

CONNECT NORTHGLENN



BICYCLE AND PEDESTRIAN MASTER PLAN

January 2018



SPONSORED BY: MAYOR DODGE

COUNCILMAN'S RESOLUTION

RESOLUTION NO.

No. CR-30
Series of 2018

18-33
Series of 2018

A RESOLUTION APPROVING THE CONNECT NORTHGLENN BICYCLE AND PEDESTRIAN MASTER PLAN AS PART OF THE CITY'S COMPREHENSIVE PLAN

WHEREAS, the City of Northglenn is a home rule municipal corporation organized under and pursuant to Article XX of the Colorado Constitution and the City of Northglenn Home Rule Charter; and

WHEREAS, by virtue of such authority, and as further authorized by State statutes including but not limited to C.R.S. § 31-23-206 *et seq.* and Section 11-40-9 of the Northglenn Municipal Code, the City has authority to make and adopt a comprehensive plan for the physical development of the municipality; and

WHEREAS, the City of Northglenn commissioned a consultant team, Alta Planning + Design, to engage the stakeholders and facilitate consensus to develop a vision and plan to create better bicycle and pedestrian connectivity throughout the City to maximize community assets and improve accessibility; and

WHEREAS, the consultant team drafted a 98 page document entitled "Connect Northglenn Bicycle and Pedestrian Master Plan" and associated appendices, that aims to make Northglenn more walk- and bike-friendly for people of all ages and abilities, which will also improve the health and economic resiliency of the community; and

WHEREAS, the Planning Commission conducted a public hearing on the Plan on January 16, 2018, and following said hearing the Commission, by a majority vote recorded in its official minutes, adopted the Connect Northglenn Bicycle and Pedestrian Master Plan as an amendment to the Comprehensive Plan; and


WHEREAS, the City Council has reviewed the Connect Northglenn Bicycle and Pedestrian Master Plan and has determined that it is in the public interest that the Plan be adopted as an amendment to the City of Northglenn Comprehensive Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF NORTHGLENN, COLORADO, THAT:

Section 1. The City Council hereby ratifies the adoption by the City of Northglenn Planning Commission of the Connect Northglenn Bicycle and Pedestrian Master Plan as an amendment to the Comprehensive Plan, attached hereto as **Exhibit 1**, and incorporated herein by this reference, and the attached Connect Northglenn Bicycle and Pedestrian Master Plan pursuant to C.R.S. § 31-23-208 and Section 11-40-9 of the Northglenn Municipal Code.

Section 2. The City Manager is directed to cause an attested copy of the attached Connect Northglenn Bicycle and Pedestrian Master Plan to be filed with the Office of the Adams County Clerk and Recorder in accordance with C.R.S. §31-23-208.


DATED at Northglenn, Colorado, this 26th day of February, 2018.


CAROL A. DODGE
Mayor

ATTEST:


JOHANNA SMALL, CMC
City Clerk

APPROVED AS TO FORM:


COREY Y. HOFFMANN
City Attorney

ACKNOWLEDGMENTS

CITY OF NORTHGLENN MAYOR + COUNCIL

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Bryan Weatherly

PROJECT STEERING COMMITTEE

Ashley Kaade, Senior Planner, Project Manager

Kyle Kammermeier, Civil Engineer

Amanda Peterson, Director of Parks and Recreation

Becky Smith, Planning Manager

Brook Svoboda, Director of Planning and Development

CONSULTANT: ALTA PLANNING + DESIGN


Sam Piper, Project Manager



Additional thanks to the Healthy Eating Active Living (HEAL) Committee, Youth Commission and Parks and Recreation Advisory Board as well as Northglenn staff members Eric Ensey, Senior Planner and Alan Sielaff, Planner, and members of the public who provided valuable input.

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CHAPTER 1

EXECUTIVE SUMMARY

CONNECT
NORTHGLENN



Connect Northglenn provides the vision and direction necessary to make walking and bicycling a safe, comfortable and desirable means of transportation for people of all ages and abilities.

1.1 WHAT IS CONNECT NORTHGLENN?

On a daily basis, thousands of people move through Northglenn to access their job or home, visit a park, go to school, take transit, shop, exercise, or reach another destination. Today, the majority of people choose to drive to these places. One key reason people choose not to walk and bicycle to these places is limited walking and bicycling infrastructure, which can make using these modes uncomfortable.¹ This is despite the fact that half of all trips are short distances that could reasonably be completed on-foot or by bicycle.²

While most people have the choice to drive, for others, walking, bicycling and transit are their only options for transportation. Those who use these modes out of necessity tend to be lower-income, at-risk populations. Making improvements for these vulnerable populations is critical, since they rely on walking, bicycling and transit to meet their daily needs.

Connect Northglenn is an initiative to remove the barriers that prevent more people from walking and bicycling, and to make it safer and more comfortable for those who walk and bicycle out of necessity. To achieve higher rates of walking and bicycling and improve safety, the plan includes over 50 infrastructure recommendations to create a comfortable, low-stress bicycle and pedestrian network. The recommendations will result in an active transportation system that connects people from their front doors to the community's destinations.

The Plan resulted from months of public engagement, field work, and data-driven analysis. It involved numerous meetings with stakeholders, and was continually refined to reflect the type of community and transportation system Northglenn residents desire in the future. This Plan will serve as a road map to create a modern, well-balanced

transportation system that provides real mobility choices. Real mobility choices mean that people can walk and bike for most trips, have convenient access to transit, all while retaining the option to drive, in a safe and comfortable environment. Implementing the Plan's recommendations will make Northglenn a more walk and bike friendly city, which in turn will put the City on a path to becoming a healthier and a more socially equitable, economically resilient community.

EXECUTIVE SUMMARY CHAPTER COMPONENTS



Vision and Goals – Presents the plan vision, as well as goals and supporting objectives.



Engaging the Public and Stakeholders – Describes public and stakeholder outreach methods for Connect Northglenn.



Developing Recommendations – Describes the planning process and recommendations development for Connect Northglenn.

Note: Throughout the document the term “planning team” is used to refer to the consultant and the project steering committee.

¹ Approximately 36 percent of survey respondents felt that bicycling is a safe, practical, and convenient transportation option, while 51 percent felt that walking is a safe, practical, and convenient transportation option.

² 50 percent of all trips nationally are three miles or less; 2010 National Household Travel Survey

1.2 PLAN VISION AND GOALS

A vision statement outlines what the city wants to be. It concentrates on the future and is a source of inspiration. The following vision statement, developed in coordination with the steering committee, City Council, City Staff, and the public, serves to guide Connect Northglenn:

Connect Northglenn Vision: *Walking and riding a bike in Northglenn is a comfortable and integral part of daily life for people of all ages and abilities. The City boasts a robust trail, pedestrian, and bikeway network. This makes Northglenn a healthy and attractive place in which citizens are proud to live, work, and recreate. The network connects neighborhoods, job centers, transit stations, shops, schools, and other daily destinations, facilitating active living and aging in the community.*

CONNECT NORTHGLENN GOALS

The following goals, developed through the planning process, will guide the City towards fulfilling the Plan vision and implement Connect Northglenn. Under each goal, a series of strategies are provided to help the City achieve the goals; some strategies are already being implemented, while others are new.



Connectivity and Convenience – Expand transportation choices by making bicycling and walking for transportation easy, efficient, and comfortable for all types of trips.

- Integrate transportation and land use policies to encourage development that facilitates walking and bicycling.
- Continue safe routes to school improvements so that all children can easily walk and bike to school.
- Adopt a Complete Streets policy, helping to ensure the needs of bicyclists and pedestrians are accommodated in all capital improvement and development projects.
- Provide bike racks and other end of trip facilities for bicyclists in accordance with industry best practices at transit hubs and destinations in the City.
- Implement wayfinding signage that assists bicyclists and pedestrians with navigation.



Safety, Comfort, and Health - Improve pedestrian and bicyclist safety while designing attractive, welcoming, and comfortable streets and trails for all users that facilitate active living.

- Reduce the number of bicyclist injuries and fatalities, establishing a downward sloping long-term trend line for crashes. Strive to reduce the number of bicyclist and pedestrian fatalities to zero.
- Develop bikeway and pedestrian facilities to meet national best practices in design, providing a safe and inviting environment for all ages and ability levels, and facilitating active living.



Usage - Increase walking and bicycling trips by replacing trips previously completed by car.

- Track changes in the primary means of transportation people take to work, and strive to continually increase the percentage of people walking and bicycling.
- Focus on improving connections to transit and park-n-ride lots.
- Document any annual increase in physical activity levels among Northglenn residents, ultimately reducing rates of obesity and related chronic diseases.
- Monitor and assess any reduction in school site vehicle trips as a gauge of reducing driving and increasing walking or bicycling.



Accessibility – Increase accessibility for all users.

- Adopt policies, standards, and specifications to meet the needs of all modes and users, including children, families, the aging, and those with mobility impairments.
- Prioritize facility improvements in areas of inequity, providing mobility options for those who rely more heavily on bicycling and walking for most of their trips.



Programs – Foster a culture that supports walking and bicycling.

- Continually support the development of education, encouragement, enforcement, and equity programs aimed at ensuring all residents and visitors feel confident bicycling and walking throughout Northglenn.
- Identify private and non-profit organizations that can become partners in the development of bicycling and walking programs.
- Continue to ensure that programs reach a wide cross-section of Northglenn citizens, including traditionally underserved populations.



Implementation – Coordinate with leadership to establish processes and funding levels necessary to enable the continued growth of the pedestrian and bicycle network.

- Adopt and implement Connect Northglenn, with the goal to implement projects and/or programs on an annual basis.
- Establish dedicated funding and explore grant opportunities for implementation of Connect Northglenn.
- Establish an annual bicycle and pedestrian work plan of programmatic, policy, and infrastructure recommendations ready for implementation.
- Dedicate staff time to implement the plan's recommendations.
- Update the City's Comprehensive Plan to reflect the goals, strategies, and recommendations from Connect Northglenn.
- Update the zoning ordinance to enhance walkability and bikeability.



Evaluation - The City will measure progress towards advancing the vision and goals of Connect Northglenn.

- Establish and maintain an annual counts program, documenting trends in pedestrian and bicycle activity.
- Coordinate pedestrian and bicycle counts with planned infrastructure investments to measure impacts.
- Conduct annual analysis of pedestrian and bicycle collision data to measure progress towards safety goals and objectives.
- Maintain up-to-date GIS inventory of pedestrian, bicycling, and transit facilities, including ADA improvements; update database bi-annually.
- Achieve Bicycle Friendly Community designation by the League of American Bicyclists, and achieve Walk Friendly Community designation by the Pedestrian and Bicycle Information Center. Once official status is gained, strive to increase designation every two years.
- Develop Annual Summary Report summarizing progress in implementing the walking and bicycling recommendations of the Plan, and present highlights to City Council.



Maintenance – Ensure the usability and safety of the bicycle and pedestrian network.

- Evaluate and supplement existing maintenance funding to establish funding levels sufficient to keep both existing and future pedestrian and bikeway facilities in good condition.
- Ensure that the design and implementation of bicycling and walking facilities minimize future maintenance costs by specifying quality materials and standard products.
- Maintain roadways and bicycling and walking facilities so that they are safe and comfortable for all users.
- Establish a program that encourages citizens to report maintenance issues through the City website that impact pedestrian and bicycle safety.

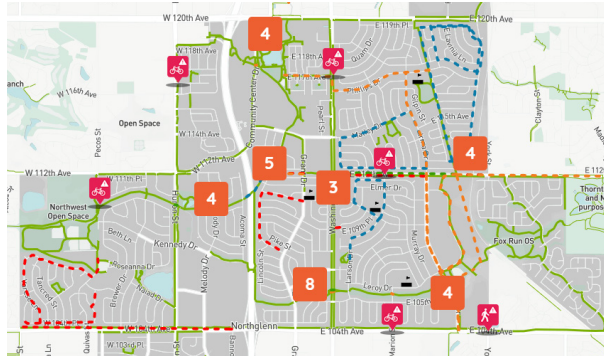
1.3 ENGAGING THE PUBLIC AND STAKEHOLDERS

The development of Connect Northglenn was a collaborative effort that brought together residents, visitors, local leaders and regional partners to create a strategic vision to improve walking and bicycling in Northglenn. The Plan included a thorough assessment of what it is like to walk and bike in the City today. To understand these conditions, the planning team sought feedback from the public and stakeholders through a variety of means, including traditional public meetings, mobile meetings where members of the planning team went out to the public at scheduled events to gain feedback, a walk and bike audit, a website and online input map, an online survey, a telephone town hall, and social media. In the fall, the draft recommendations were presented at the final public open house. Input received at the meeting was used to refine and finalize the recommendations in the plan.



In-Person Engagement

The in-person engagement provided an opportunity for community members to share their stories, experiences, and desires for how to improve walking and bicycling in Northglenn. The project included two open house meetings and six mobile meetings that occurred throughout the process.



Online Engagement

The project website provided a central place to learn about the project. Additionally, the interactive online map was used to collect specific feedback about desired routes or needed improvements in Northglenn. The online map was supplemented by an online survey, as well as notifications posted to various social media feeds.



Stakeholder Meetings

The stakeholder meetings provided an opportunity to gain technical input and general feedback from a broad range of perspectives. A steering committee comprised of City Staff met six times to guide the development of the plan. Additionally, several targeted stakeholder meetings were held to capture a broad range of input. The planning team also made presentations to City Council to provide updates on the status and direction of the plan, and seek feedback at key milestones.

MORE THAN
75 COMMENTS
COLLECTED VIA
THE MOBILE
MEETINGS

2 PUBLIC OPEN
HOUSES
6 MOBILE
MEETINGS

170 ONLINE SURVEYS
COMPLETED

75 COMMENTS ONLINE
(ROUTES OR POINTS)

93 "LIKES"
TO COMMENTS ONLINE

1 JOINT MEETING
WITH THE PLANNING
COMMISSION AND HEAL
COMMITTEE

2 AUDITS
ONE WALK/ONE BIKE

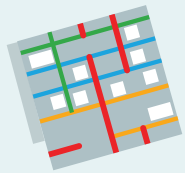
6 STEERING
COMMITTEE
MEETINGS

4 CITY COUNCIL
PRESENTATIONS

ASSESSMENT AND INPUT



EXISTING
ACTIVITY
GENERATORS



**EXISTING SUPPLY OF
WALKING & BICYCLING
FACILITIES**



BICYCLE &
PEDESTRIAN
CRASHES



PEDESTRIAN
LEVEL OF
SERVICE
ANALYSIS



BICYCLE LEVEL
OF TRAFFIC
STRESS
ANALYSIS



**COMMUNITY NEEDS &
PUBLIC INPUT**



OPPORTUNITIES
& CONSTRAINTS



EQUITY
ANALYSIS



ONLINE
ENGAGEMENT



PUBLIC
OUTREACH

**FIGURE 1.1 RECOMMENDATIONS
DEVELOPMENT PROCESS**

RECOMMENDATIONS

The development of recommendations for Connect Northglenn included multiple steps. First, the planning team identified what areas of the community have the **greatest propensity to generate walking and bicycling activity**.



This analysis was complemented by assessing the **supply of walking and bicycling facilities city-wide**, and identifying where **crashes** are occurring. This data-driven analysis was then supplemented by multiple rounds of **outreach and engagement**. The recommendations link activity centers, improve existing connections, and provide new connections where facilities do not exist.

1.4 DEVELOPING RECOMMENDATIONS

The process for developing the Plan's recommendations was divided into three phases: existing conditions analysis, needs assessment, and recommendations. The existing conditions analysis resulted in a thorough understanding of what it is like to walk and ride a bicycle in Northglenn today. The needs assessment built on this foundation, and identified where there is demand for pedestrian and bicycle infrastructure, and assessed the supply of existing pedestrian and bicycle facilities that link these areas. Recommendations were developed following the conclusion of the needs analysis. Being a bicycle and pedestrian plan, the recommendations focus on projects that fill critical gaps in the network to improve mobility for bicyclists and pedestrians. Specific emphasis was also placed on improving connections to the community's assets, including the Civic Campus, transit stations, and the City's numerous parks, trails, schools, shopping destinations, and more.

Recommendations Overview

The development of the network recommendations was an iterative and collaborative process. The needs of people walking and bicycling are balanced with the safety and comfort of other users, as well as roadway characteristics and corridor constraints. The Plan's recommendations provide guidance that can be used to move projects towards implementation. Some recommendations are conceptual, and additional coordination will be needed for implementation.

In total, over 50 recommended infrastructure projects are identified in this Plan. Projects were prioritized based on criteria developed with public and stakeholder input. Northglenn's first bike lane was installed as a pilot project in June 2017, and represents the first plan recommendation to be implemented. To support implementation of additional recommendations, designs and planning level cost estimates are included for five concept projects. The plan concludes with an implementation checklist of specific strategies and actions to achieve the Plan's vision and goals.

RECOMMENDATION FACILITY TYPES

Infrastructure recommendations fall into one of four categories: On-Street Bikeways, Off-Street Facilities, Neighborhood Bike/Pedways, and Crossing Improvements. Within each category, different types of improvements are recommended. The type of recommendation is identified on the Connect Northglenn Recommendations Map. For each recommendation, additional detail about the improvements are provided in Appendix G. A general description of the four categories include:

On-Street Bikeways: On-street bikeways provide a dedicated space within the roadway for bicyclists to ride. Bike lanes and buffered bike lanes use lane striping to delineate the bikeway, while more robust separated bike lanes use a variety of treatments to physically separate bicyclists from motor vehicles.

Off-Street Facilities: Off-Street facilities provide dedicated space for bicyclists and pedestrians separated from the roadway. This category includes the construction of new sidewalks, as well as improvements to existing sidewalks, such as the addition of a buffer between the roadway and sidewalk. Shared use paths, which provide two-way travel for both bicyclists and pedestrians, are recommended as well.

Neighborhood Bike/Pedways: Neighborhood Bike/Pedways include both bicycling and walking improvements. This recommendation is made along neighborhood streets that have existing low traffic speeds and volumes, which make them inherently comfortable for bicycle and pedestrian travel. In the short term, bikeway signing and striping improvements are recommended for these streets. Nearly all existing residential sidewalks do not meet the minimum ADA requirement width of 4 feet, and the public repeatedly voiced concern about narrow neighborhood sidewalks. Sidewalk improvements are expensive, and while all residential sidewalks are recommended to eventually be reconstructed city-wide, roadways with the Neighborhood Bike/Pedway designation represent the priority network for residential sidewalk reconstruction.

Crossing Improvements: The crossing improvements recommended for Connect Northglenn fall into two categories, intersections and mid-block crossings. Generally, these improvements will facilitate the crossing of major arterial and collector roadways, which due to the number of lanes, posted speeds, and traffic volumes, require thoughtful design to maintain comfort for bicyclists and pedestrians crossing the roadway.

On-Street Bikeways

Bike Lane

Buffered Bike Lane

Separated Bike Lane



Off-Street Facilities

Sidewalks

Sidewalk Improvements

Shared Use Paths



Neighborhood Bike/Pedways

On-street Bikeway Markings

Wayfinding Signage

Pedestrian Improvements



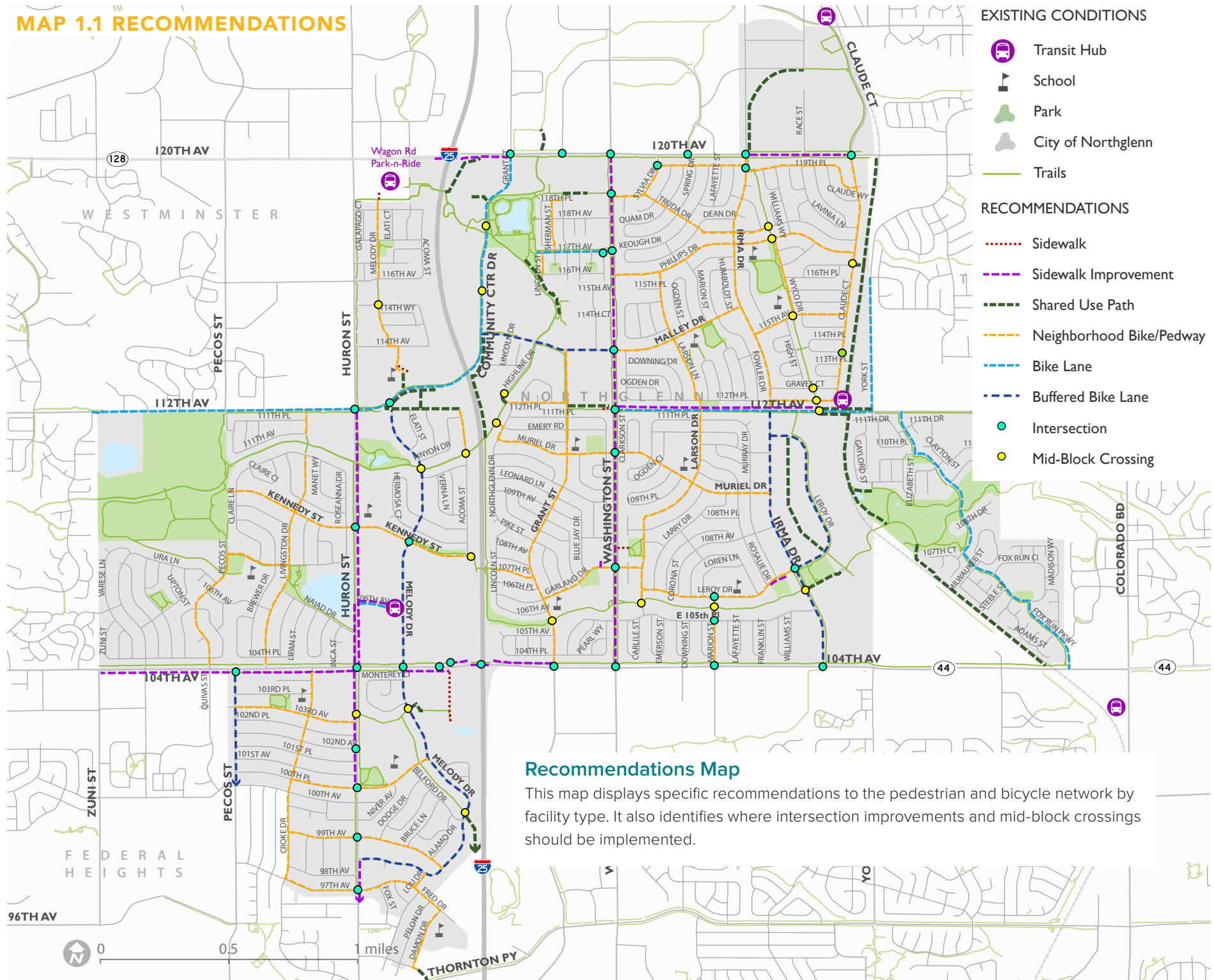
Crossing Improvements

Intersections

Mid-Block Crossings



MAP 1.1 RECOMMENDATIONS





CHAPTER 2

EXISTING CONDITIONS

CONNECT
NORTHGLENN



Active transportation can be defined as people walking or riding bicycles, which are active forms of personal transportation, wherein people move under their own power.

2.1 INTRODUCTION

In recent years, communities across the country have begun to redesign streets and expand trail networks to make active transportation more viable. In addition to providing low-cost forms of transportation, walking and bicycling offer many additional benefits to communities that develop comprehensive active transportation systems. Northglenn is well positioned to realize these benefits, including improved quality of life for residents, enhanced community health, increased mobility for those who do not have access to a vehicle, and other economic benefits.

Land Use and the Transportation Network

The City of Northglenn is a suburban community of nearly 40,000 residents, located along Interstate 25, north of Denver. Northglenn's built environment and roadway network impacts walking and bicycling in the community. Commercial, industrial, and residential uses are primarily concentrated in separate areas of the city. This increases the distance between destinations, making it less convenient to walk and bicycle between them.

Northglenn's transportation network also impacts active transportation. Major arterial corridors cross the city in both north/south and east/west directions, and Interstate 25 bisects the city. While bicycling and walking is generally comfortable within Northglenn's residential neighborhoods, traveling across and along the arterial and collector roadways can be stressful for non-motorized users.

Northglenn has prioritized the development of trails, and has installed comfortable sidewalks along several corridors in the community. These improvements facilitate connections to the many destinations in Northglenn, from schools to parks and businesses. This chapter explores the existing active transportation conditions in Northglenn.

EXISTING CONDITIONS CHAPTER COMPONENTS



Existing Active Transportation System – Presents existing active transportation infrastructure and identifies destinations that generate bicycling and walking activity.



Destinations and Community Health – Presents the Seven Dimensions of Health and Wellness, how they are embodied in different destinations throughout Northglenn, and identifies desirable connections between them.



Pedestrian and Bicycle Collisions – Reviews bicycle and pedestrian with motor vehicles collision data from 2012 to 2016 to determine collision trends. Collisions are also mapped to highlight where there are a concentration of collisions.



Roadway Network Suitability for Walking – Uses data driven models to evaluate how comfortable Northglenn's roadways are to walk today.



Roadway Network Suitability for Bicycling – Uses data driven models to evaluate how comfortable Northglenn's roadways are to bicycle today.



Existing Bicycle Parking – Assesses the type of bicycle racks in Northglenn, and where in the city bicycle racks are provided.



Programs – Provides summary of programs that support walking and bicycling in Northglenn.

2.2 EXISTING ACTIVE TRANSPORTATION SYSTEM

Northglenn has implemented off-street infrastructure to facilitate bicycle and pedestrian travel. The existing network of active transportation facilities includes shared use paths and sidewalks. The city does not have any dedicated on-street bicycle facilities.

Shared Use Paths

Sometimes called trails (not to be confused with soft surface trails), shared use paths are typically 8-12' wide, constructed of asphalt or concrete, and designed to accommodate people walking, bicycling, rollerblading, skateboarding, and using other active transportation modes. Shared use paths are physically separated from roadways, either in their own right of way or paralleling a roadway. Shared use paths that parallel roadways are called sidepaths. Shared use paths can serve as transportation and/or recreation facilities. Approximately 37 miles of shared use paths exist in Northglenn.

Sidewalks

Most of Northglenn's roadways are equipped with sidewalks. The great majority of residential streets have sidewalks on both sides of the roadway. These sidewalks were constructed when the subdivisions were built, and are typically less than five feet wide. Sidewalk conditions along arterial and collector roadways vary by corridor. Most of these sidewalks are five feet wide, and many include a buffer area between the sidewalk and the roadway. This buffer increases pedestrian comfort levels, especially on roadways with higher posted speeds and traffic volumes. Other arterial and collector roadways have sidewalks that are attached directly to the curb.

Intersection Crossings

Signalized intersections in Northglenn include marked crosswalks and pedestrian countdown signals. Northglenn also has two underpasses and one overpass, which enable grade-separated crossing of Interstate 25. These intersection treatments facilitate the crossing of major roadways, which otherwise act as barriers to bicycle and pedestrian travel.

SHARED USE PATHS

FARMER'S HIGH LINE CANAL TRAIL



104TH AVENUE SIDEPATH



SIDEWALKS

104TH AVENUE BUFFERED SIDEWALK



MELODY DRIVE ATTACHED SIDEWALK



INTERSECTION CROSSINGS

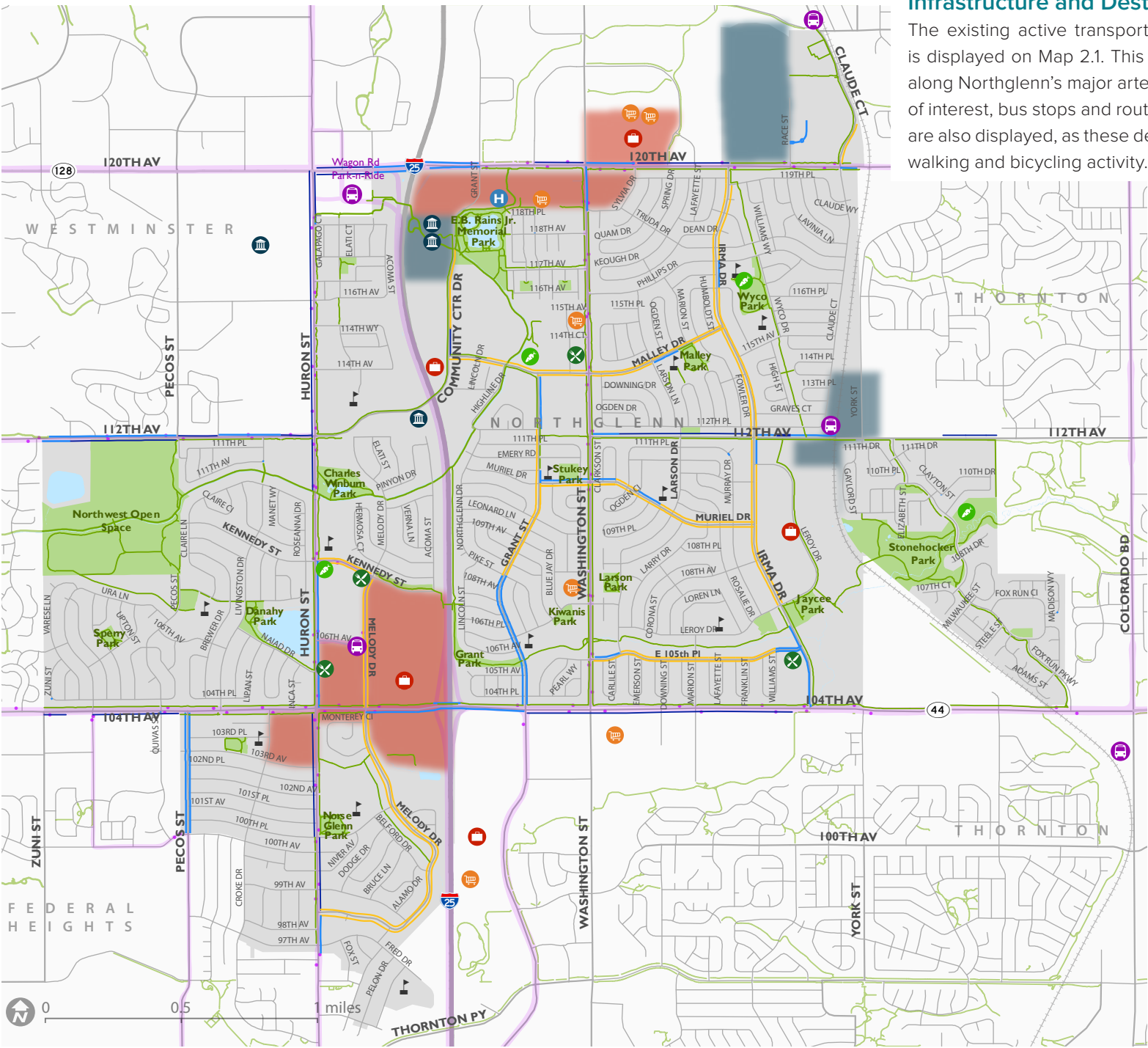
MALLEY DRIVE SIGNALIZED CROSSING



INTERSTATE 25 OVERPASS



MAP 2.1 EXISTING CONDITIONS AND DESTINATIONS



Infrastructure and Destinations

The existing active transportation infrastructure in Northglenn is displayed on Map 2.1. This map includes trails and sidewalks along Northglenn’s major arterial and collector roadways. Points of interest, bus stops and routes, transit hubs, schools and parks are also displayed, as these destinations represent generators of walking and bicycling activity.

- EXISTING CONDITIONS

 - Shared Use Path
 - Buffered Sidewalk
 - Attached Sidewalk
 - Sidewalk Less Than 5ft Wide*
 - Trail Over/Underpass
 - Bus Route/Stop
 - Transit Hub
 - School
 - Park
 - City of Northglenn
- POINTS OF INTEREST

 - Employment
 - Civic
 - Community Garden
 - Grocery
 - Food Pantry
 - Hospital
 - Major Retail Area
 - Redevelopment Area

*Based on review of aerial imagery. The maximum sidewalk width per American with Disabilities Act (ADA) is four feet, and five feet minimum is advised.

2.3 DESTINATIONS AND COMMUNITY HEALTH

Concentrating Northglenn's focus on improving active transportation will help make healthy living in the community more attainable. Research indicates that "health" is made up of many interconnected components. The Seven Dimensions of Health and Wellness represent the different facets that contribute to overall health. They have been used by public health professionals for many decades to develop assessments of community health. In recent years, transportation professionals have applied these principles to better understand destinations in the community that represent the Seven Dimensions. Improving active transportation connections between areas that represent these dimensions helps communities become healthier places to live and thrive. This section describes the Seven Dimensions.

Physical Health: The ability to maintain a healthy quality of life that allows us to get through our daily activities without undue fatigue or physical stress. It also entails the ability to recognize that our behaviors have a significant impact on our wellness, and to adopt healthy habits while avoiding destructive habits. Destinations where citizens can achieve physical health, such as parks and healthcare centers, embody this dimension.

Social Health: The ability to relate to and connect with other people in our world. Also, the ability to establish and maintain positive relationships with family, friends, and co-workers. This dimension represents destinations where citizens can achieve social health, such as recreation and entertainment uses.

Economic Health: The ability to provide for ourselves and our families. This also entails finding fulfillment in our jobs or our chosen career fields, while still maintaining balance in our lives. Local businesses, shopping plazas, and other destinations where citizens can achieve economic health embody this dimension.

Environmental Health: The ability to recognize our own responsibility for the quality of the air, water, and land that surrounds us. The ability to make a positive impact on our environment, be it our homes, our communities, or our planet. Examples of environmental health destinations include schools, trails, and open spaces.

Spiritual Health: The ability to establish peace and harmony in our lives by developing congruency between values and actions. Destinations where citizens can achieve social health, such as places of worship and natural areas, embody this dimension.

Emotional Health: The ability to understand ourselves and cope with the challenges life can bring. The ability to acknowledge and share feelings of anger, fear, sadness, or stress; hope, love, joy, and happiness in a productive manner. This dimension represents destinations where citizens can achieve emotional health, such as healthcare centers.

Intellectual Health. The ability to open our minds to new ideas and experiences that can be applied to personal decisions, group interaction, and community betterment. The desire to learn new concepts, improve skills, and seek challenges in pursuit of lifelong learning. Examples of intellectual health destinations include schools and libraries.

