



Cheyenne On-Street Bicycle Plan and Greenway Plan Update, Volume III

June 2012

PREPARED BY:

Alta Planning + Design

In collaboration with Environmental Planning Group

PREPARED FOR:

The City of Cheyenne, Wyoming, and Cheyenne Metropolitan Planning Organization



Acknowledgments

City of Cheyenne

Engineering Services Office
Parks & Recreation Department
Public Works Department
Cheyenne Transit Program
One Percent Sales Tax Construction Department
Urban Planning Office

Laramie County

Planning & Development Department
Public Works Department

Metropolitan Planning Organization

Policy Committee
Technical Committee
Citizen's Advisory Committee

Wyoming Department of Transportation

Planning Program
Traffic Program
Highway Safety Department/Bicycle and Pedestrian Program

Concerned Citizens of the Cheyenne Metropolitan Area

Cheyenne Bicycle Advisory Committee Members

Cheyenne-Laramie County Cooperative GIS Program

Federal Highway Administration, Wyoming Division

Greater Cheyenne Greenway Advisory Committee

Alta Planning + Design

Environmental Planning Group

Michael Ronkin

Disclaimer

The project is jointly funded through WYDOT, FHWA, Laramie County, and the City of Cheyenne utilizing MPO Planning Funds; a Federal Transportation, Community and System Preservation Grant; and 6th Penny Greenway Funds.

The preparation of this report has been financed in part through grant[s] from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 [or Metropolitan Planning Program, Section 104(f)] of Title 23, U.S. Code. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

This report was funded in part through grant[s] from the Federal Highway Administration [and Federal Transit Administration], U.S. Department of Transportation. The views and opinions of the authors [or agency] expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.

Project Memoranda and Other Plan Documentation

This document contains final Project Memoranda and other supporting documentation that were submitted throughout the course of the Cheyenne On-Street Bicycle Plan and Greenway Plan Update. The Project Memoranda were the primary technical deliverables of the project and were reviewed first by agency staff and the Bicycle Advisory Committee. P:\10-150 Cheyenne Bikeways-Greenways Plan\Draft and Final Plan\Final Plan\Volume III Papers and Memos

The contents of this Volume are intended to document the planning process used to complete the plan, as well as serving as a technical reference for implementation. The contents of Working Papers, meeting reports, survey summaries and other materials are accurate as of the date by which the memorandum was submitted. Please refer to the draft document for a project list for complete information about final project details.

Table of Contents and Summary of Supporting Documentation

Document	Page
Open House Report Number 1	5
Open House Report Number 2	15
Online Survey Summary #1	27
Online Survey Summary #2	31
Working Paper #1 Summary of Existing Background Documents	35
Working Paper #2 Existing Goals, Objectives	55
Working Paper #3: Vision, Goals and Objectives	79
Working Paper #4: Existing Conditions	87
Working Paper #5: Bikeway System Gap Analysis	115
Working Paper # 7: Cycle Zone Analysis – Contains a summary of the CZA analysis methodology originally submitted to City and MPO staff as Working Paper #6	123
Working Paper #8: Collision Analysis	157
Documentation of Cost Assumptions	173
Working Paper #9: Project Evaluation Criteria=	189
Working Paper #10: Recommended Bicycle Support Facilities	195
Working Paper #11: Phasing Plan	223
Working Paper #12: Potential Funding Sources	239
Working Paper #16: Recommended City Code Updates	251

Open House Report Number 1

This page intentionally blank

Memorandum

To: Jeff Wiggins and Sreyoshi Chakraborty
From: Rory Renfro and Kim Voros, *Alta Planning + Design*
Date: April 13, 2011
Re: Cheyenne On-Street Bicycle Plan and Greenway Plan Update –Open House #1 Summary



Introduction

This memorandum summarizes the Cheyenne On-Street Bicycle Plan and Greenway Plan Update Open House Number 1, held on March 24, 2011 from 5:00 PM to 8:00 PM at the Laramie County Library. The open house exhibits described the project's purpose, schedule, and expected outcomes. Additionally, participants were invited to discuss existing cycling conditions with project staff, identify system needs, and offer suggestions for improvements. This information will be used to develop a recommended bikeway network and list of recommended support programs.

Open House Attendees

The Open House was staffed by members of the project team from Alta Planning + Design, EPG, and City of Cheyenne and Cheyenne Metropolitan Planning Organization. Over the course of the evening approximately 18 people stopped by to learn more about the project and offer input. A partial list of attendees is included in Appendix A.

General Public Comments

The attendees provided the following general comments to Project Team staff during Open House #1.

- Demand for safe and direct bicycle routes to destinations that include work, shopping, or recreation
- Motor vehicle parking could create hazards for bicyclists who are riding in the bike lane.
- Please develop on street treatments as an alternative to the greenway system. Even though the greenway may be close to most households, sometimes residents feel that nearby roadways do not provide safe and convenient access. The on-street treatments could provide access to many households who want to bicycle
- On-street bicycle lanes would be a huge improvement, especially on busy one-way couplets like Carey and Pioneer, but there is a concern about the presence of on-street parking on most of these streets.
- The way snow is plowed in Cheyenne presently, it could create big issues for the on-street bikeways
- Desire for more bicycle infrastructure in the downtown area that could include pavement striping, bike parking, and a greater number of bike paths or shared lanes.
- Desire for more safe and direct on-street bicycle routes that connect destinations such as home and work.
- Desire for more education for motorists to increase their awareness of driving regulations and sharing the road with bicyclists

- Environmental impact of trail design. Greenway trails often go through the most beautiful parts of town including wetlands and wildlife habitats. Minimizing impacts on wildlife habitats should be considered in trail design and alignment.
- Maintenance needed on greenways (ice)
- Need to formally specify dollar amount and use of money for on-street bike plan (e.g., 6 penny tax or other dedicated source)

The attendees provided the following comments about specific facilities or locations:

- Make connections from Cherry Hills/ Red Sky Loop to existing greenway
- Pershing Boulevard was frequently cited as one of the most challenging places to bicycle in Cheyenne.
- Bike Path should be constructed that parallels Highway 30
- Mustang Ridge Roadway has 8' paved shoulders
 - 36' Roadways within the development could be striped for as bike lanes without reconfiguring roadway
 - Chief Washakie Ave 24' feeder is only connection to the Mustang Ridge housing development and the narrower right-of-way can create conflicts between motors and cyclists. Another Greenway access point is desired.
- Desire for municipal bike fleets - bikes available for employees at major employers (e.g. City, County, State, etc.)
- Bike lanes desired on Ridge Rd.
- Desire for a bike share system
- Bicycle wayfinding signage needed (Include destinations, distances, riding time)
- Need to address challenging intersections
- Desire for bicycle facilities on College
- Desire for bicycle facilities on/in I-25 corridor to close gaps in bikeway system.
- Need to close "East Extension" greenway gap at the Sun Valley Open Space

Education/Encouragement (Brainstorming Exercise)

The attendees provided the following ideas for programs during Open House #1.

Education

- Education for cyclists about rights and responsibilities of on-street cycling
- Teach bicycling rules of road in schools
- Provide regular education information sessions about new bikeway improvements (e.g., have a quarterly class to provide information to cyclists about new programs and infrastructure links).
- Remind people to stay right, pass on left, be aware of what's behind them, and leash law on bike paths and Greenways

Encouragement

- Develop a program, such as a 'bike commute challenge,' that provides recognition for miles traveled by bike
- Develop programs that encourage safe bicycle riding

Evaluation

- Count cyclists every year so we know how many people bike on the Greenways

Enforcement

- Bicycle police
- Bike light enforcement should be mandatory
- Patrolling by police of high car-bike incident areas
- Enforce car headlight requirement in low daylight conditions

Evaluation Criteria (Voting Exercise)

A critical component of the Plan development will be the development of a priority project list that will help focus implementation efforts where they will provide the greatest community benefit. Meeting attendees were invited to vote for the two criteria that they thought were most important. The following criteria and number of votes were tallied:

- System Connectivity: 11
- Access & Mobility/Land Use: 6
- User Safety and Comfort: 3
- Suitability for bicycling with and without improvements: 3
- Community Support: 1
- Improves Cycling Level of Service: 0
- Multi-Modal Connections: 0

Facilities and Destinations (Mapping Exercise)

Attendees were invited to provide feedback on their favorite facilities, locations where they typically access the on-street bikeway or Greenway network, and locations where existing conditions are challenging or difficult (Map 1).

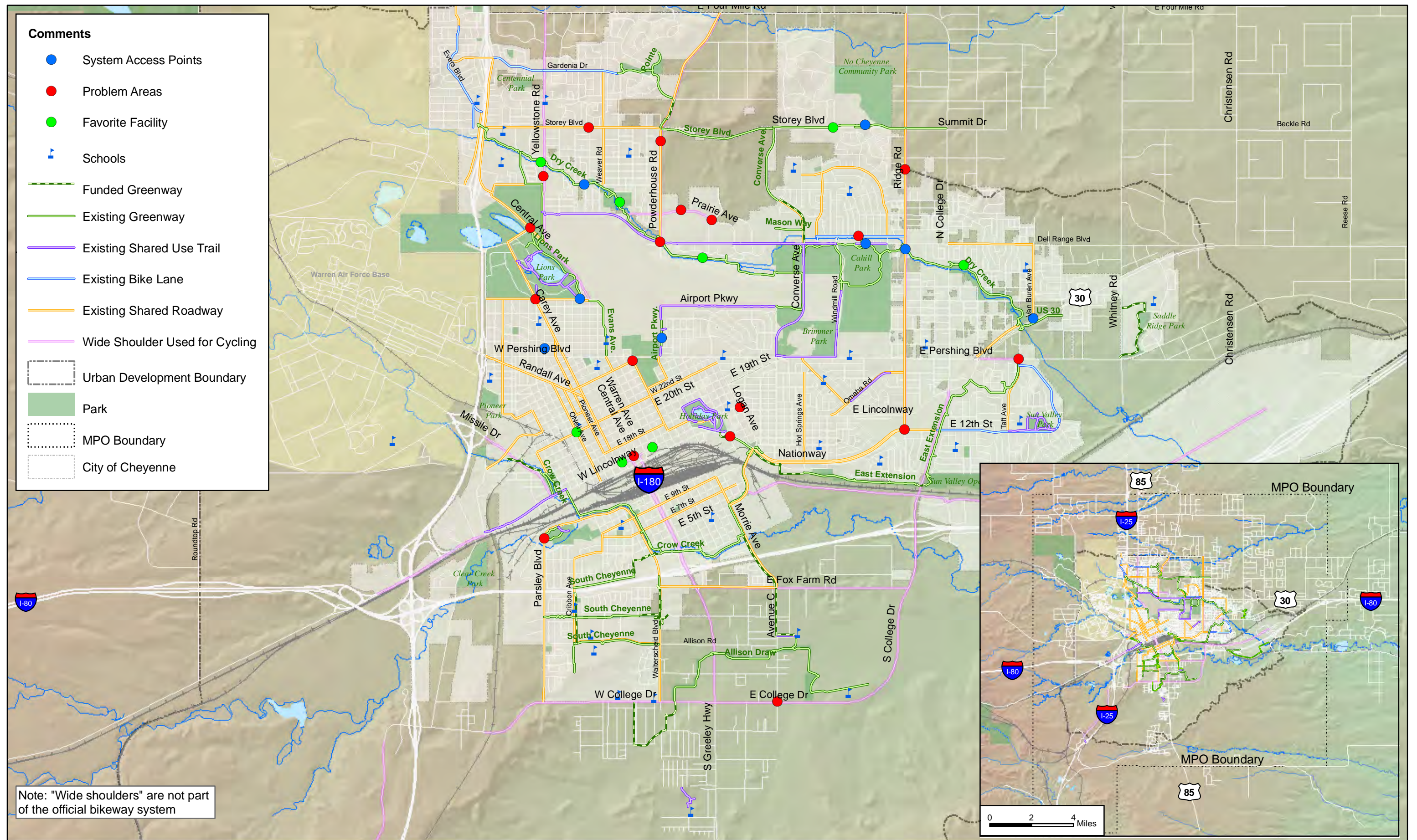
All access points mentioned by meeting attendees were in the northern portion of the Cheyenne area and were focused primarily around the Dry Creek Greenway, the longest contiguous greenway. This could indicate that the meeting was more heavily attended by cyclists that ride in northern Cheyenne. It is worthwhile to note that a number of the green points, which indicated a favorite facility, were also concentrated on the Dry Creek Greenway. Additional favorite facilities included West Lincolnway, downtown Cheyenne, the Storey Boulevard Greenway, and the O'Neil Avenue/ W 22nd Street area.

More than half of the locations noted by attendees identify challenging conditions for cyclists. Many challenging locations were noted on existing bikeways (e.g., Ridge Road, Powderhouse Road, Storey Boulevard and Nationway). Several challenging points were noted at intersections of the Greenway network and on-street network (e.g., Powderhouse Road, Dell Range Boulevard and the Dry Creek Greenway) which supports the finding that connections between the two systems could be improved. These locations include complex intersection geometry (e.g., locations where two roadway grids meet), restricted sight lines (e.g., on Dell Range Boulevard near Cahill Park) and roadways with higher motor vehicle speeds and volumes (e.g., Parsley Boulevard).

General Public Comment Cards

The attendees provided the following comments on comment cards during Open House #1.

- “What has happened to the segment that has been proposed since the original greenway funding initiative that was to go in Sun Valley from College Drive to the East, just north of the Sun Valley detention pond???”
- “I would like to see route signage that communicates what destinations are on route and the distance in TIME. Intersections need the most help in my mind because I believe the intersection complications and uncertainty discourage riders.”



Map 1. Draft Public Open House #1 Existing Bikeway System Comment Summary

Cheyenne On-Street Bicycle Plan and Greenway Plan Update

Source: Cheyenne - Laramie County Cooperative GIS Program
Date: March 2010

Volume III

This page intentionally blank

Appendix A



Sign-in Sheet

Date/Location:

March 24, Laramie County Library

Cheyenne On-Street Bicycle Plan and Greenway Plan Update Public Workshop #1

Name	Affiliation/Community/Zip Code	Phone	Email
PETE SOKOLOSKI	SILV	N/A	PSOKOLOSKI@YAHOO.COM
VICKI NEMECEK	CITY PUBLIC WORKS	634-9157	vnemecek@bresnan.net
Scott Hughes	Citizen	632-3181	scotthughes227@msn.com
Paul Carlson		637-7960	pcwy01@earthlink.net
James Hart	Citizen	632-7234	jameshart@aol.com
Paul Bercich	Citizen	638-8583	PaulBercich@gmail.com
Jeff Moench	Citizen	635-7546	
JUDITH HOSAPPA	Citizen	2	
Ree. Rottwul		307-437-2734	
Alan Ose	neighborhood	778-7770	
Carol Tullio	Citizen	635-2536	
Jim Rose	Citizen, VDC	631, 8935	jrose@commission.wcc.edu
Tom Masch	MPO	6376299	tmasc@cheyennecity.org
Susan Flobeck	Citizen		sflobeck@gmail.com
mike ogle	Citizen		mikeboy8888@yahoo.com
Nancy Olson	MPO	638-4366	nolson@cheyennecity.org
Merian Brenzeck	Citizen	635-8221	

Open House Report Number 2

This page intentionally blank

Memorandum

To: Jeff Wiggins and Sreyoshi Chakraborty
From: Rory Renfro and Kim Voros, *Alta Planning + Design*
Date: July 25, 2011
Re: Cheyenne On-Street Bicycle Plan and Greenway Plan Update – Open House #2 Summary



Introduction

This memorandum summarizes the Cheyenne On-Street Bicycle Plan and Greenway Plan Update Open House Number 2, held on June 23, 2011 from 5:30 PM to 7:30 PM at the Laramie County Library. The open house was intended to familiarize attendees with the draft bicycle network recommendations, bicycle support facilities and programmatic recommendations and also gather feedback on these topics. This information will be used to refine the recommend bikeway network, support facilities and programmatic recommendations.

Staffing

The Open House was staffed by members of the project team from Alta Planning + Design, City of Cheyenne and Cheyenne Metropolitan Planning Organization. Over the course of the evening approximately 22 people stopped by to learn more about the project and offer input. A list of attendees is included in Appendix A.

Comments

The attendees provided the following general comments to through conversation with the to Project Team staff during the open house:

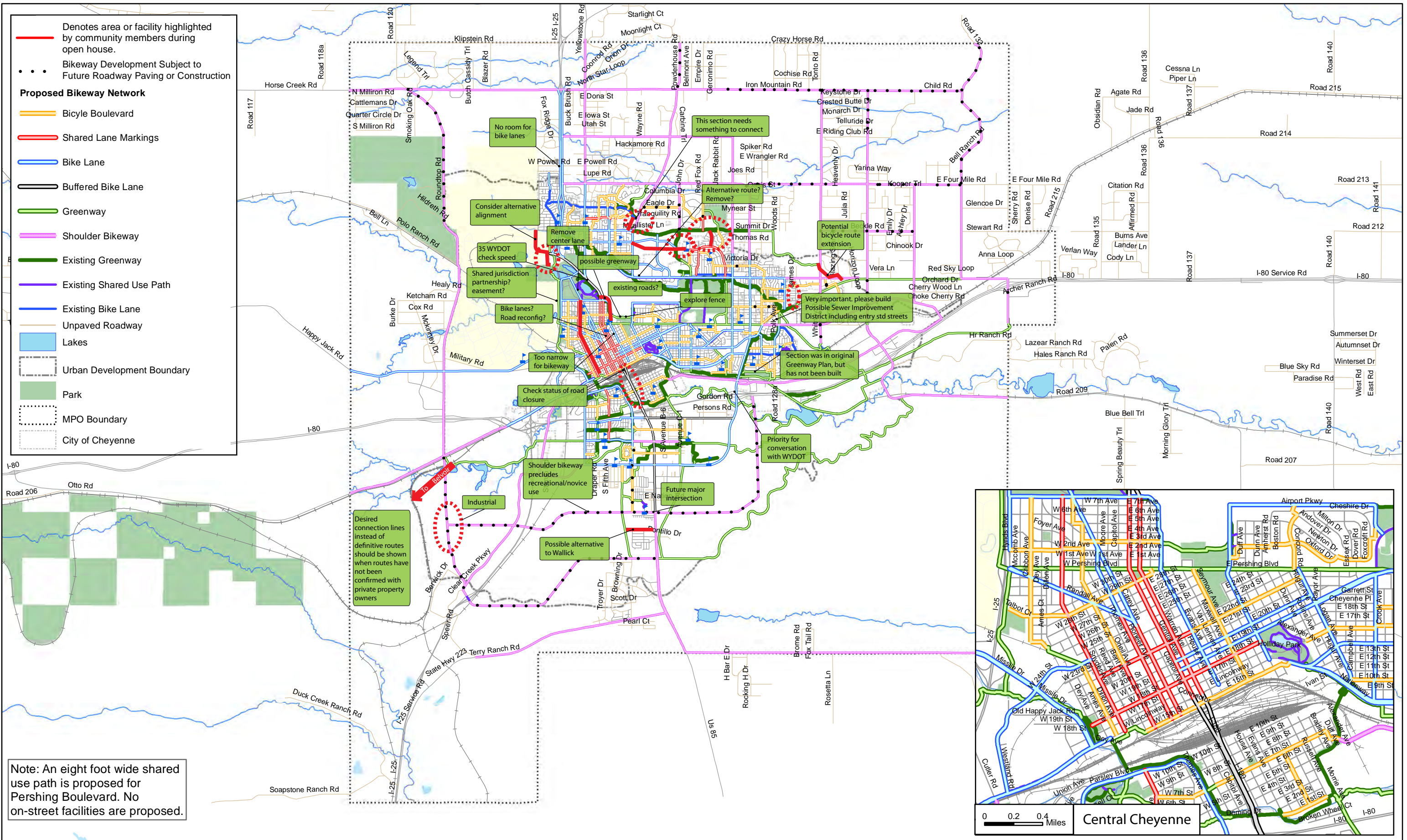
- The proposed bikeway network is ambitious, but a good aspirational roadmap for the community and the surrounding area.
- There was general support for focusing immediate improvements on roadways where the majority of Cheyenne's current riders would feel comfortable bicycling. The roadways people expressed a preference for are primarily lower posted speed and motor vehicle volume roadways such as Dillon Avenue.
- Several people expressed excitement about program recommendations especially rides aimed at getting community members out on the roadways and methods to familiarize cyclists with new facilities as they are installed.
- Increasing staff capacity at the City/MPO received support to develop volunteer programs and assist with other programmatic endeavors such as event parking for bicycles was cited as important by several people.

The attendees provided the following written comments from Open House #2

- We need single track – develop trails at High Plains Research Center
- Connect Romero Park to Greenway
- Close Greenway gap @ College Drive/UPRR
- Pave alley parallel to Pershing opposite East HS

- The transit bench on the Yellowstone Greenway at the Golf Course creates a dangerous obstacle
- Wood plank bridge decking (e.g. Smalley, Mylar, Carey Reservoir) is old/splintered/slippery when wet. Either replace with new wood or consider using concrete instead.
- Randall, Carey/Pioneer, 19th/20th may get a lot of use as on-street lanes
- In order to create a loop around the City, we need a Greenway link on the west side of Cheyenne.
- Develop trails at Belvoir Ranch.
- Develop singletrack trails that create loops with existing Greenway
 - on south side of Dry Creek in Dry Creek Parkway
 - along Dry Creek Realignment (south of Cahill)
 - through Brimmer Skate Park/VA/Jr. League/Powers land
- Run Public Service Announcements for radio/TV/print to promote bicycle rights and provide safety tips
- Develop school programs on bike safety
- Develop bike advocacy group.
- Explore option for singletrack on nearby State Trust Land (e.g. Yellowstone & Iron Mountain) with designated bike friendly routes getting there.
- Keep up the great work!

Meeting attendees also provided feedback by writing on maps depicting the draft bikeway network. These comments are summarized on Map 1.



Map 1. Community Open House #2 Comments

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update

Source: Cheyenne - Laramie County Cooperative GIS Program
Date: June 2010



This page intentionally blank

Comment Cards

The attendees responded to a series of questions via comment cards made available at the Open House. Meeting attendees were also invited to submit comments via the project website. A copy of the comment card is provided in Appendix A.

Network Development

What facilities do you see as critical for development of the on-street network?

- Randall – Carey/Pioneer – 19th/20th Avenue. I think this will be where you get new bikers because there are places to go.
- Downtown streets aren't marked with bike lanes. Converse greenway is pathetic! Pershing to Dell Range
- Look hard and ask Ed Murray for consideration for Greenway between Whitney and Dell Range on north edge of his property. He might plat an easement.

Should any routes be added, changed or removed?

- Are Warren Avenue and Central Avenue our best choices?
- Build the section between S. College Drive and Atlantic Drive, north of the detention pond. This section was on the original Greenway Plan but many sections have been built that were never on the original plan.
- Bike lanes on Hynds and Bishop probably aren't feasible, road too narrow. Ask WYDOT. For south Windmill, work with LCSD #1 when we rebuild Carey.

Bicycle Parking

Where would you like to see additional bicycle parking in Cheyenne?

- Businesses
- All public buildings and parks

Bicycle Related Programs

What programs would you most like to see in Cheyenne?

- History ride and greenway rides during Frontier Days and most summer days utilizing volunteer leaders.
- Parking valet downtown events
- Bike and ped counts!
- Bike share
- Laramie County Community College is a potential partner for education and encouragement events.

Is there anything else you would like us to know about bicycling in Cheyenne?

- Signage with destinations and minutes

Appendix A

Sign-in Sheet

Date/Location:
June 23/Laramie County Library

Public Open House #2

Name	Affiliation/Community/Zip Code	Phone	Email
Jay Byerly	Greenway Committee 82001	421-2778	sguerij@Grand.com
Nancy Chao	Greenway Advisory	638-4366	nolson13@juno.com
David Fair	Rider 82001	634 3408	bergstiger@hotmail.com
Nathan Bramble	City	638-4315	nbrahm@cheyennecity.org
James Hart	Cheyenne		jame2@aol.com
Flora Vetter	City of Cheyenne	638-4314	dvetter@cheyennecity.org
Angi Harper	WV Office of Tourism	777-2881	
Rick Menger		635-7694	
Al Simpson	MPO	634-8431	al-simpson@wyoming.com
Tom Marx		637-6299	traxen@cheyennecity.org
Jan Spires	Planning	637-6251	jspires@cheyennecity.org
Brandon Cammerata	" "	638 4503	brannerata@
Phil Olson	Citizen	719-383-2882	polson@cheyennecity.org
Dick Krahenbuhl	Greenway Com	307-296-9462	RKrahenbuhl@jaghd.com
Todd Thibodeaux	CITIZEN	214-5687	TODD.THIBODEAUX@WYO.GOV
Teresa Moore	City	X4375	
Paul Bercich	Resident 82001	638-8583	PaulBercich@q.com
Heather Tudor	Citizen 07	634-2772	



Public Open House #2

22

Comment Card

Cheyenne On-Street Bicycle Plan and Greenway Plan Update - Workshop # 2

Thursday, June 23: 5:30 PM – 7:30 PM.

Laramie County Library – Willow Room

<http://www.plancheyenne.org/bikeplan.html>

Name: _____

Email: _____

Phone: _____

Network Development:

What facilities do you see as critical for development of the on-street network?

Should any routes be added, changed or removed?

Bicycle Parking

Where would you like to see additional bicycle parking in Cheyenne?

Bicycle Related Programs

What programs would you most like to see in Cheyenne?

Is there anything else you would like us to know about bicycling in Cheyenne?

You may also leave your comments at our website: <http://www.plancheyenne.org/bikeplan.html>



This page intentionally blank

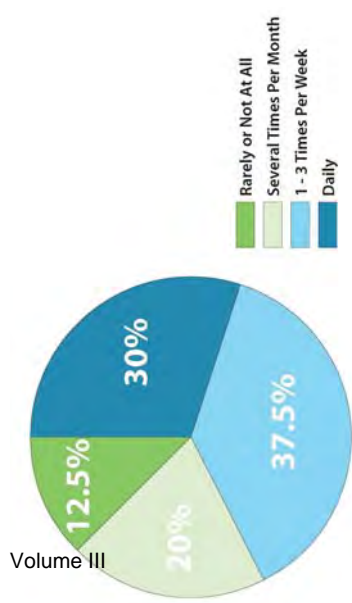
Online Survey Summary #1

This page intentionally blank

The purpose of the online survey was to gain a deeper understanding of the needs and desires of Cheyenne's existing cyclists, as well as those interested in bicycle transportation. We asked you to tell us who you are, what you like to ride on, when you bike, the places you like to bike to, and why you bike in Cheyenne. The graphs on this page tell your story and help to illustrate the ways that a bikeway network can be developed to best serve your needs.

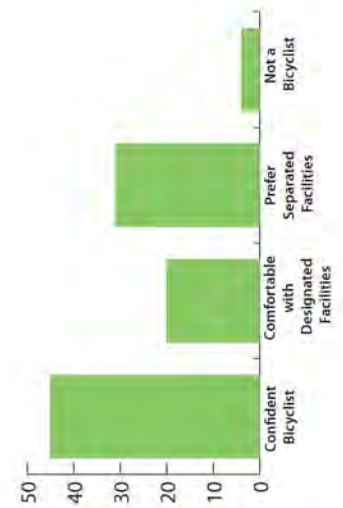
Currently, the majority of bicyclists in Cheyenne are riding for recreation or fitness. A smaller contingent is choosing the bicycle as a transportation mode and commuting to work by bike. Most of the survey respondents identify as confident cyclists who are comfortable bicycling on roadways regardless of the facilities available. A second group of bicyclists is made up of those less comfortable on the street, but perfectly at ease on a shared use path or separated facility. Cheyenne bicyclists are biking all over the place--to parks/greenways, downtown, commercial centers, and work/school. Most of these cyclists are doing this daily or weekly, too!

When do they bike?

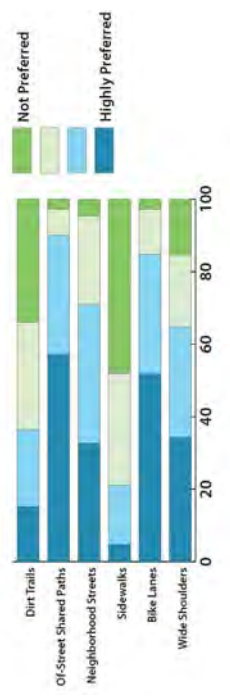


Volume III

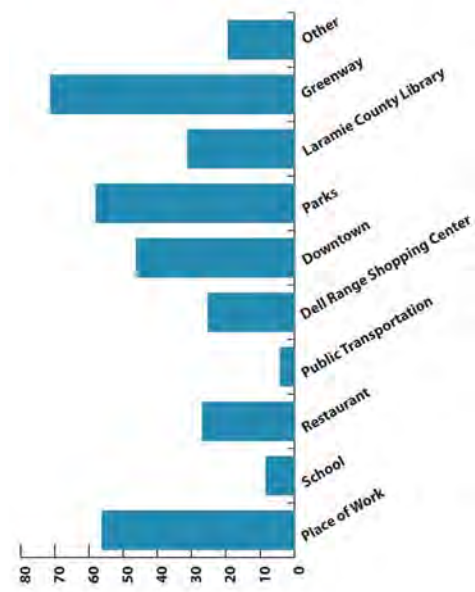
Who is bicycling?



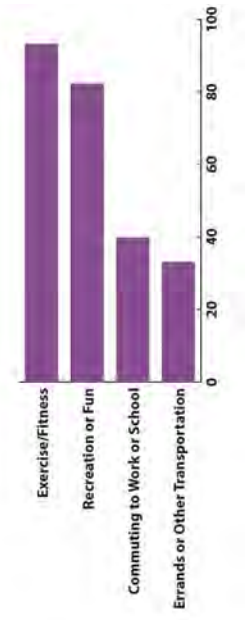
What are the preferred facilities?



Where do they bike?



Why do they bike?



Survey Results

This page intentionally blank

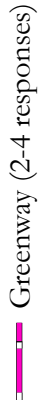
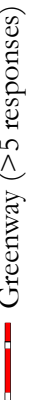
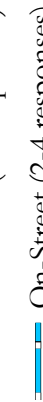
Online Survey Summary #2

This page intentionally blank

Existing Facilities



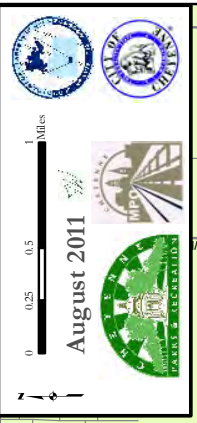
Proposed Facilities



Survey Notes:

Approximately 100 members of the public provided feedback about proposed bicycle facilities in July-August 2011.

- 8 respondents recommended on-street facilities
 & 3 recommended Greenway path on Pershing
 -5 respondents simply said "bike lanes"
 -4 respondents requested Greenways "downtown"
 -2 respondents simply said "shoulder bikeways"
 -2 respondents thought Dell Range was a bad idea



This page intentionally blank

Working Paper #1 Summary of Existing Background Documents

This page intentionally blank

Memorandum



To: Cheyenne On-Street Bicycle Plan and Greenway Plan Update Bicycle Advisory Committee

From: Rory Renfro and Kim Voros, *Alta Planning + Design*

Date: May 11, 2011

Re: Working Paper #1 Summary of Existing Background Documents and Plans

This memorandum summarizes relevant background documents and plans that regulate and establish a framework for cycling and greenway development in Cheyenne. The following documents were reviewed and summarized:

- Wyoming Bicycle and Pedestrian Transportation Plan, 2002
- WYDOT Operating Policy 40-2
- Cheyenne Area On-Street Bicycle Plan and Map, Report of Investigation, 1993
- Plan Cheyenne Transportation Plan, 2006
 - Plan Cheyenne Bicycle Vision Plan
 - Plan Cheyenne Fiscally Constrained Bicycle Plan
 - Plan Cheyenne Strategies to Implement the Bicycle Vision Plan
- Plan Cheyenne Community Plan, 2005
- Plan Cheyenne Parks and Recreation Plan, 2009
- Cheyenne Metropolitan Area Pedestrian Plan, 2010
- Cheyenne Metropolitan Area Safe Routes to School Plan, 2010
- Greenway Development Plan, 1992

State Plans and Policies

Wyoming Bicycle and Pedestrian Transportation Plan, 2002

The 2002 *State Bicycle and Pedestrian Transportation Plan* provides a blueprint for integration of cycling into Wyoming's transportation system. The Plan provides general guidance facility development of shared lanes, shoulder bikeways, bicycle lanes, and pathways consistent with the 1999 American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities*.

Bikes are allowed on all roadways in the state and the Wyoming State Bicycle Map delineates several routes of statewide significance. One of these is the Cheyenne/Laramie/Snowy Range Route that provides "access to the Snowy Range and Vedauwoo area from Laramie and Cheyenne and provides a connection to Cheyenne for tourists on the Transamerica Route who wish to visit the State Capitol. The route begins at the junction of Wyo 130 and Wyo 230 (south of Saratoga), east on Wyo 130 to Laramie; U.S. Interstate 80 east from Laramie to its junction with Wyo 210 (Happy Jack Road); Wyo 210 east to Cheyenne."

The Plan contains the following key goals and associated actions:

- Goal: Improve accommodation of the various types of bicyclists and pedestrians within the existing transportation system.

- Action: Primary focus for bicyclist accommodation should be to provide and maintain adequate shoulder width for bicyclists on highway reconstruction projects (4 foot minimum clear, paved area).
 - Action: Provide wide outside travel lanes or designated bike lanes where appropriate on urban roadway reconstruction and restriping projects.
- Goal: Institutionalize consideration of the unique needs of bicyclists and pedestrians in project planning, design, construction and maintenance.
 - Action: Provide training on bicycle and pedestrian accommodation and proper facility design to WYDOT planners and engineers.
 - Action: Provide technical assistance to Wyoming urban areas in developing bicycle and pedestrian transportation networks to include on-street facilities and pathways.
- Goal: Increase the use of bicycling and walking for transportation in Wyoming.
 - Action: Promote increased bicycle use through promotion of special bicycling events such as Wyoming bike month and bike to work days. Improve maintenance and sweeping of highway shoulders with priority on designated Bicycle Routes and High Bicycle-use Areas.
 - Action: Promote partnerships at the local level with alternative transportation, health, schools and safety groups.
- Goal: Improve safety for those utilizing non-motorized transportation through improved education of bicyclists and motorists and enforcement of vehicle code violations by bicyclists.
 - Action: Review and update the driver manual and driver test to better educate motorists on safe driving habits where bicyclists and pedestrians are present.
 - Action: Improve education of motorists regarding the legal status of bicyclists.
 - Action: Improve education of bicyclists and pedestrians regarding the rules of the road and safe operation in traffic.
 - Action: Improve enforcement of bicyclist and pedestrian violations and motorist failure to yield right-of way.
 - Action: Include consideration of bicyclist and pedestrian hazards in WYDOT's hazard elimination program and Safety Management Committee.
 - Action: Continue and expand WYDOT bicyclist safety education program in Wyoming schools.

The Plan describes a three-pronged implementation strategy centered around engineering, education and enforcement. This is consistent with a 1998 survey of bicyclists conducted by WYDOT that ranked continued education for cyclists and motorists the most important action WYDOT could take to improve cyclist safety.

WYDOT Operating Policy 40-2

Policy 40-2 regulates construction agreements and maintenance responsibilities along state roadways. WYDOT is responsible for maintenance of warranted traffic control devices along state roadways. Traffic control devices must conform to the Wyoming Traffic Code and the Transportation Commission of Wyoming *Manual of Uniform Traffic Control Devices for Streets and Highways*. In communities with more than 1,500 residents, the municipality is responsible for:

- Snow removal
- Street cleaning and sweeping
- Facility lighting
- Parking controls
- Maintaining sidewalks, bike paths, storm sewers, open drain ditches, natural drainage channels, and the curb and gutter

In order to be eligible for continued roadway maintenance, the municipality must comply with model ordinances that control placement of advertising signs, regulate parallel parking, control of access and curb cuts and street excavation. The municipality must also clear any traffic control devices with WYDOT prior to deployment. Project construction costs are covered by WYDOT, though storm sewer costs above and beyond that needed to provide drainage for the street on the state roadway system shall be covered by the municipality. Any proposed improvement plans must be submitted to WYDOT at least 60 days prior to advertisement of the project.

Local Plans and Policies

Cheyenne Area On-Street Bicycle Plan and Map, Report of Investigation, 1993

Drawing heavily on previous bicycle plans developed for the City of Cheyenne as early as 1975, the *Cheyenne Area On-Street Bicycle Plan* inventories existing roadways and makes recommendations for a system of on-street facilities. The Plan's stated purpose, to "describe a safe, convenient and economical plan for of public streets by bicycles," and carries a price tag of approximately \$114,000. The recommend improvements include striping/restriping of existing roadways, the installation of pavement markings and accompanying signs, in addition to minor street repair and construction of shoulder bikeways.

About 60 street segments were evaluated for inclusion in the on-street bikeway system. These facility recommendations were drawn from public comments, previous planning efforts, local knowledge and conversations with representatives from WYDOT and the public, among other sources. The Plan focuses primarily on development of a system of bike lanes (Table 1) but acknowledges the existing system of signed shared routes. Few recommendations are made for the signing of new routes as the designation "provides no physical protection for cyclists" and may lead cyclists and motorists to "erroneously believe that something is still being done for bikes." The Plan also states that most streets are already safe and comfortable for cyclists and "bike route signs often convey no useful information." Though no detailed information is included on facility maintenance and upkeep, a licensing fee for cyclists is suggested to create a dedicated funding stream for ongoing maintenance of bicycle facilities.

Table 1. Proposed On-Street Bicycle Facilities, Cheyenne Area On-Street Bicycle Plan and Map, Report of Investigation, 1993

Facility	Proposed Extent	Facility	Proposed Extent
Carey Ave	19 th St to 2 nd Ave	Campstool Rd	Frontier Refinery to I-80
Pioneer Ave	Pershing Blvd to 19 th St	N Industrial Rd/ Lexington Rd	Campstool Rd to College Dr
Randall Ave	Carey Ave to McComb Ave	E Dell Range Blvd	College Ave to El Camino
24 th St	Dillon Dr to Missile Dr	Evers Blvd	Vandehei Ave to Bishop Blvd
Westland Rd	Missile Dr to Old Happy Jack Rd	Western Hills	Yellowstone Rd to Buffalo Ave
W Allison Rd	Cribbon Ave to Walterschied Rd	Vandehei Ave	Evers Ave to Yellowstone Rd
Walterschied Rd	Deming Dr to W College Dr	Yellowstone Rd	Vandehei Ave to Dell Range Blvd
College Dr	Avenue "C" to I-80	Central Ave	Yellowstone Rd to Walker Rd
Parsley Blvd	W Jefferson Rd to Ames Ave	Powderhouse Rd	Riding Club Rd to Dell Range Blvd
Happy Jack Rd	Crow Creek to Roundtop Rd	I-180/Warren Ave	5 th St to 22 nd St
College Dr	I-80 to Fourmile Rd	Central Ave/I-180	22 nd St to 5 th St
Four Mile Rd	College Dr to Yellowstone Rd		

The plan is accompanied by a set of preliminary planning diagrams intended to guide the implementation of proposed bike lanes. The drawings provide detail of striping patterns, lane configurations and sign placement (Figure 1).

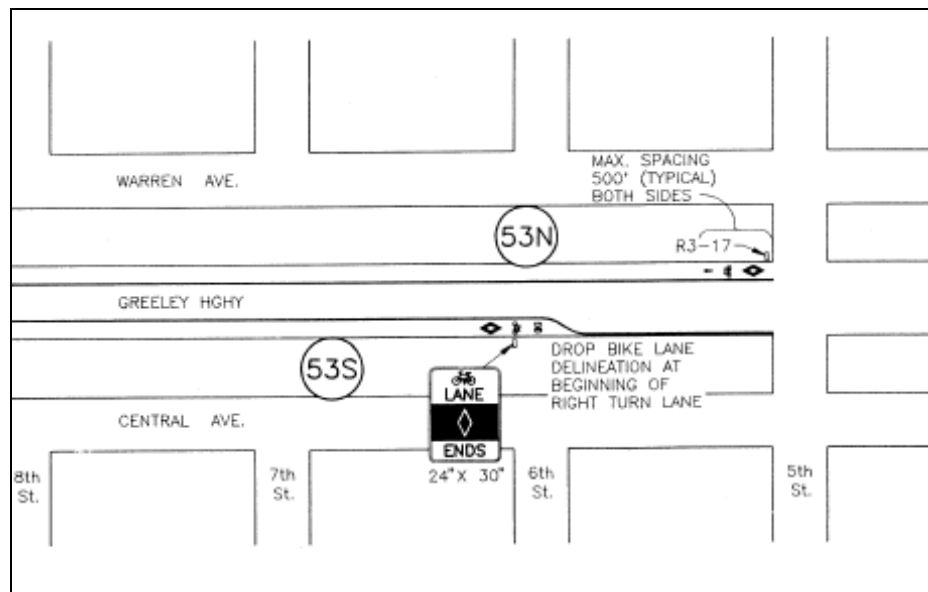


Figure 1. Example of bike lane implementation diagrams, Cheyenne Area On-Street Bicycle Plan and Map, Report of Investigation, 1993

Plan Cheyenne Transportation Plan, 2006

The *Transportation Master Plan* is a comprehensive “long-range transportation plan for the urbanized region” providing guidance for development of the pedestrian, bicycle, public transportation and motor vehicle networks. The plan is divided into four sections:

- **Snapshot** summarizes background about the transportation planning process, federal planning requirements, and describes the existing conditions of the transportation system.
- **Structure** provides general functional and design principles and strategic guidelines related to transportation.
- **Shape** outlines transportation principles and policies that support the community’s desires for a transportation system as well as the Transportation Vision Plan for 2030.
- **Build** suggests fiscally constrained strategies to implement elements of the Transportation Vision Plan.

Snapshot

Section 3: Planning Elements of the Snapshot section provides an overview of federal and state requirements for transportation planning. The section notes that one of the requirements of the current federal transportation bill SAFETEA-LU is to include “users of the pedestrian walkways and bicycle transportation facilities and representatives of the disabled” in the planning process.

Section 4: Existing Conditions notes that, “Transit service, bicycle facilities, and pedestrian infrastructure are essential to a well-balanced multi-modal transportation system.” The section also highlights the importance of complete streets to accommodate all transportation modes. The sub-section regarding Bicycle and Pedestrian transportation notes that “several key transportation corridors... do not adequately provide for bicycle travel.” Examples listed in the Plan include Pershing Boulevard, the South Greeley Highway/ Central Avenue corridor, and College Drive. Map 1 shows the existing bicycle network in Cheyenne.

Structure

The Structure section of the *Plan Cheyenne Transportation Plan* provides guidance for development of a multimodal transportation system. Key principles related to bikeways and greenways include:

Complete Streets: provide facilities for all modes of transportation on or adjacent to streets.

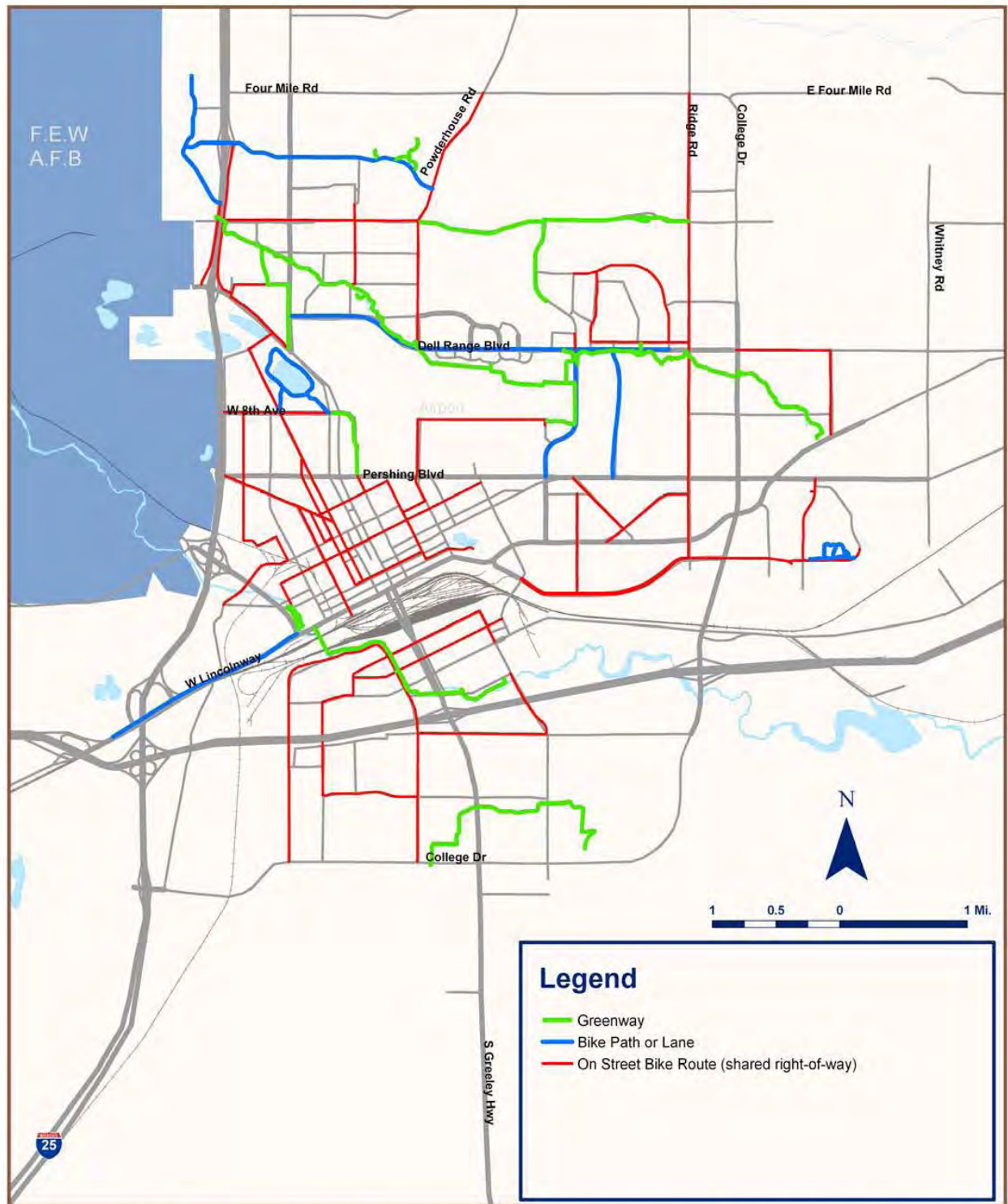
- Build bicycle facilities on all new roadways and retrofit existing roadways with major reconstruction projects.
- Integrate Complete Streets with high density or mixed-use activity centers to create multimodal corridors.

Mixed-Use Activity Centers: The transportation impacts of these centers must be considered.

- Build activity centers on only one corner of a major intersection and limit impacts to arterial traffic operation. (To minimize pedestrian crossings of arterial roads).

Directness: Provide and encourage direct pedestrian connections.

- Provide direct and visible pedestrian connections to transit, schools, activity areas, public facilities, and within neighborhoods.
- Ensure that sidewalk uses, such as sidewalk cafes, are compatible with direct pedestrian access to buildings and other destinations.
- Where barriers exist, provide pedestrian access through these barriers.



Map 1. Existing Bicycle Facilities, Plan Cheyenne Transportation Plan, 2006

Continuity: Link schools, neighborhoods, parks, activity centers, and other destinations with a continuous pedestrian network.

- Provide a continuous and understandable pedestrian network by ensuring consistency in sidewalks, building facades, park strips, and street trees.
- Use pedestrian scaled furnishings, signs, landscaping, and facilities that appear as unified and themed entities in pedestrian areas.
- Provide bridges and crossings over railroads, rivers, drainages, and other features that are major barriers to a continuous pedestrian network. Design these crossings to minimize out of direction travel.

Street Crossings: Provide safe, visible, and easy to use street crossings that will accommodate all potential users.

- Standardize street crossing improvements to include crosswalks, lighting, median refuges, corner sidewalk widenings, signs, signals, and landscaping.
- Improve the visibility of pedestrian crossings with signage, lighting, and pavement markings.
- Install stop bars on all vehicle approaches to signalized intersections where appropriate.
- Design pedestrian crossings to safely accommodate people of all ages and abilities.
- Provide pedestrian crossing signals appropriate to the surrounding area.
- Locate lighting, signal and signage poles so that they not conflict with safe pedestrian circulation and allow access for people of different abilities.

Visual Interest and Amenity: Develop comfortable and attractive pedestrian facilities and settings to make an interesting pedestrian network (follow ADA Guidelines).

- Provide attractive lighting fixtures that enhance the character of the pedestrian environment.
- Use quality materials and design, which will minimize maintenance needs. Adequate maintenance must be provided.

Security: Develop secure pedestrian settings by developing a well-lit inhabited pedestrian network and by mitigating the impacts of vehicles (follow ADA Guidelines).

- Provide clear and direct lines of sight in pedestrian settings by minimizing the use of vertical features.

Several of these guidelines should be considered when designing greenways, particularly intersections where the greenway intersects the street network. While also beneficial for cycling in the region, none of these guidelines mention bicycle travel.

Section 2: Multimodal Design Guidelines for New Development

Section 2: Multimodal Design Guidelines for New Development lists characteristics of a pedestrian-friendly development, including the following bicycle recommendations:

- Bicycle facilities on all collector and arterial streets.
- Safe and convenient pedestrian and bicycle access from the development site to existing, planned, and proposed trails or greenways located on or adjacent to the development site.
- Connections providing direct pedestrian and bicycle access from the development to adjacent neighborhoods, including but not limited to parks, schools, commercial districts, and transit stops. These connections are not necessarily associated with a street.

The chapter also addresses congestion management strategies, including travel demand management (TDM) elements, although the only mention of cycling as a congestion strategy is, “Employers can encourage use of alternative travel modes.”

Shape

The Shape section defines the transportation vision, principles, and policies for the region. Policies related to bikeways and greenways are as follows:

Principle 1: New neighborhoods will be designed to accommodate traffic growth.

- **Policy 1.f Multimodal Traffic Studies:** Traffic studies shall be prepared for all development proposals, which address automobile, transit, bicycle, and pedestrian travel. Development review for all projects should consider all modes and their connection to the transportation system.

Principle 3: The Cheyenne Area will build a multi-modal transportation system that consists of streets, sidewalks, bicycle facilities, and transit.

- **Policy 3.a Complete Streets:** Build arterial and collector streets as complete streets, providing travel lanes for automobiles, bikes, buses, bike lanes, and sidewalks.
- **Policy 3.b Neighborhood Design to Support Walking and Bicycling:** Neighborhoods should have adequate, well connected sidewalk and trail facilities to improve pedestrian and bicycle opportunities.
- **Policy 3.d Bicycle Connections:** Develop and maintain a system of safe and efficient bikeways connecting neighborhoods with activity centers, schools, parks, and other neighborhoods.

Section 4. Needs Assessment

Section 4. Needs Assessment projects growth for the region and anticipates transportation needs. The subsection on Intermodal Connections recognizes that, “It is vital that adequate bicycle and pedestrian connections be provided between transit stops and activity areas.” The subsection on bicycle needs recognizes the benefits of cycling, including cycling’s ability to help “the city to reduce congestion, improve air quality, improve the overall health of Cheyenne Area citizens, and develop a more balanced transportation system.” Bicycle facility needs identified in this section are paraphrased below:

- **Safety and Convenience:** Whichever route a cyclist may choose or need to use, that route should be as safe as possible. Routes should also provide access to various destinations by a reasonably direct means.
- **Connections to Recreational Paths and Trails:** Bicycle routes and lanes can be coordinated and connected with recreational trails to provide an expanded network.
- **Connections between Destinations:** The typical cyclist requires safe and convenient connections between their residence and with school, employment, or entertainment and shopping destinations. In particular, these linkages must provide safe access across high volume arterial streets.
- **Options:** Different levels of cyclists feel comfortable on different types of facilities. Some cyclists have different access requirements to various locations at varying times of day.
- **Signage:** The bicyclist requires clear and consistent signs that not only assist the cyclist in choosing the most appropriate route, but also alert the motorist to the presence of cyclists, increasing safety.
- **Bicycle Parking:** Safe and secure bicycle parking should be provided in the downtown area, City parks, at schools, libraries, recreational centers, other public buildings, in activity centers, along activity corridors, and in all new developments.

- **Intermodal Connections:** Intermodal trips can be made more convenient by providing connections between bicycle facilities and transit stops. At transit stops, bicycle parking or bicycle lockers provide a safe place for bicycle storage. Busfront bike racks can provide additional options to cyclists.
- **Ancillary Facilities:** Ancillary facilities include showers and lockers at places employment; access to other public transit modes; and rest areas with water at suitable intervals or locations.
- **Demand:** The most high-level bicycle facilities should be placed along corridors with the greatest potential for use, as defined by areas where relatively short trips occur (see Map 2).



