City of Greeley

BICYCLE MASTER PLAN

FINAL
May 5, 2015

"ROAD TO GOLD"

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KAISER PERMANENTE. thrive

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CHAPTER 1: INTRODUCTION

Overview

In the spring of 2013, the City of Greeley was designated as a Bronze-level "Bicycle Friendly Community" by the League of American Bicyclists. The city has done much in recent years to increase the number of bicyclists in the community - from facility improvements such as shared use paths and roadway "right-sizing" to programs and policies such as the Zombie Zoom community rides, bicycle facilities as part of the street standards and the establishment of the Bike Advocacy Group. While these changes and improvements have been welcomed and have resulted in an increase in bicycling, the city is still early in its journey to becoming a safe and accessible bicycle city.

Nationally, recent years have seen significant changes to the transportation framework. Bicycle use has increased over 60% from 2000 to 2012 according to US Census Bureau making it the fastest changing form of transportation. Other trends such as increasing gas prices, environmental damage, changing demographics, and the prevalence of health issues like obesity and heart disease are demonstrating the need for a more diverse set of transportation options and a reevaluation of common current patterns of development. At the same time, towns and cities around the country are recognizing that bicycle-friendly communities attract new businesses, residents, and visitors alike and help to combat many of these trends. On a local level, this plan represents a strong commitment to take on such issues, translating them into affordable personal mobility, vibrant communities, appealing recreational opportunities, and healthy, active lifestyles for the Greeley community.

In the fall of 2013, the Greeley Public Works Department was successful in obtaining a "Walk and Wheel" grant from Kaiser Permanente. The grant was awarded to complete a bike plan aimed at increasing bicycling as an active mode of transportation through new infrastructure, programs, events, culture, and education. Thus, this plan is being developed to address the "Five E's" of bicycling (Engineering, Education, Encouragement, Enforcement, and Evaluation), while providing an action-oriented plan that can quickly be moved forward into implementation.

The Greeley Bicycle Master Plan project team went through a process of defining plan vision and goals, studying and analyzing existing conditions, and developing recommendations for the proposed bicycle facility network, support facilities, programs, and policy and facility design guidelines. The recommended facilities were then prioritized, costs studied for priority projects, and an implementation strategy identified. The development of this plan also included an open, participatory process, with the community providing input through public workshops, stakeholder meetings, website input, and online survey and mapping platforms.

SAFETY IN NUMBERS

The likelihood that a given person walking or bicycling will be struck by a motorist decreases as the number of people bicycling and walking increases.

Jacobsen, P L, "Safety in numbers: more walkers and bicyclists, safer walking and bicycling," Journal of Injury Prevention 2003; 9: 205-209.

Figure 1-1: Safety in numbers

Figure 1-2: A protected bike lane demonstration project was installed on 65th Avenue for Public Meeting #2

Vision, Goals and Objectives

Vision Statement

The people of Greeley come together around bikes. Whether it's gathering for a quick fitness ride after work, a morning commute down the Poudre Trail, the first turn of the cranks at a Bike Rodeo, or to meet downtown for a coffee, bicycling is important for the recreation, transportation, health, and economy of the community. 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 Internal Review Team and the public, guides the Greeley Bicycle Plan:

> ***Greeley will be a Gold Level Bike Friendly Community where bicycling is a safe, accessible, and normal form of transportation and recreation.***

Goals help guide the city towards fulfilling the project vision, and relate to existing and newly-launched efforts. Objectives are more specific statements that define how each goal will be achieved. Objectives are measurable and allow tracking and benchmarking to demonstrate the city's progress toward the goals and vision

Goals & Objectives

1

- **Increase bicycle ridership in Greeley.**
  - Increase percent of commuting by bicycle to 5% (up from 1.8 %, as listed in the 2012 American Community Survey study 5-year data) by 2025
  - Increase percent of trips to school made by walking and bicycling to 20% for school age children by 2025
  - Increase the proportion of residents who have ridden their bicycle in the past six months to 60% (up from 42% in 2012, as listed in the North Front Range Metropolitan Planning Organization's Household Bicycle Use Survey)
  - Develop and implement an annual on- and off-street bicycle count plan

2

- **Incorporate considerations for bicyclists (facilities, route designation, wayfinding, signage, access, parking, and storage) in all future improvements to the transportation system and to public space.**
  - Incorporate bicycling as a prominent component of a city-wide Complete Streets Policy
  - Continue to "right size" roadways in Greeley to balance excess vehicle capacity, where present, with the potential to increase the capacity for dedicated on-street bicycling facilities. In the next ten years, analyze all arterial and collector roadways to determine potential for "right sizing"
  - Incorporate the recommendations in the Bicycle Master Plan into other parks, recreation, and trail planning documents and policies
  - Create plan and permit review requirements that bicycle facilities (bicycle parking, shared use paths, and network facilities if applicable) be a consideration in all private development projects as part of on-site improvements and off-site mitigation measures as appropriate

3

- **Develop design, construction, and maintenance standards for bike facilities.**
  - Update Greeley's design standards, enhancing bicycle facility guidelines to include best practices and innovative solutions tailored to fit Greeley's network needs
  - Include natural systems considerations (potential to increase tree canopy, integrate water quality improvements, and integrate with sustainability goals) in bicycle facility and road guidelines
  - Develop and apply maintenance standards and frequency requirements for bicycle facilities

4

» **Build a safe and efficient bicycling network and support facilities that serves the needs of all types of bicyclists, connecting residential Greeley to the University, recreational trails, downtown, retail centers, and local services.**

- Implement a continuous network of bike lanes, signed shared bikeways, and bike boulevards that serve bicyclists of all ages and abilities, including both recreational and utilitarian riders
- Ensure that all bicycle crashes are accurately reported into the crash database
- Track and reduce the bicycle-related crash rate
- Implement five quick-action bicycle facility improvement projects by 2016
- Close five major gaps in the bicycle network by 2020, not including projects completed as part of objective above
- Increase connectivity between the City of Greeley and regional bicycle infrastructure, including opportunities for active transportation and recreation between municipalities and towns in the region

5

» **Promote bicycling as a healthy and inexpensive transportation alternative, vital to economic development and affordable living choices for Greeley residents.**

- Together with program partners, continue bicycling education, enforcement and encouragement activities (bike rodeo, midnight ride, etc.), and implement five new major programs by 2020
- Integrate bicycle transportation facilities into affordable living policies
- Improve coordination with bicycle programs and planning at the University of Northern Colorado and Aims Community College
- Develop a program that encourages residents to ride to businesses and incentivizes businesses and employers to promote, accommodate, and encourage bicycling to their location
- Support Safe Routes to School and other efforts, including educational and incentive programs to encourage more students to bicycle or walk to school, through a partnership with the school districts and other interested parties

6

» **Establish a city division under public works to maintain and expand the city bicycle program.**

- Employ a Greeley Bike Coordinator to serve as an advocate and liaison for biking in Greeley
- Develop a reliable funding source able to maintain and expand the bicycle program by the 2017 budget cycle
- Monitor the ongoing process of the Bicycle Master Plan's implementation and its effectiveness in achieving the stated vision and goals by issuing a Report Card report every two years
- Update the Greeley Bicycle Master Plan every five years, or as appropriate to reflect new policies and/or requirements for bicycle funding
- Adopt the Greeley Bicycle Master Plan by the Greeley City Council as an element of the City's Comprehensive Plan
- Achieve a Gold Level Bicycle Friendly Community Designation by the League of American Bicyclists by 2020

The Planning Process

Development of the Greeley Bicycle Master Plan began in May of 2014 and concluded in December of 2014. Public participation (through workshops, Internal Review Team meetings, surveys, and interactive mapping) played a key role in this plan's development. Opportunities for public and stakeholder input were provided throughout the planing process, from the data-gathering stage to the final recommendations stage. For more information on the public involvement process for the Bicycle Master Plan, see Appendix A.

Two open houses were held as part of the master plan process: the first at the existing conditions data-gathering stage, and the second to present preliminary recommendations. Over 70 community members participated in the two meetings, with particularly good turnout and enthusiasm during the recommendations-phase meeting.

Workshop #1 – June 2014

An initial workshop was held on June 19th at the Rodarte Center. The open house format provided opportunity for the public to ask questions, familiarize themselves with this master plan effort, review information pertaining to Greeley and its existing bicycle facilities, and give input about the types of bicycling improvements they would like to see. Stations were set up to provide information and receive feedback on a number of different topics relating to the master planning process: plan purpose and process, vision and goals, origins and destinations, barriers and gaps in the current system, and needs and desires for bicycle programs and bicycling in Greeley as a whole.

Workshop #2 – October 2014

The second public workshop was held on October 22nd at the Greeley Family FunPlex. This event was held in coordination with Greeley Bike Night, a bike ride, bike rodeo, and party held to celebrate the opening of the adjacent section of the Sheep Draw Trail. During the event and workshop, a protected bike lane demonstration event was in place for participants and residents to experience outside the venue. The workshop was again presented in an open house format, allowing residents to spend as much time as desired at each station. Input gathered included needs and gaps confirmation, project network and programs recommendations feedback, prioritization process review, and finally a "straw poll" vote on preferred project.

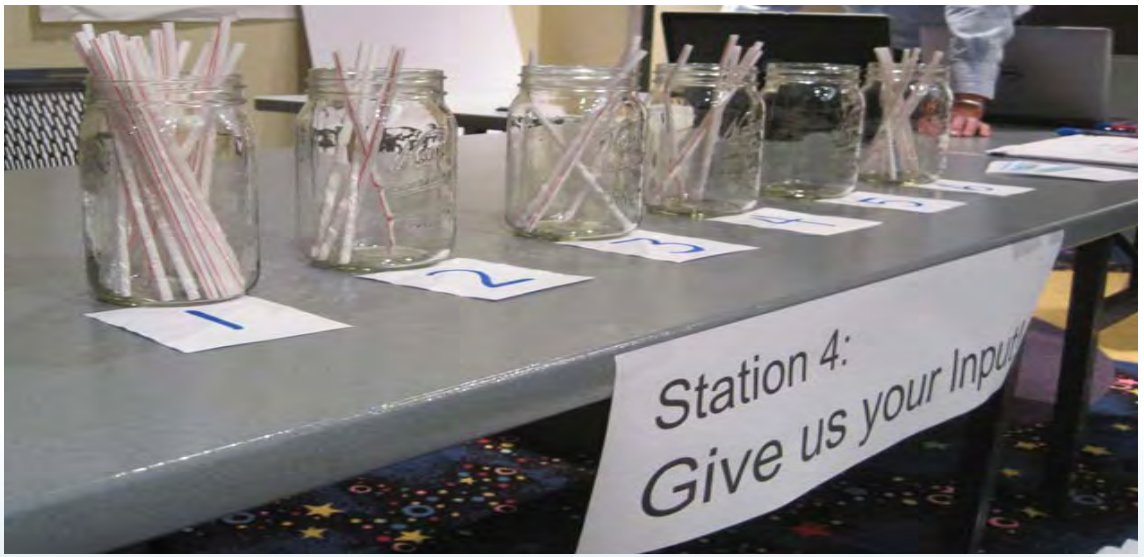

Figure 1-3: Public Workshop #2 "straw poll" results

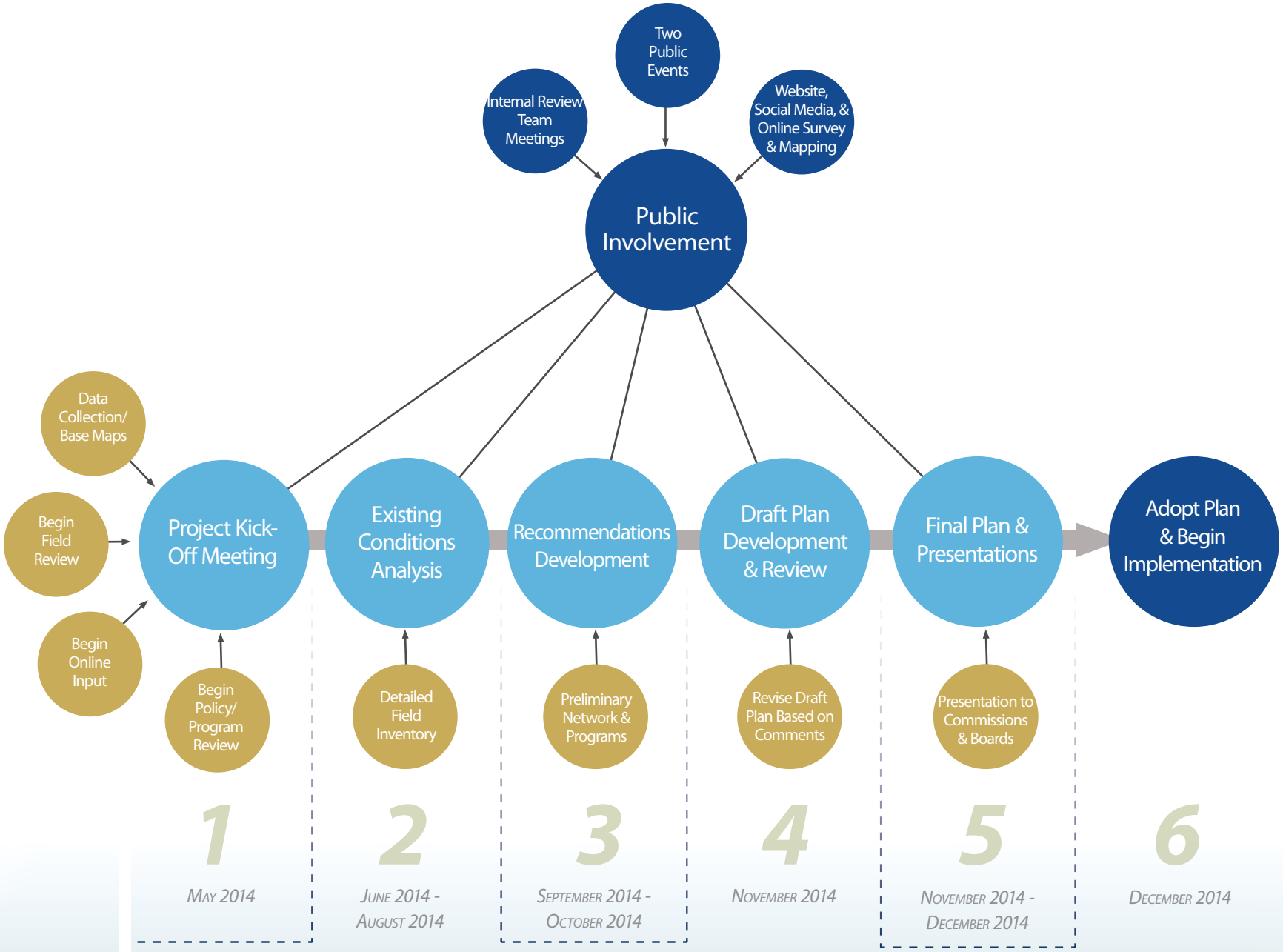

Figure 1-4: Planning Process Summary

Survey and Online Mapping

A project website was used throughout the master plan development process to announce public meetings, display information, collect general comments, and direct the public to the online survey and the two phases of mapping exercises. (www.greeleybikemasterplan.com)

The survey, which was open from mid-June to mid-August, contained questions for the respondent about what type of bicyclist they are, how often they ride, and factors that keep them from riding more, as well as questions on what type of facilities and programs would get them out riding more often. 367 respondents filled out surveys.

Two interactive, online mapping exercises were conducted using a wikimaps platform. The first exercise collected existing conditions input from residents during the same timeframe as the survey. The second online mapping exercise was open from mid-October through early November, and collected map-based feedback on the network recommendations.

Internal Review Team (IRT)

A steering committee with representation from a variety of city departments, other agencies, and local health organizations met regularly to review draft documents and generally guide development of the Greeley Bicycle Master Plan. The committee met monthly during the course of the project.

Figure 1-5: Bicyclists on bridge in Bittersweet Park

The value of a bicycle master plan

Implementation of the facilities, programs, and policies in this plan can provide a wide range of benefits to a community and its residents. This plan is a guide for the city to use to grow in an effective and coordinated way, utilizing limited available resources. It is intended to provide an understanding of current conditions, build community interest, and provide a clear path forward toward realizing the vision. Understanding the changing landscape and needs of the Greeley community, the recommendations proposed in this plan are intended to be guidance that is flexible in nature. Most importantly, this master plan is intended to drive immediate and long term progress.

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CHAPTER 2: EXISTING CONDITIONS

Overview

The City of Greeley has increased its investment in bicycle infrastructure in recent years largely through efforts of a grass roots community of residents and city staff without a dedicated budget. Shared use paths, bicycle lanes, signed bike routes, and wide multi-use sidewalks are now common in nearly every neighborhood of Greeley.

Setting and Background of Greeley

The City of Greeley, Colorado, is located about 50 miles north-northeast of Denver. It is the county seat of Weld County, Colorado, and is a major city of the Front Range Urban Corridor. The City of Greeley comprises approximately 30 square miles in area. Topography is generally flat with an average of 300 feet elevation gain between eastern and western extents of the city. Agricultural land uses are prevalent, especially on the edges of the city, in bordering communities, and in unincorporated Weld County.

The existing topography and built environment in Greeley are generally supportive to walking and bicycling with typically flat routes and wide streets laid out

Figure 2-1: Greeley location map

on a major street grid system. These existing conditions provide a solid foundation from which to improve the bicycle network.

Greeley experiences a semi-arid climate with high temperatures in the summer around 90°F and low temperatures of 15°F in the winter. The city's proximity to the Rocky Mountains and lower elevation, compared to the mountains west of the city, result in less precipitation and fewer thunderstorms. Each year, winter brings variable weather conditions including colder temperatures and snow/ice accumulation on Greeley's roads, paths, and sidewalks. Both of these factors can affect the decision to bicycle for transportation or recreation in the winter.

In 2013, Greeley was awarded a Bronze level Bicycle Friendly Community designation from the League of American Bicyclists, the national advocacy and advancement organization for bicycling. The designation celebrates and solidifies the efforts that governmental departments, interested and advocacy groups, bicyclists, schools, and others have made to improve bicycling in the city.

Figure 2-2: Internal Review Team during a field visit

Demographics of Greeley

The population of Greeley is approximately 93,000 people according to the 2012 American Community Survey (ACS), nearly a 21% increase since the 2000 Census. White residents make up 80 to 85% of the Greeley population. People identifying as Hispanic or Latino (a population which is calculated as a subcategory of the 80 to 85% listed above) make up 35.6% of Greeley's population. In 2012, 36% of Greeley's population was either under 18 or over 65, age groups that are less likely to be able to drive. Providing a safe, efficient, and comfortable active transportation system for this group (one-third of the population) can increase mobility and offer solutions to future transportation issues as well.

Between 2000 and 2012, the percentage share of all commute to work trips made by bicycle in Greeley increased from 1.1% to 1.8% (a 39% increase). For comparison, the percentage of total trips to work made by car, truck, or van decreased; public transportation increased; taxi, motorcycle, or other mode increased; and walking decreased. It should be noted that, although walking mode share decreased, most transit users are also pedestrians at some point in their trip, so pedestrian infrastructure use has not likely declined.

Greeley's commute mode share between the five trip modes is comparable to other communities of similar size in Colorado. The one Colorado city that stands out in Table 2-1 is Boulder. Boulder has a robust and progressive bicycle network, support programs and facilities, and a college-age base of bicyclists. Although Boulder does have a significantly higher bicycle mode share than most communities in Colorado, it should be noted that it is the high combined mode share of public transportation, walking, and bicycling (30%) that reduces car, truck, and van mode share use. This significant mode share shift is enabled by comprehensive, system-wide transportation improvements which benefit all modes of transportation.

Table 2-2: City of Greeley Demographics

Population	2000 (Census data)	2012 (5-year ACS data)
Total	76,930	93,082
White*	80.40%	85.80%
American Indian	0.80%	0.80%
Two or more races	2.80%	2.70%
Median Age	28.5	30.4
Under 18	25.60%	25.60%
Over 65	10.20%	10.40%
Median Income	$36,414	$44,226

*Includes 35.6% Hispanic/Latino

Table 2-1: Front Range and Peer City Mode Share Comparison

Geography	BFC Level	Population	Employed Population	Bicycle Mode Share
United States	-	309,138,7112	139,893,639	0.56%
Greeley, Co	**Bronze**	**93,082**	**40,864**	**1.80%**
Longmont, Co	Silver	86,355	42,624	0.96%
Arvada, Co	Silver	106,965	54,067	0.56%
Pueblo, Co	-	106,944	41,428	0.75%
Grand Junction, Co	-	58,867	27,091	2.34%
Fort Collins, Co	Platinum	144,329	76,023	6.75%
Boulder, Co	Platinum	99,177	52,461	10.50%

Note: Data taken from 5-year ACS dataset.

Commute Time

The amount of time that people report it takes them to get from home to work has increased about 50 percent since 2000. In 2000, the Mean Commute Time reported for the City of Greeley was 20 minutes, and in 2012 (from American Community Survey) it was reported as 31 minutes. It is likely that increased commute times in Greeley are caused by commuters traveling from outside the city and housing choices further from job centers within the city rather than significant traffic congestion.

Table 2-3: City of Greeley Commute Mode Share

Mode	2000 (Census)	2012 (5-year ACS data)	Change (+/-)
Car, truck, or van	90.7%	89.7%	-1.1%
Public transportation	0.4%	0.6%	50.0%
Other	1.0%	1.3%	30.0%
Walking	3.9%	3.4%	-12.8%
Bicycling	1.1%	1.8%	63.7%

National Household Transportation Survey (NHTS) All Trip Conversion

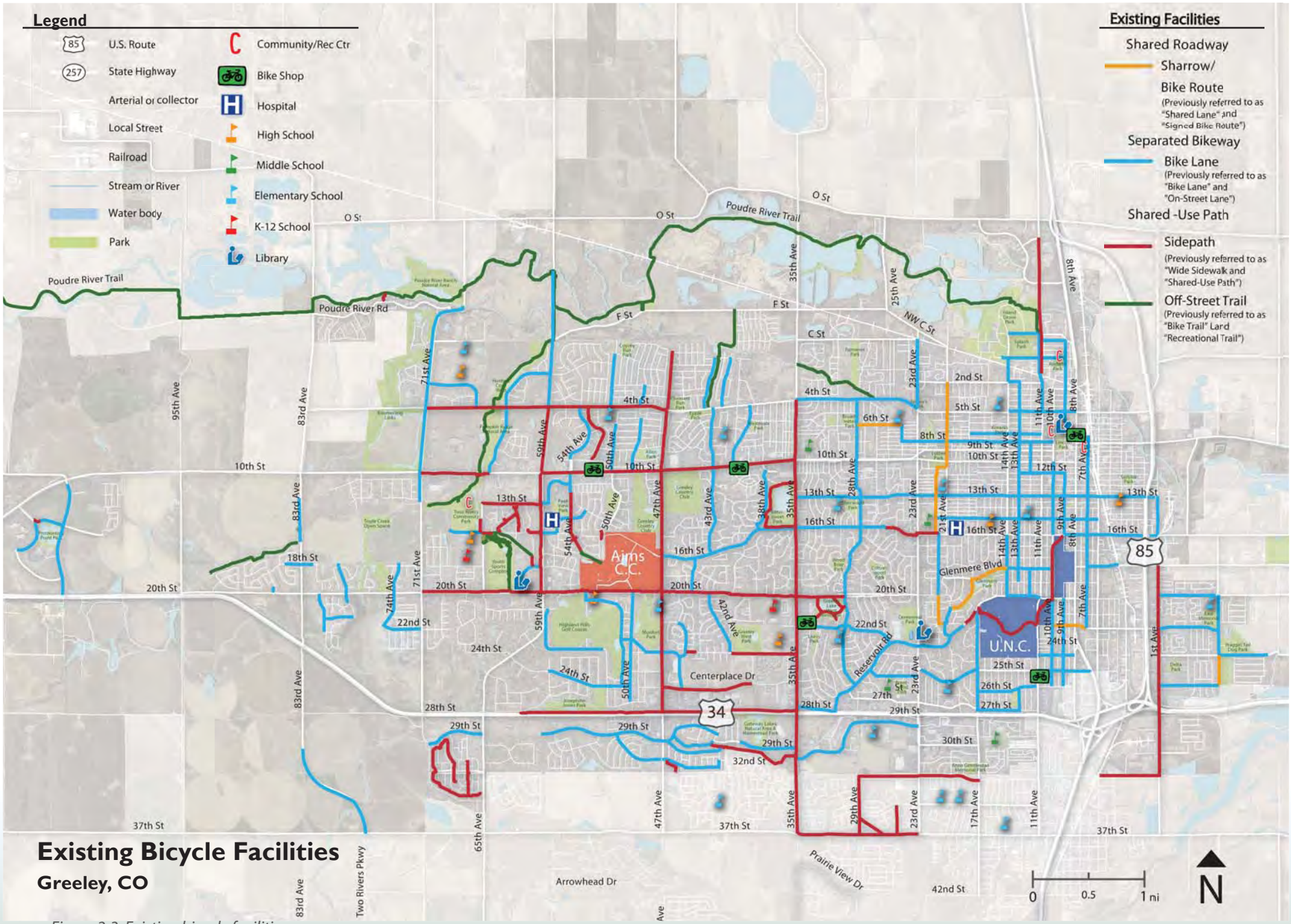
Commuting (Journey to Work) data from the American Community Survey is an important and consistent data source to measure changes in mode share over time. However, that data represents only one type of trip and does not accurately reflect overall levels of bicycling and walking over all trip types. Data from the 2009 National Household Travel Survey (NHTS) provides mode share data aggregated at the national level for all trips and not just commute to work trips. For example, NHTS indicates that for every 1 bike to work trip, there are another 1.6 utilitarian bike trips (for shopping, personal trips, transporting others, medical/dental visits, meals, other reasons), 0.5 bike to school trips, and 4.8 social or recreational trips. Overall, bike to work trips represent about 7.5 percent of all trips by bicycle in the United States.

It should be noted that approximately 41 percent of bike trips counted by NHTS are return home trips indicating bicyclists perform part of their round trip by other means.

Table 2-4 uses the national averages in the NHTS and applies them to the localized ACS commuting data to provide an estimate of overall levels of walking and bicycling in Greeley. Although some of the same trends in mode share changes can be seen in these tables as in the commute data in Table 2-3, the main difference as shown in Table 2-4 is the percentage share. The NHTS data estimates that 3.2 percent of all trips in Greeley, regardless of purpose, are done by bicycle, a figure which has increased nearly 38 percent in the last decade.

Table 2-4: City of Greeley All Trips Mode Share (NHTS)

Mode	2000	2012 (ACS)	Change (+/-)
Car, truck, or van	87.6%	86.5%	-1.3%
Public transportation	0.7%	1.1%	57.1%
Taxi, motorcycle, or other	1.8%	2.3%	27.8%
Walking	7.8%	6.8%	-12.8%
Bicycling	2.0%	3.2%	60.0%



Existing Bicycle Facilities

Greeley, CO

Figure 2-3: Existing bicycle facilities

Existing Bicycle Facilities

Greeley's existing bicycle network includes (as of summer 2014) approximately 115 miles of bikeways. These bicycle facilities have been broken down into four or five facility types with names that have varied in the past depending on the document or resource referenced. To reduce confusion and provide a consistent naming framework for the Greeley network as it potentially expands to include additional facility types, a nomenclature system based on national precedent, design guideline documents, and previous planning studies was developed and will be used throughout this plan.

Following are descriptions of each facility type, including those that currently exist in Greeley and those that are proposed as part of this plan.

Table 2-5: Existing Bicycle Facilities in City of Greeley

Facility Type	Miles	Frequency (mi./10k ppl.)
Off-street trails	30	3.2
Sidepaths	34.3	3.7
Bike lanes	43.5	4.7
Shared lanes	4.4	0.5
Mountain bike trails	2.8	0.3
Total Miles	**115**	**12.4**

Figure 2-4: Enjoying a family ride

BIKEWAYS ATTRACT PEOPLE

62%

of new transplants in Portland, Oregon, who bike said **the city's bike-friendliness was a factor in their decision to move.**

Portland Bicycle Maps and Information Survey – PBOT, 2009

Figure 2-5: Bikeways attract people

Shared Roadways (On-Street)

Shared roadways are a category of facilities where bicyclists and motor vehicles share the same roadway travel space. They are typically applied on roads with low speeds and volumes but can also be used on higher volume roads with wider outside lanes. This facility type can use a wide variety of treatments from simple bike route signage to shared lane markings ("sharrows") to more complex installations that reduce or calm traffic to create a lower stress bicycle facility. According to AASHTO, shared roadways suggest to bicyclists that a particular route has advantages over other alternate routes. Further, AASHTO indicates that shared roadways serve one of two purposes: to provide continuity to other bicycle facilities (often bike lanes) or to designate preferred alternate routes to high traffic corridors. Shared roadways are most often used by more experienced bicyclists who are more comfortable "taking a lane" or riding in close proximity to motor vehicles. Existing conditions in Greeley of this type include shared lanes.

Shared Lanes (Sharrows)

Shared Lanes in Greeley are marked with shared lane markings and signage, and are present on some grid streets on the east side of Greeley. As is common in many cities, shared lanes in Greeley generally serve as connectors between bike lane segments on lower volume roads. The City of Greeley currently has shared lanes on roads such as 22nd Avenue, Glenmere Boulevard, and 6th Street.

Figure 2-7: Shared lane on 20th Street

Figure 2-6: Typical shared lane cross section with and without parking

Bike Boulevards (Future)

Bicycle boulevards are a shared roadway facility designed to be attractive to people of all ages and abilities. They are low-volume low-speed streets that enhance bicyclist comfort by using treatments such as signage, pavement markings, traffic calming and/or traffic reduction where necessary, and intersection modifications.

