal NWR, Two Ponds NWR, Rocky Flats NWR, and Rocky Mountain National Park.		
			<u> </u>		Note: The NFRMPO and Boulder County have not engaged recently regarding this alignment.		
Key Loca	Key Local Connection Needs None Identified – Outside NFRMPO Planning Area						
Crossing	Needs	None Identified – Outside NFRMPO Planning Area					





RATC #8: Corridor-Level Information

Corridor Description	Planning References
The historical Burlington Northern Santa Fe (BNSF) railway runs through Fort Collins, Loveland, Larimer County, and Berthoud. This corridor parallels the railway	Larimer County – <u>Larimer County Open Lands Master Plan</u> (2015)*
(Rails-with-Trails) to provide multimodal access to the downtown cores of three communities. South of 57th Street in Loveland, trail development along much of	Fort Collins - Fort Collins Parks and Recreation Master Plan (2021)*
the rail corridor is only in conceptual phases and is highly dependent on future access and easement conversations with BNSF.	Loveland – Connect Loveland Transportation Master Plan (2021)
The BNSF Railroad has been carried forward in two proposed alignment alternatives for Front Range Passenger Rail (FRPR) in the 2020 FRPR Alternatives	CDOT – <u>US34 Planning and Environmental Linkages (PEL) Study</u> (2019)
<u>Evaluation Report</u> . FRPR would provide a new travel option for Colorado Front Range community members and visitors between Fort Collins and Pueblo. RATC #8	Berthoud – <u>Berthoud Unified Trail Master Plan</u> (2018)
could complement this FRPR alignment, enhancing ridership and economic activity by providing additional multimodal connectivity in areas lacking option	
currently. Although not shown, this corridor could include a long-term extension south to Longmont. These conversations have not begun.	* this plan or related plan to be updated within two years

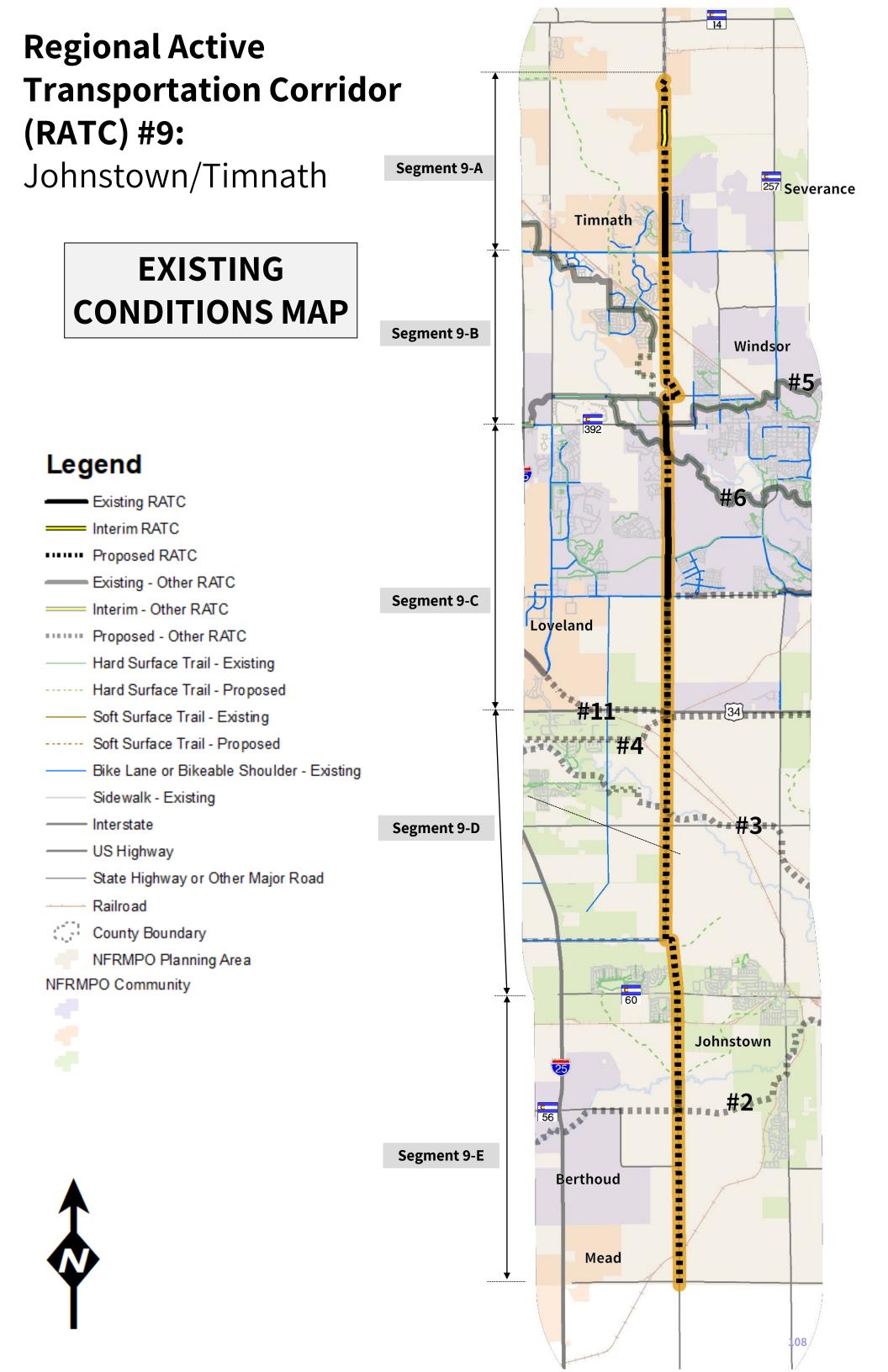
Total Ler	Total Length (Miles)		On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	
13.04	23.8	0.98	0	12.07	22.83	44,962	92,461	47,659	78,535	16	28	138	182	

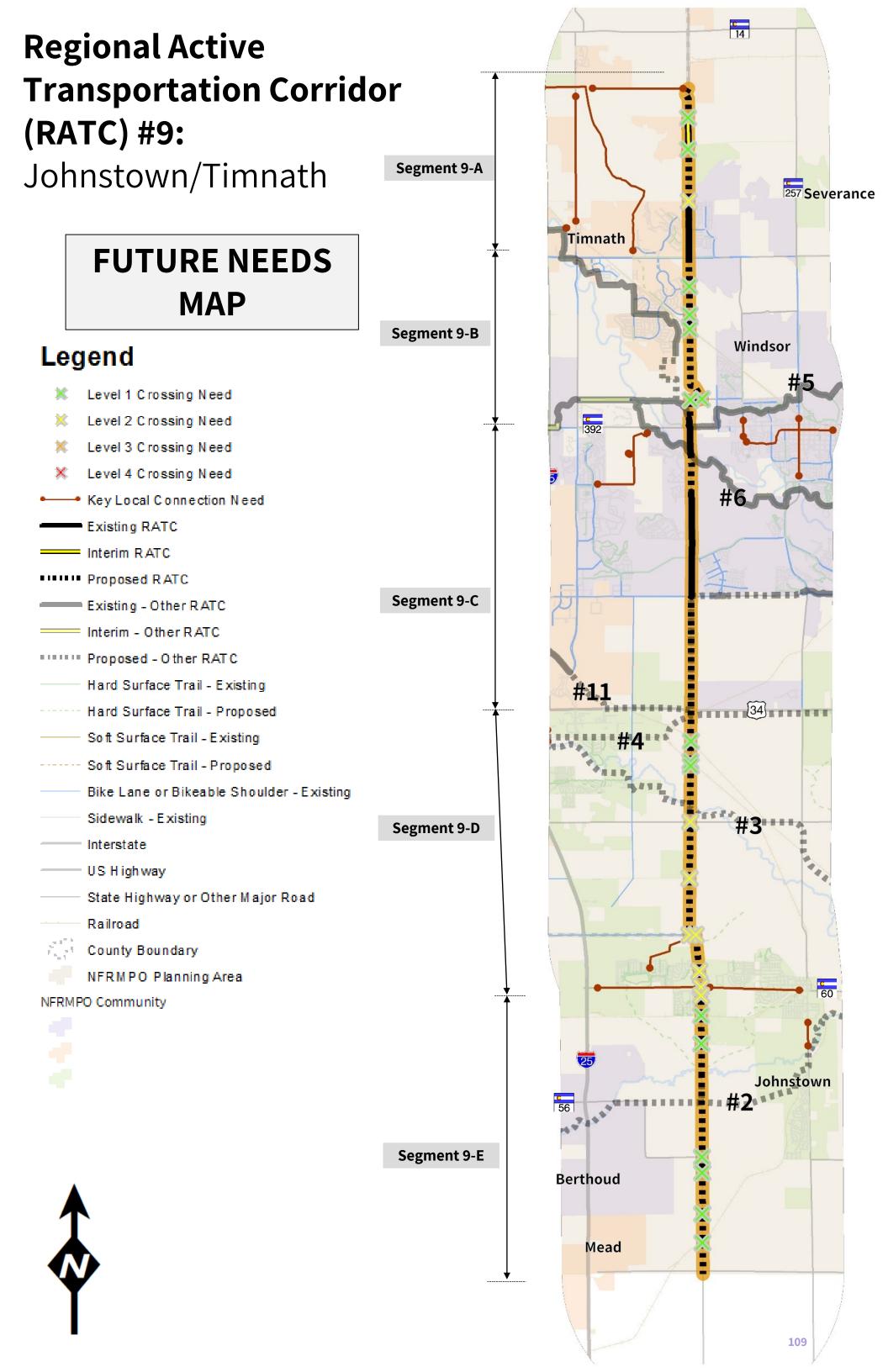
Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

RATC #8: Segment-Level Information

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description					
8-A	Hickory Street to 57th Street	Existing	Separated and	Fort Collins, Larimer County, Loveland	Hard work by Fort Collins, Larimer County, and Loveland has completed remaining gaps in this trail in recent years, with assistance from GOCO and CDOT. Great forethought and investment in 1997 preserved the unincorporated land between Fort Collins and Loveland as open space, paving the way for regional trail development					
			Roadway		and a 2018 grand opening. This segment makes connections with RATCs #5 and #6, as well as with several local trails and destinations. Important future local connections include improvements along 57th Street and enhanced connections to the CSU South Campus. Locally, individual section of this corridor segment are known as the Mason Trail, Fossil Creek Trail, and Long View Trail. The segment connects to several natural areas, open spaces, business districts, and neighborhoods.					
Keyloca	al Connection Needs	Fort Collins	Rike Co-On No	orth College Avenue Ne	The northernmost section of this segment through Old Town Fort Collins provides a great example of low stress, on-street bike facilities. Eighborhoods, CSU Veterinary Teaching Hospital, west and east along 57th Street, Coyote Ridge					
Crossing		Level 3 – 57		ortif College Avenue Ne	eignborhoods, C50 Vetermary Teaching Hospital, west and east along 57 Street, Coyote Ridge					
Ciossing	, Neeus	Level 3 - 31	Street							
8-B	57th Street to US34	Proposed	Separated	Loveland	With an enhanced crossing at 57th Street and Duffield Avenue, RATC #8 could follow edge of development east of Duffield Avenue and Trailwood Drive, transitioning into the BNSF right-of-way near Dry Creek and 43rd Street. The trail would make several at-grade road crossings alongside the railroad before reaching the BNSF underpass at US34.					
Key Loca	al Connection Needs	None Identified								
Crossing	Needs	Level 2 – 37 th Street, Garfield Avenue; Level 3 – 29 th Street; Level 4 – US34								
8-C	US34 to the 42 nd	Proposed	Separated	Loveland, Larimer	Near US34, the BNSF right-of-way becomes constrained. This segment would make much needed connections to downtown Loveland, Fairgrounds Park and RATC #7,					
	Street SW	and		County	as well as RATC #4. East-west active transportation enhancements could create new multimodal options for community members in south Loveland, including the					
		Existing			small, unincorporated community of Campion.					
Key Loca	al Connection Needs	West Lovela	and via Arkins E	Branch, RATC #7 via W L	CR16, RATC#7 via LCR14					
Crossing	Needs	Level 1 – 35	th Street SW; Le	vel 2 – W 10 th Street, W	7 th Street, W 6 th Street, W 4 th Street, W 1 st Street, Railroad Avenue, 14 th Street SW, W LCR16, W LCR14/SH60					

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description						
8-D	42 nd Street SW to the	Proposed	Separated	Larimer County,	This segment could take advantage of an existing rail underpass of BNSF and several at-grade crossings before arriving in Old Town Berthoud. The corridor would						
	Little Thompson	and		Berthoud	intersect RATC #2, the Little Thompson River Trail. The segment would benefit from enhanced east-west connections along local and major roadways.						
	River	Existing									
	Connection Needs		one Identified								
Crossing I	Needs	Level 1 – LCF	evel 1 – LCR10; Level 2 – LCR10E, Bunyan Avenue, SH56, Welch Avenue, LCR15; Level 4 – US287								
8-E	Little Thompson	Proposed	Separated	Larimer County,	From RATC #2, this corridor would continue south along the BNSF alignment or LCR15 towards the Larimer County-Boulder County line. Some publicly-owned land						
	River to NFRMPO	and		Berthoud	along LCR15 could pose an opportunity for an alignment on the east side of LCR15, especially given the limited space between the BSF right-of-way and structures on						
	Boundary	Existing			either side.						
Key Local	Connection Needs	None Identified									
Crossing I	Needs	Level 1 – LCF	Level 1 – LCR15A, LCR2E, County Line Road								
8-F	South of NFRMPO	Proposed	Separated	Boulder County	Although existing Boulder County and Longmont long-term trail plans do not call for a trail in this area, most of the land along the BNSF rail line between the Boulder						
	Boundary	and			County line and the City of Longmont is county-owned open space or a has a county conservation easement. These characteristics could make RATC#8 an appealing						
		Existing			interregional connection.						
					Note: The NFRMPO and its member agencies have not engaged with Boulder County regarding this alignment.						
Key Local	Connection Needs	None Identi	fied								
Crossing I	Needs	None Identi	fied								





RATC #9: Corridor-Level Information

Corridor Description	Planning References
The Johnstown to Timnath Corridor serves as a north-south connection down the heart of the NFRMPO Region. The corridor connects Timnath, Windsor,	Timnath – <u>Timnath Comprehensive Plan</u> (2020), <u>Timnath Transportation Plan</u> (2015)*
Johnstown, Berthoud, Larimer County and Weld County with dedicated bike lanes, bikeable shoulders, and/or shared-use paths. The corridor strategically follows	Windsor – <u>Windsor Trail System Master Plan</u> (2020)*, <u>Windsor Street Specifications</u>
County Line Road (WCR13, LCR1, Latham Parkway, Colorado Blvd) to create crucial intersections with six RATCs, provide multimodal access in the fastest growing	(2019)
area within the NFRMPO region: Little Thompson (#2), Big Thompson (#3), Great Western (#4), US34 (#11), Poudre River (#6), and the North Loveland to Windsor	CDOT – <u>US34 Planning and Environmental Linkages (PEL) Study</u> (2019)
(#5). This corridor also connects with various local trails.	Johnstown – <u>Johnstown Updated Land Use Framework Plan</u> (2019)*, <u>Johnstown</u>
Timing for the build-out of this corridor is heavily dependent on impending residential and commercial development along County Line Road. Many segments of	<u>Transportation Master Plan</u> (2008)
this corridor may have combined on-road and off-road facilities to cater to various user types and comfort levels. For on-road segments, a minimum of 6'	Weld County – <u>2045 Weld County Transportation Plan</u> (2020)
shoulders should be provided. 4' shoulders are only acceptable at pinch points where topographical challenges or other constraints make 6' width infeasible. In	
these instances, signage is important. Separated shared-use paths are preferrable wherever possible and transitions to-from the road right-of-way should be	* this plan or related plan to be updated within two years
designed with careful consideration.	
The proposed water delivery pipeline as part of the Northern Integrated Supply Project (NISP) is proposed to parallel County Line Road from Wildwing Drive to	
SH66. If the delivery pipeline is constructed, opportunities to construct RATC #9 parallel to the pipeline should be explored.	
Active mode considerations should be explored further with the development of the WCR13 Access Control Plan between 2021-2025.	

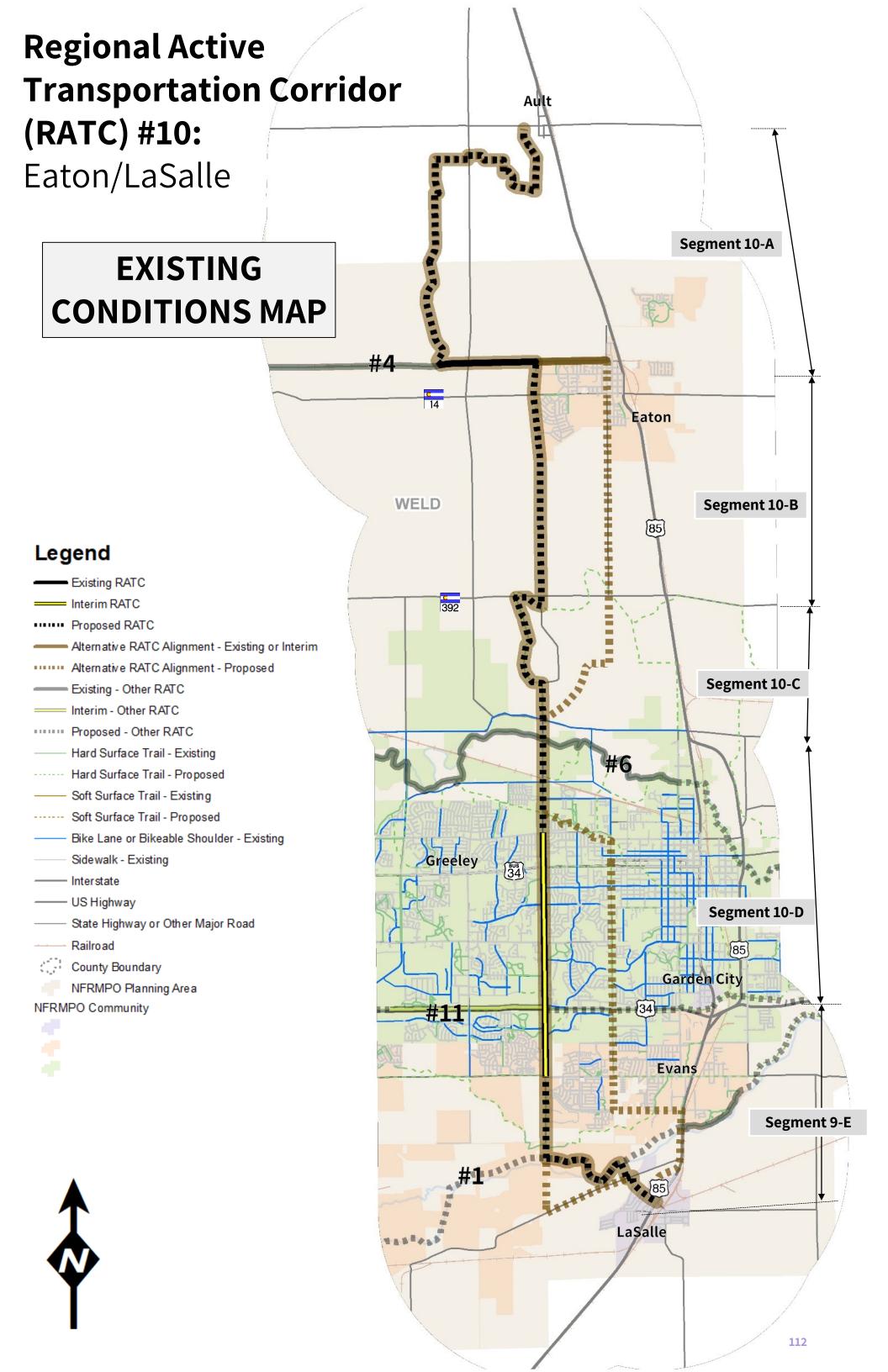
Total Len	Total Length (Miles)		On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	
4.14	21.46	4.14	17.32	4.07	17.33	12,596	60,187	1,913	8,407	0	2	0	0	

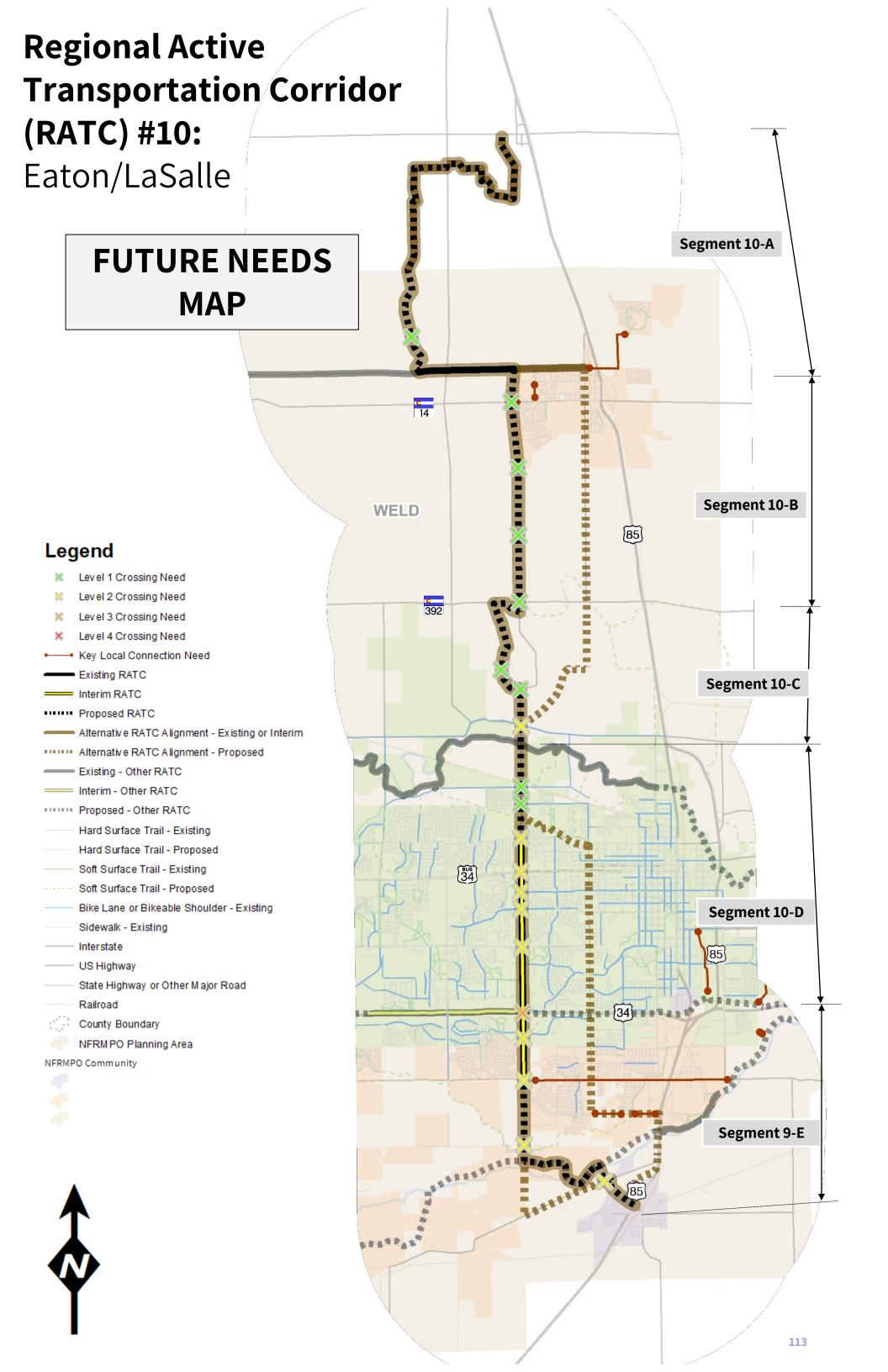
Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

RATC #9: Segment-Level Information

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description						
9-A	Prospect Road to	Proposed,	Combined	Timnath, Severance,	The northern terminus of this corridor is at Prospect Road, approximately two miles east of the new Poudre School District middle/high school on Prospect Road east of						
	Harmony Road	Interim,		Windsor	I-25 as well as the Colorado Front Range Trail preferred alignment, RATC#7. This segment is located within the Timnath and Windsor GMAs. Improvements to the						
		and			roadway in the Timnath GMA will be driven by development and will include 7'-wide bike lanes and 10'-wide detached sidewalks. Improvement to the roadway within						
		Existing			the Windsor GMA will include a minimum 6'-wide bike lanes and 6'-wide detached sidewalks.						
Key Local	Connection Needs	RATC #7 via	PATC #7 via Prospect Road								
Crossing	Needs	Level 1 – Wil	Level 1 – Wildwing Drive, Wildshore Drive; Level 2 – LCR40/WCR76/E Horsetooth Road								
	Harmony Road to SH392	Proposed	Combined		This segment is located within the Timnath and Windsor GMAs. Improvements to the roadway in the Timnath GMA will be driven by development and will include 7'-wide bike lanes and 10'-wide detached sidewalks. Improvement to the roadway within the Windsor GMA will include a minimum 6'-wide bike lanes and 6'-wide detached sidewalks. Crossing and turn movement considerations for active modes will be necessary at WCR68.5 and across the Greeley #2 Canal. The segment will take advantage of a new trail around Kyger Resrvoir and recent enhancements to the signal at County Line Road and SH392.						
Key Local	l Connection Needs	None Identi	fied								
Crossing	Needs	Level 1 – Wh	Level 1 – Wheatfield Lane, E LCR36, Great Western Railroad, Jacoby Road (x2)								

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description					
9-C	SH392 to US34	Existing	Combined	Windsor, Johnstown	The Town of Windsor recently completed a shared use path and bike lanes connecting the Poudre River Trail to SH392. Similar improvements will be made to					
		and			Crossroads Boulevards. Between Crossroads Boulevard and US34, the corridor will be on-road, with potential for transition to a shared-use path near the US34 and					
		Proposed			County Line Road intersection. This intersection is a crucial node for RATCs #4, #9, and #11. The US34 PEL calls for a "protected crossing signal or underpass/overpass"					
V1	 C	Niana Islanski	*I		to accommodate these corridors. Future improvements at this intersection should account for the visions for these RATCs and mobility along and across US34.					
	Connection Needs	None Identif								
Crossing	Neeas	Level 3 – Pol	idre River Trail	, Crossroads Boulevar	D, US34					
	I	Τ								
9-D	US34 to SH60	Proposed	Combined	Johnstown, Weld	Between US34 and LCR14/WCR50, this corridor is likely to be comprised of 7' bike lanes/bikeable shoulders. Sidewalks or a shared-use path may be provided as					
				County	development occurs along this segment. South of LCR14/WCR50, this corridor is likely to include bike lanes and a shared-use path as development is proposed near					
					the Johnstown town core in the short-term, including a large community park. The discontinuity of the corridor at these intersections should be addressed with					
					crossing enhancements when improvements are made. Bike and pedestrian enhancements will be necessary at the signalized intersection of Colorado Boulevard and					
					SH60.					
_	Connection Needs		Future Regional Park near Johnstown Reservoir, I-25 Park-n-Ride, Downtown Johnstown							
Crossing	Needs	Level 1 – Uni	on Pacific Rail	road, Great Western Ra	ilroad (Southernmost), WCR56; Level 2 - WCR54/LCR18, WCR52/LCR16, WCR50/LCR14, Ballentine Boulevard, SH60; Level 3 – Great Western Railroad (Northernmost)					
		_								
9-E	SH60 to NFRMPO	Proposed	Combined	Johnstown, Weld	South of SH60, this corridor is likely to be comprised of 7' bike lanes and shared-use path as development occurs along this segment. A new Weld County RE-5J District					
	Boundary			County	high school and large residential development will be constructed along this segment soon, increasing the importance of this corridor for safe routes to school					
					purposes. At a minimum, bikeable shoulders should continue along Colorado Boulevard as far as possible to accommodate bike travel for rural subdivisions and the					
					rapidly growing Town of Mead.					
Key Loca	l Connection Needs	None Identif	ied							
Crossing	Needs	Level 1 – Gre	at Western Rai	lroad (x2), WCR46, WCI	R42 (x2), WCR40; Level 2 – Carlson Boulevard					





RATC #10: Corridor-Level Information

Corridor Description	Planning References
Much of the eastern portion of the NFRMPO region currently lacks safe, designated corridors for active transportation. The Town of LaSalle is currently isolated	Ault – <u>Ault Comprehensive Plan</u> (2008)
from the rest of the NFRMPO region by the South Platte River. In the 2018 LaSalle Comprehensive Plan, community members identified trail connections along	Weld County – <u>2045 Weld County Transportation Plan</u> (2020)
and across the river as a top community priority. This corridor can also address identified desire for north-south multimodal connectivity in the eastern part of the	Greeley – <u>Get Outdoors Greeley 5-Year Strategic Master Plan</u> (2021), <u>Greeley Bicycle</u>
region to access destinations and amenities such as the Greeley Evans Transit (GET) system, AIMS Community College, the University of Northern Colorado (UNC),	Master Plan (2015)*
West Greeley, and various retail centers.	Evans – <u>Evans Transportation Plan</u> (2004)
	LaSalle – <u>LaSalle Comprehensive Plan</u> (2018)
	* this plan or related plan to be updated within two years

Total Len	Total Length (Miles)		On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	
5.04	18.02	0	7.78	5.04	14.39	20,298	31,870	9,237	14,918	8	12	53	57	

Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

RATC #10: Segment-Level Information

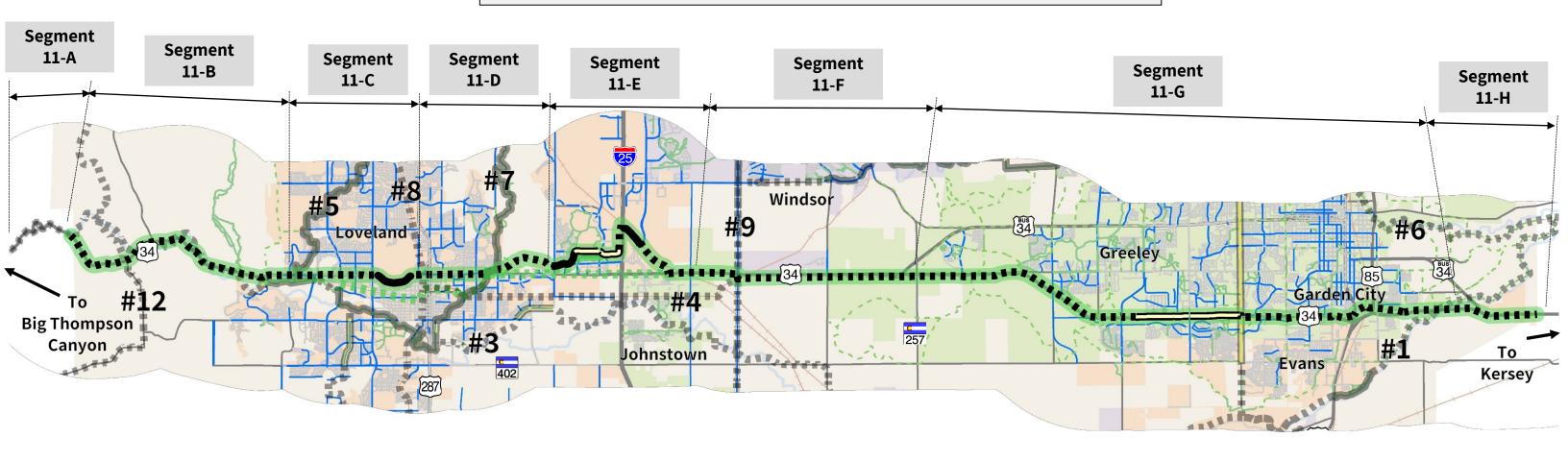
Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description				
10-A	Ault to the Great Western Trail	Proposed	Separated	Ault, Weld County	Although the majority of this segment is north of the NFRMPO boundary, it provides a key local connection to another Northern Colorado community. GOCO funding was secured in 2017 by the Town of Ault to plan the "Loop to Gateway Trail" connecting the Ault Town Core to the Great Western Trail. This segment will parallel the Eaton Ditch and provide much needed recreation and multimodal transportation options to the northeast quadrant of the NFRMPO.				
Key Local	l Connection Needs			<u> </u>	Zuton Britania provide maen needed recreation and maternoods a unoportation options to the northead quadrant or the mixim of				
Crossing	Needs	Level 1 – WC	:R76						
10-B	Great Western Trail to	Existing	Separated	Eaton, Weld County	This segment will be completed when WCR35 is widened to rural 3-lane collector standards between 2026-2035, which include a minimum 6'-wide shoulder. This				
	SH392	and	and		segment would also benefit from enhanced signage. Ultimately, this segment may be better served on WCR37, however road expansion is not expected until 2036-2045.				
		Proposed	Roadway		Regardless of alignment, crossing enhancements will be necessary.				
Key Local	l Connection Needs	Eaton Town Core							
Crossing	Needs	Level 1 - WCR74, WCR72, WCR70, SH392; Level 2 - WCR33, WCR35							
10-C	SH392 to Poudre River Trail	Proposed	Combined	Weld County, Greeley	According to the 2016 Greeley Parks, Trails, and Open Lands Master Plan, this segment south of SH392 could be a shared-use path through the subdivision north of Seeley Lake, continuing west of Seeley Lake, and finally paralleling WCR35/35th Ave south to the Poudre River Trail. In the interim, this segment may be served by bikeable shoulders along WCR35 when the road is upgraded. Ultimately, this segment may be best served along WCR37 and the potential realignment of O Street. The roundabout at WCR35 and O Street will need on- and/or off-street enhancements to better accommodate active modes. This segment intersects with RATC #6.				
Key Local	l Connection Needs	None Identi	fied						
Crossing	Needs	Level 1 - AA	Street, 35 th Ave	nue; Level 2 – O Street					

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description			
10-D	Poudre River Trail to US34	Proposed and Interim	Combined and Separated	Greeley	A high density of access points along this corridor make achieving a low level of traffic stress (LTS) for bikes challenging. By year 2023, improved bike lanes/bikeable shoulders will be added between C Street and the Poudre River Trail, connecting this corridor to the Greeley #3 Canal Trail, which will be extended in 2022. From this point, RATC #10 could continue straight south on 35 th Avenue via future on-street infrastructure or shared-use paths. Although 35 th Avenue has wide sidewalks in some areas, infrastructure along the corridor is inconsistent and contains dozens of access points for driveways, parking lots, and local streets. Alternatively, this corridor could utilize the Greeley #3 Canal Trail to connect to 23 rd Avenue, where a side path is proposed in the 2015 Greeley Bicycle Master Plan and 2016 Greeley Parks, Trails, and Open Lands Master Plan. This alignment could also take advantage of the existing grade-separation for 23 rd Avenue as it crosses US34. Many constraints and conflicts currently exist along 23 rd Avenue. Regardless of the alignment, this segment is important from a Safe Routes to School perspective and can provide safe and direct north-south connectivity between communities where no connectivity currently exists.			
Key Local	Connection Needs	None Identif	ied					
Crossing	Needs	Level 1 – F Street, C Street; Level 2 – 4 th Street, 13 th Street, 20 th Street; Level 3 – US34						
10-E	US34 to LaSalle	Interim and Proposed	Separated	Greeley, Evans, LaSalle	Similar to segment 10-D, this segment also has a high density of access points along 35th and 23rd Avenues. Shared-use paths are preferred, but some sections may most realistically served by enhanced bike lanes and sidewalks, especially in the short-term. This segment requires a crossing of the South Platte River. The preferred alignment of this corridor should account for the feasibility of a river crossing, direct access to RATC #1 for LaSalle community members, and scenic and recreational value. Opportunities should be explored in conjunction with design of the 35th Avenue/WCR35 crossing of the South Platte River and work on the US85 and/or UPRR crossings of the river.			
Key Local	Connection Needs	East Evans v	ia 37 th Street					
Crossing	Needs	Level 2 – 29th	Street, 37 th St	reet, 49 th Street, WCR3	94			

Regional Active Transportation Corridor (RATC) #11:

US34 Parallel

EXSITING CONDITIONS MAP



Legend



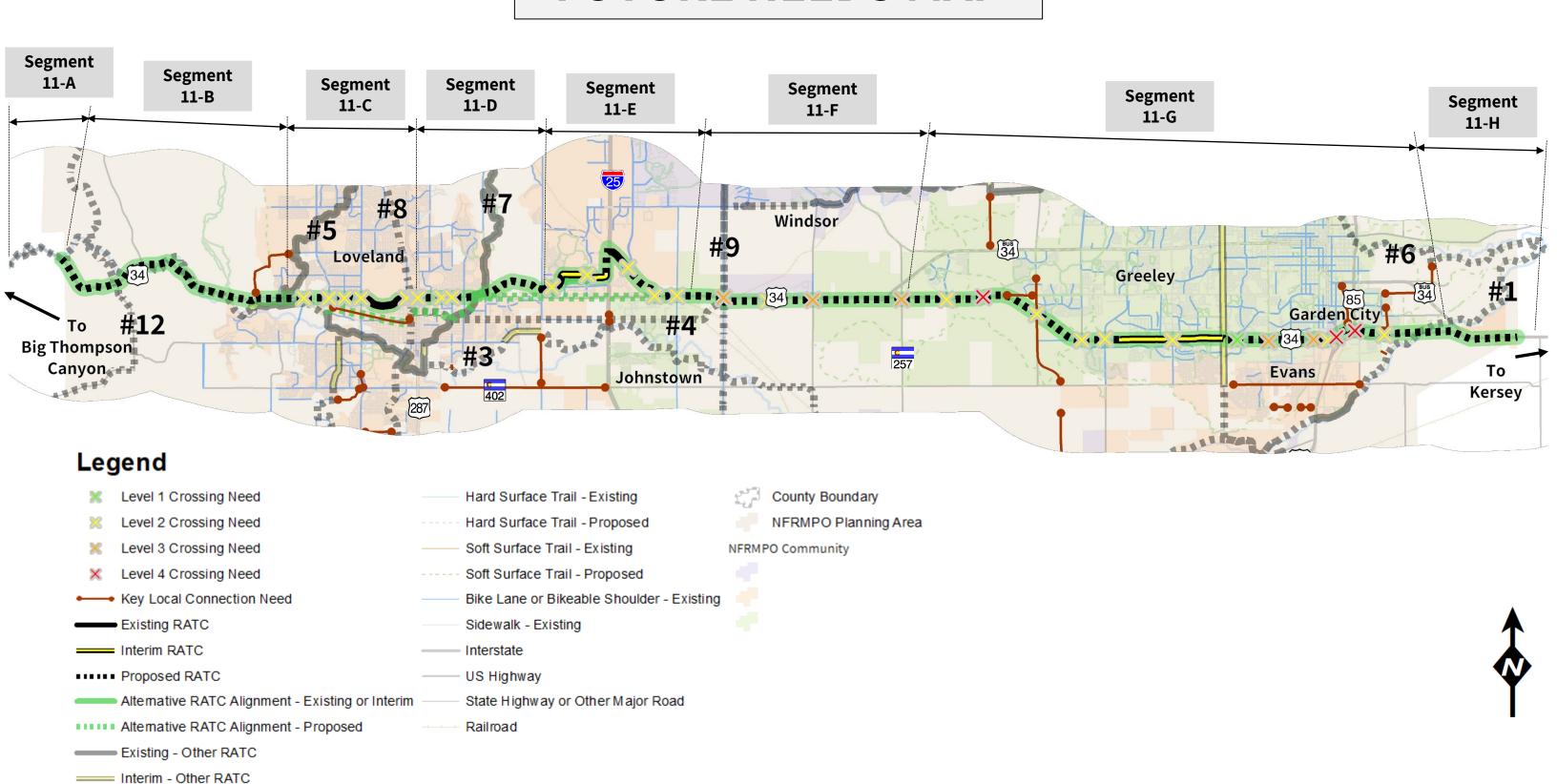


Regional Active Transportation Corridor (RATC) #11:

US34 Parallel

Proposed - Other RATC

FUTURE NEEDS MAP



RATC #11: Corridor-Level Information

Corridor Description	Planning References
The US 34 Corridor is the only RATC to parallel a highway on the State system. The Colorado Transportation Commission's Bike and Pedestrian Policy Directive	Loveland – Connect Loveland Transportation Master Plan (2021)
1602.0 (dated October 22, 2009) and subsequent State Statute 43-1-120 codify the accommodation of bicyclists and pedestrians on the state highway system. A	CDOT – <u>US34 Planning and Environmental Linkages (PEL) Study</u> (2019)
shared-use trail safely separated from the highway, would connect Greeley and Evans to Johnstown and Loveland. The corridor would leverage, but is not limited	Greeley - <u>Greeley Bicycle Master Plan</u> (2015)*
to, CDOT's right-of-way. This corridor is identified in CDOT's US34 Planning and Environmental Linkages (PEL) Study as an element to be implemented or	
accommodated in the Recommended Alternative. The facility type will vary across this corridor. Level of Traffic Stress (LTS) for bicyclists will likely be high for	*this plan or related plan to be updated within two years
cyclists in constrained areas where the facilities will be on-road. Segments visions for this corridor are divided to match the US34 PEL Recommended Alternative	
segments as closely as possible.	
Future considerations in developing this corridor should also consider the vision for RATC #3 in the area between the NFRMPO Boundary (The Dam Store /	
LCR31D) and Rossum Drive. There is opportunity for these two RATCs to be combined and/or serve as complementary alignments depending on engineering and	
cost constraints.	
It should be noted the portion of the regional non-motorized route within Larimer County identified in the US34 PEL uses RATCs #3, #4, and #7. Between WCR13	
and Madison Avenue, development of this alignment is reliant on long-term easement, right-of-way, and infrastructure conversations that are yet to begin.	
Although this alignment could provide a safer, more scenic alternative to facilities on or adjacent to US34, it does not address the multimodal mobility issues that	
exist along US34. Improved active transportation facilities along US34 would leverage existing west-east connectivity and provide first-last mile connections to	
local and regional transit, provide access to commercial destinations, and is identified in the Connect Loveland Transportation Master Plan (2021). For these	
reasons, the alignment for RATC #11 paralleling US34 within Larimer County are maintained.	

Total Length (Miles)		On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045
5.27	24.9	0	1.35	5.27	33.55	27,949	140,423	45,707	102,672	7	15	53	135

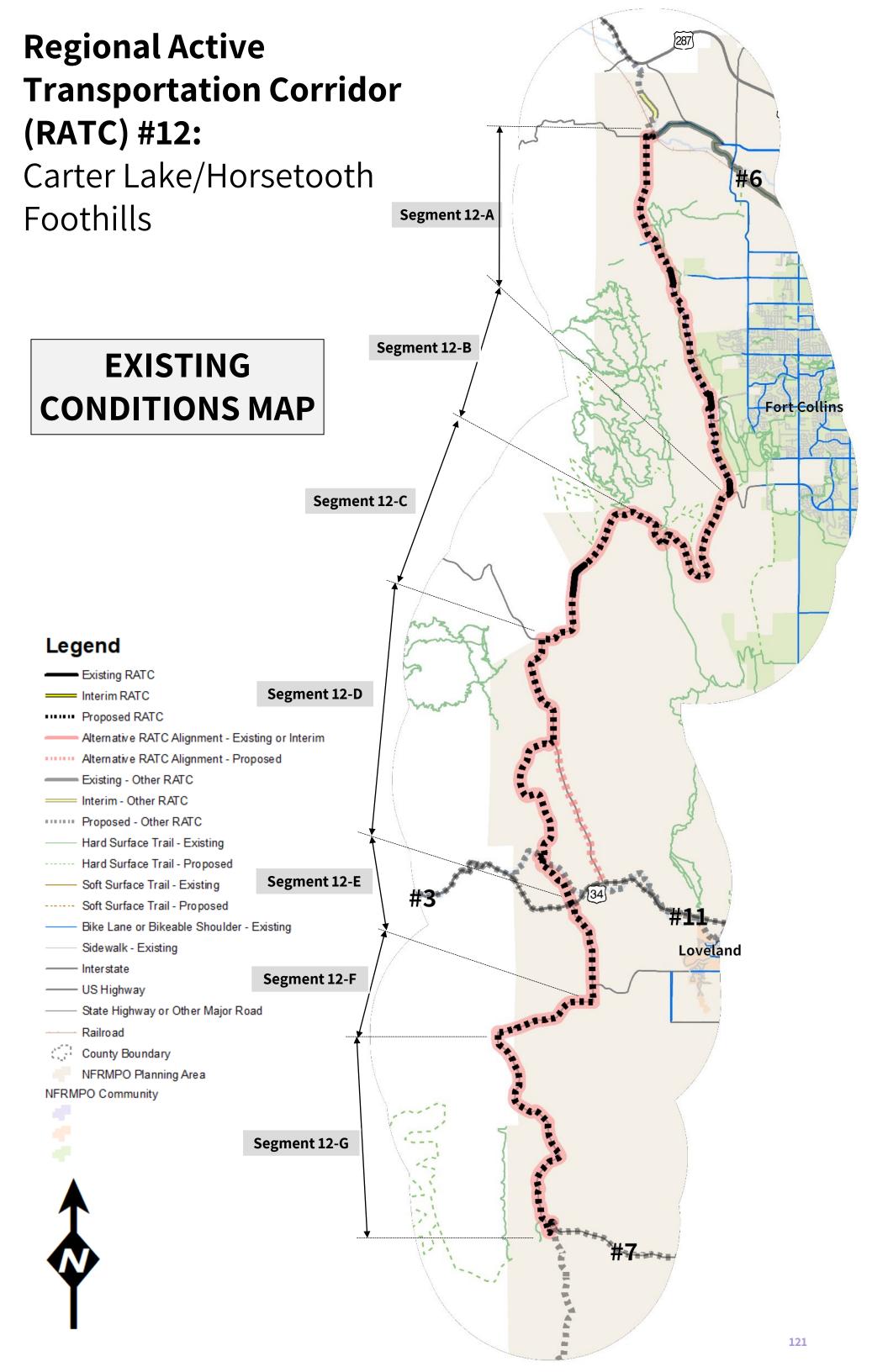
Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

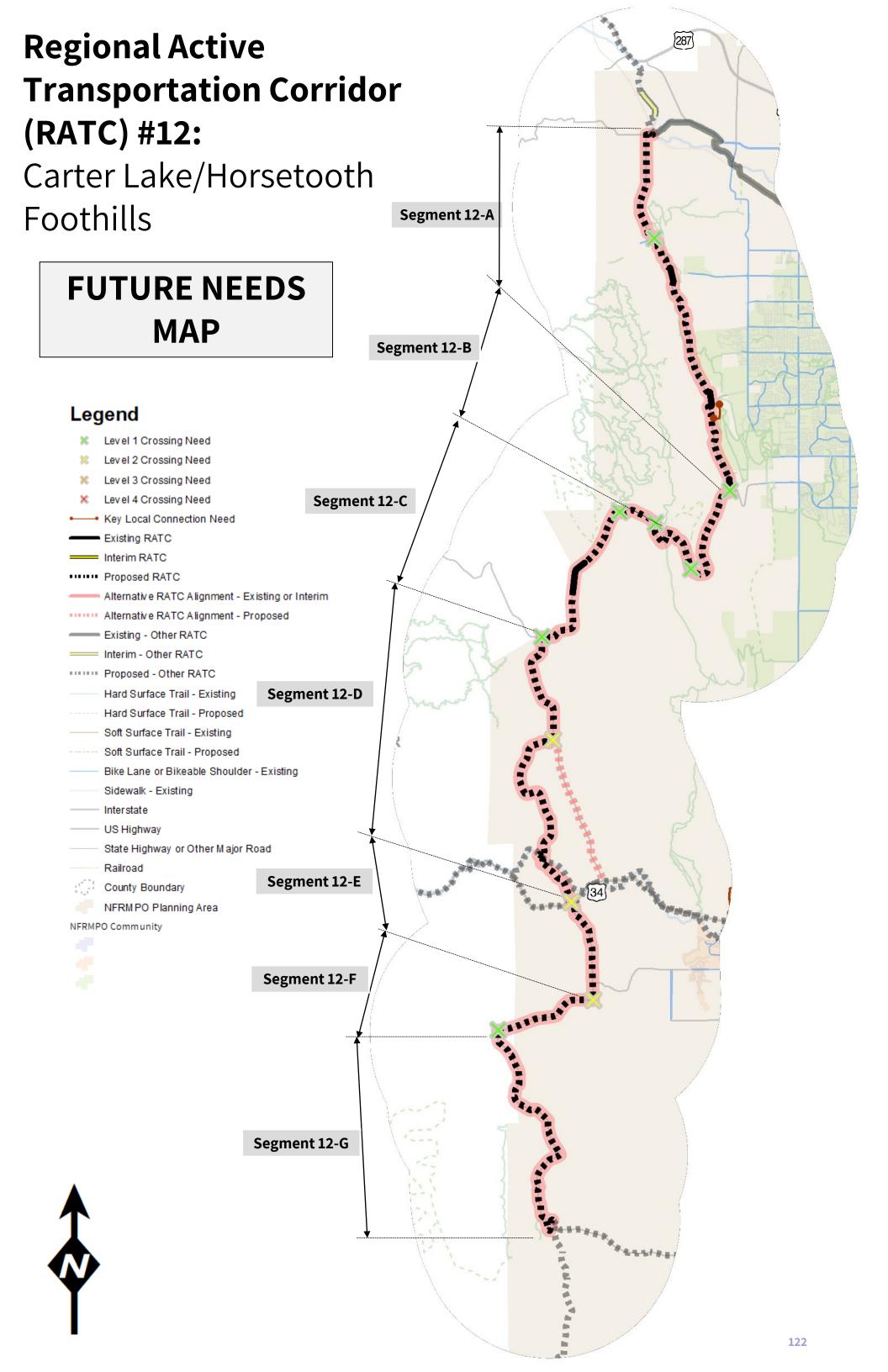
RATC #11: Segment-Level Information

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description
11-A	West of the NFRMPO Region	Interim	Roadway and Separated		In Connect Loveland, the vision for a shared-use path along US34 extends as far west as the Dam Store at LCR31D, which is very close to the NFRMPO boundary. From this point west, US#\$ enters the narrow and steep Big Thompson Canyon. Repairs and improvements to US34 following the historic Fall 2013 floods included wider shoulders for safer biking in the narrow Big Thompson canyon. Local groups, CDOT, and Larimer County have identified seven locations where enhanced signage can improve the cycling experience. Although the topography of the canyon limits possibilities for a shared-use path, there is still interest from some partners in pursuing opportunities to create an off-street corridor west of Loveland's current City boundary. In early 2021, CDOT installed enhanced signage at four locations alerting motorists and bicyclists to bicycle laws. Four additional locations have been identified.
Key Loca	Key Local Connection Needs None Identified				
Crossing	Crossing Needs Level 2 – W LCR22H				

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description
11-B	NFRMPO Boundary to Cascade Avenue	Proposed	Separated and Roadway	CDOT, Larimer County, Loveland	It is important that active transportation facilities along US34 extend this west of Loveland to provide multimodal connectivity to popular recreation amenities and future destinations such as Skyline Natural Area, Devil's Backbone Open Space, Glade Park, and the Big Thompson River. In the short-term, consistent shoulders of 8' in width are preferred in this section, with a minimum width of 6'. Although pedestrian facilities may not be feasible along this entire segment for several years, a shared-use path should be prioritized to connect Skyline Natural Area and Devil's Backbone Open Space whenever the Skyline trail network is completed and opened. This connection will complete a continuous trail loop extending as far north as Lory State Park. The US34 PEL Study Recommended Alternative calls for a bicycle/pedestrian underpass crossing of US 34 on the east side of Rossum Avenue to connect Loveland's existing Recreation Trail to the Skyline Natural Area trailhead. RATC#12 intersects this segment at LCR29 and will require crossing enhancements as traffic volumes increase. A traffic signal will be installed at Glade Road, improving safety for all users. Active transportation considerations will also be critical as improvements are made to US34 between Rossum Drive and Cascade Avenue. This segment is called the Foothills Segment in the US34 PEL Study. In Connect Loveland, this segment is identified for future shared-use paths.
Key Local	Connection Needs	Skyline Natı	ural Area	1	
Crossing	Needs	None Identi	fied		
11-C	Cascade Avenue to N Garfield Avenue Cascade A		CDOT, Loveland	In the short-term, this section will be characterized by bike lanes and sidewalks. Bike lanes/shoulders should be consistently provided at a minimum 4'-wide, with 8'-wide preferred. Buffers from traffic should be considered anywhere a minimum 4' rideable surface can be maintained, not including buffer or gutter. Minimum 4' sidewalks should be provided consistently, with a preference for greater widths and detached sidewalks wherever feasible. This segment is called the Loveland Urban Segment in the US34 PEL. In Connect Loveland, this segment is identified for future shared-use paths. In the long-term, RATC #4 could provide a comfortable and direct alternative for west-east connectivity along this segment.	
Key Local	l Connection Needs	None Identi	fied		
Crossing	Needs	Level 2 – Na	maqua Avenue	e, Wilson Avenue, Van E	Buren Avenue, Taft Avenue, Garfield Avenue
11-D	Garfield Avenue to Rocky Mountain Avenue	Proposed and Existing	Separated	CDOT, Loveland	In 2020, the section of highway between Denver Avenue and Boyd Lake Avenue received improved bike lanes and sidewalks. Similar improvements will be made east of Rocky Mountain Avenue by 2023. For more confident cyclists, these bike lanes will provide more direct access to destinations along US34. The South Boyd Lake Trail between Denver Avenue and Boyd Lake Avenue is the preferred alignment and will be under construction in 2021. This trail will pass underneath Boyd Lake Avenue. South of Equalizer Lake, access issues need to be resolved before this trail can truly serve regional active transportation. In the interim, the alignment will leverage the bike lanes along Hahn's Peak Drive. This segment intersects RATC #8 and is called the Loveland 6-Lane Segment in the US34 PEL Study. In Connect Loveland, this segment is identified for future shared-use paths. In the long-term, RATC #4 could provide a comfortable and direct alternative for west-east connectivity.
Key Local	Connection Needs	None Identi	fied	1	
Crossing		Level 2 – N (Cleveland Aven	iue, N Lincoln Avenue,	Redwood Drive, Madison Avenue, Denver Avenue, Piney River Drive, Rocky Mountain Avenue
11-E	Rocky Mountain Avenue to Larimer Parkway	Existing and Proposed	Separated	CDOT, Loveland	This section would leverage the grade-separated crossing of I-25 at Kendall Parkway. Although this alignment diverts away from US34, it provides a safe alternative and connects users to the Kendall Parkway Mobility Hub, an important multimodal asset for regional and interregional transit service. West of I-25, the section between the mobility hub and the Outlets at Loveland will be completed as part of ongoing North I-25 construction. East of I-25, completion of this shared-use path to US34 near Larimer Parkway has been prioritized in Tier 1 of the NFRMPO's 10-Year Strategic Pipeline of Projects. For this segment, the US34 PEL Study largely defers to plans within the N I-25 Environmental Impact Study (EIS) on detailed plans, and refers it as the I-25 Interchange Project. The US34 PEL does call for the implementation of enhanced bike lanes along US 34 from North Monroe Avenue to LCR 3, where missing.
	l Connection Needs	None Identi			
Crossing	Needs	Level 2 – Ce	nterra Parkway	y, Larimer Parkway	
11-F	Larimer Parkway to SH257	Proposed	Separated	CDOT, Johnstown, Greeley	Between Larimer Parkway/Kendall Parkway and County Line Road, a shared-use path is ideal to accommodate active modes transitioning between RATCs #4, #9, and/or #11, potentially along the Loveland and Greeley Canal. The intersection of US34 and County Line Road is a crucial node for these RATCs, as well. At this intersection, the US34 PEL calls for a "protected crossing signal or underpass/overpass" to accommodate these corridors. Future improvements at this intersection should account for the visions for these RATCs and mobility along and across US34. Additionally, the US34 PEL identifies design options for the intersections of US34 and WCR15, WCR17, US34 Business, and SH257/WCR19. Active mode accommodations are crucial at each of these nodes to accommodate RATC #11. This segment is called the Johnstown-Greeley Segment in the US34 PEL.

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description								
Key Loca	l Connection Needs	None Identif	fied										
Crossing	Needs	Level 2 – LCR3, WCR15; Level 3 – County Line Road, Great Western Railroad, WCR17/143 rd Avenue, SH257											
11-G	SH257 to the South Platte River	Proposed and Existing	Separated	CDOT, Greeley, Evans, Garden City	This segment would be comprised of a shared-use path paralleling US34. Of all the proposed segments across the RATC network, this segment contains the highest density of conflict points between travel modes. The US34 PEL calls for accommodation of enhanced crossings across US 34 at Promontory Parkway, 95th Avenue, 83rd Avenue, 71st Avenue, 65th Avenue, 47th Avenue, Reservoir Road (grade-separated crossing), 23rd Avenue and 17th Avenue (grade-separated crossing), as identified in the City of Greeley Bicycle Master Plan (2015) and the Greeley Parks, Trails and Open Lands Master Plan (2016). Some sections of this segment may be constructed alongside development in West Greeley. Considerations at the US34/US85 interchange (Spaghetti Junction) will need to be coordinated with the US34/US85 project (a separate effort). This segment is called the Greeley Expressway Segment in the US34 PEL. Because of the complexity of this interchange, grade-separation is heavily preferred. There may be opportunity to parallel a canal on the north and east side of the interchange. This corridor will intersect, and likely terminate at RATC#1, the South Platter River.								
Key Loca	l Connection Needs	Downtown (Greeley via Un	ion Pacific Railroad, Eas	st Memorial Neighborhood								
Crossing	Needs	Level 1 – Sur	nset Memorial	Cemetery Access Road	; Level 2 – Promontory Parkway, 83 rd Avenue, 71 st Avenue, 65 th Avenue, 47 th Avenue, 8 th Avenue; Level 3 – 35 th Avenue, 23 rd Avenue, 11 th Avenue, E 27 th Street; Level 4 – 95 th								
		Avenue, US8	35 Business, U	S85									
11-H East of the NFRMPO Proposed Separated Weld County,		Weld County,	Connections between Kersey and Greeley/Evans are being discussed. Although an alignment along the South Platter River provides an opportunity, possibilities along										
	Region			Kersey	the US34 corridor should be considered as feasibility analyzed.								
Key Loca	l Connection Needs	None Identif	fied – Outside	NFRMPO Planning Area									
Crossing	Needs	None Identif	fied – Outside	NFRMPO Planning Area									





RATC #12: Corridor-Level Information

Corridor Description	Planning References
The Carter Lake / Horsetooth Foothills Corridor is predominantly a recreational bicycling corridor that provides access to the many city, county, and state parks	Larimer County – <u>Larimer County Transportation Master Plan</u> (2017), <u>Larimer County</u>
and trailheads of the foothills in the western portion of the NFRMPO region. North to south, the corridor uses segments of Rist Canyon Road, LCR23/Centennial	Open Lands Master Plan (2015)*
Drive, LCR38E, LCR29/Buckhorn Road, LCR29, LCR18E/Pole Hill Road, LCR31, and LCR8E. The corridor frequently accommodates bicycle and running races/group	
events and is heavily trafficked by recreators of all types throughout the year. Various sections of this corridor would benefit from shoulder widening and related	* this plan or related plan to be updated within two years
improvements. Providing minimum 4'-wide shoulders should be the ultimate vision along the entirety of this corridor. These improvements should be made on	
segments labeled "proposed" when the roadway is scheduled for improvement or significant maintenance. Strategic local connections to Berthoud, Loveland,	
and Fort Collins are recognized for safe access to this corridor. With nearly 2,500 feet of climb north to south, sharp drop-offs, winding curves, blind corners, this	
corridor is characterized by areas where ample room for error is necessary for travelers moving at widely varying speeds. 19 locations along the corridor have	
been identified by stakeholders for improved signage alerting drivers to State Law regarding cyclists. In the Larimer County Transportation Master Plan, segments	
of this route are identified as "Popular Bike Routes" and/or "Highest Bicycle Use" based on Strava™ data and user feedback. Much of the corridor is also identified	
for future bike lanes or bike route designation.	
The Overland Mountain Bike Association (OMBA) has proposed significant soft surface trail construction across the many public lands this corridor connects to.	
This vision, once realized, will increase the significance of this corridor in providing safe, multimodal access to expanded recreation options.	

Total Length (Miles)		On-Street Miles		Off-Street Miles		Population within 1/2 Mile		Jobs within 1/2 Mile		Schools within 1/2 Mile		Transit Stops within 1/2 Mile	
2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045	2020	2045
1.39	31.35	1.39	29.97	0	0	944	6,905	916	1,646	0	0	1	1

Notes: On-Street and Off-Street Miles may add up to more than Total Length if RATC has segments with "combined" on- and off-street facilities. 2020 schools and transit stops were used for 2045 calculations. 2020 figures for existing facilities also include interim facilities.

