MAT-SU BOROUGH BICYCLE AND Pedestrian plan

DRAFT EXISTING CONDITIONS & ISSUES



PREPARED FOR Mat-Su Borough 350 E. Dahlia Ave. Palmer, AK 99645

SEPTEMBER 2022



RESPEC.COM

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Project Number 10946.22001



EXECUTIVE SUMMARY

This report documents the state of the bicycle and pedestrian network across the Mat-Su Borough (MSB) by identifying issues, evaluating connectivity, and analyzing pedestrian and bicycle crash data. The inventory is based on data collected from the MSB, State of Alaska, and Mat-Su Trails and Parks Foundation. Data are supplemented with interviews with stakeholders and user groups to determine where the issues are and what are the greatest needs. The information in this document will be used to help identify potential recommendations and strategies for improving the bicycle and pedestrian network across the Borough.

The MSB covers a large geographic area. Lower population densities and dispersed population centers make it challenging to provide bicycle and pedestrian connectivity across the entire borough. Likewise, different jurisdictions (borough, state, cities) have different standards and funds for constructing and maintaining non-motorized facilities. These challenges will require coordination and thoughtful planning to overcome.

However, there is a robust bicycle and pedestrian network and considerable enthusiasm for cycling, running, hiking, and walking in the borough. Advocates for non-motorized recreation and commuting can help communities identify new connections and facilities, as well as connect resources between partner organizations.

There are many opportunities to connect neighborhoods, parks, trails, and businesses with bicycle and pedestrian infrastructure such as sidewalks, separated paths, and wide shoulders. In addition to providing more opportunities for walking and biking, these connections may improve property values, promote healthy lifestyles, provide mobility options for residents without vehicles, and open opportunities for tourism. See the attached memo *Economic Impact of Bicycle and Pedestrian Paths* for more information.

Continued population growth of the region means the time to plan for the bicycle and pedestrian network is now. Conflicts between motor vehicles and bikers/walkers may increase if adequate facilities are not present. An equitable and safe network of bicycle and pedestrian infrastructure will ensure residents and visitors of all abilities and ages benefit from an improved quality of life through healthier, better-connected communities.



TABLE OF CONTENTS

1.0	STU	DY ARE	۱	1
	1.1	Popula	ation	1
		1.1.1	Growth	1
		1.1.2	Traffic Volumes	1
2.0	BICY	CLE AN	D PEDESTRIAN FACILITIES	4
	2.1	Pedes	trian	5
	2.2	Bicycl	9	5
	2.3	Conne	ctions to Transit	5
3.0	RELA	TED PL	ANS, PROJECTS, AND POLICIES	6
	3.1	Plans.	······	6
		3.1.1	2019 Alaska Statewide Active Transportation Plan	6
		3.1.2	2016 MSB Trails Plan	6
		3.1.3	MSB Official Streets and Highways Map (in progress)	6
		3.1.4	2035 MSB Long Range Transportation Plan	6
		3.1.5	Safe Routes to School Plan	7
		3.1.6	2011 MSB Economic Development Strategic Plan	7
		3.1.7	Comprehensive plans	7
	3.2	Currer	it and Planned Projects	10
		3.2.1	Planned projects	10
		3.2.2	Funded Projects	11
	3.3	Policie	s and Regulations	12
		3.3.1	National	12
			3.3.1.1 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design	12
			3.3.1.2 Public Rights of Way Accessibility Guidelines (PROWAG)	12
			3.3.1.3 Guide for the Development of Bicycle Facilities, 2012 Fourth Edition, American Association of State Highway and Transportation Officials (AASHTO)	12
			3.3.1.4 Complete Streets	12
		3.3.2	DOT&PF	12
			3.3.2.1 Alaska Traffic Manual	12
			3.3.2.2 Alaska Highway Preconstruction Manual 2020	12
		3.3.3	Mat-Su Borough	13
			3.3.3.1 MSB Code	13
			3.3.3.2 MSB Subdivision Construction Manual 2020	13
			3.3.3.3 MSB Design Criteria Manual	13
		3.3.4	City of Wasilla	13
4.0	ISSU	ES AND	NEEDS	14
	4.1	Crash	Analysis	14
	4.2	Netwo	rk Gaps & Connectivity	20

ii 🛛

	4.3	Mainte	nance	24
		4.3.1	DOT&PF	24
		4.3.2	MSB	24
		4.3.3	City of Wasilla	24
		4.3.4	City of Palmer	25
		4.3.5	City of Houston	25
	4.4	User C	onflicts	25
5.0	SUMI	MARY		. 25

LIST OF TABLES

TABLE	PAGE
Table 1 - Bicycle and pedestrian facility types found in the MSB	4
Table 2 - City of Wasilla downtown overlay district sidewalk requirements	13
Table 3 - Summary of crashes at intersections	17
Table 4 – Significant gaps in the bicycle and pedestrian network	21