Treatments for bicycle boulevards are selected as necessary to create appropriate automobile volumes and speeds, and to provide safe crossing opportunities of busy streets. Typically, local streets are most comfortable for bicyclists with vehicle speeds at or below 25 miles per hour and vehicle volumes at or below 3,000 vehicles per day (with 1,500 per day preferred).

In Greeley, it is anticipated that the proposed bicycle boulevard facilities will meet speed and volume targets without intervention. If improvements are necessary, they might include curb extensions or median refuge areas to shorten crossing distances.

Figure 2-8: Typical bike boulevard marking and signage

Figure 2-9: Bike Boulevard in Portland, OR

Separated Bikeways (On-Street)

Separated bikeways are a category of facilities that are designed exclusively for bicycle travel. They are separated from motor-vehicle travel by striping, a buffer, or a physical barrier (buffered and physically separated facilities are not present currently in Greeley) and typically display pavement stencils, signage and other treatments. Separated bikeways are generally installed on arterial or collector streets where there are higher volumes of traffic and higher speeds. Greeley currently has conventional bike lanes only.

Bike Lanes

Bike Lanes provide a striped and stenciled lane for bicycle travel on a street or highway, and are typically one-way facilities that carry bicycle traffic in the same direction as motor vehicle traffic on through streets with average daily traffic (ADT) counts of 3,000 or higher. Generally, bike lanes are four to seven feet wide and are sometimes adjacent to on-street parking. In Greeley's existing bicycle network, bike lanes are on arterial, collector, and local streets, and are present on roadways with and without parking. Many of Greeley's longer, continuous bike lanes are on roadways where lane reductions have recently been implemented, such as 13th Street between 35th Avenue and 2nd Avenue.

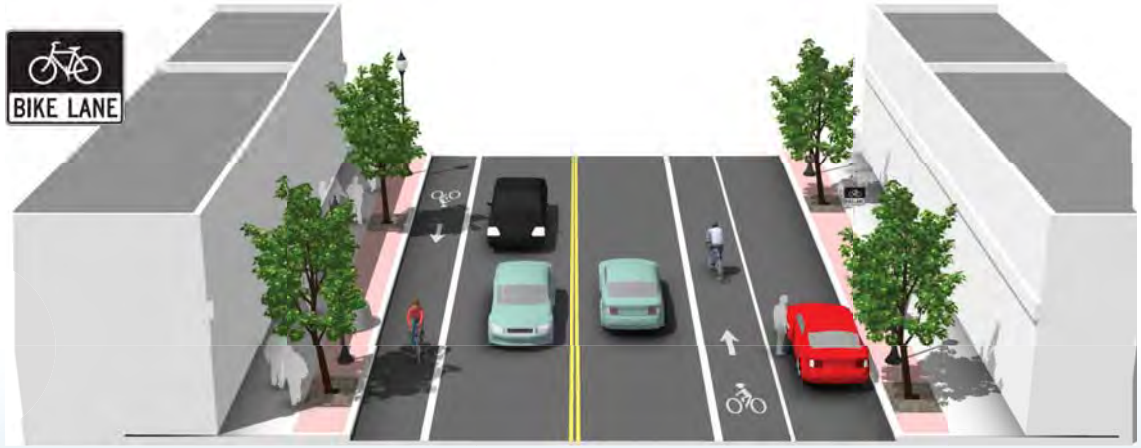


Figure 2-10: Typical bike lane cross section with and without parking

Buffered Bike Lanes (Future)

Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space, increasing the distance between the bicycle lane and the adjacent motor vehicle travel lane and/or parking lane. They provide a more comfortable experience for bicyclists, providing separation from traffic or keeping them out of the "door zone," but they also are an effective tool to discourage motorists from driving or parking in the bike lane that would otherwise be excessively wide. This treatment is appropriate for bike lanes on roadways with high motor vehicle traffic volumes and speed, adjacent to parking lanes, or a high volume of truck or oversized vehicle traffic.

Protected Bike Lanes (Future)

Protected bike lanes, also known as cycletracks, are exclusive bike facilities that combine the user experience of a separated path with the on-street infrastructure of a conventional bike lane. A protected bike lane is physically separated from motor traffic and distinct from the sidewalk. Protected bike lanes have different forms but all share common elements—they provide space that is intended to be exclusively or primarily used by bicycles, and are vertically separated from motor vehicle travel lanes, parking lanes, and sidewalks.

See Section 4 ("Recommendations") for additional details on Buffered Bike Lanes, Protected Bike Lanes, and Bike Boulevards.

Figure 2-11 Buffered bike lane in Fairfax, CA

Buffered and protected bike lanes are gaining prevalence in the United States, with protected bike lanes alone in over 20 states currently (buffered bike lanes are even more prevalent). They are popular for their increased comfort level for bicyclists, with most drawing significantly more cyclists within the first year after installation.

Figure 2-12: Raised protected bike lane in Missoula, MT

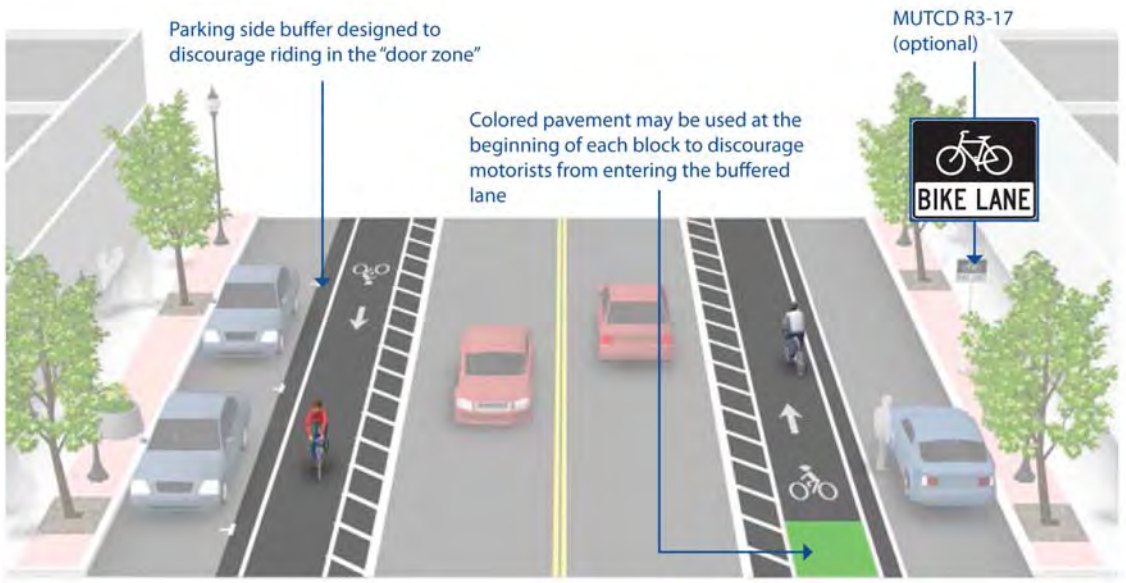


Figure 2-13: Typical buffered bike lane cross section with parking

Figure 2-14: Typical protected bike lane cross section with and without parking

Shared Use Paths (Off-Street)

Shared use path is a category of facilities that includes off-street trails, sidepaths, and subdivision trails. These facilities are two-way facilities that are intended for the shared use of bicycles, pedestrians, and other human-powered forms of transportation such as roller blading, wheelchair use and jogging. A description of Greeley's existing mountain bike facilities is also provided in this section for reference.

Off-Street Trails

Off-street trails, sometimes referred to in this document as just "trails" (referred to as "Bike Trails" on Greeley's Bikeways map) are shared use paths that are in an independent right-of-way (they are not in the roadway right-of-way) and are often along utility, railroad, drainage, or nature corridors. They offer non-motorized transportation and recreation opportunities not provided by the road system. While they are generally considered the most comfortable bicycle facility for the average bicyclist, they are often less direct than on-street facilities. Examples of off-street trails in Greeley include the Poudre River Trail and the Sheep Draw Trail. Off-street trail connections and completions are planned for the near future for both of these trails.

Figure 2-15: Off-street trail in Greeley, Poudre River Trail

Figure 2-16: Typical off-street trail

Sidepaths

Sidepaths (called out as "Shared Use Paths" on Greeley's Bikeways map) are shared use paths that are within the roadway right-of-way but are separated from the street by a curb or median. They differ from sidewalks in that they are wide enough for bicycle and pedestrian use, are generally designed to slightly different standards than sidewalks, and have been designated as bicycle facilities due to the critical connections they provide in the bicycle network. Sidepaths may be more comfortable for some bicyclists to use than sharing the roadway, typically and especially on high traffic and higher speed roads and for less experienced bicyclists. Bicyclist speed on sidepaths can be lower than on dedicated or on-road facilities because of the frequency of driveways and slower speeds of other users on shared use paths. In addition, where sidepaths cross a driveway or intersection, drivers may be less likely to anticipate a bicycle travelling potentially from the "downstream" direction on what appears to the driver as a sidewalk. Because of this additional vehicular interaction concern and because bicycle intersection turning movements are more complicated while riding a bicycle on a sidepath, these facilities are less likely to be used by experienced bicyclists and commuters who are comfortable riding on the roadway. Sidepaths are present in Greeley primarily on major grid roads, such as 47th Avenue, 35th Avenue, and 20th Street.

Figure 2-17: Sidepath in Greeley along 4th Street

Figure 2-19: Sidepath in Greeley along 47th Avenue

Figure 2-18: Typical sidepath

Subdivision Trails

Subdivision trails are shared use paths not managed by the city that are constructed as part of a specific development (usually a residential neighborhood). These trails are sometimes not designed to a particular width or material standard and, although they can serve as critical connections in a bicycle network, are generally used as connector trails that allow residents to make beginning and end of trip connections from the city network to their place of residence.

Mountain Bike Trails

Greeley's Mountain View Bike Park and Open Space has a mountain bike skills park in addition to a flat trail that is suitable for all users, regardless of skill level. The Park is located on the west side of Greeley, between the Farr Library and the Greeley Youth Sports Complex on 20th Street & 65th Avenue in open space owned by the city with about three miles of trails and skills courses for mountain bikes. It was built and maintained for a period of time by the now defunct Greeley Trails and Open Space Foundation. The area is free to all users and open to any non-motorized recreation. The future of this facility is currently under discussion because of lack of a supervisory organization for maintenance and upkeep.

Overall Network Description

The Greeley street system is set up on an approximately one-mile grid system, with major arterial streets spaced at approximately one mile intervals. Minor arterials, collectors, and local streets follow varying spacing depending on area of the city. In and around the downtown area, most local and collector roadways follow a more urban, grid pattern similar to many western cities developed in the late 19th century, while local and collector roadways outside of downtown (primarily residential areas to the west) developed in a more suburban, less connected pattern. As a result, bike facilities generally follow arterial streets in the grid pattern on the west side of town, often in the form of sidepaths, and minor grid streets in and around downtown, often in the form of bike lanes and shared lanes. Primary east-west bicycle facilities generally travel through only a portion of the city with very few facilities running the length of the city, while a number of the north-south facilities run from one edge of the city to the other. There are very few bicycle connections across the US 85 and US 34 corridors to serve regional bicyclists and residents in the eastern-most and southern-most portions of the city. Although crossing many of the arterial streets in Greeley can be uncomfortable for the average rider, 10th Street to the west of downtown is the biggest barrier within the city due to its one-way couplet configuration in the middle of the city and its larger width and higher speeds to the west.

Off-street trails are present primarily on the north side of the city and, with the exception of a facility on the University of Northern Colorado campus, have been constructed exclusively towards the edges of the city. There are only three bicycle facilities, one north of downtown, and two on the west end of town, that connect the city network with the Poudre River Trail. Many neighborhoods on the west side of town have installed subdivision trails that serve neighborhood residents wishing to bicycle recreationally.

Figure 2-20: Bicycle parking at Public Works on its first day after installation (Note: rack was re-oriented shortly after)

The only existing regional bicycle facility connecting to Greeley is the Poudre River Trail, which runs from Greeley, its eastern terminus, to the west through Windsor. This trail has planned connections to the east and northwest. Additional regional trails such as the Greeley/LaSalle trail, South Platte/American Discovery trail, US 34 Trail, and the Great Western trail are planned or underway in areas around and within the city to serve needs of more regional users (see NFR MPO Regional Bicycle Plan for more information). Although only one regional bicycle facility connection currently exists in Greeley, it should be noted that bicyclists often utilize the network of state and county roads, many of which have little or no shoulder, surrounding Greeley for recreation and regional travel.

Existing Support Facilities

Bicycle Short and Long Term Parking

Bicycle parking is provided at many area businesses, schools, and residential complexes. Government and community buildings such as the Recreation Center, the Lincoln Park High Plains Library, and the Greeley Public Works department have installed a variety of bicycle racks in locations ranging from entryways to parking spaces.

The city recently completed a bicycle parking inventory to use as a baseline

in determining bicycle parking capacity in relation to potential demand and for comparison in the future as bicycle support facilities improve. Bicycle parking racks and spaces counted included 1,565 spaces at 163 locations (82 unique locations). Of these spaces, 683 (44%) are on the UNC campus. Bicycle parking locations throughout the city are shown in figure 2-21 as red dots.

Traffic Signal Bicycle Detection

Bicycle detection is provided at some traffic signals in Greeley, allowing bicyclists to "trigger" the traffic signal similar to a vehicle. Intersections that have specific bicycle detection zones (outside of the vehicular zones) include 28th Avenue at 10th Street and 83rd Avenue at 10th Street. In locations where existing detector systems allow it, traffic signal controllers are programmed to detect bicycles, but not all locations have been programmed in this way, and not all controllers in the city have this capability. In addition, Greeley has many older loop detectors which aren't capable of bicycle detection.

Bicycle Counts

In 2010, the City of Greeley purchased infrared bicycle counters to track bicycle usage of city facilities. Results of initial counts (conducted at trailheads) are listed in Table 2-6. The city intends to continue counting bicycle and pedestrian volumes in locations throughout the system.

Table 2-6: Bicycle and Pedestrian Counts in Greeley

Location	Daily Average	Peak Day Volume	Peak Day	Count Month
Poudre River Trail at Island Grove Trailhead	69	211	Monday	January
Poudre River Trail at 25th Ave Trailhead	72	335	Sunday	January
Poudre River Trail at 35th Ave Trailhead	149	437	Sunday	May
Poudre River Trail at 35th Ave Trailhead	240	403	Saturday	July

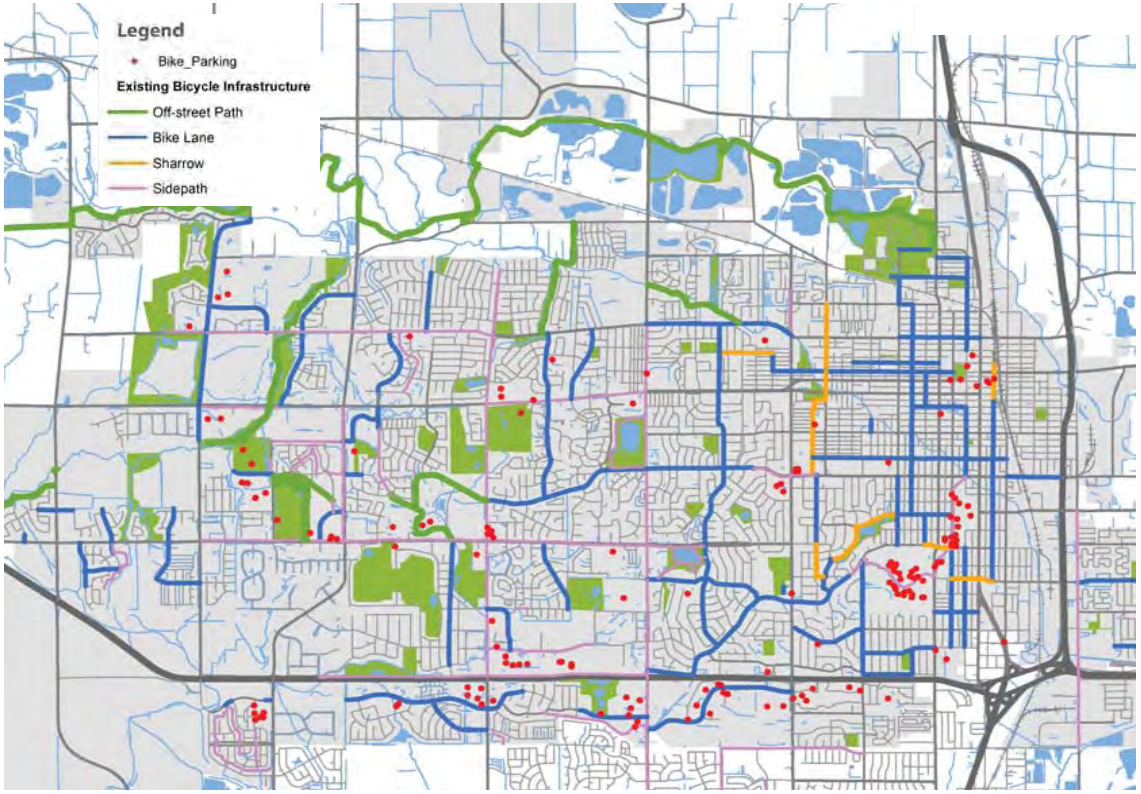


Figure 2-21: Bicycle parking locations in Greeley

Bikes on GET Buses

The Greeley Evans Transit (GET) system currently utilizes 26 buses (18 medium sized buses and eight paratransit vans) running on six fixed routes travelling throughout Greeley, Evans, and Garden City. Buses generally operate Monday through Friday for extended hours and on Saturday during daytime hours, with headways ranging from 20 minutes to 60 minutes. There are two major transfer points, one in downtown Greeley and one near the Greeley Mall. GET also operates an after-hours Call-N-Ride service (with advanced scheduling) Monday through Saturday until 9:00 pm and Sunday from 7:45 am to 1:45 pm. In addition, GET has an intergovernmental agreement with the University of Northern Colorado to provide bus service on the UNC campus.

GET buses have fold-down bicycle racks for two bicycles on the front of each of the 18 medium sized buses. However, bicycles are not allowed inside GET buses. In addition, GET buses are currently all high-floor buses requiring multiple steps to enter, making getting a bicycle on board very difficult even if they were allowed. GET tracks ridership and bicycle counts by stop regularly (see Table 2-7), and bicycle ridership on GET buses varies from approximately 20 bicycles per month to over 500. The routes with the heaviest bicycle ridership are the orange route, which serves lower income areas on the east side of the city and the red line, which serves the far west side of the city.

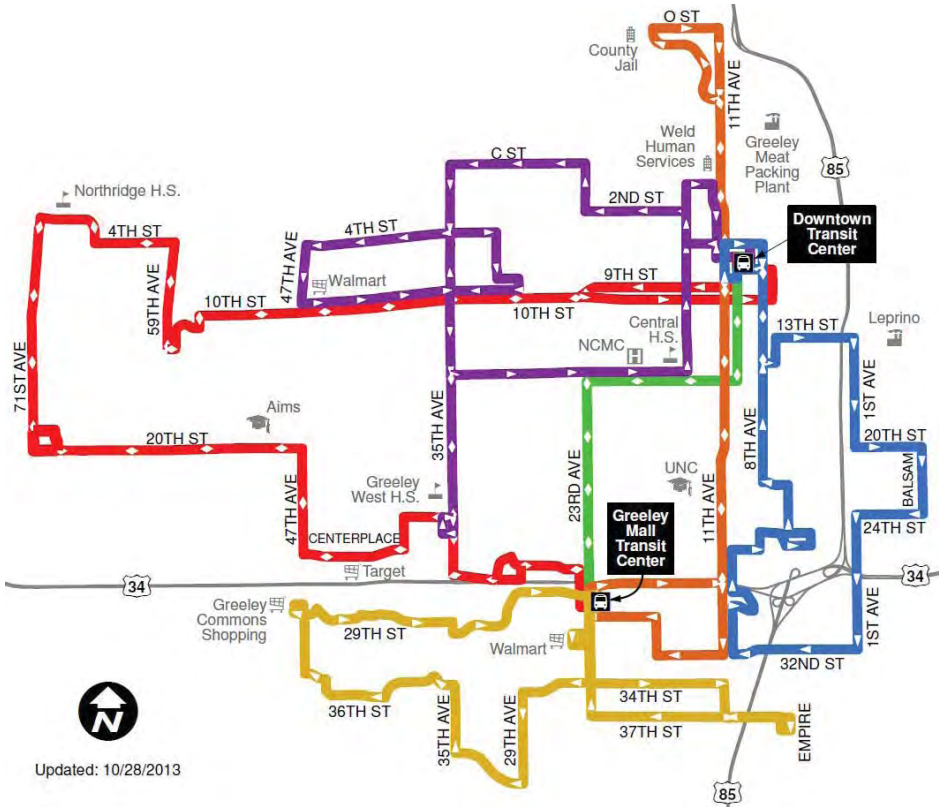


Figure 2-22: GET route map

Figure 2-23: Bicyclist boarding GET bus

Table 2-7: Bicycles on GET Buses

Route	Number of Bike Boardings*
Blue	247
Gold	101
Green	284
Orange	2280
Purple	84
Red	840
UNC Boomerang	52

*Count Period: January 1, 2014 - April 30, 2014

Maintenance

Sweeping

The City of Greeley Streets Division provides sweeping services for the on-street bike facilities at the same interval as the streets following a regular sweeping schedule. Arterials are swept eight times per year; residential streets east of 47th Avenue are swept five times per year; residential streets west of 47th Avenue are swept three times per year. Leaves are swept in the fall and spring. Roadways and bike lanes are also swept upon specific complaint or request.

Off-street bike facilities such as sidepaths and shared use trails, with the exception of the Poudre River Trail, are swept by the City Parks and Recreation Department. Although there is no written sweeping policy, paths are swept on an as-needed basis or within 48 hours of a severe storm that has brought debris onto the off-street trail.

The Poudre River Trail is managed and maintained by Poudre River Trail Corridor, Inc which is a local, non-profit organization. Maintenance activities for this off-street trail are completed in a similar manner to other off-street trails in Greeley, with sweeping completed within a few hours after mowing and on an as needed basis.

Snow Removal

Snow removal for Greeley bicycle facilities is completed in a manner similar to street sweeping, with the City of Greeley Streets Division plowing the on-street bicycle facilities when the street is plowed, following roadway plowing requirements and frequency.

Sidepaths and shared use trails are plowed by the City Parks and Recreation Department in accordance with city ordinance. Ordinance states that plowing should take place within 24 hours of the end of a snow storm; however, plowing is usually completed within the same day as the storm.

The Poudre River Trail is plowed by Poudre River Trail Corridor, Inc. within 24 hours of any storm that accumulates three inches or more of snow. Snow from storms less than three inches is not plowed.

Pavement Management

Public Works develops a pavement management plan every year that determines which roadways and locations will be designated for overlay, chip seal, or reconstruction. Because of the nature of roadway wear, this plan is fluid and is revisited and adjusted throughout the year. In the recent past, roadways designated for major maintenance (overlay, chip seal, or reconstruction) have been considered for lane reductions to determine if "right sizing" the roadway by narrowing or repurposing the lanes and installing bicycle lanes would provide a more balanced roadway that serves all user modes. Potholes in roadways and shared use paths are patched by their respective departments on a bimonthly basis and as necessary.

Drainage grates are inspected annually in the fall and after storm events, and are replaced as needed.

Figure 2-24: Winter protected bike lane maintenance in Salt Lake City

Program Highlights

Encouragement - Bike Rodeo. In Spring of 2013, the city's traffic engineering department began hosting bicycle rodeos to teach children key bike handling skills and rules of the road through a series of drills and obstacle courses. Bicycle rodeos have been held at the Poudre River Trail-athon for the past few years.

Figure 2-25: Bike rodeo at public meeting #2

Enforcement - Police Officer Training. The Greeley Police Department officers go through a bicycle component as part of their basic academy training so that they are familiar with how the law applies to bicycling.

Figure 2-26: Police officer bicycle training

Existing Programs Summary

In addition to the natural and built environment, the social environment in the form of bicycling programs and resources helps to create, engage, and sustain a bicycle friendly community. A useful framework for describing the categories into which such resources fall is the five E's: Engineering, Education, Encouragement, Enforcement, and Evaluation. While the first E represents physical infrastructure (described in "Existing Facilities" section), the last four include primarily programmatic elements. A review of the existing programmatic bicycle environment in Greeley gives a baseline for the planning effort to build on and learn from. The following programs and resources currently exist in the City of Greeley for Greeley area residents. Although a number of programs (noted within) have been very successful, most programs have not been developed to their full potential due to lack of staffing available to coordinate and perpetuate the programs. Details of each existing program, its successes and the organization currently driving the program are found in Appendix B.

Education

Education programs teach bicyclists of all ages how to ride safely on the road, including bicycling skills, bicycle-related laws, and how to interact with other modes of traffic. Some education programs also teach drivers how to safely share the road with bicyclists.

- Bike Rodeos
- Adult Education
- Public Service Announcements
- Share the Road Training

Figure 2-27: Bike rodeo at Trail-athlon

Enforcement

Enforcement programs, typically spearheaded by law enforcement agencies, improve the safety of bicyclists by enforcing laws and behaviors that contribute to comfortable bicycling environments.

- Police Officer Training
- Targeted Enforcement
- Bicycle Theft Services
- Bicycle Registration and Licensing

Figure 2-28: Police officer enforcement and encouragement station on trail

Encouragement

Encouragement programs motivate new riders to try bicycling. From marketing campaigns to group rides, encouragement programs aim to improve potential and existing bicyclists' confidence in their ability to use bicycling as a transportation and recreation option and to increase the perception that bicycling is a safe and efficient activity. Events and programs in the City of Greeley do not have a centralized person, department, or organization through which they are coordinated, making advertising, scheduling, and organizing significantly more burdensome for the individuals who do coordinate events.

- Bicycle Friendly Community – Bronze
- Bicycle Clubs and Shops
- Bicycle Resource Website (www.GreeleyBikes.com)
- Community Group Rides
- National Bike Month Celebration
- SmartTrips of Northern Colorado
- Green Government Bikes
- Greeley Bicycle Advocacy Group

Evaluation

Evaluation programs measure and evaluate the impact of projects, policies and programs. Typical evaluation programs range from a simple year-after-year comparison of US Census Journey to Work data to regular bicycle counts and community surveys. The City of Greeley doesn't currently have any evaluation programs or procedures in place, and as a result does not have any before and after comparisons of bicycle programs and facilities implemented to date.

- Bicycle Counts
- Bicycle Parking

Figure 2-29: Bicycle count and survey

Existing Plans and Documents Summary

Plans and documents prepared by local and regional agencies provide a background on current and past goals, efforts, and plans for bicycling in the city and region as well as a framework for future planning and development. Review of these plans and documents serves as a way of identifying potential future project partners and providing background support for future grant applications.

A decade of regional and local planning and policy documents were reviewed as part of this planning effort. Very few of the efforts are directly related to bicycle planning. Yet, all levels of land use, transportation, and urban design must be considered together as it's their coordination, or lack thereof, that ultimately determines the appeal of bicycling for recreation, transportation, and utility purposes.

See Appendix B for more information on existing plans and documents.

Bicycle Plans

North Front Range Regional Bike Plan
Agency: North Front Range Metropolitan Planning Organization (NFRMPO)
Date Published: 2013

North Front Range Bike Plan Survey
Agency: North Front Range MPO
Date Published: 2012

League of American Bicyclists Feedback Report
Agency: League of American Bicyclists
Date Published: 2013

Open Space and Trails Plans

Parks, Trails, and Open Lands (PTOL) Plan
Agency: City of Greeley
Date Published: Adopted August 20, 2013

Greeley Parks and Trails Master Plan
Agency: City of Greeley
Date Published: 2002

City of Greeley Conceptual Trails Plan
Agency: City of Greeley
Date Published: 2002

Transportation Plans

2035 Comprehensive Transportation Plan
Agency: City of Greeley
Date Published: 2011

North Front Range MPO Regional Transportation Plan
Agency: North Front Range MPO
Date Published: 2011

2040 Statewide Transportation Plan (in progress)
Agency: CDOT
Date Published: Anticipated 2015

Greeley Evans Transit Transfer Center Design and Route Planning (in progress)
Agency: City of Greeley
Date Published: In progress

Comprehensive/Land Use Plans

Greeley's Comprehensive Plan – 2060: Ideally Greeley
Agency: City of Greeley
Date Published: 2011

Policy and Design

City of Greeley 2014 Street Maintenance Program
Agency: City of Greeley
Date Published: 2014

City of Greeley Street Design Criteria and Construction Specifications
Agency: City of Greeley
Date Published: 2008

University of Northern Colorado Bicycle Regulations
Agency: University of Northern Colorado (UNC)

CHAPTER 3: NEEDS ASSESSMENT

Needs Assessment

The need and demand for a more accessible, safe, and functional bicycle system is apparent throughout Greeley. This need has been clearly articulated by community residents who attended open house meetings and provided input through the web-based survey and mapping exercises as well as email and in-person input provided by citizens directly to city staff and the project team. Responding to the need is becoming increasingly important given shifting views on active transportation. The benefits of a more bicycle-friendly community with an increased number of bicyclists show the positive existing and potential future impacts to public health, air quality, transportation, and recreation. Public meeting and survey input, team observations, and network analysis revealed network deficiencies, needs, and opportunities in the city's current bicycle network, presenting a strong case for potential improvements.