RATC #12: Segment-Level Information

Segment ID	Extents	Status	Facility Type (Build Out)	Jurisdictions	Segment Description
12-A	Poudre River Trail to LCR38E	Proposed and Existing	Roadway	Larimer County	Referred to as "The Dams" by bicyclists and distance runners, this segment traverses the four dams on the northern and eastern sides of Horsetooth Reservoir and is the most heavily used segment of the corridor among all user types. The 7.7-mile segment contains scenic vistas, picnic and rest areas, restrooms, hiking and mountain biking trails, and other amenities. Shoulder improvements are needed along various parts of this segment. Four locations along this segment are identified for signage improvements. Larimer County has identified the segment between the Soldier Canyon and LCR38E for future bikes lanes/bikeable shoulders.
Key Loca	Connection Needs	Along Dixon	Canyon Road		
Crossing	Needs	Level 1 – LCF	R52E, LCR48C,	LCR38E	
12-B	Centennial Ridge Rd/LCR23 to Shoreline Drive	Proposed	Roadway	Larimer County	The segment contains several curving sections where larger shoulders would provide a safer experience for the motorist and bicyclist, including the section approaching the heavily used South Bay Marina and Campground. The segment terminates at the heavily used Shoreline Drive that provides access to Horsetooth Reservoir for boaters and campers making slow turning movements across bicycle traffic. Two locations along this segment are identified for signage improvements. Larimer County has identified the segment between the LCR23 and South Bay Campground as a future bike route.
Key Loca	l Connection Needs	None Identi	fied		
Crossing	Needs	Level 1 – Sho	oreline Drive		
12-C	Shoreline Drive to Buckhorn Road	Proposed and Existing	Roadway	Larimer County	Part of this segment has adequate shoulders but widths are inconsistent. Conflict areas such as the entrance to Horsetooth Mountain Open Space and the intersection of Buckhorn Road and WCR38E are identified for signage improvements. Other conflict area exist where narrow shoulders exist alongside guardrails. Two locations along this segment are identified for signage improvements.
Key Loca	l Connection Needs	None Identi	fied		

Segment	Extents	Status	Facility Type	Jurisdictions	Segment Description
וט			(Build Out)		
Crossing	Needs	Level 1 – Re	d Cliff Road, Bı	uckhorn Road	
12-D	Buckhorn Road to US34 Proposed Roadway Larimer C		Larimer County, CDOT	The corridor is routed away from LCR 25E and LCR 27 to LCR 29 to ensure the bicyclist does not have to ride along US 34 to and take the lane to make turning movements. Users can ride straight across US34 along LCR29 to minimize conflicts with fast-moving traffic, but improved signage at this intersection could improve safety. This segment takes users by Sunrise Ranch, Green Ridge Glad Reservoir, the Big Thompson River, and other amenities. Northbound cyclists heading up the hill to Green Glad Reservoir are accommodated with a wide climbing shoulder, although it ends abruptly. Climbing shoulders like this one would be beneficial across the corridor where steep inclines cause low bicycle speeds. Conflict areas exist over the narrow bridge near the Masonville Post Office and locations where narrow shoulders exist alongside guardrails. Two locations along this segment are identified for signage improvements.	
Key Loca	l Connection Needs	None Identi	fied		
Crossing	Needs	Level 2 – LC	R29, US34		
12-E	US34 to Pole Hill Road	Proposed	Roadway	Larimer County	This section has narrow shoulders and the intersection of Carter Lake Rd/LCR29 and 1st Street/LCR20 can be a conflict point for turning bicycles and vehicles heading to/from southwest Loveland. One location along this segment is identified for signage improvements.
Key Loca	l Connection Needs	None Identi	fied		
Crossing	Needs	Level 2 – Po	le Hill Road		
12-F	Pole Hill Road to LCR31	Proposed	Roadway	Larimer County	This section has narrow shoulders and the intersection of Pole Hills Road/LCR18E and LCR31 can be a conflict point for vehicles and cyclists due to the steep grade of LCR31 and setback of the stop sign. Two locations along this segment are identified for signage improvements. Larimer County has identified this segment as a future bike route.
Key Loca	l Connection Needs	None Identi	fied		
Crossing	Needs	Level 1 – LCI	R31		
12-G	12-G LCR31 to LCR8E Proposed Roadway Larimer County		Larimer County	This section has narrow shoulders and several pinch points where cyclists must take the lane to allow safe clearance from guardrails, especially over dams and around corners. Six locations along this segment are identified for signage improvements. Larimer County has identified this segment as a future bike route.	
Key Loca	l Connection Needs	None Identi	fied		
Crossing	Needs	Level 3 – LC	R8E/Saint Vrai	n Canal Road	

Chapter 5: Action Steps

The Actions Steps identified in this Chapter should be prioritized over the next four years (one plan cycle) to improve active transportation in the NFRMPO region. Action Steps are broken into the following categories: Safety, Monitoring, Land Use and Urban Form, Equity, Local Assistance, Funding, and Wayfinding. With each Action Step, responsible agencies/partners are identified. Additional recommendations, suggestions, and other guidance are spread across corresponding sections of the *ATP*.

Safety

Support the identification of additional rural locations where "State Law: Motorists Must Give 3-FT Clearance" signs may be appropriate and assist with identifying funding opportunities for expeditious installation.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Explore opportunities to supplement crash data by developing and maintaining a regional crowdsourced near miss reporting tool using a platform such as Esri's Crowdsource Reporter.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Support efforts to expand educational programs such as the Bicycle Friendly Driver course (City of Fort Collins and Bicycle Colorado) to other local agencies.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Expand the safety analysis appendix and explore opportunities to expand the NFRMPO's Towards Zero Deaths Policy into a Safety Action Plan with emphasis on a systemic safety risk analysis, specifically for active modes.

Responsibility: NFRMPO Staff, TAC, Planning Council

Work with local agencies to conduct locally specific analysis of bike/ped crash and near miss, and other safety trends.

Responsibility: NFRMPO Staff

Monitor the implementation of actions to prevent harmful crashes involving pedestrians identified in the <u>USDOT Pedestrian Safety Action Plan</u> adopted in November 2020, and get involved where appropriate.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Encourage local agencies to work with law enforcement to enforce laws related to walking and bicycling safety with a focus on aggressive behavior from drivers, speeding, and code violations.

Responsibility: NoCo Bike & Ped Collaborative

Monitoring

Partner with students from CSU and UNC to conduct trail user surveys, an Economic Impact Assessment (EIA), and a Health Impact Assessment (HIA) of the Poudre River Trail (from LaPorte to Greeley) after its completion in 2022-2023. These analyses will help the region quantify the value these investments bring to Northern Colorado and create a replicable methodology for similar efforts on additional regional corridors.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Continue sharing collected count data with the CDOT statewide database, as well as the Rails-to-Trails Conservancy's (RTC) nationwide database.

Responsibility: NFRMPO Staff, Local Agency Staff

Continue purchasing permanent counters to be installed, managed, and maintained by local agencies.

Responsibility: NFRMPO Staff

Work with local agency staff to coordinate, train and/or assist with counts (minimum two weeks) at all priority locations identified in the Chapter 2 over a two-year period.

Responsibility: NFRMPO Staff

Explore options, including the Eco-Counter API function, to create a regional, public-facing dashboard of count data.

Responsibility: NFRMPO Staff

Assign a Bicycle Level of Traffic Stress (LTS) to all roads within the NFRMPO region and incorporate Bicycle LTS into project scoring and prioritization.

Some roads in the NFRMPO Regional Travel Demand Model (RTDM) currently have an assigned LTS. Further Bicycle LTS assignment should use a methodology that combines bicycle facility type, number of lanes, and posted speed limit in urban areas (adapted from CHCNGA-TPO and Lowry, Furth, Hadden-Loh 2016 and the Connect Loveland Transportation Master Plan) and combines traffic volumes, truck percentages, posted speed limits, and paved shoulder width in rural areas (adapted from Boulder County). Other factors may be introduced as appropriate. The figures should then be refined by local agency staff and public stakeholders using traffic volumes, access and intersection characteristics, crash and near miss history, and other context-specific information.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Incorporate future active transportation facilities into the NFRMPO's RTDM network to improve forecasting and allow active transportation-specific scenario planning using Bicycle LTS (see previous recommendation and existing RTDM methodology).

Responsibility: NFRMPO Staff, Local Agency Staff

Encourage and support more local participation in the <u>PlacesForBikes City Rating</u> system and League of American Bicyclists' <u>Bike Friendly America</u> program.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Improve regional active modes facility dataset to distinguish striped, buffered, and protected bike lanes; identify designated bicycle routes that meet a standard definition; and identify the varying qualities of soft-surface trails (surface type and width).

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Generate a public facing, interactive, mobile-friendly map of the regional low stress bike network. Explore opportunities to incorporate the map into existing apps or web maps.

Responsibility: NFRMPO Staff, TAC, NoCo Bike & Ped Collaborative, other Local Agency Staff

Explore opportunities to acquire location-based app data on bicycle travel patterns, such as Strava Metro or Streetlight datasets.

Responsibility: NFRMPO Staff

Land Use and Urban Form

Continue offering technical assistance in the review of local development plan proposals.

Responsibility: NFRMPO Staff

Review and update existing development requirements to ensure bicycle and pedestrian connectivity and access is accommodated in new areas.

Responsibility: Local Agency Staff

Evaluate opportunities in underutilized areas that lack connectivity through connector trails, etc.

Responsibility: Local Agency Staff

Equity

Update and expand the Larimer County Multimodal Index (MMI) to cover the region and explore additional ways to quantify equity, consistent with the NFRMPO's *Environmental Justice (EJ) Plan*.

Responsibility: NFRMPO Staff, Local Agency Staff

Work with staff from the Health District of Northern Larimer County (HDNLC) and the Weld County Department of Public Health and Environment (WCDPHE) to conduct deeper analyses into the Community Health Assessment (CHA) results, with specific attention to socioeconomic disparities related to active transportation.

Responsibility: NFRMPO Staff

Work with local planning partners and other community leaders to evaluate access to active transportation infrastructure and identify potential solutions.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Continually assess opportunities to incorporate well-established tools and analyses focused on transportation equity into project prioritization for the NFRMPO's Call for Projects and other grant opportunities.

These tools and analyses may include the afore mentioned MMI, CHA results, Bicycle LTS, crash and near miss history, and more.

Responsibility: NFRMPO Staff, TAC, NoCo Bike & Ped Collaborative

Local Assistance

Develop an Active Transportation Assistance Program to:

- Support community and organizational commitments and pledges to improve active transportation, including membership and advancement within the:
 - o The AARP Age-Friendly Network of States and Communities
 - o The League of American Bicyclists' <u>Bicycle Friendly America Program</u>
 - o Main Street America and creating a Main Street Program
- Conduct infrastructure audits (walking, biking, transit) to identify areas for improvement and train local leaders to conduct audits on their own;
- Assist with identification of grant opportunities and submitting grant applications for active transportation infrastructure and program improvements;
- Assist with review of existing local codes and policies, identification of best practices updates or adjustments to those codes and policies, and development of local complete streets policies;

- Host periodic training sessions (in-person, webinars, web training videos) to address areas of interest identified by planning partners;
- Improve and maintain ongoing feedback mediums such as online mapping and feedback tools (Community Remarks, Esri Crowdsource Reporter, etc.); and
- Explore opportunities to host and/or promote regional classes and trainings to improve individual confidence and comfort walking and biking, with a focus on virtual formats and a recording archive.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Micromobility

Communities considering shared mobility solutions should require prospective vendors to provide adaptive solutions that respond to barriers such as physical and sensory inaccessibility. Findings from a June 2020 Report on perception of emerging mobility services among individuals with disabilities from the San Francisco Municipal Transportation Agency (SFMTA) may be referenced.

Responsibility: Local Agency Staff

Funding

With each NFRMPO Call for Projects, identify opportunities to:

- Encourage applications representing a more diverse range of project types that are highly consistent with the intent of each funding program;
- Emphasize the importance of projects that support mode shift away from single occupant vehicle (SOV) travel; and
- Better align funding decisions with NFRMPO target achievement.

Responsibility: NFRMPO Staff, TAC, Planning Council, NoCo Bike & Ped Collaborative

Improve communication between groups with parallel missions (NoCo Bike & Ped Collaborative, Weld County Mobility Committee [WCMC], Larimer County Mobility Committee [LCMC], etc.) to identify opportunities to combine funding sources and prioritize projects with multi-faceted benefits (bikeability, ADA compliance, independent living, etc.)

Responsibility: NFRMPO Staff, Committee Leadership

Continue to regularly update the Regional Active Transportation Corridor (RATC) 10-Year Project Pipeline with cost estimates to position the NFRMPO region more competitively to pursue and respond to various funding opportunities.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative, TAC

Wayfinding

Continue leading the effort to identify wayfinding signage needs on and connecting to all Regional Active Transportation Corridors (RATCs) through a shareable and editable online interactive mapping platform, such as Community Remarks or ArcGIS Crowdsource Reporter. Individual mapping should be supplemented with in-person workshops along the network to field test and refine the initial recommendations.

Responsibility: NFRMPO Staff, NoCo Bike & Ped Collaborative

Appendix A: Resource Library

The resources listed in this section are organized into topic areas (listed below) for ease of navigation. Many of the resources are listed in one topic area have applicability to other topic areas. NFRMPO staff are available to help filter resources down based on the context of a specific project.

- Rural / Small Town
- Urban
- Bikeways
- Bike Parking
- Signalization and Intersections
- Pedestrian
- Accessibility and Mobility
- Maintenance
- Roadway

- Complete Streets
- Design Flexibility
- Measurement and Monitoring
- Community Member Resources
- Quick Win and Tactical Urbanism
- Infrastructure and Safety Audits
- Resilience and Response
- Local and State Policies and Standards
- Public Health, Equity, and Climate

Rural / Small Town

- Small Town and Rural Multimodal Networks (FHWA 2016) https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/fhwahep17024_lg_.pdf
- Colorado Downtown Streets (DOLA, CDOT, CDPHE 2020) https://drive.google.com/file/d/1-e25iz08Sry8JVX7aFGxy15 a-JoguGu/view?authsuer=0

Urban

- Urban Street Design Guide (NACTO 2013) https://nacto.org/publication/urban-street-design-guide/
- Urban Bikeway Design Guide (NACTO 2011) https://nacto.org/publication/urban-bikeway-design-guide/
- > Transit Street Design Guide (NACTO 2016) https://nacto.org/publication/transit-street-design-guide/

Bikeways

➤ Bikeway Selection Guide (FHWA 2019) https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf

Supplementary Documents:

- Traffic Analysis and Intersection Considerations to Inform Bikeway Selection (FHWA 2021) https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/FHWA-SA-21-010_Traffic_Analysis_Intersection_Considerations.pdf
- On-Street Motor Vehicle Parking and the Bikeway Selection Process (FHWA 2021) -https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/FHWA-SA-21-009 On Street Motor Vehicle Parking.pdf
- Guide for the Development of Bicycle Facilities: 4th Edition (AASHTO 2012) https://njdotlocalaidrc.com/perch/resources/aashto-gbf-4-2012-bicycle.pdf
- Separated Bike Lane Planning and Design Guide (FHWA 2015) https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/separated_bikelane_pdg/separatedbikelane_pdg.pdf
- ➤ Rethinking Streets for Bikes: An Evidence-Based Guide to 25 Bike-Focused Street Transformations (NITC, University of Oregon 2019) http://rethinkingstreets.com/
- ➤ BIKESAFE: Bicycle Safety Guide and Countermeasure Selection System (FHWA) http://www.pedbikesafe.org/bikesafe/

Bike Parking

- Essentials of Bike Parking, Selecting and Installing Bicycle Parking that Works (APBP 2015) https://www.apbp.org/Publications
- FHWA University Course on Bicycle and Pedestrian Transportation Lesson 17: Bicycle Parking and Storage (FHWA 2006) https://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/pdf/lesson17lo.pdf

Signalization and Intersections

- Manual on Uniform Traffic Control Devices (MUTCD) (FHWA 2009) https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm
- Guide to Improve Pedestrian and Bicyclist Safety at Intersections NCHRP Report 926 (TRB 2020) https://www.nap.edu/catalog/25808/guidance-to-improve-pedestrian-and-bicyclist-safety-at-intersections
- Don't Give Up at the Intersection: Designing All Ages and Abilities Bicycle Crossings (NACTO 2019) https://nacto.org/publication/urban-bikeway-design-guide/dont-give-up-at-the-intersection/

Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (USDOT 2018) https://safety.fhwa.dot.gov/ped_bike/step/docs/STEP_Guide for Improving Ped Safety at Unsig Loc 3 -2018_07_17-508compliant.pdf

Pedestrian

- ➤ Guide for the Planning, Design, and Operation of Pedestrian Facilities (AASHTO 2004) https://store.transportation.org/Item/CollectionDetail?ID=131
- ➤ PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System (FHWA) http://www.pedbikesafe.org/pedsafe/
- How to Develop a Pedestrian Safety Action Plan (FHWA 2009) https://safety.fhwa.dot.gov/ped_bike/ped_focus/docs/fhwasa0512.pdf
- Pedestrian Safety Guide for Transit Agencies (FHWA 2008) https://safety.fhwa.dot.gov/ped_bike/ped_transit/ped_transguide/transit_guide.pdf

Accessibility and Mobility

- Americans with Disabilities Act Guidelines (ADAAG) (United States Access Board 2002) https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/adaag
- Public Right-of-Way Accessibility Guidelines (PROWAG) Proposed accessibility guidelines for pedestrian facilities in the public right-of-way (United States Access Board 2011) https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/proposed-rights-of-way-guidelines
- Engaging People with Disabilities in Street Planning and Design (Toole Design 2020) https://tooledesign.com/insights/2020/07/toole-designs-resource-guide-for-engaging-people-with-disabilities/
- Manual on Pedestrian and Bicycle Connections to Transit (FTA 2017) https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/64496/ftareportno0111.pdf

Maintenance

Guide for Maintaining Pedestrian Facilities for Enhanced Safety (FHWA 2013) https://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa13037/fhwasa13037.pdf

- Winter Bike Lane Maintenance: A Review of National and International Best Practices (Alta Planning and Design 2014) –
 - https://altago.com/wp-content/uploads/winter-bike-riding-white-paper-alta.pdf
- Sidewalk Snow Clearing Guide (Minnesota Department of Health 2018) https://www.health.state.mn.us/communities/physicalactivity/docs/cleaning.pdf
- ➤ Improving Pedestrian and Bicycle Connectivity During Rehabilitation of Existing Bridges (PBIC 2016) http://www.pedbikeinfo.org/cms/downloads/PBIC WhitePaper Bridges.pdf
- Incorporating On-Road Bicycle Networks into Resurfacing Projects (FHWA 2016) https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/resurfacing_workbook.pdf

Roadway

➤ The Green Book: A Policy on Geometric Design of Highways and Streets 7th Edition (AASHTO 2018) https://aashtojournal.org/2018/09/28/aashto-releases-7th-edition-of-its-highway-street-design-green-book/

Complete Streets

- Complete Streets Local Policy Workbook (Smart Growth America 2013) https://smartgrowthamerica.org/resources/complete-streets-local-policy-workbook/
- Complete Streets Implementations: A Resource Appendix (Smart Growth America) https://smartgrowthamerica.org/wp-content/uploads/2016/09/Implementing-Complete-Streets-Policy Brief-Guidebook.pdf
- Complete Streets Policies at the Local Level: Model comprehensive plan language, model local ordinance, and model local resolution (ChangeLab Solutions 2014)
 https://www.changelabsolutions.org/product/complete-streets-policies-local-level
- ➤ Elements of a Complete Streets Policy (Smart Growth America 2018) https://smartgrowthamerica.org/resources/elements-complete-streets-policy/
- Rethinking Streets: An Evidence-Based Guide to 25 Complete Street Street Transformations (NITC, University of Oregon 2019) http://rethinkingstreets.com/

Streetmix: Street Layout Visioning Tool - https://streetmix.net/

Design Flexibility

- Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts (FHWA 2016) https://www.fhwa.dot.gov/environment/bicycle-pedestrian/publications/multimodal-networks/fhwahep-16055.pdf
- ➤ Bicycle and Pedestrian Facility Design Flexibility Memorandum (FHWA 2013) https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_flexibility.cfm
- Transforming Street and Sidewalk Management from a Liability into an Opportunity (Passport and Smart Cities Dive 2020) <a href="https://resources.industrydive.com/transforming-street-and-sidewalk-management-from-a-liability-into-an-opportunity?ignoremxtracking=mxtrue&mxcpi=0cee738d-2986-4240-a1cb-8c4861c1443e&omt=1&result=success

Measurement and Monitoring

- Nonmotorized Data Collection and Monitoring Program Guide and Implementation Plan (MDOT 2021) https://www.ms2soft.com/resources/michigan-department-of-transportation-nonmotorized-data-collection-and-monitoring-program-guide-and-implementation-plan/
- Guidebook for Developing Pedestrian and Bicycle Performance Measures (FHWA 2016) https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/performance_measures_guidebook.pdf
- Trail User Survey Workbook: How to Conduct a Survey and Win Support for Your Trail (Rails-to-Trails Conservancy 2005) -https://www.railstotrails.org/resourcehandler.ashx?name=trail-user-survey-workbook-how-to-conduct-a-survey-and-win-support-for-your-trail&id=3543&fileName=UserSurveyMethodology.pdf
- Pedestrian and Bicycle Crash Analysis Tool (PBCAT) (PBIC) http://www.pedbikeinfo.org/pbcat_us/
- Guide to Bicycle and Pedestrian Count Programs (Portland State University) https://trec.pdx.edu/sites/default/files/IBPI Guide to Bicycle %26 Pedestrian Count Programs 0.pdf
- Conducting Bicycle and Pedestrian Counts: A Manual for Jurisdictions in Lose Angeles County and Beyond (Southern California Association of Governments) -http://media.metro.net/projects_studies/call_projects/images/metroscag_bikepedcounttrainingmanual.p

- Bicycle and Pedestrian Data Collection Manual (MnDOT) https://www.dot.state.mn.us/research/reports/2017/201703.pdf
- Bicycled and Pedestrian Count Programs: Summary of Practice and Key Resources (PBIC) https://www.pedbikeinfo.org/cms/downloads/PBIC_Infobrief_Counting.pdf

Equity and Inclusion

- The New Movement: Bike Equity Today (The League of American Bicyclists 2014) https://bikeleague.org/sites/default/files/the-new-movement-report-web.pdf
- The Spectrum of Community Engagement to Ownership (Facilitating Power 2019) https://www.facilitatingpower.com/spectrum of community family involvement for education equity
- Why Am I Being Researched? (Chicago Beyond 2018) https://chicagobeyond.org/researchequity/
- Language Justice Toolkit (Communities Creating Healthy Environments 2012) https://nesfp.org/sites/default/files/resources/language justice toolkit.pdf

Community Member Resources

- SeeClickFix https://seeclickfix.com/
- Access Fort Collins https://clients.comcate.com/newrequest.php?id=150
- Fulcrum https://www.fulcrumapp.com/
- A Resident's Guide for Creating Safer Communities for Walking and Biking (FHWA 2015) https://safety.fhwa.dot.gov/ped_bike/ped_cmnity/ped_walkguide/residents_guide2014_final.pdf
- Walk Your Heart to Health: A Step-by-Step Guide to Establishing Walking Groups in Your Community (Healthy Environments Partnership, 2018) -http://www.hepdetroit.org/images/PDFs/WYHH manualtoolkit 5.3.18.pdf

Quick Win and Tactical Urbanism

Quick Builds for Better Streets: A New Project Delivery Model for U.S. Cities (PeopleForBikes 2016) https://b.3cdn.net/bikes/675cdae66d727f8833 kzm6ikutu.pdf

- ➤ Tactical Urbanist's Guide to Materials and Design Version 1.0 (Street Plans Collaborative 2016) https://issuu.com/streetplanscollaborative/docs/tu-guide to materials and design v1
- ➤ The Open Streets Guide (Street Plans Collaborative and Alliance for Biking & Walking 2012) https://issuu.com/streetplanscollaborative/docs/openstreetsproject
- Asphalt Art Guide: How to Reclaim Roadways and Public Infrastructure with Art (Bloomberg Associates 2019) https://issuu.com/streetplanscollaborative/docs/asphalt-art-guide
- Arts, Culture and Transportation: A Creative Placemaking Field Scan (Smart Growth America 2017) https://smartgrowthamerica.org/resources/arts-culture-transportation-creative-placemaking-field-scan/

Infrastructure and Safety Audits

Walking Audits

- Walk Audit Tool Kit and Leader Guide (AARP 2016) https://www.aarp.org/livable-communities/getting-around/info-2014/aarp-walk-audit-tool-kit.html
- Audit Tools [Guidelines, Prompt Lists, Checklists, and more] (PBIC) https://www.pedbikeinfo.org/resources/resources_details.cfm?id=5085
- Sidewalks and Streets Survey: Tips, Tools, and Resources for Organizers (AARP 2017) https://createthegood.aarp.org/content/dam/aarp/ctg/pdf/2019/sidewalks-streets.pdf
- ➤ Tips of Leading a Walk Audit (Mark Fenton 2003) http://markfenton.com/resources/TipsLeadingWalkAuditFenton.pdf
- > Do A Walk Audit: Forms and Templates (Victoria Walks) https://www.victoriawalks.org.au/Walking_audit/
- ➤ How to Conduct a Walk Audit in Your Community Quick Video Guide for Assessing Your Neighborhood Walkability (America Walks) https://americawalks.org/how-to-conduct-a-walk-audit-in-your-community-quick-guide-for-assessing-your-neighborhood-walkability/
- Virtual Walk Audits: The Good, the Bad & the Ugly (Ian Thomas, Project for Public Places 2020) https://www.pps.org/article/virtual-walk-audits-the-good-the-bad-and-the-ugly-of-walkability-accessibility

Road Safety Audits

Pedestrian Road Safety Audit Guidelines and Prompt Lists (FHWA 2020) https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa20042.pdf

Resilience and Response

- Streets for Pandemic Response and Recovery (NACTO 2020) https://nacto.org/wp-content/uploads/2020/09/Streets for Pandemic Response Recovery Full 20-09-24.pdf
- Rethinking Streets During COVID-19: An Evidence-Based Guide to 25 Quick Redesigns for Physical Distancing, Public Use, and Spatial Equity (NITC, SCI, University of Oregon 2021) http://rethinkingstreets.com/
- ➤ Local Actions to Support Walking and Cycling During Social Distancing Dataset (PBIC 2020) http://pedbikeinfo.org/resources/resources_details.cfm?id=5209
- COVID-19 Local Action Tracker (National League of Cities 2020) https://covid19.nlc.org/resources/covid-19-local-action-tracker/?cmp=EMC-DSM-NLC-LC-HOMFAM-202000401 LivableCommunities SC4N 899300 1315603-040120-F4-Covidtracker-Text-CTRL-4474632&encparam=OPoKpRs/Z4yCGK43kJPcejXKSOPCQDeakRRsB1lOSBg13zE/l%2B/8N9MZYr80sGTJ
- COVID-19 Livable Streets Response Strategies (Mike Lydon 2021) https://docs.google.com/spreadsheets/d/1tjam1v0NLUWkYedIa4dVOL49pyWIPIyGwRB0DOnm3Ls/edit#gid =2048567740
- Planning Considerations for Walking and Rolling to School in Fall 2020 (PBIC 2020) http://pedbikeinfo.org/cms/downloads/Planning%20considerations%20for%20walking%20and%20biking %20to%20school%20in%20fall%202020 FINAL.pdf
- Re-envisioning School Streets: Creating More Space for Children and Families (PBIC 2020) http://www.pedbikeinfo.org/cms/downloads/2161 PBIC InfoBrief SchoolStreets.pdf

Local and State Policies and Standards

Elevating Bicycle and Pedestrian Opportunities in Colorado -

- "...the Department shall include the needs of bicyclists and pedestrians in the planning, design, operation and maintenance of transportation facilities as a necessary component of all programs and activities." (CDOT 2017)
 - ➤ Policy Directive 1602.0 https://www.codot.gov/programs/bikeped/documents/1602-0-policy-bike-pedestrian
 - Procedural Directive 1602.1 https://www.codot.gov/programs/bikeped/documents/1602-1-2013-bicycle-and-pedestrian-policy

Larimer County Urban Area Street Standards (LCUASS) (Larimer County 2021) - https://www.larimer.org/engineering/standards-and-guides/urban-area-street-standards

Public Health, Equity, and Climate

> Streetsmart: Evidence and Insight for Healthy Transportation (Research Synthesis and Resource Clearinghouse) - http://www.thinkstreetsmart.org/

Appendix B: Federal and State Funding Opportunities

Table AB-1 indicates potential eligibility for pedestrian and bicycle projects under federal and state programs. Additional restrictions may apply. The list is not comprehensive and each program should be researched further with the context of a given project in mind. Notes on each program are included following the table. Additional funding sources, such as Colorado SB-260 (not passed at the time of ATP adoption) and other public or private grants, should be considered as they become available. NFRMPO staff are available to help local agencies explore grant opportunities further and support the development of applications.

