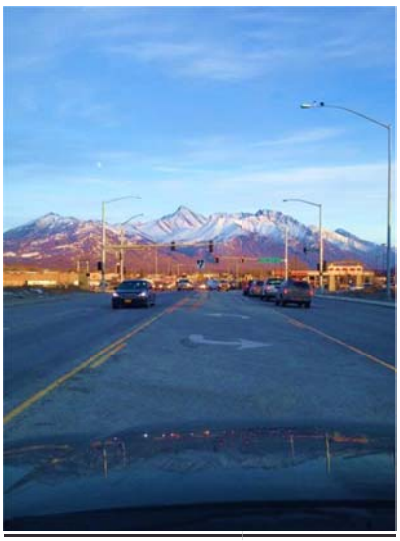

MSB LRTP

Matanuska-Susitna Borough

2035

Matanuska-Susitna Borough

Long Range Transportation Plan

Appendix A

ADOPTED

December 2017

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Attachments

Abbreviations

AAB	Aviation Advisory Board
AADT	Annual Average Daily Traffic
AASP	Alaska Aviation System Plan
ACS	American Community Survey
AMATS	Anchorage Metropolitan Area Transportation Solutions
AMP	Airport Master Plan
APV	Accident Prediction Value
ARRC	Alaska Railroad Corporation
CATS	Chickaloon Area Transit System
CMAQ	Congestion Mitigation/Air Quality
DHHS	Department of Health and Human Services
DOL&WD	Department of Labor & Workforce Development
DOT	U.S. Department of Transportation
DOT&PF	Alaska Department of Transportation and Public Facilities
FAA	Federal Aviation Administration
FAST Act	Fixing America's Surface Transportation Act
FASTLANE	Fostering Advancements in Shipping and Transportation for the Long-Term Achievement of National Efficiencies
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FNSB	Fairbanks North Star Borough
FTA	Federal Transit Administration
FY	Fiscal Year
HSIP	Highway Safety Improvement Plan
IFR	Instrument Flight Rules
JBER	Joint Base Elmendorf-Richardson
KPB	Kenai Peninsula Borough
LOS	Level of Service
LRTP	Long Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century Act
MASCOT	Mat-Su Community Transit
MLLW	Mean Lower Low Water
MOA	Municipality of Anchorage
MP	Milepost
MPO	Metropolitan Planning Organization
MSB	Matanuska-Susitna Borough
NBI	National Bridge Inventory
NHPP	National Highway Performance Program
NHS	National Highway System
NPIAS	National Plan of Integrated Airport Systems
NSB	North Slope Borough

PAPI	Precision Approach Path Indicator
PPP	Public-Private Partnership
QCEW	Quarterly Census of Employment and Wages
RASP	Regional Aviation System Plan
RHE	Rail Hazard Elimination Program
RMC	Regional Transit Maintenance Center
RSA	Road Service Area
RTP	Recreational Trails Program
SHPO	Alaska State Historic Preservation Officer
STIP	Statewide Transportation Improvement Program
STBGP	Surface Transportation Block Group Program
TA	Transportation Alternatives
TAC	Technical Advisory Committee
TAZ	Traffic Analysis Zone
TDM	Transportation Demand Management
TSM	Transportation System Management
UZA	Urbanized Area
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled
VPD	Vehicles per Day
VOR	VHF Omni-directional Radio Range
WBAPS	Web Based Accident Prediction System

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Chapter 1
Introduction

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Chapter 1 Introduction

This technical appendix is a companion document to the Matanuska-Susitna Borough (MSB) 2035 Long Range Transportation Plan (LRTP). This appendix provides additional detail about components of the plan including demographic data, roadway, rail, aviation, marine, and environmental considerations. For information of the LRTP recommendations, please see the LRTP document available under a separate cover.

This document includes the following chapters:

- Chapter 1 – Introduction
- Chapter 2 – Population and Economics
- Chapter 3 – Existing Conditions
- Chapter 4 – Financial Constraints
- Chapter 5 – Roadway Recommendations
- Chapter 6 – Transportation Improvement Strategies
- Chapter 7 – Air Transportation
- Chapter 8 – Rail Transportation
- Chapter 9 – Marine and Waterborne Transportation
- Chapter 10 – Environmental Analysis

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Chapter 2
Population and Economics

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Chapter 2 Population and Economics

Knik-Fairview is the fastest growing community in the MSB. It is located along the northwest shore of Knik Arm, heading toward Port MacKenzie. Knik-Fairview grew by more than 100 percent in the last decade. Its 2010 population of 14,923 is greater than MSB's two largest cities, Palmer and Wasilla, combined.

It is important to understand the composition of an area's population and the structure of its economy when looking at transportation patterns and trends. The population and economy of a region have an immense impact on transportation, creating traffic and travel patterns. More people, jobs, and commercial and recreational activity generate traffic as does higher income levels. Different types of industries also have different transportation needs. Some industries (e.g., construction) need to be able to transport heavy loads, while others (e.g., hotels and restaurants) need easy access and high visibility. Some jobs (e.g., retail and food service) are associated with a high number of trips, while others (e.g., storage facilities) have very low trip generation rates. As result, understanding social and economic characteristics is an important consideration in understanding travel behavior.

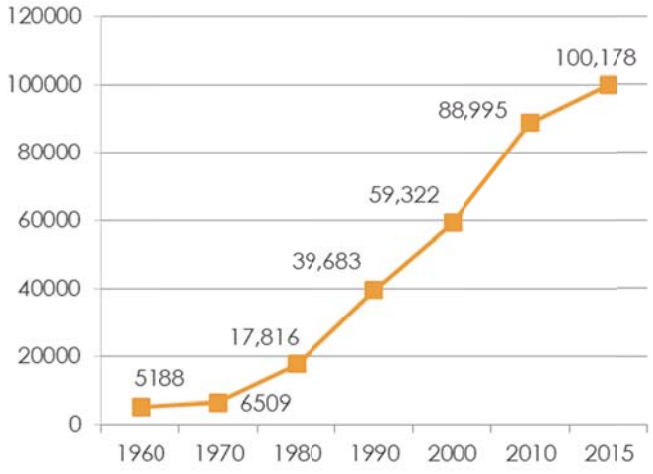
It is also important to understand demographics in order to effectively solicit input into the planning process. For example, if a community has a high percentage of families with children, having family friendly outreach activities may get more participation than a traditional public meeting.

This chapter is based on data from a variety of sources. The most recent data was used because it best reflects existing conditions but the year reported varies by data set.

Historic Population Trends

The MSB has been Alaska's fastest growing region for the last three decades (see Figure 1**Error! Reference source not found.**) and has a 2015 population of 100,178 according to the Alaska Department of Labor and Workforce Development (DOL&WD).[1]

Figure 1. MSB Population Trends, 1960-2015



Source: Department of Labor and Workforce Development, 2015

The MSB is approximately 24,682 square miles, making it similar in size to West Virginia. Most of its residents live in the southern portion of the MSB in a corridor between the communities of Willow, on the Parks Highway, and Sutton, on the Glenn Highway. There are three cities in the MSB: Wasilla, Palmer, and Houston. Approximately 17.6 percent of the MSB population lives in one of these three cities. The rest of the population lives in unincorporated areas. Table 1 depicts an overview of the MSB's demographics.

Table 1. MSB Demographic Data, 1990, 2000, 2010, and 2014

	1990	2000	2010	2014
Total households	13,394	20,556	31,824	31,104
Average number of persons per household	2.92	2.84	2.84	2.96
Average number of persons per family	3.37	3.29	3.23	3.47
Male residents	20,605 (51.9%)	30,831 (51.9%)	46,040 (51.7%)	51,799 (51.7%)
Female residents	19,078 (48.1%)	28,491 (48.1%)	42,955 (48.3%)	48,379 (48.3%)
Students enrolled in MSB	8,851 [1]	12,513 [1]	16,869[2]	18,364[2]

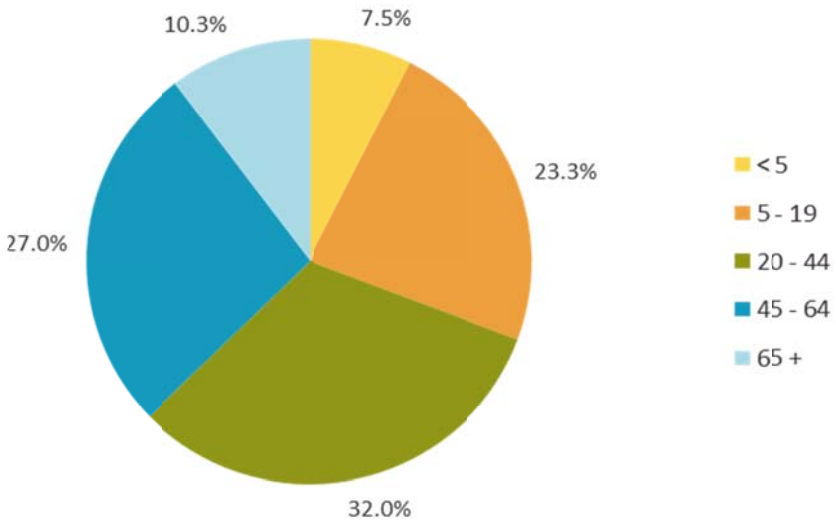
[1] DOL&WD. 2016. 2015 Population Estimates by Borough, Census Area, and Economic Region. Available on the internet at http://live.laborstats.alaska.gov/pop/index.cfm

[1] 2007 LRTP
[2] Alaska Department of Education and Early Development, Assessment and Accountability [2 3]
Sources: U.S. Census, 2007 LRTP, DOL&WD, and Alaska Department of Education and Early Development, Assessment and Accountability

Age

In 2015, the biggest age group was 20 to 44-year-olds with 32.0 percent (32,105) of the MSB population (see Figure 2). This age group grew by 3,329 between 2010 and 2015.

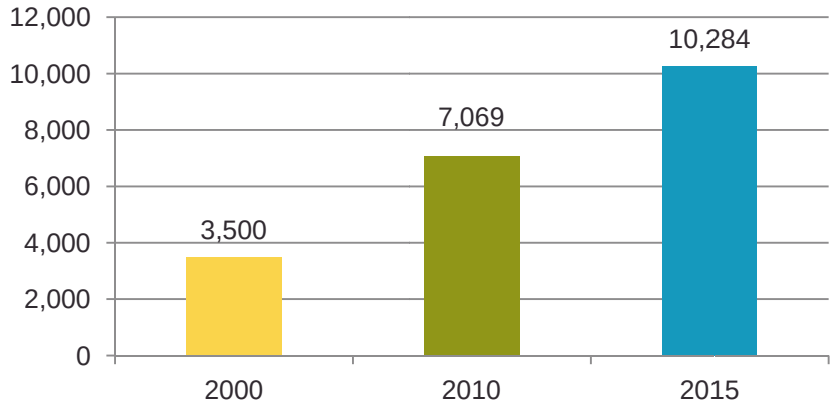
Figure 2. MSB Population by Age Group, 2015



The age group with the biggest change since 2000 was individuals 65 years and older (see Figure 3). The number of individuals in this age group has almost tripled since 2000.

[2] Alaska Department of Education and Early Development, Assessment and Accountability. 2011. District Enrollment as of October 1, 2010, FY2011. Available on the internet at https://education.alaska.gov/stats/DistrictEnrollment/2011DistrictEnrollment.pdf
[3] Alaska Department of Education and Early Development, Assessment and Accountability. 2016. District Enrollment as of October 1, 2015, FY2016. Available on the internet at https://education.alaska.gov/stats/DistrictEnrollment/2016DistrictEnrollment.pdf

Figure 3. Individuals 65 Years of Age and Older



Race

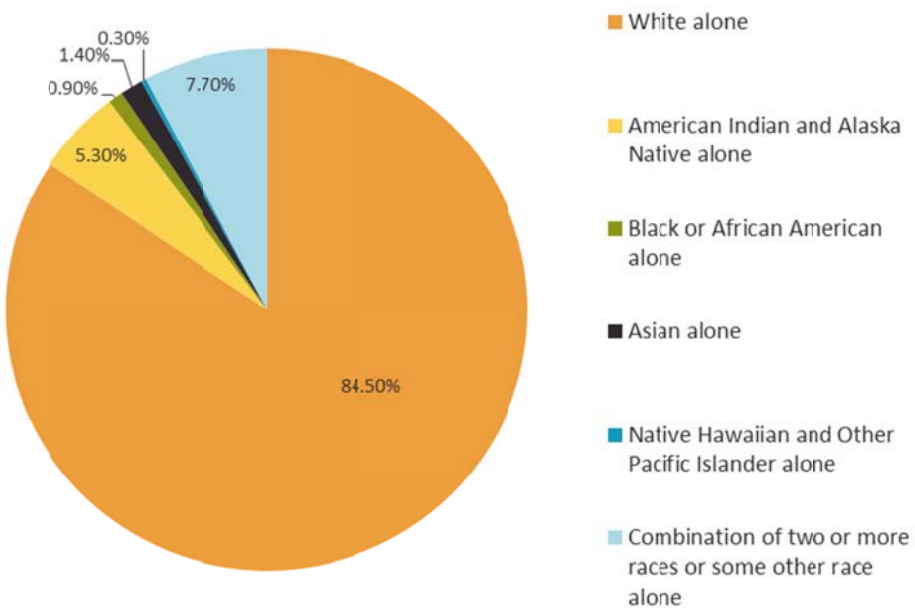
Table 2 and Figure 4 depict the MSB's population broken down by race. In general, the MSB is less racially diverse than the State as a whole, is becoming more diverse.

Table 2. MSB Racial Composition – 1990, 2000, 2010, and 2014

	1990	2000	2010	2014
Race – White alone	36,905 (93%)	51,938 (87.6%)	75,540 (84.9%)	79,273 (84.5)
Race – Percentage Non-White	7%	12.4%	15.1%	(15.5%)
Race – American Indian and Alaska Native Alone	1,808 (4.9%)	3,264 (5.5%)	4,901 (5.5%)	5,005 (5.3%)
Race – Black or African American Alone	295 (0.8%)	411 (0.7%)	856 (1.0%)	845 (0.9%)
Race – Asian Alone	258 (0.7%)	414 (0.7%)	1,096 (1.2%)	1,294 (1.4%)
Race – Native Hawaiian and Other Pacific Islander Alone		74 (0.1%)	221 (0.2%)	243 (0.3%)
Race – Combination of two or more races or some other race alone	191 (0.5%)	3,221 (5.4%)	6,381 (7.2%)	7,183 (7.7%)

Source: U.S. Census

Figure 4. MSB Population Percentage by Race, 2014



Housing Units and Household Income

A housing unit[4] is an important factor in transportation planning because it is the place where the majority of trips begin and end. According to the *Matanuska-Susitna Borough 2014 Housing Needs Assessment*, there are 40,578 *housing units* in the MSB. Of these, 30,932 (76.2 percent) were occupied and 9,655 (23.8 percent) were vacant. Of the vacant units, the majority are for seasonal, recreational, or occasional use.

According to the 2010-2014 ACS, the median household income in the MSB was $72,134 in 2014; the median family income was slightly higher at $82,369; and the per capita income was $30,013.

Economic Trends

Economic activity, such as the number of households and median income of a community, has a direct relationship to transportation demand. Generally speaking, the number of trips taken is directly related to the level of economic activity within a community. Economic activity also influences the type of travel taking place.

[4] A *housing unit* is a house, apartment, mobile home or trailer, group of rooms, or single room occupied as separate living quarters and can be occupied or empty; a *household* includes all the people who occupy a housing unit as their usual place of residence.

The MSB is a unique Alaska economic region in several aspects. The MSB has been characterized by rapid population growth during the past five decades. No other area of the State has come close to the MSB's record population and employment growth. The MSB is also unique in that substantial portion of the economic activity in the MSB is the product of MSB residents working in the MOA and spending their income within MSB's local economy. The MSB is experiencing employment growth in businesses and institutions that are providing a wider range of goods and services to its growing population.

Employment and Earnings

Local travel patterns are influenced by the number and type of jobs held by MSB residents as well as the number and type of jobs available in the MSB. Table 3, below, shows the number of workers who live in the MSB by industry.

Table 3. Number of Workers by Industry Residing in the MSB, 2012

	Number of workers	Percent of total employed
Natural Resources and Mining	2,954	7.7
Construction	4,225	11
Manufacturing	514	1.3
Trade, Transportation, and Utilities	8,006	20.8
Information	990	2.6
Financial Activities	1,280	3.3
Professional and Business Services	3,339	8.7
Educational and Health Services	5,887	15.3
Leisure and Hospitality	3,558	9.3
State Government	2,413	6.3
Local Government	4,336	11.3
Other	957	2.5
Unknown	4	0

Source: DOL&WD

Earnings by Place of Work

According to the Quarterly Census of Employment and Wages (QCEW), the annual earnings of persons employed in the MSB was $975,754,876 in 2015.[5, 6] One of the reasons many residents

[5] The QCEW information is derived from Unemployment Insurance programs in the US. Employment covered by these programs represents approximately 97% of all wage and salary civilian employment. Major exclusions from unemployment insurance include self-employed workers, most agricultural workers, members of the Armed Forces, and elected officials.

choose to work outside the MSB is because the wages are often higher. In 2015, the average monthly wage in the MSB was $3,561 compared to $4,732 in Anchorage. Even higher wages can be earned on the North Slope and elsewhere.

Labor Force

According to the 2013 ACS 5-year estimate, the MSB's labor force consisted of 44,152 persons (64.5 percent of the MSB's population), up from 24,981 in 2000 and 17,971 in 1990. Approximately 6.7 percent were unemployed in 2013, which is the same as 2000 but lower than the 11.6 percent rate of unemployment in 1990.

Figure 5 depicts the work locations for MSB residents in 2010. According to the DOL&WD, in 2010, 45 percent of MSB's employed residents worked outside the Borough.

Figure 5. Where MSB Residents Work, 2010

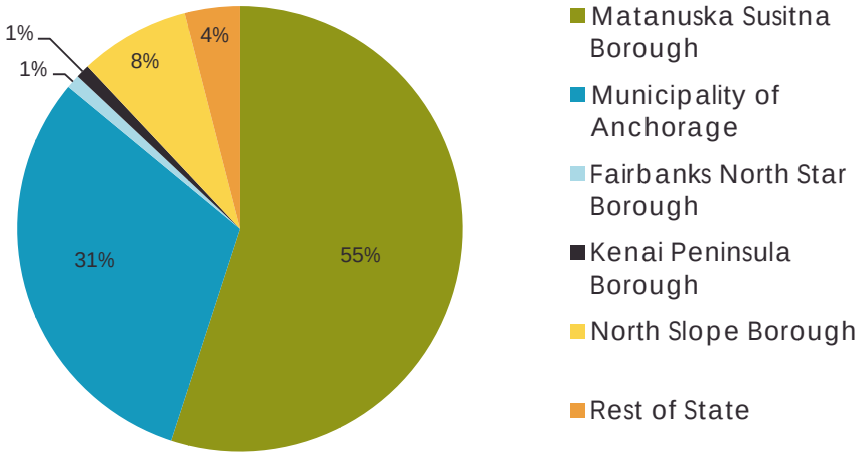


Table 4 shows the travel patterns of employed MSB residents.

[6] DOL&WD. 2015. Preliminary Annual Employment and Wages January – December 2015. Available on the internet at: http://live.laborstats.alaska.gov/qcew/ee15.pdf

Table 4. MSB Home-to-Work Travel Patterns, 1990, 2000, 2005, and 2012

Travel Mode	1990	2000	2005	2012
Worked at Home	812	1,547	1,058	2,347
Drove Alone to Work	10,380	16,988	23,451	26,703
Car Pooled	2,559	4,021	6,753	5,153
Used Public Transportation	33	160	96	320
Other	1,786	1,933	2,037	2,750
Total	15,570	24,649	33,395	37,273

Note: Numbers are for workers 16 years and older. Other commute methods include bus, railroad, motorcycle, bicycle, walking, or other means.
Sources: ACS, U.S. Census Bureau 2000, 2005, and 2012.

Table 5 shows the time it takes MSB residents to travel to work. According to the ACS, the mean travel time to work in 2000 was 40.7 minutes, which means the average commute time has decreased by nearly 8 minutes between 2000 and 2012.

Table 5. MSB Travel Time to Work, 1990, 2000, and 2012

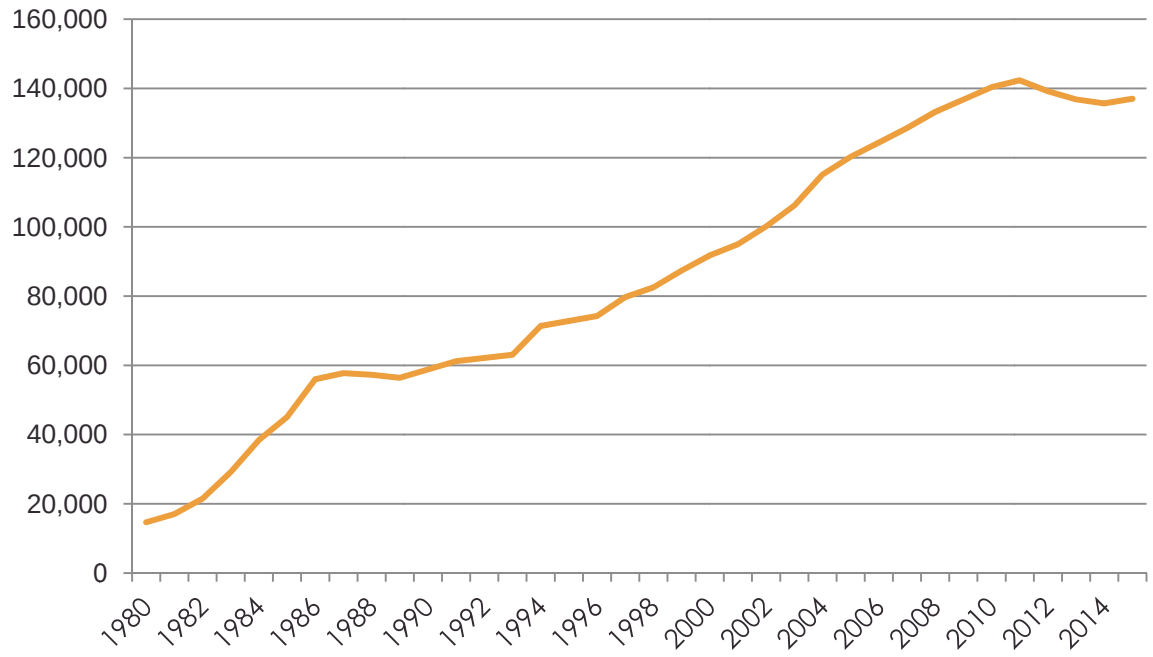
Time in Minutes	1990		2000		2012	
	# Persons	Percent	# Persons	Percent	# Persons	Percent
< 10	3,064	20.7%	3,416	14.8%	4,447	19.8%
10 to 14	2,075	14%	2,995	13.0%	4,278	19.0%
15 to 19	1,859	12.6%	2,841	12.3%	4,754	21.1%
20 to 24	1,242	8.4%	2,072	9.0%	3,260	14.5%
25 to 29	301	2.1%	777	3.4%	973	4.3%
30 to 34	753	5.1%	1,580	6.8%	2,190	9.7%
35 to 44	368	2.5%	895	3.9%	368	1.6%
45 to 59	1,199	8.1%	2,406	10.4%	264	1.2%
60 to 89	2,817	19.1%	3,784	16.4%	921	4.1%
90 >	1,080	7.3%	2,336	10.1%	809	3.6%
Total	14,758	99.9%	23,102	100.1%	22,504	100%

Source: U.S. Census Bureau

Registered Vehicles

As the MSB's population has grown, so has the number of registered vehicles (see Figure 6). The number of vehicles is an indicator of the high dependency MSB residents have on automobiles. The number of registered vehicles includes passenger, motorcycle, commercial trailer, trailer, commercial truck, pickup, bus, and snowmobile. The number of registered vehicles has generally increased between 1980 and 2011. In 2012, 2013, and 2014, the number of registered vehicles declined slightly before rising again in 2015.

Figure 6. Number of Registered Vehicles in the MSB, 1980–2015



Source: Alaska Department of Motor Vehicles
Note: Data not available for 1990, 1992, and 1995.

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Chapter 3
Existing Conditions

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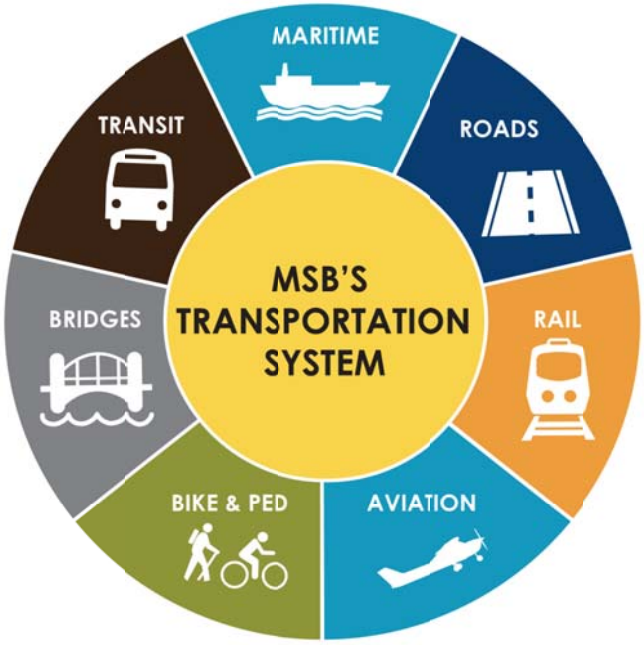
Chapter 3 Existing Conditions

This chapter includes an overview of surface transportation details such as roadway traffic volumes, functional classification, level of service, safety, transit operations, and bike and pedestrian facilities. Rail, aviation, and marine are specialized modes that are described in Chapters 7, 8, and 9.



Roadway System

Highways and roads are the primary transportation system in the MSB. The movement of people and goods requires an efficient transportation network from origin to destination.

The MSB road system is evolving from a meandering system of narrow roadways that connected communities, farms, and mining districts to its current system of Interstate Highways, arterials, collectors, and supporting local roads. Roads in the MSB are owned and maintained by DOT&PF; MSB and its RSAs; and the Cities of Houston, Palmer, and Wasilla; and a few roads are owned by the Chickaloon Village. Many improvements has been made in the last 20 years, including upgrading portions of the Glenn and Parks Highways to controlled access freeways, constructing new arterial roadways such as new sections of the Bogard/Seldon Corridor, Seward Meridian Parkway, and the new Trunk Road, improving the collector road network such as Mack Road Extension, Vine Road, and realigning South Big Lake Road. Several more projects are being implemented that will continue to upgrade the MSB road system.

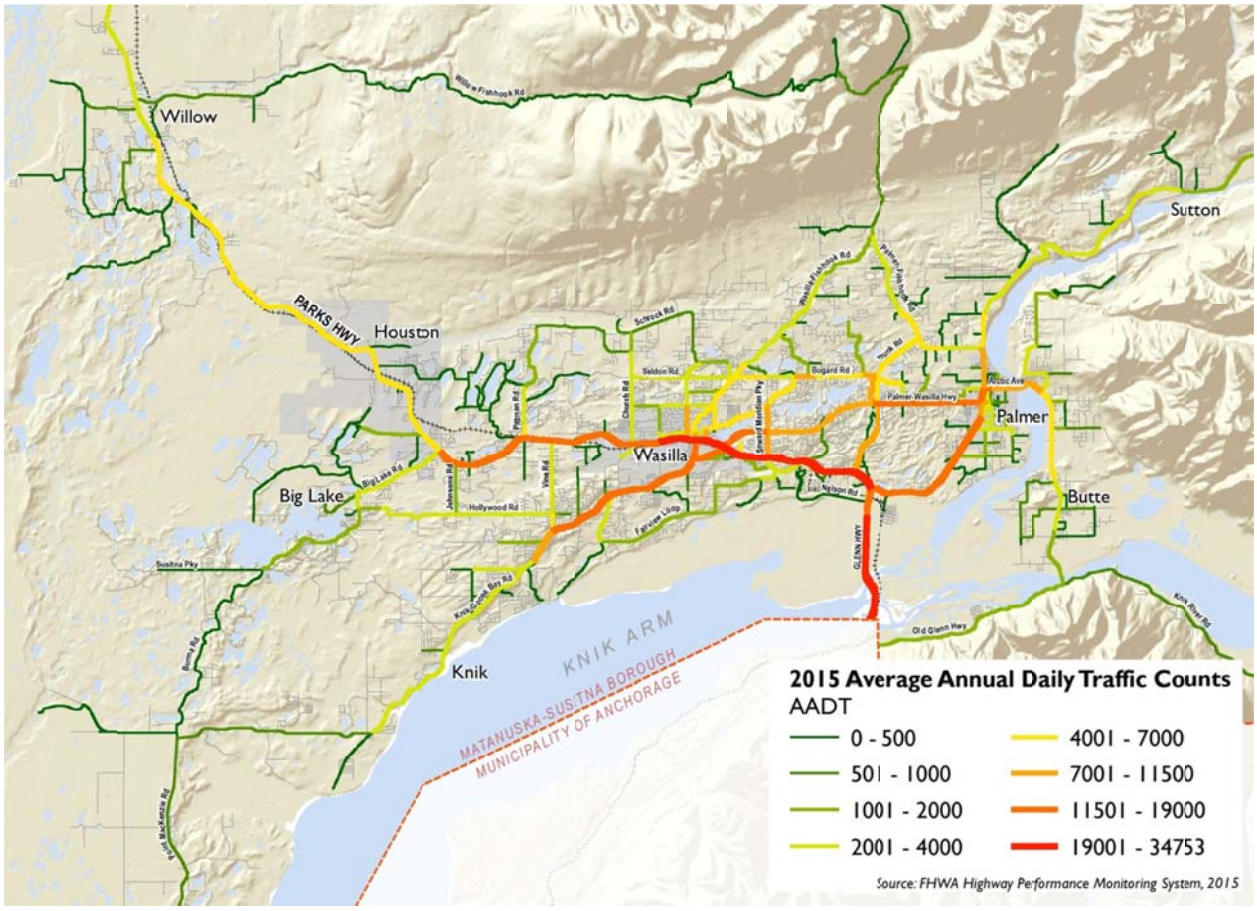
However, the ongoing rapid growth and low density development pattern of the MSB means additional roadway improvements are needed. For example, the Palmer-Wasilla Highway, is a key arterial connection between Palmer and Wasilla carries high traffic volumes and has uncontrolled access. This arterial connection also serves as a local road because many adjacent subdivisions are neither interconnected nor accessed by collector-level roads. Residents must use the Palmer-Wasilla Highway to travel less than one-quarter mile to access adjoining businesses or to visit neighbors. The collector road network needs to be expanded, to improve subdivision connectivity and reduce local traffic accessing arterials to make short trips.

Understanding the existing roadway system in the MSB, how well it functions today, important safety concerns, level of service, and other factors will aid in making sound project decisions to address current limitations and future needs. This chapter lays the foundation of informed decision making.