The information in this chapter summarizes the process used to solicit input from the public, work with an internal review team, and analyze existing bicycling-related data to identify the gaps and barriers to bicycling in Greeley. This approach results in a physical and data-based framework that guided development of the master plan. This chapter covers the following:

- Needs and Types of Bicyclists
- Summary of Public Input
- Bicycle Suitability Index Analysis
- Crash Analysis
- Economics and Health Benefits Analysis
- Gaps and Barriers Identification and Analysis

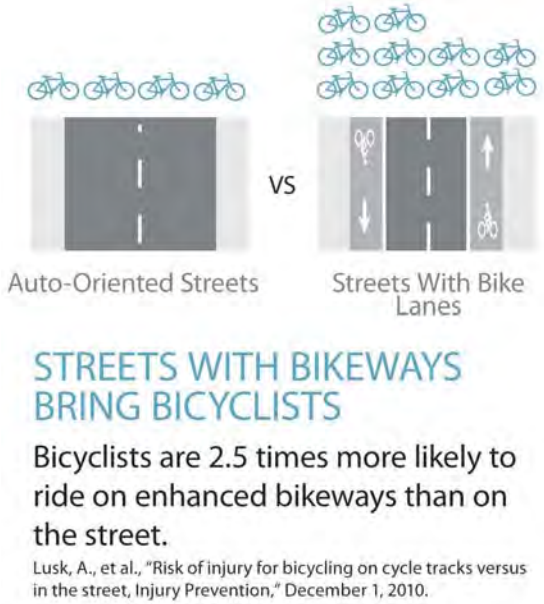


Figure 3-1: Bikeway streets bring bicyclists

Needs and Types of Bicyclists

Similar to motor vehicles, bicyclists and their bicycles come in a variety of sizes and configurations. This variation ranges from the type of bicycle a bicyclist chooses to ride to the behavioral characteristics and comfort level of the bicyclist. Bicyclists by nature are much more sensitive to poor facility design, construction, and maintenance than motor vehicle drivers.

Bicyclist skill level also leads to a dramatic variance in expected speeds, traffic tolerance, and behavior. Several methodologies for classifying bicyclists are currently in use within the bicycle planning and engineering professions. These classifications can be helpful in understanding the characteristics and infrastructure preferences of different bicyclists. Historically, the most conventional framework classified the "design bicyclist" as Advanced, Basic, or Child.

In 2012, the American Association of State Highway and Transportation Officials' Guide for the Development of Bicycle Facilities consolidated these three categories to into two: "Experienced and Confident," and "Casual and Less Confident." Both of these methodologies at the federal level consider only existing bicyclists and do not examine the American population as a whole, particularly those who do not currently bicycle but have interest.

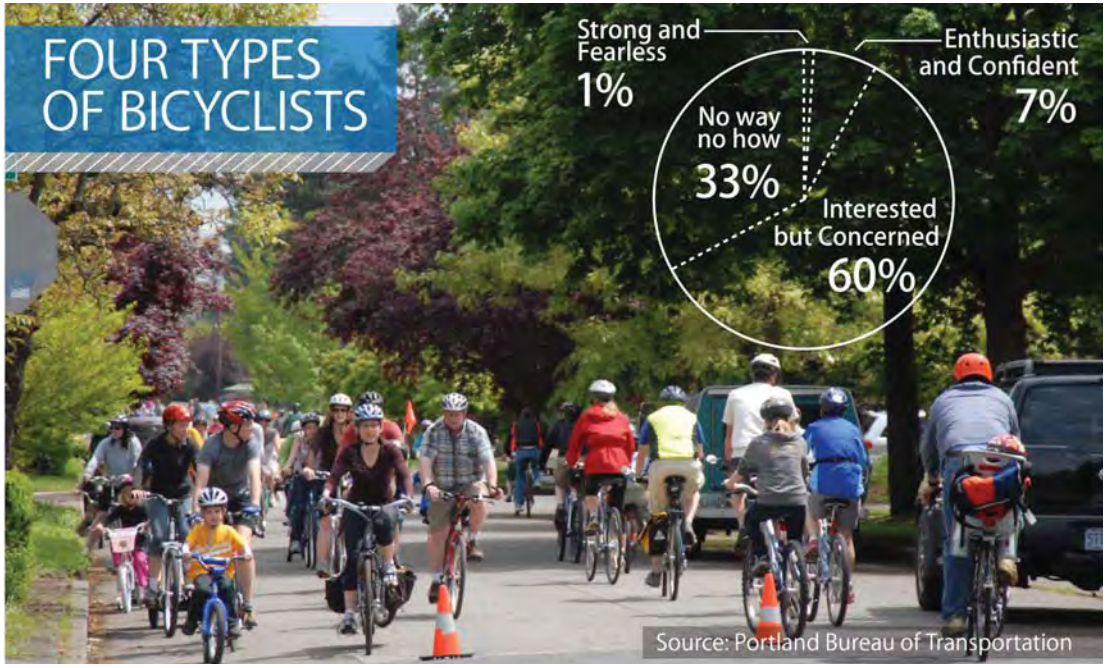


Figure 3-2: Types of bicyclists

A third methodology has been developed by planners in the City of Portland, Oregon and is supported by data collected nationally since 2005.

Strong and Fearless: These users will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes, and will typically choose roadway connections.

Enthused and Confident: This user group encompasses "intermediate" bicyclists who are fairly comfortable riding on all types of bicycle facilities, but usually choose lower-volume streets or shared use paths when available. These users may choose a longer route to ride on a preferred facility.

Interested but Concerned: This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or shared use paths under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling,.

No Way, No How: (approximately 30 percent of population): Persons in this category are not bicyclists, and perceive severe safety issues with riding in traffic.

Bicyclist type within a city varies widely based on residents' previous bicycle facility exposure and experience and city population makeup. University cities such as Greeley offer a special environment that varies significantly from the rest of the nation and even the general population within the same city. Students, faculty, and staff on university campuses typically walk and bicycle in much higher numbers than their counterparts elsewhere.

Public Input - Survey and Mapping Results

During the existing conditions phase, survey and online mapping data were collected through Survey Monkey and Wikimaps interfaces. 367 surveys were collected. See the Public Involvement Summary in Chapter 1 and Appendix A for more information.

Online mapping data included input on point of origin, destinations, need for bicycle parking, conflict areas or points, and gaps in the current network. Participants were also asked to add line segments to the map where they like to ride and feel comfortable, where they ride often but do not feel safe, where they would like to ride if improvements were made, and where they feel no one should ride. A sample of these maps are shown in figure 3-3 to give perspective on breadth of comment locations and types. This data has been incorporated into the figure 3-20 later in this chapter.

The survey, which was open from mid-June to mid-August 2014, contained questions for the respondent about what type of bicyclist they are, how often they ride, and factors that keep them from riding more as well as questions on what type of facilities and programs would get them out riding more in Greeley in the future.

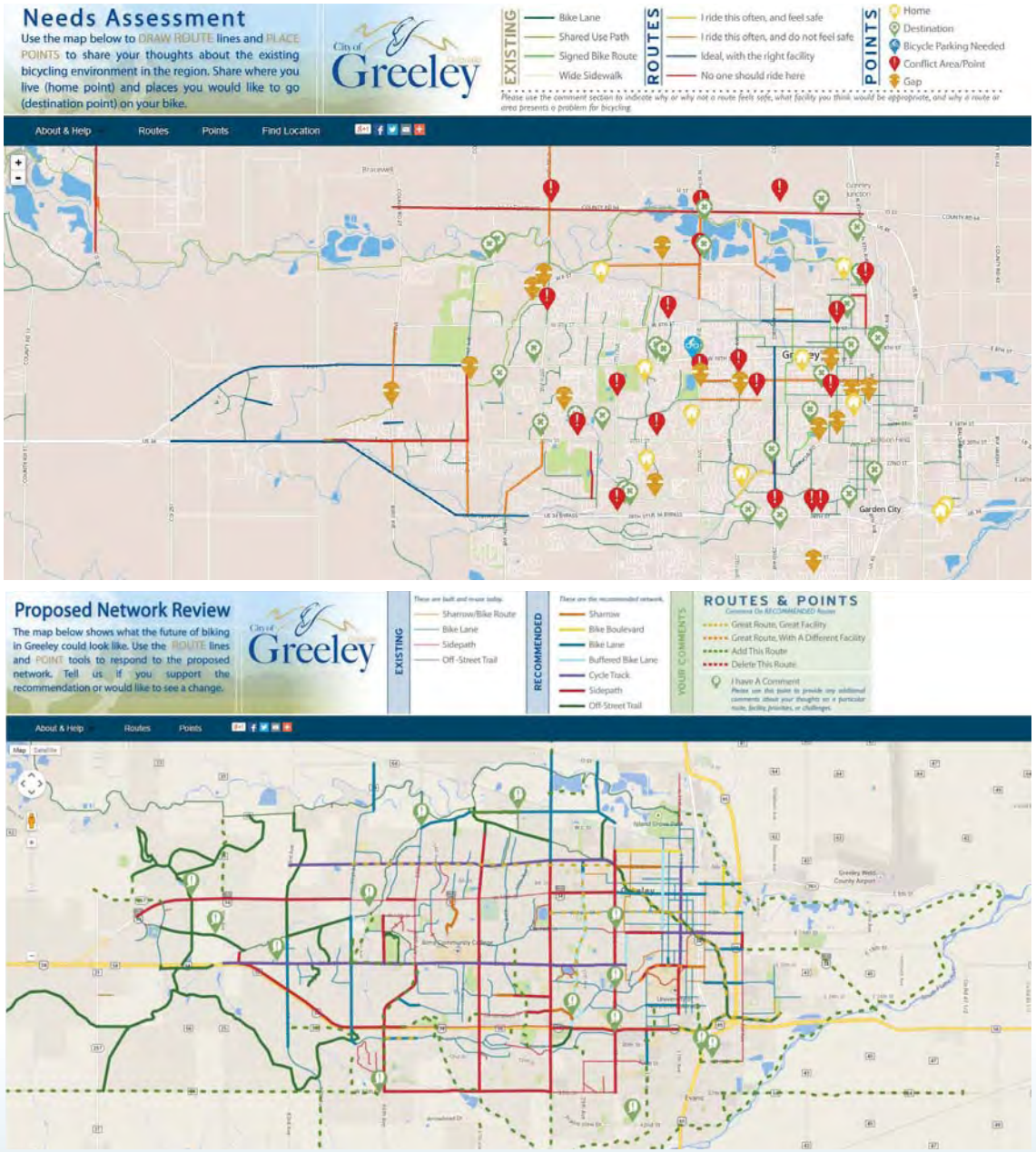
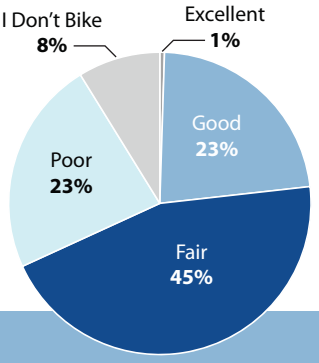


Figure 3-3: Interactive mapping results from existing conditions and recommendations phase

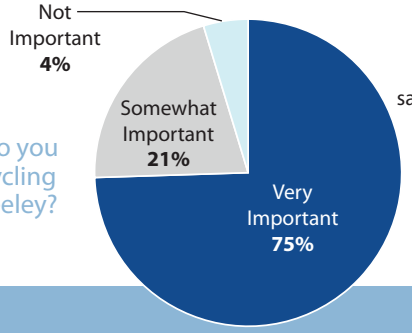
Survey Results

Bicyclists in Greeley are growing in number, and despite bicycling conditions perceived as only fair, residents are excited to see improvements to Greeley's bicycling network and programs.

How do you rate your present bicycling experience in Greeley?



How important to you is improving bicycling conditions in Greeley?



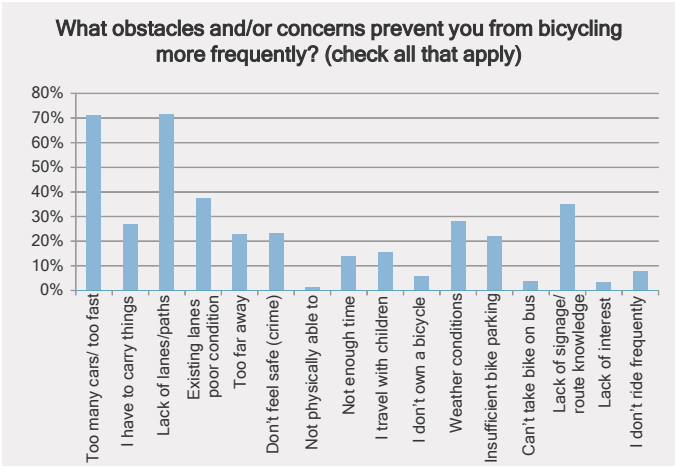
75% say **Improving Conditions** is **VERY IMPORTANT**

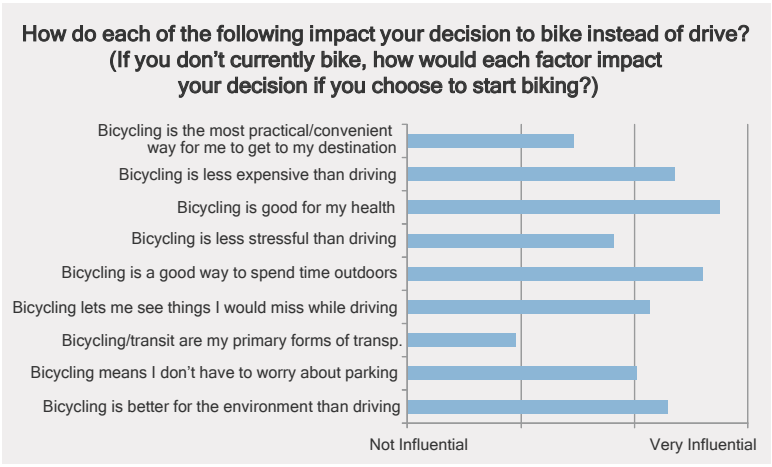
The Takeaway:

The current attitude in Greeley shows that the community is experiencing a window of opportunity with significant support for much-needed improvements to bicycle facilities and programs. Residents and business owners are concerned that neglecting to build upon the current momentum will result in lost opportunity and frustrated community members.

Why We Bike (or Don't Bike)

Residents bicycle for a variety of reasons from transportation to recreation and exercise, and voice concerns centered around perceived safety issues.





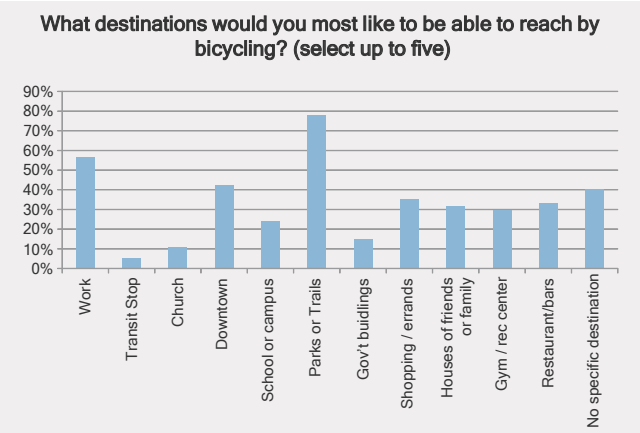
The Takeaway:

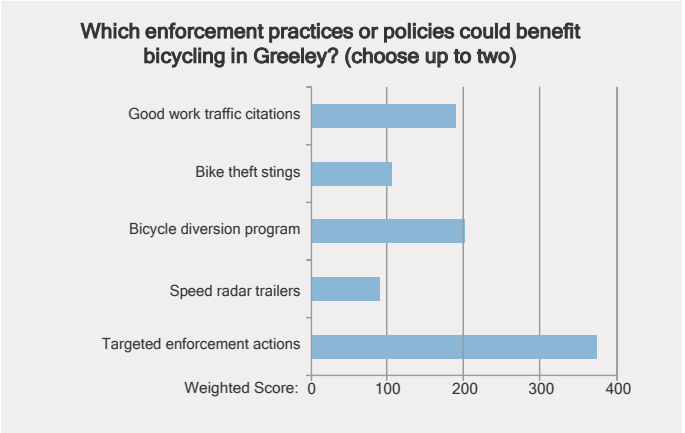
While a portion of the population uses bicycling as a form of transporation, a larger portion of Greeley bicyclists primarily enjoy the recreational and trail opportunities Greeley offers. Many residents feel that non-trail bicycling conditions in Greeley feel unsafe. As a result, proposed improvements should consider designing for a range of experience and comfort levels, and programmatic elements need to address resident on-road safety and comfort concerns.

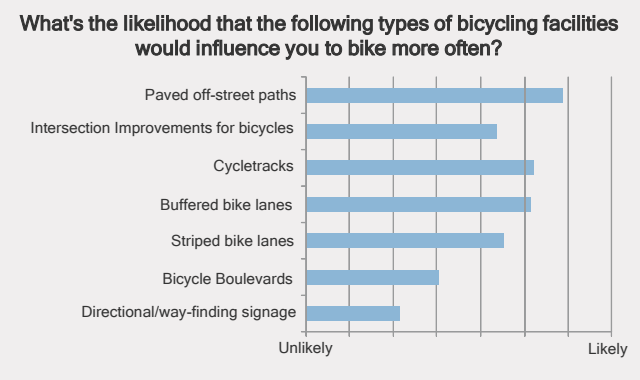
Figure 3-4: Community survey results

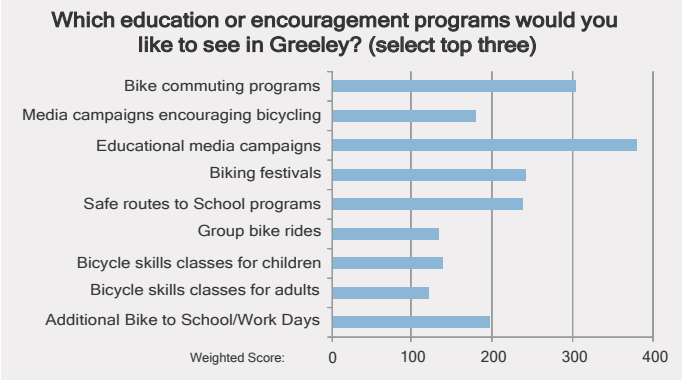
What Could be Better?

Bicyclists in Greeley primarily want to ride to parks, to trails, or to work on facilities that are separated from traffic. They are interested in a wide range of encouragement, education, and enforcement programs.









The Takeaway:

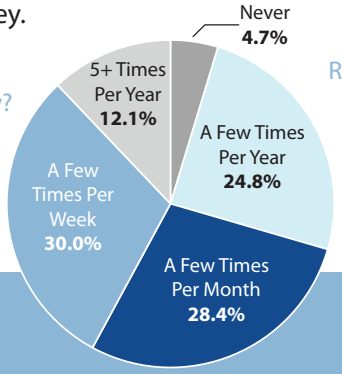
Building primarily bicycle facilities that are separated from traffic will likely increase bicycle ridership in Greeley, creating a stronger core of regular riders. However, designing only trails and separated facilities may be short-sighted in that, as ridership in Greeley grows, demands for more direct, on-street facilities will also likely grow as rider-type and trip purpose shift to include more utilitarian and commute trips. The City cannot establish an entirely off-street system that meets the needs of the whole community. Facilities of all types should be considered during network development.

Figure 3-5: Community survey results

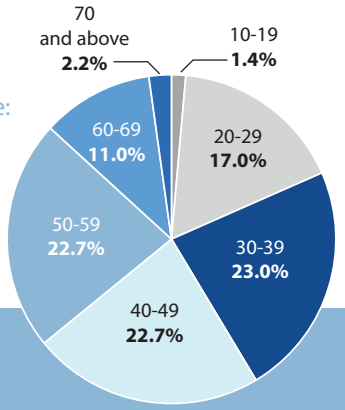
Who We Heard From

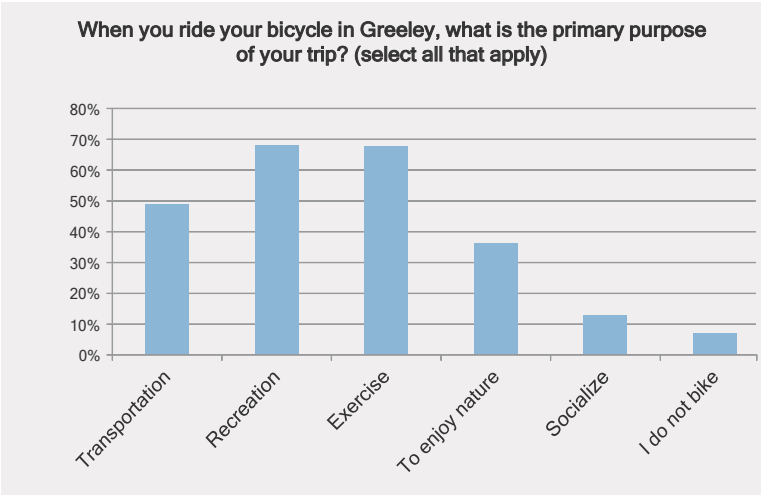
We heard from approximately 370 residents, business owners, students, and visitors. Respondents ranged in age with roughly 80% residing in Greeley.

How often do you bike now?

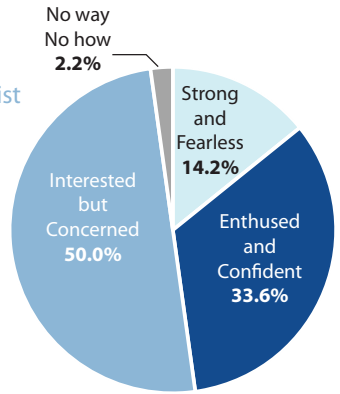


Respondent age:





What type of bicyclist are you?



The Takeaway:

Repondent bicyclists type percentages show that those taking the survey tend to be slightly more experienced bicyclists than the national average, which is not unusual for a voluntary bicycle survey. Acknowledging during the recommendations phase that there is likely a slightly larger population of bicyclists in Greeley that are less experienced and that ride less often will allow us to design for the majority of residents.

Figure 3-6: Community survey results

Bicycle Suitability Index

Model Analysis

The Bicycle Suitability Index (BSI) model utilizes existing infrastructure in a Geographic Information System (GIS) to develop composite demand and supply side models of Greeley.

Data-driven tools such as this were utilized to complement the more subjective input received during public input sessions and through survey and online mapping. Both are critical components to developing a well-rounded data and input-driven plan. More information on methodology for this analysis can be found in Appendix C.

Two tools formed the basis for this analysis:

- Bicycle Demand Analysis (demand) analyzes origins and destinations of resident trips (figure 3-7)
- Level of Traffic Stress (supply) analyzes what physical on-street infrastructure currently exists (figure 3-8)

The resulting Supply and Demand Typologies Model presents an array of potential bicycle and improvement opportunities for Greeley.

BSI provides a general understanding of expected bicycling activity by combining individual spatial analysis representative of where people live, work, play, access public transit and go to school into a composite sketch of demand.

Where people live

includes 2010 census block level population density information. These locations represent potential trip origin locations. More trips can be made in areas with higher population density if conditions are right. "Live" trip hot spots include areas around UNC, Aims CC, Bittersweet Park, neighborhoods east of US 85, and many other residential areas throughout Greeley.

Where people work

is based in 2010 total employment numbers by census block. Depending on the type of job, this category can represent both trip attractors (i.e., retail stores or cafes) and trip generators (i.e., office parks and office buildings) in terms of base employment population. Hot spots for the "work" analysis include the areas around North Colorado Medical Center, Aims CC, UNC, Weld County offices, and downtown, as well as retail areas along US 34.

Where people play

is a combination of varied land use types and destinations. Overlays such as retail destinations and parks contribute to this category. "Play" hotspots identified in this analysis include retail along the US 34 corridor, parks and retail along the 10th Street corridor including the area around Walmart and Bittersweet park, and areas in the downtown core including the trail and civic areas around Lincoln Park.

Where people learn

represents where students K-12, at community college, or at university go to school. Its basis is enrollment data from the Greeley-Evans School District, Aims Community College, and University of Northern Colorado (UNC).

Where people access transit

is assessed by location of bus stops and usage. In this case, the downtown core, the Weld County offices, the UNC area, and portions of the US 34 retail corridor as well as smaller areas along 10th Street and to the east of US 85 are identified as "hot spots."

Composite Demand

The composite demand analysis for Greeley was developed by overlaying the factor maps and applying standard weights to each factor. This analysis shows that the highest potential for bicycle travel demand are near the UNC Campus, the North Colorado Medical Center, Aims CC, the Weld County offices, neighborhoods east of US 85, downtown, and along major commercial corridors such as US 34 (north and south sides) and 10th Street.