LIST OF FIGURES

FIGURE	PAGE
Figure 1 - MSB Population Growth Projections, 2013-2040	1
Figure 2 - Traffic volumes on major corridors in the MSB	2
Figure 3 - Bicycle and pedestrian projects identified in other plans	11
Figure 4 - Crash Severity by Crash Type, 2010-2019	14
Figure 5 - Bicycle and pedestrian crash locations, 2010-2019	15
Figure 6 - Bicycle and pedestrian crash hotspots	16
Figure 7 - Crashes by Crash Type, 2010-2019	17
Figure 8 - Lighting conditions at the time of crash, 2010-2019	18
Figure 9 - Crashes by month	19
Figure 10 - Crashes by time of day	20

1.0 STUDY AREA

The Matanuska-Susitna Borough geographical area includes approximately 25,000 square miles of land and approximately 600 square miles of water (ADOLWD, 2020). The Matanuska-Susitna Valley (Mat-Su) is traditionally land of the Dena'ina and Ahtna Athabaskans and encompasses rivers, wetlands, hills, mountains, lakes, farmland, and forest. The MSB is in a transitional climate zone, which is characterized by long, cold winters and mild summers.

There are 25 communities within the MSB, including three cities – Houston (second class city), Palmer (home rule city), and Wasilla (first class city). The remaining 22 communities are classified as Census Designated Places. The borough is a second-class borough with a 7-member Assembly and Mayor.

1.1 POPULATION

According to the Alaska Department of Labor and Workforce Development, the 2020 MSB population is 107,081. The region continues to be the fastest growing part of the state due to its proximity to Anchorage, availability of land for development, and lower housing costs than Anchorage. Easy access to outdoor recreation is also a draw for new residents.

1.1.1 GROWTH

Figure 1 shows projected growth in the borough. The areas with the highest growth potential are southwest of Wasilla along Knik-Goose Bay (KGB) Road to Knik, and south of Meadow Lakes. Additional pockets of high growth projections include Houston, areas around Palmer, and the Willow area.

1.1.2 TRAFFIC VOLUMES

Traffic volumes play a significant role in determining the type of bicycle or pedestrian facility to include along a roadway. Higher volume roads benefit from separated facilities while low-volume roads may sufficiently accommodate bikes and pedestrians with a wide shoulder.

In the MSB, arterial roads carry more than 5,000 vehicles per day on average (Figure 2). These routes include the Parks and Glenn Highways, KGB Road, Seldon Road, Bogard Road, the Palmer-Wasilla Highway, Trunk Road, Seward-Meridian Parkway, and portions of Lucille, Arctic, and Wasilla-Fishhook Road. As the borough's population grows, traffic will continue to increase.



Figure 1 - MSB Population Growth Projections, 2013-2040



Figure 2 - Traffic volumes on major corridors in the MSB

2.0 BICYCLE AND PEDESTRIAN FACILITIES

The bicycle and pedestrian network consists of separated paths, paved shoulders, sidewalks, bike lanes, and shared roadways. Descriptions of each of these facility types are in Table 1.

Infrastructure type	Intended use	Description	
Separated Path	Mixed	The separated path network in the MSB connects Houston, Big Lake, Wasilla, Palmer, and Butte. Paths are generally paved with asphalt and run parallel to high-volume roadways.	
Paved Shoulder	Mixed	Paved shoulders can function the same as bike lanes. A major factor in the safety of shoulders for bicyclists is the presence and design of rumble strips that alert drivers when they leave the travel lane. In rural areas where sidewalks are not feasible, a paved shoulder can also accommodate pedestrians.	
Sidewalk	Pedestrian	Sidewalks are commonly used for pedestrian travel in urban areas. The MSB subdivision code does not have a sidewalk requirement, making sidewalks sporadic. Sidewalks are typically found in the original Palmer townsite area and the historic, commercial part of downtown Wasilla (MSB Long Range Transportation Plan).	
Bike lane	Bicycle	Bike lanes are a designated, exclusive space for bicyclists to operate one-way on the roadway using pavement markings and signs. In the MSB, there are several miles of bike lane located in Palmer.	

Table 1 - Bicycle and pedestrian facility types found in the MSB

Infrastructure type	Intended use	Description
Shared Roadway		In shared lanes, bicyclists ride in mixed traffic,
	Bicycle	therefore their comfort and safety varies widely based on traffic operating speeds and volumes.
		Roads with low traffic volumes can provide bike friendly routes in the MSB.

2.1 PEDESTRIAN

Walkers use a variety of facilities to get between destinations in the borough. In urban areas, sidewalks provide walkways between homes, businesses, and schools. Several major roadways have separated paths that run greater distances than the sidewalk network. Pedestrians also use the paved shoulder of many roadways when no other facility exists.

2.2 BICYCLE

Cyclists have several options for riding around the borough. Using roadways shared with motor vehicles is the most common facility. Likewise, paved shoulders are found on most paved roads and provide some level of separation from motor vehicle traffic, although that is dependent on the width of the shoulder. There are a few designated bike lanes in the borough, all within the City of Palmer. Multi-use separated paths are common on busier roads. Riding bicycles on sidewalks is generally permitted in Alaska except in business districts or where a regulatory traffic control device prohibits it. Sidewalk riding is discouraged by most best practices due to potential conflicts with pedestrians.

2.3 CONNECTIONS TO TRANSIT

Before hopping on a bus, the rider must walk or bike to the bus stop. Public transit services allow residents to make longer trips than would be possible solely on foot or bicycle.