			Table AB-1: Fee	deral an	d Sta	te Pede	estrian a	nd Bicyc	e Fun	ding						
= Func	ls may l	be used	for this activity								s for res	trictions				
		= Eligible, but not competitive unless part of a larger project.														
		Federal and State Sources														
Activity or Project Type	RAISE	<u>TIFIA</u>		CMAQ	<u>HSIP</u>	<u>NHPP</u>	<u>STBG</u>	<u>TA</u>	RTP	SPR & MPL	NHTSA 402	NHTSA 405(h)	<u>SRTS</u>	GOCO		
Controlling Agency	FHWA	FHWA	CDOT, Fort Collins, Loveland, Greeley (see notes)	NFRMPO	СДОТ	FHWA	NFRMPO	NFRMPO & CDOT	CPW	NFRMPO & CDOT	СДОТ	СДОТ	СДОТ	GOCO		
Access enhancements to public transportation (includes benches, bus pads)	•	•	•	•		•	•	•						0		
ADA/504 Self Evaluation / Transition Plan							•	•	•	•						
Bicycle plans			•													
Bicycle helmets (project or training related)							•	• SRTS			•		•			
Bicycle helmets (safety promotion)							•	SRTS			•		•			
Bicycle lanes on road																
Bicycle parking	0	0	•			•			•				•	0		
Bike racks on transit			•													

			Table AB-1: Fe	deral ar	ıd Sta	te Pede	estrian a	nd Bicyc	le Fun	ding				
= Fund	s may b	e used	for this activity								s for res	trictions		
	1		○ = Eligible, b	ut not co	ompet			of a larg tate Sour		ject.				
Activity or Project						Feae	eral and S	tate Sour	ces		NHTSA	NHTSA		
Type	RAISE	TIFIA	<u>FTA</u>	CMAQ	<u>HSIP</u>	NHPP	<u>STBG</u>	<u>TA</u>	RTP	SPR & MPL	402	405(h)	<u>SRTS</u>	GOCO
Bicycle share (capital and equipment; not operations)	•	•	•	•		•	•	•						
Bicycle storage or service centers at transit hubs	0	0	•	•			•	•						
Bridges / overcrossings for pedestrians and/or bicyclists	•	•	•	•	•	•	•	•	•				•	•
Bus shelters and benches	•	•	•	•		•		•						
Coordinator positions (State or local)			•	1 per State			•	SRTS					•	
Crosswalks (new or retrofit)	•	•	•	•	•	•	•	•	•				•	0
Curb cuts and ramps			•	•										0
Counting equipment										•				\circ
Data collection and monitoring for pedestrians and/or bicyclists			•		•	•	•	•	•	•			•	
Historic preservation (pedestrian and bicycle and transit facilities)	•	•	•				•	•						•
Landscaping, streetscaping (pedestrian and/or	0	0	•			•	•	•						0

	Table AB-1: Federal and State Pedestrian and Bicycle Funding													
= Fund	s may b		for this activi								s for res	trictions		
			○ = Eligible,	but not co	mpet	itive un	less part	of a larg	er pro	ject.				
						Fede	ral and S	tate Sour	ces					
Activity or Project Type	RAISE	<u>TIFIA</u>	FTA	CMAQ	<u>HSIP</u>	NHPP	STBG	<u>TA</u>	RTP	SPR & MPL	NHTSA 402	NHTSA 405(h)	<u>SRTS</u>	GOCO
bicycle route; transit access); related amenities (benches, water fountains); generally as part of a larger project Lighting (pedestrian and bicyclist scale associated with														
pedestrian/bicyclist project) Maps (for pedestrians and/or bicyclists)			•	•			•	•		•			•	
Paved shoulders for pedestrian and/or bicyclist use	•	•		0	•	•	•	•					•	
Pedestrian plans Recreational trails	0	0												
Road Diets (pedestrian and bicycle portions)	•	•			•	•	•	•						
Road Safety Assessment for pedestrians and bicyclists					•		•	•		•				
Safety education and awareness activities and programs to inform pedestrians, bicyclists,							SRTS	• SRTS		•	0	•	•	•

Table AB-1: Federal and State Pedestrian and Bicycle Funding ■ = Funds may be used for this activity (restrictions may apply); • = See program-specific notes for restrictions ○ = Eligible, but not competitive unless part of a larger project. **Federal and State Sources Activity or Project** NHTSA NHTSA RAISE TIFIA **SPR & MPL SRTS FTA CMAQ HSIP NHPP STBG** TA **RTP GOCO** 405(h) **402** Type and motorists on ped/bike safety Safety education SRTS lacktriangleSRTS positions Safety enforcement (including police SRTS SRTS patrols) Safety program technical assessment SRTS SRTS (for peds/bicyclists) Separated bicycle lanes Shared use paths / transportation trails Sidewalks (new or retrofit) Signs / signals / signal improvements Signed pedestrian or bicycle routes Spot improvement programs Stormwater impacts related to pedestrian and bicycle projects

•

Traffic calming

Trail bridges

	Table AB-1: Federal and State Pedestrian and Bicycle Funding													
• = Fund	 ■ = Funds may be used for this activity (restrictions may apply);													
		Federal and State Sources												
Activity or Project Type	RAISE	<u>TIFIA</u>	FTA	CMAQ	<u>HSIP</u>	NHPP	<u>STBG</u>	<u>TA</u>	RTP	SPR & MPL	NHTSA 402	NHTSA 405(h)	<u>SRTS</u>	GOCO
Trail construction and maintenance equipment									•					
Trail/highway intersections	•	•		•	•	•	•	•	•				•	•
Trailside and trailhead facilities (includes restrooms and water, but not general park amenities; see guidance)	0	0					•	•	•					•
Training											•			
Training for law enforcement on ped/bicyclist safety laws							SRTS	SRTS				0	•	
Tunnels / crossings for pedestrians and/or bicyclists	•	•	•	•	•	•	•	•	•				•	•

Funding Program Notes

- * RAISE: Rebuilding American Infrastructure with Sustainability and Equity (formerly BUILD and TIGER) Subject to annual appropriations.
- ❖ TIFIA: Transportation Infrastructure Finance and Innovation Act Program offers assistance only in the form of secured loans, loan guarantees, or standby lines of credit, but can be combined with other grant sources, subject to total Federal assistance limitations.
- ❖ FTA: Federal Transit Administration Capital Funds (various programs) Project funded with FTA transit funds must provide access to transit. Bicycle infrastructure plans and projects funded with FTA funds must be within a 3-mile radius of a transit stop or station, or if further than 3 miles, must be within the distance that people could be expected to safely and conveniently bike to use the particular stop or station. Pedestrian infrastructure plans and projects funded with FTA funds must be within a ⅓-mile radius of a transit stop or station, or if further than 1/2 mile, must be within the distance that people could be expected to safely and conveniently walk to use the particular stop or station. FTA funds cannot be used to purchase bicycles for bike share systems. According to the FTA Section 5310 Grant Program, "building an accessible path to a bus stop, including curb-cuts, sidewalks, accessible pedestrian signals, or other accessible features...[and] improving signage, or way-finding technology" are nontraditional eligible projects. FTA encourages grantees to use FHWA funds as a primary source for public right-of-way projects.

The following agencies in the NFRMPO region receive the following FTA funding depending on the location:

CDOT – 5307, 5310, 5339 Fort Collins – 5307, 5310, 5339 Loveland – 5307, 5339 Greeley – 5307

- CMAQ: Congestion Mitigation and Air Quality Improvement Program CMAQ projects must demonstrate emissions reduction and benefit air quality. Several activities may be eligible for CMAQ funds as part of a bicycle and pedestrian-related project, but not as a highway project. CMAQ funds may be used for shared use paths but may not be used for trails that are primarily for recreational use.
- ❖ HSIP: Highway Safety Improvement Program HSIP projects must be consistent with a State's Strategic Highway Safety Plan and either (1) correct or improve a hazardous road location or feature, or (2) address a highway safety problem.
- ❖ NHPP: National Highway Performance Program NHPP projects must benefit National Highway System (NHS) corridors.
- ❖ <u>STBG</u>: Surface Transportation Block Grant Program Activities marked "SRTS" means eligible only as a SRTS project benefiting schools for kindergarten through 8th grade. Bicycle transportation non-construction projects related to safe bicycle use are eligible under STBG (23 U.S.C. 217(a)).
- **★** TA: Transportation Alternatives (formerly Transportation Alternatives Program and Transportation Enhancements) Activities marked "SRTS" means eligible only as a SRTS project benefiting schools for kindergarten through 8th grade. Bicycle transportation non-construction projects related to safe bicycle use ARE NOT eligible under TA (23 U.S.C. 217(a)).
- * RTP: Recreational Trails Program RTP must benefit recreational trails, but for any recreational trail use. The reach of this program can be expand by combining with other federal programs and local funds. For

- example, RTP funds could be combined with FTA Section 5310 funds and local funds to connect a trail to a transit stop.
- SPR & MPL: Statewide Planning and Research (SPR) or Metropolitan Planning (MPL) funds In Colorado, SPR funds are used for planning and research activities at CDOT and with the rural Transportation Planning Regions (TPRs). MPL funds are used for planning and research activities at the MPOs.
- ❖ NHTSA 402: State and Community Highway Safety Grant Program NHTSA 402 project activity must be included in the State's Highway Safety Plan.
- NHTSA 405(h): National Priority Safety Programs (Nonmotorized safety) Subject to State eligibility, application, and award. Project activity must be included in the State's Highway Safety Plan.
- SRTS: Colorado Safe Routes to School Program The Colorado SRTS Program now holds its Call for Projects every two years. Infrastructure projects must include a noninfrastructure/programmatic/education component. Applicants within an MPO must receive a letter of support from the MPO.
- GOCO: Great Outdoors Colorado (various programs) Competitive grant programs for outdoor recreation and land conservation projects funded through the Colorado State Lottery.

Appendix C: Additional Best Practices

This section contains a non-exhaustive list of best practices in active transportation planning, programming, design, and implementation from across the NFRMPO region, the State of Colorado, and the rest of the nation. For agencies considering improvements in these areas, this list is meant to serve as a starting point. NFRMPO staff are available to assist agencies in determining how the best practices could be employed or adapted within the local context. Many other best practices are listed through the ATP and its appendices, including many related to emerging micromobility solutions in **Chapter 3**.

NFRMPO Region

Open Streets Events

Open Streets initiatives have gained popularity across North America over the past decade. At City of Fort Collins Open Streets events participants can expect 1-2 miles of car-free, family-friendly streets. Participants are encouraged to Ride the Route and explore programmed areas called "plazas", temporary hubs of activity provided by local businesses and organizations. The routes generally include attractive neighborhood elements such as parks, and other key destinations like churches, schools, and commercial centers. Open Streets events aim to show participants that travelling by bike, foot, scooter, and other active, car-free



Image credit: City of Fort Collins

transportation modes can be comfortable, easy, and a healthy alternative to driving. Plazas are strategically located throughout the event route to encourage movement along the entire route, although participants can also visit only a portion of the route for a fun-filled, relaxed experience. Each plaza is unique: they could include live music, local food trucks, health and wellness inspired activities, and participant-made art. <u>Learn more</u> here.

Bicycle Safety Stop Ordinance

With the adoption of *Traffic Code Ordinance 1285 - Section 1412.5*, the Town of Berthoud allowed people on standard bikes and e-bikes to treat traffic stop signs as yield signs, and red traffic lights as stop signs when the coast is clear. At a stop sign intersection, if the coast is clear, the person on a bicycle may proceed like they would at a yield sign at a reasonable speed (15 mph or less). At a red stop light, bicyclists must come to a complete stop and then may proceed straight or right if the coast is clear. Learn more here.

Bike and Walk Month

The City of Loveland dedicates the month of June as Bike and Walk Month, spending the month celebrating people walking and biking through various events with partners from across the community. Like many other communities, the pinnacle of the month is Bike to Work Day, held the last Wednesday of the month with dozens of morning and afternoon stations across the local bike network to encourage riders.

Trail Authorities

There are currently two trail management authorities/organizations operating in the NFRMPO region, the <u>Great Western Trail Authority</u> (GWTA) and <u>Poudre River Trail, Inc.</u> (PRT, Inc.). The GWTA is a local government entity, created by an Intergovernmental Agreement (IGA) between the towns of Windsor, Severance & Eaton to accept the donation of the abandoned Great Western Railway. The GWTA has a nine-member board and one staff member. The GWTA is responsible for managing, improving, and telling the story of the trail. The GWTA has also been very successful in securing grant funds for improvements to the trail.

PRT, Inc. is a local non-profit organization, managed by a local board comprised of representatives from Greeley, Windsor, and Weld County. The board operates under the direction of those community representatives and an intergovernmental agreement allowing the support of professional staff from the City of Greeley, Weld County, and the Town of Windsor. Together they form a community partnership that maintains and improves the trail, serving similar roles to the GWTA.

Sidewalk Improvement Prioritization

The City of Fort Collins has developed a detailed citywide inventory of sidewalks and other pedestrian facilities. To prioritize improvements or additions to this network, the City evaluates needs using a combination of demand (35 percent), health and equity (20 percent), and safety (45 percent). Each of these categories is broken into several subcategories based on available socioeconomic and infrastructure data. The scores and maps produced help City staff evaluate prioritization and other implementation considerations. Learn more here.



Intersection / Facility Focus Surveys

The Bike Fort Collins organization has sent out surveys to the general public to gather feedback on user experiences and suggestions for bike-related improvements at various on-road locations around the community. The information gathered has been presented to the Fort Collins Bicycle Advisory Committee and Transportation Board, helping improve dialogue about known problem areas around the community. <u>Learn more here.</u>

Walk and Bike Audits

In Northern Colorado, the NoCo Bike & Ped Collaborative (NoCo) has been a leader in conducting walking audits in various communities. Walk and bike audits can be conducted a variety of ways and are a great tool for engaging local leaders and community members in identifying problem areas and assessing patterns that promote or inhibit walkability or bikeability. Additionally, participants should have an opportunity debrief as a team and identify potential short-, medium-, and long-term solutions that fit the local context. Various walk and safety audit resources are referenced in **Appendix A.**



Above: Participants navigate the sidewalk network around Old Town Berthoud in a 2019 Walk Audit

2015 NoCo Bike & Walk Conference

Over 130 planners, engineers, public officials, and active transportation enthusiasts attended the Northern Colorado Bike and Walk Conference at the University of Northern Colorado (UNC) in Greeley on November 5, 2015. Keynote speaker and Active Transportation Consultant, Mark Fenton, kicked off the conference by making the case for healthy community design as an economic driver. The Colorado Department of Transportation (CDOT) Executive Director Shailen Bhatt described some of the CDOT's initiatives before introducing Governor John Hickenlooper. Governor Hickenlooper touched on personal memories of bicycling, the correlation between economic growth and bike-related spending, and addressed concerns regarding backlash from government spending on bicycle and pedestrian infrastructure.

After a networking lunch, groups formed to participate in a neighborhood walking audit or breakout sessions. A walking audit is an assessment of existing pedestrian infrastructure with consideration for pedestrian comfort, accessibility, and future improvement opportunities. The first breakout session discussed transportation funding for bicycle and pedestrian projects. The second breakout session allowed communities in the region to describe successful recent bicycle and pedestrian projects. CDOT Deputy Director, Michael Lewis wrapped up the conference with final thoughts on the future of bicycle and pedestrian initiatives in Colorado. Learn more here.



Above: Mark Fenton addresses attendees of the 2015 NoCo Bike & Walk Conference at UNC in Greeley.

Image credit: City of Fort Collins

On-Road Bicycle Safety Signage

Larimer County and CDOT Region 4 are in the process of identifying priority locations to install "State Law: Motorists Must Give 3-FT Clearance" signs across the region. They agencies have worked closely with Bike Fort Collins, Your Group Ride, the Scott Ellis Memorial Fund, and other leaders to identify high-priority locations, including locations that currently have "Share the Road" signage that can have varying interpretations. The effort will culminate in up to 80+ new signs on state highways and county roads, and in part has inspired Bicycle Colorado's 2021 legislative agenda. Other local agencies have joined the discussion. Many of the signs may be installed as a permanent solution where topography or other physical constraints limit other improvements. Some signs will be installed temporarily as a short-term solution until other infrastructure improvements can be made. Other signs will simply replace existing "Share the Road" signage. **Chapter 3** includes a map of the locations that have been identified as of May 2021.



Above: Bicycle safety signage installed in 2021 in rural Larimer County. Image credit: Your Group Ride.

Nighttime/Full Moon Bike Rides

Communities like Greeley, Windsor, Brighton, and Broomfield have organized and hosted nighttime and/or full moon bike rides. The events encourage and promote safe bike riding practice after dusk in a semi-controlled, group setting. Participants meet at a designated location and navigate a low-stress bike route.

Safe Routes to School (SRTS)

The City of Fort Collins' Safe Routes to School (SRTS) program works with strategic partners such as Poudre School District and Bike Fort Collins to increase the number of students safely walking, bicycling and taking the bus to school. Whether through bicycle and pedestrian safety classes, improved sidewalks and bike lanes, or enforcing school-zone speed limits and other "traffic calming" in school areas, the City has dedicated annual funding to promote walking, bicycling or taking the bus as a great option for children. Learn more here.



Image credit: City of Fort Collins

Bicycle Ambassador Program

The City of Fort Collins operates a Bicycle Ambassador Program consisting of a group of community members in Northern Colorado who work to get more people on bicycles and educate community members to make the roadways safe and comfortable for all users. Ambassadors teach classes, educate community members at events, report infrastructure opportunities, serve as "bike buddies" to interested, but concerned riders, and lead by example by riding safely and legally.



Image credit: City of Fort Collins

Developer Requirements for Trail Construction or Improvement

Town of Timnath Land Use Code Section 5.7.6-D states "Developers must provide trails in all areas designated on the Town Parks, Recreation, Open Space and Trails Plan Map as well as connections to any portion of the Town's trail system and other destinations within neighborhoods." Within the Town's 2020 Comprehensive Plan, the minimum and preferred trail widths have been updated to specify that "Community trails will have a minimum 10-foot trail width and a preferred corridor width of 50 feet. The Front Range and Poudre River trails are regional trails that serves as community trail. However, it may have a 12-foot width to accommodate a larger volume of users, additional amenities, and different signage. For Community Trails - 12 feet ideal; 10 feet minimum. Parallel 3-foot jogging path, and where appropriate, may include equestrian path."

In 2021, the Town of Severance enacted Pavement Requirements for the Great Western Trail through an update to *Town Land Use Code Section 16.6.10.12. – Connectivity*. The update states, "Pedestrian connectivity within and adjacent to the subdivision is highly encouraged. Each development shall provide a combination of trails, sidewalks or widened streets to accomplish connectivity. Off-street pedestrian linkage can be accomplished with the use of open greenways and drainage conveyance corridors with meandering trails or paths. Refer to Typical Subdivision Layout for examples. Each subdivision must contain a twenty (20)-foot minimum perimeter landscape buffer with a minimum six (6)-foot-wide community pathway. Where a subdivision either borders or includes portions of the Great Western Trail the developer will be required to pave the trail with a minimum 10' concrete cross section for the entirety of the trail within or adjacent to the property. Sidewalks adjacent to all school sites and parks require a minimum width of five (5) feet or wider. Projects shall connect to Severance trail network whether that be through newly dedicated neighborhood trails or connections to a previously establish Severance trail network."

The City of Fort Collins has a <u>Transportation Capital Expansion (TCEF) Program</u>. The TCEF Program collects fees from new development that are ultimately used to support projects which increase the carrying capacity of the transportation system. The TCEF Program is plan-based, referencing various City plans to determine project and funding priorities. The following plans influence how the program prioritizes projects: *Master Street Plan, City Plan, Bicycle Plan Fort Collins, Pedestrian Plan.*

Multimodal Index (MMI)

The Multimodal Index (MMI) tool currently exists for the Loveland and Fort Collins Growth Management Areas (GMAs). The MMI identifies and quantifies areas with inadequate access to safe active transportation modes

like bicycling, walking, and riding the bus. It is a compilation of data that uses 11 indicators split between three categories: Health Equity, Crash data, and Proximity to Active Transportation. The MMI was developed through a multi-agency partnership spearheaded by the Larimer County Department of Health and Environment's

(LCDHE) Built Environment Program. A replicable methodology was developed for updating and expanding the MMI using publicly available data. NFRMPO staff should work with the LCDHE and other local agencies to update the MMI, expand it to incorporate all NFRMPO communities, and explore potential applications of the tool such as the Call for Projects, the TIP, performance measurement, and the Regional Travel Demand Model (RTDM). The MMI tool can be adjusted and disaggregated for specific geographies and indicator combinations. The Weld County Department of Public Health and Environment (WCDPHE) will be an important partner for expanding the tool in a useful way to Weld County communities. Additionally, regular updates to NFRMPO datasets such as geocoded crash data, bicycle and pedestrian infrastructure GIS data, and the RTDM will provide important inputs for the MMI.

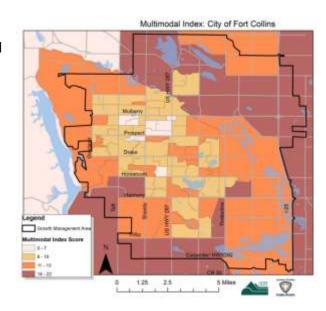


Image credit: Larimer County.

Elsewhere in Colorado

"20 is Plenty" Initiatives

Cities across the globe have begun evaluating the feasibility of lower speed limits in residential areas and areas with a high presence of active modes. In June 2020 in the City of Boulder, all speed limits on residential, local streets (70 percent of all streets) were lowered from 25 mph to 20 mph. The default speed limit in Boulder where no signs are posted was also lowered to 20 mph. The speed limit was changed at a total of 465 locations and Vision Zero 20 mph signs were installed across the community. Various studies from the United Kingdom suggest speed limits of 20 mph in residential areas reduce fatalities by 20 percent and 40 percent on arterial streets. In 2018, the World Health Organization cited speed limits of 20 mph a global best practice.



Credit: GoBoulder

⁴⁰ Schmitt, Angie. (2020). *Right of Way: Race, Class, and the Silent Epidemic of Pedestrian Deaths in America* (p. 142). Island Press.

⁴¹ World Health Organization, "Global Status Report on Road Safety 2018," June 17, 2018.

Analysis suggest the largest impacts in driver behavior from these speed limit changes is in the percentage reduction of vehicles traveling over 30 and 35 mph.⁴²

Variable "when flashing" 20 mph speed limits are already used commonly along arterial roadways within designated school zones at certain time periods across the NFRMPO region. 20 mph speed limits may be appropriate for more local roadways that are adjacent to parks, community centers, retirement communities, business districts, and other areas with high rates of bike and pedestrian traffic by vulnerable users.

Regional Complete Streets Toolkit

The Denver Regional Council of Governments (DRCOG) is currently working to develop a <u>Regional Complete Streets Toolkit</u> for the Denver region. Complete Streets are safe, context-sensitive, inclusive, equitable and flexible, and the Complete Streets approach gives pedestrians, cyclists, transit riders and other multimodal travelers the same access to safe comfortable streets as motor vehicles.

The toolkit will provide guidance for local governments to plan, design, and implement Complete Streets. It will provide strategies and give support to decision makers, planners, and designers to ensure that multimodal elements are incorporated into transportation projects. The toolkit will also:

- Support connectivity and the development of a safe and comfortable transportation network for all modes and all users.
- Promote the use of the latest design criteria and guidelines for multimodal facilities.
- Establish a vision for how local governments could adopt and apply a Complete Streets policy.
- Develop a multimodal street design typology to supplement the traditional functional classification system by identifying design elements linked to all modes of travel.
- Develop a Complete Streets toolkit to create awareness and provide guidance on a variety of street design measures available to local jurisdictions in planning and engineering safe and comfortable Complete Streets for all users of the regional transportation system.

⁴² Monsere, Mothuri, and Anderson. (2020). <u>Effect of Residential Street Speed Limit Reduction from 25 to 20 mi/hr on Driving Speeds in Portland, Oregon</u>. Portland State University.

Tactical Urbanism as Public Engagement

In redesigning Beaver Creek Boulevard to be a more bicycle and pedestrian-friendly corridor, the Town of Avon installed a temporary, mock-up installation and invited community members to test and engage with the design and provide feedback on their experience. The Town used signage, walking tours, public meetings, emails, and digital voting to help guide the final build design. The outreach was targeted to end users of the corridor living and working in the area. Users evaluated the installation and other alternative strategies. Favored elements and recommendations from users were then carried forward into the final design. These elements were highlighted and communicated back to participants to emphasize the impact of their involvement and inspire ownership in future projects. Learn more here.



Image credit: Town of Avon

Small Project Grants

State agencies such as CDOT and CDPHE have recently increased their focus on financially assisting communities to create and enhance safe spaces to bike and walk. In response to the COVID-19 pandemic, CDOT launched the Revitalizing Main Streets program intended to help communities across the state implement transportation-related projects that improve safety and yield long-term benefits to community main streets. Awards could be up to \$150,000 or \$2M depending on the grant opportunity for projects supporting communities as they find innovative ways to reuse public spaces and help businesses reopen safely, while improving multimodal safety and accessibility along urban arterials. Agencies such as the City of Fort Collins, City of Loveland, and CSU were awarded funding.

In 2020, CDPHE identified Northern Colorado as a focus area for implementing quick win (short-term) bikeability and walkability projects under \$5,000. Staff from CDPHE, Weld County Department of Public Health and Environment (WCDPHE), and Larimer County Department of Health and Environment (LCDHE) worked together to identify projects across seven communities (six in the NFRMPO region) that could create "quick win" improvements for active modes. The recipients included Berthoud, Greeley, Great Western Trail Authority (GWTA), Loveland, Milliken, Severance, and Wellington. The project includes fencing for limiting trail access, wayfinding to parks, painted curb extensions, bicycle repair stations, "Bike May Use Full Lane" signage, trailhead enhancements, and trail surface improvements. CDPHE shifts its focus to a new region of the state each year.



Snapshots before and after the trail access improvements along the Great Western Trail near downtown Severance

Active Transportation Challenge

In September 2020, the NFRMPO partnered with the City of Greeley, City of Loveland, and Town of Estes Park on an initiative to encourage Northern Coloradans to try an alternative mode of transportation. Participants in the NoCo Active Transportation Challenge took the #SwitchATrip Pledge to switch one car trip to a bike, bus, or walk trip during the week of September 20-26. 112 people across 13 communities took the Pledge for exercise, to improve air quality, or just to have fun. Greeley came in first place with the most participants, trips, and total miles switched. 55 of the participants responded to a follow-up survey, reporting a total of 138 car trips switched to an active transportation mode. These trips



saved an estimated 786 vehicle miles traveled (VMT) across the week. Over half of these respondents stated they are now more likely to bike, bus, or walk more often. Several prizes that were donated and distributed to participants randomly via a drawing, including transit passes and vouchers, gift cards, merchandise, and other small items.

Across the United States

Active Transportation GIS Data Resources

The Wasatch Front Regional Council hosts a series of online maps and other information resources that can be used to inform not only cyclists and pedestrians, but also those tasked with planning and securing funding for

future bike lanes, shared use paths and safe, connected routes. The dataset includes maps on existing features, planned features, the future active transportation network, bike and pedestrian demand, network quality, and links to local plans. <u>Learn more here.</u>

Support Walking and Cycling During Social Distancing

Through an online <u>Local Actions to Support Walking and Cycling During Social Distancing Dataset</u>, the Pedestrian and Bicycle Information Center (PBIC) tracks immediate community actions that show adaptation to changing demands on public space in response to COVID-19. It is also used as a reference for communities looking for examples from other cities on ways to create safe spaces for social distancing. The data is crowdsourced and increases knowledge of what efforts have been successfully deployed around the nation.

The dataset is open-access and all are encouraged to submit information about their communities' efforts to rebalance streets for walking, biking, and other forms of travel while promoting social distancing.

Parklets

Parklets are a conversion of underutilized or excess roadway into public plazas for gathering, resting, socializing, and more. Parklets can also be used to provide outdoor seating for restaurants, additional bike parking, public benches and tables, important tourist information, publicly available shade or temporary shelter, and much more. Through its Pavement to Parks Program, – San Luis Obispo (SLO) County offers up to \$300 to help cover the cost of plants, paint, chairs, lighting, etc. to set up a parklet, with design and marketing assistance, as well as prizes of up to \$1,000.



Above: An example of an interactive parklet in Boise, ID. Image credit: Idaho Walk Bike Alliance

National Park(ing) Day is an annual event promoted by the American Society of Landscape Architects (ASLA) that

encourages landscape architects, community members, and students to transform metered parking spaces into temporary parklets.

Safe Streets Summit

The Broward MPO created this event in 2014 to bring policymakers, technical staff and interested parties to the table and start a conversation on taking completed streets projects from planning through implementation. The Summit expanded in 2017 to include the MPO's counterparts, Miami-Dade Transportation Planning Organization (TPO) and Palm Beach Transportation Planning Agency (TPA), to emphasize the importance of partnerships in creating a safe and accessible transportation system for all users region-wide. The Safe Streets Summit focuses on promoting and creating healthier, safer, and more vibrant communities by encouraging

and building the necessary skills to implement Complete Streets throughout the South Florida region. It attracts attendees and participants from across the nation. <u>Learn more here.</u>

Appendix D: Crash Analysis

The crashes analyzed in this section include crashes involving a bicycle or pedestrian on the roadway network between 2015-2019. This dataset only includes crashes reported to the State of Colorado by law enforcement. Many bicycle and pedestrian crashes are not reported to law enforcement but may be in hospital or urgent care records if injuries resulted in treatment. Future efforts to analyze crash data should include efforts to collect any available information from health care providers.

Regionwide information presented in this section includes analysis of overall bicycle and pedestrian crash trends related to the characteristics of crashes as reported by law enforcement on the incident forms. Information reported by those involved in the crash is often lopsided. In crashes between a bicycle or pedestrian and a motor vehicle, the bicyclist or pedestrian is more likely than the driver to be in shock, flustered, injured, incapacitated, or killed. These factors affect what details are recounted and recorded.⁴³

NFRMPO staff are available to assist local agencies with further analysis of crash data.

Corridor Analysis

2015-2019 crashes were analyzed on portions of every Regionally Significant Corridor (RSC) as well as corridors with discernable concentrations of bike- or pedestrian-involved crashes upon a visual scan of the geocoded crashes. A total of 69 corridors were analyzed (Listed in **Table AD-2**), representing just 7.6 percent (approximately 230 miles) of the road centerline miles in the NFRMPO region. **Table AD-1** shows a crash summary on these corridors.

Table AD-1: Crash summary across 69 roadway corridors, 2015-2019										
	Pedestria	n-Involved	Bike-In	volved	All Other					
	Crashes	Fatalities and Serious Injuries	Crashes	Fatalities and Serious Injuries	Crashes	Fatalities and Serious Injuries				
Total	952	91	818	59	27,371	486				
Percent of Crashes in	77.8	68.9	83.0	76.6	55.9	36.1				
NFRMPO Region	percent	percent	percent	percent	percent	percent				

Table AD-1 demonstrates that a disproportionate number of pedestrian- or bike-involved fatality or serious injury (FSI) crashes and crashes overall are occurring on this small portion of the overall roadway network. Many of these 69 roadways have shared characteristics to one that may be contributing to safety issues. When looking at the 230 miles of analyzed corridors:

• 63 percent of the analyzed corridors had a 2017 Average Daily Traffic (ADT) above 10,000 vehicles

⁴³ Schmitt, Angie. (2020). *Right of Way: Race, Class, and the Silent Epidemic of Pedestrian Deaths in America* (p. 54). Island Press.

- 58 percent of the analyzed corridors had 4 or more vehicle travel lanes
- 74 percent of the analyzed corridors had speed limits of 35 mph of higher

These corridors are comprised mainly of high volume, high speed, and wide roadways. Although robust bicycle and pedestrian count data is not available, it can reasonably be assumed that the majority of bicycle or pedestrian miles are not on this network, further emphasizing the safety disparities between major roadways compared with neighborhood streets. **Figure AD-1** shows the 69 corridors analyzed, overlaid with pedestrian-and bike-involved crashes.

