2020

Bicycle & Pedestrian Plan

Rapid City Area MPO

DRAFT

Rapid City Metropolitan Area Bike and Pedestrian Master Plan Update

Rapid City Area Metropolitan Planning Organization

June 2020

HDR

RAPID CITY AREA
Metropolitan Planning Organization

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Abbreviations

BNA – Bicycle Network Analysis

FHWA – Federal Highway Administration

GIS – Geographic Information System

LAB – League of American Bicyclists

LRTP – Long Range Transportation Plan

LTS – Level of Traffic Stress

MTP – Metropolitan Transportation Plan

MPO – Metropolitan Planning Organization

RCAMPO – Rapid City Area Metropolitan Planning Organization

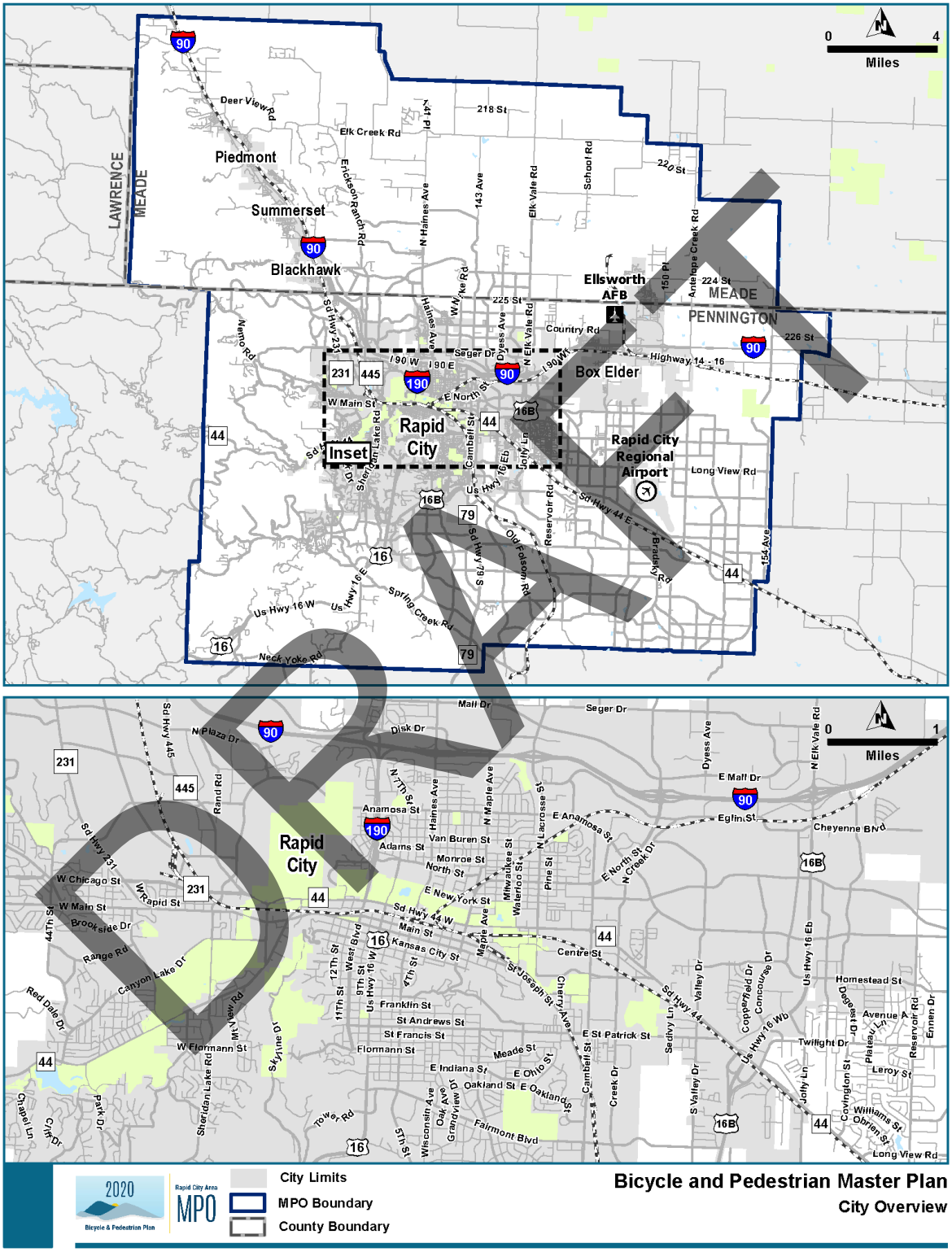
VMT – Vehicle Miles Traveled

Existing Conditions

The Rapid City Area Metropolitan Planning Organization (RCAMPO) 2020 Bicycle and Pedestrian Plan provides an update to the adopted 2011 Bicycle and Pedestrian Master Plan and the bicycle and pedestrian-related information in the RapidTRIP 2040 Long Range Transportation Plan Update, 2015. This update includes a review and assessment of the previous plans to determine which projects have been completed,, as well as update goals and objectives as needed, determine if any changes are needed to previously identified planned projects, and identify any new bicycle and pedestrian needs in the MPO area.

A map of the Rapid City area with the city limits and the MPO Boundary is shown in **Figure 1**.

Figure 1: Rapid City Overview



Existing Plans and Studies

Several plans and studies were reviewed as part of this plan update, including the Rapid City Area 2011 Bicycle and Pedestrian Master Plan, the RapidTRIP 2040 Long Range Transportation Plan Update (LRTP), 2015, the East Rapid City Traffic & Corridor Analysis Study, and the South Dakota School of Mines & Technology Campus Master Plan.

Rapid City Bicycle and Pedestrian Master Plan 2011

The Rapid City Area Bicycle and Pedestrian Master Plan 2011 built upon past and on-going bicycle and pedestrian efforts by RCAMPO and the City of Rapid City. The Bicycle and Pedestrian Master Plan was adopted as part of the Rapid City Comprehensive Plan.

Vision, Goals, and Objectives

The plan's stated vision is: *Rapid City will enhance transportation choices by developing a network of on-street and off-street bicycle and pedestrian facilities that provide connections to destinations throughout the city*. **Table 1** provides the plan's goals, objectives, actions, and benchmarks, as well as the current status and progress made toward completing the identified actions.

Table 1: Master Plan 2011, Goals and Objectives

Objective	Action	Benchmark	Status / Progress
Goal 1. Support bicycling and walking as viable transportation modes in Rapid City.			
1.1. Implement the Rapid City Area Bicycle and Pedestrian Master Plan facility recommendations to provide bicycling and walking routes to key destinations.	1. Complete the high-priority bikeway network and sidewalk gap projects in the next five years (2011 – 2015).	Miles of new bikeways and sidewalks completed; percentage of high priority projects identified in the Bicycle and Pedestrian Master Plan completed.	Completed 8 of 39 (20.5%) of high priority bikeway projects, totaling 5.66 miles; Completed 5 of 10 (50%) of the top City sidewalk projects, totaling 2.41 miles
	2. Complete the medium-priority projects within the next 20 years (2011 – 2030).	Miles of new bikeways and sidewalks completed; percentage of medium priority projects identified in the Bicycle and Pedestrian Master Plan completed.	Completed 4 of 34 (11.8%) of medium priority bikeway projects, totaling 3.23 miles; Completed 4 of 12 (33.3%) of the top sidewalk projects in three-mile planning area, totaling 12.46 miles
1.2. Seek new funding sources and strategies to reduce the financial impact on the City.	1. In the case where grant requirements or construction as part of another project make construction of a lower priority project possible or required by law, pursue funding for that project regardless of priority.	Proportion of roadway restriping, reconstruction, and construction projects that include bicycle and/or pedestrian improvements.	Some roadway projects include bike/ped components; No specific statistics available on the proportion that include bike/ped improvements
	2. Seek funding for bicycle and pedestrian transportation projects through grant opportunities.	Number of grants applied for; amount of grant funding acquired.	Live Well Black Hills has submitted grant applications before - a successful application was for 3 bike repair stations; No specific information available on number of grants or total funding acquired
1.3. Improve bicyclists' and pedestrians' safety and comfort by accommodating these modes during construction or facility repair activities.	1. Minimize disruption to bicycle and pedestrian travel by providing alternate routes during construction or repair activities.	Development of guidelines/policies for providing bicycle and pedestrian access through or around construction zones.	No progress to date
Goal 2. Promote bicycling and walking in the Rapid City area by improving awareness of bicycle and pedestrian facilities and opportunities.			
2.1 Improve public awareness of the on-street bicycle network and presence of bicyclists.	1. Install signs along all local and regional bikeways to assist with wayfinding and to increase awareness of bicyclists by motorists.	Development of a wayfinding signage plan; number of signs installed.	There has been an ongoing effort related to wayfinding, although it is not complete, and has been focused primarily on pedestrians; No information available on number of signs installed
	2. Make bicycling and walking resources available through the City of Rapid City website.	Development of web content on the City of Rapid City's website providing information about walking and bicycling; frequency of page views.	MPO doesn't have much control over City website, but can put more bike/ped-focused information on the MPO website
	3. Increase action by law enforcement officers in regards to bicycle- and pedestrian- related violations by motorists, bicyclists, and pedestrians.	Number of informational warnings and citations issued related to bicyclists or pedestrians; number of crashes involving bicyclists or pedestrians.	No information available on informational warnings & citations; Total crashes involving bicyclists or pedestrians was 221 for the five-year period from 2014-2018, including 11 fatalities
	4. Promote the availability of bicycle racks on RapidRide buses.	Development of web content on the RapidRide website providing information on how to use bike racks on the buses.	RapidRide website has video on use of bike racks on front page
2.2. Support education and encouragement efforts in the region.	1. Apply to become a Bicycle Friendly Community (BFC) through the League of American Bicyclists' award program.	Completed BFC application; goal of initial recognition at the bronze level with a target of obtaining gold level recognition	Application submitted in 2014, City received Honorable Mention, which fell short of the initial Bronze level recognition
	2. Convene a standing Bicycle Advisory Committee (BAC) to focus on Plan implementation and obtaining funding for bicycle and pedestrian projects and programs.	Appointment of a BAC; at least four meetings each year.	MPO does not have an BAC; however, there are some bicycle/pedestrian focused representatives on other MPO committees
Goal 3. Integrate bicycle and pedestrian planning into Rapid City's Planning Processes.			
3.1. Institutionalize bicycle and pedestrian planning into Rapid City Growth Management's work plan and Engineering department plans.	1. Review and update the Bicycle and Pedestrian Master Plan project and program priorities every five years.	Revised project priorities list every five years.	MPO MTP is updated every five years; Current Bike/Ped Plan (2020) is an update to the adopted 2011 plan
	2. Revise the street criteria manual to include consideration of bicycles based on road classification.	Updated street design criteria manual; appropriate bicycle and pedestrian access provided in new developments as specified in this plan.	Criteria manual not under MPO control & has not specifically been updated to address bike/ped needs or concerns
3.2. Require inclusion of bicyclists and pedestrians in citywide planning efforts.	1. Adopt a Complete Streets policy to consider the needs of pedestrians and bicyclists in new development and roadway reconstruction.	Adopted Complete Streets Policy	A Complete Streets policy has not been adopted to date

The document envisioned a 20-year plan for completing the system of walkways, bikeways, and shared-use paths, including the following specific facility recommendations:

- 5.25 miles of City sidewalk projects
- 43.5 miles of sidewalk projects in the three-mile planning area
- 6.22 miles of shoulder bikeways
- 7.17 miles of bike lane restriping
- 25.88 of shared lane markings
- 18.01 miles of signed shared roadways
- 7.78 of bike lanes requiring construction
- 8.37 miles of extensions to the Leonard “Swanny” Swandon Memorial Pathway
- 11.52 miles of bike lanes on future roadways
- 19.01 miles of sidepaths

RapidTRIP 2040 Long Range Transportation Plan Update, 2015

The RapidTRIP 2040 LRTP Update was a comprehensive study of the transportation network with an emphasis on transportation modes for vehicles, bicycles, pedestrians, and transit. The document identified the transportation needs plan for the region, anticipated future funding availability, and established the Fiscally Constrained Plan for the region over the next 25 years. The plan was adopted in 2015.

The RapidTRIP 2040 Update provided a list of bicycle and pedestrians needs within Rapid City. Bicycle needs were categorized as:

- Bike Lanes
- Crossing (improved crossing of a barrier, such as a major roadway)
- Off-Street Path (pathway not on the street, such as a bike or shared-use path)
- Shared Lanes (signed and/or sharrow-striped roadway as being a bicycle route)
- Signed Shoulder Bikeway (wide shoulder signed as a bicycle route)

All pedestrian needs were sidewalk additions. Shared use paths that accommodated both bicyclists and pedestrians were listed as “Off-Street Path” in the report.

RapidTRIP 2040 Goals and Objectives

The RCAMPO goals and objectives were utilized to develop performance measure goal areas. These performance measure goal areas allowed the RCAMPO to see the impact of the implemented changes. The goals from the RapidTRIP 2040 LRTP Update have not changed significantly in the 2045 LRTP Update. The 2040 performance categories, goals, objectives, and performance measures are shown in **Table 2**.

Table 2: Performance Measure Goal Areas

Performance Area	Goal	Objective	Performance Measure(s)
Safety	A safe transportation system for motorized and non-motorized users.	Reduce fatal and injury crash rates for all modes.	1: Change in severe crashes per 100 million vehicle miles traveled (VMT)

Performance Area	Goal	Objective	Performance Measure(s)
			2: Change in all crashes per 100 million vehicle miles traveled (VMT)
System Preservation	A well maintained transportation system.	Maintain the existing transportation system in a high quality and effective manner.	1: Percent roadway pavement in good condition 2: Percent roadway pavement in poor condition
Multi-Modal Mobility and Accessibility	A multimodal transportation system that provides access for all.	Improve the availability and quality of transportation options.	1: Annual transit ridership 2: Mode split 3: Miles of bicycle and pedestrian facilities
System Operations	An efficient and reliable transportation system.	Minimize travel times, travel costs, and congestion.	1: Vehicle delay per capita 2: VMT per capita
Economic Vitality	An accessible and integrated transportation system that support economic vitality.	Provide adequate transportation facilities to support economic development.	1: Housing and transportation costs
Environmental Sustainability	A transportation system that preserves the environmental, social, and cultural resources of the community.	Minimize impact on the environment.	1: VMT per capita
Project Delivery	Regional collaboration in transportation planning.	Facilitate coordination between regional projects to reduce project delay.	1: Number of project delays in previous planning period due to deficient agency coordination

East Rapid City Traffic & Corridor Analysis Study

The East Rapid City Traffic & Corridor Analysis Study was conducted in 2018 and 2019 by the RCAMPO. The purpose of the study was to compete analysis, alternatives development, and provide recommendations for potential infrastructure improvements along portions of East North Street, Omaha Street/Highway 44, and Cambell Street. This study provided opportunities for stakeholders and the public to provide feedback and input on potential infrastructure improvements through the use of public meetings, through the project website and through written comments mailed or emailed to the project manager.

The study described the existing multimodal network as having little consistency and gaps in the sidewalk network, with specific facility details for Cambell Street, Omaha Street/SD 44, and East North Street. There were six reported pedestrian crashes in the study area, four on East North Street, one of which was a fatality.

The only dedicated bicycle facilities in the study area are a shared-use path along Anamosa Street and the eastern portion of the Leonard “Swanny” Swanson Memorial Pathway. This pathway crosses under both Cambell Street and Omaha Street, and connects many locations in the northern portion of Rapid City. Cambell Street and Omaha Street sidewalks to the bicycle path, but there are no dedicated bicycle facilities along these roadways. Four bicycle crashes were reported in the study area.

Two programmed improvements were noted involving pedestrian and bicycle facilities including a new shared use path on the east side of Cambell Street from Rocker Drive to Omaha Street and a new shared use path on the north side of Omaha Street from LaCrosse Street to Covington Street; both are scheduled for 2021. The recommendations from the study included corridor-type improvements, intersection improvements, and future roadway improvements. The following specific multimodal improvements were recommended:

- Omaha Street / SD 44, from LaCrosse Street to Saint Patrick Street – add shared use path to the existing five-lane roadway section, short term project (and noted that it overlaps with the programmed shared use path along Omaha Street)
- Cambell Street, from Saint Patrick Street to East North Street – add sidewalk and shared use path to the existing five lane roadway section, mid-term project
- East North Street, from Cambell Street to Eglin Street – add sidewalk and shared use path to the existing five-lane roadway section, mid-term project, can be built as development fills in along East North Street in the future
- Pedestrian and bicycle facilities should be included on future roadways as they develop

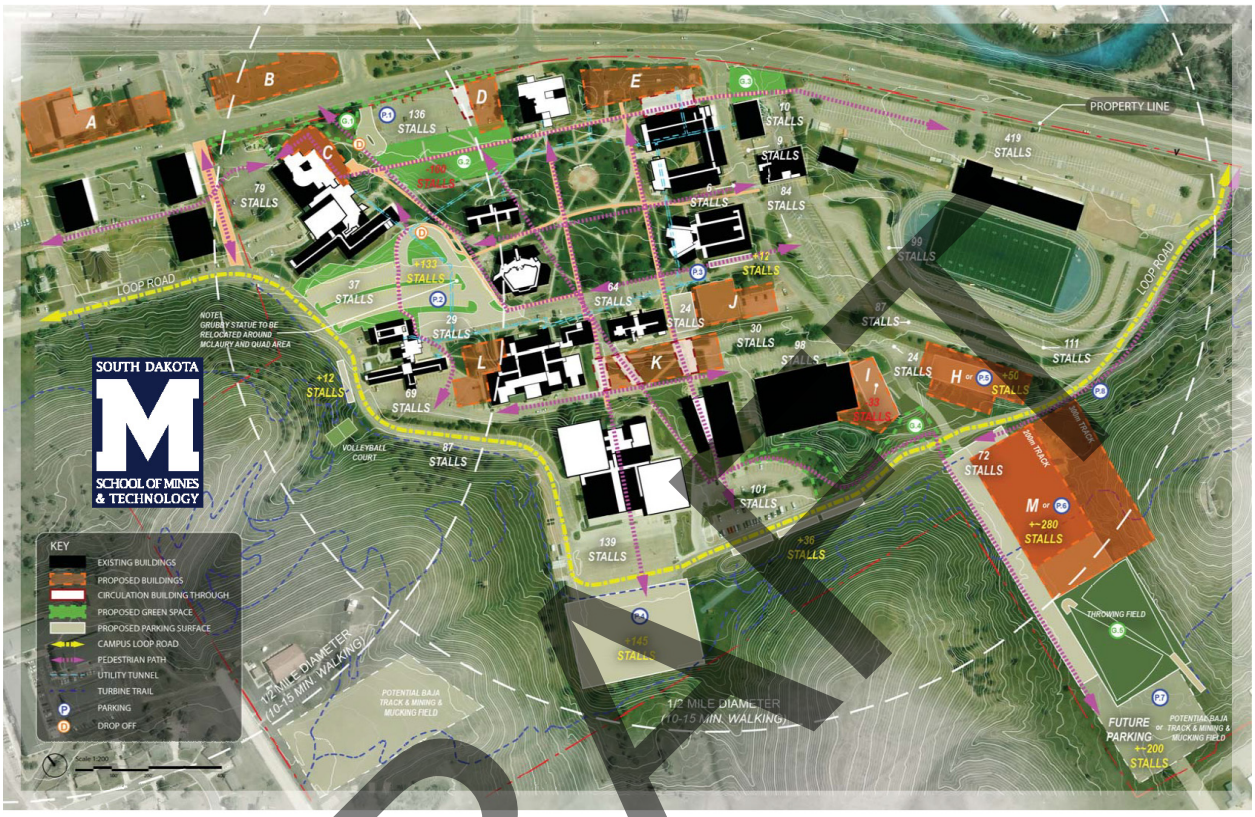
South Dakota School of Mines & Technology Campus Master Plan

The South Dakota School of Mines & Technology Campus Master Plan was updated in 2019 by the South Dakota School of Mines & Technology. The Campus Master Plan specifically referenced bicycle and pedestrian infrastructure to improve circulation. Improvements included:

- Rework pedestrian routes to reinforce major axes through the campus
- Improve connections to City bike paths
- Provide contiguous interior/exterior transition spaces that cut through buildings along major public thoroughfares
- Create waypoints of visual interest that reinforce the aesthetic of a technology school
- Provide pedestrian-scale design elements that create a positive sense of campus community along St. Joseph Street

Figure 2 shows the bicycle and pedestrian circulation map developed by the school.

Figure 2: Bicycle and Pedestrian Circulation Map



People for Bikes: Bicycle Network Analysis

People for Bikes is a nonprofit organization which includes both an industry coalition of bicycling suppliers and retailers, as well as a charitable foundation.

The Bicycle Network Analysis (BNA) was developed to determine how well a communities bicycle network connects people with the places that they want to go. BNA is calculated through a series of criteria. This criteria includes people, opportunity, core services, shopping, recreation and transit. People utilizes U.S. Census population data to determine how well a bike connects you to the people around you. Opportunity measures job data from the U.S. Census, as well as locations of K-12 schools, vocational and technical colleges, higher education institutions to evaluate how easily these opportunities are available by bike. Core Services look at basic needs such as locations to food and health care services, such as doctors, hospitals, grocery stores and social services. Shopping looks at retail districts and how well they are connected by bike. Access to nearby parks and community centers, as well as off-street bike paths and trails by bicycle make up the recreation criteria. Finally, transit looks at combining biking with bus, subway, streetcar, light rail, or any other form of public transportation in an area, and how the transit hubs connect to the areas around them.

Rapid City has a BNA score of 33 out of a possible score of 100.

Existing Bicycle and Pedestrian Network

The existing bicycle and pedestrian network includes a variety of bicycle and pedestrian facility types, including sidewalks, dedicated bicycle lanes, separated bikeways, shared lanes, and trails.

(To be added - Insert facility types descriptions)

Despite all of the recreational opportunities for bicyclists within the Black Hills region, bicycling is the least utilized method of commuting to work in the Rapid City Area. According to American Community Survey (ACS) data for 2017, only 0.4% of residents commute to work via bicycling. Pedestrians made up 3.7% of work commuters, and transit riders made up 0.6% of work commuters.

The majority of the bicycle facilities within the RCAMPO boundary are paved trails (47.1 miles), which includes shared use paths and side paths. Bike lanes and paved shoulder bikeways are the second most common bicycle facility in the Rapid City area with a total of 27.0 miles. Finally, there is 0.28 miles of separated bikeways and 1.81 miles of sharrow/shared lanes, resulting in a total of 76.2 miles of existing bicycle network. The total miles of existing bicycle facilities by type are shown in **Table 3**.

Table 3: Existing Bicycle Facilities and Length

Facility Type	Length (in miles)
Bike Lane / Paved Shoulder Bikeway	27.0
Separated Bikeway	0.3
Sharrow/Shared Lane	1.8
Trail	47.1
Total Existing Mileage	76.2

The current sidewalk network within the RCAMPO boundaries consists of 128.3 miles of arterial and collector roads with sidewalk on at least one side of the road. There are 84.8 miles of arterial and collector roads with sidewalk on both sides of the roadway, while 43.5 miles of road have sidewalk on one side of the road. The existing bicycle network can be seen in **Figure 3** and the existing sidewalk network can be seen in **Figure 4**.

Figure 3: Existing Bicycle Network

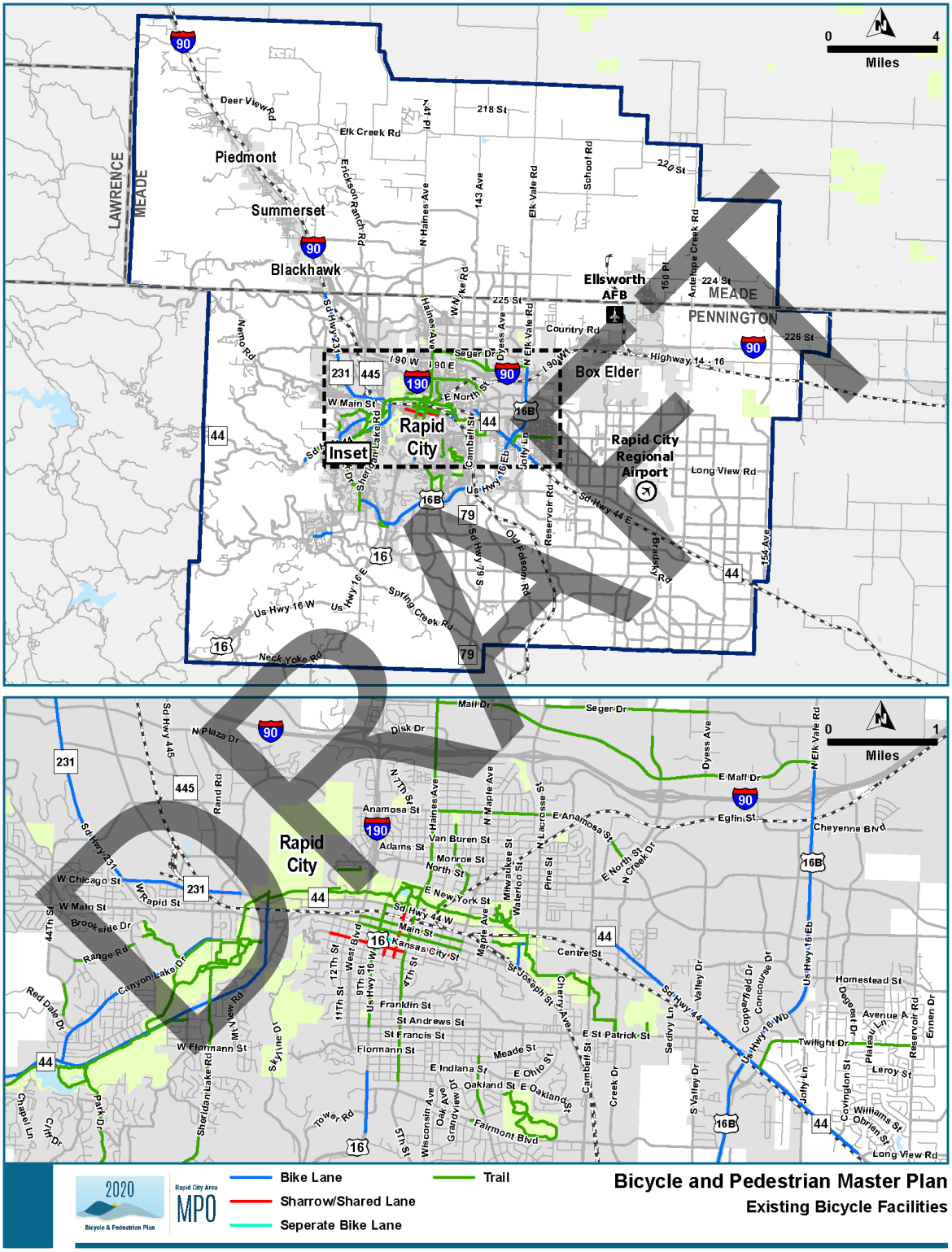
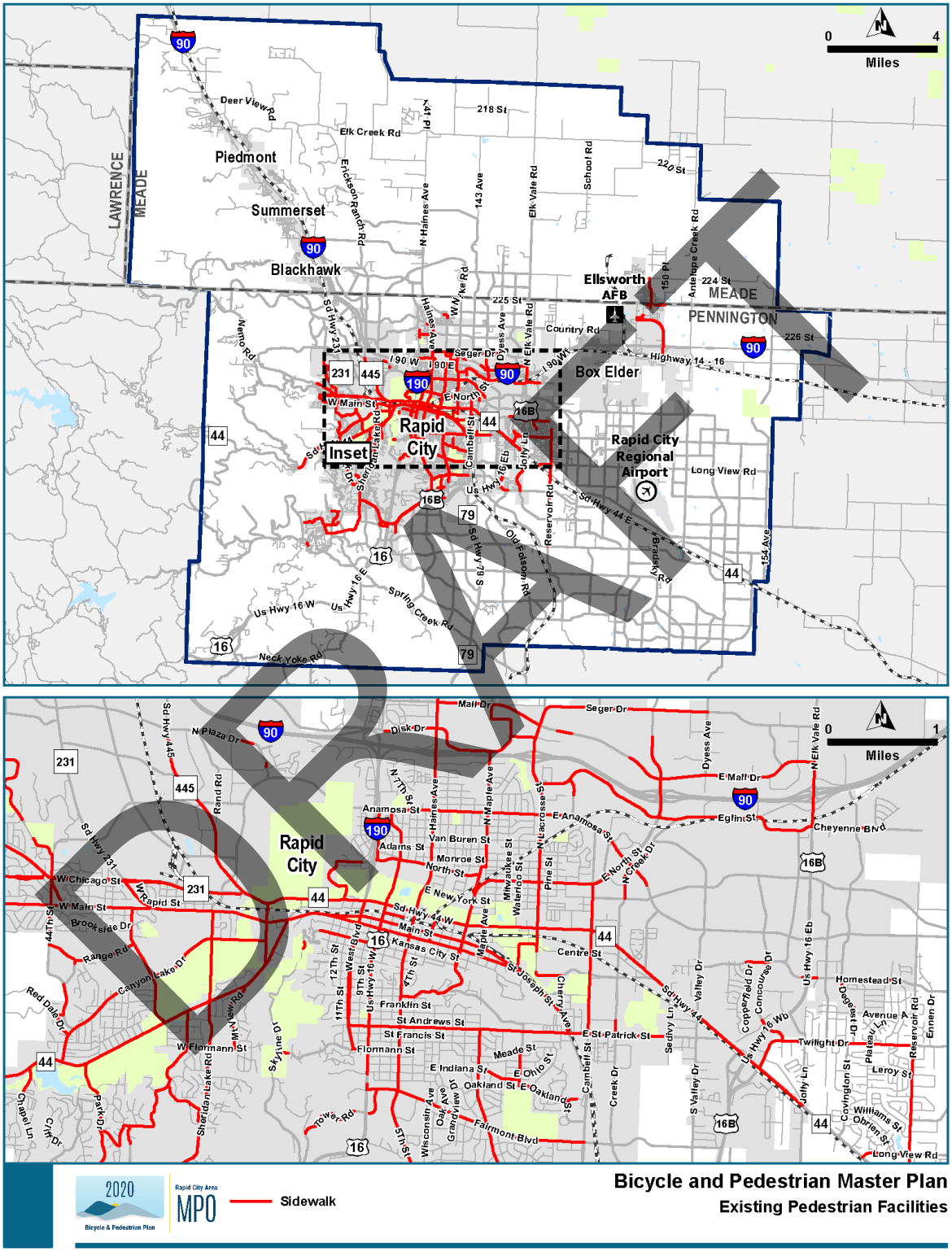


Figure 4: Existing Pedestrian Network



Bicycle, Pedestrian, and Crossing Treatment Facility Types

Different bicycle, pedestrian, and crossing treatments were considered as improvement strategies and treatments for the proposed projects in the Rapid City Bicycle and Pedestrian Master Plan Update. These facility types were included as part of the second public meeting, which asked attendees what improvements they would like to see in bicycle and pedestrian network. The details of the second public meeting are further explained in the section **Bicycle and** Pedestrian Demand

An analysis of relative levels of bicycle and pedestrian demand within the MPO area was conducted utilizing criteria corresponding to the proximity of bicyclists and walkers to various key destinations, projected population and employment density data, and socioeconomic data. This data identified populations with a higher propensity to make trips by walking or bicycling. It should be noted that the demand analysis did not consider existing "on the ground" bicycle and pedestrian conditions or facilities.