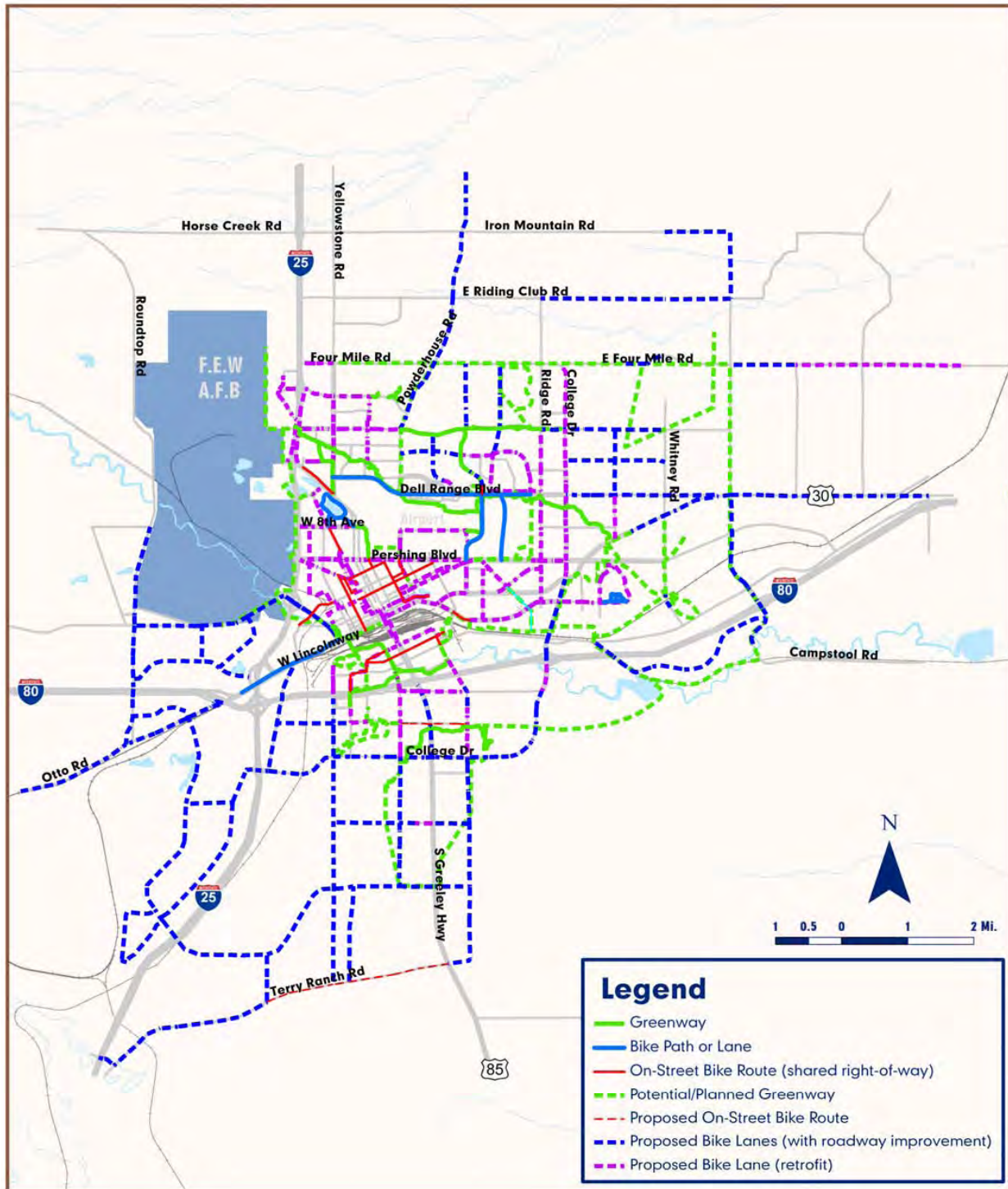
Map 2. Short Trips (Under 3 Miles) and Longer Trips (Under 6 Miles) for Potential Bicycle Demand, Transportation Master Plan

Bicycle Vision Plan

The 2030 Bicycle Vision Plan identifies a network to fulfill the needs identified in the previous section. The City's new street standards require that all roadway improvements will include the construction of separate bike facilities. The Vision Plan also recognizes that additional improvements will require retrofitting of existing roadways, which may require construction of parallel corridors where right-of-way is limited. The Vision Plan delineates a system of existing and proposed on-street bikeways and greenways that accommodate cyclists in Cheyenne and the surrounding area (Map 3). Suggested retrofit improvements that function to fill missing links between roadway improvements include:

- A facility parallel to US 85 connecting downtown to the south.
- Bicycle facilities on Lincolnway and Nationway connecting downtown to a proposed greenway extension.
- Bicycle facilities on or parallel to Pershing Boulevard.
- Bicycle facilities on Converse connecting Pershing to Lincolnway.
- A north/south connection parallel to Interstate-25.
- Bicycle facilities on College Drive where it is not proposed to be otherwise improved.

The Vision Plan also identifies system enhancements to be provided, including signage, bicycle parking, and ancillary facilities as described in the needs assessment.



Map 3. Bicycle Facilities included in the 2030 Bicycle Vision Plan

Build

The Build section of the *Transportation Master Plan* discusses limitations, strategies, and impacts associated with building the transportation vision plans.

Plan Cheyenne Fiscally Constrained Bicycle Plan

The Fiscally Constrained Bicycle Plan identifies missing links that will not be filled by the 2030 Vision and Fiscally Constrained Roadways Plan, as well as bicycle education and outreach programs and system-wide improvements that comprise the system for cyclists. The 2030 Fiscally Constrained Plan allots \$250,000 yearly to fund bicycle and pedestrian improvements that are not associated with other roadway projects.

The Build portion of the *Transportation Master Plan* includes the following strategies to implement the Bicycle Vision Plan:

- **3.a. Identify Funding Sources:** Establish a dedicated funding plan to implement the Bicycle Vision Plan and for maintenance of bicycle facilities. Funding would likely need to be provided through the general fund or as part of a 5th penny sales tax measure. By transferring development-driven roadway costs from the public to developers through a mechanism such as a fee program can help free funding for bicycle improvements.
- **3.b. Complete missing segments identified in the Bicycle Vision Plan:** Prioritize and implement critical bicycle segments that provide system continuity and connections to activity centers, parks, schools, libraries, hospitals, and the community college, etc.
- **3.c. Pursue Maintenance Agreements:** The Bicycle Vision Plan identifies corridors on City and County roads as well as on state highways. Although the federal government's Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) promotes the encouragement and use of alternative modes and bicycling, it is the current policy of WYDOT that bike lanes or shoulders on state facilities are not maintained by WYDOT. Promote an intergovernmental dialog and intergovernmental agreement that facilitates regular maintenance such as plowing and sweeping bike lanes on state facilities along with vehicular travel lanes.

These strategies are tagged as high-priority, moderate to long-term strategies that will enhance the region's cycling environment.

Implementation Strategies

Other implementation strategies that affect the development of bikeways and greenways include:

- **6.a. Multi-Modal Component in Traffic Impact Studies:** The City and County should include a multimodal component in all traffic impact studies. The multi-modal component addresses impacts to pedestrians, bicycles, transit connections, and automobiles. It also must demonstrate that a new development provides adequate non automobile links to nearby arterials and off-site destinations such as commercial centers, parks, and schools.
- **6.c. Evaluation Standards for all Transportation Modes:** The City and County should use multi-modal performance standards to ensure that adequate facilities are provided for all modes of travel. For bicycle and pedestrian modes, level of service standards might address directness, continuity, street crossing design, and security. For transit, pedestrian and bicycle accessibility to transit stops is the key component.
- **6.d. Mobility Report Card:** The City and County should conduct community-wide transportation mobility surveys on a periodic basis. The survey results will become Cheyenne's "Mobility Report Card," a tool to measure Cheyenne's progress towards meeting goals and objectives outlined in the Transportation Master Plan. The report card can also be used to measure the performance of the transportation system in accommodating the area's growth.

Plan Cheyenne Community Plan

The *Community Plan* provides background information for the comprehensive planning effort. The section on Multimodal Street Design notes that bike lanes are proposed on higher volume streets where cyclists cannot share a lane comfortably with motorists.

Structure

The Structure section identifies corridors for all types of users. Open space/greenway corridors are identified as, “Corridors that have a focus on the natural environment and are defined by their lack of built features. They may include trails, waterways, drainage components, or wildlife value.” Design principles for greenway corridors include:

- Design paths and trails to provide a comfortable width for several people walking, riding bicycles, or horses.
- Use primarily native vegetation in open space/ natural areas, with maintained landscapes in adjacent park areas.
- Incorporate landscaping to enhance the visual aspects of corridors.
- Design trails and open space corridors to take advantage of distant views.
- Increase pedestrian and bicycle connections between residential areas, businesses, and other key destinations.
- Improve visibility of access points through trailhead signage and information kiosks that are attractive and integrated into the setting.

Design principles incorporate pedestrian needs in a variety of contexts, but do not explicitly address bicycle circulation.

Shape

The Shape section provides foundations, principles, and policies to help the community build on its assets. Elements related to bikeways and greenways include:

3. Fostering a Vital Economy and Activity Centers

- Principle 3.4: Our commercial and mixed-use activity centers will be pedestrian-oriented and well-designed with public spaces.
 - Policy 3.4.b: Activity Centers Circulation and Access: Clear, direct pedestrian connections should be provided through parking areas to building entrances and to surrounding neighborhoods or streets. Main entrances or driveways should be integrated with the surrounding street network to provide clear connections between uses for vehicles, pedestrians, and bicycles.

4—Developing a Connected and Diverse Transportation System

- Principal 4.1: Roadways in and around our new neighborhoods will be designed to accommodate traffic growth.
 - Policy 4.1.e: Traffic Study Requirements: Traffic studies will be required for all larger development proposals to address automobile, transit, bicycle, and pedestrian travel.
- Principal 4.3: The Cheyenne area will have a diverse transportation system that consists of streets, sidewalks, bicycle facilities, and transit.

- Policy 4.3.a: “Multi-modal” Streets: The community will design and construct arterial and collector streets to be “multimodal,” by providing travel lanes for automobiles, bikes, buses, bike lanes, and sidewalks.
- Policy 4.3.b: Neighborhood Design to Support Walking and Bicycling: New neighborhoods should contain a mix of compatible uses so that residents have recreation, employment and shopping opportunities within walking or bicycling distance of their homes.
- Policy 4.3.d: Interconnected Neighborhood Street, Bikeway, and Sidewalk Patterns: New neighborhoods should contain street systems that encourage internal pedestrian, bike, and auto circulation. They should also limit traffic volumes and speeds on neighborhood collector and local streets where houses front.
- Policy 4.3.e: Loop Trail System Connects Greenway: The Greenway trail system serves as an important transportation and recreation system. Expanding on this system—to fill the gaps, and making connections to it—is our community’s priority for trails.

6—Creating a Legacy of Parks, Open Spaces, and Trails

- Principle 6.2: Our community will extend and enhance our trail system and Greenway.
 - Policy 6.2.a: Connected Greenway System: Recognizing the Greenway is important recreation and transportation trail resource, the community will identify and fix “gaps” in the current system.
 - Policy 6.2.b: Connected Community-Wide Trail System: The community will connect a larger community-wide primary trail system to connect major destinations and provide opportunities to recreation routes (loops), as identified through the Master Plan. Developers should provide local trails to connect neighborhoods to the regional Greenway.
 - Policy 6.2.c: Dedicated Greenway Funding: The community will identify funding sources for acquisition, development, and operation of a community trail system.

The Build section of the *Community Plan* also identifies projects in adopted sub-area plans. Table 2 below shows projects that incorporate bicycle recommendations.

Table 2. Adopted Subarea Plan Bicycle Projects, PlanCheyenne Community Plan

Source	Project
East Central Cheyenne Action Plan	<ul style="list-style-type: none"> • Implement On-Street Bicycle Plan • Construct Avenues Greenway Connection
Northwest Cheyenne Action Plan	<ul style="list-style-type: none"> • Four Mile Road from Hynds to Yellowstone – retrofit to accommodate pedestrians and bicycles • Frontage Roads, Hynds, and Bishop – retrofit to accommodate bicycles
South Cheyenne Action Plan	<ul style="list-style-type: none"> • Improve Segments II & III for Allison Draw Greenway. Install drainage and Greenway Structure on Avenue “C”.

Build

The strategies related to bikeways and greenways listed in the Build section are similar to those identified in the Transportation Plan.

Plan Cheyenne Parks and Recreation Plan

The *Parks and Recreation Plan* provides a detailed inventory of parks and services, summarizes needs and resources, and identifies projects to expand the system. The park definitions note that neighborhood and community parks are intended to be accessed by bicycle, among other modes, and should provide access to the Greenway, if adjacent.

The Shape section provides foundations, principles, and policies for parks and recreation. Those that relate to bikeways and greenways are under the foundation of ‘Creating a Legacy of Parks and Open Space.’

Principle 2: Our community will extend and enhance our trail system and greenway.

- Policy 2.1: A community-wide primary trail system that connects major destinations (e.g., Community Parks, large open space, recreation centers, shopping districts, employment districts, LCCC, downtown, major event centers, fairgrounds, etc.) will be provided. This will be balanced between trails within the city limits, and those that will reside outside of city limits, such as trails in large open space areas.
 - Policy 2.2: Emphasis will be placed on protecting trail corridors through the acquisition of easements and rights-of-way in advance of development.
 - Policy 2.3: Opportunities will be provided for 3- to 5-mile trail loops with areas of interest along the route.
 - Policy 2.4: Road rights-of-way for trails will only be used in the absence of other suitable corridors.
 - Policy 2.5: Both paved and non-paved trails will be provided to accommodate a variety of users. As such, trails will strive to provide ADA compliant grades and universal accessibility.
 - Policy 2.6: “Gaps” in the current Greenway system will be closed as soon as practical. If necessary, temporary or natural surface trails will be built until full construction to the ultimate design standard can be completed.
 - Policy 2.7: New development should be planned to support completion of the City’s trails system and provide permanent right-of-way for planned trails.
 - Policy 2.8: City departments will work together to establish trail and greenway corridors.

The recommendations for the community-wide trail system include:

- Continue development of the Cheyenne Greenway and primary multi-purpose trail system
- Provide 3-5 mile trail loops. Coordinate trails with development plans and work with other city departments
- Provide a natural surface trail along the south Cheyenne ridge.
- Secure right-of-way for future trail corridors
- Investigate possibilities for regional trail connections to the south and east of Cheyenne.
- Work with Laramie County on future City/County trails

Cheyenne Metropolitan Area Pedestrian Plan

The 2010 *Cheyenne Metropolitan Area Pedestrian Plan* is a modal element to be incorporated into the Transportation Master Plan. The plan identifies projects through 2030 that will help increase the region's walkability. The plan inventories strengths of the pedestrian system including:

- The existing greenway system
- Land uses that support multi-modal trips
- Grade separated crossings
- Connections to transit
- Grid-style development pattern in many neighborhoods

Opportunities for improvements noted in the plan that would also benefit cyclists include deployment of wayfinding signs on the greenway system, improved transit connections, and crossing improvements at key intersections. The plan recommends several greenway improvements, including the construction of the Arp Elementary Connector between the Crow Creek Greenway and Arp Elementary, and completion of a missing greenway segment along Converse Avenue between Ogden Avenue and Dell Range Boulevard.

Cheyenne Metropolitan Area Safe Routes to School Plan

The 2010 *Cheyenne Metropolitan Area Safe Routes to School Plan* documents a multi-pronged “5E’s”¹ approach to improving walking and cycling environments around elementary and middle schools within the Cheyenne metropolitan area. The plan notes that many schools are located in neighborhoods where local streets provide a safe cycling environment. The greatest barriers to increased cycling noted in the plan are crossings of collector and arterial roadways in some locations. The plan provides a discussion of existing conditions around each school and an inventory of challenges (e.g., a lack of bicycle parking) and then proposes site-specific engineering solutions, such as sidewalk infill and enhanced bicycle parking. The plan also provides a discussion of supportive programs geared to generate excitement about walking and cycling, such as a walking school bus.

1992 Greenway Development Plan

The stated purpose and intent of the 1992 *Greenway Development Plan* (Development Plan) is to supply an overview of the proposed recreational trail system and provide basic design guidance consistent with federal standards and preliminary cost estimates for approximately 15 miles of recreational trail. Designed to accommodate both pedestrians and cyclists, the trail system also includes “rest and view areas, nature trails, handicapped access and parking facilities.” The off-street greenways identified in the plan complement the previously proposed system of on-street bicycle facilities consisting of shared routes and dedicated bicycle lanes. Off-street greenway projects identified in the plan include Allison Draw, Dry Creek, Crow Creek and an abandoned rail corridor located just south of Nationway.

The plan contains information on a segment-by-segment basis for features such as trailhead design, placement of trail amenities (e.g., restrooms), bridge and crossing locations, landscaping approach and necessary right-of-way acquisition. The initial facility construction was funded primarily through the Laramie County Capital Facilities Tax, which allocated approximately \$2.8 million dollars for facility construction between 1992 and 1997, though the need for additional funding was identified to complete the system.

¹ The “Five E’s” approach includes Education, Encouragement, Enforcement, Engineering and Evaluation strategies.

This page intentionally blank

Working Paper #2 Existing Goals, Objectives

This page intentionally blank

Memorandum



To: Cheyenne On-Street Bicycle Plan and Greenway Plan Update Bicycle Advisory Committee

From: Rory Renfro and Kim Voros, *Alta Planning + Design*

Date: May 11, 2011

Re: Working Paper #2: Existing Goals, Objectives and Policies Review and Analysis

Cheyenne's On-Street Bikeway and Greenway Plans should establish goals and objectives that will foster a high quality bicycling environment. This memorandum provides an overview of goals and objectives and policies from relevant Cheyenne area plans and a best practices review of bicycle plans from three other western communities with comparable weather, size, geography and development patterns. The intent of this best practices review is to identify opportunities for new and/or enhanced goals and objectives that can improve conditions for cycling in the Cheyenne area.

Existing Goals and Objectives

The following section summarizes goals and objectives from existing Cheyenne area plans that are relevant to the Cheyenne On-Street Bicycle Plan and Greenway Plan Update. The following plans are reviewed:

- Cheyenne Area Transportation Master Plan, 2006
- Cheyenne Community Plan, 2005
- Cheyenne Parks and Recreation Master Plan, 2009
- Cheyenne Area On-Street Bicycle Plan Report of Investigation, 1993
- Greenway Development Plan, 1992
- Two Wheeling in Cheyenne, 1975

Cheyenne Area Transportation Master Plan, 2006

Relevant Principles and Policies

- Principle 1: New neighborhoods will be designed to accommodate traffic growth.
 - Policy 1.c Build Neighborhoods with Mixed Uses: Build new neighborhoods with a mix of compatible uses so that residents have employment and shopping opportunities within walking or bicycling distance of their homes.
 - Policy 1.f Multimodal Traffic Studies: Traffic studies shall be prepared for all development proposals, which address automobile, transit, bicycle, and pedestrian travel. Development review for all projects should consider all modes and their connection to the transportation system.
- Principle 2: Impacts to existing neighborhoods will be minimized.

- Principle 3: The Cheyenne Area will build a multi-modal transportation system that consists of streets, sidewalks, bicycle facilities, and transit.
 - Policy 3.a Complete Streets: Build arterial and collector streets as complete streets, providing travel lanes for automobiles, bikes, buses, bike lanes, and sidewalks.
 - Policy 3.b Neighborhood Design to Support Walking and Bicycling: Neighborhoods should have adequate, well connected sidewalk and trail facilities to improve pedestrian and bicycle opportunities.

Bicycle Needs

The bicycle is a healthy and viable alternative to the automobile for many trips. It can also play an important role in helping the city to reduce congestion, improve air quality, improve the overall health of Cheyenne area citizens, and develop a more balanced transportation system. Cheyenne has recently indicated the importance of bicycle travel with the adoption of new bicycle-friendly street standards. These standards designate bicycle lanes on all roadways as they are built or re-built, where appropriate.

Bicycle facility needs are based on general principles of safe and convenient bicycling, as well as site specific situations in the Cheyenne Area. These can be summarized as follows:

- Safety and convenience
- Connections to recreational paths and trails
- Connections between destinations
- Options
- Signage
- Bicycle parking
- Intermodal connections
- Ancillary facilities
- Demand

Bicycle Vision Plan

As defined in the City's new street standards, all roadway improvements in the 2030 Roadway Vision Plan will include construction of separate bike facilities. The City of Cheyenne has previously proposed improvements to on-street bicycle facilities. These proposed improvements are included in the 2030 Bicycle Vision Plan as bike lane retrofits shown in Figure 14.

Cheyenne Community Plan, 2005

Relevant Foundations, Principles and Policies

- Foundation 3: Fostering a Vital Economy and Activity Centers
 - Principle 3.4: Our commercial and mixed-use activity centers will be pedestrian-oriented and well-designed with public spaces.

- Policy 3.4.b. Activity centers and circulation access. Main entrances or driveways should be integrated with the surrounding networks to provide clear connections between uses for vehicles, pedestrians and bicycles.
- Foundation 4: Developing a Connected and Diverse Transportation System
 - Principle 4.2: The Cheyenne area will minimize impacts to our existing neighborhoods when making road improvements.
 - Policy 4.2.a: Limit Major Roadway Widening in Neighborhoods. In general, the community should only consider widening roadways that may impact existing neighborhoods for those roadways that already serve as major thoroughfares.
 - Policy 4.2.b: Consider Alternative Solutions to Road Widening. When alternative solutions are available, the community should prioritize solutions that will minimize impacts to existing neighborhoods, even if the solutions may be less effective at reducing traffic.
 - Policy 4.2.c: Impacts on Historically Significant Neighborhoods. Preserve the integrity and character of historically significant neighborhoods when widening roadways.
 - Principle 4.3: The Cheyenne area will have a diverse transportation system that consists of streets, sidewalks, bicycle facilities, and transit.
 - Policy 4.3.a: “Multi-modal” Streets. The community will design and construct arterial and collector streets to be “multimodal,” by providing travel lanes for automobiles, bikes, buses, bike lanes, and sidewalks.
 - Policy 4.3.b: Neighborhood Design to Support Walking and Bicycling. New neighborhoods should contain a mix of compatible uses so that residents have recreation, employment and shopping opportunities within walking or bicycling distance of their homes.
 - Policy 4.3.d: Interconnected Neighborhood Street, Bikeway, and Sidewalk Patterns. New neighborhoods should contain street systems that encourage internal pedestrian, bike, and auto circulation. They should also limit traffic volumes and speeds on neighborhood collector and local streets where houses front. Sidewalks should be installed on both sides of neighborhood collector streets and at least one side of local residential streets in accordance with street design standards.
 - Policy 4.3.e: Loop Trail System Connects Greenway. The Greenway trail system serves as an important transportation and recreation system. Expanding on this system—to fill the gaps, and making connections to it—is our community’s priority for trails.
- Foundation 6: Creating a Legacy of Parks, Open Space and Trails
 - Principle 6.2: Our community will extend and enhance our trail system and Greenway.

- Policy 6.2.a: Connected Greenway System. Recognizing the Greenway is important recreation and transportation trail resource, the community will identify and fix “gaps” in the current system.
- Policy 6.2.b: Connected Community-Wide Trail System The community will connect a larger community-wide primary trail system to connect major destinations and provide opportunities to recreation routes (loops), as identified through the Master Plan. Developers should provide local trails to connect neighborhoods to the regional Greenway.
- Policy 6.2.c: Dedicated Greenway Funding The community will identify funding sources for acquisition, development, and operation of a community trail system.
- Foundation 7: Developing in a Fiscally Responsible Way
 - Principle 7.2: The Cheyenne area will provide adequate public facilities and services for current and future residents in a fiscally responsible manner.
 - Policy 7.2.d: Schools generally should be co-located with parks, trails, and other recreation facilities to provide combined utilization of parks and transportation.

Cheyenne Parks and Recreation Master Plan

Relevant Principle and Policies

- Principle 2: Our community will extend and enhance our trail system and greenway.
 - Policy 2.1: A community-wide primary trail system that connects major destinations (e.g., Community Parks, large open space, recreation centers, shopping districts, employment districts, LCCC, downtown, major event centers, fairgrounds, etc.) will be provided. This will be balanced between trails within the city limits, and those that will reside outside of city limits, such as trails in large open space areas.
 - Policy 2.2: Emphasis will be placed on protecting trail corridors through the acquisition of easements and rights-of-way in advance of development.
 - Policy 2.3: Opportunities will be provided for 3- to 5-mile trail loops with areas of interest along the route.
 - Policy 2.4: Road rights-of-way for trails will only be used in the absence of other suitable corridors.
 - Policy 2.5: Both paved and non-paved trails will be provided to accommodate a variety of users. As such, trails will strive to provide ADA compliant grades and universal accessibility.
 - Policy 2.6: “Gaps” in the current Greenway system will be closed as soon as practical. If necessary, temporary or natural surface trails will be built until full construction to the ultimate design standard can be completed.
 - Policy 2.7: New development should be planned to support completion of the City’s trails system and provide permanent right-of-way for planned trails.

- Policy 2.8: City departments will work together to establish trail and greenway corridors.

Cheyenne Area On-street Bicycle Plan Report of Investigation, 1993

Purpose

The purpose of the On-street Bicycle Plan is "to describe a safe, convenient, and economical plan for use of public streets by bicycles. Specifically, the plan presents a proposed network of bike routes and bike lanes to serve the cycling public.

This plan does not constitute a construction contract document. It presents the following information for city, county, and state officials and the cycling public:

- A critical evaluation of the suitability for bicycle facilities on streets and roads in the Cheyenne area that have been proposed as bikeways
- Recommended criteria for bicycle facilities
- A proposed system of on-street bike lanes that meet the criteria
- Estimated programming costs
- Some suggestions for implementation of the on-street plan

The report provides a foundation for a plan by collecting street data, evaluating the "rideability" of the segments, assembling criteria, and thinking through the process of selection of the segments for an on-street system. The recommendations presented in the plan are to some extent subjective. Trade-offs were made among considerations of convenience (for cyclists and motorists), compliance with nationally recognized standards, aesthetics, and cost. The plan states that 'public officials and cyclists may prefer alternatives or modifications to these recommendations -- both in overall concept and in detail'. Additionally, the plan is expected to be revised with input from individuals and groups prior to implementation.

Objective

The plan strives to answer the question: What is the best system of on-street bike lanes that would be consistent with the needs of cyclists and the motoring public, standards of safety, and costs?

Greenway Development Plan, 1992

Purpose and Intent of the Plan

The purpose of the Greenway Development Plan is to give an overview of the entire proposed greenway path system. It is also intended to establish parameters for consistent design and quality throughout the system. The Greenway Development Plan shall be used as a guide for subsequent design and construction of the greenway path system.

In addition, the charge given the consulting team by the Greenway Technical Review Committee and the governing body was to create a Greenway Development Plan which provides for a quality greenway system to be of recreational, transportation, environmental and economic benefit to the City of Cheyenne and Laramie County.

Best Practices Review

The following best practices review summarizes relevant goals, objectives and policies from transportation, bicycle and/or greenway plans from the following jurisdictions:

- Boulder, Colorado: Transportation Master Plan, 2008
- Fort Collins, Colorado: 2008 Bicycle Plan
- Bend, Oregon: Metropolitan Transportation Plan, 2007

The first portion of this review lists goals, policies and objectives by jurisdiction, while the second portion of the review categorizes goals, policies and objectives using a “5E’s.” approach¹.

Please note that different cities and plans use terms such as “goal” and “objective” in different ways. This discrepancy should not distract from the intent of this paper, which is to demonstrate which subjects are being prioritized and how they are being framed, not terminology distinctions.

City of Boulder Transportation Master Plan, 2008

Bicycle Policies

- The city will complete a grid-based system of primary and secondary bicycle corridors to provide bicycle access to all major destinations and all parts of the community.
- The city will coordinate with Boulder County, CU, the Boulder Urban Renewal Authority (BURA), neighborhood plans, the City Parks and Recreation Department, the Open Space and Mountain Parks Department, and other government entities and plans to ensure that all city and county projects connect with and/or help to complete the corridor network.
- The city will work with property owners, developers, the BURA, the Boulder Valley School District (BVSD), the City Parks and Recreation Department and CU to ensure that commercial, public, and mixed-use and multi-unit residential sites provide direct, safe and convenient internal bicycle circulation oriented along the line of sight from external connections to areas near building entrances and other on-site destinations.
- The city will combine education and enforcement efforts to help instill safe and courteous use of the shared public roadway, with a focus on better educating students on how to properly share the road with bicyclists, pedestrians and users of transit.

Investment Policies

The city shall generally give priority to transportation investments as follows:

- Highest priority - system operations, maintenance and travel safety;
- Next priority – operational efficiency improvements and enhancement of the transit, pedestrian and bicycle system;
- Next lowest priority - quality of life, such as sound walls and traffic mitigation; and

¹ The “Five E’s” approach includes Education, Encouragement, Enforcement, Engineering and Evaluation strategies.

- Lowest priority - auto capacity additions (new lanes and interchanges).

While the most recent Boulder Transportation Master Plan includes the concise policies above, the Bicycle System Plan element of the 1996 City of Boulder Master Transportation Plan provides additional goals and policies, listed in Appendix A for reference.

City of Fort Collins 2008 Bicycle Plan

Relevant Plan Recommendations

- Engineering and the Proposed Bikeway Network
 - Continue and improve maintenance of Priority Commuter Routes.
 - Improve signal detection loops.
 - Examine innovative bicycle traffic solutions such as bike boxes and bike boulevards.
- Promoting Bicycling through Education, Encouragement
 - Maintain existing education and encouragement programs and solicit more participation.
 - Continue to develop and implement innovative education and encouragement programs, campaigns, and events.
 - Continue to foster relationships between non-profits, advocacy, and community groups and build public-private partnerships.
 - Consider the implementation of Cyclovias (car-free events).
 - Reinforce yield and safety education programs pertaining to bicyclists and other bike lane and trail users.
- Enforcement
 - Work closely with local enforcement agencies to create innovative, proactive, educational campaigns.
 - Bridge the gap of understanding between bicyclists and local enforcement agencies by providing current and consistent information.
 - Coordinate training sessions to ensure knowledge on current local, regional, and national bicycle policies and ordinances.
 - Establish enforcement techniques for handling special events and protests.
 - Explore the creation of a Share the Road Safety Class.
 - Establish “sting” operations in coordination with local enforcement agencies to address bicycle theft and traffic-law evasion by bicyclists.
- Recognizing Economic, Environmental and Community Benefits
 - Continue to support and encourage infrastructure development, bicycle sporting events, recreational biking, and bicycle facilities.

- Use the local bicycle culture to attract employers, new residents, business, and visitors.
- Encourage bicycle-related businesses and manufacturers.
- Establish measurement methods for environmental benefits.
- Coordinate with other City initiatives to measure environmental benefits.
- Pursue the formation of a Bicycle Advisory Committee (BAC).
- Pursue the Platinum Level designation with the League of American Bicyclists (LAB).
- Establish performance measures for bicycle programs and facilities.
- Maintain support for existing programs.
- Foster communication amongst the public, non-profit, and private sector to implement the recommendations in the 2008 Bicycle Plan.
- Multi-Modal Connectivity
 - Expand opportunities for bicycle-transit/bicycle-pedestrian/bicycle-car auto linkage.
 - Incorporate bicycle parking at transit stops and stations.
 - Improve and expand bicycle parking throughout the City.
 - Encourage installation of showers and changing facilities.

Bend Metropolitan Transportation Plan, 2007

Goals and Objectives

- Mobility and Balance
 - Goal 1: Provide a variety of practical and convenient means to move people and goods to, from and within the MPO area.
 - Objective 3: Promote non-motorized modes of transportation by constructing a system of safe and efficient transportation and recreation routes for pedestrians, bicyclists, and equestrians.
 - Goal 2: Develop a transportation system that serves the needs of all travel modes, provides intermodal connectivity, and provides a range of transportation options throughout the MPO area.
- Safety and Efficiency
 - Goal 1: Address traffic congestion and problem areas by evaluating the broadest range of transportation solutions, including but not limited to:
 - Operational improvements to maximize the efficiency of existing facilities;
 - Construction of new transportation corridors;

- Transportation Demand Management (TDM) - bicycle, pedestrian and carpool strategies; and
 - Transportation Systems Management (TSM) – Intelligent Transportation Systems (ITS), intersection operations and access management.
- Goal 2: Serve the existing, proposed and future land uses with an efficient and safe transportation network.
- Goal 3: Design and construct the transportation system to enhance safety for all modes.
 - Objective: In cases where improving safety will also improve efficiency, these projects should receive funding priority.
- Accessibility and Equity
 - Goal 1: Provide people of all income levels with a wide range of travel options within the MPO area.
 - Goal 2: Support all Americans with Disabilities Act (ADA) requirements and policies.
- Land Use
 - Goal 1: Integrate land use and transportation by encouraging land use patterns that provide efficient, compact uses of land that facilitate a reduced number and length of trips.
 - Goal 3: Promote development that does not rely on primary access to the state transportation system.
- Environment and Livability
 - Goal 2: Design transportation improvements that protect the environment by preserving air and water quality, minimizing noise impacts and encouraging energy conservation.
 - Goal 3: Use context sensitive design principles when designing and locating transportation facilities.
- Economic Development
 - Goal 1: Implement transportation improvements that foster economic development and business vitality.
 - Goal 2: Develop a transportation network with transportation options that enhance linkages between centers of employment, education, medical facilities and neighborhoods.
 - Goal 3: Recognize the importance of intermodal connections and maintain adaptable approaches to trends and opportunities that enhance intermodal connections.

Relevant Policies

- Assist the City, County, State, Forest Service, Park District and public agencies to acquire, develop and maintain a series of trails along the Deschutes River, Tumalo Creek, and the canal system so that these features can be retained as a community asset. Work with these same agencies to identify and

develop connections between the Bend Urban Area Bicycle and Trails System and the USFS trail system.

- Assist the City and Park District to acquire, develop and maintain the primary trails designated on the Bend Urban Area - Bicycle and Pedestrian System Plan – TSP: Map Exhibit B.
- Assist the City with developing safe and convenient bicycle and pedestrian circulation to major activity centers, including the downtown, schools, shopping areas and parks. Particular emphasis should be given to east-west access barriers to the downtown area (e.g. the Bend Parkway, the railroad, etc.).
- Work with the City to facilitate easy and safe bicycle and pedestrian crossings of major collector and arterial streets. Work with the City to identify intersection designs that include pedestrian refuges or islands, curb extensions and other elements where needed for pedestrian safety and extend bike lanes to meet intersection crosswalks.
- Work with the city and county to insure that bike lanes or bikeways are included on all new and reconstructed arterials and collectors. Add bike lanes to existing arterial and collector streets with particular emphasis to fill the gaps in the on-street bikeway system. Provide an appropriate means of pedestrian and bicyclist signal actuation at all new or upgraded traffic signal installations.
- Work with the City and County to insure that bicycle and pedestrian facilities are maintained in a manner that promotes use and safety. Perform street repair and maintenance in a manner that does not negatively impact bicycle and pedestrian facilities and their use.
- Work with the City to ensure that bicycle parking facilities are provided at all new multifamily residential, commercial, industrial, recreational, and institutional facilities, major transit stops, transit stations and park and ride lots.
- Encourage the City to establish or maintain accessways, paths, or trails prior to vacating any public easement or right-of-way.
- Work with the City, County, and State to support bicycle and pedestrian education and safety programs.
- Work with the City and the Burlington Northern – Santa Fe (BNSF) Railroad to determine where, if possible, railroad right-of-ways could be used also as trail corridors. Provided a joint-use agreement can be reached with BNSF, work with the City to evaluate the entire Rails with Trails Corridor in light of opportunities to augment the local primary trail system.
- Work with the City, County, and Park and Recreation District, to identify funding options for right-of-way acquisition, design, construction and maintenance of priority trails.
- Work with the City, County, and Park and Recreation District to update sidewalk, trail and bike lane systems inventories and identify gaps and missing system segments and prioritize these for completion.
- Work with the City and County to identify specific annual targets for bikeway in-fill projects.
- Work with the City and Park and Recreation District to identify specific annual targets for securing public right-of-ways or easements for trails and constructing trails.

Summary Tables

The following tables summarize the relevant goals, objectives and policies of these agencies' transportation and/or bicycle plans for the following "5 E's" categories:

- Engineering (Physical Improvements)
- Education
- Encouragement
- Enforcement
- Evaluation
- Other Relevant Goals, Objectives and Policies

Table 1. Goals, Objectives and Policies: Engineering

Jurisdiction	Goal/Objective/Policy
City of Boulder	<ul style="list-style-type: none"> • Complete a grid-based system of primary and secondary bicycle corridors to provide bicycle access to all major destinations and all parts of the community. • Coordinate with Boulder County, CU, the Boulder Urban Renewal Authority (BURA), neighborhood plans, the City Parks and Recreation Department, the Open Space and Mountain Parks Department, and other government entities and plans to ensure that all city and county projects connect with and/or help to complete the corridor network. • Work with property owners, developers, the BURA, the Boulder Valley School District (BVSD), the City Parks and Recreation Department and CU to ensure that commercial, public, and mixed-use and multi-unit residential sites provide direct, safe and convenient internal bicycle circulation oriented along the line of sight from external connections to areas near building entrances and other on-site destinations.
City of Fort Collins	<ul style="list-style-type: none"> • Continue and improve maintenance of Priority Commuter Routes. • Improve signal detection loops. • Examine innovative bicycle traffic solutions such as bike boxes and bike boulevards. • Incorporate bicycle parking at transit stops and stations. • Improve and expand bicycle parking throughout the City. • Encourage installation of showers and changing facilities.
City of Bend	<ul style="list-style-type: none"> • Provide a variety of practical and convenient means to move people and goods to, from and within the MPO area. • Promote non-motorized modes of transportation by constructing a system of safe and efficient transportation and recreation routes for pedestrians, bicyclists, and equestrians. • Develop a transportation system that serves the needs of all travel modes, provides intermodal connectivity, and provides a range of transportation options throughout the MPO area. • Address traffic congestion and problem areas by evaluating the broadest range of transportation solutions, including but not limited to: <ul style="list-style-type: none"> ▪ Operational improvements to maximize the efficiency of existing facilities; ▪ Construction of new transportation corridors; ▪ Transportation Demand Management (TDM) - bicycle, pedestrian and carpool strategies; and

- Transportation Systems Management (TSM) – Intelligent Transportation Systems (ITS), intersection operations and access management.
- Serve the existing, proposed and future land uses with an efficient and safe transportation network.
- Design and construct the transportation system to enhance safety for all modes.
- Assist the City, County, State, Forest Service, Park District and public agencies to acquire, develop and maintain a series of trails along the Deschutes River, Tumalo Creek, and the canal system so that these features can be retained as a community asset. Work with these same agencies to identify and develop connections between the Bend Urban Area Bicycle and Trails System and the USFS trail system.
- Assist the City and Park District to acquire, develop and maintain the primary trails designated on the Bend Urban Area - Bicycle and Pedestrian System Plan – TSP: Map Exhibit B.
- Assist the City with developing safe and convenient bicycle and pedestrian circulation to major activity centers, including the downtown, schools, shopping areas and parks. Particular emphasis should be given to east-west access barriers to the downtown area (e.g. the Bend Parkway, the railroad, etc.).
- Work with the City to facilitate easy and safe bicycle and pedestrian crossings of major collector and arterial streets. Work with the City to identify intersection designs that include pedestrian refuges or islands, curb extensions and other elements where needed for pedestrian safety and extend bike lanes to meet intersection crosswalks.
- Work with the city and county to insure that bike lanes or bikeways are included on all new and reconstructed arterials and collectors. Add bike lanes to existing arterial and collector streets with particular emphasis to fill the gaps in the on-street bikeway system. Provide an appropriate means of pedestrian and bicyclist signal actuation at all new or upgraded traffic signal installations.
- Work with the City and County to insure that bicycle and pedestrian facilities are maintained in a manner that promotes use and safety. Perform street repair and maintenance in a manner that does not negatively impact bicycle and pedestrian facilities and their use.
- Work with the City to ensure that bicycle parking facilities are provided at all new multifamily residential, commercial, industrial, recreational, and institutional facilities, major transit stops, transit stations and park and ride lots.
- Encourage the City to establish or maintain accessways, paths, or trails prior to vacating any public easement or right-of-way.
- Work with the City and the Burlington Northern – Santa Fe (BNSF) Railroad to determine where, if possible, railroad right-of-ways could be used also as trail corridors. Provided a joint-use agreement can be reached with BNSF, work with the City to evaluate the entire Rails with Trails Corridor in light of opportunities to augment the local primary trail system.

Table 2. Goals, Objectives and Policies: Education

Jurisdiction	Goal/Objective/Policy
City of Boulder	Combine education and enforcement efforts to help instill safe and courteous use of the shared public roadway, with a focus on better educating students on how to properly share the road with bicyclists, pedestrians and users of transit.
City of Fort Collins	<ul style="list-style-type: none"> • Maintain existing education and encouragement programs and solicit more participation. • Continue to develop and implement innovative education and encouragement programs, campaigns, and events. • Continue to foster relationships between non-profits, advocacy, and community groups and build public-private partnerships. • Reinforce yield and safety education programs pertaining to bicyclists and other bike lane and trail users. • Work closely with local enforcement agencies to create innovative, proactive, educational campaigns. • Bridge the gap of understanding between bicyclists and local enforcement agencies by providing current and consistent information. • Coordinate training sessions to ensure knowledge on current local, regional, and national bicycle policies and ordinances. • Explore the creation of a Share the Road Safety Class.
City of Bend	Work with the City, County, and State to support bicycle and pedestrian education and safety programs.

Table 3. Goals, Objectives and Policies: Encouragement

Jurisdiction	Goal/Objective/Policy
City of Boulder	N/A
City of Fort Collins	<ul style="list-style-type: none"> • Maintain existing education and encouragement programs and solicit more participation. • Continue to develop and implement innovative education and encouragement programs, campaigns, and events. • Continue to foster relationships between non-profits, advocacy, and community groups and build public-private partnerships. • Consider the implementation of Cyclovias (car-free events). • Continue to support and encourage infrastructure development, bicycle sporting events, recreational biking, and bicycle facilities. • Use the local bicycle culture to attract employers, new residents, business, and visitors. • Encourage bicycle-related businesses and manufacturers.
City of Bend	N/A

Table 4. Goals, Objectives and Policies: Enforcement

Jurisdiction	Goal/Objective/Policy
City of Boulder	Combine education and enforcement efforts to help instill safe and courteous use of the shared public roadway, with a focus on better educating students on how to properly share the road with bicyclists, pedestrians and users of transit.
City of Fort Collins	<ul style="list-style-type: none"> • Work closely with local enforcement agencies to create innovative, proactive, educational campaigns. • Bridge the gap of understanding between bicyclists and local enforcement agencies by providing current and consistent information. • Coordinate training sessions to ensure knowledge on current local, regional, and national bicycle policies and ordinances. • Establish enforcement techniques for handling special events and protests. • Explore the creation of a Share the Road Safety Class. • Establish “sting” operations in coordination with local enforcement agencies to address bicycle theft and traffic-law evasion by bicyclists.
City of Bend	N/A

Table 5. Goals, Objectives and Policies: Evaluation

Jurisdiction	Goal/Objective/Policy
City of Boulder	N/A
City of Fort Collins	<ul style="list-style-type: none"> • Establish measurement methods for environmental benefits. • Coordinate with other City initiatives to measure environmental benefits. • Pursue the formation of a Bicycle Advisory Committee (BAC). • Pursue the Platinum Level designation with the League of American Bicyclists (LAB). • Establish performance measures for bicycle programs and facilities.
City of Bend	<ul style="list-style-type: none"> • Work with the City, County, and Park and Recreation District to update sidewalk, trail and bike lane systems inventories and identify gaps and missing system segments and prioritize these for completion. • Work with the City and County to identify specific annual targets for bikeway in-fill projects. • Work with the City and Park and Recreation District to identify specific annual targets for securing public right-of-ways or easements for trails and constructing trails.

Table 6. Other Relevant Goals, Objectives and Policies

Jurisdiction	Goal/Objective/Policy
City of Boulder	<p>Give priority to transportation investments as follows:</p> <ul style="list-style-type: none"> ▪ Highest priority - system operations, maintenance and travel safety; ▪ Next priority – operational efficiency improvements and enhancement of the transit, pedestrian and bicycle system; ▪ Next lowest priority - quality of life, such as sound walls and traffic mitigation; and ▪ Lowest priority - auto capacity additions (new lanes and interchanges).
City of Fort Collins	<ul style="list-style-type: none"> • Maintain support for existing programs. • Foster communication amongst the public, non-profit, and private sector to implement the recommendations in the 2008 Bicycle Plan. • Expand opportunities for bicycle–transit/bicycle-pedestrian/bicycle-car auto linkage.
City of Bend	<ul style="list-style-type: none"> • Provide people of all income levels with a wide range of travel options within the MPO area. • Support all Americans with Disabilities Act (ADA) requirements and policies. • Integrate land use and transportation by encouraging land use patterns that provide efficient, compact uses of land that facilitate a reduced number and length of trips. • Promote development that does not rely on primary access to the state transportation system. • Design transportation improvements that protect the environment by preserving air and water quality, minimizing noise impacts and encouraging energy conservation. • Use context sensitive design principles when designing and locating transportation facilities. • Implement transportation improvements that foster economic development and business vitality. • Develop a transportation network with transportation options that enhance linkages between centers of employment, education, medical facilities and neighborhoods. • Recognize the importance of intermodal connections and maintain adaptable approaches to trends and opportunities that enhance intermodal connections. • Work with the City, County, and Park and Recreation District, to identify funding options for right-of-way acquisition, design, construction and maintenance of priority trails.

Summary Findings

Cheyenne's On-Street Bikeway and Greenway Plans should establish goals, objectives, and policies that incorporate elements of these best practices. The following section summarizes key elements of each goal theme identified above.

- Many goals, objectives and policies are focused on engineering or physical improvements. These statements on physical improvements emphasize creating complete networks, providing connectivity, maintaining facilities and providing support facilities such as bicycle parking. The City of Fort Collins also prioritizes exploring innovative treatments. The City of Bend also puts an emphasis on trail network development and maintenance.
- Safety education is an important part of all of the plans reviewed, particularly the Fort Collins Bicycle Plan, which emphasizes expanding education programs and fostering relationships with community partners and local law enforcement.
- The City of Fort Collins sets out to encourage bicycling through events such as Ciclovias, recreational bicycling, and taking advantage of the local bicycle culture. The City of Boulder addresses encouragement in the goals and policies of their 1996 Plan, but not their most recent plan.
- Enforcement is important for both Boulder and Fort Collins, with an emphasis on improving safety and road/path conditions for all users.
- The City of Fort Collins and the City of Bend establish evaluation goals or policies, such as establishing targets or measures. The City of Boulder's 1996 Transportation Master Plan (located in Appendix A) also includes a specific mode share goal to increase bicycle mode share by at least 4% by the year 2020.
- Finally, land use, environmental issues, funding priorities, equity, economic development and intermodal/regional connections are other themes that are addressed by these plans.

Recommendations and Application of Best Practices to the Cheyenne Metropolitan Area

Based on the review of existing Cheyenne-area plan policies and best practices from other communities, the following points should be taken into consideration when developing policies, goals and objectives for the On-Street Bicycle Plan and Greenways Plan Update.

- Consider structuring policies, goals and objectives according to the 5'E's. This approach is consistent with the approach taken by many Safe Routes to School Programs and the *Wyoming State Bicycle and Pedestrian Plan*. This format emphasizes the multi-faceted approach that will make Cheyenne a premier cycling destination.
- Clearly define the terms "policy," "goal," and "objective" in relationship to the other Cheyenne area planning initiatives. For example, *Plan Cheyenne* documents often reference "principles" and "policies" rather than "goals" and "objectives."
- Use relevant goals from existing planning efforts as the basis for the On-Street Bicycle Plan and Greenway Plan Update goals to increase cohesion of local plans. For example, the *Plan Cheyenne Community Plan Policy 2.1*: "A community-wide primary trail system that connects major destinations" could become a primary "Engineering" goal in the *Greenway Plan Update*.

- Include a statement addressing safety through ongoing bicycle and motorist education.
- Recognize the continuing need for jurisdictional coordination and cooperation for facility construction and maintenance.
- Establish desired outcomes within goals and policies (e.g., a reduction in reported bicycle crashes, increased cycling mode share and miles of on-street bikeway or greenway constructed).

Appendix A: Goals and Policies from the 1996 City of Boulder Transportation Master Plan, Bicycle System Plan Element

Goal Statements

- To increase bicycle mode share by at least 4% by the year 2020.
- To develop a mechanism for gathering continued input from the public on the bicycle system and to establish partnerships with various entities within the City and County in order to develop and improve the bicycle system.
- To develop a continuous bicycle system with access to major destination areas and to maintain the system so that it provides safe and convenient travel.
- To design and construct bicycle facilities in ways that encourage bicycle riding, provide for safer interaction with other modes, and better integrate bicyclists into the roadway system.
- To develop an urban form which is characterized by people-oriented land use patterns and which enables people to walk or ride their bicycles to destination areas.
- To complete the missing links in the regional system and to provide continuous bicycle facilities and good bicycle-transit integration between the City of Boulder and her neighboring cities.
- To develop local recognition of the bicycle as a legitimate form of transportation.
- To increase transportation safety for all modes through education and enforcement efforts.

Policies

Physical System

- The City will separate pedestrian and bicycle travel on multi-use path facilities wherever possible through the use of path marking, signs or construction of separate facilities. (1989 TMP)
- The City will ensure that all streets are made safe and accessible to bicycles and will consider bicycle needs in all road projects. (1989 TMP)
- The City will construct bicycle facilities on all roads of collector or arterial status. Where it is not possible to construct on-street bicycle lanes on roads of collector or arterial status, the City will construct a wide outside curb lane with a minimum width of 14 feet exclusive of the gutter pan. (1989 TMP)
- The City will develop a set of corridor tables and diagrams which will provide detailed information on the improvements needed along each corridor. These tables will be updated every five years.
- The City will actively work to complete the corridor network through a combination of CIP funding, federal funding, street projects and opportunities which arise through the development and redevelopment process.
- The City will use the development review process, the Greenways Master Plan, the Parks and Recreation Master Plan, and other city planning efforts to find new opportunities to provide connections for bicycles to and from the corridor network and to ensure that all development and

redevelopment projects incorporate the proposed improvements to the corridor network which are documented in the corridor tables.

- The City will continue to work to improve conditions for bicyclists through maintenance practice, equipment and technology.

Design Guidelines

- The City will use street markings, signs, raised crosswalks, intersection geometry, restricted turn movements, and intersection reconstruction opportunities to improve intersection safety where bicycle facilities intersect with curb cuts or roads. (1989 TMP)
- The City will continue to install bicycle-activated loop detectors at every actuated approach to every signal throughout the corridor network. (1989 TMP)
- The City will use the preferred standard for bicycle lane width whenever possible for new construction. The City will use road construction projects as opportunities to upgrade existing bicycle lanes to meet the new preferred standards.

Bicycle Access

- The City will encourage new development and redevelopment projects to provide shower and changing facilities for employees. (1989 TMP)
- The City will ensure that bicycle access and circulation are considered in all phases of the planning process.
- The City will require all new development and redevelopment projects to provide two bicycle parking racks for every ten automobile spaces.
- The City will design a unique system of signs denoting the primary and secondary corridors by name, symbol and/or color, to be placed at regular intervals along these corridors. The City will incorporate internationally recognized symbols into the design.
- The City will design a series of “you are here” maps to be placed at all major destination areas and other strategic locations along the primary and secondary corridor system; these maps will include the primary and secondary corridors, existing bicycle facilities and destination areas.

Regional and Intermodal Connections

- The City will ensure that every regional facility planned or already developed by Boulder County is connected to a Primary and Secondary Corridor.
- The City will ensure that every transit center and park and Ride facility is connected to a Primary and Secondary Corridor.
- The City will work with Boulder County, the Denver Regional Council of Governments (DRCOG), and other city governments to ensure that bicycle facilities or adequate shoulders are included in all road construction projects.

- The City will work with the Regional Transportation District (RTD), Boulder County and other city governments to provide for direct bicycle access from the corridor network to the bicycle parking area at all transit centers and park and Ride facilities throughout the region.
- The City will work with RTD, Boulder County and other city governments to provide bicycle lockers or secure, covered bicycle parking at all transit centers and park and Ride facilities within the region.
- The City will work with RTD to provide secure bicycle parking at transit stops throughout the City.
- The City will work with RTD to ensure that all Boulder transit routes accommodate bikes on buses by 1996.

Encouragement and TDM

- The City will continue to expand upon Bike Week events. (1989 TMP)
- The City will assist employers in establishing an employee transportation coordinator (ETC) whose job is to disseminate information on alternative transportation, including the bicycle system, and to increase awareness and support of alternative modes within the workplace. (1989 TMP)
- The City will encourage or assist employers to provide secure and convenient bicycle parking, showers and lockers and the workplace. (1989 TMP)
- The City will collaborate with manufacturers, retailers and employers to offer discounts on bicycling gear for employees who bike to work.
- The City will involve bicycle shops and organizations in community education by utilizing their expertise to sponsor maintenance clinics, training rides and other events.
- The City will allow developers a reduction in minimum automobile parking space requirements in exchange for commitments to increased bicycle access and bicycle mode share, such as bike parking, shower and locker facilities, and employee incentive programs.