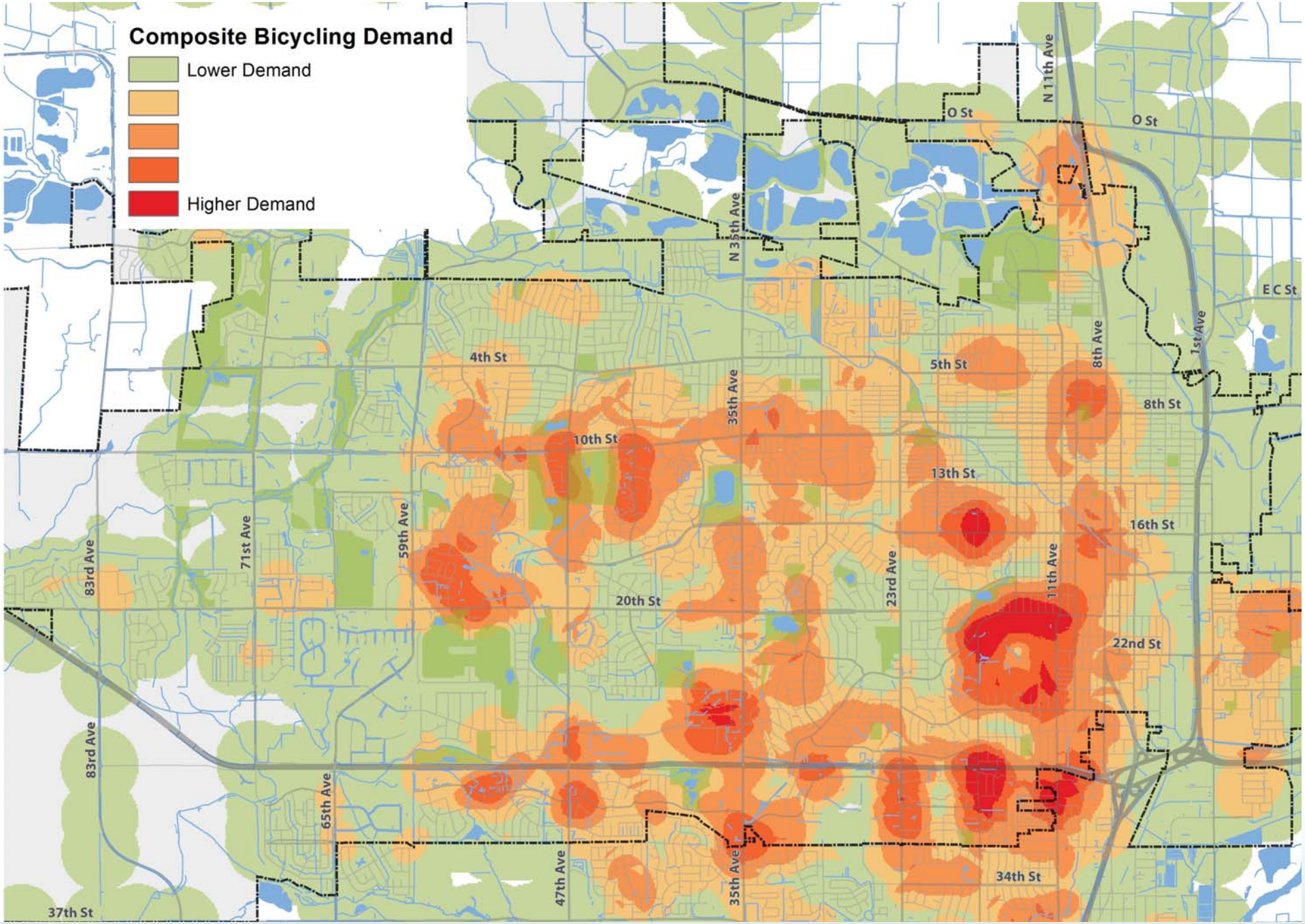


Figure 3-7: Composite bicycling demand heat map

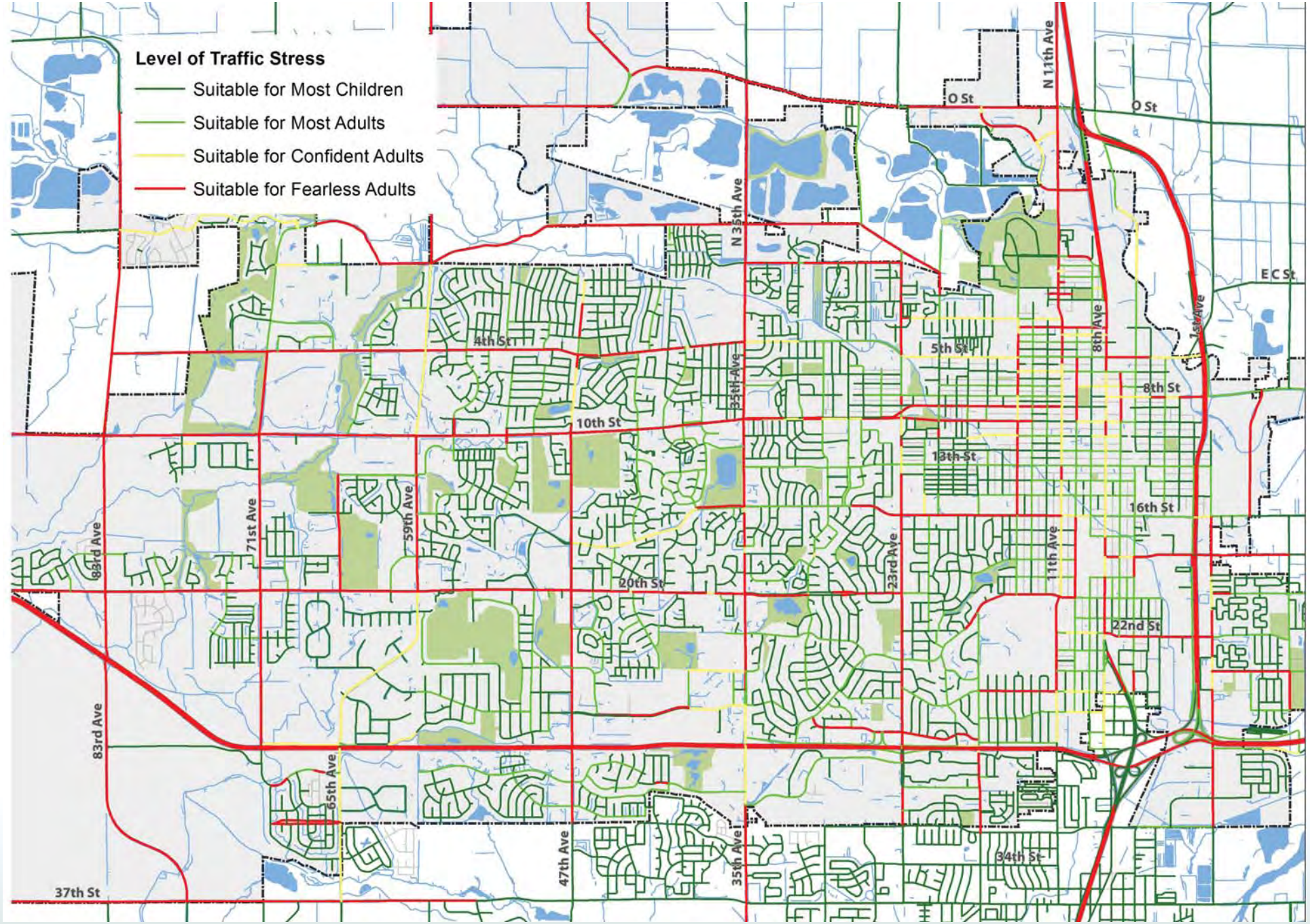


Figure 3-8: Level of travel stress analysis

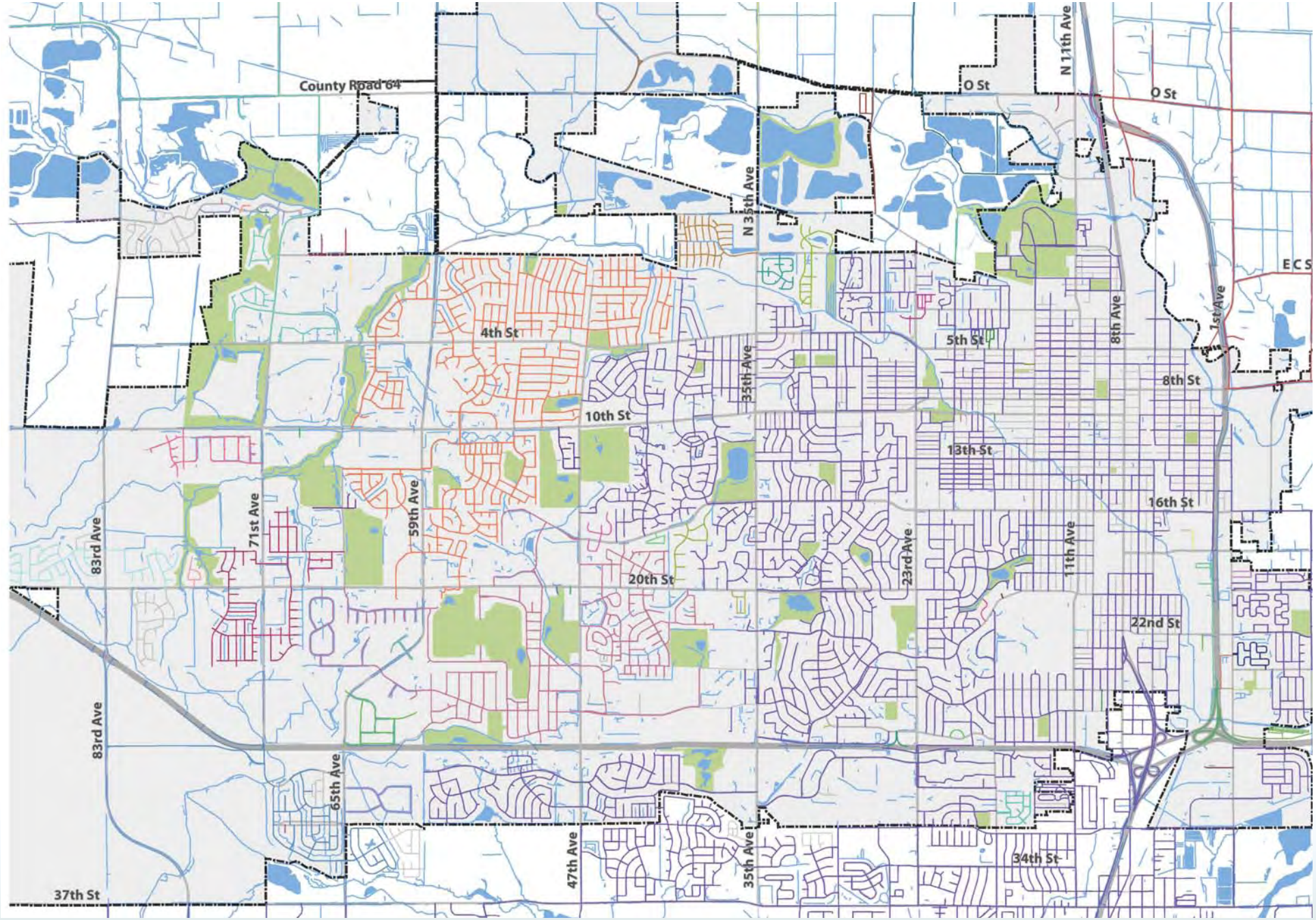


Figure 3-9: Connectivity analysis

Bicycle Conditions – Level of Traffic Stress Analysis

A bicycle network is likely to attract a large portion of the population if its fundamental attribute is low stress connectivity. In other words, a network should provide direct routes between origins and destinations that do not include links that exceed one's tolerance for traffic stress. Each user is different and will tolerate different levels of stress in their journey so these maps should be used as a general guide rather than an absolute truth.

The methods used for the Level of Traffic Stress Analysis were adapted from the 2012 Mineta Transportation Institute (MTI) Report 11-19: Low-Stress Bicycling and Network Connectivity. The approach outlined in the MTI report uses the following variables to classify roadways:

- posted speed limit
- the number (and width) of travel lanes
- the presence of bicycle lanes

In figure 3-8, road segments are classified into one of four levels of traffic stress (LTS) based on these factors.

- LTS 1 is assigned to roads that would be tolerable for most children to ride, and could also be applied to multi-use paths that are separated from motorized traffic (not shown in this analysis)
- LTS 2 roads are those that could be comfortably ridden by the mainstream adult population
- LTS 3 is the level assigned to roads that would be acceptable to current "enthused and confident" bicyclists
- LTS 4 is assigned to segments that are only acceptable to "strong and fearless" bicyclists, who will tolerate riding on roadways with higher motorized traffic volumes and speeds

Connectivity Analysis

While major roadways act as barriers along the roadways and at unsignalized crossings, signals provide a connection for bicyclists to move between low-stress neighborhood roadways. Figure 3-9 displays connected clusters of roadways (shown as one color) that can be traveled without using any link or crossing with a level of stress higher than LTS 2. In downtown Greeley and surrounding neighborhoods where the road network was built in a grid pattern, a large low-stress network is accessible. Outside of this central core, however, low–stress roads have been built without connectivity across major roadways, making travel between neighborhoods inaccessible to most adults.

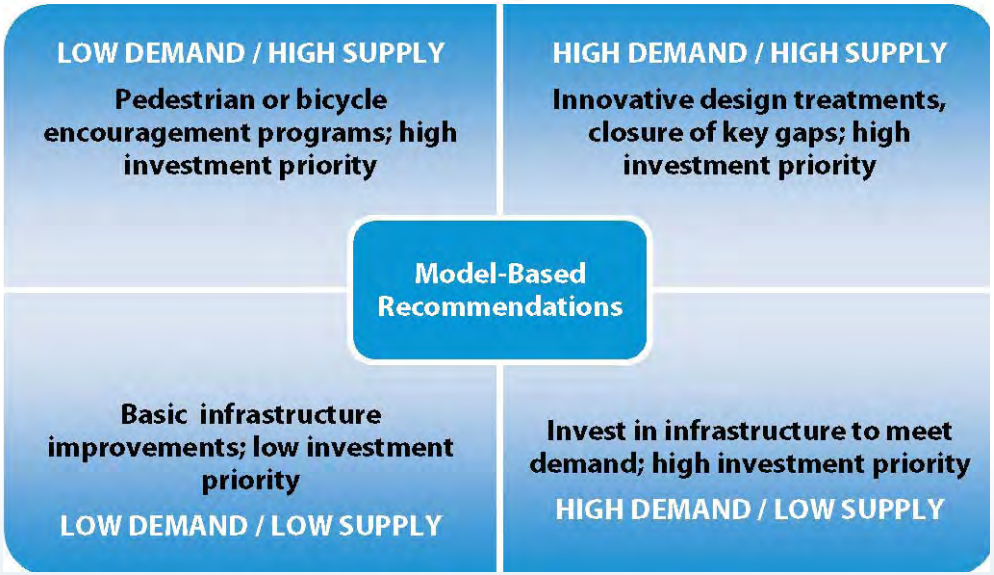


Figure 3-10: BSI model-based recommendations matrix

This display makes apparent gaps in the bicycle network that could be targeted for improvements to connect bicycling routes that are comfortable for the mainstream adult population. Along with improvements along high-stress corridors, safe crossing opportunities across those corridors will greatly increase bicycling mobility.

Bicycle Suitability Index Conclusions

BSI provided a picture of several phenomena:

- Geographic variation in demand - potential activity levels at different Census block corners
- Geographic variation in supply - the quality of the physical pedestrian and bicycle network

Variation in demand and supply are combined into the Composite BSI models. A list of possible bicycle and improvement options is summarized below.

Areas with high demand for bicycling and high supply of suitable infrastructure can benefit from innovative programs and capital projects that further support bicycling, closure of key gaps, and should be considered showcase areas where best practices can be modeled for the region. These areas provide cost-effective opportunities for improvements and should be high priority for investment.

Areas with high demand and low supply of suitable infrastructure can benefit from infrastructure improvements to improve bicycling conditions. These areas may require bicycle facilities or intersection improvements to accommodate high level of demand. They should also be high priority for investment.

Areas with low demand for bicycling and high supply of suitable infrastructure can benefit from programs to encourage bicycling and land use changes or development to increase the density of attractors and generators. These areas should be medium priority for investment.

Areas with low demand for bicycling and low supply of suitable infrastructure can benefit from basic infrastructure improvements. These areas should be low-priority for investments.

Overall the areas of highest demand for bicycling are centered around the University of Northern Colorado, AIMS College, the 10th Street corridor, the downtown area, and the commercial corridor along US 34. Other areas of Greeley are characterized by more modest potential demand.

Most adult bicyclists can circulate comfortably on local and minor collector roadways. Higher order roadways, with speeds exceeding 30 miles per hour, such as the majority of 20th Street or 4th Street, typically act as barriers to bicycling when appropriate bicycle facilities are not provided. Bike lanes decrease the level of traffic stress on many of Greeley's roadways, but enhancing the facilities with bike lane buffers or vertical separation or protection from traffic while also providing a continuous dedicated facility on higher speed or higher volume roadways will further enhance the bicycling experience for all users. Approximately 100 islands of connected facilities exist in Greeley. Concentrating short term facility construction on gap closure between these islands can significantly increase cycling in Greeley.

Figure 3-11: Benefits of separation

Crash Analysis

Safety is another reason to improve bicycling conditions in Greeley and a primary factor to consider in the development of specific recommendations. Although the incidence of crashes involving bicycles in Greeley may not be high, concern about safety is the primary obstacle to bicycling more frequently in Greeley (see "Survey Results").

Perceived safety risks can impact the number of bicycle trips made: A Safe Routes to School (SRTS) survey in 2004 found that 30 percent of parents consider traffic-related danger to be a barrier to allowing their children to walk or bike to school.

Improving bicyclist safety can also be accomplished by increasing the number of people who bike. Installation of protected bike lanes in New York City increased safety for and reduced injuries to all street users by 56%.

A total of 122 crashes involving bicycles were reported in the City of Greeley over a period of four years. Over the same period, there were a total of 8,864 vehicular crashes. Bicycles were involved in just over one percent of total crashes.

Findings

Crashes occurred at 54 different intersections throughout Greeley and did not show concentrations at specific locations. Across the city, there was a 95% increase in reported bicycle related crashes between 2010 and 2011 and then a slight decrease from 2011 to 2012 and 2012 to 2013.

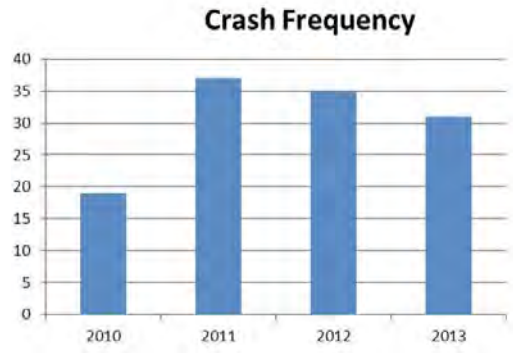


Figure 3-12: Bicycle crash frequency in Greeley

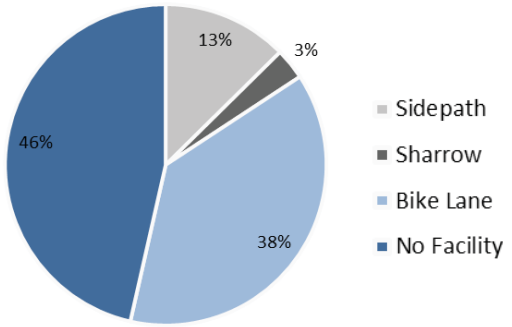


Figure 3-13: Bicycle crashes by facility type

Crash Types

Of the 122 bicycle-related crashes, 34% (42 crashes) were caused by failure to yield to right-of-way. Careless driving was the reported cause for 15% of crashes. The most common crash reported was a "right hook" collision, where a motorist passes a bicyclist on the left and turns right into the bicyclist's path. There were 30 right hook crashes reported.

Of the 122 crashes, approximately 46%, or 58 crashes, reported the bicycle to be the vehicle at fault. The most common crashes with the bicycle at fault were aggressive/careless riding and failure to yield to right-of-way.

Crash Locations

The majority of crashes, 77% or 94 crashes, occurred at intersections or were intersection-related. The location with the highest number of crashes is at the intersection of 20th Street and 23rd Avenue with four total bicycle crashes during the four year period.

Of the total crashes, 46% occurred on roads where there was no biking facility present and 38% occurred on roads where a designated bike lane is present. Although the data shows that 13% of crashes occurred where sidepaths are present, it is not clear whether or not crashes occurred on the shared use path or on the adjacent roadway. No crashes were reported on off-street trails.

Crash Analysis Comparisons and Conclusions

It is fairly difficult to determine the significance of bicycle crash trends or rates of crashes within because of the lack of historic data and limited information about overall bicycle usage within the city. In addition, bicycle crashes have historically been significantly underreported. This is especially so for those that occur with only one person involved, or two bicycles, or even a non-injury crash between a bicyclist and a vehicle. As a result, the primary limitation of crash data is that it studies reported crashes only and does not reflect near-misses, nor does it consistently capture non-injury, or minor-injury crashes.

Other key findings of this crash study include:

- The most crashes occurred when no bike facility was present
- No specific geographic patterns were identified
- Over 75% of the crashes occurred at intersections, indicating a clear need for improved accommodation of bicycles at intersections
- As nearly 50% of the accidents reported that the bicyclist was as fault, additional education of bicyclists (and motorists) may help reduce crashes.

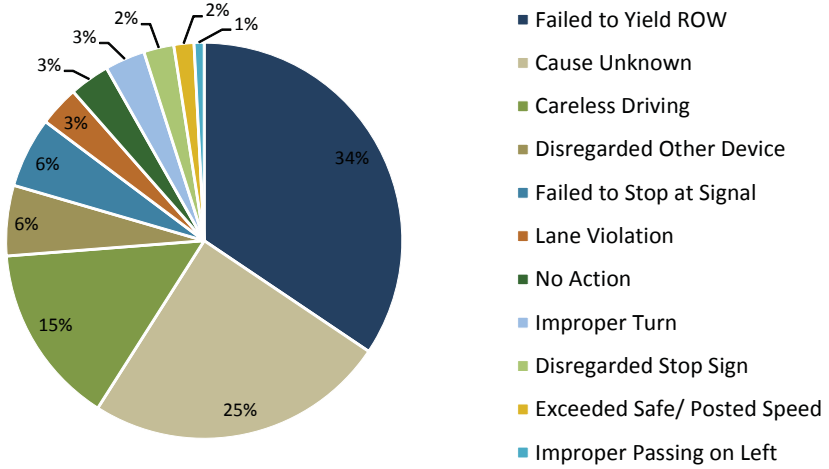


Figure 3-14: Bicycle crashes by cause

To understand common circumstances of safety issues, understanding bicycle volumes and ridership over time is critical. Comparison of annual crashes reported with bicycle volumes (from ACS data and a count program) will allow for crash rate tracking from year to year, providing a better understanding of the relative risk of bicycle crashes. In addition, developing a consistent bicycle crash reporting procedure and implementing that through regular police training will create a more accurate platform for comparison over time and can also increase the practice of reporting minor and non-injury bicycle crashes, giving a more complete picture of bicycle crash patterns in Greeley. For additional information on bicycle crashes in Greeley, see Appendix C.

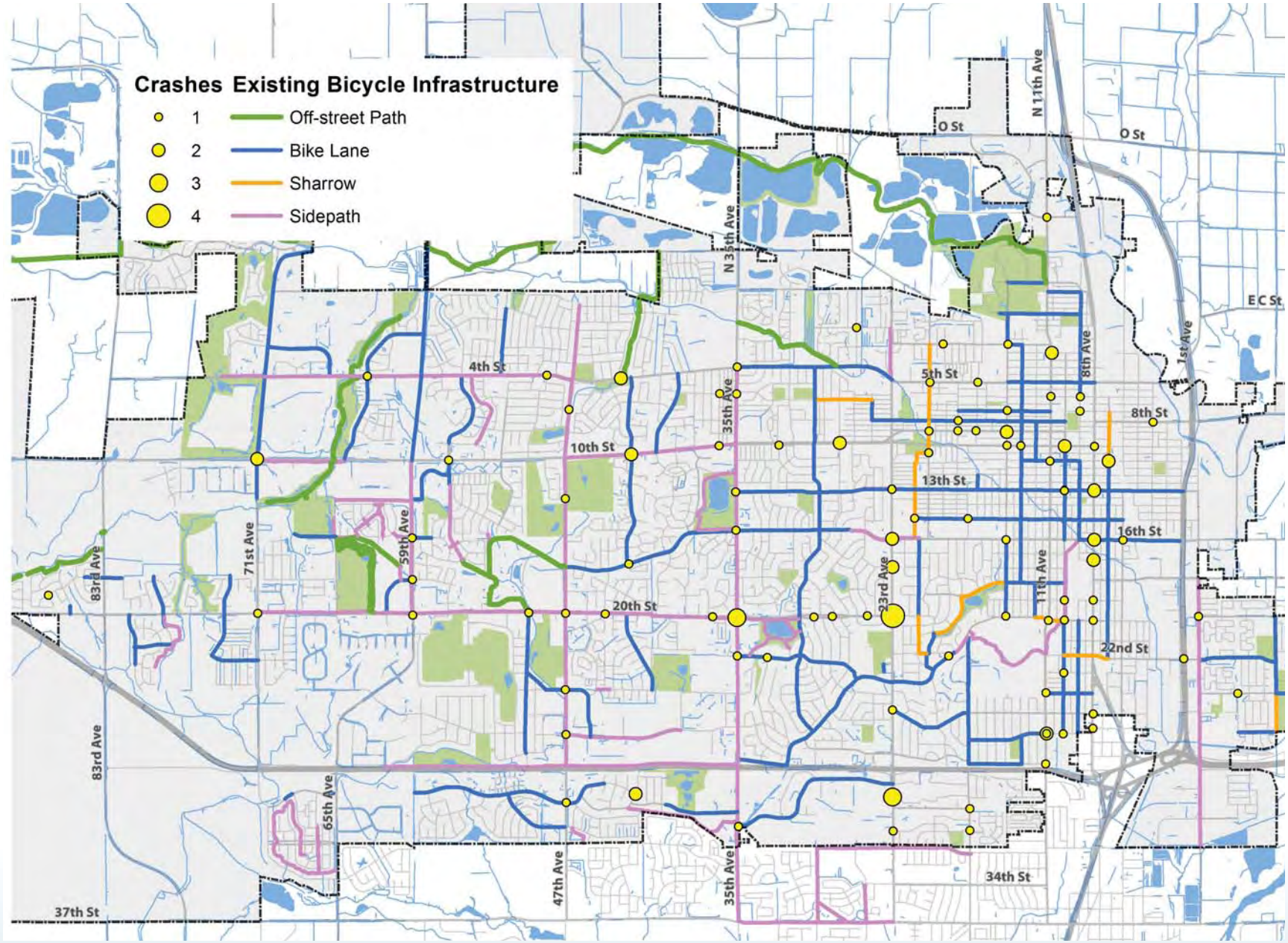


Figure 3-15: Bicycle crash locations

Economic and Health Benefits Analysis

Improvements that encourage bicycling can provide a wide range of benefits to a community and its residents. Better bicycling facilities improve safety and encourage more people to ride, which in turn improves health, provides a boost to the local economy, creates a cleaner environment, reduces congestion and fuel costs, and contributes to a better quality of life and sense of community. Communities across the country are experiencing the benefits of providing a supportive environment for bicycling. With an improved bicycle network, the City of Greeley can become a stronger, more vibrant community by producing benefits in the following areas:

- Health and Safety Benefits
- Economic Benefits
- Transportation Benefits

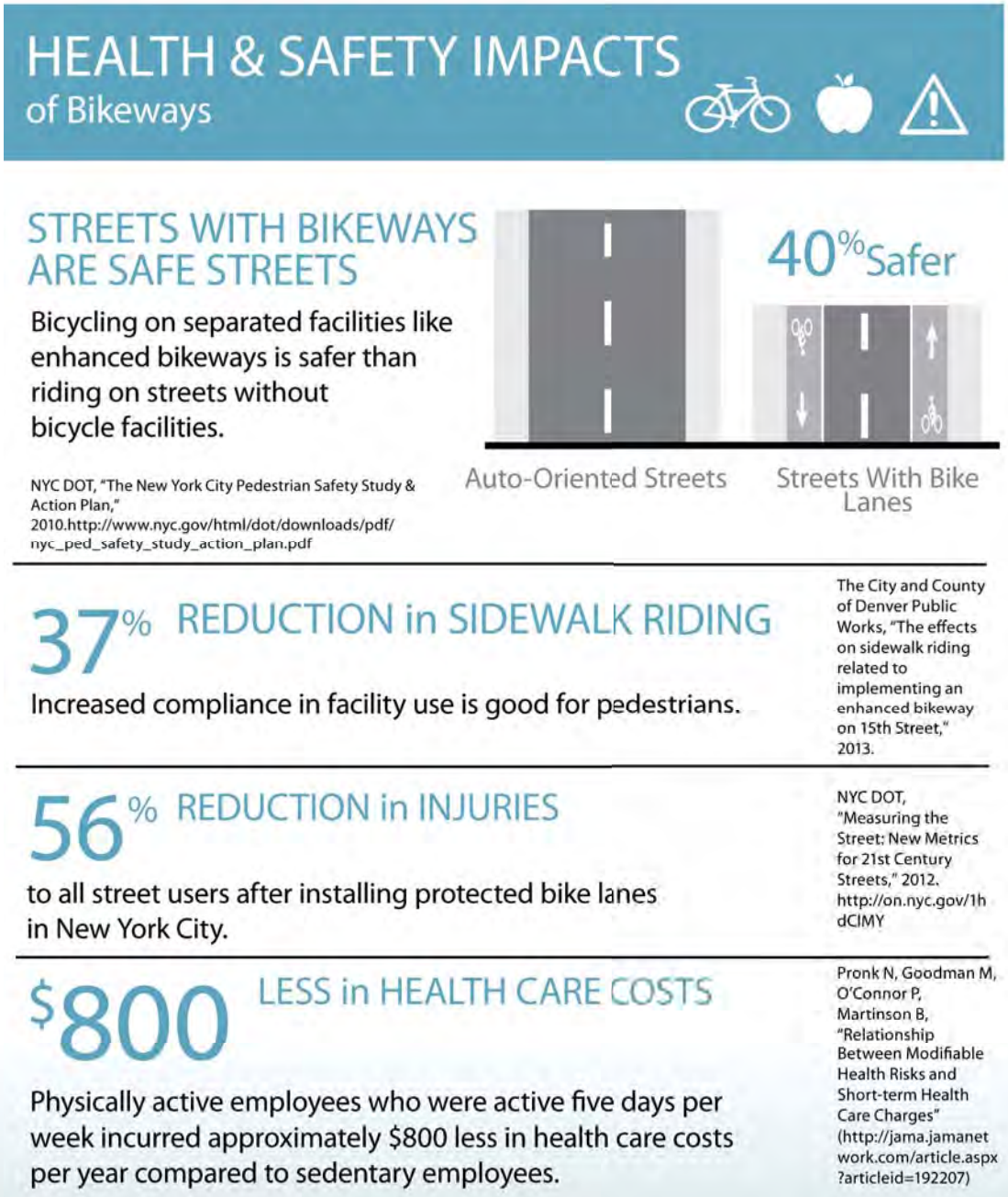
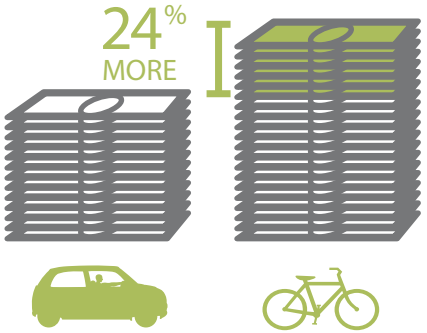


Figure 3-16: Health and safety benefits of bikeways

ECONOMIC BENEFITS
of Bikeways

BICYCLISTS SPEND MORE

Customers who arrive by automobile spend the most per visit but cyclists spend the most per month.



Kelly J. Clifton, Sara Morrissey, and Chloe Ritter, "Business Cycles: Catering to the Bicycling Market," TR News 280, 2012: 26-32. http://bit.ly/16WKfe3

The entire bikeway network of Portland, Oregon was built for less than the cost of constructing one mile of freeway.

Kullgren, Ian K, "Portland's Spent on Its Bike Infrastructure What It Would Normally Spend on a Single Mile of Highway, "The Oregonian 19 Mar. 2011: online.

Following the restriping project implemented along West 38th Ave in Wheat Ridge, CO:

- 45% MORE bicyclists
- sales tax revenues INCREASED 16%
- 38% MORE pedestrians
- speed average DECREASED 42 to 36
- traffic accidents DECREASED 11%

Homes within a half-mile of Indiana's Monon Trail sell for an average of

11% MORE THAN similar homes further away.

Lindsey, Greg, Joyce Man, Seth Payton, and Kelly Dickson, "Property Values, Recreation Values, and Urban Greenways," Journal of Park and Recreation Administration 22, 2004: 69-90. http://bit.ly/16WHbyI

Figure 3-17: Economic benefits of bikeways

Transportation Benefits

Some Greeley residents do not have access to a vehicle or are unable to drive. According to the University of Michigan's Transportation Research Institute, 15.3 percent of persons age 15 to 39 do not have a driver license, citing car ownership expense and preference for walking or bicycling as primary reasons. In Greeley, this equates to approximately 33,000 residents who do not drive. Bicycle improvements can increase access to important destinations for the young, the elderly, low-income families, and others who may be unable to drive or do not have a motor vehicle.

Investing in bicycle facilities can also help to reduce congestion and the pollution, gas costs, wasted time, and stress that comes with it. Each person who makes a trip by bicycle is one less car on the road or in the parking lot.

Bicycle facilities can also help to substantially reduce transportation costs by providing a way of getting around without a car for some trips. About half of all trips taken by car are three miles or less, equivalent to a 15-minute bike ride.

Transportation and recreation options will be especially important for older Americans in the coming years. According to the Brookings Institution, the number of older Americans is expected to double over the next 25 years. Shared use paths and other bicycle facilities will provide seniors with a place to take a low-intensity bike ride or a stroll around the neighborhood, or a way to get to nearby shops and services.

Direct Benefits to Businesses

In addition to potential for higher worker productivity, reduced health costs, and an improved quality of job applicants and employee pool due to increased desirability of living in Greeley, numerous studies have been completed that show direct benefits to businesses in bicycle friendly communities and along corridors with improved bicycle facilities.

In Fort Worth, Texas, there was a 163% increase in retail sales over two years after a bicycle lane and improved bike parking were installed in the Near Southside Community (Fort Worth South, Inc., 2011, 2009).

The University of Minnesota conducted a study that estimated that, in the Twin Cities, customers using the bicycle share system alone spent an additional $150,000 at adjacent restaurants and businesses in one season (Wang et al., 2012).

Although the majority of the research data available currently is in mid-to large-sized cities, many small- to mid-sized communities are beginning the difficult task of tracking direct benefits improved bicycle (and walking) facilities and culture have on businesses. Greeley can contribute information to this national trend and compare itself to other communities as this plan is implemented through sales tax tracking and "Report Card" measurements (see Recommendations, Chapter 4).