The rationale for each demand category and corresponding scoring is explained as follows:

- **Proximity to Key Destinations.** This demand category reflected a graduated scoring criteria that gave more points for bicyclists and pedestrians in closer proximity to destinations, accounting for the fact that people have different tolerances for how far they are willing to walk or ride a bicycle to their destination. Graduated demand scoring was applied to the areas around colleges and universities, public schools, parks, libraries, cultural centers, activity centers, and bus stops. The highest scores were given for the closest proximity of bicyclists and pedestrians to each destination (within one-quarter mile for pedestrians and one-half mile for bicyclists), decreasing to lower scores for bicyclists and pedestrians who were further away from destinations (capped at one mile for pedestrians and two miles for bicyclists). **Table 8** summarizes the graduated demand scoring for each type of destination.
- **Population and Employment Density.** The basis for the second demand category was the socioeconomic data for year 2045 from the RCAMPO regional travel demand model for the traffic analysis zones (TAZ) within the MPO area. The demand analysis reflected the anticipated and forecasted growth up to 2045. There were two specific elements included in the scoring for this category: population + employment density and employment to population ratio, which are described as follows:
    - **Population + Employment Density.** This measure is based on summing the population and employment totals for each TAZ and dividing by the acreage of the TAZ to calculate the density. It should be noted that this exercise did not include the subtraction of any non-developable acreage within an individual TAZ. Areas with higher population and employment densities are generally reflective of development patterns that are more conducive to bicycling or walking. **Table 9** summarizes the points given to each TAZ area based on the computed densities among the TAZs within Pinellas County. The points are based roughly on dividing the TAZ rankings into quintiles. The TAZs ranked highest in terms of density (in the first quintile) received the highest score.
    - **Employment to Population Ratio.** This measure is based on the ratio of total employment divided by total population in each TAZ. Those TAZs with a balance of employment and population within a single zone represent areas more likely to have bicycling and walking trips due to the proximity of complimentary land uses within shorter distances of each other – distances that are more conducive to bicycling and

walking. **Table 10** summarizes the points given to each TAZ area based on the computed ratios among the TAZs within the MPO area. As with density, the points are based roughly on dividing the rankings into quintiles. However for this ratio, the values in the middle (third) quintile are given the highest score, as these are the TAZs with the best balance between total population and total employment. Therefore these areas are more likely to have the most short-distance trips between complimentary land uses. The first and fifth quintile represent the areas that are most unbalanced. These areas have either a very high ratio (reflecting mostly employment with little to no residential) or a very low ratio (mostly residential with little to no employment).

- **Composite Equity Score.** The third demand category is based on the tabulated composite equity score based on the methodology discussed previously. An increase in the overall demand scoring for this category corresponds with increases in the composite equity score, as shown in **Table 11.** This reflects the higher bicycle and pedestrian demand typically associated with areas having above average values across multiple socioeconomic indicators.

Table 9: Population + Employment Density

	Bicycle Demand Scoring				Pedestrian Demand Scoring			
	Score by Bike Distance (mi)				Score by Bike Distance (mi)			
Destination	0.50	1.00	1.50	2.00	0.25	0.50	0.75	1.00
College/University	15	10	5	1	15	10	5	1
Parks	10	5	1	0	10	5	1	0
School (Public)	10	5	1	0	10	5	1	0
Civic Center	10	5	1	0	10	5	1	0
Bus/Transit Route Stop	10	5	1	0	10	5	1	0

Table 10: Employment to Population Ratio

	Bike/Ped Demand Scoring				
	Scoring by TAZ Quintile				
Data	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
Population + Employment Density	10	7	5	3	1
Employment / Population Ratio	1	3	5	3	1

Table 11: Composite Equity Score

	Bike/Ped Demand Scoring						
	Composite Equity Score						
Data	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Composite Equity Score*	0	0	3	6	9	12	15

*EACH POINT REPRESENTS A BLOCK GROUP BELOW THE CITYWIDE AVERAGE

The map shown in **Figure 11** illustrates the results of the demand analysis for bicyclists. **Figure 12** shows the results for pedestrians. Areas with darker colors are projected to have higher levels of demand.

It should be noted that this demand evaluation only considers transportation trips being made to destinations, and does not consider recreational trips such as leisure rides or jogs/walks that do not involve traveling to and from a destination.

Figure 11: Bicycle Demand Score

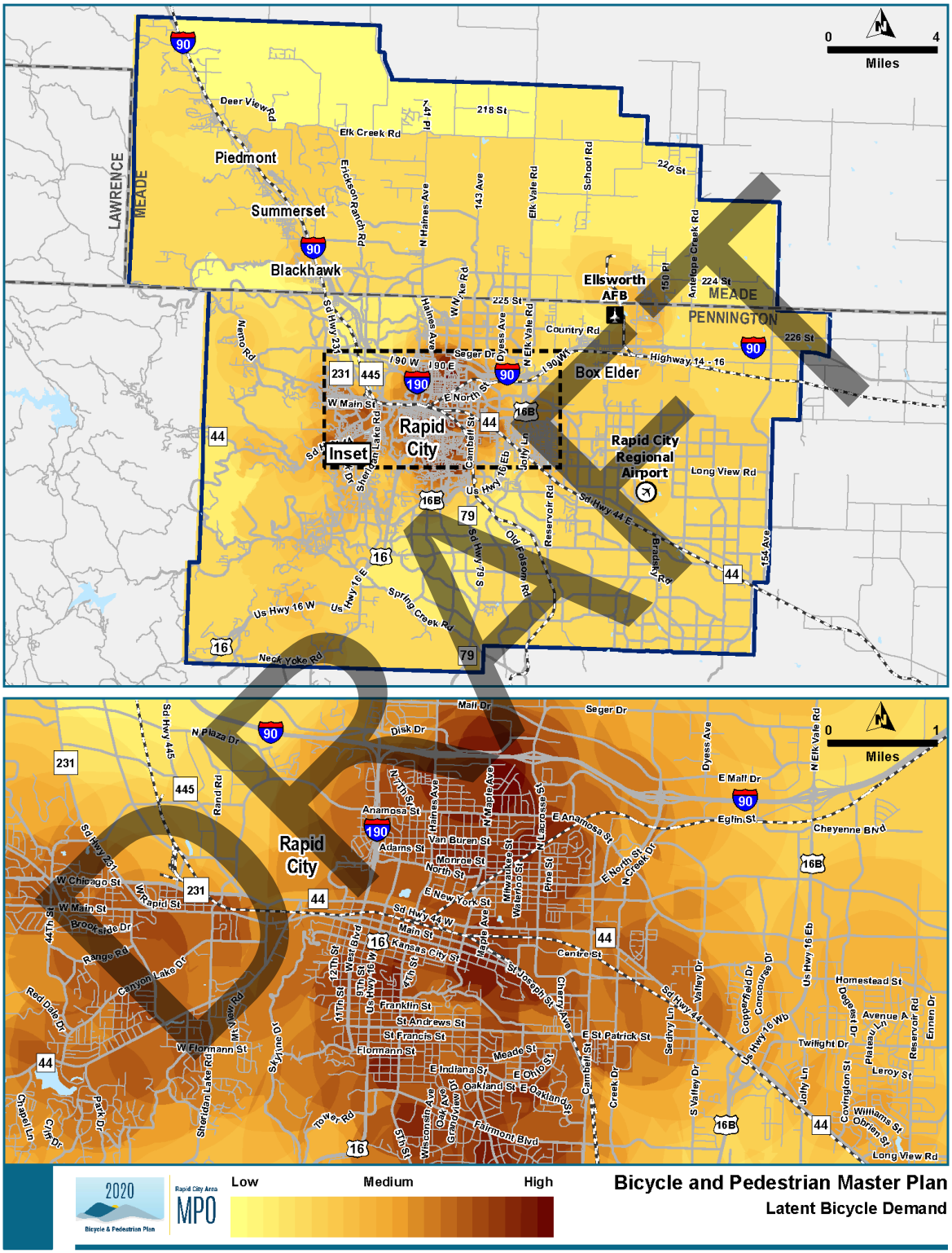
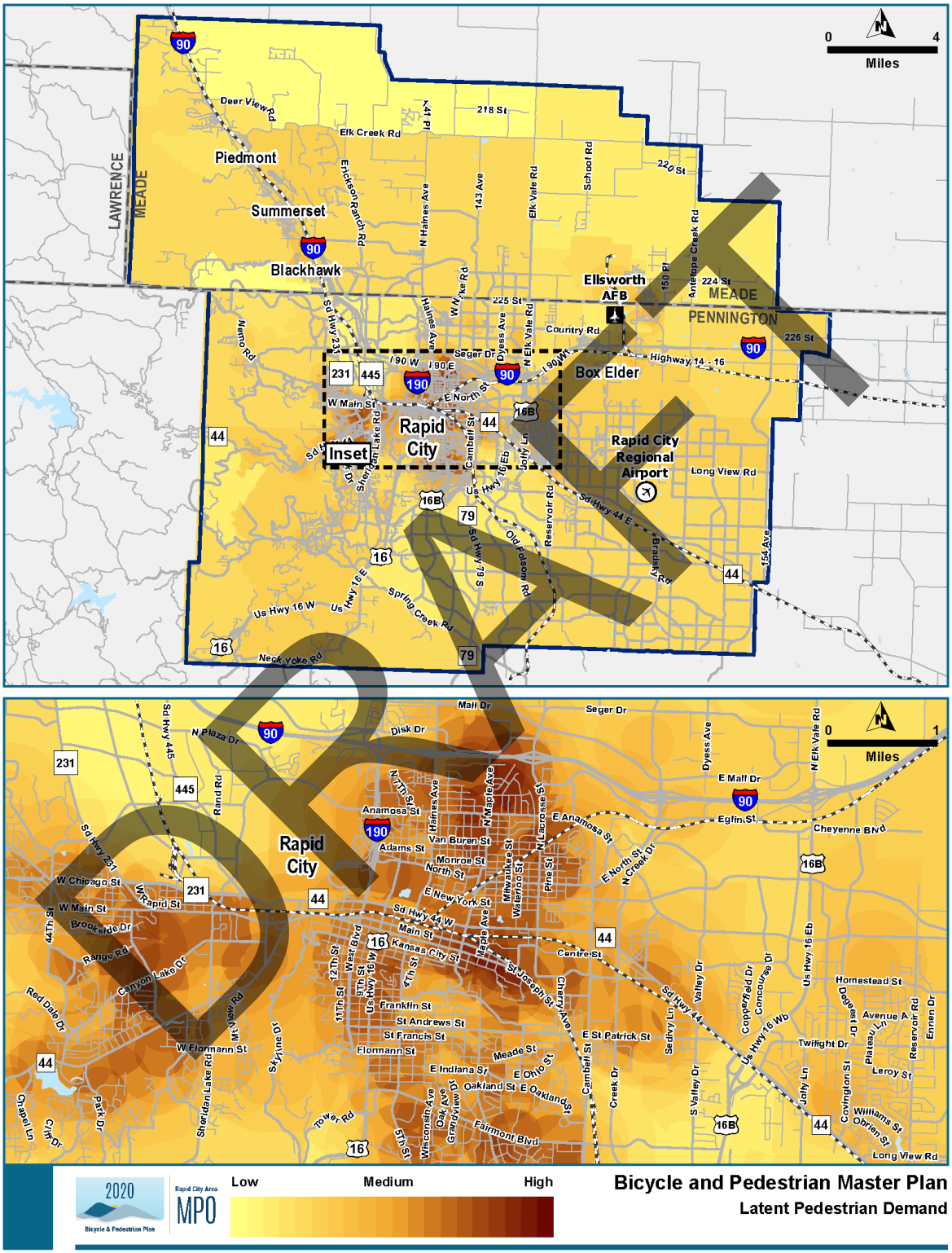


Figure 12: Pedestrian Demand Score

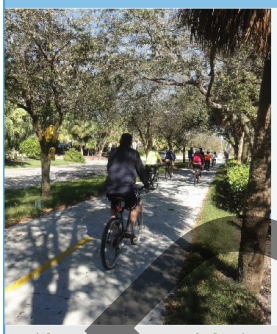


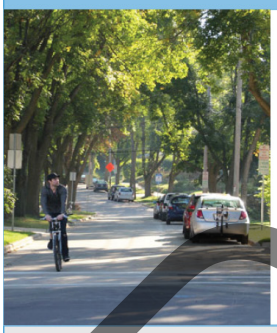
Public Involvement.

Bicycle facility types include bike lanes, buffered bike lanes, trails (which include shared-use paths, bike paths, and side paths), separated bikeways (including cycle tracks or protected bikeways), sharrow/shared lane markings, and neighborhood bikeways (also called bicycle boulevards). The existing Rapid City bicycle network was categorized by these facility types, and was applied to the proposed bicycle network. Detailed descriptions of these facility types are represented in

Table 4.

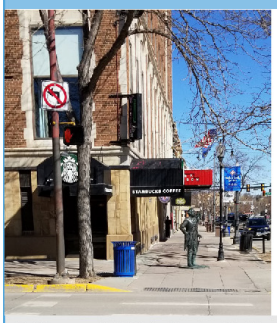
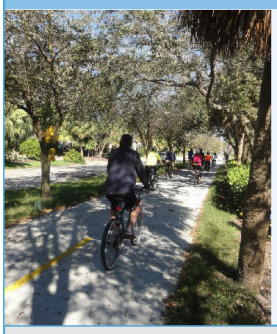
Table 4: Bicycle Facility Types

SAFETY TREATMENT	DESCRIPTION	KEY FACTORS	COST (per mile or unit)
BIKE LANE			
	• Portion of the street designated for preferential use by bicyclists. • One-way facilities that typically carry bicycle traffic in the same direction as adjacent motor vehicle traffic on the left or right side of the street. • Used in location with limited right-of-way, lower travel speeds and volume.	• Provide dedicated space for bicyclists to ride separated from vehicular traffic. • Reduces stress caused by acceleration and operating speed differentials between bicyclists and motorists. • Approved for use within Manual On Uniform Traffic Control Devices (MUTCD).	**Medium** ($10,000-$100,000)
Guidance: *Federal Highway Administration (FHWA) Bikeway Selection Guide, National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide, Florida Department of Transportation (FDOT) Design Manual (FDM)*			
BUFFERED BIKE LANE			
	• Created by painting a flush buffer zone between a bike lane and the adjacent travel lane. • Buffers may also be provided between bike lanes and parking lanes to demarcate the door zone and discourage bicyclists from riding closely next to parked vehicles. • Used in locations where separation between active travel lanes and/or parked cars is needed.	• Provides a warning for motorists and bicyclists that the street is multi-purpose. • Buffered bike lanes increase the riding comfort for bicyclists as they increase separation from vehicular traffic and/or parked vehicles. • Approved for use within MUTCD.	**Medium** ($10,000-$100,000)
Guidance: *FHWA Bikeway Selection Guide, NACTO Urban Bikeway Design Guide, FDOT FDM*			
TRAIL (SHARED-USE PATH, BIKE PATH, SIDE PATH)			
	• Physically separated from motorized traffic by an open space or barrier within the right of way or within an independent right of way. • Designed typically for two-way pedestrian and bicycle traffic. • Often run parallel to roadways, following alignments through natural areas and parks and along corridors with limited crossings like waterfronts, creeks, and current/former railroad lines.	• Provides low-stress environment for bicycling and pedestrian activity away from roadway traffic. • Can serve as arterials of the active transportation system for urban and suburan communities. • Compared with other facility types, can be the most expensive to construct.	**High** (> $100,000)
Guidance: *AASHTO Guide for the Development of Bicycle Facilities; FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts; NACTO Urban Street Design Guide; FDOT FDM*			

SAFETY TREATMENT	DESCRIPTION	KEY FACTORS	COST (per mile or unit)
SEPARATED BIKEWAY (CYCLE TRACK / PROTECTED BIKEWAY)			
	• Physically separated lane for bicycles using a vertical element within a buffer area such as bollards, parked vehicles, raised curbs, or landscaping/planters. • Used in locations where physical protection and separation is required to improve bicyclist comfort. • Also known as a cycle track or protected bikeway.	• Physical barrier provides added level of separation between travel lane and bicyclist, increasing bicyclist comfort and attracting a wider range of users. • Combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. • Approved for use within MUTCD.	**Medium** ($10,000-$100,000)
Guidance: *FHWA Bikeway Selection Guide, FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts, FHWA Separated Bike Lane Planning & Design Guide, NACTO Urban Bikeway Design Guide*			
SHARROW/SHARED LANE MARKING			
	• Marking alerts road users to the lateral position bicyclists are likely to occupy within the traveled way to be most visible to drivers and to help avoid conflicts with parked cars. • Used in locations to connect adjacent bicycle facilities and along neighborhood bikeways. • Can provide wayfinding guidance for bicyclists.	• Provide guidance to bicyclists and motorists in situations where separate bicycle facilities are not provided. • Encourages safer passing practices (including changing lanes, if necessary). • Encourages bicyclists to ride outside of the parked vehicle door zone. • Approved for use within MUTCD.	**Low** (<$10,000)
Guidance: *FHWA Bikeway Selection Guide, NACTO Urban Bikeway Design Guide, FDOT FDM*			
NEIGHBORHOOD BIKEWAY (BIKE BOULEVARD)			
	• Low traffic volume and low speed streets that are designated to give bicyclists priority. • Use signs, pavement markings, and traffic calming measures to discourage through trips by motor vehicles and provide bicyclists with enhanced crossing of arterial streets. • Typically applied along low-volume, low-speed residential streets to define multimodal priority and wayfinding.	• Provide bicyclists of all abilities with low stress route. • Enhanced safety due to reduced exposure to moving traffic. • Provide enhanced wayfinding. • Approved for use within MUTCD.	**Medium** ($10,000-$100,000)
Guidance: *FHWA Bikeway Selection Guide, FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts, NACTO Urban Bikeway Design Guide*			

Pedestrian facility types include sidewalks and trails (including shared-use paths, bike paths, and side paths). The facility types can be seen in detail in **Table 5**.

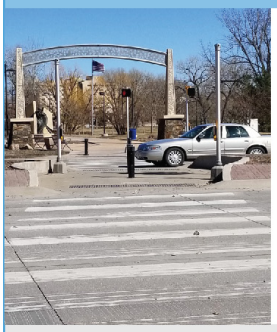
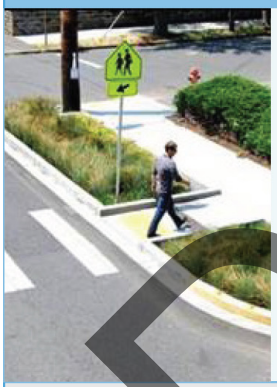
Table 5: Pedestrian Facility Types

SAFETY TREATMENT	DESCRIPTION	KEY FACTORS	COST (per mile or unit)
SIDEWALK			
	• Continuous, paved walkway along the side of a road. • Typically provided on all curbed roadways. • Sidewalk width varies by context classification, normally five feet wide. • Sidewalk grade typically mirrors roadway profile.	• Ideal to provide on both sides of roadway to optimize convenience for pedestrians, although some environments may be exempt or challenging due to available right of way. • Focus sidewalk connections in major residential areas and activity generators including schools, recreation centers, libraries, transit areas, and other pedestrian heavy locations.	**High** (>$100,000)
Guidance: *FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts, FDOT FDM, FDOT Traffic Engineering Manual (TEM)*			
TRAIL (SHARED-USE PATH, BIKE PATH, SIDE PATH)			
	• Physically separated from motorized traffic by an open space or barrier within the right of way or within an independent right of way. • Designed typically for two-way pedestrian and bicycle traffic. • Often run parallel to roadways, following alignments through natural areas and parks and along corridors with limited crossings like waterfronts, creeks, and current/former railroad lines.	• Provides low-stress environment for bicycling and pedestrian activity away from roadway traffic. • Can serve as arterials of the active transportation system for urban and suburan communities. • Compared with other facility types, can be the most expensive to construct.	**High** (> $100,000)
Guidance: *AASHTO Guide for the Development of Bicycle Facilities; FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts; NACTO Urban Street Design Guide; FDOT FDM*			

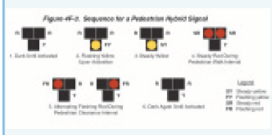
Finally, crossing treatments can be applied to both bicycle and pedestrian crossings and can provide for safe and accessible travel for all users. Different crossing treatment strategies are explained in detail in

Table 6.

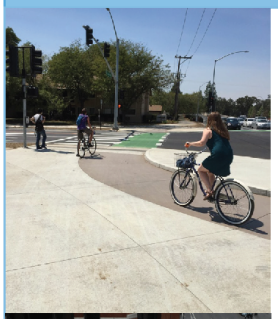
Table 6: Crossing Treatment Options

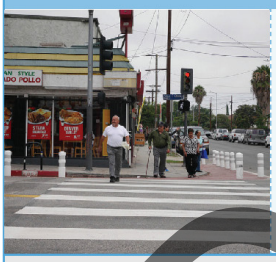
SAFETY TREATMENT	DESCRIPTION	KEY FACTORS	COST (per mile or unit)
MARKED CROSSWALKS			
	• FDOT standard is ladder-style markings. • Typically used at signalized, all- way stop-controlled intersections, and midblock crossing locations. • Designated pedestrian crossings should be considered at locations with pedestrian volumes greater than 20 per hour and/or with high vehicle-pedestrian collisions.	• Can provide a false sense of security, especially at uncontrolled crossings; consider installing additional improvements to reduce vehicle speeds, shorten the crossing distance, or increase the likelihood of motorists stopping and yielding. • Cannot utilize colors or patterns that result in driver confusion regarding intended purpose of crosswalk.	**Low** (<$10,000)
Guidance: *FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations, FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts, NACTO Urban Street Design Guide, FDOT FDM, FDOT TEM*			
HIGH-VISIBILITY SIGNS & MARKINGS			
	• High-visibility colored signs are posted at crossings to increase driver awareness of the pedestrian crossing and regulatory (state law) requirements. • Typically applied at unsignalized and signalized locations where pedestrian or bicycle movements need to be emphasized.	• Beneficial in areas where drivers might not expect a pedestrian crossing or where a higher level of driver attention is required due to potential pedestrian and bicycle conflicts.	**Low** (< $10,000)
Guidance: *FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations, FDOT FDM*			
CURB EXTENSIONS / BULBOUTS			
	• Consists of an extension of the sidewalk space into the street, narrowing the street at a pedestrian crossing. • Considered at intersection and midblock locations where there is high crossing activity, and no travel lane conflicts. • Typical application in locations with on-street parking.	• Shortens the distance pedestrians have to cross, decreasing pedestrian exposure time. • Provides opportunity to increase the sidewalk space. • Improves pedestrian visibility. • Lowers vehicle turning speeds. • Where applicable, allows for traffic control and warning devices to be placed closer to travel lane. • Provides opportunity to store and treat stormwater runoff. • Often involves an on-street parking trade-off.	**Medium** ($10,000-$100,000)
Guidance: *FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations, Institute of Transportation Engineers (ITE) Implementing Context Sensitive Design on Multimodal Throughfares, FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts, NACTO Urban Street Design, NACTO Urban Bikeway Design Guide, FDOT FDM*			

SAFETY TREATMENT	DESCRIPTION	KEY FACTORS	COST (per mile or unit)
MEDIAN ISLANDS			
	• Raised islands in the center of a street, separating opposing lanes of traffic with cutouts for pedestrian access along the pedestrian route, providing a refuge area for people crossing a street. • Used in locations on single lane or multi lane streets where there is a defined midblock crossing desire line or at intersections.	• This measure allows pedestrians to cross the street in two stages, focusing on each direction of traffic separately. • The refuge provides pedestrians with a better view of oncoming traffic as well as allowing drivers to see pedestrians more easily. • It can also split up a multi-lane road and act as a supplement to other pedestrian facility treatments.	**Medium** ($10,000-$100,000)
Guidance: *FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations, ITE Implementing Context Sensitive Design on Multimodal Thoroughfares, FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts, NACTO Urban Street Design Guide, NACTO Urban Bikeway Design Guide, FDOT FDM*			
RAISED CROSSWALKS			
 	• Speed tables outfitted with crosswalk markings and signage to facilitate pedestrian crossings. Located at crosswalks to provide pedestrians with a level street crossing. • Applied in locations where modal hierarchy is desired to promote better bicycling and pedestrian yielding compliance by drivers.	• Provide safer crossing for pedestrians. • Channelize pedestrians to an enhanced crossing. • Slow vehicular travel speeds. • Improve pedestrian visibility and accessibility.	**Medium** ($10,000-$100,000)
Guidance: *FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations, NACTO Urban Bikeway Design Guide*			
RAISED CROSSWALK AT CHANNELIZED RIGHT TURN			
	• Marked crosswalks that are raised to slow driver turning speed and increase yielding compliance. • Tighter angles in right turn channelization make crossing pedestrians more visible, slow down right turning vehicles, and make turns easier for drivers (don't have to turn their head as far to check for gaps in traffic). • Used in locations with high bicycle/pedestrian activity combined with higher speed right turning vehicular traffic.	• Provide safety advantage to pedestrians with demonstrated increased yielding by drivers. • Slows driver turning speeds.	**Medium** ($10,000-$100,000)
Guidance: *ITE Implementing Context Sensitive Design on Multimodal Thoroughfares, FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts*			

SAFETY TREATMENT	DESCRIPTION	KEY FACTORS	COST (per mile or unit)
RECTANGULAR RAPID FLASH BEACONS (RRFB)			
	• Rapid flashing LED strobe lights post-mounted in between a pedestrian or trail crossing warning sign and down arrow sign. • The beacons may be push-button activated or activated with passive pedestrian detection. • Typically applied on two-lane or four-lane streets where there is a defined midblock crossing desire line and meets established evaluation criteria.	• Increased driver yielding compliance. • Solar panels reduce energy costs associated with the device. • Wireless capabilities reduces installation cost.	**Medium** ($10,000-$100,000)
Guidance: *FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts, NACTO Urban Bikeway Design Guide, FDOT TEM*			
PEDESTRIAN HYBRID BEACON (PHB) / HIGH INTENSITY ACTIVATED CROSSWALK (HAWK)			
 	• Pedestrian-actuated beacon that is a combination of a beacon flasher and a traffic control signal. • When actuated, the beacon displays a yellow (warning) indication followed by a solid red. • During pedestrian clearance, the driver sees a flashing red "wig-wag" pattern until the clearance interval has ended and the signal goes dark. • Can be considered along higher speed multi-lane streets where increased driver visibility of multimodal crossing is desired and meets established evaluation criteria.	• Reduces pedestrian-vehicle conflicts and increases driver compliance with yielding to pedestrians. • Reduces vehicle delay when compared to standard pedestrian traffic signal.	**High** (> $100,000)
Guidance: *NACTO Urban Bikeway Design Guide, FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts, NACTO Urban Bikeway Design Guide, FDOT TEM*			