Education and Enforcement

- The City will continue to work with BVSD to present bicycle safety rodeos and transportation safety assemblies designed to teach safe riding habits and the rules of the road to young cyclists. (1989 TMP)
- The City will place brochures in packets going to CU students, bicycle stores and public places which contain information about sharing the roads along with transit routes and schedules and bicycle facility maps. (1989 TMP)
- The City will work with the state legislature to add a non-motorized portion to the State Motor Vehicle test which includes questions on appropriate behavior of motorized vehicles towards bicyclists and pedestrians. (1989 TMP)
- The City will establish a "Close Call" Hot Line to better identify high hazard locations and to pinpoint violations which lead to accidents.
- The City will collaborate with the Boulder Valley School District (BVSD), the University of Colorado, and private and public driving schools to better educate students on how to properly share the road with bicyclists, pedestrians and users of transits.

- The City will work with the University of Colorado to provide materials and instruction on bicycle safety and the “share the road” campaign and to institute a mandatory orientation session on these issues for all incoming students.
- The City will develop a strong “Share the Road” public education campaign to foster increased courtesy and respect among all modes.
- The City will develop a “Driving with Bicyclists” seminar which teaches automobile drivers about sharing the road with cyclists, emphasizing the rights and responsibilities of all road users. This will be available to the general public, to professional drivers, and for motorists who commit traffic violations involving cyclists.

References and Resources

- Cheyenne Area Transportation Master Plan (2006)
- Cheyenne Community Plan (2005)
- Cheyenne Parks and Recreation Master Plan
- Cheyenne Area On-street Bicycle Plan Report of Investigation (1993)
- Greenway Development Plan (1992)
- Two Wheeling in Cheyenne (1975)
- City of Boulder Transportation Master Plan (2008):
http://www.bouldercolorado.gov/files/Transportation_Master_Plan/2008_BoulderTMP.pdf
- City of Boulder Transportation Master Plan, Bicycle System (1996):
http://www.bouldercolorado.gov/files/Transportation_Master_Plan/Chapter6_2.pdf
- City of Fort Collins Bicycle Plan (2008): http://www.fcgov.com/bicycling/pdf/bike_plan-2008.pdf
- Bend Metropolitan Transportation Plan (2007):
http://www.ci.bend.or.us/depts/bend_mpo/metropolitan_transportation_plan.html

Working Paper #3: Vision, Goals and Objectives

This page intentionally blank

Memorandum



To: Cheyenne On-Street Bicycle Plan and Greenway Plan Update Bicycle Advisory Committee

From: Rory Renfro and Kim Voros, *Alta Planning + Design*

Date: May 3, 2011

Re: Working Paper #3: Vision, Goals and Objectives

The Vision, Goals, and Objectives of the *Cheyenne On-Street Bicycle Plan and Greenway Plan Update* are principles that will guide the development and implementation of the Plan in coming years. Goals and objectives direct the way the public improvements are made, where resources are allocated, how programs are operated, and how the City's and Cheyenne Metropolitan Planning Organization's priorities are determined. This Plan will lay out a framework for creation and expansion of facilities as well as programs and improvements to increase bicycling and trail use in the Cheyenne Metropolitan Area.

The following vision, goals, and objectives are based on a review of best practices and discussions with the Bicycle Advisory Committee, City and MPO staff. A vision statement outlines what the City and MPO wants to become. It concentrates on the future and is a source of inspiration. Goals help guide the fulfillment of that vision and relate to both existing and newly-launched efforts by the City and MPO. Objectives are more specific statements under each goal that define how each goal will be achieved. Many objectives are measurable and allow tracking and benchmarking systems to demonstrate the extent of the City's progress toward the goals and overall vision. Measureable objectives are noted with an [M] and can be used to track progress of Plan implementation. The goals and objectives of this Plan may be undertaken by several different city agencies. The responsibilities of each agency will be clarified later in the development of this Plan.

Project Vision

The Cheyenne Metropolitan Area will become a place that is increasingly friendly for cyclists and trail users of all types and abilities.

Draft Goals and Objectives

The *Cheyenne On-Street Bicycle Plan and Greenway Plan Update* will be implemented through a comprehensive program of activities based on the following goals:

1. Engineering and Maintenance
2. Education and Encouragement
3. Enforcement
4. Evaluation and Implementation

1. Engineering and Maintenance

Goal:	1-1	Develop a complete and continuous on-street bikeway and Greenway system that serves recreation and utilitarian trips, provides intermodal connectivity, and provides a range of transportation options throughout the MPO area.
Objectives:	1-1A	Serve existing, proposed and future land uses with an efficient and safe on-street bicycle and Greenway network.
	1-1B	Evaluate streets for the addition of bike facilities based on the recommended projects in this Plan when performing street resurfacing or restriping projects. Ensure that bikeways are included on all new and reconstructed arterials and collectors. [M]
	1-1C	Design and construct bikeways and Greenways in a manner that enhances safety for all transportation modes and whose regular users include women, children and the elderly. [M]
	1-1D	Examine and implement innovative bicycle traffic solutions such as bike boxes and bike boulevards. [M]
	1-1E	Work to facilitate easy and safe crossings of major collector and arterial streets. Identify intersection designs that include elements to enhance cyclist and trail-user safety.
	1-1F	Install signs along all bicycle facilities to assist with way-finding and to increase awareness of bicyclists. [M]
	1-1G	“Gaps” in the current Greenway system will be closed as soon as practical. If necessary, temporary or natural surface trails will be built until full construction to the ultimate design standard can be completed. [M]
	1-1H	Adopt and periodically update code requirements that increase the availability and quality of end-of-trip bike facilities, such as secure and sheltered bike parking, showers, clothes changing areas etc.) [M]
	1-1I	Support Americans with Disabilities Act (ADA) requirements and policies during on-street bicycle and Greenway facility construction and maintenance.
	1-1J	Accommodate bicycles on transit vehicles that provide regular fixed-route service. [M]
	1-1K	Develop routes that highlight Cheyenne's unique history and character. These routes should emphasize historical, cultural, and parks and recreation facilities.
Goal:	1-2	Maintain existing and future on-street bicycle and Greenway facilities to a high standard in accordance with guidelines established in this plan.
Objectives:	1-2A	Address bicyclist safety, access and connectivity during construction and maintenance activities.
	1-2B	Develop an on-going maintenance strategy for non-motorized transportation facilities that maximizes fiscal efficiency by developing partnerships between appropriate municipal departments. [M]

- 1-2C Ensure that bicycle and Greenway facilities are maintained in a manner that promotes use and safety (e.g., sweeping and pothole repair). Perform street repair and maintenance in a manner that does not negatively impact bicycle and Greenway facilities and their use. [M]

2. Education and Encouragement

Goal:	2	Implement comprehensive education and encouragement programs targeted at all populations in the city.
Objectives:	2A	Educate the general public on bicycle safety issues and encourage non-motorized transportation with programs that target both bicyclists and motorists. [M]
	2B	Support the continued development of Safe Routes to School and other efforts, including educational and incentive programs to encourage more students to bicycle to school, through a partnership with LCSD #1 and other interested parties. [M]
	2C	Teach cycling safety as a part of standard elementary or middle school curriculum using League of American Bicyclist-certified instructors. [M]
	2D	Work with Wyoming Department of Transportation to include bicycle related question(s) on the Driver's License written examination. [M]
	2E	Coordinate regular training sessions for state, county, MPO and city staff to ensure knowledge on current local, regional, and national bicycle policies and ordinances.
	2F	Create and distribute biking maps through bike and sports/health shops, local businesses, and governmental facilities. The maps should include rules of the road as well as an explanation of the types and use of various bicycle facilities in the public right-of-way. [M]
	2G	Create a fitness challenge among large employers.
	2H	Consider the implementation of car-free days.
	2I	Encourage health insurance providers to create wellness programs that promote bicycling as part of a healthy and active lifestyle.
	2J	Create visible, accessible and secure bike parking at well-attended events and desirable destinations (e.g., Movies in the Park, Fridays at the Depot Plaza, Superday, Cheyenne Frontier Days, etc.). [M]
	2K	Coordinate City, County, and State efforts to support bicycle and pedestrian education and safety programs.
	2L	Develop and implement innovative education and encouragement programs, campaigns, and events, such as 'bike to work week/month' through partnerships with the Cheyenne Cycling Club and WYDOT. [M]
	2M	Encourage a positive public perception of bicycling through education and encouragement programs, as well as through City communications, media partnerships, public service announcements and advertisements.

3. Enforcement

Goal:	3	Increase enforcement of safe and legal cyclist and motorist behaviors throughout the bikeway system.
-------	---	--

Objectives:	3A	Increase attention by law enforcement officers to bicycle-related violations by both motorists and bicyclists, and emphasize positive enforcement for safe bicycling behavior by children.
	3B	Increase enforcement efforts to prevent the obstruction of dedicated bikeways.
	3C	Ensure that all bicycle collisions are accurately recorded into a collision database for future analysis and monitoring. [M]
	3D	Work closely with local enforcement agencies to create innovative, proactive, educational campaigns.
	3E	Coordinate training sessions through WYDOT and Cheyenne Cycling Club to ensure knowledge on current local, regional, and national bicycle policies and ordinances. [M]
	3F	Explore the creation of a Share the Road Safety Class.
	3G	Use bicycle police patrols during warm months downtown, on the Greenway System, and for special events. [M]

4. Evaluation and Implementation

Goal:	4-1	Implement the <i>On-Street Bicycle Plan and Greenway System Plan Update</i>
Objectives:	4-1A	Establish a Bicycle Advisory Committee to pursue implementation of the <i>On-Street Bicycle Plan and Greenway System Plan Update</i> .
	4-1B	Establish a bicycle mode share goal. [M]
	4-1C	Regularly review priority project list and refine as necessary based on new opportunities and community priorities.
	4-1D	Pursue Bicycle Friendly Community designation from the League of American Bicyclists. [M]
	4-1E	Coordinate with City of Cheyenne, Cheyenne MPO, Laramie County and relevant State agencies to update trail and bikeway system inventories, identify gaps and prioritize these for completion. [M]
	4-1F	Coordinate with City of Cheyenne, Cheyenne MPO, Laramie County and relevant State agencies to identify specific annual targets for bikeway infill projects. [M]
	4-1G	Create a sustainable, dedicated source of bikeway funding within the annual city budget. [M]
	4-1H	Foster relationships between city, private, non-profit, and advocacy groups and representatives to efficiently implement recommended programs.
	4-1I	Recognize bicycle friendly establishments through programs such as the League of American Bicyclist's Bicycle Friendly Business program. [M]
	4-1J	Encourage multi-jurisdictional funding applications with the City of Cheyenne, Cheyenne MPO, Laramie County.
	4-1K	Advocate to the State Legislature in support of the creation of a safe passing law.
Goal:	4-2	Monitor implementation of the <i>On-Street Bicycle Plan and Greenway Plan Update</i>
Objectives:	4-2A	Track the success of the <i>On-Street Bicycle Plan and Greenway Plan Update</i> as a percent completed of the total recommended bikeway system. [M]

- | | |
|------|--|
| 4-2B | Track regional trends in bicycle usage through the use of Census data and annual bicycle counts. [M] |
| 4-2C | Monitor bicycle collision data to seek continuous reduction in bicycle collision rates. [M] |

This page intentionally blank

Working Paper #4: Existing Conditions

This page intentionally blank

Memorandum

To: Jeff Wiggins and Sreyoshi Chakraborty

From: Rory Renfro and Kim Voros, *Alta Planning + Design*

Date: July 6, 2011

Re: Working Paper # 4: Existing Conditions



This memorandum describes the current Greenway and on-street bikeway network in the Cheyenne Metropolitan Area (CMA). The memorandum begins with an inventory and assessment of existing bicycle and Greenway facilities. The second section discusses important destinations for bicyclists, particularly connections to downtown, greenway connections, transit and schools. An analysis of system strengths and weaknesses follows, highlighting key areas where improvement opportunities exist.

Community Setting

Cheyenne area residents have been cyclists and trail users for many years. Since the early 1970's, the City, Cheyenne Metropolitan Planning Organization, Laramie County, and the Wyoming Department of Transportation have considered cyclists and trail users in land use and transportation decisions to varying degrees. The community has received regional recognition for the existing Greenway system, which provides recreation and transportation opportunities for area residents. In 2000, approximately .03 percent of residents bicycled to work, indicating that there is current interest in cycling to work and improvements to the physical environment could substantially increase the number of regular cycling commuters.

The CMA covers about 197 square miles, has approximately 87,000 residents (according to the 2005 – 2009 American Community Survey 5-Year Estimates), and is home to Wyoming's largest city. Cheyenne is the Laramie County seat and state capital. Warren Air Force Base, directly west of the Cheyenne city boundary, is one of the area's largest employers. Other major employers include the City of Cheyenne, Laramie County, Laramie County School District Number 1, and Union Pacific Railroad. The CMA is home to bicycle-related businesses (such as Bicycle Station and Rock on Wheels). The CMA has one school district: Laramie County School District Number 1.

Existing Off-Street Bikeways

Federal and state bicycle planning and design guides define bikeways as preferential roadways accommodating bicycle travel through the use of



Figure 1. The Cheyenne area's system of off-street facilities provides recreation opportunities for users of all types.

bicycle route designations, bike lane striping, or off-street trails (e.g., Shared Use Paths and Greenways) to physically separate cyclists from motorists. Map 1 on page 7 shows the Cheyenne Metropolitan Planning Area's existing and funded on-street bikeway and Greenway network.

Off-street facilities (Shared Use Paths and Greenways) are often viewed as recreational facilities, but they are also important corridors for utilitarian trips (Figure 1). The Cheyenne area's off-street bicycle facilities can be categorized into the following typologies:

- A **Greenway** is a facility that is separated by grade from the roadway, is generally ten feet wide and is constructed with concrete.
- A **Shared Use Path** is a facility that is physically separated from the roadway, is between eight and ten feet wide, and is constructed of concrete or asphalt.

The following section describes these off-street facilities in greater detail.

Existing Greenways

Cheyenne's existing ADA-accessible Greenway system (Table 1) includes over 30 miles of physically separated trails that accommodate users throughout the year. The original vision of the Greenway system was to build a continuous loop trail around the city. To date, nearly three quarters of the original loop trail has been completed. The system is comprised of many individual segments of varying lengths, with the longest continuous segment, Dry Creek (Figure 2), providing nearly continuous east/west travel from US 30 to I-25. Within the neighborhoods south of I-80, Greenway facilities provide off-street travel facilities along roadways and waterways (e.g., Allison Draw).



Figure 2. The Dry Creek Greenway provides a pleasant traveling experience in varying weather conditions

Greenway segments are typically constructed based on design standards developed in the 1992 *Greenway Development Plan*. Trails are typically ten feet wide and constructed of concrete. The existing trail network was developed to take advantage of generous roadway rights-of-way and drainage channels (e.g., Crow Creek and Dry Creek), which function as part of the Cheyenne area's storm water management system. Coupling these two compatible uses creates a system that takes advantage of the Cheyenne Metropolitan Planning Area's natural features and provides opportunities to interact with nature.

Table 1. Existing Greenway Facilities

Existing Greenway	
Segment	Length (mi)
Airport Parkway	0.24
Allison Draw	2.74
Converse Avenue	0.69
Crow Creek	2.69
Dry Creek	8.88
East Extension	3.03
Evans Avenue	0.58
Lions Park	0.94
Mason Way	0.23
Norris Connector	1.32
Pointe	0.92
South Cheyenne	2.95
Southeast	0.66
Storey Boulevard	2.73
US 30	0.47
Yellowstone Road	1.00
Total	30.1

Funded Greenways

In recent years, city and MPO staff have worked aggressively to expand the existing Greenway system (Figure 3). As a result, nearly nine miles of Greenway have been included in the 2010 – 2013 Transportation Improvement Plan (Table 2). These facilities will improve network connectivity in the southern and eastern half of the urbanized area, primarily by filling gaps in the existing system. These funded facilities will provide connections to several schools, including Arp Elementary and Saddle Ridge Elementary. One new connection that will be created by this effort is the BNSF Rail Trail, located south of I-80 and east of College Drive. This soft surface trail will connect to the existing Southeast Greenway and travel east along Crow Creek, towards Campstool Road.



Figure 3. Newly constructed greenway facilities, such as the WAPA corridor, have significantly expanded Greenway system mileage in the past few years. The City has plans to construct additional trails in coming years.

Table 2. Funded Greenway Facilities

Funded Greenway*	
Segment	Length (mi)
Avenue C -- Reiner to Fox Farm	0.41
BNSF Rail Trail -- Abandoned RR ROW	2.65
College Drive Underpass @ UPRR	0.10
Converse -- Grandview to Dell Range	0.47
Cribbon -- I-80 Overpass to Allison	0.44
Crow Creek -- Westland to MLK Jr. Park	0.38
Deming & Walterscheid to South Park	0.43
East Phase IV - Norris Connector	0.55
Holliday Park Connector -- Lincolnway Crossing	0.12
Morrie Ave -- 1st St to Fox Farm Rd	0.54
Powderhouse -- Storey to Gardenia	0.19
Reiner Court -- Ave C to Arp Elem.	0.16
Saddle Ridge School/US 30 Connector	1.56
Walterscheid -- Fox Farm to WAPA Corridor	0.40
WAPA Corridor -- McFarland to Jefferson	0.40
Total	8.78
* These projects are programmed for construction during the current TIP cycle. Funding will likely come from a variety of sources including grants and gas tax funding	

Greenway Trailheads

There are 18 existing trailheads within the Greenway system. The existing trailheads include a variety of facilities ranging from the Dry Creek trailhead (Figure 4), which includes parking, benches, trail access and a disc golf course, to the Crow Creek Greenway trailhead located at Optimist Park, which includes parking, artwork, restrooms, interpretative signs, benches, playground equipment, and trail access points.



recreational experience, (e.g., the Dry Creek Parkway trailhead, located adjacent to the Dry Creek disc golf course).

Greenway Amenities

Greenway amenities are designed to enhance the travel experience and include pedestrian-scale lighting, interpretative kiosks, trail maps, mileage markers, trash receptacles, and artwork (Figure 5). Many Greenway amenities (with the exception of public artwork) are designed for consistency across the system. As discussed in the 1992 *Greenway Development Plan*, the use of standard amenities has several benefits. First, it provides users with a sense of familiarity and increases the perception of system connectivity. Use of consistently designed amenities also reduces maintenance costs through the development of common maintenance schedules and budgets.

Existing Shared Use Paths

Within the CMA there are several existing Shared Use Paths (Table 3). These trails typically consist of an eight-foot asphalt pathway running along one side of a roadway. Examples of Shared Use Paths in the Cheyenne area include Dell Range Boulevard and Converse Avenue. These trails function as part of the off-street trail system but were designed and constructed prior to the development of the present day Greenway system. The key differences in these facilities lay in their narrower width (generally eight feet) and surfacing material (generally asphalt).

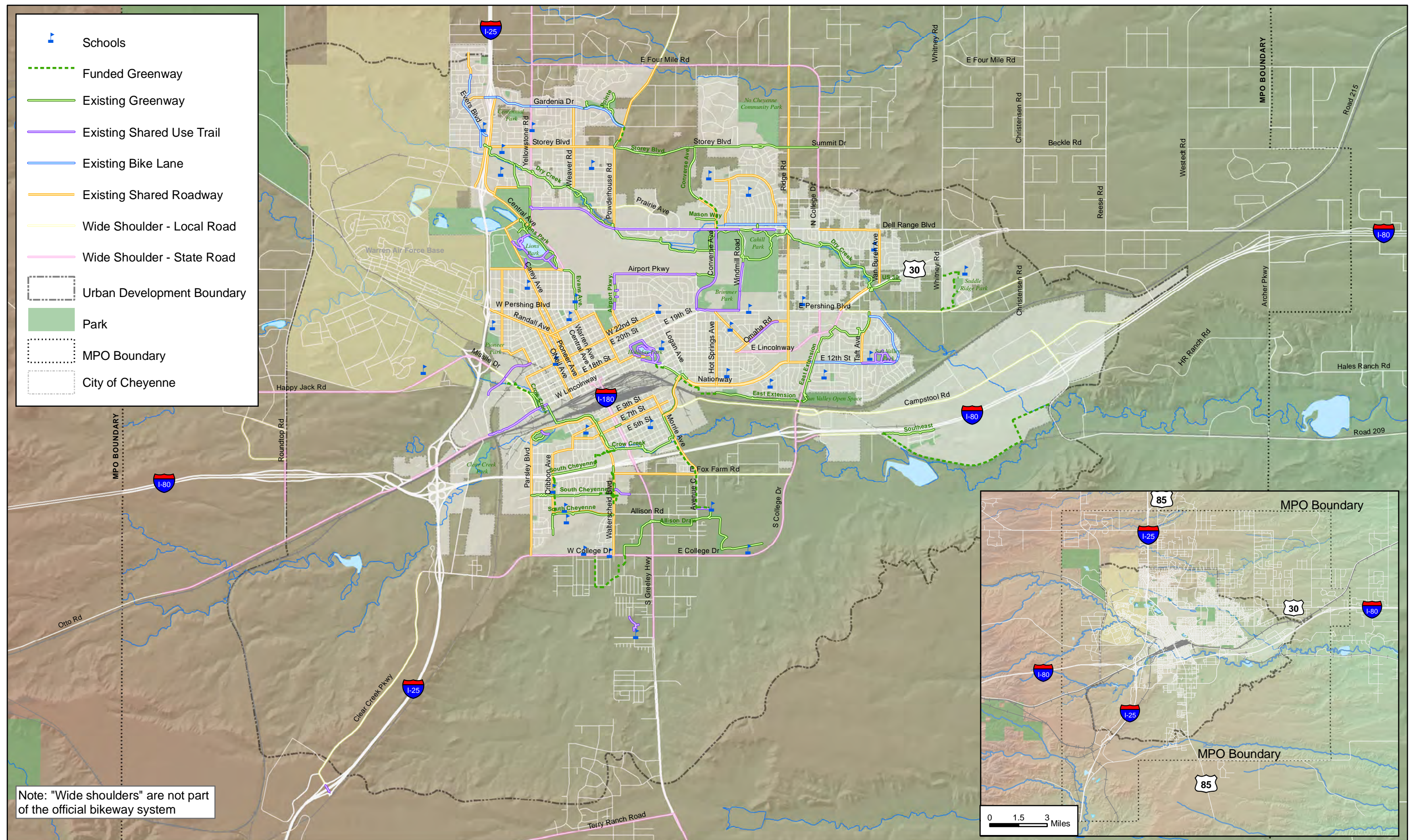


Figure 5. Trail amenities, including art installations, can be found throughout the Greenway system.

Table 3. Existing Shared Use Paths

Existing Shared Use Paths	
Segment	Length (mi)
Afflerbach School	0.27
Airport Parkway	1.25
Arp School	0.16
Converse Avenue	1.43
Dell Range Boulevard	2.93
High Plains Road	0.09
Holliday Park	1.68
Lions Park	1.45
Omaha Road	0.43
Pershing Boulevard	0.52
Romero Park	0.11
Sun Valley Park	0.97
West 24th Street	0.38
West Jefferson Road	0.21
West Lincolnway	0.82
Westland Road	0.30
Windmill Road	0.24
Total	13.2

This page intentionally blank



Map 1. Existing and Funded Bicycle Facilities

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update

Source: Cheyenne - Laramie County Cooperative GIS Program
Date: July 2011

This page intentionally blank

On-Street Bikeways

According to AASHTO's *Guide for the Development of Bicycle Facilities* (1999), the *Wyoming Bicycle and Pedestrian Plan* (2002), as well as the 1993 *Cheyenne Area On-Street Bicycle Plan Report of Investigation*, there are several types of on-street bicycle facilities. While cyclists are legally allowed to use all roadways in the CMA, on-street bikeways are distinguished as preferential roadways that have facilities to accommodate bicycles. Accommodation can consist of a bicycle route designation or bicycle lane striping.

The following types of bikeways are recognized by AASHTO and the *Wyoming Bicycle and Pedestrian Plan* and are currently found within the CMA:

- **Shared Roadway / Signed Shared Roadway (Bike Routes)** – Shared roadways include designated roadways on which bicyclists and motorists share the same travel lane. This is the most common type of bikeway. The most suitable roadways for shared bicycle use are those with low speeds (25 mph or less) or low traffic volumes (3,000 vehicles per day or fewer). Signed roadways provide links to other bicycle facilities (e.g., bicycle lanes), or to designate a preferred route through the community. Common practice is to sign the route with standard Manual on Uniform Traffic Control Devices (MUTCD) green bicycle route signs with directional arrows. Signed shared roadways can also be signed with innovative signing that highlights a special touring route (e.g., Cheyenne/Laramie/Snowy Range) or provides directional information, distance and riding time.
- **Shoulder Bikeway** – These are paved roadways that have striped shoulders wide enough for bicycle travel. The *Wyoming Bicycle and Pedestrian Plan* states that “adding or improving paved shoulders can be the best way to accommodate bicyclists in rural areas, and also benefit motor vehicle traffic.” Roadways with shoulders less than four feet are considered shared roadways. Sometimes shoulder bikeways are signed to alert motorists to expect bicycle travel along the roadway. Shoulder bikeways are not recognized as part of the official bikeway system, but are regularly used to accommodate bicycle travel.
- **Bike Lane** - Bike lanes are portions of the roadway designated specifically for bicycle travel via a striped lane and pavement stencils. AASHTO standard width for a bicycle lane is five feet. The minimum width of a bicycle lane against a curb or adjacent to a parking lane is five feet. A bicycle lane may be as narrow as four feet, but only in very constrained situations. The existing Cheyenne and Laramie County roadway design standards are consistent with these minimums. Bike lanes are most appropriate on arterials and collectors, where high traffic volumes and speeds warrant greater separation.

Existing On-Street Facilities

Bicycle Lanes

Bicycle lanes are provided along several roadways in the CMA (Table 4). Bicycle lanes are typically five feet wide and provide dedicated roadway space for cyclists, though some bicycle lanes are narrower (e.g., portions of Evers Boulevard). Within the Cheyenne area, bike lanes are typically found on wide collector roadways in residential neighborhoods (Figure 6). Facilities are marked with pavement stencils, striping, and (in some cases) signs marking the lane's beginning and end. Existing bike lanes are also connected to Cheyenne's system of designated shared use roadways.



Figure 6. Bicycle lanes, such as these facilities on Vandehei Avenue, provide a measure of separation between cyclists and motor vehicles.

A cyclist's experience may vary significantly from roadway to roadway, based in part on daily motor vehicle volumes; for example, Evers Boulevard typically carries about 1,600 vehicles per day while East 12th Avenue serves 8,000 to 10,000 vehicles per day. Other roadways with existing bike lanes have motor vehicle volumes that vary between these two limits.

Table 4. Existing Bike Lanes

Existing Bike Lane		
Segment	Jurisdiction	Length (mi)
Deer Avenue	Cheyenne	0.20
East 12th Street	Cheyenne	1.06
Evers Boulevard	Cheyenne	0.87
Gardenia Drive	Cheyenne	1.22
Meadow Drive	Cheyenne	0.72
Sheridan Street	Cheyenne	0.77
Vandehei Street	Cheyenne	0.72
Total		5.56

Shared Roadways

Cheyenne's system of shared roadways, shown in Table 5, encompasses a wide range of functional roadway classes, including principal arterials, minor arterials, collectors, and local roadways (Figure 7). Existing motor vehicle volumes range from several hundred vehicles per day on local roadways such as Morrie Avenue to over 10,000 vehicles per day (e.g., portions of Ridge Road). A cyclist's level of comfort for travel on shared roadways generally decreases as motor vehicle speeds and volumes increase, indicating that some users may not feel comfortable utilizing some of the CMA's existing system of shared roadways.

Several shared roadways in the Cheyenne area are marked with bicycle route signs, including Randall Avenue, Cribbon Avenue, Carey Avenue, East 22nd Street, Nationway, Pioneer Avenue, Snyder Avenue, East 7th Street and portions of Dell Range Boulevard. Additionally, bicycle route signs exist on some roadways that are not part of the formally recognized bicycle network.

Most neighborhood or residential streets in the CMA can be considered as undesignated "shared roadways." Opportunities may exist to take advantage of the extensive local street network to provide alternatives for cyclists who may feel uncomfortable riding on major streets.



Figure 7. Shared roadways with low motor vehicle volumes and posted speeds provide comfortable cycling conditions for many system users.



Figure 8. Higher speed and volume shared roadways, such as Logan Avenue, may not be comfortable for some riders.

Table 5. Existing Shared Roadways

Existing Shared Roadway			Existing Shared Roadway		
Segment	Jurisdiction	Length (mi)	Segment	Jurisdiction	Length (mi)
7th Street Bridge	Cheyenne	0.02	Oneil Avenue	Cheyenne	0.95
7th Street. I-180 Overpass	Cheyenne	0.07	Parsley Boulevard	Cheyenne	0.85
Bishop Boulevard	Cheyenne	0.66	Pioneer Avenue	Cheyenne	1.09
Carey Avenue	Cheyenne	2.03	Plain View Road	Cheyenne	0.58
Central Avenue	Cheyenne	0.61	Powderhouse Road	Cheyenne	2.13
Converse Avenue	Cheyenne	0.47	Randall Avenue	Cheyenne	0.97
Cribbon Avenue	Cheyenne	1.25	Ridge Road	Cheyenne	2.00
Dell Range Boulevard	Cheyenne	0.74	Ridge Road	Laramie County	1.63
Deming Drive	Cheyenne	0.88	South Cribbon Avenue	Cheyenne	0.42
Dey Avenue	Cheyenne	0.20	South Parsley Boulevard	Cheyenne	0.96
Dillon Avenue	Cheyenne	0.20	Seymour Avenue	Cheyenne	0.68
East 12th Street	Cheyenne	1.35	Sheridan Street	Cheyenne	0.77
East 17th Street	Cheyenne	0.20	Snyder Avenue	Cheyenne	0.17
East 18th Street	Cheyenne	0.39	Stanfield Avenue	Cheyenne	0.01
East 22nd Street	Cheyenne	1.04	Storey Boulevard	Cheyenne	1.03
East 23rd Street	Cheyenne	0.20	Taft Avenue	Cheyenne	0.66
East 27th Street	Cheyenne	0.39	Thomas Avenue	Cheyenne	0.26
East 7th Street	Cheyenne	1.19	US 30	Laramie County	0.47
East 8th Avenue	Cheyenne	0.07	Van Buren Avenue	Cheyenne	0.65
East 9th Street	Cheyenne	0.59	Vandehei Avenue	Cheyenne	0.85
East Fox Farm Road	Laramie County	0.71	West 18th Street	Cheyenne	0.20
Evans Avenue	Cheyenne	0.14	West 22nd Street	Cheyenne	0.72
Evers Boulevard	Cheyenne	1.16	West 24th Street	Cheyenne	0.45
Gardenia Drive	Cheyenne	0.52	West 27th Street	Cheyenne	0.51
Henderson Drive	Cheyenne	0.56	West 5th Street	Cheyenne	0.25
Hilltop Avenue	Cheyenne	0.63	West 7th Street	Cheyenne	0.07
Holliday Park	Cheyenne	0.21	West 8th Avenue	Cheyenne	0.82
Holmes Street	Cheyenne	0.12	West 9th Street	Cheyenne	0.52
Hot Springs Avenue	Cheyenne	0.79	West Allison Road	Cheyenne	0.75
Hynds Boulevard	Cheyenne	1.23	West Fox Farm Road	Cheyenne	0.31
I-80 Overpass	Cheyenne	0.06	Walker Road	Cheyenne	0.10
Kennedy Road	Cheyenne	0.23	Walterscheid Boulevard	Cheyenne	1.28
Logan Avenue	Cheyenne	0.59	Weaver Road	Cheyenne	0.99
Manewal Drive	Cheyenne	0.26	Western Hills Boulevard	Cheyenne	0.51
Meadow Drive	Cheyenne	0.05	Westland Road	Cheyenne	0.24
Melton Street	Cheyenne	0.02			
Morrie Avenue	Cheyenne	1.32			
Mountain Road	Cheyenne	0.56			
Nationway	Cheyenne	2.85			
Omaha Road	Cheyenne	0.66			
			Total		50.21

Bike Parking

Bike parking is a critical component of a community's bikeway network, and can strongly influence one's decision whether to complete a trip via bicycle. Examples of existing bicycle parking in Cheyenne include the Laramie County Library, retail locations near the downtown core, schools, and parks. The need for adequate bicycle parking is discussed in the *Road Street & Site Planning Design Standards* and the *Parks and Recreation Design Standards* lists bicycle racks as required park elements.



Figure 9. Bicycle parking near some commercial establishments could be improved by upgrading existing bicycle racks.

The quality of existing bike parking facilities varies by location, particularly due to the style of rack chosen and/or placement of the rack. Some existing racks near schools and shopping areas are considered substandard because they do not provide sufficient points of contact to support a bicycle at two points (Figure 9). In other words, they do not allow a bicycle frame and at least one wheel to be locked to the rack without the use of a long bicycle cable or mounting the bicycle over the rack.

Informal bike parking (bikes being locked to hand rails, street signs, light poles and other objects) indicates a demand for additional bike parking supply (Figure 10). Some bikes have been informally parked throughout the study area, including at multi-family residences along Lincolnway, suggesting that insufficient formal bike parking is being provided, or that it is not conveniently located in close proximity to a storefront or building entrance.



Figure 10. Informal bicycle parking at multi-family residences along Lincolnway indicates that additional bicycle parking would be beneficial.

Bicyclist Destinations

It is particularly important for the on-street bicycle and Greenway network to provide access to destinations popular among pedestrians and bicyclists. Within the Cheyenne area, popular destinations are likely to include:

- Educational facilities: elementary schools, junior high schools, high schools and Laramie County Community College
- Cheyenne Regional Medical Center

- Employment centers: Warren Air Force Base, Frontier Mall, National Center for Atmospheric Research, state and local government, Albertsons, Safeway, Qwest Corporation, etc.
- Commercial areas: the Frontier Mall, South Greeley Highway, Depot Plaza (Figure 11)
- Institutional buildings: City Hall, Laramie County Library, Cheyenne Civic Center, State Capitol Complex, National Center for Atmospheric Research
- Parks in and around Cheyenne including: Lions Park, Holliday Park, Cahill Park, and Curt Gowdy State Park



Figure 11. Depot Plaza is a popular bicycling destination for Cheyenne area residents.

Transit Connections

Providing a strong bicycle link to transit is an important part of making non-motorized transportation a part of daily life in Cheyenne. Bicycling can extend transit's reach by providing transportation for 'the last mile' of a trip.

Additionally, transit provides cyclists with the option of a ride after dark, during inclement weather, or in the case of a bicycle break down. There are several main components of bicycle transit integration:

- Allowing bicycles on transit
- Providing bicycle parking at transit stops
- Improving connections between bikeways and transit



Figure 12. Cheyenne area fixed route transit service vehicles have front racks capable of carrying two bikes.

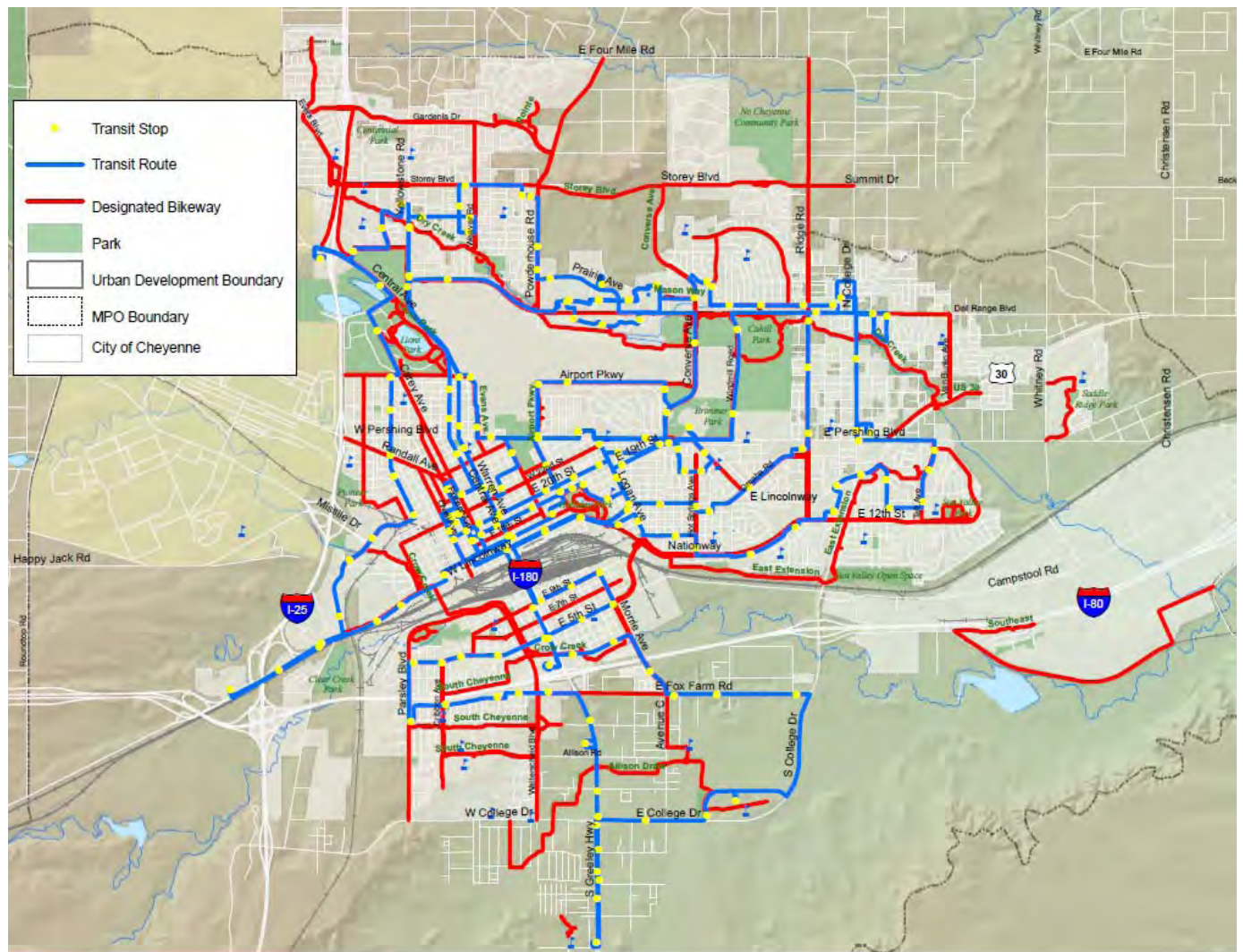
CTP, the Cheyenne Transit Program, operates several fixed-service routes and curb-to-curb paratransit service. The five fixed-service routes are geographically based and provide coverage along many collector and arterial roadways in the CMA including:

- Dell Range Boulevard
 - Storey Boulevard
 - Central Avenue
 - Powderhouse Road
 - Lincolnway
 - Nationway
- College Drive
 - South Greeley Highway
 - Fox Farm Road
 - East Pershing Boulevard

These routes, shown on Map 2 provide hourly service six days a week within the city boundaries, as well as extending south and east along College Drive and South Greeley Highway. Transit service typically runs from 6:00 AM to 7:00 PM during the week and 10:00 AM to 5:00 PM on Saturday. All

Cheyenne On-Street Bicycle Plan and Greenway Plan Update

regular buses have bike racks with capacity for two bicycles (Figure 12). Most bus stops do not have bicycle parking.



Map 2. Transit Routes and Designated Bikeways

System Opportunities and Constraints

This section provides an assessment of the existing conditions for on-street bikeways and Greenways in the Cheyenne area, outlining opportunities for improvement.

Opportunities

Various characteristics foster an environment where bicycling is comfortable and enjoyable in the Cheyenne Metropolitan Planning Area. These system strengths are described below.

Scenic, Extensive, and Well-Maintained Greenways and Shared Use Paths

Residents of the CMA benefit from an extensive network of Shared Use Paths and Greenways. These facilities encourage residents to use these trails for exercise, recreation, and connections with the natural environment.

Access to Multi-Use Trails

The geographic coverage of existing facilities ensures that 38% of residents are within one-quarter mile of a Greenway and 96% of residents are within one mile of a Greenway (Map 3).

Topography

The topography of the Cheyenne area is relatively flat, with few challenging hills to deter bicycling (Figure 13).

Grade-Separated Crossings

While the interstates, high volume arterial roadways, and railroads running through the CMA create significant barriers to bicycling connectivity, 22 grade separated crossings reduce the impact of these obstacles (Figure 14). Examples of grade-separated crossings include: exist at the following locations:

- Cribbon Avenue (crossing of I-80 near Goins Elementary School)
- Western Hills Boulevard (crossing of I-25 near McCormick Junior High School)
- Converse Avenue near Dell Range Boulevard
- Seventh Street (crossing of I-180)

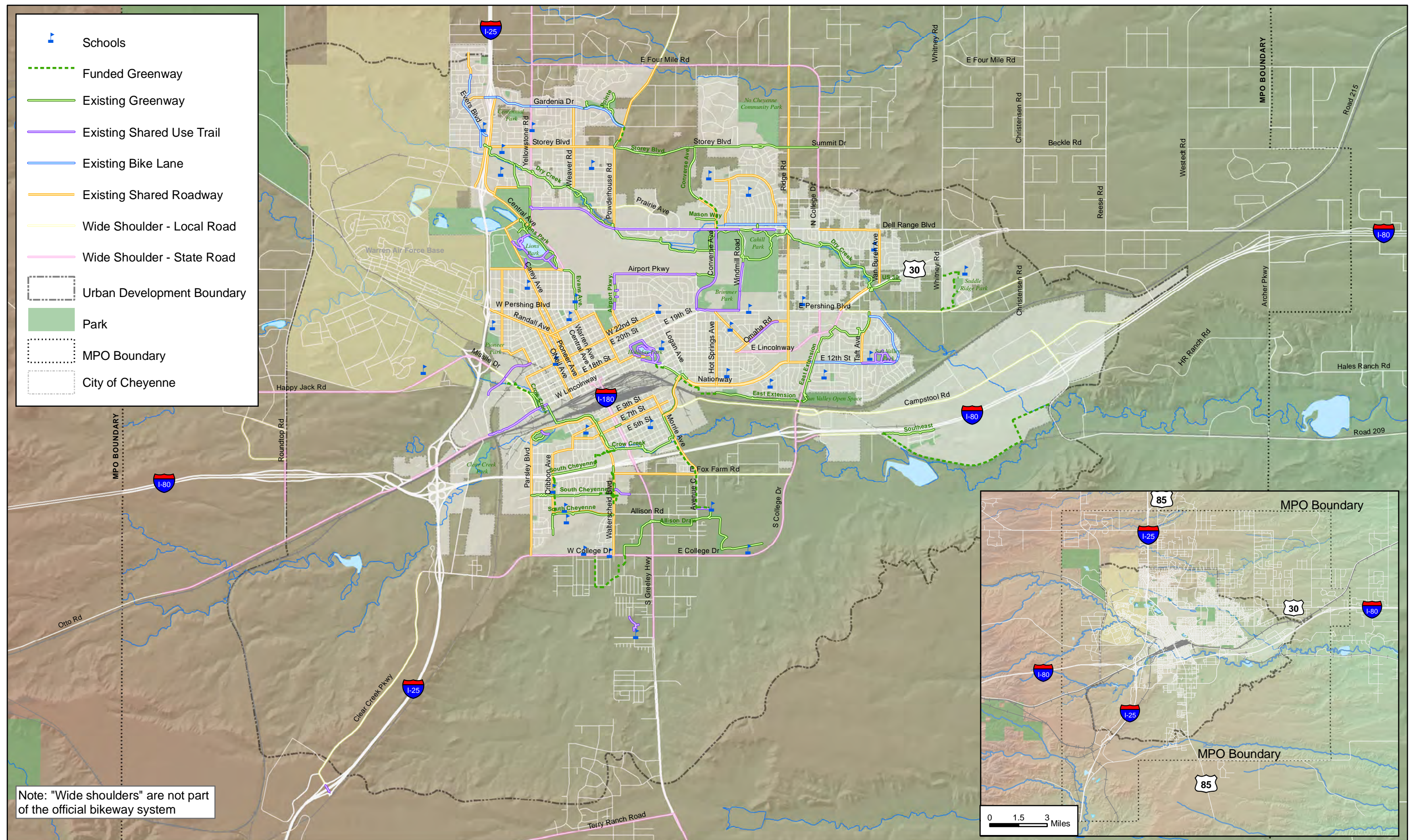


Figure 13. Many of Cheyenne's roads and off-street bikeways are relatively flat. .



Figure 14. Undercrossings, such as this one located at College Drive on the Dry Creek Greenway, provide a comfortable crossing by separating bicyclists from motorists.

- Norris Viaduct (crossing of Union Pacific Railroad tracks)



Map 1. Existing and Funded Bicycle Facilities

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update

Source: Cheyenne - Laramie County Cooperative GIS Program
Date: July 2011

This page intentionally blank

Potential for On-Street Bicycle Signal Activation

Bicycle signal activation is an important feature for bike routes, enabling cyclists to trigger traffic signals without dismounting to use the pedestrian signal or waiting for an automobile to trigger the green phase (Figure 15). Existing video detectors can be calibrated to respond to the presence of bicycles as can existing magnetic loop detectors. The City of Cheyenne provides video detection at several locations (e.g., Vandehei Street and Yellowstone Road), which could also be used to provide bicycle signal activation.

Multi-Modal Traffic Impact Studies

As discussed in the Transportation Element of *Plan Cheyenne*, transportation impact studies that are prepared for all design proposals should include consideration of impacts to all transportation modes, including cycling. These studies, such as the corridor study in progress for Fox Farm Road, contribute to the development of a balanced transportation system.



Figure 15. Traffic signals can be activated by in-pavement signal loops. Pavement markings guide cyclists in correct placement of their bicycle to trigger the traffic signal.

Generous Road Rights-of-Way and Existing Unofficial Shoulder Bikeways

The existing Greenway system makes use of generous rights-of-way to provide a system of separated trails that parallel major roadways (e.g., Converse Avenue and Allison Road).

In other locations, the existing roadway width is sufficient to mark bicycle lanes or formalize existing wide shoulders as bikeways without physically altering the roadway configuration (Figure 16). Though not officially designated as official bikeways, roadway shoulders provide varying facility widths to accommodate bicycle travel.

Examples include twelve-foot shoulders on portions of College Drive, and six-foot shoulders on Campstool Road.

A potential challenge associated with existing wide shoulders is their lack of continuity in some locations. From the perspective of an operating agency, a shoulder does not need to be continuous to serve many operational functions (e.g., as a break-down lane or snow storage).

Additionally, a shoulder can be repurposed (e.g., converted to a right turn lane) to save capital construction and right-of-way acquisition costs, further reducing facility continuity.



Figure 16. Unofficial shoulder bikeways, such as this shoulder along US 30, are already in use throughout the CMA.

Table 6. Existing Unofficial Shoulder Bikeways

Existing Wide Shoulder		
Segment	Jurisdiction Responsible Maintenance	Length (mi)
Airport Parkway	Cheyenne	0.99
Campstool Road	Cheyenne	3.52
Campstool Road	Laramie County	1.22
Campstool Way	Cheyenne	0.27
Central Avenue	WYDOT	0.63
Christensen Road	Cheyenne	0.26
Clear Creek Parkway	Laramie County	3.01
East 5th Street	Cheyenne	0.29
East College Drive	WYDOT	1.42
East Fox Farm Road	Laramie County	1.79
East Pershing Boulevard	Laramie County	1.97
Four Mile Road	WYDOT	3.45
Happy Jack Road	WYDOT	4.64
High Plains Road	WYDOT	0.09
Horizon Drive	Private	0.42
Horse Creek Road	WYDOT	5.02
I-180	WYDOT	2.27
Lincolnway	WYDOT	1.51
Logistics Drive	Private	0.53
Missile Drive	Cheyenne	0.81
North College Drive	WYDOT	3.65
North Greeley Highway	WYDOT	0.14
Otto Road	WYDOT	3.13
Pershing Boulevard	Cheyenne	0.34
Powderhouse Road	Cheyenne	2.13
Powderhouse Road	Laramie County	1.05
Prairie Avenue	Cheyenne	0.78
Ridge Road	Cheyenne	2.13
Ridge Road	Laramie County	2.50
Riding Club Road	Laramie County	3.63
Roundtop Road	WYDOT	0.62
South College Drive	WYDOT	0.98
South Greeley Highway	WYDOT	2.96
South Industrial Road	WYDOT	0.98
Terry Ranch Road	WYDOT	1.76
Venture Drive	Cheyenne	1.17
Veta Drive	Private	0.51
West College Drive	WYDOT	2.10

Existing Wide Shoulder		
Segment	Jurisdiction Responsible	Length (mi)
West Lincolnway	WYDOT	1.07
Yellowstone Road	Cheyenne	1.59
Yellowstone Road	Laramie County	0.39
Yellowstone Road	WYDOT	3.08
Total		70.80

Land use

The existing patterns of land use in the CMA provide a mix of residential, commercial, and institutional destinations within a comfortable cycling distance (i.e., less than five miles) for many area residents. Additional characteristics of the existing urban area that improve conditions for cyclists include bicycle/pedestrian accessways in cul-de-sac style development (e.g., Pinto Lane); a grid of connected streets within downtown and many inner neighborhoods (e.g., The Avenues); and shorter street blocks that enhance a cyclist's route choice and can reduce the need for out-of-direction travel.

Education and Encouragement Programs

Cheyenne's strong greenway network and growing public interest in bicycling and trail use offers great potential for education and encouragement programs. Programs teaching bicycle safety and skills to children may be an especially good fit, but education programs aimed at adults should be considered as well. The League of American Bicyclists offers a standardized bicycle training program through its certified instructors. Although there are no League-Certified Instructors in Wyoming, there are five in Denver who could be invited to present a youth or adult training course.

As far as encouragement programs are concerned, the Cheyenne Cycling Club meets regularly for sport cycling training rides, and there are a number of annual events as well such as the Moonlight Cowboy Ride, the Spring Into Green Walk/Ride/Run, the Tour de Prairie, the Cheyenne Ride for Sight, and the Cheyenne Sprint Triathlon. There is an opportunity to complement competitive events by creating more greenway and bicycling events that appeal to families and novices.

Cheyenne residents currently have access to two maps: the Greater Cheyenne Greenway Map¹ and the Greater Cheyenne Greenway: Bicycle & Pedestrian System Map². As the greenway and on-street bikeway network expands, it will be important to update these user maps. An opportunity also exists to include additional information on the map (such as bike safety information or a list of local resources) and/or to distribute the map online and to handheld devices.

Cheyenne's existing Safe Routes to School work and Plan will also jump-start future education and encouragement efforts. In the past, events have been scheduled for International Walk to School Day in October, and Safe Walking Route maps are distributed annually to LCSD #1 families.

¹ <http://www.cheyennecity.org/DocumentView.aspx?DID=2081>

² <http://www.cheyennecity.org/DocumentView.aspx?DID=2082>

Potential partners and stakeholders in creating future education and encouragement programs include the Greater Cheyenne Greenway Advisory Committee, the Cheyenne Greenway Foundation, the Nature Conservancy, WINhealth Partners, local bike shops (such as Bicycle Station), and Safe Kids Wyoming. Detailed education and encouragement recommendations will be developed for Draft Working Paper #13: 4 E's Report.

Enforcement Efforts

Law enforcement agencies are essential partners in the effort to create safer streets. While studies have shown that on-street bikeways and well-engineered greenway trail crossings improve safety, another part of the puzzle is working with the Cheyenne Police Department and the Laramie County Sheriff's Office to enforce traffic laws. The Cheyenne Police Department already circulates a radar speed enforcement trailer, and citizens can request deployment of the radar trailer. The

Transportation Safety Management Plan could be an important resource for this effort in the future.

Detailed enforcement recommendations will be developed for Draft Working Paper #13: 4 E's Report.

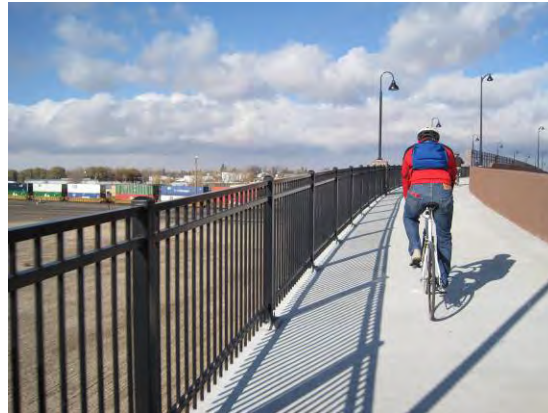


Figure 17. Barriers, such as the Union Pacific Railroad tracks, can be overcome by constructing facilities like the Greenway extension on the Norris Viaduct.