Annual Average Daily Traffic

Annual Average Daily Traffic (AADT) is a helpful tool in understanding traffic patterns. AADT is the annual traffic volume on a given roadway segment divided by the number of days in the year. AADT can be used to identify areas that may have increased wear or need improvements to handle the existing traffic volumes. The 2013 AADT is shown on Figure 7.

Figure 7. Annual Average Daily Traffic, 2015



Functional Classification

Functional classification assigns roadways categories according to the role they are expected to play in the movement of traffic. There are three basic functional classifications:

Courtesy of DOT&PF

- **Arterial:** These roads provide mobility so traffic can move from one place to another quickly and safely. Arterials are expected to be largely accessed controlled with a minimal number of intersections or interchanges.
- **Collector:** These roads link arterials and local roads and perform some duties of each. Collectors have some access control and a moderate number of intersections and driveways.
- **Local:** These roads provide access to homes, businesses, and other property. Local roads do not have any access controls and can have frequent intersections or driveways.

Table 6 summarizes the MSB functional classification and

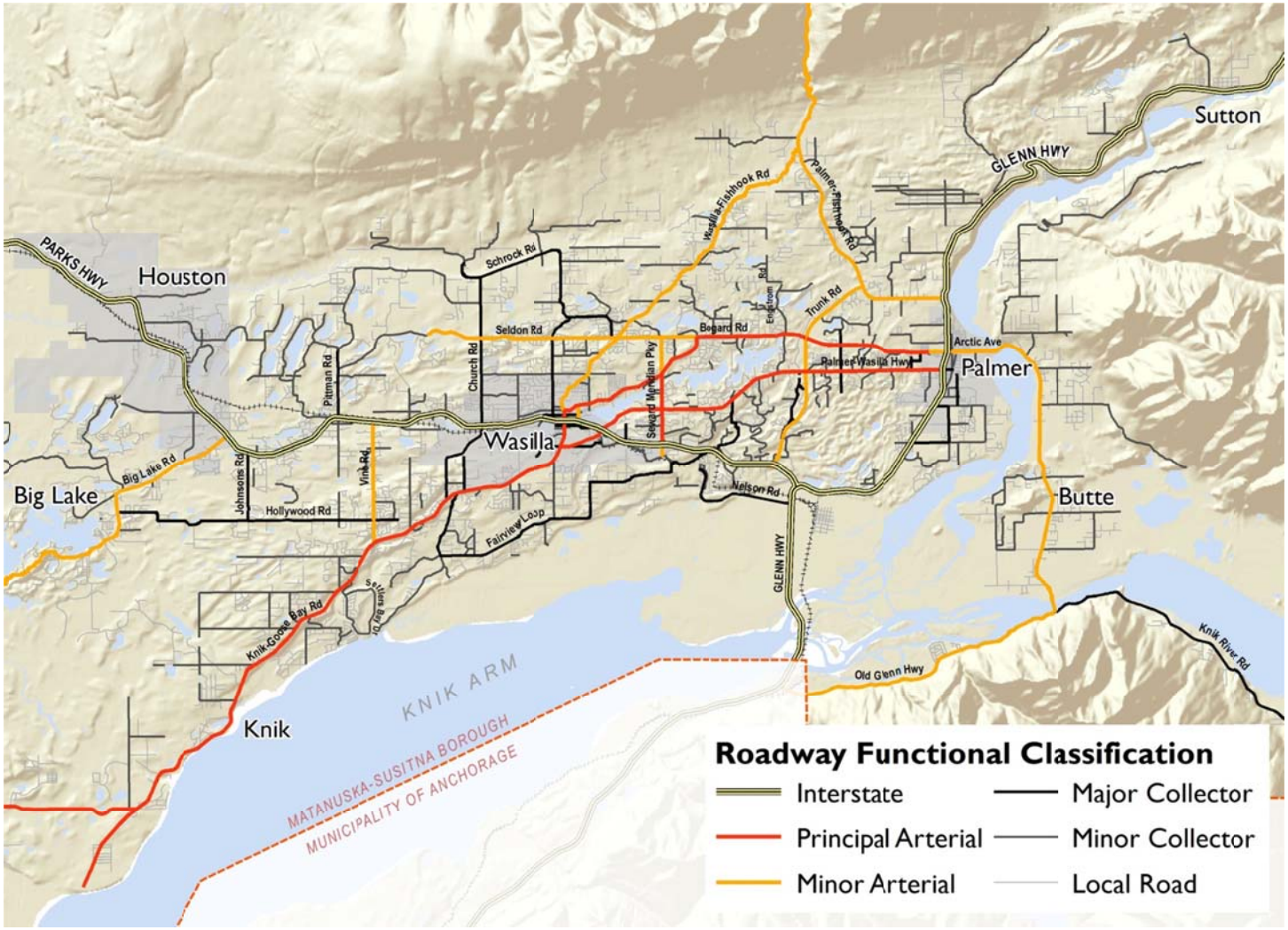
According to the MSB Community Survey 2014 and Trends 2009-2014, 63.4 percent of respondents agreed or strongly agreed that traffic congestion is a serious problem in the MSB.

Figure 8 shows current roadway functional classification.

Table 6. MSB Functionally Classified Roadways

Functional Classification	Length (Miles)	Percent of Network	FHWA Recommended Percent of Total Network Range
Local	1,633	62	65-80%
Collector	548	21	5-10%
Arterial	183	7	12-25%
Interstate	266	10	NA
Total	2,630	100%	

Figure 8. MSB Functional Classification



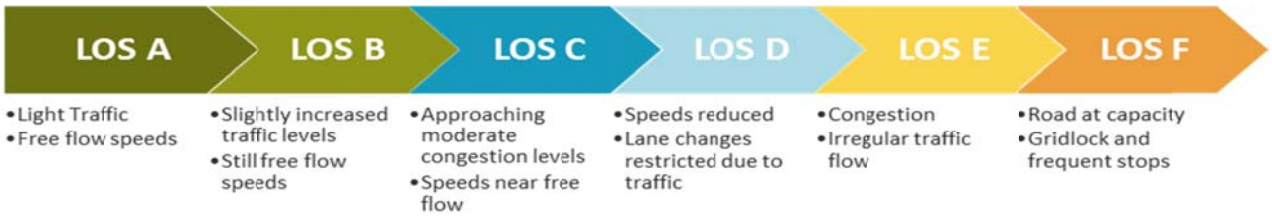
National Highway System

The National Highway System (NHS) includes the Interstate Highway System as well as other roads that are important to the national economy, defense, and mobility. Corridors that are part of the NHS within the MSB are the Glenn Highway, Parks Highway, Palmer-Wasilla Highway, and Knik-Goose Bay Road.

System Performance

One measure of transportation system performance is Level of Service (LOS), which is a qualitative measure used to describe traffic conditions and the speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety experienced by users. LOS are given letter designations, from A to F, with LOS A representing the best operational conditions and LOS F representing the worst (see Figure 9).

Figure 9. Summary of Levels of Service

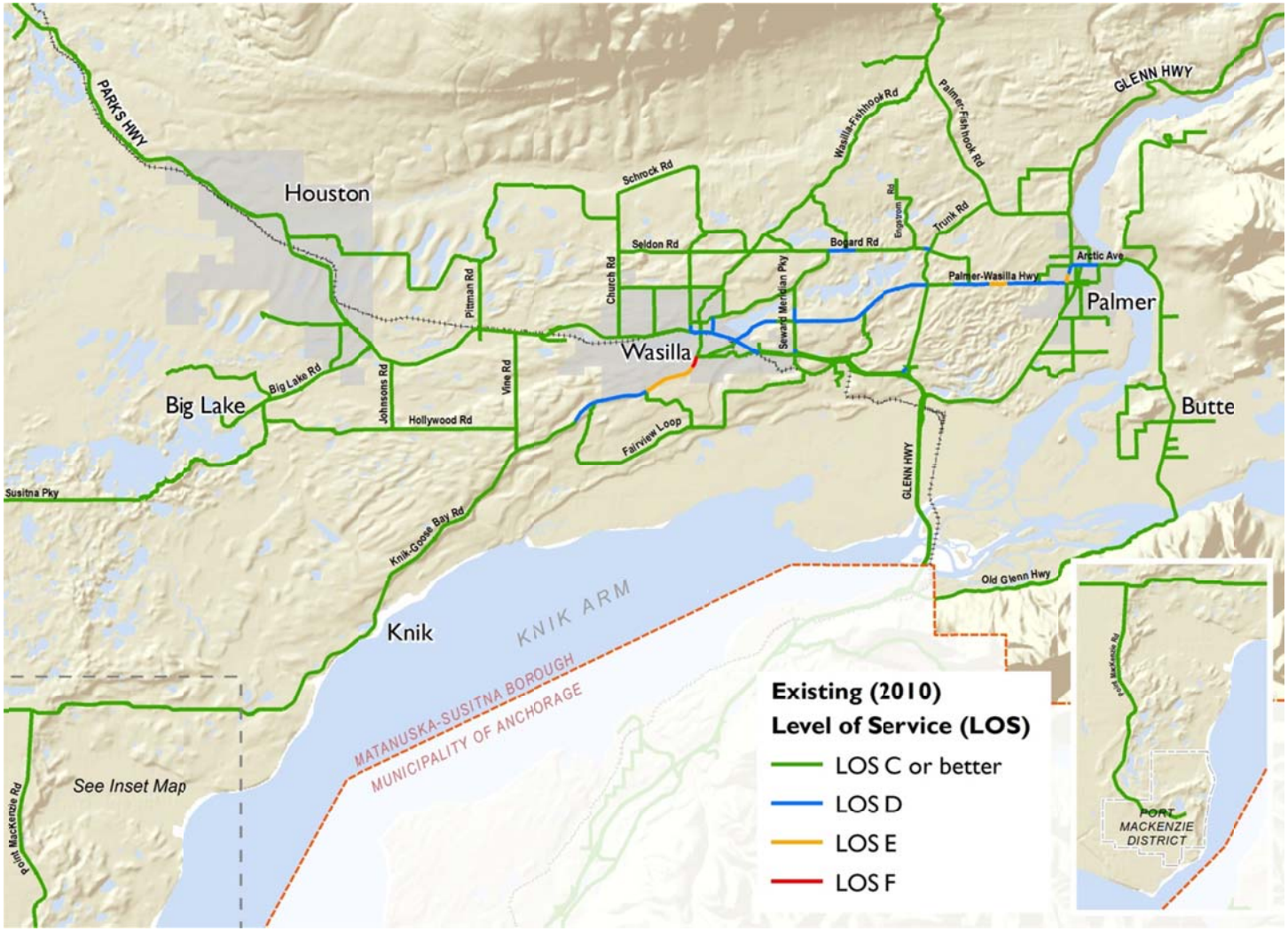


Source: Highway Capacity Manual and HDR

This LRTP update will recommend projects that improve the performance of roadways that are currently operating at an acceptable LOS. The MSB considers LOS D or above to be acceptable, but LOS C is preferred for principal arterials (e.g., the Palmer-Wasilla Highway and the new Trunk Road) and interstate highways (e.g., the Parks and Glenn Highways). The MSB Traffic Model shows that some roadways are operating at unacceptable levels today (see Figure 10). The roads that are currently performing at an unacceptable LOS include:

- **Knik-Goose Bay Road:** LOS D, E, and F
- **Palmer-Wasilla Highway:** LOS D – NO LOS F
- **Parks Highway through Wasilla:** LOS D

Figure 10. MSB Existing Level of Service



Safety

Between 2011 and 2015, the number of fatalities ranged from 11 to 15 and the number of fatal crashes ranged from 9 to 12 (see Table 7).

Table 7. Fatalities, 2011-2015

	2011	2012	2013	2014	2015
Fatal Crashes	9	11	10	12	12
Total Fatalities	13	11	11	14	15
Fatalities per 100,000 population	14.15	11.73	11.47	14.24	14.84

Source: NHTSA, 2016[7] and DOT&PF, 2016

Safety Corridors

In 2006, the State adopted Alaska Statute 19.10.075, Safety Corridor legislation to make existing roads safer.[8] Alaska adopted the following minimum criteria to identify segments for Safety Corridor consideration:

- Interstates, rural major arterials, or collectors with an AADT equal or greater than 2,000
- A 3- to 5-year fatal and major injury incident rate greater than 110 percent of statewide averages
- A 3- to 5-year fatal and major injury crash rate per 100 million vehicle miles greater than 100 percent of statewide averages
- Agencies agree on measurable, effective traffic control and traffic patrol plan
- Equal to or greater than 5 miles in length, of similar character, with logical termini

As of October 2016, there are two Safety Corridors in the MSB (see Figure 11):

7 http://dot.alaska.gov/stwdplng/hwysafety/assets/pdf/Fatal_Motor_Vehicle_Crashes_by_Brough_Census_Area_1995_2015.pdf

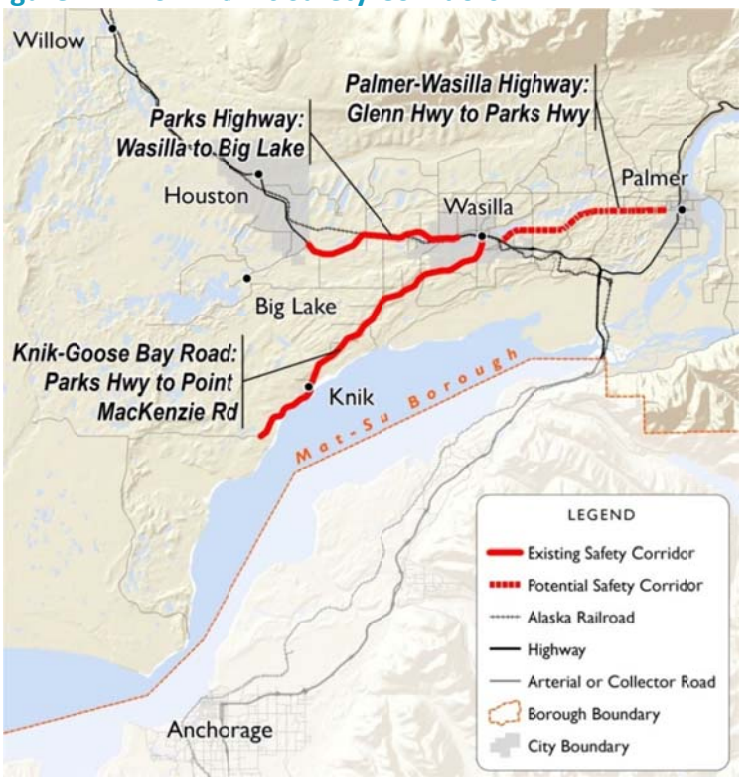
8 Thomas, Scott E., PE. n.d. Safety Corridors in Alaska. Available at http://www.westernite.org/annualmeetings/alaska11/Compendium/Moderated%20Session%20Papers/3D-Scott%20E.%20Thomas.pdf

- **Parks Highway:** Wasilla to Big Lake
- **Knik-Goose Bay Road:** Parks Highway to Point MacKenzie Road

On these corridors, DOT&PF has made roadway improvements, added signage identifying the roadway as a Safety Corridor, installed radar-activated speed limit signs, and increased fines for unsafe activity. Enforcement has also been increased. As a result of these improvements, the number of crashes in these corridors has declined.

The Palmer-Wasilla Highway, between the Glenn and Parks Highways, has been nominated as a Highway Safety Corridor.

Figure 11. MSB Traffic Safety Corridors



Bridge Conditions

FHWA maintains a database, the National Bridge Inventory (NBI), with data collected by the State Transportation Agencies, on all public bridges in the United States that are greater than 20 feet in length. Using National Bridge Inspection Standards, State inspectors visually assess and record up to 116 standards for the NBI. The database contains condition ratings for the primary bridge components—the deck, substructure, and superstructure—that provide an overall characterization of the bridge's general condition. The condition ratings, along with a structural assessment of the clearances, approach roadway alignment, deck geometry, and load carrying capacity are used to determine the sufficiency of a bridge.

An insufficient bridge is categorized in one of two ways:

- Structurally Deficient – A bridge is considered structurally deficient if the deck, substructure, superstructure, or culvert is rated at or below "poor" condition (0 to 4 on the NBI Rating Scale). A bridge can also be structurally deficient if load-carrying capacity is significantly below current design standards, or the adequacy of the waterway opening

provided is determined to be very insufficient to the point of causing intolerable roadway traffic interruptions. A bridge that is classified under the Federal definition of "structurally deficient" does not necessarily mean the bridge is unsafe. A structurally deficient bridge, when left open to traffic, typically needs major maintenance and repair to remain in service and will eventually need to be rehabilitated or replaced to address deficiencies.

- Functionally Obsolete – A bridge is functionally obsolete if the roadway geometry no longer meets current minimum design standards for width or vertical clearance classifications. A functionally obsolete classification does not mean that a bridge is unsafe. If a bridge meets the criteria for both structural deficiency and functional obsolescence, it is only identified as structurally deficient, because structural deficiencies are considered more critical.

Error! Reference source not found. shows the number of structurally deficient and functionally obsolete bridges in the MSB according to the 2015 NBI. Of the 113 classified bridges, 17 have an insufficient rating. Approximately 9.7 percent of the bridges are structurally deficient and 5.3 percent are functionally obsolete. There are additional bridges that do not qualify for the NBI but have low sufficiency ratings.

Table 8. Structurally Deficient and Functionally Obsolete Bridges in the MSB, 2015

Status	Number of Bridges	Percent of Total
Structurally Deficient	11	9.7
Functionally Obsolete	6	5.3
Not Deficient	96	85

Source: NBI[9]

DOT&PF's 2013 Bridge Report

Alaska DOT&PF's most recent 2013 Bridge Report may be found at the following link: http://dot.alaska.gov/stwddes/desbridge/assets/pdf/2013bridgereport.pdf

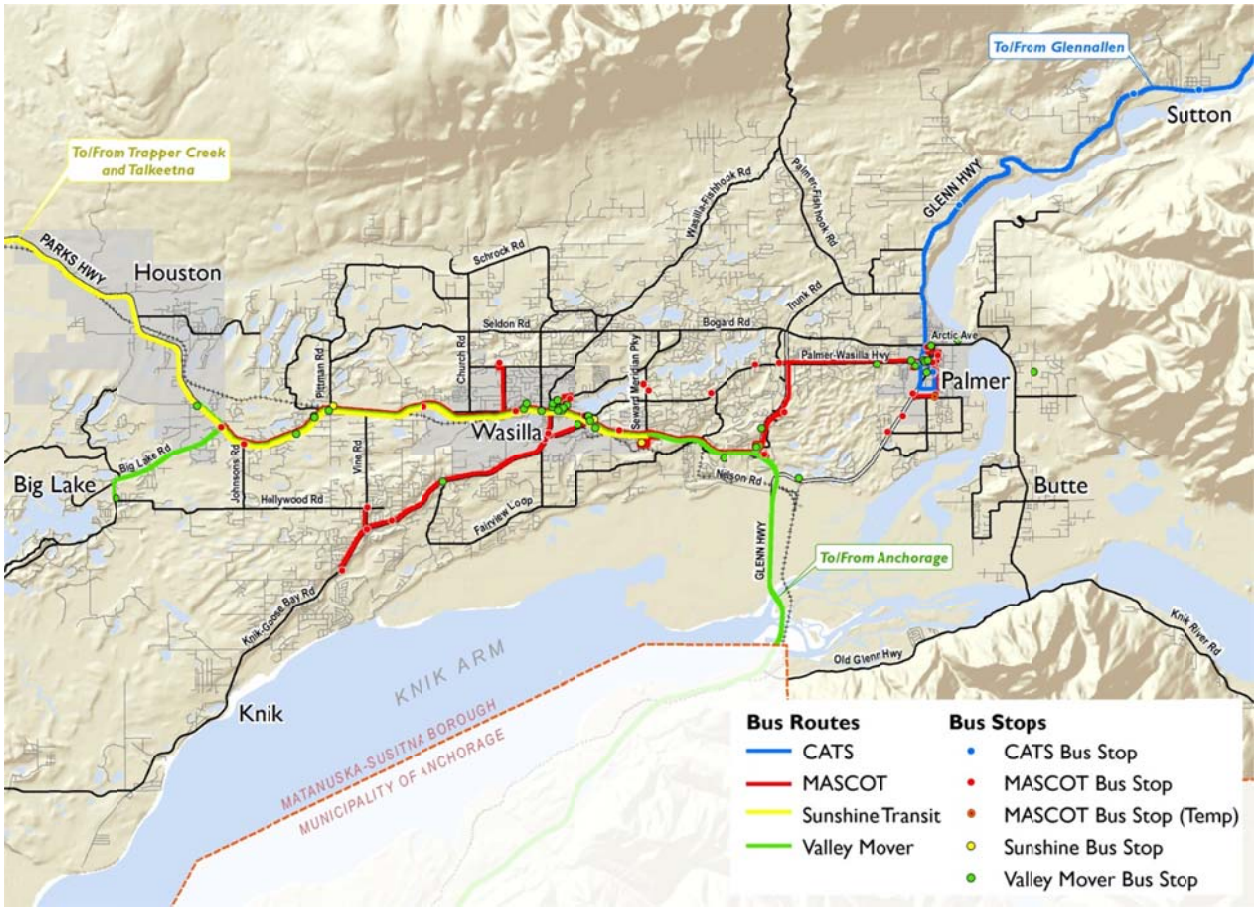
Transit System

Non-profit entities, rather than local government, provide public transit services in the MSB. These entities include Mat-Su Community Transit (MASCOT), Valley Mover, Sunshine Transit, Chickaloon Area Transit System (CATS) and People Mover's Share-a-Ride vanpool program. The Mat-Su Senior Center (formerly known as the Palmer Senior Citizens Center) also provides transportation to individuals who meet certain eligibility qualifications such as being over 60

[9] NBI. 2016. The National Bridge Inventory Database. Available at http://nationalbridges.com/index.php (accessed 8/25/2016)

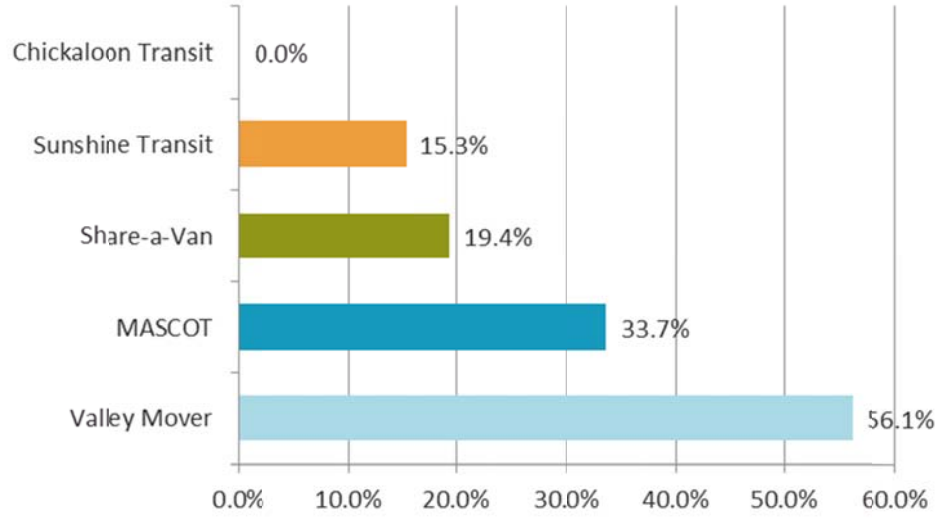
years of age or qualifying for the Medicaid Waiver program. The routing and stops for each transit provider is shown in Figure 12.

Figure 12. Existing Transit Service



The 2014 *Matanuska-Susitna Borough Community Survey* found that over 90 percent of survey respondents had never used public transportation in the MSB. Of the respondents that used transit, approximately 56 percent used Valley Mover, the major provider of commuter fixed-route service between the MSB and Anchorage (see Figure 13).

Figure 13. MSB Public Transportation Services Used, 2014

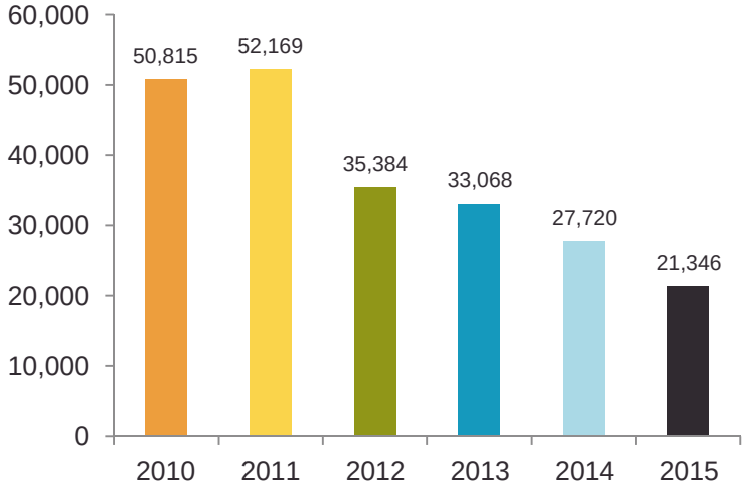


Source: Matanuska-Susitna Borough Community Survey, 2014

MASCOT

MASCOT is a non-profit organization that provides public transportation and is primarily funded through Federal, State, and local grants. Other sources of revenue include passenger fares, private donations, local government contributions, and advertisements. It provides service in the core area of Palmer and Wasilla with limited service to Meadow Lakes and Knik. It currently operates three vehicles providing "Route Deviation" bus service, meaning that buses can deviate from their route for pickups and drop offs. Depending upon the closeness of the location to the route and the time requested. It provides "demand response" bus service, which does not follow a printed schedule, trips are scheduled in advance by clients. All services are available to the general public. Its hours of

Figure 14. MASCOT Ridership, 2010-2015

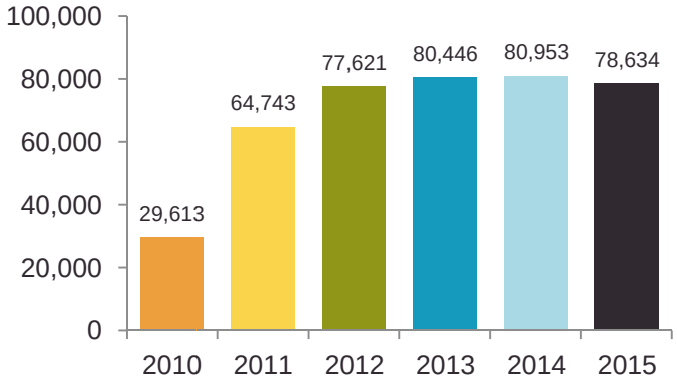


operation are typically Monday through Friday from 5:30 am to 7:30 pm. In 2014, it operated 14 vehicles and had an average weekly ridership of 570. Annual ridership is shown in Figure 14.

Valley Mover

Valley Mover is a non-profit public transportation system that provides transit between the MSB and Anchorage. It operates Monday through Friday and provides 15 round trips per day between the MSB and the Anchorage Bowl and another 2 trips between the MSB and Eagle River. Annual ridership is shown in Figure 15.

Figure 15. Valley Mover Ridership, 2010-2015



Sunshine Transit

Sunshine Transit provides public transportation for the Upper Susitna Valley (primarily Talkeetna, Trapper Creek, Willow, and Wasilla). It is operated by the non-profit Sunshine Community Health Center, doing business as the Sunshine Transit Coalition. Sunshine Transit operates Monday through Saturday on a deviated flexible route service[10] in the Talkeetna area (with flag stops), with on-demand service to Trapper Creek, Willow, and Wasilla. It operates four vehicles and has a typical weekly ridership of 119.

Chickaloon Area Transit

Chickaloon Area Transit (CATS) has been operated by the non-profit Chickaloon Native Village since 2006. It operates as a demand response service between Chickaloon and Palmer.[11] Service is provided Monday through Friday from 8:30am to 5:00pm. In 2014, it operated three vehicles and had a typical weekly ridership of 50.

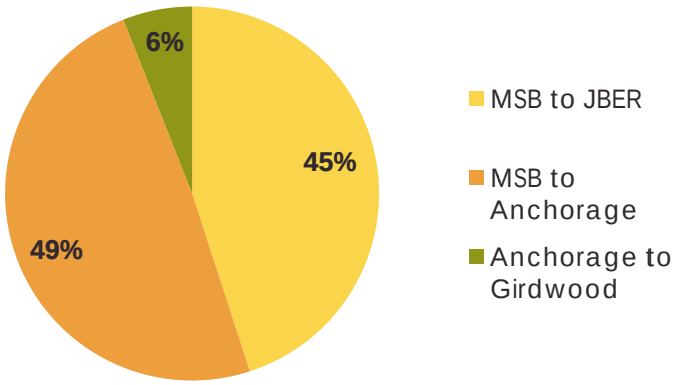
Other transit providers

Anchorage Share-A-Ride added vanpooling service to the MSB in 1995. The program provides vans that can accommodate eight to 13 people for approximately $130 per month. The Share-A-Ride program has a weekly ridership of approximately 2,400. Forty-five percent of the clientele is comprised of people commuting between the Matanuska-Susitna Valley and Joint

[10] The bus can go up to ¾ mile off the Spur Road for individuals with special needs.
[11] MP 40 to 70 of the Glenn Highway, Chickaloon to Sutton, Buffalo, Soapstone, and Palmer.

Base Elmendorf-Richardson (JBER), 49 percent is comprised of Valley to Anchorage commuters, and 6 percent is traveling between Girdwood and Anchorage (see Figure 16). [12, 13]

Figure 16. Distribution of Share-A-Ride Trips by Location



The Mat-Su Senior Center primarily operates in the core area of the MSB but may go as far as Willow, Chickaloon, and Anchorage. It currently operates 29 vehicles and has a typical weekly ridership of 550.

Transit Consolidation

DOT&PF has mandated a consolidation of transit services provided by MASCOT and Valley Mover[14] to try to reduce duplicate expenses and put more buses on the road to provide better service. A study funded through the Mat-Su Regional Health Foundation explored the potential for consolidated transit service and recommended the best operating structure for transit in the MSB. MASCOT and Valley Mover have since merged as part of the consolidation process.