SAFETY TREATMENT	DESCRIPTION	KEY FACTORS	COST (per mile or unit)
GRADE-SEPARATED CROSSING			
	• Pedestrian and bicyclist-only overpass or underpass over or under a street or topographical barrier. • Provides complete separation of pedestrians and bicyclists from motor vehicle traffic, normally where no other pedestrian facility is available. • Typically applied in locations with defined pedestrian/bicycle desire line that extends across a major barrier.	• Allow for the uninterrupted flow of pedestrian movement separate from vehicular traffic. • Underpass configuration can reduce energy expenditure for bicyclists by spanning existing topography. • Eliminates conflict between pedestrians, bicyclists, and moving traffic.	**High** (> $100,000)
Guidance: *AASHTO Guide for the Development of Bicycle Facilities; ITE Transportation Planning Handbook: Bicycle and Pedestrian Facilities*			
BIKE BOXES			
	• Applied in locations with high volumes of bicyclists where there may be right or left turning conflicts with vehicles. • Also applied in conjunction with red signal indication where there is a desire for bicyclists to transition from one side of the street to the other at signalized intersections.	• Provides dedicated space at the intersection for bicyclists, improving visibility to drivers during a red signal indication. • Brings bicyclists to the front of the queue, prioritizing bicycle traffic. • Does not benefit bicyclists approaching on a green signal indication. • Bicycle Boxes require formal request and approval from FHWA to use under current interim approval.	**Medium** ($10,000-$100,000)
Guidance: *FHWA Separated Bike Lane Planning and Design Guide, NACTO Urban Bikeway Design Guide, FDOT FDM*			

SAFETY TREATMENT	DESCRIPTION	KEY FACTORS	COST (per mile or unit)
INTERSECTION MARKINGS			
	• Consists of using green and white colored pavement markings at conflict points such as at the start of right turn lanes adjacent to bike lanes, or additional bike symbols such as turn queue boxes within the intersection. • Increase the visibility of bicyclists to drivers, identify areas of potential conflict, and provide guidance to bicyclists on their intended alignment through the intersection. • Typically applied on high ease-of- use facilities and at high conflict locations.	• Increases visibility of bicyclists. • Raises driver and bicyclists awareness of conflict areas. • Increases driver yielding behavior. • Increases bicyclists comfort level. • Two-Stage Bicycle Turn Boxes require formal request and approval from FHWA to use under current interim approval.	**Medium** ($10,000-$100,000)
Guidance: *NACTO Don't Give up at the Intersection, Desiging All Ages and Abilities Bicycle Crossings, FHWA Separated Bike Lane Planning and Design Guide, NACTO Urban Bikeway Design Guide, FDOT FDM*			
PROTECTED INTERSECTIONS			
 	• Intersection design that provides separated space for pedestrians and bicyclists leading up to and through an intersection. • Typically applied at the intersection of two protected bike lanes or in locations where additional intersection protection is desired.	• Protected Intersections reduce the potential for people on bicycles to mix with vehicular traffic at the intersection, providing a continuous low-stress facility when combined with protected bike lanes. • Combines multiple treatments in one intersection (reduced curb radii, intersection markings, and protected bike lanes). • Enhances right-turning driver's visibility of approaching cyclist through setback of bike lane crossing. • Works better with larger setbacks between the bikeway and adjacent lane, which provide better visibility and more space for vehicles to wait and yield to people on bikes. • Challenging to implement at intersections with large volumes of turning trucks. • Approved for use within MUTCD.	**High** (> $100,000)
Guidance: *NACTO Don't Give up at the Intersection, Designing All Ages and Abilities Bicycle Crossings, FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts*			

SAFETY TREATMENT	DESCRIPTION	KEY FACTORS	COST (per mile or unit)
WAYFINDING SIGNS			
	• Posting a series of pedestrian and bicycle wayfinding signs that orient pedestrians and bicyclists to destinations. • Used along bikeways and pedestrian walking corridors to identify destinations and travel times and distances.	• Encourages more walking and bike trips by providing people with a reference point to a destination.	**Low** (<$10,000)
Guidance: *NACTO Urban Bikeway Design Guide*			
BICYCLE SIGNALS			
	• Dedicated signal head for bicyclists. • Used in locations with separated bicycle facilities.	• Provides ability to provide separate signal phase for bicyclists when desired for enhanced safety or non-traditional signal operations. • Past national studies have shown an increase in compliance with signal indication. • Bicycle Signals require formal request and approval from FHWA to use under current interim approval.	**Low** (< $10,000)
Guidance: *NACTO Don't Give up at the Intersection, Desiging All Ages and Abilities Bicycle Crossings, FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts, FHWA Separated Bike Lane Planning and Design Guide, NACTO Urban Bikeway Design Guide*			
LEADING PEDESTRIAN / BICYCLE INTERVALS			
	• Traffic signal timing that provides pedestrians/bicyclists with a few seconds head start prior to motor vehicles on the parallel street being given the green light. • Typically applied in locations with high pedestrian/bicyclist conflicts with turning vehicles or vulnerable pedestrian populations.	• Increases pedestrian/ bicyclist visibility for turning vehicles and driver yielding compliance for pedestrians. • Helps reduce conflicts between turning vehicles and pedestrians/ bicyclists.	**Low** (< $10,000)
Guidance: *NACTO Don't Give up at the Intersection, Desiging All Ages and Abilities Bicycle Crossings, ITE Implementing Context Sensitive Design on Multimodal Thoroughfares, FHWA Achieving Multimodal Networks, Applying Design Flexibility & Reducing Conflicts, FHWA Separated Bike Lane Planning and Design Guide, NACTO Urban Street Design Guide, FDOT TEM*			

Bicycle and Pedestrian Network Analysis

Improvements to the bicycle and pedestrian networks will be prioritized in high demand areas. Pedestrian improvements will be focused on filling sidewalk gaps, while bicycle improvements are intended to support a network of low-stress corridors. To help inform specific improvements to the bicycle and pedestrian network, a series of analyses was undertaken, including level of traffic stress, equity, and bicycle and pedestrian demand.

Level of Traffic Stress

Bicycle and pedestrian Level of Service (LOS) are measures that have been used in many communities to determine the suitability of bicycle and pedestrian facilities in a shared roadway environment. However, this method has limitations in terms of the types of facilities it covers

(does not directly account for sharrows, separated bikeways, or shared-use paths) and is also typically not applied to local streets where traffic count data isn't usually available. It also requires a substantial amount of data related to traffic and street cross sections that is also not usually available.

An alternative approach is Level of Traffic Stress (LTS), which provides a comprehensive evaluation of a street network's stressfulness corresponding to different user profiles, providing a way to map the bicycle network according to which populations they serve rather than just according to facility type. LTS accounts for different bicycle user types and their specific needs and preferences, including those categorized as "interested but concerned" that can make up as much as 60% of the general population and require separated facilities or low speed, low volume neighborhood streets in order to feel comfortable riding a bicycle. These user types are referenced in the 2019 FHWA Bikeway Selection Guide, as shown in **Figure 5**, along with brief descriptions of each type.

Figure 5: FHWA Bicycle Design User Profiles

SOURCE: 2019 FHWA BIKEWAY SELECTION GUIDE

Level of Traffic Stress (LTS) is an analysis methodology that provides a comprehensive evaluation of a street network's stressfulness corresponding to different bicycle user types and their specific needs and preferences, providing a way to map the bicycle network according to which populations they serve rather than just according to facility type. LTS is determined based on various traffic and geometric factors, but primarily the bicycle facility type, number of lanes on the street, and the posted speed of the street. **Table 7** provides a summary of the four LTS levels, and their corresponding suitability for different types of bicyclists.

Table 7: Level of Traffic Stress User Descriptions

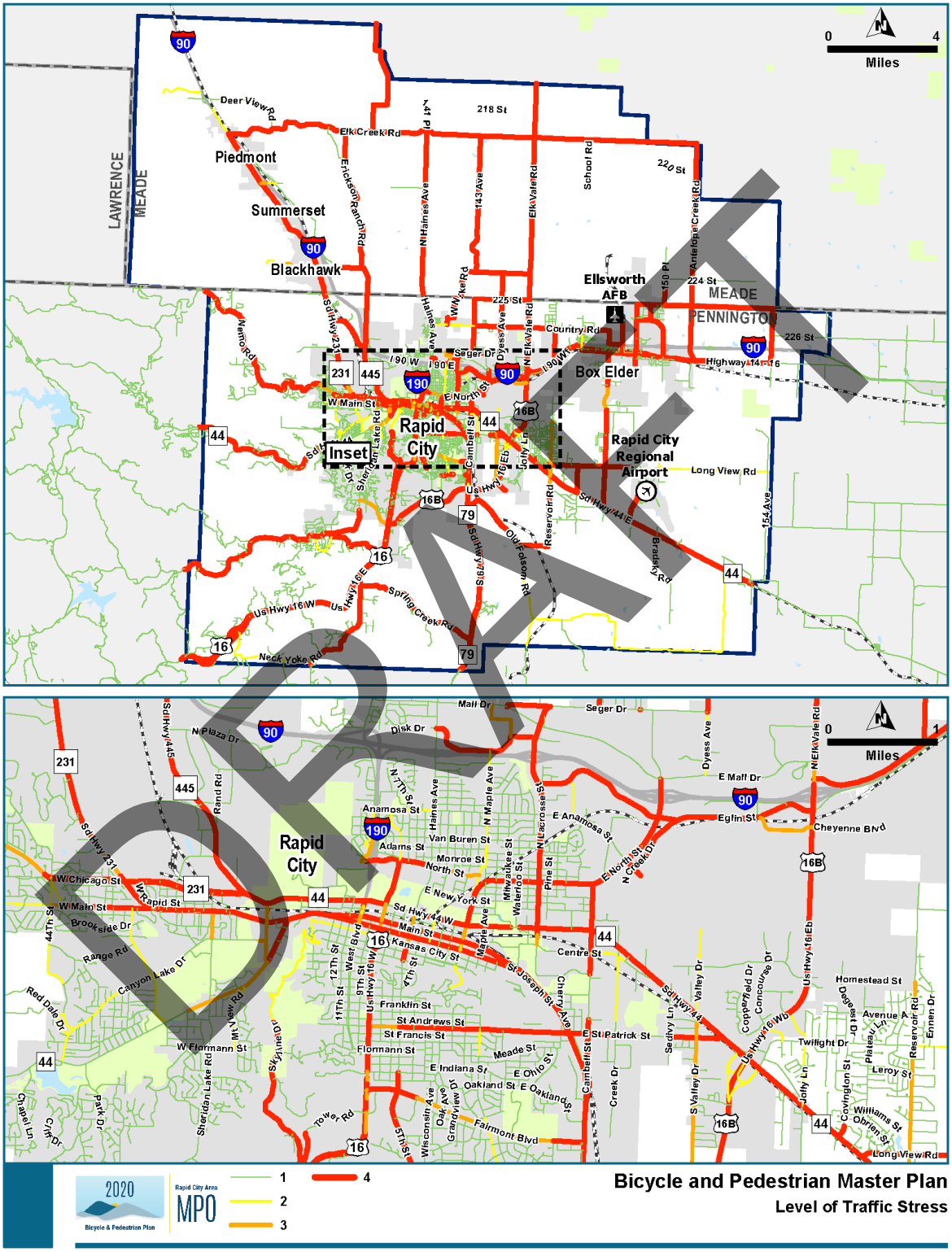
An LTS analysis was completed for all roadways within the RCAMPO boundaries. All separated bike lanes, sidepaths, and trails are considered LTS level 1. Streets with bike lanes or paved shoulders can be classified from LTS level 1 to level 4 based on the number of lanes per direction and the posted speed. Other mixed traffic streets without designated facilities can also be classified from LTS level 1 to level 4 based on the number of lanes per direction, the facility type/functional classification, and the posted speed. Based on the available data, several simplifying assumptions were made to complete the analysis, including the following:

- On streets with on-street parking, these parking lanes were not considered
- On streets with bike lanes or paved shoulders, the widths of these facilities were not considered, only whether they were present
- The presence of raised medians was not considered
- The blockage of bicycle lanes was not considered
- All streets classified as local streets were assumed to have one lane per direction

Figure 6 shows LTS on all streets, including local streets, within the Rapid City MPO boundaries. As indicated in Table 7, facilities classified as LTS level 1 or 2 are considered low stress, while facilities classified as LTS level 3 or 4 are considered high stress. As shown in Figure 6, most of the region's major roadways are high stress, while low stress streets are typically limited to local neighborhood streets and minor collector roadways.

The LTS analysis provides opportunities to identify potential alternative corridors to target for bicycle improvements, either to route around higher stress streets, or to specifically target improvements on higher stress streets that connect low-stress routes and facilities. Improvements on roadway segments with higher LTS levels would be targeted to reduce the LTS to lower levels – this could be done in several ways, such as by providing a bicycle facility with more separation from traffic (separated bike lanes or a sidepath), reducing the number of lanes on a street (right sizing or "road diet"), or by reducing the posted speed.

Figure 6: Rapid City Level of Traffic Stress Map



Equity Analysis

People who rely on walking, bicycling, and transit to access jobs and meet every day needs often live in areas that are the least supportive of active transportation modes. Such areas are often characterized by sidewalk networks that have gaps or are in poor condition, infrequent transit service and/or absence of safe bicycle facilities. The health, safety, mobility, and economy of a community is compromised when its residents are not provided with viable mobility choices. Developing bicycle and pedestrian networks that serve all areas of the MPO region, including areas that have a high density of historically under-served populations and relatively few bicycle and pedestrian facilities, is important to the development of this plan.

To better understand the needs of communities most affected by the lack of access to active transportation options, an equity analysis was conducted based on their demographic attributes. The analysis also considered the spatial relationship of underserved areas to existing bicycle and pedestrian facility networks. This section provides an overview of this analysis that resulted in a geographic equity score that helped to identify areas where people would be more likely to walk or ride a bicycle, to meet their daily transportation needs.

Equity Analysis Methodology

The Equity Analysis included an evaluation of six 2016 American Community Survey (ACS) socio-economic factors, based on census block group data, and was the same data used in the Rapid City Area MPO Transit Feasibility Study in April 2018. The data used includes:

- Population below poverty level
- Minority population
- Limited English proficiency
- Population age 65 or above
- Population age 18 or below
- Zero-vehicle households

The analysis used a threshold for each of the six factors, so that those census block groups that had a greater value than the regional mean value for any given indicator was given a score of one (1). The scores for the individual categories were then summed across the six socio-economic indicators to generate a composite equity score. For example, if a census block has an above average number of people below poverty level and an above average number of people 65 years of age or older, the census block group was given a score of two (2). The composite equity score range has a possible high score of six (6), indicating above average values for each of the socioeconomic indicators, and a minimum possible low equity score of zero (0), which would indicate no above average values. Individual maps for each socio-economic indicator are located in **Appendix X**.

The composite equity map was then overlaid with the existing network of bicycle facilities (bike lanes, trails, and signed/marked bike routes), and overlaid separately with the existing network of pedestrian facilities (sidewalks and trails), to determine areas of low service. For both the bicycle and pedestrian analysis, the facility service level was calculated by dividing the total mileage of bicycle or pedestrian facilities in a census block group by the number of square miles in the census block group (e.g., bicycle facility miles/square miles). Block groups with a population density less than 1 person per acre were excluded from the analysis. Block groups in the lowest quartile (lowest 25%) were considered to be “low service areas.”

The results of the equity analysis combined with the assessment of low service areas within the MPO boundary highlight areas where improvements to the bicycle or pedestrian network would benefit underserved populations. **Figure 7** represents a schematic diagram of the equity analysis framework that used six socioeconomic factors to derive a composite equity score, and then overlaid the existing bicycle/pedestrian facilities to help determine where areas of high composite equity score overlapped with areas of low bicycle or pedestrian service within the Rapid City area.

Figure 7 shows the composite equity analysis. Darker areas on the composite map signify locations with concentrated socio-economic indicators

Figure 7: Rapid City Equity Analysis Framework

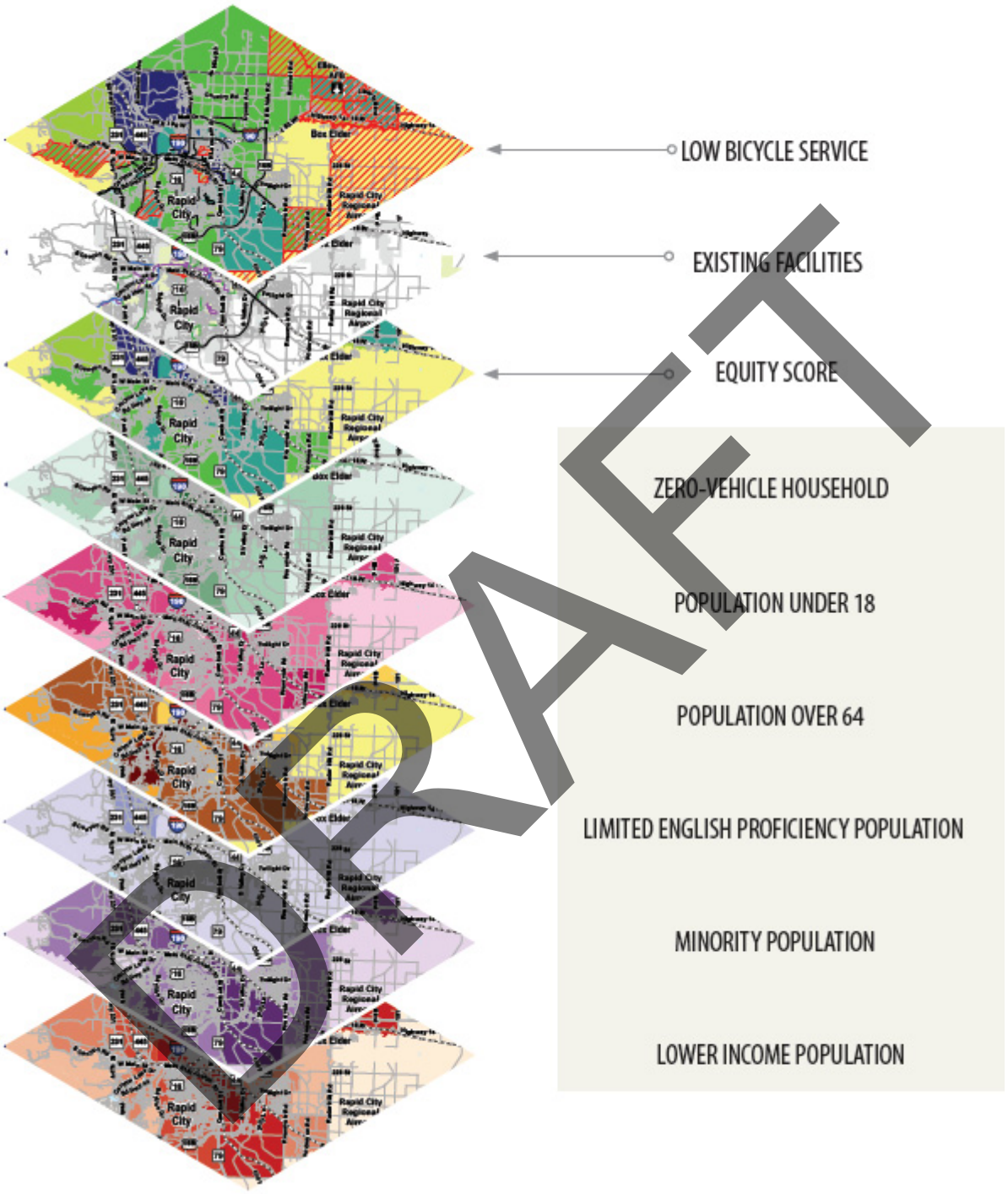
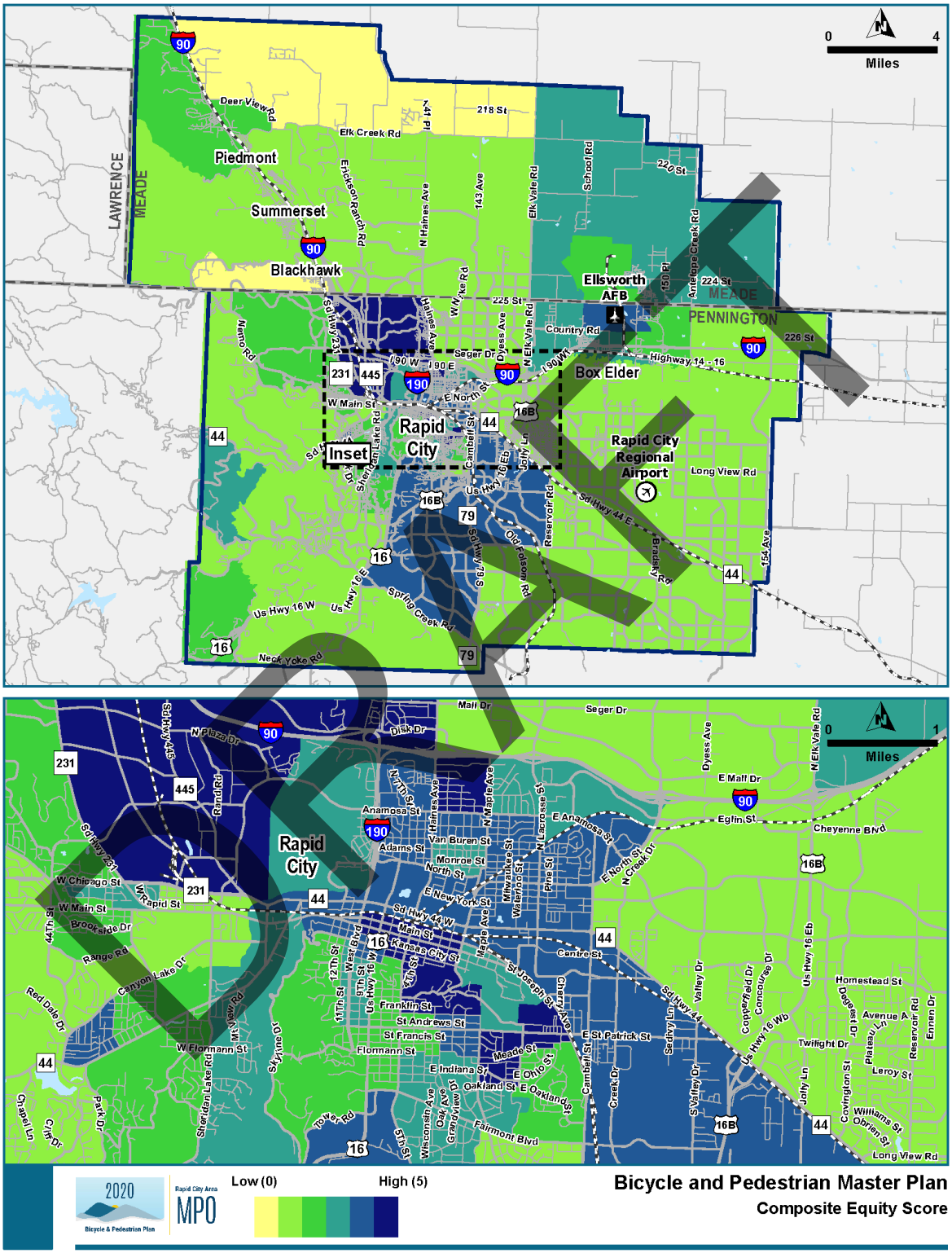


Figure 8: Composite Equity Score



Equity Score and Low Bicycle/Pedestrian Service Areas

Figure 8 and **Figure 9** show the results of combining the equity score data and the existing bicycle and pedestrian facilities data revealing the areas of low bicycle service and low pedestrian service in the Rapid City Area, respectively. As noted previously for Figure 8, areas with higher equity scores are noted with darker colors. The low service areas are highlighted on the map by red hatched markings. Efforts should be focused on areas where low service areas and concentrated high composite equity scores overlap. These are areas on the map shown in darker colors that also have red hatched markings. They identify concentrations of the most vulnerable user populations and where improvements should be prioritized to enhance and provide equitable mobility access.

Figure 8: Low Bicycle Service

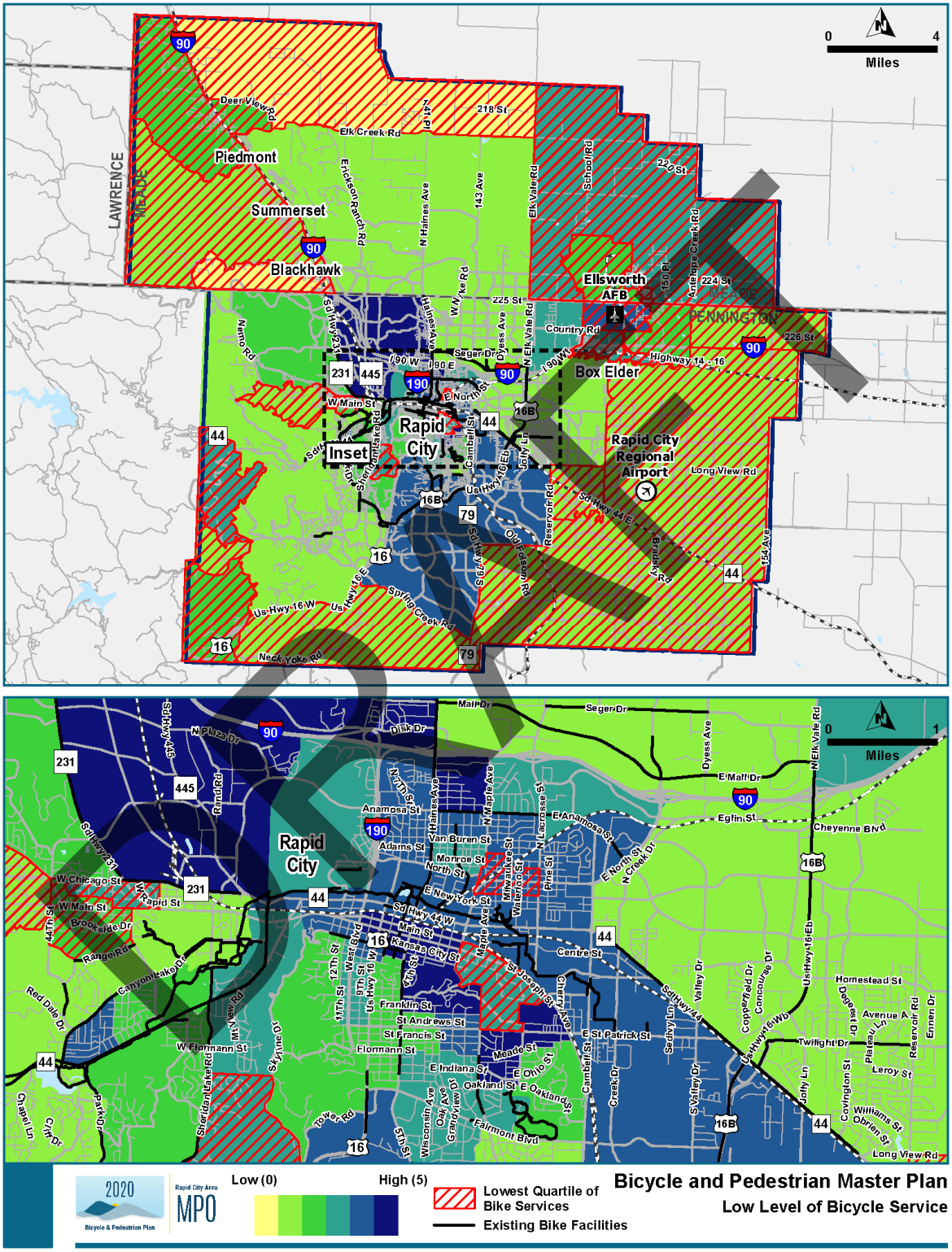
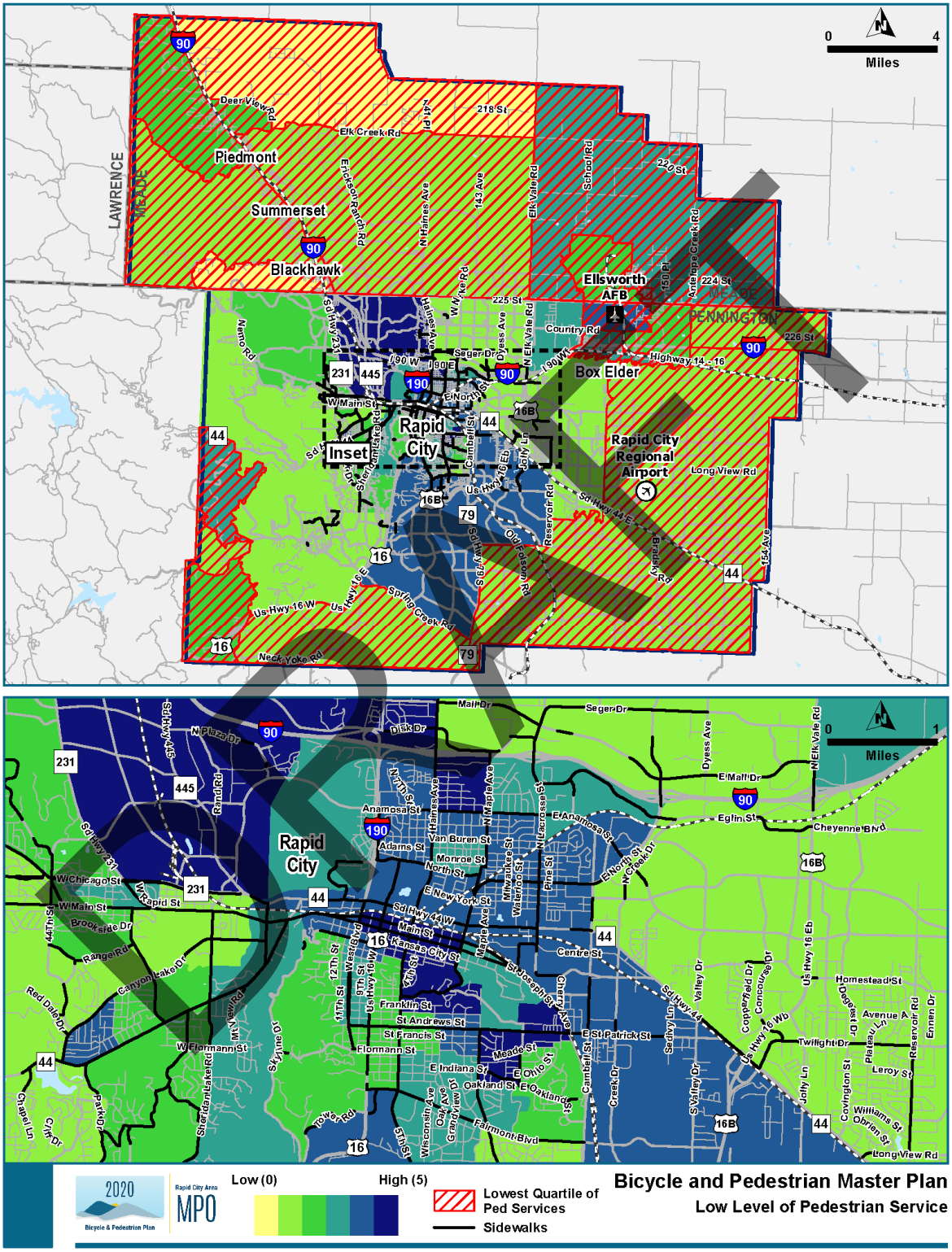


Figure 9: Low Pedestrian Service



Bicycle and Pedestrian Demand

An analysis of relative levels of bicycle and pedestrian demand within the MPO area was conducted utilizing criteria corresponding to the proximity of bicyclists and walkers to various key destinations, projected population and employment density data, and socioeconomic data. This data identified populations with a higher propensity to make trips by walking or bicycling. It should be noted that the demand analysis did not consider existing "on the ground" bicycle and pedestrian conditions or facilities.