Evaluation and Benchmarking

Ongoing evaluation will help Cheyenne track progress towards meeting the goals of the On-Street Bicycle Plan and Greenway Plan, and will be an important way to communicate with elected officials and the public. The City of Cheyenne is already interested in performing annual bicycle and pedestrian counts on greenways and bicycle facilities; the National Bicycle and Pedestrian Documentation Project has created templates that can jump-start this process. Other benchmarks and reporting recommendations will be developed for Draft Working Paper #13: 4 E's Report.

Constraints

Described below, bicyclists in the Cheyenne area face a variety of challenges.

Limited On-Street Bikeway Options

The existing bicycle network serves residents by providing routes through the city and connecting to recreational opportunities. The separation provided by the Greenway is beneficial to new or inexperienced cyclists, who may be uncomfortable riding in traffic as well as recreational cyclists. The CMA could benefit from a more complete network of on-street bikeways that provides direct utilitarian connections to destinations throughout the region.

Barriers

Major roadways, freeways, airport and railroad tracks are significant barriers to bicycling in Cheyenne. As the City, MPO and County continue to make progress and overcome these barriers, they will face a variety of challenges. For example, I-80, I-25 and I-180 are barriers due to the long distance between crossing locations. Other roadways that

serve as barriers to bicycle movement due to higher vehicle speeds and volumes include arterials such as Yellowstone Road, Dell Range Boulevard, Nationway, College Drive, Pershing Boulevard and South Greeley Highway. Finally, roads that cross the regular grid at a diagonal can create complicated intersection geometry and increase crossing distances. Examples include Randall Avenue and Logan Avenue. The Union Pacific Railroad also creates a barrier due to the distance between crossing locations (Figure 17).

Challenging Intersections

Major intersections can be challenging for cyclists riding either on-street or on the Greenway system. These challenges include:

- Complex crossing movements for bicyclists (e.g., West Pershing Boulevard and Randall Avenue, Ames Avenue and West Lincolnway, Nationway and East Lincolnway, Pershing Boulevard and US 30)
- Greenway crossings set back from the intersection can reduce the visibility of users to motorists making a right turn on red (e.g., Dell Range Boulevard and Windmill Road)
- Intersections with limited access roadway interchanges where motorists may not be required to stop before merging (e.g., I-80 and North College Drive)
- Lack of bicycle loop detection or other methods for a cyclist to trigger a signal change (system-wide)
- Bicycle lanes dropping upstream from an intersection (e.g., East 12th Street east of College Drive)
- Bicycle conflicts with vehicle turning movements at driveways and intersections (e.g., College Drive and East Fox Farm Road)

Challenging Travel Conditions on Existing Bicycle Facilities

The Cheyenne area's existing bicycle system includes facilities that may create a less than ideal experience for cyclists of some ages and abilities:

- Challenging intersections, which are described in more detail in the preceding section
- Locations where facilities drop (e.g., disappearance of the shoulder bikeway along College Drive at Laramie County Community College)
- Shared roadways with high motor vehicle volumes (e.g., Dell Range Boulevard, Ridge Road, Storey Boulevard, and Powderhouse Road)

Limited Street System Connectivity

Although streets are well connected in downtown Cheyenne and surrounding neighborhoods such as The Avenues, Fairview Heights, South Cheyenne and Western Hills, there is limited north-south connectivity due to system gaps created by the Cheyenne Regional Airport, the Dell Range Shopping Mall, the interstate system and railroads. Roads providing the most connectivity and covering longer distances tend to be high-volume streets lacking bicycle facilities (Figure 18). Examples of these major corridors include Powderhouse Road and South Greeley Highway.



Figure 18. Limited bikeway system connectivity can result in cyclists riding on sidewalks.

Network Gaps

While bicyclists in the CMA benefit from the Greenway facilities and designated on-street bikeways, there are locations where the system is fragmented (Figure 19). In addition, larger network gaps between facilities require bicyclists to either ride on the road or on a sidewalk to access another greenway facility (e.g., College Drive, Dell Range Boulevard, Whitney Road, portions of Lincolnway, and Pershing Boulevard). Additional information on an analysis of system gaps is included in Draft Working Paper #5 Bikeway System Gap Analysis.



Figure 19. Network gaps can create challenging conditions for bicycle travel.

Lack of Wayfinding Tools

While the Greenway system is branded with identifying signs and some directional signs are available throughout the Cheyenne area (Figure 20), the bikeway system could benefit from signage and additional wayfinding tools to orient users and direct them to and through major destinations including downtown, schools, parks, and commercial areas. As the on-street network is being developed, cyclists should be directed to key destinations along the bikeway, raising awareness of new facilities and encouraging more residents to try bicycling.



Figure 20. While some wayfinding tools are present in the Greenway system, wayfinding signs found along roadways are infrequently placed and do not provide reinforcement of cycling routes.

User Conflicts on Trails

Conflicts can arise between faster-moving

cyclists and slower-moving pedestrians along some Shared Use Paths in Cheyenne, particularly where they pass through areas with higher demand (e.g., the eight-foot wide Shared Use Path on the south side of Dell Range Boulevard). Though the 1992 *Greenway Development Plan* recommends a ten foot minimum width for new Greenway facilities Shared Use Paths built prior to plan implementation were built to the eight foot standard and are subject to a potentially higher incidence of user conflicts.

Greenway Safety Concerns

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of trails adjacent to roadways. Though most Greenway facilities and some Shared Use Paths are completely separated from the road right-of-way, several existing facilities do parallel major roadways (e.g., Yellowstone Road, Dell Range Boulevard, Converse Avenue and Storey Boulevard). Also known as “side paths”, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where cyclists enter or leave the path. This can result in an unsafe situation where motorists entering or crossing the roadway at intersections and driveways do not notice bicyclists coming from their right, as they are not expecting traffic coming from that direction. Stopped cross-street motor vehicle traffic or vehicles exiting side streets or driveways may also block path crossings. Even bicyclists coming from the left may go unnoticed, especially when sight distances are poor.

Inclement Weather

Winter weather conditions can create challenges both in terms of cyclist use and system maintenance (Figure 21). The CMA’s average winter snowfall is approximately sixty inches and requires plowing of major roadways after most snow events to make the roadways traversable for all users. Frequent plowing reduces the lifetime of paint and other materials used to mark bicycle lanes or shared roadways unless the roadway surface is ground out and markings installed below the level of the plow blade.

Cheyenne’s geography and prevailing weather patterns also create windy conditions that can either benefit or deter cyclists, depending on their direction of travel. During certain times of year prevailing winds of 15 to 20 miles an hour can halt a cyclist in their tracks and limit forward momentum. Typically wind has a more pronounced effect in less urbanized areas of the Cheyenne MPO, where fewer trees and buildings exist to provide a measure of protection.



Figure 21. Inclement weather conditions can reduce the number of people willing to bicycle in winter months.

This page intentionally blank

Working Paper #5: Bikeway System Gap Analysis

This page intentionally blank

Memorandum

To: Jeff Wiggins and Sreyoshi Chakraborty
From: Rory Renfro, Kim Voros and Drew Meisel, *Alta Planning + Design*
Date: May 11, 2011
Re: Working Paper #5: Bikeway System Gap Analysis



The purpose of the Bikeway System Gap Analysis is to identify gaps in the existing on-street bikeway and Greenway system. These gaps range from spot gaps (e.g., a location where bike lanes drop upstream from an intersection) to system gaps (areas where no bikeway facilities exist).

Analysis Methodology and Data Considerations

The gap analysis was developed based on field visits and existing available data provided by the City of Cheyenne and Cheyenne Metropolitan Planning Organization (MPO). The review identifies gaps based on the existing and funded on-street street network, shared use paths and greenways. Roadways with wide shoulders that are suitable for cycling but are not officially part of the existing bikeway network are noted as system gaps in several locations. Facility quality was generally discussed in other parts of the existing conditions and needs analysis, though several exceptions were made for arterial and collector roadways designated as shared roadways. Information on existing bikeways was not available for Warren Air Force Base when this study was conducted.

Defining Bikeway Gaps

Bikeway 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 facilities at all. Gaps are organized based on length and other characteristics and may be classified into five main categories:

- **Spot gaps:** Spot gaps refer to point-specific locations lacking dedicated facilities or other treatments to accommodate safe and comfortable bicycle travel. Spot gaps primarily include intersections and other areas with potential conflicts with motor vehicles. Examples include bicycle lanes on a major street “dropping” to make way for right turn lanes at an intersection.
- **Connection gaps:** Connection gaps are missing segments (one-quarter mile or less) on a clearly defined and otherwise well-connected bikeway. Major barriers standing between destinations and clearly defined routes also represent connection gaps. Examples include bicycle lanes on a major street “dropping” for several blocks to make way for on-street parking, or a freeway standing between a major bicycle route and a school.
- **Lineal gaps:** Similar to connection gaps, lineal gaps are one-quarter to one-half mile long missing link segments on a clearly defined and otherwise well-connected bikeway.
- **Corridor gaps:** On clearly defined and otherwise well-connected bikeways, corridor gaps are missing links longer than one-half mile. These gaps will sometimes encompass an entire street corridor where bicycle facilities are desired but do not currently exist.

- System gaps: Larger geographic areas (e.g., a neighborhood or business district) where few or no bikeways exist would be identified as system gaps. System gaps exist in areas where a minimum of two intersecting bikeways would be required to achieve the target network density.

Gaps typically exist where physical or other constraints impede bikeway network development. Example constraints may include bike lanes "dropping" at an intersection to provide space for vehicle turn lanes, narrow bridges on existing roadways, severe cross-slopes, or potential environmental impacts associated with wider pavement widths. Traffic mobility standards and other policy decisions may also lead to gaps in a network. For instance, a community's strong desire for on-street parking or increased vehicle capacity may hinder efforts to install continuous bicycle lanes along a major street. Figure 1 presents a theoretical diagram illustrating the five gap types described above.

In some cases, a formalized bikeway itself may represent a gap despite its status as part of a designated network. This condition typically occurs when a corridor (often a major street) lacks the type of bicycle facilities to comfortably accommodate a broader user base, including infrequent or less confident cyclists. Other examples include roadway corridors lacking formalized facilities (e.g., bike lanes) where conditions such as higher vehicle speeds and volumes would otherwise justify greater separation between motorists and cyclists.

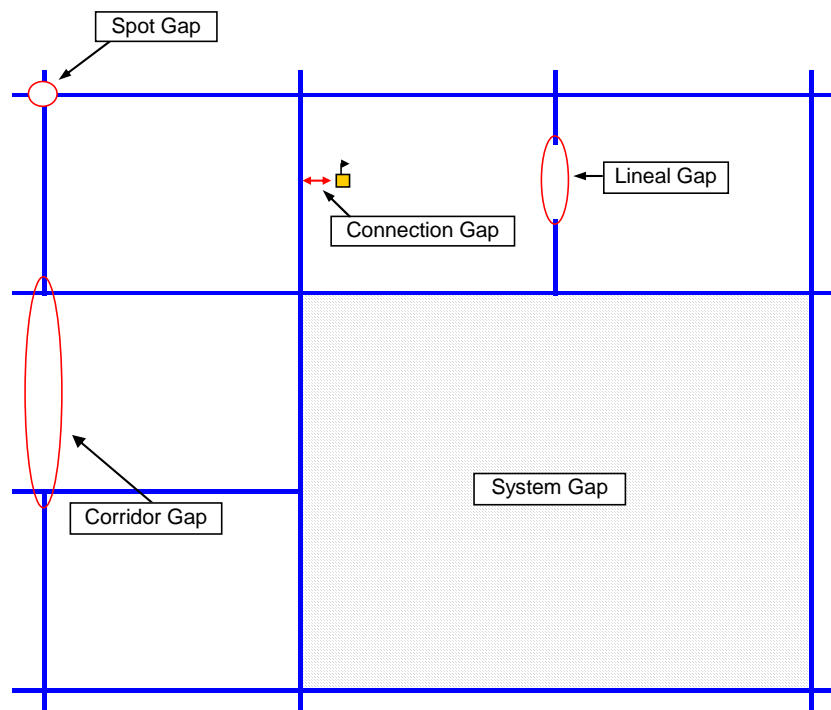


Figure 1. Diagram of Bikeway System Gap Types

Identifying and Addressing Bikeway Network Gaps

Identifying and addressing network gaps can be considered a multi-step process that will last throughout the planning development of the *On-Street Bicycle Plan and Greenway Plan Update*.

Cheyenne On-Street Bicycle Plan and Greenway Plan Update

This process includes the following steps:

Step 1: Locate and identify network gaps

Step 2: Identify appropriate range of gap closure measure types

Step 3: Determine appropriate location for gap closure measures

Step 4: Determine preferred gap closure measure for each identified gap

Gaps are identified in the Existing Conditions and Needs Analysis project phase (Step 1); the process will be completed during network development.

Findings

The Cheyenne Metropolitan Area already includes many elements of a good bicycling system; however, there are gaps throughout the system that can create uncomfortable cycling conditions. The network gaps shown on Map 1 were identified through field investigation, review of existing planning documents and bikeway system data, analysis of crash history, and feedback from the community through public events.

In general, the best system connectivity exists in the downtown area north of Interstate 80, where the denser street grid and lower traffic speeds and volumes allows cyclists a greater range of route choices. The facilities in this area consist mainly of shared roadways that provide cyclists with a system of established, intermittently signed routes. Despite the relative connectedness of the downtown area, access leading into and out of the central business district is more challenging due to corridor gaps on Pershing Boulevard and Lincolnway, as well as system gaps east of Holliday Park and smaller lineal gaps on East 18th Street, Morrie Avenue, and W 27th Street. Of note are the corridor gaps along Warren and Central Avenues, though existing parallel bicycle routes are available on Pioneer Avenue and Carey Avenue. If developed, these two north/south roads would lead to the existing Evans Avenue Greenway north of downtown and provide greater access to the neighborhoods north of Lions Park. Smaller connection gaps exist west of downtown, between the South Cheyenne Greenway and Parsley Boulevard. A narrow bridge on Parsley Boulevard over Interstate 80 is a spot gap that further restricts north-south travel in this area. A significant impediment to travel west of downtown is the general lack of facilities along and across the I-25 corridor. This has been identified as a corridor gap along most of the corridor, in addition to other corridor gaps identified at important crossing points, such as Missile Drive, and Central Avenue.

Just east of the central business district, between Holliday Park and Hot Springs Avenue, is a large system gap. The density of residential units in the Fairview Heights and Mountain View neighborhoods and network indicate that this area could serve a number of cyclists safely and comfortably on low-speed and low-volume roadways. Several spot gaps exist (e.g., Hot Springs Avenue and Nationway) which restrict travel into and out of this area. Development of a bikeway network and improvements at spot gaps could enhance access between the commercial core and the residential neighborhoods to the east.

One of the main east/west arterials through Cheyenne, Pershing Boulevard, is a long corridor gap in the bikeway network. Pershing Boulevard is one of the few uninterrupted east/west connections through the city. Given the lack of continuous parallel streets to Pershing Boulevard, there are few alternative options available to improve connectivity along this main thoroughfare. Instead, it is likely that Pershing Boulevard or alternative corridors will need to be analyzed further to assess its potential for safe bicycle travel as Pershing Boulevard. Future roadway reconstruction plans do call for extension of the existing eight-foot side path between Converse Avenue and Concord Road, which will enhance bicycle connectivity in the corridor. For travel farther east beyond Pershing Boulevard, Dell Range Boulevard offers the greatest possibility for direct access. However, this potential is limited by a long corridor gap leading up to the archer interchange at I-80.

System gaps blanket the northeast and eastern portions of the Cheyenne Metropolitan Area. Land use in these areas consists mainly of residential housing that is less dense than older neighborhoods, like the Avenues. During the development of several of these neighborhoods (e.g., Mustang Ridge), the installation of bicycle facilities was not a city priority. These neighborhoods do benefit from the existing Dry Creek Greenway and several existing on-street facilities (e.g., Van Buren Avenue), though corridor gaps, such as the one on Dell

Cheyenne On-Street Bicycle Plan and Greenway Plan Update

Range Boulevard west of College Drive, restrict the system's overall connectivity. Several lineal gaps to the south in the Sun Valley neighborhood further isolate this area.

South of Interstate 80 the street network is less dense. However, the area does boast a comparatively high number of existing greenway trails that provide access to nearby schools (Goins Elementary, Johnson Junior High, and South High School). Filling in a number of connection gaps between Parsley Boulevard and Cribbon Avenue could greatly improve access to these trails from existing neighborhoods. Several of these gaps will be filled with greenway links that are funded, with construction scheduled to occur in the next two to three years.

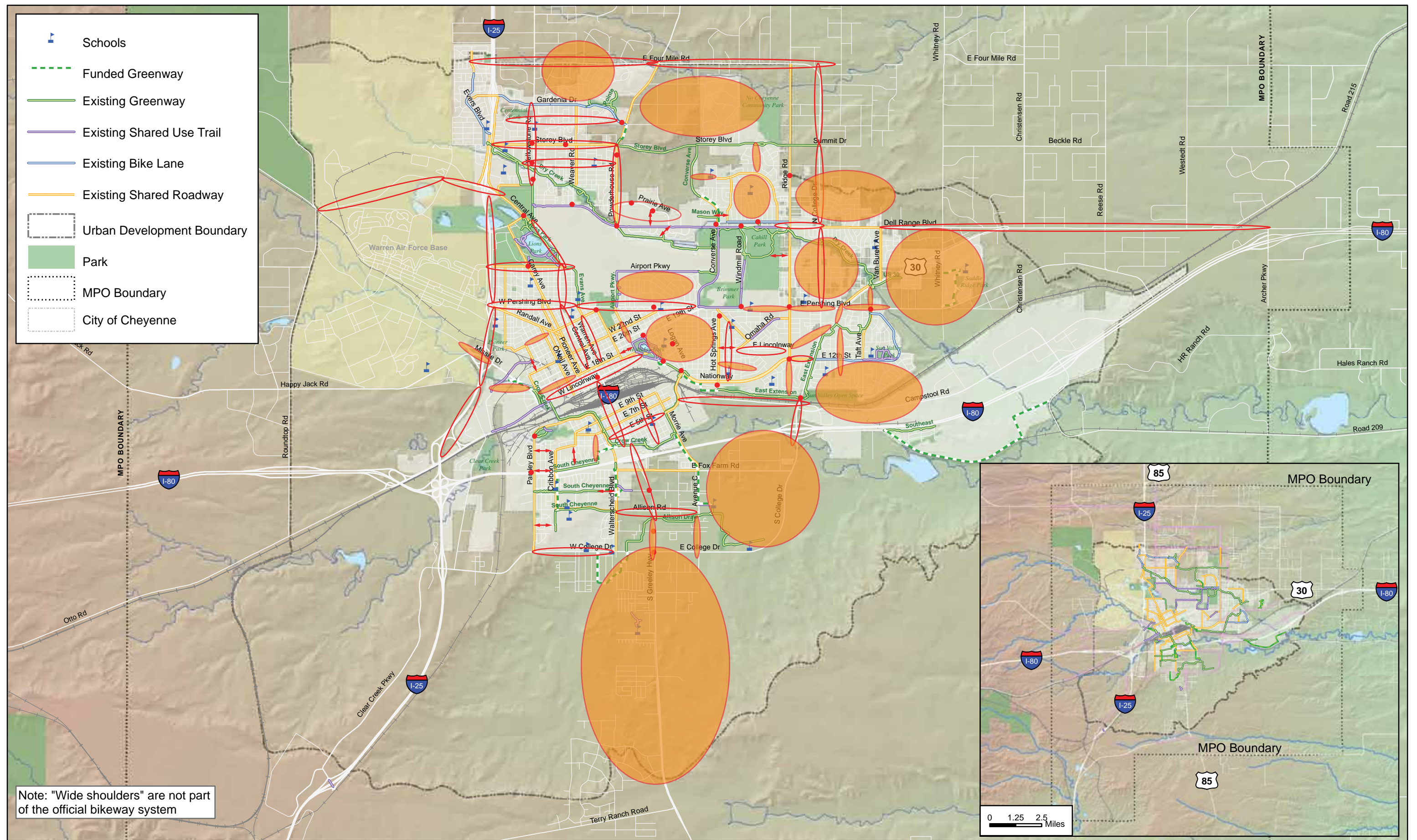
The Cheyenne Metropolitan Area has a number of roadways with wide shoulders that can accommodate bicycle traffic that are both unmarked and unsigned. Of special note is the area south of Interstate 80 where the inclusion of wide shoulder lanes along College Drive and Campstool Road strongly enhances connectivity of the bikeway network. Other important roadways include Yellowstone Road and Prairie Avenue, both north of the central business district. Formalizing these facilities with signing and marking will enhance overall bicycle system connectivity.

There are a number of spot gaps along existing bicycle facilities. Spot gaps typically occur in the Cheyenne Metropolitan Area at intersections with heavy volumes of right turning traffic or slip lanes that do not require vehicles to stop (e.g., Missile Drive at W 24th Street, Morrie Avenue at E 1st Street, College Drive at Dell Range Boulevard, Pershing Boulevard, 12th Street and South Greeley Highway), along roadways with numerous driveways (e.g., South Greeley Highway, Pershing Boulevard and Lincolnway), and at locations where the on-street facility or greenway do not extend to the intersection. In many situations, application of minimal treatments will result in enhanced system connectivity. Additional spot gaps are marked at locations identified by community members as "problem areas" during public events.

Conclusion

The Bikeway System Gap Analysis identifies opportunities to improve bikeway facility connectivity throughout the Cheyenne Metropolitan Area. The information provided in this analysis will be used to aid in identifying potential priority bikeway network improvement corridors and intersection upgrades. Furthermore, it illustrates that taking advantage of existing wide shoulders on several key roadways—through their incorporation into the bikeway network—would provide substantial benefits to bicyclists. Additionally, Cheyenne's cyclists could benefit from upgrades to the network of designated shared roadways. These and other improvements can help to increase bikeway connectivity and access to downtown, neighborhood parks, greenways, schools, and the other key bicyclist destinations.

This page intentionally blank



Map 1. Draft Bicycle System Gap Analysis

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update

Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011

- Spot Gap
- ↔ Connection Gap
- Lineal Gap
- Corridor Gap
- System Gap



0 0.5 1 Miles



This page intentionally blank

Working Paper # 7: Cycle Zone Analysis – Contains a summary of the CZA analysis methodology originally submitted as Working Paper #6

This page intentionally blank

Memorandum



To: Jeff Wiggins and Sreyoshi Chakraborty

From: Rory Renfro and Kim Voros, *Alta Planning + Design*

Date: May 5, 2011

Re: Working Paper # 7: Cycle Zone Analysis

This memo summarizes technical information related to the Cycle Zone Analysis (CZA) and Bikeway Quality Index (BQI) used to evaluate Cheyenne's official existing on-street bikeway and Greenway network conditions for the *Cheyenne On-Street Bicycle Plan and Greenway Plan Update*.

This analysis identifies areas having the greatest potential for cycling by evaluating connectivity, bikeway density and existing land use characteristics. In addition, the future CZA provides insight into conditions for cycling throughout the city and indicates areas that will require additional investment to provide a connected network of bicycle routes.

Introduction

Academic research has shown that density, land use mix, route connectivity, and topography are the built environment factors that have the most significant impact on levels of transportation cycling. The Cycle Zone Analysis is a GIS-based methodology that considers the relationship between the built environment and cycling behavior to predict the quality of the cycling environment.

The cycle zones provide an organizing principle that allow for more nuanced discussion about cycling conditions in and around Cheyenne. Analysis of each zone offers a more fine-grained understanding of how cycling conditions differ across the study area and how investments can be tailored to respond to those different conditions. The following composite metrics can be extracted from a completed CZA:

- **Existing Bicycle Network Conditions.** A description of the existing on-street bicycle system and Greenways comprised of bikeway network density, connectivity and facility quality.
- **Composite Existing Conditions¹.** A measure that describes the existing cycling conditions in terms of roadway connectivity and density, attractive land uses and current population, bikeway network conditions and topography.
- **Cycling Potential.** A composite measure that describes a zone's potential bicycle friendliness in terms of attractive land uses and current population, existing roadway connectivity and density, and topography.

The purpose of the Bikeway Quality Index (BQI) is to construct a snapshot of the current condition of existing on-street bikeways and greenways in relation to each other. This analysis allows planners

¹ This metric includes factors such as roadway connectivity, roadway density, and land use and provides a more generalized overview of existing conditions within the zone.

and decision makers to visualize and understand the quality of existing facilities, identify deficiencies in the existing network and identify improvement opportunities.

Bikeway Quality Index Analysis

As a CZA input, Bikeway Quality can be developed quantitatively if GIS data contains sufficient information to indicate the likely comfort of bicyclists riding on an existing bicycle facility. This typically includes information such as bicycle facility type, lane width, pavement quality, adjacent roadway volume and speed, difficulty of crossings and other characteristics. Because of a lack of sufficient information, the Bikeway Quality factor for the CMA CZA was developed as a qualitative measure. Existing facilities were assigned a score of one to four by City of Cheyenne and Cheyenne MPO staff based on functional characteristics mentioned above. Each facility type was assigned a typical base score, based on the assumption that increased separation from motor vehicles is preferable for most cyclists:

- Shared Roadway 1-2
- Bike Lane 2-3
- Greenway 3 – 4

Map 1 shows the BQI scores assigned to each existing on-street bikeway and Greenway segment. The average score across the system was 2.2 points. For comparison, Table 1 includes an example of facilities and their numeric score.

Table 1. Sample of Existing Bicycle Facilities and Bikeway Quality Score

Roadway or Greenway Corridor	Functional Classification	Facility Type	BQI Score
Bishop Blvd	Collector	Shared Roadway	1
Hynds Blvd	Collector	Shared Roadway	1
Storey Blvd	Minor Arterial	Shared Roadway	1
W Allison Rd	Collector	Shared Roadway	1
S Greeley Hwy	Principal Arterial	Shared Roadway	1
Dell Range	Shared Use Path	Shared Use Path	1
Morrie Ave	Collector	Shared Roadway	2
Dey Ave	Local	Shared Roadway	2
Central Ave	Principal Arterial	Shared Roadway	2
Powderhouse Rd	Minor Arterial	Shared Roadway	2
Vandehei Ave	Collector	Bicycle Lane	3
Gardenia Dr	Collector	Bicycle Lane	3
Evans Ave	Greenway	Greenway	3
Converse Ave	Shared Use Path	Shared Use Path	3
Dry Creek	Greenway	Greenway	4
South Cheyenne	Greenway	Greenway	4

Most Greenways received higher scores than on-street facilities, as they provide opportunities for travel that are completely separated from the roadway. System-wide analysis of the BQI results reveal that:

The majority of on-street bikeways are of moderate quality. Most of these facilities are classified as shared roadways. Several on-street bikeways have higher facility scores (e.g., Evers Boulevard) as these facilities provide some measure of separation from motor vehicles (e.g., bike lanes).

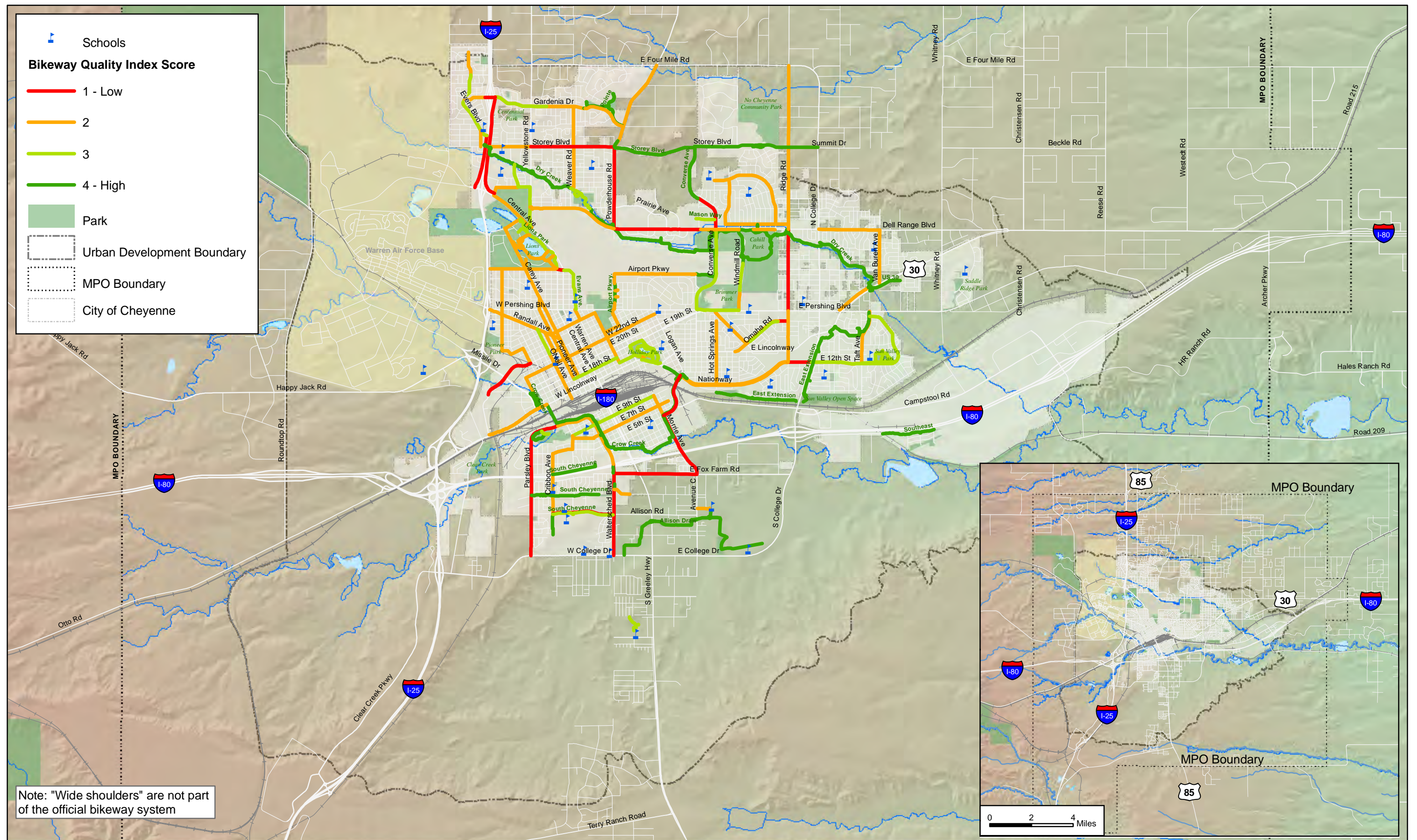
On-street facilities exhibiting the lowest quality include:

- East Fox Farm Road
- Walterscheid Boulevard
- Allison Road
- Parsley Boulevard
- Pershing Boulevard
- Ridge Road
- Dell Range Boulevard
- Storey Boulevard
- Bishop Boulevard
- Hynds Boulevard

The factors that contribute to low facility quality are high motor vehicle speeds and volumes, driveway conflicts, and intersection conflicts.

Bridges create moderately challenging travel conditions. Examples of these conditions include grade separated crossings of I-80, I-25 and I-180. These overpasses do provide grade protection from motor vehicles but typically have long approach ramps which can increase travel distance and create challenges for cyclists of various ages and abilities.

This page intentionally blank



Map 1. Bikeway Quality Index Score

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update

Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011



This page intentionally blank

Cycle Zone Analysis

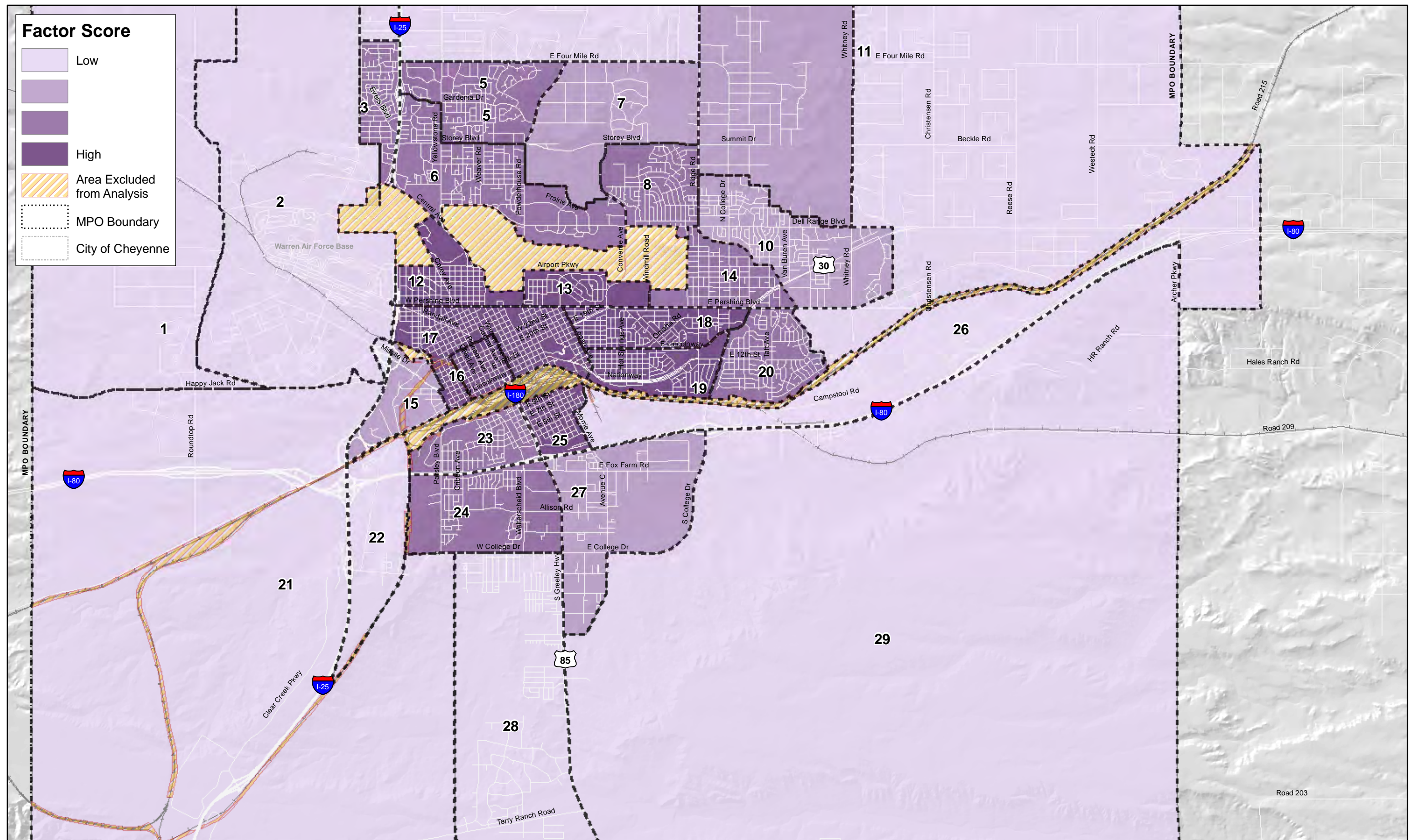
Each cycle zone consists of a more-or-less homogeneous cycling environment based on employment and population density, land use mix, road network density and connectivity, and topography. Cycle zone boundaries also reflect barriers in the bicycling environment, such as UPRR tracks, I-80, I-25 and South Greeley Highway. The GIS model created by Alta Planning + Design used inputs provided by the City and MPO staff related to roadway connectivity, topography, land use and bicycle network quality and connectivity. The formulas used to convert inputs into scores representing overall existing cycling conditions, existing bicycle network conditions and cycling potential for each zone have been developed with guidance from academic researchers and make use of studies related to the impact of land use and network factors on cycling rates. More detailed information on CZA analysis factors and methodology is available in Appendix A.

Maps 2 through 4 show the results of the CZA scores for each zone. Map 2 shows scores that represent the overall quality of bicycling conditions at the present. Map 3 shows scores that represent the relative quality of the bicycle network. Map 4 shows scores that represent the relative cycling potential in each part of the city.

Table 2 provides a summary of composite factors as well as individual factors for each zone. A generalized summary of opportunities and constraints by zone is included in Appendix B. These opportunities and constraints will be considered during network development for example in Zone 18 where roadway density and connectivity is good and bikeway connectivity is low network development strategies will focus on gap closure and utilization of the existing roadway network. While network development strategies in Zone 20, where bikeway quality and connectivity are already good may focus on improving access along College Drive and UP railroad tracks. Generally at a citywide level, the CZA results demonstrate that:

- Street connectivity and integrated land use are the primary determinants of bikeability for an area because they allow for shorter, more direct and more convenient bicycle trips.
- Topography is a limiting factor for bicycling primarily in zones 3 and 10, along Buffalo Ridge and in the Western Hills. Parts of the Cheyenne Metropolitan Area score poorly for existing conditions yet have flat topography (such as SE Ranches), suggesting that addressing land use and street connectivity challenges will substantially improve bicycling conditions. Areas with unchangeable characteristics (e.g., topography) or characteristics that will change with time (e.g., land use) require creative solutions to enhance cycling conditions in the short term. Potential measures include improved transit connections.
- Zones near the center of the city provide the highest quality cycling experience under existing conditions. The qualities that make these zones pleasant places to ride include good roadway connectivity and density, proximity to destinations and many potential riders. Improvements made near the city center will likely improve many people's cycling experiences, but may not bring the biggest return on investment in terms of attracting new riders. Zones in this area may be optimal targets for low cost, high benefit on-street facilities such as bicycle boulevards. The portions of the Cheyenne Metropolitan Area with the greatest potential for improvement over the existing conditions are zones 1, 2 and 15 (NW Ranchettes, FE Warren Air Force Base and West Lincolnway & Missile Drive),

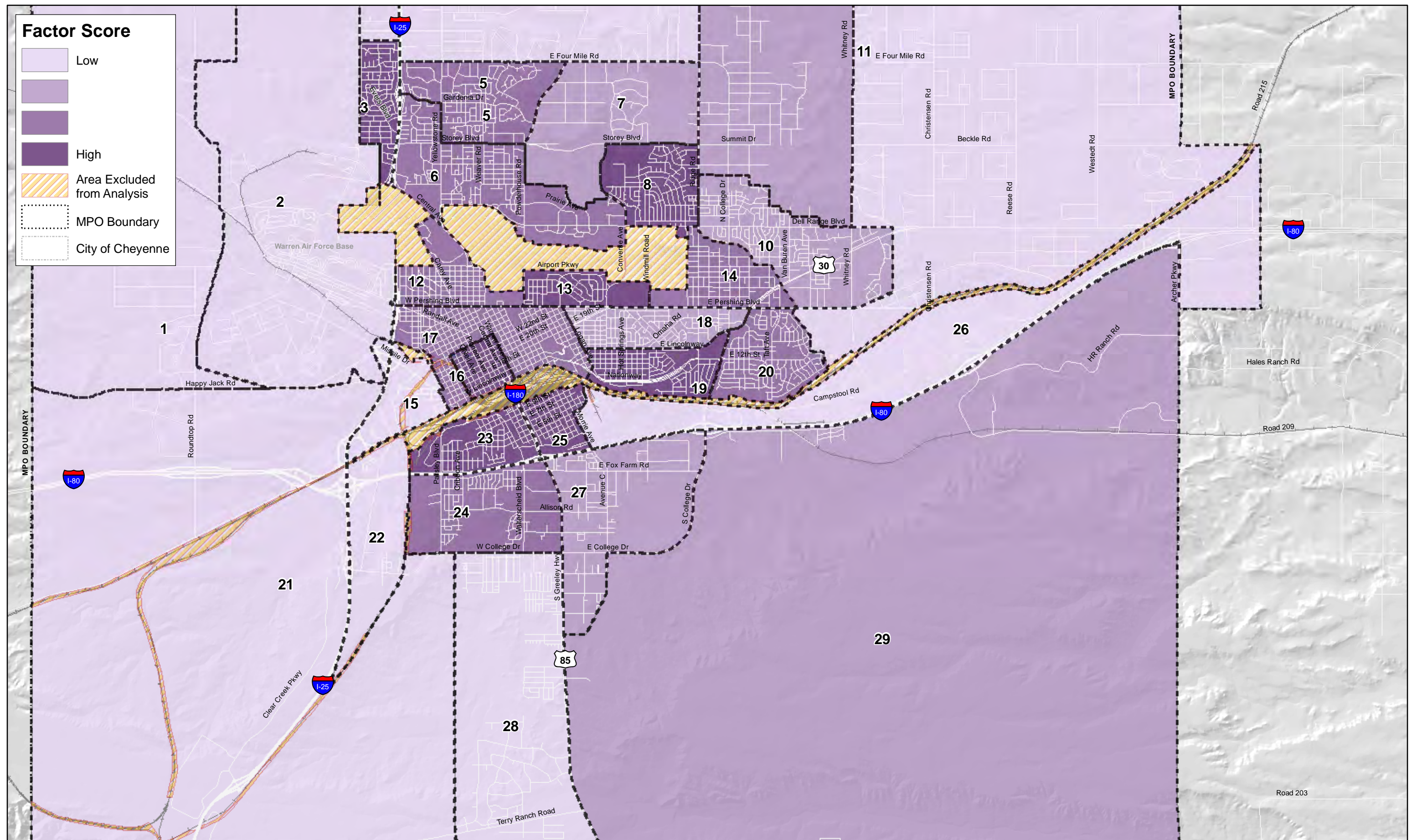
Lakeview/Dakota Crossing/Saddle Ridge and Fairview Heights). The relative land use mix, and roadway connectivity in combination with the low existing bikeway network density and connectivity indicate that improvement in these zones will potentially encourage many cyclists and could be a good place to invest in bikeway projects.



Map 2. Cycle Zone Analysis - Overall Existing Conditions

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update
Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011

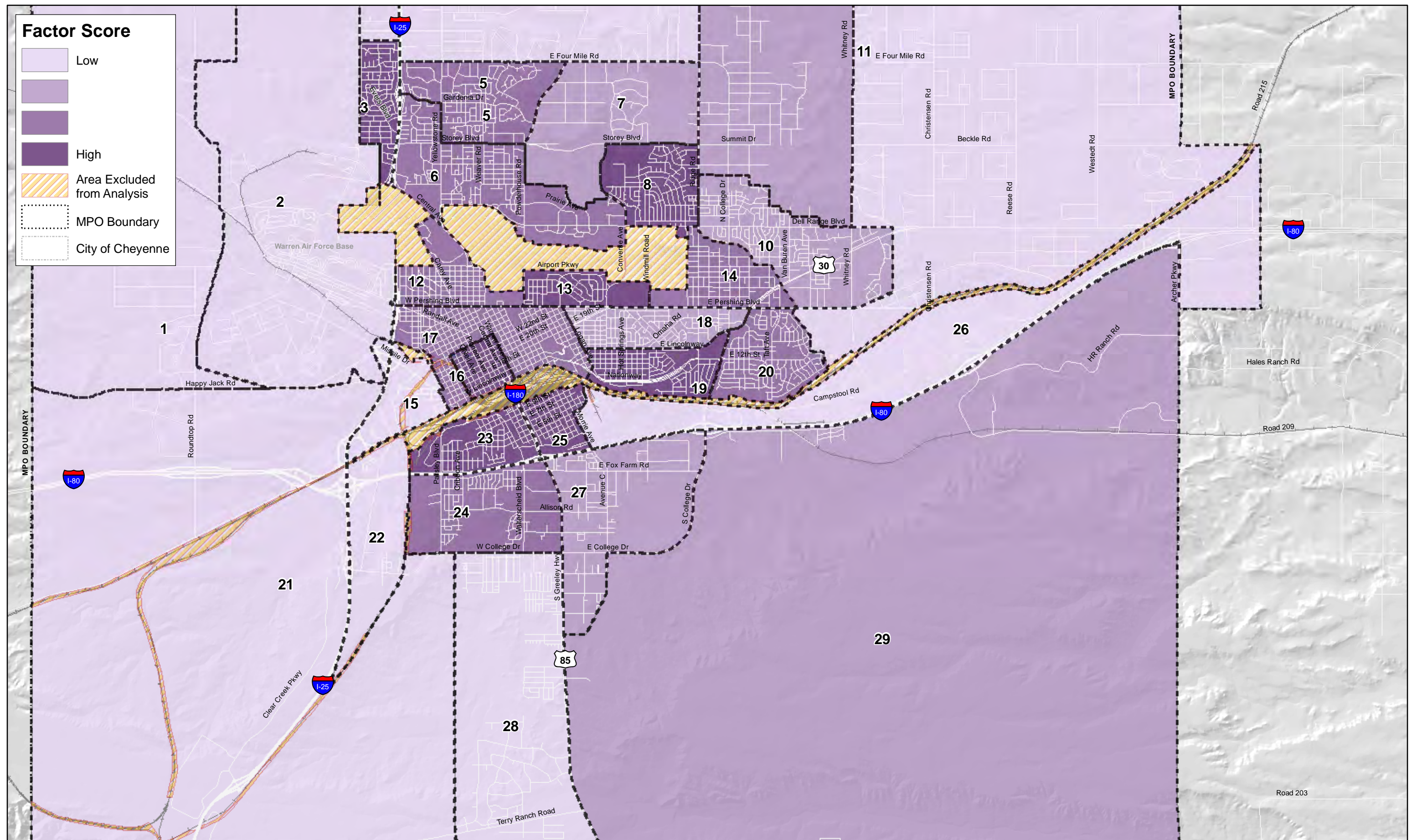
This page intentionally blank



Map 3. Cycle Zone Analysis - Existing Bikeway Conditions

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update
Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011

This page intentionally blank



Map 4. Cycle Zone Analysis - Cycling Potential

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update
Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011

This page intentionally blank

Table 2. Summary of CZA Findings by Zone

High Score

Low Score



#	Description	Overall Existing Conditions	Existing Bikeway Network	Cycling Potential	Road Network Connectivity	Road Network Density	Bikeway Connectivity	Bikeway Density	Topography	Permeability	Landuse/Population	Bikeway Quality
1	NW Ranchettes											
2	FE Warren Air Force Base											
3	Western Hills											
4	N Ranchettes											
5	Pointe, Monterey Heights, Bar X											
6	Upper Dry Creek & Dell Range commercial strip											
7	North											
8	Buffalo Ridge											
9	N Ranchettes											
10	Lakeview, Dakota Crossing, Saddle Ridge											
11	NE Ranchettes											
12	Avenues											
13	Eastridge											
14	Sunnyside Addition											
15	West Lincolnway & Missile Drive											
16	Downtown											
17	Original City											
18	Mountain View											
19	Fairview Heights											
20	Sun Valley											
21	SW											
22	Southwest Drive											
23	Cole Elementary											
24	South Cheyenne											

#	Description	Overall Existing Conditions	Existing Bikeway Network	Cycling Potential	Road Network Connectivity	Road Network Density	Bikeway Connectivity	Bikeway Density	Topography	Permeability	Landuse/Population	Bikeway Quality
25	Hebard Elementary											
26	Commercial/Industrial											
27	Arp Elementary											
28	Orchard Valley, Winchester Hills & trailer courts											
29	SE Ranches											

Appendix A: Cycle Zone Analysis Methodology

This appendix explains the methods used to perform the Cycle Zone Analysis (CZA) for the *Cheyenne On-Street Bicycle Plan and Greenway Plan Update*.

Introduction to Cycle Zone Analysis

The methodology first requires dividing the region into geographically distinct cycle zones. Each cycle zone consists of a more-or-less homogeneous cycling environment based on employment and population density, land use mix, road network density and connectivity, and topography. Cycle zone boundaries also reflect barriers in the bicycling environment, such as UPRR tracks, I-80, I-25 and South Greeley Highway. The cycle zones provide an organizing principle that allow for more nuanced discussion about cycling conditions in the Cheyenne Metropolitan Area (CMA). Analysis of each zone offers a more fine-grained understanding of how cycling conditions differ across the CMA and how investments can be tailored to respond to those different conditions.

Input Factors

The specific factors input into a Cycle Zone Analysis are dependent on the availability and usability of GIS data. The following factors were input to the CMA Cycle Zone Analysis:

- Road Network Connectivity
- Road Network Density
- Topography
- Land Use/ Population Mix
- Permeability
- Bicycle Network Connectivity (existing and funded)
- Bicycle Network Density (existing and funded)
- Bikeway Quality

All factors used in the CMA Cycle Zone Analysis except for Bikeway Quality were developed quantitatively. As a CZA input, Bikeway Quality can be developed quantitatively if GIS data contains sufficient information to indicate the likely comfort of bicyclists riding on an existing bicycle facility. This typically includes information such as bicycle facility type, facility width, pavement quality, adjacent roadway volume and speed and other characteristics. Because of a lack of sufficient information, the Bikeway Quality factor for the CMA CZA was developed as a qualitative measure. City and MPO staff scored each bicycle facility on a four point scale according to perceived comfort and quality of bicycling experience on each route.

The table below provides a description of the method by which each input factor was measured for Cheyenne's cycle zones.

Table 1. CZA Analysis Factors and Description

Factor	Description
Road Network Connectivity	Connected Node Ratio (ratio of intersections to dead ends) of the road network in the cycle zone
Road Network Density	Road network length divided by area of cycle zone
Topography	Percentage of road network with slope of 5% or greater
Land Use/Population	The degree of concentration of cycling generating land uses in each zone with the residential and employment density in the zone
Permeability	Average distance between access points along the perimeter of the cycle zone
Bicycle Network Connectivity	Connected Node Ratio (ratio of intersections to dead ends) of the existing and funded bicycle network in the cycle zone
Bicycle Network Density	Bicycle network length divided by area of cycle zone
Bikeway Quality	Average subjective Bikeway Quality Index score per foot of existing bicycle facilities within the cycle zone

Normalization

Because each input factor is measured differently, values must be normalized before being combined and weighted to provide a total score for each cycle zone. Normalized values for each factor scale the lowest-scoring cycle zone's value to zero and the highest-scoring cycle zone's value to one, and preserve the relative value for each cycle zone in between.

Factor Weights

Cycle Zone Analysis input factors are combined and weighted to illustrate the overall quality of the bicycle network across different areas of the city. Differing weights were used to create the three Cycle Zone Analysis overview maps in the body of this memo. The table below shows the weights used in each map.

Table 2. Cycle Zone Composite Factors and Analysis Factor Weights

Factor	Weight (%)		
	Cycling Potential	Existing Bicycle Network Conditions	Overall Existing Conditions
Road Network Connectivity	20		10
Road Network Density	20		10
Topography	20		10
Land Use	40		20
Permeability			10
Bicycle Network Connectivity (existing and funded)		35	14
Bicycle Network Density (existing and funded)		35	14
Bikeway Quality		30	12
TOTAL	100	100	100

Detailed Maps and Tables

The following maps and tables were developed for the Cheyenne Metropolitan Planning Area Cycle Zone Analysis but not discussed in detail in the body of this memo. They include:

Cycle Zone Factor Maps

- A1. Road Network Connectivity
- A2. Road Network Density
- A3. Topography
- A4. Land Use and Population Density Composite Factor
- A5. CZA Permeability
- A6. Existing and Funded Bicycle Network Connectivity
- A7. Existing and Funded Bicycle Network Density
- A8. Bikeway Quality Index Score

Tables

- Cycle Zone Scores by Normalized Factor Values.

This table shows the normalized composite scores for each factor, with scores ranging from 0 – 1, and also shows how the zones relate to each other. For example for ‘Overall Existing Conditions’, zone 16 (downtown) received the highest score, a one, and zone 2 (FE Warren Air Force Base) received a score of .31. These numbers should not be strictly interpreted to mean that the cyclist in zone 16 will have an experience that is 3 times better than their experience in zone 2, as a rider’s preference and tolerance for network characteristics is variable. But it does mean that in relation to zone 16, conditions in zone 2 are currently more challenging for cyclists. Table 2, located in the body of the report, provides more detail on the reasons for zone 2’s low score (primarily lack of existing bicycle facilities and poor permeability).