Mapping The Seven Dimensions

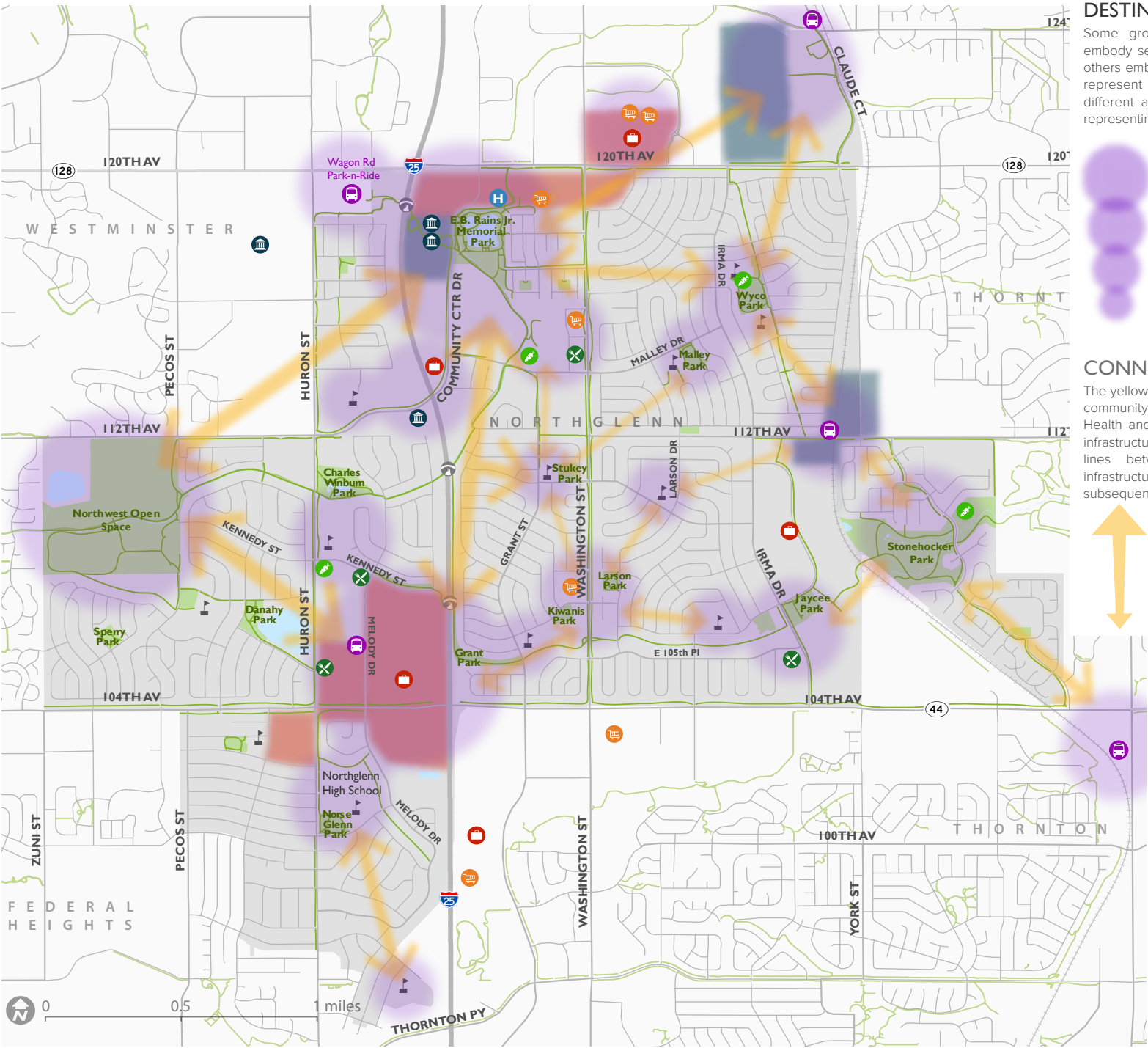
Map 2.2 explores the concentration of the Seven Dimensions throughout Northglenn, and identifies desirable connections between them. This map was developed in coordination with the Project Steering Committee. Areas that were found to represent most of the Seven Dimensions are highlighted below. Ensuring bicycle and pedestrian connections exist to these and other destinations will help Northglenn achieve total health.

AREAS THAT REPRESENT THE SEVEN DIMENSIONS



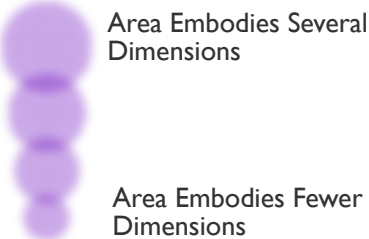
These destinations were found to represent most, if not all, of the Seven Dimensions of Public Health and Wellness. They represent community gathering areas that draw people from all over the city. Bicycle and pedestrian connections to these areas will be assessed in subsequent chapters. Improving access will help Northglenn to achieve total health.

MAP 2.2 CONNECTING DIMENSIONS AND DESTINATIONS



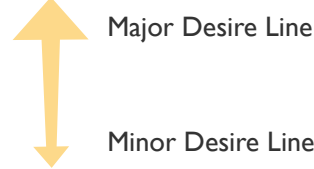
DESTINATIONS AND DIMENSIONS

Some groupings of destinations in the community embody several dimensions of health in wellness, while others embody fewer. The size of the circles on Map 2.2 represent how many dimensions are represented in different areas of Northglenn, with the largest circles representing areas that embody the most dimensions.



CONNECTING DESTINATIONS

The yellow lines are desire lines that connect areas in the community that embody the Seven Dimensions of Health and Wellness. These lines do not follow existing infrastructure, but rather, indicate the most direct desire lines between these areas. Analysis of the infrastructure along these lines is presented in subsequent chapters.



DESTINATIONS

- Employment
- Civic
- Community Garden
- Grocery
- Food Pantry
- Hospital
- Transit Hub
- School
- Park
- Major Retail Area
- Redevelopment Area

2.4 PEDESTRIAN AND BICYCLE COLLISIONS

Safety is a major concern for residents when making the choice to use active modes of transportation. The City of Northglenn provided data summarizing motor vehicle collisions with pedestrians and bicyclists from January 2012 to December 2016, representing five years of crash data.¹ During this time period, a total of 98 collisions were recorded, of which two resulted in pedestrian fatalities.²

Collisions Over Time. Collisions generally decreased between 2012 and 2015, with the lowest number of collisions occurring in 2015 (13 collisions). However, the number of collisions more than doubled in 2016, when compared to 2015.

Intersections. A majority of collisions occurred at intersections during the time frame analyzed. 61 percent of collisions with pedestrians and bicyclists occurred at intersections, while 39 percent of collisions occurred at non-intersections.

Collision Speed and Severity. 66 percent of the 98 collisions occurred on roadways with posted speeds greater than 35 mph, indicating that the majority of crashes occur on higher posted speed roadways. The two collisions that resulted in fatalities occurred on roads with posted speeds of 35 mph. The great majority of collisions resulted in some form of bodily injury to the pedestrian/bicyclist (81 percent).

Collisions By Road Type. Nearly half (47 percent) of the collisions recorded occurred on arterial roads. Collector roads experienced the fewest number of collisions (20 percent of all collisions), while approximately one-third of all collisions occurred on local roads.

Figures 2.1 to 2.5 present the major findings from the collision analysis, and Map 2.3 displays the location of the collisions.

¹ The crash data analyzed did not differentiate between bicyclist and pedestrian collisions. Figures 2.1 to 2.5 display findings from the data collected from January 2012 to December 2016.

² An additional fatality was recorded on Interstate 25 in Northglenn, but this crash is not included in the summary findings.

FIGURE 2.1 ANNUAL COLLISIONS WITH MOTORISTS (2012 TO 2016)

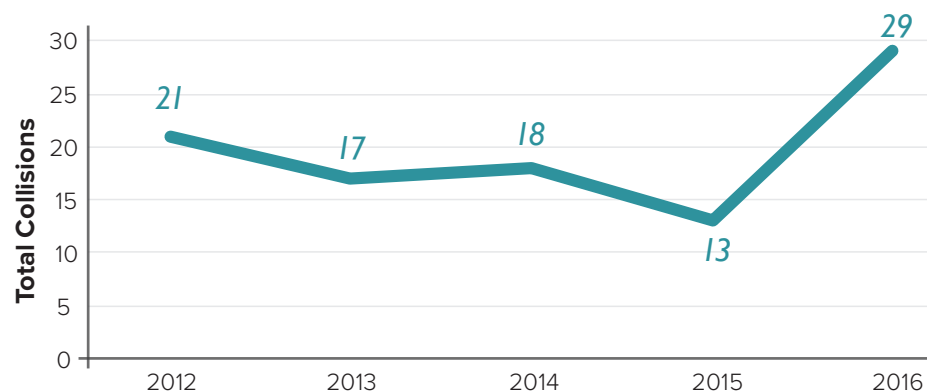


FIGURE 2.2 LOCATION OF COLLISIONS

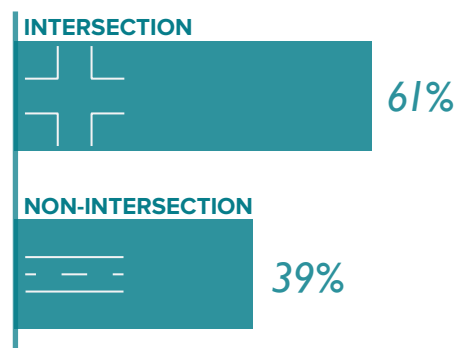


FIGURE 2.3 COLLISION SPEED

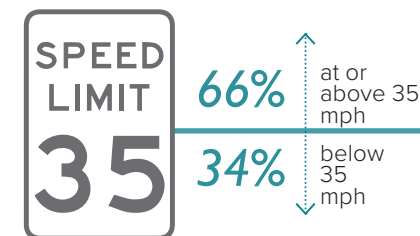


FIGURE 2.4 COLLISIONS BY ROAD TYPE

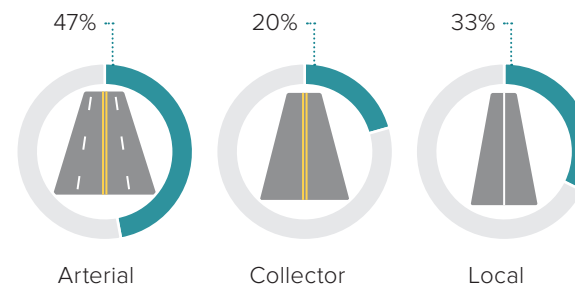
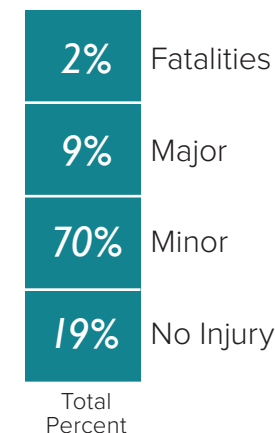
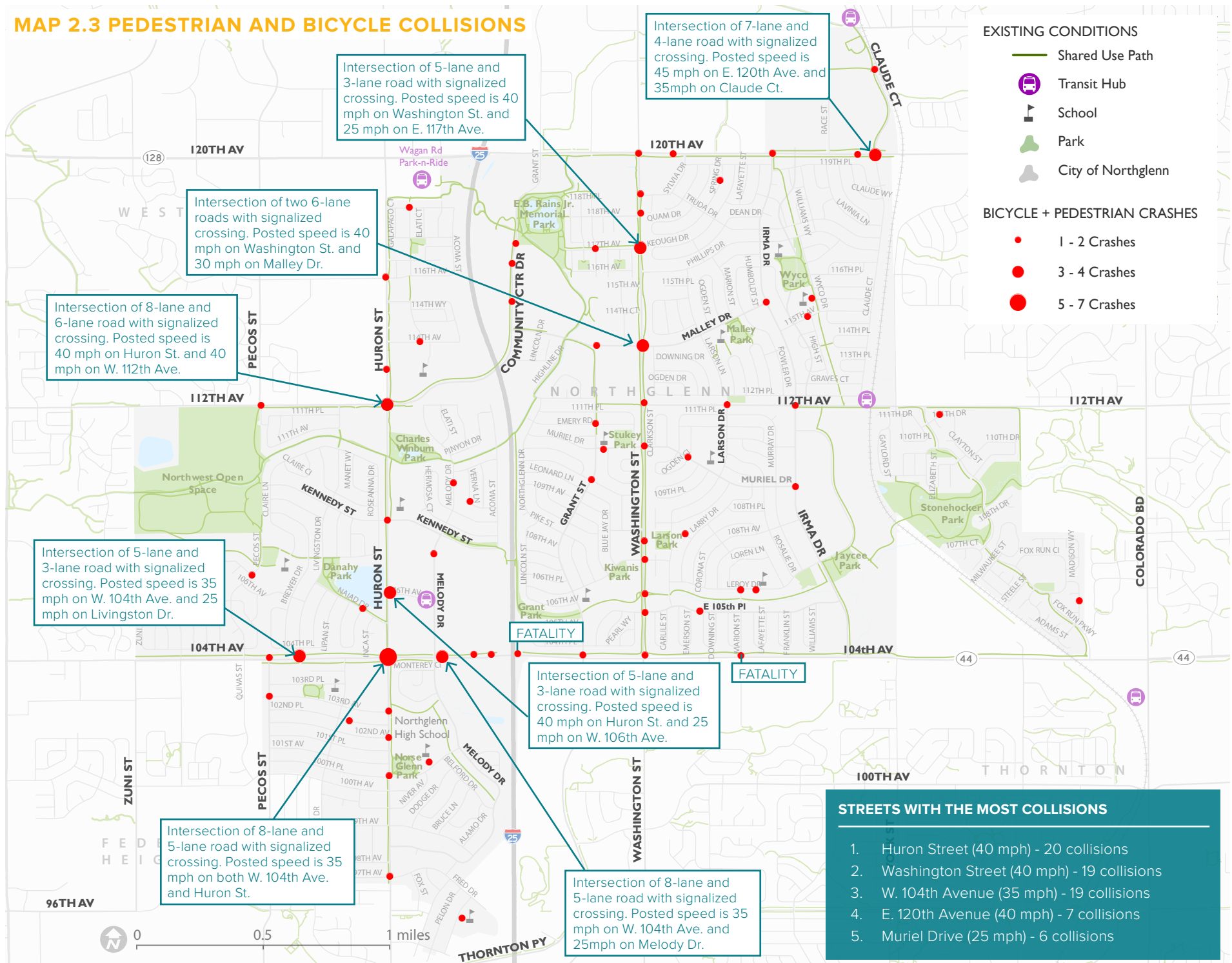


FIGURE 2.5 SEVERITY OF COLLISIONS



MAP 2.3 PEDESTRIAN AND BICYCLE COLLISIONS





2.5 ROADWAY NETWORK SUITABILITY FOR WALKING

A Pedestrian Level of Service Analysis (PLOS) model is used to assess existing walking conditions in Northglenn. For this analysis, a level of service is identified for each roadway segment in the city, which represents how comfortable Northglenn's roadways are to walk along.

Analysis Methodology

The PLOS analysis measures pedestrian comfort using five factors: posted speed limit, the number of travel lanes, the presence of sidewalks, the presence of a buffer area between the sidewalk and the roadway, and land use. Motor vehicle speeds have a significant impact on pedestrian safety, with a doubling of travel speed resulting in a four-fold increase in stopping time and resulting crash severity. The presence of sidewalks, and presence of a buffer between the sidewalk and roadway, also impact pedestrian safety, especially as speeds and the number of travel lanes increase. Commercial districts impact PLOS scores too, specifically in suburban communities like Northglenn, where these areas tend to prioritize access for motor vehicles.

The combination of these criteria create four Pedestrian Levels of Service scores for the existing roadway network. The lower the number, the higher the level of service the road provides for pedestrians. Additional details on the PLOS methodology are provided in the appendix.

- **PLOS 1.** Residential streets with sidewalks OR multi-lane roadways with buffered sidewalks on both sides
- **PLOS 2.** Multi-lane roadways with low-to-moderate posted speeds and attached sidewalks on both sides OR that have a buffered sidewalk on one side
- **PLOS 3.** Multi-lane roadways with moderate posted speeds and attached sidewalks OR that have a sidewalk on only one side of the road
- **PLOS 4.** Multi-lane roadways with higher posted speeds and attached sidewalks OR that lack sidewalks on one or both sides of the road

Figure 2.6 presents examples of the four PLOS scores in Northglenn. The results of the Pedestrian Level of Service Analysis analysis are displayed graphically on Map 2.4.

FIGURE 2.6 PEDESTRIAN LEVEL OF SERVICE SCORES

PLOS 1



Malley Drive west of Irma Drive

PLOS 2



112th Avenue west of Irma Drive

PLOS 3



Melody Drive north of 104th Avenue

PLOS 4

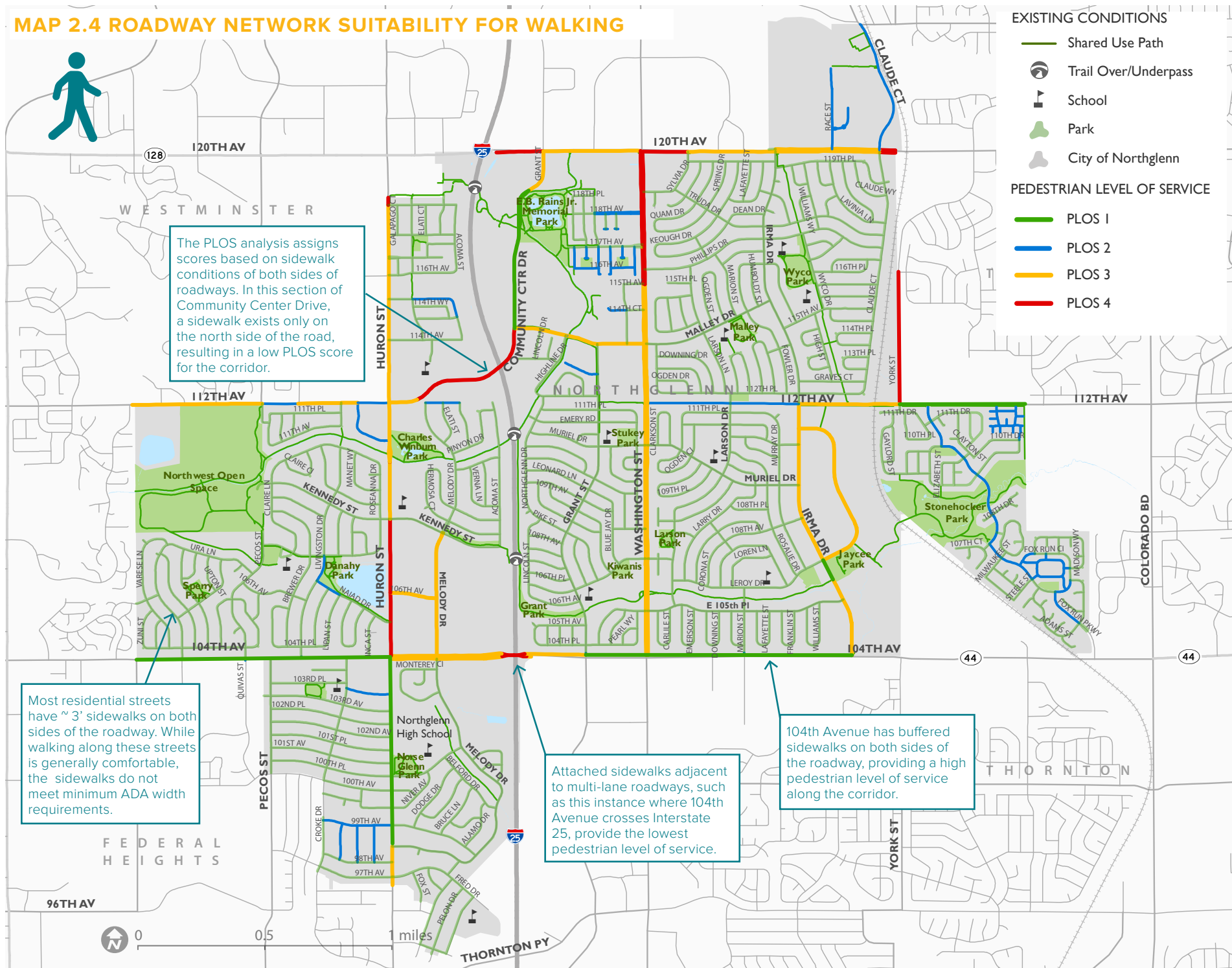


104th Avenue above Interstate 25

MOST COMFORTABLE

LEAST COMFORTABLE

MAP 2.4 ROADWAY NETWORK SUITABILITY FOR WALKING





2.6 ROADWAY NETWORK SUITABILITY FOR BICYCLING

Low stress connectivity to and from neighborhoods, jobs, recreation areas, and other destinations is an important factor in encouraging people of all ages and abilities to walk and ride a bicycle in every part of the city. Low stress facilities, like shared use paths and dedicated on-street bikeway facilitates, appeal to a diverse cross section of the public, especially as alternatives to high volume and/or high posted speed streets.

Analysis Methodology

The Level of Traffic Stress (LTS) analysis used for Connect Northglenn is adapted from the 2012 *Mineta Transportation Institute (MTI) Report 11-19: Low-Stress Bicycling and Network Connectivity*. LTS is designed to objectively assess how comfortable roadway conditions are, but does not assess conditions on sidewalks. The LTS analysis uses roadway network data (i.e. posted speed limit, street width, number of travel lanes, intersection conditions, presence and character of bikeway facilities, and land use context) to determine bicyclist comfort level.

The combination of these criteria creates four levels of traffic stress for the existing roadway network. The lower the number, the higher the level of comfort for people on bicycles. Additional details on the BLTS methodology are provided in the appendix.

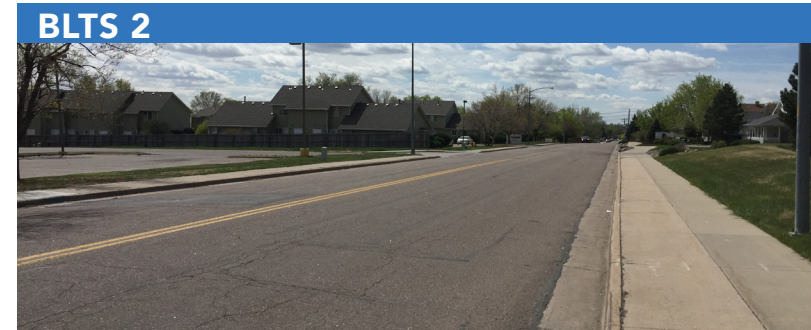
- **BLTS 1.** Low-stress roadways suitable for all ages and abilities; also includes paved shared use paths
- **BLTS 2.** Roadways that are comfortable enough that the mainstream adult population would ride a bicycle on them
- **BLTS 3.** Roadways that are probably only comfortable when ridden by an experienced, confident bicyclist
- **BLTS 4.** Roadways ridden only by strong or fearless bicyclists

Figure 2.7 presents local examples of the LTS scores. The results of the Bicycle Level of Traffic Stress analysis are displayed graphically on Map 2.5.

FIGURE 2.7 BICYCLE LEVEL OF TRAFFIC STRESS SCORES



E 114th Avenue west of Irma Drive



Grant Street south of Malley Drive



Malley Drive west of Community Center Drive

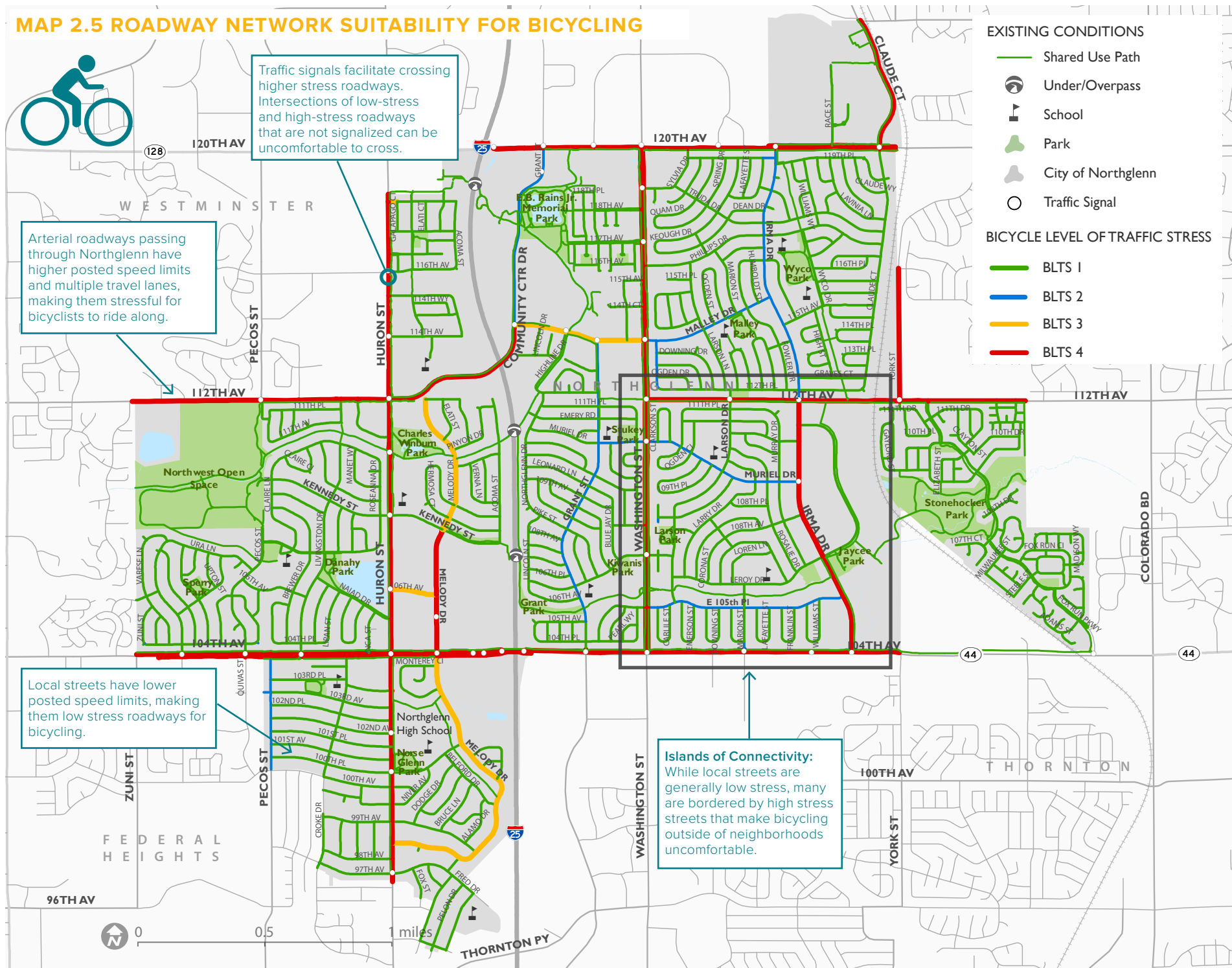


Huron Street south of 104th Avenue

LEAST STRESSFUL

MOST STRESSFUL

MAP 2.5 ROADWAY NETWORK SUITABILITY FOR BICYCLING



2.7 EXISTING BICYCLE PARKING

Bicycle parking is a central building block of bicycle friendly communities. Bicyclists expect a safe, convenient place to secure their bicycle when they reach their destination. This may be short-term parking of two hours or less, or long-term parking that is intended to be used all day or overnight. Both short-term and long-term bicycle parking exist in Northglenn.

Short-term bicycle parking is generally intended to be used for short duration trips. Typical land uses where this parking is installed include commercial or retail uses, medical/healthcare facilities, parks and recreation areas, community centers, or libraries.

Long-term bicycle parking is intended to be used all day or overnight. Primary users of this parking type are employees, residents, students, or travelers leaving their bicycles at transit hubs. Typical land uses where this parking is installed include multi-family residential, workplaces, transit hubs, and schools.

The Association of Bike and Pedestrian Professionals (APBP) provides Bike Parking Design Guidelines that define recommended rack styles. Currently, Northglenn has a mix of rack types (both public and private), the majority of which do not meet APBP standards, as shown by Figure 2.8. Recommended racks provide two points of contact on the bike frame, allow the bike to be locked with a U-Lock, are securely anchored to the ground, and resist cutting and deformation.

FIGURE 2.8 APBP RACK APPROVAL STATUS

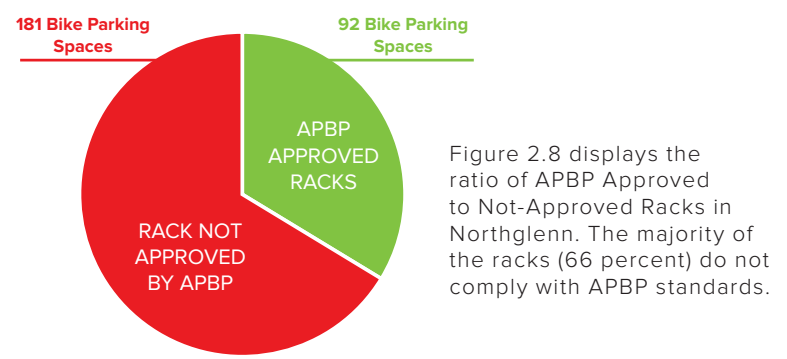







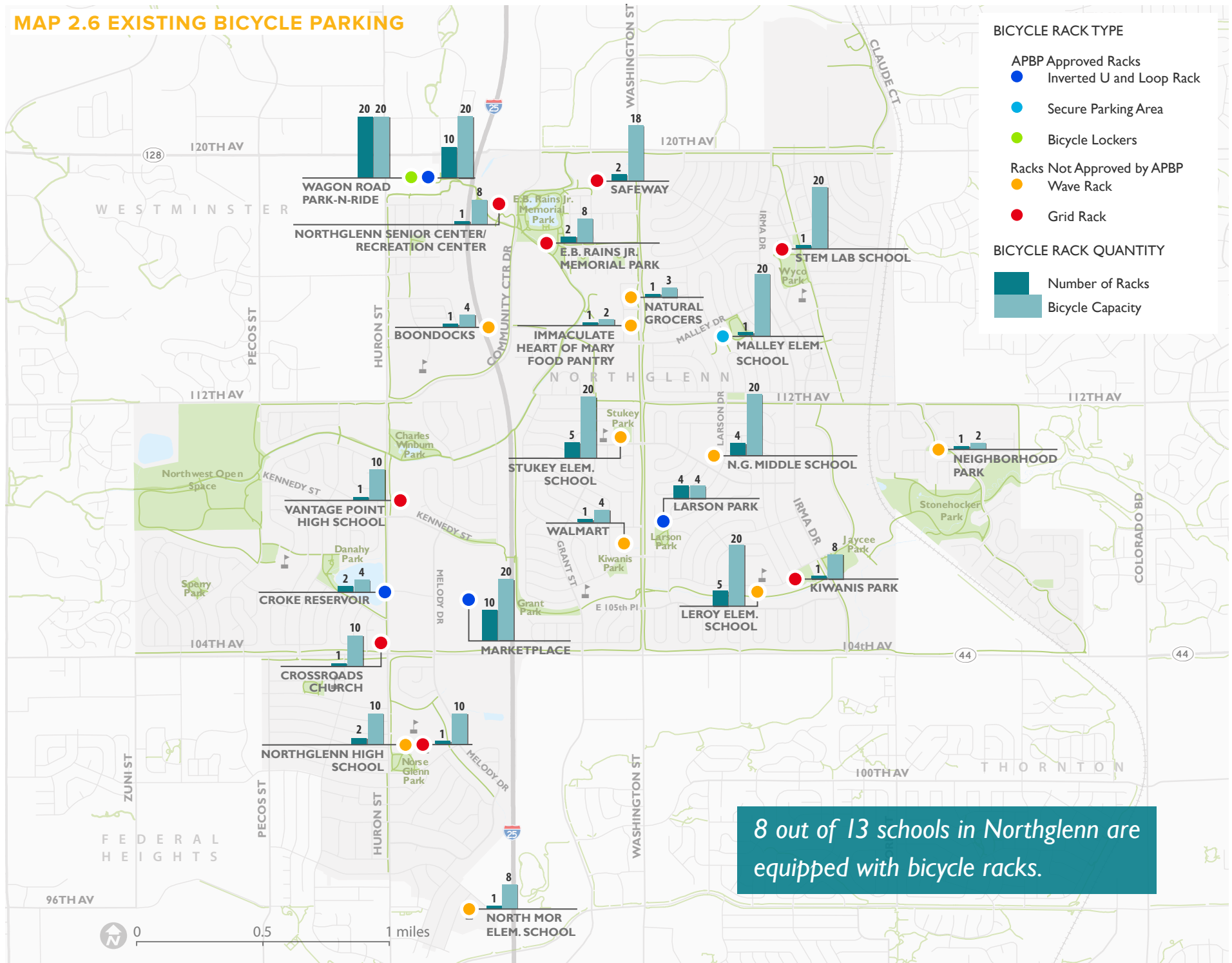
Figure 2.8 displays the ratio of APBP Approved to Not-Approved Racks in Northglenn. The majority of the racks (66 percent) do not comply with APBP standards.

The existing rack types in Northglenn are identified in Figure 2.9. In this figure, APBP approval status, the type of rack, the total number and capacity of the rack type city-wide, and rack descriptions are provided. Map 2.6 displays the location of the racks.

FIGURE 2.9 EXISTING BICYCLE PARKING IN NORTHGLENN BY RACK TYPE

<div>INVERTED U</div> 	# OF RACKS	BICYCLE CAPACITY	Most functional bicycle rack type. Provides two points of contact. Available in many styles and price points. (Image: Larson Park)
	26	52	
<div>SECURE PARKING AREA</div> 	# OF RACKS	BICYCLE CAPACITY	Secure Parking Areas (SPAs) provide long-term bicycle storage and limited access to those with a key or code. This rack type is ideal where bicycles will be stored all-day or overnight, such as at schools, employers, and apartment buildings. (Image: Malley Elementary)
	1	20	
<div>LOCKER</div> 	# OF RACKS	BICYCLE CAPACITY	Bike lockers provide secure parking for one or two bicycles per locker. Provide very high security for long-term bicycle storage, protected from the elements. Cost per parking spot is expensive compared to other rack types and SPA facilities. (Image: Wagon Road Park-N-Ride)
	1	20	
<div>WAVE RACK</div> 	# OF RACKS	BICYCLE CAPACITY	Wave racks tend not to be user friendly, due to design. Difficult to place bicycles adjacent to each other, and due to this, actual bicycle capacity rarely meets manufacturers' specifications. Secures bicycle at only one location. (Image: Immaculate Heart of Mary Food Pantry)
	22	93	
<div>GRID RACK</div> 	# OF RACKS	BICYCLE CAPACITY	Grid racks are inexpensive and inferior rack types. Lack two points of contact, which makes bicycles more prone to tipping over. Also, prone to bending wheels if bicycle tips over. When properly used, bicycle frame cannot be locked to rack, increasing theft risk. (Image: Global Village)
	10	88	

MAP 2.6 EXISTING BICYCLE PARKING



2.8 PROGRAMS

Creating walk-and-bicycle friendly communities requires more than building infrastructure. Programs supplement engineering improvements and result in cultures that support walking and bicycling. The “Five E” programs are widely accepted components of successful walk-and-bicycle friendly communities, and include education, encouragement, enforcement, evaluation, and equity programs.

Education programs targeting the community reduce barriers to bicycling and trail use. Similar to education programs, encouragement programs provide incentives and benefits to increase rates of active transportation. Enforcement programs help to provide greater compliance with the “rules of the road,” and evaluation programs track progress and statistics related to bicycling and walking. Equity programs facilitate access to active transportation options for traditionally underserved populations. Figure 2.10 summarizes the 5 E’s.

This section presents existing programs in the City of Northglenn that support walking and bicycling. Currently, there are eight programs in the community, all of which are focused on either Education or Encouragement. Existing city programs have provided educational opportunities to children, encouragement for possible bicycle commuters, group walks and bike rides, and more. Table 2.1 summarizes these programs. For each program, a name, description, and “E” category is provided.