The MSB has limited scheduled, route-based transit services. Additionally, local transit is provided ondemand. Therefore, there are very few designated bus stops or shelters across the borough. Without widespread, scheduled transit service, the connectivity of the bicycle and pedestrian network is more important for ensuring that residents without a motor vehicle can get safely to their destination. If route-based transit is developed in the future, it will be important to ensure that there are connections to non-motorized facilities.

3.0 RELATED PLANS, PROJECTS, AND POLICIES

3.1 PLANS

3.1.1 2019 ALASKA STATEWIDE ACTIVE TRANSPORTATION PLAN

The Alaska Statewide Active Transportation Plan (ASATP) seeks to improve safety, increase accountability, and promote healthy lifestyles in Alaskan communities and to develop a safer and more efficient active transportation network and infrastructure to encourage walking and bicycling. The Plan sets a framework for how to plan for and measure progress toward a vision for increased and safer active transportation opportunities across the state. The performance measures identified in the Plan may be useful for formulating local performance measures in the BPP.

3.1.2 2016 MSB TRAILS PLAN

The MSB Trails Plan was initially adopted in 2000 and updated several times over the years. The most recent update was completed in 2016 and then adopted in June 2017. This plan focuses on the backcountry and underfunded trails through the MSB, unlike the separated trails that run parallel to the road system. The BPP will evaluate links between the recreational trail network and the paved non-motorized system to ensure connections between the two.

3.1.3 MSB OFFICIAL STREETS AND HIGHWAYS MAP (IN PROGRESS)

The purpose of the Official Streets and Highways Plan is to have a logical road network with relevant classifications based on use and volume that also addresses safety concerns. The map depicts corridors for future road projects based on development and build-out estimates that gauge where the MSB population is going to work and live in the next two decades. The estimated completion date for the plan in the summer of 2022. The BPP will utilize the OSHP map to complement the forecasted development and road construction in the MSB.

3.1.4 2035 MSB LONG RANGE TRANSPORTATION PLAN

The Bike and Pedestrian Plan is seen as a supplemental chapter to the 2035 MSB Long Range Transportation Plan (LRTP) that was adopted in 2017. The LRTP assessed growth within the MSB over the next 20 years and provides overarching transportation goals for the MSB.

As the MSB is the fastest growing region in Alaska and has been for the last 20 years, key elements from the 2035 LRTP can be incorporated into the Bike and Pedestrian Plan. This will ensure that the Bike and Pedestrian Plan will not interfere with the current transportation system goals of the MSB and will complement the LRTP with longevity and resiliency in mind.

Policy strategies and actions suggested in the LRTP that are relevant to Bike and Pedestrian Planning:

- Develop an Active Transportation Master Plan
- Improve connectivity

- Adopt a Policy Requiring Bike/Pedestrian Improvements near/along Transit Corridors
- Improve Awareness of Transportation Choices
- Continue Coordination with MSB School District Regarding Safe Routes to Schools (SRTS)
- Proactively Support Active Transportation Provisions with Highway Facility Improvements
- Prepare a Regional Trail Map Reflecting Trail Systems

The LRTP developed a prioritized, fiscally constrained list of roadway improvements to be completed through 2035, which includes several projects that involve pedestrian or bicycle infrastructure. Several of these projects are already adapted into the Statewide Transportation Improvement Program, while others are suggested at a later timeframe (see Figure 3).

- Big Lake Road Reconstruction with appropriate pedestrian amenities
- Seldon Rd Upgrade and pedestrian facilities
- Seward Meridian Parkway with pedestrian path
- Vine Road Improvements with included pedestrian facilities
- Knik Goose Bay Road improvements with appropriate pedestrian amenities
- Bogard Road Improvements with appropriate pedestrian facilities

3.1.5 SAFE ROUTES TO SCHOOL PLAN

The 2014 Safe Routes to School (SRTS) plan assessed the walking/biking infrastructure around 17 schools throughout the MSB, provided general bike and pedestrian recommendations, and school-specific recommendations for improving the walking/biking conditions. The plan's study and recommendations focused on a half-mile radius around schools. Goals in the bike and ped plan will align with the SRTS plan, while covering a much broader geographic extent and demographic of users. The bike and ped plan can potentially build on the SRTS plan with the potential for connections to pedestrian and bike infrastructure near schools outside of the immediate half-mile radius.

3.1.6 2011 MSB ECONOMIC DEVELOPMENT STRATEGIC PLAN

Although developed in 2010 and adopted in 2011, there are still several strategies to be utilized from the MSB Economic Development Strategic Plan. As part of the MSB BPP, an updated economic analysis will be developed. A prioritized list of projects will be incorporated into the BPP meant to increase tourism, recreation, and hospitality spending. This will be done using the 2011 MSB Economic Development Strategic Plan, a current economic analysis, and input from stakeholders. The updated bike and pedestrian network will promote connectivity to areas that will benefit from better infrastructure and facilities.