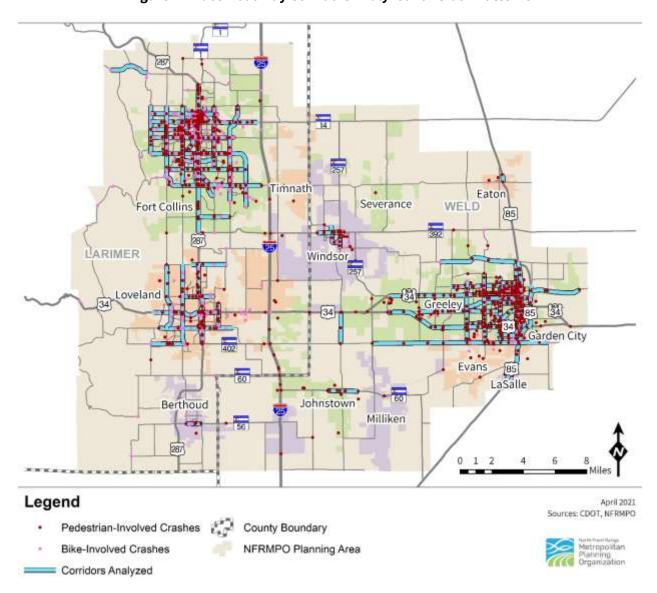


Figure AD-1: 69 Roadway Corridors Analyzed for Crash Patterns

High Crash Corridors

These corridors represent the roads where the highest total number of bike- or pedestrian-involved crashes or FSI crashes are occurring, or where they are the highest as a percentage of all crashes or FSI crashes on that

specific corridor. These corridors are not normalized by length and were identified based on a visual scan of crash concentrations. These corridors do not reflect crash rates, such as "hot spots" where crash rates are higher than expected based on bicycle and pedestrian volumes, motor vehicle volumes, or other characteristics of the roadway or are travel patterns. Corridors are identified in **Table AD-2** and **Figure AD-2** as high crash corridors if they are in the Top 5 for the following metrics, measured using all crashes between 2015-2019:

- Total bike- or pedestrian involved crashes
- Total bike- or pedestrian involved crashes resulting in a fatality or serious injury (FSI)
- Bike- or pedestrian-involved crashes as a percentage of all crashes (minimum 10 bike or ped crashes)
- Bike- or pedestrian-involved FSI crashes as a percentage of all FSI (persons minimum 2 FSI)

Table AD-2: NFRMPO High C	rash Pedestr	ian- and I	Bike-Involved Corridors, 2015-2019
Corridor Name	Crash Type	Mileage	Extents (N-S, W-E)
11 th Ave (Greeley and Evans)	Ped	5.1	O St to 37 th St
16 th St (Greeley)	Ped	3.5	47 th Ave to 8 th Ave / Bus. US85
23 rd Ave (Greeley and Evans)	Ped	4.1	C St to 47 th Ave
29 th St (Loveland)	Bike & Ped	2.0	Taft Ave to Madison Ave
7 th St (Windsor)	Ped	1.0	SH2392 to Eastman Park Dr
Boise Ave (Loveland)	Bike	1.6	Silver Leaf Dr to 1st St
Center Place Dr (Greeley)	Ped	1.1	47 th Ave to 35 th Ave
College Ave / US287 (Fort Collins)	Bike & Ped	9.4	SH1 to Carpenter Rd / SH392
Drake Rd (Fort Collins)	Bike & Ped	5.0	Overland Trail to Timberline Rd
E 20 th St (Greeley)	Ped	0.9	14 th Ave to 4 th Ave
Harmony Rd (Fort Collins)	Ped	6.3	Taft Hill Rd to Strauss Cabin Rd
Horsetooth Rd (Fort Collins)	Bike	5.0	Taft Hill Rd to Ziegler Rd
Lake St (Fort Collins)	Bike	1.2	Shields St to Mathews St
LaPorte Ave (Fort Collins)	Ped	3.0	Taft Hill Rd to College Ave / US287
Loomis/Meridian (Fort Collins)	Bike	0.7	Mountain Ave to North Dr
Mason St/Tr (Fort Collins)	Bike	1.7	Cherry St to Prospect Rd
Mulberry St (For Collins)	Ped	3.7	Overland Trail to Riverside Dr
Overland Tr (Fort Collins)	Bike	3.0	Vine Dr to Drake Rd
Pitkin St (Fort Collins)	Bike	1.1	Shields St to Remington St
Plum/North (Fort Collins)	Bike	0.7	City Park Ave to Meridian Ave
Remington St (Fort Collins)	Bike & Ped	1.7	Mountain Ave to Spring Park Dr
Shields St (Fort Collins)	Bike	5.0	Vine Dr to Harmony Rd
Timberline (Fort Collins)	Bike	6.2	Vine Dr to Kechter Rd
US287 (Loveland)	Ped	6.8	57 th St to SH402
W 20th St (Greeley)	Bike	5.1	83 rd Ave to 23 rd Ave
W Business US34 (Greeley)	Ped	9.8	Promontory Pkwy to 8 th St / Bus. US85
W Elizabeth (Fort Collins)	Bike	2.0	Overland Trail to Shields St
Prospect Rd (Fort Collins)	Bike	5.3	Overland Trail to Prospect Park Way
Ziegler Rd (Fort Collins)	Ped	4.2	Timberline Rd to Trilby Road

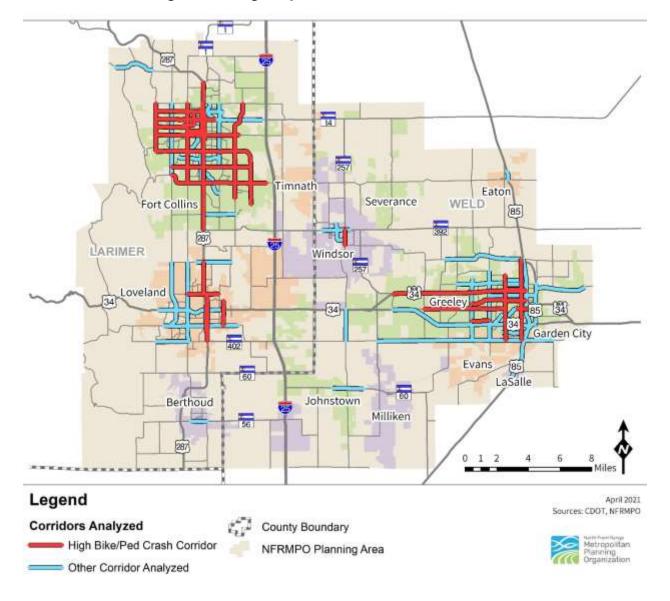


Figure AD-2: High Bicycle and Pedestrian Crash Network

Pedestrian-Involved (PI) Crashes

Table AD-3: Top Corridors fo	r Pedestri	an-Involved Crashes (Totals), 2015-201	.9			
Total Pedestrian-Involved Cras	nes	Total FSI in Pedestrian-Involved Crashes				
Rank	Crashes	washan Bank				
Ralik	Crasiles	Rank	(Persons)			
1. College Ave / US287 (Fort Collins)	103	1. College Ave / US287 (Fort Collins)	12			
2. W Bus. US34 (Greeley)	92	2. US287 (Loveland)	10			
3. 11 th Ave (Greeley and Evans)	61	3. Harmony Rd (Fort Collins)	7			
4. 23 rd Ave (Greeley and Evans)	52	4. 29th St (Loveland)	6			
5. US34 (Greeley)	50	5. Drake Rd (Fort Collins)	6			

Table AD-4-: Top Corrid	ors for Pe	destrian-Ir	volved Crashes (Percentage	s), 2015-20	19		
Pedestrian-Involved Crashes as	s a Percent	FSI in Pedestrian-Involved Crashes as a					
Crashes		Percentage of	f All FSI				
Rank	Percent-	Crashes	Rank	Percent-	FSI		
Rank	age	Crasiles	Ralik	age	(Persons)		
1. 16th St (Greeley)	7.0	34	1. LaPorte Ave (Fort Collins)	66.7	4		
2. Remington St (Fort Collins)	6.8	15	2. 7th St (Windsor)	50.0	8		
3. E 20th St (Greeley)	6.5	10	3. Mulberry St (For Collins)	44.4	26		
4. 11th Ave (Greeley and Evans)	6.2	61	4. 23rd Ave (Greeley and	37.5	52		
5. Center Place Dr (Greeley)	5.9	14	Evans)				
			5. Ziegler Rd (Fort Collins)	37.5	7		

Bike-Involved Crashes

Table AD-5: Top Corrido	rs for Bike-Ir	nvolved Crashes (Totals), 2015-20	19		
Total Bike-Involved Crashe	es	Total FSI in Bike-Involved Crashes			
Rank	Crashes	Rank	FSI (Parsons)		
			(Persons)		
1. US287 (Fort Collins)	82	US287 (Fort Collins)	9		
2. Shields (Fort Collins)	80	Shields (Fort Collins)	5		
3. Drake Rd (Fort Collins)	59	Horsetooth Rd (Fort Collins)	5		
4. Timberline (Fort Collins)	49	29th St (Loveland)	3		
5. W Prospect Rd (Fort Collins)	45	Timberline (Fort Collins)	3		

Table AD-6: Top Coi	ridors for I	Bike-Invol	ved Crashes (Percentages), 2	015-2019		
Bike-Involved Crashes as a	Percentag	FSI in Bike-Involved Crashe	s as a Per	centage of		
Crashes		All FSI				
Rank	Percent-	Crashes	Rank	Percent	FSI	
Ralik	age	Crasiles	Ralik	-age	(Persons)	
1. Loomis/Meridian (Fort	18.5	10	1. Plum/North (Fort Collins)	66.7	2	
Collins)			2. Mason St/Tr (Fort	50.0	2	
2. Pitkin St (Fort Collins)	18.0	18	Collins)			
3. Remington St (Fort Collins)	10.8	24	3. Overland Tr (Fort Collins)	50.0	2	
4. Lake St (Fort Collins)	10.6	13	4. Boise Ave (Loveland)	50.0	2	
5. W Elizabeth (Fort Collins)	8.4	31	5. W 20th St (Greeley)	33.3	2	

Other Spatial Analysis

This section includes additional spatial analysis of crashes unrelated to roadway corridors. The geographic areas included are representative of point locations, Census Blocks, and/or Census Block Groups that are significant for various planning purposes.

Activity Centers

For the 2045 Regional Transportation Plan, 21 activity centers were identified, including higher education main campuses, all major medical centers, regional airports, major business and industrial parks, central business districts, and other and major commercial centers. Within ¼ mile of the activity centers:

- 47 percent (571) of all pedestrian-involved crashes occurred;
 - o 39 percent (51) of pedestrian-involved fatalities or serious injuries occurred;
- 50 percent (496) of all bike-involved crashes occurred; and,
 - o 32 percent (25) of bike-involved fatalities or serious injuries occurred.

University Campuses

Two specific activity centers with some of the highest rates of walking and bicycling are the Colorado State University (CSU) and University of Northern Colorado (UNC) main campuses in Fort Collins and Greeley, respectively. Within ¼ mile of the CSU and UNC main campuses:

- 13 percent (159) of all pedestrian-involved crashes occurred;
 - o 10 percent (13) of pedestrian-involved fatalities or serious injuries occurred;
- 16 percent (158) of all bike-involved crashes occurred; and,
 - o 10 percent (8) of bike-involved fatalities or serious injuries occurred.

K-12 Schools

Many K-12 students across the NFRMPO region bike or walk to school. Although some schools are not located in particularly pedestrian- or bicycle-friendly areas, many students have no other choice. The benefits of biking or walking to school include lower transportation costs for school districts and families, reduced student absences and tardiness, healthier students, improved academic performance, fewer asthma attacks, and

more.⁴⁴ These benefits, however, cannot be realized if safe walking and biking conditions do not exist around the school. Within ¼ mile of K-12 schools in the NFRMPO region:

- 32 percent (391) of all pedestrian-involved crashes occurred;
 - o 23 percent (31) of pedestrian-involved fatalities or serious injuries occurred;
- 24 percent (238) of all bike-involved crashes occurred; and,
 - o 19 percent (15) of bike-involved fatalities or serious injuries occurred.

Transit Stops

Transit stops are most commonly accessed as a pedestrian, and often as a cyclist. For individuals who do not have access to a vehicle and rely on transit, their safety is dependent on the quality of the bicycle and pedestrian infrastructure leading to and from transit stops. Within ¼ mile of transit stops within the NFRMPO region:

- 57 percent (701) of all pedestrian-involved crashes occurred;
 - o 54 percent (71) of pedestrian-involved fatalities or serious injuries occurred;
- 66 percent (650) of all bike-involved crashes occurred; and,
 - o 52 percent (40) of bike-involved fatalities or serious injuries occurred.

Environmental Justice (EJ) Areas

Approximately 46 percent of the NFRMPO population lives in EJ areas, according to 2014-2018 five-year estimates from the American Community Survey (ACS) and 2016-2017 estimates from the Colorado State Demography Office (SDO). EJ Areas were analyzed with a 100-foot buffer to capture the road right-of-way along their borders. Within 100 feet of EJ Areas:

- 82 percent (1,003) of all pedestrian-involved crashes occurred;
 - o 75 percent (99) of pedestrian-involved fatalities or serious injuries occurred;
- 80 percent (786) of all bike-involved crashes occurred; and,
 - o 74 percent (57) of bike-involved fatalities or serious injuries occurred.

Crash Characteristics, Conditions, and Contributing Factors

Certain crash attributes reported within the original dataset were selected for further analysis. A few of these attributes are reported below. Certain attributes such as age cannot be reliably summarized due to how missing values are coded in the crash database. Other attributes may warrant further analysis.

Alcohol or Drugs Suspected

Crashes in which alcohol or drugs are suspected tend to be deadlier in pedestrian- and bike-involved crashes than in all other crashes. **Table AD-7** illustrates the percentage of crashes resulting in a death or serious injury in which alcohol or drugs was suspected by someone involved in the crash.

⁴⁴ "Benefits of Safe Routes to Schools, Sage Routes Partnership (2020). https://www.saferoutespartnership.org/safe-routes-school/101/benefits

Table AD-7: Fatality and Serious Injury Rates based on Suspected Alcohol or Drug Use									
Criterion	No Alcohol	or drugs su	spected	Alcohol or drugs suspected					
Criterion	Pedestrian-	Bike-	All	Pedestrian-	Bike-	All			
	Involved	Involved	Other	Involved	Involved	Other			
Percent of crashes resulting	0 parcent	7	1	20 percent	27	7			
in a fatality or serious injury	8 percent	percent	percent	29 percent	percent	percent			

Month

Travel mode decisions are often dependent on time of year and weather patterns. Biking is more common in warmer weather months. Although this is true to some extent for pedestrian activity, nearly all trips involve some amount of time as a pedestrian, regardless of season. **Figure AD-3** illustrates that bike-involved fatalities and serious injuries are most common in the warmest months (May-August) and pedestrian-involved fatalities are more evenly distributed, with peaks across different seasons. All other crashes are more evenly distributed, with a small peak during summer months.

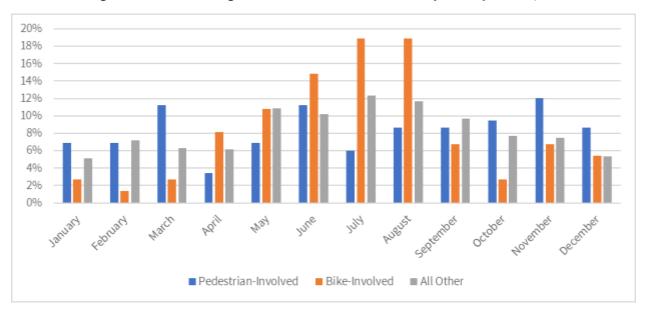


Figure AD-3: Percentage of All Fatalities and Serious Injuries by Month, 2015-2019

Roadway and Weather Conditions

Bike-involved crashes and fatalities or serious injuries are more common in fair or dry roadway or weather conditions than for pedestrian-involved and all other crashes.

Table AD-8	Table AD-8: Crashes by Roadway and Weather Conditions, 2015-2019											
	Perce	entage of Cra	shes	Percentage o	Percentage of Fatalities or Serious Injuries							
Road Surface Condition	Pedestrian- Bike- All Oth Involved		All Other	Pedestrian- Involved	Bike- Involved	All Other						
Dry	87 percent	94 percent	84 percent	91 percent	100 percent	89 percent						
Other (Wet, Muddy, Snowy, Icy, Slushy, etc.)	13 percent	6 percent	16 percent	9 percent	0 percent	11 percent						
Weather Conditions	Pedestrian- Involved	Bike- Involved	All Other	Pedestrian- Involved	Bike- Involved	All Other						
Fair	91 percent	95 percent	89 percent	95 percent	100 percent	92 percent						
Other (Rain, snow, sleet, hail, fog, dust, wind)	9 percent	5 percent	11 percent	5 percent	0 percent	8 percent						

Human Contributing Factor

Human error is the most common reason for any type of crash. Specific conditions, actions, or impairments can often be identified as contributing factors to the crash. Although a contributing factor may not necessarily be the main reason for the crash, it can offer insight into the behaviors or actions that most often contribute a specific type of crash. **Table AD-9** highlights the top human contributing factors in pedestrian- or bike-involved crashes that resulted in a fatality or serious injury.

Contributing factors such as cell phone distraction are underreported because drivers are unlikely to admit to the action unless caught. In 2019, only 26 percent of Larimer County adults under age 44 reported never texting and driving, compared to 50 percent of those age 45-64 and 82 percent of those 65 or older. Although adults admit to cell phone use, 78 percent support policies that would restrict the use of handheld cell phones while driving.

Tab	Table AD-9 Top Three Human Contributing Factors in Crashes Resulting in a Fatality or Serious Injury, 2015-2019											
	Pedestrian-Involv	ed	Bike-Involved		All Other							
Rank	Contributing Percent of All FSI		Human Contributing Factor	ot ΔII		Percent of All FSI						
1	Distracted/Other i.e., Food, Objects, Pets	16 percent	DUI, DWAI, PUID	20 percent	DUI, DWAI, PUID	27 percent						
2	DUI, DWAI, PUID	14 percent	Driver Inexperience	11 percent	Aggressive Driving	12 percent						
3	Driver Inexperience	12 percent	(TIE) Aggressive Driving; Distracted/Other i.e., Food, Objects, Pets	7 percent (each)	Driver Inexperience	10 percent						
	Other (without narrative)	43 percent	Other (without narrative)	43 percent	Other (without narrative)	17 percent						

Driver Action

Certain actions by drivers may be more common with different types of crashes; however, in many cases a specific driver action may not be identified. This is especially true in pedestrian- or bike-involved crashes that result in a serious injury or fatality. In these crashes, the victim may either be in a state of shock or too incapacitated to offer their version of the events that led to the crash. Often, driver actions were not witnessed by anyone but those involved. For reasons such as these, driver actions are not always identified or may only portray one person's perception of the events. **Table AD-10** highlights the top driver actions that were reported in pedestrian- or bike-involved crashes that resulted in a fatality or serious injury.

Tak	Table AD-10: Top Three Driver Actions in Crashes Resulting in a Fatality or Serious Injury											
	Pedestrian-	Involved	Bike-Ir	nvolved	All Other							
Rank	Driver Action	Driver Action Percent of All FSI		Percent of All FSI	Driver Action	Percent of All FSI						
1	Careless Driving	8 percent	Failed to Yield ROW	7 percent	Careless Driving	10 percent						
2	Reckless Driving	4 percent	Careless Driving	6 percent	Failed to Yield ROW	6 percent						
3	Failed to Yield ROW	4 percent	Lane Violation	5 percent	Lane Violation	3 percent						
	No Actions	58 percent	No Actions	73 percent	No Actions	69 percent						

Pedestrian Action

Similar to driver actions, pedestrian actions may be dependent solely on the judgment of the reporting officer and the perceptions of those coherent enough to accurately report the events. **Tables AD-11** and **AD-12** below highlight the top pedestrian actions that were reported in pedestrian-involved crashes.

Table AD-11 Top Three Pedestrian Actions identified in Pedestrian- Involved Crashes			
	All Pedestrian-Involved Crashes		
Rank	Pedestrian Action	Percent of All	
		Crashes	
1	Cross/Enter at Intersection	15 percent	
2	Cross Against Signal	7 percent	
3	Cross/Enter NOT at Intersection	5 percent	
	No Actions	48 percent	
	Other (without narrative)	17 percent	

Table AD-12: Top Three Pedestrian Actions identified in Pedestrian- Involved FSI Crashes			
	All Pedestrian-Involved Fatalities or Serious Injuries		
Rank	Pedestrian Action	Percent of All FSI	
1	Cross/Enter at Intersection	10 percent	
2	Cross/Enter NOT at Intersection	7 percent	
3	Cross Against Signal	5 percent	
	No Actions	66 percent	
	Other (without narrative)	6 percent	

Appendix E: Wayfinding Guidance

This section includes guidance on active transportation wayfinding adapted from the City of Fort Collins. In 2015, the City of Fort Collins adopted a <u>Bicycle Wayfinding Network Master Plan</u>, creating a wayfinding template and guiding principles for application along the City's trail and bikeway system. Although the Plan was specific to bicycles, much of the guidance is appropriate for other active modes. The City agreed to share their wayfinding documentation with the NFRMPO to distribute to member communities. This turnkey solution allows NFRMPO member agencies employ the basic elements, adapt templates to the local context, and apply their own branding. Signage related to active transportation must be compliant with the Manual on Uniform Traffic Control Devices (MUTCD) and should be designed to meet the needs of older adults and individuals with visual disabilities.

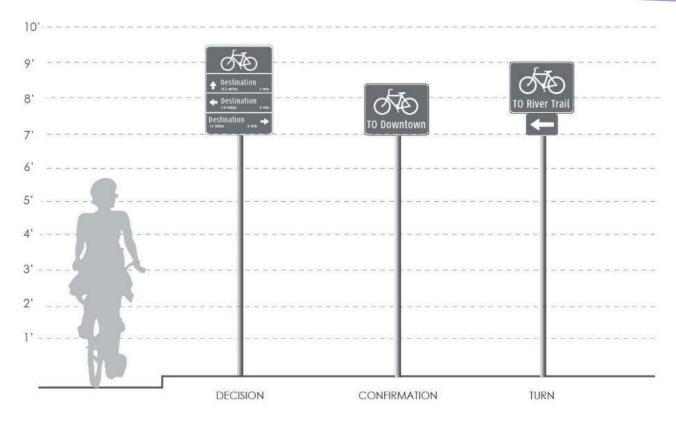
The vision for wayfinding across the Regional Active Transportation Corridor (RATC) network is signage infrastructure that provides consistent messaging to RATC users no matter where they are, but that also allows for unique local branding that complements and highlights local context and character. The following guidance offers principles to inspire confidence in users and guide them across neighborhoods and communities in a relatively seamless experience. Wayfinding elements should be included with every project on an RATC. RATC projects awarded funding through the NFRMPO Call for Projects will be required to include wayfinding elements, unless wayfinding is already implemented. Assistance from NFRMPO staff and/or the NoCo Bike & Ped Collaborative can supplement the following guidance.

Wayfinding Elements, Placement and Technical Guidance Memo Fundamental Wayfinding Elements

The following sign typologies are recommended for the local and regional bicycle network. Unless noted otherwise, all wayfinding elements are oriented and scaled for the bicycle user.

Fundamental Navigational Elements

The fundamental family of signs which provide cyclists with navigational information consists of decision, confirmation, and turn signs. The function, content, and placement of each are described below.



Above: Fundamental on-street wayfinding tools. Credit: City of Fort Collins

Decision Sign

Function and content: Decision signs clarify route options at junctions where more than one potential route exists. Decision signs include system branding elements, space for up to three destinations, distances to destinations in miles and/or time (based on 10 mph or 6 minute per mile travel speed) and may include the route or path name.

Per the FHWA's Standard Highway Sign Manual, the standard three-line decision sign for both on- and off-street bicycle facilities is formatted horizontally at 18 inches high by 30 inches wide. ⁴⁵ Many municipalities have three-line decision signs that are formatted vertically at 24 inches wide by 30 or 36 inches tall by omitting the bicycle symbol from each separate line and including a single bike symbol at the top of the sign. Regardless of orientation, six inches of vertical space per destination line is generally provided to allow for the two-inch minimum text height.



Above: Decision Sign example. Credit: City of Fort Collins

Placement: Detailed in the following section

⁴⁵ Sign width is not standardized by the USDOT in the Manual for Uniform Traffic Control Devices (MUTCD).

Confirmation Sign

Function and Content: Confirmation signs are placed after a turn movement or intersection to reassure cyclists that they are on the correct route. Signs include a system brand mark and may include the route or path name.

For both on- and off-street bike routes, the minimum size of 24" wide by 18" high should be used.

Placement: Detailed in the following section



Above: Confirmation Sign example. Credit: City of Fort Collins

Turn Sign

Function and Content: Turn signs are used when only one route option exists to indicate a change in route direction. Signs include a system brand mark, route or pathway name and directional arrow.

Standard D1-1 series signs may be used to indicate turns. Standard turn arrow signs (M5 and M6 series) may also be used in conjunction with bike route signs to clarify turn movements. Similar to decision signs, a minimum height of 6" should be used and width may vary according to destination length.

Placement: Detailed in the following section



Above: Turn sign example. Credit: City of Chicago, IL

Supplemental Wayfinding Elements

A robust wayfinding system for active modes includes additional elements to orient, inform, and inspire confidence in the facility user. These elements can vary widely in character. They can come in the form of a standard sign, pavement marking, public art, and more. Supplemental elements can add interpretive, historical, and/or cultural value to the system, enhancing the overall experience. By including elements that celebrate and honor the historical significance of an area, indigenous peoples, and/or feature local art, communities can create more pride and ownership in the system while also making themselves more competitive for certain grant programs. With supplemental wayfinding, it is also important to consider what additional languages should be included. At a minimum, supplementary signs that include important information regarding facility rules and regulations, amenities, hazards, and warnings should be printed in Spanish and English.



Above: Supplemental Wayfinding Elements ad examples. Credit: City of Fort Collins.

Mile Markers

Function and Content: Mile markers enable pathway users to measure distances travelled and provide pathway managers and emergency response personnel with reference points to identify field issues such as maintenance needs or locations of emergency events. Mile markers include the system brand mark, distance in whole number miles or decimal miles when less than one mile and may include path name and jurisdiction.



Credit: Town of Milliken

Placement: Mile markers should be placed every ½ to ½ mile along the pathway Above: Mile marker example. network. Mile markers may be installed on one side of a pathway, back-to-back. Point zero should begin at the southern and westernmost terminus points of a pathway. Mile numbering should be reset at zero as a pathway crosses a jurisdictional boundary. Distances along onstreet routes should be included within mile measurements.

Primary Pathway Identity Sign

Function and Content: Primary pathway identification signs are oriented and scaled for vehicle drivers and serve as the initial welcome and identification of primary pathway access points. Signs include the system brand mark, pathway name, and local jurisdiction identity/logo.

Placement: Signs should be located at trailheads or regional pathway access points. Care should be taken to maintain site lines between roadways and entries at trailhead locations.



Above: Primary Pathway Identity Sign. Credit: Town of Milliken

Secondary Pathway Identity Sign

Function and Content: Secondary pathway identity signs are oriented and scaled for pedestrian and bicycle network users and serve as the initial welcome and identification of secondary pathway access points. Signs include the system brand mark, pathway name and local jurisdiction identity/logo.

Placement: Signs should be located at pathway access points visible from adjacent bicycle facilities.



Above: Secondary Pathway Identity Sign. Credit: Town of Milliken

Information Kiosk

Function and Content: Kiosks provide a clearing house of information at a more detailed level than other elements. Kiosks include orientation map graphics indicating the on- and off-street route and connections, major geographic features, destinations rules and responsibilities, emergency and pathway manager contact information and jurisdiction logo.

Placement: Kiosks should be located at major pathway system access points and set back from the edge of the path travelway to provide areas to dwell and consider the information. Per accessibility guidelines, kiosks should be placed at a distance greater than three feet from the pathway edge to provide clear circulation areas and avoid the creation of a potential physical obstacle from the bicycle travelway.



Above: Information Kiosk example. Credit: City of Loveland

System Identifiers

Function and Content: System identifiers present opportunities to add the system brand mark or logo to existing features to expand visibility at an affordable rate. Identifiers may include vinyl wraps, adhesive graphics, sign toppers, and pavement markings with system name or brand mark.

Placement: Identifiers may be placed at each jurisdiction's discretion based on need for augmented system visibility.



Above: System Identifier example. Credit: Capital District Transportation Committee

Wayfinding Element Placement

The various elements of the wayfinding family should be located in a consistent and logical manner within and across communities. Signs may be mounted to existing or new wayfinding sign posts. Focusing efforts at the

following locations can address a majority of the navigational issues requiring clarification by bike network users:

- On-street route intersections
- Gaps in path network
- Path-path intersections
- Path-roadway intersections
- Off-street and on-street transitions
- Pathway access points

On-street Wayfinding Element Placement

On-street wayfinding element placement recommendations are provided below. However, engineering judgement and a review of the existing site conditions should also be used on a case-by-case basis to determine the specific placement of each sign.

Decision Signs

The distance of a decision sign from a turn or transition is determined by design speed, site lines and slope. Decision signs should be placed along the right-of-way in places where the cyclist can see an upcoming sign from an appropriate distance given the design speed and physical context.

On busy streets with center turn lanes or left turn pockets, signs should be placed further from the intersection to decrease the possibility of conflicting cyclist/motorist movements while preparing for a left turn. The location of the sign should exceed the stopping distance needed by the fastest expected travel speed, but should not be placed so far in advance that the relevance of the sign is lost or forgotten.

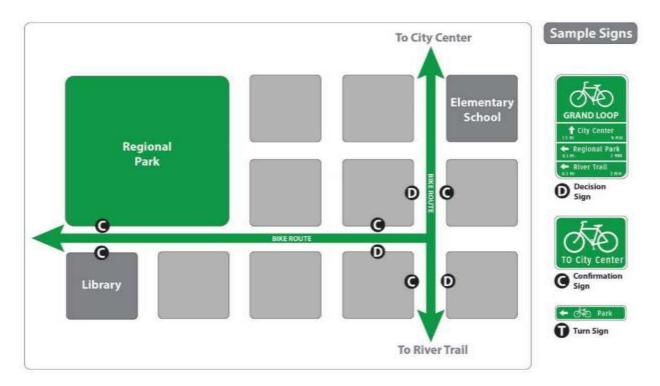
Confirmation Signs

Confirmation signs provide reassurance of direction after decision points and along long routes with no intervening destinations or decision points. At decision points, the sign should be placed 50 to 100 feet after the intersection or turn. Confirmation signs should not occur after every intersection and should be prioritized at complex intersections. Complex intersections include those having more than four approaches, non-right angle turns, roundabouts, or in-direct routing.

Along routes in developed areas with few decision points, confirmation signs should be placed every two or three blocks for reassurance. Where less reassurance is needed (for example, less developed areas, low volume streets or separated pathways) confirmation signs should be placed roughly every 0.5 miles.

Turn Signs

Turn signs should be placed at points prior to the turning action to provide cyclists advance notice of a change in direction. Signs may also be used in conjunction with a decision sign at complex intersections warranting additional information.



Above: Typical placement scenario showing a decision sign being located prior to an intersection of two bicycle facilities. A confirmation sign is provided after the turn movement as well as periodically along the route for reassurance.

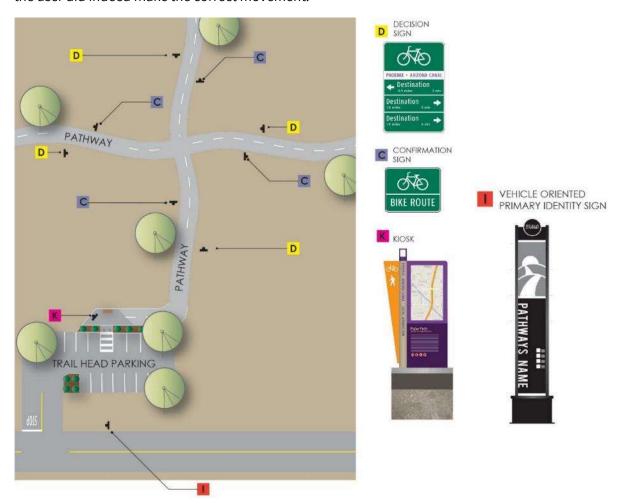
Off-street Wayfinding Element Placement

Pathway Access Points

Major pathway access points or trailheads should be identified via primary identity signs. Primary identity signs should be oriented towards approaching vehicles. Care should be taken to not obstruct site lines between the roadway and entry points or driveways. Pathway system access points not providing vehicle parking should utilize the secondary bicycle sign. As an option, kiosk signs with orientation maps may be placed at developed trailheads or access points.

Path-Path Intersection

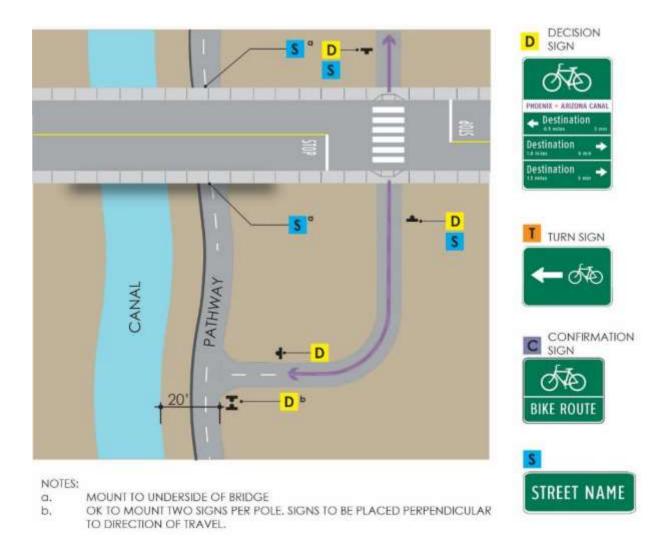
When pathways intersect each other, multiple destinations are likely. Thus, decision signs should be placed prior to the intersection. As an option, confirmation signs may be placed after intersections to reinforce that the user did indeed make the correct movement.