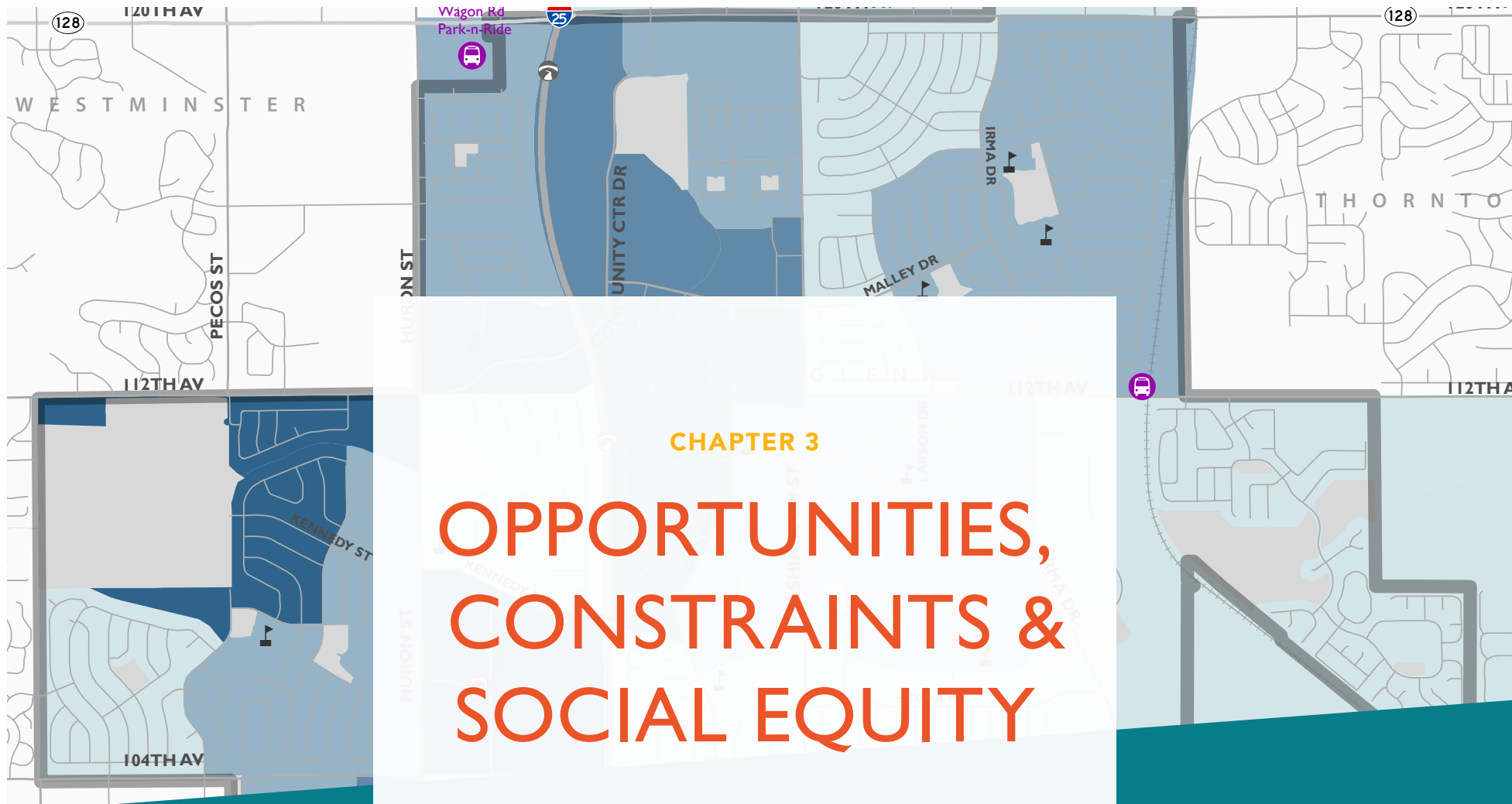
Bike to Work Day has been a successful program that helps to build a culture in Northglenn that supports bicycling.

FIGURE 2.10 THE FIVE E’S



TABLE 2.1: EXISTING PROGRAMS

Committee/ Organization/Event	Program Description	"E" Category
Kids' Fishing Derby Presents HEAL Day (Healthy Eating Active Living)	<p>2017 was the first year that HEAL events and vendors were incorporated into the well-established Fishing Derby. The events included the Bike Rodeo and Learn-to-Ride activity through Bicycle Colorado. The city's planned 2016 stand-alone bike rodeo event was canceled due to rain.</p> <p>The June 3, 2017 event included:</p> <ul style="list-style-type: none"> • Free Bike Rodeo and Learn-to-Ride Obstacle Course (Bicycle Colorado) • Family-friendly activities like family yoga and blender bikes • Healthy vendors and presentations like beekeeping • Raffle give-away for 30 refurbished children's bikes (Northglenn Bike Program) and new helmets (Northglenn Community Foundation) 	Education
Walking Wednesdays	<p>Seniors meet and walk in E.B. Rains Jr. Memorial Park on Wednesday mornings during the summer.</p> <p>Other, informal groups of seniors frequently walk together in the park. The City of Northglenn organized a former program called Bike Mondays for seniors, but it ended in 2013 due to lack of participation.</p>	Encouragement
Bike Repair Station at E.B. Rains Jr. Memorial Park	<p>The station, paid for by the City at the request of the HEAL Committee, was installed in October 2016. It includes:</p> <ul style="list-style-type: none"> • QR Code leading to a website that shows how to make many basic repairs • Tools such as wrenches and screwdrivers • Arms to hang your bicycle from, making repairs easier • A pump for low or flat tires <p>Pending any issues, the Committee will work with Parks to explore other locations for installation in 2018 or 2019. The City is hoping to incorporate it into the Bike Rodeo and/or Bike to Work Day events.</p>	Encouragement
Northglenn Bike Program	A volunteer group works two days a week to repair donated bicycles and distribute them through food banks to children in need. The program has grown since it began 25 years ago. The group gave out more than 500 bikes in 2016. Funding is provided by the City (\$2,000) and by grants from SunCorp Energy and Northglenn Community Foundation. A larger volunteer group distributes 400+ bicycles during the December holidays.	Encouragement
Bike to Work Day	The Denver Regional Council of Governments holds Bike to Work Day on the fourth Wednesday in June. Participants receive information about water stations located throughout the city, which offer water and healthy snacks. The City annually provides water for the Smart Commute Metro North water station at E.B. Rains Jr. Memorial Park.	Encouragement
School Assessments	School assessments provide school principals with maps and information about the safest routes for students to access their respective schools. Principals distribute this information to students and parents. The assessments are not official Safe Routes to School grants or projects, so they do not include significant education components.	Encouragement
Bicycle Village Westminster Group Rides	Bicycle Westminster holds free, weekly group rides on Saturday mornings. Group rides are sorted into four skill, speed, and distance categories. Bicycle Westminster provides flat tire support during the rides. While not located in Northglenn, Northglenn residents can participate in this program.	Encouragement
Firecrackers and Flapjacks 4 Mile Run	The Northglenn Community Foundation hosts a 4 mile walk/run annually as part of the City's 4th of July Festival at E.B. Rains Jr. Memorial Park with close to 200 participants.	Encouragement
Colorado Association of Recreational Athletics (CARA) Cross-Country	The City's Parks and Recreation Department coaches a team of approximately 20 youth ranging in ages from 6-14 to compete in cross-country running competitions throughout the state. The objective is to provide youth a recreational distance running experience in a fun, age-appropriate, and skill developmentally based atmosphere.	Encouragement
Trails Map Brochure	Provide route and facility information and highlighting walking and bicycling destinations.	Encouragement



CHAPTER 3

OPPORTUNITIES, CONSTRAINTS & SOCIAL EQUITY

CONNECT
NORTHGLENN



Northglenn has assets that facilitate the expansion of the active transportation network, and constraints that need to be addressed to improve mobility options for all community members.

3.1 INTRODUCTION

The built environment in Northglenn impacts mobility. In some areas of the city, the design of the built-environment facilitates bicycling and walking, while in other areas, constraints exist that make traveling by bicycle or foot challenging. This chapter presents existing opportunities that can be leveraged to improve the active transportation network, and constraints that need to be addressed to create a more comfortable and connected network.

In addition to the built environment, socioeconomic factors also impact mobility options in Northglenn. Complementing the opportunities and constraints analysis, this chapter identifies areas in the community where concentrations of vulnerable populations exist. Research suggests that these populations rely more heavily on walking and bicycling for all types of trips.¹ By identifying these areas, recommendations can be developed that will serve to improve mobility for vulnerable populations in Northglenn.

Together, the opportunities, constraints and social equity analysis highlight existing assets that can be leveraged to improve walking and bicycling in the community, and specific areas where focus needs to be placed to address both physical and socioeconomic barriers to mobility.

1. Dannenberg A, Frumkin H, Jackson R. *Making Healthy Places*. 1st ed. Washington D.C.: Island Press; 2011.

OPPORTUNITIES AND CONSTRAINTS CHAPTER COMPONENTS



Opportunities – Highlights assets that can be leveraged to expand the active transportation network in Northglenn.



Constraints – Presents barriers that need to be addressed to make walking and bicycling comfortable for people of all ages and abilities.



Equity Analysis – Identifies areas in the community that have a concentration of vulnerable populations.

3.2 OPPORTUNITIES AND CONSTRAINTS

As described in the Existing Conditions chapter, shared use paths and sidewalks form the basis of the city's active transportation network. Pedestrian facilities along some major roadways provide a comfortable pedestrian experience, and local streets are generally low-stress for both bicyclists and pedestrians, as indicated in the results of the Bicycle Level of Stress (BLTS) Analysis and Pedestrian Level of Stress (PLOS) Analysis. While these areas are well suited for walking and bicycling, many other areas need improvement to make them comfortable for active transportation.

Public outreach, field observations, network analysis, and the safety analysis revealed safety concerns and physical barriers that need to be addressed to create a seamless, comfortable network for pedestrians and bicyclists. The following section presents the current opportunities and constraints in Northglenn for walking and bicycling. These represent the major themes consistently identified through outreach and analysis. Map 3.1 displays examples of where these themes exist in Northglenn.

Opportunities

Northglenn has many existing opportunities that can serve to improve active transportation in the community.

Neighborhood Schools

There are a number of schools situated within and adjacent to residential neighborhoods. A seamless sidewalk and bicycling network near a concentration of children means more parents and their children can expect a safe walk or bike ride to school. These schools also present partnership potential and Safe Routes to School (SRTS) programming opportunities.

Local Streets

Local streets are typically low-volume and low-speed, making them suitable in their current condition for walking and bicycling. Opportunities exist to leverage the condition of these streets to create low-stress active transportation connections.



Many neighborhood parks are accessible to residents by bicycle and walking

Neighborhood Parks

The City of Northglenn boasts numerous parks and open spaces, many of which are located in residential neighborhoods throughout Northglenn. By improving connectivity from parks to residences, more people may choose to walk and bicycle to these places, minimizing parking demand, reducing local vehicle trips, and promoting a healthy habit for residents.

Future Redevelopment focused on Multi-Modal Access

The City of Northglenn is largely built-out, and recent planning efforts are focused on redeveloping sites into places with a mix of retail and housing, and improved transit connections. Redevelopment sites include the 112th Station Area, Civic Campus, and Marketplace. Mixed-use development supports walking and bicycling, and improving pedestrian and bicycle accessibility to and within these new assets represents a key opportunity for the community.

Dispersed Destinations

Destinations, including the places where people live, learn, work, and play, are spread throughout Northglenn, creating demand for active transportation city-wide. Connecting these activity generators with comfortable and safe bikeway and pedestrian facilities represents an opportunity to increase the number of people bicycling and walking to them.

Opportunities exist to install On-Street Bikeways

There are several streets in the roadway network with available space to potentially install bikeways within the existing curb-lines. These opportunities exist throughout the community, especially along residential collector streets that could serve as important north-south connections.

Future Trail Connections

While the community is largely built-out, opportunities may exist where future trails could be routed. These connections would provide enhanced mobility between key destinations.

Future Connections to Transit

The Regional Transportation District (RTD) will soon open its North Metro commuter rail line, which will include a station at 112th Avenue and York Street. The vision for this area is to become a vibrant, walkable, mixed-use community. Improving bicycling and walking access to the station area represents an opportunity to combine bicycling, walking, and transit trips. Opportunities also exist to improve bikeway and pedestrian connections to existing transit stations and park-n-ride lots in the city.

Regional Coordination

Northglenn is surrounded by developed communities, including Westminster, Thornton, and Federal Heights. Interstate 25, which is under the jurisdiction of the Colorado Department of Transportation (CDOT), travels directly through the community, and many regional travelers access the interstate in Northglenn. Additionally, RTD provides transit service to Northglenn and the greater metro-area. These surrounding municipalities and regional agencies represent potential partners. Northglenn can work with these entities to leverage funding and implement regionally significant walking and bicycling improvements.

Integrating Trails with On-Street Facilities

Northglenn boasts a robust trail network that provides access to many destinations throughout the community. Opportunities exist to connect the trail network to on-street bikeway and adjacent pedestrian facilities to expand the reach of the active transportation network.

OPPORTUNITIES



A SNAPSHOT

Neighborhood Schools

Local Streets

Neighborhood Parks

Future Redevelopment

Dispersed Destinations

On-Street Bikeways

New Trail Connections

New Transit Connections

Regional Coordination

On-Street and Off-Street Facility Integration



Children can use trails to bicycle and walk to neighborhood schools (Image: Trail to Northglenn High School)



Constraints

Northglenn also has many physical barriers to improving active transportation city-wide.

Auto-Oriented Shopping Centers

Many of Northglenn's retail centers are difficult to access by foot and bicycle due to their location along high-traffic, high-speed, and wide roadways. Also, the low density of development, high frequency of driveways, and large parking lots in front of businesses along these corridors decreases comfort and increases walking and bicycling distances and potential vehicle and pedestrian/bicyclist conflicts.

Super-Grid of Arterial Roadways

Large roadway corridors such as (but not limited to) 120th Avenue, 104th Avenue, Huron Street, Washington Street, and Irma Drive, are barriers for pedestrians and bicyclists trying to traverse these roads due to long distances between marked crossings. The BLTS and PLOS analysis results indicate that many of these roadways are uncomfortable for bicyclists and pedestrians to travel along as well. Furthermore, the presence of these roadways creates islands of connectivity, where residential neighborhoods are bounded by arterial roads, limiting mobility for bicyclists and pedestrians into and out of their neighborhoods.

Interstate 25

Interstate 25 divides Northglenn. Three non-motorized crossings exist for bicyclists and pedestrians to cross the interstate, but the distance

between these crossings is long (half a mile on average, or a 10-15 minute walk, between dedicated crossings). Two at-grade crossings exist, but both these crossings represent high stress crossings for bicyclists and pedestrians. The interstate limits the mobility of people seeking to access destinations on either side.

Narrow Neighborhood Sidewalks

Most local streets are equipped with sidewalks on both sides of the road, but in general, these sidewalks are narrow, and do not provide adequate space for two pedestrians to walk side-by-side. This results in people walking in the street, which poses a potential safety issue. Of all bicycle and pedestrian crashes recorded, 32 percent occurred on local streets. Sidewalks less than four feet wide also do not meet minimum ADA requirements, and limit the mobility of people with disabilities, as well as parents pushing strollers, people walking dogs, and other activities that require additional space.

Limited Accessibility along Major Roads

Along some major corridors, wide sidewalks with buffers exist, such as along sections of 104th Avenue and 120th Avenue. However, along other major corridors, such as sections of Huron Street, Washington Street, Irma Drive, and other roads, the sidewalk zone lacks design features that make for a safe and enjoyable experience. These sidewalks exhibit challenges, in that they are adjacent to fast moving traffic, or constrained by obstructions such as utility poles or maintenance issues. Many

sidewalks also lack street furniture, pedestrian scale lighting, landscaping, greening elements, and other features of charm that add a sense of place like banners or flags on light poles, decorative pavers, and public art.

Lack of On-Street Bikeways

There are currently no on-street bicycle facilities in Northglenn, other than a pilot project on Grant Street which is part of the Connect Northglenn planning process. There is both need and demand for a well-connected bicycle network, particularly enhancing trail connections.

Large, Multi-Lane Intersections

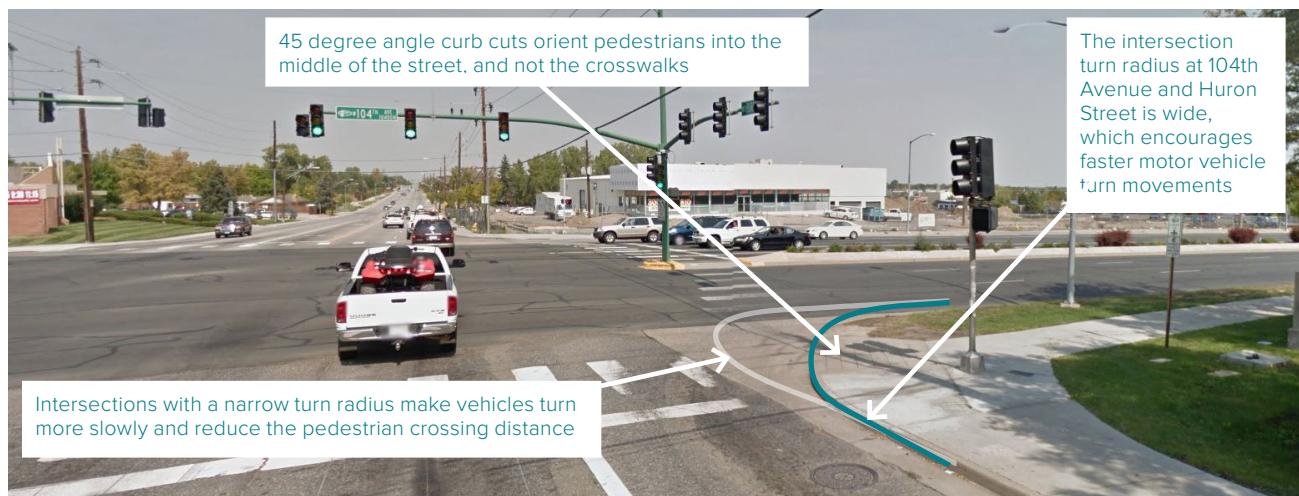
Intersections along Northglenn's major roads include multiple through and turning lanes, creating very long crossing distances for bicyclists and pedestrians (for example, the 104th Avenue and Huron Street north/south crossing distance is 140 feet long), and long wait times at traffic signals. People cross roadways at different speeds, and long crossing distances can be challenging for the elderly, people with children, and those with disabilities. Additional constraints associated with major intersections include:

- The intersection turn radius of many major intersections are large, enabling vehicles to make turns at higher speeds than if the turn radius were more narrow. This design prioritizes motor vehicle movements over pedestrian accessibility. Additionally, large intersection turn radii increase the crossing distance for pedestrians, compared to intersections with smaller turn radii.
- Many major intersections have diagonal curb ramps, which orient pedestrians into the middle of the street, rather than to the crosswalks leading from the intersection corners. This ramp design is not recommended by FHWA. Instead, FHWA and CDOT recommend perpendicular curb ramps.
- The crash analysis indicated the majority (60 percent) of crashes occurred at intersections, highlighting the challenges that bicyclists and pedestrians have when moving through intersections.

Mapping Constraints

Map 3.1 displays examples of the opportunities and constraints in relation to where they exist in Northglenn.

The north/south crossing distance at 104th Avenue and Huron Street is approximately 140 feet long



CONSTRAINTS



A SNAPSHOT

Auto-Oriented
Shopping Centers

Arterial Roadways

Interstate 25

Narrow Neighborhood
Sidewalks

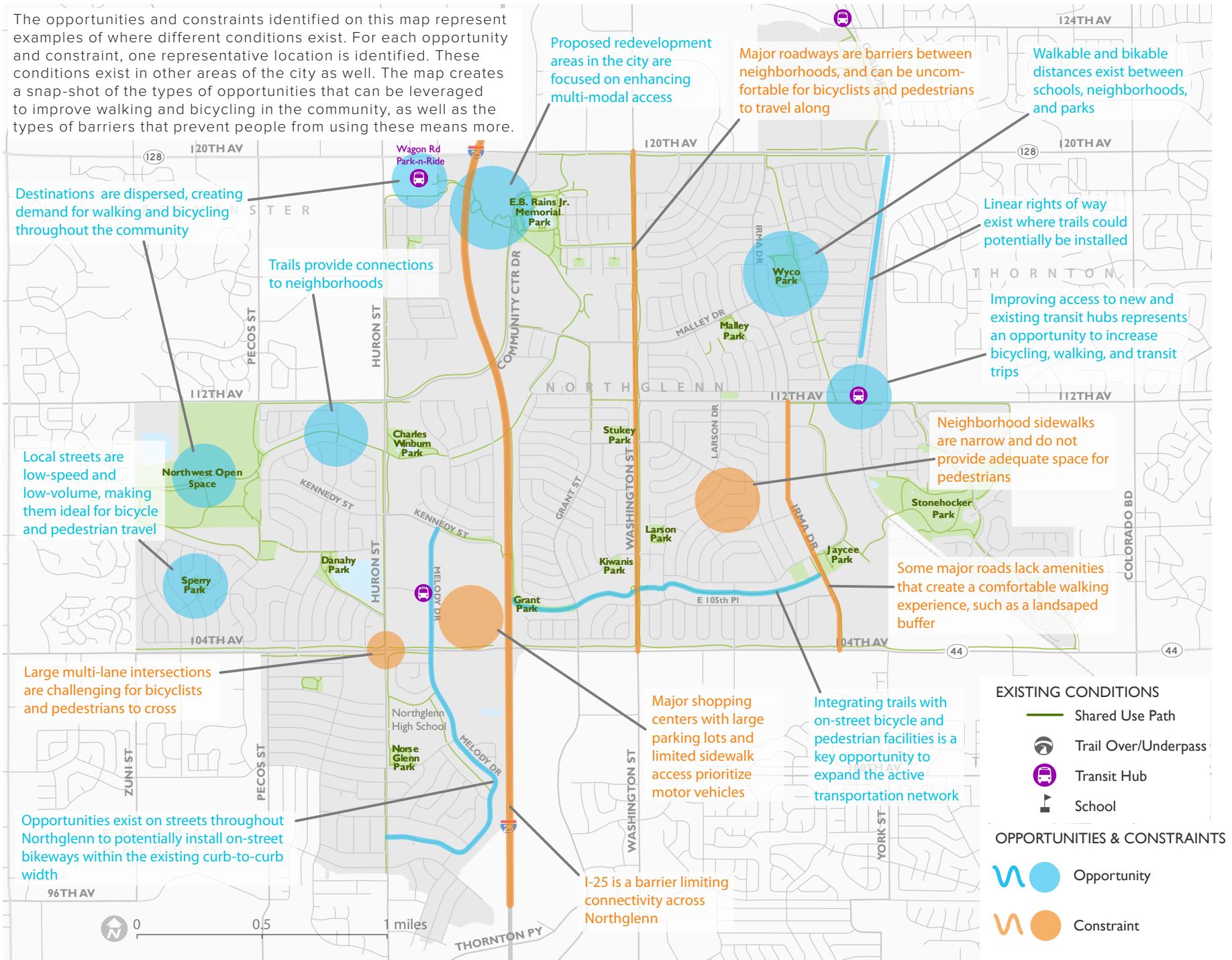
Limited Accessibility

Lack of On-Street
Bikeways

Large Intersections

MAP 3.1: OPPORTUNITIES AND CONSTRAINTS

The opportunities and constraints identified on this map represent examples of where different conditions exist. For each opportunity and constraint, one representative location is identified. These conditions exist in other areas of the city as well. The map creates a snap-shot of the types of opportunities that can be leveraged to improve walking and bicycling in the community, as well as the types of barriers that prevent people from using these means more.



3.3 EQUITY ANALYSIS

Some people choose to walk, bicycle and take transit, but have other options for their personal mobility, such as driving. For others, walking, bicycling and transit are their only options for transportation. Those who use these modes out of necessity tend to be lower-income, at-risk populations. Making improvements for these people is critical, since they rely on walking, bicycling and transit to meet their daily needs.

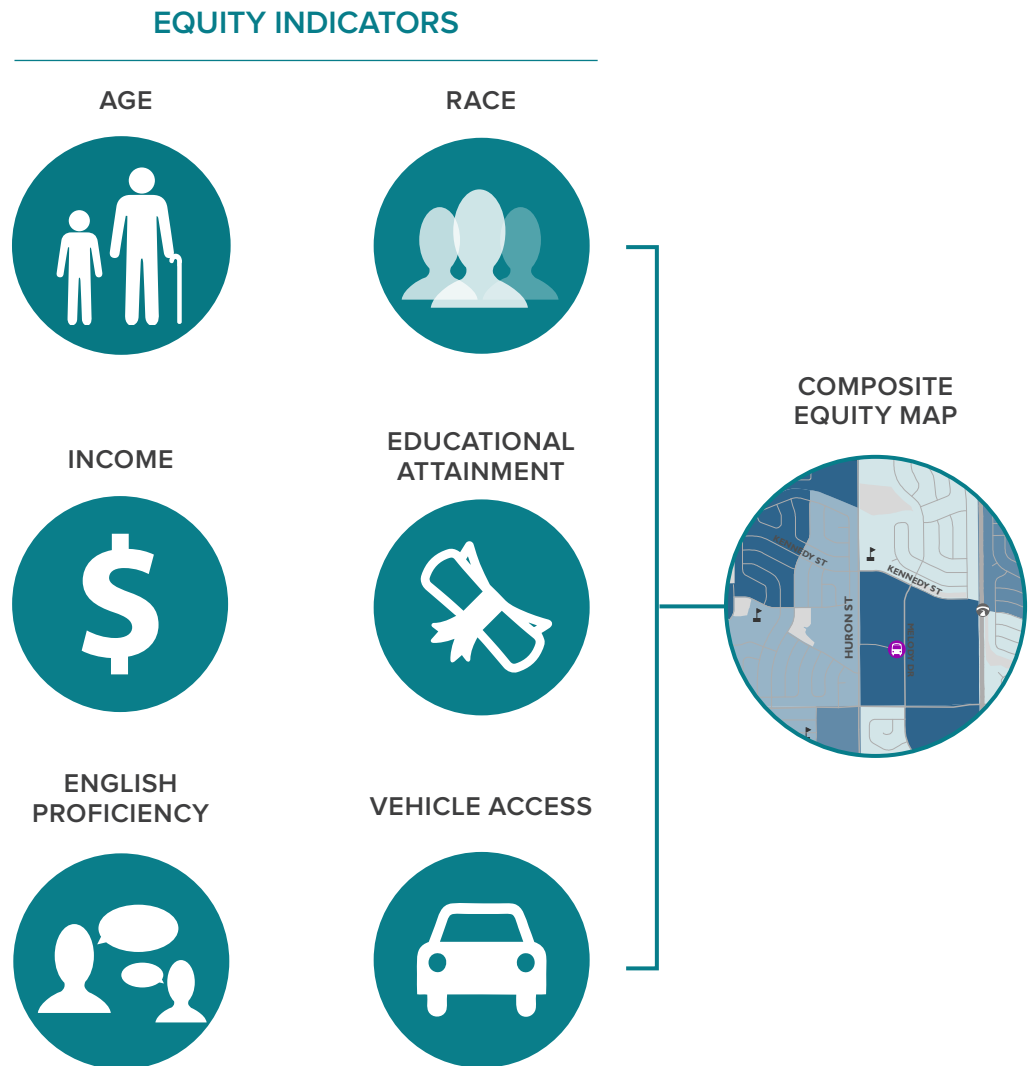
The equity analysis considers demographic factors, that when combined, indicate where there are concentrations of historically vulnerable populations. Active transportation investments in these areas could help alleviate a broader range of issues (access to jobs, education, and healthcare, for example). This analysis brings attention to neighborhoods or corridors that may be most in need of improvements, and provides a starting point for identifying priority areas.

The equity analysis for Connect Northglenn uses a combination of six socioeconomic characteristics as indicators to identify vulnerable populations.¹ Map 3.2 displays a composite map of the indicators combined. The indicators include:

- **Age:** Individuals under the age of 18 and over the age of 65 comprise this indicator.
- **Race:** This indicator measures the percentage of the population that identifies as non-white.
- **Income:** This indicator measures individuals of working age living at or below 200 percent of the Federal Poverty Level, which is a threshold set by the U.S. Census Bureau and is updated annually.
- **Educational Attainment:** This indicator represents the percentage of the population over 25 years of age that does not have a high school diploma or equivalent.
- **Limited English Proficiency (LEP):** This indicator measures the percentage of the population that identifies as not speaking English well or at all.
- **Access to a Vehicle:** This indicator measures the percentage of households that do not have regular access to a vehicle.

The rationale for selecting these indicators is provided on page 3-8. All data was obtained from the 2011 to 2015 American Community Survey (ACS). Additional information regarding the equity analysis, and the rationale for selecting the specific indicators, is included in Appendix B.

¹ Alta Planning + Design's Equity Analysis is based on empirical research, and is a more comprehensive approach to identifying equity than using strictly low-moderate income (LMI) census tracts, which is used for Community Development Block Grants (CDBG). See Appendix B for more information.



AGE



Indicator: Populations under the age of 18 years of age and over the age of 65 years of age.

Rationale: The population under 18 and over 65 years of age is thought to have a higher active transportation infrastructure need because they have less access to motor vehicles and may rely more on active modes of transportation.¹ As a whole, approximately 35 percent of Northglenn is under 18 or over the age of 65. Certain census blocks, such as those southeast of E.B. Rains Jr. Memorial Park and northeast of the Northwest Open Space, have considerably higher proportions of young and elderly populations, at 66 and 51 percent respectively.

INCOME



Indicator: Households at or below 200 percent of the Federal Poverty Level.

Rationale: Poverty is a socioeconomic vulnerability, linked with limited access to resources, such as transportation.² 34 percent of all Northglenn households are at or below 200 percent of the Federal Poverty Level. Low-income households are concentrated in the census block groups south of the Northglenn Marketplace (71 percent) and southeast of E.B. Rains Jr. Memorial Park (69 percent).

LIMITED-ENGLISH PROFICIENCY (LEP)



Indicator: Limited English Proficiency (LEP) is measured as percentage of households in which individuals over the age of five identify as not speaking English well or at all.

Rationale: Individuals that meet this indicator tend to rely more on active transportation as their primary means of transportation than the average English speaker.² Just under 20 percent of households in the census block groups surrounding and northeast of Northglenn Marketplace identify as LEP, compared to just four percent of Northglenn as a whole.

NON-WHITE POPULATION



Indicator: Non-white is measured as the percentage of all individuals not identifying as white and not of Hispanic origin. This includes people identifying as Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, or some other race.

Rationale: Racial or ethnic minorities are more likely to live in areas with poor or limited active transportation facilities, and tend to be more dependent on transit and active transportation. Northglenn's non-white population is concentrated in the census block groups south of Northglenn Marketplace (73 percent) and north of Grant Park (64 percent).

EDUCATIONAL ATTAINMENT



Indicator: This indicator represents the percentage of the population over 25 years of age that does not have a high school diploma or equivalent.

Rationale: Nationwide those without high school diplomas have the highest rates of walking and the second highest rates of bicycling to and from⁴ work. 50 percent of the census block group west of Northglenn High School, and 32 percent of the census block group south of Northglenn Marketplace do not have a high school diploma or equivalent, compared to 14 percent of all Northglenn residents.

VEHICLE ACCESS



Indicator: Motor vehicle access is measured from a question on the American Community Survey about whether a household has access to one or more cars, trucks, or vans.

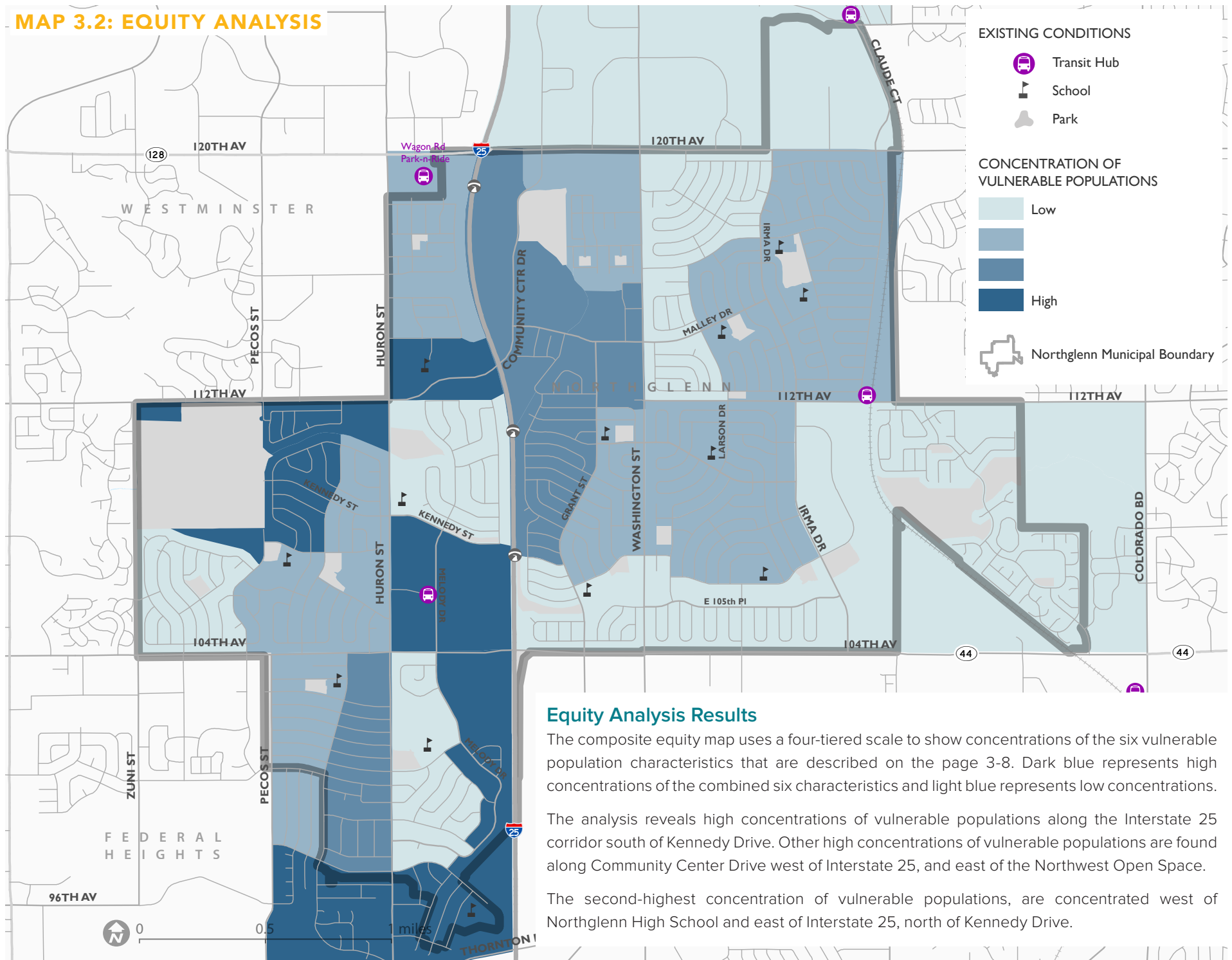
Rationale: Households with limited or no access to motor vehicles by necessity have to take advantage of other transportation options such as walking, bicycling, and transit. Only eight percent of Northglenn households meet this indicator, though 74 percent of households in the census block group southeast of E.B. Rains Jr. Memorial Park do.


1. Dannenberg A, Frumkin H, Jackson R. Making Healthy Places. 1st ed. Washington D.C.: Island Press; 2011.

2. McKenzie B. Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008–2012. Am Community Surv Reports. 2014.

3. Rubin V. Sustainable Communities Series: Regional Planning for Health Equity. PolicyLink. 2015.

MAP 3.2: EQUITY ANALYSIS



A photograph of a public outreach event on a grassy field. In the foreground, a large map is laid out on the grass, with several colorful sticky notes (pink, yellow, green, blue) placed on it. To the left of the map, there are some papers and markers. In the background, a person is standing near a sign that reads "Northglenn BICYCLE AND PEDESTRIAN MASTER PLAN". Another person, wearing a camouflage hat and a brown shirt, is standing to the right of the map. The scene is outdoors with trees and a clear sky in the background.