Inter-Region Bus

As of February 2017, there were three inter-region bus companies offering transit service between the MSB and communities other than Anchorage. These include:

[12] MOA, 8/15/2014. See also http://www.vride.com

[13] DOT&PF. 2016. Alaska Statewide Long-Range Transportation Plan. Let's Keep Moving 2036: Policy Plan. September 2016. Draft. Available at http://dot.alaska.gov/stwdplng/areaplans/lrtpp2014/docs/20160907_LRTP_policyplan_draft.pdf

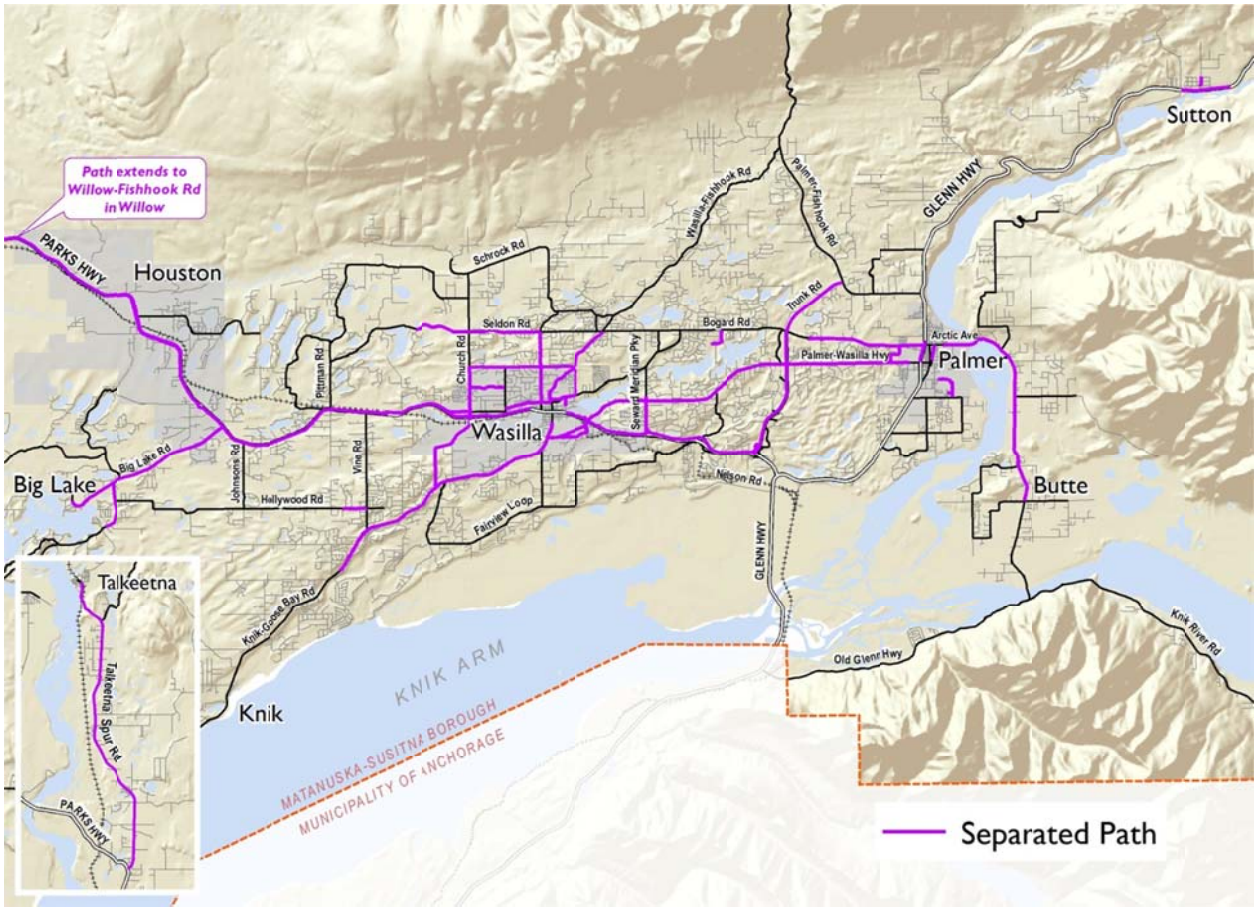
[14] Sunshine Transit was excluded because it was an extension of the health clinic, and CATS was excluded because it is operated using tribal funds, not DOT&PF funding.

- **The Park Connection** – The Park Connection provides bus service between Seward, Anchorage, Talkeetna, and Denali Park. It serves Whittier, Girdwood, and Moose Pass on a limited basis. It provides service seven days per week between mid-May and mid-September. In 2015, it carried more than 20,000 passengers.
- **Interior Alaska Bus Line** – The Interior Alaska Bus Line provides service between Anchorage, Fairbanks, Tok, and Northway. In the MSB, its only stop is in Palmer. It operates year-round on Monday, Wednesday, and Friday. Its fleet consists of three cut-away buses and two 12 passenger vans.
- **Soaring Eagle Transit** – Soaring Eagle Transit provides public transportation along the lower Richardson and Glenn Highways within the Copper River Basin and MSB. Its Gulkana-Valdez-Anchorage route includes a stop in Palmer. This route operates three days per week.

Active Transportation System

Active transportation in the form of walking and bicycling are of interest to MSB residents and policy makers. Almost everyone is a pedestrian for at least a portion of each trip taken. Our active transportation network consists largely of sidewalks and separated paths. The MSB does not have a sidewalk requirement, so the presence of sidewalks is sporadic. Sidewalks are typically found in the original Palmer townsite area and historic, commercial part of downtown Wasilla. The separated paths trail network is typically associated with recent DOT&PF and MSB arterial road projects that built the paths in conjunction with roadway improvements. The existing separated paths are shown in Figure 17.

Figure 17. MSB Separated Bicycle and Pedestrian Trails



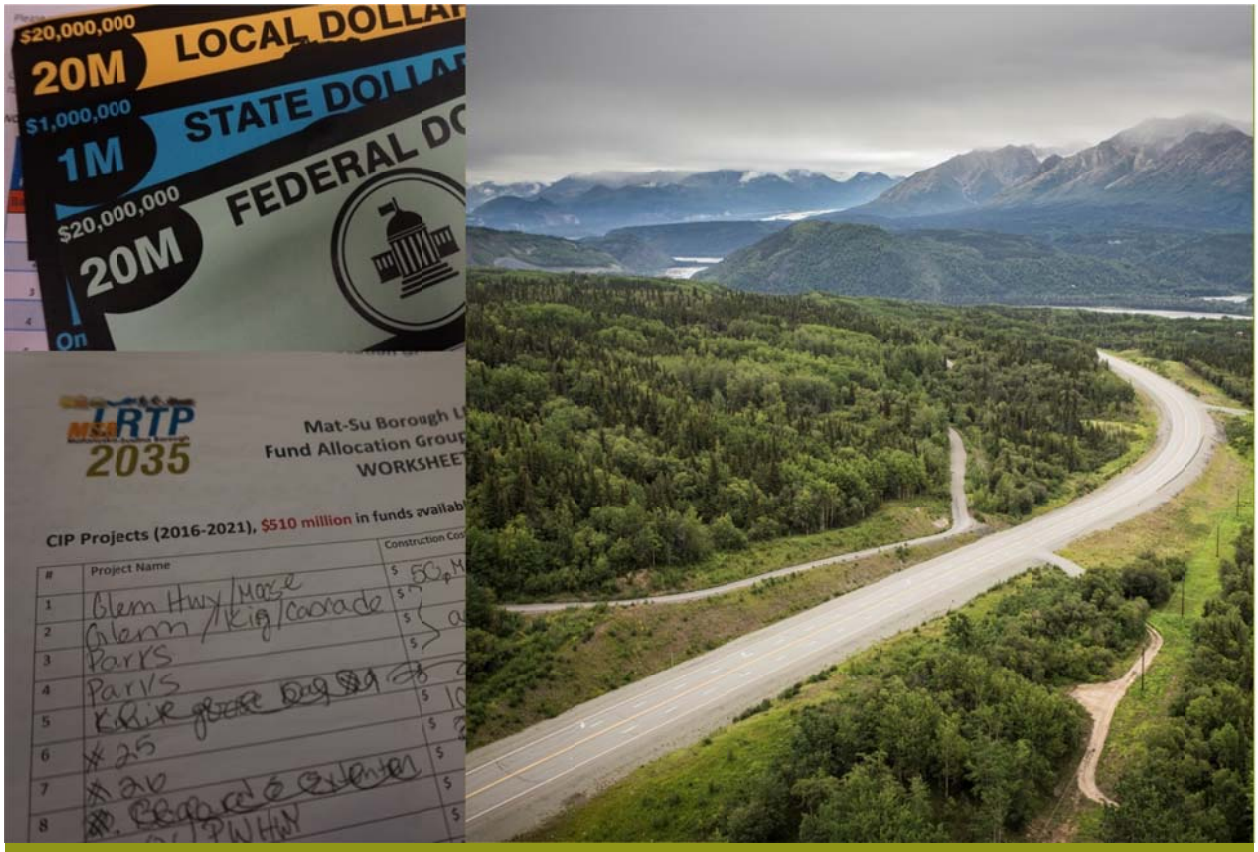
Freight

The safe and efficient movement of freight is important to the MSB economy and quality of life. In the MSB, like most areas of the United States, freight is moved mainly by truck and rail. Trucking serves both long haul and local delivery with rail serving long haul and very large freight transport. The major routes for hauling goods to, from, and through the MSB are the Glenn and Parks Highways with visual observation indicating an increase in freight traffic on the Bogard-Seldon corridor from the City of Palmer to Church Road. Some of the freight traffic on the Glenn and Parks Highways is

destined for the MSB, but much of it is being transported between Anchorage and Fairbanks or Anchorage and the Lower 48. Of the freight designed for the MSB, much of it is associated with retail goods being trucked in from Anchorage or the Lower 48 to retail big box stores and gas stations.

There is also considerable interest in increasing freight activity in the MSB related to Port MacKenzie and the Port MacKenzie Rail Extension. Port MacKenzie is a deep water and industrial/commercial area. The port was designed to ship heavy industrial and bulk materials such as wood products, mineral ores, gravel, liquid and gaseous fuels, and cement. It has a large upland area that is currently being developed as part of the Port MacKenzie Rail Extension and is adjacent or in proximity to the existing deep draft and barge docks. As a result, bulk materials can be offloaded, stored, reclaimed, and shipped via rail, truck, pipeline, barge, and ship without excessive constraints and limitations. The Port MacKenzie Rail Extension, when completed, will create the shortest rail route from Interior Alaska to tidewater. It may also provide a staging and lay down area for the Alaska Natural Gas Line Project.

Please see Chapter 10 for additional information regarding the Port MacKenzie Rail Extension Section and Chapter 11 for additional information regarding Port MacKenzie.



Chapter 4
Fiscal Constraints

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Chapter 4 Financial Constraints

Recognizing financial realities is critical to the long-range transportation planning process. Identifying funding constraints adds realism to the plan as it shows how the LRTP's proposed improvements can be implemented. Fiscal constraints help communicate priorities because they require the MSB to forecast the amount of transportation funding they will have for the next 20 years. A fiscally constrained LRTP can only recommend projects that fit within a reasonable revenue forecast. Projects that are part of a fiscally constrained plan are a higher priority than those that are not included.

The MSB has experienced significant population growth over the last 40 years and currently exceeds 100,000 residents. It is at the cusp of population and density milestones required to have the more densely populated portion of the MSB established as a Metropolitan Planning Organization (MPO).[15] This designation will likely occur after the 2020 Census. MPOs are required to develop a fiscally constrained LRTP.

Unlike previous MSB LRTPs, this LRTP update is fiscally constrained. This LRTP presents a realistic financial plan to pay for the recommended projects. This initial effort will only look at the costs of roadway improvements and funding categories to pay for them: Federal Highway Funds, including State General Fund Match; State General Funds; and Local MSB Bond revenues. Once an MPO is established in the MSB, the fiscal constraint analysis must comply with FHWA regulations and address the many sub-categories of Federal-aid funding.

Traditionally, funding for surface transportation projects in the MSB comes from three main sources: FHWA, the State, and the MSB. Historically, approximately 85 percent of State revenues have been the result of income generated by oil and gas royalties and taxes. In August 2014, the price of a barrel of Alaskan Crude Oil exceeded $100.00. However, since that time, the price has dropped to $30.00 per barrel at its low point. As of October 2016, the price has rebounded to the high $40.00 to low $50.00 per barrel range. Low prices are now coupled with

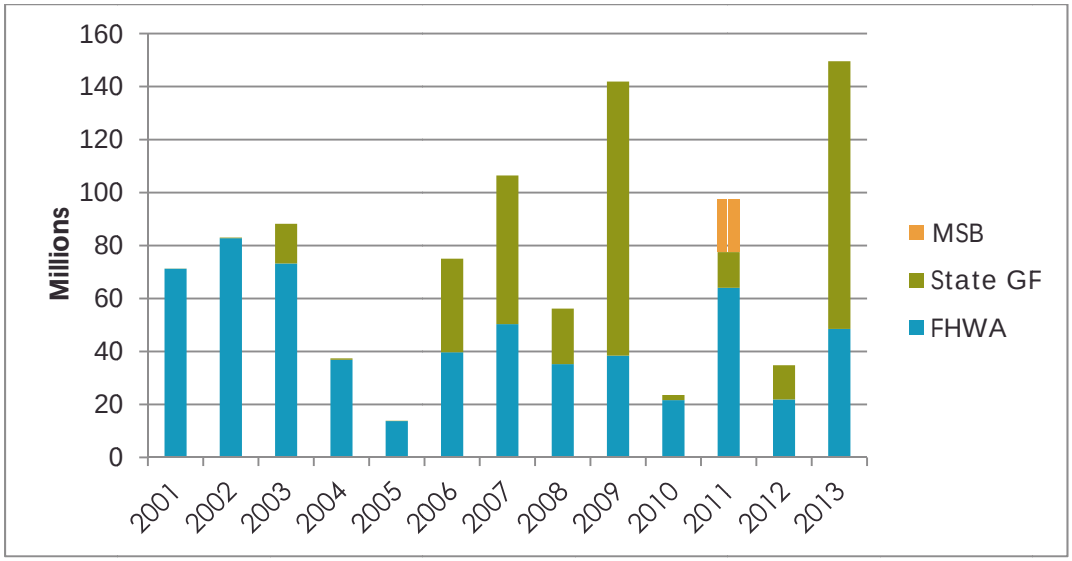
[15] Federal regulations require any urbanized area (UZA) with a population greater than 50,000 and a density of _____ to have an MPO. A UZA is a census-designated urban area with 50,000 residents or more.

low production, with the Trans-Alaska Pipeline only operating at 25 percent capacity, or roughly 500,000 gallons per day, resulting in greatly reduced revenues for the State.

This has had a significant impact on the State's ability to fund transportation projects. Two years ago, the Fiscal Year (FY) 2015 State Capital Improvement Program included over $1 billion in State funded transportation projects in addition to the federally funded transportation projects statewide. Since then, there has been essentially no State General funding or General Obligation Bonds issued for roadway projects except for the roughly 10 percent match needed to leverage Federal Highway and Aviation Funds. This decrease in State funding limits the ability to respond to the many roadway needs in the MSB. It is expected that will be the case until oil revenues and production increase significantly and/or new State and local revenue sources are identified.

Between 2001 and 2013, the MSB received an average of $46 million per year from FHWA via DOT&PF and $27.8 million per year from the State (Figure 18). In addition, the MSB received $40.0 million from the 2011 Road Bond Package (50 percent of the bond was funded by the State).

Figure 18. Annual Transportation Funding by Source, 2001-2013



DOT&PF administers several Federal-aid funding programs. As listed in the 2016-2019 Statewide Transportation Improvement Program (STIP) Surface Transportation Funding Sources[16], these programs include:

CMAQ (Congestion Mitigation/Air Quality) – *These funds are for projects that can be proven to reduce traffic congestion and/or improve air quality in federally designated non-attainment areas. Projects such as park and ride lots, transit bus replacement, vehicle inspection and maintenance program improvements, signal coordination, ride sharing, and paving for dust control qualify for these funds. The federal funds ratio varies and is either 90.97 percent or 100 percent, depending upon the specific category of work.*

NHPP (National Highway Performance Program) – *In MAP-21 section 1106, Congress designated the NHPP to provide support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS. This funding code incorporates previous NHS, IM and some BR fund codes. The federal funds ratio is 90.97 percent.*

RHE (Rail Hazard Elimination Program) – *This purpose of this program is to reduce the number of fatalities and injuries at public highway-rail grade crossings through the elimination of hazards and/or the installation/upgrade of protective devices at crossings. This program funds the federal requirement that each state conducts and systematically maintain a survey of all highways to identify railroad crossings that may require separation, relocation, or protective devices, and establish and implement a schedule of projects for this purpose. The federal funds ratio is 90 percent.*

RTP (Recreational Trails Program) – *This funding category is intended to develop and maintain recreational trails and trail related facilities for both non-*

[16] DOT&PF. 2016. 2016-2019 STIP Surface Transportation Funding Sources. Available at: http://dot.alaska.gov/stwdplng/cip/stip/assets/1619_stipfundcodes.pdf

motorized and motorized recreational trail uses. This program is administered by the Department of Natural Resources. The federal funds ratio is 90.97 percent.

S148 (Safety Sanction) – *This special category of MAP-21 safety funds addresses highway safety improvement projects similar to Safety (SA40) below. New SA funding terminated following 2012 apportionment with the passage of MAP-21. The funds are made available by a sanction, or reduction, to Alaska's NHPP and Surface Transportation Block Group Program (STBGP) apportionments. Each year, 2.5 percent of these program funds are reallocated because Alaska does not have conforming laws addressing repeat driving under the influence charges and open alcoholic containers on motorcycles. The federal share is 100 percent.*

SA40 (Safety Sanction) – *This special category of safety funds addresses highway hazard eliminations similar to Safety (SA148) above, 100 percent federal. The funds are made available by a sanction or reduction to Alaska's Interstate Maintenance, National Highway System and Surface Transportation Program apportionments. Each year, 3 percent of these program funds are reallocated because Alaska does not have conforming laws addressing repeat driving under the influence charges and open alcoholic containers on motorcycles.*

STBGP (Surface Transportation Block Group Program) – *Flexible funding that may be used by the state and localities for projects on any Federal-aid highway, including the NHS, bridge projects on any public road, transit capital projects, bus terminals and facilities. Unlike other states, Alaska is allowed to use these funds on any public road in Alaska, regardless of classification. The federal funds ratio varies, typically 93.4 percent if spent on interstate routes or 90.97 percent otherwise. Prior to the FAST Act, this was known as the Surface Transportation Program.*

TA (Transportation Alternatives) – *The Moving Ahead for Progress in the 21st Century Act (MAP-21) replaced the Transportation Enhancement (TE) Activities with the Transportation Alternatives (TA) Program, a new program, with funding derived from the NHPP, STP, Highway Safety Improvement Plan (HSIP), CMAQ and Metropolitan Planning programs, encompassing most activities funded under the Transportation*

Enhancements, Recreational Trails, and Safe Routes to School programs under SAFETEA-LU. The federal funds ratio is 90.97 percent.

In addition, the new federal transportation funding bill, the Fixing America's Surface Transportation Act, or FAST Act, was signed into law. The FAST Act recognizes and creates funds for freight improvements. Freight funding under the FAST Act is primarily through two programs:

- **National Highway Freight Program (NHFP):** The FAST Act provides $6.3 billion in formula funds to States over a 5-year period. Eligible projects are those that contribute to efficient freight movements on the National Highway Freight Network and are identified in a freight improvement plan included in a state's freight plan **(**FHWA, 2016).[17] States can use a maximum of 10 percent of its NHFP apportionment for intermodal or rail freight projects. Alaska has 1,222.23 miles in the National Highway Freight Network, including the Glenn and Seward Highways in Anchorage. Alaska is expected to receive $80 million in funding through this program (Martinson, 2015).
- Fostering Advancements in Shipping and Transportation for the Long-Term Achievement of National Efficiencies (FASTLANE) Grant Program: This new competitive grant program will provide $4.5 billion of funding to nationally and regionally significant freight and highway projects over the next 5 years. Funding will be identified "**to complete projects that improve safety and hold the greatest promise to eliminate freight bottlenecks and improve critical freight movements" (U.S. Department of Transportation [DOT], n.d.).** FASTLANE grants can be used for a maximum of 60 percent of total eligible project costs. However, 10 percent of FASTLANE grants are reserved for small projects, with a minimum grant amount of $5 million. In addition, state Departments of Transportation need to spend at least 25 percent of each fiscal year's FASTLANE grants for project in rural areas (DOT, 2016).[18] States, Metropolitan Planning Organizations (MPOs), local governments, and tribal governments are among those organizations eligible to apply for a grant. Special purpose districts and public authorities (including port authorities), and other parties are eligible to apply for funding to complete projects that improve safety and hold the greatest promise to eliminate freight bottlenecks and improve critical freight movements.

[17] Required in FY 2018 and beyond.
[18] According to FHWA, a rural area is an area outside a U.S. Census Bureau designated urbanized area with a population of more than 200,000.

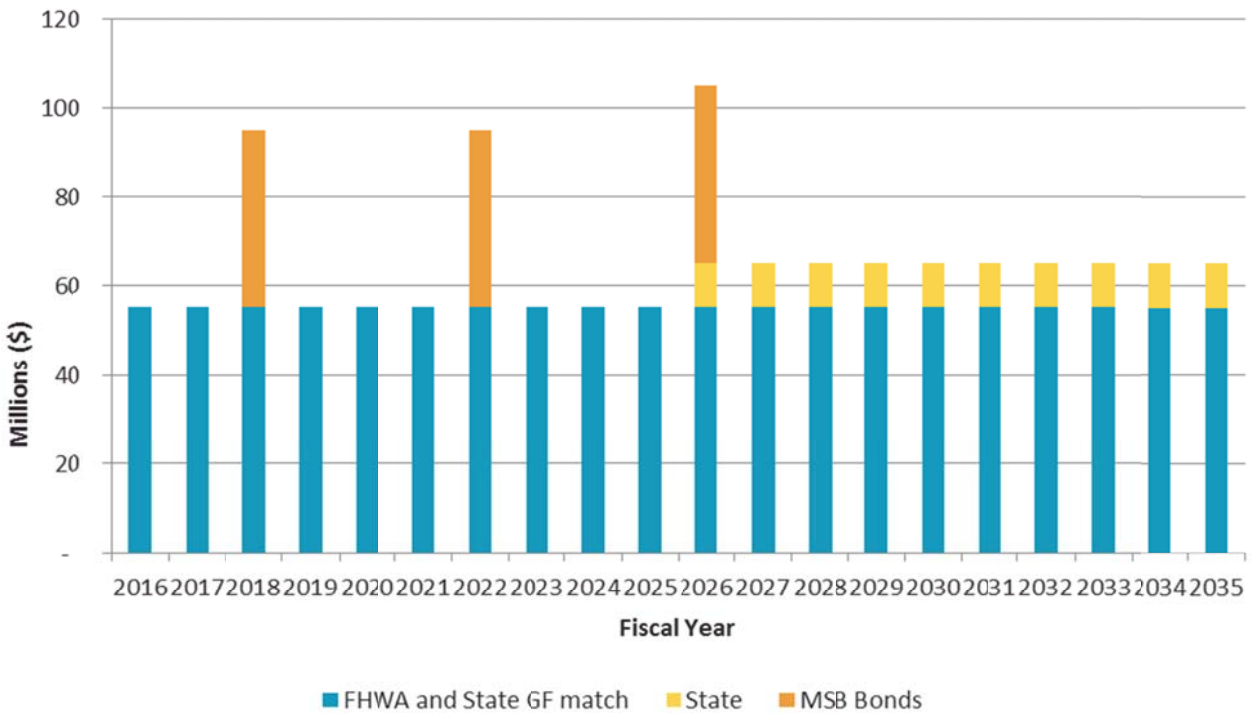
2035 MSB LRTP Fiscal Constraint Parameters and Assumptions

The requirements of each program and funding level vary from year to year as some funding sources are formula apportioned, while others are discretionary allocations. As a result, basing future funding levels on historical funding may be misleading. The projected funding levels were developed based on historical information combined with guidance from DOT&PF and the MSB. The estimated revenue includes the following assumptions:

- $55 million annually in Federal Highway Funds and State General Fund Match over the next 20 years
- No State General Fund revenue for roadway projects from 2016 to 2025
- $10 million annually in State General Fund revenue for 2026 to 2035 through DOT&PF
- $40 million road bonds to be issued in 2018, 2022, and 2026 ($20 million for each bond issue funded by voter approved tax revenue and $20 million provided through State or other matching funds)

In total, these financial assumptions provide $1.1 billion in Federal Highway and State General Fund Match, $100 million in State General Funds for DOT&PF projects, and approximately $120 million in MSB Bond revenues for a total of $1.3 billion over the 20-year horizon of the LRTP. These figures will provide general guidance in preparing the LRTP's fiscally constrained roadway program. Certain years may receive more or less of the funding identified, but the overall cost of the 20-year recommended roadway program is consistent with the estimated revenues. For example, the current FY 2016-2019 STIP shows significantly more federal dollars addressing MSB projects than the $55 million annual federal funding target, but it is consistent with the target through 2035. Figure 19 shows the projected future roadway revenue for 2016 through 2035.

Figure 19. Projection of Future Roadway Revenue, 2016-2035



Operations and Maintenance

Fiscal constraints also must recognize that roadway infrastructure must receive routine ongoing maintenance to ensure that the roadways remain functional throughout their design life. This includes both winter maintenance, which ensures that roadways remain open during adverse winter weather conditions, and summer maintenance such as crack sealing, which helps ensure that roadways will achieve their full functional life. Deferred maintenance often results in a roadway having to undergo a major rehabilitation prior to the end of its projected design life. Roadways in the MSB are maintained by the State of Alaska; the MSB; and the Cities of Houston, Palmer, and Wasilla. The majority of roadways are in State or MSB ownership.

Operations and maintenance activities and challenges include:

- Snow removal, culvert thawing, road sanding, and traction maintenance
- Dust control and grading

- Drainage
- Culvert thawing
- Guard rail repair
- Brush removal and vegetation management
- Pothole and paved shoulder repair
- Crack sealing and repaving
- Pavement markings
- Signage
- Traffic signal and street light maintenance
- Traffic counting
- Avalanche management

Future Operations and Maintenance Issues:

- Level of Service
  - Equipment
  - Brushing
- Complex Intersections
  - Roundabouts
  - Signals
- Population growth
- Unfunded pavement repair and replacement
- Illumination
- Municipal Separate Storm Sewer Systems ("MS4") permitting
- ATV Conflicts
- Rapid development

The State General Fund provides most of the funding for operations and maintenance for DOT&PF owned roads but has been significantly reduced in 2015 providing a much lower level of service than previously provided State owned highways and roads.

For MSB owned roads, most of the funding is derived from taxes raised in RSAs. The MSB administers 13 maintenance contracts for the 16 RSAs (six RSAs are combined into three contracts). For FY 2014, the revenue for road maintenance (from taxes and investments) was $16.6 million. All funds, except administration, are RSA specific.

The major costs in 2014 were:

- Administrative ($2.2 million)
- Maintenance ($9.3 million)
- Capital improvements ($5.1 million)

Capital improvements are funded by RSAs only if funding remains after maintenance. RSA funding for capital projects is not included in the fiscal constraint analysis since it primarily deals with the needs of the local road system. However, the fiscally constrained project funding deals primarily with the improvement or management of roadways with a functional classification of minor collector or above.

Of the 1,397 miles of MSB owned roads, 1,073 miles are routinely maintained. The remaining 324 miles are unmaintained but monitored. Only 384 miles are paved.

Chapter 5
Roadway Recommendations

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Chapter 5 Roadway Recommendations

This chapter describes the future roadway system conditions as well as short-, medium-, and long-term recommendations for improvement.

2014 Travel Model Background

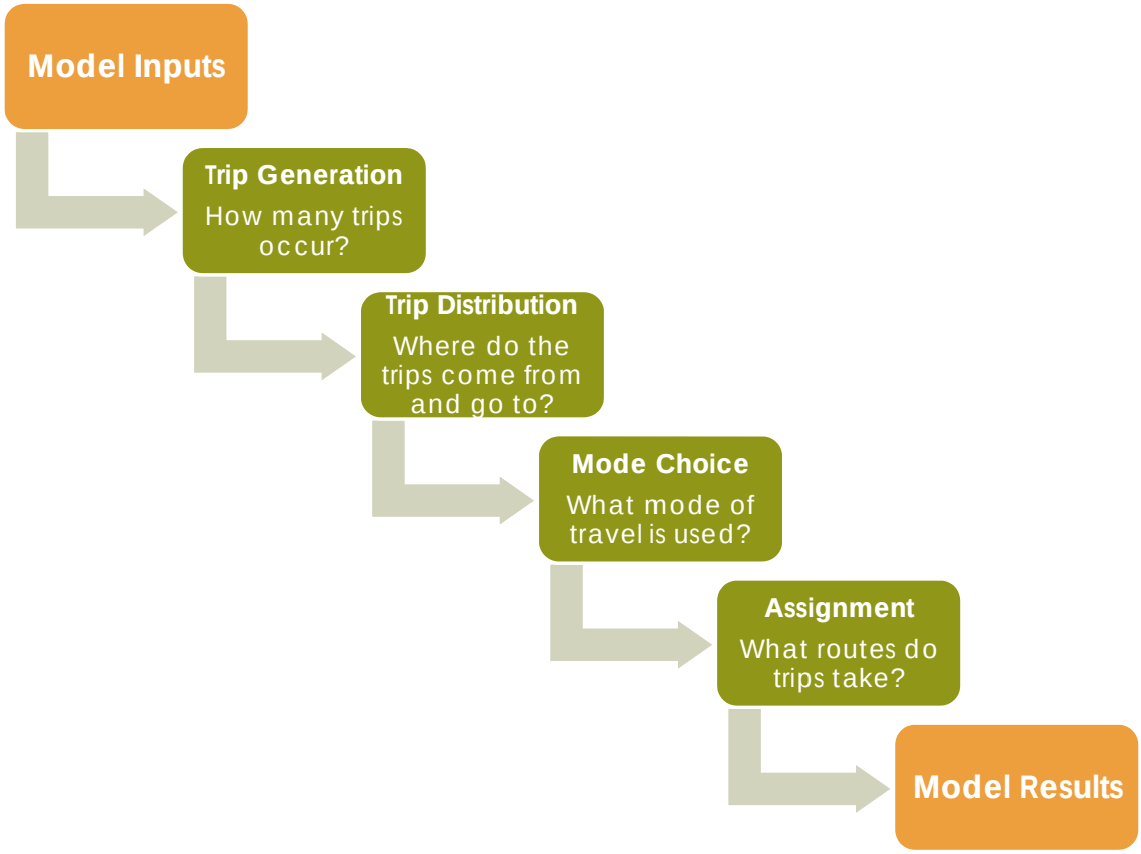
The MSB's travel model evaluates regional travel to help the MSB make informed decisions regarding transportation improvements. The model is based on the current anticipated levels of population, the locations and employment growth. The model used in the MSB is part of the regional model that includes the Anchorage Metropolitan Area Transportation Solutions (AMATS) portion of the MOA. It uses a simplified planning approach consisting of four steps, including:

- **Trip[19] generation:** How many trips occur in the modeled area?
- **Trip distribution:** Where does the trip come from and go to?
- **Mode split:** Which mode will be used by each trip (e.g., personal vehicles, transit)?
- **Trip assignment:** Which route will each trip take?

The modeling process is summarized in Figure 20.

[19] A trip is travel between two points for one purpose, for example, between home and work, home and school, or work and shopping.

Figure 20. Modeling Process Summary



The model estimates traffic for an average workday. Trips are generated using household and employment information at the TAZ level. Traffic forecasts are generated based on land use inputs such as the transportation network. The model can be used to evaluate forecasts by altering the two main inputs: land use changes and transportation network changes.

The MSB model used for this LRTP has a base year of 2010 because that was the most recent year for which socioeconomic and traffic count data were available when the model was developed. This information was used to validate the model to ensure it reasonably mirrors baseline traffic volumes and patterns before the model is used to project future traffic.

Model Population and Employment

Figure 21 and Figure 22 show the travel model's base year household and employment distribution by Traffic Analysis Zone (TAZ) [20].

[20] A TAZ is a geographic unit used for identifying demographic and land use in transportation planning models.