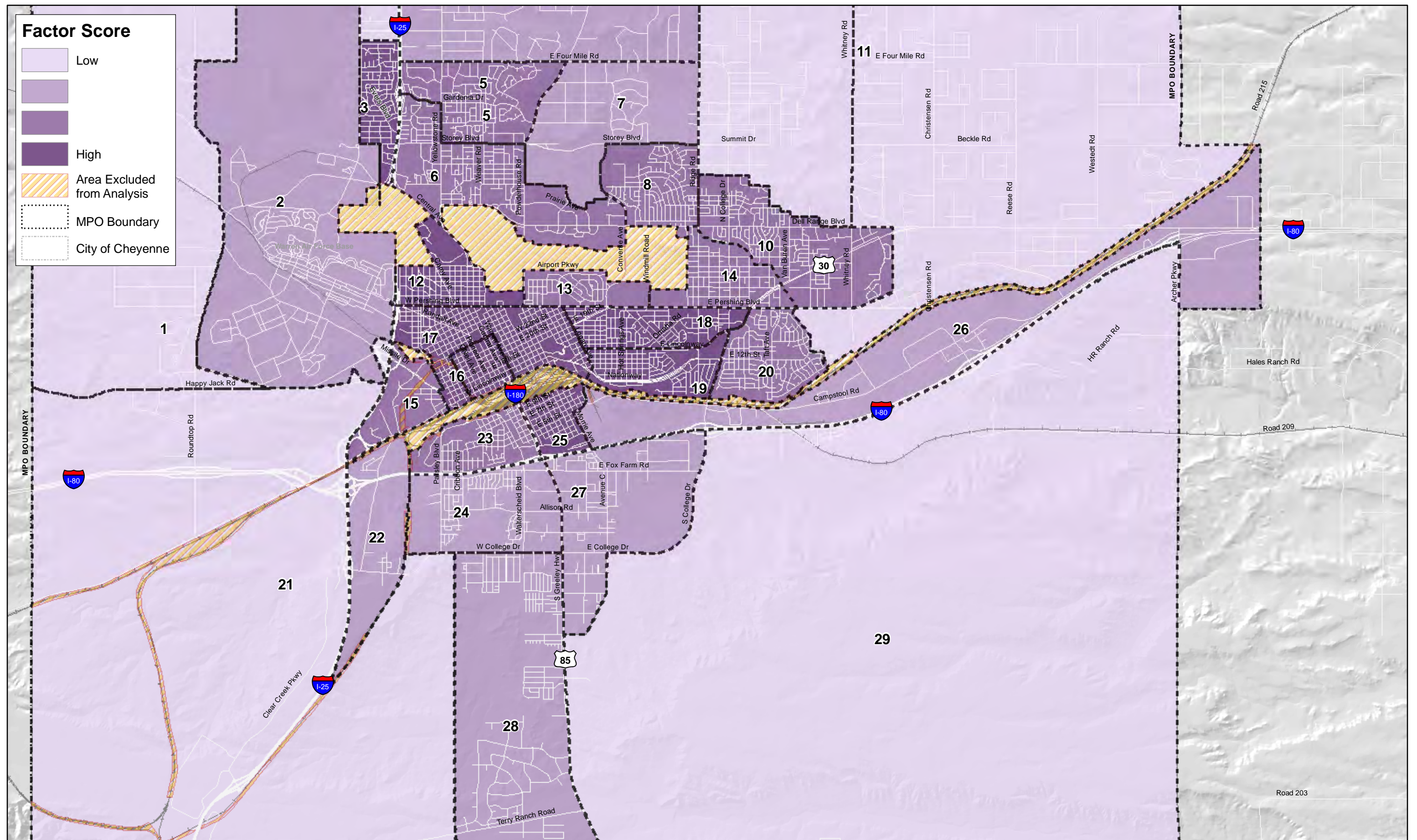
Table 3. Cycle Zone Scores by Normalized Factor Values²

Zone	Description	Overall Existing Conditions (Map 2)	Existing Bikeway Network (Map 3)	Cycling Potential (Map 4)
1	NW Ranchettes (Happy Jack, base, MPO boundary)	0.31	0.00	0.56
2	FE Warren Air Force Base	0.31	0.00	0.56
3	Western Hills	0.77	0.80	0.77
4	N Ranchettes (I-25, Powderhouse, MPO, Four Mile)	0.37	0.17	0.51
5	Pointe, Monterey Heights, Bar X	0.67	0.65	0.63
6	Upper Dry Creek & Dell Range commercial strip	0.80	0.69	0.86
7	North (water tower, Mustang Ridge, Cole pasture)	0.58	0.55	0.60
8	Buffalo Ridge	0.80	0.96	0.67
9	N Ranchettes (Whitney, Powderhouse, ridge, MPO)	0.47	0.50	0.45
10	Lakeview, Dakota Crossing, Saddle Ridge	0.51	0.38	0.60
11	NE Ranchettes (Whitney, RR, MPO boundary)	0.25	0.00	0.43
12	Avenues	0.90	0.70	1.00
13	Eastridge	0.94	1.00	0.90
14	Sunnyside Addition	0.78	0.76	0.81
15	West Lincolnway & Missile Drive	0.56	0.21	0.80
16	Downtown	1.00	0.89	1.00

² Factors and relative weights for each Cycle Zone Score are found in Table 2

Cheyenne On-Street Bicycle Plan and Greenway Plan Update

Zone	Description	Overall Existing Conditions (Map 2)	Existing Bikeway Network (Map 3)	Cycling Potential (Map 4)
17	Original City	0.96	0.77	1.00
18	Mountain View	0.84	0.56	0.96
19	Fairview Heights	0.86	0.83	0.84
20	Sun Valley	0.67	0.63	0.72
21	SW (ranches, developing industrial)	0.28	0.08	0.45
22	Southwest Drive (rural residential)	0.34	0.00	0.61
23	Cole Elementary (I-80, I-180, RR)	0.79	0.85	0.80
24	South Cheyenne (I-80, BNSF, College, S. Greeley)	0.66	0.67	0.67
25	Hebard Elementary (RR, I-180, refinery, I-80)	0.89	0.85	0.91
26	Commercial/Industrial (LEADS, Archer, refinery)	0.35	0.10	0.56
27	Arp Elementary (I-80, College Dr., S. Greeley)	0.58	0.48	0.67
28	Orchard Valley, Winchester Hills & trailer courts	0.32	0.12	0.46
29	SE Ranches (College Dr., I-80, MPO boundary)	0.37	0.33	0.41

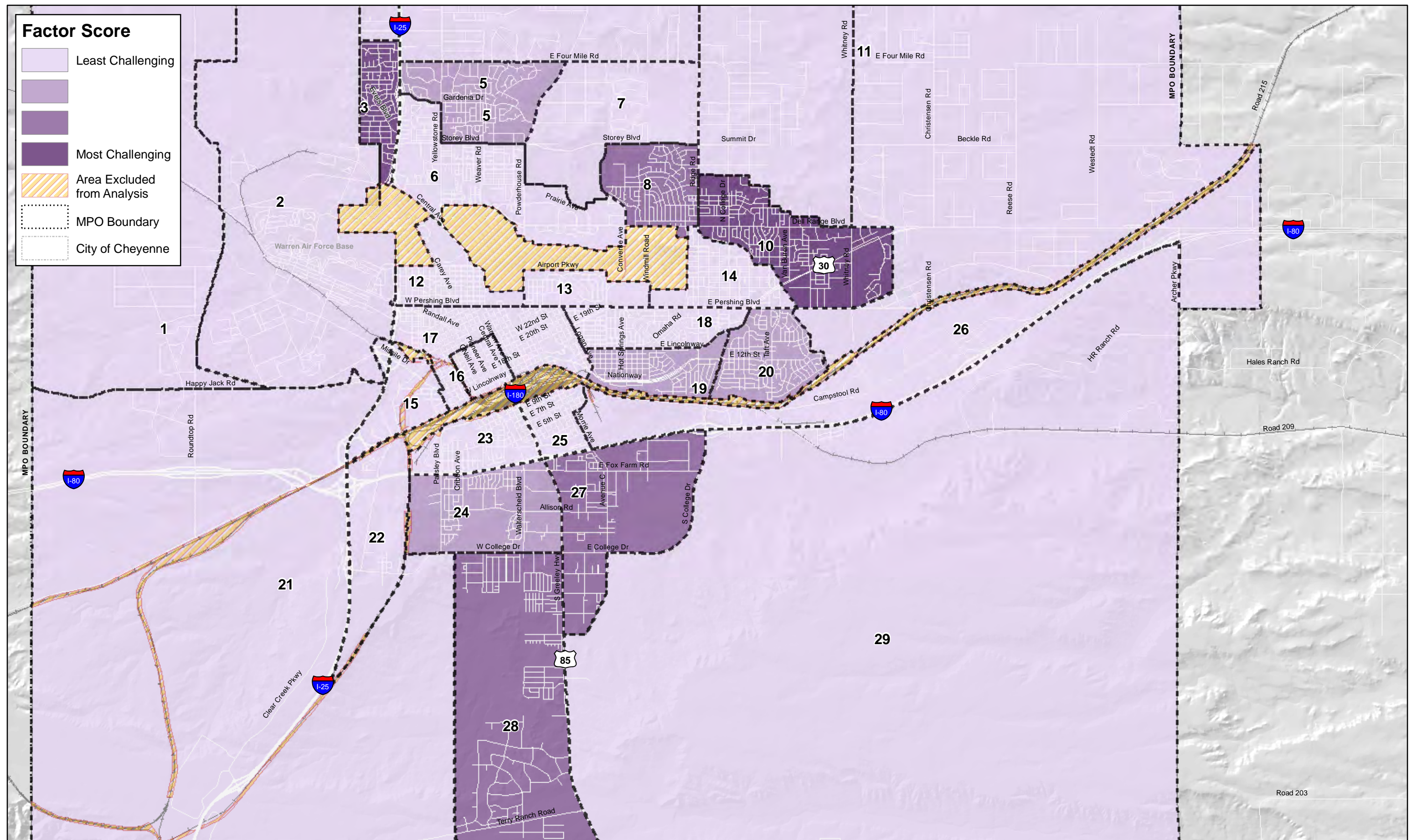


Map A2. Cycle Zone Analysis - Road Network Density

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update

Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011



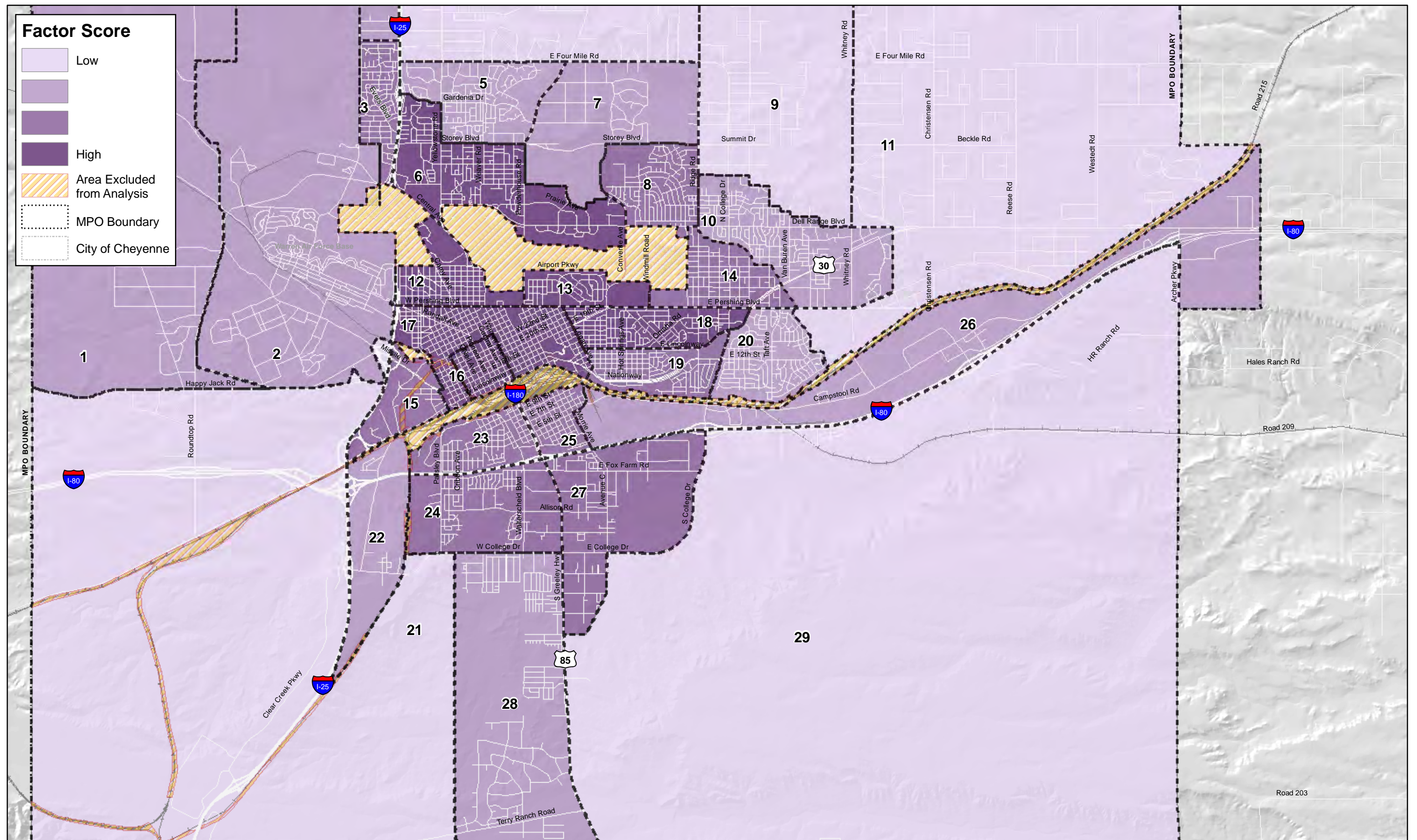


Map A3. Cycle Zone Analysis - Topography

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update

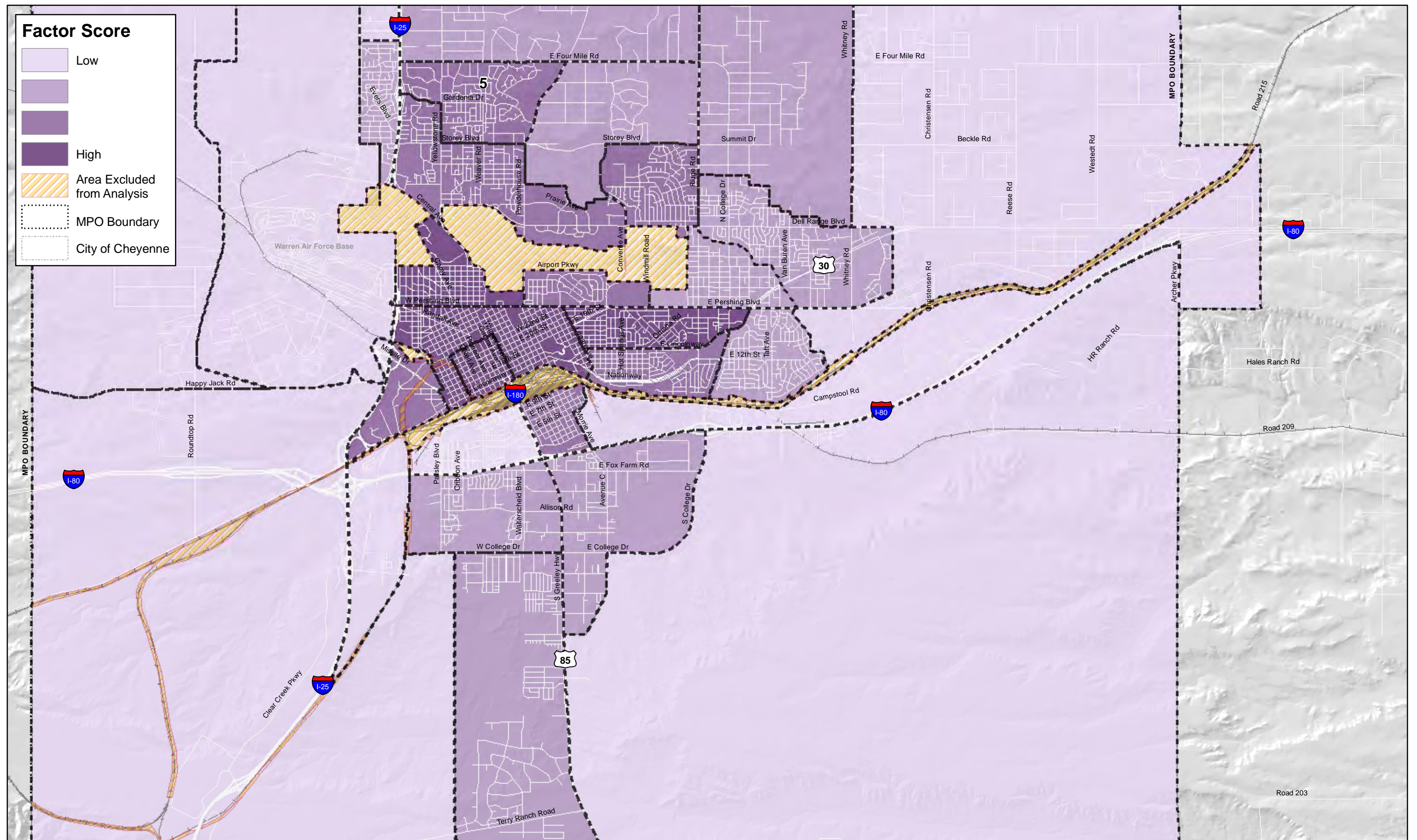
Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011





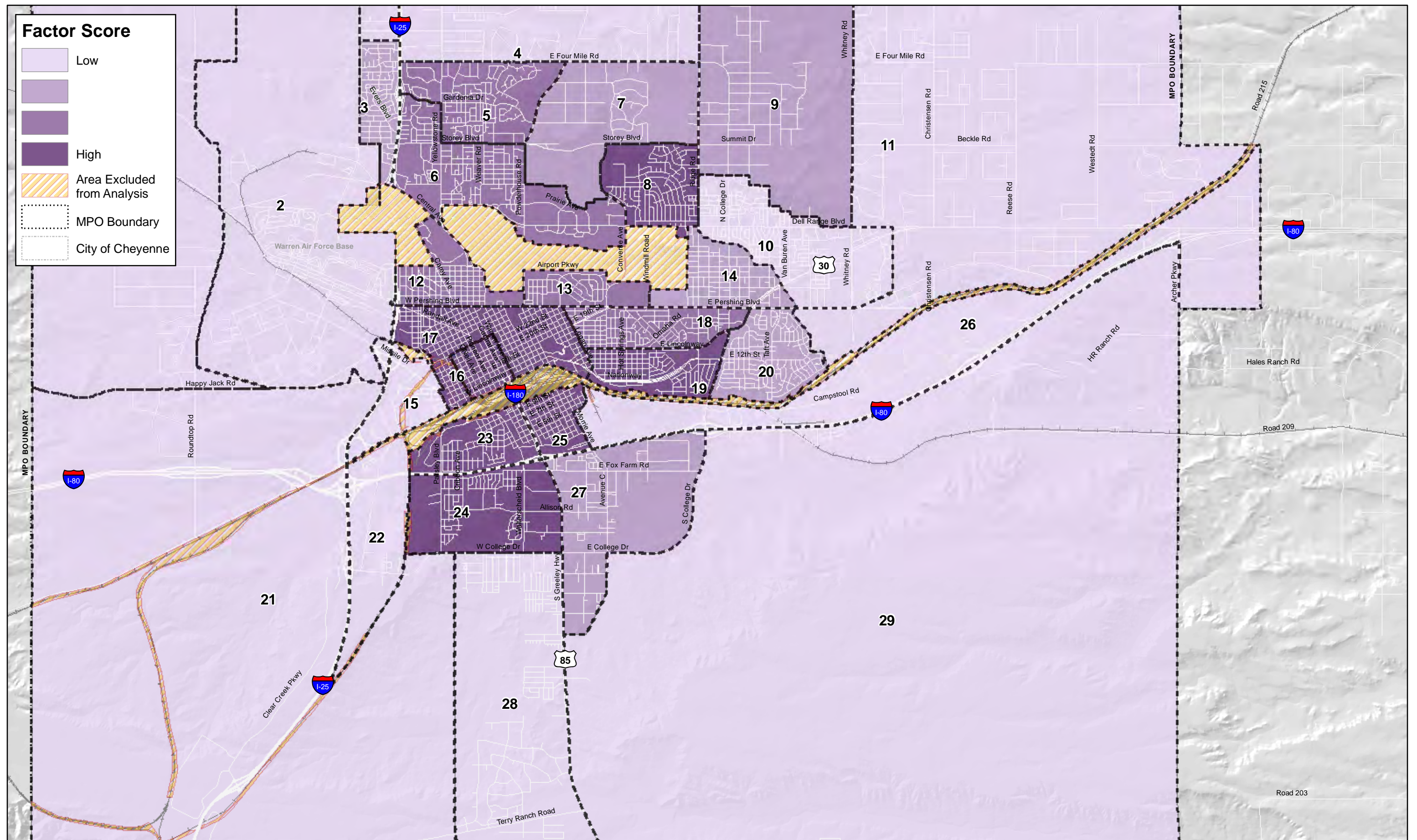
Map A4. Cycle Zone Analysis - Land Use and Population Composite

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update
Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011



Map A5. Cycle Zone Analysis - Zone Permeability

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update
Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011

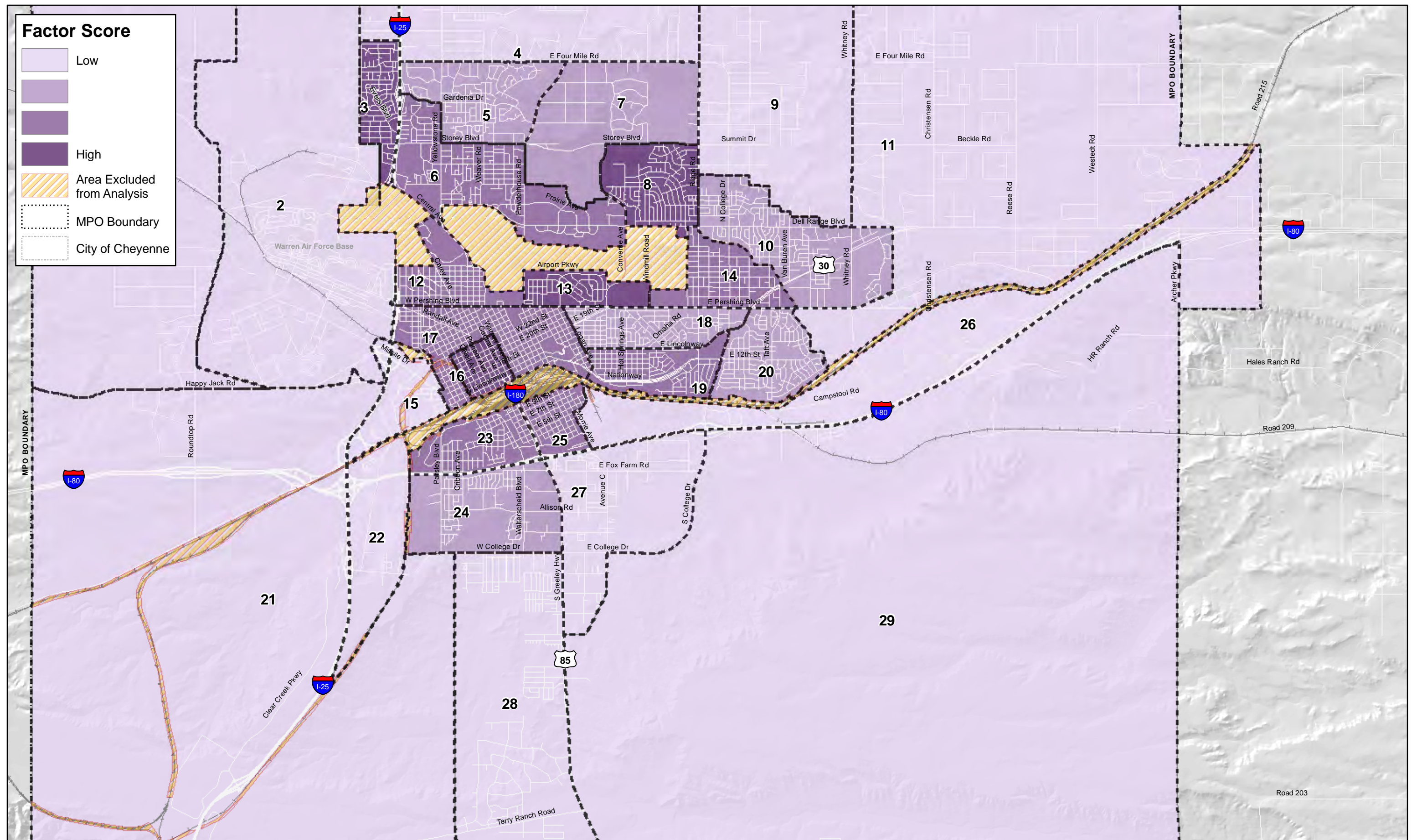


Map A6. Cycle Zone Analysis - Existing and Funded Bikeway Connectivity

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update

Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011





Map A7. Cycle Zone Analysis - Existing and Funded Bikeway Density

Cheyenne On-Street Bicycle Plan
and Greenway Plan Update

Source: Cheyenne - Laramie County Cooperative GIS Program
Date: May 2011

Appendix B: Analysis of Opportunities and Constraints

Table 1. Cycle Zone Summary of Opportunities and Constraints

Zone	Description	Opportunities	Constraints
1	NW Ranchettes (Happy Jack, base, MPO boundary)	Good roadway connectivity and relatively little change in topography, moderate cycling potential	Poor roadway density Roadway surface is generally granular and may deter from the quality of the cycling experience
2	FE Warren Air Force Base	Good existing roadway connectivity, moderate cycling potential	Access to the general public is restricted
3	Western Hills	Presence of existing bikeway network, high bikeway quality. Improvements to Vendhei improve access	Topography may limit cycling activity in this area.
4	N Ranchettes (I-25, Powderhouse, MPO, Four Mile)	Existing bikeways are high quality Density and connectivity of these bikeways is moderate	Land use and employment restricts the number of potential cyclists Roadway surface is generally granular and may deter from the quality of the cycling experience
5	Pointe, Monterey Heights, Bar X	Moderate bikeway connectivity and density in conjunction with good roadway connectivity and density contribute to cycling potential	Land use and employment restricts the number of potential cyclists
6	Upper Dry Creek & Dell Range commercial strip	Excellent existing conditions for cycling due to presence of numerous destinations and population	Perimeter barriers make accessing this zone difficult
7	North (water tower, Mustang Ridge, Cole pasture)	Moderate roadway and bikeway quality	Low existing population and land use density scores limit the number of potential cyclists in this area
8	Buffalo Ridge	Good cycling potential based on roadway connectivity and density	Perimeter barriers make entry/exit into this zone difficult
9	N Ranchettes (Whitney, Powderhouse, ridge, MPO)	Good roadway connectivity and existing bikeway quality	Though roadways are well-connected, the network is not dense Roadway surface is generally granular and may deter from the quality of the cycling experience
10	Lakeview, Dakota Crossing, Saddle Ridge	High cycling potential	Low existing bikeway connectivity and density
11	NE Ranchettes (Whitney, RR, MPO boundary)	Moderate roadway density and bikeway quality	Low existing population and land use density scores limit the number of potential cyclists in this area Roadway surface is generally granular and may deter from

Zone	Description	Opportunities	Constraints
			the quality of the cycling experience
12	Avenues	Excellent internal roadway connectivity and density	Barriers to entry include Pershing Boulevard, the golf course and I-25
13	Eastridge	Excellent roadway connectivity and grid of lower traffic streets well suited to cycling	Cheyenne Regional Airport limits entry to the north
14	Sunnyside Addition	Moderate roadway and bikeway quality. Good land use and population density	Barriers to permeability include US 30 and Pershing Boulevard. Lower roadway density impacts cycling potential
15	West Lincolnway & Missile Drive	Overall good cycling conditions based on moderate scores in contributing factors	This zone is difficult to access based on proximity to I-25 and Union Pacific Railroad tracks
16	Downtown	Excellent overall existing conditions based on roadway and bikeway connectivity. Zones of this type may benefit from low-cost treatments such as bicycle boulevards	Many roadways in this zone carry high volumes of motor vehicle traffic. These roadways may require crossing treatments to increase their bicycle friendliness
17	Original City	Excellent overall existing conditions based on roadway and bikeway connectivity. Zones of this type may benefit from low-cost treatments such as bicycle boulevards. Many potential routes into and out of this zone	Low bikeway network connectivity
18	Mountain View	Good roadway connectivity and density	Moderate bikeway connectivity
19	Fairview Heights	Good roadway connectivity and density. Funded greenways will enhance the cycling experience in this zone	Access to this zone is restricted by Nationway and Union Pacific Railroad tracks
20	Sun Valley	Good existing bikeway connectivity and bikeway quality	Access to this zone is restricted by College Drive and Union Pacific Railroad tracks
21	SW (ranches, developing industrial)	Good roadway connectivity	Existing roadways are typically higher speed and volume. Land uses are typically industrial, reducing the number of potential cycling destinations. Roadway surface is generally granular and may deter from the quality of the cycling

Zone	Description	Opportunities	Constraints
			experience
22	Southwest Drive (rural residential)	Moderate roadway connectivity	Existing roadways are typically higher speed and volume
23	Cole Elementary (I-80, I-180, Railroad)	Moderate population/land use mix, well established street grid	Access to this zone is restricted by Union Pacific railroad tracks, I-80 and I-180
24	South Cheyenne (I-80, BNSF, College, S. Greeley)	Moderate population/land use mix, roadway connectivity	Lower bikeway connectivity and density. Few points of entry into zone reduce permeability
25	Hebard Elementary (RR, I-180, refinery, I-80)	Good roadway grid. Good quality existing bikeway facilities and density of bikeway network	Access to zone is impacted by I-180 and Union Pacific Railroad tracks
26	Commercial/Industrial (LEADS, Archer, refinery)	Moderate roadway network connectivity Major employment clusters present	Cycling potential impacted by low road network density and low land use density
27	Arp Elementary (I-80, College Dr., S. Greeley)	Moderate scores for roadway network connectivity and density and land use. Funded bikeways will increase the quality of cycling within this zone	Few access points and lower roadway connectivity restrict the cycling potential of this zone
28	Orchard Valley, Winchester Hills & trailer courts	Moderate cycling potential based on roadway connectivity and density	Permeability to this zone is low as is roadway density Current low cycling potential based on all contributing factors Roadway surface is generally granular and may deter from the quality of the cycling experience
29	SE Ranches (College Dr., I-80, MPO boundary)	Existing bikeways are good quality	

This page intentionally blank

Working Paper #8: Collision Analysis

This page intentionally blank

Memorandum



To: Jeff Wiggins and Sreyoshi Chakraborty

From: Rory Renfro and Kim Voros, *Alta Planning + Design*

Date: August 29, 2011

Re: Working Paper #8: Collision Analysis

Local crash data are a valuable source of information for identifying difficult or dangerous areas for bicyclists. This memorandum summarizes reported crashes in the Cheyenne Metropolitan Area that involved bicyclists between 2000 and 2009. The following analysis identifies specific issues and trends indicated by national and local crash data, as well as common dangerous bicyclist and motorist behaviors.

Introduction

According to national and local surveys, safety concerns are the most common reason people do not bicycle or do not ride more often. Many bicyclists feel that motorists do not see them or are openly hostile to them on roadways, particularly at intersections. National bicycle crash research shows that the most commonly reported bicycle/vehicle crashes occur at major arterial intersections. In addition, national studies show that many bicyclists involved in crashes are younger people who have less experience riding on the road and/or cyclists who are riding the wrong way or on the sidewalk¹. Though Cheyenne's existing crash database does not contain sufficient information to replicate this study, it is likely that a similar trend exists within the Cheyenne Metropolitan Area.

Certain caveats are necessary when interpreting crash data. First, bicycle crashes, and in particular incidents that do not result in serious injury, are generally considered to be significantly under-reported. A street or intersection that did not experience a crash during the analysis period is not an indication that people are not bicycling or walking there, nor is it evidence that the area does not present hazards to bicycling. Crash data also do not take into consideration "near misses", which characterize conditions at many high-risk locations without reported incidents. Second, in the absence of bicycle and vehicle counts, there is no way to measure "exposure" to crashes, defined as crashes per bicycle mile traveled. For example, consider two streets that experienced the same number of crashes but different cyclist volumes. The street with greater bicycle traffic is likely to be less dangerous than the street that saw the same number of crashes despite seeing little bicycle traffic (measured by crashes per bicyclist or crashes per miles traveled). Third, coding of crash data may be inaccurate, incomplete, or biased, which can limit the explanatory power of the data.

¹ Federal Highway Administration. "Bicycle Type Manual for Bicyclists" (<http://www.fhwa.dot.gov/publications/research/safety/pedbike/96104/>). n.d. Web. March 1, 2011.

Study Area Summary of Reported Bicycle Crashes, 2000 – 2009

Bicycle-related crash data were collected for ten years in Cheyenne from 2000 through 2009 (Table 1). These data were provided by the Cheyenne Metropolitan Planning Organization. A crash is usually defined as “reportable” if the incident results in death or injury, or if property damage exceeds \$1,000 for any single person’s property and occurred between a cyclist and a motor vehicle within the road right-of-way. Crashes that occurred on the Greenway, within parks or on private property are not considered in these totals.

There were 169 reported crashes involving bicycles during the ten-year period. One crash resulted in a fatality, while 163 resulted in an injury, of which 18 were incapacitating. Only five of the reported crashes resulted in no injury and 39 crashes resulted in possible injury (additional information was not available on the status of these crashes). The single fatality occurred on a clear, dry day as a motorist overtook a cyclist. Alcohol use by the motorist was cited as a contributing factor in this crash.

Over time, the number of reported crashes is decreasing; 11 crashes were reported in 2009, down nearly 60% from the 27 reported crashes in 2000. This downward trend could indicate that the Cheyenne area is becoming increasingly safe for cyclists, or it could indicate that the same number of crashes is still occurring but reporting trends have changed significantly.

Table 1. Summary of Reported Cyclist Crashes, 2000 - 2009

Year	Type of Injury					Total
	Fatality	Incapacitating	Not Incapacitating	Possible Injury	No Injury	
2000		3	15	9		27
2001		4	14	5	1	24
2002		1	16	3		20
2003		2	8	4		14
2004			7	2	2	11
2005		3	8	6		17
2006		1	13	2		16
2007		2	15	1		18
2008		2	3	4	2	11
2009	1		7	3		11
Total	1	18	106	39	5	169

Measuring the *rate* of bicycle crashes also accounts for the number of people bicycling in the city. Data from the decennial Census and American Communities Survey indicates that approximately 136 people commuted to work via bicycle between 2005 and 2007, compared with approximately 130 riders in 2000. Since the number of reported crashes has decreased significantly during the same period while bicycling has remained constant, this represents an overall reduction in the reported bicycle crash rate of roughly 25 to 40 percent.

Crashes by Time, Day of Week, and Year

Figure 1 through Figure 3 show reported crashes by month, day, and time of day. As shown in Figure 1, the greatest number of crashes were reported in summer months, with the frequency of reported incidents peaking in August and falling off in September. This is consistent with observed patterns of bicycle use in Cheyenne, which peaks between

Memorial Day and Labor Day and roughly coincides with summer vacation and increased planned activity downtown and throughout the park system. Figure 2 shows the frequency of reported crashes by day of the week. Crashes were most frequently reported on Wednesday, while the fewest crashes were reported on the weekend. Anecdotal, this pattern matches commonly recognized trend that the reported cyclist crash rate tends to decrease as the number of cyclists on the roadway increases, also referred to as ‘safety in numbers.’ This trend can be confirmed in Cheyenne with the development of a bicycle count program which quantifies the number of weekday and weekend cyclists.

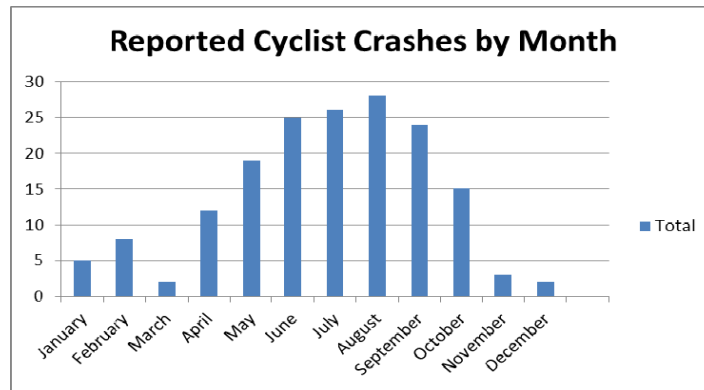
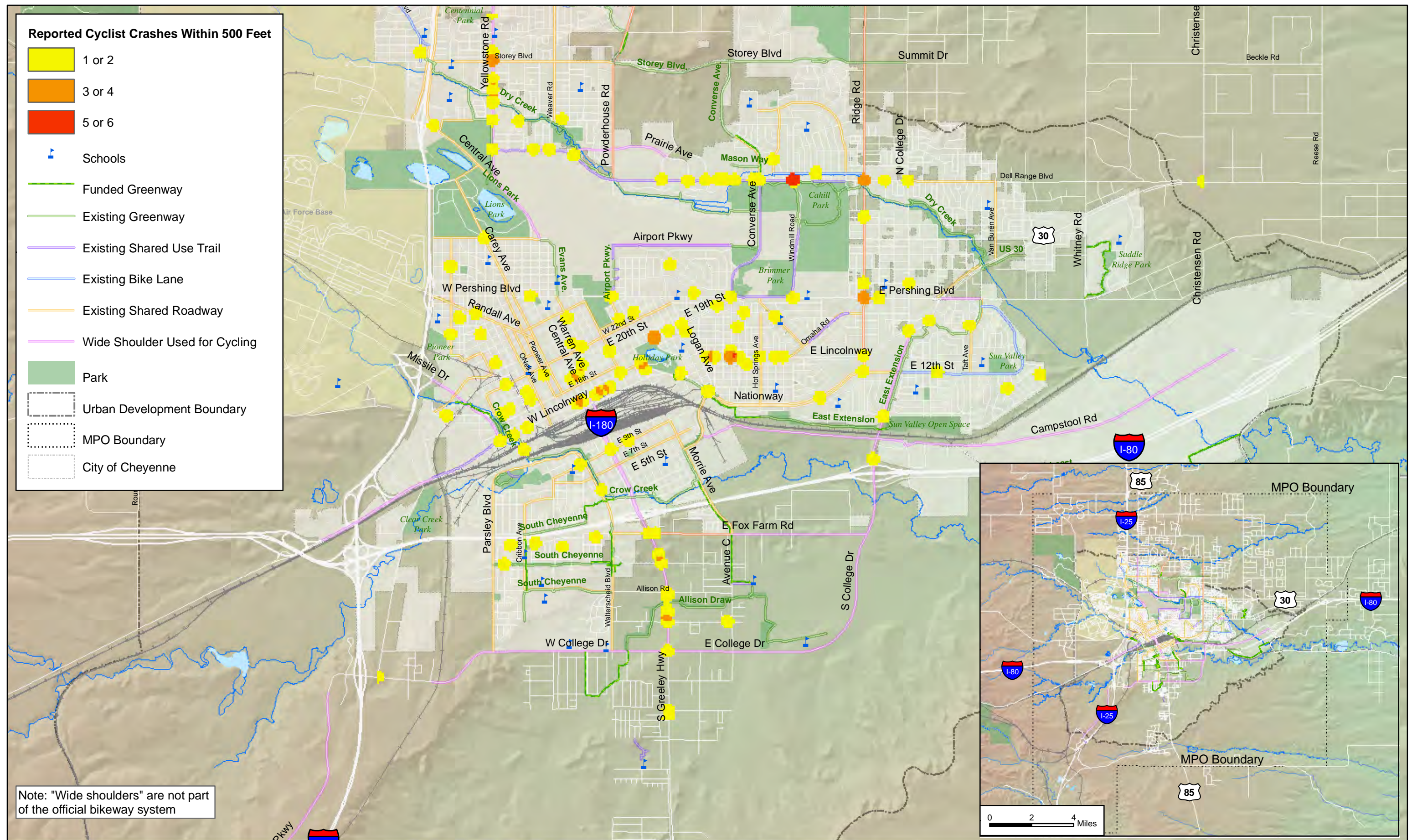


Figure 1. Reported Crashes by Month



Map 1. Draft Reported Cyclist Collisions, 2000 - 2009

more utilitarian trips than recreational trips. On utilitarian trips, cyclists (like motorists) generally prefer to take the shortest possible route, which generally involves travel on higher-order roadways (e.g., Lincolnway and Nationway), resulting in greater exposure to motor vehicles.

The reported collisions occurred most frequently during the afternoon hours; nearly half of all crashes occurred between 1 PM and 6 PM (Figure 3), with the greatest number of crashes occurring between 4 PM and 6 PM. There were no crashes reported between midnight and 6 PM, and alcohol was only cited as a contributing factor in six instances. This is well below the national average, according to at least one study which reported alcohol was involved in nearly one-third of reported cyclist collisions². This late afternoon spike in reported crashes is roughly correlated with the evening work commute as well as children traveling home from school. As mentioned previously, Cheyenne's reported cyclist crash database does not contain age information so it is not possible to compare the age of crash victims.

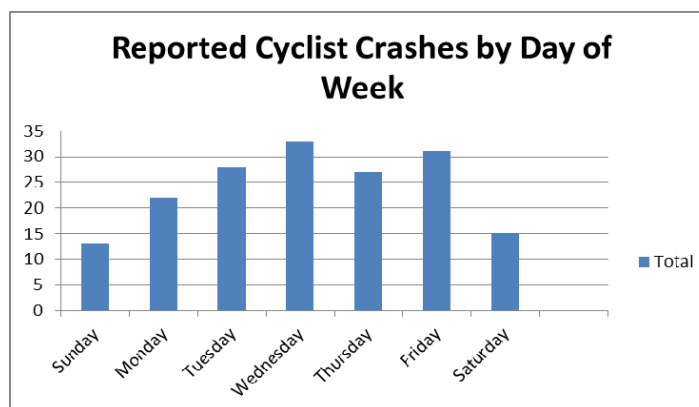


Figure 2. Reported Crashes by Day of Week

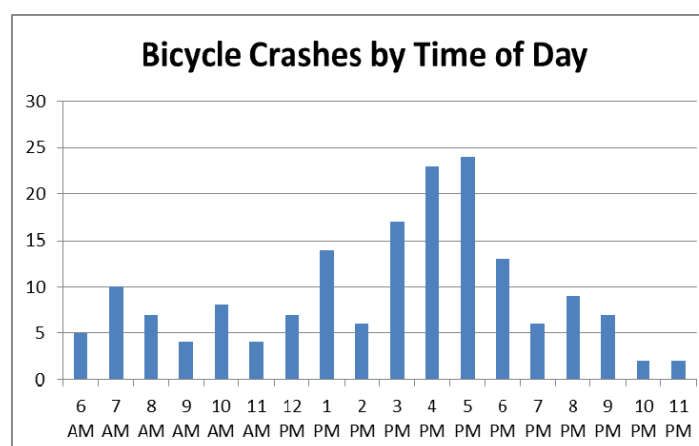


Figure 3. Reported Crashes by Time of Day

Reported Crash Locations

Map 1 shows the locations of reported crashes. These locations are likely the roadways where most bicycling occurs. These crashes are concentrated within the city boundaries and are located along several travel corridors including: Dell Range Boulevard, Lincolnway, South Greeley Highway, Yellowstone Road, 19th Street, Ridge Road and Pershing Boulevard.

² U.S. Department of Transportation. Traffic Safety Facts 1996: Pedalcyclists. <http://www.fars.nhtsa.dot.gov/www/library/file0022.pdf>. n.d. Web. March 1, 2011.

Table 2. Arterial Roadway Segments with Three or More Reported Cyclist Crashes

Roadway	From	To	Number Crashes	Corridor Length (MI)	Crashes per Mile
Dell Range Boulevard	Ridge Road	North College Drive	5	0.4	13.5
Yellowstone Road	Storey Boulevard	Dell Range Boulevard	10	0.7	13.4
East Lincolnway	Nationway	Converse Avenue	7	0.5	12.9
South Greeley Highway	Fox Farm Road	College Drive	13	1.0	12.7
Pershing Boulevard	Ridge Road	College Drive	5	0.4	12.5
Dell Range Boulevard	Converse Avenue	Ridge Road	10	0.9	11.2
Ridge Road	Dell Range Boulevard	Pershing Boulevard	9	1.0	8.7
East Lincolnway	Converse Avenue	Ridge Road	9	1.1	7.9
Dell Range Boulevard	Powderhouse Road	Converse Avenue	9	1.3	7.2
19th Street	Morrie Avenue	Converse Avenue	6	0.9	6.5
Lincolnway/16th Street	Ames Avenue	Central Avenue	4	0.6	6.2
Lincolnway/16th Street	Warren Avenue	Morrie Avenue	3	0.5	5.8
Yellowstone Road	Four Mile Road	Storey Boulevard	5	1.0	5.0
East 19th Street	Dey Avenue	Central Avenue	3	0.7	4.2
Dell Range Boulevard	Yellowstone Road	Powderhouse Road	4	1.1	3.6

Note: Crashes may be counted in multiple roadway segments if they occurred at a bounding intersection.

Table 2 lists roadway arterial roadway corridors where three or more crashes occurred. Corridors are defined by intersections with other arterial roadways and provide a generally homogenous travel environment for bicycles (e.g., posted speed, number of travel lanes and average daily motor vehicle volumes are typically consistent throughout the roadway segment). Roadways with greater numbers of reported crashes were generally correlated with higher crash rates, though exceptions did occur such as Dell Range Boulevard between Ridge Road and North College Drive.

Key observations from Table 2 and Map 1 include:

- The roadway segment with the highest crash rate is Dell Range Boulevard between Ridge Road and College Drive. In this area, Dell Range Boulevard is characterized as a Principal Arterial with four travel lanes, a center turn lane, with mixed retail commercial development and residential land uses. There are several driveway access points in this segment. Bicycle facilities are not defined for this section of roadway, but a shared use path runs along the south side of the roadway west of Ridge Road and Dell Range Boulevard becomes a shared roadway east of College Drive. Cyclists can cross Ridge Road along via an undercrossing of the Dry Creek Greenway approximately 200 feet south of Dell Range Boulevard.
- Dell Range Boulevard accounts for the greatest number of segments reported cyclist crashes. The roadway is characterized as a Principal Arterial with four travel lanes, a center turn lane/median and motor vehicle oriented land use. Bicycles are accommodated throughout the segments via shared use path on the south side of the roadway. Cyclists have called Pershing

Boulevard the most challenging place to bicycle in the city, but the roadway with the greatest number of crashes and highest crash rate is Dell Range Boulevard. This could be due in part to existing conditions, or the provision of existing bicycle facilities.

- The greatest number of crashes in any single segment occurred along South Greeley Highway. This roadway represents one of the few continuous travel corridors south of the railroad tracks.
- Arterial roadways within the central business district typically had lower crash rates than arterials located in areas characterized by more suburban style development.

While the higher number of reported collisions and higher crash rates create a compelling case for bicycle safety improvements, especially at roadway intersections, consideration of improvements should not be limited to only these arterial roadways. For example, four crashes occurred along Snyder Avenue, a collector roadway which provides a travel route parallel to arterial roadway couplets such as Warren Avenue and Central Avenue, which may be less comfortable for cyclists of varying ages and abilities. Additionally, Cheyenne's cyclists have reported a desire for improved facilities such as bicycle boulevards along local roadways that provide a high level of safety and comfort for many cyclists.

Table 3. Intersections with Multiple Reported Cyclist Collisions

Number of Crashes	Roadway 1	Roadway 2
6	Dell Range Blvd	Windmill Road
4	Pershing Boulevard	Ridge Road
3	Dell Range Blvd	Ridge Road
3	Western Hills Blvd	Yellowstone Road
2	Lincolnway/16th	Capitol Avenue
2	East 19 th Street	Alexander Ave
2	East 19 th Street	Warren Ave
2	Big Horn Avenue	Lincolnway
2	Bluegrass Circle	Dell Range Blvd
2	Carlson Street	Yellowstone Road
2	College Drive	S Greeley Highway
2	Converse Avenue	Lincolnway
2	Dell Range Boulevard	Frontier Mall Drive
2	Dell Range Boulevard	Seminole Road
2	Jefferson Road	S Greeley Highway
2	Logan Avenue	Nationway
2	Pershing Boulevard	Windmill Road
2	Prosser Road	S Greeley Highway

Many reported crashes (39 percent) occurred at roadway intersections while an additional one-third of crashes were somehow related to roadway intersections and approximately 14 percent were associated with a driveway.³ Table 3 shows the 12 intersections in Cheyenne experiencing two or more reported bicycle crashes. Many of these intersections are located along the roadway corridors reported in Table 2, further indicating a potential need for bicycle safety improvements along these streets. These crashes most commonly occur at intersections of two higher-order streets (e.g., collector-collector or collector-arterial) rather than at local neighborhood streets. Intersections with more than one reported crash typically include multiple travel lanes, slip lanes that allow drivers to make right turns without slowing or high volumes of left- or right-turning vehicle traffic.

Table 4 provides a summary of cyclist and motorist actions during reported collisions. In most cases, the cyclist was traveling in a straight line and the motor vehicle was going straight or turning right.

Table 4. Cyclist and Motorist Actions During Reported Crashes

Cyclist Action	Motorist Action									
	Backing	U-Turn	Overtake	Slowing	Start	Stopped	Straight	Turn Left	Turn Right	Total
Backing							1			1
Change Lanes			1				1			2
Other							2		1	3
Slowing							1			1
Starting					1		4		1	6
Stopped							1	1		2
Straight	2	1		1	11	4	56	15	38	128
Turn Left							3			3
Turn Right							1			1
Total	2	1	1	1	12	4	70	16	40	147 ⁴

Key findings from Table 4 include:

- Crashes most frequently occurred with both the cyclist and motor vehicle were traveling in a straight line. Reasons for these crashes most commonly include a motorist overtaking a cyclist, or a cyclist/motorist failing to yield the right-of-way at an intersection.
- Crashes involving a right-turning motor vehicle are more frequent than those involving a left-turning motor vehicle.
- Right-hook crashes (crashes that occur when a cyclist is going straight and a motor vehicle is turning right) account for nearly 25% of incidents. These types of crashes most frequently

³ Additional details of 'intersection related' classification was not available in the reported data.

⁴ Information about Vehicle 1 or Vehicle 2 was incomplete for 22 crashes

occur in circumstances where the cyclist is not clearly visible (e.g., due to the cyclist's position in the travel lane).

A significant number of injury crashes involved turning motor vehicles. The comparatively high number of crashes attributed to vehicle turning movements is not unique to Cheyenne. This trend may indicate issues with intersection control, motorist failure to yield to bicyclists, or a lack of general awareness of bicyclists on the roadway. For instance, when a cyclist is traveling on a shoulder bikeway, they may be on the right side of a vehicle right-turn-only lane creating a direct conflict point between right-turning motorists and through bicyclists.

Conclusion

In absence of bicycle count data, collision data provides insight into the time of year, time of day and locations where people cycle. The data suggest that people bicycle at all times of the year, but that there are more bicyclists on the roads in months with better weather (May through September). The data also suggests that people bicycle all throughout the daylight hours and into the evening, but reported crashes occur with the greatest frequency in the afternoon.

Most of the streets where reported crashes occurred are major streets with multiple travel lanes in either direction that can create more challenging travel conditions for cyclists. These roadways provide access to destinations of interest for both cyclists and motorists; in several locations alternative routes do not exist, or would require significant out of direction travel. Most of the roads with frequent crashes do not have dedicated cycling facilities (e.g., West Lincolnway) and require cyclists to share a travel lane with motorists or ride on a sidewalk, circumstances that can increase the risk of a crash.

Alternate routes can be provided on lower-volume streets, while a complimentary network of signage can direct cyclists to routes that are safer for bicycling. However, while it may be desirable to provide bicycle facilities to encourage bicycle travel on less-traveled streets, key destinations such as stores, restaurants, and employment sites are often located on major streets. It is thus important to provide facilities to enable bicyclists to travel safely on streets with key destinations. Furthermore, bicyclists travel on major streets because they often provide the most direct route to their destinations. Finally, some busy streets (e.g., Dell Range Boulevard, South Greeley Highway, Ridge Road and West College Drive) do not have a lower-volume parallel street that is better suited for bicycles due to a lack of street connectivity. For the above reasons, creating multi-modal streets is a worthy goal of this planning effort.

Documentation of Cost Assumptions

This page intentionally blank

Development of cost opinions

The planning level unit costs include preliminary estimates of material unit costs based in part on average WYDOT cost bids, and estimates from Cheyenne and other cities. Table 1 shows a menu of costs that may be associated with the construction of various on-street bicycle facilities. The costs should be reviewed with the following considerations in mind:

- Burden rate (30%) is inclusive of contingency, engineering, public process, design, construction overhead, mobilization, and management.
- Assumes water based paint, epoxy based paint requires less frequent maintenance and may be considered as a cost saving measure.
- All projects except the shoulder bikeway assume the presence of a curb and no parking. An additional stripe should be included in a cost opinion when motor vehicle parking is present.

When costs from cities outside the region were used to estimate material costs, adjustments were made based on the KS Means Siteworks and Landscape Cost Data guide. Important assumptions used to arrive at these estimates include:

- Costs do not include property acquisition and utilities
- Standard construction methods and materials are used

These preliminary estimates are based on a planning-level understanding of components, rather than on a detailed design. They should be considered as planning level cost opinions that indicate the relative magnitude of likely cost. Given the level of uncertainty in the design at this point in the process and implementation timeframe of this Plan, many factors can affect final construction costs may change, including:

- Final construction phasing
- Selected alignment
- Revisions to the design as required by local, state and federal permitting agencies
- Additional requirements imposed by property owners as a condition of granting property rights (e.g., fencing, vegetated buffers, etc.)
- Fluctuations in commodity prices during the design and permitting processes
- Selected construction materials
- Type and quantity of amenities (e.g., construction material, pavement markings, striping, etc.)
- Availability of donated materials and volunteer labor
- Property acquisition

As each project progresses through preliminary, semi-final and final design phases, these uncertainties begin to diminish. With each round of refinement a range of expected construction costs will become more accurately known.