CHAPTER 4

PUBLIC OUTREACH & NEEDS ASSESSMENT

CONNECT
NORTHGLENN



Data-driven analysis is combined with public and stakeholder outreach to understand the community's needs for improving the active transportation network.

4.1 INTRODUCTION

The existing conditions, opportunities and constraints, and equity analysis in Chapters 2 and 3 indicated where physical and socioeconomic barriers to active transportation exist in Northglenn. To more fully understand the community's needs, the planning team supplemented this data-driven analysis with public and stakeholder input.

Connect Northglenn incorporated a robust public and stakeholder outreach process, involving both in-person meetings and online tools. The outreach methods included two public meetings, walk and bike audits, mobile meetings, an online survey, and an online input map. These methods, and the key findings of the outreach process, are described in this chapter.

The public outreach provided the planning team with information about where improvements are needed to improve walking and bicycling in the community, and what the public's priorities are. This information is combined with the data-driven analysis in the previous chapters to identify gaps in Northglenn's active transportation network. The final section of the chapter presents the gap analysis, establishing the foundation for the development of recommendations to improve active transportation city-wide.

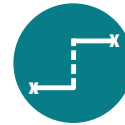
PUBLIC OUTREACH & NEEDS ASSESSMENT CHAPTER COMPONENTS



In-Person Outreach – Describes the series of public meetings, stakeholder audits, and mobile meetings that were held to solicit input from community members.



Online Engagement Tools – Describes the results of the online survey and online input map, which asked respondents to provide their opinions about walking and bicycling in Northglenn.



Gap Analysis – Identifies gaps in the existing pedestrian and bicycle network, based upon community input and the results of data-driven analysis.

4.2 IN-PERSON OUTREACH

Connect Northglenn included multiple rounds of in-person outreach. Recognizing that the public lead busy lives, the planning team held both conventional meetings as well as meetings that brought the project to the public. This combined approach to engagement generated a wide range of input. This section summarizes the in-person outreach conducted for the Plan.

PUBLIC MEETINGS

The first public meeting was held on May 10th at the Northglenn Senior Center. At the meeting, the planning team led a virtual walking tour of Northglenn, which enabled attendees to visualize existing pedestrian conditions, and consider strategies for improvement. Afterwards, attendees were encouraged to participate in four stations, including a voting station where people could pick their preferences for different types of bicycle and pedestrian infrastructure, an online survey station, a station where people could identify opportunities and challenges to walking and bicycling, and a city-wide map station where people could place post-its corresponding to different infrastructure improvements they desired. A children's table was provided as well.

The second public meeting was held on September 20th at the Northglenn Maintenance and Operations Facility. The planning team presented the draft infrastructure recommendations to improve walking and bicycling, and the public had the opportunity to comment and give feedback on both the recommendations and the Grant Street Pilot Project. See page 6-2 for more information about the Pilot Project.

STAKEHOLDER AUDITS

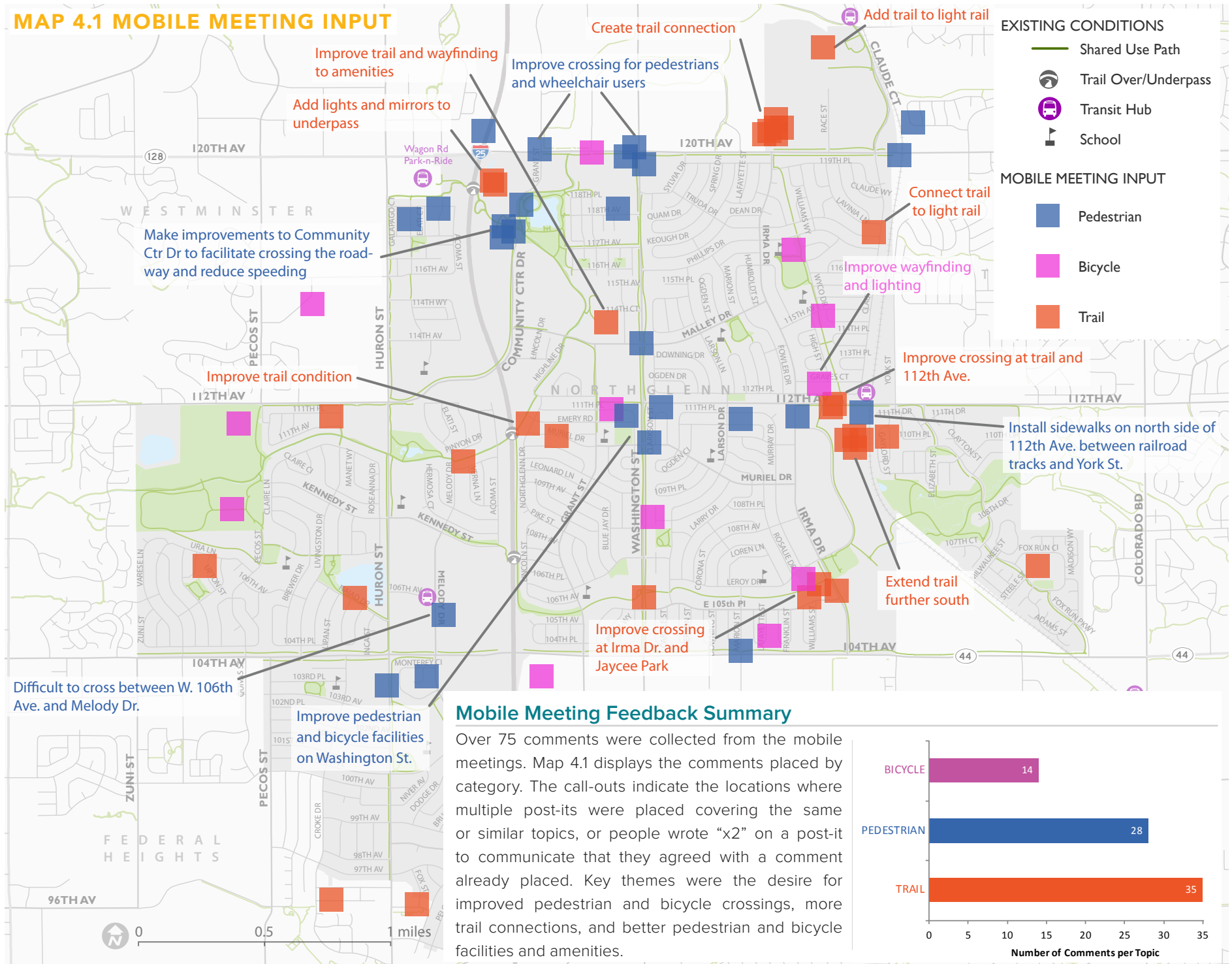
The planning team also led walking and bicycling audits for stakeholders and city staff. During these meetings, the groups walked and biked through sections of Northglenn that represented different contexts of development, and assessed how well existing facilities accommodated bicyclists and pedestrians. The stakeholder group then discussed strategies to improve conditions to make Northglenn more walk-and-bike friendly.

MOBILE MEETINGS

Additionally, the planning team led *Mobile Meetings*, where a large vinyl map of Northglenn was brought out to the public at six different events and locations. At each meeting, the public was asked to place post-its on the maps corresponding to different infrastructure improvements. These comments helped the team to understand the community's priorities for improvement. Map 4.1 displays the feedback collected at these meetings.



MAP 4.1 MOBILE MEETING INPUT



4.3 ONLINE ENGAGEMENT TOOLS

A number of tools were used to engage the public online. Northglenn community members were invited to comment on the existing walking and bicycling conditions in the City through an online survey and an online input map. These were available through the project website, www.connectnorthglenn.com, which was regularly updated with project information. The question and answer survey collected general information about walking and bicycling in Northglenn, while the online mapping tool enabled respondents to comment on specific locations. Social media was also used extensively to advertise how the public could get involved in the planning process. Analysis of the community responses are detailed in this section.

ONLINE SURVEY RESULTS

The online question and answer survey, which was open from May through June 2017, was completed by 170 people. Respondents were asked twenty-three questions about their transportation habits and demographic information. Through the survey, residents identified how frequently they walked and bicycled, for what purposes, and where they walked and bicycled to. Respondents also expressed how comfortable they think walking and bicycling in Northglenn is, and identified preferred strategies to improve conditions. The survey also provided an opportunity to share priorities for future transportation investment, and how non-motorized infrastructure should be funded.

Most of the respondents live in Northglenn (77 percent), but work outside of the City (75 percent). Respondents in-large agreed that local transportation dollars should be used to fund pedestrian (77 percent) and bicycle facilities (80 percent). As a whole, when asked how they would spend \$100 on transportation improvements, respondents on average allocated about \$37 to trails and greenways, \$20 to the improvement and addition of sidewalks, and \$16 towards improving safety of intersections. The

remaining \$43 were allocated to on-street bikeways, more pedestrian crosswalks, bicycle parking, and bicycle and pedestrian wayfinding.

Just over 50 percent of respondents agreed with the statement that walking is a safe, practical, and convenient way to get from one place to another in Northglenn, and nearly 60 percent reported walking one or more times per week. Fewer, 36 percent, agreed that bicycling is a safe, practical, and convenient way to get from one place to another in Northglenn. Respondents also indicated that they bicycle less frequently than they walk, with only 33 percent reporting that they bicycle one or more times per week.

Overall, most people walk and bicycle for exercise. When asked what destinations people would like to walk and bike to, respondents indicated the following in order of preference:

- 1) Parks and trails
- 2) Community events
- 3) Grocery stores and farmers markets
- 4) Commercial districts and retail shops
- 5) Schools

To make Northglenn a more comfortable and safe place to walk, respondents requested more trails and greenways, wider and buffered sidewalks, and safer intersections and crossings. To improve bicycling conditions, respondents favored dedicated bicycle facilities (such as bicycle lanes), multi-use trails, and safer intersections. The complete survey results are included in Appendix C.

TELEPHONE TOWN HALL

Participants in the August 2nd, 2017 telephone town hall were asked the question “Do you support allocating local transportation dollars to expand the bicycle and pedestrian network?” Of the 139 respondents, 40 percent said yes, 33 percent said no, and 27 percent said that they need more information before answering.

FIGURE 4.1 KEY ONLINE SURVEY RESULTS

TOP THREE REASONS WHY PEOPLE WALK & BIKE



EXERCISE



ENJOY NATURE



FAMILY/SOCIAL TIME

WALKING/BICYCLING IN NORTHGLENN IS A “SAFE, PRACTICAL, AND CONVENIENT WAY TO GET FROM ONE PLACE TO ANOTHER.”



AGREE

51%



NEUTRAL

18%



DISAGREE

31%



AGREE

36%



NEUTRAL

15%



DISAGREE

41%



ALLOCATE LOCAL TRANSPORTATION DOLLARS TO EXPAND THE BICYCLE AND PEDESTRIAN NETWORK?



AGREE

79%



NEUTRAL 15%



DISAGREE 6%

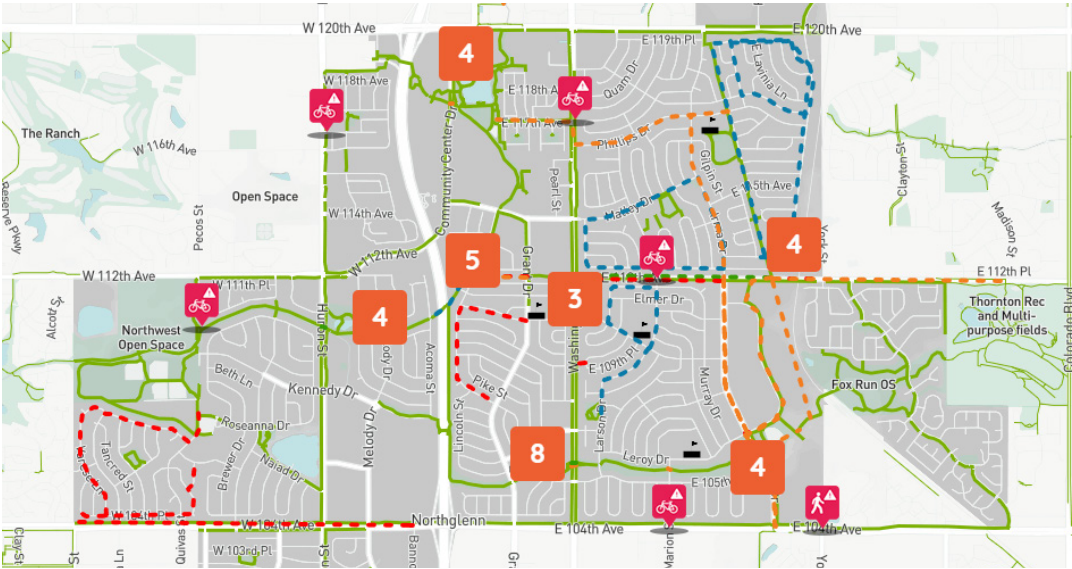
ONLINE INPUT MAP SUMMARY

The planning team developed an online input map that enabled users to draw lines and drop points to represent their opinions about walking and bicycling in Northglenn. Subsequent visitors could then vote and comment on other users' input. The online input map included the following base layers: existing roadways, existing trail infrastructure, and points of interest. In total, the map recorded 170 individual interactions, including lines being drawn, points being placed, and people commenting and voting on lines/points that others had drawn.

People were asked to identify comfortable existing walking and bicycle routes and those that need improvement. The two line categories that received the most input by miles drawn are *Route Needs Improvement for Bicycling* (7.3 miles) and *Safe and Comfortable Route for Walking* (6.3 miles), highlighting a discrepancy between pedestrian and bicycle amenities.

Users were also asked to place points representing three categories, including obstacles to walking and bicycling, and places where people would like to have bicycle parking. Participants placed 39 points indicating where obstacles to walking and bicycling exist, and requested bicycle parking in four locations. Key statistics representing interactions with the online input map are displayed in Figure 4.2.

Map 4.2 displays the line and point comments collected via the online input map. Specifically, it shows the line features that were drawn indicating where linear improvements are desired, the point features that were drawn to indicate obstacles to walking and bicycling, and the locations where bicycle parking is desired. This tool resulted in a robust dataset that the planning team referenced throughout the development of the plan's recommendations.

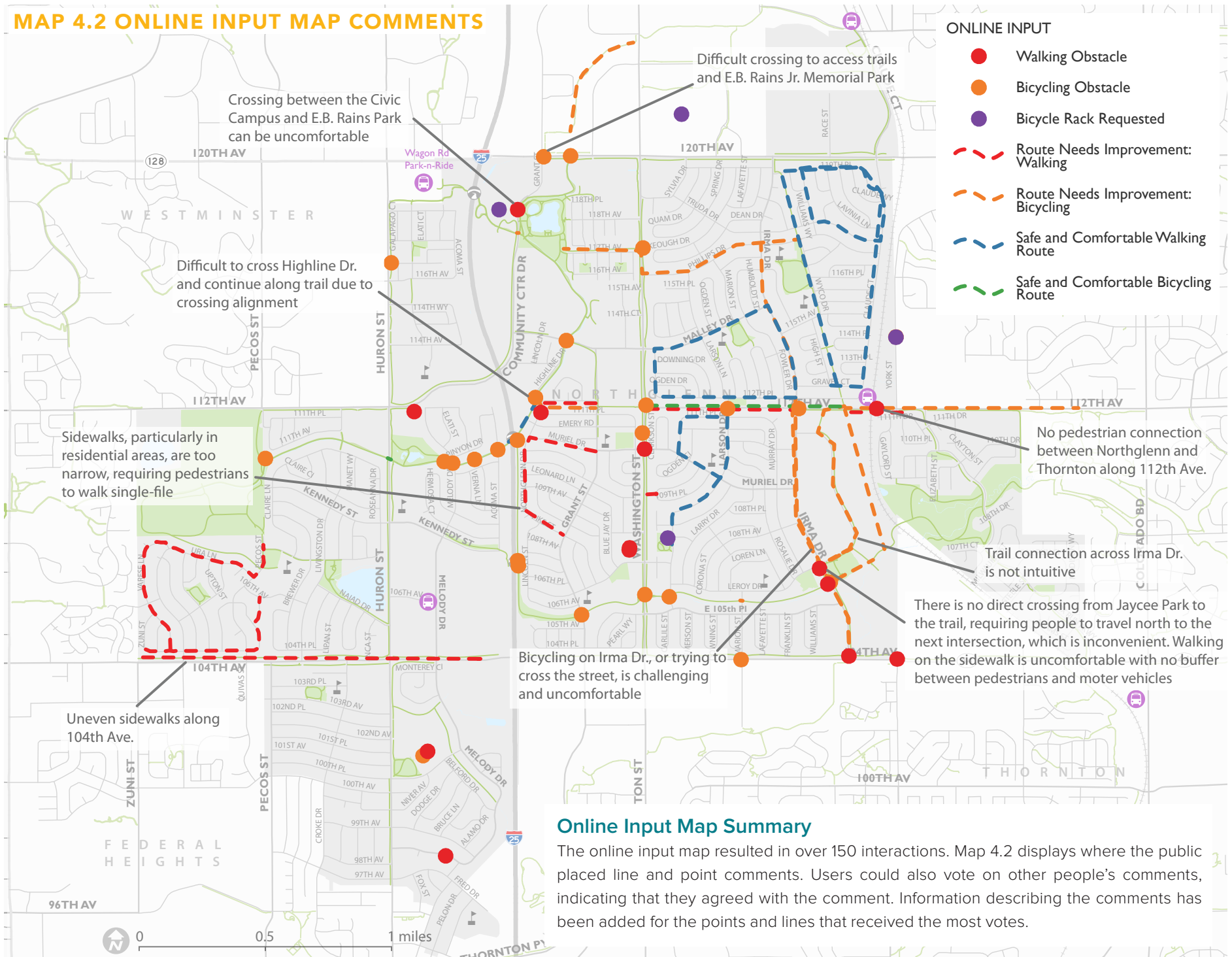


Respondents to the online input map drew lines to indicate safe and comfortable walking and bicycling routes, as well as those that need improvement. Respondents also placed points to indicate barriers to walking and bicycling, and to request new bicycle parking.

FIGURE 4.2 ONLINE INPUT MAP SUMMARY



MAP 4.2 ONLINE INPUT MAP COMMENTS



4.4 GAP ANALYSIS

The gap analysis identifies missing links in Northglenn's active transportation system. The planning team identified the gaps through a combination of data-driven analysis and public outreach. The layers of information that informed the development of this analysis include:

- Existing Infrastructure and Activity Generators
- Bicycle and Pedestrian Crash Analysis
- Pedestrian Level of Service Analysis
- Bicycle Level of Traffic Stress

- Opportunities and Constraints Analysis
- Equity Analysis
- In-Person Outreach
- Online Engagement

Gaps are presented on Map 4.3, and are grouped into two general categories, route and crossing gaps. The pictures on this page illustrate the various types of route and crossing gaps identified in Map 4.3. The gap analysis served as the foundation for the development of recommendations to improve walking and bicycling connections city-wide.

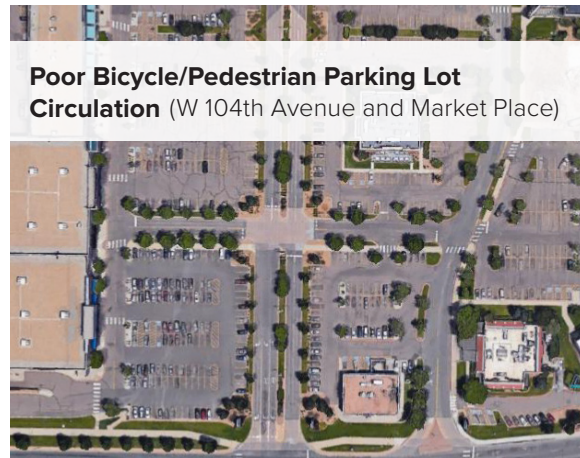
Desirable Route with No Designated Bike-way and Narrow and/or Attached Sidewalks
(Malley Drive)



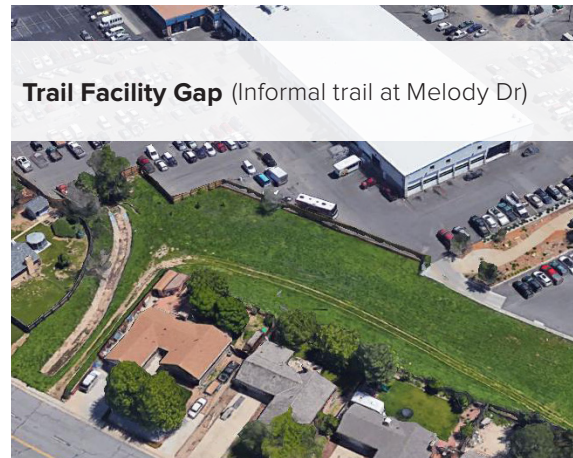
On-Street Bikeway Facility Gap along Major Roadway (W 112th Avenue)



Neighborhood Trail Crossing Needs Assessment (Trail crossing at Melody Drive)



Poor Bicycle/Pedestrian Parking Lot Circulation (W 104th Avenue and Market Place)



Trail Facility Gap (Informal trail at Melody Dr)

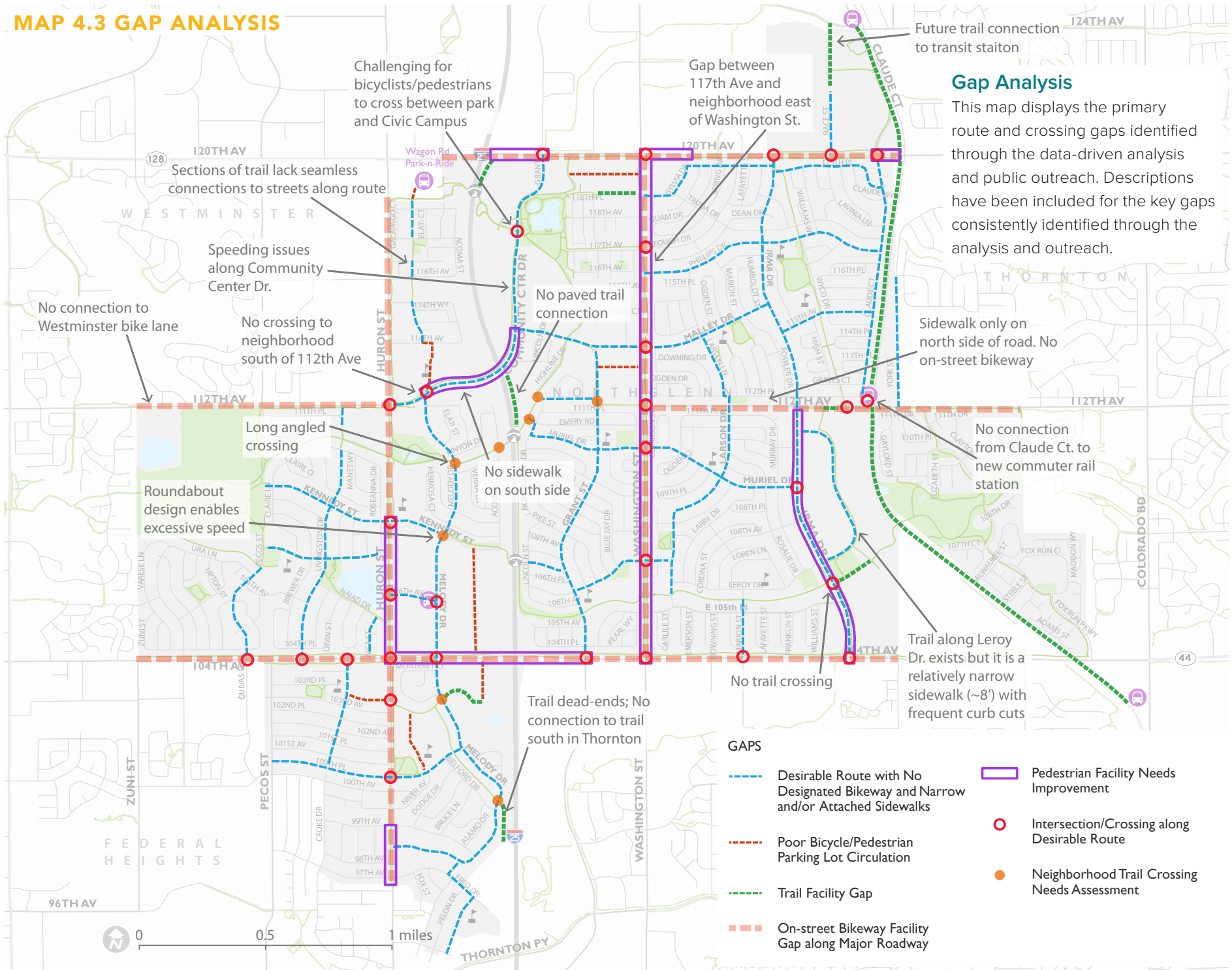


Pedestrian Facility Needs Improvement
(Huron Street)



Intersection/Crossing along Desirable Route (Trail crossing at Irma Drive)

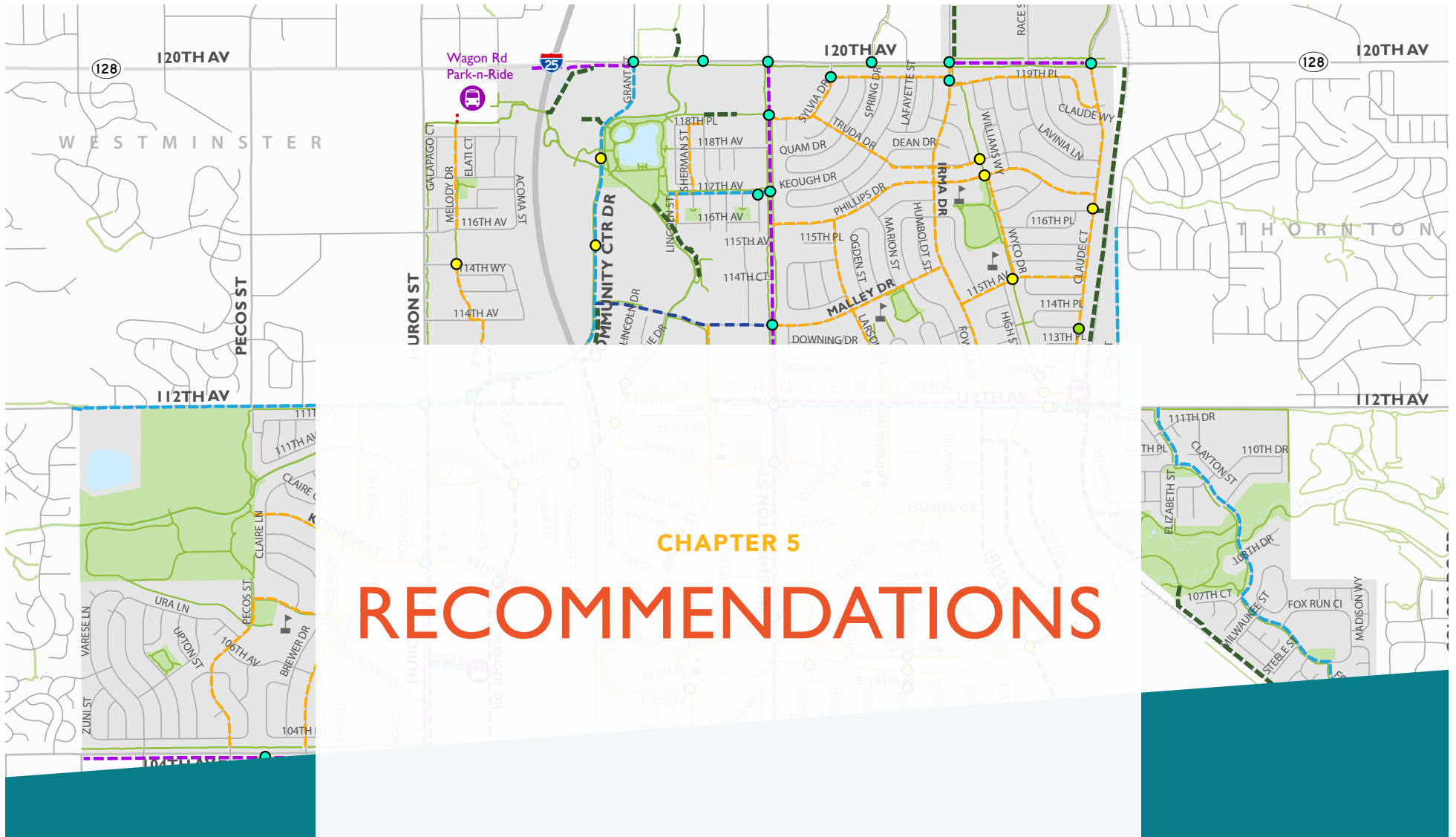
MAP 4.3 GAP ANALYSIS



Gap Analysis

This map displays the primary route and crossing gaps identified through the data-driven analysis and public outreach. Descriptions have been included for the key gaps consistently identified through the analysis and outreach.

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CHAPTER 5

RECOMMENDATIONS

CONNECT
NORTHGLENN



People of all ages and abilities should have the choice to walk or bicycle because walking and bicycling are safe, convenient, and pleasant transportation options.

5.1 INTRODUCTION

The vision of Connect Northglenn includes making walking and riding a bicycle a comfortable and integral part of daily. Recommended walking and bicycling facilities, such as separated bike lanes, shared use paths, wide and/or landscaped sidewalks, and neighborhood bike/pedways create networks for people of all ages and abilities that are comfortable for the majority of Northglenn residents. These facility types, which are described in this chapter, are considered low stress because they provide dedicated space for bicyclists and pedestrians, or take advantage of low volume, low-speed streets, which are inherently comfortable for walking and bicycling.

Increased active transportation mode share can lead to improved air quality and health outcomes, as well as economic benefits. This chapter presents recommendations, which once implemented, will help to help make Northglenn a more walkable, bikable and livable community and improve social equity. The types of facilities recommended are described in this chapter, and displayed on the Connect Northglenn Recommendations Map. Recommendations for active transportation support infrastructure and program recommendations are included in this chapter as well.

RECOMMENDATIONS CHAPTER COMPONENTS



Recommendation Facility Types – Presents the different types of recommendations included in the plan.



Prioritization – Describes the criteria used to prioritize projects and lists projects by priority.



General Recommendations - Presents general recommendations that should be prioritized that supplement the facility recommendations.



Community Program and Event Recommendations – Provides list of '5E' program recommendations, which will support engineering improvements to make a more walkable/bikeable Northglenn.

RECOMMENDATIONS DEVELOPMENT

The planning team developed recommendations to improve walking and bicycling in the community through an iterative and collaborative process. This process is illustrated in Figure 5.1. The recommended active transportation system will establish seamless, connected routes that link people to their destinations.

The majority of this plan's recommendations include additional guidance, such as proposed roadway cross-sections and various options where multiple roadway configurations may exist. A high-level summary of the recommendations are included in this chapter, and additional details are provided in Appendix G. General considerations for the recommendations include:

- **Inter-Jurisdictional Coordination** – Some projects will require coordination with adjacent municipalities and/or RTD and CDOT to advance the project to implementation.
- **Capitalize on Redevelopment** – All future development and redevelopment should include high-quality bicycle and pedestrian facilities, both within the development and on its perimeter. Any intersection improvements that occur due to the development should be designed to balance motor vehicle and pedestrian/bicycle access.
- **Property Acquisition** - Projects may require the acquisition of private property, and can only be implemented with the willing cooperation of affected land-owners.
- **Changes to Intersection Geometry** - Vehicle Level of Service (VLOS) is the standard methodology used to determine the quality of motor vehicle traffic flow at intersections. VLOS impacts need to be evaluated for all recommended intersection geometry modifications, such as reducing turn radius at corners, for both the peak hour and the daily service rating. Changes to VLOS should be balanced with changes to bicycle and pedestrian access at intersections.

All recommendations are subject to change and refinement as site conditions and development patterns change, and as other adjacent or intersecting projects are implemented. Additionally, projects may require feasibility studies to verify routing or applicability.

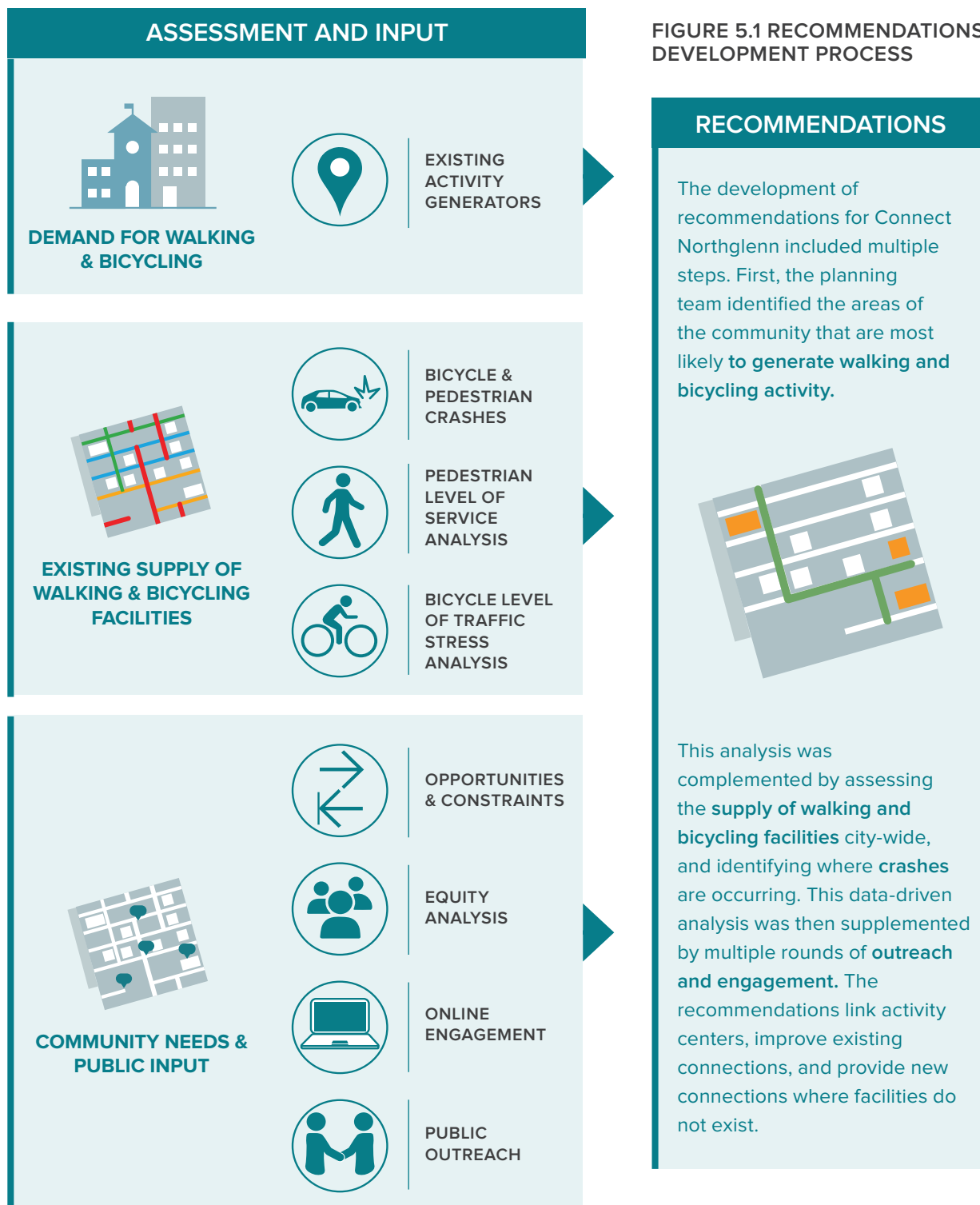


FIGURE 5.1 RECOMMENDATIONS DEVELOPMENT PROCESS

RECOMMENDATION FACILITY TYPES

Infrastructure recommendations fall into one of four categories: On-Street Bikeways, Off-Street Facilities, Neighborhood Bike/Pedways, and Crossing Improvements. Within each category, different types of improvements are recommended. The type of recommendation is identified on the Connect Northglenn Recommendations Map. For each recommendation, additional detail about the improvements are provided in Appendix G. A general description of the four categories include:

On-Street Bikeways: On-street bikeways provide a dedicated space within the roadway for bicyclists to ride. Bike lanes and buffered bike lanes use lane striping to delineate the bikeway, while more robust separated bike lanes use a variety of treatments to physically separate bicyclists from motor vehicles.