Error! Reference source not found.**Figure 21. Household Distribution by TAZ, 2010**

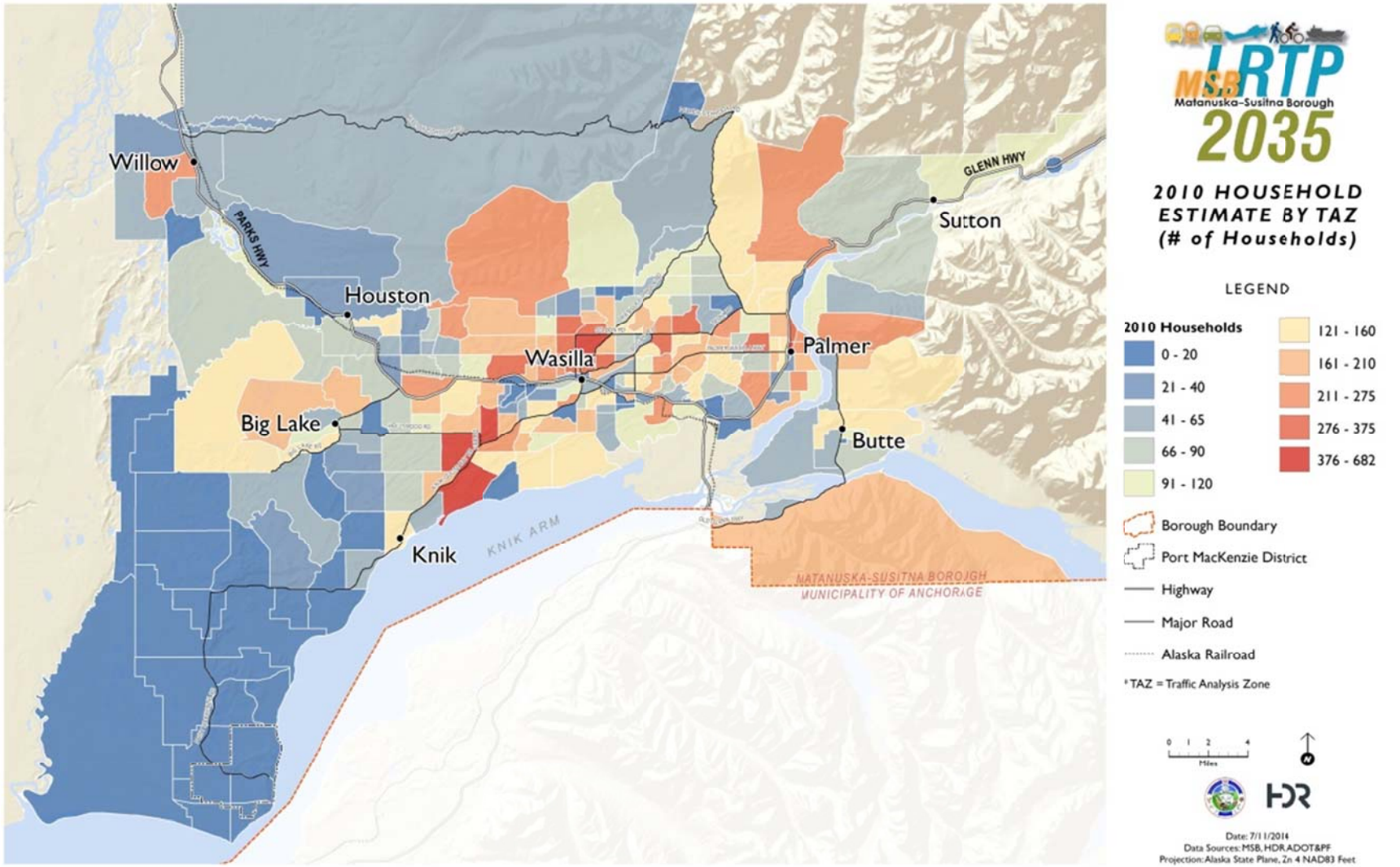
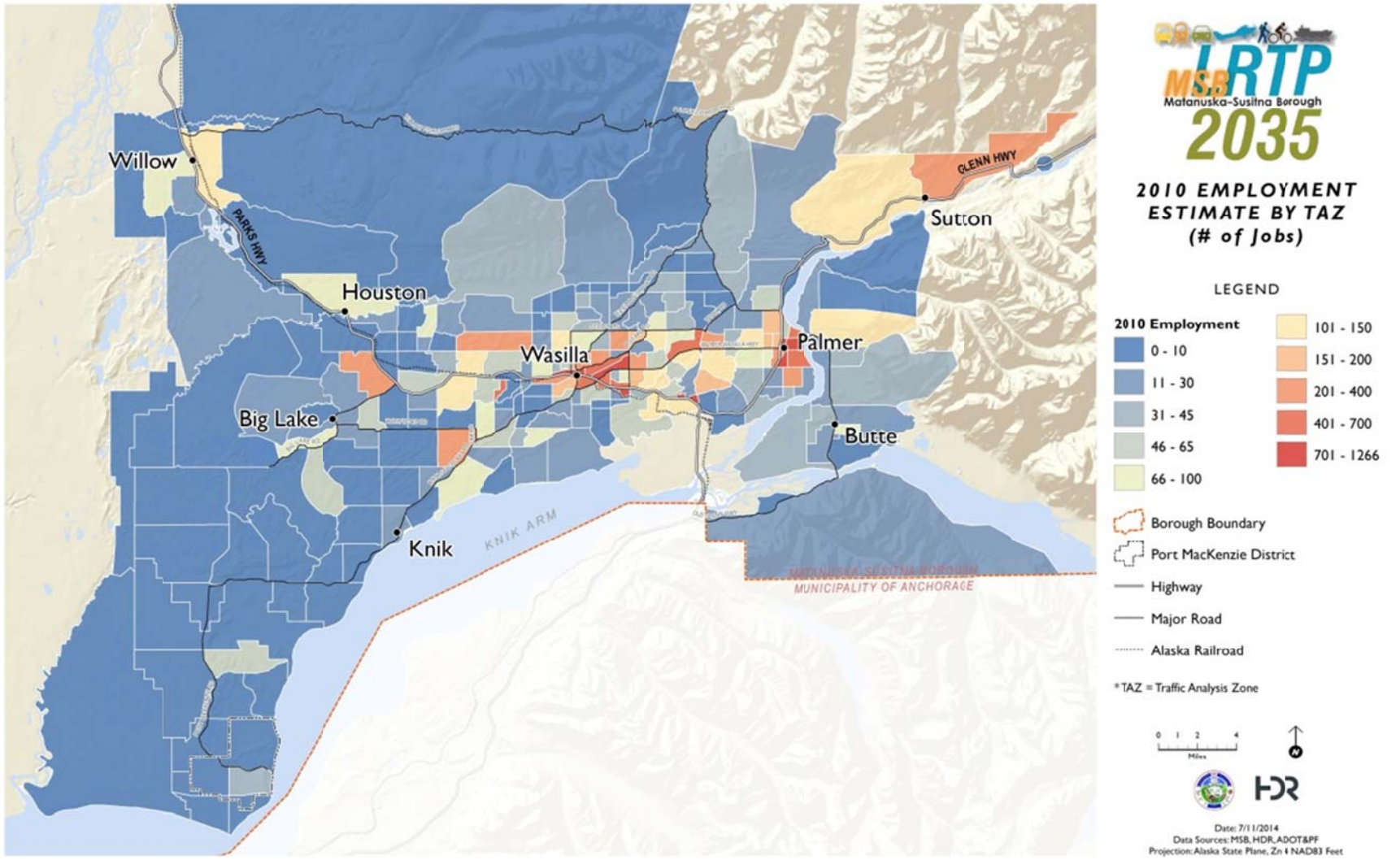


Figure 22. Employment Distribution by TAZ, 2010



At the time the model was developed, the 2035 population was forecasted to be 189,000 and employment was expected to be 51,300 employees. To identify the distribution of the population and employment, a charette (or workshop) was held in August 2010 as part of the Parks Highway Alternative Corridor project. Charette participants included stakeholders representing public and private sector organizations with long-term knowledge of development in the MSB. They were tasked with identifying the likely locations of future residential and employment development. The results of the 2010 charette are summarized below.

The workshop indicated that areas of future growth would include:

- The Core Area between Palmer and Wasilla, where moderate growth would occur as existing subdivisions, and land between subdivisions, are in-filled;
- The western Fairview Loop Area, where a higher level of growth would occur as new subdivisions are developed, with the potential for some smaller lots (less than 1 acre) and multi-family development;
- The Lazy Mountain and Palmer/Wasilla Fishhook areas, where slower growth with continued large lot development would occur because of water availability issues; and
- The Butte, where large agricultural tracks and some water quantity issues would also result in slower growth.

The workshop indicated that the areas of highest potential growth would continue to be located west of Wasilla in the Meadow Lakes, Big Lake, and Houston areas as well as southwest of Wasilla along Knik-Goose Bay Road to Settlers Bay, with a mix of single and multi-family development. The Point MacKenzie area's growth would be dependent on the construction of the Knik Arm Crossing, the Point MacKenzie rail extension, Goose Bay Correctional Center, and ongoing expansion of Port MacKenzie. Growth is expected to be slow in the near term and increase as development and job opportunities occur.

This population and employment distribution is consistent with the MSB's 2012 Density and Build-out Study. This study predicted population and housing quantities at build-out (when all the developable land is used). Build-out is estimated to occur in 2060.

The resulting population and employment forecasts are shown in Figure 23 and Figure 24.

Figure 23. Household Distribution by TAZ, 2035

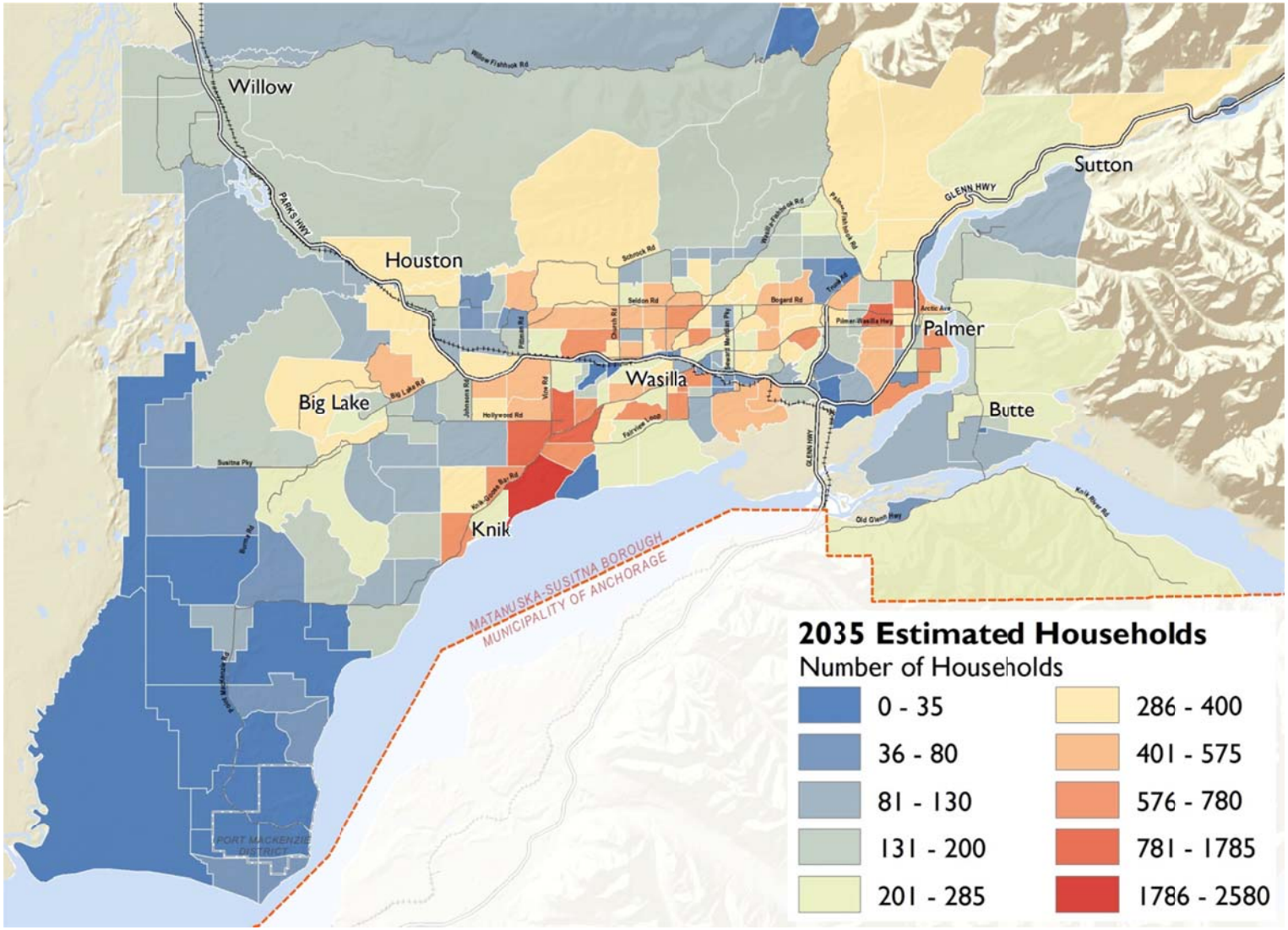
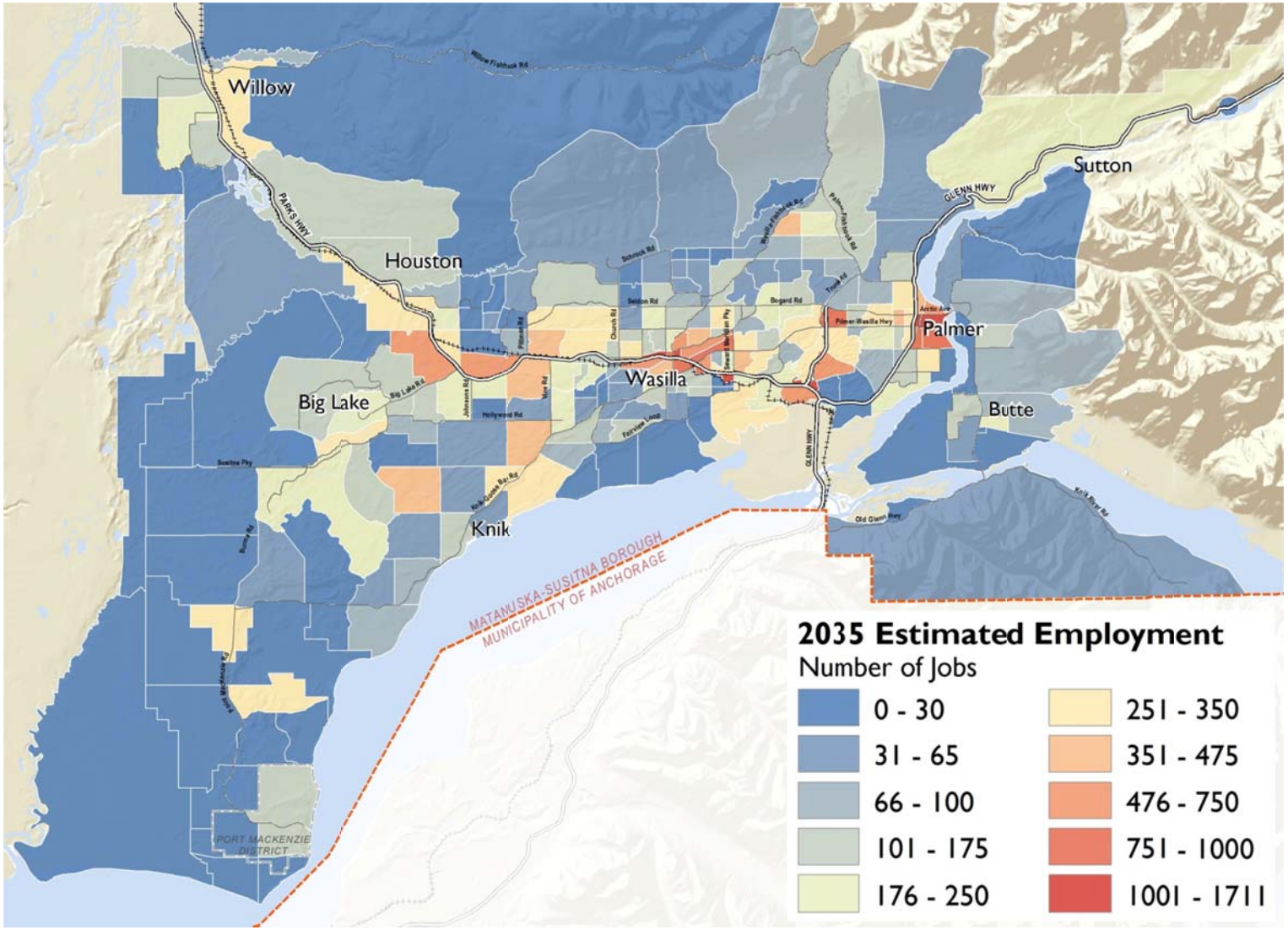


Figure 24. Employment Distribution by TAZ, 2035



Future Roadway System Performance

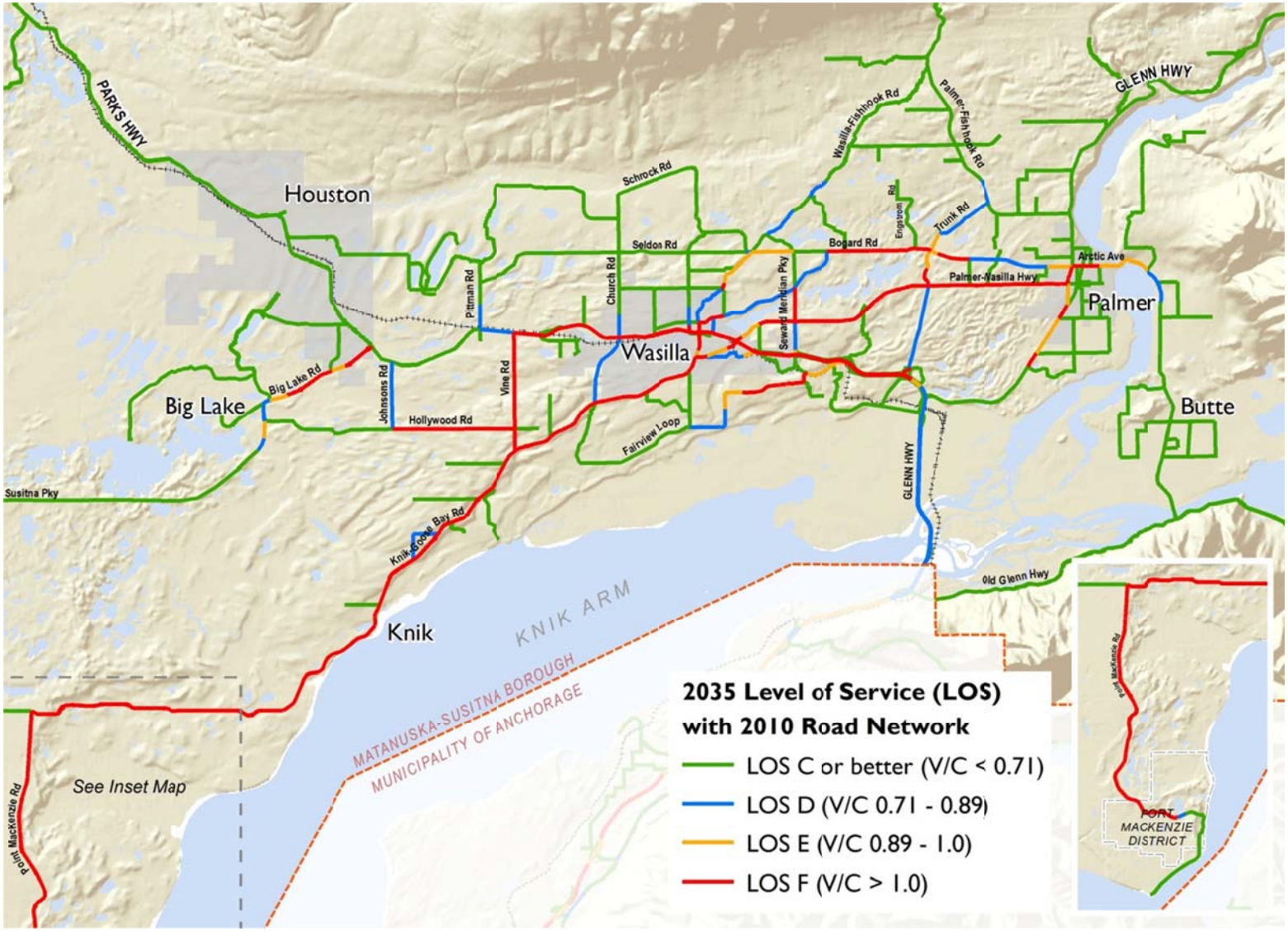
Traffic forecasts were prepared for a 2035 planning horizon to understand our future traffic needs. When this LRTP update began in 2014, it was assumed that within the 20-year life of the LRTP, the Knik Arm Crossing and the Alaska Natural Gas Line would be constructed, and the population within the MSB would continue grow at approximately 2.71 percent annually[21]. The State's General Fund Capital Budget exceeded $1.0 billion dollars and several major capital improvements were under construction including the Point MacKenzie Rail Extension and the Bogard East Road Extension. However, in mid-2014, the value of a barrel of Alaska North Slope oil began its steady decline, reaching a low point of less than $21 per barrel in February 2016, creating a fiscal crisis for the State of Alaska. As of February 2017, the price rose has risen to over $55 per barrel, but still well below the June 2014 price of over $100 per barrel, which has done little to improve the State's fiscal position. During 2016, work on the Knik Arm Crossing was stopped, the timing of the Alaska Natural Gas Line became less certain, the State General Funded Capital Budget was virtually non-existent, and population growth within the MSB slowed.

Within this set of changed circumstances, and uncertainly about the 2035 conditions, it was decided that the LRTP should continue to use the existing MSB traffic model to make a reasonable forecast of Future Roadway System Performance[22] and adjust recommendations accordingly, given that the Knik Arm Crossing will not be constructed by 2035. Less emphasis has been placed on projects in the lower Knik-Goose Bay Road and Point Mac Kenzie Road areas and more emphasis has been placed on the upper Knik Goose Bay and Parks Highway Corridor areas. Figure 25 shows the how the existing roadway system is expected to perform in 2035. Based on this information, several key roads including the Parks Highway, Knik-Goose Bay Road, the Bogard-Seldon corridor, and the Palmer-Wasilla Highway would have unacceptable levels of congestion.

[21] These forecasts were based on the University of Alaska Institute of Social and Economic Research's growth projections completed in December 2009.

[22] The MSB considered updating the travel model to reflect existing conditions. However, due to the extent of the changes that would have to be made, updating the model would result in substantial increases to the budget and schedule of the LRTP update.

Figure 25. MSB Future 2035 Level of Service



As shown in Figure 25, by 2035, unless there are improvements made to the transportation system, the following roads are anticipated to have unacceptable levels of congestion:

- Parks Highway
- Glenn Highway
- Knik-Goose Bay Road
- Big Lake Road
- Seldon Road
- Palmer-Wasilla Highway
- Hollywood Road
- Vine Road
- Seward Meridian Parkway
- Trunk Road

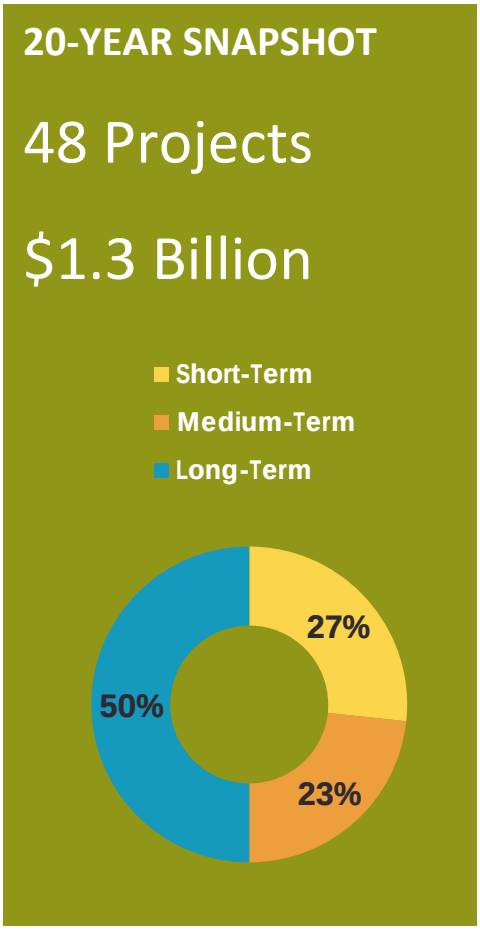
The project team analyzed these results to identify which roadway improvements will be needed over the next 20 years[23] due to congestion. Congestion on local roads has different effects depending on surrounding development. Most local roads have not had, and are not likely to have, substantial increases in capacity or operational capability. Capacity or operational upgrades could be accomplished through providing transit service, adding lanes of traffic and/or adding more traffic control measures such as median barriers, roundabouts, and traffic signals. Congestion on local streets can limit access to adjacent properties and tends to lower residential property values or increase demand for other land uses.

Congestion on major roadways has less of an effect on adjacent land use. Property owners along major roadways are more likely to have bought the property because of existing or anticipated heavy traffic volumes. Although a business may have fewer customers during certain times of the day as roadway congestion increases, the business is likely to remain if other connecting roadways in the nearby area do not exposure to the public to similar congestion. Major roadway improvements may require limiting access through a variety of methods to relieve congestion. These improvements may include medians, right turn in/right turn out access; and frontage roads. These improvements may affect adjacent land uses, impact business, and require changes in travel patterns.

[23] These results predict higher traffic volumes in the Point MacKenzie area due to the assumption of the Knik Arm Crossing being built. Without the bridge, less population and employment growth is expected to occur in Point MacKenzie and surrounding areas. The analysis, and resulting recommendations, have incorporated this change in population and employment distribution.

There are multiple ways to address congestion. One way is to provide additional capacity for motorized vehicles. The added capacity should be done in ways that fully consider the costs of the new controls and restrictions. Additionally, limiting access to a major highway at few locations helps peak hour flows but increases the time and distance for locals trying to access businesses unnecessarily during off-peak hours. Roadway projects to help address congestion are discussed in Chapter 5.

Another way to address congestion is to encourage people to use alternatives modes of transportation such as walking, biking, or taking transit. As congestion increases, people may choose walking or bicycling because of convenience. Other factors that influence increasing non-motorized trips include the availability of sidewalks/pathways, distance between neighborhoods and commercial/industrial uses, safety, and more. The MSB is pursuing alternatives to roadway improvements to address congestion. Please see Chapter 6 for additional information.



Safety Concerns

In addition to long range transportation planning for capacity, there needs to be monitoring and adjustment for safety. Public safety concerns typically begin to increase in terms of calls, observations, conflicts, and crashes before roads reach capacity. Past experience in Alaska demonstrates there are safety indicators which justify making roadway improvements. Using these indicators allow the MSB and DOT&PF be preventative and efficient in terms of resolving safety problems as they develop, but before they have recurring serious crash problems. Table 9 shows known capacity levels and operational triggers which have led to safety mitigation projects. With this information, additional LRTP projects or project categories may be considered before capacity levels of LOS E or F are reached.

Table 9. Safety Indicators

Safety Concern	Indicator	Description	Mitigation Options	Past Experience/ Examples
Two land HIGH volume segments	>= 16,000 vehicles per day (vpd)	Common to Safety Corridor candidates. Lane volumes as high as multilane urban arterials. Volumes can result in serious crash conflicts without further access management, enforcement, education, and spot improvements.	Auxiliary turn lanes, traffic signals, or roundabouts may be considered. Increased attention to education and enforcement may also be considered as interim treatment.	Knik-Goose Bay Road, Parks Highway near Wasilla
Two lane INTERMEDIATE volume segments	>=12,000 vpd	Can be difficult for turning access even if there are not collective side streets of significant volume. Frequent driveway conflicts can lead to crash patterns throughout the corridor.	Auxiliary turn lanes at side streets, driveway spacing and consolidation, alternative routing.	Palmer-Wasilla Highway, Seldon Road, Old Glenn Highway
Two land HIGH volume intersections	>= 8,000 vpd mainline with >=1,500 side streets	In combinations with higher mainline volumes, these intersection can meet traffic signal criteria or need for a roundabout alternative, otherwise may see increasing intersection crashes.	Auxiliary turn lanes, traffic signals, or roundabouts may be considered. Alternative routing may also be an option.	Knik-Goose Bay Road/Fern Street. Fairview Loop Road, Vine Road
Multilane HIGH volume segments	>= 20,000 vpd	Four or more lanes at higher volumes without further access management can lead to serious turning crash conflicts.	Median separations and access consolidation along with backage/ frontage road circulation needs consideration.	Palmer-Wasilla Highway – Parks Highway to Cottonwood Creek compared to Tudor Road, Muldoon Road, and DeBarr Road
Multilane HIGH volume intersections	>= 60,000 million entering vehicles (MEV), or six through lanes crossing four or more thru lanes	High turning demand tends to conflict with high thru demand and compete for limited signal timing. Signal movements experience longer turnaround time. Roundabouts not typically feasible at high entering volumes.	Distributing turns to alternate routes, backage/frontage roads needs consideration. Widening other roads is an alternative to six lanes.	Parks/Palmer-Wasilla Highway and Parks Highway/Main Street approaching 50,000 mark
Multilane inefficient HIGH volume	>=100 vpd split phased	When approach demand exceeds 100 vpd, shared thru/left turn lanes can	Separate left turning from thru traffic at higher approach	Glenn/Palmer-Wasilla Highway

Safety Concern	Indicator	Description	Mitigation Options	Past Experience/ Examples
intersections		demand service every signal cycle, unduly holding up large volumes on other approaches. Leads to significant rear end collision increases, red light running.	demands. Allow simultaneous movement of opposing turns and opposing thru traffic.	
Poor COLLECTOR alignment	Overlong cul-de-sacs	Sole points of access to larger neighborhoods and higher density centers. Lacks efficient access, options for emergency medical service, fire, police, transit, incident routing, detours. Reduces community interaction, cohesion. Crashes and incidents can block access completely.	Seek two points of access, alternative routes.	Hospital access, Engstrom Road, France Road, Settlers Bay Drive
Poor COLLECTOR alignment	Platting for offset tee intersections	Future potential signals or roundabouts are expensive solutions and need to serve both sides of a main roadway when possible. Negative offsets at future major intersections can result in increased opposing vehicle crashes as they compete for turning space.	Use only positive offset tee intersections for busier collectors. Use four legs aligned for collectors that have the potential for more efficient signal/roundabout upgrades. Thru traffic signal timing windows are longer and more efficient than turning traffic timing.	Midtown – Golden Hills Drive, Shoreline Drive/Shennum Drive/Luke Drive

Roadway Recommendations

Roadway improvements are needed for a variety of reasons, including improving congestion, safety, accessibility, and mobility. Many of the transportation improvements identified through the planning process are desirable, but the State and the MSB lack sufficient funding to implement them all. This section presents fiscally constrained roadway recommendations to serve as the blueprint for roadway improvements over the next 20 years. Roadways are the backbone of the MSB transportation system. Roads provide access to residences, businesses, and industries in the MSB. They are used by automobiles, trucks, buses, and bicycles to allow people and goods to move around the region.