3.1.7 COMPREHENSIVE PLANS

Borough Comprehensive Development Plan (2005; update in progress)

The Matsu Borough Comprehensive Plan was developed in 2005 with an update currently in progress. It's intended use is to develop general goals and policy recommendations to help guide future development and identify infrastructure needs at the borough-wide level. In addition to the boroughwide plan, community based comprehensive plans provide residents with the opportunity to guide development within their specific community. The BPP will be guided by the borough and community comprehensive plans and can be used to guide future comprehensive plan updates.

The borough-wide comprehensive plan includes a parks and open space goal to acquire, develop, and redevelop a system of parks, recreation facilities, community centers, and open spaces that are accessible to the entire community. The plan promotes the development of pedestrian and bicycle linkages between schools, public facilities, neighborhoods, parks and open spaces, and population centers where feasible.

A borough-wide transportation goal is to develop an integrated surface transportation network that facilitates the efficient movement of people, goods, and services. This constitutes policy recommendations that encourage a multi-modal system, street and trail connectivity, and the delegation to local community plans to address specific community level needs.

Borough Core Area Comprehensive Plan (2007 update)

The core area plan reiterates much of the needed transportation infrastructure identified in the old Long Range Transportation Plan. The plan does identify a goal of providing safe and efficient vehicular and non-motorized travel within the core area and between the core area and other destinations. Additionally, the plan supports a policy of increasing local transit services.

Wasilla (2011)

The City of Wasilla Comprehensive Plan includes a goal to maintain and improve City sidewalks and non-motorized pathways to increase walkability. It identified concerns of limited connectivity, maintenance costs, and multi-modal sharing issues that the city needs to address. The plan specifically looked at the core downtown area and strategies to revitalize it, and improving the pedestrian environment in this area with sidewalks and crosswalks was identified as an important aspect of the communities' future downtown vision.

The plan suggested improving pedestrian access around parks and schools, enhancing connectivity between commercial establishments, improving safety using signs and designated road crossings, and improving walkways using strategies such as a year-round maintenance plan, enhancing ADA accessibility, and encouraging low-impact lighting.

Houston (2016)

An overall transportation objective in the Houston Comprehensive plan is to improve and expand nonmotorized transportation facilities where possible. Specific strategies include expanding multi-use pathways and lighting improvements, designing safe crossings of the Parks Highway to connect residential and commercial areas, and to support the development of a Hawk Lane bike path.

Palmer (2006)

The Palmer Comprehensive Plan also recognized the need for improved pedestrian and bike infrastructure. Two priorities identified in the plan are to upgrade and better maintain downtown sidewalks, and to develop a trail along the railroad right-of-way from the State Fairgrounds through the City and north to Sutton. The plan identifies the area bounded by the Glenn Highway to the west, Eagle Avenue to the north, South Airport to the east and E. Commercial Drive to the south – as an area that should have sidewalks extended as the area grows.

The plan recommends policy that all subdivisions make adequate provisions for safe, functional pedestrian circulation. And it identifies the need for better winter maintenance and snow removal, suggesting a partnership with the planned Business Improvement District to achieve this.

Big Lake (2009)

8

The development of a pedestrian and bicyclist friendly street network is identified as a strategy aligned with the community's transportation goals. Desired land use patterns specify a "town center" use area.

Improving the pedestrian environment of the central town area is important for the town center vision. The plan recommends better access to Jordan Lake Park and to Big Lake itself, including adding a walking trail to the lake. To meet recreational goals, the plan recognizes that conflicts between motorized and non-motorized users on bike paths is a concern.

Chase (2017)

The only formally developed surface access into Chase is via railroad, boat, or fly-in. Current access into and through the Chase area relies on a system of trails. A primary conflict is pedestrian use of railroad right-of-way and even the tracks themselves for transportation, which is an illegal and dangerous practice. The plan also identifies the need to improve the trail system to expand legal access to parcels within the planning area.

Chickaloon (2008)

A transportation recommendation in this plan is to build a separated path on the Glenn Highway, between Fish Land Road (MP 73) and Chickaloon River Road (MP 78). The plan also recommends supporting development of trails that connect open areas and parks to residential and commercial areas in the community.

Lazy Mountain (2008)

This plan advocates for several non-motorized policies and goals, including encouraging street and trail connectivity, improving roadside trails, and constructing roadside trails with future road projects. The plan also identifies the Clark-Wolverine Road corridor as a priority location for a pathway, as well as a connection between the Old Glenn Highway and the George W. Palmer Bridge.

Fishhook Comprehensive Plan (2017)

A strategy to meet recreational goals in this plan is to develop additional pedestrian and bike trails and linkages between parks, open spaces, water bodies, and neighborhoods. Acquiring additional public greenbelts to enhance these links through collaboration with foundations, non-profits, and government sources will help to meet this objective.

The plan advocates for the design and construction of recognized bike lanes and off-road vehicle (ORV) access along the Palmer and Wasilla Fishhook Roads by maintaining a working relationship with the State of Alaska Department of Transportation and Public Facilities (DOT&PF), and state and local elected officials to ensure awareness of the need for these infrastructure upgrades.

Meadow Lakes (2005)

The Meadow Lakes comp plan suggested creating a pedestrian-oriented, mixed-use town center along the south side of the Parks Highway near the Pittman Road intersection. This town center concept includes development standards to promote walking, such as requiring sidewalks, planting vegetation between streets and buildings, screening parking areas, and encouraging denser development.