Off-Street Facilities: Off-Street facilities provide dedicated space for bicyclists and pedestrians separated from the roadway. This category includes the construction of new sidewalks, as well as improvements to existing sidewalks, such as the addition of a buffer between the roadway and sidewalk. Shared use paths, which provide two-way travel for both bicyclists and pedestrians, are recommended as well.

Neighborhood Bike/Pedways: Neighborhood Bike/Pedways include both bicycling and walking improvements. This recommendation is made along neighborhood streets that have existing low traffic speeds and volumes, which make them inherently comfortable for bicycle and pedestrian travel. In the short term, bikeway signing and striping improvements are recommended for these streets. Nearly all existing residential sidewalks do not meet the minimum ADA requirement width of 4 feet, and the public repeatedly voiced concern about narrow neighborhood sidewalks. Sidewalk improvements are expensive, and while all residential sidewalks are recommended to eventually be reconstructed city-wide, roadways with the Neighborhood Bike/Pedway designation represent the priority network for residential sidewalk reconstruction.

Crossing Improvements: The crossing improvements recommended for Connect Northglenn fall into two categories, intersections and mid-block crossings. Generally, these improvements will facilitate the crossing of major arterial and collector roadways, which due to the number of lanes, posted speeds, and traffic volumes, require thoughtful design to maintain comfort for bicyclists and pedestrians crossing the roadway.

On-Street Bikeways

- Bike Lane
- Buffered Bike Lane
- Separated Bike Lane



Off-Street Facilities

- Sidewalks
- Sidewalk Improvements
- Shared Use Paths



Neighborhood Bike/Pedways

- On-Street Bikeway Markings
- Wayfinding Signage
- Pedestrian Improvements



Crossing Improvements

- Intersections
- Mid-Block Crossings



ON-STREET BIKEWAYS

Bikeway facilities provide a dedicated space for bicyclists to ride. As traffic volumes and speeds increase, more separation from motor vehicle traffic is necessary to maintain comfort levels for bicyclists. Due to the range of roadway conditions in Northglenn, different bikeway improvements are recommended. Of important note is that bikeway facilities, once implemented, can evolve into more robust facilities over time. For instance, a conventional buffered bike lane can be installed and evaluated. After evaluating the facility, physical barriers between the bikeway and travel lanes can be implemented if deemed necessary. In the long-term, the roadway can also be reconstructed, and a grade-separated bike lane implemented.

BIKE LANES

Bike lanes are portions of the roadway that have been designated by striping, signing, and pavement markings for preferential and exclusive use by bicyclists. Bike lanes are typically located on both sides of the road and carry bicyclists in the same direction as adjacent motor vehicle traffic. Bike lanes should be five feet wide, and wider where gutter pans exist.

BUFFERED BIKE LANES

Buffered bike lanes are conventional bike lanes paired with a designated buffer space, separating the bike lanes from the adjacent motor vehicle travel lanes and/or parking lanes.

Buffered bike lanes are designed to increase the space between bike lanes and the travel lanes and/or parked cars, providing more comfortable conditions for bicyclists. This treatment is appropriate for bike lanes on roadways with high motor vehicle traffic volumes and speeds, adjacent to parking lanes, or a high volume of truck or oversized vehicle traffic.

SEPARATED BIKE LANES

Of all on-street bicycle facilities, separated bike lanes (SBLs) offer the most protection and separation from adjacent motor vehicle traffic. SBLs are bicycle facilities that are physically separated from motor vehicle traffic by a painted buffer and physical barriers such as flexible delineators, curbs, or planters. Parking lanes can also be used as a means of separation if there is a buffer space between the bike lane and the parking lane. SBLs are ideally placed on streets with few driveways or mid-block access points for motor vehicles. Eight feet is the minimum recommended total width for a protected bike lane; five feet of bike lane and three feet of physical buffer zone.

In the long-term, roadways can be reconstructed to include grade-separated bikeways. These bikeways can either be at the same grade as the sidewalk, or at an intermediate grade between the roadway and sidewalk. SBLs can be one or two-way facilities.



Providing more separation between bicyclists and motor vehicles is necessary to maintain comfort levels, especially as speeds and volumes increase.

Bike Lanes



Buffered Bike Lanes



Separated Bike Lanes (At-Grade)



Grade Separated Bike Lanes



OFF-STREET FACILITIES

Off-street facilities provide dedicated space for pedestrians and bicyclists, separated from the roadway. For Connect Northglenn, these improvements include the construction of new shared use paths along linear corridors, sidepaths to be constructed adjacent to roadways, the construction of new sidewalks, and the reconstruction of existing sidewalks to make them more comfortable for pedestrians. The range of off-street facility improvements are described below.

Shared Use Paths

Shared use paths, often called trails, allow for two-way, off-street use by pedestrians, bicyclists, skaters, wheelchair users, joggers, and other non-motorized users. These facilities are frequently found in parks, along canals, railroads, or utility corridors where there are few conflicts with motorized vehicles. Path facilities can also include amenities such as lighting, signage, and fencing (where appropriate). To enable two-way travel, shared use paths should be ten feet wide (AASHTO requires a minimum width of eight feet), with wider paths constructed where volumes are expected to be high. In high-volume areas, separate paths for bicycles and pedestrians can be provided.

Sidepaths

Sidepaths are a type of path that run adjacent to a street. Because of operational concerns, it is generally preferable to place paths within independent rights-of-way away from roadways. However, in many situations in Northglenn, existing roads provide the only corridors available. When designed correctly, these facilities have the ability to provide a high level of comfort for pedestrians and bicyclists. However, the *AASHTO Guide for the Development of Bicycle Facilities* cautions practitioners to limit the number of driveways and street crossings along sidepaths to minimize potential conflicts, especially in suburban contexts. Where implemented, sidepaths should be coupled with strict access management regulations or improvements.

Sidewalks

Sidewalks provide a dedicated space for pedestrians to travel. Sidewalks should be at least five feet wide (with a minimum width of four feet to meet ADA requirements). The City of Northglenn has an extensive sidewalk network, and few gaps in the network exist. This type of improvement is focused on installing new sidewalks to fill the remaining gaps in Northglenn's sidewalk network.

Sidewalk Improvements

Northglenn has many multi-lane, high-speed arterial and collector roadways that travel north/south and east/west through the city. For pedestrians to be comfortable walking along these corridors, wide, buffered sidewalks should be available on both sides of the road. This facility improvement is focused on recommendations to reconstruct roadways to install wider, buffered sidewalks.

Shared Use Paths



Sidepaths



Sidewalks



Sidewalk Improvements



NEIGHBORHOOD BIKE/PEDWAYS (BPways)

Neighborhood BPways are streets with low motorized traffic volumes and speeds, designed to give bicycle and pedestrian travel priority. In Northglenn, this facility is recommended along both local streets and residential collector streets, and both short-term and long-term recommendations are provided. These corridors also represent the priority network for residential sidewalk reconstruction.

SHORT TERM (STRIPING AND SIGNAGE IMPROVEMENTS)

In the short term, it is recommended that signage and pavement markings be installed on these corridors. Depending on the roadway context, either shared lane markings (SLMs) and striped parking lanes or bike lanes are recommended. SLMs are appropriate on roadways with low traffic volumes (less than 3,000 vehicles per day, with a target volume of 1,500 vpd). On higher volume residential collectors, bike lanes are recommended. Both bike lanes and parking lanes will delineate travel lanes, providing more separation between motor vehicles and sidewalks, which can improve comfort levels for pedestrians walking on the sidewalks. In addition to pavement markings, on-street wayfinding signage is also recommended for Neighborhood BPways, facilitating navigation for bicyclists and pedestrians. Unique branding can be used for the signage to provide user continuity for this type of facility.

FIGURE 5.2 OPTION 1 - SHARED LANE MARKING

This option includes striped parking lanes and shared lane markings. Parking is retained on both sides of the street. Bicyclists will share the travel lane with motor vehicles.

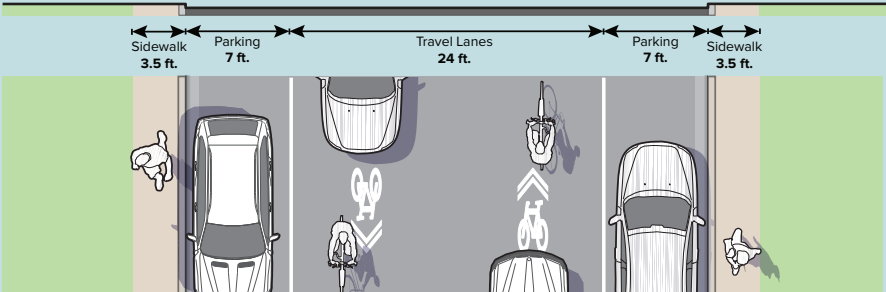
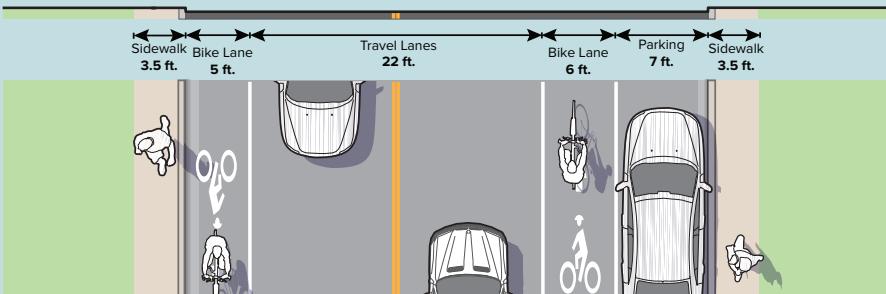


FIGURE 5.3 OPTION 2 - BIKE LANE

This option includes striped bike lanes. With this option, parking is only retained on one side of the street, making it most appropriate for corridors with lower parking utilization or roads with higher traffic volumes.



LONG TERM (ROADWAY RECONSTRUCTION REQUIRED)

Long term BPways will require the reconstruction of the roadway. While the goals of the on-street pavement markings are consistent with short term recommendations, the purpose of the reconstruction is to widen existing sidewalks. Three options for roadway reconstruction are recommended, depending on the roadway context.

FIGURE 5.4 OPTION 3 - SHARED LANES WITH ATTACHED SIDEWALKS

With this option, sidewalks are widened to six feet, and parking is retained on both sides of the road. This option is most appropriate on corridors with high parking utilization.

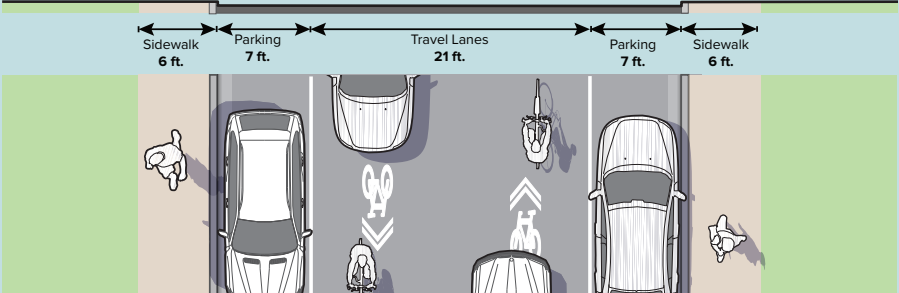


FIGURE 5.5 OPTION 4 - SHARED LANES WITH TREE LAWN

With this option, parking is retained on one side of the road. A tree lawn buffer is included. This option is appropriate for streets with lower parking utilization.

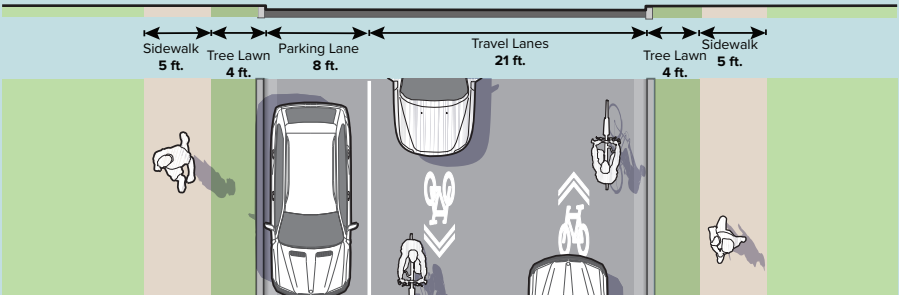
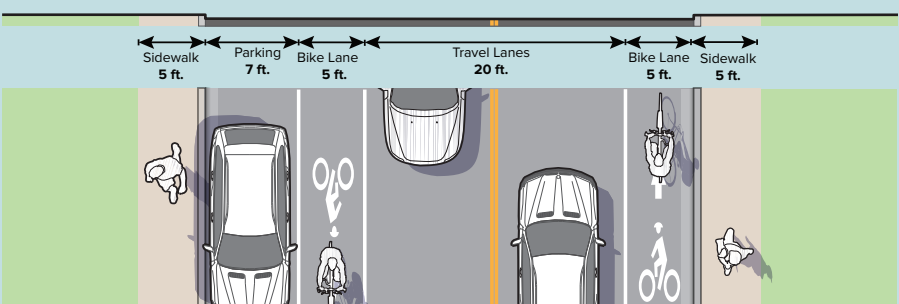


FIGURE 5.6 OPTION 5 - BIKE LANE

With this option, parking is retained on one side of the street. This option is appropriate for higher volume roadways, such as residential collectors. Parking utilization should be assessed prior to reconstruction.



CROSSING IMPROVEMENTS

Connect Northglenn recommends a range of crossing improvements. Crossing improvements should be coordinated with linear improvements. For instance, individual Neighborhood BPway improvements should be implemented along with the crossing improvements indicated along the corridors, rather than implemented separately. Crossing improvements fall into two categories; intersections and mid-block crossings. Intersection improvements are recommended at existing four- and three-way intersections. Mid-block crossing improvements are recommended at existing or proposed locations where bicycle and pedestrian crossing demand exists, like at trail crossings.

Intersections

Signalized intersections are typically the preferred crossing location for pedestrians, since traffic is stopped in one direction and motorists generally expect crossing pedestrians. However, vehicular turning speed, visibility, crossing distance, and signal timing can be great barriers for pedestrians on roadways that are designed to primarily accommodate vehicular traffic. For Connect Northglenn, intersection improvements are primarily focused on the arterial and collector roadway network. Infrastructure recommendations are conceptual, and will require additional analysis and assessment. The following types of improvements are recommended:

- **Perpendicular Curb Ramps** - Reduce crossing distance and orient pedestrians directly into crosswalks, which is especially important for visually impaired pedestrians. Pedestrian push buttons should be located adjacent to the ramps.
- **Channelized Right Turn Lanes** - Facilitate the crossing of large, multi-lane intersections by dividing the crossing into phases and isolating turning conflicts. Proper design of the channel island reduces turning vehicle speeds.
- **Intersection Geometry Improvements** - Reconstruct corners of large intersections to shorten the turn radius and shorten the crossing distance for pedestrians, reduce exposure time, and require vehicles to turn more slowly. Geometric improvements to roadways need to consider heavy truck volumes and roadway design speed, but accommodation of these factors should be balanced with the impacts on pedestrian crossing conditions.
- **Raised Medians/Refuge Islands** - In Northglenn, some medians stop short of the crosswalk to facilitate left turns, and extending these medians to the crosswalk should be evaluated. Where they can be accommodated, pedestrian refuge islands should be considered, which facilitate the crossing of wide roadways.
- **High Visibility Crosswalks and Pedestrian Signals** - Provide the highest level of visual contrast at crosswalks. Providing these and pedestrian signals at all intersection approaches enables pedestrians to only cross the leg of the intersection they need to, rather than cross only on legs where marked crossings exist, which could require crossing the intersection in additional phases.
- **Lengthened/Leading Pedestrian Intervals (LPI)** - Provide pedestrians with a head-start to cross the roadway, before cars receive the green signal. Signal timing should be evaluated to provide enough time for pedestrians to cross, which is especially important on wide, multi-lane roadways that take longer to cross.

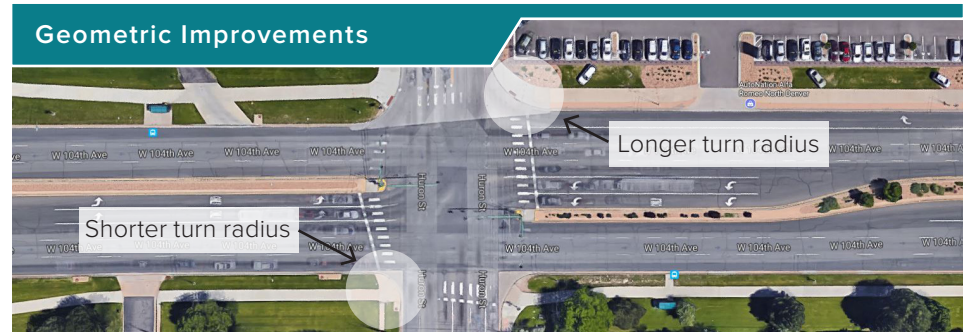
Perpendicular Curb Ramps



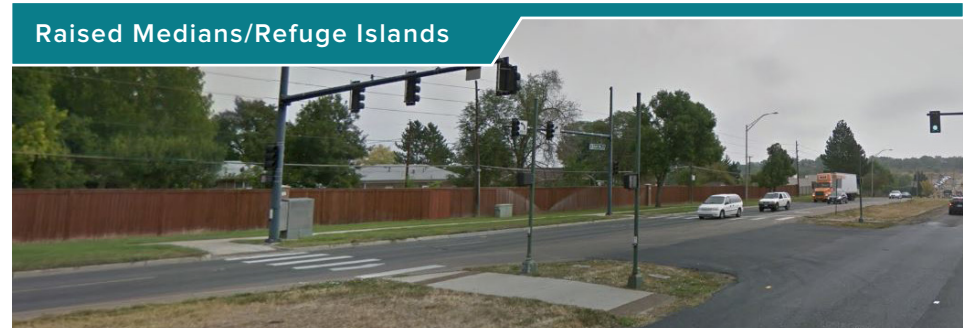
Channelized Right Turn Lanes



Geometric Improvements



Raised Medians/Refuge Islands



MID-BLOCK CROSSINGS

Mid-block crossings typically consist of a marked crossing area, signage, and other roadway design elements to slow or stop traffic. The approach to designing crossings at unsignalized locations depends on an evaluation of vehicular traffic, line of sight, pathway traffic, use patterns, vehicle speed, road type, road width, and other safety issues. The types of mid-block crossing improvements recommended include the addition of beacons, as well as curb extensions and pedestrian refuge islands.

HAWK Beacons

High-Intensity Activated crossWalk (HAWKs) beacons provide a high level of comfort for crossing users through the use of a red-signal indication to stop conflicting motor vehicle traffic. A HAWK beacon has been installed on 112th Avenue in Northglenn. HAWK beacons are used to improve non-motorized crossings of major streets in locations where side-street volumes do not support installation of a conventional traffic signal, and where the distance between marked crossings is long. HAWKs are most appropriate in areas of heavy traffic with multiple travel lanes (roadways with four lanes or more).

Flashing Beacons

Rectangular Rapid Flash Beacons (RRFBs) use an irregular flashing pattern to alert drivers to yield where pedestrians and/or bicyclists are crossing at a marked crosswalk, and have been shown to drastically improve motor vehicle yielding compliance over no beacon. RRFBs can be either user or sensor activated, and are appropriate on three lane roads, or two lane roads with high traffic volumes and speeds where gaps in traffic are infrequent.

Curb Extensions

Curb extensions, or bulb outs, are expansions of the curb into the parking lane, and reduce the crossing distance and exposure time for pedestrians and bicyclists. In the short term, curb extensions can be delineated using paint.

Median Refuge Islands

Median refuge islands reduce the exposure time experienced by a pedestrian in an intersection. They are generally applied at locations where speeds and volumes make crossing challenging, or where three or more lanes of traffic make pedestrians feel exposed or unsafe in the intersection. Median refuge islands have been proven to improve safety of pedestrians crossing mid-block.

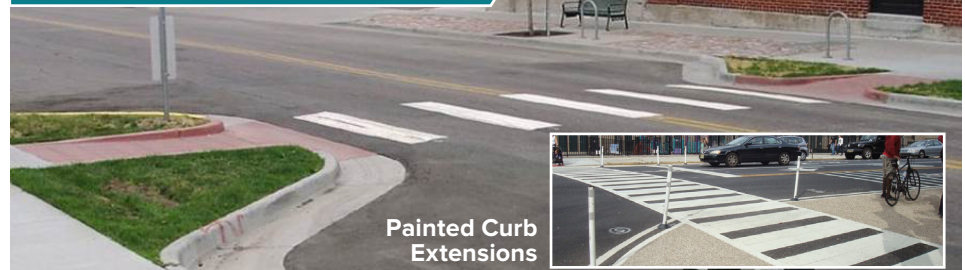
HAWK Beacons



Flashing Beacons



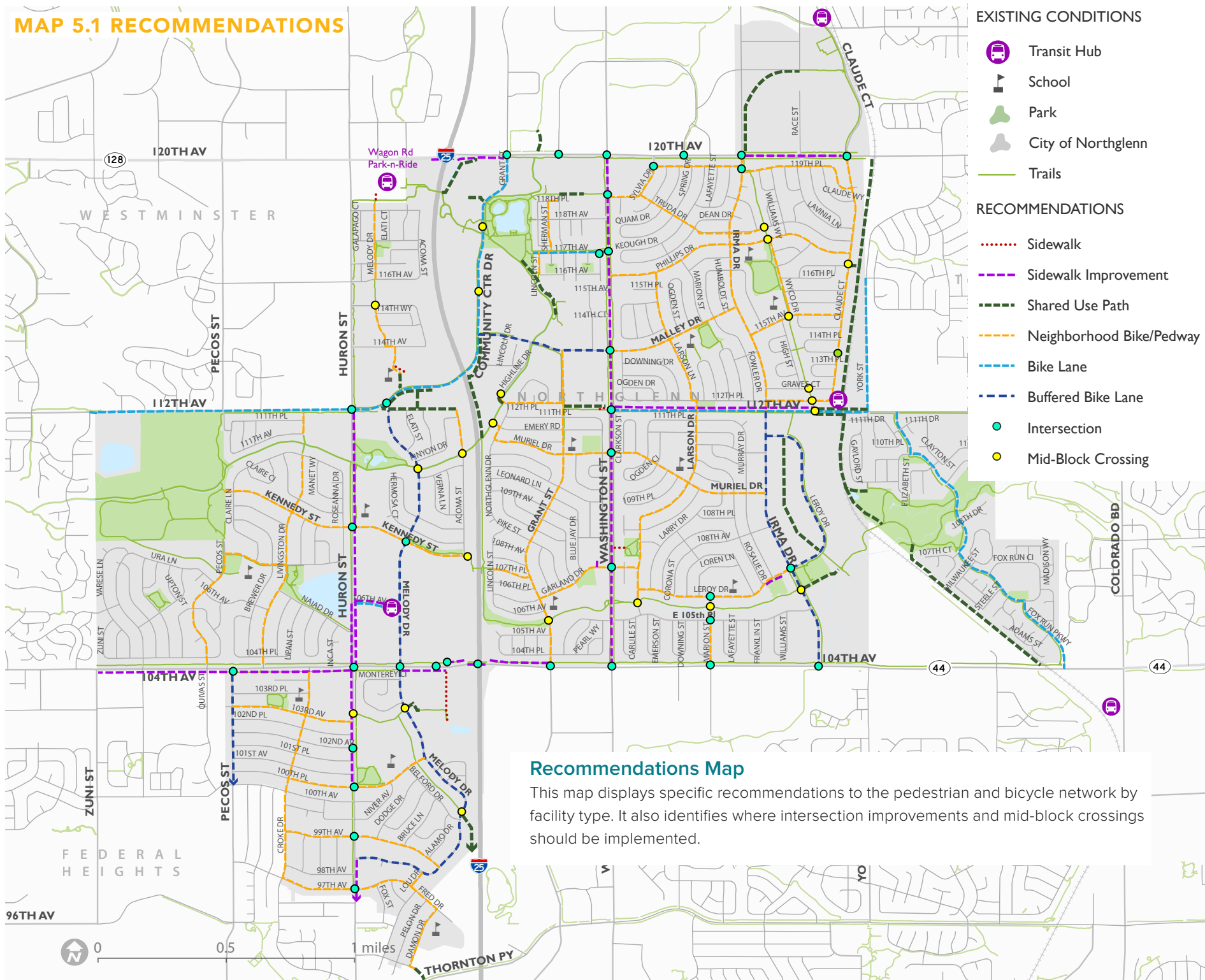
Curb Extensions



Median Refuge Islands



MAP 5.1 RECOMMENDATIONS



5.3 PRIORITIZATION

The prioritization criteria are based upon best-practices and feedback from the steering committee and are used to score project recommendations. The prioritization process was designed to be an objective, data-driven process, using proximity to the criteria to assign scores. Using this method, projects that meet more criteria receive highest scores, corresponding to the highest priority projects



PUBLIC INPUT

Connect Northglenn has engaged the public through public workshops, stakeholder meetings, an online survey, and an online mapping exercise. Projects with demonstrated public endorsement qualify for this prioritization criterion.



PROXIMITY TO SCHOOLS

To encourage more students to walk and bicycle to school, proposed facilities that connect to, or travel within a quarter mile of K-12 schools (public and private) qualify for this prioritization criterion.



BICYCLE AND PEDESTRIAN CRASHES

Projects that include corridors or intersections with higher rates of bicycle- and pedestrian-involved crashes (according to data from the past five years) score higher than those where no crashes have occurred.



EQUITY

Areas with high concentrations of traditionally underserved populations typically have higher rates of walking and bicycling, and are usually more underserved when it comes to existing infrastructure. US Census data is used, and projects that serve areas with a high concentration of historically underserved populations score more points than areas with lower concentrations of these populations. Included data cover age, race, income, educational attainment, Limited English Proficiency (LEP), and access to a private vehicle.



CONNECTIONS TO ACTIVITY CENTERS

By increasing bicycle and pedestrian accessibility to major activity centers (e.g. parks, major retail areas, employment centers, etc.), the Connect Northglenn recommendations can reduce traffic congestion and support residents and visitors who choose to bicycle or walk for transportation. Projects that connect to these centers qualify for this prioritization criteria.



MULTI-WARD PROJECTS

Northglenn is comprised of four wards, which are each represented by two Councilmembers. Projects which span multiple wards will facilitate governmental collaboration and will score higher in this criterion.



PROJECT COST

Bikeway and pedestrian facilities range in project readiness and construction cost. Bikeway and pedestrian projects that require minimal changes to the built environment score higher on this criterion.



CONNECTIVITY TO EXISTING FACILITIES

Extending the existing network to create longer continuous routes will result in a more connected system as it expands versus implementing isolated and disconnected projects. Facilities that connect to an existing trail or buffered sidewalk qualify for this scoring criterion.



CONNECTIVITY TO EXISTING FACILITIES

Gaps in the bikeway and pedestrian network discourage use because they limit route continuity or require users to choose less direct paths to access their destinations. Recommendations that fill gaps between two otherwise continuous facilities in the existing bikeway and pedestrian network qualify for this criterion. Facilities that are redundant, or are parallel to other existing facilities, receive no points, giving preference to projects that fill network gaps.

TABLE 5.1: PROJECT RECOMMENDATIONS

Project Name	Project Description	Project Streets	Extent (from)	Extent (to)	Project Type	Priority
100th Pl.	In the short term, install SLM and signage. In the long term, reconstruct roadway to accommodate wider sidewalks. Improve intersection at Huron St. and 100th Pl. to facilitate pedestrian and bicyclist access.	100th Pl.	Croke Dr.	Melody Dr.	Neighborhood Bike/Pedway	High
103rd Ave.	In the short term, install SLM and signage. In the long term, reconstruct roadway to accommodate wider sidewalks.	103rd Ave.	Pecos St	Huron St.	Neighborhood Bike/Pedway	High
Community Center Dr. - 112th Ave.	In the short term, stripe bike lanes. In the long term, assess option to reconfigure roadway to accommodate buffered bike lanes. Improve mid-block crossings in coordination with Civic Campus redevelopment. Improve intersections along corridor to facilitate pedestrian and bicyclist access.	Community Center Dr.; 112th Ave.	Alcott St.	120th Ave.	Bike Lane	High
Croke Dr. - 97th Ave.	In the short term, stripe bike lanes from 100th Pl. to 104th Ave. and install SLM and signage from 100th Ave. to 97th Ave. and Croke Dr. to Huron St. In the long term, reconstruct roadway to accommodate wider sidewalks. Improve the intersection at 97th Ave. and Huron St. to facilitate pedestrian and bicyclist access.	Croke Dr.; 97th Ave.	104th Dr.	Huron St.	Neighborhood Bike/Pedway	High
Grant Dr.	In the short term, stripe bike lanes or install SLM and signage. In the long term, reconstruct roadway to accommodate wider sidewalks. Construct curb extensions at mid-block crossing with trail. Improve the intersection at Grant Dr. and 104th Ave. to facilitate pedestrian and bicyclist access.	Grant Dr.	Malley Dr.	104th Ave.	Neighborhood Bike/Pedway	High
Huron St.	Reconfigure roadway and reconstruct sidewalks to accommodate wider detached sidewalks along Huron St. Assess the consolidation of driveways to reduce conflicts with pedestrians on sidewalks. Improve intersections to facilitate pedestrian and bicyclist access.	Huron St.	112th Ave.	96th Pl.	Sidewalk Improvement	High
Kennedy Dr.	In the short term, stripe bike lanes. In the long term, reconstruct roadway to accommodate wider sidewalks. Improve intersection at Huron St. to facilitate pedestrian and bicyclist access. Create formal connection from Kennedy Dr. to trail.	Kennedy Dr.	Claire Ln.	Acoma St.	Neighborhood Bike/Pedway	High
Larson Ln. - Larson Dr.	In the short term, install SLM and signage. In the long term, reconstruct roadway to accommodate wider sidewalks. Construct curb extensions at mid-block crossing with trail.	Larson Ln.; Larson Dr.	Malley Dr.	Trail	Neighborhood Bike/Pedway	High
Leroy Dr. - 107th Ave. - Garland Dr.	In the short term, install SLM and signage from Lincoln St. to Grant Dr. and Larson Dr. to Irma Dr.; stripe bike lanes from Grant Dr. to Larson Dr. In the long term, reconstruct roadway to accommodate wider sidewalks. Improve intersections along corridor to facilitate pedestrian and bicyclist access.	Leroy Dr.; 107th Ave.; Garland Dr.	Lincoln St.	Irma Dr.	Neighborhood Bike/Pedway	High
Livingston Dr.	In the short term, install SLM and signage. In the long term, reconstruct roadway to accommodate wider sidewalks.	Livingston Dr.	104th Ave.	112th Ave.	Neighborhood Bike/Pedway	High
Lou Dr. - Fred Dr. - Damon Dr. - Trail Connection	In the short term, install SLM and signage on roadways and construct SUP from Thornton Pkwy. to existing trail. In the long term, reconstruct roadways to accommodate wider sidewalks. Improve the intersection at 97th Ave. and Huron St. to facilitate pedestrian and bicyclist access.	Lou Dr.; Fred Dr.; Damon Rd.	Huron St.	Thornton Pkwy.	Neighborhood Bike/Pedway and Trail	High
Malley Dr. West	In the short term, restripe roadway to accommodate buffered bike lanes. In the long term, reconstruct roadway to accommodate wider detached sidewalks. Improve intersections along corridor to facilitate pedestrian and bicyclist access.	Malley Dr.	Community Center Dr.	Washington St.	Buffered Bike Lane	High
Malley Dr. - 115th Ave.	In the short term, install SLM and signage from Irma Dr. to Claude Ct. and stripe bike lanes from Washington St. to Irma Dr. In the long term, reconstruct roadway to accommodate wider sidewalks. Construct curb extensions at mid-block crossing with trail on 115th Ave. Improve intersections along corridor to facilitate pedestrian and bicyclist access.	115th Ave.; Malley Dr.	Washington St.	Claude Ct.	Neighborhood Bike/Pedway	High

Color Denotes Project Priority: Higher Priority Medium Priority Lower Priority

SLM = Shared Lane Marking

TABLE 5.1: PROJECT RECOMMENDATIONS (CONTINUED)

Project Name	Project Description	Project Streets	Extent (from)	Extent (to)	Project Type	Priority
Melody Dr.	In the short term, reduce lanes from 5 to 3 and stripe buffered bike lanes. In the long term, reconstruct roadway to accommodate wider sidewalks. Improve mid-block crossings along corridor where trail intersects road. Improve intersections to facilitate pedestrian and bicyclist access.	Melody Dr.	112th Ave.	Huron St.	Buffered Bike Lane	High
Muriel Dr. - Northglenn Dr. - Emery Rd.	In the short term, stripe bike lanes from Northglenn Dr .to Irma Dr .and install SLM and signage from Muriel Dr. to trail. In the long term, reconstruct roadway to accommodate wider sidewalks. Formalize connection to trail from Emery Rd.	Muriel Dr.; Northglenn Dr.; Emery Rd.	Trail	Irma Dr.	Neighborhood Bike/Pedway	High
Phillips Dr.	In the short term, install SLM and signage. In the long term, reconstruct roadway to accommodate wider sidewalks.	Phillips Dr.	Washington St.	Claude Ct.	Neighborhood Bike/Pedway	High
Quivas St. - Roseanna Dr.	In the short term, install SLM and signage. In the long term, reconstruct roadway to accommodate wider sidewalks.	Quivas St.; Roseanna Dr.	104th Ave.	Livingston Dr.	Neighborhood Bike/Pedway	High
Washington St.	Reconfigure roadway to accommodate wider detached sidewalks. Improve intersections along corridor to facilitate pedestrian and bicyclist access.	Washington St.	120th Ave.	104th Ave.	Sidewalk Improvement	High
104th Ave.	Remove and replace attached sidewalks where they exist along 104th Ave with detached 8' sidewalks. Where attached sidewalks cannot be constructed due to right-of-way constraints near Interstate 25, erect vertical barrier between roadway and sidewalk. On eastern portion of roadway, assess the consolidation of driveways to minimize conflicts with pedestrians on sidewalks. Improve intersections to facilitate pedestrian and bicyclist access.	104th Ave.	Zuni St.	Grant St.	Sidewalk Improvement	Medium
112th Ave.	Construct 5' sidewalk on north side of 112th Ave. west from Washington St. Remove existing trail and replace with 10' SUP. Construct SUP connecting SUP to Highline Dr. Install lighting along corridor. Improve intersection at 112th Ave and Washington St. to facilitate pedestrian and bicyclist access. Construct	112th Ave.	Grant Dr.	Washington St.	Sidewalk and Trail	Medium
112th Ave. East	Reconfigure roadway cross-section to accommodate bike lanes. Remove existing sidewalk on north side of road and construct 10' sidepath. Construct trail connecting 112th Ave. crosswalk and proposed trail on west side of railroad tracks to existing Thornton trail. Improve intersection at Washington St. and 112th Ave. to facilitate pedestrian and bicyclist access.	112th Ave.	Washington St.	York St.	Sidepath Improvement, Bike Lane, and Trail	Medium
112th Ave. - Fox Run Open Space - RTD Trail Connector	On the south side of 112th Ave, remove existing sidewalk and construct 10' sidepath. In coordination with RTD, railroad, and private property owners, construct SUP along railroad corridor to connect to trails south. Install RRFB and crosswalk across 112th Ave.	112th Ave.	112th Ave.	104th Ave.	Trail	Medium
112th Pl. - Claude Ct.	In the short term, stripe bike lanes. Improve intersection at 120th Ave. and Claude Ct. to facilitate pedestrian and bicyclist access. In the long term, reconstruct roadway to accommodate wider sidewalks.	112th Pl.; Claude Ct.	Irma Dr.	120th Ave.	Neighborhood Bike/Pedway	Medium
112th Pl. - Highline Dr. Trail Connection	In the short term, install SLM and signage. Remove existing sidewalk on southeast side of road and construct 10' sidepath. Reconstruct bridge over creek. Install mid-block crossing at intersection with trail.	112th Pl.	Highline Dr.	Grant Dr.	Neighborhood Bike/Pedway and Trail	Medium
Community Center Dr. Trail Connection	Construct 10' SUP along Interstate 25, and construct bridge over creek. Project will require coordination with CDOT.	Trail	Malley Dr.	Existing Trail	Trail	Medium