One of the biggest challenges facing the roadway network is that much of the existing system is aging and needs improvements. Another major issue is that growth in some parts of the MSB has resulted in increased traffic volumes and has caused a need for improvements to reduce congestion. The MSB roadway system needs to be maintained and improved to remain an efficient and safe means of travel.

There have been several projects that have been recently completed by the MSB and the State that have made significant improvements to the MSB roadway system. These projects were identified in the MSB's 2007 LRTP or with recent input from the public and agencies and represents nearly $100 million in investments. Those projects are:

- Bogard Road East Extension
- South Big Lake Road Realignment
- Fern Street Connection
- Vine Road Upgrade
- Clapp Mack Road Extension
- Seldon Road/Lucille Street Intersection
- Sullivan Road/Caudill Street Upgrade
- Long Lake Drive Reconstruction
- Seldon Road, Church Road to Beverly Lake Road
- Lu Young Road Paving
- Port Access Road Paving
- Knik River Road Spot Improvements
- Sutton School Pathway
- Hawk Lane Upgrade
- Trunk Road Improvements
- Trunk Road Extension South
- Lucus Road Improvements

Given the 20-year revenue forecast presented in Chapter 4, the roadway recommendations in this chapter focus on near-, medium-, and long-term improvements that will help complete the MSB roadway system and provide the greatest benefit for dollars expended. These projects address safety, congestion reduction, capacity, connectivity, and asset management needs to produce an efficient and reliable roadway system.

Short Term (2016–2019)

The short-term projects are those that address the critical mobility, asset management safety needs that are proposed for construction in the near term. The short-term plan covers the first four years of the plan. The projects to be implemented by DOT&PF are identified in the STIP, which guides the expenditure of Federal-aid transportation funds in Alaska. As of September 2016, funds are committed to the projects shown in Table 10 **Error! Reference source not found.** and on Figure 26.[24] The total short-term roadway costs are $412.8 million.

[24] DOT&PF is able to amend the STIP and change priorities and schedules if State transportation needs and priorities change.

Several projects are initiated in the short term but are not funded for construction until the medium- or long-term portion of the program due to funding limitations. These projects are designated with a number followed by a letter. For example, the Glenn Highway MP 34 to 42 Parks to Arctic Renovation 4-Lane is designated 1a in the Short Term Project List and 1b in the Medium Term Project List, which is when the balance of construction funding is proposed.

Table 10. DOT&PF Short-term Roadway Projects in the MSB

ID	Description	Purpose	Estimated Cost (millions)	Potential Funding Source
1a	**Glenn Highway MP 34-42 Reconstruction (Parks to Arctic Renovation, 4-Lane)** - Upgrade the NHS Glenn Highway to a four-lane arterial with frontage roads where appropriate from the Glenn-Parks Interchange through Palmer to the Arctic/Old Glenn Highway intersection.	Congestion Relief	$56.0	FHWA
2	**Glenn Highway - Erosion Protection MP 63 and MP 64** - Provide erosion protection at locations along the Glenn Highway between Sutton and Chickaloon where the road is susceptible to erosion and failure under normal flow conditions in the braided sections of the Matanuska River.	Safety, Asset Management	$5.6	FHWA
3	**Knik-Goose Bay Road** - Widen Knik-Goose Bay Road to a divided four-lane facility from Centaur Avenue to Vine Road, a distance of 6.44 miles. Scope includes separate bike and pedestrian facilities and safety improvements, including rumble strips and combined access points. Project will be built in multiple phases.	Congestion Relief	$83.2	FHWA
4	**Knik-Goose Bay Road Widening - Vine Road to Settlers Bay Drive -** Knik-Goose Bay Road Safety Corridor project development activities for the safety corridor, including the rehabilitation of Knik-Goose Bay Road between Vine Road and Settlers Bay Drive. This is a State funded project, separate from, but coordinated with, the Federally funded project on Knik-Goose Bay Road from Centaur Avenue to Vine Road.	Congestion Relief	$27.2	State Bond FHWA
5	**Parks Highway/Talkeetna Spur Road Pedestrian Improvements** - Pedestrian improvements, including an undercrossing to accommodate the safe access to the Su-Valley Jr/Sr High School.	Safety	$3.17	FHWA
6	**Parks Highway MP 43.5-48.3 - Lucus Road to Pittman Road** - Widen Parks Highway to four lanes, with attendant traffic and safety improvements, between Wasilla and Pittman Road.	Congestion Relief	$15.1	FHWA
7a	**Parks Highway MP 48.8 to 52.3 - Pittman Road to Big Lake Road Reconstruction** - Widen Parks Highway to four lanes, with attendant safety improvements, between Pittman Road and Big Lake Cutoff.	Congestion Relief	$42.8	FHWA
8	**Point MacKenzie Road Improvement, MP 21.8 to 23** - Improvements to the road leading into the Port MacKenzie area.	Congestion Relief	$1.23	FHWA

ID	Description	Purpose	Estimated Cost (millions)	Potential Funding Source
9	**Seward Meridian Parkway** - Reconstruct Seward Meridian Parkway between the Palmer-Wasilla Highway and Bogard Road to a four-lane arterial with a pedestrian trail. Extend the Seward Meridian Parkway from Bogard Road to Seldon Road as a two-lane arterial with pedestrian facilities.	Congestion Relief	$29.3	FHWA
10a	**Vine Road Improvements – Knik-Goose Bay Road to Hollywood Boulevard** - Project will rehabilitate the State owned portion of Vine Road to an improved 2-lane facility, including drainage, repaving, lighting, pedestrian facilities, and safety improvements as necessary.	Congestion Relief	$2.0	FHWA
11a	**Wasilla Fishhook Road/Main Street (Yenlo Couplet)** - Create a North-South Couplet to improve traffic movement in these directions in downtown Wasilla. Main Street and Knik-Goose Bay Road will be the southbound leg and Talkeetna and Yenlo will be the northbound leg.	Congestion Relief	$5.7	FHWA
12	**Palmer-Wasilla Highway** - Near term HSIP project to address immediate traffic and safety issues along this Highway Safety Corridor by establishing a center turn lane to improve traffic flow.	Safety	$21.8	HSIP
13a	**DOT&PF MSB Intersection Improvement Program** - Assess and construct traffic signal or roundabouts at intersections that meet need. Locations to be considered over the entire life of the LRTP include, but are not limited to: Hollywood/S. Big Lake, Hollywood/Vine, Spruce/Lucille, Peck/Wasilla Fishhook, Seldon/Church, Seldon/Caribou, Glenn/Palmer Fishhook, Bogard/Engstrom/Green Forest.	Safety	$5.0	HSIP
14a	**Glenn Highway MP 53-56 Reconstruction - Moose Creek Canyon** - Major reconstruction of the Glenn Highway through the Moose Creek Canyon. The highway will be straightened and a new 800-foot bridge spanning Moose Creek will be constructed. Right of way.	Asset Management	$3.0	FHWA
15a	**Glenn Highway MP 84.5-92 Rehabilitation - Long Lake Section** - Improve alignment and mitigate rock fall. Design.	Asset Management	$5.0	FHWA
16a	**Glenn Highway Rehabilitation MP 79-84.5** - Improve alignment and mitigate rock fall. Design, right of way, utilities.	Asset Management	$7.7	FHWA
17a	**Parks Highway Bridge Replacement - Montana and Sheep Creek** - The new bridges will have top widths that match the roadway width at the time of construction. Pedestrian facilities will be addressed.	Asset Management, Safety	$0.73	FHWA
18	**Parks Highway MP 90-99 Rehabilitation (Trapper Creek)** - Rehabilitate base and surface, widen shoulders as appropriate, and construct safety improvements.	Asset Management	$21.0	FHWA
19	**Parks Highway MP 99-123.5 Rehabilitation** - Rehabilitate the Parks Highway from MP 99 to 123.5. This project is one of the construction phases of the parent project, Need ID 28291.	Asset Management	$35.76	FHWA

ID	Description	Purpose	Estimated Cost (millions)	Potential Funding Source
20a	**Parks Highway MP 163-183 Rehabilitation** - Rehabilitate the Parks Highway between MP 163 and MP 183 to improve drainage and construct passing lanes. Includes grade separated rail crossing at Hurricane.	Asset Management	$0.59	FHWA
21	**Parks Highway MP 183-192** - Reconstruct Parks Highway between MP 183 and 192 and replace East Fork Chulitna River Bridge.	Asset Management	$0.92	FHWA

Phased projects are indicated by the use of a letter after the project ID.

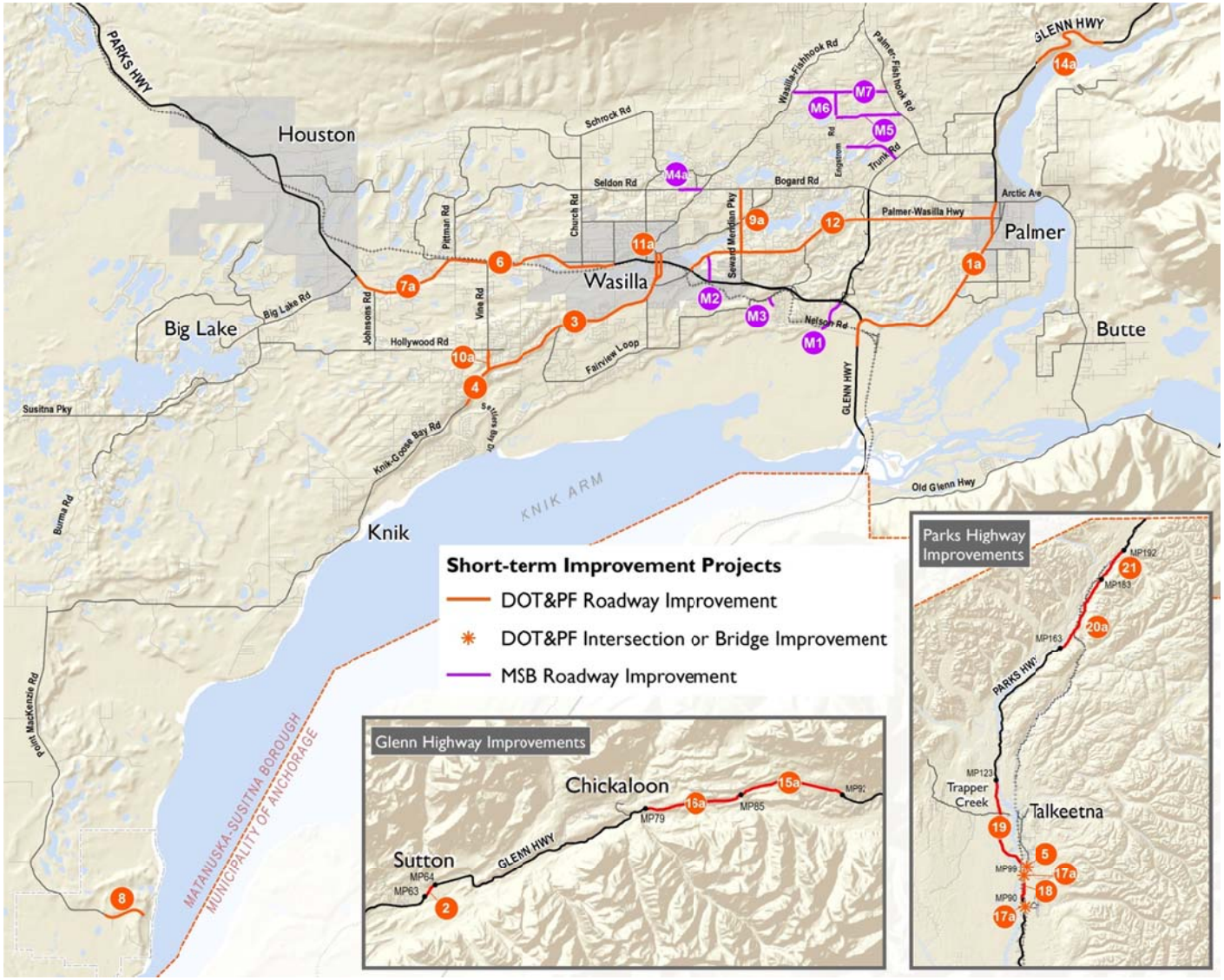
In addition to the projects funded by DOT&PF, there are several projects that should be completed by the MSB in the short term. These locally funded bond projects are shown in Table 11**Error! Reference source not found.** and on Figure 26. These projects total $37.5 million.

Table 11. MSB Short-term Roadway Projects

ID	Description	Purpose	Estimated Cost (millions)	Potential Funding Source
M1	**South Trunk Road Extension Phase 2** - Complete extension from Parks Highway to Nelson Road, including bridge over the Alaska Railroad and replacing the bridge over Wasilla Creek.	Congestion Relief	$5.0	MSB Bond, State Legislative Grant
M2	**Hermon Road Reconstruction and Extension - Parks Highway to Palmer-Wasilla Highway** - Upgrade existing roadway to four lanes and new four-lane construction to provide an additional north-south corridor in the Wasilla Commercial District (distance of 0.8 mile).	Congestion Relief	$6.0	MSB Bond, City of Wasilla, and/or State Legislative Grant
M3	**Nelson Road Extension -** Extend Nelson Road north to Fairview Loop Road, providing secondary access to the area south of the Trunk Road-Parks Highway Interchange.	Congestion Relief, Safety	$3.0	MSB Bond, State Legislative Grant
M4a	**Seldon Road Upgrade - Wasilla Fishhook to Snow Goose** - First phase of the project to reconstruct Seldon Road, between Wasilla Fishhook and Lucille Street, to minor arterial highway standards. This section of Seldon road has pavement grade, sight distance, drainage, and embankment issues. Includes pedestrian facilities.	Capacity Improvement	$13.0	MSB Bond, State Legislative Grant
M5	**Engstrom Road Congestion Relief** – assess various alternatives to relieve congestion on Engstrom Road and provide a second access to Trunk Road and or Palmer Fishhook Road.	Congestion Relief, Safety	$2.5	MSB Bond, State Legislative Gran
M6	**Engstrom North Extension to Tex Al** - Construct an upgraded two-lane major collector from the northern terminus of Engstrom Road to its intersection with Tex	Congestion Relief, Safety	$2.5	MSB Bond, State Legislative

ID	Description	Purpose	Estimated Cost (millions)	Potential Funding Source
	Al Drive.			Grant
M7	**Tex Al Road Upgrade and Extension** - Construct an upgraded two-lane major collector from Wasilla Fishhook Road to its existing terminus. Extend Tex Al Drive east to Palmer Fishhook Road.	Congestion Relief, Safety	$5.5	MSB Bond, State Legislative Grant

Figure 26. Short-term Roadway Recommendations



The MSB also has the following recurring programs that are proposed to be funded as part of the potential MSB road bonds to be issued in 2018, 2022, and 2026. These programs are funded at $2.5 million in 2018, $4.0 million in 2022, and $6.0 million in 2026. These programs are proposed to be funded for 1 or 2 years using bond revenues, and include:

- **MSB Recurring Projects** – Planning Studies, Safe Routes to Schools, Traffic Calming, Trails, Transit, Reconnaissance Engineering
- **MSB Substandard Road Improvements** – Address various MSB owned substandard roads
- **MSB Substandard Bridge Improvements** – Address various MSB owned substandard bridges
- **MSB Asset Management Program** – Obtain funding to do major maintenance or upgrades to MSB owned collectors and arterials

The MSB also has its annual **Fish Passage Program**, which funds the replacement of non-functioning culverts that hinder fish passage with either an improved culvert or a bridge structure. This program is funded through grants from the U.S. Fish and Wildlife Service, the Alaska Department of Fish and Game, the Mat-Su Salmon Partnership, or other conservation organizations. The local match is covered with MSB non-bond revenues. It is estimated that this program will occur annually throughout the 20-year life of the LRTP at a cost of $1 million annually.

MSB voters passed a **2013 School Access Road Bond** that was only partially matched by the State. The MSB will continue to attempt to secure the remaining $14 million in State funds for these projects. **Neither the Fish Passage Program nor the State match for the 2013 School Access Road Bond package are included in the MSB fiscally constrained program**.

Medium Term (2020–2025)

The medium-term elements are those that are higher-priority and address some of the MSBs mobility and safety needs. The DOT&PF medium-term roadway projects are shown in Table 12**Error! Reference source not found.**. The total roadway costs for these medium-term projects are $342.66 million. These projects are shown on Figure 27.

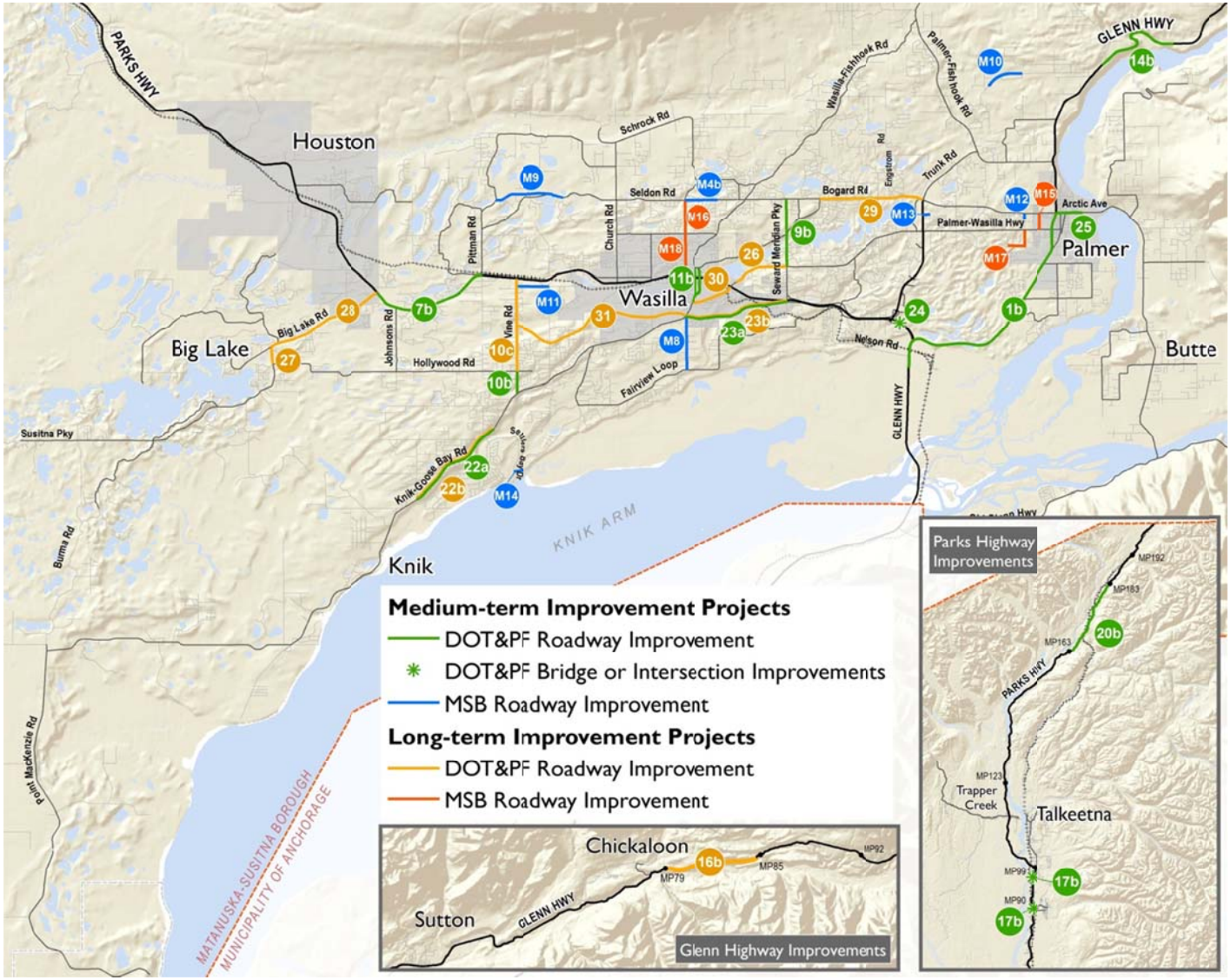
Table 12. DOT&PF Medium-term Roadway Projects in the MSB

ID	Description	Purpose	Estimated Cost (millions)	Potential Funding Source
1b	**Glenn Highway MP 34-42 Reconstruction (Parks to Arctic Renovation, 4-Lane)** - Complete the upgrade the NHS Glenn Highway to a four-lane arterial with frontage roads where appropriate from the Glenn-Parks Interchange through Palmer to the Arctic/Old Glenn Highway intersection.	Congestion Relief	$27.3	FHWA
7b	**Parks Highway MP 48.8 to 52.3 - Pittman Road to Big Lake Road Reconstruction** - Widen Parks Highway to 4 lanes, with attendant safety improvements, between Pittman Road and Big Lake Cutoff.	Congestion Relief	$15.50	FHWA
9b	**Seward Meridian Parkway – Palmer-Wasilla Highway to Seldon Road** – Reconstruct Seward Meridian Parkway between the Palmer-Wasilla Highway and Bogard Road to a four-lane arterial with a pedestrian trail. Extend the Seward Meridian Parkway from Bogard Road to Seldon Road as a two-lane arterial with pedestrian facilities.	Congestion Relief	$13.4	FHWA
10b	**Vine Road Improvements - Knik-Goose Bay Road to Hollywood Boulevard** - Project will rehabilitate the State owned portion of Vine Road to an improved two-lane facility, including drainage, repaving, lighting, pedestrian facilities, and safety improvements as necessary.	Congestion Relief	$8.5	FHWA
11b	**Wasilla Fishhook Road/Main Street (Yenlo Couplet)** - Construct the North-South Couplet to improve traffic movement in these directions in downtown Wasilla. Main Street and Knik-Goose Bay Road will be the southbound leg and Talkeetna and Yenlo will be the northbound leg.	Congestion Relief	$27.1	FHWA
13b	**DOT&PF MSB Intersection Improvement Program** - Assess and construct traffic signal or roundabouts at intersections that meet need. Locations to be considered over the entire life of the LRTP include, but are not limited to: Hollywood/S. Big Lake, Hollywood/Vine, Spruce/Lucille, Peck/Wasilla Fishhook, Seldon/Church, Seldon/Caribou, Glenn/Palmer Fishhook, Bogard/Engstrom/Green Forest.	Safety	$15.0	HSIP
14b	**Glenn Highway MP 53-56 Reconstruction** - **Moose Creek Canyon** - Major reconstruction of the Glenn Highway through the Moose Creek Canyon. The highway will be straightened and a new 800-foot bridge spanning Moose Creek will be constructed.	Asset Management	$58.0	FHWA
17b	**Parks Highway Bridge Replacement - Montana and Sheep Creek** - The new bridges will have top widths that match the roadway width at the time of construction. Pedestrian facilities will be addressed.	Asset Management, Safety	$25.06	FHWA

ID	Description	Purpose	Estimated Cost (millions)	Potential Funding Source
20b	**Parks Highway MP 163-183 Rehabilitation** - Rehabilitate the Parks Highway between MP 163 and MP 183 to improve drainage and construct passing lanes. Construct a grade separated rail crossing at Hurricane.	Asset Management	$44.0	FHWA
22a	**Knik-Goose Bay Road - Settlers Bay to South Alix Drive** - Widen to 4 lanes with appropriate intersection improvements and pedestrian amenities (distance of approximately 3 miles). Design, ROW, Utilities	Congestion Relief	$8.2	FHWA
23a	**Parks Highway Alternative Corridor – Segment 1 Parks Highway/Seward Meridian Parkway to Knik-Goose Bay Road** - Construct a controlled access highway south of Wasilla to move through traffic around Wasilla. Corridor preservation is the highest priority.	Congestion Relief	*$12.6*	*FHWA/State*
24	**Glenn Parks Interchange - Hospital Access Improvements** - Develop additional accesses to the Mat Su Regional Medical Center, which is currently only served by a single access point. Develop Old Mat Road as a frontage road to the Glenn Highway. Open Duchess Drive at Trunk Road to left turn ingress and egress.	Safety/Access	$12.0	HSIP
25	**Old Glenn Highway - New Glenn Highway to Airport Road** - Expand to a five-lane section.	Congestion Relief	$12.00	State
	Ongoing DOT&PF Asset Management and HSIP Programs: Annual funding for future asset management and HSIP projects estimated at $4.0 million annually.	Asset Management and Safety	$24.0	FHWA/HSIP

Phased projects are indicated by the use of a letter after the project ID.
Projects that are not completed by 2035 are shown in italics. Additional funding will be required to complete these projects.

Figure 27. Medium- and Long-term Roadway Recommendations



Projects to be funded by the MSB in the medium term are shown in Table 13**Error! Reference source not found.**. These projects total $36 million.

Table 13. MSB Medium-term Roadway Projects

ID	Description	Purpose	Estimated Cost (millions)	Potential Funding Source
M4b	**Upgrade Seldon Road from Snow Goose to Lucille Street** - Phase 2 of the reconstruction of Seldon Road between Wasilla Fishhook and Lucille Street to major collector or higher standards. This section of Seldon Road has grade, sight distance, drainage, embankment, and failing pavement issues.	Capacity and Congestion Relief	$13.0	MSB Bond, State Legislative Grant
M8	**Fern Street -** Upgrade Fern Street between Knik-Goose Bay Road and Fairview Loop Road, creating an upgraded north-south collector route.	Congestion Relief and Connectivity	$6.0	MSB Bond, State Legislative Grant
M9	**Seldon Road - Beverly Lake Road to Pittman Road** - This project completes the Bogard-Seldon corridor from the Glenn Highway to Pittman Road.	Capacity and Safety	$7.0	MSB Bond, State Legislative Grant
M10	**Jensen Road Extension to Soapstone Road** - This will provide direct access from the growing Soapstone Road area to Palmer Fishhook Road, allowing more direct access to Trunk Road and the Parks Highway.	Capacity and Safety	$1.5	MSB Bond, State Legislative Grant
M11	**Museum Drive Extension - West to Vine Road** - Provides local frontage road connections to the south side of the Parks Highway.	Congestion Relief and Safety	$4.0	MSB Bond, State Legislative Grant
M12	**Hemmer Northern Extension to Bogard Road East Extension** - Extend Hemmer Road north to Bogard Road to provide a more direct connection. The distance less than 1/4 mile, right of way is needed.	Connectivity	$0.5	MSB Bond, State Legislative Grant
M13	**Katherine Drive Connection to Trunk Road** - This project will connect Mid-Town Estates to Trunk Road at the already constructed median break and turn pockets on Trunk Road.	Connectivity and Safety	$1.0	MSB Bond, State Legislative Grant
M14	**Settlers Bay Drive Extension to S. Hayfield Drive** – Connect these two routes to allow for secondary access from the Settlers Bay Development to Fairview Loop Road via South Hayfield Drive.	Connectivity and Safety	$3.00	MSB Bond, State Legislative Grant

Long Term (2023–2035)

The long-term elements address some of the remaining mobility and safety needs. The roadway projects are shown in Table 14. The total roadway costs for the DOT&PF long-term project is $634.0 million. These projects are shown on Figure 27, above.

Table 14. DOT&PF Long-Term Roadway Projects

ID	Description	Purpose	Estimated Cost (millions)	Potential Funding Source
10c	**Vine Road Improvements – Hollywood Boulevard to Parks Highway** - Project will rehabilitate the MSB owned portion of Vine Road to an improved four-lane facility, including drainage, repaving, lighting, pedestrian facilities, and safety improvements as necessary.	Congestion Relief, Connectivity, Safety	$33.5	FHWA
16b	**Glenn Highway Rehabilitation MP 79-84.5** - Improve alignment and mitigate rock fall.	Asset Management	$36.3	FHWA
22b	**Knik-Goose Bay Road - Settlers Bay to South Alix Drive Widen to 4 Lanes Construction**	Congestion Relief	$37.80	FHWA
23b	**Parks Highway Alternative Corridor Segment I: Parks Highway/Seward Meridian to Knik-Goose Bay Road: Construction**	Congestion Relief	$132.40	FHWA/State
26	**Palmer-Wasilla Highway: Seward Meridian Parkway to Fred Meyers Widen to 5 lanes –** Add two additional travel lanes and widen Cottonwood Creek Bridge to five lanes.	Congestion Relief	$30.00	FHWA
27	**South Big Lake Road - North Shore Drive to Hollywood Road Rehabilitation** - Rehabilitate Big Lake Road from North Shore Drive through the Big Lake Town Center to Hollywood Road with appropriate pedestrian amenities.	Asset Management	$5.0	State
28	**Big Lake Road - North Shore Drive to Parks Highway Reconstruction** - Reconstruct Big Lake Road to a four-lane facility with pedestrian amenities.	Congestion Relief	$5.0	FHWA
29	**Bogard Road Between Seldon and Trunk -** Widen to four lanes to accommodate increased traffic with pedestrian facilities.	Congestion Relief Capacity	$49.0	State
30	**Palmer-Wasilla Highway Extension Reconstruction** - Expand to a five-lane facility between the Parks Highway and Knik-Goose Bay Road.	Congestion Relief Capacity	$20.0	FHWA
31	**Parks Highway Alternative Corridor Segment 2: Knik-Goose Bay Road to Vine Road: Design, ROW, Utilities , Construction**	Congestion Relief	$160.0	FHWA/State
	Ongoing DOT&PF Asset Management and HSIP Programs: Annual funding for future asset management and HSIP projects estimated at $8.5 million annually.	Asset Management and Safety	$85.0	FHWA/HSIP

Phased projects are indicated by the use of a letter after the project ID.
Projects that are not completed by 2035 are shown in italics. Additional funding will be required to complete these projects.

Projects to be funded by the MSB in the long term are shown in Table 15**Error! Reference source not found.** and Figure 27, above. The long-term MSB funded projects total $34 million.