Bicycle Friendly Communities

Other cities awarded Bicycle Friendly Community designation can provide a valuable reference point for setting goals and creating a vision for what role bicycling could play in local transportation in future. Around the state, 19 other cities, 42 businesses and two universities have achieved Bicycle Friendly status. Bicycle friendly communities have reputations for livability and the quality of their bicycling programs and environment, providing examples for how active transportation can help create healthier, livable communities. Table 3-1 shows existing bicycling rates in Greeley compared to other peer communities and local BFC communities. Note that for the Benefits in Greeley estimation calculations, the 3-year American Community Survey data has been used (in comparison to the 5-year data, used in Chapter 2) because it offers an appropriate balance of precision and currency for the calculations used in the following methodology.

Estimating Benefits in Greeley

The benefits created by bicycling are directly linked to levels of use or activity. For each additional mile traveled by bicycling instead of driving, about one pound of greenhouse gas emissions is prevented, a few less cents are spent on gas, and a person gets a few minutes closer to reaching their recommended healthy levels of physical activity for the week.

The following steps are used to estimate Greeley's bicycling benefits:

- Estimate overall bicycling activity for employed workers and adults, college students, and school children
- Extrapolate activity based on trip purpose ratios average trip length, and vehicle trip replacement
- Measure Overall Physical Activity Benefits in terms of number of trips, distance travelled and Vehicle Miles Traveled (VMT) reduced

Current levels of bicycle transportation already make a significant contribution to the overall level of physical activity and health of residents in the community. Given the estimates of annual bicycling activity using the methodology described above, Greeley residents bike nearly 2.6 million trips annually, traveling more than 5.8 million miles. This translates into almost 600,000 hours of moderate intensity physical activity annually from bicycling.

Table 3-1: Front Range and Peer City Mode Share Comparison

Geography	BFC Level	Population	Employed Population	Bicycle Mode Share
United States	-	306,603,772	139,488,206	0.53%
Greeley, Co	**Bronze**	**94,217**	**41.399**	**1.60%**
Longmont, Co	Silver	84,474	42,312	0.96%
Arvada, Co	Silver	107,960	53,657	0.68%
Pueblo, Co	-	107,364	41,459	0.57%
Grand Junction, Co	-	59,586	26,626	2.49%
Fort Collins, Co	Platinum	146,235	75,098	6.39%
Boulder, Co	Platinum	100,403	53,247	10.52%

Data source: 3-year 2012 ACS dataset

Table 3-2: Greeley Estimated Physical Activity Benefits of Bicycling

	Number of Trips	Average Distance (miles)	Total Annual Distance (miles)
Commute bicycling trips	332,324	3.54	1,176,427
Utilitarian bicycling trips	535,411	1.89	1,013,709
K-12 school bicycling trips	53,322	0.77	40,949
College commute bicycling trips	55,610	2.09	116,048
Social/recreational bicycling trips	1,584,512	2.2	3,484,719
Total	2,561,179		**5,831,853**
Total Hours of Exercise per year (assumed speed of 10 mph)			***593,185 hours***

Case Study: 13th Street Right Sizing

Potential transplants to Greeley want to live on streets that fit their lifestyle. In the summer of 2014, a young family looking to relocate to the Greeley area was considering where to live. Their realtor gave them information on a house on 13th Street in an area where the roadway had been recently "right-sized" (converted from four lanes with parking to three lanes with parking and bike lanes). The family reviewed the property online, including viewing aerials of the roadway which showed the older four-lane roadway configuration, and decided they weren't interested in living on a roadway of that character. After visiting town and looking at a number of other houses that weren't a good fit, they drove past the house on 13th Street. Upon seeing the transformation of the character of the roadway and learning of the newly installed bike lanes, the family bought the house immediately. The family now enjoys commuting to work by bicycle regularly.

Figure 3-18: 13th Street after right sizing

Table 3-3: Greeley Potential Annual Economic Bicycling Benefits

	Current	Goal Bicycle Mode Share
Bicycle Commute Mode Share	1.60%	5.0%
Annual VMT Reduced	1,957,941	6,118,566
Air Quality		
CO2 Emissions Reduced (pounds)	1,592,797	4,977,491
Other Vehicle Emissions Reduced (pounds)	63,540	198,563
Total Vehicle Emissions Costs Reduced	$66,285	$207,141
Social Benefits		
Reduced Traffic Congestion Costs	$137,056	$428,300
Reduced Vehicle Crash Costs	$978,971	$3,059,284
Reduced Road Maintenance Costs	$293,691	$917,784
Individual Benefits		
Household Vehicle Operation Cost Savings	$1,106,237	$3,456,991
Health Care Cost Savings from Physical Activity	$94,838	$296,369
Total Benefits	**$2,677,077**	**$8,365,866**

Note: Estimates reflect conceptual benefits that would be generated at given increases in bicycle use as if they existed in Greeley today. Values are rounded for readability. Values are not discounted and do not reflect future demographic growth, cost changes or other multiplier changes.

Estimates for air quality, social, and individual cost savings are calculated based on cost savings data and calculations to develop a bottom line number of estimated cost savings benefits for existing and goal-level bicycle mode share. Greeley is already benefiting from over $2.5 million per year in reduced costs due to current levels of bicycling, and once the community achieves its goal of achieving 5% bicycle mode share, will benefit from an estimated $8.4 million cost savings per year due to bicycle use alone. Additional details on Economic and Health Benefits methodology, calculations, and data sources can be found in Appendix C.

Needs, Gaps, and Barriers

As in any city, Greeley has many gaps and barriers in the bicycle network that make bicycling in Greeley difficult for many users. Gaps, barriers, and needs of bicyclists in Greeley were analyzed and mapped using data from public input, the BSI analysis, field visits, and IRT input.

Facility Gaps

Bicycle facility gaps are significant constraints in Greeley, while simultaneously presenting opportunities. Gaps typically exist where physical or other constraints impede bicycle network development. Typical constraints include narrow bridges on existing roadways, narrow right-of-way, severe cross-slopes, and potential environmental damage associated with wider pavement widths.

Bicycle gaps exist in various forms, ranging from short "missing links" on a specific street or path corridor, to larger geographic areas with few or no non-motorized facilities at all. Gaps can then be organized based on length and other characteristics.

Spot gaps: Spot gaps refer to point-specific locations lacking dedicated bicycle facilities or other treatments to accommodate safe and comfortable travel. Spot gaps primarily include intersections and other vehicle/bicycle conflict areas posing challenges.

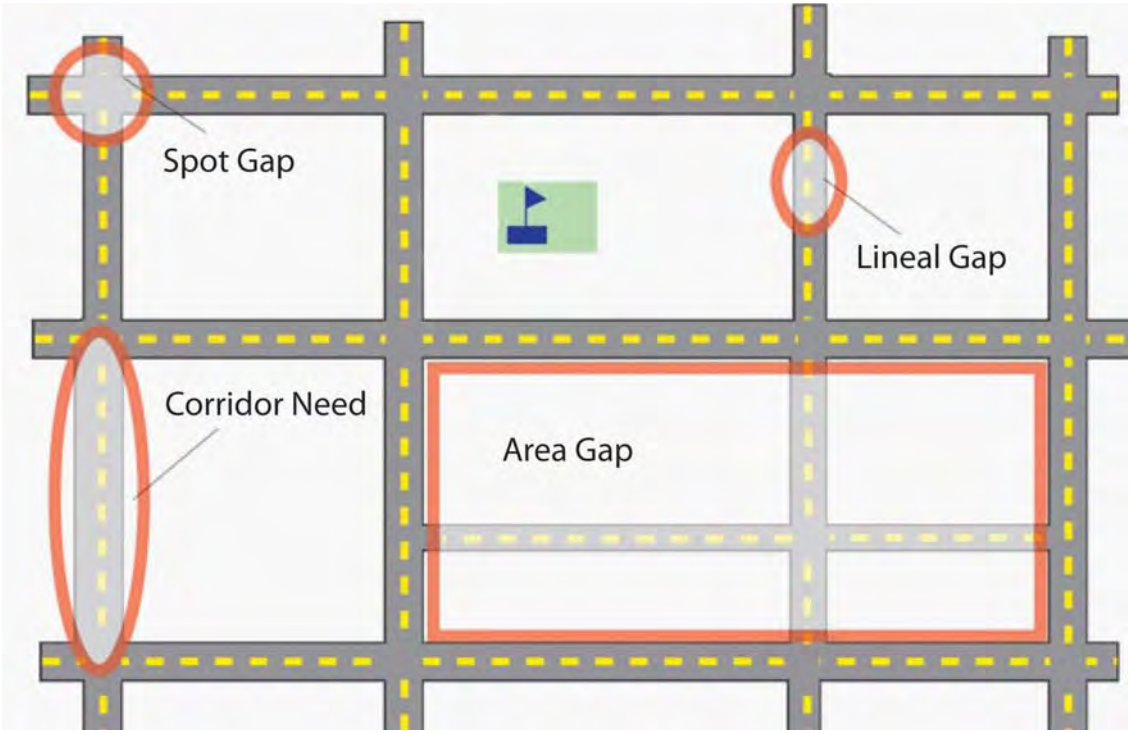


Figure 3-19: Gaps and needs diagram

Lineal gaps: Lineal gaps are ½- to one-mile long missing link segments on a clearly defined and otherwise well-connected bikeway or shared use paths.

Area gaps: Larger geographic areas (e.g., a neighborhood or business district) where few or no bikeways exist would be identified as an area gap. Area gaps exist in areas where a minimum of two intersecting bikeways would be required to achieve the target network density (generally considered to be a bicycle facility within a ½-mile grid).

Corridor Need: Public feedback identified a number of corridors where an existing need is not being met. While some of the corridors identified are lacking bicycle facilities, some have an existing sidepath that is not serving all needs due to design (narrow path, uncomfortable crossings) or because some bicyclists feel an on-street facility is needed.

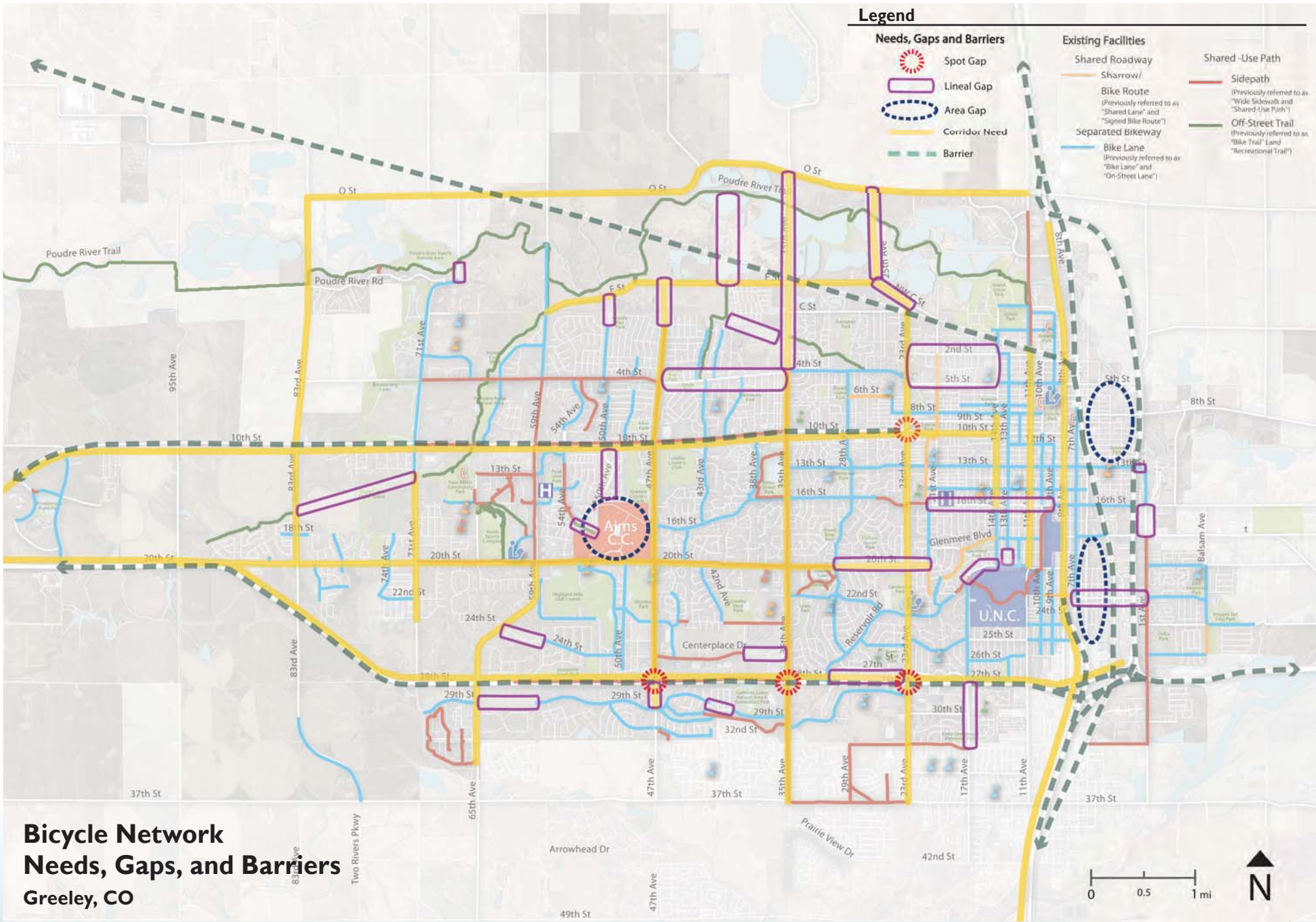


Figure 3-20: Needs, gaps and barriers

Barriers

Several corridors in Greeley serve as barriers to bicycle and pedestrian travel. The primary type of barrier found in Greeley is called a physical barrier. A physical barrier describes a physical impediment to travel where crossings can only occur at major interchanges or intersections. US 34 and US 85 are examples of this type of barrier.

Maintenance

One final type of deterrent to bicycling in Greeley that has been evident primarily through survey responses and public input is maintenance concerns, as listed below:

- Bike lanes or bike facilities with road debris in them
- Shared use paths or bike lanes with grass clippings from mowing or overhanging grass or trees
- Facilities with poor pavement quality
- Bike facilities, especially bike lanes, where snow is not removed quickly

Opportunities

Greeley has made significant investment in recent years in bicycle facilities as part of the parks and streets system improvements. Improvements such as the right sizing recently completed on 13th Street and path improvements in area parks appear to have increased interest, awareness, and likely ridership. Incorporating improvements such as these as stand-alone projects or as critical elements in larger road, parks, or development projects has been and will be critical in making significant improvements in the Greeley bicycling community. In order to begin developing recommendations for future bicycle facility improvements, the project team summarized opportunities of the Greeley network.

Roads

Generally, the relatively flat topography, combined with the grid layout of many of Greeley's streets, support year-round bicycling activities and a regular bicycle facility network. However, many of Greeley's roadways appear to have more vehicle capacity than is currently needed. For example some residential and collector streets have curb-to-curb widths greater than needed to support on-street parking and one travel lane in each direction. These wide roadways present an opportunity to enhance multi-modal transportation options.

Figure 3-21: Gap created by bike lane ending on 4th Street

On-Street Parking

The allocation of vehicle parking on the public right-of-way can play a significant role in the provision and condition of on-street bikeways. In some instances, on-street parking may be hazardous to bicyclists depending on the design and parking occupancy and turnover rate. In other instances, it may be determined that some on-street parking is under-utilized and could be removed in order to provide bicycle facilities. Sometimes parking can actually be beneficial to bicyclists by helping to slow vehicles speeds.

In some locations in Greeley, existing bicycle lanes adjacent to on-street parking could be widened or buffers could be added reducing the potential of dooring, and in some locations where no bicycle facility exists, a bike lane could be added.

Figure 3-22: On-street parking with bike lanes on 13th Street

Expansion of Shared Use Path Network

Greeley's shared use paths, in the form of off-street trails and sidepaths, are a significant amenity to bicyclists. These paths are highly desired because they provide separation from motor vehicle traffic, making them a more comfortable place to ride for many bicyclists.

Opportunities to expand existing shared use paths or develop new shared use paths can be limited, especially for cities like Greeley where there is limited land available for new development in higher-potential bicycle demand areas. Despite these limitations, there are opportunities for the expansion of shared use paths in Greeley and the improvement of existing facilities. It should also be noted that continued coordination with surrounding agencies (Evans, Weld County, and other regional cities) could create additional opportunities for regional coordination.

Transit

Significant opportunity exists to create more robust connections to the GET transit system in Greeley. Combining bicycle travel with bus travel gives many users a longer "reach" when utilizing active transportation. Due to the upcoming 2015 relocation of the downtown transfer center, bus routes and stop locations will be re-examined in the near future. Bicycle facilities should consider future bus stops and routes to enhance the active transportation possibilities in Greeley.

CHAPTER 4: RECOMMENDATIONS

Overview and Methodology

This chapter discusses recommendations for improving bicycling in Greeley, from physical improvements on the network connectivity level to programs and policies that will help move Greeley forward as a bicycle friendly community. Meeting the goals of the Greeley Bicycle Master Plan will require more than implementation of recommended bicycle facilities. It will also require the initiation and continued support of bicycle-related programs from officials, residents, and community organizations. In addition, the implementation of these facilities and programs will be greatly improved with adoption of new bicycle-related city policies and facility design guidelines referenced in this chapter.

The recommendations in this master plan are organized into the "Five E's" to emphasize the importance of a well-rounded plan that addresses all aspects of bike culture necessary to create a great bicycling community. To prepare the recommendations contained within this plan, the following key inputs were used. Many of these inputs can be found in Chapter 3: Needs Assessment.

Figure 4-1: Greeley Bicycle Master Plan recommendations input

New Facility Type: Protected Bike Lanes

Protected bike lanes, sometimes called cycletracks, are becoming more prevalent across the United States and have been used in other countries for decades.

Protected bike lanes are distinct from bike lanes or buffered bike lanes in that they have some element of vertical separation from vehicular traffic. Separation measures used include flexible posts or bollards with a striped buffer, a raised median, parallel vehicular parking, and raised landscape planters. The protected bike lane can also be installed at the same elevation as the adjacent sidewalk or at an elevation half way between the sidewalk and roadway, providing a vertical elevation difference between vehicles and bicycles.

Cities in the United States have installed successful one-way protected bike lanes (one direction on each side of the roadway, generally in the direction of vehicle travel). Protected bike lanes may also be two-way with both directions of bicycle travel accommodated on one side of the street.

Choice of type of vertical separation (from posts to vertical separation such as a median or a raised facility) and lane configuration (one way, two way, and side of road) is dependent on individual roadway characteristics and is studied and finalized during the design phase of a project.

Engineering

This section lays out a plan focused on the next ten to twenty years for enhancing the network and support facility components of the bikeway system in Greeley. The recommended network represents a connected system that builds upon previous and on-going local and regional planning efforts and reflects the input offered by city staff, the project Internal Review Team, bicycle and stakeholder groups, and city residents and visitors.

System improvements include enhancing the on-street bikeway system, upgrading intersections for safer shared use path and designated bicycle facility crossings, improvements to many bicycle facilities, and projects to enhance safety and encourage bicycling. Suggested improvements include low-cost measures yielding immediate results, such as small network gap closures on 20th Street and 13th Avenue downtown and bicycle parking improvements. Other improvements, such as the Number Three Ditch Trail through the heart of the city, represent longer-term strategies for transforming Greeley. The engineering recommendations in this chapter are planning-level in nature, but have been analyzed for preliminary feasibility by the project team.

Facility Types

The bicycle facilities (also called "bikeways") recommended in this master plan consist of strategic routes that interact with the existing system to provide a high quality user experience and enable access to key destinations in and around the city. The bikeways are comprised of the following categories and facility types:

Shared Roadway (On-Street)

» Sharrow

» Bike Boulevard (new to Greeley)

Separated Bikeway (On-Street)

» Bike Lane

» Buffered Bike Lane (new to Greeley)

» Protected Bike Lane (new to Greeley)

(A Sharrow/Bike Lane combination is also shown to accommodate a dedicated bicycle "climbing lane" in the uphill direction and a sharrow in the downhill direction where space is constrained.)

Shared Use Path (Off-Street)

» Sidepath

» Off-Street Trail

A full description of existing and proposed facility types is shown in Chapter 2. Design guidelines and details for each of these facilities are included in Supplement A.

Figure 4-2: Typical bike boulevard

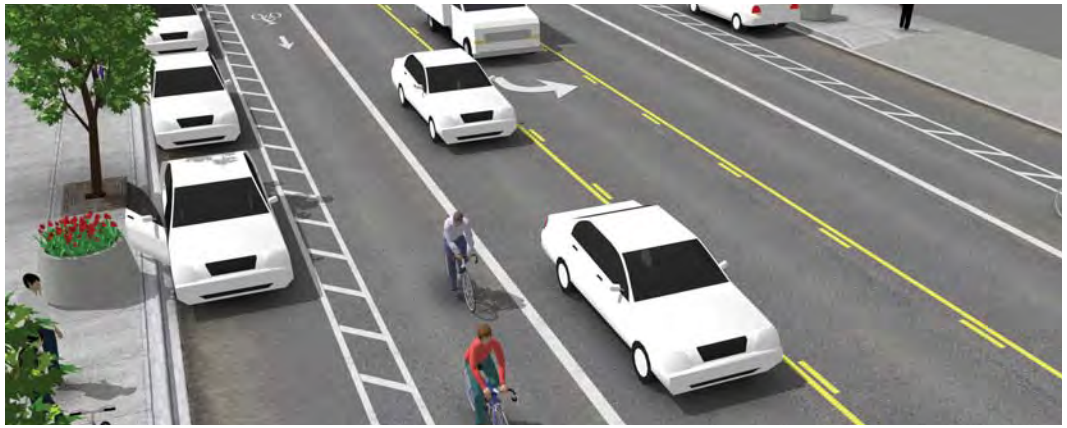
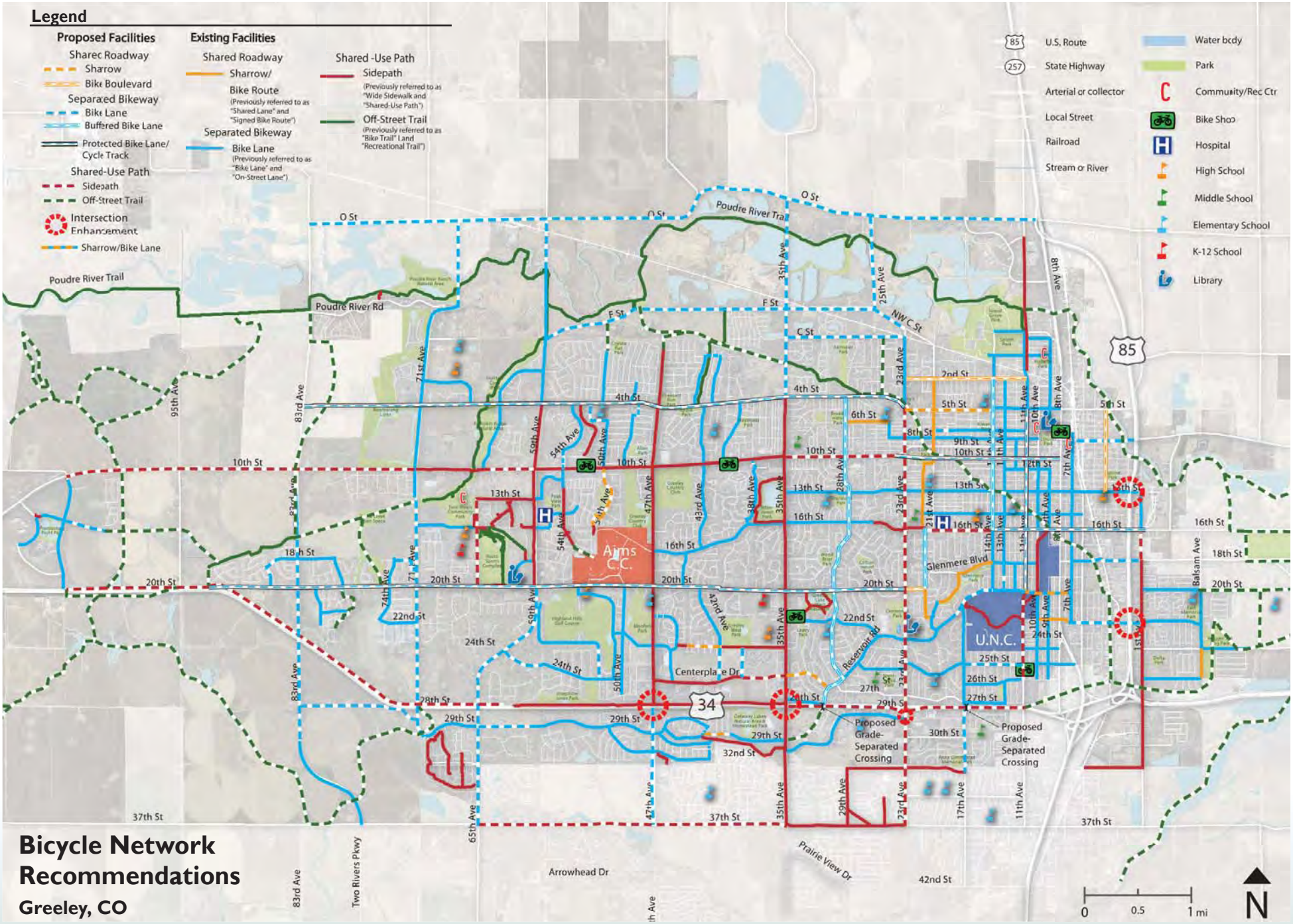


Figure 4-3: Typical buffered bike lanes with parking-side buffer

Figure 4-4: Typical parking-protected bike lane



Bicycle Network Recommendations

Greeley, CO

Figure 4-5: Network recommendations

Network and Spot Improvements

The recommended bikeway network depicted in figure 4-5 includes on-street and off-street bicycle and shared use path facilities connecting key destinations in and around Greeley. These recommendations place particular emphasis on better accommodating the "interested but concerned" segment of the Greeley community discussed in Chapter 2. Further investigations at the permitting, design, and construction documentation stages will be necessary to finalize specific shared use path alignments and facility types. Also, recommended off-street trail alignments may change due to future opportunities such as new easements, land acquisitions or newly added sidewalks and/or bicycle facilities. Additional details on implementation phasing, costs, and funding can be found in Chapter 5.

In addition to corridor improvements recommended in the network map, additional spot and network-wide improvements will be critical to creating a comfortable, barrier-free experience to Greeley bicyclists. Spot improvements identified in figure 4-5 primarily focus on specific intersections and crossings, but continued emphasis should also be placed on network-wide improvements to mid-block crossings, intersection continuity, and sidepath adequacy. The recommended improvements should be implemented as soon as possible, and apply to the entire Greeley network.

Intersections

Retrofit all existing locations where bicycle lanes drop at the intersection approach to provide guidance to bicyclists as they cross intersections. See "Support Facilities" for additional intersection recommendations that apply to all Greeley intersections. Examples: Eastbound 4th Street approaching 23rd Avenue, and Westbound 13th Street approaching 35th Avenue.

Mid-Block Crossings

Where existing or proposed facilities create a demand for mid-block bicycle or pedestrian crossing, consider enhanced mid-block crossing facilities such as rectangular rapid flashing beacons (RRFBs), hybrid beacons (HAWKs), or refuge island installation to allow users to more comfortably cross roadways without significant delay or out-of-path travel. See Supplement A for more information on these crossing treatments. Examples: 43rd Avenue and the Larson Trail at 4th Street, and the Poudre River Trail crossing of 35th Avenue.

Sidepath Adequacy

Many existing sidepaths in Greeley are essentially wide sidewalks with no additional considerations for multiple user types, wayfinding, or potential driveway or intersection conflicts. In order to create sidepaths that all users will be comfortable and safe using, all existing sidepaths should be considered for enhancements such as: driveway consolidation and closures, path widening, roadway warning signage for vehicles and bicycles, separate treads for pedestrians and bicycles in areas with heavy or increasing bicycle use, and enhanced crossing design at driveways or roadways. This is especially critical on primary bicycle corridors where the existing sidepath will remain without an additional on-street bicycle facility. Examples: 35th Avenue and 47th Avenue.

Shoulder Widening

Although not specifically called out in the network plan, the opportunity exists in many areas at the edges and outside of the City of Greeley to provide wide shoulders during road reconstruction or with minor widening. Examples: 83rd Avenue and 59th Avenue north of Greeley.

Railroad Crossings

The roadway surface and bicycle lane treatment should be improved or maintained in a smooth manner with as little grade change as possible, with additional signage provided for bicyclists on high-angle crossings on all roadways crossing railroad tracks, especially those with existing or proposed bicycle facilities. Examples: 35th Avenue north of F Street.

Support Facilities

The term 'bicycle support facilities' refers to bicycle parking and other end-of-trip facilities such as showers and clothing lockers for bicyclists; signalization at intersections, wayfinding signing, which directs bicyclists to popular destinations; and bike racks on buses, or other facilities that promote bicycle and transit integration. These types of support facilities can be the determining factor in a person's decision to make a trip by bicycle.

Bicycle Parking

People need bicycle parking options that provide security against theft, vandalism, and weather. Like automobile parking, bicycle parking is most effective when it is located close to destinations, is easy to access, and is easy to find. Where quality bicycle parking facilities are not provided, determined bicyclists lock their bicycles to street signs, parking meters, lampposts, benches, trees or other fixed objects. These alternatives are undesirable as they are usually not secure, may interfere with pedestrian movement, and can create liability concerns and damage street furniture or trees.

Bicycle parking includes both long-term and short-term parking, which cater to different people with different needs depending largely on their trip duration and desired level of protection from weather and theft.

Short-term parking: Bicycle parking meant to accommodate visitors, customers, messengers and others expected to depart within two hours; requires approved standard rack, appropriate placement, and weather protection.