TABLE 5.1: PROJECT RECOMMENDATIONS (CONTINUED)

Project Name	Project Description	Project Streets	Extent (from)	Extent (to)	Project Type	Priority
Ditch Trail East	Construct 10' SUP in coordination with private property owners. Project may require environmental review and permitting.	Existing Private Trail	Existing Trail	EB Raines Park	Trail	Medium
Fox Run Pkwy.	Restrict parking on one side of street and stripe bike lanes.	Fox Run Pkwy.	112th Ave.	104th Ave.	Bike Lane	Medium
Irma Dr. South	In the short term, conduct a 5-to-3 lane road diet, and install buffered bike lanes. In the long term, reconstruct roadway to accommodate wider detached sidewalks. Improve intersections to facilitate pedestrian and bicyclist access. Assess installation of mid-block crossing with a HAWK beacon and pedestrian refuge island at Jaycee Park.	Irma Dr.	112th Ave.	104th Ave.	Buffered Bike Lane	Medium
Justice Center Trail - Community Center Dr. - Acoma St.	In the short term, on Acoma St., install SLM and signage, and in the long term, reconstruct roadway to accommodate wider sidewalks. Construct curb extension where trail crosses Acoma St. Construct new trail segments in coordination with Justice Center Development on the north side of 112th Ave., along Community Center Dr. from the existing trail east to the new traffic signal on Community Center Dr., and north of Community Center Dr. connecting to Melody Dr.	Acoma St.; Community Center Dr.	W. 114th Ave.	Existing Trail	Neighborhood Bike/Pedway and Trail	Medium
Marion St.	In the short term, install bike lanes if parking utilization is low, and if high, install shared lane markings and signage. Improve intersections to facilitate pedestrian and bicyclist access. In the long term, reconfigure roadway to accommodate wider sidewalks and on-street bike lanes. Consider traffic calming measures to reduce volumes along street.	Marion St.	Leroy Dr.	104th Ave.	Neighborhood Bike/Pedway	Medium
Melody Dr. - 114th Ave. - Wagon Rd. Pedestrian Connection	In the short term, install SLM and signage along Melody Dr. On 114th Ave., and on Melody Dr. from 114th Ave. to W. 114th Ave., restrict parking on one side of street to accommodate bike lanes. Stripe pedestrian lane or construct sidewalk through Park N' Ride parking lot in coordination with RTD. At 115th Ave., construct curb extensions at mid-block crossing with trail. In the long term, reconstruct Melody Dr. to accommodate wider sidewalks.	Melody Dr.; 114th Ave.	Wagon Rd. Park-N-Ride	Melody Dr.	Neighborhood Bike/Pedway and Sidewalk	Medium
Melody Dr. - Bannock St. - High School Trail Extension	Construct 10' SUP connecting to existing trail in coordination with private property owners. Install mid-block crossing at trail. Reconfigure Bannock St. to accommodate wider detached sidewalk.	Melody Dr.; Bannock St.	Bannock St. Trail	104th Ave.	Sidewalk and Trail	Medium
Plaza Trail - 117th Ave. Neighborhood Connector	In the short term, install SLM and signage on the roads. In the long term, reconstruct roadways to accommodate wider sidewalks. Assess opportunity to construct 10' SUP through development to connect existing trails, which will require coordination with property owners.	118th Pl.; Sherman St.; 117th Ave.; Lincoln St.	118th Pl.	116th Ave.	Neighborhood Bike/Pedway and Trail	Medium
Rec Center-I-25 Trail Connector	Construct 10' SUP to connect to existing trail network. One segment of trail will require construction of retaining wall adjacent to Interstate 25. Environmental permitting and review may be required. Project will require coordination with CDOT.	--	120th Ave.	Community Center Dr.	Sidewalk and Trail	Medium
Sylvia Dr. -119th Pl.	In the short term, install SLM and signage. In the long term, reconstruct roadway to accommodate wider sidewalks. Improve intersections to facilitate pedestrian and bicyclist access.	Sylvia Dr.; 119th Pl.	Washington St.	Claude Ct.	Neighborhood Bike/Pedway	Medium
Wyco Dr. -Truda Dr.	In the short term, stripe bike lanes from Phillips Dr. to 115th Ave.; install SLM and signage from Sylvia Dr. to existing trail. Construct two curb extensions at mid-block crossing with trail on Wyco Dr. In the long term, reconstruct roadway to accommodate wider sidewalks.	Wyco Dr.; Truda Dr.	Sylvia Dr.	115th Ave.	Neighborhood Bike/Pedway	Medium

Color Denotes Project Priority: Higher Priority Medium Priority Lower Priority

SLM = Shared Lane Marking

TABLE 5.1: PROJECT RECOMMENDATIONS (CONTINUED)

Project Name	Project Description	Project Streets	Extent (from)	Extent (to)	Project Type	Priority
99th Ave.	In the short term, install SLM and signage. In the long term, reconstruct roadway to accommodate wider sidewalks. Improve intersection at Huron St. and 99th Ave. to facilitate pedestrian and bicyclist access.	99th Ave.	Croke Dr.	Melody Dr.	Neighborhood Bike/Pedway	Low
106th Ave.	Reconfigure roadway to accommodate bike lanes. Assess removal of two-way left-turn lane and consolidation of driveways. Improve intersections to facilitate pedestrian and bicyclist access.	106th Ave.	Huron St.	Melody Dr.	Bike Lane and Sidewalk improvement	Low
117th Ave.	Restrict parking on north side of roadway to accommodate bike lanes. Construct sidewalk from existing sidewalk east to Pearl St., and install crosswalk across Pearl St.	117th Ave.	EB Raines Park	Washington St.	Sidewalk and Bike Lane	Low
120th Ave. Trail Connector	Construct 10' SUP along creek in coordination with City of Thornton.	--	Existing Trail	120th Ave.	Trail	Low
120th Ave. - I-25 Bridge	Reconfigure roadway to reduce travel lane widths providing space to extend the curb line and construct detached sidewalks east of I-25, and on the Interstate 25 bridge, wider sidewalks. Construct vertical barriers between roadway and sidewalk on bridge.	120th Ave.; I-25 Bridge	1-25 Ramp SB	Grant St.	Sidewalk Improvement	Low
Irma Dr. North	In the short term, stripe bike lanes. In the long term, assess removal of parking to accommodate wider detached sidewalks. Improve intersection at 120th Ave. and Irma Dr. to facilitate pedestrian and bicyclist access.	Irma Dr.	120th Ave.	112th Ave.	Neighborhood Bike/Pedway	Low
Jaycee Park Trail	Construct 10' SUP between Irma Dr. and existing trail east of Jaycee Park.	Irma Dr.	Irma Dr.	Regatta Apts Driveway	Trail	Low
Karl's Farm	In coordination with Karl's Farm development, construct 6' wide detached sidewalks on Race St., and SUP through development. Improve intersection at 120th Ave. and Irma Dr to facilitate pedestrian and bicyclist access. On 120th Ave. from Gilpin St. to Irma Dr., construct detached 8-10' sidewalks in coordination with roadway widening project. Improve intersections to facilitate pedestrian and bicyclist access.	Race St.; 120th Ave.	Irma Dr.	Claude Ct.	Sidewalk, Sidewalk Improvement, and Trail	Low
Leroy Dr.	Install 5' wide detached sidewalk on south side of Leroy Dr.	Leroy Dr.	Rosalie Dr.	Irma Dr.	Sidewalk	Low
Leroy Dr. East	In the short term, reconfigure roadway to accommodate buffered bike lanes. In the long term, reconstruct roadway to accommodate wider detached sidewalks and separated bike lanes. Install traffic signal at Leroy Dr. and Irma Dr. if warranted to facilitate crossing of Irma Dr.	Leroy Dr.	Irma Dr. (north)	Irma Dr. (south)	Buffered Bike Lane	Low
Pecos St.	Remove parking on east side of Pecos St. and stripe bike lanes. Improve intersection at 104th Ave. and Pecos St. to facilitate pedestrian and bicyclist access.	Pecos St.	104th Ave.	Northglenn Boundary	Bike Lane	Low
Railroad Trail	Coordinate with railroad and property owners to construct 10' SUP in abandoned railroad ROW.	--	Leroy Dr.	Leroy Dr.	Trail	Low
RTD Commuter Trail	Construct SUP along railway corridor. Project will require coordination with property owner. Assess making connection from Claude Ct. to proposed trail corridor at 116th Dr. and 113th Ave.	--	120th Ave.	112th Ave.	Trail	Low
Thornton Trail Connection	Construct 10' SUP in coordination with City of Thornton and private property owners. Construct curb extensions at Melody Dr. to facilitate trail crossing.	--	Melody Dr.	Thornton Tpk	Trail	Low
York St.	When property adjacent to York St. develops, install bike lanes and detached sidewalks in coordination with roadway reconstruction.	York St.	112th Ave.	116th Way	Bike Lane	Low

Color Denotes Project Priority: Higher Priority Medium Priority Lower Priority

SLM = Shared Lane Marking

5.4 GENERAL RECOMMENDATIONS

The Recommendations Map displays specific improvements to improve walking and bicycling city-wide. In addition to these specific recommendations, general recommendations are provided in this section.

Wayfinding

In recent years, cities around the country have started to invest in comprehensive active transportation wayfinding systems, which provide standardized sign types and placement practices for both on-street and off-street networks. Wayfinding represents a cost-effective means to enhance system navigation, making active transportation networks more intuitive and helping to guide people along designated routes to destinations. The City of Northglenn should develop a comprehensive wayfinding plan that defines a family of signage for on-street and off-street application, creates a tiered list of destinations to be signed to, and identifies best practices for placement. Appendix D includes general best practices for wayfinding. Page 5-16 provides a high-level summary of wayfinding best practices and sign family elements.

Bike Parking

People will be more likely to bicycle if safe, accessible, and convenient bicycle parking is provided. Like cars, bicycles are valuable investments that people want to protect. Improving short term bike parking, including covered parking, and long-term parking are integral to supporting the growth of Northglenn's bicycle mode share. Additionally, providing convenient parking can reduce instances of bikes being parked to objects in the public right of way, which can be hazardous to pedestrians. Page 5-17 displays types of bike parking that should be developed in Northglenn, ranging from short-term to long-term parking.

Lighting

Sufficient lighting along active transportation corridors makes navigating in the dark easier, makes bicyclists and pedestrians more visible to vehicle drivers, and helps create a perception of safety that may encourage more people to walk or bicycle, and more frequently. A number of Northglenn's trails are not part of the street network, and therefore do not benefit from street lights. The City should aim to provide consistent lighting along its bicycle and pedestrian network to improve user comfort and safety.

Seating

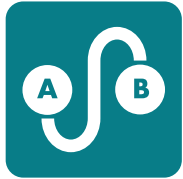
People of all ages and abilities may be more inclined to use the bicycle and pedestrian network when there are sufficient places to rest. Northglenn should install benches where needed, especially along the City's trail network.





Wayfinding provides navigational assistance to bicyclists, pedestrians, and trail users, including information about destinations, and travel distances. Wayfinding systems are comprised of fundamental wayfinding elements and enhanced off-street navigational elements, such as kiosks and mile markers. Additional information on wayfinding principles and best practices can be found in Appendix D. General best practices are described on this page.

WAYFINDING PRINCIPLES



1. CONNECT PLACES

Facilitate travel between destinations and provide guidance to new destinations.



2. KEEP INFORMATION SIMPLE

Present information simply, using clear fonts and simple designs, so that it can be understood quickly.



3. MAINTAIN MOTION

Be legible and visible for people moving so that they can read the signage without stopping.



4. BE PREDICTABLE

Standardize the placement and design of signs so that patterns are established and the signage becomes predictable.



5. PROMOTE ACTIVE TRAVEL

Encourage increased rates of active transportation by helping people to realize they can use the bikeway and pedestrian network to access the places they want to go.

FUNDAMENTAL NAVIGATIONAL ELEMENTS

Fundamental wayfinding elements consist of decision signs, confirmation signs, and turn signs. These signs are intended to be implemented on both on-street and off-street facilities. Since they will be applied on-street, they should conform with Manual of Uniform Traffic Control Devices (MUTCD) requirements. Signage elements should include distance to destination information, including both mileage and estimated travel time.

ENHANCED NAVIGATIONAL ELEMENTS

Enhanced navigational elements provide additional wayfinding assistance beyond decision, confirmation, and turn signs for on-street and off-street bikeway networks. Signs included in this category are: 1) mile markers, 2) gateway markers, 3) interpretive signage, 4) pavement markings, and 5) map kiosks. Pavement markings are an ideal tool to provide navigational assistance along a neighborhood bikeway or trail route, while reducing sign clutter. Map kiosks, which tend to be located at trailheads and downtown locations, provide people with information about the surrounding area, amenities, and bikeway and trail routes. Kiosks may also include orientation maps. Since this signage is installed off-street, there is more flexibility in terms of design.

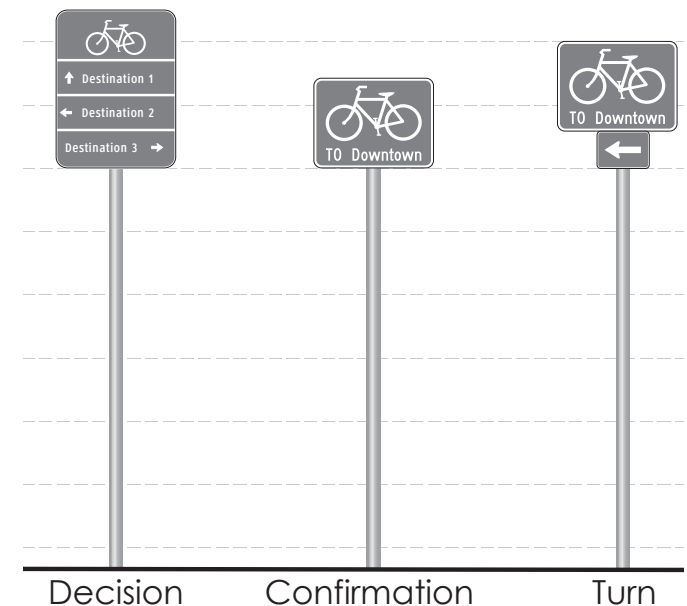
WAYFINDING NEXT STEPS

Implementing wayfinding along the pedestrian and bicycle network will help people navigate the system more easily. To achieve this end, Northglenn should develop a wayfinding plan to define wayfinding for the pedestrian and bicycle route systems. This plan would carry forward

the best practices identified in Connect Northglenn. Key steps in the development of this plan should include:

- Identify destinations that should be signed to
- Identify routes to be signed
- Adopt standard placement practices for wayfinding signs
- Install signage along priority routes

FIGURE 5.1 WAYFINDING FUNDAMENTAL NAVIGATIONAL ELEMENTS (MUTCD COMPLIANT)



PARKING DURATION - The following icons and descriptions indicate the term of the parking



Short-Term Parking

Short-term bicycle parking is generally intended to be used for short duration trips. Typical land uses where this parking is installed includes commercial or retail uses, medical/healthcare facilities, parks and recreation areas, community centers, or libraries.



Long-Term Parking

Long-term bicycle parking areas are intended to be used all day and/or night. Primary users of this parking type are employees, residents, students, or travelers leaving their bicycles at transit hubs. Typical land uses where this parking is installed includes multi-family residential uses, workplaces, transit hubs, and schools.



Tier 1: Short-Term Bicycle Parking: Short-term bicycle parking is to be placed on sidewalks in front of higher turn-over establishments, or near the entrance to buildings on private property.



Tier 2A: Bicycle Corral: Bicycle corrals provide high-capacity parking outside of the pedestrian zone, helping to minimize sidewalk clutter. This rack type should be installed at locations with high demand, such as at shopping plazas or near restaurants. Many corrals are designed to fit conveniently within one conventional vehicle parking space.



Tier 2B: Covered Short-Term Bicycle Parking: For an added level of weather protection, covered bike racks are recommended at higher demand locations, such as schools and parks.



Tier 2B: Indoor/Garaged Bicycle Parking: This type of parking is installed within buildings, or enclosed areas within a larger structure (for example, an enclosed portion of a parking garage). They can be designed to be open to any user, or can be Secure Parking Areas (SPAs), which are limited access (i.e. require a key or card for entry). This type of parking is particularly useful at major destinations that attract all-day users, such employment centers, apartment buildings, and transit hubs.

5.5 COMMUNITY PROGRAM AND EVENT RECOMMENDATIONS

Equally important as providing bikeway and pedestrian infrastructure (or engineering improvements) is ensuring that users are familiar with the treatments and know how to use them. The “Five Es”, first introduced in Chapter 2, address these factors. Northglenn has been particularly successful in implementing encouragement programs, which are an important component of the Five Es, but has relatively few programs that address the additional components of education, enforcement, evaluation, and equity. To achieve a well-rounded program approach, the City should work towards establishing programs that address all of the Five Es.

This section lists the status of existing programs and presents new program recommendations, grouped by ‘E’ category. For each program, the name, description, and future recommendation is provided.

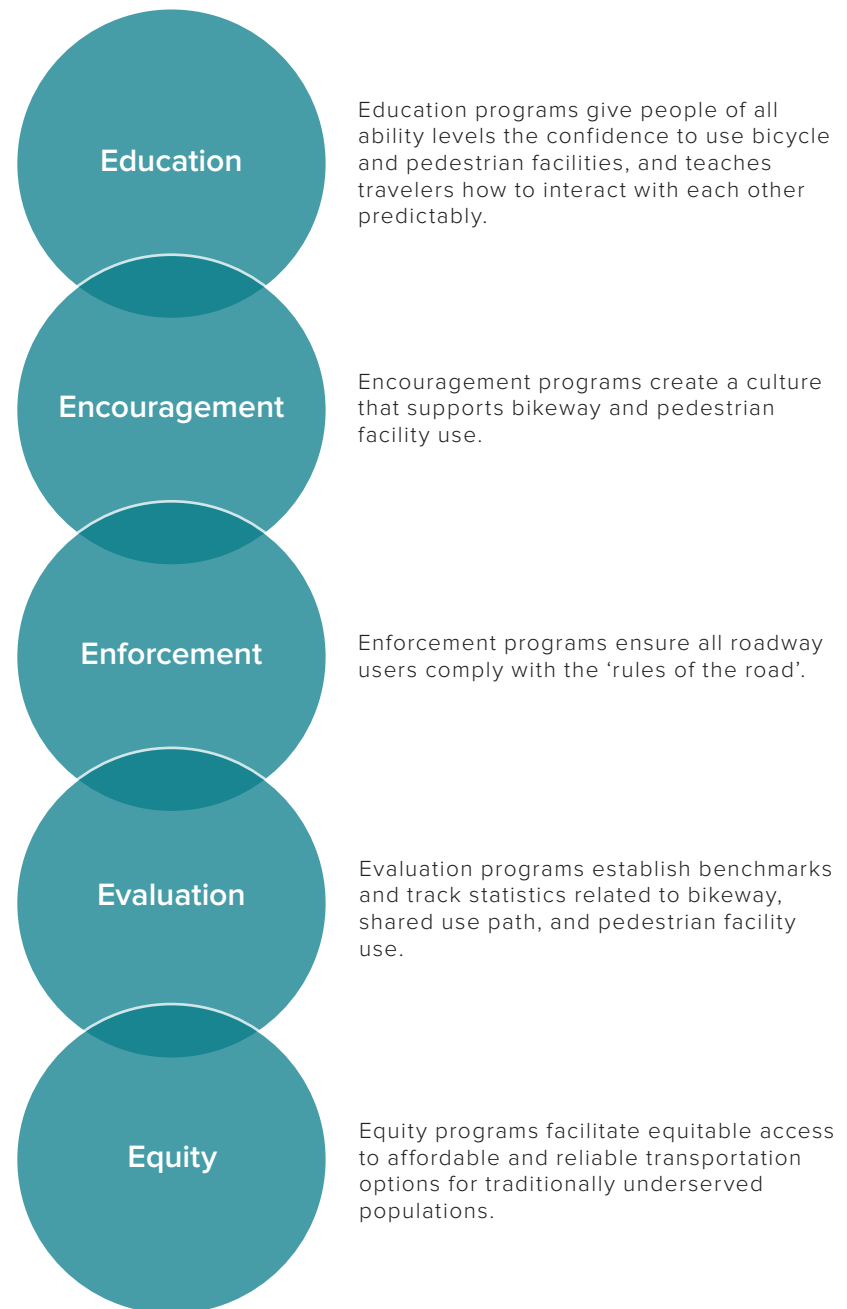


TABLE 5.2: NORTHGLENN EDUCATION PROGRAM RECOMMENDATIONS

Program Name	Program Description	Future Recommendation
Bicycling Skills Courses	Provide bicyclists with needed road and riding skills. The 2017 Kids' Fishing Derby and HEAL Day (Healthy Eating Active Living) included a Bike Rodeo and Learn-to-Ride obstacle course that provided children with bicycle riding skills. A raffle give-away also distributed 30 refurbished children's bikes (Northglenn Bike Program) and new helmets (Northglenn Community Foundation).	Continue to implement program for children of all ages, and make program available annually to adults. Coordinate their efforts to establish best practices and reduce administration and program development costs.
Bicycling Legal Guide	Educate the public about the legal rights and responsibilities of bicycling.	Distribute pamphlets at civic buildings, bike shops and other retail shops that includes the 'rules of the road'.
Lights On Campaign	Encourage bicyclists to use lights after dark.	Create campaign using various mediums to share information, such as pamphlets, social media, and internet radio station advertising.
Road User Respect Campaign	Increase respectful behavior between bicyclists, pedestrians and motorists.	Create campaign using various mediums to share information, such as pamphlets, social media, and internet radio station advertising.
Share the Trail Campaign	Encourage responsible, respectful behavior by trail users.	Provide information about sharing the trail in the Trails Map Brochure.
Active Transportation Website	Provide Northglenn active transportation information on a single website, or webpage on the city's website.	Establish a website or webpage, and continue to update website/webpage with new maps, events, and other information.
School Health Champions Toolkit	Help children to understand safe routes to school from a young age. Establishing healthy travel habits while young is important to influencing life-long behavior.	Create a toolkit for healthy students that includes information on Safe Routes to School and Walk/Bike to School activities. Toolkit can be distributed to schools and administrators in the community.
Walk Bike Ambassador Programs	Help people who are not yet comfortable walking and bicycling alone to learn from someone who is. These programs are appropriate for both children and for adults. Websites can be established to match ambassadors with interested citizens.	Provide information on webpage or website that can be used to match ambassadors with interested citizens. Identify interns or volunteers who could become Walk Bike Ambassadors for the community.

TABLE 5.3: NORTHGLENN ENCOURAGEMENT PROGRAM RECOMMENDATIONS

Program Name	Program Description	Future Recommendation
Bike Month	Encouraging bicycling to work and school through fun, social activities and incentives.	Continue to promote and grow awareness for Bike Month and Bike to Work Day. Encourage local businesses to support Bike Month and Bike to Work Day by providing commuter breakfast and coffee stations.
SmartTrip Program	Encourages residents or employers in a target area to order customized information packets containing travel information at homes or workplaces, along with an incentive gift of their choice.	SmartTrips programs are most effective when bikeway and trail infrastructure is well established. Northglenn's existing facilities are relatively disconnected. This program should be revisited after more facilities have been implemented.
Bike Share System	Promote work-related trips by bicycle, reduce daytime auto-trips and provide more mobility options through the establishment of a bike share system. While bike share systems in the U.S. were initially implemented primarily in large cities, they are now being implemented in small to mid-size cities like Northglenn.	Northglenn should continue to coordinate with Smart Commute Metro North to assess the feasibility of implementing a bike share system.

TABLE 5.3: NORTHGLENN ENCOURAGEMENT PROGRAM RECOMMENDATIONS (CONTINUED)

Program Name	Program Description	Future Recommendation
Bicycle Benefits Program	Create incentives for bicycling by partnering with local businesses to provide discounts on purchases for registered bicyclists. Bicycle Benefits program remain an effective way to encourage people to bicycle more.	Community partners should coordinate to establish a bicycle benefits program in Northglenn. Coffee shops, take-out restaurants, and bike share vendors are typically willing partners of such initiatives. Bicycle Benefits could also be promoted during Bike to Work Day and Bike Month to raise additional awareness of the program, and reward bicyclists.
Bicycle and Trails Map	Provide route and facility information and highlighting walking and bicycling destinations.	Update Trails Map Brochure. Make the map accessible online as well.
Safety Equipment Use Encouragement	Encourage the use of bicycle lights, helmets and reflective clothing by promoting the use of this equipment and hosting equipment giveaways.	Organizations, such as local school and school districts, should coordinate their efforts, sharing resources, establishing best practices and program development costs.
Organized Walks and Bicycle Rides	Organize critical mass rides to raises awareness of bicyclists in the community. Bicycle Westminster holds free, weekly group rides on Saturday mornings. While not located in Northglenn, Northglenn residents can participate in this program.	All-inclusive critical mass walks and rides should be organized in the community. These could be routed through neighborhoods and use the trail system until more infrastructure is available city-wide. Explore partnerships with organizations such as Walk2Connect.
Fun Runs	Use of trails for running/walking events. The Northglenn Community Foundation hosts the Firecrackers and Flapjacks 4 mile Run as part of the City's 4th of July Festival at E.B. Rains Jr. Memorial Park. These events also encourage use of the trails, and can provide revenue for maintenance of the system.	Continue to organize runs using Northglenn's trail system, and allocate proceeds to the maintenance and expansion of the trail system.
Regional Coordination of Safe Routes to School	Currently, Safe Routes to School (SRTS) programs are coordinated by individual school districts throughout the community, and other organizations. While SRTS efforts focus on transportation and behaviors at individual schools, this initiative would provide regional coordination of the SRTS activities.	A regional approach for SRTS can help practitioners coordinate their efforts better, establishing best practices and reducing administration and program development costs.
Commute Trip Reduction and Employer Incentives Program	Employers provide incentives for employees to ride their bicycles to work, such as an annual allowance to spend on bicycle repairs or purchasing a new bicycles.	Collaborate with other organization, such as Smart Commute Metro North, and identify opportunities to provide commuter benefits.
City of Northglenn Bicycle Friendly Business (BFB)	Encourage employees to commute by bicycle through programs and on-site bicycle parking. This also helps communicate the City of Northglenn is committed to supporting employees who commute via bicycle.	Seek to qualify the City of Northglenn as a Bicycle Friendly Business, through the League of American Bicyclists BFB accreditation process.
Open Streets Events	Identify opportunities to close down a street to motor vehicle traffic for a period on the weekend, and encourage people to walk and bike in the street. These events help to build a community that supports walking and bicycling, and emphasizes that streets are public spaces for all users.	Identify street/s that would be good candidates for such events. Work with residents to plan and implement the event.

TABLE 5.4: NORTHGLENN ENFORCEMENT PROGRAM RECOMMENDATIONS

Program Name	Program Description	Future Recommendation
Law Enforcement Training	Educate law enforcement officers on bicycle laws and safety. Consider creating a percentage of officers who patrol on bicycle.	Consider establishing a bicycle officer program in Northglenn by providing Law Enforcement Bicycle Training (LEBA) for all officers. If initiated, LEBA training should also be given to a percentage of the overall force annually, so that more officers have the opportunity to receive the training.
Enforcement and Diversion Class	Class can be taken in lieu of paying a ticket for a bicycle and pedestrian related traffic violations, such as a bicyclist running a stoplight or a motorist speeding through a school zone.	A pilot diversion class should be established that focuses on motorists speeding through school zones. Officers should also be placed periodically at known locations where bicyclists do not follow traffic laws. Officers should stop bicyclists who do not follow the laws and issue them warnings. The same officers should practice positive reinforcement, giving coupons or bike lights to people who they observe obeying the traffic laws.
Speed Feedback Signs	Speed Feedback signs have been shown to reduce speeding, and are a cost effective way to increase speed compliance where speeding is an issue.	Install speed feedback signs on corridors where speeding is a documented issue, and in school zones.

TABLE 5.5: NORTHGLENN EVALUATION PROGRAM RECOMMENDATIONS

Program Name	Program Description	Future Recommendation
Bicycle-Friendly Communities (BFC) Designation	Assess progress and celebrate success made towards improving bicycling conditions.	Northglenn should apply annually for the League of American Bicyclists (LAB) BFC designation. Northglenn should review feedback and continually make improvements to increase their BFC Level Designation.
Walk Friendly Communities (WFC) Designation	Assess progress and celebrate success made towards improving walking conditions.	Northglenn should apply annually for the Pedestrian and Bicycle Information Center (PBIC) WFC designation. Northglenn should review feedback and continually make improvements to increase their WFC Level Designation.
Crash Reporting Program	Create reliable database of bicycle and pedestrian crashes.	The City of Northglenn should continue to ensure crashes are geocoded, and review data annually for trends and hotspot issue areas.
Comprehensive Counts Program	Data on walking and bicycling is necessary to track growth in these modes and determine where investments are necessary.	Establish an annual bicycling and pedestrian data collection program to evaluate sidewalk, bikeway and trail use using manual and automated counters.
Measuring the Street Program	Before and after the installation of a new bikeway, sidewalk, or trail facility, collect data on bicycle, pedestrian and motor vehicle volumes, crashes, and motor vehicle speeds.	Data can be used to evaluate how effective new bikeways, sidewalks, or trails are in achieving goals.
Bicycle and Pedestrian Advisory Committee (BPAC)	This committee provides recommendations to the City regarding non-motorized transportation matters in the community. One of the key purposes of this group is to evaluate progress made on active transportation improvements in the community.	Initially, coordinate BPAC meetings with HEAL Committee meetings. As popularity grows, consider holding standalone BPAC meetings. Encourage members of the public and law enforcement officers to become active participants.
Annual Summary Report	Assess progress towards achieving the goals of this Plan.	The City of Northglenn should develop an annual Bicycle and Pedestrian Summary Report, to be presented to City Council. The report should include total miles of bikeways, trails, and sidewalks implemented, data on bikeway, trail use, and sidewalk use, and crash data that identifies issue areas.

TABLE 5.6: NORTHGLENN EQUITY PROGRAM RECOMMENDATIONS

Program Name	Program Description	Future Recommendation
Bicycling Advocacy	Educate local and state governments about the needs of active transportation users.	State and local governments are the primary sources of funders for active transportation. Engaging them in a conversation about the importance of non-motorized transportation can help to increase dedicated funding for infrastructure improvements.
All-inclusive Trail Events	Provide an opportunity for people with disabilities to use trails with temporary infrastructure (shelter, water stops, etc.)	Trails should be available to all users, despite their ability levels. All-inclusive events help to raise awareness about the needs of people with different abilities.
Bicycle Giveaways	Provide bicycles, bike education, bike safety equipment, and locks to low-income children, veterans, people in substance abuse programs, and people in half-way houses. The Northglenn Bike Program repairs and distributes donated bicycles to children in need through food banks.	Many people in Northglenn do not have access to private vehicles, and the transit service may not work well given their schedules. Providing bicycles to these vulnerable populations will help to increase their mobility. Continue to support and grow the Northglenn Bike Program.

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CHAPTER 6

IMPLEMENTATION

Implementing the recommendations in Connect Northglenn will take many years. By updating policies and practices, dedicating funding, leveraging opportunities, and forging partnerships, continuous progress will be made to make Northglenn a more walk and bike friendly community.

6.1 INTRODUCTION

Implementing the recommendations in Connect Northglenn will take many years, and will involve opportunistically implementing projects through routine repaving and reconstruction projects, as well as identifying specific improvements and implementing them with dedicated city and grant funds. This chapter provides a summary of implementation strategies. It starts with an overview of the Grant Street Pilot Project, and ends with a list of best practices to integrate active transportation into all transportation and development projects in Northglenn.

The first section provides a summary of the Grant Street Pilot Project, the City's first bike lane. This project serves as an example of how a recommendation from the Plan can be implemented at a relatively low cost and without major roadway modification. The project has been a success, and can serve as a model for how other projects are implemented.

This summary is followed by a presentation of five concept projects. The selected projects are intended to provide a visual representation of how different improvements can be implemented. The projects represent a range of project types and costs, including roadway modifications, on-street bikeways, and enhanced pedestrian crossings. Cost estimates are provided for these projects to help communicate the relative costs of improvement types.

The next section of the chapter summarizes funding sources that can be leveraged to implement the Plan's recommendations. The funding options are grouped by type, including federal sources, other national sources, state and regional sources, and local and other sources. The City will likely need to use a variety of funding sources to advance the Plan's recommendations through design and implementation. Also, by integrating bicycle and pedestrian improvements with scheduled maintenance and reconstruction, as well as private development, progress can also be made building-out the Plan's recommendations. The four primary ways to fund projects are identified in Figure 6.1: Getting Projects Built.

The final section of the chapter, Implementation Checklist, includes strategies to update the City's policies and practices to achieve the Plan's vision and goals. The checklist is divided into Engineering, Policies and Codes, Data Collection, Programs, Staffing and Plan Integration, and Maintenance sections. The recommendations will facilitate the integration of active transportation planning into all the levels of government in Northglenn, and will help to ensure the needs of bicyclists and pedestrians are considered in all transportation and development projects.

IMPLEMENTATION CHAPTER COMPONENTS



Pilot Project– Summarizes the successful Grant Street Pilot Project, which serves as a model for implementing bikeways.



Concept Projects– Presents five concept projects which are examples of how different improvements can be implemented.



Funding Sources– Summarizes potential funding sources that could be leveraged for plan implementation.



Implementation Checklist– Presents recommendations to continue and update City policies and practices to achieve the Plan's vision and goals.

6.2 PILOT PROJECT

Beginning in July 2017, a pilot project was implemented on Grant Street between Malley Drive and Muriel Drive to test the operation of an on-street bike lane in Northglenn. This was the City's first bike lane, and it provided the opportunity for the community to see and experience it, and give feedback regarding its operation. Prior to implementation, the City conducted parking counts, distributed informational mailers to area residents and businesses, and installed temporary signs along the corridor to provide notice of the bikeway implementation.