Table 15. MSB Long-term Roadway Projects

ID	Description	Purpose	Estimated Cost (millions)	Potential Funding Source
M15	**Felton Road Extension - Arctic/Bogard to Palmer-Wasilla Highway** - Two-lane extension to provide north-south access from the Palmer-Wasilla Highway to Arctic/Bogard and Palmer High School.	Congestion Relief	$8.0	MSB Bond, State Legislative Grant
M16	**Lucille Street - Spruce to Seldon (MSB) 4-Lane Upgrade** - Upgrade Lucille Street to a four-lane rural section with drainage, intersection improvements, and pedestrian amenities (distance of 1.0 mile).	Congestion Relief	$7.0	MSB Bond, State Legislative Grant
M17	**Valley Pathways School Access Improvement** - Construct a new road from Valley Pathways at the end of France Road east to intersect with the signalized intersection at the Palmer-Wasilla Highway and Hemmer Road.	Congestion Relief	$9.0	MSB Bond, State Legislative Grant
M18	**Lucille Street - Parks Highway to Spruce (City of Wasilla) 4-Lane Upgrade** - Upgrade Lucille Street to a four-lane urban section with drainage, intersection improvements, and pedestrian amenities (distance of 1.25 miles).	Congestion Relief	$10.0	MSB Bond, City of Wasilla, and/or State Legislative Grant

Illustrative Projects

Due to the future system needs and limited financial resources, there was not sufficient funding to include several needed improvements. Among the projects not included in this fiscally constrained plan are:

- Expand the Glenn Highway from Eklutna to the Glenn/Parks Interchange to six lanes
- Upgrade Trunk Road Interchange to accommodate westbound left turn movements
- Johnson Road Upgrade and Extension to Knik-Goose Bay Road
- Pave Hatcher Pass Road, MP 18 to 20
- Widen Knik-Goose Bay Road from Centaur to Settlers Bay Drive to six lanes
- Widen Knik-Goose Bay Road from Alix Drive to Point MacKenzie Road to four lanes
- Expand the Parks Highway from the Glenn/Parks Interchange to Seward Meridian Parkway to six lanes
- Reconstruction of Pittman Road
- West Carmel Drive Reconstruction

- Point MacKenzie Road – Knik-Goose Bay Road to Ayshire Reconstruction upgraded two-lane facility
- Knik Arm Crossing Frontage Roads at Port MacKenzie Access
- Bogard/Seldon Roads Corridor – 4-Lane Upgrade from New Trunk to Bogard/Seldon Intersection
- Seward Meridian – South Extension to Fairview Loop
- Ayshire Road to Little Su Landing Improvements
- New Big Lake Collector Road – North Shore to West Susitna Parkway
- Foothills Drive Reconstruction
- Oilwell Road Upgrade – Petersville Road to Moose Creek Bridge
- Smith Road Reconstruction and Pedestrian Pathway
- West Susitna Parkway Extension to Fish Creek Agricultural Area
- Sylvan Road to Hollywood Upgrade and Extension South to Hollywood Drive
- West Susitna Access Development Program
- South Big Lake Road Town Center Realignment
- Seldon Road Extension – Pittman Road to Parks Highway
- Point MacKenzie Road – Port MacKenzie to Ayshire Rehabilitation
- Burma Road Construction – Upgrade and Realign Burma Road from Point MacKenzie Road to West Susitna Parkway

Several other identified DOT&PF project needs can be found at http://www.dot.state.ak.us/stwdplng/cip/stip/needslist/index.cfm. The MSB needs list can be found in their Capital Improvement Program, which is available online at http://www.matsugov.us/cip.

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Chapter 6
Strategy Development

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Chapter 6 Transportation Improvement Strategies

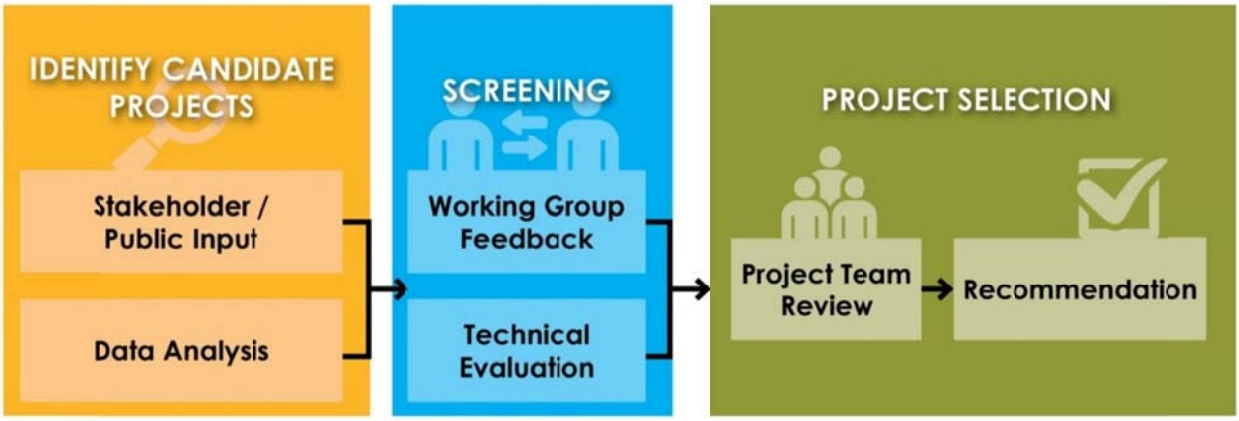
This chapter describes the processes used to identify and develop other transportation improvement strategies to meet the LRTP's goals. While road improvements are needed to address the MSB's transportation needs, other improvements are also needed. Ideas for these additional strategies came from the MSB community and residents through public meetings, stakeholder meetings, workshops, and online feedback as well as technical analysis.

Identification of Alternatives to Roadway Improvements

The Alternative Transportation and Land Use Workshop, held in April 2016, reviewed the transportation issues facing the MSB and gave participants an overview of non-roadway strategies that other communities are using to solve transportation problems. Workshop participants were divided into groups and asked to provide input on what type of land use, transit, bicycle/pedestrian, and transportation demand management (TDM)/transportation system management solutions (TSM) the MSB should pursue. An online open house allowed the general public to provide feedback on these alternative strategies. Based on feedback from the public, the working group meeting, and the technical analysis, alternative strategies were identified and evaluated for improvements that should be implemented by the MSB. Figure 28 summarizes the strategy identification and evaluation process.

Alternative Transportation and Land Use Workshop

Figure 28. Strategy Identification and Evaluation Process



Evaluation

The candidate strategies were further assessed by a working group process and a technical evaluation. The working group scored each strategy on their compatibility with the goals and objectives of the MSB 2035 LRTP, the extent of the strategy's benefits, and their willingness to support the improvement. The technical evaluation was scored based on compatibility with goals and objectives, the extent of the improvement's benefits, and its technical feasibility.

The scoring process used to evaluate the candidate strategy was not the only criterion for project selection and inclusion. Improvements were selected based on several factors including:

- Technical evaluation scoring
- Degree to which candidate strategies are complementary with other projects to create overall system improvements
- Feedback from the public and stakeholders
- Consideration of which strategies were implementable from a public support and project development viewpoint
- Required by agency or regulation
- Available funding

Recommendations

The resulting recommended strategies are described in Chapter 2 of the LRTP.

Chapter 7
Air Transportation

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Chapter 7 Air Transportation

The MSB has the highest concentration of public and private airports in the nation. Aviation generates approximately 380 jobs, $21 million in labor income, and $17.5 million in business sales within the MSB[25] and provides the only reliable year-round means of access to remote areas of the MSB. With an estimated Borough population of 100,178, and almost 1,500 aircraft, the MSB hosts an average of one airplane for every 68 residents. The number of aircraft reported as personal property within the MSB has increased from approximately 500 in 1984 to 1,472 in 2017[26]. This increase of 3.3 percent per year is likely to continue as the MSB grows. The MSB does not levy an aviation personal property tax on aircraft registered in the Borough.[27] For additional information on air transportation in the MSB, please see the Regional Aviation System Plan (RASP).

Existing Air Transportation Facilities

There are currently eight public airports within the MSB that are under the jurisdiction of DOT&PF and two municipal airports (see Figure 29 and Table 16). None have regularly scheduled commercial airline operations. The two municipal and three state airports have air taxi operations. There are also 34 seaplane bases and nine heliports registered with the Federal Aviation Administration (FAA). Most seaplane bases are public domain but many of the heliports are private. The MSB is also home to more than 200 private airports/airstrips[28], generally concentrated in residential areas with road access. Nearly one-third of these airports are unregistered with the FAA. There are also approximately 15 private airparks[29] in the MSB. Several of these airparks, such as Wolf Lake and Anderson Lake, have more than 100 based aircraft and are among the busiest airports in the MSB.

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25 Northern Economics. 2016. Economic Contributions of Matanuska-Susitna Borough Airports. January 2016. Prepared for the MSB. Available on the internet at: https://www.matsugov.us/plans?task=download&collection=plan_documents&xi=3&file=plan_document_upload&id=14499

26 According to the FAA Registry available on the internet at: http://registry.faa.gov/aircraftinquiry/statecounty_inquiry.aspx

27 MSB Assessor's office, 8/2014.

28 An airstrip is an airplane landing facility that typically has one runway and only basic facilities, while an airport generally has one or more runway(s) and more facilities such as an air traffic control tower, or passenger terminal.

29 In this LRTP, airpark refers to an airport owned by a group of private property owners with homes, hangars, and/or other facilities adjacent to a shared private runway.

Figure 29. Public Airports in the MSB

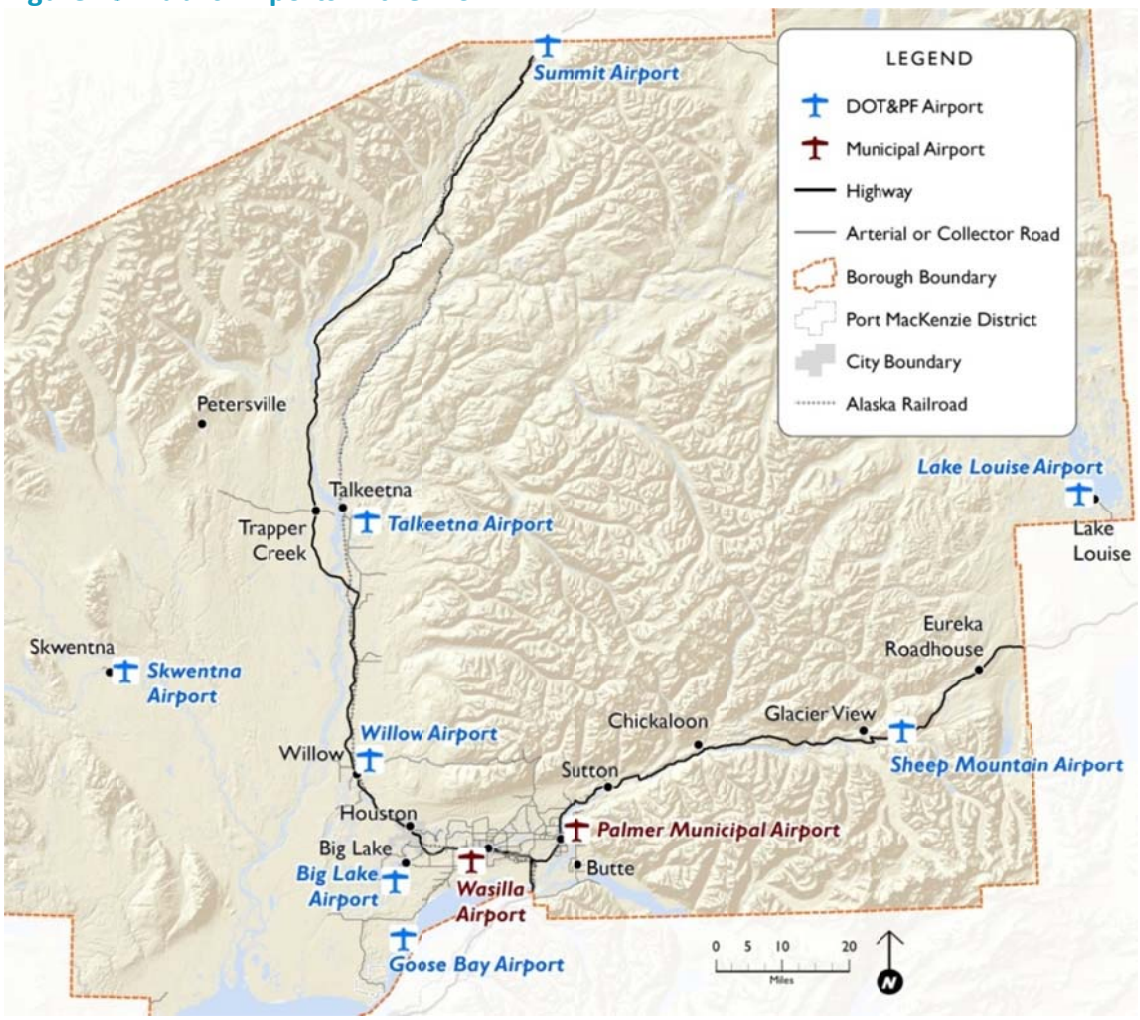

Table 16. MSB Public Airports

Airport	Owner	Length (ft.)	Width (ft.)	Surface	Approach Navigation Aids	Instrument or Visual
Big Lake	DOT&PF	2,435	70	Gravel	VOR	IFR
Goose Bay	DOT&PF	3,000	75	Gravel	None	VFR
Lake Louise	DOT&PF	3,000	60	Gravel	None	VFR
Palmer	City	6,009	100	Asphalt	VASI/PAPI	IFR
Sheep Mountain	DOT&PF	2,270	60	Gravel	None	VFR
Skwentna	DOT&PF	3,400	75	Gravel	None	VFR
Summit	DOT&PF	3,814	80	Gravel	None	VFR
Talkeetna	DOT&PF	3,500	75	Asphalt	VASI	IFR
Wasilla	City	3,700	75	Asphalt	PAPI	IFR
Willow	DOT&PF	4,400	75	Gravel	None	VFR

IFR= Instrument Flight Rules; PAPI= Precision Approach Path Indicator; VASI= Visual Approach Slope Indicator; VFR= Visual Flight Rules; VOR=VHF Omni-directional Radio Range
Source: http://www.gcr1.com/5010web/ and http://www.dot.state.ak.us/stwdav/documents/

Public Airports under DOT&PF Jurisdiction

The public airport facilities under DOT&PF jurisdiction in the MSB include:

- Big Lake Airport;
- Goose Bay Airport;
- Lake Louise Airport;
- Sheep Mountain Airport;
- Skwentna Airport;
- Summit Airport;
- Talkeetna Airport; and
- Willow Airport.

DOT&PF is responsible for the maintenance and operations of these airports. None of these airports has an Air Traffic Control Tower. The only airport under DOT&PF jurisdiction with a manned Flight Service Station is the Talkeetna Airport, which also has the highest activity level (approximately 30,000 operations/year) of the eight airports. All but two of the DOT&PF-owned facilities (Sheep Mountain and Summit) are included in the 2015-2019 National Plan of Integrated Airport Systems (NPIAS). Inclusion in the NPIAS is a requirement for receiving Federal funding for airport improvements. To be considered for inclusion in the NPAIS, an airport must have at least 10 locally owned based aircraft, be no closer than 20 miles from the nearest NPAIS airport, and be located at a site that can be expanded and improved to provide safe and efficient airport facilities.

Big Lake Airport

The Big Lake Airport has one gravel runway (2,435 feet long and 70 feet wide). The airport lighting is operated by pilot control, and the weather data source is via transcribed weather broadcast. There is no designated runway for planes equipped with skis in the winter, although a snow pack is maintained when possible to allow for planes on skis. Big Lake is not a recognized seaplane base, but the lake is used regularly by airplanes in both summer and winter. Big Lake Airport is the site of approximately 20,000

Big Lake Airport

aircraft operations annually[30]. The runway surface was rehabilitated in 2010, and airspace obstructions (e.g., brush, small trees) were removed in 2013. The need for apron expansion and flood mitigation has been identified by DOT&PF, but funding is currently unavailable. As of August 2016, Big Lake Airport was starting an update to their airport master plan.

Goose Bay Airport

The Goose Bay Airport has one gravel runway (3,000 feet long and 75 feet wide). The airport lighting is operated via pilot control, and there is no weather data source. There are no designated facilities to accommodate seaplanes or planes equipped with skis, although a snow pack is maintained when possible to allow for planes on skis. There is no State maintenance performed on this facility, and there are approximately 5,500 annual aircraft operations. The runway surface was rehabilitated in 2011. No further needs have been proposed for funding in the DOT&PF 6-year spending plan[31].

Lake Louise Airport

The Lake Louise Airport has a gravel runway (3,000 feet long and 60 feet wide) and serves approximately 300 aircraft operations annually. There is no lighting or weather data source available, and the airport is not maintained in the winter. Evergreen Lodge, on Lake Louise, is recognized as a private seaplane base. The airport has been almost completely reconstructed since 2007, and the runway surface was rehabilitated in 2012. No further needs have been proposed for funding in the DOT&PF 6-year spending plan[32].

Sheep Mountain Airport

The Sheep Mountain Airport has one gravel/dirt runway (2,270 feet long and 60 feet wide[33]). There is no lighting or weather data source available. The airport does not accommodate seaplanes, and no State maintenance is performed on the airport or runway. The runway condition is not monitored, and pilots are advised to perform a visual inspection prior to using. This airport experiences minimal traffic, with roughly 120 operations annually.

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[30] All estimates of airport operations in this chapter are based on the 2014 FAA Terminal Area Forecast. Available at https://taf.faa.gov/

[31] DOT&PF. 2015. Alaska DOT&PF Rural Airport System Draft FFY '11—'17 AIP Spending Plan. December 9, 2015. Available at http://dot.alaska.gov/stwdav/documents/Rural_Airport_System_AIP_Spending_Plan.pdf

[32] DOT&PF. 2015. Alaska DOT&PF Rural Airport System Draft FFY '11—'17 AIP Spending Plan. December 9, 2015. Available at http://dot.alaska.gov/stwdav/documents/Rural_Airport_System_AIP_Spending_Plan.pdf

[33] The official runway width is 10 feet but there is a cleared area that is approximately 75 feet wide.

Skwentna Airport

The Skwentna Airport consists of one gravel runway (3,400 feet long and 75 feet wide). It is the site of approximately 3,500 aircraft operations annually. The airport lighting is operated via pilot control, but there is no weather data source. There are no facilities to accommodate seaplanes. There is no designated runway for planes equipped with skis in the winter, although a snow pack is maintained when possible to accommodate planes on skis west of the Runway 27 threshold. The runway is marked with reflective cones. The runway surface was rehabilitated in 2010, and airspace obstructions (e.g., brush, small trees) were removed in 2013. The Skwentna River is eroding the southeast end of the runway; however, no further needs have been proposed for funding in the DOT&PF 6-year spending plan[34].

Skwentna Airport

Summit Airport

The Summit Airport, near the MSB's northern boundary, has a gravel runway (3,814 feet long and 80 feet wide) that is not monitored, and there is no airport lighting. The weather data source is via transcribed weather broadcast. There is no line-of-sight visibility between the runway ends. Small brush and weeds up to 30 inches high are common on sections of the airfield. Approximately 800 aircraft operations occur annually. There are no seaplane facilities available, and the airport is not maintained during the winter.

[34] DOT&PF. 2015. Alaska DOT&PF Rural Airport System Draft FFY '11—'17 AIP Spending Plan. December 9, 2015. Available at http://dot.alaska.gov/stwdav/documents/Rural_Airport_System_AIP_Spending_Plan.pdf

Talkeetna Airport

The Talkeetna Airport has an asphalt runway (3,500 feet long and 75 feet wide). The airport lighting is operated via pilot control, and the weather data source is via transcribed weather broadcast. There is no designated runway for planes equipped with skis in the winter, although a snow pack is maintained when possible to allow for planes on skis. There are no facilities to accommodate float planes. A gravel helipad (480 feet long and 85 feet wide) is available at the airport. The helipad is currently located on the active runway. During the summer, it is one of the busiest non-primary airports. The airport averages 30,000 operations annually. A considerable number of improvements have been implemented at the airport over the past 20 years, including apron expansion, taxiway construction, runway rehabilitation, and obstruction removal (e.g., brush, trees). DOT&PF is currently working on improvement and pavement rehabilitation. Specific improvements include resurfacing existing taxiways/runways, additional signage, updating runway designation from 18/36 to 1/19, converting Taxiway C to an exit taxiway, construction of a new transient apron and taxi-lane, tree clearance, a new pedestrian pathway, and new fencing.

Talkeetna Airport

Willow Airport

The Willow Airport has a gravel runway (4,400 feet long and 75 feet wide). The airport lighting is via pilot control. When available, weather data reports are provided on an hourly basis only. The airport, which is the site of approximately 15,700 operations annually, is maintained by DOT&PF year-round. Willow Lake is used regularly by airplanes in summer, on floats, and winter, on skis. The runway was rehabilitated in 2005 and 2007, and an airport master plan (AMP) was initiated in 2009. Identified needs at the Willow Airport include taxiway improvements, construction of access roads, signage, fencing, relocation of the Senior Center


Willow Airport

Access Road, installation of Automated Weather Observation System, highway crossing improvements, and an extension of Runway 3/21. A $3.8 million airport improvement project has been identified in the DOT&PF 6-year spending plan[35], but it remains unfunded.

Municipal Airports

Palmer Airport

The Palmer Airport, managed by the City of Palmer, is one of two municipal airports located within the MSB. The Palmer Airport was constructed in 1947, and at that time consisted of two, 3,000 foot runways. Ownership of the airport was transferred from the State of Alaska to the City of Palmer in 1963.

The airport has three runways for aircraft use. The primary runway is a 6,009-foot-long by 100-foot-wide paved runway (16/34). A gravel runway, parallel to 16/34, is available for aircraft with tundra tires. This runway (16/34S) is 1,560 feet long and 60 feet wide. A 3,615-foot-long by 75-foot-wide paved runway (9/27) provides crosswind coverage but is closed to aircraft greater than 12,500 pounds. The 3,615-foot-long runway has a paved parallel taxiway, while the 6,000-foot-long runway has only exit and apron taxiways.

The airport has two apron areas, one for general aviation, and another for commercial cargo and/or passenger operations. The airport is the site of approximately 30,000 aircraft operations annually.

Palmer Airport

FAA maintains a manned Flight Service Station with two employees. There are 111 based aircraft at the Palmer Airport. Services available at the airport include: a flight school, 24-hour fuel service, engine rebuilding, airframe repair/painting, and

[35] DOT&PF. 2015. Alaska DOT&PF Rural Airport System Draft FFY '11—'17 AIP Spending Plan. December 9, 2015. Available at http://dot.alaska.gov/stwdav/documents/Rural_Airport_System_AIP_Spending_Plan.pdf

avionics. Although there are no scheduled commercial flights using the Palmer Airport, the airport has been used as a staging area for air shipments to rural Alaska for several years. Also, federal agencies periodically use the airport for logistical support and the State Division of Forestry uses the airport during the summer fire season. Existing land use around the airport is compatible with general aviation use.

Over the past 20 years, the airport has been the site of taxiway construction, runway extension, apron expansion, land acquisition, and runway lighting rehabilitation. The 2015 Palmer AMP proposed many improvements to be accomplished by 2035. Recommended improvements included relocating the golf course fence, construction of security fencing, construction of a sand storage building, relocation of Taxiway B, construction of a heliport, and commercial apron expansion. As of July 2017, the airport was in the process of rehabilitating and repaving Runway 16/34.

Wasilla Airport

The Wasilla Airport, managed by the City of Wasilla, is the other municipal airport located within the MSB. The airport's 3,700-foot-long by 75-foot-wide paved runway is being extended to 5,800 feet. The airport has approximately 1.6 million square feet of apron space, which includes 144 tie-down spaces and 20 lease lots. An AMP update was completed in 2012. In addition to the runway extension, other improvements identified in the master plan included development of a pilot/passenger facility, expansion and paving of the general aviation apron, extension of the parallel taxiway, utility improvements, and development of the North Airpark.

Short-term (5 years or less) improvements included:

- LPV approach
- Property acquisition for airport development
- Pilot/passenger facility
- General aviation apron expansion and paving
- Airport access road improvements
- Parallel taxiway extension
- ILS equipment installation

Wasilla Airport

Mid-term (6 to 10 years) improvements included:

- Seaplane base
- Airport water and sewer utility improvements
- North Airpark development

Long-term (11 to 20 years) improvements included:

- Taxiway, heliport, and lease lot development
- East Apron expansion

The total cost of these improvements is approximately $85 million in 2012 dollars.

In the long term, the City of Wasilla is interested in establishing a commercial base of operations for passenger and/or cargo services that will promote the economic vitality of the community and surrounding region.

Private Airstrips

It is estimated that there are currently more than 200 private airstrips throughout the MSB. About one-third of these airports are not registered with the FAA, and only slightly more than half have had an FAA airspace review. Many private airstrips are located within subdivisions in the road-accessible portions of the MSB. Some private airports/airstrips developed within residential airparks are among the busiest airports in the MSB. Wolf Lake is an example of a private residential airpark.

As the MSB continues to grow, the availability of large, open land areas that provide the space needed for safe aviation activities will decrease and aircraft operators will face more operational restrictions. The FAA requires private airports to complete an airspace analysis evaluation to ensure the safe operations of aircraft in the vicinity of other developments. Very few airport owners complete this evaluation. Enforcement of this policy is limited due to a lack of public awareness and trained personnel as well as the large number of airports needing evaluations.

Controlled and Reserved Airspace

Airspace is controlled by the Federal government for maintaining separation between aircraft as well as between aircraft and terrain to avoid collisions. Airspace reservations require aircraft to fly at set altitudes, on set routes, in certain directions, or at certain speeds. Airspace in various locations throughout the MSB is reserved for specific purposes such as military training, the protection of areas immediately surrounding airports, and the maintenance of designated

flight routes. Land owners are required by Federal regulation to obtain an airspace determination prior to the construction of an airport.

MSB Regional Aviation System Plan Recommendations

While the MSB is not currently an airport owner and operator, it has responsibilities regarding land use planning and promoting economic development, and is interested in working with aviation interests and the public to promote/preserve aviation and encourage compatibility with other activities in the region. The MSB is currently completing Phase II of its RASP to identify how aviation in the MSB may change over time and what actions the MSB should take to support this transportation mode. The RASP was developed in two phases. Phase I, which is complete, includes extensive research to identify demand for new airport facilities in the MSB, preliminary screening of over 30 sites within the MSB, and recommendations. Phase II includes five major tasks: an economic impact assessment of State airports in the MSB, a floatplane base location study, public involvement of user groups, an AMP and layout plan analysis, and a compatible land use study.

The 2008 RASP provided recommendations within five issue categories, summarized below:

- Involvement of the Aviation Community
  - Establishment of an Aviation Advisory Board (AAB). The AAB was established in 2009 by MSB Assembly action and currently meets on a monthly basis. The nine member board is composed of a diverse mix of aviation and non-aviation interests and reports to the MSB Planning Commission.
- Airspace
  - Require new and existing airports, commercial floatplane bases, helipads, and heliports to obtain an FAA airspace determination and registration
  - Encourage pilots to fly with landing lights on to increase their visibility to other planes
  - Hold ongoing discussions between the MSB, FAA, and AAB to discuss military airspace issues
  - Support implementation of Capstone-type technology[36] in the MSB
- Communications
  - FAA should continue to reassign radio frequencies to airports in the MSB following a logical geographic pattern

[36] Capstone refers to a joint industry and FAA research and development project designed to improve aviation safety and efficiency in Alaska putting cost effective, new technology avionics equipment into aircraft and providing the supporting ground infrastructure. The Capstone project was discontinued in 2006 and the FAA has incorporated it into Automatic Dependent Surveillance–Broadcast surveillance system.

  - Communicate private airport locations and radio frequencies to pilots
  - FAA should establish standard VFR reporting points and provide information on military routes
  - Implement a comprehensive pilot education program about all of the topics such as noise abatement procedures, radio frequencies, use of radios and landing lights, land use rules, and more
  - Expand radio and radar coverage in the MSB
- Airport Compatibility
  - Notify property owners of airport locations on MSB or DOT&PF maps and note close proximity to an airport on plats
  - Address airports in comprehensive plans and Special Land Use Districts
  - Involve AAB in Lake Management Plans that address aviation
  - Encourage consolidation of antenna towers and involve AAB in antenna/tall tower reviews
  - Consider airport proximity when siting public facilities near airports
  - Require conditional use permits, planned unit development, or land use permits for new airports, commercial floatplane bases, helipads, and heliports; adopt airport template(s) that address minimum airport safety standards
  - Amend Title 27 (now listed as Title 43) to define platting requirements specifically for airports; require airports to be shown on a plat if subdivision of land is required
- Public Airport Improvements
  - Airport owners should consider RASP public comments about future airport improvement needs

The RASP also recommended that all existing and new airports in the MSB be required to obtain FAA airspace determination and registration.

Other Recommendations

Proposed Precision Instrument Approach to Wasilla Airport

There is currently no regularly scheduled airline commuting services or air freight services available for residents. To address this and provide Anchorage-bound IFR traffic an alternate airport location for use during poor weather, the Wasilla AMP proposed development of a precision instrument approach for Wasilla Airport. To implement an instrument approach at Wasilla Airport, the FAA would likely establish Class E controlled airspace around the airport. This would significantly restrict the operation of VFR aircraft traffic in the area and could effectively close all airports within 5 miles when aircraft approach Wasilla Airport during instrument landing conditions (i.e., ceiling less than 1,000 feet or visibility less than 3 miles). As

mentioned in the Wasilla AMP, airspace conflicts with surrounding airports would need to be resolved.

Improved Airports

Recognizing the importance of aviation within the MSB, it is recommended that the Borough continue to actively support the development, improvement, maintenance, operation, and funding of a system of public airports and seaplane bases throughout the MSB. DOT&PF managed airports should continue to be improved to provide for the needs of air taxi operators and private pilots. The improvements should be prioritized based on activity level and safety needs. The two municipal airports should be improved to provide for the needs of commercial aviation companies as well as air taxi operators and private pilots.

Seaplane Bases

Although public seaplane bases are not generally recognized in the MSB, many of the lakes are used as seaplane bases, with the private sector providing the necessary support facilities. These same lakes are popular recreation sites for residents as well as visitors. The potential for conflicts arises when occupants of aircraft, boats, jet skis, and other watercraft attempt to utilize the same area at the same time. The development of non-commercial seaplane facilities should be encouraged when the need is demonstrated, provided that it is compatible with adjacent recreational and residential land uses. These facilities should be developed with appropriate FAA notification and airspace review and in compliance with U.S. Coast Guard standards for navigable waterways. To the greatest extent possible, facilities (e.g., docks, ramps, floats, hangars, fueling facilities, terminals) for commercial seaplane operations should be restricted to public seaplane facilities for reasons of safety and land use compatibility.

Capital Funding

It is anticipated that the availability of funding from the Federal Airport Improvement Program, which has historically supported a majority of public airport development in the MSB, will be reduced in the foreseeable future. Federally funded airport projects will likely be focused on essential operational improvements deemed necessary by the FAA to keep the airports open and operating in a safe manner. The MSB should encourage public airport sponsors to investigate the potential for Public-Private Partnerships (PPP) in the provision and/or operation of airport infrastructure in the MSB. A PPP is an agreement whereby the private sector utilizes its capital and expertise to provide a service or a facility to a public agency. In return, the public agency shares in the benefits and risks of the project.