Pathway Access Branches

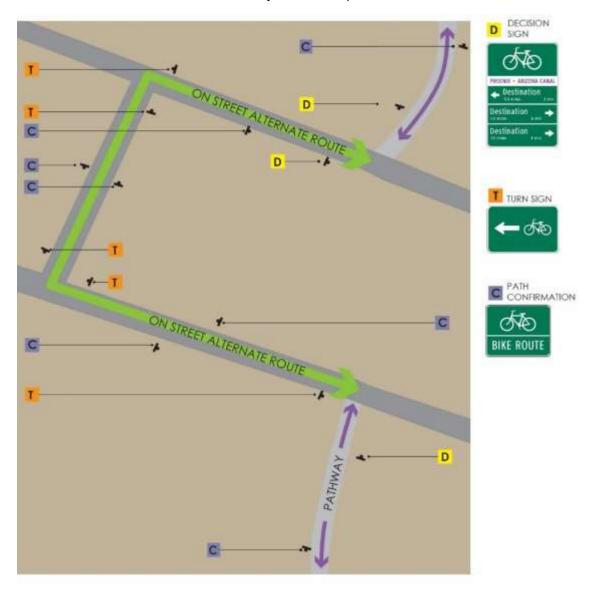
Connections and access points between the off-street and on-street network may result in path branches between the facilities. At such junctions, it is important to inform cyclists of where the alternative route option goes. This may be done via decision signs located at junctions.

Grade separated roadway crossings would benefit from applying street name sign blades to crossing improvements such as bridge infrastructure.



Gap in Path Network

Where gaps in the off-street bicycle network exist, pathway users may be routed to on-street bicycle facilities to provide improved connectivity. The typical pattern for wayfinding signs includes a decision sign prior to the intersection of route options, followed by an optional confirmation sign. Turn signs should be placed to reinforce the route in locations where only one route option exists.



Off-street / On-street Transition

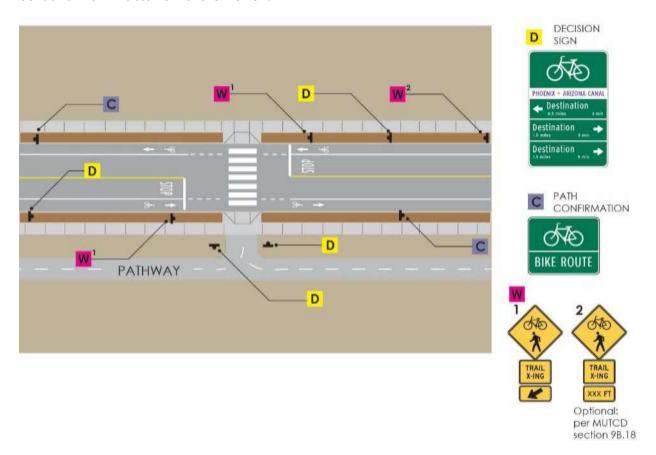
When transitioning from an off-street facility to an on-street facility, it is important to advise travelers of their route options. In this scenario, decision signs direct cyclists to their destination choices while confirmation signs reinforce that the user is on a designated facility after a turn movement is made.

Decision signs should also be placed at the entry to the off-street bicycle network. Once on the off-street bicycle network, confirmation signs are optional.

Vehicle oriented bicycle and pedestrian crossing warning signs should be placed in advance of crosswalks. In urban areas, signs should not be placed within four feet of a crosswalk in order to maintain visibility of those intending to cross the roadway.

Advance warning signs are optional per the MUTCD. If they are used, their placement should provide needed time for detection, recognition, decision, and reaction. Table 2C-4 in the MUTCD provides guidance for advance warning sign placement based on vehicle speeds.

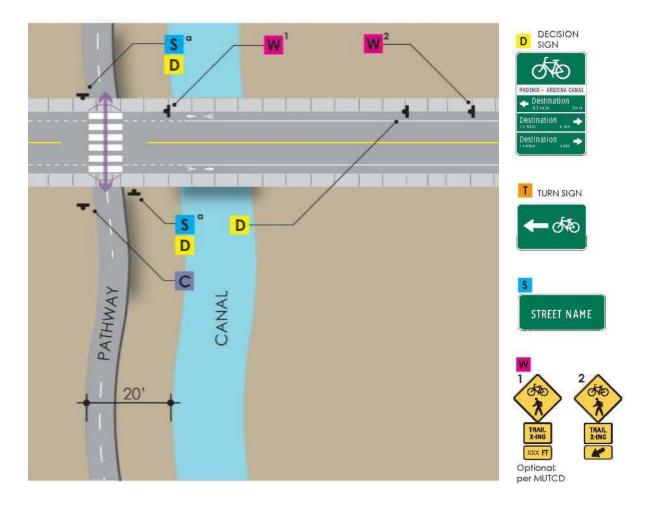
On-street directional signs leading to the pathway network should not obscure other roadway signs including warning signs. They should be spaced according to roadway travel speeds with faster roadways warranting wider spacing. Guidelines for the placement of advance warning signs based on perception-response time may be found within Table 2C-4 of the MUTCD.



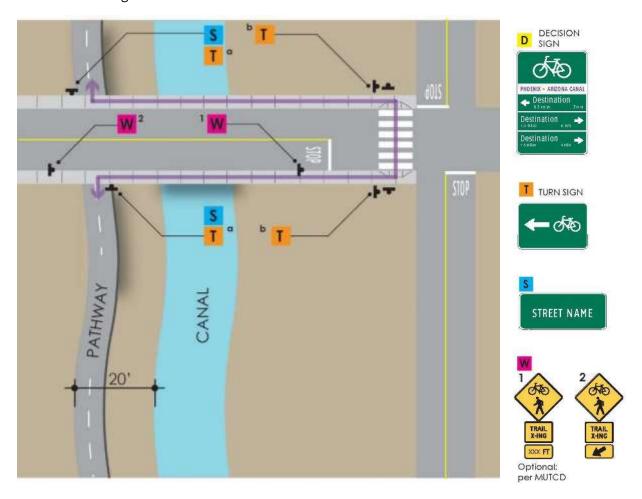
Path-Roadway Intersection

Pathway users should be directed to cross roadways only where improvements such as curb ramps, crosswalk striping, and warning signs exists. If the cross street has bicycle facilities such as bike lanes, a bicycle boulevard, or cycle track, a decision sign should be placed prior to the intersection to inform cyclists of their route options. If a cyclist-oriented stop sign is present, it should not be obscured by the wayfinding sign. Decision signs may be topped with street name sign blades to enhance one's awareness of their location. As an

option, confirmation signs may be placed at pathway entries to assure cyclists that they are on a bicycle facility.



Oftentimes, direct travel via midblock roadway crossings is not provided for. Instead pathway users are expected to divert to the nearest improved or signalized intersection. In this scenario, turn signs should be used to direct cyclists to the intersection with safety improvements. Again street name blades may be mounted above decision signs to reinforce location.



<u>Level 1</u>
Cities, Towns, and Other Regional

Destination Selection and Prioritization

The process of selecting and prioritizing the destinations to include on wayfinding should include input from a stakeholder committee representing system users, stewardship groups/agencies, advocates, schools/school districts, business community/chamber of commerce in each community.

A consistent approach to selecting destinations to be included on wayfinding elements is necessary given the multitude of potential destinations. Signs should follow the same approach throughout the region so that the system is clear and predictable. Destinations and their names should be referred to consistently until they are reached.

Potential destinations for inclusion on signs should be categorized into four levels. These levels are explained in detail in **Table AE-1**

Level 2
Districts and Neighborhoods

Level 3
Landmarks

Level 4
Local
Destinations

and **Figure AE-1**. For on-street and off-street regional pathways, Level 1 destinations should receive first priority, followed by Level 2 and then 3. Level 4 destinations should only be included when other destinations are not present to fill available slots on a sign. local routes typically serve shorter trips within their immediate community. Signs on such facilities may prioritize Level 2-4 destinations recognizing that longer, regional trips are more likely to occur via the regional pathway network.

Table AE-1: Wayfinding Destination Categorization

Level 1 - Cities, Towns, and Other Regional Destinations

Level 1 destinations include regional destinations accessed via the system, either within the community or in neighboring communities. Highlighting nearby cities/towns provides large scale geographic orientation for users, especially those making regional trips. Level 1 destinations provide "pull through" destinations for users who are travelling significant distances as well as a full range of attractions and services. Appropriate facilities should exist to the destination if it is included on a sign. Level 1 destinations should be included on directional signs and orientation maps. Level 1 destinations should be included on signs up to 5 miles away.

Level 2 - Districts and Neighborhoods

Level 2 destinations provide a finer grain of navigational information than Level 1 destinations by directing users to comprehendible districts and neighborhoods. These may be city centers, historic, commercial, cultural, or educational districts, or neighborhoods with a distinct name and character. Emphasis should be placed on districts providing a mix of services. Neighborhoods not offering services or attractions, need not be included. Level 2 destinations should be included on signs up to 2 miles away.

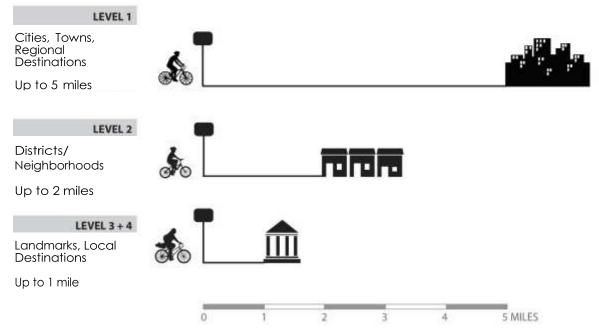
Level 3 - Landmarks

Level 3 destinations are specific landmarks or major attractions which generate easily or commonly accessed by an active mode. Landmarks could include transit stations, major tourist venues, regional parks, open spaces and post-secondary educational institutions. Level 3 destinations should be signed up to 1 mile away.

Level 4 - Local Destinations

Level 4 destinations are local destinations such as civic buildings, parks, high schools, shopping centers, and healthcare facilities. They are typically present on signs in low density areas where few other destinations are present or along pathways not connecting higher priority (Level 1-3) destinations. Level 4 destinations may be signed up to 1 mile away.

Figure AE-1: Maximum Suggested Signing Distances Based on Destination Level



Distances may be measured either to a destination boundary or center, as long as the approach is consistent throughout the region. Cities (level 1 destinations) typically have a well-defined edge and thus should be measured to boundary lines. Districts (level 2 destinations) are less defined in terms of their boundaries and thus should be measured to their centers. Level 3 and 4 destinations are typically specific addresses and thus distances should be measured to the main entrance of their specific location. If a level 3 or 4 destination is large or has several access points, distance should be measured to the point at which the user will arrive at the destination.

Destination Selection Criteria

Level 1 - Cities, Towns, and Other Regional Destinations

Level 1 destinations should include nearby towns, cities, and other large regional destinations such as state or county parks/open spaces if the system extends past a city or town.

Level 2 - Districts and Neighborhoods

Districts and neighborhoods may be included on signs if the area has been formally established by resolution or ordinance of the appropriate local agency or if the district has developed and implemented its own internal wayfinding sign plan. Examples of districts include: city centers, university districts and arts districts. Neighborhoods having historic character or otherwise significantly contributing to the culture and vibrancy of a city may also be signed.

Level 3 - Landmarks

Landmarks included within the inventory have been sorted between levels 3 and 4. Level 3 landmarks have regional importance and can reasonably be expected to be in operation for years to come. Level 3 destinations include:

Businesses and Services

- Medical Facility Hospitals, veterans' services providers, and clinics may be considered if the facilities meet all of the following criteria:
 - Service is provided 24 hours a day, 7 days a week.
 - o Emergency department facilities and services are provided.
 - The facility is licensed or approved for definitive medical care by an appropriate State authority.
- <u>Shopping Center</u> A group of shops, retail stores, and/or restaurants that is regionally significant in size with respect to the size of the community or area of the region.
- <u>Visitor Center</u> A facility having the primary purpose of providing information and tourist support services. Must be approved by the State Department of Community and Economic Development.

Education

- <u>College/University</u> An educational institution that is nationally accredited and grants degrees.
- Public 2 Year College An educational institution that is nationally accredited and grants degrees.

Entertainment and Culture

- <u>Historic Site</u> A structure or place of historical, archaeological, or architectural significance listed on the National Register of Historic Places.
- <u>Museum</u> A facility of national or regional significance exhibiting works of artistic, historic, or scientific value.
- <u>Performing Arts Venue</u> A facility focused on the enjoyment of the performing arts and providing a minimum capacity of two hundred seats.
- <u>Botanical Garden or Zoo</u> Accredited institution, where plants and/or animals are kept and cared, while also offering public education.

Public Facility

- <u>Recreation or Community Center</u> Publicly owned buildings offering places to recreate, learn, and/or gather.
- <u>Library</u> A repository for literary and multi-media materials, such as books, periodicals, newspapers, recordings, films, and electronic media, kept and systemically arranged for use and reference.
- Park/Open Space Publicly owned National, State, and Regional parks.
- <u>Pathway</u> Named regional facilities built for transportation and recreation purposes and used by both cyclists and pedestrians.
- <u>Transit Center</u> Passenger terminals facilitating access to multiple bus lines.

Sports Facility

- Golf Course A facility open to the public and offering at least eighteen holes of play. Miniature golf courses and driving ranges are not considered a level 3 landmark.
- <u>Stadium or Arena</u> A permanent facility used for the primary purpose of presenting organized sporting events. Includes county and state fairgrounds.
- <u>Sports Complex</u> A facility open to the public that commonly holds sporting events on multiple fields, such as baseball or softball tournaments.

Level 4 - Local Destinations

Extending the wayfinding system to include local destinations may be useful in lower density areas or on more rural routes where Level 1-3 destinations are not present. Each community is unique but, generally, larger civic institutions such as libraries, museums, or community centers will take precedent over specific local services and visitor accommodations.

Businesses and Services

- <u>Medical Facility</u> Licensed facilities that provide emergency or urgent care services. Need not be open 24 hours per day, seven days per week.
- <u>Shopping Center</u> A group of shops, retail stores, and/or restaurants that is significant mainly on a local level, with respect to the size of the community or area of the region.

Community Facilities

• Cemetery - A large public park or ground laid out expressly for the interment of the dead.

Education

- <u>Primary School</u> Public schools providing elementary school level education to students generally aged six through eleven. Private schools may be considered on a case-by-case basis
- <u>Secondary School</u> Public schools providing high school level education to students generally aged eleven through eighteen. Private schools may be considered on a case-by-case basis

Entertainment and Culture

- <u>Museum</u> A facility of local recognition exhibiting works of artistic, historic, or scientific value to the general public.
- <u>Performing Arts Venue</u> A facility focused on the public's enjoyment of the performing arts and having a capacity of less than two hundred seats.

Public Facility

- <u>Civic Building</u> City hall, courthouse, fire or police station.
- Local Park Publicly owned local parks.
- <u>Post Office</u> Official federal postal service center.

Sports Facility

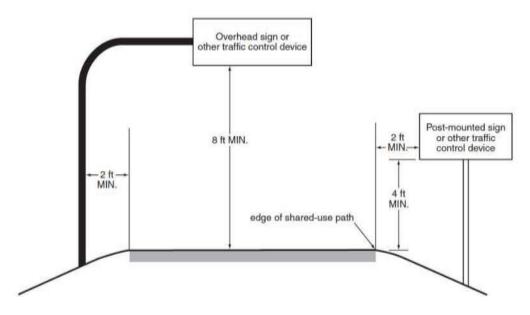
- <u>Golf Course</u> A facility open to the public and offering fewer than eighteen holes of play. Miniature golf courses and driving ranges may be considered.
- <u>Sports Field</u> A permanent facility used for the primary purpose of presenting and practicing local organized sports.
- <u>Public Pool, Swimming Area, or Waterpark</u> A facility open to the public for water recreation. The facility may already be referenced if it is part of a recreation or community center.

In situations where two destinations of equal significance and distance may be properly designated and the two destinations cannot appear on the same sign, the two names may be alternated on successive signs. If a facility ends abruptly, signs should signify "End of Trail" or "End of Route" as the lowest priority after all other possible destinations, up to 1 mile before the facility ends.

Additional Technical Guidance

A variety of standards and guidelines influence both sign design and placement of wayfinding elements in Fort Collins. The following provides information related to national standards for wayfinding signage.

In general, regulatory and warning signs are a higher priority than wayfinding signs. Care should be taken to not obscure priority information. This includes providing a typical spacing of no less than 75 feet between signs along off-street pathways. This distance is based on travel speeds and thus is generally greater for on-street systems.



Minimum Sign Clearances on Shared-Use Paths

Accessibility Standards

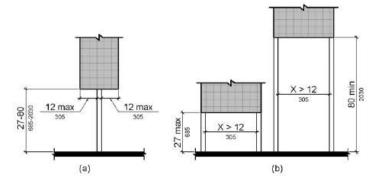
As wayfinding systems often relate to accessible routes or pedestrian circulation, it is important to consider technical guidance from the ADA so that signs and other elements do not impede travel or create unsafe situations for pedestrians and/or those with disabilities. The Architectural and Transportation Barriers Compliance Board provides guidance for accessible design for the built environment. Standards which should be considered when designing and placing wayfinding signs includes the following:

Vertical Clearance

Vertical clearance should be a minimum of 80 inches high or maximum of 27 inches when signs protrude more than 12 inches from the sign post or support structure.

Post-Mounted Objects

Where a sign or other obstruction is mounted between posts or pylons



and the clear distance between the posts or pylons is greater than 12 inches, the lowest edge of such sign or obstruction should be 27 inches maximum or 80 inches minimum above the finish floor or ground.

Protruding Objects

Objects with leading edges more than 27 inches and not more than 80 inches above the finish floor or ground should protrude 4 inches maximum horizontally into the circulation path.

Required Clear Width

Protruding objects shall not reduce the clear width required for accessible routes. Generally this requirement is met by maintaining four feet minimum clear width for maneuvering. This requirement applies to both sidewalks and pedestrian circulation paths.

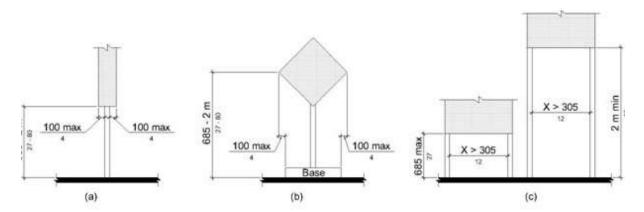
4 max 100 X > 80 X > 80 X > 80

Limits of Protruding Objects

Shared Use Paths

Accessibility standards for shared use paths are currently being developed. Proposed standards address post mounted objects. Where objects are mounted on free-standing posts or pylons

and the objects are 27 inches minimum and 80 inches maximum above the finish surface, the objects should overhang pedestrian circulation paths 4 inches maximum measured horizontally from the post or pylon base. The base dimension should be a minimum of 2.5 inches thick. Where objects are mounted between posts or pylons and the clear distance between the posts or pylons is greater than one foot, the lowest edge of the



object should be 27 inches maximum or 80 inches minimum above the finish surface.

Current proposed standards for post mounted objects along shared use paths.

AASHTO Guide for the Development of Bicycle Facilities

The Guide for the Development of Bicycle Facilities by the American Association of State Highway
Transportation Officials, or AASHTO, provides information on the physical infrastructure needed to support
bicycling facilities. The AASHTO guide largely defers to Part 9 of the Manual on Uniform Traffic Control Devices
(MUTCD) for basic guidelines related to the design of wayfinding systems for bicycles (see page 16). Additional
information provided by AASHTO regarding wayfinding is as follows:

- Many communities find that a bicycle wayfinding system enhances other encouragement efforts by providing a visible invitation to new bicyclists and encouraging current bicyclists to explore new destinations.
- Bicycle wayfinding signs along do not improve safety or rider comfort and should supplement other infrastructure improvements so that conditions are favorable for bicycling.
- Guide signs may be used to designate continuous routes that are composed of a variety of facility types and settings.
- Wayfinding guidance may be used to provide connectivity between two or more major bicycle facilities, such as a street with bike lanes and a shared use path.
- Wayfinding may be used to provide guidance and continuity in a gap between existing sections of a bikeway, such as a bike lane or shared use path.
- Road/path name signs should be placed at all path-roadway crossings to help users track their locations.
- Reference location signs (mile markers) assist path users in estimating their progress, provide a means for identifying the location of emergency incidents, and are beneficial during maintenance activities.
- On a shared use path, obstacles, including signs, should be placed no closer than 24 inches from the near edge of the travel way and no more than 6 feet away. For pole mounted signs, the lowest edge of the sign shall be 4 5 feet above the existing ground plane.

Manual on Uniform Traffic Control Devices (MUTCD)

Bicycle Sign Standards

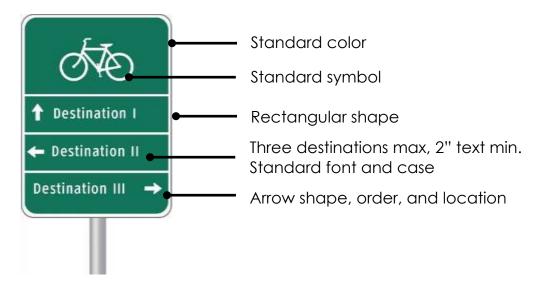
The Manual on Uniform Traffic Control Devices, or MUTCD, is a document issued by the Federal Highway Administration of United States Department of Transportation. The MUTCD specifies the standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel. The MUTCD was established in order to achieve uniformity and consistency in traffic control devices (wayfinding signage is considered a traffic control device) so that information would be readily recognized and understood by travelers. Both on-street and off-street bicycle facilities are required to follow the standards within the MUTCD.





Per the MUTCD, devices should be designed so that:

- Size, shape, color, composition, lighting or retro-reflection, and contrast are combined to draw attention to the devices; simplicity of message combined to produce a clear meaning.
- Legibility and size combine with placement to permit adequate time for response.
- Uniformity, size, legibility, and reasonableness of the message combine to command respect.



Standard MUTCD compliant directional or decision sign

Sign Arrangement

The MUTCD also recommends the arrangement and amount of text, or legend, on each section of each sign:

 Guide signs should be limited to no more than three lines of destinations, which include place names, route numbers, street names, and cardinal directions.

- A straight ahead location should always be placed in the top slot followed by the destination to the left and then the right. If two destinations occur in the same direction, the closer destination should be listed first followed by the farther destination.
- Arrows shall be depicted as shown above for glance recognition, meaning straight and left arrows are to be located to the left of the destination name, while an arrow indicating a destination to the right shall be placed to the right of the destination name. The approved arrow style must be used.
- 19 characters (incuding spaces) in titlecase should be considered a maximum length for a single destination title. 10-14 characters (including spaces) in titlecase should be considered an ideal maximum length for a single destination title.
- In situations where two destinations of equal significance and distance may be properly designated and the two destinations cannot appear on the same sign, the two names may be alternated on successive signs.
- Approved fonts include the Federal Series (series B, C, or D), also known as Highway Gothic. Clearview is also currently approved for use, however the FHWA is considering rescinding the use of Clearview.
- A contrast level of 70% needs to be achieved between forground (text and graphics) and background.

Case Studies

Local agencies in Northern Colorado have conducted planning and implemented their own local wayfinding systems to varying degrees. The following examples illustrate the elements of those efforts and cost estimates where possible.

Fort Collins On-Street Bicycle Wayfinding Network: Master Plan and Initial Implementation Master Plan Development - \$39,000⁴⁶ (2015)

• Tasks included consultant selection, stakeholder engagement, site assessment, landmark identification, general approach, sign location, destination, phased implementation plan, signage plan and cost estimates.

Implementation: Phase I (2016-2017) - \$6,000 - \$9,000⁴⁷ per route

- Five routes, \$6,000 \$9,000 per route (decision, confirmation, and turn signs; pavement markings
 - Remington Street (71 signs, 8 miles), Swallow Road (56 signs, 5 miles), Centre Avenue (78 signs, 8 miles), City Park Ave (94 signs, 7 miles)

Moving Forward

• Goal is to sign two routes per year as infrastructure is implemented.

-

^{46 2015} Dollars

⁴⁷ 2016-2017 Dollars

Milliken Wayfinding to the Town Park System

Initial Design (2020) - no cost

• Sign concepts were created in 2020 by Brandon Smith, volunteer member of the Great Outdoors Milliken (GO Mill) Committee

Final Design, Production, and Installation (2021) - under \$5,000

- Design was finalized to as 24"x18" sign with a brown background and white lettering incorporating the Town of Milliken logo, following current MUTCD standards and Town Design Codes.
- 57 signs were produced at \$42 per unit. Additional costs associated with signposts and installation hardware have kept the project under \$5,000 (budget was based on a CDPHE grant awarded in early 2021)
- In-house installation

Loveland Recreation Trail (paved) Wayfinding Signage Program

Initial Design (2016) - \$20,000 - Completed with in-house staff

• Tasks included assessment of sign needs, sign types, design, sign location, update of Bikeway & Recreation map/brochure, phased implementation plan, signage plan and cost estimates.

Implementation: (2017-2018) - \$120,000

- 15 new or restored trail kiosks for 21-mile trail system- \$80,000
- Seven trail segments with sign identification- 400 new sign installations @\$100 per sign installed. Where
 feasible, 2 signs combined back-to-back and viewable both directions. Signs were located for route
 identification, safety, regulatory/etiquette, local feature identification, distances and turn signs. \$40,000
- Mileage Markers- removal of old concrete mileage marker system and installation of new ¼ mile markers for emergency management trail location identification and trail user convenience. Cost of \$100 per mile marker installed (including demo and removal of old concrete markers)- \$8400

Continuation of wayfinding program

• New trail segments will be named and signed when developed for public access using the same design and sign criteria as the existing system.

Appendix F: Crossing Countermeasure Matrices

This section contains excerpts from the NCHRP Research Report 926: Guidance to Improve Pedestrian and Bicyclist Safety at Intersections. This report published in 2020 by the Transportation Research Board (TRB) with sponsorship from the American Association of State Highway and Transportation Officials (AASHTO) and in cooperation with the Federal Highway Administration (FHWA). Resources within this report were chosen above others for their comprehensive and consolidated nature. Use of the following matrices (Figure AF-2: Countermeasure Summary Matrix and Figure AF-4: Design Trade-Offs of Countermeasures Matrix) assume previous knowledge of the 34 countermeasures references. Key information about individual countermeasures begins on page 117 in the Appendix of NCHRP Research Report 926 and other important supplemental information can be found throughout the report. Other resources found in Appendix A: Resource Library also include bicycle and/or pedestrian crossing guidance. Multiple countermeasures may be appropriate for a given crash type. Not all countermeasures listed in the matrices are MUTCD compliant.

Figure AF-1: Key for Figure AF-2

- Countermeasure description. A brief description of the countermeasure and how it works.
- Crash Modification Factor (CMF)/rating. If a CMF is available, it is listed, along with the crash types to which it
 is applicable. If no CMF is available, a summary of the latest understanding from research is presented.
- Example applications. Photos or illustrations showing the countermeasure in use.
- Applicable crash types. Common crash types that may be addressed by the countermeasure; note that the
 countermeasure may also be applicable to less-common crash types not listed.
- . Applicable contexts. Contexts in which the countermeasure is appropriate for use.
- Complementary countermeasures. Other countermeasures that should accompany the countermeasure; other countermeasures that may accompany the countermeasure.
- Considerations. Design considerations to maximize the countermeasure's effectiveness, potential non-safety
 effects, situations where the countermeasure may be unsultable, and other information to consider when evaluating the countermeasure.
- Systemic safety potential. Information about whether the countermeasure is appropriate for use systemically, or better used as a spot treatment.
- Estimated cost. Approximate cost to design and install the countermeasure, as of the time of writing, provided as one of four cost ranges:

\$ = <2,500

\$\$ = 2,500-49,999

\$\$\$ = 50,000-150,000

\$\$\$\$ = >150,000

- Potential effects on travel modes. A brief listing of potential positive and negative effects to each travel mode.
- Alternative treatments. A listing of alternatives to the countermeasure, if applicable.
- Additional information. A listing of additional resources to learn more about the countermeasure.