Long-term parking: Bicycle parking meant to accommodate employees, students, residents, commuters, and others expected to park more than two hours. This parking is to be provided in a secure, weather-protected location.

Greeley already has bike parking in many locations, and can increase the supply by consistently requiring developers to provide high quality bicycle parking with specific type, quantity, and location requirements. Tables 4-1 and 4-2 show suggested bicycle parking characteristics and requirements recommended by the Association of Pedestrian and Bicycle Professionals (APBP) in the 2010 Bicycle Parking Guidelines.

Table 4-1: Characteristics of Short and Long Term Parking

Criteria	Short-Term Bicycle Parking	Long-Term Bicycle Parking
Parking Duration	Less than two hours	More than two hours
Typical Fixture Types	Bicycle racks	Lockers, or racks provided in a secure area
Weather Protection	Unsheltered or sheltered	Sheltered or enclosed
Security	High reliance upon personal locking devices and passive surveillance (i.e., eyes on the street)	Restricted access and/or active surveillance/supervision Unsupervised: • "Individual-secure" (e.g., bicycle lockers) • "Shared-secure" (e.g., bicycle room or outdoor enclosure) Supervised: • Valet bicycle parking • Video, Closed-Circuit Television (CCTV) or other surveillance
Typical Land Uses	Commercial or retail, medical/ healthcare, parks and recreation areas, community centers, transit centers	Residential, workplace, transit, schools, train stations, airports

Source: Association of Pedestrian and Bicycle Professionals (2010)

Table 4-2: Recommended Bicycle Parking Requirements		
Type of Activity	**Long-Term Bicycle Parking Requirement**	**Short-Term Bicycle Parking Requirement**
Residential Land Uses		
Single-family dwelling	No spaces required	No spaces required
Multi-family dwelling		
a) with private garage for each unit	No spaces required	0.5 for each bedroom
b) without private garage for each unit*	0.5 spaces for each bedroom, minimum 2 spaces	0.5 spaces for each bedroom, min 2 spaces
c) Senior housing	Minimum 2 spaces	Minimum 2 spaces
Civic/Cultural Land Uses		
Non-assembly cultural (library, government buildings, etc.)	1 space for each 10 employees, min. 2 spaces	1 space for each 10,000 s.f. of floor area, minimum 2 spaces
Assembly (church, theater, stadium park, beach)	1 space for each 20 employees, min. 2 spaces	Spaces for 2% of minimum expected daily attendance
Health care/hospital	1 space for each 20 employees, or 1 space for each 70,000 s.f. of floor area, whichever is greater, min. 2 spaces	1 space for each 20,000 s.f. of floor area, minimum 2 spaces
Education		
a) Public, parochial, and private day-care centers for 15 or more children	1 space for each 20 employees, min. 2 spaces	1 space for each 20 students of planned capacity, minimum 2 spaces
b) Public, parochial and private nursery schools, kindergartens, and elementary schools (1-3)	1 space for each 10 employees, min. 2 spaces	1 space for each 20 students of planned capacity, minimum 2 spaces
c) Public, parochial and elementary (4-6) public and high schools	1 space for each 10 employees, plus 1 space for each 20 students or planned capacity, min. 2 spaces	1 space for each 20 students of planned capacity, minimum 2 spaces
d) Colleges and universities	1 space for each 10 employees, plus 1 space for each 10 students planned capacity; or 1 space for each 20,000 s.f. of floor area, whichever is greater	1 space for each 20 students of planned capacity, minimum 2 spaces
Rail/bus terminals and stations/airports	Spaces for 5% of projected am peak period daily ridership	Spaces for 1.5% am peak period daily ridership
Commercial Land Uses		
Retail		
General food sales or grocery	1 space for each 12,000 s.f. of floor area, min. 2 spaces	1 space for each 2,000 s.f. of floor area, minimum 2 spaces
General retail	1 space for each 12,000 s.f. of floor area, min. 2 spaces	1 space for each 5,000 s.f. of floor area minimum 2 spaces
Office	1 space for each 1,000 s.f. of floor area, min. 2 spaces	1 space for each 20,000 s.f. of floor area, minimum 2 spaces
Auto related		
Automotive sales, rental & delivery, automotive servicing/repair, cleaning	1 space for each 12,000 s.f. of floor area, min. 2 spaces	1 space for each 20,000 s.f. of floor area, minimum 2 spaces
Off-street public parking lots/garages without charge on a fee basis	1 space for each 20 automobile spaces, min. 2 spaces - unattended surface parking lots excepted	Min 6 spaces or 1 per 20 auto spaces - unattended surface parking lots excepted
Industrial Land Uses		
Manufacturing and production	1 space for each 15,000 s.f. of floor area, min. 2 spaces	Number of spaces to be prescribed by Planning Director or Coordinator. Consider min. 2 spaces at each public building entrance
* A private locked storage unit may be considered as a private garage if a bicycle can fit into it.		

The City of Greeley can continue to improve availability and quality of bicycle parking with the following action items:

- Require bicycle parking with new development and redevelopment projects
- Continue to provide incentives (see below) to encourage bicycle parking facilities beyond the minimum requirements, refining quantity, type, and location requirements per this plan
- Provide guidance on the design and placement of bicycle parking facilities, including standard short term parking racks, lockers, bike rooms, and bike cages
- Establish a bike rack program that assists in locating, designing, and funding bicycle racks in the public right-of-way

Incentive Programs

A number of incentives can be used to encourage developers to provide adequate and high-quality bicycle parking. Strategies that the City of Greeley could employ include:

Reducing the required number of motor vehicle parking spaces on new development or redevelopment where bicycle parking is provided beyond the minimum requirements.

In space constrained applications, such as redevelopment of an existing building, allow for the conversion of motor vehicle parking spaces into short- and long-term bicycle parking to meet the automobile parking requirements (refining allowances given new quantity and type requirements).

Extending or introducing payment-in-lieu of parking programs to allow funds to be collected in-lieu of vehicle parking and placed in a sustainable transportation infrastructure fund to fund active transportation projects, which may include a centralized bicycle parking and end-of-trip facility (e.g., a bike depot). Note: this should not replace bicycle parking and end-of-trip facility requirements.

Bike Rack Program

Many cities have bike parking programs to install and maintain bicycle parking in the city's right-of-way. These programs can work with business owners who desire bicycle parking either by installing racks on request or by cost-sharing.

The City of Greeley should establish a Bicycle Rack Program to work with interested land owners to supplement the existing supply of bicycle parking. Through the program, at a minimum, Greeley can provide information to business owners and those interested in (or required to) install bicycle parking on possible vendors as well as rack design and placement. A next step for Greeley would be to develop a bike parking master plan to better coordinate and formalize the rack program. A bike parking master plan often includes elements such as rack distribution throughout downtown and the city (a framework plan) developed using a demand model, actual rack usage counts, and a formal application process for rack placement and installation.

Figure 4-6: Bicycle parking near the library

Signalized Intersections

Accommodating bicyclists at traffic signals can be challenging for traffic engineers as the needs and characteristics of bicycles and motor vehicles vary. This section contains guidance on how bicycles can be better accommodated within Greeley's existing traffic signal system. The difference in acceleration and speed between motorists and bicyclists provides some challenges that can be addressed with signal timing modifications.

The following modifications are recommended in locations where a potential need is identified by existing users, through observation, or in proposed priority bicycle corridors. Greeley should consider such modifications along the 4th Street, 20th Street, 16th Street, 28th Avenue, and 11th Avenue corridors as a first step.

- Increase the minimum green interval to effect a minimum bicycle timing sufficient to allow bicycles to clear the last conflicting lane. Bicyclists have slower speeds and accelerations than motor vehicles and even if they are at the head of the vehicle queue when a green light is given, in some locations the bicyclist may still lack sufficient time to clear the intersection during the green
- Lengthen the amber change interval of the intersection slightly to allow for the slower acceleration and speed of bicyclists. Careful consideration is necessary when implementing this modification as longer amber intervals can also encourage motor vehicles to enter intersections under this phase
- Lengthen the 'all red' clearance interval of the intersection. This allows any vehicles or bicyclists still in the intersection to clear it before a green interval is given to opposing traffic. The maximum length of the 'all red' phase should not generally be greater than three seconds
- Shorten cycle lengths to reduce wait times and increase red light compliance
- If demand warrants, rest the signal in green on the street that serves the high priority bicycle network
- Install "bicycle only" traffic signal heads in areas of high conflict or unique geometry, creating a bicycle only phase
- Add a bike phase to the traffic signal timing plan, such that the presence of a bicyclist in the bike lane has the effect of extending the green time

Innovative Design: Protected Intersections

Protected intersections are a new, innovative design idea in the United States. The concept includes elements such as separation of through and queuing bicycles using protected bike lanes from both pedestrians and vehicles with "bumpout-like" corner treatments.

Pedestrians have two queuing areas, and cross the bicycle facility separately from the roadway, while bicycles have a dedicated queuing area, and a dedicated space through the intersection adjacent to the crosswalk.

Figure 4-7: Protected intersection concept

The concept was developed to address intersections where two high-bicycle-volume protected bike lane corridors meet. The first applications of protected intersections are currently in the planning and design stages in a number of different cities with the goal of implementing in the next two years.

Bicycle Detection

Additionally, the difference in bicycle and motor vehicle size and material composition can pose detection challenges, creating the need for alternative detection solutions.

While pretimed traffic signals have pre-set timing and the changes in signal phase are dependent on the passing of time rather than the presence of vehicle traffic, actuated signals are dependent on the presence of a vehicle or pedestrian to trigger a phase change.

Although most detection technologies can detect bicycles when appropriately located and calibrated, their sensitivity varies and they can seem unreliable to bicyclists. Bicycle detection at these signalized intersections is a critical aspect of a bicycle network; if bicyclists cannot trigger a signal along a bikeway they may not be able to use a route at certain times of the day because a motor vehicle may not come along to demand the phase change. In this situation, a bicyclist is left to run the red light or activate the pedestrian phase, which typically requires dismounting or sophisticated bicycle handing skills.

As described in the existing conditions, a number of intersections in Greeley have the capability to detect bicyclists and have been programmed to do so. The city should continue to reprogram signals when the capability exists, and should prioritize upgrades to detection technology on existing and proposed bicycle routes, especially those identified in the network plan as buffered or protected bicycle lanes. When a more comprehensive signal re-timing effort is completed, the bicycle network should be considered and adjustments to timing made network-wide on bicycle facilities.

The City of Greeley can improve detection of bicycles and use of signals by bicyclists through the following actions:

- Work with bicyclists to develop a list of intersections along frequently used routes where the existing infrastructure can be modified to detect bicyclists better at a relatively low cost. Prioritize these locations, as well as priority bikeways for signal improvements
- Ensure that all new signals provide a means of bicyclist activation
- Consider adjusting signal timing plans to provide a minimum bicycle clearance interval at appropriate intersections

Wayfinding Signing

Wayfinding uses landmarks, signs, and environmental cues to assist in navigation. It creates a sense of empowerment and security by providing directional cues to inform a bicyclist how to reach a destination without confusion. Road signs direct motor vehicle traffic to destinations and provide

Figure 4-8: Greeley-specific and typical bicycle wayfinding signage

information about major streets and key turns, reinforcing drivers' confidence as they travel to a destination. However, automobile wayfinding is usually located along major streets and most bicycle routes do not provide this information. This same level of guidance is equally important to helping bicyclists navigate their environment.

Designing wayfinding systems for bicyclists should reflect specific attributes of riding. Traditional elements of a wayfinding system include signs, pavement markings, and maps. Interactive web mapping and hand held digital devices such as those in Greeley that provide a QR code for additional city information are also popular tools. When using interactive web mapping, a system should be selected that will be relevant in the long term to ensure system longevity.

Signage can serve both wayfinding and safety purposes including:

- Helping to familiarize users with the bicycle network
- Helping users identify the best routes to destinations
- Helping to address misconceptions about time and distance
- Bicycle wayfinding signs can also visually cue motorists that they are driving along a bicycle route and should use caution

Recommended Wayfinding Signing Program

The City of Greeley should develop a bicycle signing program with the specific uniform standards as recommended here, or as determined by city staff. This process should result in a formal plan or memo including destination programming and sign placement standards prior to implementation. Members of the public may collaborate on sign design and layout, as well as which destinations should be included. The signing program can be implemented in several phases to make use of available funding and construction opportunities.

Bicycle Transit Integration

This section describes recommendations related to bicycle access to transit and accommodation on transit vehicles.

Transit Stop Planning

Determining the appropriate type of bicycling infrastructure for each transit stop is critical to attracting and maintaining transit riders. Recommended provisions at transit stops, which will vary depending on the type and use of stops, include:

Trip information: essential information that should be provided at every stop includes the route number and the stop number. It is preferable to also provide a route map and

Figure 4-9: Bicycle boarding GET bus

timetable. Real-time arrival information may be appropriate where there are frequent bus arrivals and multiple lines at a stop and if the required technology is in place (at the new transit center, for instance).

Bicycle parking: In general, minor and local stops can make do with bike racks. As the stop's importance increases, more secure options should be provided.

End-of-trip facilities: major transit hubs and stops may offer end-of-trip facilities beyond parking such as showers, washrooms, clothing lockers, etc.

The Transit Cooperative Research Program report, Bicycle and Transit Integration, recommends that bicycle parking receive priority siting near the bus loading zone. Parking should also be located so that bicyclists do not need to carry bicycles through crowds of travelers. The parking facility should be located in the clear view of the general public, vendors or transit staff as security is a particular concern with bicycle parking.

Bicycle/Transit Interface

In addition to providing safe routes to get to transit, it is important to minimize potential conflicts between bicyclists and transit vehicles as well as people waiting or boarding transit. Where bicycles and transit share lane space, buses frequently stop to pick up or drop off passengers. This can delay bicyclists or require them to pass the transit vehicle creating a potentially unsafe "leapfrog" scenario.

Recommendations for improving bicyclists' safety around buses include:

- Designate dedicated space for bicyclists through use of bike lanes or other pavement markings
- Provide infrastructure to increase bicyclists' visibility at intersections
- Educate transit drivers about areas where bicyclists may be present and typical bicycle behavior

Figure 4-10: GET bus

Natural Systems Considerations

Consideration of natural systems in bicycle facility design is important to the Greeley community and to the success of the bicycle network. By nature, increasing bicycle mode share decreases emissions and provides a more pleasant environment for those who bicycle and those who do not. However, it is important to consider impacts of proposed facilities on natural systems. All improvements, from off-street trails (generally coordinated with parks natural systems requirements) to bike lanes should consider their impact to the environment (increased impervious area, construction impact, tree canopy impact), and should be context-sensitive on an environmental level. Neglecting to do so may reduce effectiveness of the facility (by reducing demand) and may negate positive environmental impacts of increased bicycling.

Design Guidelines

A number of existing design documents, policies, and guidelines in Greeley address bikeway design and inclusion as part of roadway and development projects. Table 4-3 summarizes many of the existing requirements currently in place and provides recommendations for modifications. Design of bicycle, pedestrian and shared use path facilities should follow recommendations made in Supplement A "Design Guidelines." These guidelines are intended to be flexible and can be applied with professional judgment by designers and engineers.

	Table 4-3: Greeley Guidelines and Standards Modification Recommendations			
	Bike Facility/ Topic	**Existing Greeley Standard**	**Existing Standard Source**	**Recommended Standard, Standard Modification**
On- and Off-Street Bicycle Facilities Standards	Sharrow	None	None (use state and federal)	Planning and Engineering standards and considerations per Design Guidelines Supplement
	Bike Boulevard	None	None (use state and federal)	Planning and Engineering standards and considerations per Design Guidelines Supplement
	Bike Lane	S-3, S-3-10 Minor Collector - 6' at and between intersections S -4, Major Collector - 6' at and between intersections S-5 Minor Arterial - 6' at and between intersections S-6 Major Arterial - 6' at and between intersections S-38, 1-2 Bike Lane Marking Detail	Greeley Street Design Criteria and Construction Standard Details Manual - 2008	Modifications to and additional details for planning and engineering standards and considerations per Design Guidelines Supplement
	Buffered Bike Lane	None	None (use state and federal)	Planning and Engineering standards and considerations per Design Guidelines Supplement
	Protected Bike Lane/ Cycletrack	None	None (use state and federal)	Planning and Engineering standards and considerations per Design Guidelines Supplement
	Sidepath	S-6-1 Parkway Arterial - 10' detached at and between intersections S-29 Joint Detail for bikeway/sidepath/off-street trail	Greeley Street Design Criteria Manual - 2008	Modifications to and additional details for planning and engineering standards and considerations per Design Guidelines Supplement
	Off-Street Trail	Existing standard is for 10' bikeway 1.23 Trail crossings under roadways - 12' horizontal clearance to abutment or edge of water; 10' vertical clearance to underside of bridge Trail surface shall be at or above high water mark for 2-year storm	Greeley Street Design Criteria Manual - 2008	Modifications to and additional details for planning and engineering standards and considerations per Design Guidelines Supplement
	Intersection Treatments for Bikeways	None	None (use state and federal)	Signing, striping, signal design, layout, and other engineering considerations per Design Guidelines Supplement. Treatment selection and other planning considerations per Design Guidelines Supplement.
	Mid-Block Crossing Treatments for Bikeways	None	None (use state and federal)	Signing, striping, beacon or signalization, layout and other engineering considerations per Design Guidelines Supplement. Crossing location, treatment selection, and other planning considerations per Design Guidelines Supplement.

	Table 4-3 (continued): Greeley Guidelines and Standards Modification Recommendations			
	Bike Facility/ Topic	**Existing Greeley Standard**	**Existing Standard Source**	**Recommended Standard, Standard Modification**
Code Requirements	Pedestrian and bicycle access and circulation requirements	Pedestrian and bicycle access and circulation shall be required to provide convenient, safe and visible circulation systems for pedestrians and bicyclists and to provide logical linkages between the origins and destinations of pedestrians and bicyclists. Pedestrian and bicycle level of service criteria relating to route directness, continuity, street crossings, amenities and security shall follow the criteria found in the 2002 Greeley Comprehensive Transportation Plan. Dedication of pedestrian and bicycle lanes, paths and trails may be required under Section 18.04.1160(a).	Municipal Code - Title 18 Development Code, Adopted 2014: 18.04.1130 Streets, alleys, and easements	As modified by the Complete Streets Policy, Supplement B
	Allocation of Right-of-way for Paths and Trails	A subdivider shall be required to dedicate rights-of-way for pedestrian and bicycle lanes, paths and trails and drainage and utility easements as needed to serve the area being platted and to provide for future development of adjacent lands. Section 18.04.1130(h) provides additional information regarding pedestrian and bicycle lanes, paths and trails. In addition, rights-of-way and/or easements shall be required for subdivisions adjacent to the route of existing or proposed trails, to provide for the trail location and for pedestrian and bicycle access from the subdivision to the trail	Municipal Code - Title 18 Development Code, Adopted 2014: 18.04.1160 Dedications for public sites, bike lanes, paths and trails	No modification proposed
	Site Plan Review Requirements	Site Plan Requirements include the following be submitted for review: (10) Number and location of off-street parking, including guest, disabled, bicycle and motorcycle parking and including typical dimensions of each, as well as any areas proposed for shared or reduced parking and related narrative information. (18) Location of existing and proposed pedestrian and bicycle circulation system, including its interrelationships with the vehicular circulation system and indicating the proposed treatment of points of conflict.	Municipal Code - Title 18 Development Code, Adopted 2014: 18.16.030 Site plan requirements	Site plans should be reviewed for compliance with Complete Streets (Supplement B) in addition to existing requirements. Bicycle parking requirements should be per Bicycle Parking Guidelines table in this Bicycle Master Plan, and per Design Guidelines Supplement

Table 4-3 (continued): Greeley Guidelines and Standards Modification Recommendations

	Facility/ Topic	Existing Greeley Standard	Existing Standard Source	Recommended Standard, Standard Modification
Code Requirements	Pedestrian and Bicycle Access and Circulation Standards	These standards are intended to provide for safe, visible and convenient pedestrian and bicycle movement on-site and to provide the opportunity to connect to surrounding areas. (2) Sidewalks or pedestrian pathways shall be provided on-site connecting the site and public sidewalks; all principal buildings on the site; parking lots and principal buildings on the site; and, where logical, connections to off-site locations can be made as identified in the City's pedestrian and bicycle route maps in the Transportation Plan. In no event is placement of a sidewalk or pedestrian pathway intended to displace existing landscaped areas or to duplicate existing pedestrian routes. (3) Where it is necessary for the primary pedestrian route to cross internal roadways, the pedestrian crossing shall be designed to emphasize and prioritize pedestrian access and safety. Such crossings shall be identified using pavement treatments, signals, lighting, traffic calming techniques, median refuge areas and/or landscaping along with signs and striping. (4) A system of pathways shall be provided for the use of bicyclists to use throughout and to and from the site. Off-street routes may be combined with pedestrian sidewalks or pathways and where combined shall be a minimum of eight (8) feet wide to accommodate the amount of pedestrian and bicycle traffic volumes expected to use the sidewalks or pathways. (Ord. 65, 2002 §1; Ord. 27, 1998 §1)	Municipal Code - Title 18 Development Code, Adopted 2014: 18.40.060 Pedestrian and bicycle access and circulation standards.	Reference the Bicycle Master Plan report for bicycle facility connections. "…duplicate existing pedestrian routes" requirement should be removed due to potential presence of parallel/duplicate pedestrian and bicycle facilities. Add reference to bicycle facilities and routes in addition to pedestrian routes (for example "...primary pedestrian or BICYCLE route to cross..."). Add "where pedestrian and bicycle volumes are not anticipated to exceed capacity" after "may be combined with pedestrian sidewalks or pathways." Where pedestrian and bicycle facilities are combined, the combined width shall be per the "Sidepath" section of the Design Guidelines Supplement.
	Bicycle Parking Requirements	Bicycle parking spaces shall be provided meeting the following standards: (1) One-half (½) space per unit or one-third (⅓) space per bedroom, whichever is greater, in multi-family residential developments of greater than four (4) units; and at least (3) spaces, or five percent (5%) of the total required off-street parking spaces, whichever is greater, for nonresidential developments and uses. (2) A securely fixed, tamper-resistant structure designed for bicycle parking in a more or less permanent location on the ground which supports the bicycle frame in a stable position without damage to wheels, frame or components and which is compatible in design with adjacent buildings and street furniture. In lieu of a bicycle parking structure, a secured bicycle parking area may be provided on an all-weather surface which may include gravel, within a convenient distance of and visible from the primary entrance to the building for which the spaces are intended to be used and shall not obstruct pedestrian access to or through the building, or be located any closer than three (3) feet from vehicle parking areas. Bicycle parking spaces may be provided within the principal building as long as the location does not impede pedestrian access. (Ord. 40, 2009 §1; Ord. 65, 2002 §1; Ord. 27, 1998 §1)	Municipal Code - Title 18 Development Code, Adopted 2014: 18.42.070 Bicycle parking	Modify bicycle parking requirements per the Bicycle Parking Guidelines Table in this Bicycle Master Plan. Modify bicycle parking rack and facility type requirements per the "Bicycle Parking" section of the Design Guidelines Supplement.

	Table 4-3 (continued): Greeley Guidelines and Standards Modification Recommendations			
	Facility/ Topic	**Existing Greeley Standard**	**Existing Standard Source**	**Recommended Standard, Standard Modification**
Affordable Housing Policy	Low Income Housing Strategy	2. Develop a comprehensive strategy to facilitate the availability of housing to meet the capabilities of low to moderate income persons (a) Work with areas employers to provide housing support packages to help area workers to have access to reasonable housing choices, thus helping to stabilize the local employment base (see also EC2A11) (d) In supporting low-income housing, expect development to be well-designed, practical, sustainable and to complement the full range of community development objectives in this Plan)	2060 Comprehensive Plan: HS5 Housing.	Add requirement to consider active transportation options from existing and proposed housing, and supplement bicycle, walking, and transit facilities to existing or proposed housing where active transportation options are not present and convenient.
	Special Needs Housing Strategy	6. Encourage development of housing for special needs populations including facilities for the elderly, the disabled and other populations requiring group homes as a result of age, physical or mental limitations (a) When considering land use proposals for such housing, evidence should be provided demonstrating that the proposed facilities will be in close proximity to shopping, medical services, entertainment, and public transportation before approval is granted. Every effort should be made to avoid concentration of these homes in one area of the community (see also LU2A62)	2060 Comprehensive Plan: HS5 Housing	Add requirement to supplement active transportation options (walking, bicycling, and transit) where active transportation options are not present and convenient..

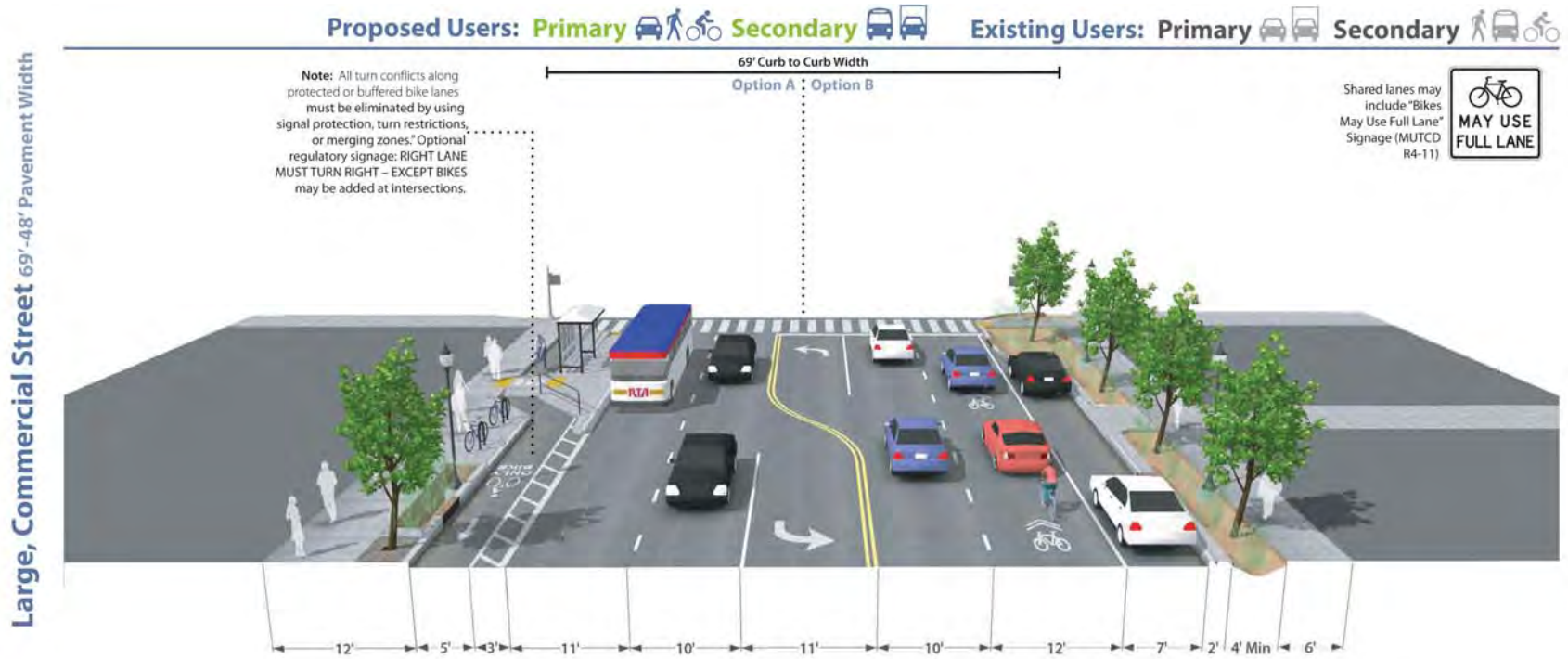


Figure 4-11: Typical complete street design for large commercial street

Complete Streets

"The Complete Streets movement fundamentally redefines what a street is intended to do, what goals a transportation agency is going to meet and how a community will spend its transportation money. The Complete Streets approach breaks down the traditional separation between highways, transit, biking, walking, and instead focuses on the desired outcomes of a transportation system that supports safe use of the roadway for everyone." ("The Best Complete Streets Policies of 2013," Smart Growth America, http://www.smartgrowthamerica.org/documents/cs/resources)

A Complete Streets Policy seeks to ensure that transportation planners and engineers consistently design community roadways for all potential users including bicyclists, public transportation vehicles and riders, persons with disabilities, and pedestrians of all ages and abilities. Complete streets design also considers natural systems (landscaping, plantings, etc) in roadway design. Incorporating complete streets into design guidelines and regulations is critical to institutionalizing bikeways and pedestrian facilities into the fabric of the community.

In complement to the Bicycle Master Plan improvements and policies that Greeley seeks to implement, adoption of a Complete Streets Policy will encourage consideration of all users, including bicyclists and pedestrians, in roadway design and retrofit. The complete streets policy developed as part of this plan found in Supplement B strives to provide sufficient flexibility to enable detailed design to respond to site-specific constraints and to deal with challenging transitions from existing conditions to desired future development patterns while providing enough rigidity to truly transform Greeley.