Table 1. Bicycle Facility Cost Menu for Raw Materials						
Bicycle Boulevard						
Item Description	Unit	Quantity per mile	Unit Price	Total	Notes	Source/Notes
Signs (MUTCD)	EA	26	\$170.00	\$4,488.00	Every 400' each direction	City of Cheyenne Pedestrian Plan
Pavement markings, bike w/chevron (Thermoplastic)	EA	53	\$392.00	\$20,697.60	Every 200' each direction	Flint Trading PreMark Price Guide
Pavement markings, bike w/chevron (Paint)	EA	53	\$129.74	\$6,875.96	Every 200' each direction	City of Tehachapt, CA. Adjusted using KS Means Siteworks and Landscape Guide
Turn stop signs	EA	4	\$300.00	\$1,200.00	4 intersections per mile	City of Eugene, Oregon
Median refuge island	EA	1	\$20,000.00	\$20,000.00	1 per mile	Cost will vary with the physical dimensions of the installation
Curb Extensions	EA	2	\$75,000.00	\$150,000.00	2 intersections per mile.	Curb extensions downtown Cheyenne have historically cost \$50-100,000 per intersection including pavers, etc. Drainage requirements have a significant impact on installation cost. If storm sewer is not present, it may not be possible to install curb extensions.
Annual Maintenance						
Sign replacement (MUTCD)	EA	2.6	\$170.00	\$448.80	10% of total sign cost per mile budgeted for annual replacement	City of Cheyenne Pedestrian Plan
Pavement marking replacement, bike w/chevron (Thermoplastic)	EA	7	\$392.00	\$2,587.20	7 markings per mile replaced annually	City of Cheyenne, phone conversation April 2012
Pavement marking replacement, bike w/chevron (Paint)	EA	53	\$129.74	\$6,875.96	Annually	City of Tehachapt, CA. Adjusted using KS Means Siteworks and Landscape Guide

Buffered Bike Lane - 7 ft with 2 ft buffer						
	Unit	Quantity per mile	Unit Cost	Cost	Notes	Source/Notes
Striping removal	LF	5,280	\$0.87	\$4,572.06	2 vehicle lanes in each direction, 4 stripes total	Chicago, IL. Adjusted using KS Means Siteworks and Landscape Guide
Striping bike lanes and travel lanes (paint)	LF	5,280	\$1.52	\$8,025.60	2 vehicle lanes, 1 bike lane, plus extra paint for buffer (3 lines per buffered bike lane and travel lane plus two smaller lines for buffer) in each direction, 10 stripes total	City of Cheyenne quotes a cost of \$0.20. A similar cost of \$0.18 per LF was found in Boulder, Co. Interior buffer stripes cost approximately 2/3 the cost of a travel lane stripe.
Striping bike lanes only (paint)	LF	5,280	\$1.32	\$6,969.60	2 bike lanes, plus buffer (2 lines per buffered bike lane) 8 stripes total	City of Cheyenne quotes a cost of \$0.20. A similar cost of \$0.18 per LF was found in Boulder, Co. Interior buffer stripes cost approximately 2/3 the cost of a travel lane stripe.
Signs (MUTCD)	EA	26	\$170.00	\$4,488.00	Every 400' each direction	Source City of Cheyenne Pedestrian Plan
Pavement markings, standard bike rider w/arrow (Thermoplastic)	EA	53	\$296.00	\$15,628.80	Every 200' each direction	Flint Trading PreMark Price Guide
Pavement markings, standard bike rider w/arrow (Paint)	EA	53	\$133.92	\$7,097.76	Every 200' each direction	City of Tehachapt, CA. Adjusted using KS Means Siteworks and Landscape Guide
Annual Maintenance						
Pavement marking replacement, standard bike rider w/arrow (Thermoplastic)	EA	7	\$296.00	\$1,953.60	7 markings per mile replaced annually	Source Flint Trading PreMark 2012 Price Guide

Pavement marking replacement, standard bike rider w/arrow (Paint)	EA	53	\$133.92	\$7,097.76	Annually	City of Tehachapt, CA. Adjusted using KS Means Siteworks and Landscape Guide
Re-striping bike lanes only (paint)	LF	5,280	\$1.32	\$6,969.60	2 bike lanes, plus buffer (2 lines per buffered bike lane) 8 stripes total	City of Cheyenne quotes a cost of \$0.20. A similar cost of \$0.18 per LF was found in Boulder, Co. Interior buffer stripes cost approximately 2/3 the cost of a travel lane stripe.
Sign replacement (MUTCD)	EA	2.6	\$170.00	\$448.80	10% of total sign cost per mile budgeted for annual replacement	City of Cheyenne Pedestrian Plan
Bike Lane						
Item Description	Unit	Quantity per mile	Unit Cost	Total	Notes	Source/Notes
Striping removal	LF	5,280	\$0.87	\$4,572.06	Assumes 2 lanes in each direction, 4 stripes total	Chicago, IL. Adjusted using KS Means Siteworks and Landscape Guide
Striping bike lanes and travel lanes (paint)	LF	5,280	\$1.20	\$6,336.00	2 vehicle lanes and 1 bike lane in each direction. 6 stripes total	City of Cheyenne quotes a cost of \$0.20. A similar cost of \$0.18 per LF was found in Boulder, Co.
Striping bike lane only (paint)	LF	5,280	\$0.40	\$2,112.00	Bike lane in each direction, 2 stripes	City of Cheyenne quotes a cost of \$0.20. A similar cost of \$0.18 per LF was found in Boulder, Co.
Pavement markings, standard bike rider w/arrow (Thermoplastic)	EA	53	\$296.00	\$15,628.80	Every 200' each direction	Source Flint Trading PreMark Price Guide
Pavement markings, standard bike rider w/arrow (Paint)	EA	53	\$133.92	\$7,097.76	Standard Bike Rider and Arrow	City of Tehachapt, CA. Adjusted using KS Means Siteworks and Landscape Guide

Signs (MUTCD)	EA	26	\$170.00	\$4,488.00	Every 400' each direction	City of Cheyenne, Pedestrian Plan
Annual Maintenance						
Re-stripping bike lanes (paint)	LF	5,280	\$0.40	\$2,112.00	Bike lanes in each travel directions, 2 stripes	City of Cheyenne quotes a cost of \$0.20. A similar cost of \$0.18 per LF was found in Boulder, Co.
Sign replacement (MUTCD)	EA	2.6	\$170.00	\$448.80	10% of total sign cost per mile budgeted for annual replacement	City of Cheyenne, Pedestrian Plan
Pavement marking replacement, standard bike rider w/arrow (Thermoplastic)	EA	7	\$296.00	\$1,953.60	7 markings per mile replaced annually	Source Flint Trading PreMark Price Guide
Pavement marking replacement, standard bike rider w/arrow (Paint)	EA	53	\$133.92	\$7,097.76	Annually	City of Tehachapt, CA. Adjusted using KS Means Siteworks and Landscape Guide
Shoulder Bikeway						
Item Description	Unit	Quantity per mile	Unit Cost	Total	Notes	Source/Notes
Clearing and grubbing	LF	5,280	\$0.26	\$1,373.00	12' wide corridor on each side	WYDOT Average Price Bid
Grading	LF	5,280	\$3.68	\$19,430.00	12' wide corridor on each side	Eugene, Oregon. Highly dependent on where the road side ditches are located. If ditches have to be moved, cost could be significantly higher.
Saw cut	LF	5,280	\$8.36	\$44,141.00	Assumes 6" deep cut on each side of the road	\$2 - 4" deep, \$5 - 6" deep Source: City of Tehachapt, CA. Adjusted using KS Means Siteworks and Landscape Cost Data.
8 in. asphalt	SY	9,387	\$35.00	\$328,533.33	8' wide paved corridor	WYDOT

4 inch base course	SY	9,387	\$6.20	\$58,197.33	4" base course under pavement, both sides of the road	Source: Barnum North Mountain Bike Skills Park, Colorado. . Adjusted using KS Means Siteworks and Landscape Cost Data.
8 inch sub-base course	SY	9,387	\$12.40	\$116,394.67	8" base course under pavement, both sides of the road	Source: Barnum North Mountain Bike Skills Park, Colorado. . Adjusted using KS Means Siteworks and Landscape Cost Data.
Restoration	LF	5,280	\$1.00	\$5,280.00	10' wide corridor on both sides of the road	City of Cheyenne, phone conversation April 2012
Striping (paint)	LF	5,280	\$0.40	\$2,112.00	Fogline in each direction to demark the bicycle facility	City of Cheyenne quotes a cost of \$0.20. A similar cost of \$0.18 per LF was found in Boulder, Co.
Pavement markings, standard bike rider w/arrow (Thermoplastic)	EA	53	\$296.00	\$15,628.80	Every 200' each travel direction	Source Flint Trading PreMark Price Guide
Pavement markings, standard bike rider w/arrow (Thermoplastic)	EA	53	\$133.92	\$7,097.76	Every 200' each travel direction	City of Tehachapt, CA. Adjusted using KS Means Siteworks and Landscape Guide
Signs (MUTCD)	EA	26	\$170.00	\$4,488.00	Every 400' each tavel direction	City of Cheyenne, Pedestrian Master Plan
Annual Maintenance						
Re-striping (paint)	LF	5,280	\$0.40	\$2,112.00	Bike lanes, both travel directions, 4 stripes	City of Cheyenne quotes a cost of \$0.20. A similar cost of \$0.18 per LF was found in Boulder, Co.
Sign replacement (MUTCD)	EA	2.6	\$170.00	\$448.80	10% of total sign cost per mile budgeted for annual replacement	City of Cheyenne, Pedestrian Plan
Pavement marking replacement, standard bike rider w/arrow (Thermoplastic)	EA	7	\$296.00	\$1,953.60	7 markings per mile replaced annually	Source Flint Trading PreMark 2012 Price Guide

Pavement marking replacement, standard bike rider w/arrow (Paint)	EA	53	\$133.92	\$7,097.76	Annually	City of Tehachapt, CA. Adjusted using KS Means Siteworks and Landscape Cost Data
Shared Lane Marking						
Item Description	Unit	Quantity per mile	Unit Cost	Total	Notes	Source/Notes
Pavement markings, bike w/chevron (Thermoplastic)	EA	53	\$392.00	\$20,697.60	Every 200' each travel direction	Source Flint Trading PreMark Price Guide
Pavement markings, bike w/chevron (Paint)	EA	53	\$129.74	\$6,875.96	Every 200' each travel direction	City of Tehachapt, CA. Adjusted using 2010 KS Means Siteworks and Landscape Cost Data
Signs (MUTCD)	EA	26	\$170.00	\$4,488.00	Every 400' each travel direction	City of Cheyenne, 2009 Pedestrian Plan
Annual Maintenance						
Sign replacement (MUTCD)	EA	2.6	\$170.00	\$448.80	10% of total sign cost per mile budgeted for annual replacement	City of Cheyenne, Pedestrian Plan
Pavement marking replacement, bike w/chevron (Thermoplastic)	EA	7	\$392.00	\$2,587.20	7 markings per mile replaced annually	Source Flint Trading PreMark Price Guide
Pavement marking replacement, bike w/chevron (Paint)	EA	53	\$129.74	\$6,875.96	Annually	City of Tehachapt, CA 2012 Costs. Adjusted using 2010 KS Means Siteworks and Landscape Cost Data

Facility Cost Opinions

In order to help planners, the public, and decision makers to understand potential facility development costs, Tables 2 through 5 provide a low and high cost opinion for each recommended on-street bicycle facility type. Master cost tables for each on-street facility type provide a list of potential costs that may be associated with each type of on-street facility (e.g., pavement marking symbols that may be constructed from either paint or thermoplastic). These tables can be used to select the line items that apply to each project when staff are developing a preliminary cost opinion for each project. Table 6 provides a comparison of facility costs in several US cities.

Table 2. Bike Boulevard

Bike Boulevard		Low Estimate		High Estimate
	Element	Cost (Mi)	Element	Cost (Mi)
Installation	Signs (MUTCD)	\$4,488.00	Signs (MUTCD)	\$4,488.00
	Pavement marking replacement, standard bike rider w/arrow (Paint)	\$7,097.76	Pavement markings, bike w/chevron (Thermoplastic)	\$20,697.60
			Turn stop signs	\$1,200.00
			Median refuge island	\$20,000.00
			Curb Extensions	\$150,000.00
Total	Material cost per mile	\$11,585.76	Material cost per mile	\$196,385.60
	Burdened cost per mile	\$15,061.49	Burdened cost per mile	\$255,301.28
	Burdened cost per linear foot	\$2.85	Burdened cost per linear foot	\$48.35
Annual Maintenance	Sign replacement (MUTCD)	\$448.80	Sign replacement (MUTCD)	\$448.80
	Pavement marking replacement, bike w/chevron (Paint)	\$6,875.96	Pavement marking replacement, bike w/chevron (Thermoplastic)	\$2,587.20
Annual maintenance per mile		\$7,324.76	\$3,036.00	
Annual maintenance per linear foot		\$1.39	\$0.58	

Table 3. Buffered Bike Lane

Buffered bike lane		Low Estimate		High Estimate
	Element	Cost (Mi)	Element	Cost (Mi)
Installation	Signs (MUTCD)	\$4,488.00	Signs (MUTCD)	\$4,488.00
	Pavement markings, standard bike rider w/arrow (Paint)	\$7,097.76	Pavement markings, standard bike rider w/arrow (Thermoplastic)	\$15,628.80
	Striping bike lanes only	\$6,969.60	Striping removal	\$4,572.06
			Striping bike lanes and travel lanes (paint)	\$8,025.60
Total	Material cost per mile	\$18,555.36	Material cost per mile	\$32,714.46
	Burdened cost per mile	\$24,121.97	Burdened cost per mile	\$42,528.79
	Burdened cost per linear foot	\$4.57	Burdened cost per linear foot	\$8.05
Annual Maintenance	Sign replacement (MUTCD)	\$448.80	Sign replacement (MUTCD)	\$448.80
	Pavement marking replacement, bike w/chevron (Paint)	\$6,875.96	Pavement marking replacement, standard bike rider w/arrow (Thermoplastic)	\$1,953.60
	Re-striping bike lanes only (paint)	\$6,969.60	Re-striping bike lanes only (paint)	\$6,969.60
	Annual maintenance per mile	\$14,294.36		\$9,372.00
Annual maintenance per linear foot		\$2.71		\$1.78

Table 4 Standard Bike Lane

Bike lane		Low Estimate		High Estimate
Installation	Element	Cost (Mi)	Element	Cost (Mi)
	Signs (MUTCD)	\$4,488.00	Signs (MUTCD)	\$4,488.00
	Pavement markings, standard bike rider w/arrow (Paint)	\$7,097.76	Pavement markings, standard bike rider w/arrow (Thermoplastic)	\$15,628.80
	Striping bike lane only (paint)	\$2,112.00	Striping removal	\$4,572.06
			Striping bike lanes and travel lanes (paint)	\$6,336.00
Total	Material cost per mile	\$13,697.76	Material cost per mile	\$31,024.86
	Burdened cost per mile	\$17,807.09	Burdened cost per mile	\$40,332.31
	Burdened cost per linear foot	\$3.37	Burdened cost per linear foot	\$7.64
Annual Maintenance	Sign replacement (MUTCD)	\$448.80	Sign replacement (MUTCD)	\$448.80
	Pavement marking replacement, standard bike rider w/arrow (Paint)	\$7,097.76	Pavement marking replacement, standard bike rider w/arrow (Thermoplastic)	\$1,953.60
	Re-striping bike lanes (paint)	\$2,112.00	Re-striping bike lanes (paint)	\$2,112.00
Annual maintenance per mile		\$9,658.56	\$4,514.40	
Annual maintenance per linear foot		\$1.83	\$0.86	

Table 5 Shoulder Bikeway

Shoulder Bikeway		Low Estimate		High Estimate
Installation	Element	Cost (Mi)	Element	Cost (Mi)
	Striping (paint)	\$ 2,112.00	Clearing and grubbing	\$ 1,373.00
	Pavement markings, standard bike rider w/arrow (Thermoplastic)	\$ 7,097.76	Grading	\$ 19,430.00
	Signs (MUTCD)	\$ 4,488.00	Saw cut	\$ 44,141.00
			8 in. asphalt	\$ 328,533.33
			4 inch base course	\$ 58,197.33
			8 inch sub-base course	\$ 116,394.67
			Restoration	\$ 5,280.00
			Striping (paint)	\$ 2,112.00
			Pavement markings, standard bike rider w/arrow (Thermoplastic)	\$ 15,628.80
			Pavement markings, standard bike rider w/arrow (Thermoplastic)	\$ 7,097.76
			Signs (MUTCD)	\$ 4,488.00
Total	Material cost per mile	\$ 13,697.76	Material cost per mile	\$ 602,675.89
	Burdened cost per mile	\$ 17,807.09	Burdened cost per mile	\$ 783,478.66
	Burdened cost per linear foot	\$ 3.37	Burdened cost per linear foot	\$ 148.39
Annual Maintenance	Signs (MUTCD)	\$ 4,488.00	Signs (MUTCD)	\$ 4,488.00
	Pavement marking replacement, standard bike rider w/arrow (Paint)	\$ 7,097.76	Pavement marking replacement, standard bike rider w/arrow (Thermoplastic)	\$ 7,097.76
	Re-striping (paint)	\$ 2,112.00	Re-striping (paint)	\$ 2,112.00
Annual maintenance per mile		\$ 13,697.76	\$ 13,697.76	
Annual maintenance per linear foot		\$ 2.59	\$ 2.59	

Table 6 Shared Lane Markings

Shared Lane Marking		Low Estimate		High Estimate
Installation	Element	Cost (Mi)	Element	Cost (Mi)
	Signs (MUTCD)	\$4,488.00	Signs (MUTCD)	\$4,488.00
	Pavement markings, bike w/chevron (Paint)	\$6,875.96	Pavement markings, bike w/chevron (Thermoplastic)	\$20,697.60
Total	Material cost per mile	\$11,363.96	Material cost per mile	\$25,185.60
	Burdened cost per mile	\$14,773.14	Burdened cost per mile	\$32,741.28
	Burdened cost per linear foot	\$2.80	Burdened cost per linear foot	\$6.20
Annual Maintenance	Sign replacement (MUTCD)	\$448.80	Sign replacement (MUTCD)	\$448.80
	Pavement marking replacement, bike w/chevron (Paint)	\$6,875.96	Pavement marking replacement, bike w/chevron (Paint)	\$6,875.96
Annual maintenance per mile		\$7,324.76	\$7,324.76	
Annual maintenance per linear foot		\$1.39	\$1.39	

Table 7 Comparison of Unit Costs

Item Description	Cost Unit					
	Cost Unit	Cheyenne	Eugene	Orem	Salt Lake City	Colorado (Various)
Striping (paint + glass beads) (6 inch with stripe)	LF	\$0.20	\$1.13	\$0.12	\$0.13	\$0.17
Bicycle Pavement Markings	EA	\$75.00	\$250.00		\$150.00	150-200
Signs	EA	\$100.00		\$600.00	\$35.00	\$300.00
Poles	EA	\$70.00			\$40.00	
Curb Extensions	EA	\$6,000.00				
Warning Signs	EA	\$300.00			\$35.00	
Pedestrian Refuge Island	EA		\$20,000.00			
Turn Stop Signs	EA		\$300.00			
Stripe Removal	LF				\$0.60	
Clearing and Grubbing	LF		\$1.79			\$1.15
Grading	LF		\$1.84			
Saw Cut	LF		\$2.44			
8 in. asphalt	SY		\$30.00			\$35.00
4 in. base course	SY		\$5.00			
8 in. sub-base course	SY		\$7.50			
6 in. base course	SY					\$10.50
9 in. sub-base course	SY					\$15.30
Restoration	LF		\$2.00			

Working Paper #9: Project Evaluation Criteria

This page intentionally blank

Memorandum



To: Cheyenne On-Street Bicycle Plan and Greenway Plan Update Bicycle Advisory Committee

From: Rory Renfro and Kim Voros, *Alta Planning + Design*

Date: August 29, 2011

Re: Working Paper #9 Project Evaluation Criteria

The Cheyenne On-Street Bicycle Plan and Greenways Plan Update will focus implementation efforts where they will provide the greatest community benefit. While all projects represent important steps for improving Cheyenne's on-street bikeway and Greenway system, limited financial resources require a prioritization mechanism.

This memorandum describes evaluation criteria that can be used to evaluate on-street bikeway and greenway infrastructure improvements (Table 1) and supportive programs (Table 2). These criteria can be considered together to evaluate projects based on the relative benefit, 'neutral,' 'moderate,' or 'high' benefit score assigned to each criterion. The goal is to develop three tiers of project priorities so that Cheyenne can focus funding and funding applications on the highest priority projects. The resulting ranked project lists should be considered 'living documents' and should be reviewed regularly to confirm that they reflect Cheyenne's current priorities.

Table 1. Infrastructure Evaluation Criteria

Criteria	Definition
Suitability for bicycling with and without improvements	To what extent is the on-street facility already suitable for cycling?
Closing Gaps	To what degree does the project fill a missing gap or overcome a barrier in the current system?
Safety and Comfort	Can the project improve walking and bicycling conditions at locations with perceived or documented safety issues? Does the project make cycling and trail use comfortable for all users?
Access & Mobility/Land Use	How many user generators does the project connect within a reasonable walking or cycling distance? Are adjacent land uses supportive of walking and bicycling? To what degree will the project generate users?
Multi-modal Connections	To what degree does the project integrate cycling into the existing transit system?
Has Community Support	Project was mentioned through the public planning process.
Cycling Level of Service	To what extent does the project increase the Cycling Level of Service? Will the improvement provide facilities in a neighborhood received a low score for the quality of the existing cycling experience during Cycle Zone Analysis.
Serves an Immediate Safety Need	To what extent the project improve conditions at locations with a history of reported bicycle crashes.
Low Stress Facility	To what extent can cyclists expect to feel safer and more comfortable because the stress of negotiating with motorists for space in the roadway has been reduced or eliminated by design.

Table 2. Programmatic Evaluation Criteria

Criteria	Definition
Reach	How many Cheyenne residents will be reached through this program concept?
Resources needed	How resource-intensive will this effort be, considering staff time, materials, and other expenses?
Reaches new audiences	To what extent will this effort help Cheyenne residents who currently do not bicycle give bicycling a try?
Buy-in from partners	To what extent will this effort require coordination and pro-active support from agency and community partners beyond the City of Cheyenne and the Cheyenne MPO?
Community need/feedback	To what extent have stakeholders and Cheyenne community members identified this program concept as a need, or to what extent have community members specifically requested this program?

Criteria Measurement

Each evaluation criterion will be assigned relative level of benefit shown in Table 3. Tables 4 and 5 show how each criterion will be measured.

Table 3. Prioritization Rating Criteria

Benefit Ranking	
Neutral Benefit	○
Moderate Benefit	◐
High Benefit	●

Table 4. Application of Infrastructure Project Evaluation Criteria

Criteria	Ranking	Measurement
Closing Gaps	●	Project is within a 1/8 mile of existing on-street bikeway or Greenway. The network gap may be any length.
	◐	Project is within a 1/4 mile of existing on-street bikeway or Greenway. The network gap may be any length.
	○	Project within a 1/2 mile of existing on-street bikeway or Greenway. The network gap may be any length.
Safety & Comfort	●	The project will create an off-street facility separated from motor vehicle traffic.
	◐	The project will improve facilities where at least one reported bicycle crash has occurred in the last ten years
	○	The project is on-street and does not have a history of reported bicycle crash
Access & Mobility/ Land Use	●	Within 1/8 of existing multi-use, commercial or institutional land uses, schools, parks open space, or other activity center
	◐	Within 1/4 of existing multi-use, commercial or institutional land uses, schools, parks open space, or other activity center
	○	Within 1/2 of existing multi-use, commercial or institutional land uses, schools, parks open space, or other activity center
Multi-modal Connections	●	Project within 1/8 mile of transit service
	◐	Project within 1/4 mile of transit service
	○	Project within 1/2 mile of transit service
Community Support	●	Project was mentioned in during the public involvement process
	◐	
	○	Project was not mentioned during the public involvement process
Improves Cycling Level of Service	●	Project is located in a zone scoring in the lowest tier during Cycle Zone Analysis
	◐	Project is located in a zone scoring in the middle tier during Cycle Zone Analysis
	○	Project is located in a zone scoring in the highest tier during Cycle Zone Analysis
Suitability for bicycling with and without improvements	●	Proposed facility is off-street or on a local/neighborhood roadway
	◐	Project is on-street and the roadway is classified as a minor arterial or collector
	○	Facility requires additional work to create a safe and comfortable cycling facility
Serves an immediate safety need	●	Project identified as a location of previously reported within 1/16 mile of reported bicycle crash
	◐	Project within 1/8 mile of reported bicycle crash
	○	Project is not near a crash location
Low Stress Facility	●	Proposed improvement is a bicycle boulevard or off-street facility
	◐	Proposed improvement is a buffered bike lane
	○	Proposed improvement is a bike lane, shared lane marking, or shoulder bikeway

Table 5. Application of Programmatic Project Evaluation Criteria

Criteria	Ranking	Measurement
Reach (# of people reached)	●	Likely to reach over 50 people annually
	◐	Likely to reach 25 – 50 people annually
	○	Likely to reach fewer than 25 people annually
Resources needed	●	Low budget/staff time required
	◐	Medium budget/staff time required
	○	High budget/staff time
Reaches new audiences	●	Primarily reaches residents who never or very infrequently use bicycles
	◐	Primarily reaches residents who may bicycle occasionally; helps them increase the frequency of use
	○	Primarily reaches residents who already use bicycles regularly
Buy-in from partners	●	Low level of partner coordination required; can largely be completed by City/MPO
	◐	Moderate level of agency/community partner coordination needed (e.g. steering committee will be needed, but City/MPO feel confident that they can execute the partner involvement and complete the project)
	○	High level of agency/community partner coordination needed (e.g. City/MPO are not the appropriate lead agency; significant support and participation from other groups will be required to successfully complete the project)
Community need/feedback	●	High level of community feedback related to this program concept and/or the problem this program addresses (e.g. numerous members of the public brought up the program concept; BAC members stated that the program is a priority)
	◐	Moderate level of community feedback related to this program concept and/or the problem this program addresses (e.g. several community members brought up this program/need in public meetings or through the BAC)
	○	Low level of community feedback related to this program concept and/or the problem this program addresses

Working Paper #10: Recommended Bicycle Support Facilities

This page intentionally blank

Memorandum



To: Jeff Wiggins, *City of Cheyenne* and Sreyoshi Chakraborty *Cheyenne Metropolitan Planning Organization*

From: Rory Renfro and Kim Voros, *Alta Planning + Design*

Date: August 25, 2011

Re: Working Paper #10: Bicycle Support Facilities

The term 'bicycle support facilities' refers to bicycle parking and other end-of-trip facilities such as showers and clothing lockers for cyclists; signal loop detectors, an element of the street network, which aids cyclists crossing at intersections; wayfinding signing, which directs cyclists 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. *Plan Cheyenne* and several other City and Metropolitan Planning Organization (MPO) documents endorse the development and provision of bicycle support facilities.

Bicycle Parking and End of Trip Facilities

Bicycle parking is an important component in encouraging people to use their bicycles for everyday transportation. Studies have shown that people are willing to bicycle more frequently if better bicycle facilities are provided¹. Peoples' needs for bicycle parking range from short term parking near a destination such as a grocery store, to more long term storage. A bicycle locker offers protection from weather, theft and vandalism, as well as potential space for gear storage, and 24-hour personal access. Most bicycles today cost 350 dollars to over 2,000 dollars and are one of the top stolen items in some communities, with components being stolen even when the bicycle frame itself is securely locked

This portion of the memorandum outlines best practices for bicycle parking facility types and the requirements of short- and long-term parking. This memorandum recommends policies that the City of Cheyenne could adopt to require or encourage developers to provide the most appropriate bicycle parking facilities possible, as well as identifying a City bike rack program.

Bicycle Parking Facility Types

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

¹ Pucher, J., Dill, J. and Handy, S. (2010). *Infrastructure, programs, and policies to increase bicycling: An international review*. Preventative Medicine 50:S106-S125.

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 / or 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.

Table 1 compares the typical characteristics of short and long term bicycle parking.

Table 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 secured 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: <ul style="list-style-type: none"> • “Individual-secure” (e.g., bicycle lockers) • “Shared-secure” (e.g., bicycle room or outdoor enclosure) Supervised: <ul style="list-style-type: none"> • 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)

Existing Conditions for End of Trip Facilities

Short-term bicycle parking facilities in Cheyenne are located at the Laramie County Library, retail locations near the downtown core, schools, and parks. All state government buildings provide long term bicycle

parking, although it is not accessible to the public. A few bus stops and the Cheyenne Transit Program (CTP) Transfer Station have bike racks on the sidewalk but do not provide long-term parking.

The quality of existing short-term bike parking facilities varies by location, particularly due to the style of rack chosen and/or placement of the rack. Some existing racks near schools and shopping areas are substandard because they are not designed to support a bicycle at two points; the bicycle frame and at least one wheel cannot be locked to the rack without the use of a long bicycle cable or mounting the bicycle over the rack.

Informal bike parking (bikes being locked to hand rails, street signs, light poles and other objects) indicates a demand for additional bike parking supply. Some bikes have been informally parked throughout Cheyenne, including at multi-family residences, suggesting that insufficient formal bike parking is being provided or that it is not conveniently located in close proximity to a storefront or building entrance.

The location of showers and changing facilities is difficult to track as they may be supplied by a private entity, such as the owner of a public office building. Facilities exist in several state buildings but are not available for use by the general public.

Existing Bicycle Parking Code

Cheyenne's bicycle parking standards are located in Chapter 9 of the *Road Street & Site Planning Design Standards*. These standards discuss the need for both short-term and long-term bicycle parking as necessary to promote bicycle use throughout the system. The standards state the facilities should be designed in accordance with design guidelines set forth in Chapter 2 of the American Association of State Highway and Transportation Officials (AASHTO) 1999 *Guide for the Development of Bicycle Facilities*. Other factors that impact the usefulness of bicycle parking are discussed and include:

- Visibility
- Security
- Weather Protection
- Clearance
- Bicycle Parking Supply

The existing guidelines, shown in Table 2, provide bicycle parking supply recommendations that are based on land use and motor vehicle parking supply. Some land uses (e.g., public transit stations) do not have explicit standards set forth in the current design standards.

Table 2. Current Bicycle Parking Standards, Source: Road, Street and Site Planning Design Standards

Type of Establishment	Minimum Number of Bicycle Parking Spaces
Primary or Secondary School	10% of the number of students, plus 3% of the number of employees.
College or University	3% of the number of students, plus 1% of the number of employees.
Commercial—Retail or Office	One space per 10,000 sq. ft. of commercial space or 10% of the number of automobile spaces.
Sport and Recreation Center	5% of the number of automobile spaces.
Movie Theater or Restaurant	5% of the number of automobile spaces.
Industrial	2% of the number of automobile spaces.
Multi-unit Housing	1 space per 2 apartments.
Public Transit Stations	Varies, depending on usage.

Overview of Best Practices for Bicycle Parking and Changing Facilities

Short-Term Bicycle Parking

The majority of short-term bicycle parking facilities are racks placed on a sidewalk or in a private development near a building entrance. Key characteristics to consider when choosing a bicycle rack include the following:

- **Support:** The rack must support the bicycle upright by its frame at two points in a horizontal plane to prevent the bicycle from falling.
- **Security:** The rack must be usable with common bicycle locks, including cable locks or U-shaped locks, and should be designed so that the frame and one or both wheels can be secured.
- **Flexibility:** The rack must accommodate a wide range of bicycle sizes, wheel sizes, and types.
- **Materials:** The rack should be covered with a material that will not chip the paint of a bicycle that leans against it. The materials used should also resist rusting and corrosion.



Figure 1. Bicycle parking can function as attractive streetscape features.

Inverted u-racks, post and ring racks, and coat hanger racks meet these criteria, while comb or toaster racks (where bicycles are rolled into wheel slots) are not recommended. The Association of Pedestrian and Bicycle Professionals (APBP) *Bicycle Parking Guidelines* (2010) provides detailed information on the types of materials, maintenance requirements, and security considerations for bicycle parking racks.

On-sidewalk parking should be placed where it does not interfere with pedestrian use of the sidewalk. It is essential to provide sufficient space around the rack, otherwise people will lock their bicycles perpendicular to the rack, which may block the sidewalk. Table 3 provides additional consideration for short-term bicycle rack placement.

Table 3. Short-Term Bicycle Rack Placement Guidelines

Design Issue	Recommended Guidance
Minimum Rack Height	To increase visibility to pedestrians, racks should have a minimum height of 33 inches or be indicated or cordoned off by visible markers.
Signing	Where bicycle parking areas are not clearly visible to approaching cyclists, signs at least 12 inches square should direct them to the facility. The sign should give the name, phone number, and location of the person in charge of the facility, where applicable.
Lighting	Lighting of not less than one foot-candle illumination at ground level should be provided in all bicycle parking areas.
Frequency of Racks on Streets	In popular retail areas, two or more racks should be installed on each side of each block. This does not eliminate the inclusion of requests from the public which do not fall in these areas. Areas officially designated or used as bicycle routes may warrant the consideration of more racks.
Location and Access	Access to facilities should be convenient; where access is by sidewalk or walkway, accessible curb ramps should be provided. Parking facilities intended for employees should be located near the employee entrance, and those for customers or visitors near the main public entrances. (Convenience should be balanced against the need for security if the employee entrance is not in a well traveled area). Large expanses of bicycle parking make it easier for thieves to operate undetected.
Locations within Buildings	Provide bike racks within 50 feet of the entrance. Where a security guard is present, provide racks behind or within view of a security guard. The location should be outside the normal flow of pedestrian traffic.
Locations near Transit Stops	To prevent people from locking bicycles to transit sign poles - which can create access problems for transit users, particularly those with mobility impairments. - racks should be placed as close as possible to the stops themselves where demand for short-term bike parking is higher than elsewhere. Special care should be taken to locate the bike parking area clear of the transit loading zone.
Retrofit Program	In established locations, such as schools, employment centers, shopping centers and transit centers, the City should conduct bicycle parking audits to assess the bicycle parking availability, suitability, and access. Additional bicycle racks should be installed where necessary.

Bike Racks

Design Summary

- Bicycle racks should be easy to use.
- Bicycle racks should be securely anchored to a surface or structure.
- The rack element (part of the rack that supports the bicycle) should keep the bicycle upright by supporting the frame in two places. The rack should allow one or both wheels to be secured.
- Avoid use of multiple-capacity “wave” style racks. People commonly misunderstand how to correctly park at wave racks, placing their bikes parallel to the rack and limiting capacity to 1 or 2 bikes.
- Position racks so there is enough room between parked bicycles. Racks should be situated on 36” minimum centers.
- A five-foot aisle for bicycle maneuvering should be provided and maintained beside or between each row of bicycle racks.
- Empty racks should not pose a tripping hazard for visually impaired pedestrians. Position racks out of the walkway’s clear zone.
- For sidewalks with heavy pedestrian traffic, at least seven feet of unobstructed right-of-way is desirable.
- Racks should be located close to a main building entrance, in a lighted, high-visibility area protected from the elements.

Discussion

Bicycle Parking Manufacturers:

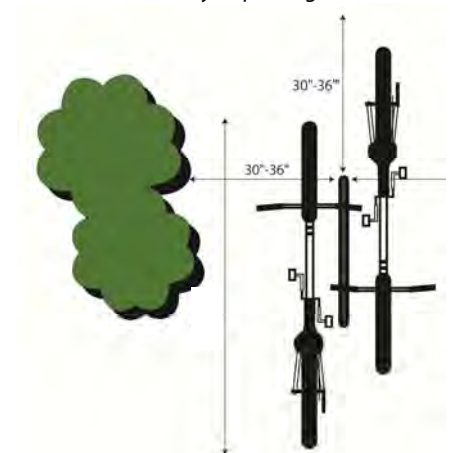
- Palmer: www.bikeparking.com
- Park-a-Bike: www.parkabike.com
- Dero: www.dero.com
- Creative Pipe: www.creativepipe.com
- Cycle Safe: www.cyclesafe.com
- Saris: www.saris.com



Standard bicycle 'staple' rack.



Art racks can be an attractive way of marketing the bicycle parking.



Racks should be situated on 30" - 36" minimum centers.

Long-Term Bicycle Parking

Long-term bicycle parking facilities protect the entire bicycle, its components and accessories against theft and against inclement weather, including snow and wind-driven rain. Examples include lockers, check-in facilities, monitored parking, restricted access parking, and personal storage.

Bike Lockers

Design Summary

- Large metal or plastic stand-alone boxes
- Place near building entrances or on the first level of a parking garage.
- Provide door locking mechanisms and systems.
- A flat, level site is needed; concrete surface is preferred.
- Enclosure must be rigid.
- Transparent panels are available on some models to allow surveillance of locker contents.
- Minimum dimensions: width (opening) 2.5'; height 6'; depth 4'.
- Stackable models can double bicycle parking capacity, but decrease ease of use.



Bike lockers at a transit station.

Discussion

Although bicycle lockers may be more expensive to install, they can make the difference for commuters who are deciding whether or not to cycle because they offer the highest level of personal bicycle parking security available.

Some lockers allow access to two users - a partition separating the two bicycles can help ensure users feel their bikes are secure.

Security regulations may require that locker contents be visible. Providing visibility into the locker also reduces unintended uses, such as use as homeless shelters, trash receptacles, or storage areas. Requiring users to procure a key or code to use the locker also reduces these unintended uses.

Traditionally, bicycle lockers have been available on a sign-up basis, whereby people are given a key or a code to access a particular locker. Computerized on-demand systems allow users to check for available lockers or sign up online. Models from eLocker and CycleSafe allow keyless access to the locker with the use of a SmartCard or cell phone. With an internet connection, central, computerized administration allows the parking provider to monitor and respond to demand for one-time use as well as reserved lockers.

Lockers available for one-time use have the advantage of serving multiple users a week. Monthly rentals, by contrast, ensure renters that their own personal locker will always be available. Bicycle lockers are most appropriate:

- Where demand is generally oriented toward long-term parking.
- At airports, train stations, transit exchanges and park-and-rides to help encourage multi-modal travel.
- Medium-high density employment and commercial areas and universities.
- Where additional security is required and other forms of covered storage are unfeasible.

Bicycle Secure Parking Areas (Bike SPAs)

Design Summary

- See Bike Rack guidelines for placement and clear zone dimensions.
- A SPA of 18' by 18' can accommodate up to 20 bicycles and uses the space of approximately two automobile parking spots.
- Improves surveillance through public lighting, video cameras, and visibility by other users of the facility.
- Bicycle SPAs should have an exterior structure consisting of expanded metal mesh from floor to ceiling.
- In an attended parking facility, locate within 100' of the responsible attendant or security guard.
- Entry doors should be at least 3'-0" in width and constructed of steel panels or wire mesh, with "tamper proof" hinges. If a solid surface door is used, a window may be provided in the door to allow permanent visual access.



Secure Parking Area (SPA) in Portland, OR uses both inverted 'U' and double high bicycle racks.

Discussion

Bicycle SPAs are fully enclosed, stand-alone bicycle parking structures. SPAs should not only have a locked gate but should also allow for the frame and both wheels to be locked to a bicycle rack, as other users also have access to all bicycles within the facility. Bicycle SPAs are recommended for employment or residential bicycle parking areas, or for all-day parking at transit exchanges, workplaces, schools, airports and train stations. They can be located outdoors at street level or within parking garages.

Bicycle SPAs are being adopted by transit agencies across the nation. They provide high capacity, secure parking areas for 80-100 or more bicycles at light rail and bus transit centers. The Bicycle SPAs are semi-enclosed covered areas that are accessed by key cards and monitored by security cameras. The increased security measures provide an additional transportation option for those who may not be comfortable leaving their bicycle in an outdoor transit station exposed to weather and the threats of vandalism. They may also include amenities that make the Bicycle SPA more attractive and inviting for users such as benches, bicycle repair stations, bicycle tube and maintenance item vending machines, as well as racks which allow people to leave their locks at the SPA.

Bicycle Rooms

Design Summary

- See Bike Rack guideline for placement and clear zone dimensions.
- Improve surveillance through public lighting, video cameras, and visibility by other users of the facility.
- Walls should be solid and opaque from floor to ceiling.
- Install a panic button so as to provide a direct line of security in the event of an emergency.



Bike rooms can be provided in office or apartment buildings.

Discussion

Bicycle rooms are locked rooms or cages which are accessible only to cyclists, and which may contain bicycle racks to provide extra security against theft. Bicycle rooms are used where there is a moderate to high demand for parking, and where cyclists who would use the bicycle parking are from a defined group, such as a group of employees. Bicycle rooms are also popular for apartment buildings, particularly smaller ones in which residents are familiar with one another.

The bicycle parking facilities should be no further from the elevators or entrances than the closest motor vehicle parking space, and no more than 150' from an elevator or building entrance. Buildings with more than one entrance should consider providing bicycle parking close to each entrance, and particularly near entrances that are accessible through the bicycle network. Whenever possible, bicycle parking facilities should allow 24-hour secure access.

Dedicated bicycle-only secure access points should be provided through the use of security cards, non-duplicable keys, or passcode access. The downside is that bicyclists must have a key or know a code prior to using the parking facilities, which is a barrier to incidental use.

Bike Depots

Design Summary

- While each depot is unique, they often provide:
 - Attended or restricted-access parking spots
 - Bicycle rentals
 - Repair areas
 - Access to public transportation
 - Commute trip-planning information
 - End of trip support such as showering and changing rooms
 - Community space

Discussion

Bike depots generally refer to full-service parking facilities typically located at major transit locations that offer secure bicycle parking and other amenities. There is no universally accepted terminology to describe different types of full-service bicycle parking facilities.

The company BikeStation™, which runs several parking facilities in California, Oregon, and Washington, DC, offers a variety of free and for pay secure parking opportunities during business hours and after-hours. Paying members enjoy a number of services. Services, which differ by location, may include bicycle repairs, bicycle rentals, sales and accessories, restrooms, changing rooms and showers, and access to vehicle-sharing. They can also incorporate restaurants or other services.



Bike depot in Washington.



The downtown Berkeley BikeStation allows 24-hour access.

Recommended Bicycle Parking Code

Cheyenne can encourage developers to provide bicycle parking by including type and quantity requirements in the Code of Ordinances and by updating design guidelines included in the *Road, Street and Site Planning Design Standards*. Table 4 shows suggested bicycle parking requirements recommended by the Association of Pedestrian and Bicycle Professionals (APBP) in the 2010 *Bicycle Parking Guidelines*. These bicycle parking requirements can be phased in over a period of months or years; short-term bicycle parking requirements should be implemented first, followed by long-term bicycle parking requirements.

Table 4. 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 spaces 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, minimum 2 spaces	1 space for each 10,000 s.f. of floor area, minimum 2 spaces
Assembly (church, theater, stadium, park, beach, etc.)	1 space for each 20 employees, minimum 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, minimum 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, minimum 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, minimum 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, minimum 2 spaces	1 space for each 20 students of planned capacity, minimum 2 spaces

Type of Activity	Long-Term Bicycle Parking Requirement	Short-Term Bicycle Parking Requirement
d) Colleges and universities	1 space for each 10 employees, plus 1 space for each 10 students or 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% projected a.m. peak period daily ridership	Spaces for 1.5% a.m. peak period daily ridership
Commercial Land Uses		
Retail		
General food sales or grocery	1 space for each 12,000 s.f. of floor area, minimum 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, minimum 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, minimum 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, minimum 2 spaces	1 space for each 20,000 s.f. of floor area, minimum 2 spaces
Off-street public parking lots/garages without charge or on a fee basis	1 space for each 20 automobile spaces, minimum 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, minimum 2 spaces	Number of spaces to be prescribed by the Director of City Planning. 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.

Recommended City Programs

The City of Cheyenne can significantly improve availability and quality of bicycle parking with the following action items:

- Require bicycle parking with new development and redevelopment projects.
- Provide incentives to encourage bicycle parking facilities beyond the minimum requirements.

- Provide guidance on the design and placement of bicycle parking facilities, including staple racks, lockers, bike rooms, and bike cages.
- Encourage partnerships between private business that may not have shower facilities and health clubs (e.g., Curves and Smart Sports).
- Establish a bike rack program that assists in locating, designing, and funding bicycle racks in the public right of way.
- Work with the Cheyenne Transit Program to install short- and long-term bicycle parking at the Transfer Station and other transit stops.

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 Cheyenne 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 long-term bicycle parking to meet the automobile parking requirements (typically five bicycle parking spaces can be achieved per motor vehicle parking space).
- 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

Several 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 program can make the location of parking available online. Portland, Oregon's bicycle parking program includes helpful information:

<http://www.portlandonline.com/transportation/index.cfm?c=34813>

The City of Cheyenne should establish a Bicycle Rack Program to work with interested land owners to supplement the existing supply of bicycle parking. Cheyenne can provide information on possible vendors as well as rack design and placement as part of these guidelines.

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 Cheyenne'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.

Additionally, the difference in bicycle and motor vehicle size and material composition can pose detection challenges, which lend themselves to other solutions.

Bicycles and traffic signal timing

Bicycles typically travel more slowly than motor vehicles and can find themselves with inadequate time to clear an intersection before the conflicting green phase begins. The time allowed for reacting to the change in signal, starting up and accelerating to free flow speed, plus the time to clear the width of the intersection must be accommodated within the combined time of the green plus amber change intervals. The duration of both the green and amber intervals of signals is typically determined by the expected motor vehicle startup, acceleration, and speed through an intersection, which is faster than the average cyclist speed. Methods for better accommodating bicyclists once they have been detected at an intersection include:

- 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, the bicyclist may still lack sufficient time to clear the intersection during the green. (An example of this strategy can be seen in Caltrans Policy Directive 09-06)
- Lengthening the amber change interval of the intersection slightly to allow for the slower acceleration and speed of bicyclists. This should be only part of the solution 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. Under no circumstances should this time be extended beyond six 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
- Time coordinated signals in the urban core to keep travel speeds relatively low, such as 20 miles per hour, which will also accommodate bicyclists traveling 10 miles per hour. This strategy makes it possible to alter signal timing to provide ‘green waves’ for bicyclists without significantly impeding motor vehicle flow².
- Install “bicycle only” traffic signals in areas of high conflict or unique geometry to trigger a bicycle only phase.
- Use signal detection to detect moving bicyclists. Video detection technology can be programmed to detect the presence of bicyclists and trigger a bike phase or extend the green phase based on their presence in a bike lane. This technique is not recommended when bicycles and motor vehicles share a travel lane as video technology cannot always make the distinction between a cyclist and a motor vehicle.

² ‘Green wave’ refers to the practice of intentionally coordinating signal timing at multiple intersections along a travel corridor to facilitate continuous travel at a specific travel speed (e.g., 10 – 15 miles per hour). A vehicle traveling at this speed will see a cascade or wave of green lights, allowing them to avoid stopping.

- 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. This strategy would not be necessary if minimum bicycle timing were provided at all traffic signals.

Bicycle Detection

While some traffic signals are pretimed and the changes in signal phase are dependent on the passing of time rather than the presence of vehicle traffic, demand 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 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 cyclists 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 handling skills which leave the bicyclist in the crosswalk or facing the wrong direction when the light changes.

The City of Cheyenne is currently running demand actuated signals on 60% of the 75 signals in the traffic signal network. The primary detection mechanism is video (80%), with 19% running on loop detection, and the remainder on the Sensys³ system. The City discontinued the practice of installing loop detectors in 2006. WYDOT, on the other hand utilizes video detection for 20% of its network within the City, 40% loops, 5% microwave or radar, and 35% Sensys. Some traffic signals are running different technologies on different legs, with a mix of semi- and fully- actuated signals throughout the networks (personal communication from Traffic Engineer, dated July 21, 2011.)

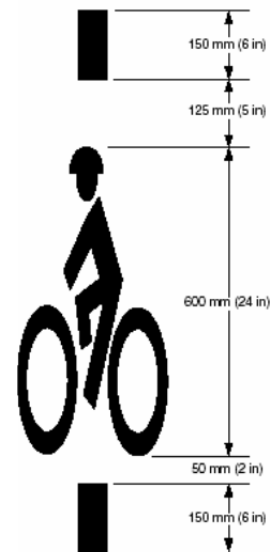


Figure 2. Loop detector marking design.

Loop Detectors

Inductive loop detectors are installed within the roadway to allow the presence of a motor vehicle or bicycle to trigger a call to the traffic signal controller that demands a change in the traffic signal, through its sensing of the presence of a conductive metal object. This allows the bicyclist to stay within the lane of travel and avoid maneuvering to the side of the road to trigger a push button. The type, placement, and sensitivity of detector loops influences the reliability of the loop in responding to a bicyclist's presence. Unfortunately, inductive loop detection technology may not always detect a bicyclist's presence. If bicyclists fail to position themselves correctly over the loop, they may fail to trigger the signal or a bicycle may not have enough material to be detectable to the loop.

Although most types of inductive loop detectors, can be tuned to adjusted to detect cyclists, the practice requires ongoing maintenance by skilled technicians, who must adjust the loops to be sensitive enough that

³ <http://www.sensysnetworks.com/home>

they detect bicyclists, but not so sensitive that they respond to nearby parked cars or other atmospheric influences. The loops used for presence detection within the City are typically the 6' x 20' quadrupole type, which are difficult to keep tuned for bicycles. The smaller 6' x 6' square loops are used in some places for advance detection, however, these smaller loop detectors are typically positioned in the motor vehicle lane in advance of the intersection, where the loop does not discriminate between a bicycle and motor vehicle in the signal sent to the controller. The loops that best accommodate bicycle detection are typically 3' in diameter. Some states utilize the practice of installing loops specifically wound to increase the probability of detection by bicyclists, for example, the D-Loop in California. The City of Cheyenne currently calibrates in-pavement loop detectors for motor vehicles. In several locations, signals with loop detection have been tuned in the past to detect cyclists. Currently, the City does not track whether these locations detect cyclists; it is possible that these signals they have drifted out of calibration and no longer detect cyclists.

Even in well-adjusted loops, some bicycles may lack enough detectable material to be picked up. However, loops that are sensitive enough to detect bicycles should include pavement markings to instruct cyclists how place their bicycle to successfully trigger a signal phase change (see Figure 2).

Video Detection

Video detection technology can detect a bicyclist's presence over a larger area by using pixel analysis of an image to detect the change from absence to presence of vehicles or bicycles. With video detection, disturbance to the pavement can be avoided, and the relative placement of bicyclists and their ability to create a disturbance to the electromagnetic field compared to vehicles become inconsequential. Changes to the detection can be made quickly with a few modifications to the software to adjust to a change in lane configuration or the addition of a bike lane. The detection zones can also be hand drawn to the appropriate size relatively easily, should it be found that bicyclists tend to position themselves outside of the expected vehicle detection zone. However, video detection cannot differentiate between a motor vehicle and a bicycle in a shared travel lane and therefore cannot be used to extend or create a signal phase unique for bicyclists. This may be possible when a bicycle lane is provided, but would still require evaluation at each intersection.

Shortcomings to video can include poor detection in darkness (a lighted intersection and bicycles well equipped with lights solve this), and the shadows of adjacent vehicles triggering the bicycle area during certain times of day. Video camera system costs range from \$20,000 to \$25,000 per intersection.

Remote Traffic Microwave Sensor Detection (RTMS)

RTMS is a system developed in China, which uses frequency modulated continuous wave radio signals to detect objects in the roadway. This method is marked with a time code which gives information on how far away the object is. The RTMS system is unaffected by temperature and lighting, which can affect standard video detection cameras.

Push Button Activation

Similar to pedestrian push button activation, a button positioned on the side of the roadway will allow a cyclist to trigger a signal change without dismounting from his or her bicycle or riding up on the sidewalk to push the button. This design takes advantage of existing infrastructure, diminishes the potential for bicycle/pedestrian conflicts, and increases the convenience of the route for cyclists. Well-designed push

button activation will be curbside and mounted at a height easily reached by cyclists. On-street parking near the push button area should be prohibited.

Recommendations

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

- Work with cyclists to develop a list of intersections along frequently used routes where the existing infrastructure can be modified to detect cyclists better at a relatively low cost. Prioritize these locations for signal improvements.
- Ensure that all new signals provide a means of cyclist activation.
- Consider adjusting signal timing plans to provide a minimum bicycle timing at appropriate intersections
- Use pavement markings to identify the most sensitive spots of in-pavement loop detectors

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 cyclist how to reach a destination without confusion. Road signs direct motor vehicle traffic to destinations and provide 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 cyclists navigate through their environment.

Designing wayfinding systems for cyclists 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 are also becoming popular tools. This section provides an overview of how to develop a wayfinding system, the elements of wayfinding and best practices from national and international cities with successful bicycle wayfinding systems.

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 misperceptions about time and distance.

Bicycle wayfinding signs also visually cue motorists that they are driving along a bicycle route and should use caution.