Figure AF-2: Countermeasure Summary Matrix

Countermeasure		Effectivenes	s	Public Process		Moto	orist T	raveli	ng Stra	aight		Motorist Turning				
	Tier 1: Supports motorist yielding	Tier 2: Requires intervention to induce motorist yielding	Tier 3: Separate modes or require motorists to stop	1 to 5 scale: 1 = no public process and 5 = extensive public process	Motorist falled to yield to pedestrian	Pedestrian failed to yield	Pedestrian dash	Bike crossing paths with uncontrolled motorist	Bike rides through/out – STOP sign	Motorist drives out into bike – STOP controlled	Bike rides through/out – signalized intersection	Motorist left turning into pedestrian parallel path	Motorist right turning into pedestrian parallel path	Motorist right turning into bike – same direction	Motorist left turning into bike opposite direction	
Active Warning Beacons	М	М	L	1	•	•	•	•	•			•	•	•	•	
Advance Stop/Yield Lines	Н	М	L	79	•	•	•	•	•							
All-Walk Phase	M	Н	Н	3	•	•	•					•	•			
Bicycle Lane Extension through Intersections	М	L	L	1				•		•				•	•	
Bicycle Signals	М	М	н	1							•			•	•	
Bike Boxes	М	М	М	1										•		
Continuous Raised Medians	Н	Н	Н	4	•	•	•	•	•		•	•			•	
Hardened Centerlines	Н	Н	н	1								•			•	
Crossing Barriers	L	М	н	5	•	•	•	•								

Note: H = High, M = Medium, L = Low

(Continued) Figure AF-2: Countermeasure Sumamary Matrix

Countermeasure		Effectivenes	is	Public Process		Mot	orist T	raveli	ng Str	aight		М	otoris	t Turni	ing
	Tier 1: Supports motorist yielding	Tier 2: Requires intervention to induce motorist yielding	Tier 3: Separate modes or require motorists to stop	1 to 5 scale: 1 = no public process and 5 = extensive public process	Motorist falled to yield to pedestrian	Pedestrian failed to yield	Pedestrian dash	Bike crossing paths with uncontrolled motorist	Bike rides through/out - STOP sign	Motorist drives out into bike – STOP controlled	Bike rides through/out signalized intersection	Motorist left turning into pedestrian parallel path	Motorist right turning into pedestrian parallel path	Motorist right turning into bike – same direction	Motorist left turning into bike – opposite direction
Crossing Islands	н	Н	н	3	•	•	•	•	•		•	•			•
Curb Extensions	М	≅M:	М	1	•	•	•	•	•	•	•	•	•	•	•
Curb Radius Reduction	М	М	М	1									•	•	
Gateway Treatments (R1-6 Signs)	н	М	L	Ť	•	•	•	•							
Grade-Separated Crossings	L	М	н	5	•	•	•	•	•	•	•	•	•	•	•
High-Visibility Crosswalk Markings	н	н	H	1	•	•	•	•	•	•		•	•	•	•
In-Street Pedestrian Crossing Signs	н	M	L	1	•	•	•	•	•						
Leading Bicycle Interval	н	Н	н	1								•	•	•	•
Leading Pedestrian Interval	н	н	н	1:								•	•	•	•
Lighting	н	Н	Н	4	•	•	•	•	•	•	•	•	•	•	•
Mini-Traffic Circles	м	М	М	4	•	•	•	•	•	•	•	•	•	•	•
Mixing Zone Treatments	М	L	L	3										•	
No Turn on Red Signs	н	Н	н	1									•	•	

Note: H = High, M = Medium, L = Low

(Continued) Figure AF-2: Countermeasure Sumamary Matrix

Countermeasure		Effectivenes	is	Public Process		Mot	orist T	raveli	ng Stra	aight		М	otoris	Turn	ing
	Tier 1: Supports motorist yielding	Tier 2: Requires intervention to induce motorist yielding	Tier 3: Separate modes or require motorists to stop	1 to 5 scale: 1 = no public process and 5 = extensive public process	Motorist failed to yield to pedestrian	Pedestrian failed to yield	Pedestrian dash	Bike crossing paths with uncontrolled motorist	Bike rides through/out - STOP sign	Motorist drives out into bike - STOP controlled	Bike rides through/out - signalized intersection	Motorist left turning into pedestrian parallel path	Motorist right turning into pedestrian parallel path	Motorist right turning into bike – same direction	Motorist left turning into bike – opposite direction
Parking Restrictions at Crossing Locations/ Daylighting	н	н	н	2	•	•	•	•	•	•	•	•	•	•	•
Passive Bicycle Signal Detection	н	н	н	313							•				
Pedestrian Countdown Signals	н	н	Н	Ť		•	•					•	•		
Pedestrian Hybrid Beacon	М	н	Н	1	•	•	•	•	•						
Protected intersections	н	н	н	3							•	•	•	•	•
Protected Phases	М	н	н	4								•	•	•	•
Raised Crossings	М	н	н	3	•	•	•	•	•	•	•	•	•	•	•
Rectangular Rapid Flash Beacon	н	М	L	1	•	•	•	•							
Road Diet/Rechannelization	Н	н	Н	5	•	•	•	•	•	•	•	•	•	•	•
Roundabout	н	Н	Н	5	•	•	•	•	•	•	•	•	•	•	•
Signal Timing	Н	н	н	3	•	•	•	•			•	•	•	•	•
Traffic Signals	M	М	М	3	•	•	•	•			•	•	•	•	•
Two-Stage Bicycle Turn Queue Boxes	M	М	M	1										•	

Note: H = High, M = Medium, L = Low

Figure AF-3: Key for Figure AF-4

KEY

- ++ very positive benefit
- + positive benefit +/- neutral
- disbenefit
- -- strong disbenefit

Relative Cost

\$\$\$\$ = >150,000

- \$ = <2,500 \$\$ = 2,500-49,999 \$\$\$ = 50,000-150,000
 - 000

Public Process

- No public process, engineering decision
- Public notice, engineering decision
- Minimal public process, engineering decision
- Moderate public process needed to build partner agency
- and community support
- Extensive public process needed to build community and political support

Figure AF-4: Design Trade-Offs of Countermeasures Matrix

	Spatial Impact	Estimated Cost	Maintenance Cost	Public Process		Motorists			Pedestrians			Bicyclists	
					Operations	User Comfort	Safety	Operations	User Comfort	Safety	Operations	User Comfort	Safety
Active Warning Beacons	Small	SS	SS	1	+/-	+/-	+/-	+/-	*	+	+/-	+:	±
Advance Stop/ Yield Lines	Small	\$	\$	1	+/-	+/-	+;	+/-	++		+/-	**	++
All-Walk Phase	Small	\$	S	3	**	++	++	**	++	tt:	(8.8).	:++	++
Bicycle Lane Extension through Intersections	Moderate	S	\$	1	+/-	*	+/-	+/-	+/-	+/-	+/-	+	+
Bicycle Signals	Small	\$\$	SS	1	+/-	+/-	+/-	+/-	+/-	+/-	+/-	++	+
Bike Boxes	Moderate	\$\$	SS	1	-	+	+/-	+/-	++	+	+	++	+
Continuous Raised Medians	Moderate	\$\$	\$\$	4	+/-	+/-	+	(6)		++	-	+	**
Hardened Centerlines	Small	\$	s	1	+/-	+/-	+	727		++	2	+	++
Crossing Barriers	Moderate	\$\$	SS	5	++	++	++			++			++
Crossing Islands	Moderate	\$\$	SS	3	+/-	+/-	+	++	++	++	++	++	++
Curb Extensions	Moderate	SS	SS	1.	+7-	++:	+/-	++	++	+	++	:++	+
Curb Radius Reduction	Moderate	\$\$	ss	1.	**	*	+	**	++	++	:++	:++	++
Gateway Treatments (R1-6 Signs)	Small	\$	\$	1	+/-	5	+/-	+	÷.	++	+	+	++
Grade-Separated Crossings	Large	\$\$\$\$	\$88\$	5	+/-	**	++	22		++	227	22	++

(Continued) Figure AF-4: Design Trade-Offs of Countermeasures Matrix

	Spatial Impact	Estimated Cost	Maintenance Cost	Public Process		Motorists			Pedestrians			Bicyclists	
					Operations	User Comfort	Safety	Operations	User Comfort	Safety	Operations	User Comfort	Safety
High-Visibility Crosswalk Markings	Small	\$	ŝ	1	+/-	+	+/-	+	+	ŧ	+	*	+
In-Street Pedestrian Crossing Signs	Small	s	\$	1	+/-	155	+/-	*	+	+	+	٠	+
Leading Bicycle Interval	Small	\$\$	\$\$	1	8	.+	+/-	*	(2 4)	+-		* 3	+
Leading Pedestrian Interval	Small	\$	s	1	Ę		+/-	*	**	+	*	**	٠
Lighting	Small	\$\$	SS	4	+		++	+		++	+		++
Mini-Traffic Circles	Large	\$\$	\$\$	4	~	::=:	+	-	-	+	-	-	+/-
Mixing Zone Treatments	Moderate	\$\$	ss	3	*	+/-	+/-	+/-	+/-	+/-	+/-	73	+
No Turn on Red Signs	Small	\$	s	1	22	+/-	++	++	**	++	**	**	++
Parking Restrictions at Crossing Locations/ Daylighting	Moderate	\$	s	2	+/-		**		.*	++	+	+	**
Passive Bicycle Signal Detection	Small	\$\$	\$\$	1	+/-	+/-	+/-	+/-	+/-	+/-	++	++	+
Pedestrian Countdown Signals	Small	SS	SS	1	+/-	+/-	+/-	*	***	**	*:	++	++
Pedestrian Hybrid Beacon	Small	\$8\$	sss	4	S.		*	*	**	++	+	**	**
Protected Intersections	Large	ssss	ssss	3	*	**	+	+	**	++	**	**	++
Protected Phases	Small	\$	s	4		**	+		**	**		**	::++
Raised Crossings	Moderate	\$\$	\$\$	3			,	++	**	++	++	**	++

(Continued) Figure AF-4: Design Trade-Offs of Countermeasures Matrix

	Spatial Impact	Estimated Cost	Maintenance Cost	Public Process		Motorists			Pedestrians			Bicyclists	
					Operations	User Comfort	Safety	Operations	User Comfort	Safety	Operations	User Comfort	Safety
Rectangular Rapid Flash Beacon	Small	\$\$	ss	1	+/-	+/-	+/-	+/-	+	+	٠	+	+
Road Diet/ Rechannelization	Large	\$\$	ss	5	=	+/-	++	++	++	++	++	++	++
Roundabout	Large	\$\$\$\$	SSSS	5	++	+	++	+	~	+/-	+		+/-
Signal Timing	Small	\$	\$	3	+/-	+/-	+	+	+	+	+		+
Traffic Signals	Small	\$\$\$\$	SSSS	3	+/-	+	+/-	+/-	+	+/-	+/-	3 4 3	+/-
Two-Stage Bicycle Turn Queue Boxes	Small	\$	\$	1	+/-	+	+/-	+/-	*	+/-	+/-	+	+/-

Appendix G: Bicycle Parking Guidance

This section includes basic guidance on bicycle parking considerations for cities, towns, and businesses from the Association of Pedestrian and Bicycle Professionals (APBP) and the Federal Highway administration (FHWA). For more comprehensive guidance on bicycle parking, local agencies should refer directly to resources such as APBP's Essentials of

What would help you walk or bike more? Knowing I have a good, safe place to lock or store my bike.

-Loveland Resident, 2020

<u>Bike Parking, Selecting and Installing Bicycle Parking that Works and the FHWA University Course on Bicycle and Pedestrian Transportation Lesson 17: Bicycle Parking and Storage and Bicycle Parking Guidelines, 2nd Edition.</u>

Adequate bicycle parking is a crucial, and often overlooked component of a complete bicycle network. Studies have shown bicyclists tend to purchase less per visit at businesses but make more frequent visits than a motorist.⁴⁸ Creating safe, secure, attractive bicycle parking near destinations encourages bicycle ridership by instilling confidence and sense of belonging in bicyclists. A community installing bicycle racks must consider the duration users will lock a bicycle to the rack. Users parking for more than two hours will most likely value security and shelter over the convenience and ease of short-term parking.

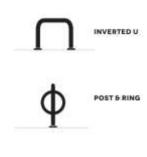
Short-Term Parking

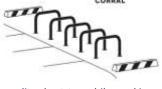
- ❖ Should be visible from and close to the entrance it serves.
 - o A benchmark of 50 feet or less is recommended.
- Shelters reduce the demand for users to bring wet bicycles into buildings.
- Lighting improves the safety and security of the user and the bicycle.
- * Racks should be secured properly and located in view of the public.
- ❖ The number of spots necessary to serve latent demand for bike parking is likely higher than the existing observed demand.

Long-Term Parking

- Users are typically willing to trade a degree of convenience for weather protection and increased security.
- ❖ Since users will leave bicycles unattended for hours an increased number of parking spaces will be needed to accommodate users throughout the day.
- Bicycle lockers, enclosures, or a room in a building may be necessary to fulfill long term parking demand.

⁴⁸ Clifton, et. al. Consumer Behavior and Travel Choices: A Focus on Cyclists and Pedestrians. Department of Civil and Environmental Engineering. Portland State University. August 1, 2012. http://nacto.org/docs/usdg/consumer_behavior_and_travel_choices_clifton.pdf



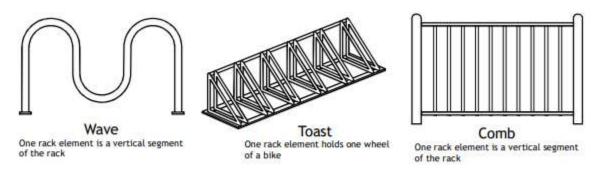


Above: High quality short-term bike parking examples.

Credit: <u>APBP</u>



Above: Secure bike shelter at University Ave MAX Bus Station on CSU Main Campus in Fort Collins. Paid registration is required for access. Credit: CSU



These bicycle racks are not recommended

Above: Examples of bike parking designs that are not recommended due to lack of functionality, intuitiveness, limited storage capacity, or potential for damage to the bike. Image Credit: FHWA

Table <i>i</i>	AG-1: Performance Criteria for Bike Parking
Criteria	Details
Supports bike upright without putting stress on wheels	The rack should provide two points of contact with the frame—at least 6" apart horizontally. Or, if a rack cradles a bicycle's wheel, it must also support the frame securely at one point or more. The rack's high point should be at least 32".
Accommodates a variety of bicycles and attachments	The racks recommended on page 6 ("racks for all applications") serve nearly all common bike styles and attachments—if installed with proper clearances (see placement section). Avoid designs and spacing that restrict the length, height, or width of bicycles, attachments, or wheels.
Allows locking of frame and at	A closed loop of the rack should allow a single U-lock to capture
least one wheel with a U-lock	one wheel and a closed section of the bike frame. Rack tubes with
	a cross section larger than 2" can complicate the use of smaller U-
	locks.
Provides security and	Steel and stainless steel are common and appropriate materials
longevity features appropriate	for most general-use racks. Use tamper-resistant mounting
for the intended location	hardware in vulnerable locations. Rack finish must be appropriate
	to the location (see materials and coatings section).
Rack use is intuitive	First-time users should recognize the rack as bicycle parking and
	should be able to use it as intended without the need for written
	instructions.
	Source: APBP

Local and Regional Best Practices

Bike Parking Program

City of Fort Collins

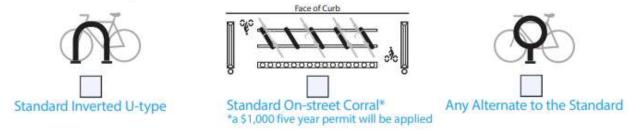
The City of Fort Collins offers bike parking guidance on their website and accepts bike parking location suggestions by individuals and businesses through the Access Fort Collins website and smartphone app or bike corrals through a PDF application. The City also offers temporary bike racks for events. Learn more here.

City-Funded Bike Parking Application Program

City of Denver Department of Transportation & Infrastructure (DOTI)

DOTI accepts applications from Property Owners and Businesses for city-funded bicycle parking. The applications are reviewed throughout the year as they are received. The application limits the type of bicycle parking to ensure usability and consistency across the City. Residents can also suggest locations through the same webpage. <u>Learn more here.</u>

What type of rack is requested? Please check one of the following (please note that Denver Public Works will not install an alternate to the standard bicycle rack or corral).



Above: A snapshot of the acceptable bike parking types that will be funded by Denver DOTI

Bicycle Parking Quantity

Humboldt County Association of Governments (HCAOG) Bike Parking Sourcebook: Sample Policies, Municipal Codes, & Programs

Among other guidance, the <u>HCAOG Bike Parking Sourcebook</u> advises that the amount of bicycle parking needed in a specific area depends on various factors, including type occupancy, location and proximity to streets conducive to heavy bicycle traffic, and the adjacent and nearby businesses. HCAOG suggests the following bike parking amounts based on land use. The list is non-exhaustive, and the amounts serve as a starting point and should be adjusted up or down based on local context:

- Multi-Family Residential: two bicycle parking spaces per dwelling unit.
- **Commercial (all zones):** bicycle spaces numbering 30 percent of motor vehicle spaces otherwise required.
- Public Facilities (such as municipal offices, parks, swimming pools, museums, parks, auditoriums, churches and similar uses): provide bicycle spaces numbering 30 percent of the motor vehicle parking normally required or immediately available to the facility.
- **Public and Private Schools (K-12):** provide bicycle spaces numbering 85 percent of peak enrollment. For post-secondary, provide spaces at least 50 percent of peak enrollment.
- **Employee Specific Parking:** Provide one bicycle space for every two employees during the heaviest work shift in addition to bicycle parking otherwise required for visitors/patrons. This parking may be located separately from the public parking but shall be at least as convenient as employee motor vehicle parking.

Appendix H: Count Program Guidance

The prevailing practice for collecting short-duration bicycle and pedestrian traffic data has been to focus on targeted locations where interest in travel patterns is the highest. Although this non-random site selection may not yield a statistically representative regional estimate on facility usage, it provides a more efficient use of limited data collection resources (e.g., random samples could possibly result in many locations with low or very low non-motorized use).

Why Count Active Modes?

Count data can be applied in a variety of ways. Some of the applications commonly cited by local agencies performing counts in the NFRMPO region include:

- To estimate facility or community usage and demand
- To justify the need for improvements or additional facilities
- To quantify the impact of new investments along a corridor (and compare it with neighboring corridors)
- To support grant applications
- To understand trailhead or access point usage patterns
- To plan maintenance activities during times with the lowest usage
- To understand the impact of special events (races, festivals, etc.) or abnormal periods (COVID-19, unseasonable weather, etc.)

General Count Location Selection

Short-duration counts (with mobile counters) and long-duration counts (with permanently installed counters) can complement one another. Long-duration counts are great at locations where data is desired on trends over long periods of time. Short-duration counts are often used to answer more specific questions. NFRMPO staff are available to assist with location selection.

Although the following criteria were developed as recommendations for short-duration count location selection, they can also apply to permanent long-duration count location selection:

- Pedestrian and bicycle activity areas or corridors (downtowns, near schools, parks, etc.);
- Representative locations in urban, suburban, and rural locations;
- Key corridors that can be used to gauge the impacts of future improvements (i.e. corridors of regional significance);
- Locations where counts have been conducted historically;
- Locations where ongoing counts are being conducted by other agencies through a variety of means, including videotaping;
- Gaps, pinch points, and locations that are operationally difficult for bicyclists and pedestrians (potential improvement areas);
- Locations where either bicyclist and/or pedestrian collision numbers are high; and
- Select locations that meet as many of the criteria as possible.

The number of count locations will depend on the available budget and the planned uses of the count data. For most agencies, getting started with counting active mode users, a count program is best developed by working with other key stakeholders interested in collecting and using this data. By discussing needs and budgets, this group can identify and prioritize short- and long-duration count locations. **Table AH-1** summarizes counter placement recommendations for the Regional Active Transportation (RATC) Network and other shared-use paths with high usage and/or serving regional traffic.

Table AH-1: Coun	ter Placement Recommendations for Regional and High-Usage Facilities							
Permanent Counts								
Consideration	Guidance							
Spacing	Rural = 5 miles, Suburban = 2 miles, Urban/Park = 1 mile, or between major access points							
	Short-Duration Counts							
Consideration	Guidance							
Spacing	Rural = 5 miles, Suburban = 2 miles, Urban/Park = 1 mile, or between major							
	access points							
Duration	1-2 weeks minimum							
Period	April - October (year-round if facilities are well-maintained)							
Timing	Before and after construction or improvement of a facility, a typical week							
<u> </u>	across each season, during special events							

Site-Specific Positioning Considerations

Once general locations have been identified, the most suitable counter positioning should be determined. The NBPD Project recommended the following guidance for counter positioning:

General

- Point away from direct sunlight.
- Narrower paths are usually better for counter accuracy.
- Test cellular network coverage if automatic data upload is desired.
- Be discrete where possible.
- Consider vegetation growth and other potential activity within the sensor's line of sight.
- Avoid gathering spots.

Based on surrounding uses

- For multi-use paths and parks, locations near the major access points are best.
- For on-street bikeways, locations where few if any alternative parallel routes are best.
- For traditional downtown areas, a location near a transit stop or in the center of downtown is best.
- For shopping malls, a location near the main entrance and transit stop is best. Count at one access point.

- For employment areas, either on the main access roadway or near off-street multi-use paths is best. Count at one access point, typically a sidewalk and street.
- For residential areas, locations near higher density developments or near parks and schools are the best. Count at one access point, typically a sidewalk or street.

In many cases, these recommended counter-positioning locations will result in the highest non-motorized traffic volumes. Given limited data collection resources and specific data uses, this focus on high-use locations may be appropriate. However, one should recognize that these high-use locations might represent a biased estimate of use levels and trends. High or low usage may only be indicative of the presence or absence of infrastructure. A high count on one route may not necessarily indicate adequate infrastructure; it may just mean that particular route is the only option. Conversely, a low count does not mean there is not demand; it may mean the existing infrastructure is not viewed as safe. This relates to the saying, "You do not determine the demand for a bridge by the number of people swimming across the river."

Data Collection and Analysis

Many count systems allow for automatic data upload to a web-based service that allows users to log into a paid account and analyze data in a variety of ways. Other count systems require manual data collection or the user has opted for manual data collection to save money. Regular manual data collection can be incorporated into normal maintenance activities by local agency staff. Once the data has been collected, the most commonly produced reports include:

- Daily averages by week, month, or year
- Daily averages by weekday and weekend day
- Hourly time series across an average weekday or weekend day
- Year-to-year comparison: daily averages annually or monthly
- Average mode split (bicycles vs pedestrians)
- Daily counts compared with weather

Different types of reports are appropriate for different formats such as table, line graph, bar graph, or pie chart. NFRMPO staff are available to assist with count data analysis and report production. Prior to analysis, the data must be cleaned and checked for quality.

Quality Check Procedures

Periodically ensuring counters are functional and are accurately and consistently monitoring bicycle and/or pedestrian patterns is an important part of any count program. Some count systems with automatic data upload capabilities can perform automated tests and flag abnormal counts daily. Alternatively, manual quality checks should be conducted whenever data is collected before reporting any summaries.

The following procedures are adapted from the Non-Motorized Traffic Data Quality Control Procedures used by CDOT and methods used within the NFRMPO bicycle and pedestrian count program. Although the following checks help flag abnormalities in the dataset, those abnormalities may not necessarily be inaccuracies. Additional context about the site, such as time of day, weather conditions, special events,

maintenance activities, and other factors should be considered as possible contributors to abnormal counts.

Consecutive Zeros Check

For warmer weather months (April 1 to October 30), any count site exhibiting more than two continuous days of zero values may be a candidate for inspection or maintenance. Consecutive zero days are common in the colder weather months and recent weather events should be taken into consideration.

Data Gaps

Counts should be flagged if there is more than one hour of missing data in a 24-hour reporting period. If a counter fails to record or transmit data, it may signify a failing battery or otherwise faulty power supply.

Maximum Daily Total Check

The user can choose to flag counts that are abnormally high, exceeding a maximum daily threshold. For permanent sites, a good starting point is to flag any daily count that is more than 3 times the previous year's average daily traffic (ADT) value. These counts can be examined further and removed if necessary. The threshold can be adjusted as needed.

Directional Split

If your counter distinguishes user direction of travel, it is important to check for abnormal splits. Most count sites (other than bike lanes) will capture close to a 50/50 directional split between the primary and secondary direction of travel. This can vary by site and the "normal" split should be adjusted accordingly if accurate historic data is available. If 50/50 is considered normal, any count site exhibiting a direction split greater than 70/30 should be flagged for further analysis or count verification.

Interquartile Range (IQR)

This check uses a statistical algorithm to identify suspect values on a quarterly/seasonal basis. This formula specifies the maximum deviation from typical conditions based on statistical parameters. If daily counts exceed the IQR then they will be removed from the data set. The maximum recommended analysis period is 3 months within the same/similar season, due to the significant variations in counts between seasons. The interquartile range (IQR) formula is:

$$IQR = 2.5(Q_3 - Q_1) + Q_3$$

Where: Q_3 = Third quartile of quarterly data

 Q_1 = First quartile of quarterly data

If daily counts exceed the IQR then they will be removed from the data set.

Manual Validation and Adjustment

After performing checks such as the ones listed in the previous section, going to the site for a manual validation or verification count can be helpful in diagnosing why the counts are abnormal. This can also be done on a semi-regular basis as good practice. Adjustments to the data may be appropriate if a consistent margin of error can be established. If any of the following practices are used, it is important to note them and include what assumptions were made before distributing the data.

Adjustment Factors

Most counters will slightly undercount based on their sensitivity setting, physical characteristics of the count site, travel patterns at the site (many people walking side by side), or other factors. Other counters may overcount for various reasons. Performing a manual count at the site and comparing it to the abnormal data the counter is collecting can help identify the extent to which a counter is undercounting. The longer these validation counts, the better. If after a validation count, it is determined the counter is undercounting users by 5 percent, an adjustment factor of 1.05 can be applied to count totals (recorded count multiplied by 1.05) to inflate them to a more realistic estimate.

Reference Counter Association (RCA)49

Reference Counter Association (RCA) is a technique of using data from other count locations to validate, reconstruct, and/or extrapolate count data at another counter (target counter) location where information is missing, incomplete, or inaccurate. Compared with the target counter, potential reference counters include counters within close proximity, same user type(s), similar facility type. Correlation tests can be used to determine how similar the sites actually are on an hourly and/or daily basis. Correlations where r >= .80 indicate good reference counter candidates. Once reference counters have been identified and estimation model can be build using regression and/or ratio analysis. The results can then be used for:

- **Validation and Reconstruction** flagging counts that are abnormal according to the estimation model, or missing altogether, and substituting in estimation model values
- **Extrapolation** taking a short-term count (at least two weeks) at a target counter location and using the estimation model to make long-term estimates

For simple applications, less advanced variations of RCA can be employed by generating a reference factor for the target counter compared with the reference counters (as explained above) on days when count values are known for all counters. The reference counter represents the ratio of the target count value to the average of the reference counters for a given day. This reference factor can then be applied for reconstruction or extrapolation (as explained above). This method should only be employed for "order of magnitude" estimations and should be used cautiously since it is less statistically sound than a true estimation model.

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⁴⁹ Adapted from guidance by Barrett Hedges, Head of Data Services at Eco-Counter.

Additional Resources

The list below covers additional resources which outline the proper selection of non-motorized count locations.

Guide to Bicycle and Pedestrian Count Programs (Portland State University)

<u>Conducting Bicycle and Pedestrian Counts: A Manual for Jurisdictions in Los Angeles County and Beyond</u> (Southern California Association of Governments)

Bicycle and Pedestrian Data Collection Manual (MnDOT)

Bicycle and Pedestrian Count Programs: Summary of Practice and Key Resources (PBIC)

Appendix I: Outreach and Engagement Summary

NFRMPO staff collected feedback at two public events in early 2020 prior to the COVID-19 pandemic. After these two events, NFRMPO staff did not attend or hold in-person public events for the *ATP*. The majority of the public outreach for the *ATP* was conducted digitally through various mediums. The outreach methods and feedback received are described throughout this Appendix.

General Public

In-Person Events

Built Environment Speaker Series - Connecting Transportation and Health50

What do you see as the largest barrier to safer and more reliable biking and/or walking in your community?

- Funding
- Lack of connectivity
- High speed limits and road design that encourages high speeds
- Speed
- Low fuel prices
- Connectivity
- Alternative transportation incentives
- Perception of users
- I don't feel safe riding on street in my neighborhood would prefer a separate bike lane
- Lack of regular, safe crossings
- Lack of protected facilities
- Safe crossings of I-25
- Unsafe bikers and drivers

Fort Collins Transportation Projects Fair

What do you see as the largest barrier to safer and more reliable biking and/or walking in your community?

- Laziness
- Funding for infrastructure
- Lack of funding and support from decision makers
- Direct routes = shortest distance
- Sidewalk connectivity
- Multimodal connections for distances
- Shields and Taft Hill
 - o Gap
 - o Difference between infrastructure
- Protections between cars and bikes

-

⁵⁰ Pre-registration was required

- Too much space devoted to cars in the roadway and for parking
- Increased separation from vehicles that also provides direct/straight-line access to destinations

Digital Engagement

2020 Active Transportation Challenge Survey51

What would help you switch trips more often?

- When I buy a bike
- Get over my laziness
- Weather is a big factor. :o)
- Awareness campaigns / challenges like these are great reminders
- If buses were running... And if I had a better way to carry things on my bike.
- Nice weather.
- More bike friendly paths
- Good weather without smoke in the air and living near places I go to.
- More frequent transit
- Skinnier streets safer for cycling
- Good weather
- Weather, planning in advance
- Warmer clothes! I just moved here from Florida.
- More options, safer routes, pedestrian dedicated routes that bypass intersections (pedestrian underpasses, bridges), better air quality, better street lighting, better street signal cyclist recognition (street signals may skip over a cyclist waiting at an intersection in early morning hours), better maintenance of bike lanes (street sweepers push debris and snow into bike lanes and shoulders where cyclists ride taking away safe lanes of travel)
- Ongoing challenges
- More time
- quicker public transit
- Motivation to move
- BETTER WEATHER LOL
- More time; distance to work is kind of far.
- A warm winter!
- A cargo bike.
- Knowing I have a good, safe place to lock or store my bike.
- Nothing
- Good weather and bike tires that hold air for more than a few days.
- Safe bike routes/paths
- Time
- More bike lanes offered throughout the city.
- Designated bike lanes and street sweeping/repairs
- Unfortunately time is the biggest factor for me.