Roadway Retrofitting for Complete Streets

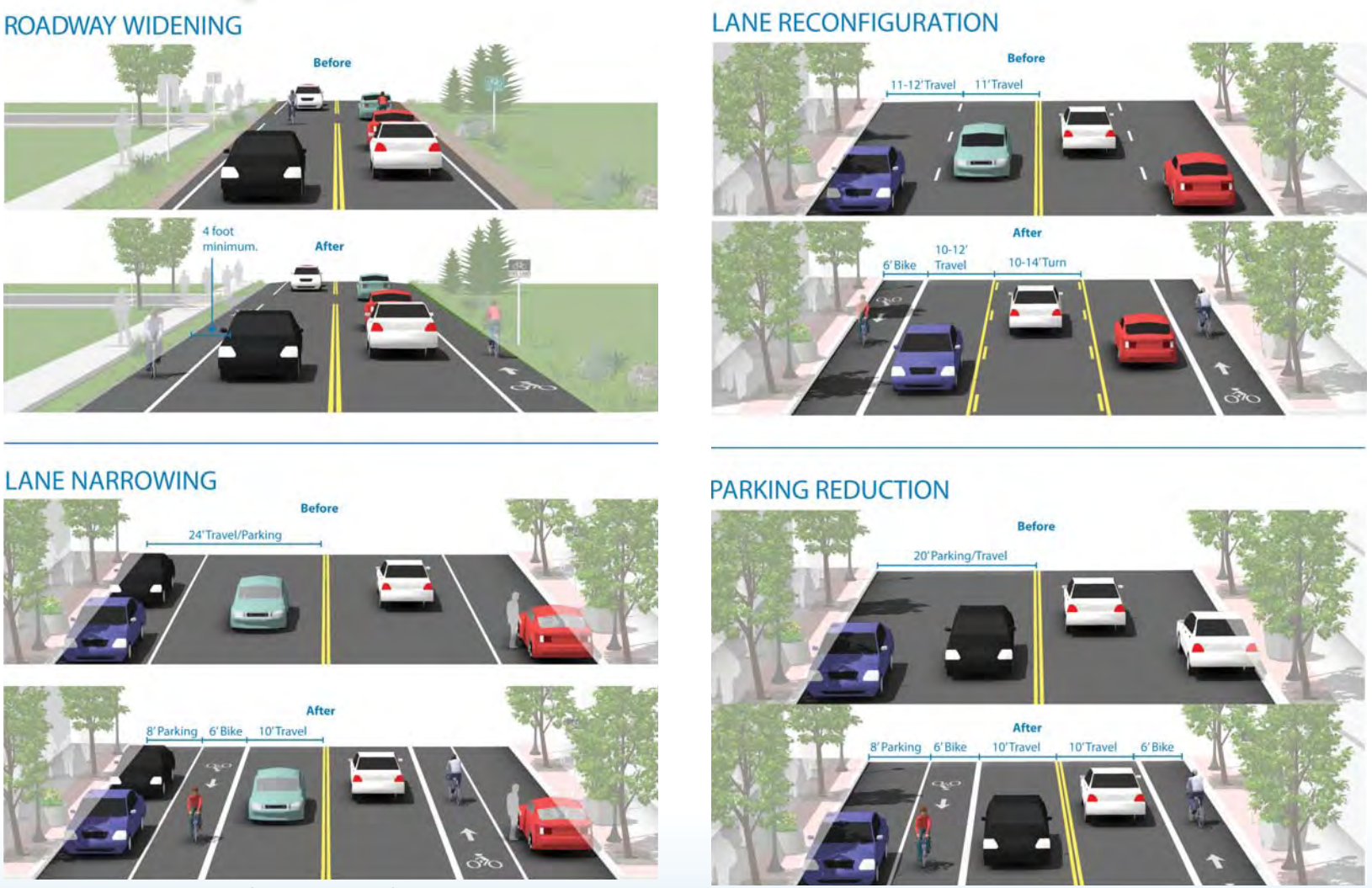


Figure 4-12: Roadway retrofitting concepts for complete streets

Encouragement, Education, Enforcement, and Evaluation

While a system of world-class shared use paths and on-street bicycle facilities will begin to move Greeley on the path to being a Gold-level bicycling community with increased ridership, it is the programmatic elements of a city's bicycle culture that connect residents to information about new and improved facilities and the benefits of bicycling, and provide positive reinforcement about why and how to integrate bicycling into their everyday lives. In essence, these efforts market bicycling to the general public and provide the maximum "return on investment" in the form of more people bicycling and a higher degree of safety and awareness around bicycling in Greeley. Programs are the element of this bicycle program that will sustain the bicycle culture that this plan aims to create.

This section contains recommendations for education, encouragement, enforcement, and evaluation programs (the remaining four of the "Five E's") that should be pursued along with infrastructure investments. For each of the priority programs, the technical team has provided information about the program purpose, a description of the basic approach and, wherever possible, links to model programs.

Program concepts were developed by the project team and based on knowledge of existing Greeley programs, community needs and desires, coordination with the Internal Review Team and the public on programs priorities, and knowledge of national best practices.

Figure 4-13: Greeley bike to work day station

Figure 4-15: Greeley Unexpected sign at Denver International Airport

Figure 4-14: Sheep Draw Trail connection opening twilight ride

"I am a bicyclist" Campaign

Project Description

Greeley's "I am a bicyclist" campaign will normalize bicycling by showing that anyone can be considered a bicyclist. This campaign can help promote that - regardless of the trip length or purpose - anyone who rides a bicycle is a "bicyclist," which can reduce stereotypes about who rides bikes and contribute to empathetic traffic behaviors.

The campaign messages could highlight people riding to school, types of professionals riding to work, and parents riding with their children. Featuring elected officials, appointed decision makers, and other prominent Greeley residents could put a known face to bicycling and show that the city supports it. The campaign will portray bicycling as a positive community value in Greeley.

Greeley's "I am a bicyclist" campaign will utilize both traditional and online media. Traditional media sources for this campaign include but are not limited to billboards (such as on the 10th Street corridor), bus wraps, and bus shelter ads. Online media could include campaign images in newsletters, on city and other websites, and on social media sites. In addition, the campaign will include posters and flyers in local businesses and bike shops and at City facilities such as parks and community centers, and build off past efforts with public service announcement radio spots.

Example Program

The Community Cycling Center's "I ride" campaign is working to raise awareness and to affect individual behavior choices in regards to bicycling. In 2011, the "I ride" campaign graphics were featured on 15 bus benches in North and Northeast Portland from May through November. The "I Ride" images, coupled with programs to help people access bicycling, have helped to change perceptions about bicycling and increase ridership within underrepresented communities.

"**I ride** to the grocery store."
"**I ride** because I don't have a car."
"**I ride** to get to work."
"**I ride** for my health!"

Staffing

The Public Works Department will serve as the lead and will dedicate approximately 350 hours of Staff, graphic design, and the potential future Bike Coordinator's time to development and implementation of this campaign. The City's Marketing department will handle creative development (included in the estimated 350 hours). Potential partner city departments and local organizations include:

- Greeley-Evans Transit for promotion on buses and bus shelter ads
- Parks Department for promotion in parks and community centers
- Local advocates and organizations, such as NCMC, the library district, Aims CC, and UNC, for promotion through their various channels

Other Resources

Community Cycling Center's "I ride" Campaign: www.communitycyclingcenter.org/index.php/community/i-ride/

Bike Pittsburgh's "Drive With Care" Campaign: bikepgh.org/care/

Minneapolis's "Bike Walk Move" Campaign: www.bikewalkmove.org/2011/bike-walk-move-campaign-aims-to-get-more-people-moving

Time Frame

The campaign would run for two months in addition to an initial four-month planning and design phase, during which messaging and graphics will be developed. While campaign materials on billboards, buses, and other higher-priced locations may be featured for the two month period, online media can be publicized for a longer period of time. The city can use campaign materials after the end of the formal media campaign as needed or desired.

Next Steps

- Review sample campaigns
- Develop campaign messaging
- Contact potential partners for promotion
- Reach out to elected officials, appointed decision makers, and prominent residents for participation

Estimated Cost

$80,000 (not including staff time)

This cost includes media buys - such as billboards and bus shelters - online media, printing posters, and translation services.

Bike Month Program

Project Description

The City of Greeley should continue to promote Bike Month activities by creating and promoting a unified, umbrella Bike Month program. Every June, various Greeley organizations celebrate biking to work through community rides, classes, and other events; the city could develop a Bike Month brand and organize a city-wide events calendar so that the community can more easily learn about the many activities occurring as part of Bike Month. The program branding should be based on the Greeley Bikes logo to increase recognition of the city's overall work to improve bicycling and build on the city's current efforts to organize a Winter Bike to Work Day.

The city should also organize additional Bike Month activities, focusing on Bike to Work Week, such as infrastructure demonstration projects and bike-in movies in the park. The city could also provide a limited number of giveaway items (such as t-shirts or water bottles) to encourage participation.

As part of Bike Month, the city should promote the use of the League of American Bicyclists' National Bike Challenge web tool. The tool provides the web capability to track biking and allow businesses or organizations to compete for the most bicycling miles logged or number of days ridden. The city should reach out to elected officials and agency heads to challenge each other and their staff to increase political support for bicycling. The tool can be used for any period of time from May through September. At the end of the competition, the city should highlight the resulting miles logged and recognize those that rode the most.

Time Frame

The pilot Bike Month program will occur in June 2015 and include two months of preparation time. The city will choose to continue or modify the program for subsequent years.

Example Program

The Sacramento Area Council of Governments organizes a comprehensive Bike Month celebration with many different program activities. These activities range from employer, school, and city challenges, to women's workshops, community rides, and education and maintenance classes. All events are shown on a user-friendly online events calendar.

Next Steps

- Develop Bike Month branding based on Greeley Bikes logo
- Determine promotional efforts for the National Bike Challenge and reach out to businesses to sign up
- Create a plan for which Bike Month activities and giveaways the city will manage
- Set up events calendar on Greeley Bikes webpage and collect event details

Staffing

The Public Works Department will serve as the lead department managing the branding development, events calendar, promotion of the National Bike Challenge, and organization of additional Bike Month events, and dedicate approximately 150 hours of the potential future Bike Coordinator's time.

Potential partners include existing and future Bike Month activity organizers, such as NCMC, UNC, Aims CC, and local businesses to participate in the challenge.

Other Resources

Sacramento Region Bike Month:
www.mayisbikemonth.com/events.asp

League of American Bicyclists National Bike Challenge:
www.nationalbikechallenge.org/

Tacoma-Pierce County Bike Month:
www.piercetrips.com/148/Bike-Month

Estimated Cost

$13,000 (not including staff time)

This cost includes printing flyers and posters, giveaways, translation services, food for events, promotional ads, and equipment.

Bike-Friendly Business Program

Project Description

Greeley's Bike-Friendly Business Program will recognize businesses that go the extra mile to welcome bicyclists, and encourage business owners to take action to become more bike friendly. It will function as a partnership between the city and businesses where participating businesses receive additional resources from the city, such as educational training (discussed below).

The city's potential Bicycle Coordinator will reach out to businesses to explain why Greeley is supporting bike-friendly businesses, and how the businesses can make their shops and locations more convenient and appealing to people arriving by bike. This will involve in-person communications and the distribution of educational materials. The city will also survey businesses to understand the status of existing bike-friendly businesses and the resources that businesses would like from the city to enhance their appeal to bicycling customers.

The city's program will formally kickoff by encouraging businesses to apply to become Bicycle Friendly Businesses through the League of American Bicyclists' (LAB) program. The city will promote and honor businesses that become recognized and work with these businesses to establish a discount program for patrons that arrive by bicycle.

In conjunction with encouraging businesses to apply to the LAB for Bike-Friendly Business designation, the city will focus infrastructure efforts on the defined business district(s). This can include the implementation of bikeways from this Plan that are in business district(s), increasing sidewalk bike racks and bike corrals, and other amenities that would create a more convenient and comfortable biking environment, such as traffic calming, wayfinding, map kiosks, and maintenance stations.

In the long- term, the city would like to include efforts to educate businesses on how to integrate bicycle-friendly business practices for their employees to increase commute trips made by bicycle.

Time Frame

The pilot Bike-Friendly Business Program will occur over the course of one year. The city will provide ongoing services to businesses and continue to encourage increased participation in the program.

Example Program

The City of Long Beach manages a comprehensive Bike-Friendly Business Program to encourage riding to businesses and promote businesses implementing bike-friendly policies and practices. As part of the program, the city has increased bike-related businesses, bike racks and corrals, bike lanes, and signage along major corridors in six business districts. Cargo bikes are available for businesses with delivery services and more than 170 businesses provide "Bike Saturdays" discounts to customers that opt to bicycle instead of drive. The business districts are also the destination of regular Kidical Mass rides to bring more bicyclists into the area.

Next Steps

- Define the parameters of the geographic area and/or business types to focus on
- Begin outreach to businesses to explain the program and conduct the survey
- Encourage businesses to apply

Staffing

The Public Works Department will serve as the lead department and dedicate approximately 500 hours of the potential future Bike Coordinator's time. Potential partners include:

- The Chamber of Commerce to encourage business participation
- Bicycle advocacy groups to recognize businesses that participate

Other Resources

The LAB Program: www.bikeleague.org/business

Long Beach's Bicycle Friendly Business District Program: www.bikelongbeach.org/welcome/bike-share-program/bicycle-friendly-business-district-program

Boulder's Bicycle Friendly Business Program: www.communitycycles.org/programs/bike-friendly-business.html

Travel Oregon's Bike Friendly Business Video Tutorials: www.industry.traveloregon.com/industry-resources/product-development/bike-friendly-business-program/steps-to-get-recognized/

Estimated Cost

$5,000 (not including staff time)

Cost includes printing promotional and educational materials, giveaways, and supplies.

Bicycle Coordinator

Project Description

The City of Greeley's Bicycle Coordinator will be responsible for organizing, collaborating, and managing the city's bicycle programs and projects. Potential job duties include:

- Overseeing implementation of the Bicycle Master Plan and its priority projects and programs
- Align with the Public Works department, reviewing bicycle plans and proposals for the design and construction of on- and off-street bikeways
- Managing bicycle counts, evaluation efforts, and the Bicycle Report Card report
- Publicizing events and programs
- Coordinating with University and school staff, NCMC, and other potential partners
- Reviewing development plans for properly including bikeways and bicycle parking
- Managing programs such as Bike to Work Month, Bike Ambassador, Bike Friendly Business, and Safe Routes to School Programs
- Identifying new projects and programs to benefit Greeley
- Pursuing funding sources for project and program implementation
- Reporting on progress to the City Council

Time Frame

As a first step in implementing the projects and programs in the Bicycle Master Plan, the city should fund and fill the position of the bicycle coordinator. This process should begin immediately after Plan adoption. The position should be permanent and ongoing.

Next Steps

- Finalize job description
- Secure funding for position
- Receive approval for new position

Staffing

The Bicycle Coordinator position will be within the Public Works Department. The position will be full-time and dedicated solely to bicycle transportation.

Estimated Cost

$98,000

Cost includes $70,000 for salary, $23,000 for benefits, and $5,000 for supplies for one year.

Other Resources

The Association of Pedestrian and Bicycle Professionals (APBP) has many online resources, including an online listserv that Bicycle Coordinators can use to connect with other professionals and further their knowledge. APBP is currently working on setting up a program for Local Bicycle and Pedestrian Coordinators (LBPCs) that will provide a guidebook for staff in these positions, a training program for new LBPCs, and a certification program.

www.apbp.org

The Initiative for Bicycle and Pedestrian Innovation (IBPI) is a center for research and learning that is focused on bicycle and pedestrian travel. IBPI offers educational resources and courses for practicing professionals.

www.pdx.edu/ibpi/

The Victoria Transport Policy Institute published a Pedestrian and Bicycle Guide to Best Practices report covering basic information on various planning and design concepts and references to help practicing professionals implement the concepts.

www.tinyurl.com/lhvf5gh

Advocacy Advance published a guide on Best Practices for Bicycle and Pedestrian Advisory Committees that provides information on structure, benefits, and challenges relevant for Bicycle Coordinators.

www.advocacyadvance.org/site_images/content/bpac_best_practices(web).pdf

Bicycle Report Card

Project Description

Greeley's Bicycle Report Card will track the changes in bicycling infrastructure, programs, attitudes, and safety as a result of Bicycle Master Plan adoption. The report will include the following areas of analysis:

- A map and description showing changes in bikeways and programs implemented
- Bicycle counts to measure changes in ridership citywide and analyze before and after results of new infrastructure
- Bicyclist surveys to measure residents' thoughts about new bicycle projects and programs and the bicycling environment in Greeley
- Collision analyses to highlight changes in bicycle crashes and determine where prioritized improvements are needed
- Sales tax evaluations to determine economic impacts of increased bicycle projects and programs

The report will be publicized throughout Greeley to promote the successes of the bicycle program and demonstrate to the community that the city is doing its part to improve mobility options.

Example Program

The City of Los Angeles includes on its bicycle program website an interactive map showing changes to infrastructure as they are completed. As soon as a new bikeway project is ready for public use, the map is updated so that the community can be constantly up-to-date on the current status of bicycle infrastructure. The map also breaks down planned bikeways for the next year and long-term proposed bikeways.

Staffing

The Public Works Department will be responsible for collecting and analyzing data, and compiling and publicizing the report. This will involve approximately 100 hours of the potential future Bike Coordinator's time. The City's Marketing Department will be responsible for report layout and graphic design.

Other Resources

Los Angeles's Interactive Infrastructure Tracking Map: www.bicyclela.org/maps_main.htm#lamaps

Seattle's Bicycle Report Card: www.faculty.washington.edu/ostergrn/CommuterProfiles/infoAboutCommutingModes/BicycleReportcard_web.pdf

Cincinnati's Bicycle Report Card: www.cincinnati-oh.gov/bikes/linkservid/DB6EA3D5-ED05-6CC1-0B0246EFE1EAD6D5/showMeta/0/

New York's "The Economic Benefit of Sustainable Streets" Report: www.nyc.gov/html/dot/downloads/pdf/dot-economic-benefits-of-sustainable-streets.pdf

Time Frame

The Bicycle Report Card report will be published annually after the end of either the calendar year or the fiscal year.

Next Steps

- Determine report metrics and data sources
- Confirm layout and design responsibilities of the Marketing Department

Estimated Cost

$1,000 (not including staff time)

Cost includes printing promotional materials.

Additional Program Recommendations

Education Programs

Biking and Health Campaign: A campaign showing the connection between health and biking.

Example: www.effectivedesigns.co.uk/blog/better-bike-campaign-which-promotes-cycling-in-argentina/

Driver Education Campaign: A campaign to focus on driver behavior issues that impact bicycling, such as sharing the road, passing bicyclists safely, or distracted driving.

Example: Los Angeles Metro, Every Lane is a Bike Lane, www.thesource.metro.net/2013/04/11/every-lane-is-a-bike-lane/

Bicycle Education Courses: Classes using the LAB bicycle skills curriculum to teach adults bicycle checks and basic maintenance, basic and advanced on-road skills to minimize conflicts, commuting, and driver education. The city could provide funding and partner with local advocacy groups to conduct the courses.

Example: Los Angeles County Bicycle Coalition and LA Metro, jointly hosted education courses, www.la-bike.org/streetcyclingskills

Bicycle Co-op: A community bike shop that is run by volunteers that teach people how to repair their own bikes in a comfortable, approachable environment. The city could partner with Turn Around Bikes for implementation.

Example: Los Angeles, Bicycle Kitchen, www.bicyclekitchen.com/index.php?/projects/home/

Bicycle and Pedestrian Education Coalition: The city could join this group, which offers one-hour trainings as part of their Bike Ambassadors Program.

Example: Northern Colorado Bike Ambassadors Program, www.bicycleambassadorprogram.org/

Encouragement Programs

Winter Bicycling Encouragement Events: Events that encourage people to try riding in winter weather and thus also educate how to do so.

Example: Portland, Worst Day of the Year Ride, www.worstdayride.com/

Safe Routes to School (SRTS) Pilot Program: A SRTS program can include a wide variety of different infrastructure and non-infrastructure programs. A pilot program starts small and generally includes walk audits at schools to recommend bike/pedestrian improvements, student commute hand tallies, and a series of programs like bike education, children's bike rides, and family educational events.

Example: LA Metro, SRTS Pilot Program, www.metro.net/projects/srts/

Individualized Marketing Program: A program to work with a subset of a community (at the neighborhood level) to help educate residents about their transportation options and make it easier for them to try out different modes of transportation.

Example: Chicago's Go Pilsen, www.gopilsen.org/

Open Streets Events: Events that close the street to non-motorized activities for a limited period of time. These can be one-time or regular events, and can be combined with other activities and festivals.

Example: Guide to Open Streets, www.openstreetsproject.org/blog/2012/02/21/open-streets-project-releases-best-practices-guide/

Enforcement Programs

Targeted Enforcement: Increases focus on enforcing laws that create safe conditions for all road users and educates road users in the process. Targeted enforcement can include intersection patrols, handing out informational materials, and enforcing speed limits.

Example: www.smspoke.org/wp-content/uploads/2012/12/Poor-Driving-December-2012.jpg

Bicycle Diversion Program: Bicyclists that are given tickets for traffic violations have the option of attending a class on how to safely use a bicycle in traffic in lieu of paying the moving violation fine.

Example: Santa Cruz County, Bike Traffic School, www.sctrafficsafety.org/BikeTrafficSchool.htm

Good Work Citations: Officers reward drivers and bicyclists with good behavior rather than citing them for bad behavior.

Example: Operation Safe Summer, www.jobs.aol.com/videos/what-its-like/police-hand-out-ice-cream-to-kids-wearing-helmets/517806516/

CHAPTER 5: IMPLEMENTATION

"Road to Gold"

Strategy

The projects, programs, and policies recommended in Chapter 4 of this document, if implemented, detail the improvements and changes that will benefit the city over the next 10 to 15 years. Without implementation, this plan would never become reality. This chapter describes how to make the improvements, programs and policies in this document a reality. Not all of these improvements can be made quickly; it will take many years of steady, incremental progress to achieve this vision. In prioritizing projects, identifying "low hanging fruit," and identifying costs and funding opportunities, this chapter will be a "road map" to realizing Greeley's bicycling potential and moving towards Gold-level Bicycle Friendly Community status.

Implementation of this plan will take place in small steps over many years. The following strategies will guide the city toward developing and implementing the projects identified in the plan.

Complete inexpensive "**low-hanging fruit**" projects first to gain a more connected network. Such projects could include:

- Bicycle boulevards (such as 2nd Street and 4th Avenue)
- Bike lanes that require striping only to complete (such as 59th/65th Avenue, 20th Street east of campus, and 17th Avenue)
- Gap fill striping projects (such as 13th Avenue north of 20th Street and Reservoir Road/20th Street west of 14th Avenue)

Opportunistically pursue projects such as bike lanes or shoulder bikeways in conjunction with **roadway resurfacing** projects as they occur.

Strategically pursue high-priority projects and programs with local or grant funding, including CMAQ funding pursuits currently underway.

Incrementally pursue projects based on **available resources** with the goal of eventually completing the project in full.

Incrementally pursue projects based on opportunities associated with **new development**.

Regularly revisit the Bicycle Master Plan every few years to evaluate progress on project implementation and every five years to fully review project list, priority, and applicability of programs and projects in the current bicycling environment. Elevate implementation priority for projects that will significantly enhance the non-motorized network as it grows.

If hired, **involve the Greeley Bicycle Coordinator** in implementation decisions.

Project Prioritization

Along with the Internal Review Team and the public, the project team completed a prioritization process to help identify the infrastructure projects that will create the most impact in Greeley's bicycle system and that best aid in achieving the project goals and objectives. Priority projects are those that have a significant value to the community and will have a larger impact to the overall network than simply developing an isolated bike lane or pathway.

Figure 5-1: Number Three Ditch off of 13th Street - potential off-street trail corridor

Ranking Methodology

The ranking methodology and rating was developed by the project team in conjunction with city staff and the public using a "weight 'em and rate 'em" process of developing ranking criteria, assigning weights to each criteria, and rating each project in relation to the developed criteria. This process is described in detail in Appendix D.

Figure 5-2: 20th Street - potential protected bike lane corridor

Scoring and Ranking

The criteria discussed on the next page were applied to each facility. The facility was first assigned a numeric value (score) to the degree it meets the criteria requirements. Each project's score in each category was then multiplied by the category's weight which was established by the review team with public input. Then the project's weighted scores for each criteria were added up to give a total score. These total scores were compared, and the projects ranked according to total score. This tool can be used and modified as necessary by the city as additional projects are desired or as criteria emphasis preferences change. It should be noted that this process is a tool to be considered when determining next project priorities, but is not the determining factor in which projects will be constructed in what order.

Scoring Criteria

Bicycling Stress Reduction

Because one of the main goals of the plan is to encourage the "60%" (interested but concerned) population to ride more, reduction of bicycling stress is a critical component of the bike network. With this criteria, high-scoring projects significantly decrease the level of bicycling stress. This criteria was not used in off-street trail ranking.

Connectivity to Existing Facilities

Bicycling is typically higher along designated facilities. Creating connectivity to existing bike facilities enables more trips to be made by bike, and provides bicyclists of varying capabilities multiple routes for reaching their destination. Facilities that connect to an existing bikeway or bikeways will receive this scoring criterion.

Connectivity to Proposed Facilities

In addition to the existing bikeway network, this plan proposes the addition of many projects throughout Greeley. While not as immediately effective for bikeway continuity, facilities that connect to proposed facilities will help create a robust and cohesive network. Proposed facilities that intersect with other proposed facilities will be awarded this criterion.

Connectivity to Schools

The project team heard from community members, city staff, and city commissions that increasing the number of students who are comfortable bicycling to school is a high priority in Greeley. One of the primary ways to accomplish this is to provide adequate bicycling facilities near schools. To encourage more students to walk and bicycle to school, proposed facilities that directly connect to or travel within ¼ mile of any school (public or private) would qualify for this prioritization criteria.

Connectivity to Underserved Areas

There are a number of areas in Greeley that are currently underserved, meaning they are not in close proximity to an existing bicycle facility. Many of these underserved areas are also areas where a higher percentage of the population uses bicycling, walking, or transit travel as their only transportation option. To encourage connectivity to these areas of the city, projects that are proposed in areas further than ½ mile from an existing bicycle facility qualify for this criteria.

Connectivity to Recreation

One of the community's primary immediate concerns is improving access to the parks and off-street trail network. Increasing ease of use and access for recreational riders, children, and anyone wishing to take advantage of Greeley's recreation opportunities was therefore a significant consideration in plan development. Therefore, projects with direct access to a public park, open space, or off-street trail destination qualify for this criteria.

Connections to Jobs, Activity Centers, and Transit

Activity centers and jobs are the major trip-driving destinations within Greeley (e.g. commercial districts, employment centers, Downtown, etc.). By increasing accessibility to major activity centers and to transit stops that will ultimately take people to the activity centers, the recommendations in this plan can help reduce vehicle miles travelled and support residents and visitors who choose to bicycle or walk. Projects that connect to these centers qualify for this prioritization criterion.

Connectivity to Residential

Just as connecting to "end of trip" destinations such as jobs and activity centers is critical to encouraging residents to bicycle for more trips, so is connecting to the trip origin, most often a house or residence. This criteria rewards projects that pass through residential "hot spots" according to the BSI analysis, where, in general, a higher density of housing is present in the surrounding areas.

Network Gap Closure

Gaps in the bicycling network discourage use of this mode because they limit route continuity, sense of belonging and security, or require users to choose less direct paths to access their destinations. Some feel "stranded" when a facility abruptly ends or does not easily connect to their destination, forcing users to ride on a street that does not accommodate their proficiency level or increases the length of their trip. Facilities that fill identified gaps in the existing bicycling and walking network will qualify for this criterion.

Safety

Increasing bicyclist and all users' safety is paramount in any infrastructure project. Because a majority of the bicycle-vehicle crashes occur at locations without a bicycle facility, and because by nature of providing an improved facility, safety is likely to increase, projects that include locations with reported bicycle crashes qualify for this criteria.

Ease of Implementation

Although not a primary consideration in the development of a bicycle network, ease of implementation is a critical piece of whether a network will be successfully and quickly implemented. The project list includes some projects that are "low hanging fruit" ready to be implemented within the next year, but it also includes projects such as the Number Three Ditch Trail, which will require significant right-of-way coordination, time-consuming planning and engineering, and is on a longer time frame than many of the other projects. To recognize projects that are "shovel ready" (already have the required planning and engineering in place or require little planning or engineering prior to implementation), require little to no physical roadway modification, or have an existing funding source in place, projects that will be easier to implement are awarded this criteria.