Sign Information

Uniformity, legibility, and adherence to existing standards are among the elements to consider when determining the appropriate wayfinding sign design for Cheyenne. National, state, and local standards, along with local input, should guide the development of signage design. Uniformity considerations include size, font, abbreviations or stacking for long labels,⁴ number of labels, and arrow placement. National guidance on wayfinding signage is found in the *Manual on Uniform Traffic Control Devices* (MUTCD) and the American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities*.



Figure 3. Milwaukie, Oregon uses high-visibility green signs with mileage and time estimates.



Figure 4. MUTCD sign D1-3C can be used for wayfinding with or without distance information.

⁴ For example, a common practice is to abbreviate destination names when it will fit on a single line. Unabbreviated destination names can be stacked on two lines if sufficient space exists on the sign. Abbreviations can be used on stacked text if necessary to accommodate long destination names.

Destinations to include on wayfinding signs can include:

- On-street bikeways
- Commercial centers (e.g., Frontier Mall)
- Greenways (e.g., Crow Creek and Dry Creek)
- Civic/community destinations (e.g., Cheyenne Depot Plaza and the Laramie County Library)
- Local parks and paths (e.g., Cahill Park, Lions Park and Holliday Park)
- Hospitals (e.g., Cheyenne Regional Medical Center)
- Schools (e.g., elementary schools, junior high schools, high schools and Laramie County Community College)
- Public transit sites (e.g., Cheyenne Transit Program Transfer Station)

At greater distances, area destinations (e.g., downtown and neighborhoods) should be signed as a general location. As the distance to these areas decreases, specific destinations within the area can be named. The closest destination to each sign should be placed in the top slot. Destinations that are further away should be placed in the subsequent slots. This allows the nearest destination to ‘fall off’ the sign and subsequent destinations to move up the sign as the bicyclist approaches.

Some signs may be temporary or contain future destinations. Signs in some locations can reserve space for destinations that do not yet exist.

Distance and Time

Signs should include mileage and travel time estimates to help minimize the tendency to overestimate the amount of time it takes to travel by bicycle (Figure 5. Example decision sign. Most jurisdictions use a 10 mph average speed be used to estimate travel time based on an average urban bicycling speed.

Mileage and travel time for each destination should be listed when text is stacked, if possible. Time and distance may be listed as a single line of text to the right, left, or below the destination if necessary. Consistency in placement is desirable.

Sign Placement

Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes. Turn signs (e.g., a bicycle route sign with a directional arrow) indicate where a bikeway turns from one street onto another street. Turn signs are located on the near-side of intersections. Decision signs mark the junction of two or more bikeways. Decision signs are located on the near-side of intersections. They can include destinations and their associated directional arrows, but not distances.

Additional placement recommendations include:

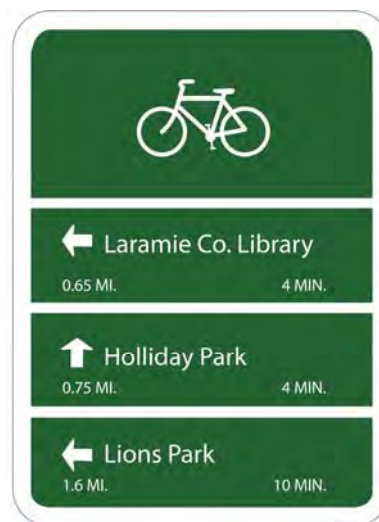


Figure 5. Example decision sign.

- Signs should be placed along all designated city bikeways. In cases where the bikeway does not yet exist, sign installation should occur simultaneously with, or immediately after, bikeway construction.
- Signs should be placed in locations where the direction of the bike route is not immediately obvious (e.g., changes in direction), at key intersections along developed bikeways, at key decision points, and as guidance through complex routing areas.
- Signs should be placed along the right-of-way in places where the cyclist can see an upcoming sign from approximately 100 feet away. On steep downhill segments, the sign should be placed further upstream from the intersection to provide a cyclist adequate time to make a directional decision. Signs should also be placed further from the intersection on busier streets with a center turn lane or left turn pocket to provide a cyclist with enough time to safely signal entry into the turn pocket.

Pavement markings may be used to reinforce routes and directional signage. Markings, such as shared lane markings, may be used in addition to or in place of turn signs along bike routes.

Recommended Wayfinding Signing Program

The City of Cheyenne should develop a signing program with the specific uniform standards as recommended above, or as determined by City staff. Members of the public can 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. Signs should be integrated with Cheyenne's existing greenway signing.

Cheyenne should begin by signing bicycle facilities included in the finalized *On Street Bicycle Plan and Greenway Plan Update*. Installation of signage on bikeways outside the current city limits or bikeways managed by Laramie County or Wyoming Department of Transportation will require coordination with these agencies.

Bicycle Transit Integration

This section describes typical issues related to bicycle access to transit and accommodation on transit vehicles. Issues covered in this section include:

- Appropriately planning for expected levels of bicycling to transit and desire for bike-on-bus facilities.
- Providing connections between the bicycle and transit networks.
- Providing appropriate bicycle parking facilities at transit stops.
- Creating convenient access at, to, and from transit stops.
- Developing policies for carrying bicycles onto transit vehicles.
- Accommodating cyclists in the physical design of the transit stop.

Expected Demands

The Cheyenne Transit Program (CTP) provides transit service for the metropolitan area. Bicycle racks on all transit vehicles currently accommodate cyclists on buses. Interviews with the transit authority indicate that these racks are used, though they are not frequently filled to capacity. When both racks are full, cyclists can bring their bicycles inside the transit vehicle, though this occurs infrequently. Areas of the transit system that typically experience higher use are downtown, near the transfer station at W 17th Street and Carey Avenue,

and along the “South” route that serves Laramie County Community College. Recently, Cheyenne has experienced population growth to the east of the downtown core, slightly increasing transit ridership in the area. Interviews with the transit provider indicated that there was potential for population growth in west and southwest and the 2012 update to the CTP *Transit Development Plan and Coordination Study* will analyze these areas in more detail.

The transit system’s largest user group are “transportation disadvantaged” users who do not have access to an automobile or cannot drive (e.g., for medical reasons). The transit system generally serves utilitarian (e.g., trips to work or school) rather than recreational trips (e.g., getting to the greenway for a recreational ride). CTP is interested in expanding the user base by targeting individuals that have access to a motor vehicle but could become interested in using a bus instead of a car to extend the bicycle portion of their trip. Potential targets for pockets of commuter cyclist and transit use include the downtown area and Frontier Mall.

Rack capacity could become an issue as the population of the Cheyenne Metropolitan Area increases over time. Bicycle presence on transit vehicles should be tracked informally and a formal analysis of rack capacity should be undertaken if transit operators frequently report that racks are full. Cheyenne should also consider installing additional bicycle parking (discussed earlier in this memorandum) to accommodate future demand.

One method of estimating future bicycle parking needs and bicycle use is by developing a “Bicycle Access Growth Factor”, such as the one shown in Table 5. This analysis is a tool that can be used to prioritize installation of short- or long-term bicycle parking throughout the system based on potential demand. This analysis can be modified to use available local data, or can use readily-available US Census and American Community Survey Data.

Table 5. Bicycle Transit Access Growth Factor Analysis

Variable	Rating
Home-Based Ridership	▪ Points given to stop based upon home-based weekday passenger entries.
Ridership Rate	▪ Points given to stop based upon total weekday passenger entries.
Bicycle Mode Share in AM Peak	▪ Points given to stop based upon percent bicycle mode share during AM peak period.
Population within 1 Mile of Station	▪ Points given to stop based upon population within 1 mile of station.
Households with No Car within 1 Mile of Station	▪ Points given to stop based upon number of households with no car available within 1 mile of station.
Topography/Traffic/ Barrier Factor	▪ Points given to stop based upon factors affecting bicycle travel such as surrounding topography, traffic on roadways leading to stop, and impediments to bicycle travel including railroad tracks and freeway ramps.

Adapted from the San Francisco Bay Area Rapid Transit (BART) Station Access Evaluation System, (2002)

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:

- Seating: either benches or seats attached to the bus stop post. Seating should be placed so that waiting passengers are visible to the bus driver.
- Shelter: can be a dedicated bus shelter or make use of surrounding building elements such as awnings to provide rain and wind protection. A shelter should provide adequate room for cyclists to maneuver and avoid potential conflicts with other transit users.
- 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 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.
- 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. For example, the transfer station at W 17th Street and Carey Avenue is an ideal location for secure long-term bicycle parking. Additional guidance on bicycle rack placement and location is discussed previously in this memorandum.
- End-of-trip facilities: major transit hubs and stops may offer end-of-trip facilities beyond parking such as showers, washrooms, clothing lockers, etc.
- Pedestrian-scale lighting to increase security and visibility for riders and transit operators.
- A trash container.

Cheyenne's transit stops generally provide trip information and occasionally seating and trash receptacles. Recently the City upgraded a number of bus shelters with funding provided by the American Recovery and Reinvestment Act. Amenities were upgraded at approximately 41 stops within the system service area. Typical improvements included improved shelters, seating and wind screening. Bicycle parking was not installed at this time but CTP indicated interest in future rack or locker installation.

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 cyclists do not need to carry bicycles through large crowds of travelers. The parking facility should be located in the clear view of the general public, vendors or transit staff. Security is a particular concern if bicycle parking is provided within a garage. In these cases, bicycle parking should be located in a central, frequently traveled part of the garage, ideally near an attendant. Most guidelines recommend against providing bicycle racks in unattended garages. Garages may also require treatments to manage conflicts between bicycles, automobiles and pedestrians at entrances and within the garage.

Bicycles on Transit

Carrying bicycles onto transit enables cyclists to avoid potentially difficult situations, including large hills, busy streets, long distances and inclement weather. It also reduces the fear of being stranded in the case of equipment failure. Various mechanisms for allowing bicycles on transit vehicles are described below as well as other considerations for facilitating bike-on-bus programs.

Front-Mounted Bike Racks

Most bike racks on buses hold two bicycles, although some transit agencies have been testing racks with capacity for three to five bicycles. When not in use, the bike rack typically folds up on the front of the bus. When cyclists want to use the rack, they pull it down and lift their bicycle onto the unit. Some buses are capable of kneeling, to help with mounting of the bicycle.

The two-bike front racks add six to nine inches of length to the bus (folded), requiring additional storage space in the bus yard. For certain size buses, racks can interfere with windshield wiper, headlight, and turn signal operations.

The capital costs of a bike-on-bus program include primarily the purchase and installation of the rack units. In 2005, these cost between \$500 and \$1,000 each (including installation) for two-bicycle racks. Purchasing bike racks on new buses reduces the labor cost of retrofitting. It is recommended that at a minimum a visual inspection of the rack is performed each day along with a 30-day general maintenance inspection, which consists of tightening bolts and checking for wear and tear. Maintenance of the bike racks costs about \$50 to \$100 per rack per year. They need to be replaced after six to seven years, often due to rust or colliding with other objects.

Rear-Mounted Bike Racks

Some transit agencies have experimented with rear-mounted racks, but these designs are problematic because of user safety concerns. They also block access to the engine and reduce driver visibility, as drivers cannot see the rack and monitor the safety and security of bicyclists as they load and unload their bicycles. Bicycles can also get dirtied by exhaust at the rear of the bus.

Bikes-in-Buses

Another option is to allow the cyclist to carry his or her bicycle onboard. In some jurisdictions, the driver can allow cyclists to bring their bicycle into the bus when the rack is full. However, this is often a cumbersome maneuver, requiring bicyclists to lift the bike up stairs and can be problematic during busy periods. Where bicycles are allowed in buses, bus drivers usually have authority to decide when to allow bicycles on the bus. In a few cases, where buses have additional space for luggage, bicycles are allowed to be stored in this compartment, often underneath the bus.

Education and Marketing

First-time and novice users are often concerned about how to load their bicycle on to the bus or train and have fears about the system being time-consuming or otherwise difficult to use. There are numerous examples where advertising, events, and targeted audience participation have successfully introduced users to their use. Information should be made available on CTP's and/or the City's website(s). Videos are an effective means of instruction.

Tri-Met, in Portland, Oregon, has a model bike rack which they bring to fairs and employment centers. Users can experiment with the system before having to depend on it. Similarly, in Chicago representatives of a mayor's bicycling education program have staged demonstrations of bike-on-bus racks at events for hands-on training.

Bicycle/Transit Interface

In addition to providing safe routes to get to transit, it is important to minimize potential conflicts between cyclists 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 cyclists or require them to pass the transit vehicle.

Recommendations for improving bicyclists' safety around buses include:

- Designate dedicated space for bicyclists through use of bike lanes or greenways (although this introduces new conflicts between bicycles and pedestrians boarding the bus that can be addressed with proper design).
- Provide advance crossbars, a bike box, or a dedicated signal cycle to increase cyclists' visibility at intersections.

Bicycle/Transit Integration Recommendations

- The City and MPO should work with CTP to provide bicycle lockers near the Transfer Station and other locations where cyclists may desire long-term parking (e.g., Laramie County Community College).
- Consider partnering with CTP to obtain grant money for bicycle rack installation near transit stops that experience high use.
- Explore a partnership with CTP and other agencies or organizations (e.g., Laramie County Community College and Warren Air Force Base) that may have a high potential for transit use to promote the potential benefits of transit to cyclists (e.g., by taking transit to work and bicycling home).
- Continue to support CTP's bikes-on-bus policy.
- Work with CTP to develop questions about bicycle and bus integration that can be included on the 2012 passenger survey that will support the *CTP Transit Development Plan and Coordination Study* update. Include these questions on subsequent passenger surveys to track changes in user behavior and attitudes over time.
- Work with CTP to pursue expanded transit service that may be desirable to commuters and other choice users.

This page intentionally blank

Working Paper #11: Phasing Plan

This page intentionally blank

Memorandum

To: Cheyenne On-Street Bicycle Plan and Greenway Plan Update Bicycle Advisory Committee
From: Rory Renfro and Kim Voros, *Alta Planning + Design*
Date: November 21, 2011
Re: Phasing Plan

The recommended on-street bikeway and greenway projects represent Cheyenne's ambitious efforts to create a comprehensive and well-connected bicycle network serving users of all types and abilities. Approximately 350 projects comprise the proposed bikeway system. Based on the evaluation framework described below, the proposed bicycle network projects have been organized into three tiers representing a general implementation timeline:

- Tier 1, Near-term
- Tier 2, Medium-term
- Tier 3, Longer-term

Development of Phasing Plan

While all projects represent important steps for improving Cheyenne's cycling environment, prioritizing projects will allow the City and MPO to program limited financial and staff resources in the most strategic way. The development of project priorities included the following process:

The individual projects were first ranked based on the evaluation criteria established at the beginning of this planning process. The criteria included:

- Suitability for bicycling with and without improvements
- Closing gaps
- Safety and comfort
- Accessibility & mobility/Land use
- Multi-modal connections
- Cycling level of service
- Community support
- Serves an immediate safety need

The resulting analysis resulted in a preliminary project ranking based on project need. These results were reviewed in consultation with the Bicycle Advisory Committee to gauge how the preliminary project ranking matched a realistic implementation timeframe.

The outcome of this exercise was refined based on committee feedback into a project ranking scheme that reflects recognized need and ease of implementation, with a focus on creating a near-term network with connections to the existing greenway system.

It is recommended that near-term projects be constructed first, but it is likely that several links within corridors included in the near-term priorities may require more time to implement fully (e.g., the I-25 Greenway.) Development and construction of these the links was recognized as a priority by the Bicycle Advisory Committee though full project implementation will likely span into the medium or long-term timeframe.

It should be strongly noted that the purpose of this exercise is to understand the relative priority of projects so that the City, MPO and/or other agency partners may apportion available funding to the highest priority projects. Medium- and longer-term projects are also important, and may be implemented at any point in time as part of a development or public works project, or as additional funding becomes available. The ranked lists should be considered a “living document” and should be frequently reviewed to ensure they reflect current priorities.

Prioritization within Project Tiers

For the process of project prioritization within each tier and the associated apportionment of funding, it may be desirable for City and MPO staff to undertake a second prioritization exercise utilizing criteria that are closely focused on the details of project implementation. This process would enable staff to objectively rank the ease and benefits of implementation. Sample recommended criteria are presented in Table 1.

Table 1. Potential Secondary Project Ranking Criteria

Criteria	Ranking	Measurement
Budget Need	2	More than half of funding is already secured
	1	Less than half of funding is already secured
Expected Environmental Process or Discretionary Funding	3	Project expected to receive exemption or exclusion (local or state funding)
	2	Project expected to receive exemption or exclusion (federal funding)
	1	Project expected to require minor environmental/discretionary review
	0	Project expected to require significant environmental/discretionary review
Jurisdictional Complexity	3	Project requires departmental coordination with minimal involvement from other agencies
	2	Project requires coordination with 2 agencies
	1	Project requires coordination with 3 or more agencies
Potential to Leverage Other Funding	2	Initiating project now will secure 80% or more of the funds
	1	Initiating project now will secure less than 80 % of the funds
Policy Directive	1	Project specified by policy

Using any of the sample criteria of Budget Need, Expected Environmental Process, Jurisdictional Complexity, Potential to Leverage other Funding or Policy Directive, staff can develop a weighted decision-making matrix to rank the relative importance and feasibility of projects in Tier 1. The weight of each of the criterion may change annually based on the economic climate or other changes in the areas surrounding each of the projects. Therefore it is recommended that the evaluation be used to select projects competing for capital funding during every budget cycle, or as grant opportunities arise. See sample Table 2 below.

Table 2. Sample Application of Secondary Project Ranking

	Budget Need	Env./Discretionary	Jurisdictional Complexity	Potential Leverage	Policy Directive	Total Score	Weighted Total
Weighting	3	2	1	1	3		
Project Name							
Project A	1	2	0	0	1	4	10
Project B	3	1	1	2	0	7	14
Project C	3	2	2	1	1	9	19

This page intentionally blank

Tier	Length (Mi.)	Type	Name	From	To	Cycling Level of Service	Access and Mobility	Suitability without Improvement	Low Stress Bikeway	Multi Modal Connections	Safety and Comfort	Gap Closure	Community Support	Safety Improvement
Short	0.55	Bicycle Boulevard	Dillon Ave	W. 24th Street	W. Lincolnway	○	●	●	●	●	◐	◐	○	●
Short	0.33	Bicycle Boulevard	E 16th St	Logan Avenue	Converse Avenue	◐	●	●	●	●	◐	○	○	●
Short	0.34	Bicycle Boulevard	E 18th St	Converse Avenue	Lilac Court	◐	●	●	●	●	◐	○	●	●
Short	0.85	Bicycle Boulevard	E 22nd St	Evans Avenue	Logan Avenue	○	●	●	●	●	◐	◐	○	●
Short	0.25	Bicycle Boulevard	Gettysburg Dr	E. 12th Street	UPRR Rail Trail	◐	◐	●	●	○	◐	●	○	●
Short	0.32	Bicycle Boulevard	Greenway St	McCann Avenue	E. Lincolnway	◐	●	●	●	●	◐	●	○	●
Short	0.53	Bicycle Boulevard	Olive Dr/Lilac Ct	Forest Drive	Willow Drive	◐	●	●	●	●	◐	●	○	●
Short	0.45	Bike Lane	Dell Range Boulevard	Rue Terre	Converse Avenue	◐	●	○	○	●	◐	●	●	●
Short	0.79	Bike Lane	Dell Range Boulevard	Powderhouse Road	Rue Terre	◐	●	○	○	●	◐	●	●	●
Short	1.09	Bike Lane	Dell Range Boulevard	Yellowstone Road	Powderhouse Road	◐	●	○	○	●	◐	●	●	●
Short	1.07	Bike Lane	E 19th Street	Converse Avenue	Logan Avenue	◐	●	◐	○	●	◐	○	●	●
Short	0.56	Bike Lane	Henderson Drive	E. Pershing Boulevard	Omaha Road	◐	●	◐	○	●	◐	◐	●	●
Short	1.23	Bike Lane	Hynds Boulevard	Vandehei Avenue	Walker Road	◐	●	◐	○	●	◐	●	●	●
Short	0.88	Bike Lane	Logan Avenue	E. Pershing Boulevard	Nationway	◐	●	◐	○	●	◐	◐	●	●
Short	0.07	Bike Lane	Missile Drive	W. 17th Street	W. Lincolnway	●	●	◐	○	●	◐	●	○	●
Short	0.10	Bike Lane	Missile Drive	W. 18th Street	W. Lincolnway	●	●	◐	○	●	◐	●	○	●
Short	0.04	Bike Lane	Missile Drive	Connector	W. 19th Street (S)	●	●	◐	○	●	◐	●	○	●
Short	3.71	Bike Lane	Nationway/E 12th Street	E. Lincolnway	N. College Drive	○	●	◐	○	●	◐	●	●	●
Short	0.62	Bike Lane	Ridge Road	Dell Range Boulevard	Laramie Street	○	●	◐	○	●	◐	◐	●	●
Short	0.01	Bike Lane	W Lincolnway	Missile Drive (W)	Missile Drive (E)	●	●	○	○	●	◐	●	●	●
Short	1.27	Bike Lane	Westland Road/W 24th St	Snyder Avenue	W. Lincolnway	●	●	◐	○	●	◐	●	○	●
Short	1.03	Bike Lane	Yellowstone Road	Carlson Street	Central Avenue	◐	●	○	○	●	◐	●	●	●
Short	1.03	Buffered Bike Lane	S Greeley Hwy	Fox Farm Road	College Drive	◐	●	○	◐	●	◐	●	●	●
Short	0.30	Greenway	Ames Ave. to Depot	Ames Avenue	Depot Plaza	○	●	●	●	●	●	◐	○	●
Short	0.25	Greenway	Avenue C	E. Prosser Road	E. College Drive	◐	●	●	●	●	●	○	●	○
Short	0.05	Greenway	Avenue C	Drew Couth	E. Prosser Road	◐	●	●	●	●	●	●	●	●
Short	0.07	Greenway	Avenue C	Briar Court	Drew Court	◐	●	●	●	●	●	●	●	●
Short	0.12	Greenway	Avenue C	E. Allison Road	Briar Court	◐	●	●	●	●	●	●	●	○
Short	0.06	Greenway	Avenue C	Sunridge Drive	E. Allison Road	◐	●	●	●	●	●	●	●	○
Short	0.02	Greenway	Avenue C	Reiner Court	Sunridge Drive	◐	●	●	●	●	●	●	○	○
Short	0.41	Greenway	Avenue C -- Reiner to Fox Farm	E Fox Farm Road	Reiner Court	◐	●	●	●	●	●	◐	●	○
Short	0.10	Greenway	College Drive Underpass @ UPRR	East Extension W	East Extension E	○	●	●	●	●	●	●	●	●
Short	0.47	Greenway	Converse	Grandview Avenue	Dell Range Boulevard	◐	●	●	●	●	●	●	○	○
Short	0.21	Greenway	Cribbon -- I-80 Overpass to WAPA Corridor	W Leisher Rd	South Cheyenne Greenway	○	●	●	●	●	●	●	●	●
Short	0.23	Greenway	Cribbon -- WAPA Corridor to Allison	South Cheyenne Greenway	W Allison Road	○	●	●	●	●	●	●	●	○
Short	0.40	Greenway	Crow Creek -- I-25 to Westland	I-25	Westland Road	●	●	●	●	●	●	●	●	○
Short	0.38	Greenway	Crow Creek -- Westland to MLK	Westland Road	Martin Luther King Court	●	●	●	●	●	●	◐	●	○
Short	0.15	Greenway	Dry Creek	Mason Way	Dell Range Boulevard	◐	●	●	●	●	●	●	○	●
Short	1.22	Greenway	Dry Creek -- US 30 to UPRR	US 30	UPRR ROW	●	●	●	●	●	●	◐	○	○
Short	0.55	Greenway	East Phase IV - Norris Connector	Logan Avenue	Hot Springs Avenue	○	●	●	●	●	●	◐	●	○
Short	0.52	Greenway	Evans to Morrie	Evans Avenue	Airport Parkway	◐	●	●	●	●	●	◐	●	○

Tier	Length (Mi.)	Type	Name	From	To	Cycling Level of Service	Access and Mobility	Suitability without Improvement	Low Stress Bikeway	Multi Modal Connections	Safety and Comfort	Gap Closure	Community Support	Safety Improvement
Short	0.09	Greenway	Existing I-80 Overpass	South Cheyenne Greenway	Cribbon Greenway	○	●	●	●	●	●	●	○	●
Short	0.67	Greenway	Henderson Ditch -- UP RR to Lincolnway	Sparks Road	East Extension	○	●	●	●	●	●	○	●	○
Short	0.12	Greenway	Holliday Park Connector -- Lincolnway Crossing	Holliday Park	Dunn Avenue	○	●	●	●	●	●	●	●	●
Short	0.71	Greenway	I-25 to Freedom Elementary	Carlin Avenue	Interstate 25	●	●	●	●	●	●	○	●	○
Short	0.23	Greenway	Pershing -- Dry Creek to Taft	Taft Avevne	Dry Creek Greenway	◐	●	●	●	●	●	●	●	○
Short	1.25	Greenway	Pershing Boulevard	Cleveland Avenue	Windmill Road	◐	●	●	●	●	●	◐	●	●
Short	0.53	Greenway	Pershing Boulevard	Converse Avenue	Windmill Road	◐	●	●	●	●	●	●	●	○
Short	1.01	Greenway	Pershing Boulevard	Airport Parkway	Converse Avenue	◐	●	●	●	●	●	○	●	○
Short	0.47	Greenway	Pershing Boulevard	Evans Avenue	Airport Parkway	○	●	●	●	●	●	◐	●	○
Short	1.03	Greenway	Pershing Boulevard	Hynds Boulevard	Evans Avenue	◐	●	●	●	●	●	○	●	○
Short	0.19	Greenway	Powderhouse	Storey Boulevard	Gardenia Drive	○	◐	●	●	●	●	●	●	○
Short	0.16	Greenway	Reiner Court -- Avenue C to Arp Elem.	Avenue C	Avenue C-1	◐	●	●	●	●	●	●	○	○
Short	2.55	Greenway	S Greeley Loop -- East	E College Drive	SE Ridgeline	○	◐	●	●	●	●	○	●	○
Short	0.03	Greenway	Sunny Hill Greenway Extension	Sunny Hill Drive	End of Street	◐	●	●	●	●	●	●	○	○
Short	0.12	Greenway	UP Depot to Holliday Park	E 15th Avenue	Holliday Park Connector	○	●	●	●	●	●	●	○	●
Short	0.13	Greenway	Walterscheid -- Allison to Underpass	Allison Draw Underpass	W Allison Road	○	◐	●	●	●	●	●	○	○
Short	0.84	Greenway	Western Hills Connector	Western Hills Boulevard	Lions Park to Country Club	●	●	●	●	●	●	○	●	○
Short	0.89	Shared Lane Markings	Snyder Avenue	W. 29th Street	W. Lincolnway	○	●	◐	○	●	◐	●	●	●
Medium	1.11	Bicycle Boulevard	29th St/House Ave/Talbot Ct	E. Pershing Boulevard	Cribbon Avenue	○	●	●	●	●	○	○	●	○
Medium	0.40	Bicycle Boulevard	Basin St	Pineridge Avenue	Ridge Road	○	◐	●	●	●	○	◐	○	○
Medium	0.49	Bicycle Boulevard	Bomar Dr	Lafayette Boulevard	Dalcour Drive	○	◐	●	●	●	○	●	○	○
Medium	0.47	Bicycle Boulevard	Cleveland Ave	E. 12th Street	E. 6th Street	◐	●	●	●	●	○	◐	○	○
Medium	0.11	Bicycle Boulevard	Cleveland Ave	Rio Verde Street	Weathertop Avenue	◐	●	●	●	●	○	●	○	○
Medium	0.48	Bicycle Boulevard	Conco Road/Andover Dr	Airport Parkway	E. Pershing Boulevard	○	●	○	●	●	◐	◐	○	●
Medium	0.23	Bicycle Boulevard	Continental Pl/Sunny Dr	Meadow Drive	Sunny Hill Drive	◐	●	●	●	●	○	●	○	○
Medium	0.25	Bicycle Boulevard	Cribbon Ave	W. 4th Street	W. Fox Farm Road	○	●	●	●	●	○	◐	●	○
Medium	1.14	Bicycle Boulevard	Cribbon Ave/W 27th St	W. 8th Avenue	W. 27th Street	○	●	●	●	●	○	○	●	○
Medium	0.25	Bicycle Boulevard	E 14th St	Diamond Avenue	Cleveland Avenue	◐	●	●	●	●	○	●	○	○
Medium	0.33	Bicycle Boulevard	E 14th St	Cleveland Avenue	Taft Avenue	◐	●	●	●	●	○	◐	○	○
Medium	0.25	Bicycle Boulevard	E 16th St	Converse Avenue	Hot Springs Avenue	◐	●	●	●	●	○	○	○	○
Medium	0.17	Bicycle Boulevard	E 16th St	Logan Avenue	Alexander Avenue	○	●	●	●	●	○	●	○	○
Medium	0.54	Bicycle Boulevard	E 3Road Ave	Bent Avenue	Evans Avenue	◐	◐	●	●	●	○	○	○	○
Medium	0.17	Bicycle Boulevard	E 6th St	Cleveland Avenue	Taft Avenue	◐	●	●	●	●	○	○	○	○
Medium	0.79	Bicycle Boulevard	E 7th St/E 6th St/Duff Ave	Warren Avenue	Duff Avenue	○	●	●	●	●	○	◐	○	○
Medium	0.47	Bicycle Boulevard	E 8th St	Baldwin Drive	Cleveland Avenue	◐	●	●	●	●	○	◐	○	○
Medium	0.55	Bicycle Boulevard	E Prosser Road	S. Greeley Highway	Avenue C	◐	●	●	●	●	○	◐	○	○
Medium	0.24	Bicycle Boulevard	Everton Dr	Cindy Avenue	N. College Drive	◐	●	●	●	●	○	○	○	○
Medium	0.21	Bicycle Boulevard	Fillmore Avenue	Rio Verde Street	300' south of Rock Springs Street	◐	●	●	●	●	○	●	○	○
Medium	0.50	Bicycle Boulevard	Green River Street/Rio VeRoade Street	Cleveland Avenue	Van Buren Avenue	◐	◐	●	●	●	○	◐	○	○
Medium	0.12	Bicycle Boulevard	Laramie Street	Monroe Avenue	Cleveland Avenue	○	●	●	●	●	○	◐	○	○

Tier	Length (Mi.)	Type	Name	From	To	Cycling Level of Service	Access and Mobility	Suitability without Improvement	Low Stress Bikeway	Multi Modal Connections	Safety and Comfort	Gap Closure	Community Support	Safety Improvement
Medium	0.98	Bicycle Boulevard	Marshall Road	Gardenia Drive	Melton Street	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.05	Bicycle Boulevard	Mccann Ave	Holmes Street	Greenway Street	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.50	Bicycle Boulevard	Melton St	Weaver Road	Powderhouse Road	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.21	Bicycle Boulevard	Moccasin Ave	Prairie Hills Drive	Western Hills Boulevard	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.24	Bicycle Boulevard	Ocean Ave/Superior Ave	Dell Range Boulevard	Rio Verde Street	🕒	🕒	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.50	Bicycle Boulevard	Ocean Loop/Everton Dr	N. College Drive	Ocean Loop	🕒	🕒	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.28	Bicycle Boulevard	Pine Dr/Forest Dr	E. Pershing Boulevard	Omaha Road	🕒	🟢	🟢	🟢	🟢	🕒	🟢	🕒	🕒
Medium	0.33	Bicycle Boulevard	Point Boulevard	Plain View Road	Converse Avenue	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.80	Bicycle Boulevard	Prairie Hills Dr/North Gate Ave/Main St	Vandehei Avenue	Yellowstone Road	🕒	🕒	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.41	Bicycle Boulevard	Seymour Ave	E. 7th Street	E. 1st Street	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🟢	🕒
Medium	0.85	Bicycle Boulevard	Seymour Ave	E. Pershing Boulevard	E. 15th Street	🕒	🟢	🕒	🟢	🟢	🕒	🕒	🟢	🟢
Medium	0.17	Bicycle Boulevard	Shoshoni St/Jenny Lake	E. Carlson Street	Shoshoni Street	🕒	🟢	🟢	🟢	🟢	🕒	🟢	🕒	🕒
Medium	0.25	Bicycle Boulevard	Sunset Dr	Storey Boulevard	E. Carlson Street	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.37	Bicycle Boulevard	Sunset Dr/Jenny Lake	Tower Junction Road	Dell Range Boulevard	🕒	🟢	🕒	🟢	🟢	🕒	🕒	🕒	🟢
Medium	0.48	Bicycle Boulevard	Taft Ave	E. 12th Street	Raleigh Drive	🕒	🕒	🕒	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.47	Bicycle Boulevard	US 30	Cleveland Avenue	Polk Avenue	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🟢	🕒
Medium	1.08	Bicycle Boulevard	W 15th St	Bent Avenue	Nationway	🕒	🟢	🕒	🟢	🟢	🕒	🕒	🟢	🟢
Medium	0.50	Bicycle Boulevard	W 2nd Ave	Hynds Boulevard	Bent Avenue	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.63	Bicycle Boulevard	W 5th Ave/Reed Ave/Bent Ave	W. 8th Avenue	W. 31st Street	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.13	Bicycle Boulevard	W 7th St	Central Avenue	Carey Avenue	🕒	🟢	🟢	🟢	🟢	🕒	🟢	🕒	🕒
Medium	0.35	Bicycle Boulevard	W 7th St/Stanford Ave	Deming Drive	Snyder Avenue	🕒	🟢	🟢	🟢	🟢	🕒	🕒	🕒	🕒
Medium	0.44	Bicycle Boulevard	W Jefferson Road	Walterscheid Boulevard	S. Greeley Highway	🕒	🟢	🟢	🟢	🟢	🕒	🟢	🕒	🕒
Medium	0.47	Bicycle Boulevard	W Prosser Road	Walterscheid Boulevard	S. Greeley Highway	🕒	🟢	🟢	🟢	🟢	🕒	🟢	🕒	🕒
Medium	0.25	Bicycle Boulevard	Wills Road	Charles Street	E. Pershing Boulevard	🕒	🟢	🕒	🟢	🟢	🕒	🕒	🕒	🟢
Medium	1.13	Bike Lane	Bishop Boulevard	Vandehei Avenue	Central Avenue	🕒	🟢	🕒	🕒	🕒	🕒	🟢	🟢	🟢
Medium	0.55	Bike Lane	Carey Avenue	Kennedy Road	W. 8th Avenue	🕒	🟢	🕒	🕒	🟢	🕒	🟢	🟢	🕒
Medium	0.55	Bike Lane	Carey Avenue	W. 8th Avenue	E. Pershing Boulevard	🕒	🟢	🕒	🕒	🟢	🕒	🕒	🟢	🕒
Medium	0.85	Bike Lane	Converse Avenie	E. 19th Street	E. 8th Street	🕒	🟢	🕒	🕒	🟢	🕒	🕒	🟢	🟢
Medium	0.37	Bike Lane	Dell Range Boulevard	Ridge Road	N. College Drive	🕒	🟢	🕒	🕒	🟢	🕒	🕒	🟢	🟢
Medium	0.89	Bike Lane	Dell Range Boulevard	Converse Avenue	Ridge Road	🕒	🟢	🕒	🕒	🟢	🕒	🟢	🟢	🟢
Medium	0.36	Bike Lane	Deming Dr	W. 9th Street	W. 4th Street	🕒	🟢	🕒	🕒	🟢	🕒	🟢	🕒	🟢
Medium	1.04	Bike Lane	E 19th Street	Central Avenue	Logan Avenue	🕒	🟢	🕒	🕒	🟢	🕒	🟢	🟢	🕒
Medium	1.04	Bike Lane	E 20th Street	Central Avenue	Logan Avenue	🕒	🟢	🕒	🕒	🟢	🕒	🟢	🟢	🕒
Medium	1.51	Bike Lane	E Lincolnway	Omaha Road	E. Pershing Boulevard	🕒	🟢	🕒	🕒	🟢	🕒	🕒	🟢	🟢
Medium	1.12	Bike Lane	E Lincolnway	Omaha Road	W. 15th Street	🕒	🟢	🕒	🕒	🟢	🕒	🕒	🟢	🟢
Medium	0.89	Bike Lane	Evans Avenue	E. Pershing Boulevard	E. Lincolnway	🕒	🟢	🕒	🕒	🟢	🕒	🕒	🕒	🟢
Medium	0.21	Bike Lane	Manhattan Ln	Gardenia Drive	Montclair Drive	🕒	🕒	🟢	🕒	🟢	🕒	🟢	🕒	🕒
Medium	0.07	Bike Lane	Missile Drive	W. 19th Street	W. 18th Street	🕒	🟢	🕒	🕒	🟢	🕒	🟢	🕒	🕒
Medium	0.05	Bike Lane	Missile Drive	W. 19th Street (N)	Connector	🟢	🟢	🕒	🕒	🟢	🕒	🟢	🕒	🕒
Medium	0.04	Bike Lane	Missile Drive	Connector	W. 19th Street	🟢	🟢	🕒	🕒	🟢	🕒	🟢	🕒	🕒
Medium	0.24	Bike Lane	Missile Drive	I-25	W. 24th Street	🟢	🟢	🕒	🕒	🟢	🕒	🟢	🕒	🕒
Medium	0.76	Bike Lane	Morrie Avenue	E. Pershing Boulevard	E. 15th Street	🕒	🟢	🕒	🕒	🟢	🕒	🕒	🟢	🕒
Medium	0.51	Bike Lane	N College Dr	Rawlins Street	E. Pershing Boulevard	🕒	🟢	🕒	🕒	🟢	🕒	🕒	🟢	🟢
Medium	1.03	Bike Lane	N College Drive	E. Pershing Boulevard	0.2M North of Campstool Drive	🕒	🟢	🕒	🕒	🟢	🕒	🟢	🟢	🕒
Medium	0.84	Bike Lane	Parsley Boulevard	Interstate 80	Ames Avenue	🕒	🟢	🕒	🕒	🟢	🕒	🟢	🟢	🕒

Tier	Length (Mi.)	Type	Name	From	To	Cycling Level of Service	Access and Mobility	Suitability without Improvement	Low Stress Bikeway	Multi Modal Connections	Safety and Comfort	Gap Closure	Community Support	Safety Improvement
Medium	0.99	Bike Lane	Powderhouse Road	Storey Boulevard	Dell Range Boulevard	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.66	Bike Lane	Prairie Ave	Powderhouse Road	Cutoff Road	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.35	Bike Lane	Prairie Ave	Dell Range Boulevard	Powderhouse Road	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	1.04	Bike Lane	Randall Avenue	Hynds Boulevard	Carey Avenue	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.14	Bike Lane	Ridge Road	E. Lincolnway	E. 12th Street	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.38	Bike Lane	Ridge Road	Laramie Street	E. Pershing Boulevard	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.50	Bike Lane	Ridge Road	Douglas Street	Dell Range Boulevard	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.04	Bike Lane	Stanfield Ave	W. Fox Farm Road	W. Leisher Road	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.37	Bike Lane	Storey Boulevard	Marshall Road	Powderhouse Road	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.65	Bike Lane	Storey Boulevard	Yellowstone Road	Marshall Road	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.66	Bike Lane	Taft Avenue	E. Pershing Boulevard	E. 12th Street	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.01	Bike Lane	W 24th St	Missile Drive (E)	Missile Drive (W)	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.96	Bike Lane	W 8th Avenue	Hynds Boulevard	House Avenue	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.22	Bike Lane	W Carlson Street	Education Drive	Yellowstone Road	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.25	Bike Lane	W Fox Farm Road	Stanfield Avenue	Walterscheid Boulevard	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.17	Bike Lane	W Leisher Road	Ahrens Avenue	S. Cribbon Avenue	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.50	Bike Lane	W Leisher Road	S. Cribbon Avenue	Stanfield Avenue	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	2.47	Bike Lane	W Lincolnway	Interstate 80	Cutler Road	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.78	Bike Lane	W Lincolnway	Westland Road	Missile Drive	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.02	Bike Lane	W Lincolnway	Ames Avenue (W)	Ames Avenue (E)	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.79	Bike Lane	Walterscheid Boulevard	Deming Drive	W. Allison Road	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.50	Bike Lane	Walterscheid Boulevard	W. Allison Road	W. College Drive	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.00	Bike Lane	Walterscheid Boulevard	Serenade Drive	Dot Ray Place	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.49	Bike Lane	Yellowstone Road	Montclair Drive	Carlson Street	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	1.25	Buffered Bike Lane	Central Avenue	Yellowstone Road	8th Avenue	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.97	Greenway	Allison Draw Phase III	Park Avenue	W College Drive	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.74	Greenway	Allison Draw to Afflerbach School	Plum Street	Venus Avenue	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.52	Greenway	Allison Road. to Allison Draw	Walterscheid Boulevard	Allison Draw Greenway	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	3.71	Greenway	Business Park to Big Hole	Otto Road	Big Hole	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.04	Greenway	Cleveland Avenue Greenway Extension	Rock Springs Street	Cleveland Avenue	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	3.78	Greenway	Crow Creek -- Lummis Corridor	Morrie Avenue	Allison Draw I	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.43	Greenway	Deming & Walterscheid to South Park	South Cheyenne Greenway	Crow Creek Greenway	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.27	Greenway	Dillon Avenue Greenway Extension	W. 27th Street	Dillon Avenue	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.43	Greenway	East High School Connector	E. Pershing Boulevard	Charles Street	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.87	Greenway	East Phase IIIC - East	N. College Drive	Taft Avenue	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.94	Greenway	Grove	Pershing Boulevard	Dry Creek Greenway	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.04	Greenway	Hot Springs Avenue Greenway Extension	E. 7th Street	1980 Corporate Limit	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.45	Greenway	JL Ranch WAPA Soft Surface	BNSF Rail Trail	Banner Drive	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.71	Greenway	LEADS Open Space	UPRR	Campstool Road	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.45	Greenway	LEADS Open Space -- Campstool to I-80	Campstool Road	I-80	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒
Medium	0.71	Greenway	Lions Park to Country Club	Lions Park	Country Club	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒	🕒

Tier	Length (Mi.)	Type	Name	From	To	Cycling Level of Service	Access and Mobility	Suitability without Improvement	Low Stress Bikeway	Multi Modal Connections	Safety and Comfort	Gap Closure	Community Support	Safety Improvement
Medium	0.32	Greenway	Morrie Avenue -- 1st Street to Teton	E 1st Street	Teton Street	○	●	●	●	●	●	◐	○	○
Medium	0.22	Greenway	Morrie Avenue -- Fox Farm to Teton	Teton Stret	Fox Farm Road	◐	●	●	●	●	●	○	○	○
Medium	1.37	Greenway	S Greeley Loop -- West	Park Avenue	SE Ridgeline	◐	◐	●	●	○	●	○	●	○
Medium	0.63	Greenway	Saddle Ridge US 30 Connector	Hayes Avenue	Whitney Road	◐	●	●	●	○	●	○	●	○
Medium	0.21	Greenway	South Park -- Ames to Cribbon	Deming Drive	W 5th Street	○	●	●	●	●	●	●	○	○
Medium	0.27	Greenway	South Park -- Ames to YACC	Ames Avenue	Union Avenue	○	●	●	●	●	●	●	○	○
Medium	0.25	Greenway	South Park -- Snyder Connector	Snyder Avenue	South Park Trail	○	●	●	●	●	●	◐	○	○
Medium	0.13	Greenway	South Park Greenway Extension	W. 5th Street	W. 4th Street	○	●	●	●	●	●	◐	○	○
Medium	0.12	Greenway	South Park YACC Connector	Romero Park	South Park	○	●	●	●	●	●	●	○	○
Medium	0.24	Greenway	Taft Ave. -- US 30 to Pershing	US 30	E Pershing Boulevard	○	●	●	●	●	●	●	○	○
Medium	0.56	Greenway	Taft to South Industrial -- Under I-80	Taft Avenue	HR Ranch Road	●	●	●	●	○	●	○	○	○
Medium	1.16	Greenway	UPRR ROW	Taft Avenue	Whitney Road	◐	●	●	●	○	●	◐	○	○
Medium	1.06	Greenway	US30 -- Whitney to Christensen	Whitney Road	Christensen Road	◐	◐	●	●	○	●	○	●	○
Medium	2.00	Greenway	US30 Christensen to Archer	Christensen Road	Westedt Road	●	○	●	●	○	●	○	●	○
Medium	0.06	Greenway	W 7th Street Conceptual Corridor	Carey Avenue	Creek Bridge	○	●	●	●	●	●	●	○	○
Medium	0.40	Greenway	Walterscheid -- Fox Farm to WAPA Corridor	W Fox Farm Road	W Jefferson Road	○	●	●	●	●	●	●	○	○
Medium	0.26	Greenway	Walterscheid Underpass	Derr Avenue	W Jefferson Road	○	●	●	●	●	●	●	○	○
Medium	0.14	Greenway	WAPA Corridor -- McFarland to Walterscheid	Mcfarland Avenue	Walterscheid Boulevard	○	●	●	●	●	●	●	○	○
Medium	1.91	Greenway	Warren AFB N-S Connector	Kennedy Road	Crow Creek	○	●	●	●	●	●	○	●	○
Medium	0.68	Shared Lane Markings	Carey Ave	W. 25th Street	W. 15th Street	○	●	◐	○	●	◐	○	●	●
Medium	0.99	Shared Lane Markings	Central Ave	Pershing Boulevard	Lincolnway	○	●	○	○	●	◐	○	●	●
Medium	0.48	Shared Lane Markings	Oneil Ave	W. 22nd Street	W. 15th Street	○	●	◐	○	●	◐	○	○	●
Medium	0.80	Shared Lane Markings	Pioneer Ave	Randall Avenue	W. 15th Street	○	●	◐	○	●	◐	○	●	●
Medium	0.42	Shared Lane Markings	Snyder Ave	W. Leisher Road	W. Allison Road	○	●	◐	○	●	○	●	●	○
Medium	0.83	Shared Lane Markings	Snyder Avenue	W. 8th Avenue	W. 29th Street	◐	●	◐	○	●	○	○	●	○
Medium	0.72	Shared Lane Markings	W 22nd St	Snyder Avenue	Evans Avenue	○	●	●	○	●	◐	○	○	●
Medium	0.96	Shared Lane Markings	Warren Ave	E. Pershing Boulevard	E. Lincolnway	○	●	○	○	●	◐	○	●	●
Medium	0.18	Shared Lane Markings	Western Hills Boulevard	Antelope Avenue	Bishop Boulevard	○	◐	●	○	○	◐	●	○	●
Medium	1.22	Shoulder Bikeway	E Pershing Boulevard	Cleveland Avenue	Whitney Road	●	●	◐	○	●	○	◐	●	○
Medium	1.18	Shoulder Bikeway	Powderhouse Road	E. Four Mile Road	Storey Boulevard	○	◐	◐	○	○	○	◐	●	○
Long	0.42	Bicycle Boulevard	Avenue C-1	E. Fox Farm Road	Reiner Court	◐	●	○	●	●	○	◐	○	○
Long	0.84	Bicycle Boulevard	Ballad Ln/Concerto Ln/Medley Loop/Sonata Ln//Serenade Dr/Little Ditty Ln	Center Drive	Walterscheid Boulevard	○	●	●	●	○	○	◐	○	○
Long	0.90	Bicycle Boulevard	Buckskin Trl	Columbia Drive	Chief Washakie Avenue	○	●	●	●	○	○	○	○	○
Long	0.48	Bicycle Boulevard	Canyon Road	Storey Boulevard	Hilltop Avenue	○	◐	●	●	○	○	◐	○	○
Long	0.25	Bicycle Boulevard	Chief Washakie Ave	Tranquility Road	Storey Boulevard	○	◐	◐	○	○	○	●	○	○
Long	0.74	Bicycle Boulevard	Chief Washakie Ave	E. Four Mile Road	Tranquility Road	○	●	○	●	○	○	○	○	○
Long	0.51	Bicycle Boulevard	Cleveland Avenue Greenway Extension	Rawlins Street	E. Pershing Boulevard	○	●	●	●	●	○	○	○	○

Tier	Length (Mi.)	Type	Name	From	To	Cycling Level of Service	Access and Mobility	Suitability without Improvement	Low Stress Bikeway	Multi Modal Connections	Safety and Comfort	Gap Closure	Community Support	Safety Improvement
Long	0.13	Bicycle Boulevard	Cleveland Avenue Greenway Extension	Rock Springs Street	Rawlins Street	○	●	●	●	●	○	●	○	○
Long	0.81	Bicycle Boulevard	Converse Avenue/Powderhouse Road Greenway Extension	Powderhouse Boulevard	Converse Avenue	○	○	○	●	○	○	○	○	○
Long	1.00	Bicycle Boulevard	Division Ave	W. College Drive	W. Wallick Road	◐	●	○	●	●	○	◐	○	○
Long	0.15	Bicycle Boulevard	Dot Ray Pl	Walterscheid Boulevard	W. Prosser Road	○	●	○	●	●	○	◐	○	○
Long	0.70	Bicycle Boulevard	E Jefferson Road	S. Greeley Highway	Avenue C-1	◐	●	○	●	●	○	○	○	○
Long	0.12	Bicycle Boulevard	Everton Dr	Ridge Road	Cindy Avenue	◐	●	○	●	●	○	◐	○	○
Long	1.35	Bicycle Boulevard	Foxcroft Road/E 2nd Ave/Newton Dr/Leeds Pl/Black Ct/Bradley Ave/Amherst Road	Airport Parkway	Airport Parkway	○	●	●	●	●	○	○	○	○
Long	0.34	Bicycle Boulevard	Green River Street/Woodcrest Avenue/Liberty Street	Van Buren Avenue	Hayes Avenue	◐	●	●	●	○	○	○	○	○
Long	0.03	Bicycle Boulevard	Green Valley Road	Long Valley Road	Cheyenne Surgical Center	○	●	○	●	●	○	○	○	○
Long	0.51	Bicycle Boulevard	Greenmeadow Drive	Whitney Road	Hayes Avenue	◐	●	●	●	○	○	○	○	○
Long	0.91	Bicycle Boulevard	Hitching Post Lane	Woodhouse Drive	Foster Avenue	◐	●	●	●	○	○	○	○	○
Long	0.20	Bicycle Boulevard	Jazz Dr	S. Parsley Boulevard	Blues Drive	○	◐	●	●	○	○	◐	○	○
Long	0.38	Bicycle Boulevard	Lafayette Boulevard	Bomar Drive	Legacy Parkway	○	●	○	●	○	○	◐	○	○
Long	0.12	Bicycle Boulevard	Laramie Street	N. College Drive	Monroe Avenue	○	●	●	●	●	○	○	○	○
Long	0.51	Bicycle Boulevard	Laramie Street	Grove Drive	N. College Drive	○	●	●	●	●	○	○	○	○
Long	0.43	Bicycle Boulevard	Laramie Street/Parsons Place	Cleveland Avenue	Highway 30	○	●	○	●	●	○	◐	○	○
Long	0.76	Bicycle Boulevard	Legacy Pkwy	E. Four Mile Road	Gardenia Drive	○	●	●	●	○	○	●	○	○
Long	0.28	Bicycle Boulevard	Manhattan Ln	Lafayette Bouelvard	Gardenia Drive	○	◐	●	●	○	○	◐	○	○
Long	0.28	Bicycle Boulevard	New BedfoRoad Dr	Manhattan Lane	Gardenia Drive	○	●	●	●	○	○	●	○	○
Long	1.08	Bicycle Boulevard	Old Trail Road/E 10th St/Green Valley Road/Cactus Hill Road/Windmill Road	Green Valley Road	Logan Avenue	○	●	●	●	●	○	○	○	○
Long	0.65	Bicycle Boulevard	Oneil Ave	W. 31st Street	W. 22nd Street	○	●	○	●	●	○	○	○	○
Long	0.73	Bicycle Boulevard	Park Ave	W. College Drive	Plum Street	◐	●	●	●	○	○	○	○	○
Long	0.69	Bicycle Boulevard	Pineridge Ave/Pattison Ave	Mountain Road	Sheridan Street	○	●	●	●	●	○	○	○	○
Long	0.49	Bicycle Boulevard	Rawlins Street	Cleveland Avenue	Van Buren Avenue	○	●	◐	●	○	○	●	○	○
Long	0.44	Bicycle Boulevard	Ridge Road/Hillcrest Road	E. 12th Street	Barbell Court	○	●	●	●	●	○	○	○	○
Long	0.34	Bicycle Boulevard	Rue Royal	Bomar Drive	Storey Boulevard	○	●	●	●	●	○	○	○	○
Long	0.58	Bicycle Boulevard	Spirit Ln/Montclair Dr	Weaver Road	Gardenia Drive	○	◐	○	●	●	○	◐	○	○
Long	0.53	Bicycle Boulevard	Stevens Dr/Henderson Dr/Homestead Ave/Eda Pl	Eda Place	Hillcrest Road	○	●	○	●	●	○	●	○	○
Long	0.51	Bicycle Boulevard	W 5th St	Parsley Boulevard	Snyder Avenue	○	●	◐	●	●	○	◐	○	○
Long	0.13	Bicycle Boulevard	Wills Road	Laramie Street	Charles Street	○	●	○	●	●	○	○	○	○
Long	0.21	Bicycle Boulevard	Woodhouse Drive	Dell Range Boulevard	U.S. 30	◐	●	○	●	○	○	○	○	○
Long	1.66	Bike Lane	Airport Pkwy	E. Pershing Boulevard	Converse Avenue	○	◐	◐	○	●	○	●	○	○
Long	2.41	Bike Lane	Bishop Boulevard	Iron Mountain Road	Vandehei Avenue	●	●	◐	○	○	○	○	●	○
Long	0.44	Bike Lane	Carey Avenue	W. Pershing Boulevard	W. 25th Street	○	●	◐	○	●	○	○	●	○
Long	0.92	Bike Lane	Chestnut Drive/Hot Springs Avenue	Chestnut Drive	E. 7th Street	◐	●	○	○	●	◐	○	○	●
Long	0.47	Bike Lane	Cleveland Ave	E. Lincolnway	E. 12th Street	◐	◐	◐	○	●	○	◐	○	○
Long	0.08	Bike Lane	Cutoff Road	Rue Terra	Prairie Avenue	◐	●	○	○	●	○	◐	○	○
Long	0.74	Bike Lane	Dell Range Boulevard	N. College Drive	Van Buren Avenue	◐	◐	○	○	●	○	○	●	○
Long	0.51	Bike Lane	Deming Dr	Central Avenue	W. 9th Street	○	●	◐	○	●	○	●	○	○