The rationale for each demand category and corresponding scoring is explained as follows:

- **Proximity to Key Destinations.** This demand category reflected a graduated scoring criteria that gave more points for bicyclists and pedestrians in closer proximity to destinations, accounting for the fact that people have different tolerances for how far they are willing to walk or ride a bicycle to their destination. Graduated demand scoring was applied to the areas around colleges and universities, public schools, parks, libraries, cultural centers, activity centers, and bus stops. The highest scores were given for the closest proximity of bicyclists and pedestrians to each destination (within one-quarter mile for pedestrians and one-half mile for bicyclists), decreasing to lower scores for bicyclists and pedestrians who were further away from destinations (capped at one mile for pedestrians and two miles for bicyclists). **Table 8** summarizes the graduated demand scoring for each type of destination.
- **Population and Employment Density.** The basis for the second demand category was the socioeconomic data for year 2045 from the RCAMPO regional travel demand model for the traffic analysis zones (TAZ) within the MPO area. The demand analysis reflected the anticipated and forecasted growth up to 2045. There were two specific elements included in the scoring for this category: population + employment density and employment to population ratio, which are described as follows:
    - **Population + Employment Density.** This measure is based on summing the population and employment totals for each TAZ and dividing by the acreage of the TAZ to calculate the density. It should be noted that this exercise did not include the subtraction of any non-developable acreage within an individual TAZ. Areas with higher population and employment densities are generally reflective of development patterns that are more conducive to bicycling or walking. **Table 9** summarizes the points given to each TAZ area based on the computed densities among the TAZs within Pinellas County. The points are based roughly on dividing the TAZ rankings into quintiles. The TAZs ranked highest in terms of density (in the first quintile) received the highest score.
    - **Employment to Population Ratio.** This measure is based on the ratio of total employment divided by total population in each TAZ. Those TAZs with a balance of employment and population within a single zone represent areas more likely to have bicycling and walking trips due to the proximity of complimentary land uses within shorter distances of each other – distances that are more conducive to bicycling and walking. **Table 10** summarizes the points given to each TAZ area based on the computed ratios among the TAZs within the MPO area. As with density, the points are based roughly on dividing the rankings into quintiles. However for this ratio, the values in the middle (third) quintile are given the highest score, as these are the TAZs with the best balance between total population and total employment. Therefore these areas are more likely to have the most short-distance trips between complimentary land uses. The first and fifth quintile represent the areas that are most

unbalanced. These areas have either a very high ratio (reflecting mostly employment with little to no residential) or a very low ratio (mostly residential with little to no employment).

- **Composite Equity Score.** The third demand category is based on the tabulated composite equity score based on the methodology discussed previously. An increase in the overall demand scoring for this category corresponds with increases in the composite equity score, as shown in **Table 11**. This reflects the higher bicycle and pedestrian demand typically associated with areas having above average values across multiple socioeconomic indicators.

Table 9: Population + Employment Density

	Bicycle Demand Scoring				Pedestrian Demand Scoring			
	Score by Bike Distance (mi)				Score by Bike Distance (mi)			
Destination	**0.50**	**1.00**	**1.50**	**2.00**	**0.25**	**0.50**	**0.75**	**1.00**
College/University	15	10	5	1	15	10	5	1
Parks	10	5	1	0	10	5	1	0
School (Public)	10	5	1	0	10	5	1	0
Civic Center	10	5	1	0	10	5	1	0
Bus/Transit Route Stop	10	5	1	0	10	5	1	0

Table 10: Employment to Population Ratio

	Bike/Ped Demand Scoring				
	Scoring by TAZ Quintile				
Data	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
Population + Employment Density	10	7	5	3	1
Employment / Population Ratio	1	3	5	3	1

Table 11: Composite Equity Score

	Bike/Ped Demand Scoring						
	Composite Equity Score						
Data	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Composite Equity Score*	0	0	3	6	9	12	15

*EACH POINT REPRESENTS A BLOCK GROUP BELOW THE CITYWIDE AVERAGE

The map shown in **Figure 11** illustrates the results of the demand analysis for bicyclists. **Figure 12** shows the results for pedestrians. Areas with darker colors are projected to have higher levels of demand.

It should be noted that this demand evaluation only considers transportation trips being made to destinations, and does not consider recreational trips such as leisure rides or jogs/walks that do not involve traveling to and from a destination.

Figure 11: Bicycle Demand Score

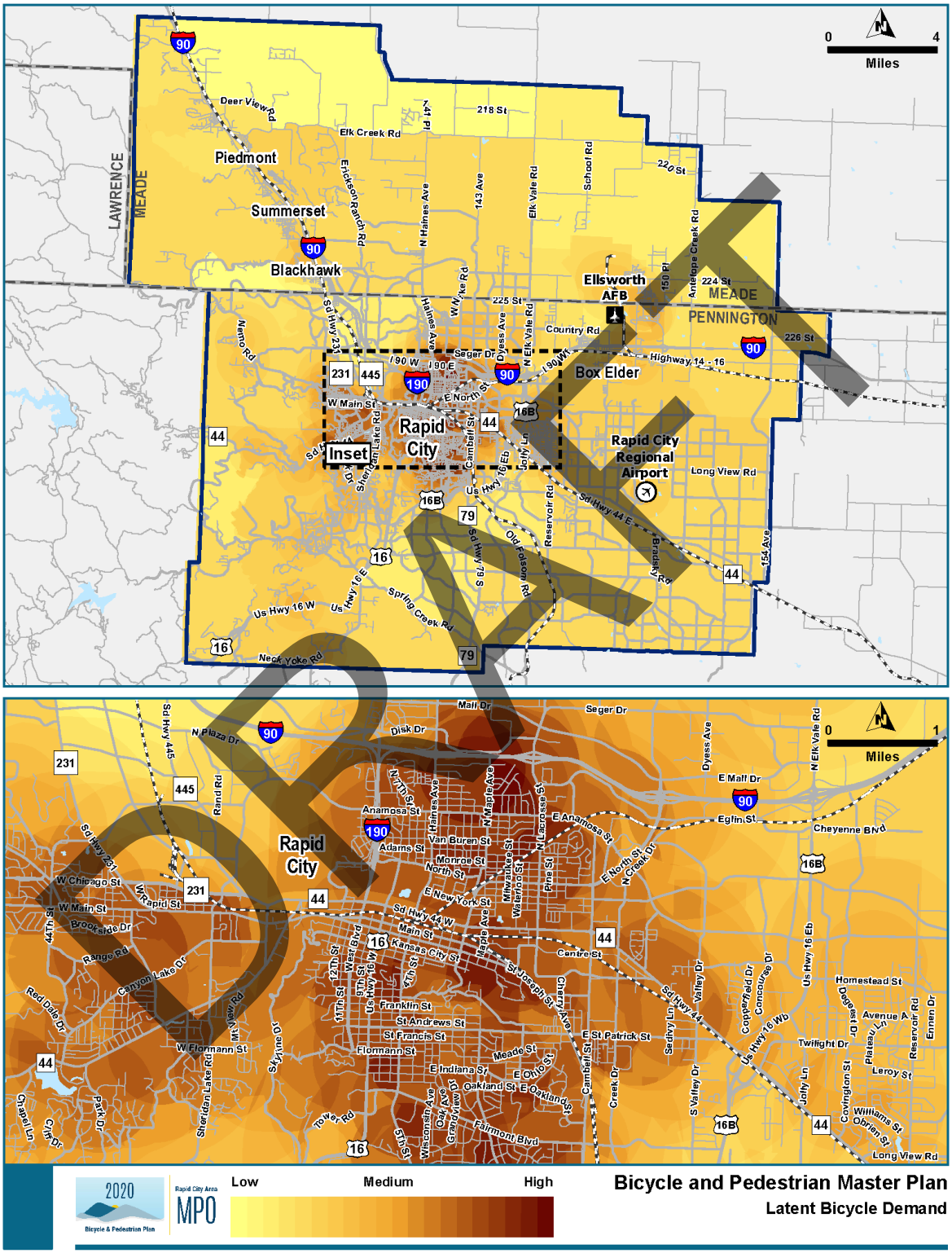
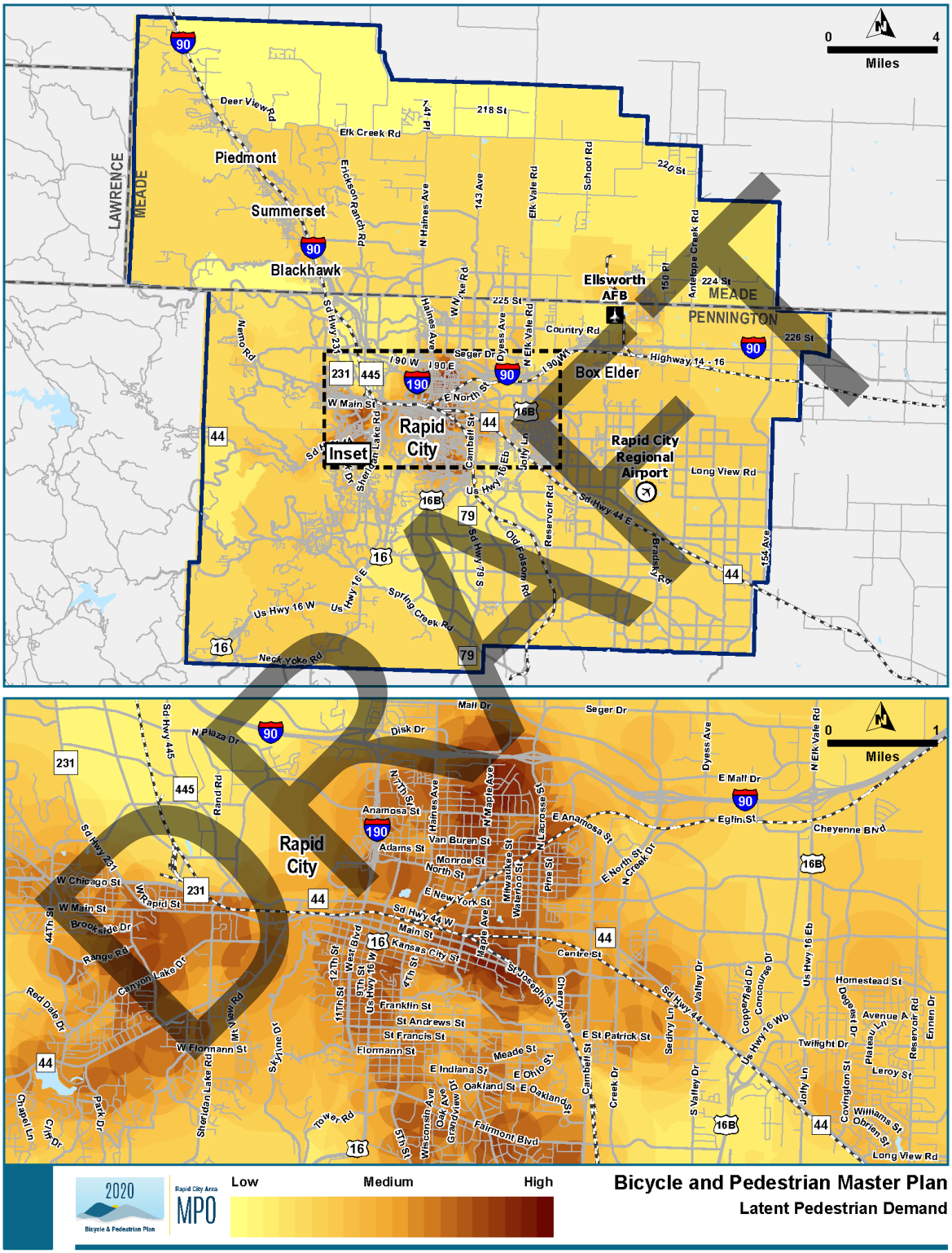


Figure 12: Pedestrian Demand Score



Public Involvement

Public involvement for the Bicycle and Pedestrian Master Plan Update included an in person presentation and an online ArcGIS story map.

Public Meeting #1

The first public meeting was held on October 29, 2019 from 4:00pm to 5:45pm at the Rapid City City Hall Council Chambers. The public meeting was held in an open house style format, and was advertised through local newspapers, the project website, the MPO website, email flyers, and through a Facebook event page. There were approximately 60 people in attendance.

The purpose of the first public meeting was to present an overview of the Rapid City Area MPO Metropolitan Transportation Plan (MTP), along with the Bicycle and Pedestrian Plan Update, and gather feedback from the public and stakeholders.

A presentation was given to attendees that presented the details and scope of the project, and reviewed the existing analysis that had been completed at that point. Interactive maps and markers were provided to attendees following the presentation, in order to gain feedback on the existing and future transportation system needs. The presentation can be seen in **Appendix X**.

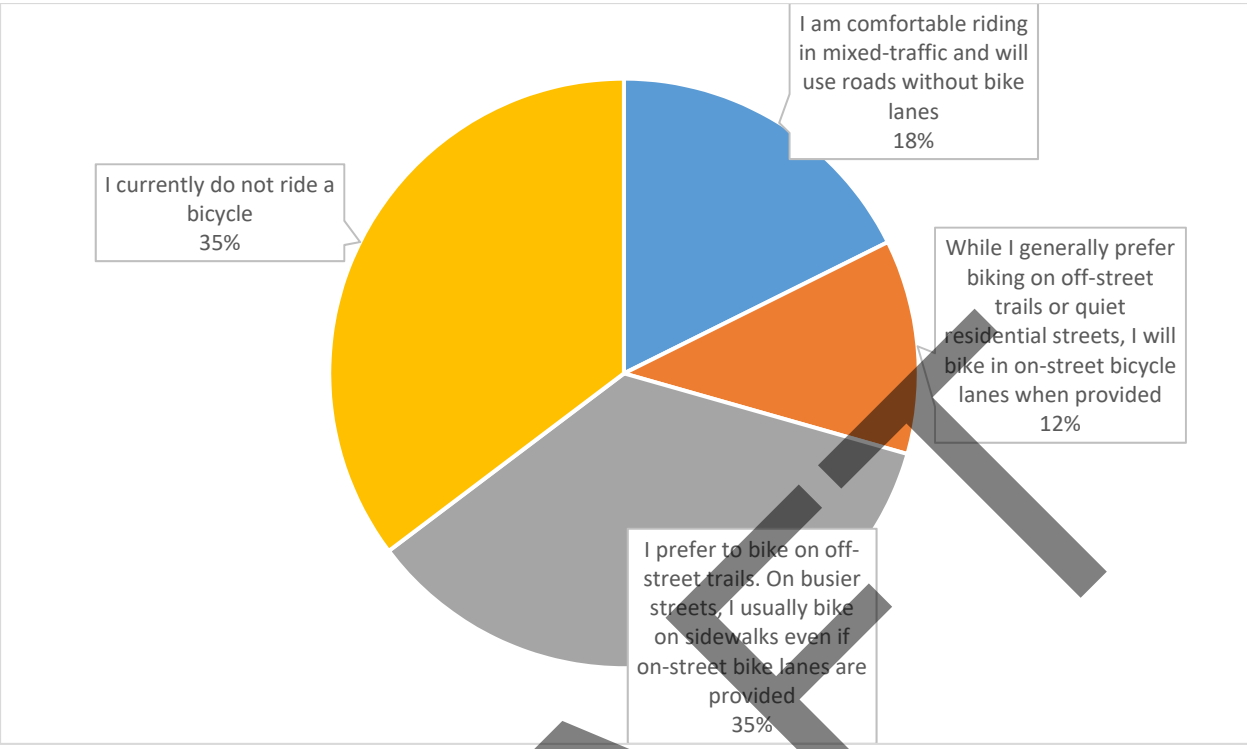
Public comments were taken in various forms, such as through the submission of a comment form, notes on the interactive map, email, or on the project website. This discussion primarily focused on transit, bicycle, and pedestrian issues and needs. Specific concerns were given regarding Highway 16/16B/Catron Boulevard intersection, the Highway 16/Neck Yoke Road intersection, and intersections near the South Dakota School of Mines campus. The initial public comment period was from the start of the public meeting through November 15, 2019. Public comments from this meeting can also be found in **Appendix X**.

Public Meeting #2

The second public meeting consisted of an ArcGIS online story map. This story map was created in lieu of an actual in person meeting due to the Covid-19 pandemic, and began on April 20, 2020. This online story map allows for the public to learn more about the project and what has been done since the first public meeting. Feedback was also collected from the public through the online story map. Attendees were able to put their comments on maps associated with roadways, bicycle lanes, sidewalks, and transit routes. The comments, depending on the slide, could be places as points or as lines. The ArcGIS online story map was open until MONTH, DAY, 2020. The results of the ArcGIS online story map can be found in **Appendix X.**

In addition to the maps, attendees were asked to complete a survey about Bicycle & Pedestrian Prioritization. The survey was meant to gauge attendees experience bicycle or walking around the Rapid City area, and how they felt about the existing networks. To assist with answering the questions and providing comments on the map, bikeway, pedestrian, and crossing treatment facility documents were developed and provided to give attendees more insight as to the potential improvements that could be implemented in the Rapid City area. From the survey, attendees were able to rank how comfortable they felt bicycling along the existing Rapid City bicycle network, seen in **Figure 10**.

Figure 10: How would you describe your approach to bicycling?



This question was meant to understand how Rapid City residents feel about their own comfort levels when bicycling, and compare their comfort levels with the FHWA Bicycle Design User Guidelines. For those who are comfortable riding in mixed-traffic and use roads without bike lanes, they would fall under the highly confident rider category. Participants who chose “while I generally prefer biking on off-street trails or quiet residential streets, I will bike in on-street bicycle lanes when provided” would be categorized as somewhat confident. Those who do not currently ride a bicycle or who identify with “I prefer to bike on off-street trails. On busier streets I usually bike on sidewalks even if on-street bike lanes are provided” are categorized as interested but concerned bicyclists.

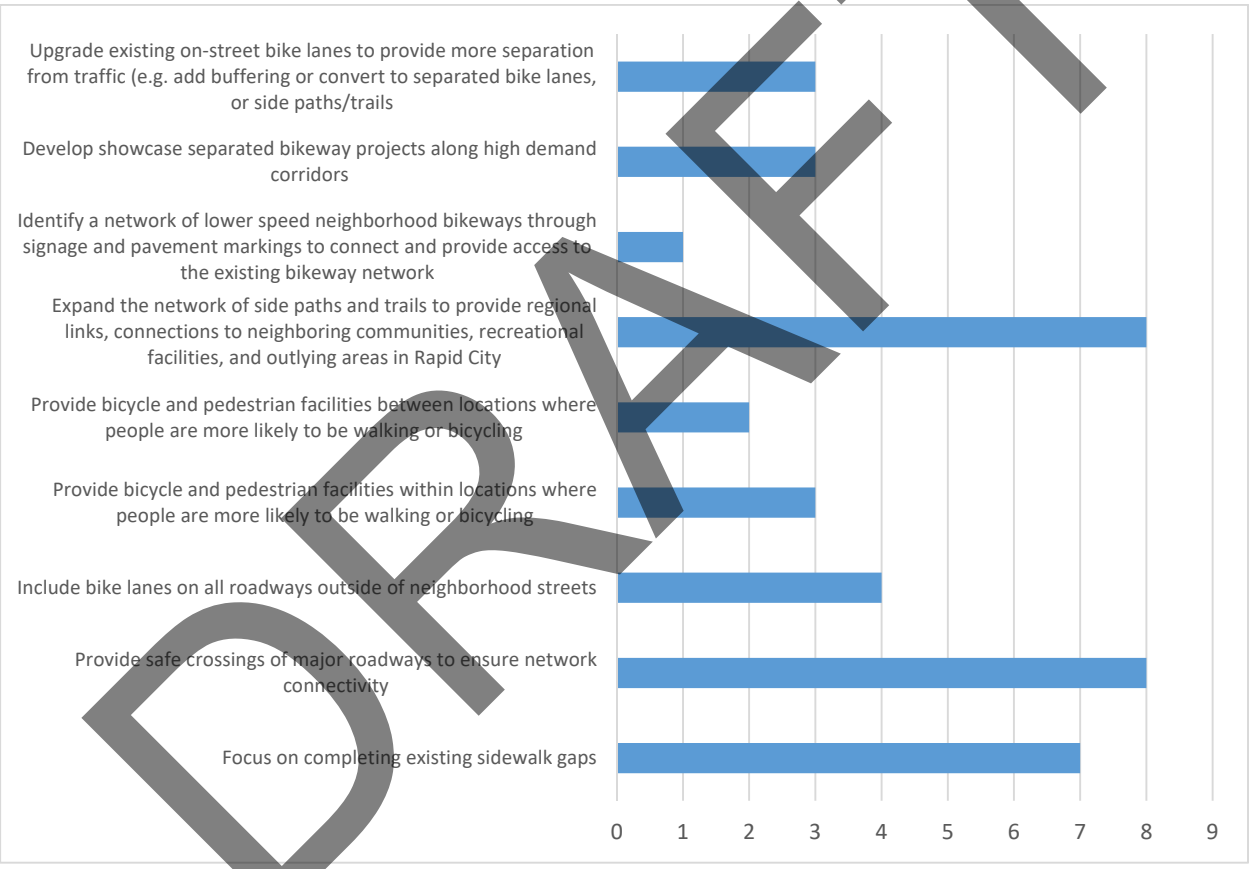
The last question in the survey asked participants “which of the following approaches do you believe would most improve the bicycle and pedestrian network?” and were allowed to select up to three responses. Responses included:

a. Focus on completing existing sidewalk gaps
b. Provide safe crossings of major roadways to ensure network connectivity
c. Include bike lanes on all roadways outside of neighborhood streets
d. Provide bicycle and pedestrian facilities within locations where people are more likely to be walking or bicycling
e. Provide bicycle and pedestrian facilities between locations where people are more likely to be walking or bicycling
f. Expand the network of side paths and trails to provide regional links, connections to neighboring communities, recreational facilities, and outlying areas in Rapid City
g. Identify a network of lower speed neighborhood bikeways through signage and pavement markings to connect and provide access to the existing bikeway network
h. Develop showcase separated bikeway projects along high demand corridors

i. Upgrade existing on-street bike lanes to provide more separation from traffic (e.g. add buffering or convert to separated bike lanes, or side paths/trails

There were a total of 39 responses, with "Provide safe crossings of major roadways to ensure network connectivity" and "Expand the network of side paths and trails to provide regional links, connections to neighboring communities, recreational facilities, and outlying areas in Rapid City" being the top two choices, both having 8 responses. This question was included to help guide the prioritization of bicycle and pedestrian projects. **Figure 11** shows the total responses for each option.

Figure 11: Which of the following approaches do you believe would most improve the bicycle and pedestrian network?



The complete list of survey questions and public responses are included in **Appendix X**.

Public Meeting #3

June/July time frame

Recommendations

Vision, Goals, and Objectives

The vision, goals, and objectives of the Bicycle and Pedestrian Master Plan Update are consistent with the Vision, Goals, and Objectives of the RapidTRIP 2040 LRTP Update.

Performance Measures & Evaluation Criteria

The performance measures and evaluation criteria for the bicycle network and the pedestrian network were based off of different themes. These themes followed closely to the old Bicycle and Pedestrian Master Plan Update goals, as well as incorporating new ideas and public interest. The evaluation criteria were divided into one of these themes, and were then scored and weighted.

Bicycle Network Prioritization

The bicycle network evaluation criteria and prioritization can be found in **Table 8**.

Table 8: Bicycle Network Evaluation Criteria

Theme	Evaluation Criteria	Score
System Safety & Connectivity	Project completes a gap in the existing network by connecting two or more existing facilities	25
	Project addresses a location of a fatality of a person biking	50
	Project provides a critical regional link due to limited street connectivity, or provides a crossing of a major barrier (e.g. railroad, a facility of 6 or more lanes, or at an unsignalized location of 4 or more lanes).	25
Bicycle Accessibility	Average weighted latent demand score over the project length*	0 to 50 possible points
	Project is within, or provides direct access to, an area with a high equity score (3 or higher)	10
	Project is within, or provides direct access to, an area with the lowest quartile of bicycle services	15
	Project is within an equity target area: equity score (3-5) and lowest quartile of bicycle services	25
Regional Benefit	Project is located along a transit corridor (City Trolley, Rapid Bus)	50
	Project provides a direct connection to, or an extension of, a recreational facility / destination (e.g. parks, riding trails)	50
	Project Priority Score:	**0 – 300 Possible Points**
Relative Cost / Benefit	Ratio of the initial prioritization score per project mile to the project cost per mile	0 to 50 possible points
Project History	Project identified as a high priority in the 2015 LRTP Update	15
	Project identified as a high priority in the 2011 Plan	15
Project Synergy	Project coincides with a priority roadway or sidewalk project	20
	Project Priority Score:	**0 – 100 Possible Points**
	TOTAL PROJECT SCORE:	**0 – 400 Possible Points**

Pedestrian Network Prioritization

The pedestrian network prioritization and evaluation criteria can be found in **Table 9**.

Table 9: Pedestrian Evaluation Criteria

Theme	Evaluation Criteria	Score
System Safety & Connectivity	Project completes a gap in the existing network by connecting two or more existing sidewalks	25
	Project addresses a location of a **fatality of a person walking**	25
	Distance between signalized crossings	Greater than ½ mile apart: 25 Between ¼ - ½ mile apartment: 15 Between ¼ - 1/8 mile apart: 5
Pedestrian Demand	Average weighted latent demand score over the project length*	0 to 50 possible points
	Project is within, or provides direct access to, an area with a high equity score (3 or higher)	25
	Presence of an existing physical demand path	25
Regional Benefit	Project is located along a transit corridor (City Trolley, Rapid Bus)	25
	Functional classification of the adjacent roadway	Principal Arterial: 25 Minor Arterial: 15 Collector: 5
	Project Priority Score:	**0 – 300 Possible Points**
Relative Cost / Benefit	Ratio of the initial prioritization score per project mile to the project cost per mile	0 to 50 possible points
Project History	Project identified as a high priority in the 2015 LRTP Update	15
	Project identified as a high priority in the 2011 Plan	15
Project Synergy	Project coincides with a priority roadway or bike project	10
	Project Priority Score:	**0 – 100 Possible Points**
	TOTAL PROJECT SCORE:	**0 – 400 Possible Points**

Proposed Projects

The proposed projects were developed based off of the evaluation criteria and input received from the public and stakeholders.