⁵¹ Only included subset of the participants in the 2020 Active Transportation Challenge, which was open to all

- If public transportation was more of an option; I used to ride the Poudre Express to work daily until they had to cut back on the number of service times because of COVID
- When my younger daughter starts kindergarten, I can take her in the bike trolley.
- warmer weather :)
- Better sidewalks
- On going challenges
- Getting into better shape.
- Provide info on bus routes. Info on health benefits.
- Grocery, coffee
- More personal motivation
- Weather cooperating and not as much smoke from the wildfires
- Getting myself prepared to ride my bike or walk (doing it on days when I don't have errands, etc)
- The weather
- Pre-planning, incorporation with daily steps
- Reminders to do so.
- Better weather: not so hot and not so smoky
- Cost of living in foco not being so high so I can be closer to work
- My mind set
- Less wind and less smoke (tongue in cheek)
- Personal health and environmental health
- Better driver behavior and slower vehicle speeds
- Clean roads
- Better bike lanes on 57th St East of Longview Trail
- Great weather was very helpful! I just need to balance my time better and have buffers between meetings.
- warmer weather, winter is tough
- When I go back to the office; I used to switch daily (bike for car)

Community Remarks

DET/ 233 257 Timnath Eaton Fort Collins 87 Severance WELD 1526992 [85] 160161 1330 1116 392 2530 287 Windsor LARIMER 223 53 257 723 2533 154 51 Greeley 158 161 155 85 34 34 **277** 1993 Loveland [34] 153 163 172 167 Garden City 163₁₆₉ 2157 233 Evans 85 LaSalle Johnstown Berthoud Milliken 287 2 1 Legend April 2021 Sources: CDOT, NFRMPO Positive feature (point) Needs Improvement (line)

County Boundary

NFRMPO Planning Area

Figure AI-1: Location-Specific Feedback Received through Community Remarks Webpage

North Trank Range Metropolitan Planning Organization

Needs Improvement (point)

Other Location-Specific Comment (point)

		Table AI-1: Community Remarks Comments
ID	Community	
20	Fort Collins	Build a connection across Harmony Road!!
21		Bike lanes on Mason!!
22	Fort Collins	All of the crossings along Canyon are frustrating as a pedestrian.
26	Fort Collins	These two neighborhoods have no sidewalk connectivity to the rest of Fort Collins. Since the neighborhood is on the edge of city limits, this
		is made more complex.
27	Fort Collins	I consistently see people in wheelchairs trying to cross Harmony between College and JFK. There isn't a cross-walk for quite a stretch, so I
20	F + C :	think they are left choosing taking a significantly longer route or a very dangerous route.
29	Fort Collins	I would love to see a pedestrian/bike underpass under College somewhere in south Fort Collins. Crossing College on foot or bike to get between Target/REI/etc on the west side to Best Buy/TJ Maxx/etc is not the best experience as College is generally always busy and drivers do not always see peds. Going up to the underpass at the mall is too far out of the way to be practicable (although I appreciate that underpass!).
30	Greeley	Not sure why 18th street is not indicated on the map. 85 is a major thoroughfare, it would be nice to have a dedicated pedestrian/cyclist
		cross way at 18th, 16th, 13th, or 8th streets. Individuals have to effectively cross at least 6 lanes of traffic to converse both the parallel side street and 85.
31	Greeley	This base map is bad and is missing so many streets. Use a better map to apply your layers to.
32	Fort Collins	Improve connectivity along Timberline north of Mulberry to Mountain Vista now given the amount of residential construction proposed.
33	Larimer	Place sensor to detect bicycles here. There is a car sensor here, but if there are no autos, the sensor is not triggered. There is a button on the light pole, but cyclists must cross a busy right turn lane from the dedicated bike lane. This is a favorite route for cyclists to access the
35	Fort Collins	bike trail underpass on Harmony and for rides towards Masonville. Going north to CSU from the Spring Creek trail is very awkward here. Many cyclists stay on the west side of the road, contrary to the correct
		side to be on, to avoid needing to cross the street again 100 meters north in order to be able to use the Prospect underpass.
36	Fort Collins	This bike lane is often full of snow in the winter, making this an extremely unsafe place to ride. Why is it never plowed?
38	Larimer	Given the growing amount of residences planned along Timberline out to Mountain Vista, this needs to be elevated as a bike route to connect to the Poudre Trail.
39	Fort Collins	Trying to cross Vine coming from the bike path out of the new water park is frustrating because traffic is coming from 3 directions and there is no crosswalk or sidewalk. This can be dangerous for both cyclists and pedestrians.
40	Fort Collins	I am worried about this crossing once traffic picks up. There is no crosswalk for cyclists or peds. Why this is not a roundabout has been a
		mystery to me since construction of this road started. :)
41		No ped or cyclist crossing. This should have been a roundabout from the start.
42 43	Larimer	A connector between this bike path and northern neighborhoods would be desirable to avoid College Avenue. With the growing number of neighborhoods, a sidewalk along Willox would be desirable (traffic passing at higher speeds, oftentimes with
		no regard for peds), as well as a connector to Soft Gold Park without having to cut through neighborhoods.
		There is no sidewalk onthis section of Willox. It would be good for pedestrians to be away from traffic when walking to the natural areas and parks from the west.
		Thank you for the roundabout. It helps the flow of traffic and avoids unnecessary idling of vehicles while stopped. We should have more of these!
46	Fort Collins	Going uphill on the Mason trail, especially in the late afternoon or mid-day in the summer, it's apparent that there's no shade or trees along this stretch.
47	Fort Collins	Crossing Drake at Meadowlark can be pretty dangerous - I've almost been hit and seen others almost be hit by cars turning left or right who don't see a pedestrian, especially in the dawn or dusk hours (which can coincide with rush hour). Would be better to have a pedestrian-only walk sign when no cars can go.
48	Fort Collins	One of the worst intersections in the city - so many pedestrians are almost hit here. It's too wide and the turning vehicles are trying to focus on cars coming towards them AND check for pedestrians (to the detriment of the pedestrians).
49	Fort Collins	Another awful, hazardous intersection for cars - so many pedestrians are almost hit here. It's too wide and the turning vehicles are trying to focus on cars coming towards them AND check for pedestrians (to the detriment of the pedestrians).
52	Fort Collins	A dangerous intersection for pedestrians and cyclists alike. I regularly witness dangerous situations here. Drivers are so eager to make the short green arrow window that they overlook peds and cyclists regularly. I fear for my life at this one.
54	Fort Collins	Bike lanes are narrow to nonexistant most of the way between College and Stover on Drake. Some areas were improved a bit this summer but there are still sketchy spots. As population increases this has become a scarier area to ride.
55	Larimer	This section needs to be completed. 57th has no bike lane
56		The North/South bike line transitions at the Ziegler and Horsetooth roundabout are non existent.
57		Flashing red crosswalk desperately needed here. Use this crossing regularly on bicycle traffic moves too quickly to cross safely
58	Fort Collins	a sidewalk is needed so we can safely walk or bike along Trilby
60	Loveland	walking and bicycling is dangerous here
61	General	To many bikers do not announce when they are passing. More education is needed.
62		Need connection to East side of Taft Hill from Spring Creek trail
63	Fort Collins	Widen path to 6' from 3' to make this a safer connection to the Senior Center

<i>c :</i>	F C 211	
64	Fort Collins	This is a dangerous intersection since many riders don't stop when heading northbound on Mason trail and tunnel riders have to pull into
	F + C !!!	the intersection to see. Move intersection 10' to the west to allow for disability when coming out of tunnel.
_		Excellent way to handle an intersection. Lot's of room and a different color center triangle as a guide
_		Underpass at Centre Ave is frequently flooded
67	Fort Collins	The bike lane on the block of Mason between Cherry and Maple is so tricky to navigate in the winter - both northbound and southbound as
		ice/snow/plow detritus often end up in the bike lanes. To make matters more treacherous the northbound bike lane is not plowed around
		the railroad tracks, nor is the sidewalk. The area is heavily trafficked and it's really dangerous for bike and peds in the winter
68	Fort Collins	I love the new bike/ped crossing on Loomis at LaPorte. We need more of these! And we need such crossings enforced (for the drivers who
		still blow through them).
69	Fort Collins	The trail out to Boyd lake is great, but the sidewalk along Lemay is the "weak link". Widen sidewalk to allow bike and
		pedestrians to pass
\vdash	Larimer	I love the newly improved bike/ped/equestrian crossing on the Poudre Trail at Taft Hill! The city is thinking of everyone!
_	Loveland	Looking forward to this connection. Riding on Wilson is no fun.
72	Fort Collins	No bike lane on JFK in this area. Cars heading north are coming down the hill fast. Need some painting to show bike lane crossing into straight through traffic.
73	Fort Collins	This intersection, as well as the intersection of College and Mountain and various others in Old Town and campus areas, would really
		benefit from something like this intersection in the photo in Madison, WI. Here at this intersection and many others in Madison (a city, I
		believe, is one of Fort Collins' peers in terms of biking) all vehicle traffic in all directions stop (with no turn on red signs) to allow for 20-30
		seconds of ped/bike traffic in all directions. It acknowledges bikes and peds in areas where they make up a considerable amount of the
		traffic and gives them a fighting chance to move through intersections in the directions they need.
74	Fort Collins	This intersection, as well as the intersection of College and Mountain and various others in Old Town and campus areas, would really
		benefit from something like this intersection in the photo in Madison, WI. Here at this intersection and many others in Madison (a city, I
		believe, is one of Fort Collins' peers in terms of biking) all vehicle traffic in all directions stop (with no turn on red signs) to allow for 20-30
		seconds of ped/bike traffic in all directions. It acknowledges bikes and peds in areas where they make up a considerable amount of the
		traffic and gives them a fighting chance to move through intersections in the directions they need.
_	Larimer	Can't wait for this connection!
76		Need a connection across I-25 in this area. Mulberry is a "no go" and Prospect is getting too busy.
77	Larimer	I try to avoid this roundabout on a bike at all costs but sometimes I need to use it. Although there is a Bicycle Share the Road sign on 287
		westbound before the roundabout it is a harrowing place to try and bike. The shoulders are full of rusty metal, broken glass, and gravel and
	0 1	cyclists are forced to take the lane in the roundabout (where drivers aren't very thrilled to be sharing the road).
_	General	There needs to be more enforcement of distracted drivers.
80		We really would love to have a bike trail alongside Overland Trail, to connect the Poudre trail to the trails out of Spring Canyon Park.
81	Larimer	Shields south of 287 is a popular route for a lot of cyclists riding recreationally and commuting to and from work. The road is narrow
00		without a shoulder. It would be wonderful to see a bike lane or (wishfully!) a greenway here that connects to the Poudre trail.
82	Larimer	1'm am a 70 year old female who loves to ride bikes. I recently got an electric mountain bike and despite having had a knee
		replacement in May, I was out on my bike in about 5 weeks post surgery. My bike has allowed me a wonderful way to rehabilitate my knee.
		I was very disappointed to learn that I can't use my ebike on non paved city trails including Soapstone Prairie. Many seniors are able to continue to enjoy cycling with electric bikes. This restriction disproportionately effects seniors who are the main users of ebikes.
		Most ebikes motor assists cut off at 20 mph. There are many young mountain bikers who could easily exceed this speed on trails. Most
		senior bikers are pretty conservative in their riding and probably rarely hit 20 mph on a non paved trail.
		Please remove this restriction to allow for all of us to enjoy all of our wonderful trails in the city.
84	Larimer	The trail section ends at this intersection. The crossing of Ziegler at this location is used by numerous bike riders and residents. In the
'		winter time the crossing is very dangerous even as a pedestrian. Many times, crossing at night, you have to stand within the Continuous Left
		Hand Turn Lane waiting for an opening in heavy traffic. Traffic never stops to let pedestrians or bicyclist cross safely.
85	Fort Collins	Can't wait until the bike trail goes under I 25
		I've complained about this intersection to the City and the response was that despite numerous complaints (That right there should tell you
		something.), there are surprisingly few incidents here. But the fact that people regularly sprint across this intersection, even when they're in
		a crosswalk, because motorists don't slow down, and therefore avoid an " incident" does not mean this intersection is safe. And
		the diagonal parking that was added just makes visibility even worse for motorists to see crossing peds or bicyclists.
87	Fort Collins	I thought there was a proposed future trail connection here, i.e. something that would cross over the railroad track and run along the canal
		to Timberline Road. Southeast Fort Collins (south of Harmony, east of Timberline) is virtually cut off from the rest of the trail system.
88	Fort Collins	Need a trail here to connect the southeast neighborhoods to the rest of the bike trail system.
89	Fort Collins	The tunnel under College is great, but it's difficult to get on the bike path connection from Monroe because the curb cut it at the college ave
		crosswalk and cars are frequently backed up in this area waiting to make a right turn with no room for bikes to pass safely on the right.
		Putting a curb cut and connection to sidewalk 100' east of intersection would be helpful
90	Fort Collins	This is the gold standard for an underpass: safe, no sharp turns of blind corners, and large enough to allow snow to collect in tunnel without
		impacting travel. Most is also exposed to the sun in winter so little ice.
91	Fort Collins	There is no good access across I-25 from South Fort Collins. Kechter is the lowest traffic alternative, but there is no shoulder for some of it
		and the bridge is horrible.

92	Fort Collins	There is no good way to access the wonderful rides around horsetooth reservoir from East Fort Collins. If you aren't going to add a trail to
32		the obvious place across the railroad tracks North of Southridge golf course, then please widen the shoulder along Trilby, particularly under
		the railroad tracks and over the bike path just to the West.
94		This intersection needs improvement for pedestrians and bikers. There are a lot of kids who travel across this intersection on their way to
		school and home. When traveling west bound, getting to the traffic pole is difficult, often requiring you to get off your bike and walk over to
		the pole. Some better infrastructure is needed at this intersection
95	Fort Collins	I suggest a spur exiting the north side of Spring Creek Trail that would merge with north bound Shields traffic. It is awkward to go south up
		the narrow ramp to then turn north.
96	Fort Collins	The sidewalk on the south side of the street is too narrow and too close to traffic to comfortably walk from Whitcomb to Centre
97	General	I bike all over Larimer Co. and one issue which exists needing to be changed, is with bike lanes that are approaching intersections & Description Bike all over Larimer Co. and one issue which exists needing to be changed, is with bike lanes that are approaching intersections & Description Bike all over Larimer Co. and one issue which exists needing to be changed, is with bike lanes that are approaching intersections & Description Bike all over Larimer Co. and one issue which exists needing to be changed, is with bike lanes that are approaching intersections & Description Bike all over Larimer Co. and one issue which exists needing to be changed, is with bike lanes that are approaching intersections & Description Bike all over Larimer Co. and One issue which exists needing to be changed, is with bike lanes that are approaching intersections Bike all over Larimer Co. and One issue which exists needing to be changed, is with bike lanes that are approached in the large Bike all over Larimer Co. and One issue which exists needing the large Bike all over Larimer Co. and One issue which exists needing the large Bike all over Larimer Co. and One issue which exists needing the large Bike all over Larimer Co. and One issue which exists needing the large Bike all over Larimer Co. and One issue which exists need Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bike all over Larimer Co. and One is with the large Bik
31	General	push riders into a lane that is to the L of the R turn lane, i.e., going west on Harmony approaching Timberline or going west on Horsetooth
		approaching Taft. These are too dangerous and bike lanes for riders need to be kept on the Right. Vehicles turning right, can get in front or
		behind bikes.
98	Fort Collins	Yes! We finally have ramps at the end of our sidewalks instead of sharp drops. This will be a huge help for folks pushing strollers or kids on
30	TOTE COUNTS	bikes. Thank you, City of Fort Collins!
99	Fort Collins	The stop sign to the north needs to be brought south to the intersection. Folks at the stop sign to the north often aren't seen by folks at any
		of the other points of the intersection because they're set so far back from where everyone else approaches the intersection.
100	Fort Collins	Thank you for bike lanes on Shields!!!!!
		Yes! The improvements to Mulberry make the street feel quite a bit safer for bicyclists, provide more parking for motorists, and also provide
		a smoother ride for motorists since now you don't have to worry about getting stuck behind someone making a left hand turn from the left
		lane.
102	Fort Collins	This intersection is horrible for motorists and basically a meat blender for pedestrians. And yet there are people on one side of I-25 who
		need to get to the other side of I-25 without a motor vehicle. When is this intersection going to be dealt with? It's an absolute miracle that
		people aren't regularly dying at this intersection. All I can figure is that God has a heavy-duty squad of Navy Seal Angels set up here to save
		lives.
103	Fort Collins	I wouldn't say this stretch between Peterson and the Poudre is perfect yet, but it's a whole heck of a lot better than it used to be. The gravel
		shoulder and skinny bridge were truly scary before.
104	Larimer	I haven't had a chance to ride it yet, but I'm thrilled to see a new bike trail here connecting the Irish Elementary neighborhood with the
		Lincoln Middle School area. This was sooooo needed. Thank you!
105	Larimer	The connection between Lincoln Middle School and the Poudre Trail is Soooooo needed. Thank you for putting this in!!!
106	Larimer	We need sidewalks along Vine. Too many students walk to school along this street not to have sidewalks.
107	Fort Collins	I hate walking along S. College between the MAX line and our auto repair shop. College needs sidewalks! The fact that there are social trails
		shows that lots of people walk and ride along the street. But it's not safe to be walking in the street when cars are traveling 55 mph or faster
		on that same street! The side trails work when there's no mud or snow. But that's not always an option.
108	Fort Collins	Power Trail should connect East-West in (mid-town) to Mason Trail and/or Remington low-stress. One place to do that could be near (or
		even along) Collindale Golf Course (or that canal that is in the area) and then along Warren Lake. That would then drop right near the Mall
		(and the underpass at College that iI NEVER see being used) or to the Low Stress North-South streets that eventually become Remington.
109	Fort Collins	Grade separated crossings on the Power Trail would increase speed/efficiency for both the bike pedestrians and the East-West car traffic.
		(This would be even more true for Mason + MAX, but I imagine that gets pretty complicatedand priceypretty quickly).
110	Fort Collins	Underpass beneath Timberline to coincide with construction of Mail Creek connection, the widening of Timberline, and Safe Routes to
		School for Bacon (and the future park going there?).
111	Fort Collins	Grade-separated crossing under Timberline at FCHS and the Power Trail kick out. That could make this a true Safe Route to School AND a
		solid East-West Connector from Power Trail to the eventual trail extension at Environmental Learning Center.
112	Larimer	Why does the paved trail around Rigden Reservoir just stop? It would be way better if that went all the way around (I actually can't think of
		any other loops in town. And we all know loops are better than out-and-backs). At the very mininum, at each paved trail end, make it a
		bulb so someone on a road bike (or rollerblades or whatever else with wheels that can be deadly at moderate speeds that suddenly stop)
112	Fort Collins	can easily flip a U. It would be way cooler if we could cut from Power Trail to Fossil Creek with a trail along South Ridge (along the most southern border). Golf
113	I OIL COUITIS	is cool, but it would make that huge (tax-subsidized) green space more used/useful for the general public that doesn't golf.
114	Larimer	This may overlap with (future) Poudre Trail connections at Rigden, but this canal already has a huge " path" alongside it for the
114	Lammer	duration. It could be an easy conversion and useful connection for a bunch of SE Neighborhood commuters.
115	Fort Collins	Not sure if this is the format for this, but a stair-incline (Like the Manitou Incline) would be a really, really cool "trail"
_	Windsor	Please work on bicycle facilities that parallel 392
		The original bike plan connected these northern neighborhoods with the existing Poudre Trail. What happened to those plans? There are
111	I OI L COUIIIS	
		several major developments with hundreds of home in progress and with no connector bike trails including Trailhead, Mosaic and Montana in the future.
118	General	in the future.
	General Fort Collins	

121	General	Please remove all the Push Buttons pedestrian traffic lights. This does not encourage people to be pedestrian. This treats pedestrians like
	oc.iciat	someone who should ask permission to use the public space (here is equity?) and put pedestrians in a different category than car drivers?
		Why we pedestrians need to request permission and not the more dangerous car drivers? This should stop, please! in many countries, this
		does not exist, and pedestrians have the same right that any other transportation mode to use the public spaces. Also, with the pandemic,
		you should avoid and remove all contact surfaces that are not needed, and these pushbuttons are a good example of what is unnecessary in
		the public space. Please automatize all traffic lights for pedestrians!!
122	Fort Collins	Thanks for creating the pedestrian crossing in Elizabeth!! It is great!!
		Please make pedestrian these streets, we need more public space in downtown
		These need to be car-free streets!
	General	We need more car-free streets, public space, squares, and plazas, for social interaction
	General	We need to expand all the sidewalks; there are many places where you can not walk together. I need to help my mom when she walks. And
		in many streets, I can not be on the same sidewalk because it is too narrow. WE should update all sidewalks to be at least 6-9 feet wide.
127	Fort Collins	E-scooters are parking on the sidewalks, and many times here are just looking at the whole sidewalk or are dropped on the floor
		completely. E-scooters should have designated parking spaces and should not be allowed to be parked anywhere!
128	Fort Collins	A pedestrian and car-free zone here
129	Fort Collins	Very narrow sidewalks. It is hard to walk with supermarket bags, the king's sooper I just in the corner, and Elizabeth have very narrow
		sidewalks
130		The bike lane should have a physical separation, there are not more bike lanes in parallel to this Thaft section, so you feel forced to go through that, and the traffic goes very fast.
131	Fort Collins	Many cars turn from shields to mulberry, and not many are aware of the bike lane; please add more colors on the ground or physical barrier
		to protect cyclists here.
132	Loveland	The route through McCaffey park is really a great addition. To improve this, there needs to be better signage for biking through the Sports
		complex, getting on to the river trail and then navigating that short piece up Wilson to get to the gravel canal then over to the north side of
		36. It's so much better than 5 years ago!
133	Fort Collins	The end of the Pitkin Bikeway needs to connect to the Spring Creek Trail/Power Trail/Poudre Trail in some way. It dead ends with no bike
		lane, or you have to jump on a narrow sidewalk to get to one of these other connections.
134	Larimer	I bike Taft Hill from FC to Loveland a couple times a week to get to work. I would use the Long View Trail, but it's too far out of the way.
		When this road is improved, it should be widened and the bike lane made more distinct.
135	Loveland	Starting here (Rossum) and going west on 34, there should be a protected bike lane since there are no bike trails. It is hard to go east/west in
		Loveland on bike trails, so I look forward to future regional connections along the Highway 34 corridor and into the Big Thompson canyon.
126		(Think Boulder canyon road.)
136	Larimer	The Poudre Trail should finish at Morning Fresh/the Howling Cow Cafe, not the parking lot outside Watson Lake. I know there are private
127	Fort Collins	property issues, but the paved trail should go through Watson Lake at least, and then hopefully can continue NW at some point.
		We need better options than Gregory, Hwy 1 and Timberline for getting into town or connecting to other regional trails. It would be good to improve the connection for the bike lane on Stuart St. across Taft Hill Rd. Cyclists traveling West cannot safely cross Taft
140	FOIL COULIS	without having to ride south on the sidewalk (east side of Taft) to the school crossing at Blevins or completely change their route and cross
		at Valley Forge where there is a stop light.
1//1	Fort Collins	Improving the connection between Hampshire and Fuqua St at Prospect Rd would be nice to see. It can feel dangerous to bike with kids and
141	FOIL COULIS	connecting these segments of Bike routes. Families are currently force to travel on the Prospect sidewalk (south side of Prospect) all the
		way to the school light crossing at Fuqua.
142	Fort Collins	Improvement to cross Drake to connect the Hamsphire bikeway to the Hampshire Ponds neighborhood (and the Spring creek trail) would
	TOTE COULTS	be helpful. When traveling with kids, it is daunting to cross Drake where the speed limit is 40mph and we have to cross 5 lanes (2 in each
		direction plus the median lane).
143	Fort Collins	Thank you for adding this stop light (bike and pedestrian specific) to cross Taft Hill and also forcing cars to make a right hand-turn, it makes
		it much safer to travel as a family and connecting to east-west neighborhoods.
145	Fort Collins	Bike lanes on Lemay are super narrow, which is quite dangerous when cars can go up to 40mph. The lanes should be wider with buffers in
		high speed sections
146	Fort Collins	There should be a crossing light similar to the one on Swallow/Mason Trail. Cars don't always recognize the crosswalk is part of the bike
		path, even if you stop and wait for them.
147	Fort Collins	This section of Stuart and these side of the Spring creek trail are poorly plowed during the winter time, despite the amount of traffic in both
		areas. The bike lanes on Stuart are generally covered in snow and at least an inch of ice
148	Larimer	This intersection seems to become less safe since the reaving. The cars on the right when going Northbound would essentially stop with
		their bumpers in or less than 2feet from the "bike lane"/shoulder.
149	Larimer	It would be really cool if the was a pedestrian/cyclist underpass or overpass here. There's lots of people who cross this section of 287 and it
		was make it safer for all road users.
150	Larimer	There's a solid amount of cyclists riding through here, but the shoulder ends up becoming super narrow, if not non existent with all of sand,
		glass, and other road debris. Beautiful place to ride though!
151	Fort Collins	Here and a few other major intersections should have protected left turn bike lanes. This way the drivers are less inclined to be aggressive
131		and annoyed towards cyclists and aids in the flow of traffic.

152	Fort Collins	We need a hiking/biking trail connection from Avondale to the trail on Shields. Trilby is not really safe for bicycling in this section from Avondale to Shield.
153	Greeley	On 4th St. Between 47th and 35th there are no bike lanes and sidewalks are narrow. Hazardous to bike on.
156	Loveland	Traffic on CR 20 is very heavy at commute time because people are trying to get off 34. It's heavy enough that it's very difficult to make a left
	Loveland	hand (turning east). This is a residential area, not designed to deal with large amounts of traffic.
	Loveland	This intersection is a disaster! It's desperately in need of a traffic light! With the projected development on 402, this is only going to get
	Lovetaria	worse.
159	Windsor	Need continuous bike lanes on CR32E connecting from CR5 into windsor shopping center with King Soopers
	Villasoi	Also need bike lanes on Ketcher Road from CR5 west to Fossil Ridge High School
160	Larimer	I would love a safe way to cross 392 to get to this trail.
	Greeley	The bike trail along Hwy 34, needs a connection to the bike route on 50th Ave. There is a 40ft easement, with barbed wire fence blocking the
	,	connection, it doesn't logically make sense, to have the barb-wire fence blocking a connection for Pedestrians and Bicyclist. Also on the the
		same Bike trail, their is no visible entrance from the trail to the Josephine Park along Hwy 34. I don't understand why the bike route, park
		and bike path are not connected.
163	Greeley	Bike trail, has no visible entrance from the trail to the Josephine Park along Hwy 34. I don't understand why the bike route, park and bike
	ĺ	path are not connected.
164	Greeley	Positive feature- North/South existing Bike route that avoids heavy traffic along 47th Ave. Needs to connect to existing trail along Hwy34.
	Evans	Perfect place for a Bike route, and can connect into Riverside bike trail to the East.
	Weld	Sidewalk or Bike Route is badly needed for students trying to commute to new middle school that was built on 65th and 37 St.
_	Greeley	North/South Bike Route needed to link Riverside Trail to Poudre River Trail.
	Greeley	Proposed future underpass, linking bike route and a possible trail extension. Redevelopment of 35th Ave interchange by CDOT.
	Greeley	Underpass bike tunnel is needed to connect subdivisions and retail.
_		Speed bumps along Yorkshire are much welcomed as cars had a tendency to speed through this section of neighborhood
171	Fort Collins	There is a decent amount of traffic turning onto Cedarwood Dr. (west) from Hampshire (either directions). The majority of users
	TOTE COULTS	(cars/pedestrians/cyclists) are respectful, but we could enhanced the safety of that intersection. It would be great to see a new form of
		speed reduction in this area (i.e. pavement painting/art). Bike Fort Collins is proposing and working toward a similar concept at the
		intersection of Canyon Ave., Sherwood St. and Magnolia St.
172	Greeley	Great bike/pedestrian feature to allow under highway 34 access crossing. Tunnel works great and was installed decades ago, more are
	ĺ	needed.
173	Greeley	Great example of tunnel under busy thoroughfare!
174	Evans	Very pleasant bike/pedestrian trail along the river and through the Park, great redevelopment of area after 2013 Flood. Thanks!
175	Greeley	This is a nice Bike route linking to UNC or Downtown!
	Weld	Great designed trail, could use more maintenance w/weeds in the summer but is a very great place for pedestrians and bicyclists!
177	Greeley	Greeley has done a great job expanding the trail into new residential communities and linking the trail to Sheep Draw Trail, which links to
		Poudre River Trail. Some new trail has been added in this area, which the map isn't showing currently.
178	Fort Collins	I'd like to see the Power Trail go under Harmony.
179 180	Fort Collins	It would be nice if the Power Trail went under Drake (and Horsetooth). There is a lot of Trail traffic which often stops cars. A separated
		grade crossing would help traffic flow for everyone and increase safety.
	Windsor	Great job on the bike and walking path north and west of 392 and CR13, BUT, there needs to be a walking bike tunnel under CR13. North of
		392. Similar to the one under 392 west of this intersection. They are laying the Thornton Water pipe, would be a good time to jump on with
		that.
	Fort Collins	This Ketcher bridge has got to slatted for destruction and rebuild with the work being done on widening of 125. Be a good time to put in
		some good bike and pedestrian ways along Ketcher.
	Fort Collins	We have to cross this street to walk or bike ride. Unsafe. This road was 25 mph when we bought our home.
	Loveland	This stretch desperately needs to be finished. Riding on 34 is too dangerous
	Loveland	This stretch desperately needs to be finished. Riding on 34 is too dangerous
	Fort Collins	Bike paths absent in FC city park
	Windsor	I'm considering getting an e-bike for the daily commute Windsor to Loveland but some of the roads are not bicycle friendly, especially
		during rush hour.
	Greeley	Get rid of the "dark sky" lights and get some real street lights so I don't get mugged. I can't go out in my yard at night, much less walk
		somewhere. This kind of initiatives don't have any meaning for me.
	General	Walking Routes

Other Key Stakeholders

Digital Engagement

Fort Collins Bicycle Advisory Committee

- Acknowledge the plans for interregional connections (Brighton, Cheyenne, Boulder) and any current planning efforts
- Factor in cost considerations and the type of use a trail will likely get
- Further guidance on how to manage Class III e-bikes
- Connecting to Wellington is a priority better connections are needed around Anheiser-Busch and the Fort Collins Soccer Complex
- Look at opportunities through the ARDEC property
- Engage with CSU stakeholders more often
- Make the process for providing input more clear

Fort Collins Transportation Board

- Better connections to destinations such as:
 - Grocery stores
 - o College Avenue corridor destinations from mid-town/mall area to Harmony Road
 - Wellington
 - Windsor
- Ensuring good connections between Montava and nearby destinations
- Regional maps that highlight difficulty and comfort of the facility
- Design considerations that are appropriate for the main user group (Is it mainly used for commuting? recreation? both? something else?)
- Emphasizing the importance of Kechter Road as a regional connector
- Regional guidance on bike parking
- Use Platforms such as Nextdoor for outreach
- Prioritize corridors and improvements that serve the most people first
- Links to local maps in one centralized place
- Concerns that RATC #5 is not an efficient use of limited funding based on low population density
- Wondering if Power Trail underpass at Harmony Road is an efficient use of funds given the high price tag and ability to make that money go much further elsewhere

Loveland Transportation Advisory Board

- Continue improvements along 57th Street
- A better on-street connection is needed between Fairgrounds Park and downtown
- More bike racks are needed downtown they need to be intuitive and not too artistic to be recognized as bike racks
- Additional wayfinding = a quick win
- A more pedestrian friendly environment could help entice travelers on their way to Estes Park to stop and visit the downtown area getting RVs to downtown is a challenge

- Better connections are needed between the North side of town (N of US34) and downtown Loveland
- Street names should be labeled clearly at trail underpasses
- Non-traditional outreach strategies such as social media, neighborhood pages, etc. have been effective
- More continuity and connectivity needed between trail network and on-street bike network, with consistent standard based on road type
- Project prioritization should be destination focused (downtown businesses, breweries)
- Having a map/materials that feature existing facilities as well as upcoming or planned facilities would help build awareness, excitement, and advocacy.

Greeley Citizens Transportation Advisory Board

- Addressing how bike/ped network interacts with transit network
 - First and last mile connections at Hill and Park opportunities when talking with Evans/Weld
- Bike lanes are now on 65th, comment from 2016 can be removed
- How to address bike travel along arterials like Business 34 parallel off-street path with better signage and/or parallel streets
- Equity conversation should look specifically at neighborhoods in East Greeley like East Memorial
- North side of town needs connectivity between the various bike paths (Larson-Broadview-Poudre)
- Have more public meetings in diverse ways to capture feedback from many people through various mediums
- A quick win in Greeley would be additional bike lanes on more streets

Larimer County Mobility Committee

- Addressing the impacts of COVID-19 and how to have a more resilient AT network
- Pop-up projects and programs are very helpful in engaging the community and getting them started towards permanent improvements (parklets, etc.)
- Public perception that transit is really unsafe
- Talk to City of Fort Collins about their sidewalk gap prioritization matrix
- Make deliberate effort to involve older adults and individuals with disabilities
 - Talk to Disability and Mobility Access Priority Group
 - Shift Your Ride campaign
- Trail crowding is a real concern for slower moving users
- Keep reaching out to older adults and individuals with disabilities

Weld County Mobility Committee

- Mile markers and other information is important emergency response consideration for regional trails
- Sidewalk gap/barrier specific to Greeley is lack of infrastructure connecting to Bella Romero

- Limited bike rack space and on-board space (or on-board prohibition) of bikes is emerging issue we should address
- Other micromobility solutions include OneWheel, Segway

Additional Meetings and Conversations

- Town of Berthoud Planning Staff
- City of Evans Community Development Staff
- City of Fort Collins Parks Planning and Development Staff
- City of Fort Collins FC Moves Staff
- City of Greeley Transportation Planning Staff
- City of Greeley Natural Areas & Trails Department
- Town of Johnstown Planning Staff
- Town of Milliken Planning Staff
- Larimer County Engineering Staff
- Larimer County Natural Resources Staff
- Weld County Public Works Staff
- Weld County Public Health and Environment Staff
- City of Loveland Public Works Staff
- City of Loveland Open Lands Staff
- Town of Windsor Open Space and Trails Staff
- Town of Severance Planning Staff
- Town of Timnath Community Development Staff
- Town of Wellington Staff
- Bike Fort Collins Staff and Board Members
- Larimer County Built Environment Leadership Team
- Partnership for Age Friendly Communities