Willow (2013)

This plan includes a community goal of creating a walkable community and a pedestrian-oriented town center. Goal 3 in the plan is to "Establish, improve, and maintain appropriate roadside trails and pedestrian paths."

3.2 CURRENT AND PLANNED PROJECTS

Across the borough, infrastructure projects are developed by several entities. Figure 3 depicts bicycle and pedestrian infrastructure projects that are either funded or needed based on other planning efforts.

State of Alaska Department of Transportation & Public Facilities – The DOT&PF is responsible for the state highway network, which includes separated pathways, sidewalks, and bike lanes. State transportation infrastructure projects are funded by a combination of federal, state, tribal, and local money.

Mat-Su Borough – The borough develops roads through the subdivision process. Developers construct roads at the time of subdivision before selling any subdivided parcels. Additionally, the borough can design and construct infrastructure through voter-approved bond packages. The Capital Improvement Plan (CIP) can be used to prioritize bike and pedestrian facilities, but it does not have fiscal backing. Projects can be nominated by MSB staff or other stakeholders to be put on the CIP.

City of Wasilla – The City of Wasilla maintains a CIP that identifies new infrastructure such as roads, paths, and sidewalks. The CIP is a 5-year plan for implementation and is funded through tax revenues and grants.

City of Palmer – The City of Palmer maintains a Capital Improvement Plan (CIP) that identifies new infrastructure such as roads, paths, and sidewalks. The CIP is a 5-year plan for implementation and is funded through tax revenues and grants.

City of Houston – The City of Houston maintains a Capital Improvement Plan (CIP) that identifies new infrastructure such as roads, paths, and sidewalks. The CIP is a 5-year plan for implementation and is funded through tax revenues and grants.

The Mat-Su region is also in the process of establishing a **Metropolitan Planning Organization** (MPO). The newly formed MPO will coordinate transportation projects within the designated urbanized area, including non-motorized infrastructure projects. The MPO is expected to be in place in late 2023, pending designation as an urbanized area per the 2020 US census results.

3.2.1 PLANNED PROJECTS

MSB Long Range Transportation Plan (LRTP) – The LRTP makes specific transportation improvement recommendations that will guide transportation investment through 2035. These projects can be adapted into the Alaska Statewide Transportation Improvement Program or funded with an MSB bond package. Projects listed in the LRTP are not necessarily funded, but they do represent the transportation priorities of the MSB. The LRTP is considered fiscally constrained because each project within the plan will be constructed within the planning horizon.

MSB Capital Improvement Program (CIP): The CIP is a nomination-based program that provides a list of projects with community support for possible funding. Once the Bike and Pedestrian Plan is adopted, many of the projected additions or changes to the network will qualify as valid CIP projects.

3.2.2 FUNDED PROJECTS

Alaska Statewide Transportation Improvement Program (STIP): The STIP covers all surface (non-aviation) transportation improvement projects for which partial or full federal funding is approved and that are expected to take place within a four-year period.

2021 MSB Transportation System Package: A list of transportation projects, potentially funded with general obligation bonds that was approved by voters in 2021. The MSB has not sought bonds for these projects yet.

2018 MSB School District Pedestrian Improvements:

Projects identified through the borough's Safe Routes to School program. This on-going effort is based on the 2014 Safe Routes to Schools assessment.



3.3 POLICIES AND REGULATIONS

Implementation of planned bicycle and pedestrian infrastructure is guided by local, state, and federal policies and regulations. These include design standards, engineering best practices, and local code.

3.3.1 NATIONAL

3.3.1.1 2010 AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS FOR ACCESSIBLE DESIGN

The "2010 Standards" set minimum requirements, both scoping and technical, for newly designed and constructed or altered state and local government facilities, public accommodations, and commercial facilities to be readily accessible to and usable by individuals with disabilities.

3.3.1.2 PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES (PROWAG)

Beginning in 1992, specific guidelines were proposed to regulate accessibility on public streets, within public rights-of-way. These guidelines became known as PROWAG. These guidelines remain in development, but are the recommended best practices when planning, designing, and constructing pedestrian features within public rights-of-way.

3.3.1.3 GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES, 2012 FOURTH EDITION, AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

A comprehensive design guide on how to incorporate bicycle travel into roadway design. This guide is the primary reference used by engineering professionals in designing infrastructure for bicycles.

3.3.1.4 COMPLETE STREETS

Complete Streets policies are enacted at the local level to ensure all streets are safe and feel safe for all users. The Federal Highway Administration (FHWA) and the National Complete Streets Coalition support communities in developing a context sensitive Complete Streets policy.

3.3.2 DOT&PF

3.3.2.1 ALASKA TRAFFIC MANUAL

The Alaska Traffic Manual Is Alaska's standard traffic control device manual for public roads. It consists of the Manual on Uniform Traffic Control Devices (MUTCD) and the Alaska Traffic Manual Supplement. It references the Alaska Sign Design Specifications, which is the sign layout standard for Alaska public roads. For non-motorized transportation, the ATM includes sections on traffic control for school areas and traffic control for bicycle facilities.