The list of proposed bicycle projects can be seen in Table X. The list of proposed trail projects can be seen in Table X. The list of proposed sidewalk projects can be seen in Table X.

Table X: Proposed Bicycle Network Projects

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	BIKE DEMAND VALUE	SPEED LIMIT
P035	Bike Lane	Proposed	Sheridan Lake Rd	Wildwood Drive - Muirfield Drive	1.63	25.12	50
P047	Bike Lane	Proposed	E Anamosa St Extension	E Anamosa Street - Homestead Street	2.80	34.49	0
P073	Bike Lane	Proposed	Minnesota St	Cambell Street - Jolly Lane	2.60	21.66	25
P136	Bike Lane	Proposed	Soo San Rd	W Main Street - Range Road	0.16	65.12	25
P207	Bike Lane	Proposed	Sturgis Rd	W Main Street - 255 ft North of W Chicago Street	0.41	59.06	35
P352	Bike Lane	Planned	N 40th St	W Chicago Street - N 40thSt	0.18	55.00	25
P358	Bike Lane	Planned	Triple Crown Dr	E Catron Boulevard - E Minnesota Street	0.69	44.58	0
P362	Bike Lane	Planned	Black Hills Blvd	Catron Boulevard - E Stumer Road	0.12	37.41	0
P363	Bike Lane	Planned	West Blvd	North Street - Anamosa Street	0.46	60.49	55
P366	Bike Lane	Planned	County Hwy 1416	West Gate Road - S Ellsworth Road	2.00	21.75	35
P367	Bike Lane	Planned	SD 445 (Deadwood Ave)	W Chicago Street - N Plaza Drive	1.73	24.42	35
P369	Bike Lane	Planned	Ellsworth Rd	Highway 14-16 - Liberty Boulevard	1.26	29.78	45
P370	Bike Lane	Planned	Ellsworth Rd	Liberty Boulevard - 225th Street	0.58	30.00	45
P371	Bike Lane	Planned	West Blvd	W Omaha Street - North Street	0.41	60.07	45
P372	Bike Lane	Planned	Liberty Blvd	N Ellsworth Road - Tower Road	0.51	32.02	35
P373	Bike Lane	Planned	Liberty Blvd	Highway 14-16 - Tower Road	1.64	27.76	35
P374	Bike Lane	Planned	N Plaza Dr	Sturgis Road - Deadwood Avenue N	1.01	11.13	0
P375	Bike Lane	Planned	Radar Hill Rd	229th Street - County Highway	2.26	22.06	30
P376	Bike Lane	Planned	Rapid St / 3rd st	5th Street - Omaha Street	0.27	66.67	25
P377	Bike Lane	Planned	Haven St	Covington Street - Twilight Drive	0.74	39.66	0

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	BIKE DEMAND VALUE	SPEED LIMIT
P379	Bike Lane	Planned	S Valley Dr	E Minnesota Street - Fairmont Street	0.67	17.66	30
P380	Bike Lane	Planned	Long View Rd	Reservoir Road - 154th Avenue	8.68	21.61	25
P381	Bike Lane	Planned	Tower Rd	Liberty Boulevard - Patriot Drive	0.17	34.24	35
P382	Bike Lane	Planned	Tower Rd	225th Street - 224th Street	1.03	29.90	0
P383	Bike Lane	Planned	Mt. Rushmore Rd	Main Street - Omaha Street	0.16	60.21	25
P386	Bike Lane	Planned	City Springs Rd	Galena Drive - I-90 BL	1.77	29.36	25
P390	Bike Lane	Planned	Dyess Ave and Seger Dr	E Mall Drive - N Elk Vale Road	1.62	30.52	25
P391	Bike Lane	Planned	Seger Dr	E Mall Drive - 75 ft East of Freeland Avenue	0.38	51.90	45
P392	Bike Lane	Planned	143rd Ave	Seger Drive - Country Road	1.00	33.94	45
P393	Bike Lane	Planned	Dyess Ave and Seger Dr	Seger Drive - Country Road	1.01	27.58	45
P394	Bike Lane	Planned	Radar Hill Rd	SD 44 - 229th Street	3.49	21.17	40
P395	Bike Lane	Planned	Rockerville Rd	Pine Grove Road - S Highway 16	2.89	20.60	25
P397	Bike Lane	Planned	Silver St / Philadelphia St	Executive Drive - Silver Street	0.47	59.51	30
P398	Bike Lane	Proposed	W Chicago St	N 4th Street - Sturgis Road	0.67	57.42	35
P409	Bike Lane	Proposed	Minnesota St	Minnesota Street Park - Cambell Street	0.23	51.03	35
P411	Bike Lane	Proposed	Cathedral Dr/Fairmont Blvd	Mount Rushmore Road - Cambell St	2.09	64.78	30
P414	Bike Lane	Proposed	Cambell St	Bridgeview Drive - E Catron Boulevard	0.19	52.37	45
P448	Bike Lane	Proposed	Jackson Blvd	W HIghway 44 - Chapel Lane	0.34	33.32	45
P470	Bike Lane	Proposed	Jackson Blvd	Mountain View Road - W Main Street	0.48	53.17	35
P490	Bike Lane	Proposed	Anamosa St	North Street - East of N Reservoir Road	0.47	45.62	0
P491	Bike Lane	Proposed	Anamosa St	North Street - East of N Reservoir Road	0.56	48.99	30

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	BIKE DEMAND VALUE	SPEED LIMIT
P492	Bike Lane	Proposed	Anamosa St	North Street - East of N Reservoir Road	0.97	34.57	0
P493	Bike Lane	Proposed	Anamosa St	North Street - East of N Reservoir Road	1.01	35.48	0
P496	Bike Lane	Proposed	Harmony Heights Lane	Deadwood Avenue - Anamosa Street	1.72	45.30	25
P500	Bike Lane	Proposed	St. Patrick St	5th Street - Elm Avenue	0.74	59.55	30
P504	Bike Lane	Proposed	North St	West Boulevard N - Allen Avenue	0.87	64.06	30
P508	Bike Lane	Proposed	Copperfield Dr	Anamosa Street - Existing Street	0.94	35.97	0
P509	Bike Lane	Proposed	Valley Dr	Anamosa Street - Fairmont Street	2.02	42.84	30
P512	Bike Lane	Planned	Cambell St Service Rd	Richland Drive - E Fairmont Boulevard	0.38	58.92	25
P515	Bike Lane	Proposed	Mickelson Dr	E Anamosa Street - E Highway 44	0.59	53.62	25
P516	Bike Lane	Planned	West Blvd	Silver Road - Anamosa Street	0.37	57.81	25
P518	Bike Lane	Proposed	Fairmont Blvd	Creek Drive - S Valley Drive	0.78	32.00	0
P524	Bike Lane	Proposed	Mt. Rushmore Rd	North Street - Omaha Street	0.44	57.56	30
P529	Bike Lane	Proposed	St. Martins Dr/N 44th St	Sturgis Road - W Chicago Street	0.67	50.04	25
P531	Bike Lane	Planned	Country Rd	N Elk Vale Road - Highway 14-16	2.76	16.74	25
P535	Bike Lane	Planned	225th St	Tower Road - 150th Pl	0.50	34.70	45
P536	Bike Lane	Planned	225th St	150th Pl - 154th Avenue	4.01	17.31	45
P537	Bike Lane	Planned	Cambell St	E St Patrick Street - 970 ft N of E St Patrick Street	0.18	61.00	40
P538	Bike Lane	Planned	Cambell St	970 ft N of E St Patrick Street - E St James Street	0.17	57.32	40
P540	Bike Lane	Planned	Cheyenne Blvd	N Cambell Street - N Elk Vale Road	2.56	40.30	45
P541	Bike Lane	Planned	Cimarron alignment	N Ellsworth Road - Liberty Boulevard	1.02	25.92	25
P542	Bike Lane	Planned	Douglas Middle School	Patriot Drive - 225th Street	0.40	36.00	35

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	BIKE DEMAND VALUE	SPEED LIMIT
P543	Bike Lane	Planned	Douglas Middle School	N Ellsworth Road - Tower Road	0.50	30.03	45
P547	Bike Lane	Planned	N La Crosse St	E Mall Drive - Seger Drive	0.21	57.08	35
P548	Bike Lane	Proposed	N Plaza Dr	Deadwood Avenue - Anamosa Street	1.08	16.06	25
P549	Bike Lane	Planned	Neck Yoke Rd	Pine Grove Road - S Highway 16	5.30	23.17	50
P550	Bike Lane	Planned	Old Folsom Rd	5,780 ft S of Antelope Creek Road - 1,490 ft E of Ser Road	6.27	15.33	25
P551	Bike Lane	Planned	S Ellsworth Rd	S Ellsworth Rd - County Highway	0.74	29.00	40
P554	Bike Lane	Planned	SD 44	830 ft E of St Germaine Road - S Airport Road	5.21	18.61	25
P557	Bike Lane	Planned	SD 79 (Cambell St) / Cambell St	E Cantron Boulevard - Swanson Memorial Pathway Extension	0.58	43.56	55
P558	Bike Lane	Planned	SD 79 (Cambell St) / Cambell St	1,355 ft S of E Cantron Boulevard - E Cantron Boulevard	0.26	25.40	55
P559	Bike Lane	Planned	Sheridan Lake Rd	3,100 ft W of Burgess Road - Albertta Drive	5.85	21.95	50
P560	Bike Lane	Planned	Spring Creek Rd	Neck Yoke Road - 3,820 ft E of S Highway 79	5.56	12.18	50
P564	Bike Lane	Planned	Villa Dr / Briggs St	N Ellsworth Road - Briggs Street	0.33	30.00	25
P572	Bike Lane	Proposed	Disk Drive	N Maple Avenue - N La Crosse Street	0.23	69.04	30
P037	Cycle Track	Proposed	W Main St	44th Street - Soo San Drive	0.76	60.16	35
P454	Cycle Track	Proposed	W Main St	Soo San Road - West Boulevard	2.14	55.51	35
P561	Cycle Track	Planned	St. Joseph St	West Boulevard - University Loop	1.60	66.56	30
P573	Cycle Track	Draft New Proposed	N Lacrosse Street	Mall Drive - Railway Trail	1.98	67.57	35
P031	Shared Lane	Proposed	Highway 16 Service Rd	Skyline Drive/Tower Road - Catron Boulevard	1.99	23.46	25
P041	Shared Lane	Proposed	Hillsview Dr	W Saint Patrick Street - Canyon Lake Road	0.46	54.98	25

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	BIKE DEMAND VALUE	SPEED LIMIT
P054	Shared Lane	Proposed	Flormann St/Meade Street	West Boulevard - 5th Street	0.76	55.25	25
P066	Shared Lane	Proposed	Red Cloud St	Northridge Drive - Mall Drive	0.63	37.55	25
P075	Shared Lane	Proposed	E Centennial St/Locust St	Parkview Drive - E Fairmont Boulevard	0.82	67.65	25
P081	Shared Lane	Proposed	Milwaukee St	Crestwood Drive - E New York Street	1.00	71.30	25
P082	Shared Lane	Proposed	N Maple Ave/E Philadelphia St	Leonard "Swanny" Swanson - Cambell Street	1.17	62.87	25
P085	Shared Lane	Proposed	N Maple Ave	Disk Drive - Anamosa Street	0.57	69.87	25
P090	Shared Lane	Proposed	Reservoir Rd/Longview Road	Twilight Drive - E HIghway 44	1.48	37.38	30
P091	Shared Lane	Proposed	Covington St	Twilight Drive - E HIghway 44	0.88	39.48	25
P098	Shared Lane	Proposed	Anamosa St	Commerce Road - Silver Street	1.29	39.29	0
P249	Shared Lane	Proposed	Dunsmore Rd	Moon Meadows Drive - Sheridan Lake Road	0.14	23.09	35
P412	Shared Lane	Proposed	Creek Dr	E Saint Patrick Street - Fairmont Boulevard	1.02	48.49	25
P439	Shared Lane	Proposed	Commerce Rd/Lien St	Railroad - Rand Road	0.81	25.09	25
P451	Shared Lane	Proposed	44th St	W Chicago Street - Raider Road	1.06	50.89	25
P452	Shared Lane	Proposed	Raider Rd	44th Street - Hillsview Drive	0.55	58.77	25
P458	Shared Lane	Proposed	5th St	Omaha St - Columbus St	0.45	64.80	25
P462	Shared Lane	Proposed	Anamosa St	Silver Street - Haines Avenue	0.66	64.67	25
P489	Shared Lane	Proposed	Jolly Lane	E Highway 14 - Daly Circuit	0.93	22.50	25
P499	Shared Lane	Proposed	Flormann St/Meade Street	West Boulevard - 5th Street	0.50	67.90	25
P505	Shared Lane	Proposed	Bunker Dr	Sagewood Street - Disk Drive/I-90	0.86	37.30	25
P506	Shared Lane	Proposed	East Blvd	Quincy Street - Signal Drive	0.37	67.19	30

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	BIKE DEMAND VALUE	SPEED LIMIT
P510	Shared Lane	Proposed	E Kansas City St	East Boulevard - SD School of Mines & Technology	0.67	75.09	25
P519	Shared Lane	Proposed	Degeest Dr	Homestead Street - Twilight Drive	0.64	34.52	25
P522	Shared Lane	Proposed	Franklin Ave/Belleview Dr/E St Andrew St	West Boulevard - 5th Street	0.55	67.54	25
P530	Shared Lane	Proposed	Quincy St	West Street - East Boulevard	0.49	66.02	25
P533	Shared Lane	Proposed	Moon Meadows Dr	Dunsmore Road - E Cantron Boulevard	2.27	20.23	35
P574	Shared Lane	Proposed	Cathedral Dr/Fairmont Blvd	Cambell St - Creek Drive	0.26	47.72	0
P001	Shoulder Bikeway	Proposed	Airport Rd	Airport - North of E Highway 44	1.30	25.51	50
P169	Shoulder Bikeway	Proposed	Country Rd	Haines Avenue - N Elk Vale Road	3.50	28.92	35
P178	Shoulder Bikeway	Proposed	N Elk Vale Rd	E Mall Drive - Country Road	1.43	22.26	45
P268	Shoulder Bikeway	Proposed	S Canyon Rd	100 ft W of Berry Boulevard - N 44th Street	0.96	47.99	30
P273	Shoulder Bikeway	Proposed	Nemo Rd	1,770 ft W of Berry Boulevard - 100 ft W of Berry Boulevard	0.31	35.05	35
P282	Shoulder Bikeway	Proposed	Nemo Rd	Wide View Drive - 1,770 ft W of Berry Boulevard	0.76	24.55	35
P368	Shoulder Bikeway	Proposed	E North St	South of Eglin Street - North of N Cambell St	0.87	50.77	40
P044	Signed Shared Roadway	Proposed	Nordby Lane	W Saint Louis Street - W Main Street	0.19	56.72	25
P061	Signed Shared Roadway	Proposed	Silver St	Anamosa Street - West Boulevard	0.61	58.94	25
P078	Signed Shared Roadway	Proposed	E Fairlane Dr	Elm Avenue - Robbinsdale Park	0.25	68.96	25

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	BIKE DEMAND VALUE	SPEED LIMIT
P092	Signed Shared Roadway	Proposed	W South St	Soo San Road - Leonard "Swanny" Swanson	0.11	65.00	25
P095	Signed Shared Roadway	Proposed	West Blvd	Leonard "Swanny" Swanson - Flormann Street	1.18	64.95	25
P267	Signed Shared Roadway	Proposed	San Marco Blvd	City Springs Road - W Chicago Street	0.36	43.32	25
P384	Signed Shared Roadway	Proposed	Apolda St	Mt Rushmore Road - 6th Street	0.19	62.00	25
P396	Signed Shared Roadway	Proposed	W Chicago St	San Marco Boulevard - N 44th Street	0.35	58.15	25
P415	Signed Shared Roadway	Proposed	E Oakland St	Hawthorne Avenue - Creek Drive	0.82	64.07	25
P438	Signed Shared Roadway	Proposed	Sagewood St/Northridge Dr	Bunker Drive - Haines Ave	0.56	31.23	25
P497	Signed Shared Roadway	Proposed	Oak Ave	E Indiana Street - Colorado Street	0.62	64.95	25
P498	Signed Shared Roadway	Proposed	Alta Vista Dr/Anaconda Rd	East of City View Drive - E Fairmont Boulevard	1.68	58.82	25
P501	Signed Shared Roadway	Proposed	9th St	Quincy Street - Flormann Street	1.00	65.39	25
P502	Signed Shared Roadway	Proposed	Prairie Ave	Saint Patrick Street - E Indiana Street	0.35	65.06	25
P503	Signed Shared Roadway	Proposed	Minuteman Dr	Lindbergh Avenue - Anamosa Street	0.62	67.10	25
P507	Signed Shared Roadway	Proposed	Copperfield Dr	End of Existing Street - Highway 44	0.64	42.34	25
P513	Signed Shared Roadway	Proposed	Parkview Dr	E Liberty Street - E Minnesota Street	0.13	63.34	25

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	BIKE DEMAND VALUE	SPEED LIMIT
P514	Signed Shared Roadway	Proposed	N Spruce St	Meadowlark Road - E Philadelphia Street	0.50	65.72	25
P520	Signed Shared Roadway	Proposed	Allen Ave	Van Buren Street - North Street	0.51	63.69	25
P521	Signed Shared Roadway	Proposed	Van Buren St	Allen Avenue - Milwaukee Street	0.99	67.51	25
P523	Signed Shared Roadway	Proposed	Meade St/E Indiana Street	5th St - Hawthorne Avenue	1.23	63.09	25
P525	Signed Shared Roadway	Proposed	Soo San Rd	W Main Street - Range Road	1.00	59.93	25
P528	Signed Shared Roadway	Proposed	W Flormann St	Argyle Street - Mountain View Road	0.63	57.06	25
P552	Signed Shared Roadway	Proposed	San Marco Blvd	City Springs Road - W Chicago Street	0.31	53.37	25

Table X: Proposed Trail Network Projects

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	PED DEMAND VALUE	SPEED LIMIT
P034	Side Path	Proposed	Parkview Dr	Parkview Park - 5th Street	0.30	35.10	25
P053	Shared-Use Path	Proposed	St. Cloud St extension	5th St - Hawthorne Avenue	1.32	40.78	0
P056	Side Path	Proposed	Maple Ave	Haines Avenue - Disk Drive	0.89	56.59	30
P071	Shared-Use Path	Proposed	SDSMT Connector	Meade Street - Main St	0.84	50.98	25
P089	Side Path	Proposed	Maple Ave	Mall Drive - Disk Drive	0.47	47.54	25

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	PED DEMAND VALUE	SPEED LIMIT
P106	Side Path	Proposed	E Minnesota St	Parkview Drive- Odde Drive	0.46	39.06	35
P122	Side Path	Proposed	Argyle St	Jackson Boulevard - W Flormann Street	0.21	52.93	25
P192	Railway Trail	Proposed	Railway Trail	1st Street - Cambell Street	1.32	53.29	0
P202	Railway Trail	Proposed	SD 231 (Sturgis Rd) / Universal Dr	Lien Street - Merritt Road	3.45	8.08	0
P204	Railway Trail	Proposed	SD 231 (W Chicago St)	W Chicago Street - Lien Street	0.95	15.58	0
P235	Shared-Use Path	Proposed	West Blvd		0.35	46.11	0
P239	Railway Trail	Proposed	Connection to Rapid City path system	1st Street - 1,480 ft E of West Gate Road	6.14	32.80	0
P240	Shared-Use Path	Proposed	Off Street Trail	370 ft S of Melody Lane - 170 ft S of E Highway 44	3.52	11.55	0
P241	Shared-Use Path	Proposed	Off Street Trail		0.83	17.54	0
P242	Shared-Use Path	Proposed	Swanson Memorial Pathway Extension	Cambell Street - Fairmont Blvd	0.78	27.14	0
P243	Shared-Use Path	Proposed	Off Street Trail		0.85	14.26	0
P244	Shared-Use Path	Proposed	Off Street Trail		0.20	14.47	0
P248	Shared-Use Path	Proposed	Off Street Trail		0.55	34.06	0
P262	Shared-Use Path	Proposed	Swanson Memorial Pathway Extension	S Highway 16 - Elk Vale Road	4.98	10.04	0
P264	Shared-Use Path	Proposed	Off Street Trail		3.40	22.38	0

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	PED DEMAND VALUE	SPEED LIMIT
P287	Shared-Use Path	Proposed	Off Street Trail		0.19	36.43	0
P291	Shared-Use Path	Proposed	Off Street Trail	100 ft S of Founders Park Drive - Philadelphia Street	0.21	47.00	25
P294	Shared-Use Path	Proposed	Off Street Trail	450 ft N of W Omaha Street - N Plaza Drive	1.74	16.87	0
P325	Side Path	Proposed	Elm Ave	E Saint Patrick Street - Field View Drive	0.25	45.33	25
P354	Side Path	Proposed	Elm Ave	E Saint Patrick Street - Field View Drive	1.04	49.37	25
P400	Side Path	Proposed	5th St	Cleveland Street - Texas Street	0.88	52.10	35
P405	Side Path	Proposed	Elm Ave	Field View Drive - E Catron Boulevard	0.58	26.97	0
P419	Side Path	Proposed	E St. Patrick St/Highway 44	Existing Side Path - Twilight Drive	1.14	28.85	45
P421	Side Path	Proposed	Concourse Dr	Elk Vale Road - Twilight Drive	0.21	22.18	25
P422	Shared-Use Path	Proposed	SD 44		4.02	20.56	65
P424	Shared-Use Path	Proposed	SD 44	Twilight Drive - Cambell Street	1.89	36.09	45
P431	Side Path	Proposed	Cambell St		0.23	42.65	40
P441	Railway Trail	Proposed	2nd St	150 ft S of Rapid Street - Omaha Street	0.07	52.64	25
P463	Side Path	Proposed	Anamosa St	Silver Street - Haines Avenue	0.66	52.25	25
P534	Shared-Use Path	Proposed	Founders Park Dr	220 ft N of Executive Drive - 780 ft N of Executive Drive	0.11	45.13	25
P544	Shared-Use Path	Proposed	Hawthorne Ave	Meade Street - Main St	0.34	44.70	25
P545	Shared-Use Path	Proposed	Swanson Memorial Pathway Extension		0.57	17.44	0

PROJECT ID	FACILITY TYPE	STATUS	ROUTE	EXTENT	LENGTH MILES	PED DEMAND VALUE	SPEED LIMIT
P546	Shared-Use Path	Proposed	Swanson Memorial Pathway Extension	Elk Vale Road - E Minnesota Street	0.62	17.35	0
P556	Shared-Use Path	Proposed	SD 44		1.21	22.88	45
P570	Bike Path	Planned	Jackson Boulevard	Cliffside Park - Existing Trail	0.75	34.37	0
P571	Side Path	Draft New Proposed	Disk Drive	Bunker Dr - Haines Avenue	0.51	27.25	0

Table X: Proposed Sidewalk Network

PROJECT ID	ROAD NAME	STATUS	SIDES	LENGTH MILES	PED DEMAND VALUE
0214	JACKSON BLVD	Draft New Proposed	Both Sides	0.42	46.34
0480	MOUNTAIN VIEW RD	Draft New Proposed	Both Sides	0.30	37.04
0579	SHERIDAN LAKE RD	Draft New Proposed	Both Sides	1.78	20.03
0726	SAINT JOSEPH ST	Draft New Proposed	One Side	0.10	39.95
0755	CATRON BLVD	Draft New Proposed	Both Sides	5.46	17.67
1227	DANCHRISTY LN	Draft New Proposed	Both Sides	0.08	21.51
1499	E SAINT PATRICK ST	Draft New Proposed	Both Sides	0.03	34.93
1562	EAST BLVD	Draft New Proposed	One Side	0.04	62.00
1656	N CAMBELL ST	Draft New Proposed	Both Sides	0.13	49.52
1661	CAMBELL ST	Draft New Proposed	Both Sides	0.30	41.33
1670	CAMBELL ST	Planned	One Side	0.16	46.00
1799	N MAPLE AVE	Draft New Proposed	Both Sides	0.64	51.15

PROJECT ID	ROAD NAME	STATUS	SIDES	LENGTH MILES	PED DEMAND VALUE
1846	E NORTH ST	Draft New Proposed	Both Sides	0.11	33.50
1865	EGLIN ST	Draft New Proposed	Both Sides	0.76	27.08
2010	N ELK VALE RD	Draft New Proposed	Both Sides	0.15	20.18
2092	E HIGHWAY 44	Programmed	Both Sides	0.53	21.09
2131	PORTRUSH RD	Draft New Proposed	Both Sides	0.03	22.00
2140	OMAHA ST	Programmed	One Side	0.20	43.08
2141	CAMBELL ST	Planned	Both Sides	0.23	42.63
2143	CAMBELL ST	Planned	One Side	0.13	44.63
2144	E OMAHA ST	Programmed	Both Sides	1.26	42.67
2145	W OMAHA ST	Planned	Both Sides	0.51	34.21
2147	DEADWOOD AVE	Planned	Both Sides	1.81	14.26
2149	HAINES AVE	Planned	One Side	1.23	27.96
2150	JACKSON BLVD	Planned	Both Sides	1.07	33.27
2151	N LA CROSSE ST	Programmed	One Side	0.19	32.82
2152	RESERVOIR RD	Programmed	Both Sides	3.01	24.58
2153	E OMAHA ST	Programmed	Both Sides	0.31	44.63
2154	E OMAHA ST	Programmed	One Side	0.19	39.00
2155	RESERVOIR RD	Programmed	One Side	1.01	27.86
2156	RESERVOIR RD	Programmed	Both Sides	0.28	25.89
2157	225 ST	Planned	One Side	0.35	25.46
2158	LIBERTY BLVD	Planned	Both Sides	2.15	23.24
2159	TOWER DR	Planned	One Side	1.03	21.75
2160	225 ST	Planned	One Side	0.12	25.00

PROJECT ID	ROAD NAME	STATUS	SIDES	LENGTH MILES	PED DEMAND VALUE
2161	TOWER RD	Planned	One Side	0.06	31.00
2162	APOLDA ST	Planned	Both Sides	0.19	52.00
2163	VILLA DR	Planned	Both Sides	0.33	26.83
2166	W MAIN ST	Draft New Proposed	One Side	0.56	40.57
2177	NORTH ST	Draft New Proposed	One Side	0.18	53.45
2180	NORTH ST	Draft New Proposed	One Side	0.11	53.48
2182	SHERIDAN LAKE RD	Draft New Proposed	One Side	0.13	58.00
2183	SHERIDAN LAKE RD	Draft New Proposed	One Side	0.08	52.74
2184	E MAIN ST	Draft New Proposed	One Side	0.47	63.54
2199	N ELK VALE RD	Draft New Proposed	One Side	0.05	21.00
2200	EGLIN ST	Draft New Proposed	One Side	0.58	12.46
2203	E NORTH ST	Draft New Proposed	One Side	0.11	29.00
2204	DISK DR	Draft New Proposed	One Side	0.71	55.82
2205	MUIRFIELD DR	Draft New Proposed	One Side	0.36	22.00
2209	E SAINT PATRICK ST	Draft New Proposed	One Side	0.14	21.00
2213		Draft New Proposed	Both Sides	0.02	56.12

The proposed bicycle network can be seen in

Figure 12.