Table 5-1: Project Prioritization Criteria and Weights

Criteria	Description	Range	Weight
Bicycling Stress Reduction	The project decreases the level of travel stress between intersections or increases clarity or protection at an intersection. (not used in off-street trail ranking)	Cycletrack and off-street facilities (especially on roads >35mph) are the most comfortable to most people. Signed bicycle routes are the least comfortable for most people.	3
Connectivity - Existing	The project connects to an existing bicycle facility.	Direct access to an existing bicycle or trail facility. (highest score to 2 connections in off-street trail ranking) Does not directly or indirectly access an existing bicycle facility.	2
Connectivity - Proposed	The project connects to a proposed bicycle facility.	Direct access to a proposed bicycle or trail facility (highest score to 2 connections in off-street trail ranking) Does not directly or indirectly access a proposed bicycle or trail facility.	1
Connectivity - School	The project provides a new or improves upon an existing access to a school.	Direct access to any school. Does not directly or indirectly access a school.	3
Connectivity - Underserved Areas	The project provides a new or improves upon an existing access to an area currently underserved by bicycle infrastructure.	Direct access to a destination or area that is currently further than 1/2 mile from a bicycle facility (underserved area). Does not directly or indirectly access an underserved area.	2
Connectivity - Recreation	The project provides a new or improves upon an existing access to a public park, open space, off-street trail, or other recreation destination.	Direct access to a public park, open space, or trail (PTOL) destination. (Highest points to connection for the Poudre River Trail or Sheep Draw Trail) Does not directly or indirectly access a PTOL.	3
Connectivity - Jobs and Activity Centers	The project provides new or improves upon existing access to a major job center, activity center, or transit stop.	Directly connects to a major trip-driving destination or transit center/stop. Does not directly or indirectly connect to a major trip-driving destination or transit center/stop.	3
Connectivity - Residential	The project provides a new or improves upon an existing access to existing or proposed residential uses.	Direct access to a high number of residential units. No direct access to residential units.	2
Network Gap Closure	The project closes a gap in the existing bicycling network.	Fills a network gap between two existing facilities. Does not directly fill a gap between two existing or an existing and proposed facility.	3
Safety	The project potentially improves bicyclist safety in a location with reported bicycle crashes. (not used in off-street trail ranking)	Includes locations with five or more reported bicycle crashes, as reported in the "Crash Analysis" section of this report. Includes no locations with reported bicycle crashes, as reported in the "Crash Analysis" section of this report.	3
Ease of Implementation	The project is "shovel ready," requires little road reconfiguration, or has an existing funding source/ project that it can be implemented under.	Can be constructed/installed with the least difficulty. Will require major effort (time, money, right-of-way, preparation) to implement.	2

Table 5-2: On-Street Project Ranking							
Ranking	Project Name	Length (mi)	Limit 1	Limit 2	Classification	City/County	Score Total
1	23rd Ave	3.1	5th St	37th St	Sidepath	Greeley/Weld	47
2	20th St	3.5	71st Ave	28th Ave	Protected Bike Lane	Greeley	43
3	14th Ave	1.3	2nd St	16th St	Buffered Bike Lane	Greeley	42
4	17th Ave	0.5	US 34	32nd St	Bike Lane	Greeley	42
5	4th St	2.1	59th Ave	23rd Ave	Protected Bike Lane	Greeley	40
6	16th St	0.8	14th Ave	1st Ave	Protected Bike Lane	Greeley	37
7	20th St	0.6	28th Ave	23rd Ave	Protected Bike Lane	Greeley	37
8	Reservoir Road	0.5	14th Ave	21st Ave	Bike Lane	Greeley	36
9	13th Ave	0.2	Cranford Pl	20th St	Bike Lane	Greeley	35
10	16th St	0.6	21st Ave	14th Ave	Sidepath	Greeley	35
11	20th St	0.3	11th Ave	7th Ave	Bike Lane/Sharrow	Greeley	35
12	28th Ave	1.7	16th St	US 34 (on Reservoir)	Buffered Bike Lane	Greeley	35
13	11th Ave	1.8	5th St	20th St	Protected Bike Lane	Greeley	34
14	28th Ave	1.1	4th St	16th St	Buffered Bike Lane	Greeley	34
15	4th Ave	0.7	5th St	13th St	Bike Boulevard	Greeley	34
16	50th Ave	0.6	10th St	Aims CC	Sharrow	Greeley	34
17	59th/Westridge/65th Ave	2.2	20th St	37th St	Bike Lane	Greeley/Weld	34
18	10th St	3.0	Promontory Pkwy	71st Ave	Sidepath	Greeley	33
19	11th Ave	1.0	20th St	27th St	Sidepath	Greeley	33
20	22nd St	0.7	7th Ave	1st Ave	Bike Lane	Greeley	33
21	35th Ave	1.70	0 St	4th St	Bike Lane	Greeley	32
22	65th Ave	0.7	13th St	20th St	Sidepath	Greeley	32
23	10th St	1.0	35th Ave	23rd Ave	Sidepath	Greeley	31
24	US 34	1.7	35th Ave	11th Ave	Sidepath	Greeley	31
25	20th St	0.6	79th Ave	71st Ave	Protected Bike Lane	Greeley	30
26	20th St	0.2	23rd Ave	21st Ave	Buffered Bike Lane	Greeley	30
27	4th St	0.8	83rd Ave	Dundee Ave (74th Ave)	Protected Bike Lane	Greeley/Weld	30
28	10th St	0.4	63rd Ave	59th Ave	Sidepath	Greeley	29
29	2nd St	1.0	23rd Ave	11th Ave	Bike Boulevard	Greeley	29
30	38th Ave	0.2	23rd St	Centerplace	Bike Lane	Greeley	29
31	5th St	0.8	23rd Ave	14th Ave	Sharrow	Greeley	29
32	10th St	1.2	23rd Ave	7th Ave	Protected Bike Lane	Greeley	28
33	8th St	0.6	7th Ave	US 85	Bike Lane	Greeley	28
34	W. 25th St	0.4	38th Ave	35th Ave	Sidepath	Greeley	28

Table 5-2: On-Street Project Ranking							
Ranking	**Project Name**	**Length (mi)**	**Limit 1**	**Limit 2**	**Classification**	**City/County**	**Score Total**
35	42nd Ave	0.2	23rd St	Centerplace	Bike Lane	Greeley	27
36	4th St	1.3	Dundee Ave (74th Ave)	59th Ave	Protected Bike Lane	Greeley	27
37	25th St	0.5	17th Ave	11th Ave	Bike Lane	Greeley	26
38	71st Ave	1.7	16th St	29th St	Bike Lane	Greeley	26
39	C St	1.0	35th Ave	23rd Ave	Bike Lane	Greeley	26
40	F St	2.2	59th Ave	23rd Ave	Bike Lane	Greeley	26
41	1st Ave	0.3	16th St	18th St	Sidepath	Greeley	25
42	21st Ave	0.5	16th St	20th St	Buffered Bike Lane	Greeley	25
43	N 25th Ave	0.8	F St	O St	Bike Lane	Greeley	25
44	US 34	2.8	95th Ave	65th Ave	Sidepath	Greeley	25
45	O St	6.3	83rd Ave	US 85	Bike Lane	Greeley/Weld	24
46	"16th St"	0.3	Promontory Pkwy	103rd Ave	Bike Lane	Greeley	23
47	47th Ave	1.0	US 34	37th St	Bike Lane	Greeley/Weld	23
48	18th St	0.3	Railroad tracks	1st Ave	Bike Lane	Greeley	22
49	71st Ave	0.8	O St	F St	Bike Lane	Greeley	22
50	20th St	1.4	95th Ave	79th Ave	Protected Bike Lane	Greeley	21
51	29th St	0.5	65th Ave	58th Ave	Bike Lane	Greeley	21
52	37th St	2.6	65th Ave	35th Ave	Sidepath	Greeley/Weld	21
53	30th St	0.2	41st Ave	39th Ave	Sharrow	Greeley	20
54	83rd Ave	1.5	17th St	30th St	Bike Lane	Greeley	20
55	W. 25th St	0.4	35th Ave	Mountain Lane	Sharrow	Greeley	20
56	23rd St	0.3	44th Ave Ct	42nd Ave	Sharrow	Greeley	18
57	24th St	0.3	Westridge Ave	59th Ave	Bike Lane	Greeley	15

Table 5-3: Off-Street Trail Project Ranking

Ranking	Project Name	Length (mi)	Limit 1	Limit 2	Type	City/ County	Score Total
1	Greeley Number 3 Ditch	3.3	4th St and 23rd Ave	27th St and 2nd Ave	Off-Street Trail	Greeley	32
2	Aims C.C. connection from 16th St Ln	0.2	16th St Ln	Aims C.C.	Off-Street Trail	Greeley	28
3	Poudre Trail East Extension	2.5	11th Ave	Ash Ave	Off-Street Trail	Greeley	25
4	Greeley Number 3 Ditch	0.6	Larson Trail	35th Ave	Off-Street Trail	Greeley	24
5	Sheep Draw Trail	1.1	83rd Ave	71st Ave	Off-Street Trail	Greeley	24
6	50th Ave	0.2	F St	Coyote Run	Off-Street Trail	Greeley	23
7	Canal Road - Waggin' Tail Connection	1.5	29th St at 11th Ave	Waggin' Tail Dog Park	Off-Street Trail	Greeley	21
8	47th Ave Connection to Number 3 Ditch	0.2	47th Ave	Number 3 Ditch	Off-Street Trail	Greeley	20
9	Greeley Number 3 Ditch	0.9	F St	Larson Trail	Off-Street Trail	Greeley	19
10	Greeley CTP Map 7	1.1	Sheep Draw	20th St at 74th Ave, s. through Mntn Vista and Triple Creek	Off-Street Trail	Greeley	19
11	35th Ave connection	1.1	29th St at 35th Ave	US 34 (assumes grade separated crossing completion)	Off-Street Trail	Greeley	16
12	24.5 Ave connection	0.7	C St	4th St	Off-Street Trail	Greeley	10

Table 5-4: Spot Improvements		
Project Name	**Description**	**City/ County**
13th Street and US 85 Intersection	Intersection signing/striping/markings, pedestrian refuge, signal timing modifications	CDOT/Greeley
22nd Street and US 85 Intersection	Intersection signing/striping/markings, pedestrian refuge, signal timing modifications, curb and gutter for frontage road and three corners. Modification of frontage road to reduce intersection conflict.	CDOT/Greeley
23rd Ave and US 34 Interchange (EB on and off ramp and underpass)	Intersection signing/striping/markings, pedestrian refuge (on southern leg at a minimum), signal timing modifications, possible pork chop installation on NW and SE corners, additional crossing on southern leg. Possible underpass lighting modification.	CDOT/Greeley
35th Ave and US 34 Intersection	Pedestrian refuges on east and west legs, additional pork chop in NE corner, signal timing modifications, bike/pedestrian signing and striping enhancements.	CDOT/Greeley
47th Ave and US 34 Intersection	Intersection signing/striping/markings, pedestrian refuges on east and west legs, additional pork chop islands on NE and SW corners, signal timing modifications	CDOT/Greeley
US 34 Grade-Separated Crossing at 29th St	Potential overpass or underpass. Connect to proposed US 34 path as well as Reservoir Road. Significant additional consideration, costing, and planning required to determine potential usage and feasibility.	CDOT/Greeley
US 34 Grade-Separated Crossing at 17th Ave	Replace current underpass, ideally close to 17th Ave instead of offset. Overpass or underpass.	CDOT/Greeley
US 34 and US 85/US 85 Business Route Interchange	Planning process currently underway to consider potential intersection and interchange modifications. Once future configuration is determined, consider north-south connection through or near this interchange connecting Evans to the 9th Avenue South area.	CDOT/Greeley
Note: signal timing enhancements if necessary.		

Priority Projects and Costs

Priority Projects

The top twelve ranked on-street (or roadway-adjacent) projects resulting from the prioritization process are listed on the following pages, as are the top six off-street trail projects (including the Poudre River Trail extension east, which is under development by other agencies in coordination with the Parks Department). To assist Greeley in moving forward quickly with the highest ranking projects and with additional "low hanging fruit" projects, project information for these projects including costs, notes, distance, and facility type can be found in Appendix D.

In addition to priority roadway and off-street trail projects, table 5-4 shows spot improvements of varying ease of implementation. These projects should be considered as funding is available.

The top 18 bicycle projects in this chapter were determined through this planning process largely based on prioritization, with additional Internal Review Team, staff and public input. The city should consider these projects as the first set of critical projects to consider for construction. "Low hanging fruit" projects (those with implementation scores of two out of two) within the top projects should be considered first, and additional "low hanging fruit" projects ranked lower in the prioritization list will also be important to consider. See inset, this page, for list of "low hanging fruit" projects. It is unlikely that the bicycle network will be built in the order presented in this chapter. Many bicycle facilities will be constructed as opportunities present themselves in the resurfacing and roadway construction process.

Implementation Costs

Detailed planning-level implementation cost estimates were developed for the top 17 facility improvements (Poudre River Trail extension was excluded, as planning has already begun) as well as the top five programs recommendations. Programs costs are listed in the Programs Recommendations section. Infrastructure costs are shown on project cut sheets and in cost details in Appendix D.

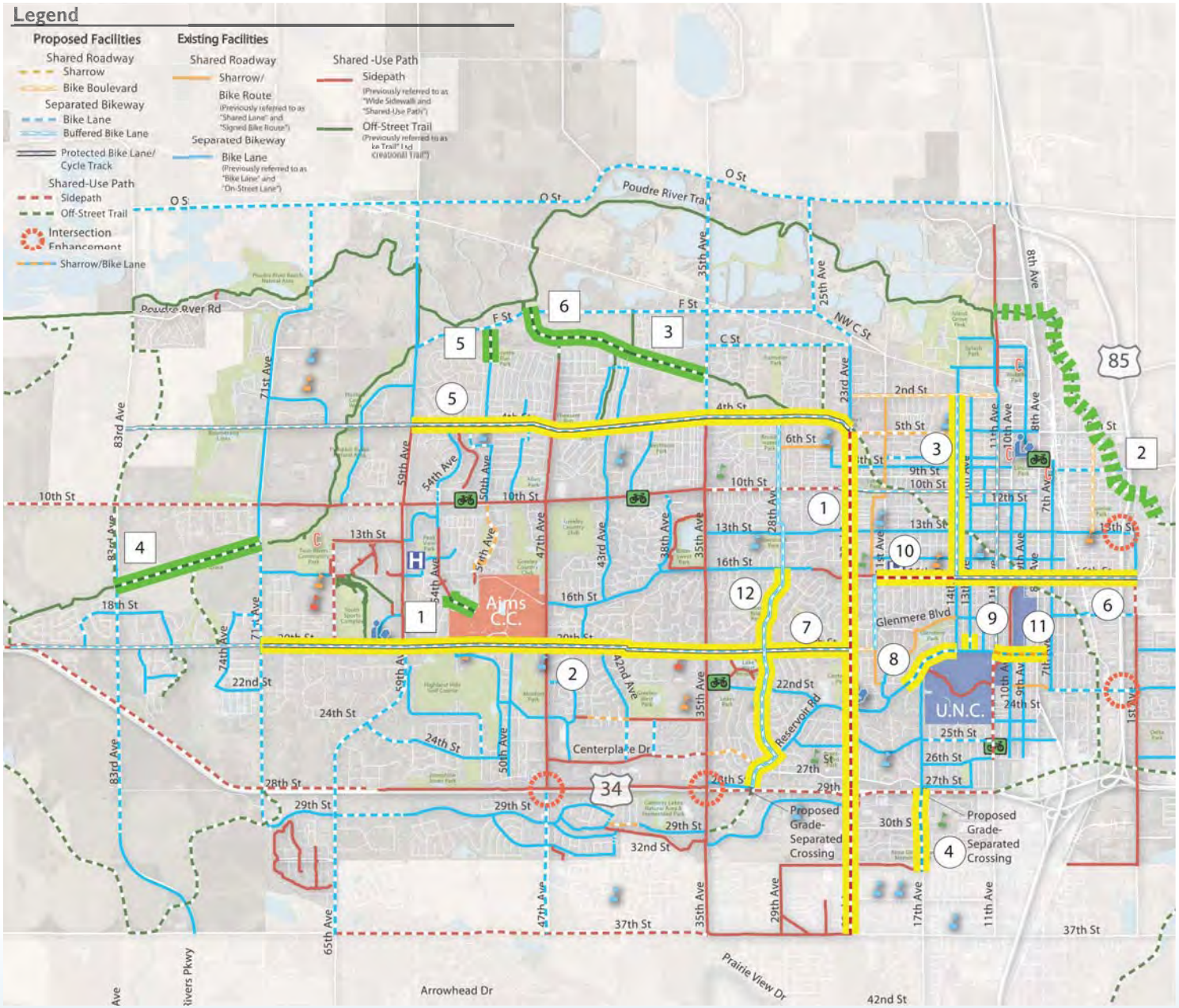
Total Plan Cost

The total cost of implementation for a project takes into consideration the length in miles of the proposed project as well as removal of any existing elements, signing and striping, additional barriers, removal or addition of curb and gutter, any lump sum items and contingencies. The total cost for all planned projects listed in Appendix D is $13.7 million. To compare with the Greeley Master Street Plan, total cost of implementation was estimated at $350 million.

Low-Hanging Fruit Projects

"Low Hanging Fruit" projects are those that are relatively easy or inexpensive to implement. Although some are not listed on the top priority projects list, low hanging fruit projects should be considered for implementation as soon as funding is available to continue momentum and make progress on network implementation.

- 4th Avenue from 5th St to 13th Street - bike boulevard
- 50th Avenue from 10th St to Aims CC - sharrows
- 59th/65th Avenue from 20th Street to 37th Street - bike lanes
- 22nd Street from 7th Avenue to 1st Avenue - bike lanes
- 2nd Street from 23rd Avenue to 11th Avenue - bike boulevard
- 38th Avenue from 23rd Street to Centerplace - bike lanes
- 5th Street from 23rd Avenue to 14th Avenue - sharrows
- 18th Street from railroad to 1st Avenue - bike lanes
- 30th Street from 41st Avenue to 39th Avenue - sharrows
- W. 25th Street from 35th Avenue to Mountain Lion - sharrows
- 23rd Street from 44th Avenue Court to 42nd Avenue - sharrows



On-Street

1. 23rd Ave from 5th St to 37th St
2. 20th St from 71st Ave to 28th Ave
3. 14th Ave from 2nd St to 16th St
4. 17th Ave from US 34 to 32nd St
5. 4th St from 59th Ave to 23rd Ave
6. 16th St from 14th Ave to 1st Ave
7. 20th St from 28th Ave to 23rd Ave
8. Reservoir Road from 14th Ave to 21st Ave
9. 13th Ave from Cranford Pl to 20th St
10. 16th St from 21st Ave to 14th Ave
11. 20th St from 11th Ave to 7th Ave
12. 28th Ave from 16th St to US 34 (on Reservoir)

Off-Street

1. Aims C.C. connection from 16th St Ln to Aims C.C
2. Poudre Trail East Extenstion from 11th Ave to Ash Ave
3. Greeley Number 3 Ditch from Larson Trail to 35th Ave
4. Sheep Draw Trail from 83rd Ave to 71st Ave
5. 50th Ave from F St to Coyote Run
6. Greeley Number 3 Ditch from F St to Larson Trail

Figure 5-3: Priority project locations

Priority Project Descriptions

1. 23rd Avenue Sidepath

This project will include a sidepath along the western side of 23rd Avenue from 5th Street to 37th Street. Several challenges exist with implementing this 10-foot side path including overhead utility poles and right-of-way constraints. This project will include replacement of existing sidewalk, curb and gutter replacement, as well as additional signing and marking.

2. 20th Street Cycletrack

In the long term, as bicycle volumes and demand for space increases, a fully-separated protected bikeway is recommended for 20th Street. However, due to space constraints, cost, and existing demand, an interim condition with portions of dedicated bicycle space and portions of sidepath is recommended. This project will convert existing sidewalk (when not wide enough) in the near term to sidepath, and in the long term would split out bicycle and pedestrian treads to create a protected bikeway/cycletrack between 71st Avenue and 28th Avenue. Much of the sidewalk along this route is currently ten feet wide, however in areas where the sidewalk is less than ten feet, replacement would be required. The project also includes signing and marking improvements.

3. 14th Avenue Buffered Bike Lane

This project will include a buffered bike lane between 2nd Street and 16th Street. In order to accommodate a buffered bike lane, roadway right-sizing is necessary. In order to accommodate the buffered bike lane, the number of through lanes would be reduced to one lane in each direction. The project will include the removal and replacement of striping, and signing.

4. 17th Avenue Bike Lane

This project would add a bike lane to 17th Avenue from US 34 south to 32nd Street. 17th Avenue has two lanes in each direction with on-street parking. To provide one lane in each direction, striped bike lanes, and on-street parking, roadway right sizing would be required. Work elements would include removal and replacement of striping as well as signing improvements.

5. 4th Street Protected Bike Lane

This project would include right sizing to one lane in each direction, a two-way left-turn lane and a protected bike lane from 59th Avenue to 30th Avenue. Between 30th Avenue and 23rd Avenue, there will be one lane in each direction and a protected bike lane and will include the addition of curb, gutter, and sidewalk along the north side of 4th Street in areas where it does not currently exist between 30th Avenue and 23rd Avenue. Existing parking is not anticipated to be impacted by these modifications, but should be verified. Work elements for this project include installation of curb, gutter, sidewalk, removal and replacement of striping, signing improvements, and the installation of delineator posts.

6. 16th Street Protected Bike Lane

This project will install protected bike lanes between 14th Avenue and 1st Avenue. Roadway right-sizing would be necessary between 14th Avenue and 6th Avenue to accommodate the protected bike lane. East of 6th Avenue would include removal and replacement of striping as well as installing curb and gutter for the portion of 16th Street where it does not currently exist.

7. 20th Street Protected Bike Lane

This project will add a protected bike lane between 28th Avenue and 23rd Avenue. Right-sizing, lane narrowing, or a grade-separated protected bike lane is necessary in order to accommodate the proposed facility for this portion of 20th Street. Work elements would include removal and replacement of striping, signing, and installation of delineators.

8. Reservoir Road Bike Lane

This project would include right sizing to convert this portion of Reservoir Road to one lane in each direction, a two-way left-turn lane, and a bike lane in both directions. Work will include the removal and replacement of striping as well as signing improvements.

9. 13th Avenue Bike Lane

This project will extend the bike lane to 20th Street, closing the existing gap between the 13th Avenue bike lanes and 20th Street. This portion of 13th Avenue is not striped and would require the addition of striping and signing. The existing cross-section is wide enough to accommodate the bike lane, one lane in each direction, and eight-foot parking on both sides.

10. 16th Avenue Sidepath

This project would include improving the existing sidewalk to create a sidepath along the north end of 16th Street between 21st Avenue and 14th Avenue. Much of the sidewalk is currently ten-feet wide, but there are portions with widths of five and eight feet. The sidewalk with a width of less than ten feet will be removed and replaced with a ten-foot wide sidepath. Work elements include removal and replacement of sidewalk and signing.

11. 20th Street Bike Lane

This portion of 20th Street (11th Avenue to 7th Avenue) is located on the northern edge of the UNC campus. The existing cross sections consists of on-street parking, one lane in each direction, and a two-way center turn lane. In order to accommodate a bike lane in this section, parking would be removed on one side of the street. The project would include striping replacement and signing.

12. 28th Avenue Buffered Bike Lane

This project will reduce the level of stress on 28th Avenue and a portion of Reservoir Road by converting the existing bike lanes to buffered bike lanes between 16th and US 34. The existing lane configuration will remain the same; however, there may be some areas where parking removal would be necessary on one side to accommodate the buffer. Work elements include removal and replacement of striping as well as signing improvements.

1. Off-Street. Aims Community College Connection from 16th Street Lane

This project will convert the existing dirt trail between Winograd Lane on Aims Community College Campus and 16th Street Lane, providing bicycle access for all users to Aims Community College from the northwest. The existing path width appears to be adequate to accommodate a paved off-street trail. Work elements include minor grading and paving.

2. Off-Street. Poudre Trail East

This project is in early planning stages now, so is not included in description and costing in this document.

3. Off-Street. Greeley Number 3 Ditch Trail from Larson Trail to 35th Avenue

This project will install asphalt or concrete off-street trail connecting the short portion of the Number 3 ditch trail to the east and the Larson Trail. The trail would likely follow an existing dirt access road along the north side of the ditch, connecting to Larson Trail near 42nd Ave Work elements include minor grading and paving.

4. Off-Street. Sheep Draw Trail from 83rd Avenue to 71st Avenue

This project will install asphalt or concrete off-street trail completing the existing gap in Sheep Draw Trail. The trail would run along the Sheep Draw (possibly on the north side) between 83rd Avenue and 71st Avenue with future potential connection to 77th Avenue. Work elements include clearing, minor grading and paving.

5. Off-Street. 50th Avenue Extension from F Street to Coyote Run Park

This project will install asphalt or concrete off-street trail extending north from the end of 50th Avenue, 50th Avenue Court, or 50th Avenue Place, and connect to F Street. The trail will stay on the south side of the Number 3 ditch, so no bridges will be necessary. Work elements include clearing, minor grading, and paving.

6. Off-Street. Greeley Number 3 Ditch Trail from F Street to Larson Trail

This project will install asphalt or concrete off-street trail between the Larson Trail and F Street, providing a connection to the Poudre Trail. The trail would likely follow an existing dirt access road along the north side of the ditch. Work elements include clearing, minor grading, and paving.

Table 5-5: On-Street Priority Projects Cost Estimate Summary				
Rank	**Project**	**Length (miles)**	**Facility Type**	**Cost**
1	23rd Ave (5th Street to 37th Street)	3.1	Sidepath	$2,500,000
2	20th St (71st Avenue to 28th Avenue)	3.5	Cycletrack	$300,000
3	14th Ave (2nd Street to 16th Street)	1.3	Buffered bike lane	$100,000
4	17th Ave (US 34 to 32nd Street)	0.5	Bike lane	$50,000
5	4th St (59th Avenue to 23rd Avenue)	3.1	Protected bike lane	$1,250,000
6	16th St (14th Avenue to 1st Avenue)	1.2	Protected bike lane	$700,000
7	20th St (28th Avenue to 23rd Avenue)	0.6	Protected bike lane	$150,000
8	Reservoir Road (21st Street to 14th Avenue)	0.4	Bike lane	$50,000
9	13th Ave (Cranford Place to 20th Street)	0.2	Bike lane	$25,000
10	16th St (21st Avenue to 14th Avenue)	0.6	Sidepath	$200,000
11	20th St (11th Avenue to 7th Avenue)	0.4	Bike lane	$75,000
12	28th Ave (16th St to US 34)	2.0	Buffered bike lane	$150,000

Table 5-6: Off-Street Priority Projects Cost Estimate Summary				
Rank	**Project**	**Length (miles)**	**Facility Type**	**Cost**
1	Aims CC Connection from 16th St Ln	0.2	Off-Street Trail	$100,000
2	Poudre River Trail East - in development (not included in this document)			
3	Greeley Number 3 Ditch (Larson Trail to 35th Ave)	0.6	Off-Street Trail	$325,000
4	Sheep Draw Trail (83rd Ave to 71st Ave)	1.1	Off-Street Trail	$750,000
5	50th Avenue Extension (F St to Coyote Run)	0.2	Off-Street Trail	$100,000
6	Greeley Number 3 Ditch (F St to Larson Trail)	0.9	Off-Street Trail	$600,000

Importance of Partnering

Greeley is home to two institutes of higher education and School District 6. Relationships with educational agencies in and around Greeley provide opportunities for cooperation on the facility and program coordination level as well as on the pursuit of funding.

- University of Northern Colorado (UNC) is located south of downtown, with approximately 10,000 students on a 250 acre campus. The UNC campus has pedestrian and bicycle paths throughout, primarily connecting buildings, parking lots, and athletics facilities within campus, with fewer paths connecting to adjacent roadways and bikeways. UNC was just awarded Bronze-level Bicycle Friendly University status, showing its dedication to improving its bicycling culture on campus. The close physical proximity and the city and university's joint interest in promoting bicycling provide a great opportunity to coordinate on bicycle facility connections (see Network Recommendations for proposed facilities connecting to UNC), and on programs, such as encouragement events and education programs.

- Aims Community College (Aims CC) is located on the west side of town on a campus approximately the same size as UNC's. Campus has a more rural feel with fewer pedestrian and bicycle paths on campus, and only one connecting to the surrounding roadway network. Students or residents riding to or through campus generally share the roadway lanes with cars on the three main roadways into campus. Significant opportunities exist for the city and Aims CC to improve connections onto campus benefitting those students who wish to ride to campus and Greeley residents who wish to ride through campus. In addition, education courses of all kinds are often offered in coordination with community colleges, creating potential for partnering on safety, driver and bicyclist education, courses.

- District 6, which serves elementary through high school students, has 30 schools throughout Greeley and Evans. In a coordinated effort to encourage bicycling and walking to school, the city of Greeley and District 6 have unsuccessfully applied for Safe Routes To School (SRTS) funding in the past. Through this master planning effort, discussion has begun on renewing the push for developing a SRTS program, which will take significant coordination between the school district and city. This program is not identified in this plan as a priority program because the city is planning to address this program in the near term as an independent project. However, this effort is a critical one to accomplishing a number of the master plan goals, and should be pursued as soon as possible.

Funding Opportunities

Funding opportunities are available for bicycle infrastructure, programs, and support facilities from a number of different local, regional, state, and federal programs. A summary of available funding is shown in the table on the adjacent page.

Table 5-7: Key - Summary of Available Funding

Abbreviation	Description
TAP	Transportation Alternatives
CMAQ	Congestion Mitigation and Air Quality Improvement
STP	NFR MPO Surface Transportation Program
HSIP	Highway Safety Improvement Program
RTP	Recreation Trails Program
NHPP	National Highway Performance Program
UZA	Urbanized Area Formula Program
BBF	Bus and Bus Facilities
GOCO	Great Outdoors Colorado
SRTS	Safe Routes to School - CDOT
DOLA	Department of Local Affairs
LWCF	Land and Water Conservation Fund Act
RTT	Rails to Trails
BB	Bikes Belong
W&W	Walk & Wheel - Kaiser Permanente

Table 5-8: Summary of Available Funding																
Funding Need		**Federal Highway and Transit Programs**								**State Programs**			**Advocacy Groups**			
		TAP	**CMAQ**	**STP**	**HSIP**	**RTP**	**NHPP**	**UZA**	**BBF**	**GOCO**	**SRTS**	**DOLA**	**LWCF**	**RTT**	**W&W**	**BB**
Roadway Improvements	Sharrows			X			X								X	
	Bicycle Lanes on Roadway	X	X	X	X		X	X		X					X	X
	Paved Shoulders	X	X	X	X		X	X								X
	Signed Bike Route	X	X	X			X	X		X					X	X
	Intersection Improvements	X	X	X	X		X	X		X		X			X	
	Trail/highway intersection	X	X	X	X	X	X							X		X
	Signal improvements	X	X	X	X		X								X	
Off-Street	Shared Use Path/ Trail	X	X	X	X	X	X			X		X	X	X	X	X
	Recreation Trail	X		X		X	X			X		X	X	X	X	X
Parking	Bicycle parking facilities	X	X	X				X	X	X		X			X	
	Bike racks on buses	X	X	X				X	X							
Programmatic	Coordinator position		X				X									
	Safety/education position	X		X												
	Police Patrol	X														
	Helmet promotion			X							X					X
	Safety brochure/ book		X	X		X					X					
	Training		X	X		X					X					
	Technical Assistance	X	X	X											X	
	Maps	X	X	X												

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