Chapter 8
Rail Transportation

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Chapter 8 Rail Transportation

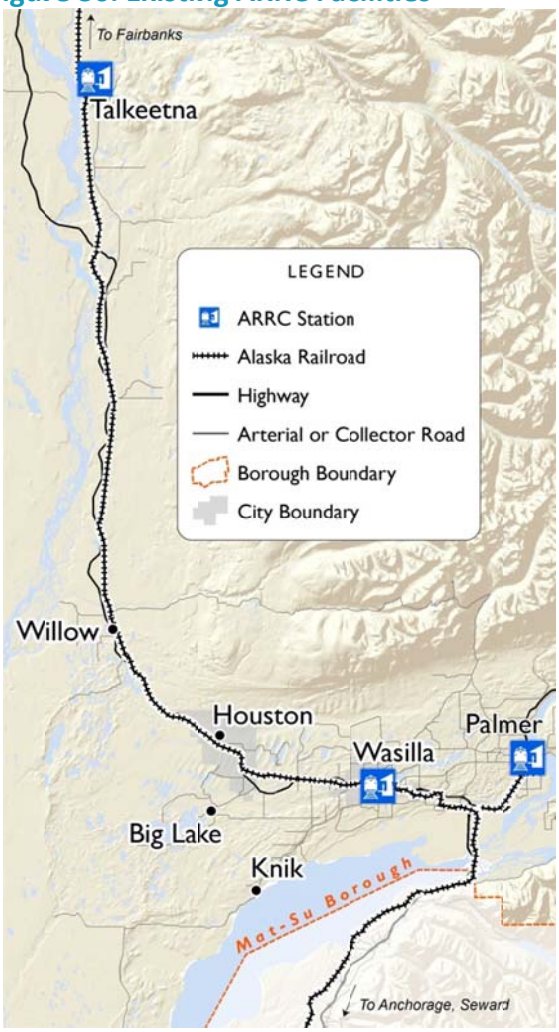
The Alaska Railroad has played a fundamental role in the development and economy of the MSB. Wasilla, Palmer, Chickaloon, Sutton, and other communities got their start as a byproduct of railroad construction and operation between 1915 and 1920. Although some early industries such as coal mining are no longer major economic drivers, others (e.g., gravel extraction and transport) continue to be a thriving basic industry. The railroad has expanded its range of freight and passenger services over the past 20 years. It will play a key role in the long-term growth of Port MacKenzie and development of Matanuska-Susitna Valley industry.

The Alaska Railroad was purchased from the Federal government by the State of Alaska via the establishment of the Alaska Railroad Corporation (ARRC) in 1985. It operates independently as a State-owned corporation under the direction of an appointed board of directors. ARRC provides freight and passenger rail service.

Existing Conditions

Within in the MSB, ARRC has approximately 185.2 miles of mainline track[37] and three stations (Palmer State Fair Ground[38], Wasilla, and Talkeetna), with whistle stops in remote areas (see Figure 30).

Figure 30. Existing ARRC Facilities



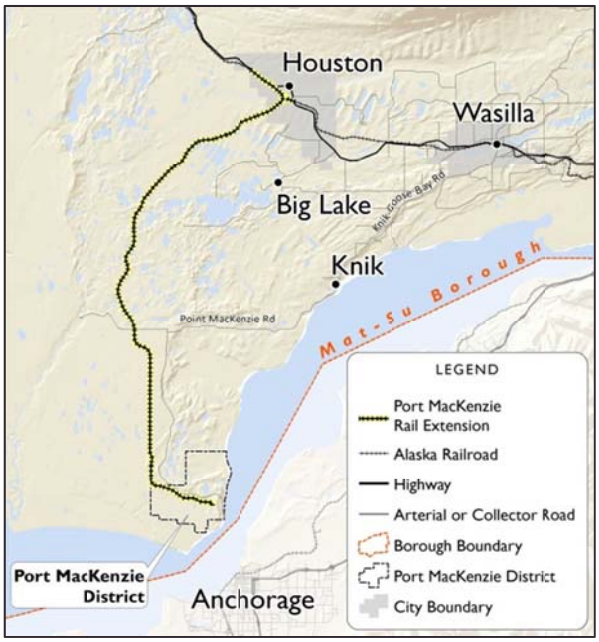
[37] The Palmer spur line is approximately 11 miles.
[38] This station is used to support special events at the State Fair Ground. There is no regular service to this station.

Planned Improvements

Port MacKenzie Rail Extension

The Port MacKenzie Rail Extension project is a MSB project being constructed in cooperation with the ARRC. The project is building a new 32-mile track connecting Port MacKenzie on the Knik Arm of Cook Inlet to the ARRC mainline track near Houston (see Figure 31). When complete, the new rail line would operate as part of the ARRC system. Port MacKenzie lies approximately 30 miles southwest of Wasilla and 5 miles due north of Anchorage, across Cook Inlet. The port has a deep-draft dock (60 feet at low tide) that requires no dredging and can serve the world's largest ships. The port's 8,940 upland acres and 1,300 tide-land acres provide ample room to accommodate bulk resource storage, transport, and processing facilities, as well as rail and terminal facilities for efficient train loading and unloading. All of the project funding thus far has come from State grants. A September 2014 estimate indicated that the project cost will exceed $300 million[39]. As of July 2017, the project is on hold with approximately 60 percent completed. It will cost approximately $125 million to complete the project, but funding has not been identified.

Figure 31. Port MacKenzie Rail Extension



Glenn Highway MP 34–42 Improvements

The Palmer Branch of the ARRC track parallels the Glenn Highway from the Parks/Glenn Highways interchange to downtown Palmer. Over time, residential development has occurred along this area. This growth has resulted in additional side streets connecting to the Glenn Highway. These streets are blocked during the gravel loading process at gravel pit tipple. As the Palmer gravel site is expected to produce gravel for another 20 years, the ARRC is working with DOT&PF, the City of Palmer, and the MSB to identify a solution to the blocked crossings.

[39] As reported by PMRE Executive Director, Joe Perkins, at an August 5, 2014 meeting of the MSB Assembly and reported by KSKA on August 6, 2014.

The gravel train issue at Outer Springer Loop is part of a larger issue for ARRC—improving safety at all locations along the Glenn Highway where the residential side streets cross the railroad tracks.

DOT&PF is considering the railroad as part of its Glenn Highway MP 34-42 Reconstruction project. The DOT&PF project will reconstruct the highway to accommodate increasing traffic, include adding lanes, widen shoulders, install turn pockets, and address other traffic and safety improvements such as road/rail crossings. As part of the design process, the project team is working with a multi-agency Diagnostic Team comprised of engineering and traffic experts. The project will identify options for addressing the gravel train activity at Outer Springer Loop, as well as provide recommendations for improving all road/rail crossings between MP 34 and 42 of the Glenn Highway (see Figure 32).

Possible solutions include:

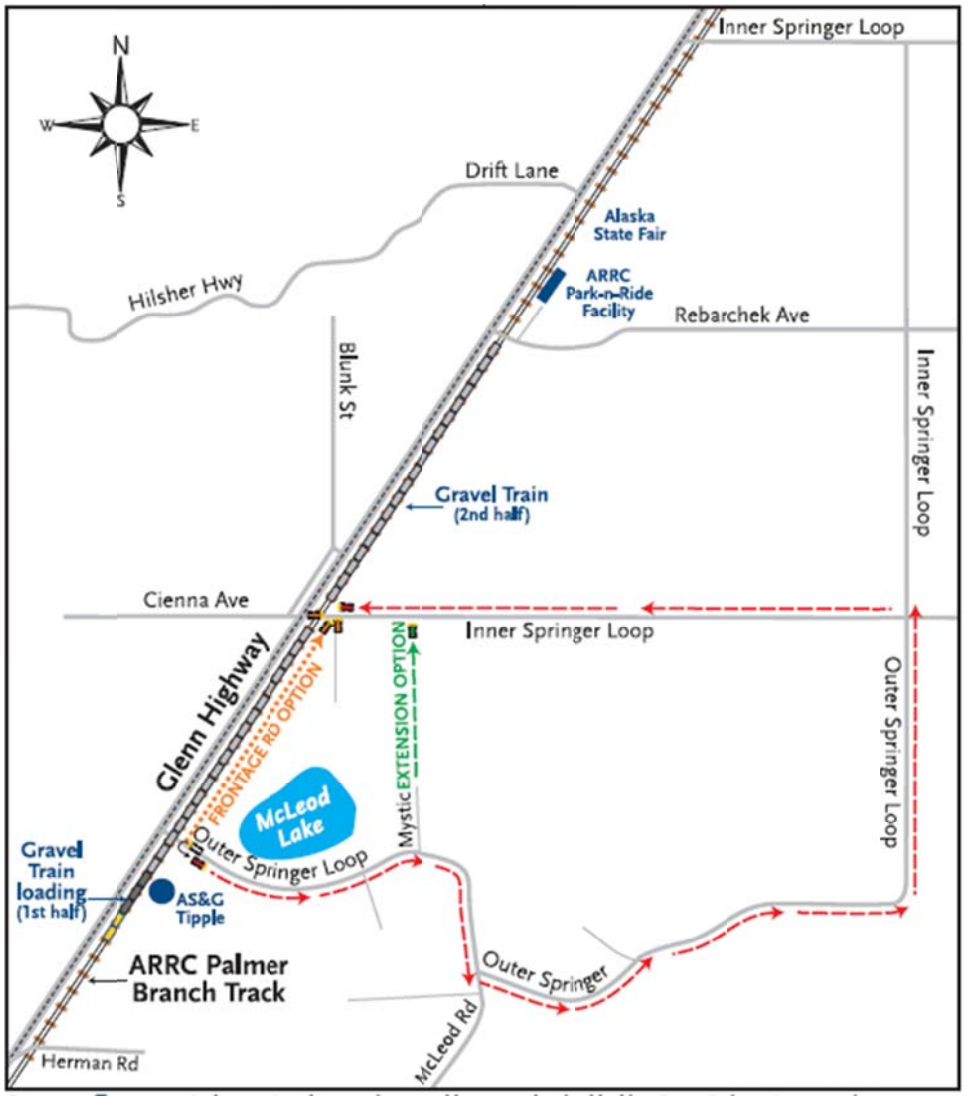
- Providing a shorter bypass route by extending Mystic Circle
- Building a frontage road along the east side of the tracks
- Grade separating one or more crossings
- Extending McLeod Road to the Glenn Highway to eliminate some crossings

Gravel Loading Process:

When an empty gravel train arrives in Palmer, it pulls all 80 to 86 hopper cars (measuring approximately 1 mile long) north of the tipple. The train breaks into two sections to avoid blocking Inner Springer Loop. As the first 40 or so hopper railcars are loaded with gravel, the train moves slowly south, blocking Outer Springer Loop for about an hour.

The process repeats for the second half of the train. When Springer neighborhood vehicle traffic encounters the blocked crossing at Outer Springer Loop, drivers must either wait (up to an hour) for the crossing to clear, or turn around and drive approximately 3 miles to Inner Springer Loop to access the highway.

Figure 32. Potential Improvements to Reduce Blocked Crossings in Palmer

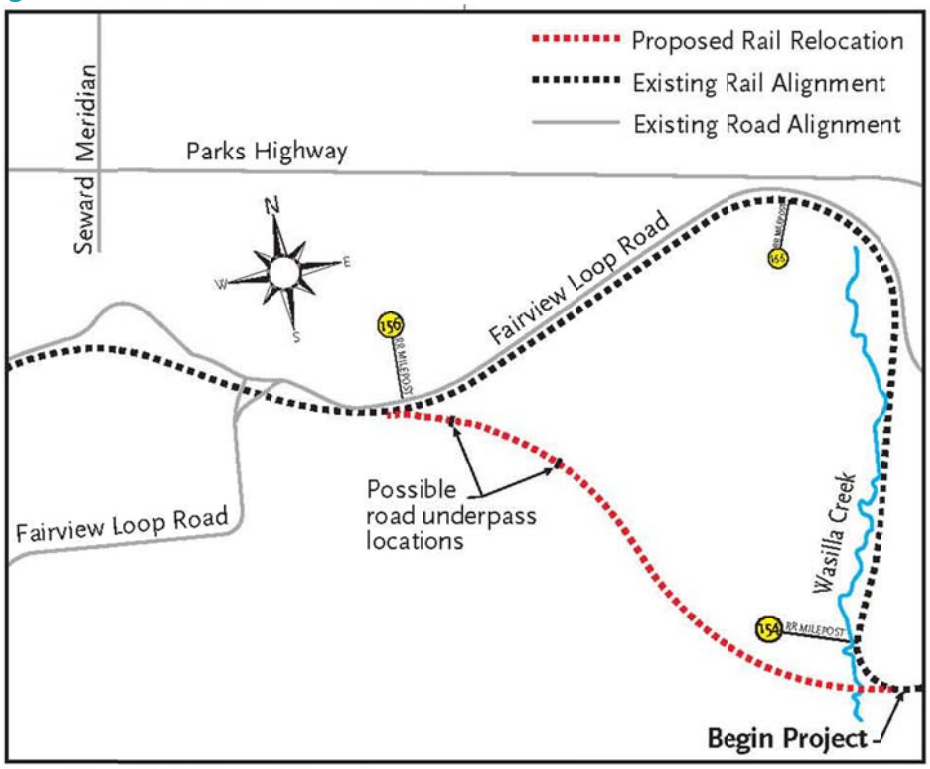


Map Source: ARRC

South Wasilla Rail Line Relocation

The ARRC, in cooperation with the Federal Transit Administration (FTA), plans to straighten curves along the mainline track between ARRC MP 154 (south of Gershmel Loop, where the track begins a sharp curve to the north) and MP 158 (just south of the intersection of the Old Matanuska Road and Glenwood Avenue; see Figure 33). This is part of a larger ARRC effort to reduce track curvature and improve safety along the main line track between Girdwood and Wasilla. This project has both freight and passenger applications, as it will reduce travel times on this section of track as well as improve freight train efficiency and safety. Reducing travel time on this segment would support development of a Wasilla-Anchorage commuter rail. ARRC has the right of way it needs for this relocation effort. This project is estimated at $40 million.

Figure 33. South Wasilla Rail Line Relocation



Source: ARRC

Railroad-Highway Grade Crossings

A railroad-related issue that directly affects the movement of people within the MSB is the adequacy and safety of the railroad-highway grade crossings located on the main line and the Palmer branch. The decision to grade-separate a rail-highway crossing is primarily a matter of safety and economics. Separating a grade crossing normally requires a significant investment and affects many users and nearby property owners.

Decisions should be based on long-term, fully allocated life cycle costs, including highway and railroad user costs, rather than purely on initial construction costs. And as traffic is increasing

on nearly all roads in the MSB, projected traffic levels should be used. Analysis of whether to separate an at-grade crossing should consider the following[40]:

- Savings in highway-rail grade crossing surfaces, crossing signal installation, and maintenance costs;
- The benefits of improved emergency access;
- Eliminating train/vehicle collisions (by using accident prediction values);
- Driver delay cost savings;
- Costs associated with providing increased highway storage capacity (to accommodate traffic backed up by a train);
- Fuel and pollution mitigation cost savings (from idling queued vehicles);
- Effects of any "spillover" congestion on the rest of the roadway system;
- The potential for closing one or more additional adjacent crossings; and
- Train derailment costs.

DOT&PF and ARRC have been working on eliminating some of the at-grade crossings in the MSB. DOT&PF is currently constructing two grade separations of the Parks Highway at Montana Creek (Parks Highway MP 91.6/ARRC MP 206.25) and Sunshine (Parks Highway MP 100.7/ARRC MP 214.30).

An additional grade crossing project (MP 194 Broad Pass RR Overcrossing) is included in the STIP. However, no funds have been allocated for this project.

Federal Railroad Administration Web Accident Prediction System

The Federal Railroad Administration has a web-based accident prediction system (WBAPS) to help states, railroads, and others in determining which crossings may be more hazardous than others. The accident prediction formula is based on information about a crossing's physical and operating characteristics and five years of accident history data at the crossing. It does not consider certain factors such as sight-distance, highway congestion, and hazardous material traffic. The WBAPS data should not be used to rank crossings as most to least dangerous, but it can be used with other information to help identify crossings that may need further evaluation. The WBAPS for the MSB is shown in Table 17.

[40] FHWA. 2002. Guidance on Traffic Control Devices at Highway-Rail Grade Crossings. November 2002. Available at http://safety.fhwa.dot.gov/media/twgreport.htm#72

Table 17. WBAPS Accident Predication Values

#	APV	Crossing	City	Road	Number of Collisions					Warning Device	Trains per Day	Number of Tracks	Maximum Allowable Train Speed	# of Highway Traffic Lanes	AADT
					13	12	11	10	09						
1	0.075797	868318Y	Wasilla	Knik Goose Bay	0	0	1	0	0	GT	18	2	25	4	10,336
2	0.051065	910224K	Wasilla	Abby Blvd	0	1	0	0	0	GT	18	1	35	2	2,000
3	0.039846	868331M	Willow	Willow Station	0	0	0	0	1	GT	18	2	65	2	350
4	0.026881	868311B	Wasilla	Glenn Hwy	0	0	0	0	0	GT	14	1	55	2	20,000
5	0.024132	868319F	Wasilla	Snider	0	0	0	0	0	SS	18	1	49	2	200
6	0.021571	868322N	Wasilla	Pittman Rd	0	0	0	0	0	GT	20	1	49	2	4,280
7	0.020891	868520J	Palmer	Evergreen Ave	0	0	0	0	1	OS	0	2	10	2	9,500
8	0.020409	868315D	Wasilla	Fairview Loop	0	0	0	0	0	GT	18	1	35	2	3,740
9	0.018773	868335P	Willow	Parks Hwy	0	0	0	0	0	GT	18	1	49	2	2,620
10	0.017600	910335C	Wasilla	S Mack Drive	0	0	0	0	0	GT	18	1	49	2	2,000
11	0.016508	868328E	Houston	Nancy Lk Land	0	0	0	0	0	SS	18	1	65	2	200
12	0.016441	868338K	Talkeetna	Parks Hwy	0	0	0	0	0	GT	18	1	49	2	1,510
13	0.016088	868341T	Talkeetna	Talkeetna Spur	0	0	0	0	0	GT	18	1	49	2	1,806
14	0.015696	868323V	Wasilla	Meadow Lakes Rd	0	0	0	0	0	GT	18	1	49	2	1,250
15	0.015538	868325J	Houston	Cheri Lake Rd	0	0	0	0	0	GT	18	1	49	2	1,200
16	0.015256	868512S	Palmer	Outer Springer	0	0	0	0	0	XB	8	1	10	2	400
17	0.014998	868510D	Palmer	Grandview	0	0	0	0	0	XB	12	1	10	2	200
18	0.014851	868320A	Wasilla	Lucille Lane	0	0	0	0	0	GT	18	1	49	2	1,000
19	0.014851	868334H	Willow	Hidden Hills	0	0	0	0	0	GT	18	1	49	2	1,000
20	0.013579	868316K	Wasilla	Glenwood	0	0	0	0	0	GT	18	1	30	2	700
21	0.012772	910360K	Wasilla	East Fireweed	0	0	0	0	0	GT	18	1	55	2	550
22	0.012527	868332U	Willow	Fishhook Willow	0	0	0	0	0	GT	18	1	65	2	510
23	0.012527	868342A	Talkeetna	Talkeetna	0	0	0	0	0	GT	18	2	40	2	510
24	0.012464	910225S	Wasilla	Jude Rd	0	0	0	0	0	GT	18	1	25	2	500
25	0.009772	868345V	Cantwell	Parks Hwy	0	0	0	0	0	GT	12	1	60	2	1,860

#	APV	Crossing	City	Road	Number of Collisions					Warning Device	Trains per Day	Number of Tracks	Maximum Allowable Train Speed	# of Highway Traffic Lanes	AADT
					13	12	11	10	09						
26	0.009355	868343G	Cantwell	Parks Hwy	0	0	0	0	0	GT	14	1	35	2	1,315
27	0.007766	868327X	Houston	Lynx Lake	0	0	0	0	0	SS	18	1	65	2	20
28	0.006927	910343U	Willow	Kashwitna Trail	0	0	0	0	0	SS	18	1	49	1	20
29	0.005488	868508C	Palmer	Matanuska Spur R	0	0	0	0	0	SS	12	1	10	1	50
30	0.000304	868513Y	Palmer	Inner Springer	0	0	0	0	0	XB	0	1	10	2	1,250
31	0.000304	910245D	Palmer	Cope Ind. Way	0	0	0	0	0	XB	0	2	10	2	2,000
32	0.000304	910242H	Palmer	Thuma St	0	0	0	0	0	XB	0	1	10	2	1,500
33	0.000304	868522X	Palmer	Blueberry Ave	0	0	0	0	0	OS	0	1	10	2	300
34	0.000304	868519P	Palmer	Fireweed Ave E	0	0	0	0	0	OS	0	1	10	2	2,860
35	0.000304	868517B	Palmer	Commercial Dr	0	0	0	0	0	OS	0	2	10	2	500
36	0.000304	868516U	Palmer	Springer Inner	0	0	0	0	0	XB	0	1	10	2	3,490
37	0.000304	910308F	Palmer	South Chugach	0	0	0	0	0	XB	0	1	10	2	3,110
TTL:	0.562801				0	1	1	0	2						

AADT=Annual Average Daily Traffic; APV= Accident Prediction Value; FQ=Four Quad Gates; FL=Flashing lights; GT=All Other Gates; HS=Wigwags, Highway Signals, Bells, or Other Activated; NO=No Signs or Signals; OS=Other Signs or Signals; SP=Special Protection (e.g., a flagman); SS=Stop Signs; XB=Crossbucks

Commuter Rail

The concept of commuter rail service between Anchorage and the MSB has been studied by the MOA, the MSB, and the ARRC (1979, 1988). In 2002, the ARRC sponsored the *South Central Rail Network Commuter Study and Operation Plan*[41], which, in addition to service between the Matanuska-Susitna Valley and Anchorage, explored service between Girdwood and Anchorage. The ridership element of that study was updated in 2009 with the *Wasilla-Anchorage Commuter Rail Concept of Operations*, a technical memorandum prepared for ARRC. The early studies concluded that three requirements would need to be met before commuter service could be initiated: there would need to be 10,000 or more commuters between the Matanuska-Susitna Valley and Anchorage, the track between Wasilla and Anchorage would need to be realigned to achieve competitive train speeds, and a commuter service-specific labor agreement would be needed to achieve labor costs appropriate for short-run train service. All of these requirements have been completely or nearly met. The key remaining element is the straightening of track between Matanuska and Wasilla, which would support competitive running times from Wasilla to Anchorage.

The draft 2016 *Alaska State Rail Plan* updated the 2009 conceptual operating plan for commuter rail. The conceptual plan was based on three stations (Wasilla[42], Matanuska, and Ship Creek; see Figure 34), with three southbound peak period trips in the morning, the reverse during the evening peak period, and one mid-day round trip. The trip from a new Wasilla station near the Wasilla Airport to Ship Creek would have a run time of approximately 54 minutes.[43] The rolling stock for this service is assumed to be self-propelled rail cars. The cars would have level boarding to speed up the boarding/unloading process. With this scenario, it is estimated that total weekday ridership could reach 1,500 by 2020.

To handle this projected ridership, the commuter rail service would require a three-car train-set that costs approximately $9.5 million in 2014 dollars. Three train-sets plus one spare would be needed, bringing the cost for rolling stock to approximately $38 million. While using ARRC equipment would be possible, it would limit commuter rail service as the ARRC is already at capacity in the summer with its current passenger fleet. Using ARRC equipment for a

[41] Wilbur Smith Associates, Harding ESE, Debbie Bloom Consulting, Nancy Whelan Consulting, and Craciun Research Group. 2002. *South Central Rail Network Commuter Study and Operation Plan*

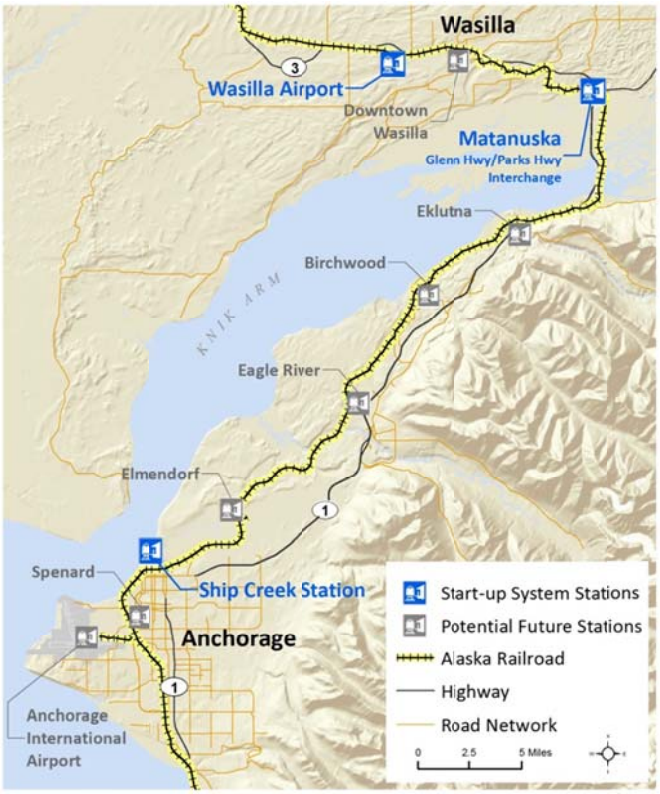
[42] As of August 2016, this station is under development.

[43] This run time assumes an average speed of 53 miles per hour. This speed is comparable to other commuter rail services, and it assumes that the track straightening between Matanuska and Downtown Wasilla has been completed.

demonstration project during the winter months when there is less demand for ARRC equipment may be possible.

The stations are assumed to accommodate approximately 100 to 500 vehicles as well as accommodate transit and a passenger drop-off/pick-up area. Stations would have an enclosed waiting room and electronic ticket vending machines. Each station is anticipated to cost between $1 and $5 million.

Figure 34. Potential Commuter Rail System



It is estimated that the service could cost approximately $6.3 million per year to operate. Annual fare box revenue is estimated at $2.7 million, producing an operating subsidy of approximately $3.6 million per year. Given the projected revenue and operating costs, the fare box recovery for the commuter rail service in 2020 would be 43 percent. This is similar to the fare box recovery ratio achieved by other commuter rail systems. The capital cost to implement the "start-up" phase of commuter rail is estimated at $45.7 million ($5.3 million in station improvements, $38 million for equipment, $2 million for a layover facility, and $0.4 million for testing).

While not required to operate commuter rail, the South Wasilla Rail Line Realignment would benefit the service as it would reduce the run trip by up to 6 minutes and eliminate multiple at-grade crossings.

The next steps to implement commuter rail include:

- Coordination with the MOA and MSB
- Consultation with ARRC to verify run time and needed improvements
- Demonstration of service
- Formation and funding of the operating authority
- Construction of facilities and equipment purchase

Recommendations

Commuter Rail

During development of the *Alaska State Rail Plan*, stakeholders in the MSB indicated that they would like to see commuter rail implemented. Currently, there is no funding to implement commuter rail, so it is not a fiscally-constrained element of the LRTP. If implemented, funding would likely come from a variety of sources, including the MSB, MOA, DOT&PF, and FTA. The MSB, MOA, DOT&PF and ARRC should continue to work together to pursue commuter rail in South-central Alaska. Specific issues to be addressed include identifying the appropriate managing authority and operator for this service, addressing the transportation connection between the Ship Creek depot and the commuter's final destination, identifying potential funding sources, and pursuing the development of a pilot project.

The MSB LRTP also recommends the ARRC continue to implement their planned improvements within the MSB to improve efficiency, promote safety, and facilitate economic development.

Relocate Wasilla Train Station

The Wasilla Main Street project is being developed to put in a couplet to reduce north-south congestion through Wasilla. The proposed design for that project requires the relocation of the existing passenger boarding facility in Wasilla. A new facility is being planned near the old Kenai Supply Building. The City of Wasilla has purchased property for a new facility.

This facility will be developed as a "conditional stop" rather than a "station" because the train only stops when there is a confirmed passenger to get on or off at that location.

Completion of the Port MacKenzie Rail Extension

The Port MacKenzie Rail Extension project is approximately 65 percent complete. When funding is available, the MSB should pursue the completion of this project. The project will shorten the trip between tidewater and Interior Alaska, which may reduce the cost of exporting natural resources. The project will also support activity at Port MacKenzie, which includes 14 square miles of staging ground, a 100-rail-car-loop for the efficient handing of bulk materials, and a port that can accommodate large ocean-going vessels. This rail connection may also reduce rail congestion on the mainline between the MSB and Anchorage.

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Chapter 9
Marine and Waterborne Transportation

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Chapter 9 Marine and Waterborne Transportation

Marine and waterborne transportation remains an important part of the MSB's transportation system. The MSB has consistently given a high priority to the development of a deep water port and related industrial and infrastructure development in the Point MacKenzie area. Port MacKenzie is planned to function as the primary regional facility for the export of resources and for the import of supplies and equipment.

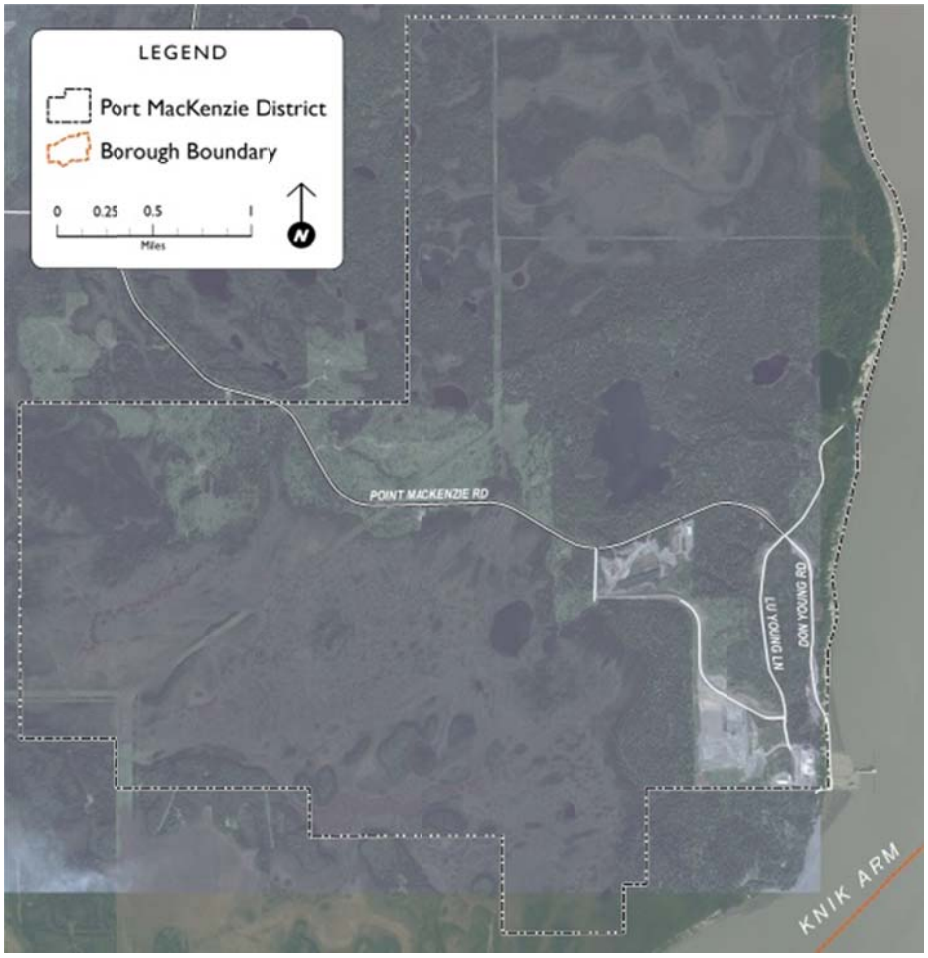
Marine and waterborne transportation provides an important type of access for some of the non-road accessible areas of the MSB. The river system provides access to private residential and recreational properties as well as commercial and public recreational properties in the more remote areas of the MSB. Area lakes also provide access to some properties not otherwise accessible. A good example of this is Big Lake. In the Big Lake area, there are homes, businesses, and recreational properties that are accessible only by water.