3.3.2.2 ALASKA HIGHWAY PRECONSTRUCTION MANUAL 2020

The DOT&PF's preconstruction manual covers all aspects of highway project development – from preliminary engineering and environmental through final Plans, Specifications, and Estimates (PS&E). The manual does not prescribe design standards directly. However, it does outline the steps in the process and potential studies and analyses that may be needed when developing new or improved roadway infrastructure. The Design Study Report is a key step of the development process and is the step in which pedestrian and bicycle accommodations are identified.

3.3.3 MAT-SU BOROUGH

3.3.3.1 MSB CODE

Borough code does not contain design standards for roadways, bicycle facilities, or pedestrian facilities. Title 11 directs the Public Works Department to establish standards for the design and construction of roads in the borough. Title 43 covers borough subdivisions. It does not prescribe the construction of sidewalks or pathways.

3.3.3.2 MSB SUBDIVISION CONSTRUCTION MANUAL 2020

This document provides established standards for the design of roads. Road standards are prescribed based on the roadway's functional classification. There are no provisions for mandatory bicycle or pedestrian facilities along subdivision roads. The manual indicates that bicycle and pedestrian pathway design shall follow the current edition of the Guide for the Development of Bicycle Facilities (AASHTO).

3.3.3.3 MSB DESIGN CRITERIA MANUAL

The MSB is in the process of creating a design criteria manual that will include sections on nonmotorized facilities.

3.3.4 CITY OF WASILLA

The City's *Downtown overlay district design standards* sets requirements for sidewalks (Table 2) and identifies sidewalk clear zone standards. This document contains design standards that apply to the development of public and private areas and for the creation of systems and amenities that are beneficial to the public, in the Downtown Overlay District and all of its sub-districts. The design standards contained in this article are mandatory. The instructions for application, enforcement, and interpretation of these standards are further discussed in Title 16 of the City of Wasilla Municipal Code. Title 16 contains detailed definitions of as well as the description of the downtown overlay district and its boundaries. Within the downtown overlay district, the regulations set forth in this article shall be the minimum requirements and shall apply uniformly to each class or kind of building, structure, or land.

Corridor	Min. distance from back of curb (BOC)	Paved furniture zone at BOC	Sidewalk req. both sides	Min. width of sidewalk
Avenues	2'	NA	Y	6'
Parkways	2'	NA	Υ	5'
Boulevards	4.5'	NA	Y	5'
Main Streets	4'	4'	Υ	8'
Urban Streets	4'	4'	Y	6'
Local Streets	3'	NA	Y	5'
Alleys	NA	NA	NA	NA

Table 2 - City of Wasilla downtown overlay district sidewalk requirements

4.0 ISSUES AND NEEDS

4.1 CRASH ANALYSIS

Crash data for the period 2010-2019 were collected and analyzed to determine if there were any hotspots of crash activity and to get a general sense of the severity and quantity of crashes involving bicycles and pedestrians. DOT&PF provided raw tabular data that included the crash location, type and severity of the crash, time of day, day of week, year, and weather conditions. The locations were mapped using ArcGIS Pro software.

The number of bicycle and pedestrian crashes was relatively low with only 103 reported incidents over ten years (Figure 4). However, approximately 33% of all crashes resulted in either serious injury or a fatality. All seven fatalities were pedestrians. Crashes were nearly even between cyclists and pedestrians, with 52 cyclist crashes and 51 pedestrian crashes.



Figure 4 - Crash Severity by Crash Type, 2010-2019

Crashes occurred throughout the borough, with slightly more incidents in Wasilla and Palmer than surrounding areas (Figure 5 and Figure 6). This is likely due to the higher density of residents and higher traffic volumes in these areas.





Figure 6 - Bicycle and pedestrian crash hotspots



For the period analyzed, the number of crashes has declined for both bicycles and pedestrians (see Figure 7). In 2013, there was a higher number of bicycle crashes (17) than in subsequent years. The cause of this spike in bicycle crashes is not clear from the data.



Figure 7 - Crashes by Crash Type, 2010-2019

Most crashes involving a pedestrian or cyclist happened at intersections (see Table 3). Intersections are locations where pedestrians or cyclists are crossing the path of motor vehicles, which introduces potential conflicts between modes.

Summary of Bike and Pedestrian Crashes				
Total Bike and Pedestrian Crashes				
Percent Bike Crashes				
	At an Intersection	82%		
	On a Dark, Not Lighted Street	<1%		
Percent Pedestrian Crashes		50%		
	At an Intersection	67%		
On a Dark, Not Lighted Street				





73% of crashes occurred during daylight (see Figure 8). This is likely because there is more bicycle and pedestrian activity during the summer, when available daylight is at its peak.



Figure 8 - Lighting conditions at the time of crash, 2010-2019



Crashes show a seasonal pattern with crashes peaking in July (Figure 9). September and October are the second highest months for crashes, likely due to the beginning of school when students are walking or biking to school before cold weather. January and November did not experience any bicycle crashes, and there was only one each for February, March, and December. This is presumably due to the reduction in the number of cyclists during the winter.