Figure 12: Proposed Bicycle Network

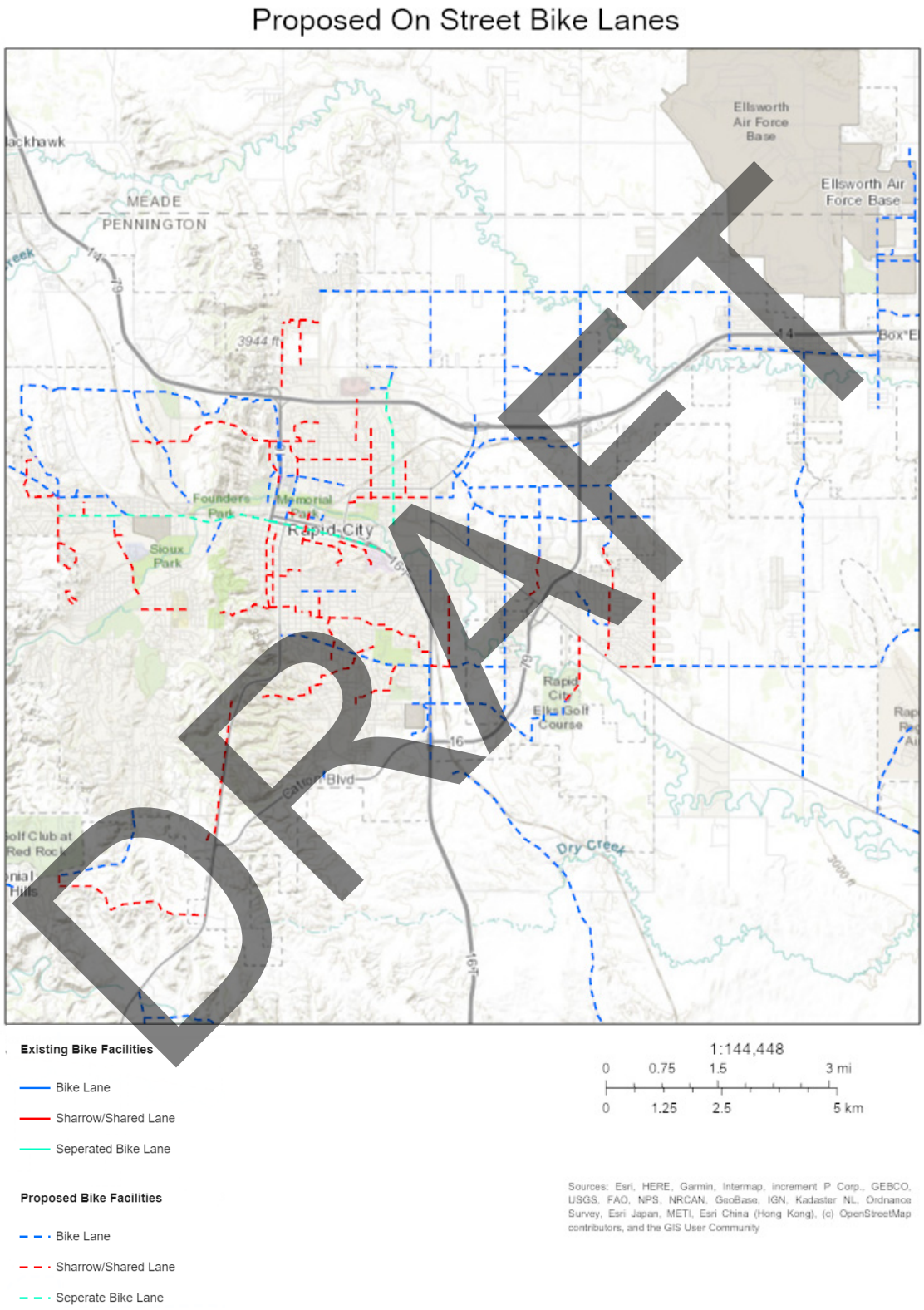


Figure X: Proposed Trail and Crossing Enhancement Network

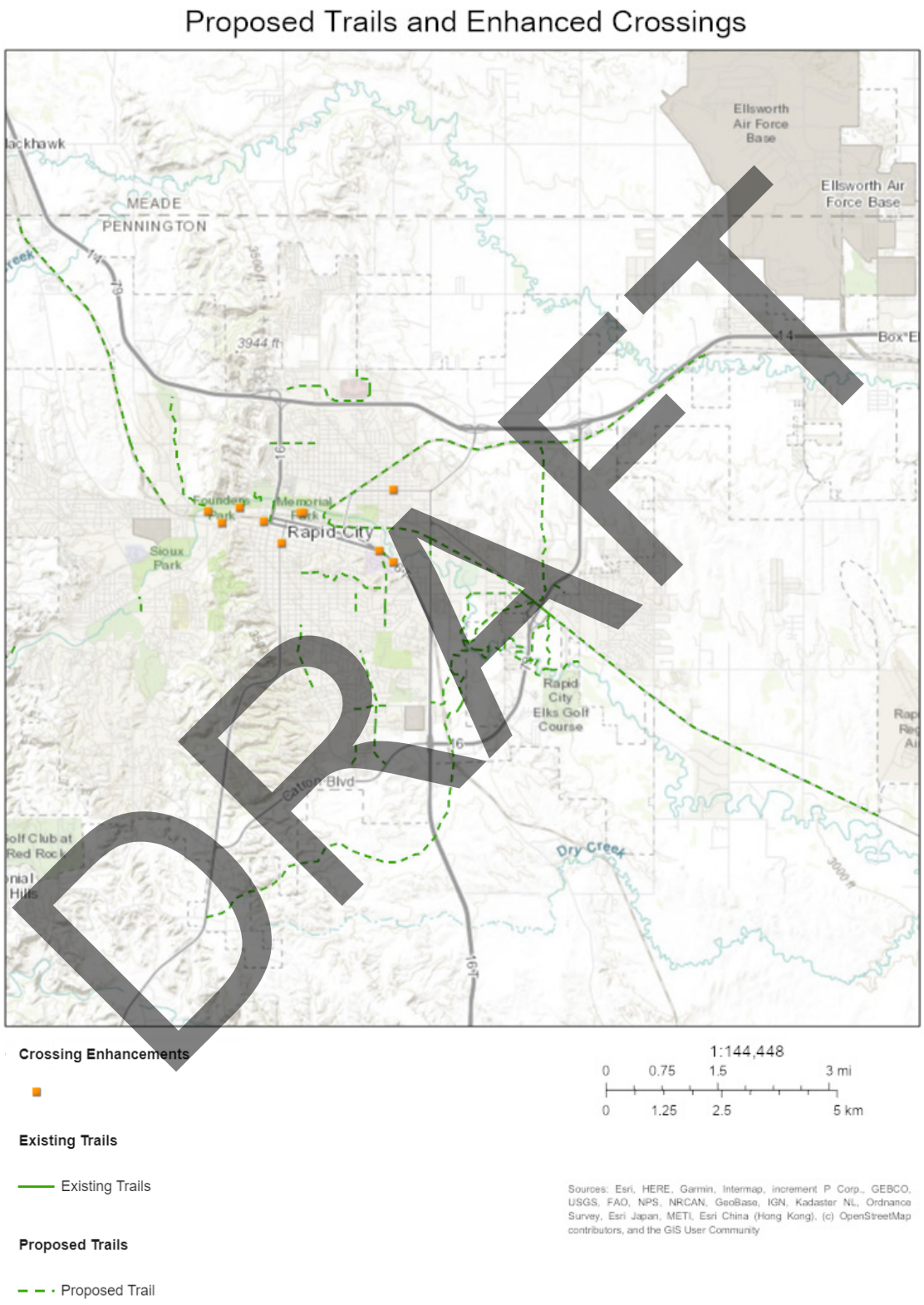
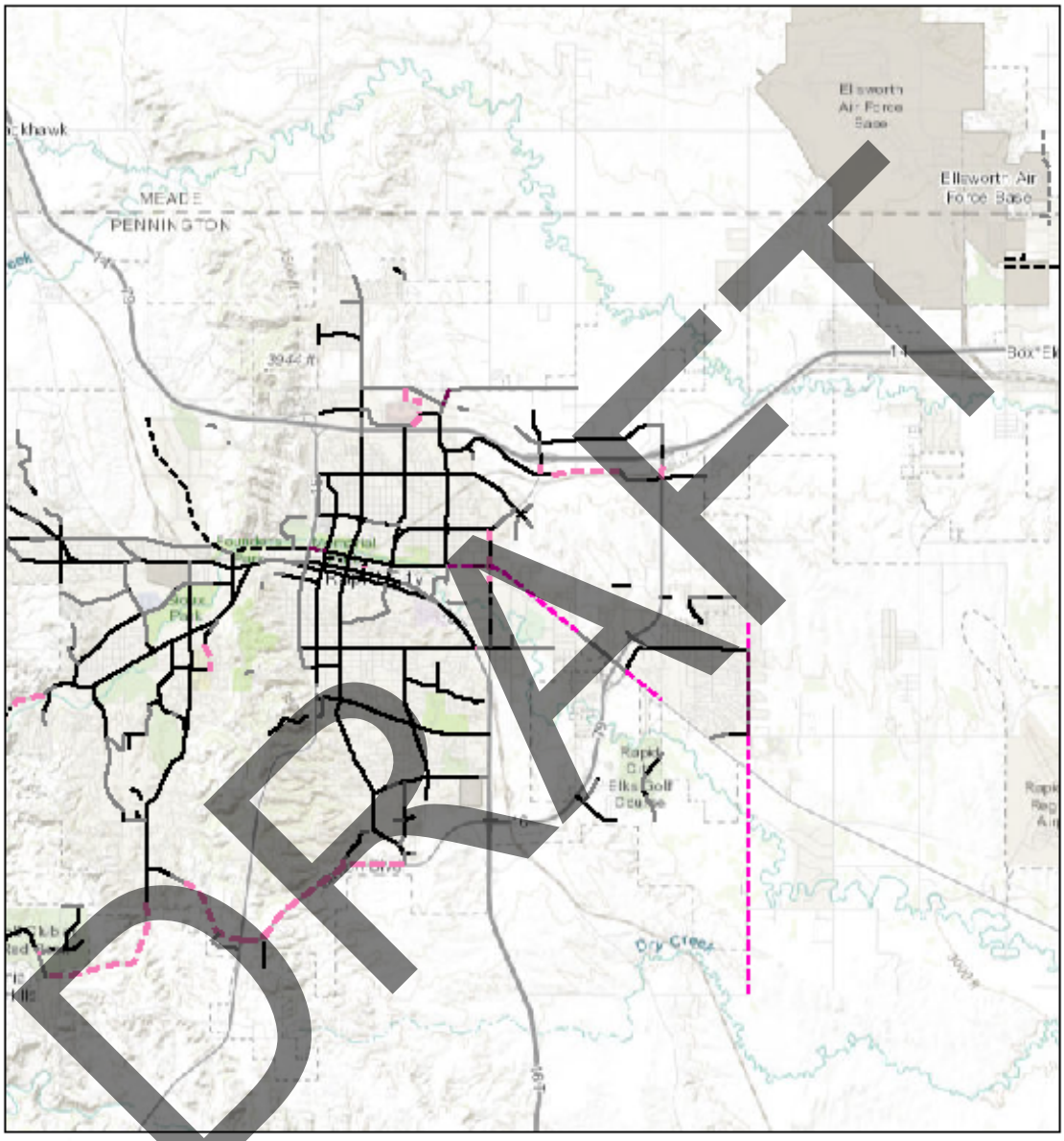


Figure X: Proposed Sidewalk Network

Existing and Proposed Sidewalks



Sidewalks

- Existing, Both Sides
- Existing, One Side
- Planned, Both Sides
- Planned, One Side
- Programmed, Both Sides
- Programmed, One Side
- Draft New Proposed, Both Sides

1:144,448

0 0.75 1.5 3 mi

0 1.25 2.5 5 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Strategies

Bicycle Friendly Community Report Card

To measure how bicycle-friendly a state or community is, the League of American Bicyclists created the Community Report Cards. These report cards identify key metrics that track what all applicants should have, called the Building Blocks of a Bicycle Friendly Community. There are 10 Building Blocks that appear on the report card, including:

1. High Speed Roads with Bicycle Facilities
2. Total Bicycle Network mileage to Total Road Network Mileage
3. Bicycle Education in Schools
4. Share of Transportation Budget Spent on Bicycling
5. Bike Month and Bike to Work Events
6. Active Bicycle Advocacy Group
7. Active Bicycle Advisory Committee
8. Bicycle Friendly Laws & Ordinances
9. Bike Plan is Current and is Being Implemented
10. Bike Program Staff to Population

It is recommended that Rapid City work towards the Building Blocks listed in the Bicycle Friendly Community Report Card and begin the application process. Currently, South Dakota is ranked #40 out of 50 states for being bicycle friendly in the Bicycle Friendly State Report Card.

LAB provides communities with a guide that provides background information on each of the Building Blocks and data points on the Report Card and how to apply it to the Report Card application. Many communities undertake efforts that do not readily fit into the selected data necessary to receive their Report Card score. The questions and their applicable building block are presented in **Table 10**.

In 2014, Rapid City completed the Bicycle Friendly Community application. They received an honorable mention.

To be added - More detail

Table 10: Community Report Card Guide

Building Block	Question	Answer Options
1. High Speed Roads with Bike Facilities, 2. Total Bicycle Network Mileage to Total Road Network Mileage	B15. How many miles of road network fall within the following posted speed limits?	Communities answer in the number of centerline miles that exist for each type of road within their community.
1. High Speed Roads with Bike Facilities	B16c. Are there any on-street bicycle facilities on roads with posted speeds of >35mph?	Communities answer yes or no. If a community answers yes, then additional questions are asked.
1. High Speed Roads with Bike Facilities	B16c1. On streets with posted speeds of > 35mph, how many miles of each of the following bicycle facilities	Communities answer in terms of center line miles of each of the following options:

Building Block	Question	Answer Options
	are there that meet or exceed current AASHTO or NACTO standards?	Wide paved shoulder (ridable surface > 4 feet between rumble strips) Bike lanes (incl. standard, contra-flow, left-side) (ridable surface > 4 feet) Buffered bike lanes Protected bike lanes (one-way or two-way) Raised cycle tracks (one-way or two-way)
2. Total Bicycle Network Mileage to Total Road Network Mileage	B13a. How many miles of the following off-street accommodations that can be legally used by bicyclists are within your community's boundaries?	Communities answer in terms of miles of each of the following options:
2. Total Bicycle Network Mileage to Total Road Network Mileage	B16. Does your community have on-street bicycle facilities?	Communities answer yes or no. If a community answers yes, then they are promoted to answer a series of questions about on- street bicycle facilities on roads with posted speed limits per the same categories in Question 15. The bicycle facility types asked about vary based on speed, and can be found in Questions B16a1, B16b1, and B16c1.
3. Bicycle Education in Schools	C1a. What percentage of your public and private elementary schools offer bicycle education?	Communities select one of the following options: 1-25% 26-50% 51-75% 75-99% 100%
3. Bicycle Education in Schools	C2a. What percentage of your public and private middle schools offer bicycle education?	Communities select from the same options given for C1a.
3. Bicycle Education in Schools	C3a. What percentage of your public and private high schools offer bicycle education?	Communities select from the same options given for C1a.
4. Share of Transportation Budget Spent on Bicycling	F10. What percentage of the community's total annual transportation budget – on average over the last five fiscal years – was invested in bicycle projects?	

Building Block	Question	Answer Options
5. Bike Month and Bike to Work Events	D5. How is National Bike Month/your own dedicated Bike Month promoted in your community?	Answers are counted and that county is used to separate communities into 6 descriptive categories: 1. Needs Improvement 2. Acceptable 3. Average 4. Good 5. Very Good 6. Excellent
6. Active Bicycle Advocacy Group	Contact Information. List all bicycle, active transportation, and transportation equity advocacy groups in your community, if any.	LAB reaches out to all groups listed in this section as part of the BFC process.
7. Active Bicycle Advisory Committee	F5a. How often does the [officially-recognized Bicycle Advisory Committee] meet?	
8. Bicycle-Friendly Laws & Ordinances	E5. Are there any local ordinances or state laws that protect bicyclists in your community?	
8. Bicycle-Friendly Laws & Ordinances	E6. Do any local ordinances in your community place restrictions on bicyclists?	The answers to each question are counted and the count of responses to Question E6 is subtracted from the count of responses to Question E5. The net result is used to segment communities into six categories: 7. Needs Improvement, 8. Acceptable, 9. Average, 10. Good, 11. Very Good, and 12. Excellent.
9. Bike Plan is Current and is Being Implemented	F7. Does your community have a comprehensive bicycle master plan or similar section in another document?	
9. Bike Plan is Current and is Being Implemented	If yes: *F7a. What year was the plan adopted?	Communities answer with a four-digital year.
9. Bike Plan is Current and is Being Implemented	F7d. Does your plan include goals (including project lists) that are evaluated annually?	Communities answer yes or no. If a community answers yes, then additional questions are asked.
9. Bike Plan is Current and is Being Implemented	F7d1. How many goals/projects do you evaluate progress on annually?	Communities answer with a whole number.

Building Block	Question	Answer Options
9. Bike Plan is Current and is Being Implemented	F7d2. How many goals/projects did you meet annual target for in the most recent calendar year?	Communities answer with a whole number.
9. Bike Plan is Current and is Being Implemented	F7d3. How many goals/projects have you improved your performance on without meeting your target in most recent calendar year?	Communities answer with a whole number.
10. Bike Program Staff to Population	A8. Total Population.	Communities answer with a whole number.
10. Bike Program Staff to Population	F3. How many government employees (including the Bicycle Program Manager and the Safe Routes to Schools Coordinator), expressed in full-time equivalents (FTE), work on bicycle issues in your community?	Communities answer with a number, often reported to the tenth decimal place. A person that person 1/10 of their time on bicycle issues should be report as 0.1 FTE.

Figure 13 shows a comprehensive infographic of the Bicycle Friendly Community Report Card standards in congruence with the Five “E” Approach.

Figure 13: Bicycle Friendly Community Infographic

Six “E” Approach

The League of American Bicyclists is an organization that represents bicyclists to create safer roads, stronger communities, and a Bicycle Friendly America through education, advocacy, and promotion.

The essential elements of a Bicycle Friendly America, as defined by the League of American Bicyclists, are a way to ensure consistency while making places bicycle friendly. The five E’s include

- Engineering: Create safe and convenient places to ride and park
- Education: Giving people of all ages and abilities the skills and confidence to ride
- Encouragement: Creating a strong bike culture that welcomes and celebrates bicycling
- Enforcement: Ensuring safe roads for all users
- Evaluation & Planning: Planning for bicycling as a safe and viable transportation option

To achieve a bicycle friendly America for everyone, the League of American Bicyclists adopted a sixth “E”, known as Equity, Diversity & Inclusion.

Primarily, Engineering was the most utilized “E” throughout the Rapid City Bicycle and Pedestrian Master Plan Update. However, to have a complete and comprehensive Bicycle and Pedestrian Update, utilization of the rest of the “E’s” is important to consider. Recommendations to incorporate all of the E’s can be found in **Table 11**.

Table 11: Recommendations for a Bicycle Friendly Community

E	Action	Details	Coordination
Engineering	Wayfinding / Signage	Add more wayfinding and signage along city bicycle facilities and shared use paths for bicyclists and pedestrians.	City communications, City Parks and Rec
Engineering	Weather Conditions	Ensure that bicycle and pedestrian facilities are able to be easily maintained to deal with different weather conditions.	City Parks and Rec, City Public Works
Education	Community Newsletter	Include a regular blurb about bicycle and pedestrian safety – 2-4 messages per year	City communications
Education	Education seminars at bicycle shops	Host education and safety seminars for bicyclists, promote to city employees and residents	Local bicycle shops, City communications
Education	Bicycle education pamphlets	Distribute pamphlets at events to provide an easy to understand and cost-effective method of conveying safe cycling concepts to the public	City communications
Education	Update City Website	Update the city website to better showcase and highlight the work being done to advance bicycling throughout the city	City communications
Encouragement	Bicycle Wayfinding	Complete final planning and design projects with wayfinding signs; Target places for immediate implementation	City Public Works
Encouragement	Community Bike Rides / Bike to Work events	Host regular community bike rides / events (monthly or quarterly)	City Public Works, City Parks and Rec
Enforcement	Establish that police officers are educated on traffic laws that apply to bicyclists		City Police Department
Evaluation & Planning	Work with public transit to coordinate bicycling improvements		City Public Works

E	Action	Details	Coordination
Evaluation & Planning	Specifically allocate bicycle-related funding to high priority locations and low-income and minority communities.	Locations in the composite equity score map, low service maps	City Public Works
Evaluation & Planning	Complete the LAB Bicycle Friendly Community Application		City Public Works, City Parks and Rec

Equity

The sixth "E", Equity, Diversity and Inclusion are essential to truly achieve a vision of a bicycle friendly city for everyone, and all elements should be viewed through this lens. For the purpose of this update and to protect marginalized and historically excluded populations, the follow nine equity variables should be considered during bicycle and pedestrian planning:

1. Racial/ethnic equity
2. Language equity
3. Geography/spatial equity
4. Process/participation equity
5. Physical ability equity
6. Income equity
7. Gender equity
8. Culture equity
9. Mode equity

Actions to incorporate these equity variables are located in **Table 12**.

Table 12: Equity Action

Action	Description	Equity Variable
1	Foster more equitable treatment of diverse languages in the public sphere, communications and marketing, and planning processes	Language Equity
2	Prioritize street and bikeway investment, and maintenance in low-service areas	Racial & Safety Equity
3	Encourage the full and fair participation of low-income and minority communities in the transportation decision-making process	Process Equity
4	Document and increase mobility and access for the elderly and persons with disability	Ability Equity
5	Engage with women to deepen understanding of behavior and usage differences to improve overall access and mobility	Gender Equity

6	Engage with foreign-born populations to deepen understanding of behavior and usage differences to improve overall access and mobility	Cultural Equity
7	Partner and collaborate with local non-profit organization to provide bicycles to low-income and minority residents	Income Equity
8	Increase citywide investments in bike infrastructure and maintenance	Modal Equity