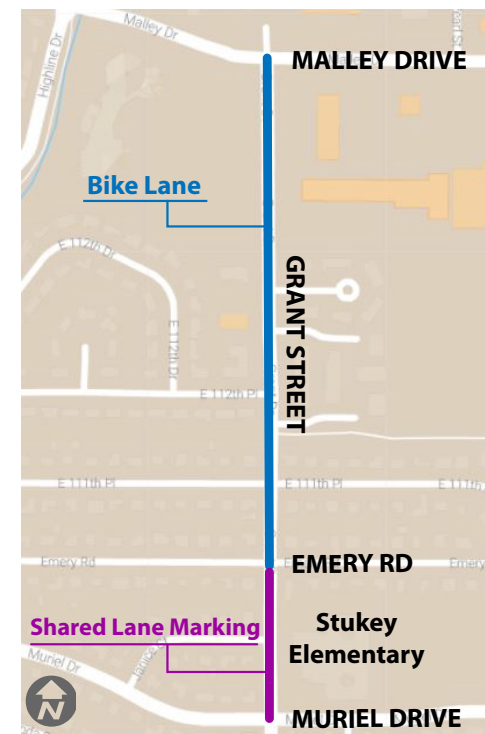
The pilot project included bikeway and parking lane striping and pavement markings, as well as sign installation. The new roadway configuration from Malley Drive to Emery Road includes two striped bike lanes, two 11 foot travel lanes, and a striped parking lane on the east side. Parking is restricted on the west side of Grant Street in this section of the corridor. From Emery Road to Muriel Drive, the roadway configuration includes striped parking lanes on both sides of the street and 'sharrow' bicycle symbols encouraging drivers to share the road within two wide travel lanes.

Grant Street was chosen for the pilot project for a number of reasons. First, the roadway width and existing traffic volumes made much of Grant Street well-suited to the addition of a bike lane. Second, Northglenn residents had submitted Grant Street to Public Works for traffic calming considerations. The bike lane helps to visually narrow travel lane widths, which has been shown to moderate travel speeds. Third, the restriction of parking to one side of Grant Street from Malley Drive to Emery Road—which was necessary to provide space for the bike lane—was shown through studies to provide more parking capacity than the previous usage. Finally, many streets in Northglenn have similar widths and land uses as Grant Street.

Generally, the project was a success—the public reacted positively to the facility, and there have been no issues with the flow of traffic. Though designed to be temporary, it is anticipated that the Grant Street bike lane will remain in place, and will continue to serve as an example for future bike lane installations in Northglenn. The success of the Grant Street project indicates that similar on-street bike lanes could be successful on other Northglenn streets.



The Grant Street bike facility post installation.



Extents of the Grant Street Pilot Project



The Grant Street Pilot Project Grand Opening on August 2nd, 2017.

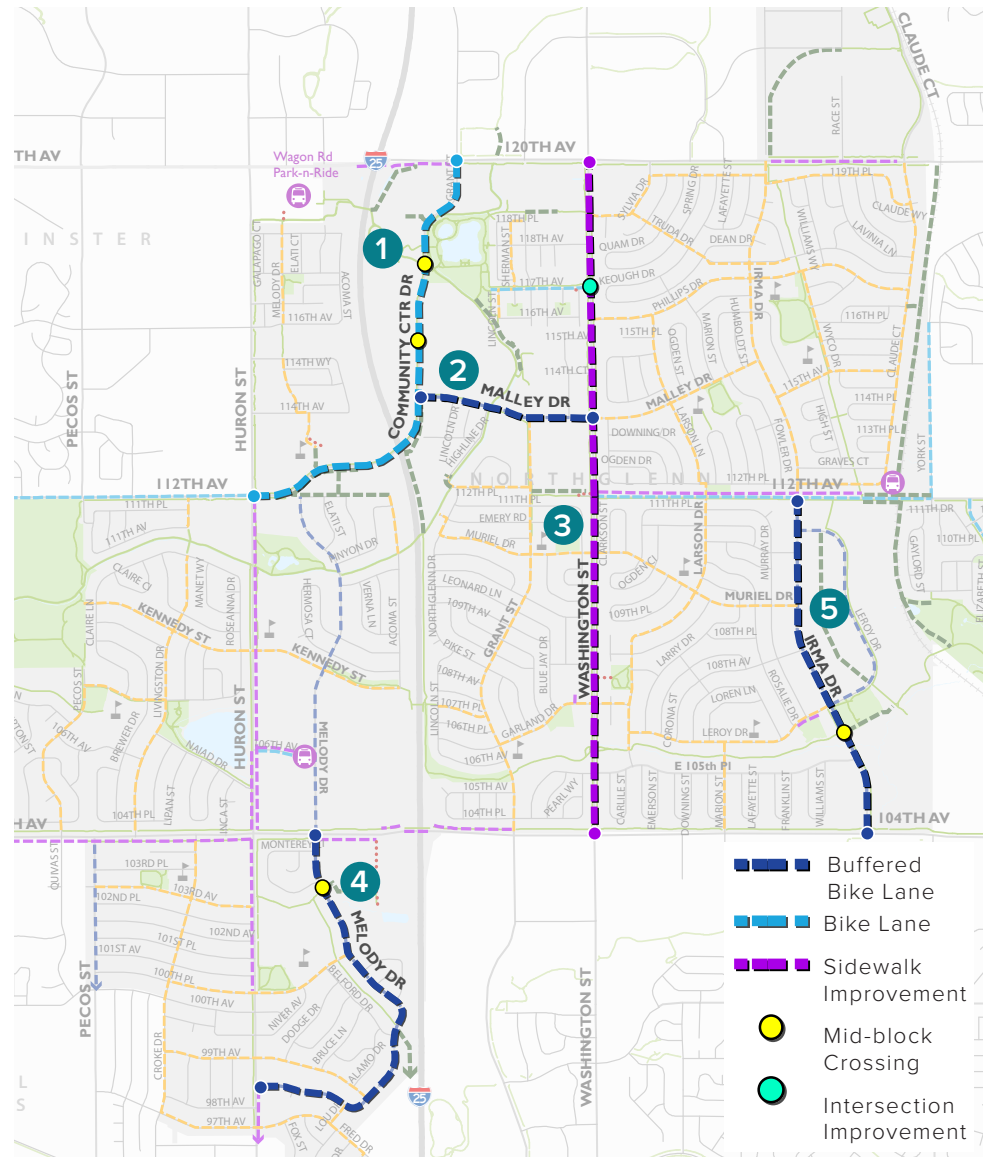
6.3 CONCEPT PROJECTS

The Recommendations Chapter presented over 50 infrastructure improvements that will make walking and bicycling in Northglenn safer and more desirable options for transportation. To provide a visual representation of how these projects can be implemented, five Concept Projects were selected. These projects represent a range of project types, including both roadway modifications, on-street bikeways, and enhanced pedestrian crossings. They also represent corridors and intersections that were among the most frequently cited locations where improvements are desired by the public, identified through both online and in-person engagement, or where a demonstrated safety issue exists, as identified through the Plan's collision analysis.

Ultimately, the selection of these projects is intended to showcase a variety of improvement options, and provide additional details of how projects can be designed. They will not necessarily be the first to be implemented, nor are they intentionally ranked. Detailed information, including context, benefits, design, and cost estimate information, is provided for each project. The specifications provided for these projects can be used to pursue future funding and grant opportunities, will build momentum for the plan's recommendations, and will serve as visual examples of how the Plan's recommendations can be achieved.

The proposed improvements for these locations are conceptual, and additional analysis, design, and engineering is necessary to advance the projects towards implementation. Due to this, all proposed concepts are subject to modification.

MAP 6.1 CONCEPT PROJECT LOCATION MAP



Community Center Drive

Project Summary

Community Center Drive travels north/south between the proposed Civic Center Campus redevelopment site and E.B. Raines Jr. Memorial Park. The public consistently reported through in-person and online engagement that crossing the roadway as a pedestrian can be challenging due to poor motor vehicle yielding compliance at marked crosswalks. The police department noted that there are speeding issues along the corridor as well. This project seeks to slow traffic and improve yield compliance at mid-block crossings through the following improvements: installing striped bike lanes along the corridor and installing two medians and enhanced pedestrian signage at mid-block crossings.

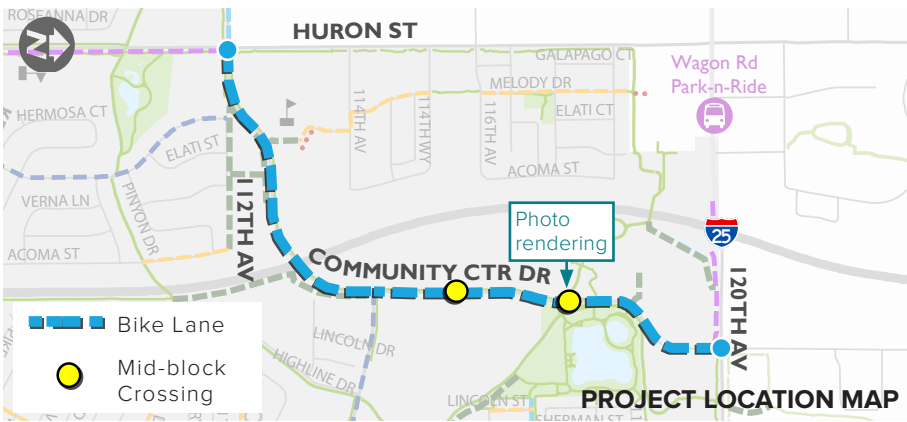
The provision of bike lanes will help to visually narrow the corridor and the two medians will provide horizontal speed management. Both these improvements will help to slow traffic along the corridor. Additionally, the medians will increase the visibility of the mid-block crossings, which will help to increase yield compliance at these locations. Optional improvements include Radar Speed Feedback Signs, which have been shown to reduce speeding, and Rectangular Rapid Flash Beacons (RRFBs) at the mid-block crossings. It is recommended that the median crossings be implemented and evaluated. If pedestrian yield compliance at the mid-block crossings remains an issue, then and only then should RRFBs be installed. These improvements are illustrated on the proposed photo-rendering.

Existing Issues:

- Speeding along corridor
- Poor yield compliance for pedestrians seeking to cross the roadway
- Both these factors cause crossing the roadway to be uncomfortable for pedestrians

Project Goals:

- Reduce speeding
- Improve yield compliance for pedestrians crossing the roadway
- Provide a dedicated space for bicyclists to ride in the roadway
- Improve crossing conditions between Civic Center Campus and E.B. Raines Jr. Memorial Park



Cost Estimate*	\$
Roadway Striping	\$188,855
Mid-Block Crossing Improvements (two total)	\$39,762
Optional: RRFB Assemblies (8 total)**	\$48,000
Optional: Radar Feedback Signs (4 total)**	\$20,000
Subtotal	\$228,617
Total Project Cost (with 20% contingency)	\$274,340

*Cost does not include pavement resurfacing. Assumes project will be completed when roadway is resurfaced.

**Not included in total project cost



- A** Raised medians will increase visibility of crossing locations and help to improve motor vehicle yield compliance at the mid-block crossings
- B** If yield compliance at the crosswalks remains an issue after the installation of raised medians, RRFBs can be installed
- C** Striped bike lanes will provide dedicated space for bicyclists and visually narrow the corridor, which could help to reduce speeds
- D** Radar Speed Feedback signs can be installed. These signs help to reduce speeding issues

MALLEY DRIVE WEST

Project Summary

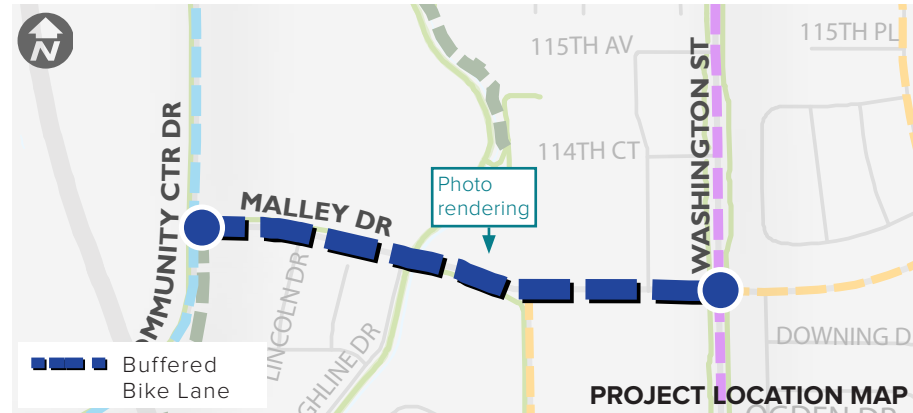
Malley Drive travels east/west from Community Center Drive to Irma Drive. This concept project focuses on the section of the corridor between Community Center Drive and Washington Street, which has a five-lane cross-section, which generally have the capacity to carry more than 30,000 vehicles per day. The road carries approximately 14,000 vehicles per day, indicating that the roadway has excess capacity. Since the land is built-out along the corridor, it can be anticipated that volumes will remain generally consistent in the future. Along the corridor, there are a mix of high-to-low density residential uses, as well as retail and institutional uses. There is also a popular trail crossing along the corridor, east of Highline Drive. This mix of uses and presence of the trail generates demand for walking and bicycling along the corridor.

Currently, the corridor has attached sidewalks and no dedicated bikeway facility. This results in pedestrians walking immediately adjacent to motor vehicle traffic, with no buffer separation. This can make walking along the corridor uncomfortable. Given the lack of a bicycle facility, bicyclists tend to ride on the sidewalk. Since the sidewalks are five feet wide, this creates potential conflicts when bicyclists and pedestrians pass each other.

Since the road carries 14,000 vehicles per day, Malley Drive is a good candidate for a 5-to-3 lane conversion, while still maintaining a high level of service for vehicles. This re-allocation of the roadway will provide excess space, which can be used to install buffered bike lanes. The bike lanes will provide dedicated space for bicyclists, and provide more separation for pedestrians on the sidewalk from motor vehicles. The proposed cross-section will need to be modified at the intersections along the corridor, such as dropping the bike lane buffer in advance of the intersection and establishing a shared right-turn lane. Additional traffic analysis is required to determine the appropriate configuration at each intersection.

Existing Issues:

- Narrow sidewalks with no buffer separation from motor vehicles



Given the higher speeds and volumes along Malley Drive, and no dedicated bikeway facility, many bicyclists feel most comfortable bicycling on the sidewalk. This creates conflicts with pedestrians.

- No dedicated bicycle facility along the corridor, which contributes to sidewalk riding and conflicts with pedestrians

Project Goals:

- Provide more separation from motor vehicle traffic for pedestrians on sidewalks, improving the comfort of walking along the corridor
- Provide dedicated bikeway facility along the corridor to reduce instances of sidewalk riding
- Create bikeway connection between neighborhoods east of Washington Street and Community Center Drive



- A** Converting Malley Drive from a five-to-three lane road provides additional street-space for the installation of bike lanes while also maintaining an acceptable level of vehicle service
- B** Providing buffered bike lanes along the corridor will create a comfortable, on-street facility for bicyclists, while also increasing pedestrian comfort by increasing space between the sidewalk and vehicle traffic
- C** Providing on-street bikeways will help to reduce sidewalk riding and conflicts with pedestrians on the sidewalk

Cost Estimate*	\$
Roadway Striping	\$99,049
Subtotal	\$99,049
Total Project Cost (with 20% contingency)	\$118,859

*Cost does not include pavement resurfacing. Assumes project will be completed when roadway is resurfaced

WASHINGTON STREET

Project Summary

Washington Street is an arterial roadway that travels north/south between 120th Avenue and 104th Avenue. The roadway is posted 35 miles per hour and carries 26,000 vehicles per day, making it a higher-speed, high-volume roadway. There are a mix of land-uses along the corridor, including commercial, retail, and higher-density residential. Portions of the corridor also pass through areas of Northglenn that have an above average concentration of historically underserved populations (as indicated by the project Equity Analysis; see pg 3-7). The mix of land-uses and context of the roadway results in active transportation demand along the corridor.

The planning team consistently heard that walking along Washington Street can be uncomfortable. Many sections of the sidewalk are attached to the roadway. This provides minimal separation from higher-speed, high-volume motor vehicle traffic, which can make walking along the corridor stressful. Some sections include a concrete buffer between the sidewalk and road. This, and a lack of shade trees along the street, contributes to a heat-island effect in summer months. Intersections along the corridor are challenging for pedestrians too, with large turn radii that promote higher turning speeds for vehicles, and diagonal curb ramps that lead pedestrians into the center of the street, can be confusing to disabled and visually-impaired pedestrians.

These issues on Washington Street contribute to both comfort and safety issues for pedestrians and bicyclists; Washington Street received a Pedestrian Level of Service Score of 4 (the lowest possible score; see pg 2-6), recorded the second most bicycle/pedestrian and motor vehicle crashes of all streets in Northglenn (19 collisions total from 2012-2016; see pg 2-8). Issues for bicyclists and pedestrians were also consistently reported through in-person outreach and the online comment tool.

This concept project represents a visionary long-term solution for pedestrian conditions along the corridor. Funding will need to be secured to further assess the feasibility of these improvements before design is advanced. The project includes a reconstruction of the roadway that would maintain the same five-lane roadway

cross-section, but re-allocate space within the existing right-of-way to provide more space for pedestrians, resulting in a safer and more comfortable experience. The re-constructed roadway would include 5-10 foot sidewalks on both sides of the street, with 5-10 foot landscaped buffers. The landscaping could be continuous along the corridor, or installed at block-ends and mid-block to reduce cost. Intersections along the corridor would also be reconstructed to include perpendicular curb ramps, and where appropriate, adjusted turn radii to improve pedestrian safety.

The plan view illustration displays how these improvements can be integrated into the corridor, and how an example intersection (117th Ave and Washington Street) could be reconstructed to improve pedestrian circulation. This intersection is illustrated because it recorded the most bicycle/pedestrian and motor vehicle collisions along the corridor.

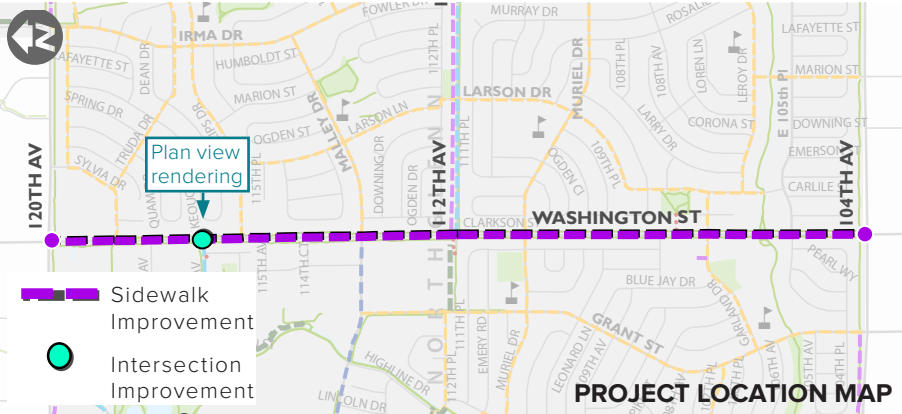
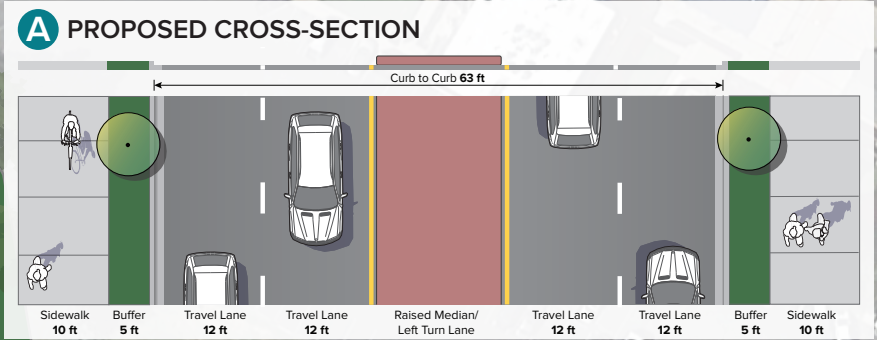
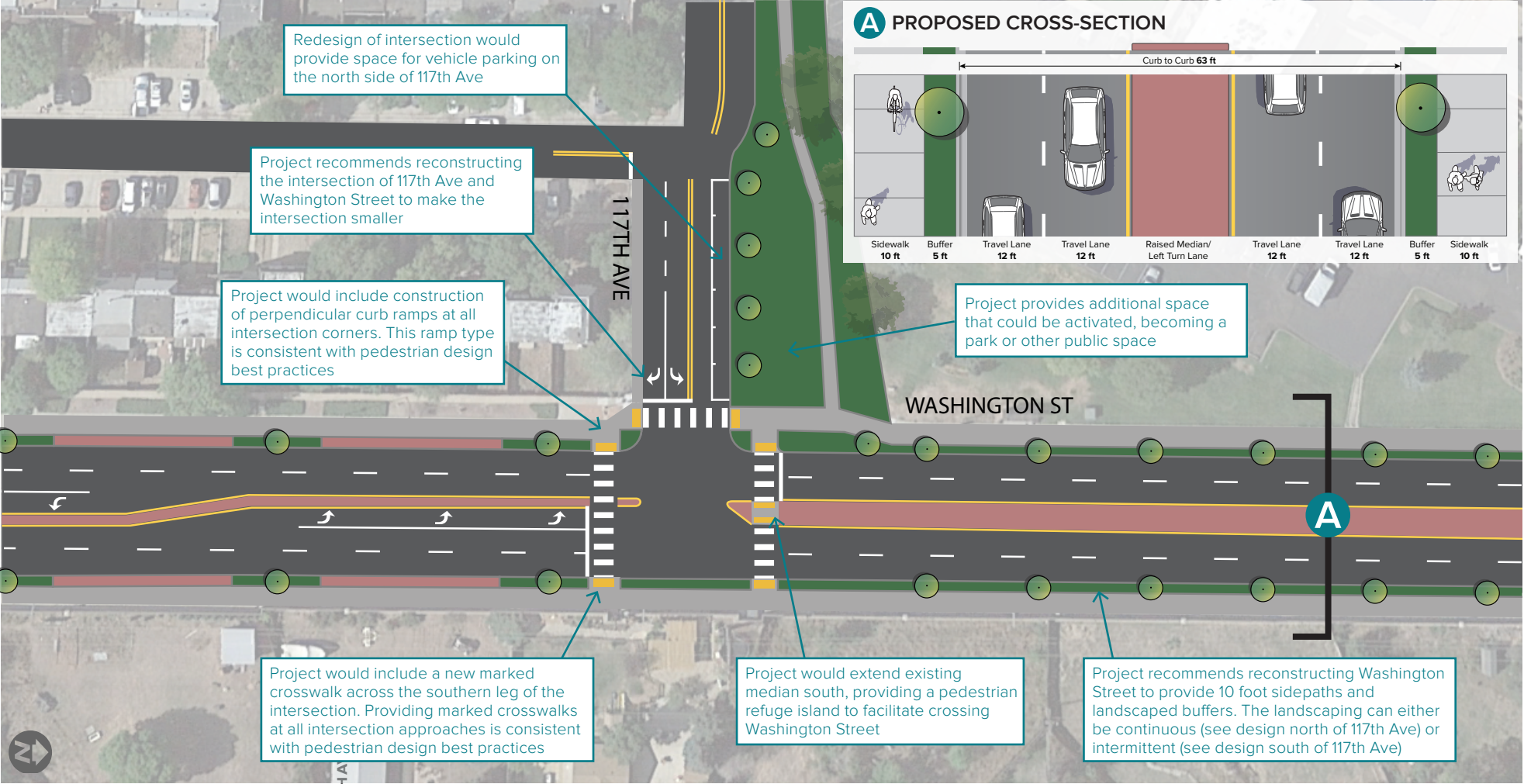
Existing Issues:

- Poor pedestrian experience along the corridor caused by sub-standard pedestrian facilities
- Heat-island effect for pedestrians caused by lack of shade-trees and long stretches of fence along the corridor
- Second highest number of crashes of all streets in Northglenn
- Above average concentration of traditionally underserved populations, indicating that a higher concentration of people who have no other choice but to walk or bike live/work along the corridor

Project Goals:

- Provide more space for pedestrians and bicyclists along the corridor
- Provide a landscaped buffer between the sidewalk and roadway
- Improve overall pedestrian experience and reduce heat-island effect through the use of shade trees
- Improve intersection crossing conditions for pedestrians, while balancing the impact to motor vehicle level of service

PROPOSED IMPROVEMENT



Cost Estimate*	\$
Repaving	\$3,584,956
Roadway Striping	\$62,821
117th Ave & Washington St Intersection Redesign**	\$75,592
Subtotal	\$3,723,369
Total Project Cost (with 20% contingency)	\$4,468,043

*Cost does not include utility or street lighting relocation

MELODY DRIVE

Project Summary

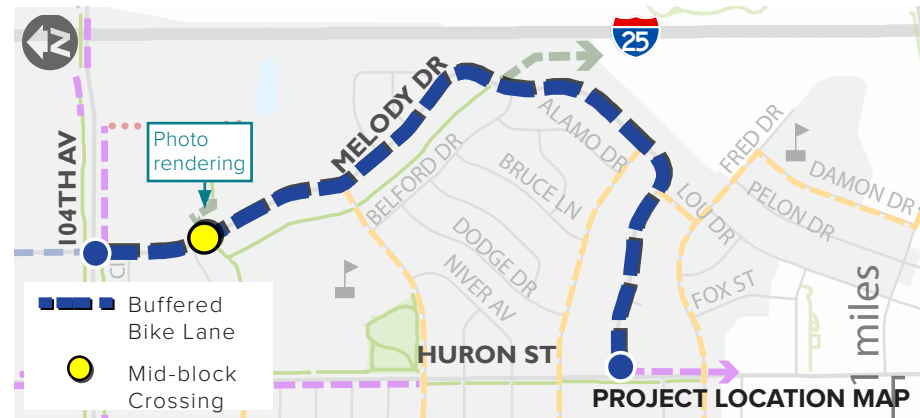
Melody Drive is primarily a residential street that travels from West 112th Avenue to Huron Street. This concept project is focused on the portion of the roadway between 104th Avenue and Huron Street. Melody Drive is a wide street (approximately 64 feet from curb-line to curb-line) and carries generally very low traffic volumes (500 to 2,000 vehicles per day, depending on location). Currently, this portion of the roadway is striped as a four-lane road. In general, four lane roads have the capacity to carry more than 20,000 vehicles per day, significantly more than the volume of traffic that travels on the road today. Since the land along the roadway is built-out, it can be anticipated that traffic volumes will stay generally consistent into the future.

Since the roadway has significant excess capacity, speeding along the corridor is an issue. Residents submitted this roadway to the City's traffic calming program. Also, four lanes of travel make crossing the roadway difficult for pedestrians. Pedestrians must navigate two directions of travel at once. This requires the pedestrian to mentally calculate gaps in traffic in both directions, which can be difficult, especially if the speeds of on-coming vehicles are different. Sidewalks along the corridor are narrow (<4 feet), making it difficult for two pedestrians to both walk side-by-side, which results in pedestrians walking in the street. Additionally, no bikeway exists along the street.

This project includes shorter-term improvements that will help to improve these issues by restriping the roadway to include parking lanes, buffered bike lanes, two travel lanes, and a two-way left turn lane. With the three lane cross-section, mid-block crossings and a pedestrian refuge can be provided. Where provided, pedestrians can navigate one direction of travel, wait in the center median, and then navigate the opposing lane of travel. This crossing pattern has been shown to improve safety for pedestrians. The project includes establishment of a mid-block crossing where the high-school trail intersects Melody Drive south of Monterey Circle, where demand for a crossing has been demonstrated.

Existing Issues:

- Speeding along corridor, and a desire from the public to calm traffic
- Current roadway striping provides excess carrying capacity, and is inconsistent with the residential character of the road



Demand for a marked crossing has been demonstrated where the high school trail intersects Melody Drive south of Monterey Circle.

- Four-lane cross-section presents challenges for pedestrians crossing the road
- No marked crossing exists where the high school trail intersects Melody Drive

Project Goals:

- Visually narrow corridor to reduce speeding and complement the residential character of the road
- Provide a striped parking lane, which will provide more separation between pedestrians on the sidewalk and the travel lanes
- Provide a dedicated space for bicyclists to ride in the roadway
- Install a marked crossing where the high school trail intersects Melody Drive

PROPOSED IMPROVEMENT (New Cross-Section: Two 7 foot parking lanes, two 6 foot bike lanes with 3 foot buffer, two 10.5 foot travel lanes, and a 11 foot two-way left turn lane)



- A** Delineating parking and buffered bike lanes will help to visually narrow the corridor and slow vehicular traffic
- B** Striped bike lanes will provide dedicated space for bicyclists to ride
- C** Installing a mid-block crossing at this location will facilitate crossing the street
- D** Converting Melody Drive from a four-to-three lane road will help to make the roadway more consistent with the residential character of the street

Cost Estimate	\$
Mill and Overlay	\$714,860
Roadway Striping	\$230,450
Mid-block Crossing Improvements	\$6,063
Subtotal	\$951,373
Total Project Cost (with 20% contingency)	\$1,141,648

IRMA DRIVE

Project Summary

Irma Drive travels north/south from 120th Ave to 104th Ave. This concept project focuses on the section of the corridor between 112th Avenue and 104th Avenue that has a five-lane cross-section, which generally, have the capacity to carry more than 30,000 vehicles per day. The road carries up to 13,000 vehicles per day, indicating that the roadway has excess capacity. Since the land is built-out along the corridor, existing volumes will likely remain consistent in the future. The corridor has commercial land-uses as well as a park, and provides connectivity to trails east and west of the road. This mix of uses, and presence of the trail, generates demand for walking and bicycling.

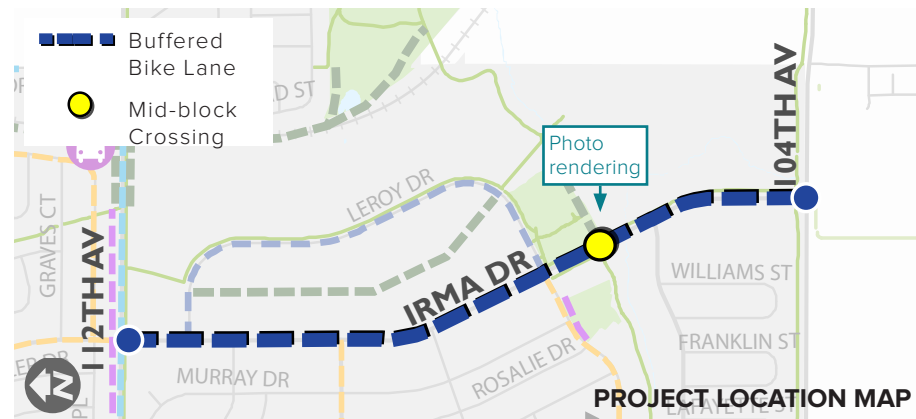
The corridor has attached sidewalks and no dedicated bikeway facility. Pedestrians walk immediately adjacent to motor vehicle traffic, with no buffer separation. This was repeatedly cited as an issue for pedestrians on Irma Drive through in-person and online public engagement. Given the lack of a bicycle facility, bicyclists tend to ride on the sidewalk. This creates conflicts when bicyclists and pedestrians pass each other.

Due to the excess capacity along Irma Drive, a 5-to-3 lane conversion is recommended. This re-design of the roadway will provide excess space, which can be used to install buffered bike lanes. The bike lanes will provide dedicated space for bicyclists, and provide more separation for pedestrians on the sidewalk from motor vehicles.

This project also provides an opportunity to install a mid-block crossing between Alvin Thomas Park and Jaycee Park. This crossing was repeatedly cited as a desirable crossing location for the installation of a marked crosswalk; overall, it was the most frequently cited location where a crossing improvement is desired through the online input map. Field work confirmed that people cross at this location, even without a marked crosswalk; navigating five lanes of traffic without a traffic control device is uncomfortable and potentially unsafe for many pedestrians to attempt. The concept project includes the installation of a marked crossing here, along with rectangular rapid flash beacons and a raised median to facilitate crossing. This improvement is illustrated on the proposed rendering.

Existing Issues:

- Narrow sidewalks with no buffer separation from motor vehicles, creating uncomfortable conditions for pedestrians



Demand for a marked crossing has been demonstrated between Alvin Thomas Park and Jaycee Park. The proposed lane conversion and mid-block crossing will improve the safety of crossing at this location

- No dedicated bicycle facility along the corridor, which contributes to sidewalk riding and conflicts with pedestrians
- No marked crossing location between Alvin Thomas Park and Jaycee Park and existing trail segments on both sides of Irma Drive; Demand for a crossing in this location creates safety issues

Project Goals:

- Provide more separation from motor vehicle traffic for pedestrians on sidewalks, improving the comfort of walking along the corridor
- Provide dedicated bikeway facility along the corridor to reduce instances of sidewalk riding
- Establish a marked crosswalk between Alvin Thomas Park and Jaycee Park to improve safety of crossing pedestrians and provide better connectivity between existing trails and parks



- A** Project will establish a new marked crossing between Alvin Thomas Park and Jaycee Park to facilitate crossing the street
- B** Converting Irma Drive from a five-to-three lane road will help to make crossing the street easier for pedestrians
- C** The lane conversion will also provide space for the installation of buffered bike lanes, which will increase separation between pedestrians and motorists
- D** Flashing beacons will help to increase the visibility of the marked crossing location

Cost Estimate*	\$
Roadway Striping	\$198,099
Mid-Block Crossing Improvements	\$57,957
Subtotal	\$256,056
Total Project Cost (with 20% contingency)	\$307,267

*Cost does not include pavement resurfacing

6.4 IMPLEMENTATION CHECKLIST

This section includes strategies organized in checklist form to update the City's policies and practices to achieve the Plan's vision and goals. The checklist is divided into six sections: Infrastructure, Policies and Codes, Data Collection, Programs, Staffing and Plan Integration, and Maintenance sections. Action items are identified for each section. For each action item, the responsible department is noted and short term (1-5 years) progress goals are identified, as well as a limited number that would take place as infrastructure is installed. Some action items would require additional staffing or monetary resources to be feasibly implemented. The checklist will facilitate the integration of active transportation planning into all the levels of government in Northglenn, and will help to ensure the needs of bicyclists and pedestrians are considered in all transportation and development projects.

Complementary to the checklist in Connect Northglenn, a *working checklist* should also be developed and maintained by Staff. This checklist should include the information included in the Plan, as well as additional columns such as staff assignment, funding source and action item status. It should be reviewed and updated frequently (at least once per quarter) to track progress. Staff time will need to be dedicated to tracking and implementing the items in the checklist, and additional resources should be dedicated to these efforts as needed.

A major component of the checklist is developing an Annual Summary Report. This will summarize achievements made to improve walking and bicycling in the community during the past year. This should be a visual document that includes charts and bulleted summaries of progress made on each of the action items listed in the Implementation Checklist. This report should be delivered to City Council, and highlights from it presented to them once annually. Depending on how much progress is made, this presentation represents an opportunity to note if more funding should be dedicated to active transportation improvements in the community, and to help council understand if the Plan's vision and goals are being met.