Figure 9 - Crashes by month



Figure 10 shows the number of crashes by time of day. Bicycle and pedestrian crashes peak in early afternoon and early evening. There is also a spike in crashes for both pedestrians and cyclists between midnight and 1am. Very few crashes occurred between 1am and 8am.



Figure 10 - Crashes by time of day

4.2 NETWORK GAPS & CONNECTIVITY

A combination of analysis, review of planned projects, one-on-one stakeholder interviews, and public comments have been used to develop a preliminary list of network gaps and connectivity issues. Public comments were obtained via an online comment map and individual emails to the project team or MSB staff.

Table 4 – Significant gaps in the bicycle and pedestrian network

What is the gap?	Description	What is the source of this need?
Smith Road Extension pathway	Provide a pathway connection between the Old Glenn Highway and the recreational trailhead access	2021 Transportation System Package
Old Glenn Highway pathway between Sodak Circle and Knik River	There is a gap in the pathway	2021 Transportation System Package
49 th State Street pathway between Bogard Road and Palmer- Wasilla Highway	No dedicated bicycle/pedestrian facility between two major corridors	2021 Transportation System Package
Lucille Street pathway from Spruce Street to Seldon Road	No dedicated bicycle/pedestrian facility along this busy corridor that includes access to an elementary school. The crash analysis showed several bike/pedestrian crashes on this segment during 2010-2019.	2021 Transportation System Package
Tex-Al Drive pathway	The connection between the east and west segments of Tex- Al Drive would provide a major east-west corridor in this area of the borough	2021 Transportation System Package
Edgerton Parks Road and Mountain Trails Drive pathway	A pedestrian/bicycle facility would connect the Palmer- Fishhook Road to the Government Peak Recreational Area	2021 Transportation System Package
Palmer-Fishhook Road pathway	This fast-growing area of the borough needs a connection between the Trunk Road pathway, the Glenn Highway, and the Little Susitna Bridge	2021 Transportation System Package; Fishhook Comprehensive Plan; public input
Fern Street pathway	Provide a connection between KGB Road and Fairview Loop in this fast-growing portion of the borough	2021 Transportation System Package; public input
Bogard Road pathway	Provide a dedicated pathway on this busy road between Trunk Road and Seldon Road	2017 MSB Long-range Transportation Plan
West Karen Street pathway	Provide a separated pathway along this busy corridor to connect the Meadow Lakes Community Center with Pittman Road	2021-22 MSB Capital Improvement Plan
Church Road pathway	Provide a connection north from the Church Road separated path that ends at Spruce Avenue to Schrock Road	2021-22 MSB Capital Improvement Plan
Schrock Road pathway or widened shoulders	Provide a connection from Church Road to the Little Susitna River to connect the Pittman Road, Church Road, and Parks Highway Master Circle trail system	2021-22 MSB Capital Improvement Plan

What is the gap?	Description	What is the source of this need?	
Vine Road pathway	This fast-growing area of the borough does not have a bicycle/pedestrian connection between Parks Highway, Hollywood Road, and KGB Road. This would also connect to the separated path on West Hollywood Road that extends to Goose Bay Elementary School. There were three serious bike/pedestrian crashes on this segment between 2015 and 2019.	2021-22 MSB Capital Improvement Plan	
Meadow Lakes Loop Road pathway	Connect Parks Highway separated path to the intersection of Pittman Road to accommodate bicycles and pedestrians along this significant corridor in a fast-growing area of the borough	2021-22 MSB Capital Improvement Plan	
Pittman Road pathway or widened shoulders	Provide a dedicated space for bikes and pedestrians along this busy road between the separated path on Parks Highway all the way to Church Road	Analysis; public input	
Inner and Outer Springer Loops sidewalks, pathway, or widened shoulders	This area is projected to grow significantly over the next 20 years. There are no dedicated bicycle or pedestrian facilities along these roads. A dedicated facility would provide connections between residential areas and the core Palmer commercial area (via Chugach Street sidewalks)	Analysis; public input	
Knik-Goose Bay Road pathway	Extending the separated path from South Settlers Bay Road to Malemute Run would provide a safe facility for pedestrians and cyclists along this high-volume, high-speed road in a fast-growing area of the borough.	Analysis; public input	
Fairview Loop pathway	This fast-growing region of the borough would benefit from a non-motorized facility that connects the separated path at Top of the World Circle to South Abby Boulevard. The facility would service residential areas, an elementary school, and a recreational area.	Analysis; public input	
Parks Highway pathway	There is no dedicated facility north of Willow that connects to the separated path along Talkeetna Spur Road.	Public input	
Glenn Highway pathway	Extending the separated path north from Scott Road to Palmer-Fishhook Road would connect neighbors to schools and the commercial center of Palmer. This would complete a loop if a Palmer-Fishhook Road path is constructed.	Analysis; public input; Palmer Comprehensive Plan	
Glenn Highway pathway	Connecting Palmer-Fishhook Road to the separated path at Jonesville Road in Sutton would provide connectivity between the Sutton and Palmer.	Public input; Palmer Comprehensive Plan	