Implementation Plan

To Be Added

Fiscally Constrained Plan

To Be Added

Appendix X: Equity Analysis Maps

Figure 14: Population with Lower than Average Income

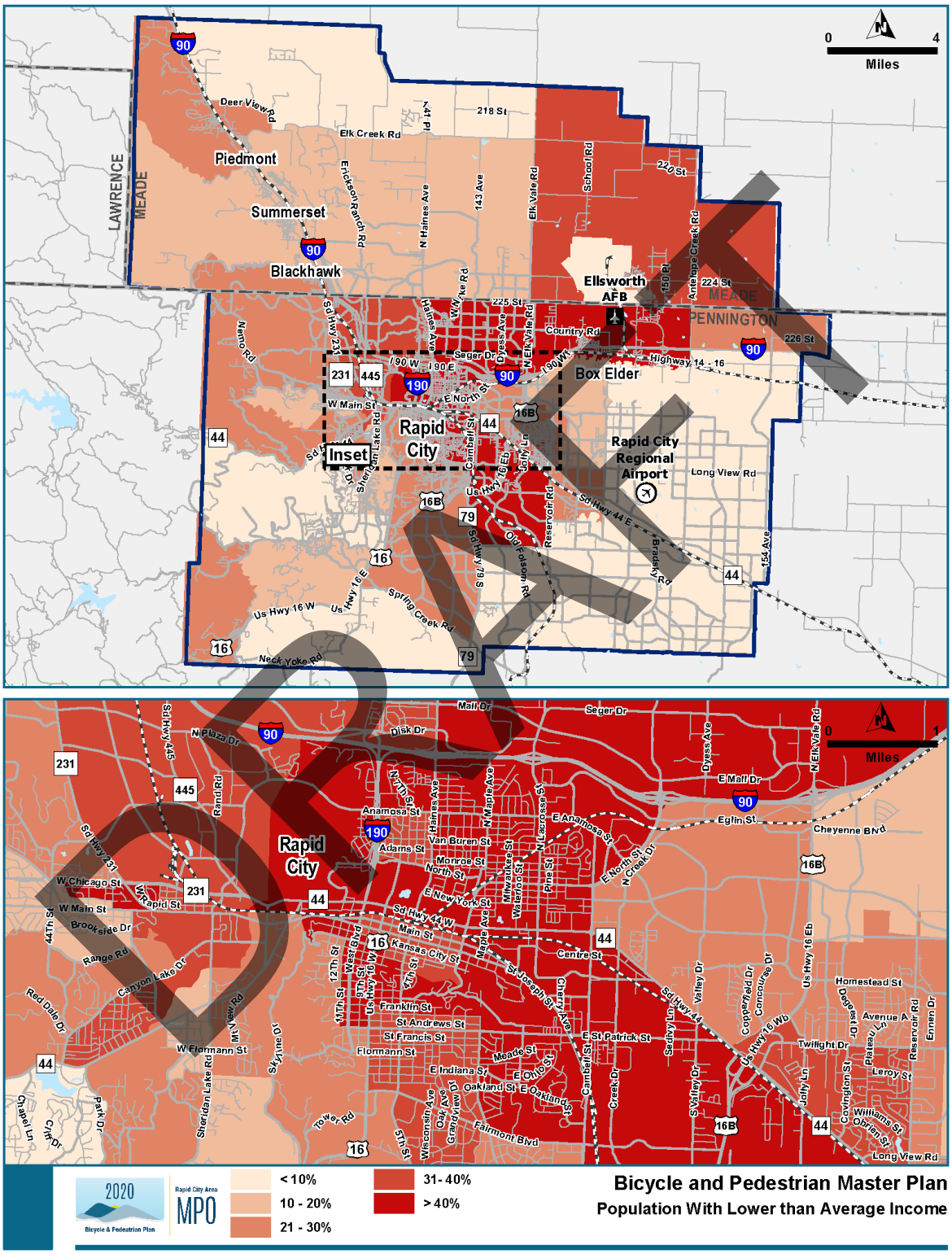


Figure 15: Percentage of Minority Population

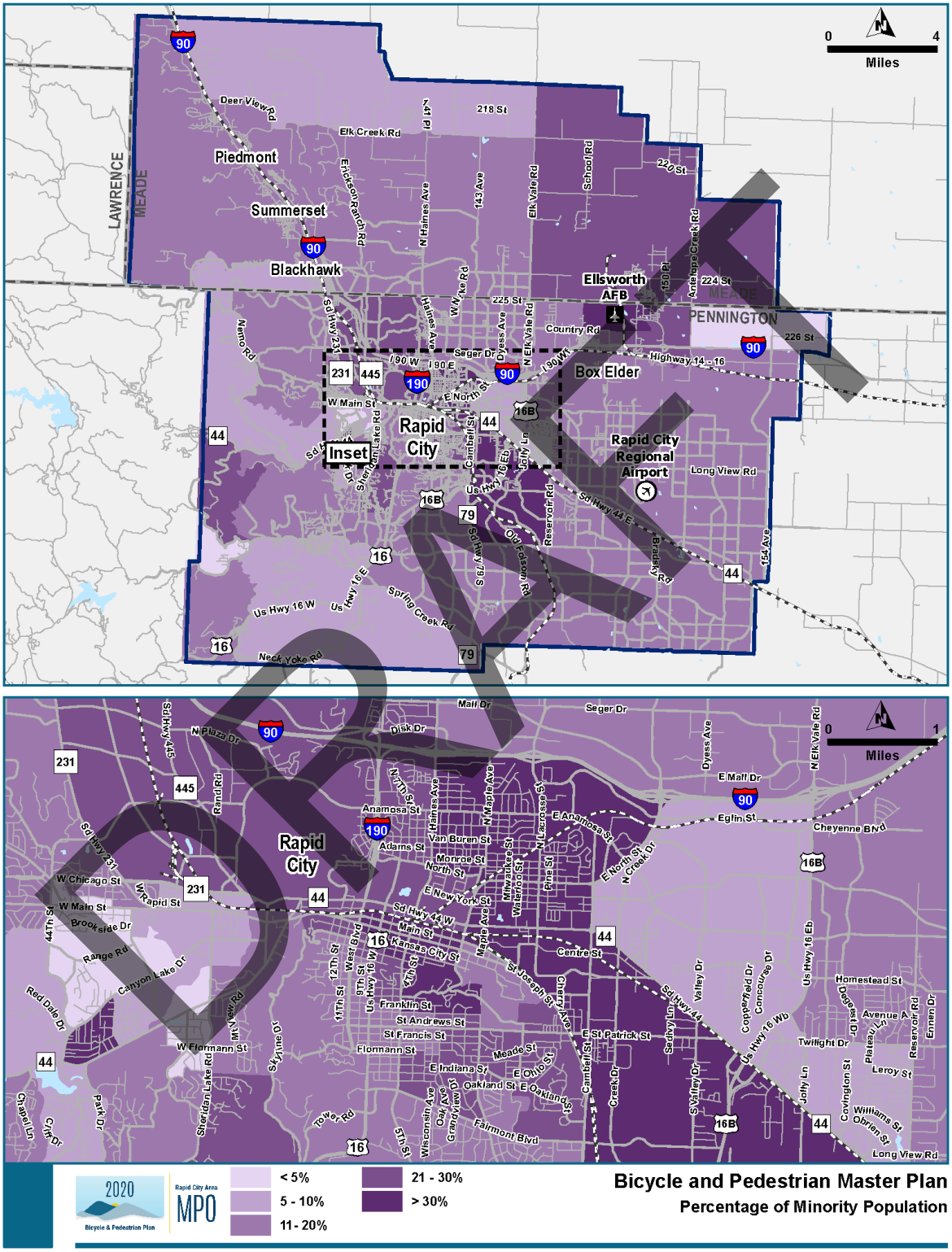


Figure 16: Percentage of Zero Car Households

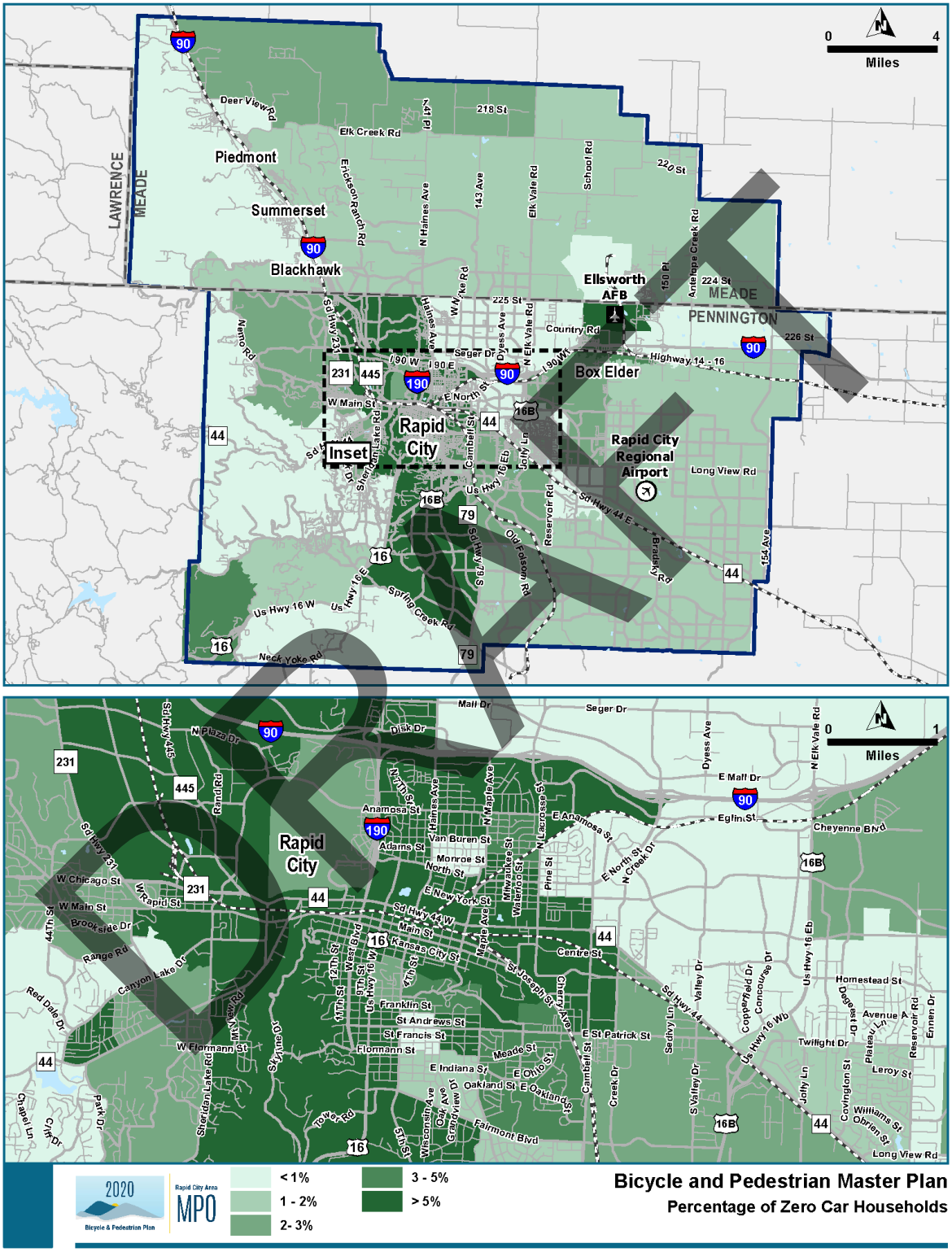


Figure 17: Percentage of Population Age 64 or Above

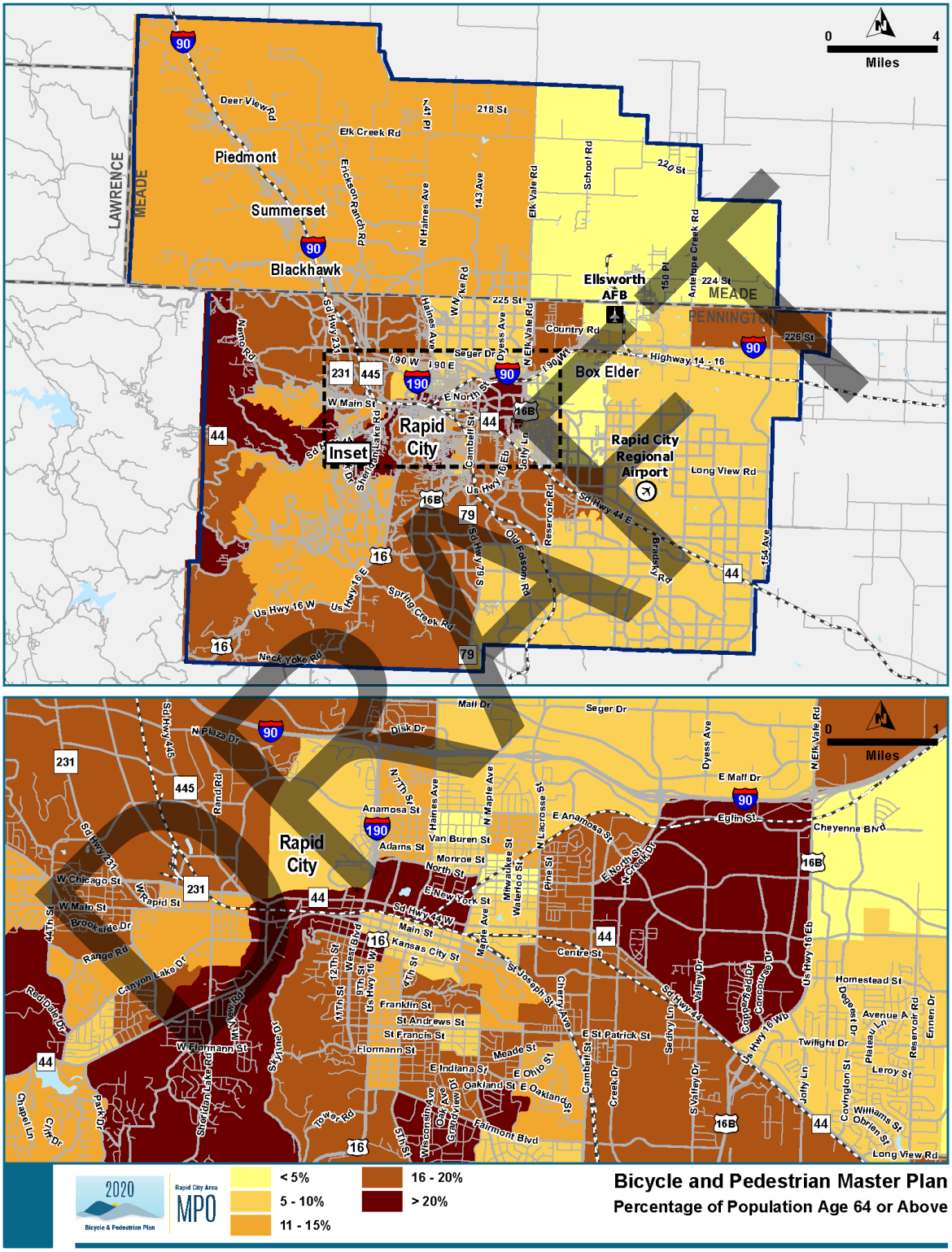


Figure 18: Percentage of Population Age 18 or Below

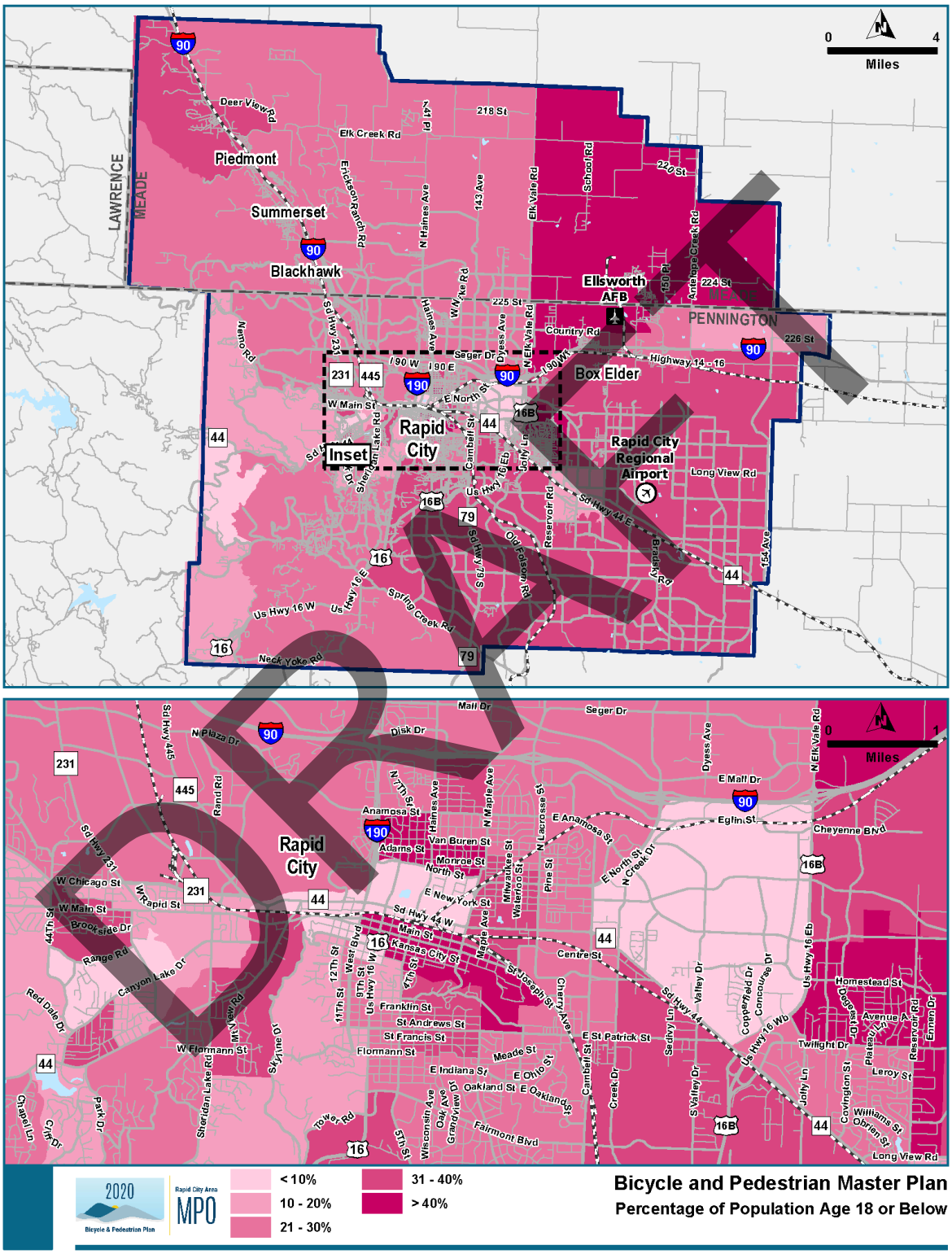
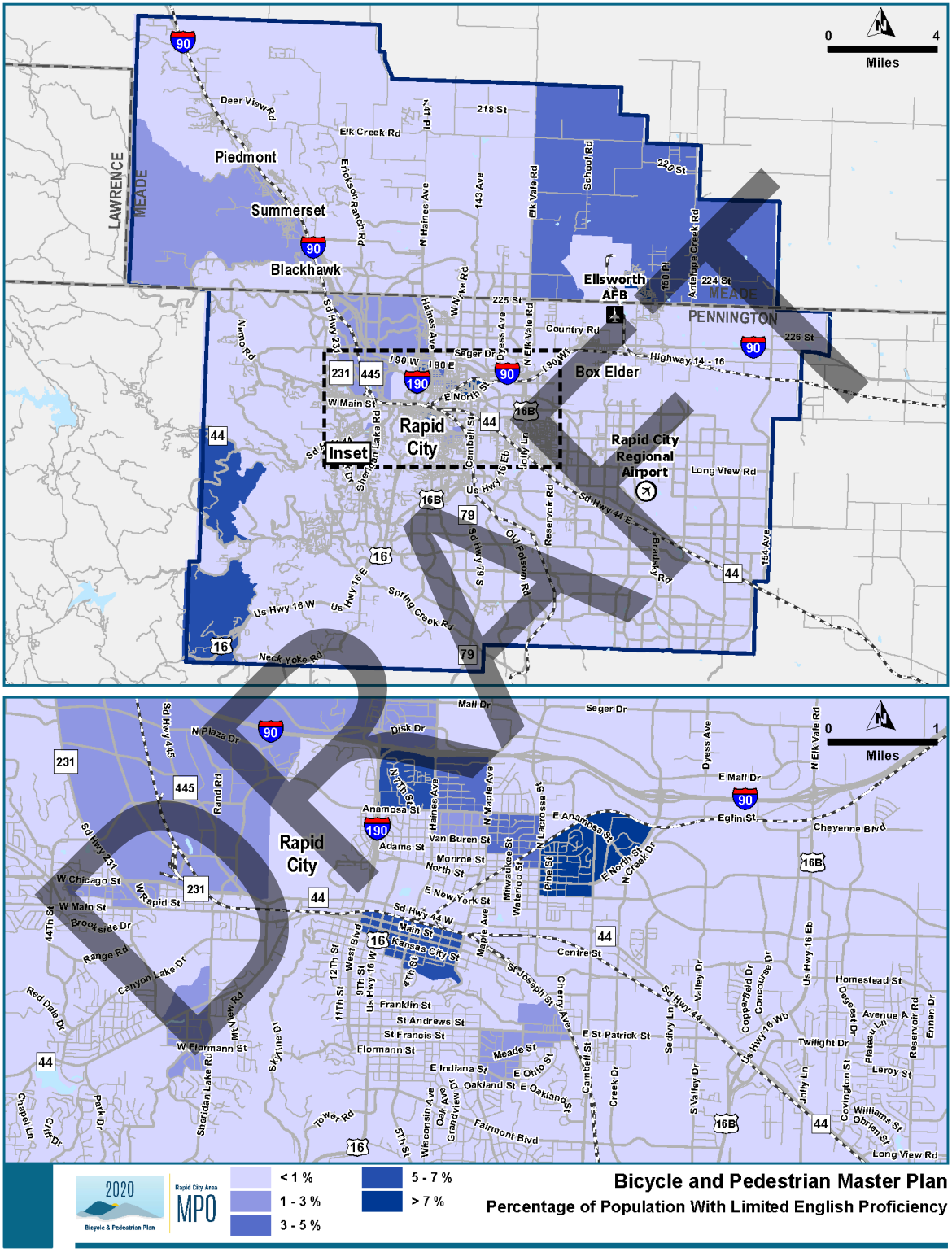


Figure 19: Percentage of Population with Limited English Proficiency



Appendix X: Public Meeting #1 Presentation and Comments

Add PDF during Export

Appendix X: Public Meeting #2 ArcGIS Story Map Results

The public comments from the ArcGIS Story Map were saved into a kmz file. All of the public comments, including comments for the roadway portion of the public meeting, can be seen in **Table 13**, and are represented in **Figure 20**. Public comments will spelling errors have been correct for ease of reading.

Table 13: Public Meeting #2 Comments

Map ID	Type	Comment
1	Grade Separation	A pedestrian bridge here would be a safer alternative to current crossing.
4	New Traffic Signal	All new signals that are installed need to be accessible Pedestrian Signal for the visually imparted.
11	Crossing Enhancement	Difficult crossing viewing distance/multiple lanes.
12	Crossing Enhancement	Difficult pedestrian/bike crossing – viewing distance/multiple lanes – during events.
13	Crossing Enhancement	Accessible Pedestrian Signals or a handicap accessible bridge are needed her.
14	Crossing Enhancement	Need a safe way for pedestrians and bicyclists to cross Omaha here.
15	Crossing Enhancement	It would be nice (and presumably safer and less confusing for all involved) if the pedestrian walk signals automatically changed with the green light, rather than having to push the button.
16	Crossing Enhancement	It can be difficult to cross 3 lanes of traffic here and Main Street. Crosswalk markings or pedestrian signage might be helpful.
17	Crossing Enhancement	This crossing is really important for keeping the community connected and providing a safe way for pedestrians and bicyclists to cross Omaha… please keep it!
18	Crossing Enhancement	The pedestrian signals should automatically coordinate with the traffic lights so pedestrians have the right-of-way when the light turns green. There are a lot of pedestrians that cross here and they have to wait if they don't push the button in time.
19	Crossing Enhancement	Need a pedestrian signal and safe way to cross here. Hopefully this is planned as part of the reconstruction project.
20	Crossing Enhancement	A safer pedestrian/bicycle crossing is needed here. I've almost been hit by vehicles multiple times even though I had the walk signal.
21	Bikeway	Would be nice to have a bikeway from Autumn Hills to the Skyline trail system. This would provide a beautiful connection through the woods and views of the blackhills.
22	Sidepath	Alternate path for bicycles instead of Sheridan Lake Road.
23	Sidewalk	Sidewalk along Hwy 44 should continue to at least Covington or Long View.
24	Bikeway	Cycle track needed on Main St as well for westbound bicycle traffic.
25	Bikeway	It would be ideal to connect all of the existing/proposed bike lanes, etc. to create a more complete bicycle network.

Map ID	Type	Comment
26	Bikeway	It would be ideal to connect all of the existing/proposed bike lanes, etc. to create a more complete bicycle network.
27	Bikeway	It would be ideal to connect all of the existing/proposed bike lanes, etc. to create a more complete bicycle network. Bicycle infrastructure connecting to the YMCA is especially needed.
28	Bikeway	It would be ideal to connect all of the existing/proposed bike lanes, etc. to create a more complete bicycle network.
29	Bikeway	This bike lane should connect to Mt. Rushmore Road at a minimum, but West Blvd would be ideal. It makes no sense to stop it at 5th Street.
30	Sidewalk	Would be good to have a sidewalk connecting the intersection to the bike path here in case the bike path is flooded under the bridge.

Figure 20: Public Meeting #2 Comment Map

Appendix X: Public Meeting #2 Survey Questions and Responses

In total, there were 17 responses to the survey. Some questions in the survey were left blank by the public, resulting in less than 17 responses. These responses will be noted in the corresponding question. For more details about the second public meeting and the purpose of the questions, see the section titled **Bicycle and** Pedestrian Demand

An analysis of relative levels of bicycle and pedestrian demand within the MPO area was conducted utilizing criteria corresponding to the proximity of bicyclists and walkers to various key destinations, projected population and employment density data, and socioeconomic data. This data identified populations with a higher propensity to make trips by walking or bicycling. It should be noted that the demand analysis did not consider existing "on the ground" bicycle and pedestrian conditions or facilities.

The rationale for each demand category and corresponding scoring is explained as follows:

- **Proximity to Key Destinations.** This demand category reflected a graduated scoring criteria that gave more points for bicyclists and pedestrians in closer proximity to destinations, accounting for the fact that people have different tolerances for how far they are willing to walk or ride a bicycle to their destination. Graduated demand scoring was applied to the areas around colleges and universities, public schools, parks, libraries, cultural centers, activity centers, and bus stops. The highest scores were given for the closest proximity of bicyclists and pedestrians to each destination (within one-quarter mile for pedestrians and one-half mile for bicyclists), decreasing to lower scores for bicyclists and pedestrians who were further away from destinations (capped at one mile for pedestrians and two miles for bicyclists). **Table 8** summarizes the graduated demand scoring for each type of destination.
- **Population and Employment Density.** The basis for the second demand category was the socioeconomic data for year 2045 from the RCAMPO regional travel demand model for the traffic analysis zones (TAZ) within the MPO area. The demand analysis reflected the anticipated and forecasted growth up to 2045. There were two specific elements included in the scoring for this category: population + employment density and employment to population ratio, which are described as follows:
    - **Population + Employment Density.** This measure is based on summing the population and employment totals for each TAZ and dividing by the acreage of the TAZ to calculate the density. It should be noted that this exercise did not include the subtraction of any non-developable acreage within an individual TAZ. Areas with higher population and employment densities are generally reflective of development patterns that are more conducive to bicycling or walking. **Table 9** summarizes the points given to each TAZ area based on the computed densities among the TAZs within Pinellas County. The points are based roughly on dividing the TAZ rankings into quintiles. The TAZs ranked highest in terms of density (in the first quintile) received the highest score.
    - **Employment to Population Ratio.** This measure is based on the ratio of total employment divided by total population in each TAZ. Those TAZs with a balance of employment and population within a single zone represent areas more likely to have bicycling and walking trips due to the proximity of complimentary land uses within shorter distances of each other – distances that are more conducive to bicycling and walking. **Table 10** summarizes the points given to each TAZ area based on the computed ratios among the TAZs within the MPO area. As with density, the points

are based roughly on dividing the rankings into quintiles. However for this ratio, the values in the middle (third) quintile are given the highest score, as these are the TAZs with the best balance between total population and total employment. Therefore these areas are more likely to have the most short-distance trips between complimentary land uses. The first and fifth quintile represent the areas that are most unbalanced. These areas have either a very high ratio (reflecting mostly employment with little to no residential) or a very low ratio (mostly residential with little to no employment).

- **Composite Equity Score.** The third demand category is based on the tabulated composite equity score based on the methodology discussed previously. An increase in the overall demand scoring for this category corresponds with increases in the composite equity score, as shown in **Table 11.** This reflects the higher bicycle and pedestrian demand typically associated with areas having above average values across multiple socioeconomic indicators.

Table 9: Population + Employment Density

	Bicycle Demand Scoring				Pedestrian Demand Scoring			
	Score by Bike Distance (mi)				Score by Bike Distance (mi)			
Destination	**0.50**	**1.00**	**1.50**	**2.00**	**0.25**	**0.50**	**0.75**	**1.00**
College/University	15	10	5	1	15	10	5	1
Parks	10	5	1	0	10	5	1	0
School (Public)	10	5	1	0	10	5	1	0
Civic Center	10	5	1	0	10	5	1	0
Bus/Transit Route Stop	10	5	1	0	10	5	1	0

Table 10: Employment to Population Ratio

	Bike/Ped Demand Scoring				
	Scoring by TAZ Quintile				
Data	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
Population + Employment Density	10	7	5	3	1
Employment / Population Ratio	1	3	5	3	1

Table 11: Composite Equity Score

	Bike/Ped Demand Scoring						
	Composite Equity Score						
Data	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Composite Equity Score*	0	0	3	6	9	12	15

*EACH POINT REPRESENTS A BLOCK GROUP BELOW THE CITYWIDE AVERAGE

The map shown in **Figure 11** illustrates the results of the demand analysis for bicyclists. **Figure 12** shows the results for pedestrians. Areas with darker colors are projected to have higher levels of demand.

It should be noted that this demand evaluation only considers transportation trips being made to destinations, and does not consider recreational trips such as leisure rides or jogs/walks that do not involve traveling to and from a destination.

Figure 11: Bicycle Demand Score

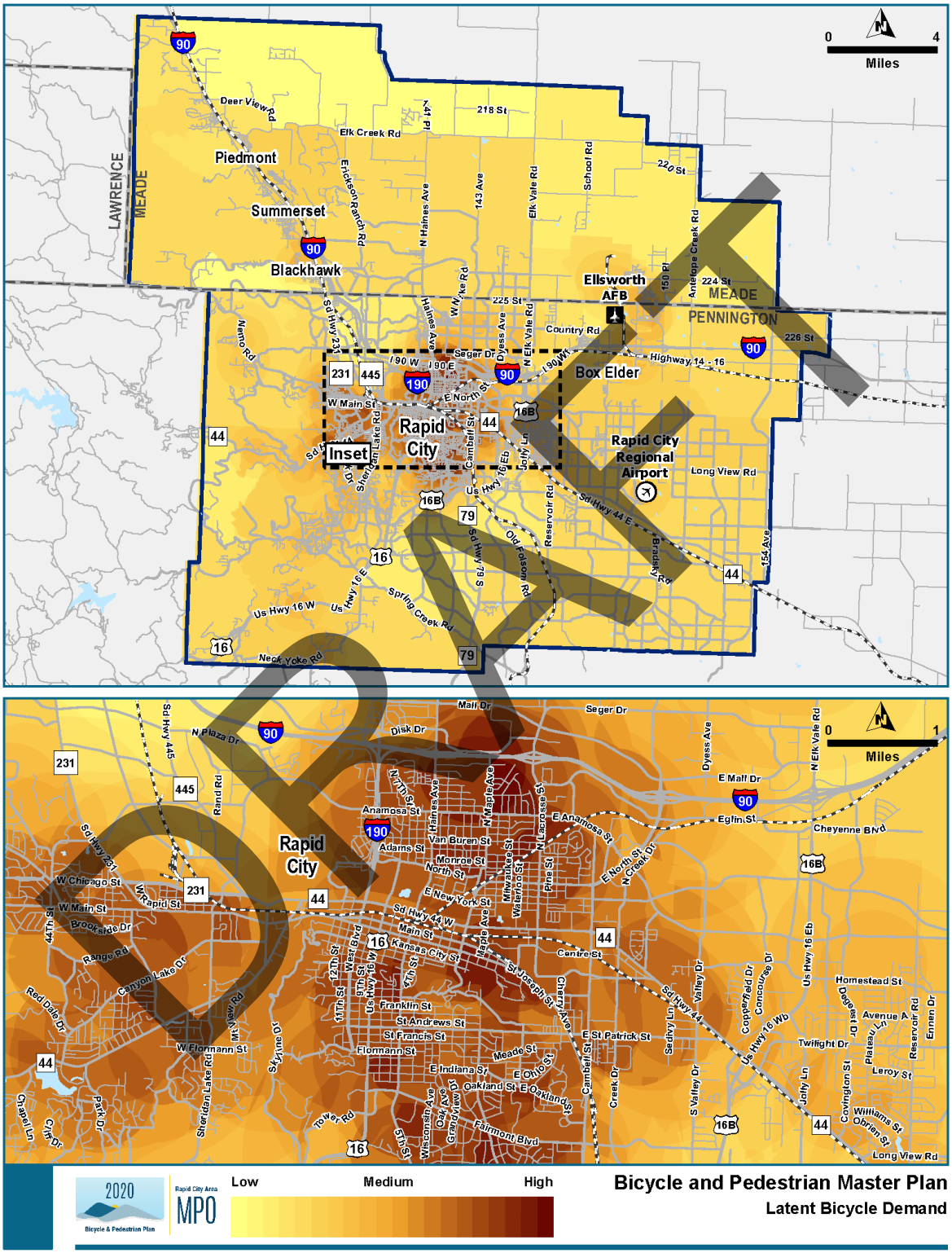
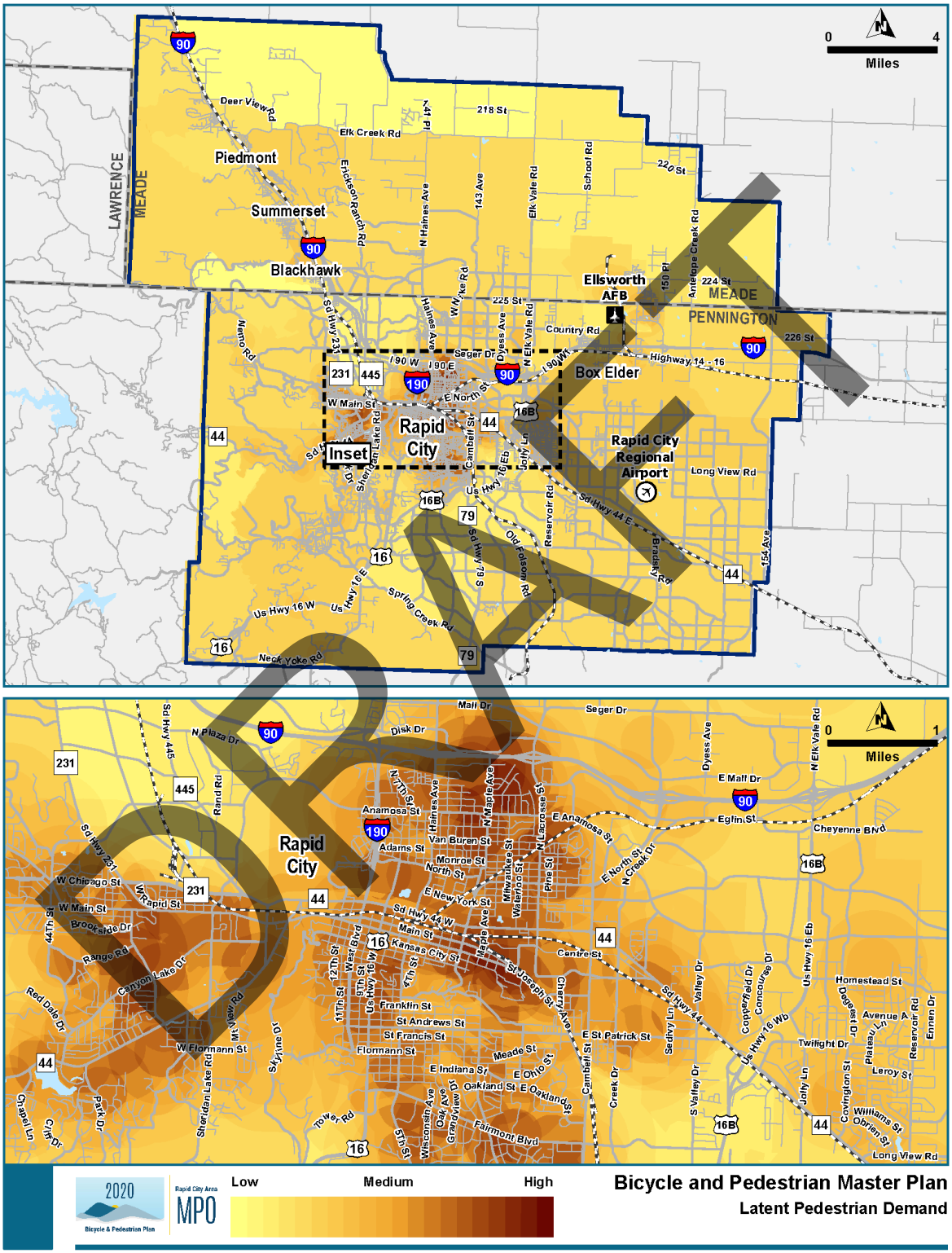


Figure 12: Pedestrian Demand Score



Public Involvement.