INFRASTRUCTURE



POLICIES AND CODES



DATA COLLECTION



PROGRAMS



STAFFING AND PLAN INTEGRATION



MAINTENANCE

TABLE 6.1: IMPLEMENTATION CHECKLIST


 INFRASTRUCTURE	Topic	Responsible Department	Action Item/s	Follow-up Action Item/s	Stakeholder/ Public Involvement
	Database of Pedestrian, Bikeway and Trail Facilities	Planning, Parks and Public Works Departments	Map all existing sidewalks in the community, including location, width, presence/absence of a buffer, and condition (for condition, use a rating scale from 1 to 5, with 1 being poorest condition and 5 being highest condition).	Update database biannually in GIS.	N/A
			Update map showing locations of all curb ramps (including type) and add crosswalks in the community.		
			Create an official trail designation (8' minimum hard surface shared use path or sidepath), and code all facilities that meet this standard as trails. Name all existing trails. All facilities that do not meet this standard should be coded as sidewalks.		
			As bikeways are installed, create database of bikeway facilities.		
			Map all existing bike parking in the community, including location, rack type, and rack capacity.		
			Map all existing roadway signage in the community. In the short term, focus on mapping trail, pedestrian, and bikeway signage.		
	Annual Bicycle and Pedestrian Work Plan	Planning, Parks, and Public Works Departments	Establish a dedicated line item in the City's budget for the implementation of active transportation infrastructure, including on- and off-street improvements, as well as wayfinding and bike parking. Seek to set this budget at \$250-\$500k (\$500k could leverage up to \$2 million annually in grants that require a 20 percent local match).	Annually, increase the dollar amount and mileage of bicycle and pedestrian projects built through the work plan.	N/A
			Develop an annual work plan that includes the following elements: <ul style="list-style-type: none"> • Bicycle and pedestrian improvements to be funded through the active transportation (AT) line item. • Bicycle and pedestrian improvements to be included through regular Operations and Maintenance schedule (restriping, resurfacing, ADA upgrades, sidewalk projects, signal maintenance/replacement). • CIP projects that can integrate recommendations included in Connect Northglenn. • Projects that the City is going to submit grant applications for and required matches for the City for each grant. 	Update work plan annually: <ul style="list-style-type: none"> • Create spreadsheets that track bicycle and pedestrian projects completed annually through the AT line item, O&M activities, and other CIP projects. Include project type, description, mileage, and costs. • Track percentage of grants won and projects completed using grant funds. Include project type, description, mileage, and costs. Seek feedback on non-successful applications, and what needs to be done to make grants successful. 	N/A
	Wayfinding Implementation	Planning and Parks Departments	Develop and adopt a Wayfinding Master Plan for the City, including placement practices, design standards, and destination hierarchy. <ul style="list-style-type: none"> • Implement signs on two priority routes as part of the Wayfinding Master Plan update. 	Thereafter, continue to install wayfinding on at least two priority routes per year, or more if funding allows.	Engage stakeholders, including HEAL Committee, and the public to help define the design aesthetic of community signage.

TABLE 6.1: IMPLEMENTATION CHECKLIST (CONTINUED)


 POLICIES AND CODES	Topic	Responsible Department	Action Item/s	Follow-up Action Item/s	Stakeholder/ Public Involvement
	Complete Streets Policy	Planning and Engineering Departments	Draft and seek adoption of a Complete Street policy. Smart Growth America has templates that can be used and strategies for adoption. See that adopted policy includes binding language (i.e. shall instead of should).	Track implementation of Complete Streets policy.	N/A
			Adopt Complete Street policy.		N/A
			Formalize the integration of Complete Street policy with all relevant City departments and processes.	Assess integration of policy into processes and identify opportunities for improvements.	N/A
	Bike Parking Code and Policy	Planning Department	Integrate bike parking requirements in the City's zoning update per recommendation in Connect Northglenn.	Track the number and type of bike parking installed via the bike parking code.	N/A
			Adopt a city-wide bike parking policy, based on model language included in Connect Northglenn.	Track the number and type of bike parking installed via the bike parking policy.	Consider establishing an online request-a-rack map.
			Map all existing bike parking in the community, including location, rack type, and rack capacity.	Update the city-wide bike parking map in GIS biannually.	N/A
	Zoning Code and Site Plan Review Policy	Planning Department	The City of Northglenn is updating its Unified Development Ordinance. As part of this update, integrate best practices and policy language that supports the development of walkable/bikeable communities.	Evaluate effectiveness of UDO to guide development in the community that facilitates walking and bicycling annually.	N/A
			Update site plan review process to include checklist for bicycle and pedestrian accommodation.	Evaluate effectiveness of site plan review process to require bicycle and pedestrian facilities with new development annually.	N/A
	Standards and Specifications	Planning and Engineering Departments	Determine process to update Standards and Specifications to integrate bicycling and walking best practices (based on recommendations in Connect Northglenn), either updating individual sections or completing an overhaul of the document.	Update Standard and Specifications.	N/A
	Vision Zero Policy	Planning and Engineering Departments	Explore adopting a Vision Zero policy, one that aims to achieve a transportation system with no fatalities or serious injuries in the roadway system.	Adopt policy.	N/A
			Formalize the integration of Vision Zero policy with all relevant City departments and processes.	Assess integration of policy into departments and processes annually, and identify opportunities to improve integration.	N/A
				Develop Vision Zero Action Plan to identify high crash corridors and prioritize improvements - both infrastructure and non-infrastructure.	N/A
	Safe Routes to School Policy	Planning Department	Work with school board to develop and adopt Safe Routes to School Memorandum of Understanding that facilitates walking and bicycling to school through engineering improvements and programs.	Evaluate implementation of Safe Routes to School policy annually.	Coordinate with school board and local school officials.
	Bike Share Policy/Permit	Planning Department and Parks Department	Explore opportunities to implement bike share in Northglenn, set goals to support implementation (if desired), and evaluate station placement standards. This might require developing a permit system for vendors.	Implement pilot bike share system, locating stations near transit stations and major employment centers.	Coordinate with other municipalities and regional stakeholders.

TABLE 6.1: IMPLEMENTATION CHECKLIST (CONTINUED)


 DATA COLLECTION	Topic	Responsible Department	Action Item/s	Follow-up Action Item/s	Stakeholder/ Public Involvement
	Establish a City-Wide Bicycle and Pedestrian Count Program	Planning, Parks and Public Works Departments	Develop city-wide count plan. Include locations where permanent counters should be installed, where temporary automated counts should be conducted, and where manual counts should be conducted. Reference the National Bicycle and Pedestrian Documentation Project to establish program.	Deploy count devices at priority locations. Increase the number of locations annually. Consider hiring summer intern to lead data collection efforts annually. Also consider using volunteers to conduct manual counts.	N/A
			Purchase and install three permanent trail counters (inductive loops combined with infrared sensors collects both bicycle and pedestrian data) at priority locations to collect data continuously. <ul style="list-style-type: none"> Determine if there are grant opportunities that could be used to fund count devices. Submit application(s). 	Increase the number of sites with permanent trail counters annually.	N/A
			Purchase and deploy automated data collection equipment (pneumatic tubes paired with infrared sensor captures bicycle and pedestrian data) to collect data at key locations throughout Northglenn. Data should be collected at these locations for two weeks per site.	Increase the number of automated data collection devices the city owns annually. Increase the number of sites for which data is collected annually. Always count the same locations during the same two week period annually, so that year-to-year data can be compared.	N/A
			Conduct manual counts at the sites counted for Connect Northglenn twice annually, once in the Spring and once in the Fall, in coordination with the National Bicycle and Pedestrian Documentation Project protocols.	Increase the number of manual counts conducted annually. Always count the same locations for the same duration of time, twice annually, so that year-to-year data can be prepared. Over time, convert sites with data collected manually to automated count locations.	Enlist volunteers to assist with count program.
	Crash Tracking	Planning and Police Departments	Meet with police department to formally update data collection procedures. Specifically, request that bicycle and pedestrian crashes be coded differently. Also, require the type of crash, precipitating factors, location, time of day, and injury severity level to be recorded.	Verify that updated procedures are being followed.	Coordinate with Northglenn PD.
			Verify that crash data collected by state police is included in City of Northglenn's crash database.	Verify annually.	Coordinate with State Police.
			Map bicycle/pedestrian crash data annually in GIS.	Map crashes annually.	N/A
			Update the charts included in Connect Northglenn to track crash metrics. Also link crash tracking action steps to the Vision Zero policy goals.	Start creating separate charts for bicyclists and pedestrians.	N/A
	Journey to Work	Planning Department	Review American Community Survey Data (ACS) 5-year estimates annually and chart mode share for commute to work mode.	Update charts annually with most recent ACS data.	N/A
			Since census data underestimates total levels of walking and bicycling, work with DRCOG to conduct a regional travel survey that includes Northglenn.	Every five years, work with DRCOG to coordinate a new travel survey.	Coordinate with DRCOG.

TABLE 6.1: IMPLEMENTATION CHECKLIST (CONTINUED)





 DATA COLLECTION	Topic	Responsible Department	Action Item/s	Follow-up Action Item/s	Stakeholder/ Public Involvement
	Journey to School	Planning Department	Work with City of Northglenn schools to develop and deploy a survey on how children get to school. If possible, collect trip origin and mode information. If precise origin information cannot be collected, ask respondents to report how long (minutes or miles) the trip to school takes and the mode the child uses to get to school (walk, bike, bus, carpool with other students, public transit, or drive alone). Allow respondents to indicate if multiple modes of transportation are used for a single trip, or if different modes are taken weekly (i.e. sometimes drive, sometimes bike). Use online survey tool to facilitate data collection and summation.	Deploy survey annually.	N/A
			Create charts that summarize journey to school data for individual schools and for the City in general.	Update charts annually.	N/A
			Identify schools that exhibit the highest walking/bicycling rates, as well as schools with short average trip length (<2 miles) but high drive alone trip rates (these schools represent opportunities to change travel behavior through investments in walking/bicycling).	Prioritize investments in the annual work program at these locations. Track impact in journey to school post improvements.	N/A
 PROGRAMS	Bicycle and Pedestrian Action Committee (BPAC)	Planning Department	Organize a BPAC of stakeholders (City staff from all departments, advocacy groups, Police, etc.) to create a new BPAC, which will be responsible for discussing all things bike/pedestrian related in the community. BPAC should meet quarterly. Initially, add BPAC agenda items to HEAL commission meeting agenda to minimize volunteer/staff fatigue. As group grows, consider forming stand-alone committee.	As the committee grows, consider increasing meeting frequency. Consider requiring attendance at two consecutive meetings before person is added to BPAC committee.	Coordinate with local stakeholders and the general public.
	Active Transportation Webpage	Planning Department	Create an active transportation webpage on the City's website.	Review and update content on webpage annually.	N/A
	Program Implementation	All departments	Work with community advocates, volunteers, businesses, and other organizations to implement one program from each of the 5 E categories listed in Connect Northglenn (5 programs total).	Update tables in Connect Northglenn with existing program status. Prioritize the implementation three additional programs, plus the programs implemented in year(s) prior.	Coordinate with local stakeholders and the general public.
	Bicycle Friendly Community Designation	Planning Department	Submit application for designation as a Bicycle Friendly Community (BFC) through the League of American Bicyclists website.	Review feedback and prioritize next steps listed in report card to elevate BFC designation level. Seek to increase BFC level every two years.	N/A
	Walk Friendly Community Designation	Planning Department	Submit application for designation as a Walk Friendly Community (WFC) through the Walk Friendly Communities website.	Review feedback and prioritize next steps listed in report card to elevate WFC designation level. Seek to increase WFC level every two years.	N/A

TABLE 6.1: IMPLEMENTATION CHECKLIST (CONTINUED)

 STAFFING/ PLAN INTEGRATION	Topic	Responsible Department	Action Item/s	Follow-up Action Item/s	Stakeholder/ Public Involvement
	Staff Time	All departments	Determine staff time needed to implement Connect Northglenn action items.	Assess ability of staff to implement action items annually. Increase staff time needed to complete task work if necessary.	N/A
	Plan Integration	Planning Department	Develop a paragraph that requires a review and integration of Connect Northglenn recommendations. Include this paragraph in all Scopes of Work for future planning and engineering plans and design projects in the City of Northglenn.	Track that this task has been completed to a satisfactory level annually.	N/A
	Annual Summary Report	Planning Department	Develop summary report that lists achievements made to improve walking and bicycling in the community. Make this a visual document that includes charts and bulleted summaries of progress made on each of the action items listed in the Connect Northglenn Plan Implementation Checklist.	Publish summary report annually and present key findings and 'major wins' to City Council annually.	N/A
	Update Connect Northglenn	Planning Department	N/A	Update Connect Northglenn in 2023.	N/A
 MAINTENANCE	Restriping	Public Works Department	Continue restriping practices and review and implement new practices where necessary: <ul style="list-style-type: none"> • Restripe bikeways and pedestrian facilities in the Spring and Summer • Currently, all pavement marking symbols are thermoplastic and lines/crosswalks are painted; Consider using thermoplastic instead of paint for crosswalks and symbols. • Consider milling and recessing thermoplastic markings to reduce wear/tear caused by snow plows. • Develop life-cycle replacement schedule for all symbols. 	Review restriping practices annually.	N/A
	Sweeping	Parks and Public Works Departments	Continue sweeping practices and review and implement new practices where necessary: <ul style="list-style-type: none"> • As bikeways are installed, increase frequency of street sweeping along dedicated bikeways, including Neighborhood Bike/Pedways. • Continue practices of multiple sweepings occurring in the Spring after snow melt to clean up debris. • Trails should be swept as needed, and continue practice of prioritizing sweeping along trails where debris from trees/leaves tend to accumulate. 	Review effectiveness of sweeping practices annually.	N/A
	Snow Removal	Parks and Public Works Departments	Continue snow removal practices and review and implement new practices where necessary: <ul style="list-style-type: none"> • Continue proactive snow removal policy for trails and add bikeways as they are installed: Prior to snow events, apply de-icing material. After snow event, clear snow and reapply de-icing material (this reduces the overall anti-icing material needed). • Continue to require property owners remove snow from sidewalks immediately following snow events. Enforce policy. Expand Snow Stormers Program. 	Review effectiveness of snow removal practices annually.	N/A
	Budget	Parks and Public Works Departments	Implementing an improved bikeway, sidewalk, and trail maintenance program may require additional resources. Increase budget as necessary to meet maintenance goals.	Review and increase annually as needed.	N/A

6.5 FUNDING SOURCES

This section presents funding mechanisms to implement active transportation projects. Figure 6.1 presents the four primary ways projects can be constructed. The chart communicates that the majority of projects can be implemented by leveraging existing opportunities, including scheduled operations and maintenance (O&M) activities, through programmed Capital Improvement Projects (CIP), or implemented as a condition of private development. The fourth option is to create or prioritize new projects solely to make bicycle and pedestrian improvements. To implement this type of project, city funds can be used, but they typically need to be augmented by outside funding sources, since transportation projects are capital intensive. This section lists

available federal, state, and local funding sources that can be used to supplement local funds to implement active transportation projects. Most funding sources are competitive, require the preparation of applications, and a percent match from the city. More grant funds can be leveraged if the city sets aside a larger amount of matching funds. Also, applications may be more successful if prepared jointly with other local and regional agencies.

Northglenn could generate local funds for active transportation improvements through a variety of measures. These options are listed in this section as well.

FIGURE 6.1 HOW PROJECTS GET BUILT

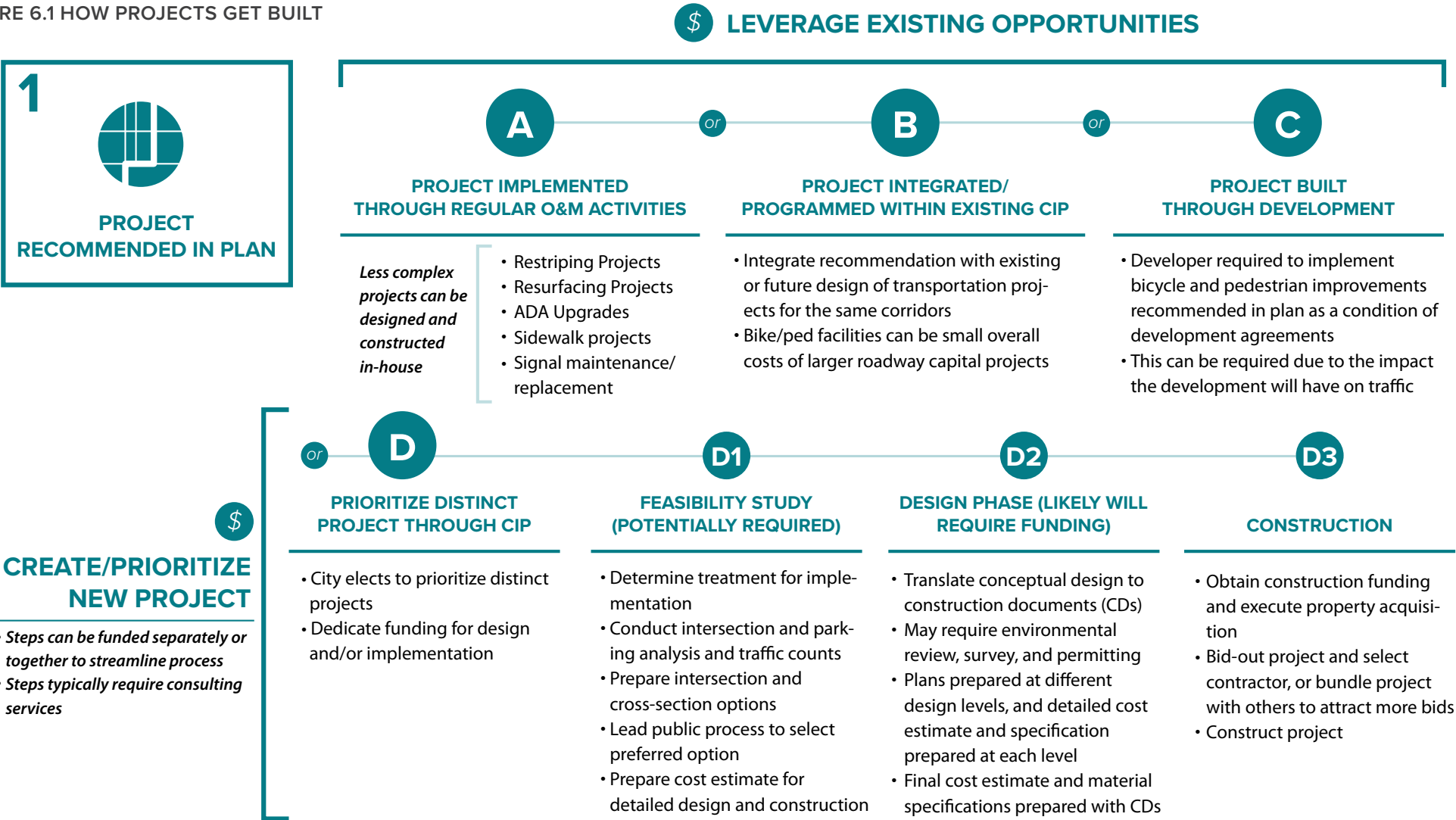


TABLE 6.2: FEDERAL FUNDING SOURCES

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Funding Source Detail
Surface Transportation Block Grant Program (STBGP)	Bicycle and pedestrian improvements, among others	Varies	CDOT and MPO	With the passage of the 2016 Federal Transportation Bill, Fixing America's Surface Transportation Act (FAST Act), the former Surface Transportation Program (STP) has become the Surface Transportation Block Grant Program (STBGP), which now includes Transportation Alternatives Program funding (described below). The Denver Regional Council of Governments (DRCOG) accepts concept reports for consideration of programming funds. This program has a state and an MPO component.
Transportation Alternatives Program (TAP)	Bicycle and pedestrian improvements only	Funds can be used for construction, planning and design of on and off-road bicycle and pedestrian facilities	CDOT and MPO	The FAST Act combines the former TAP (which included the former Recreational Trails and the Safe Routes to School programs) into the STBGP (above). Though program requirements will stay roughly the same, total funding has been slightly increased. Most projects have an 80/20 federal/local match split, and can include sidewalks, paths, trails (including Rails-to-trails), bicycle facilities, signals, traffic calming, lighting and safety infrastructure, and ADA improvements. Unless a state opts out, it must use a specified portion of its TA funds for recreational trails projects. Since the DRCOG Metro Area is larger than 200,000 people, funds are distributed based upon competitive applications by the MPO to municipalities.
Highway Safety Improvement Program (HSIP)	Infrastructure and program safety improvements	Public road with a correctable crash history, expected to reduce crashes, positive cost-benefit ratio, or, a systemic safety project	CDOT	Program purpose is to reduce fatalities and serious injuries on public roads through infrastructure and programs. HSIP can fund low cost, systemic improvements if benefit-cost is met.
Transportation Infrastructure Finance and Innovation Act (TIFIA) Loans	Large projects	Varies	USDOT	While not a competitive grant funding source, these loans do provide financing options, including credit assistance in the form of direct loans, loan guarantees, and standby lines of credit for large, surface transportation projects of national or regional significance, as well as public-private partnerships.
Transportation Investments Generating Economic Recovery (TIGER)	Shovel ready, surface transportation projects	Positive estimated cost-benefit ratio meeting federal transportation goals, benefiting country as a whole	USDOT, State and Local Gov'ts	Approvals for the eighth round of TIGER, totaling \$500 million, were signed into law in 2015 and applied for in 2016. Projects involving highways, bridges, bicycle and pedestrian facilities, transit, rail, and intermodal are eligible. Detailed application must be completed. Projects are highly competitive, and require a minimum 20 percent local match funding.
Partnership for Sustainable Communities	Bicycle and pedestrian infrastructure	Project must fulfill Livability Principles	EPA, HUD, and USDOT	Joint project of the Environmental Protection Agency (EPA), the U.S. Department of Housing and Urban Development (HUD), and the U.S. Department of Transportation (USDOT). It is based on five Livability Principles, one of which explicitly addresses the need for pedestrian and bicycle infrastructure. It is not a formal agency with a regular annual grant program. Nevertheless, it is an important effort that has already led to some new grant opportunities.
Community Development Block Grants (CDBG)	Street improvements	Project must benefit low or moderate-income populations	HUD and Local Gov't	Funds can be used for reconstructing or rehabilitating housing and other property; building public facilities and improvements, such as streets, sidewalks, community and senior citizen centers and recreational facilities and paying for planning and administrative expenses. Trails and greenway projects that enhance accessibility are an ideal fit for this funding source. CDBG funds could also be used to write an ADA Transition Plans.

TABLE 6.2: FEDERAL FUNDING SOURCES (CONTINUED)

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Funding Source Detail
Community Transformation Grants	Bicycle and pedestrian infrastructure and programs	Projects and programs aimed at increasing physical activity to reduce risk of disease	CDC	Community Transformation Grants, administered through the Center for Disease Control (CDC), support community-level efforts to reduce chronic diseases such as heart disease, cancer, stroke, and diabetes. Active transportation infrastructure and programs that promote healthy lifestyles are a good fit for this program, particularly if the benefits of such improvements accrue to population groups experiencing the greatest burden of chronic disease.
Federal Transit Admin. (FTA) Funding	Bicycle and pedestrian infrastructure	Project must enhance or be related to public transportation facilities	FTA	Multiple FTA funding sources exist. Most FTA funding can be used to fund pedestrian and bicycle projects “that enhance or are related to public transportation facilities.”
Additional Federal Funding	Varies	Varies	Varies	The landscape of federal funding opportunities for pedestrian and bicycle programs and projects is always changing. A number of Federal agencies, including the Bureau of Land Management, the Department of Health and Human Services, the Department of Energy, and the Environmental Protection Agency have offered grant programs amenable to pedestrian and bicycle planning and implementation, and may do so again in the future. For up-to-date information about grant programs through all federal agencies, see: http://www.grants.gov/

TABLE 6.3: OTHER NATIONAL FUNDING SOURCES

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Funding Source Detail
AARP Livable Communities	Built environment improvements, expansion of opportunities, community engagement and interaction	Projects will be assessed on impact, innovation, and execution	AARP	The AARP Community Challenge funds projects to enhance the quality of life for people of all ages. To be selected, projects need to address at least one of the following: built environment improvements that benefit people of all ages and abilities; the expansion of opportunities for all residents, such as through jobs, volunteerism, educational opportunities, and training; or community engagement and interaction across diverse community residents, for instance via public spaces and placemaking, healthy living, etc.
PeopleForBikes Community Grant Program	Bicycle infrastructure and advocacy initiatives	Funding cannot be for more than 50% of total project cost	People For Bikes	PeopleForBikes grant funds are typically awarded for bicycle infrastructure projects and will cover engineering and design work, construction costs (including materials, labor, and equipment rental), and reasonable volunteer support costs. Bicycle advocacy projects are also eligible. PeopleForBikes accepts requests for funding up to \$10,000. Although a specific percentage match is not required, they do carefully consider leverage and funding partnerships.
America Walks Community Change Micro Grants	Pedestrian projects and programs	Projects will promote walking and the benefits of walkability	American Walks	America Walks awards up to \$1,500 for small-scale, low-cost projects and programs that aim to increase the prevalence of walking, expand the diversity of people and organizations working to advance walkability, and help to make walking safer, easier, and more fun for people of all ages and abilities.
Walmart Community Grants	Quality of life and public safety projects	Projects must directly benefit the service area of the facility from which funding is requested	Walmart	Walmart community grants range from \$250 to \$2,500. Applications are tied to a particular Walmart facility and should directly benefit the communities in that facility's service area. Projects must fall within one of eight categories: hunger relief and healthy eating, health and human service, quality of life, education, community and economic development, diversity and inclusion, public safety, and environmental sustainability.

TABLE 6.3: OTHER NATIONAL FUNDING SOURCES (CONTINUED)

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Funding Source Detail
Our Town Grants	Design projects	Projects should be carried out by nonprofit organization in partnership with a local government entity	National Endowment for the Arts	Grants are awarded to projects that will impact livability by affecting public safety, health, blight and vacancy, environment, job creation, equity, local business development, civic participation, and/or community cohesion. Projects should reflect the distinct character of their communities, meet the needs of the existing residents, include a vision for improving social and/or economic livability, and support artists, design professionals, and arts organizations that integrate arts and design into civic life and/or community plans.
Clif Bar Family Foundation Small Grants	Projects related to outdoor activities	Cannot include capital construction	Clif Bar Family Foundation	Priority is given to projects that address the following funding priorities from a holistic perspective: 1) protect Earth's beauty and bounty, 2) create a robust, healthy food system, 3) increase opportunities for outdoor activity, 4) reduce environmental health hazards, and 5) build stronger communities. Projects should have strong community ties and promote positive change through clearly defined objectives and viable plans to achieve them.
Surdna Foundation	Sustainable Transportation	Cannot include capital campaigns or investments	Surdna Foundation	The Surdna Foundations' Sustainable Environments Program seeks projects that will improve transportation options, increase access and mobility, reduce VMT and greenhouse gas emissions, and advance climate resilient strategies. Preference is given to efforts that target communities that rely on public transportation and integrate transportation improvements with other infrastructure needs.

TABLE 6.4: STATE/REGIONAL FUNDING SOURCES

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Funding Source Detail
Highway User Tax Fund (HUTF)	CDOT, County and Municipal transportation projects	Varies	CDOT	Colorado's Highway Users Tax Fund collects revenues from motor fuel excise taxes, annual vehicle license and registration fees, and passenger-mile taxes on vehicles. Revenues from the fund are disbursed to recipients, including Northglenn, based on a formula prescribed by statute.
State Highway Fund (SHF)	CDOT	Varies	CDOT	The State Highway fund is a subset of the HUTF that is administered by CDOT for the maintenance of the state's highway system. The fund also generates revenue through interest earnings on the fund balance. The SHF can also be used for matching available federal highway construction funding.
State General Fund	CDOT	Varies	CDOT	The State General Assembly has provided mechanisms that can be used to allocate General Fund revenues for transportation projects, including direct transfers. Another mechanism, passed in 2009 by the General Assembly, creates a trigger of transfers from the General Fund to the HUTF when Colorado personal income grows 5 percent or more in a calendar year.
Department of Local Affairs (DOLA) Grants and Loans	Public facility and service needs	Varies	DOLA	The Local Government Financial Assistance section manages a number of grant and loan programs within the Department of Local Affairs specifically designed to address public facility and service needs. Through coordination and outreach with the department's field offices, grant and loan resources are distributed on both a formula and discretionary basis depending upon applicable state statutory provisions, federal requirements and/or program guidelines.
Statewide Transportation Improvement Program (STIP)	Transportation projects, including bicycle and pedestrian infrastructure	Varies	MPO and CDOT	The Statewide Transportation Improvement Program (STIP) is CDOT's short-term capital improvement program, providing project funding and scheduling information for the department and Colorado's metropolitan planning organizations. CDOT, as well as the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) approve the STIP.

TABLE 6.4: STATE/REGIONAL FUNDING SOURCES (CONTINUED)

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Funding Source Detail
Metropolitan Planning Organization Transportation Improvement Program (TIP)	Transportation projects, including bicycle and pedestrian infrastructure	Varies	MPO	MPOs are responsible for planning and prioritizing all federally funded transportation improvements within an urbanized area. DRCOG is the Metropolitan Planning Organization (MPO) for Northglenn and surrounding urban areas. MPOs maintain a long-range transportation plan (LRTP) and develop a transportation improvement program (TIP) to develop a fiscally constrained program based on the long-range transportation plan. This Plan recommends that Northglenn continues to work closely with MPO to ensure pedestrian and bikeway improvement projects recommended in this Plan are listed in the TIP.
Colorado Safe Routes to School	Infrastructure and non-infrastructure (program) projects	Projects that improve access for children to walk and bike to school	CDOT	Safe Routes to School (SRTS) was established in 2005 through Federal legislation to enable and encourage children, including those with disabilities, to walk and bicycle to school; to make walking and bicycling to school safe and more appealing; and to facilitate the planning, development and implementation of projects that will improve safety, and reduce traffic, fuel consumption, and air pollution in the vicinity of schools. CDOT manages the Colorado SRTS program. In 2015, the CDOT approved the continuation of the SRTS program by committing to fund the program with \$2 million for infrastructure projects and \$0.5 million for non-infrastructure projects. Grants are awarded through a statewide competitive process.
GOCO Grants	Bicycle and Pedestrian Planning and Infrastructure Improvements		GOCO	GOCO invests a portion of Colorado Lottery proceeds to help preserve and enhance the state's parks, trails, wildlife, rivers and open spaces. GOCO manages several grant programs that provide funds for bicycle and pedestrian planning and infrastructure projects. GOCO's planning grant program offers competitive planning grants up to \$75,000 to help entities develop strategic master plans for outdoor parks and recreation projects, trails, or site-specific plans (applicants must provide at least 25% of the total project cost in matching funds). GOCO also manages Trail Grants that can be used to fund large and small trail projects and trail planning and maintenance. Lastly, GOCO manages The Connect Initiative, which funds projects focused on connecting existing trail gaps, constructing new, highly demanded trail systems, and providing better walkable and bikeable access for youth and families to existing outdoor recreation opportunities.
Kaiser Permanente	Community Health Initiatives	Projects should respond to identified health needs in communities served by Kaiser Permanente	Kaiser Permanente	Kaiser Permanente's Community Health Initiatives support innovative efforts to improve communities through prevention-driven approaches that promote healthy physical, social, and economic environments.
HEAL Cities & Towns Campaign	Active Communities Projects	Projects must be completed within 6 months of receiving the grant	LiveWell Colorado	The HEAL (Health Eating Active Living) Cities and Towns Campaign is a partnership between LiveWell Colorado and the Colorado Municipal League, funded by Kaiser Permanente, that provides technical assistance and training to municipalities to adopt policies that improve their communities' food and physical activity environments. Grants are disbursed in amounts up to \$5,000 and are intended to provide resources for communities to implement a HEAL policy. The LiveWell website also has an extensive list of other small grant opportunities.
Colorado Health Foundation	Healthy Living Projects		Colorado Health Foundation	The Colorado Health Foundation funds projects that help Coloradans live their healthiest lives by advancing opportunities to pursue good health and achieve health equity within six focus areas: access to care, behavioral health, healthy behaviors, healthy children and adolescents, healthy communities, and social determinants of health. Preference is given to projects that focus on serving populations who face barriers to health due to income, age, race, ethnicity, or geography.

TABLE 6.5: LOCAL & OTHER FUNDING SOURCES

Funding Opportunity	Eligible Project Types	Qualifications	Lead Agency	Funding Source Detail
General Fund	Maintenance, Capital Improvements List projects	Projects should incorporate active transportation accommodation	Local Gov't	The General Fund is often used to pay for maintenance expenses and limited capital improvement projects. Projects identified for reconstruction or re-pavement as part of the Capital Improvements list should also incorporate recommendations for bicycle or pedestrian improvements in order to reduce additional costs.
Bond Financing	Varies	Varies	Varies	Bonds are a financing technique and not a funding source. Money is borrowed against a source of revenue or collateral (i.e. parcel tax revenue). Bonds do not increase total funding, but rather shift investment from future to present.
Special Assessments or Taxing Districts	Varies	Varies	Local Gov't	Special assessments are additional property taxes that are self-imposed on properties close to a new transportation facility or service. They can be used as a dedicated annual revenue stream for funding operations or bonded against under the right set of circumstances. The assessment is levied against parcels in an area that receives a special benefit that can be clearly identified and measured. Implementation of special tax districts can be challenging and before this mechanism can be considered an option, affected local landowners and businesses would need to buy into the premise that the tax is worth the value that the infrastructure or service improvement provides. Nationally, special tax districts are one of the most common forms of value capture for transportation projects.
Business Improvement Area or District	Varies	Projects should benefit surrounding businesses' customers	TBD	Pedestrian and bicycle improvements can often be included as part of larger efforts aimed at business improvement and retail district beautification. Business Improvement Areas collect levies on businesses in order to fund area wide improvements that benefit businesses and improve access for customers. A portion of this revenue could be used to fund bicycle and pedestrian improvements.
Development and Impact Fees	Varies	Varies	Local Gov't	Development impact fees are one-time charges collected from developers for financing new infrastructure construction and operations, and can help fund bicycle and pedestrian improvements. Impact fees are assessed through an impact fee program.
Sales Tax	Varies	Varies	Local Gov't	Local governments can choose to exercise a local option sales tax, and use the tax revenues to provide funding for a wide variety of projects and activities. A small portion of the Northglenn sales tax funds being directed towards transportation should be dedicated for active transportation projects. State approval is required to enact local sales tax.
Property Tax	Open space acquisitions	Varies	Local Gov't	Property taxes generally support a significant portion of a local government's activities. However, the revenues from property taxes can also be used to pay debt service on general obligation bonds issued to finance open space system acquisitions. Property taxes can provide a steady stream of financing while broadly distributing the tax burden. It should be noted that other public agencies compete vigorously for these funds, and taxpayers are generally concerned about high property tax rates.
Excise Tax	Varies	Varies- could specifically focus on tourism	Local Gov't	Excise taxes are taxes on specific goods and services. These taxes require special legislation and the use of the funds generated through the tax are limited to specific uses. Examples include lodging, food, and beverage taxes that generate funds for promotion of tourism, and the gas tax that generates revenues for transportation-related activities.
Tax Increment Financing	Infrastructure projects	Projects should specifically benefit the TIF area	Local Gov't	Tax Increment Financing is a tool to use future gains in taxes to finance the current improvements that will create those gains. When a public project (e.g., shared use path) is constructed, surrounding property values generally increase and encourage surrounding development or redevelopment. The increased tax revenues are then dedicated to support the debt created by the original public improvement project.
Street User Fees	Infrastructure projects	Varies	Local Gov't (Public Works)	Many cities administer street user fees through residents' monthly water or other utility bills. The revenue generated by the fee can be used for operations and maintenance of the street system, and priorities would be established by the Public Works Department. This approach could be more equitable than property taxes, which just impact property owners.
In Lieu of Fees	Open space or trail projects	Varies	Local Gov't	Developers often dedicate open space or trail projects in exchange for waiving fees associated with park and open space allocation requirements in respect to proposed development.