What is the gap?	Description	What is the source of this need?
Wasilla-Fishhook Road pathway	There is no constructed bicycle/pedestrian facility north of Seldon Road. A dedicated non-motorized facility extending to Palmer-Fishhook Road would create a loop that connects dozens of subdivisions throughout this fast-growing area.	Fishhook Comprehensive Plan; analysis; public input
Bodenburg Loop pathway	The Butte Trail is a significant recreational destination. Connecting the trailhead to the Old Glenn Highway path would fill the gap along Bodenburg Loop.	Analysis; public input
Maud Road pathway	Development in the area has increased traffic on Maud Road. The road is narrow with narrow shoulders. A separated non- motorized path would connect residential areas to the Old Glenn Highway path.	Analysis; public input
Seward Meridian Road pathway	Healthcare facilities along Seward Meridian generate considerable vehicular traffic. There is no dedicated bike/pedestrian facility north of Palmer-Wasilla Highway. A separated path would connect to the path along Seward Meridian south of Palmer-Wasilla Highway and provide connections to an elementary school, businesses, and healthcare facilities.	Public input



4.3 MAINTENANCE

Maintaining bicycle and pedestrian infrastructure throughout the year is important to ensure yearround use by the residents that rely on walking or biking for their everyday needs. Winter maintenance includes removal of snow and ice from walkways and paths, as well as providing sand or gravel for traction. Summer maintenance entails sweeping up gravel and brushing back vegetation.

Snow removal from sidewalks and shared-use paths is a concern. Icy sidewalks or sidewalks full of snow make it difficult or dangerous to walk, particularly for the elderly and individuals with mobility impairments. Inconsistent snow removal is also a concern as it makes it difficult for a pedestrian or cyclist when they encounter differing levels of snow removal along their route.

Once the snow and ice melts, there can be a significant amount of gravel left behind on roadway shoulders. This is also a problem on shared-use paths where all-terrain vehicles (ATVs) ride adjacent to or cross the path and kick gravel onto the path. Gravel is particularly problematic for road bikes with narrow tires. Increased sweeping efforts would address this need.

Each facility owner employs different maintenance policies for maintaining their infrastructure.

4.3.1 DOT&PF

The DOT&PF removes snow from roadways and pathways according to their assigned priority. Priority is generally based on the functional classification of the roadway. Thus, higher functioning roads receive higher priority snow removal. Sidewalks and pathways share the same priority level as the adjacent roadway. However, in practice, snow is not removed from paths and sidewalks as quickly as it is removed from roads. Often this is due to the need for specialty equipment or manual labor to remove snow from pedestrian paths.

4.3.2 MSB

Most road maintenance on borough roads is contracted out to private parties. After a snowfall of four inches or more, plows must plow main roads and school bus routes within 12 hours. Snow removal priority, in descending order, is primary collectors, secondary roads, and then subdivision roads. In addition to snow plowing, the borough oversees sanding, grading of gravel roads, drainage control, minor road repairs, and pavement patching. The borough maintains more than 1,100 miles of road.

4.3.3 CITY OF WASILLA

The City of Wasilla snow removal plan includes continuous plowing of a primary 'snow route' on main city roads, with the next priority being downtown streets, and then subdivision streets. Sidewalk plowing and sanding is not specified in the snow removal plan, and there are no sidewalk maintenance provisions in the city municipal code.





4.3.4 CITY OF PALMER

Snow removal and sanding are performed on city streets and roads in the following order of priority:

- 1. Main arterial and business district streets, school routes, etc.
- 2. Main feeder or collector streets leading to arterial streets and highways, and Palmer Municipal Airport.
- 3. Neighborhood residential streets and subdivisions.
- 4. All other low-density streets

Municipal code specifies those owners or occupants of premises bordered by a paved sidewalk are responsible for removal of snow and ice from sidewalks. The City of Palmer Department of Public Works' *Snow Removal Information* states that the city will remove snow and ice from sidewalks around city buildings and will attempt to clear snow along school routes, bike paths, and a single lane along core downtown area sidewalks, as time allows.

4.3.5 CITY OF HOUSTON

The City of Houston prioritizes school routes for snow removal, followed by main roads, then side streets. Houston municipal code does not include provisions on sidewalk maintenance, and sidewalks are not explicitly included in the city snow removal plan

4.4 USER CONFLICTS

Conflicts between non-motorized users and motorized users are common across Alaska. Issues in the MSB include motorized use of non-motorized facilities, motorized users riding adjacent to non-motorized facilities and causing damage to pathways, and motorized users kicking gravel and debris onto non-motorized facilities.

Additionally, there have been reported conflicts between non-motorized users and motor vehicles in the borough. This is generally between motorists and cyclists that are riding on the roadway. Cyclists on road bikes with narrow tires often cannot ride on separated pathways due to gravel or poor-quality asphalt and thus ride in the road or on the shoulder.

5.0 SUMMARY

The bicycle and pedestrian network in the Mat-Su Borough provides key connections to destinations across the borough. The infrastructure projects currently in development will provide additional connections and ensure safe travel for walkers and cyclists. However, there are still several significant gaps in the non-motorized network. As the borough continues to grow and traffic volumes increase, it is important to fill these gaps and enable mobility for everyone in the borough.