Tier	Length (Mi.)	Type	Name	From	To	Cycling Level of Service	Access and Mobility	Suitability without Improvement	Low Stress Bikeway	Multi Modal Connections	Safety and Comfort	Gap Closure	Community Support	Safety Improvement
Long	0.01	Bike Lane	E 10th Street	Converse Avenue	Converse Avenue	○	●	●	○	●	○	◐	○	○
Long	0.37	Bike Lane	E Carlson Street	Marshall Road	Powderhouse Road	◐	●	◐	○	●	○	○	○	○
Long	0.65	Bike Lane	E Carlson Street	Yellowstone Road	Marshall Road	◐	●	◐	○	●	○	◐	○	○
Long	0.22	Bike Lane	Education Dr	Western Hills Boulevard	W. Carlson Street	◐	●	◐	○	●	○	●	○	○
Long	0.52	Bike Lane	Evans Avenue	E. 8th Avenue	E. Pershing Boulevard	◐	●	◐	○	●	○	●	○	○
Long	0.34	Bike Lane	Evers Boulevard	Sterling Drive	Oakhurst Drive	○	●	●	○	○	○	◐	○	○
Long	4.64	Bike Lane	Happy Jack Road	I-25	2M West of Roundtop Road	●	●	◐	○	○	○	○	●	○
Long	0.25	Bike Lane	Holmes Street	Ridge Road	McCann Avenue	◐	●	●	○	●	○	○	○	○
Long	0.78	Bike Lane	Hynds Boulevard	Kennedy Road	W. 2nd Avenue	○	●	◐	○	●	○	○	●	○
Long	2.41	Bike Lane	Hynds Boulevard	Iron Mountain Road	Vandehei Avenue	◐	◐	◐	○	○	○	○	●	○
Long	0.44	Bike Lane	Kennedy Road	Central Avenue	Hynds Boulevard	◐	●	◐	○	●	○	◐	○	○
Long	0.27	Bike Lane	Missile Drive	W. 24th Street	W. 19th Street	●	●	◐	○	●	○	◐	○	○
Long	0.29	Bike Lane	Missile Drive	I-25 Overpass	I-25 Overpass	●	◐	◐	○	●	○	○	○	○
Long	0.21	Bike Lane	Missile Drive	I-25 Overpass	I-25 Overpass	●	◐	◐	○	●	○	○	○	○
Long	0.81	Bike Lane	Missle Drive	I-25	W. Lincoln Way	●	●	◐	○	●	○	◐	○	○
Long	0.49	Bike Lane	N College Dr	Dell Range Boulevard	Rawlins Street	○	●	○	○	●	○	●	●	○
Long	0.37	Bike Lane	N College Dr	Carla Drive	Dell Range Boulevard 0.2M North of Campstool Road	◐	●	○	○	●	○	○	●	○
Long	1.02	Bike Lane	N College Drive	E. Fox Farm Road	Road	◐	◐	○	○	○	○	○	●	○
Long	0.78	Bike Lane	Omaha Road	E. Lincolnway	Ridge Road	◐	●	◐	○	●	○	●	○	○
Long	0.50	Bike Lane	Pioneer Ave	W. 2nd Avenue	Randall Avenue	○	●	◐	○	●	○	○	●	○
Long	0.49	Bike Lane	Ridge Road	E. Pershing Boulevard	E. Lincolnway	◐	●	◐	○	●	○	◐	○	○
Long	0.28	Bike Lane	Rue Terre	Cutoff Road	Dell Range Boulevard	◐	●	◐	○	●	○	◐	○	○
Long	2.40	Bike Lane	S College Drive	S. Greeley Highway	E. Fox Farm Road	○	●	○	○	●	○	●	●	○
Long	0.96	Bike Lane	S Parsley Boulevard	Interstate 80	W. College Drive	○	●	◐	○	●	○	○	○	○
Long	0.28	Bike Lane	Seminoe Road/Melton St	Melton Street	Dell Range Boulevard	◐	●	◐	○	●	○	●	○	○
Long	0.65	Bike Lane	Van Buren Ave	Dell Range Boulevard	U.S. 30	◐	●	◐	○	○	○	◐	○	○
Long	0.47	Bike Lane	W Allison Road	S. Arp Avenue	Snyder Avenue	○	●	○	○	●	○	●	○	○
Long	0.51	Bike Lane	W Allison Road	Snyder Avenue	Walterscheid Boulevard	○	●	◐	○	●	○	●	○	○
Long	1.49	Bike Lane	W College Drive	S. Parsley Blvd	S. Greeley Hwy	◐	●	○	○	○	○	○	●	◐
Long	0.31	Bike Lane	W Fox Farm Road	Walterscheid Boulevard	N. Greeley Highway	○	●	◐	○	●	○	◐	○	○
Long	0.49	Bike Lane	Weaver Road	Storey Boulevard	Melton Street	◐	●	◐	○	●	○	◐	○	○
Long	0.28	Bike Lane	Weaver Road	Montclair Drive	Storey Boulevard	○	◐	●	○	●	○	○	○	○
Long	0.51	Bike Lane	Western Hills Boulevard	Hynds Boulevard	Yellowstone Road	◐	●	◐	○	●	○	◐	○	○
Long	0.01	Bike Lane	Yellowstone Road	Montclair Drive	North Gate Avenue	◐	●	○	○	●	○	◐	●	○
Long	0.75	Bike Lane	Yellowstone Road	Four Mile Road	Montclair Drive	○	◐	○	○	○	○	◐	●	○
Long	1.89	Buffered Bike Lane	Connector	Bishop Boulevard	Yellowstone Road	○	●	○	◐	●	○	○	○	○
Long	1.14	Buffered Bike Lane	E Fox Farm Road	Morrie Avenue	N. College Drive	◐	●	◐	◐	●	○	○	○	○
Long	0.70	Buffered Bike Lane	E Fox Farm Road	Greeley Highway	Morrie Avenue	◐	●	◐	◐	●	○	○	○	○
Long	2.38	Buffered Bike Lane	N Greeley Hwy/I-80	E. Lincolnway	Fox Farm Road	○	●	○	◐	●	◐	○	○	●
Long	1.00	Buffered Bike Lane	S Greeley Hwy	College Drive	Wallick Road	◐	●	○	◐	●	○	○	●	○
Long	1.03	Conceptual	Conceptual Corridor	Powderhouse Road	Converse Avenue	○	●	○	○	○	○	◐	○	○
Long	0.75	Conceptual	Conceptual Corridor	Storey Boulevard	Rue Terra	○	●	○	○	●	○	○	○	○
Long	2.93	Conceptual	Roundtop Road Conceptual Corridor	Otto Road	Clear Creek Parkway	●	○	○	○	○	○	○	○	○

Tier	Length (Mi.)	Type	Name	From	To	Cycling Level of Service	Access and Mobility	Suitability without Improvement	Low Stress Bikeway	Multi Modal Connections	Safety and Comfort	Gap Closure	Community Support	Safety Improvement
Long	4.48	Conceptual	SE Ridgeline conceptual Corridor	Interstate 25	Highway 85	●	○	○	○	○	○	○	○	○
Long	9.02	Conceptual	Wallick Road Conceptual Corridor	Interstate 80	Roundtop Road	○	○	○	○	○	○	○	○	○
Long	2.69	Greenway	Allison Draw I	Avenue C-1	Hereford Ranch Reservoir	○	◐	●	●	○	●	○	○	○
Long	0.88	Greenway	Allison Draw II	Allison Draw I	Terminus	○	●	●	●	○	●	○	○	○
BNSF Rail Trail -- Abandoned RR ROW				HR Ranch Road	Campstool Road	○	●	●	●	○	●	○	○	○
Long	2.65	Greenway	Christensen	UPRR	Norris Viaduct	○	●	●	●	○	●	○	○	○
Dry Creek -- I-80 to Water Reclamation Facility				I-80	Water Reclamation Facility	○	●	●	●	○	●	○	○	○
Long	0.36	Greenway	HR Ranch Road -- Burlington Trail to Campstool	Banner Drive	Christensen Road	○	●	●	●	○	●	○	○	○
Long	1.75	Greenway	Lowham Property -- Campstool to Archer	Campstool Way	Archer Parkway	○	●	●	●	○	●	○	○	○
Long	2.90	Greenway	North Cheyenne Park -- Canyon Road	Painted Horse Trail	Storey Boulevard	○	●	●	●	○	●	○	○	○
Pointe -- Prairie Wind Connector Ridge Connector -- Summit to Whitney				Pointe	E Four Mile Road	○	●	●	●	○	●	○	○	○
Long	0.58	Greenway	Rossman School Connector	N College Drive	Whitney Road	○	◐	●	●	○	●	○	○	○
Long	2.12	Greenway	Saddle Ridge School Connector	South High School Loop	Little Ditty Lane	○	●	●	●	○	●	○	○	○
Long	0.37	Greenway	Saddle Ridge School Connector	E Pershing Boulevard	Saddle Ridge Elementary	◐	●	●	●	○	●	○	○	○
Long	0.93	Greenway	SE Ridgeline	South Greeley highway	Campstool Road	○	○	●	●	○	●	○	○	○
Long	9.00	Greenway	South High School Loop	South Cheyenne Greenway	South Cheyenne Greenway	○	●	●	●	○	●	◐	○	○
Long	1.40	Greenway	Sun Valley Open Space	N College Drive	Raleigh Drive	○	●	●	●	○	●	○	○	○
Long	0.64	Greenway	Whitney -- Pershing to UPRR	Pershing Boulevard	UPRR	○	●	●	●	○	●	○	○	○
Long	0.34	Greenway	Central Ave	8th Avenue	W. Pershing Boulevard	◐	●	○	○	●	○	◐	●	○
Long	0.50	Shared Lane Markings	Hilltop Ave/Plain View Road	Point Bluff	Dell Range Boulevard	○	◐	◐	○	○	○	○	○	○
Long	1.26	Shared Lane Markings	Montclair Dr	Yellowstone Road	Weaver Road	○	◐	●	○	●	○	◐	○	○
Long	0.52	Shared Lane Markings	Mountain Road	Plain View Road	Sheridan Street	○	●	◐	○	●	○	○	○	○
Long	0.56	Shared Lane Markings	Snyder Ave	Deming Drive	W. 3rd Street	○	●	○	○	●	○	○	●	○
Long	0.59	Shared Lane Markings	W 18th St	Ames Avenue	Morrie Avenue	○	●	○	○	●	◐	○	○	●
Long	1.29	Shared Lane Markings	Warren Ave	E. 8th Avenue	E. Pershing Boulevard	◐	●	○	○	●	○	◐	●	○
Long	0.48	Shared Lane Markings	Archer Parkway	U.S. 30	South end of I-80 Bridge	●	◐	○	○	○	○	○	○	○
Long	0.29	Shoulder Bikeway	Archer Parkway	Archer Ranch Road	HR Ranch Road	○	○	○	○	○	○	○	○	○
Long	0.56	Shoulder Bikeway	Archer Parkway	I-80 Bridge	Archer Ranch Road	○	●	○	○	○	○	○	○	○
Long	0.10	Shoulder Bikeway	Beckle Road	Whitney Road	Reese Road	●	○	○	○	○	○	○	○	○
Long	2.00	Shoulder Bikeway	Bell Ranch Road	Child Road	Westedt Road	●	○	○	○	○	○	○	○	○
Long	1.81	Shoulder Bikeway	Bell Ranch Road	Road 132	Child Road	●	○	○	○	○	○	○	○	○
Long	1.19	Shoulder Bikeway	Campstool Road	BNSF Rail Trail	Crow Chief Loop (E)	○	○	◐	○	○	○	○	○	○
Long	2.96	Shoulder Bikeway	Campstool Road	I-80	BNSF Rail Trail	○	●	◐	○	○	○	○	○	○
Long	0.63	Shoulder Bikeway	Campstool Road/E 5th Street	Logan Avenue	Livingston Avenue	●	●	◐	○	●	○	◐	○	○
Long	2.06	Shoulder Bikeway	Campstool Way	N. College Drive	Christensen Road	●	●	◐	○	○	○	○	○	◐
Long	3.61	Shoulder Bikeway	Chalk Bluff Road	U.S. 85	7M east of U.S. 85	○	○	◐	○	○	○	○	○	○
Long	6.91	Shoulder Bikeway	Child Road	Iron Mountain Road	Bell Ranch Road	○	○	○	○	○	○	○	○	○
Long	1.00	Shoulder Bikeway	Christensen Road	Highway 30	Tate Road	●	○	○	○	○	○	○	○	◐
Long	0.88	Shoulder Bikeway				●	●	○	○	○	○	○	○	◐

Tier	Length (Mi.)	Type	Name	From	To	Cycling Level of Service	Access and Mobility	Suitability without Improvement	Low Stress Bikeway	Multi Modal Connections	Safety and Comfort	Gap Closure	Community Support	Safety Improvement
Long	1.00	Shoulder Bikeway	Christensen Road	Beckle Road	U.S. 30	●	●	◐	○	○	○	○	○	◐
Long	0.99	Shoulder Bikeway	Christensen Road	E. Riding Club Road	E. Four Mile Road	●	○	◐	○	○	○	○	○	○
Long	1.00	Shoulder Bikeway	Christensen Road	Iron Mountain Road	E. Riding Club Road	●	○	○	○	○	○	○	○	○
Long	0.52	Shoulder Bikeway	Christensen Road	Tate Road	Campstool Road	●	●	○	○	○	○	○	○	○
Long	1.00	Shoulder Bikeway	Christensen Road	E. Four Mile Road	Beckle Road	●	○	◐	○	○	○	○	○	○
Long	3.01	Shoulder Bikeway	Clear Creek Parkway	High Plains Road	College Drive	●	○	○	○	○	○	○	○	○
Long	0.25	Shoulder Bikeway	Converse Ave	E. Four Mile Road	Columbia Drive	○	○	●	○	○	○	○	●	○
Long	0.75	Shoulder Bikeway	Converse Ave	Columbia Drive	Storey Boulevard	○	○	○	○	○	○	○	●	○
Long	1.59	Shoulder Bikeway	Dell Range Boulevard	Van Buren Avenue	Highway 30	●	●	○	○	○	○	○	●	○
Long	0.55	Shoulder Bikeway	E Allison Road	S. Greeley Highway	Avenue C	◐	●	◐	○	●	○	●	○	○
Long	0.67	Shoulder Bikeway	E Four Mile Road	Heavenly Drive	Christensen Road	●	○	◐	○	○	○	○	○	○
Long	1.91	Shoulder Bikeway	E Four Mile Road	N. College Drive	Heavenly Drive	○	○	○	○	○	○	○	○	○
Long	1.54	Shoulder Bikeway	E Four Mile Road	Ridge Road	Thomas Drive	○	●	○	○	○	○	○	○	○
Long	1.53	Shoulder Bikeway	E Four Mile Road	Yellowstone Road	Powderhouse Road	○	●	○	○	○	○	○	○	○
Long	1.60	Shoulder Bikeway	E Four Mile Road	Powderhouse Road	Ridge Road	○	●	○	○	○	○	○	○	○
Long	1.00	Shoulder Bikeway	E Four Mile Road	Reese Road	Westedt Road	●	●	○	○	○	○	○	○	○
Long	1.00	Shoulder Bikeway	E Four Mile Road	Christensen Road	Reese Road	●	●	○	○	○	○	○	○	○
Long	1.09	Shoulder Bikeway	E Pershing Boulevard	Whitney Road	Christensen Road	●	●	◐	○	○	○	○	●	○
Long	1.76	Shoulder Bikeway	E Pershing Boulevard	Christensen Road	I-80	●	●	◐	○	○	○	○	●	○
Long	3.63	Shoulder Bikeway	E Riding Club Road	I-25	Ridge Road	◐	●	◐	○	○	○	○	○	○
Long	4.45	Shoulder Bikeway	Horse Creek Road	W. Milliron Road	Interstate 25	●	○	◐	○	○	○	○	●	○
Long	0.39	Shoulder Bikeway	I-80	E. Pershing Avenue	Ventura Drive	●	○	◐	○	○	○	○	○	○
Long	4.00	Shoulder Bikeway	Iron Mountain Road	Child Road	Geronimo Road	○	○	○	○	○	○	○	○	○
Long	1.07	Shoulder Bikeway	Iron Mountain Road	Powderhouse Road	Geronimo Road	○	○	◐	○	○	○	○	○	○
Long	2.53	Shoulder Bikeway	Iron Mountain Road	Bishop Boulevard	Powderhouse Road	◐	○	○	○	○	○	○	○	○
Long	0.37	Shoulder Bikeway	N College Drive	Thomas Road	Carla Drive	◐	◐	○	○	●	○	○	●	○
Long	3.65	Shoulder Bikeway	Otto Road	I-80	2M West of Roundtop Road	●	○	◐	○	○	○	○	●	○
Long	1.02	Shoulder Bikeway	Powderhouse Road	Iron Mountain Road	E. Riding Club Road	◐	○	◐	○	○	○	○	●	○
Long	1.00	Shoulder Bikeway	Powderhouse Road	Rising Star Road	Iron Mountain Road	○	○	○	○	○	○	○	●	○
Long	1.05	Shoulder Bikeway	Powderhouse Road	E. Riding Club Road	E. Four Mile Road	◐	○	◐	○	○	○	○	●	○
Long	2.00	Shoulder Bikeway	Reese Road	E. Four Mile Road	U.S. 30	●	○	◐	○	○	○	○	○	○
Long	0.51	Shoulder Bikeway	Reese Road	U.S. 30	E. Pershing Avenue	●	○	●	○	○	○	○	○	○
Long	2.50	Shoulder Bikeway	Ridge Road	E. Riding Club Road	Douglas Street	○	●	◐	○	○	○	○	○	○
Long	3.28	Shoulder Bikeway	Roundtop Road	Hildreth Road	Happy Jack Road	●	○	◐	○	○	○	○	●	○
Long	1.81	Shoulder Bikeway	Roundtop Road	Happy Jack Road	Otto Road	●	●	◐	○	○	○	○	●	○
Long	3.00	Shoulder Bikeway	Roundtop Road	Smoking Oak Road	Hildreth Road	●	●	○	○	○	○	○	●	○
Long	0.21	Shoulder Bikeway	Roundtop Road	Horse Creek Road	Smokin' Oak Road	●	○	○	○	○	○	○	●	○
Long	3.56	Shoulder Bikeway	S Greeley Highway	High Plains Road	Chalk Bluff Road	◐	○	○	○	○	○	○	●	○
Long	1.46	Shoulder Bikeway	S Greeley Hwy	Wallick Road	High Plains Road	○	●	○	○	○	○	○	●	○
Long	1.70	Shoulder Bikeway	Southwest Drive	W. Lincolnway	W. College Drive	●	●	◐	○	○	○	○	○	◐
Long	4.21	Shoulder Bikeway	Terry Ranch Road	Speer Road	S. Greeley Highway	●	○	○	○	○	○	○	○	○
Long	1.00	Shoulder Bikeway	Us 30	Westedt Road	Archer Parkway	●	●	○	○	○	○	○	●	○
Long	1.10	Shoulder Bikeway	Venture Dr	Campstool Road	I-80	●	●	◐	○	○	○	○	●	○
Long	0.46	Shoulder Bikeway	W Allison Road	Walterschied Boulevard	S. Greeley Highway	○	●	◐	○	●	○	◐	○	○
Long	1.46	Shoulder Bikeway	W College Drive	Clear Creek Parkway	S. Parsley Boulevard	●	●	○	○	○	○	○	●	◐

Cheyenne On-Street Bicycle Plan and Greenway Plan Preliminary Project Prioritization

Tier	Length (Mi.)	Type	Name	From	To	Cycling Level of Service	Access and Mobility	Suitability without Improvement	Low Stress Bikeway	Multi Modal Connections	Safety and Comfort	Gap Closure	Community Support	Safety Improvement
Long	0.49	Shoulder Bikeway	W Four Mile Road	Hynds Boulevard	Yellowstone Road	⦿	●	⦿	○	○	○	○	○	○
Long	0.54	Shoulder Bikeway	Westedt Road	Bell Ranch Road	E. Four Mile Road	●	○	○	○	○	○	○	○	○
Long	2.00	Shoulder Bikeway	Westedt Road	E. Four Mile Road	U.S. 30	●	○	○	○	○	○	○	○	○
Long	1.00	Shoulder Bikeway	Whitney Road	Beckle Road	Dell Range Boulevard	●	○	⦿	○	○	○	○	○	○
Long	1.00	Shoulder Bikeway	Whitney Road	E. Four Mile Road	Beckle Road	●	○	⦿	○	○	○	○	○	○
Long	2.01	Shoulder Bikeway	Whitney Road	Iron Mountain Road	E. Four Mile Road	●	○	⦿	○	○	○	○	○	○
Long	1.09	Shoulder Bikeway	Whitney Road	U.S. 30	Dry Creek	⦿	●	○	○	○	○	○	○	○
Long	0.30	Shoulder Bikeway	Whitney Road	Dell Range Boulevard	U.S. 30	⦿	●	⦿	○	○	○	○	○	○
Long	3.08	Shoulder Bikeway	Yellowstone Road	Star Valley Drive	W. Four Mile Road	⦿	●	○	○	○	○	○	●	○

Working Paper #12: Potential Funding Sources

This page intentionally blank

Memorandum

To: Jeff Wiggins, *City of Cheyenne* and Sreyoshi Chakraborty *Cheyenne Metropolitan Planning Organization*

From: Rory Renfro and Kim Voros, *Alta Planning + Design*

Date: December 16, 2011

Re: Working Paper #12: Potential Funding Sources



Introduction

Funding is integral to the successful development of the on-street bikeway network and greenway network. Funding may come from a variety of sources including matching grants, sales tax or other taxes, bond measures, or public/private partnerships. This memorandum provides information on potential federal, state, and local funding sources.

Potential Funding Sources

Federal Funding Sources

Federal funding is primarily distributed through a number of different programs established by Congress. The latest act, the Safe, Accountable, Flexible, Efficient Transportation Equity Act – a Legacy for Users (SAFETEA-LU) was enacted in August 2005 as Public Law 109-59.

SAFETEA-LU authorized the federal surface transportation programs for highways, highway safety, and transit for the 5-year period 2005-2009. SAFETEA-LU legislation expired on September 30, 2009, but at the time of writing had been extended to March 31, 2012. It should therefore be noted that it is not possible to guarantee the continued availability of any listed SAFETEA-LU programs, or to predict their future funding levels or policy guidance. Nevertheless, many of these programs have been authorized in some form in repeated federal transportation reauthorization acts, and thus may continue to provide capital for improvements.

In Wyoming, federal funding is administered through the Wyoming Department of Transportation (WYDOT) and regional planning agencies such as Cheyenne Metropolitan Planning Organization. Most, but not all, of these programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and enhancing inter-modal connections. Federal funding is intended for capital improvements and safety and education programs, and projects must relate to the surface transportation system. There are a number of programs identified within SAFETEA-LU that are applicable to projects. These programs are discussed below.

More information: <http://www.fhwa.dot.gov/safetealu/index.htm> SAFETEA-LU

Surface Transportation Program

The Surface Transportation Program (STP) provides states with flexible funds which may be used for a wide variety of projects on any Federal-aid Highway including the National Highway System, bridges on any public road, and transit facilities.

Bicycle improvements are eligible activities under the STP. This covers a wide variety of projects such as on-street facilities, off-road trails, bicycle signals, parking, and other ancillary facilities.

As an exception to the general rule described above, STP-funded bicycle facilities may be located on local and collector roads which are not part of the Federal-aid Highway System. In addition, bicycle-related non-construction projects, such as maps, coordinator positions, and encouragement programs, are eligible for STP funds. STP funds are typically divided into several pots of money and distributed through specific funding programs, such as Transportation Enhancements.

Transportation Enhancements

Administered by WYDOT, this program utilizes STP funds. Ten percent of STP funds are designated for Transportation Enhancement Activities (TEAs), which include “provision of facilities for pedestrians and bicycles”, “provision of safety and educational activities for pedestrians and bicyclists,” and the “preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails)” 23 USC Section 190 (a)(35). The Wyoming Transportation Enhancement Activities – Local (TEAL) program provides funding for community-based projects that “compliment surface transportation facilities by stressing mobility, protection of human and natural environment, community preservation, sustainability and livability.”

TEAL applications are competitive and are reviewed on an annual basis with applications due on June 1 each year. TEAL provides 80 percent reimbursement for project costs to project sponsors and an average of \$2 million is distributed annually. Applications are reviewed by the Advisory Selection Committee, which is made up of five members, with four members representing different state agencies and one member representing the Federal Highway Administration. Recently, Cheyenne has been awarded TEAL funding for the Norris Viaduct project (2008) and Walterscheid Boulevard Underpass (2010).

The Transportation Enhancement Activities – State (TEAS) program stresses mobility, community and livability. Projects must qualify in one of 12 categories including provision of bicycle facilities and education. TEAS projects are not subject to an annual application period and are initiated by a written request to the WYDOT District Engineer, who is responsible for review. Successful projects will be located on or adjacent to a State Highway System and may not compromise safety, drainage, or adversely impact automobile travel.

More information: <http://www.dot.state.wy.us/wydot/site/wydot/teal>,

http://www.dot.state.wy.us/wydot/planning_projects/transportation_programs/enhancement_projects

Congestion Mitigation/Air Quality Improvement Program

The Congestion Mitigation/Air Quality Improvement Program (CMAQ) provides federal funding for projects and programs that reduce transportation emissions in air quality non-attainment and maintenance areas for ozone, carbon monoxide, and particulate matter. Historically Wyoming's program places a priority on funding projects aimed at dust suppression on county roads, but a change in policy could make this a viable funding source for bicycle projects that reduce travel by automobile. Recreational facilities generally are not funded. Annually, each state receives a minimum of 0.5 percent of the total CMAQ funds, with additional funds assigned to states according to the size of population located in areas experiencing excess levels of air pollution. Language in SAFETEA-LU changed CMAQ funding restrictions, allowing each state's 0.5 percent minimum apportionment to be distributed to any jurisdiction, not just air quality non-attainment areas.

The Wyoming CMAQ program can provide up to 80 percent of eligible project funding, but the full project cost is not commonly awarded, and local funding match over the 20 percent minimum is highly encouraged.. WYDOT makes approximately \$2 million in funding is available annually to local governments, with applications made available on September 15 each year. These applications are evaluated by the CMAQ Advisory Committee, which makes recommendations to the Wyoming Transportation Commission, who has final award authority.

More information: http://www.dot.state.wy.us/wydot/planning_projects/transportation_programs/cmaq

Highway Safety Improvement Program

This program funds projects designed to achieve significant reductions in traffic fatalities and serious injuries on all public roads, bikeways, and walkways. The program prioritizes projects with the greatest likelihood to reduce crashes and crash-related injuries. The process for project development is outlined in Wyoming's Performance & Highway Safety Plan, which is published annually. Wyoming was allotted \$5.4 million for Highway Safety Improvement Program projects in 2009. This program replaces the Hazard Elimination Program from TEA-21 and includes the Railway-Highway Crossings Program and the High Risk Rural Roads Program.

More information: <http://safety.fhwa.dot.gov/hsip/resources/fhwasa09030/>

Recreational Trails Program

The Recreational Trails Program of the Federal Transportation Bill provides funds to states to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. Examples of trail uses include hiking, bicycling, in-line skating, equestrian use, and other non-motorized and motorized uses. These funds are available for both paved and unpaved trails, but may not be used to improve roads for general passenger vehicle use or to provide shoulders or sidewalks along roads.

Recreational Trails Program funds may be used for:

- Maintenance and restoration of existing trails

- Purchase and lease of trail construction and maintenance equipment
- Construction of new trails, including unpaved trails
- Acquisition or easements of property for trails
- Educational programs to promote safety and environmental protection related to trails (limited to five percent of a state's funds)

Recreational Trails Program grant funding is administered locally by the Wyoming Trails Program. Approximately \$1.2 million was available in the 2010 fiscal year, with 30 percent reserved for non-motorized projects and 40 percent reserved for diversified projects. Diversified projects must combine both motorized and non-motorized uses in the same trail corridor. Local, state, and federal agencies, as well as qualifying private organizations such as non-profit trail stewardship organizations, are eligible to apply. Project sponsors are required to provide a minimum 20 percent local funding match. Awards are capped at \$50,000 for non-motorized projects and \$100,000 for diversified projects.

More information: <http://wyotrails.state.wy.us/>

Safe Routes to School (SRTS)

Under the Safe Routes to School (SRTS) Program, federal funds are administered by WYDOT. The grants can be used to identify and reduce barriers and hazards to children walking or bicycling to school (70 to 90 percent of fund), or for non-infrastructure encouragement and education programs (10 to 30 percent). Between 2005 and 2010, approximately \$1 million has been made available in Wyoming annually. Eligible projects can be fully funded with no local match requirement, but due to high competition, projects that leverage SRTS dollars with funding from other sources are preferred. Infrastructure project applications are limited to \$200,000 in funding annually. Entities such as state agencies, counties, or non-profit organizations are encouraged to apply, but projects must be coordinated with the local school district, and every project must include a school or schools as co-applicants.

More information: http://www.dot.state.wy.us/wydot/planning_projects/transportation_programs/srts

Community Development Block Grants

The Community Development Block Grant Program is a part of the Department of Housing and Urban Development. The program has flexible guidelines that allow its funding to be distributed to many different types of projects that aid low-income populations, prevent or alleviate urban blight, or address a community's urgent need.

Grantees may "use Community Development Block Grants funds for activities that include (but are not limited to): acquiring real property; reconstructing or rehabilitating housing and other property; building public facilities and improvements, such as streets, sidewalks."

Community Development Block Grant funding is allocated by formula to states and to cities with populations over 50,000. In 2009, Wyoming received \$3.2 million and Cheyenne received \$546,000 to distribute to grant applicants. Government agencies, non-profit organizations, and individuals are all eligible to apply for a grant. In Cheyenne, the program is administered by Cheyenne Housing and Community Development. Grants are awarded on an annual cycle, with the process beginning in October and applications due in December.

More information: <http://www.cheyennecity.org/index.aspx?nid=170>

Transportation, Community, and System Preservation Program

The Transportation, Community, and System Preservation (TCSP) Program provides federal funding for transit-oriented development, traffic calming, and other projects that improve the efficiency of the transportation system, reduce the impact on the environment, and provide efficient access to jobs, services, and trade centers. The program is intended to provide communities with the resources to explore the integration of their transportation system with community preservation and environmental activities. The TCSP Program funds require a 20 percent match. Cheyenne has successfully leveraged these funds to help fund this planning effort.

Because the TCSP Program is one of many programs authorized under SAFETEA-LU, current funding has only been extended through March 31st of 2012, and program officials are not currently accepting applications for 2011. In most years, Congress has identified projects to be selected for funding through the TCSP program. Assuming that this method is used to allocate TCSP monies in the future, the City of Cheyenne will need to work closely with WYDOT and Members of Congress to gain access to this funding.

More information: <http://www.fhwa.dot.gov/tcsp/>

Rivers, Trails and Conservation Assistance Program

The Rivers, Trails and Conservation Assistance Program (RTCA) is a National Parks Service program which provides technical assistance via direct staff involvement to establish and restore greenways, rivers, trails, watersheds, and open space. The RTCA program provides only planning assistance—there are no implementation monies available. Projects are prioritized for assistance based on criteria that include conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments. Technical assistance is available for a period of one fiscal year, lasting October 1st through September 30th. Applications for the following year are due annually on August 1. Alan Ragins, Intermountain Region Program Manager, is the Wyoming contact for information and project applications. This program may benefit trail development in and around Cheyenne indirectly through technical assistance, particularly for community organizations, but should not be considered a future capital funding source.

More information: <http://www.nps.gov/pwro/rtca/who-we-are.htm>

Land and Water Conservation Fund

The Land and Water Conservation Fund (LWCF) is a federally-funded program providing grants for planning and acquiring outdoor recreation areas and facilities, including trails. It is a matching grant, reimbursing up to 50 percent of the total cost of the project. Funds can be used for right-of-way acquisition and construction. The Wyoming State Parks, Historic Sites and Trails Department administers the project. Wyoming's total apportionment for fiscal year 2010 was \$334,000. Applications are reviewed annually and are due on January 30 each year. Set aside land in perpetuity.

More information: <http://www.nps.gov/state/wy/index.htm>

Federal Transit Administration Funds

The Federal Transit Administration (FTA) views walking and bicycling as modes that complement public transit, as many people either begin or end their transit trip on foot or by bicycle. The FTA has recently issued a policy statement that expands the catchment area around transit stops within which bicycle projects are eligible for FTA financial support. All bicycle projects within three miles of a public transit stop are considered to have a *de facto* relationship with public transportation. Projects within this catchment area are thereby eligible for one of the grant programs administered by the FTA to fund the design, construction, and maintenance of bicycle projects that enhance or are related to public transportation facilities.

Projects that may be eligible due to geographic co-location with transit stops are also subject to additional statutory criteria, such as requirements to:

- Enhance economic development or incorporate private investment
- Enhance the effectiveness of a public transportation project and relate physically or functionally to that project
- Establish new or enhanced coordination between public transportation and other transportation
- Provide a fair share of revenue for public transportation

Recipients of FTA funding will not be required to certify ridership numbers related to their projects within the catchment areas. Research has indicated that improved access to a stop or station typically results in increased ridership.

More information: <http://edocket.access.gpo.gov/2009/pdf/E9-27240.pdf>

Transportation Investment Generating Economic Recovery (TIGER) Grants

Originally funded under the 2009 American Recover and Reinvestment Act, TIGER grants have been made available for the last 3 years for transportation projects. Projects that are awarded these grants are intended to provide long-term economic benefits for rural and urban communities. Previous grant cycles have required a minimum request of 10 million dollars with a minimum local match of twenty percent. Successful bicycle

related projects have included bicycle/pedestrian bridges and regional greenway trails. Grant funding has not been announced for 2012.

More information: <http://www.dot.gov/tiger/>

State Funding Sources

Motor Vehicle Taxes

Vehicle registration fees and taxes are collected by the state to fund transportation projects. The state distributes these funds to cities, with the Cheyenne area currently receiving about \$1.2 million from this source.

Business Ready Community Program

Wyoming's Business Council provides financing for publically owned infrastructure that serves the needs of business and promotes economic development within Wyoming's communities. Cities, towns, counties and tribes are eligible to apply for funding of physical infrastructure (e.g., roads) and recreational facilities. Cheyenne would likely qualify for a Community Enhancement Project grant, defined as 'infrastructure to improve aesthetics or quality of life to make a community more attractive for business development.' The maximum award is \$250,000 with a 50% match.

More information: <http://www.wyomingbusiness.org/program/business-ready-community-program/1246>

Local Funding Sources Currently in Use

Fifth Penny Tax

The Fifth Penny Tax is a one percent general purpose sales tax that generates funding specifically for transportation projects. This optional, county-wide tax requires voter reauthorization every four years; the current funding approval extends through 2014. The Fifth Penny Tax generates about \$7 million annually in Laramie County. The majority of this funding source (80 percent) is reserved for street maintenance and rehabilitation. However, up to 20 percent is available (though not exclusively designated) for multi-modal projects. There is potential for on-street bikeway projects to be accommodated as part of regular roadway construction and repaving projects as well as through special multi-modal project allocation.

More information: <http://www.cheyennecity.org/index.aspx?nid=1561>

Neighborhood Matching Grant Funds

This program allows neighborhoods to apply for up to \$5,000 of matching grant funding, assuming they provide at least 50 percent of the overall project cost in cash or labor. This competitive process generally

occurs in spring and fall, as funds are available. Proposals are reviewed and prioritized by citizen and city staff committees with the City Council providing final approval. This program is funded through the Fifth Penny Tax as a line item and could be used in development of the bicycle boulevard network.

More information: <http://www.plancheyenne.org/NTMPFinal.pdf>

Sixth Penny Tax

The Sixth Penny Tax is a one percent Laramie County sales tax that generates funding for special community projects such as the Greater Cheyenne Greenway. Proposed projects are reviewed by a committee of representatives from each city in Laramie County, and then approved for the ballot. Projects must be approved by voters in a public election. This funding mechanism has been used to fund a variety of greenway projects such as the Holliday Park Connector improvements, and can potentially be used to fund development of the on-street bikeway system.

More information: <http://www.cheyennecity.org/index.aspx?NID=352>

Potential Local Funding Sources

The following section discusses funding sources that are currently not used for bicycle and trail related improvements in Cheyenne. One or several of these funding sources could be implemented to provide additional funding for Plan implementation.

Local Bond Measures

Local bond measures, or levies, are usually initiated by voter-approved general obligation bonds for specific projects. Bond measures are typically limited by time based on the debt load of the local government or the project under focus. Funding from bond measures can be used for right-of-way acquisition, engineering, design, and construction of bicycle facilities. Transportation-specific bond measures featuring a significant bicycle/pedestrian facility element have passed in other communities, such as Seattle's "Closing the Gap" measure.

Tax Increment Financing/Urban Renewal Funds

Tax Increment Financing (TIF) is a tool for using future gains in taxes to finance the current improvements that will create those gains. When a public project (e.g., sidewalk improvements) is constructed, surrounding property values generally increase and encourage surrounding development or redevelopment. The increased tax revenues are then dedicated to finance the debt created by the original public improvement project. Tax Increment Financing typically occurs within designated Urban Renewal Areas (URA) that meet certain

economic criteria and are approved by a local governing body. To be eligible for this financing, a project (or a portion of it) must be located within the URA. Enabling legislation for TIF funding has not yet been enacted in the state of Wyoming.

System Development Charges/Developer Impact Fees

System Development Charges (SDCs), also known as Developer Impact Fees, are typically tied to trip generation rates and traffic impacts produced by a proposed project. A developer may reduce the number of trips (and hence impacts and costs) by paying for on- or off-site cycling improvements that will encourage residents to ride or use trails. In-lieu parking fees may be used to help construct new or improved bicycle or trail facilities. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical in avoiding a potential lawsuit.

Local Improvement Districts (LIDs)

Local Improvement Districts (LIDs) are most often used by cities to construct localized projects such as streets, sidewalks or bikeways. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as potential to generate vehicle trips.

Business Improvement Districts

Cycling improvements can often be included as part of larger efforts aimed at business improvement and retail district beautification. Business Improvement Districts collect levies on businesses in order to fund area-wide improvements that benefit businesses and improve access for customers. These districts may include provisions for bicycle improvements such as bicycle parking.

Street User Fees

Street user fees are an additional way to fund transportation projects and can take several forms. Some street user fees come in the form of a utility fee, based on the land type use. These fees are paid monthly, and vary on the size and type of development. Another type of street user fee are tolls, commonly used in highway projects or high-speed arterial routes. The revenue generated by a street user fee is used for operations and maintenance of the street system, and priorities are established by the Public Works Department. Revenue from this fund could be used to maintain on-street bicycle facilities, including routine sweeping of bicycle lanes and other designated bicycle routes.

Working Paper #16: Recommended City Code Updates

This page intentionally blank

Memorandum

To: Jeff Wiggins, *City of Cheyenne* and Sreyoshi Chakraborty, *Cheyenne Metropolitan Planning Organization*

From: Rory Renfro and Kim Voros, *Alta Planning + Design*

Date: Jan 10, 2012

Re: Working Paper #16 Cheyenne City Code Review & Recommendations



Introduction

The purpose of Working Paper #16 is to review Chapter 10.80 Cheyenne Municipal Code as it relates to bicycling, and present recommend modifications that will better allow Cheyenne to leverage bicycle improvements in tandem with new development. The preliminary review considered the existing code as well as changes proposed by staff.

10.80.010 Effect of regulation.

This section is the introduction or preamble to bicycle statutes of Cheyenne City Code. It states that all adults are responsible for their conduct, and children under their legal care, to ensure compliance with the law. Failure to comply with the following statute results in a misdemeanor.

Recommendation:

Reword section C to read as follows: "These regulations applicable to bicycles shall apply whenever a bicycle is operated upon any roadway or upon any path or trail set aside for the use of bicycles subject to those exceptions stated herein."

Rationale: This clearly outlines where the regulation applies and provides context for the rest of the chapter.

10.80.020 Definitions.

This section outlines the definitions to be used within the section, including bicycle lane, path, bikeway, park, pedestrian and police officer.

Recommendation:

Modify and update the current definition of bikeway, and add the terms 'bike lane' and 'shared use path.' The terms should be defined in the following manner:

Bikeway: A generic term for any road, street, path or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

Bicycle lane or bike lane: A portion of a roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and possibly signs.

Shared Use Path: A trail or path physically separated from motorized vehicle traffic and designated exclusively for bicycles or shared by bicycles and pedestrians.

Motor Vehicle: As defined by Wyoming State Statute 31.1.101, a motor vehicle is defined as “every vehicle which is self-propelled except vehicles moved solely by human power or motorized skateboards.”

Rationale: These updated terms are consistent with terminology commonly used to define cycling facilities.

10.80.030 Traffic ordinances apply to persons riding bicycles.

Section 10.80.030 states that bicyclists operating on a roadway are “granted all of the rights” and are “subject to all of the duties” of persons operating a vehicle. This section contains powerful language that empowers bicyclists to be equal users of the road.

Recommendation:

Provide reference to Wyoming State Code Title 31, mentioning that statewide laws governing bicycle operation are also found in this ordinance.

Rationale: Providing this reference can provide connection to relevant state laws.

10.80.040 Obedience to traffic-control devices.

This section outlines the needs for bicyclists to obey traffic control devices just as cars and other motor vehicles do. Language does qualify that if a bicyclist dismounts from their bicycle, then they must abide traffic control devices as a pedestrian.

Recommendation:

No recommended change

10.80.050 Parking.

This section is designed to reduce informal bicycle parking. According to this section, bicyclists are required to park bicycles on racks and in a manner that makes for the “least obstruction to pedestrian traffic.” The wording of this statute is somewhat unclear and should be clarified to make it easier to enforce. It also does not account for the many objects within the urban fabric that make for convenient, non-obstructive places to park a bicycle.

Recommendation:

Consider rewording as follows: “No person may leave a bicycle so that it unreasonably obstructs vehicle or pedestrian traffic on a roadway, sidewalk, driveway, handicap access ramp, building entrance, or alley.”

Rationale: This recommendation clarifies how a bicycle can be parked and provides additional detail that will make the statute easier to enforce.

10.80.060 Riding on sidewalks.

This section prohibits bicyclists from riding bicycles on sidewalks within a business district. One problem with this type of code is enforcement, as it can be difficult for bicyclists to understand when and where the business district is defined. This section also calls for bicyclists to give an audible warning when passing a pedestrian and to yield right of way.

Recommendation:

Reword the City Code to prohibit sidewalk riding only in the Central Business District as this is the area where bicycle and pedestrian conflict is most likely to occur frequently. Update the Cheyenne City Code to provide a description of the roadways that bound the CBD and consider providing a description of this area on the citywide bicycle user map. The area where cyclists are not allowed to ride on the sidewalk should initially conform to the CBD. If it is deemed necessary in future years, staff may consider extending the zone where sidewalk riding is prohibited. This action would require a modification to the current language in city code, which restricts the zone to the central business district. Additionally, the City should consider allowing bicycle mounted law enforcement officers and authorized emergency personnel to ride on the sidewalk in the course of their work duties.

Rationale: Clearly describing the area where sidewalk riding is not allowed will increase the chances that cyclists will follow established rules in the downtown area. While allowing mounted police and children to bicycle on the sidewalk is consistent with practices in other communities, provides a safety benefit for children and allows police to more effectively execute their job duties through increased mobility.

10.80.070 Riding on bikeway.

This section prohibits any vehicle except a bicycle from driving on an existing bikeway except in emergency circumstances, or as permitted by the exceptions contained within the code.

Recommendation:

Restructure this section to differentiate between shared use trails and on-street bicycle facilities. The proposed changes are discussed in the section detailing recommended code additions at the end of this memorandum.

Rationale: There are times when a motor vehicle may be permitted to use an on-street bikeway (e.g., when making a right turn). Describing separately the exceptions for motorized vehicle use of on-street and off-street facilities will clarify the Code and make it easier to understand and enforce.

10.80.80 Parking on a bikeway.

This section prohibits vehicular parking a bikeway except in times of emergency, maintenance, repair or service of the facility. This code adequately addresses when it is permissible for vehicles to stop on a bikeway, but does not address the other obstacles that can be found on a bikeway. For instance, if a bike lane runs along a residential street, it is common for residents to place trash receptacles in a bike lane or pile leaves or construction materials in a bicycle lane, forcing a bicyclist to leave the bicycle lane completely. The Code could also address other physical obstructions in bike lanes, beyond vehicular parking.

Recommendation:

- Update the City Code to prohibit parking on a bike lane for consistency within the code.
- Update Cheyenne City Code to include other obstructions in bike lanes beyond parked cars, including construction materials, trash receptacles and other items that present a hazard to bicyclists or require leaving the bike lane to proceed.
- Additionally, update title of Section 10.80.080 to read “Obstructing a Bicycle Lane” to reflect the expanded content of the section.
- Update references from bikeway to bike lane for consistency.

Rationale: Expanding the current parking prohibition to include other obstructions will allow expanded enforcement and provide cyclists with rights that are more consistent with motor vehicles.

10.80.90-160 Bicycle licensing.

Sections 10.80.90-10.80.160 outline the City’s bicycle licensing program. Bicycle licensing code was common in the 1970s and 1980s, but since then, most municipalities have found that the administrative costs to run the program were not offset by the revenue gained in licensing fees.

Recommendations:

- Discontinue bicycle licensing and associated programs, (e.g., fees, license plates, inspections, renewals and transfer of ownership processes). Remove associated sections from Cheyenne City Code.
- For security and tracking measures, the City could promote and encourage the use of private bicycle registration programs (e.g., Boomerangit, etc.).

Rationale: Removing this bicycle licensing requirement is consistent with current best practices observed in other cities, is cost effective and aligns with current practice in Cheyenne.

10.80.170 Rental agencies.

Section 10.80.170 requires businesses that rent bicycles to be licensed and have license plates and other safety features required by the State Vehicle Code.

Recommendation:

Remove this section from Cheyenne City Code.

Rationale: Removal of this requirement is consistent with other proposed modifications to Code. Bicycle rental agencies are still required to provide a bicycle that meets Wyoming State safety requirements as

described in Title 31 of Wyoming State Code. The removal of license plates is consistent with other parts of the code. An alternative solution is to retain Section 10.80.170 but remove the language that mandates licensed bicycles.

10.80.180 Bicycle dealers.

This section requires any person buying and selling new/used bicycles to submit monthly reports to the Chief of Police on the sales of all bicycles. The purpose of this program is to track bicycle commerce to prevent stolen bicycles from being sold, and to track stolen property.

Recommendation:

It is recommended that this section be reworded to require used bicycle dealers excluding licensed pawnbrokers and secondhand dealers as defined in Code Chapter 5.56 to record the following information to identify the seller and bicycle:

- Name
- Date of Birth
- Phone Number
- Bicycle Make and Model
- Bicycle Serial Number
- Seller's Signature

. The bicycle must be held for 15 days, during which time it may be displayed and sold, but cannot leave the shop and the buyer's money must be refunded if the bicycle turns out to be stolen. If no matching serial number appears in the Police database during the holding period, or a report matching the bicycle is not filed, the bicycle may be sold. Any pawnbroker or secondhand dealer, as licensed by the City must comply with record keeping requirements set out in City Code Chapter 5.56 and 5.60. The intent of this regulation is to create a system that is more likely to identify stolen bicycles and those who are selling them.

Rationale: This process is consistent with the requirements set forth for sale of items by a licensed pawnbroker as described in City Code Chapter 5.56.040, 5.56.090 and 5.56.60.

10.80.190 Violations--Penalties.

This section ascribes fines to any violation of the aforementioned provisions in this section. It specifically addresses an accompanying penalty of removal or detention of one's bicycle license/plate.

Recommendations:

Strike the current language and replace with the following language recommended by Cheyenne's City Clerk, "Any person violating the provisions of this chapter is punishable pursuant to the general penalty provided for in Chapter 1.24 of the city code, and/or by state law."

Rationale: This creates enforcement conditions that are more consistent with consistent with Cheyenne's current Code.

Cheyenne City Code Additions

The additional sections are recommended for inclusion in the Cheyenne City Code.

10.80.025 Authority to install.

“The City traffic engineer is authorized to place and maintain official traffic control devices designating all city bikeways, including bicycle paths, pathways, lanes, shared lane markings and routes.”

Recommendation and Rationale: This provides clear authority and responsibility for Cheyenne’s bikeways and is consistent with best practices in other cities. This recommendation may be included as City Code Chapter 10.80.025, integrated into City Code Chapter 10.80.010 and defined in City Code Chapter 10.20 at City Staff discretion.

10.80.070 Driving on shared use path.

Proposed new language for section 10.80.070 would prohibit driving on shared use path in most circumstances.

Recommendations:

Proposed Code Section 10.80.075 could read as follows:

No person shall drive a vehicle other than a bicycle upon any shared use path except in an emergency or as follows:

- A. Any vehicle and other equipment owned or operated by any public agency or public utility while necessarily in use for construction, repair work, work upon the surface of a highway, or work of installation, removal, repairing or maintaining official traffic-control devices;
- B. Any rubbish or garbage truck while actually engaged in the collection of rubbish or garbage;
- C. Any street sweeper while actually engaged in sweeping a street;
- D. Any snow removal equipment while actually engaged in removing snow from a shared use path;
- E. Any authorized emergency vehicle, while actually responding to an emergency.

Additionally, the Code language should include clarification that a wheelchair is not defined as a vehicle under Wyoming State Motor Vehicle Code and is therefore not prohibited on shared use trails. Code language should additionally be clarified to include or exclude motorized bicycle and e-bikes on Cheyenne’s shared use trails if their use has the potential to create significant user conflicts.

Rationale: Clarifying user access to Cheyenne’s shared use paths will create Code language that is easier to understand and enforce.

10.80.075 Driving on bicycle lane.

Proposed section 10.80.075 would prohibit driving on a bicycle lane in most circumstances.

Recommendations:

Proposed Code Section 10.80.075 could read as follows:

- A. No person shall drive a vehicle other than a bicycle upon any bicycle lane except in an emergency or as follows:
- B. To enter or leave the street or highway;

- C. To prepare for a right turn;
- D. To park where parking is permitted;
- E. Any vehicle and other equipment owned or operated by any public agency or public utility while necessarily in use for construction, repair work, work upon the surface of a highway, or work of installation, removal, repairing or maintaining official traffic-control devices;
- F. Any rubbish or garbage truck while actually engaged in the collection of rubbish or garbage;
- G. Any streetsweeper while actually engaged in sweeping a street;
- H. Any snow removal equipment while actually engaged in removing snow;
- I. When authorized by a law enforcement officer;
- J. Any authorized emergency vehicle while actually responding to an emergency.

Rationale: Describing separately the exceptions for use of a motorized vehicle on a bike lane and off-street facilities create code that is easier to use and enforce.

10.80.85 Opening and closing vehicle doors.

“Consistent with Wyoming State Statute 31.5.121 no person shall open any door on a motor vehicle unless and until it is reasonably safe to do so and can be done without interfering with the movement of other traffic including bicycle traffic, nor shall any person leave a door open on a side of a vehicle adjacent to moving traffic for a period of time longer than necessary to load or unload passengers.”

Rationale: Bicyclists are particularly vulnerable to drivers or passengers opening a vehicle door into them. Cheyenne does not have any existing ordinance that addresses this concern. The proposed ordinance reminds drivers of this hazard, and protects bicyclists in case of ‘dooring.’

10.80.200 Authority to Sell Unclaimed Property.

“As described in Code 2.88 the chief of police has the authority to sell or donate unclaimed bicycles that have come into possession of the department during the course of enforcement activities.”

Rationale: This provides clear authority and responsibility for duties and rights already granted to the police.