Question 1

How would you describe your approach to bicycling?

a) I am comfortable riding in mixed-traffic and will use roads without bike lanes

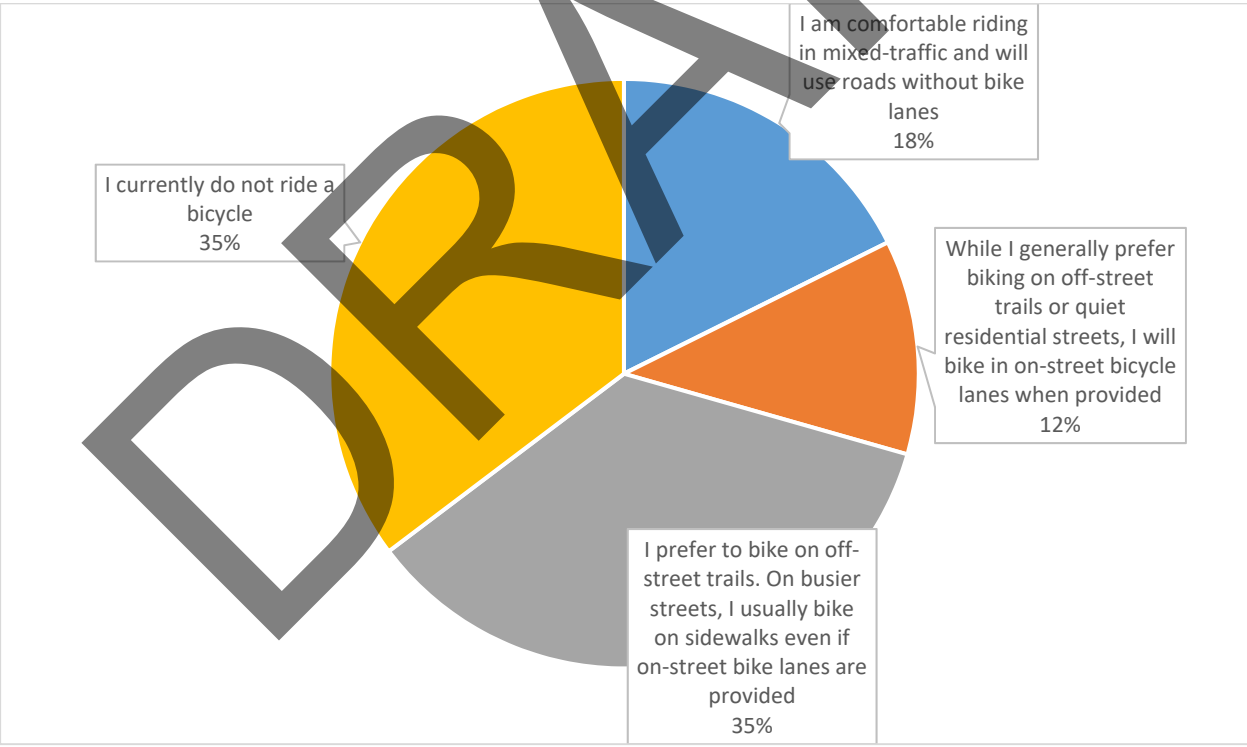
b) While I generally prefer biking on off-street trails or quiet residential streets, I will bike in on-street bicycle lanes when provided

c) I prefer to bike on off-street trails. On busier streets, I usually bike on sidewalks even if on-street bike lanes are provided

d) I currently do not ride a bicycle

This question was answered by 17 participants. Three participants said that they feel “I am comfortable riding in mixed-traffic and will use roads without bike lanes”. Two people responded with “While I generally prefer biking on off-street trails or quiet residential streets, I will bike in on-street bicycle lanes when provided”. Six people said “I prefer to bike on off-street trails. On busier streets, I usually bike on sidewalks even if on-street bike lanes are provided”, and another six people said “I currently do not ride a bicycle”.

Figure 21: How would you describe your approach to bicycling?



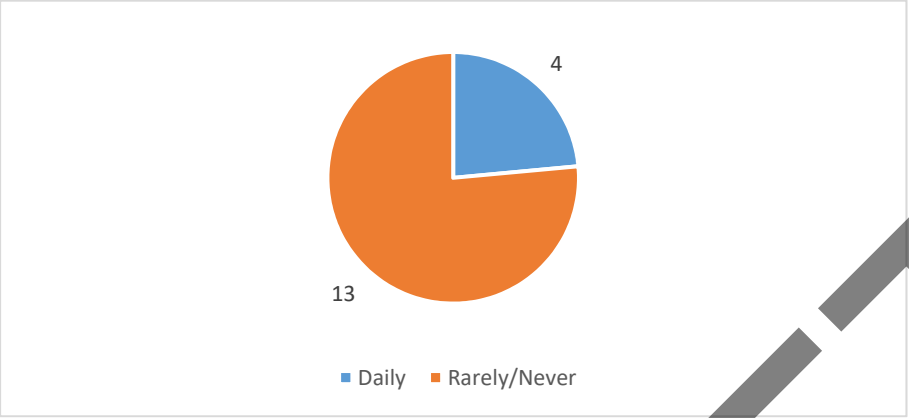
Question 2

How frequently do you walk to work or school?:

Daily | At Least Once a Week | At Least Once a Month | Rarely/Never

There were 17 responses in total, with 4 people saying “Daily”, and 13 people saying “Rarely/Never”.

Figure 22: How frequently do you walk to work or school?



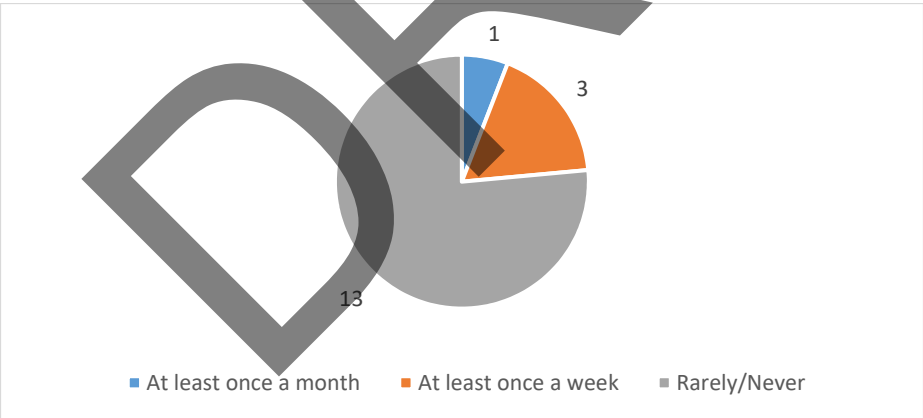
Question 3

How frequently do you bike to work or school?:

Daily | At Least Once a Week | At Least Once a Month | Rarely/Never

There was 1 response for “At least once a month”, followed by 3 people saying “At least once a week”, and 13 people saying “Rarely/Never”.

Figure 23: How frequently do you bike to work or school?



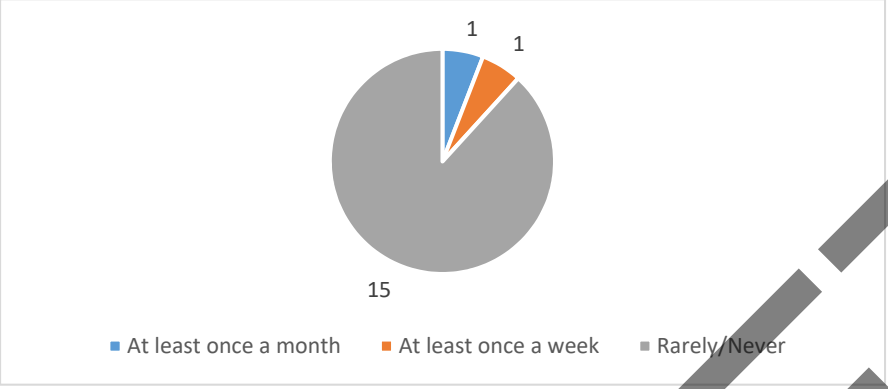
Question 4

How frequently do you walk to or from a transit stop?:

Daily | At Least Once a Week | At Least Once a Month | Rarely/Never

One person responded with “At least once a month”, one person said “At least once a week”, and 15 people responded with “Rarely/Never”.

Figure 24: How frequently do you walk to or from a transit stop?



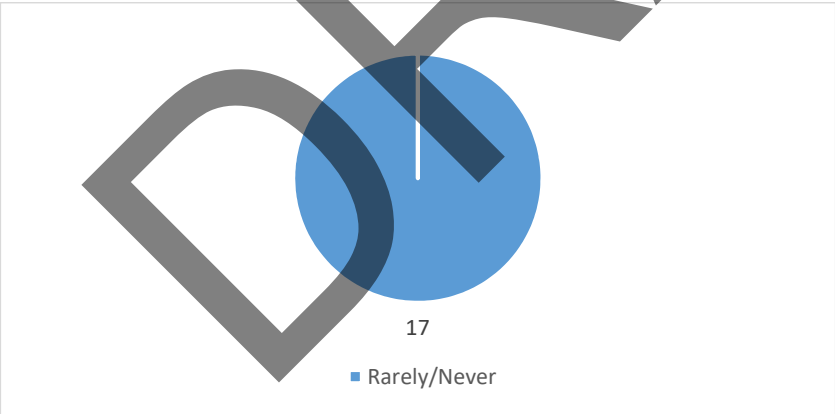
Question 5

How frequently do you bike to or from a transit stop?:

Daily | At Least Once a Week | At Least Once a Month | Rarely/Never

All 17 participants in the survey responded with “Rarely/Never”.

Figure 25: How frequently do you bike to or from a transit stop?



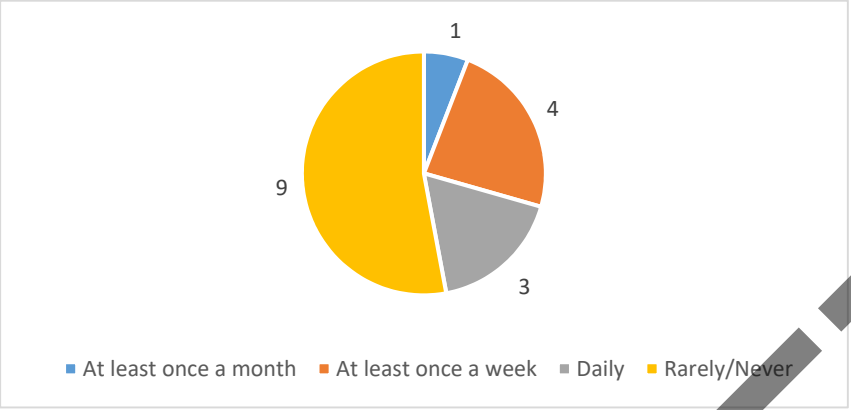
Question 6

How frequently do you walk to shopping, out to eat, or run errands?:

Daily | At Least Once a Week | At Least Once a Month | Rarely/Never

One person responded with “At least once a month”. Four people said “At least once a week”, with three people saying “Daily”, and nine people saying “Rarely/Never”.

Figure 26: How frequently do you walk to shopping, out to eat, or run errands?



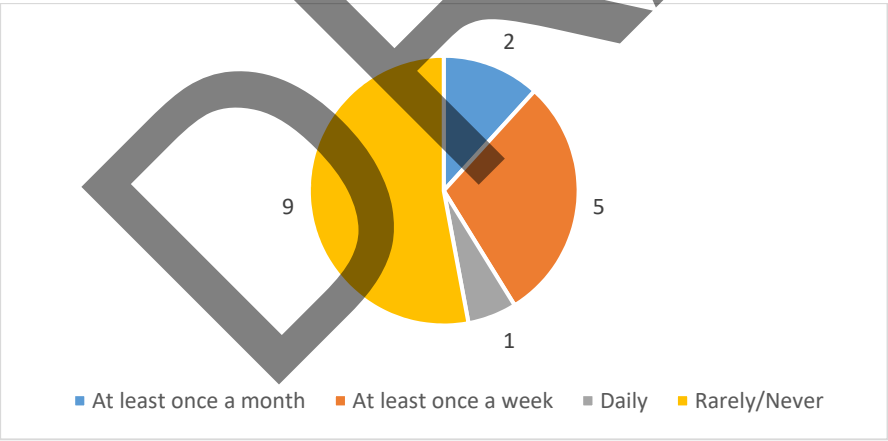
Question 7

How frequently do you bike to shopping, out to eat, or run errands?:

Daily | At Least Once a Week | At Least Once a Month | Rarely/Never

Two people responded to the question with “At least once a month”, with five people saying “At least once a week”. One person said that they ride “Daily”, and nine people said “Rarely/Never”.

Figure 27: How frequently do you bike to shopping, out to eat, or run errands?



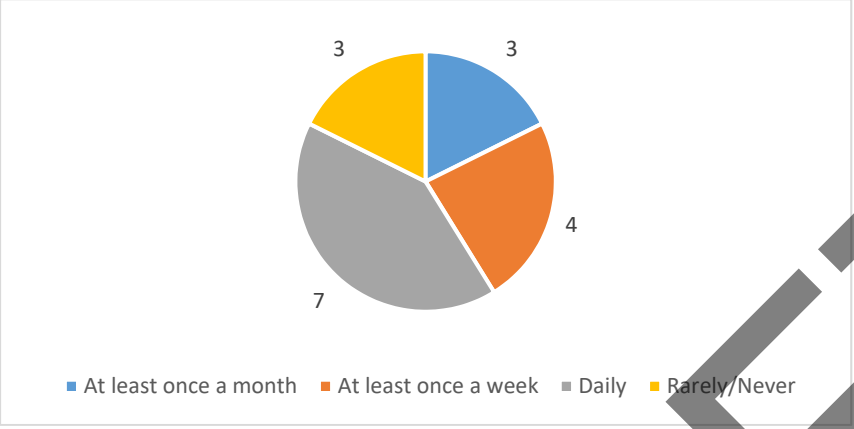
Question 8

How frequently do you walk to Exercise/Recreate?:

Daily | At Least Once a Week | At Least Once a Month | Rarely/Never

Three people responded with “At least once a month”, four people said “At least once a week”, seven people said “Daily”, and three people said “Rarely/Never”.

Figure 28: How frequently do you walk to exercise/recreate?



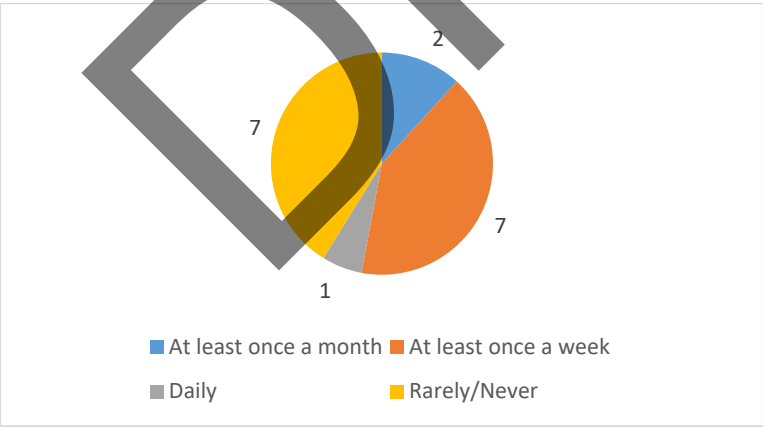
Question 9

How frequently do you bike to Exercise/Recreate?:

Daily | At Least Once a Week | At Least Once a Month | Rarely/Never

Two people responded to the question with “At least once a month”, seven people said “At least once a week”. One person rides their bike to exercise/recreate “Daily”, and seven people said “Rarely/Never”.

Figure 29: How frequently do you bike to exercise/recreate?



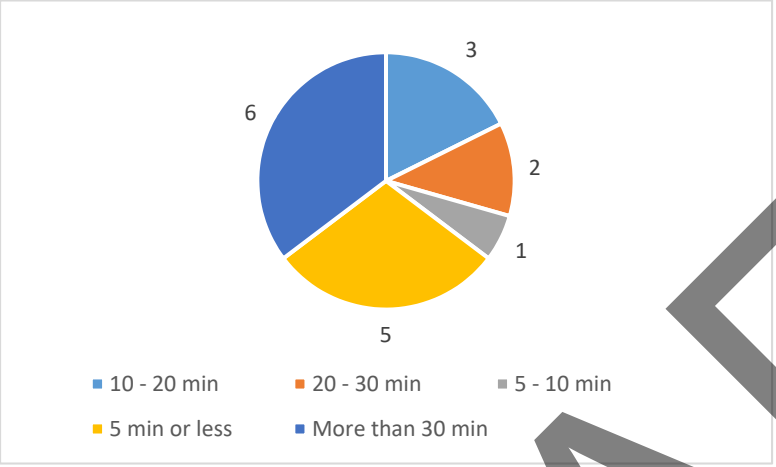
Question 10

How long are/ you generally willing to walk to reach your destination?

5 min or less | 5 - 10 min | 10 - 20 min | 20 - 30 min | More than 30 min

Five people said they are willing to walk “5 min or less”, one person said “5 – 10 min”, three people said 10 – 20 minutes, and two people said 20 – 30 minutes. Six participants said that they were willing to walk “More than 30 min” to reach their destination.

Figure 30: How long are you generally willing to walk to reach your destination?



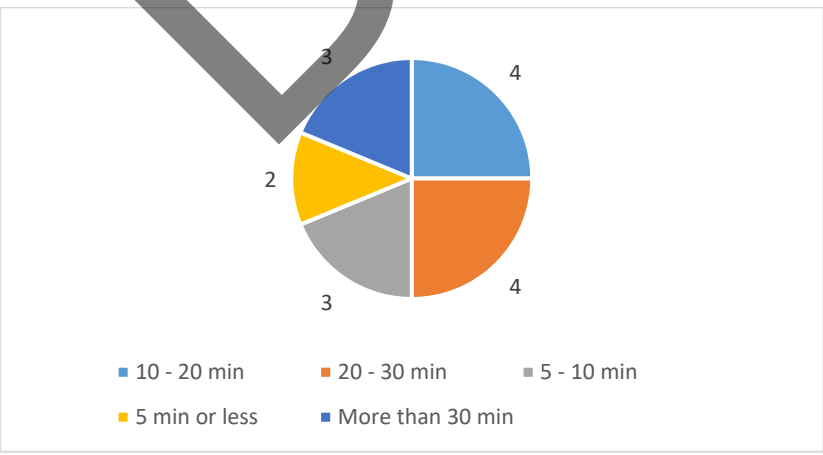
Question 11

How long are you generally willing to bike to reach your destination?

5 min or less | 5 - 10 min | 10 - 20 min | 20 - 30 min | More than 30 min

Four people said they are willing to bike “10 – 20 min” to reach their destination, with another four people saying “20 – 30 min”. Three people said “5 – 10 min”, and two people said “5 min or less”. Finally, three people said “More than 30 min”, for a total of 16 responses.

Figure 31: How long are you generally willing to bike to reach your destination?



Question 12

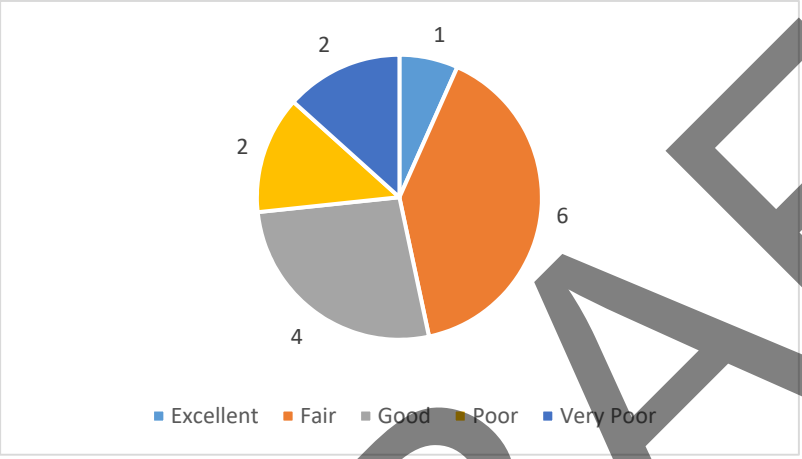
Question 12 is in regards to the existing bicycle network in the Rapid City area.

How would you describe the quality of Rapid City's existing bicycle network?

Very poor | Poor | Fair | Good | Excellent

One person answered with "Excellent", while four people said "Good", six people saying the network is "Fair", two people saying "Poor", and another two people saying "Very Poor". In total, 15 people responded.

Figure 32: How would you describe the quality of Rapid City's existing bicycle network?



Question 13

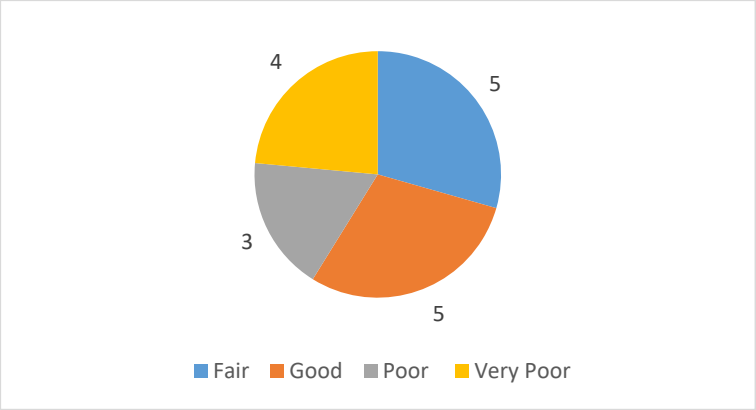
Question 13 asked participants about Rapid City's existing pedestrian network.

How would you describe the quality of Rapid City's existing pedestrian network?

Very poor | Poor | Fair | Good | Excellent

Five people responded with "Good", and another five people said the network was "Fair". Three participants said "Poor", and four people said the network was "Very Poor", for a total of 17 responses.

Figure 33: How would you describe the quality of Rapid City's existing pedestrian network?



Question 14

Which of the following approaches do you believe would most improve the bicycle and pedestrian network? (select up to 3)

a) Focus on completing existing sidewalk gaps

b) Provide safe crossings of major roadways to ensure network connectivity

c) Include bike lanes on all roadways outside of neighborhood streets

d) Provide bicycle and pedestrian facilities within locations where people are more likely to be walking or bicycling

e) Provide bicycle and pedestrian facilities between locations where people are more likely to be walking or bicycling

f) Expand the network of side paths and trails to provide regional links, connections to neighboring communities, recreational facilities, and outlying areas in Rapid City

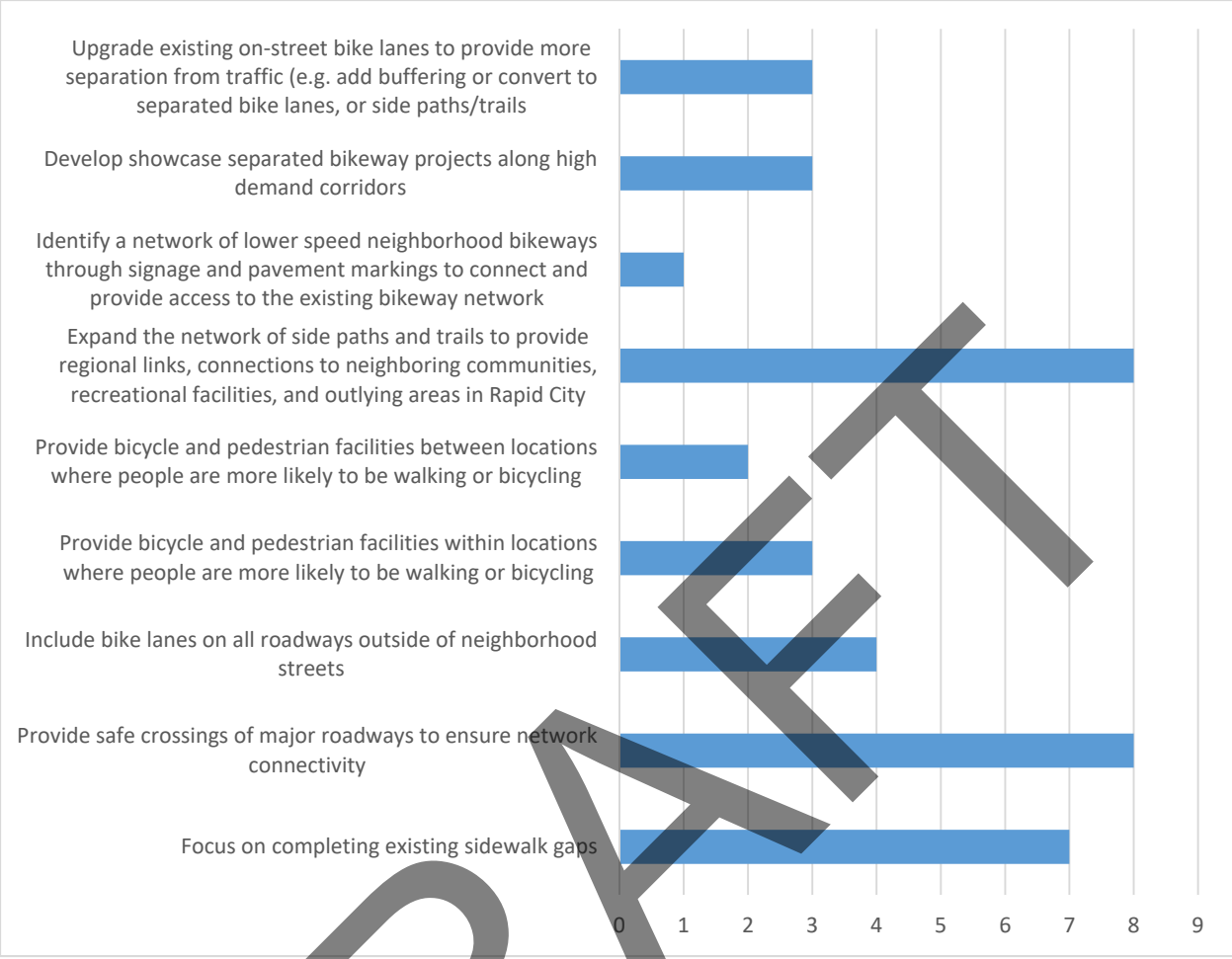
g) Identify a network of lower speed neighborhood bikeways through signage and pavement markings to connect and provide access to the existing bikeway network

h) Develop showcase separated bikeway projects along high demand corridors

i) Upgrade existing on-street bike lanes to provide more separation from traffic (e.g. add buffering or convert to separated bike lanes, or side paths/trails)

Since attendees were able to pick up to 3 responses, there was a total of 39 responses. The two most popular responses were to “expand the network of side paths and trails to provide regional links, connections to neighboring communities, recreational facilities, and outlying areas in Rapid City”, and “Provide safe crossings of major roadways to ensure network connectivity”.

Figure 34: Which of the following approaches do you believe would most improve the bicycle and pedestrian network?


Upgrade existing on-street bike lanes to provide more separation from traffic (e.g. add buffering or convert to separated bike lanes, or side paths/trails
Develop showcase separated bikeway projects along high demand corridors
Identify a network of lower speed neighborhood bikeways through signage and pavement markings to connect and provide access to the existing bikeway network
Expand the network of side paths and trails to provide regional links, connections to neighboring communities, recreational facilities, and outlying areas in Rapid City
Provide bicycle and pedestrian facilities between locations where people are more likely to be walking or bicycling
Provide bicycle and pedestrian facilities within locations where people are more likely to be walking or bicycling
Include bike lanes on all roadways outside of neighborhood streets
Provide safe crossings of major roadways to ensure network connectivity
Focus on completing existing sidewalk gaps
0
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703 Main Street, Suite 200
Rapid City , SD 57701
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