Existing Conditions

Port MacKenzie

Operating since 2001, Port MacKenzie (Figure 35) has 9,033 acres (14 square miles) within the port district dedicated to commercial and industrial development. The docks are designed to efficiently export natural resources, but the port can accommodate many other types of cargo.

Figure 35. Port MacKenzie



Infrastructure at Port MacKenzie includes:

- **Barge Dock** - a 14.7-acre gravel surface at -20-feet mean lower low water (MLLW) with a 500-foot sheet pile face for docking. The load capacity of the gravel pad is 1,000 pounds per square foot.
- **Deep-Draft Dock** - The 1,200-foot-deep-draft dock can accommodate Panama and Cape class vessels. The dock is equipped with a 5-foot-wide conveyor system capable of loading bulk commodities at 2,000 tons per hour.
- **Terminal Building** - The 7,000 square foot terminal building is located on the southeast corner of the barge dock. It has offices available for lease, bathrooms with showers, and a kitchenette. Utilities include fuel oil heat, electricity, water, sewer, telephone, and DSL internet service.

Rivers and Lakes

Currently, public and private boat launches provide the necessary facilities for river and lake waterborne transportation for boats and floatplanes in the summer. It is important that these facilities continue to be available to users. Future availability of existing facilities should not be an issue, but there are some concerns associated with the operation and maintenance of these facilities. The first issue is the condition of the facilities as it relates to safety. Facilities need to be maintained to ensure the public's safety. Another concern is litter cleanup at the facilities as well as along the waterways being used for transportation. Funding sources are available for the development of boat launch facilities, but those same funding sources are generally not available for the operation and maintenance of the facilities. It is important that maintenance and operating funds be identified and provided for public boat launch facilities.

Recommendations

The recommended improvements to the marine transportation system are described below.

Port Development

Continued development of Port MacKenzie is recommended. To the extent that Federal or State grants can be obtained to further the improvement of the port area infrastructure, upgrades and improvements should be made pursuant to the Port MacKenzie Master Plan. Some of the major needs of the port include:

- New highway connections to the Parks Highway
- Completed rail connection to the ARRC
- Natural gas supply
- Second trestle connecting the barge dock to the deep draft dock

Ongoing Operation and Maintenance

It is recommended that the need for continued operation and maintenance of existing public boat launch facilities and public access points to lakes and rivers be recognized. The clean-up, maintenance, and improvement of existing public access points and boat launch facilities should be a priority. Improvements should include appropriate signage indicating allowed uses; facilities such as fire pits, toilets, and litter containers if camping or picnicking is allowed; and fencing when necessary to delineate the boundaries of public property. Also, new facilities should not be built without a provision for continued maintenance of the facilities.

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Chapter 10
Environmental Analysis

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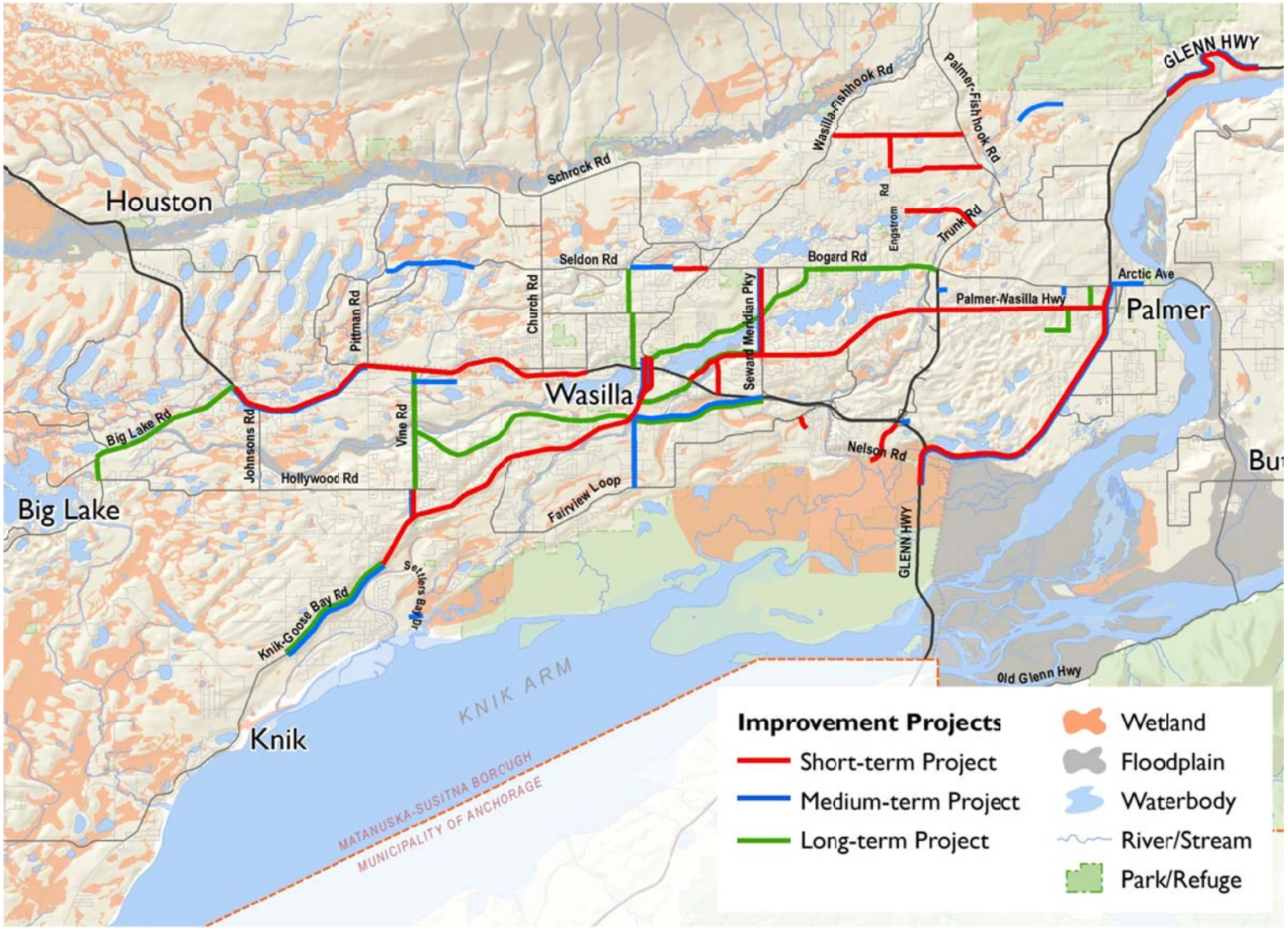
Chapter 10 Environmental Analysis

It is important for the LRTP to consider how well the alternatives fit with the natural and built environment. Figure 36. shows the location of recommended roadway projects and how they relate to environmentally sensitive areas in the study area.

As the MSB moves towards being designated an MPO it is noted that federal regulations require MPOs to consider environmental mitigation activities in developing transportation plans. The LRTP examines system level issues and may alert agencies to issues that may need to be considered during the project development process. This high-level environmental review may inform the National Environmental Policy Act process but does not replace it. Projects identified in this LRTP will require more detailed environmental review prior to design and construction.

Figure 36. Environmentally Sensitive Areas



Environmental Screening/Considerations

Environmental resources that could potentially be affected by transportation projects in the 2035 LRTP are discussed in this section. Projects included in this LRTP will require additional project development before they can be implemented.

Archaeological and Historic Resources

Archaeological and historic resources are regulated under Section 106 of the National Historic Preservation Act and may require consultation with DOT&PF and the Alaska State Historic Preservation Officer (SHPO). At the start of any project development process, the lead agency should coordinate with the SHPO regarding archaeological and historic resources to determine what coordination and research needs to be undertaken.

Wetlands and Waters of the U.S.

Wetlands and waters of the U.S. will need to be considered as projects move from the planning stage to design and construction. Wetland delineations are recommended in the initial stages of a transportation improvement project to confirm the boundaries of wetlands and Waters of the U.S. within the project area and to coordinate with U.S. Army Corps of Engineers to determine jurisdiction. Relevant wetland-related GIS datasets available for the MSB include:

1. National Wetlands Inventory mapping prepared by the U.S. Fish and Wildlife Service.
2. Mat-Su Borough Wetland Mapping prepared by Mike Gracz (Gracz 2009).
3. Soil survey mapping from Soil Survey of the Matanuska Valley, Alaska, produced by the Natural Resource Conservation Service (NRCS 1995).
4. Stream mapping from the USGS National Hydrology Dataset.

Floodplains

Development in floodplains is regulated by the Federal Emergency Management Agency (FEMA), the Alaska Department of Natural Resources, and the MSB. FEMA regulations prohibit encroachment in regulated floodways unless it is accompanied by a no-rise analysis that shows the project will not cause an increase in the 100-year flood level.

Threatened and Endangered Species

Fish and wildlife species listed under the Federal Endangered Species Act will need to be considered for each project. The State of Alaska has its own list of endangered species, species of special concern, and fish stocks of concern. Consultation with the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game should be undertaken to determine which species have the potential to occur within each project area and for the project to affect each species present.

Section 4(f) and Section 6(f) Resources

The Federal Department of Transportation Act of 1966 included a provision, Section 4(f), which is designed to protect publically owned parks, recreation areas, wildlife and waterfowl refuges, or public and private historical sites. U.S. Department of Transportation agencies, including FHWA, cannot approve any project that requires the use of this land unless there is no feasible and prudent alternative to the use of the land and all possible planning to minimize harm to the resource has been done or FHWA determines that the use of the property would have a *de minimis* impact. *De minimis* is a determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or refuge for projection under Section 4(f), or a Section 106 finding of no adverse effect or no historic properties affected for a historic property (i.e., an archaeological, historic, or cultural resource determined eligible for listing on the National Register of Historic Places).

Section 6(f), created as part of the Land and Water Conservation Act, protects state and local projects funding by the Land and Water Conservation Fund. These lands cannot be converted to a non-park/recreation use without the approval of the National Park Service. Conversion of these lands is allowed if it is determined that there are no practicable alternatives to the conversion and that there will be provision for a replacement property. Mitigation for Section 6(f) lands impacted by a project need to include replacement with land of at least the same market value and reasonable equivalent usefulness and location relative to the impacted land.

Environmental Justice

Environmental Justice is intended to ensure that Federal actions treat all populations equally. It was introduced into Federal actions and funding by Executive Order 12898 of 1994. This executive order is founded by Title VI of the Civil Rights Act, which prohibits discrimination on the basis of race, color, or national origin. Environmental Justice requires Federal agencies to identify and address the effects of its programs, policies, and activities on "minority populations and low-income populations."

Minority Populations

FHWA defines a "minority population" as:

- Black: a person having origins in any of the black racial groups of Africa
- Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South America, or other Spanish culture or origin regardless of race
- Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent

- American Indian and Alaska Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition
- Native Hawaiian and Other Pacific Islander: a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

Data from the ACS was used to determine the number and percentage of minority population in the MSB. Figure 37 shows a summary of the recommended roadway projects in relation to the location of minority populations.

Low Income Populations

FHWA defines a "low income population" as any readily identifiable group of low-income persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons who will be similarly affected by a proposed FHWA program, policy, or activity. FHWA defines "low income" as a person whose median household income is at or below the Department of Health and Human Services (DHHS) poverty guidelines. The best approximation for the number of people below the DHHS poverty guidelines in a certain area is the number of persons below the Census Bureau poverty threshold in that area. The ACS, a Census Bureau product, was used to determine the number of households in poverty (low-income populations) in the MSB. Figure 38 shows the location of projects in relation to these populations.

Figure 37. Minority Populations

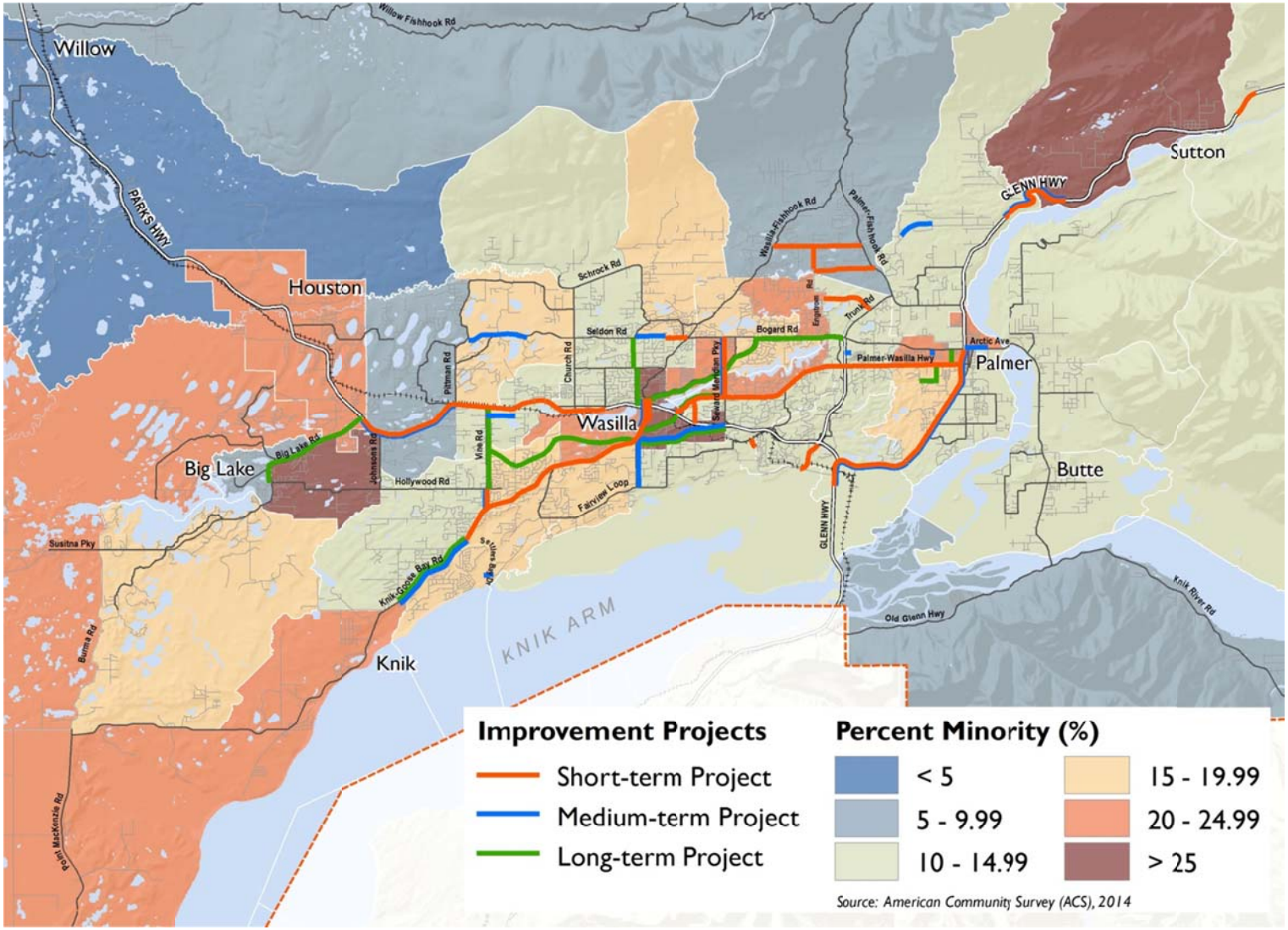
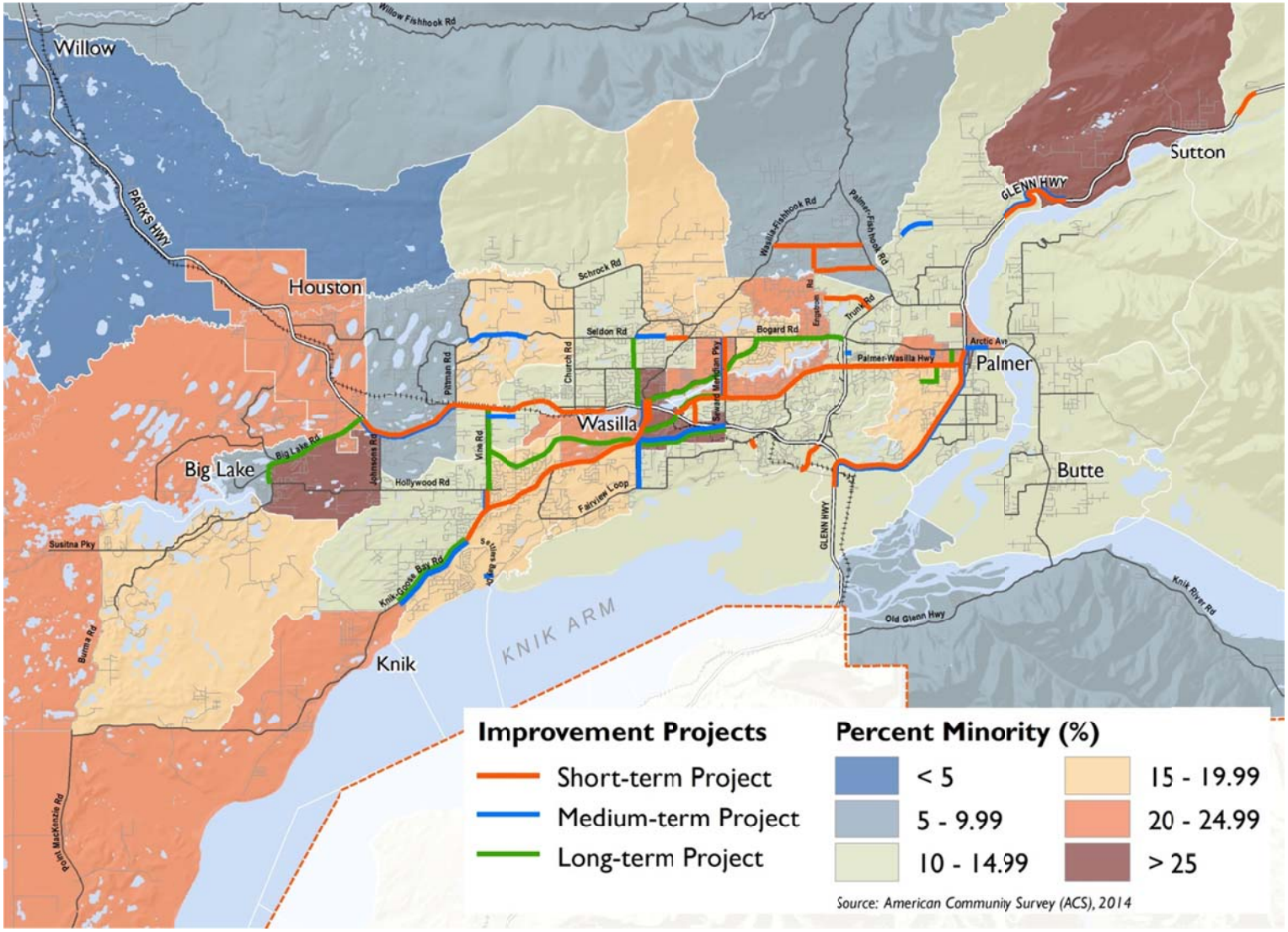


Figure 38. Low Income Populations



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Attachment A

Memo

Date: Friday, June 27, 2014

Project: **MSB Long Range Transportation Plan**

To: **Mat-Su Borough LRTP Technical Advisory Committee**

From: **Murph O'Brien, Project Manager** *MMO*

Subject: **Travel Demand Model Calibration Results**

Background

The purpose of this memorandum is to document the travel demand model calibration results. The purpose of the calibration process is to ensure that the model replicates traffic volumes on the network of main roads in the Mat-Su Borough.

Model Update

Based on the agreement with the project Technical Advisory Committee, the HDR study team performed a calibration review of the Parks Highway Alternative Corridor (PHAC) model to ensure that the calibration results for major roads, in addition to the Parks Highway, were within acceptable limits. The modeled area includes the most densely populated part of the Borough, extending from Willow and Big Lake in the west to Sutton and Butte in the east, Fishhook in the north and to the Parks-Glenn junction and Point MacKenzie in the south. HDR used the existing roadway network data to evaluate overall model performance by comparing model volume estimates to Matanuska-Susitna Borough (MSB) and Alaska Department of Transportation and Public Facilities (DOT&PF) traffic counts. The validation/calibration criteria were developed based on the Federal Highway Administration's Travel Demand Validation and Reasonableness Checking Manual.

Transportation Modeling Process

The transportation demand model is a representation of the transportation facilities within the MSB modeled area and the travel patterns on these facilities. The model contains inventories of the existing roadway facilities, and of housing units and employment, organized by traffic analysis zones (TAZs).

During the calibration process, model-generated traffic volumes are compared to current traffic counts. Unlike modeling of future traffic volumes, for calibration the model uses current household and employment data to develop the estimates of current traffic volumes. Model parameters are adjusted to achieve the most accurate area-wide replication of current traffic volumes. When the model-produced volumes match traffic counts within an acceptable range of error, the model can then be used to test future year alternative roadway improvements.

Roadway Network

Attributes of road segments in the network database were refined with input from MSB, DOT&PF and a review of existing conditions. Road network attributes include number of travel lanes, travel direction, name, functional classification, speed (mph), presence of median, area type and capacity by lane.

Trip Generation and Distribution

Socioeconomic data, primarily households and employment by travel analysis zone (TAZ) for the MSB area, was updated for the PHAC project. Future employment data were disaggregated into 13 employment categories, and future location of employment was developed for each. Location of future households was based on the results of a charrette convened for that specific purpose, along with consideration of land suitability and related factors. The employment and household distributions were reviewed and approved by MSB Planning and Public Works staff. Subsequent model trip generation by trip purpose was developed and is presented in Table 1.

Table 1: 2010 MSB Trips by Purposes

Purpose	Trips	% of All Trips
Home based Work	44,500	17%
Home based Shop	20,400	8%
Home based School	26,100	10%
Home based Other	84,500	33%
Non Home based Work	20,200	8%
Non Home based non Work	63,200	24%
Total Trips by All Purposes	**258,900**	**100%**

Source: HDR Engineering, Inc., May 2014

Traffic Assignment

The purpose of traffic assignment is to assign vehicle trips to specific paths, or routes, in the transportation network. Trip assignment is a function of the shortest travel time along paths between zones, and the level of congestion on the links within those paths. Vehicle trips for the study area were assigned to the transportation network using the TransCAD User Equilibrium Assignment Algorithm which uses an iterative process to achieve a convergent solution, in which no travelers can improve their travel times by shifting routes. Figure 1 shows the 2010 traffic assignment within the MSB area. Level of Service (LOS) based on volume-capacity ratio was calculated and is also presented.

Model Calibration/Validation

The purpose of validation and reasonableness checking is to confirm the ability of the model to predict future behavior by comparing its predictions to existing observations. The FHWA Travel Model Validation and Reasonableness Checking Manual, Second Edition (2010) and the Ohio Department of Transportation's Ohio Certified Traffic Manual (2007) are the two main references used in this process.

Validation involves a review of each model component and comparing its prediction to observed behavior. This section provides a comparison of model-predicted traffic volumes with observed traffic counts.

Figure 1 shows the 2010 existing model volumes within the MSB area. Level of Service (LOS) was calculated based on the volume-capacity ratio to identify roadway segments operating at unacceptable LOS E or F. LOS analysis indicates that the roadway network within the MSB modeled area is operating at acceptable LOS C or better (V/C <0.71), for the most part. Many segments along Palmer-Wasilla Highway north of Parks Highway as well as Parks Highway between Seward Meridian Road and Lucille Street operate at LOS D (V/C 0.71 to 0.89). A few segments along Knik-Goose Bay Road, south of the Palmer-Wasilla Highway operate at unacceptable LOS E (V/C 0.89 to 1.0) or F (V/C >1). Road users may perceive different peak hour directional congestion, not presented in this exhibit.

Traffic Counts

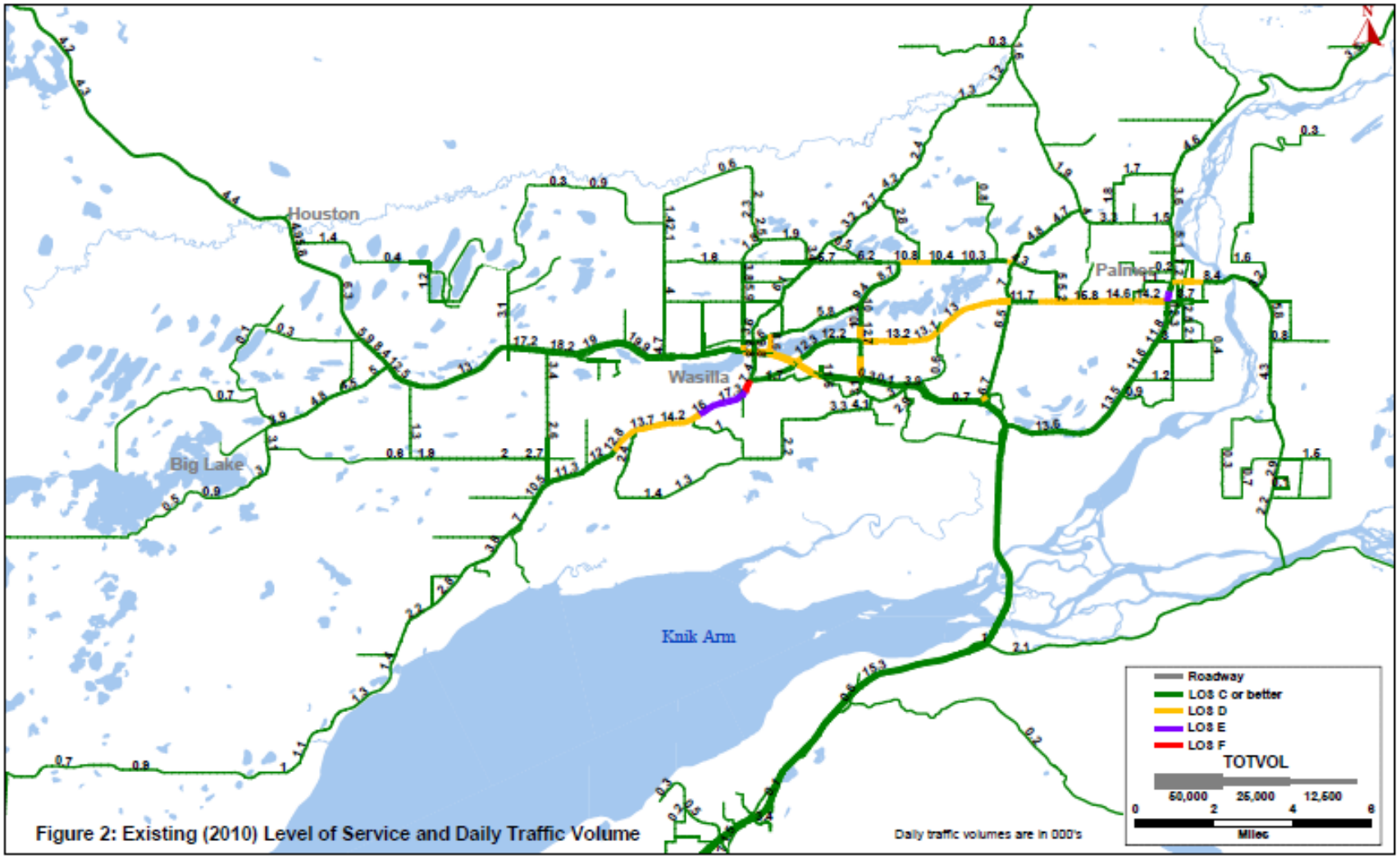
Traffic counts were gathered from the Alaska DOT&PF website[1]. There were 205 locations identified to have available traffic counts data against which the model results were compared for validation.

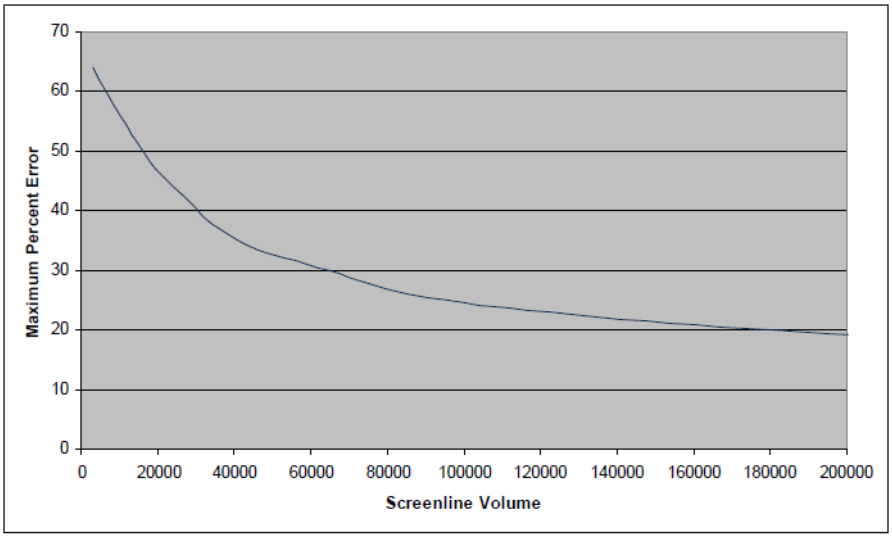
Cutline Analysis

Cutlines provide a comparison of modeled volumes to observed counts along a corridor containing multiple facilities. Figure 3 introduces FHWA validation guidelines for cutlines. The figure shows that maximum percent error decreases as screenline or cutline volume increases.

[1] www.dot.state.ak.us/stwdplng/mapping/adt.shtml

Figure 1: Existing Level of Service and Daily Traffic Volume in Thousands of Vehicles per Day





Source: Calibration and Adjustment of System Planning Models, FHWA, December 1990.

Figure 2: Validation Guidelines for Cutlines

The results of the cutline analysis are summarized in Table 2 showing a comparison of model volume estimates and observed traffic counts for facilities crossing each cutline. The table shows that for all cutlines the difference between the estimated and observed traffic is well within the guidelines shown in Figure 2.

Table 2: Cutline Analysis Results

#	Traffic Count	Model Flow	%-Difference	Max Desirable Deviation	Within Target	RMSE	Volume/ Capacity
1	15,131	14,346	5%	50%	Yes	12%	0.2
2	32,297	31,981	1%	40%	Yes	6%	0.5
3	57,380	52,707	8%	32%	Yes	18%	0.4
4	46,127	53,015	15%	35%	Yes	18%	0.6
5	28,349	31,352	11%	42%	Yes	16%	0.4
6	13,509	13,497	0%	55%	Yes	27%	0.2
7	28,400	31,551	11%	41%	Yes	16%	0.3
8	19,960	18,525	7%	46%	Yes	10%	0.6
9	34,373	36,172	5%	38%	Yes	12%	0.3
Overall	**275,526**	**283,146**	**3%**	**17%**	**Yes**	**17%**	**0.4**

RMSE stands for Percent Root Mean Squared Error (see page 7, below)
Source: HDR Engineering, Inc., May 2014

Figure 3 shows the cutline locations and their respective volume-capacity ratio. The traffic is operating at acceptable LOS C or better at each of the cutline locations.

Figure 3: 2010 Cutline Analysis Results

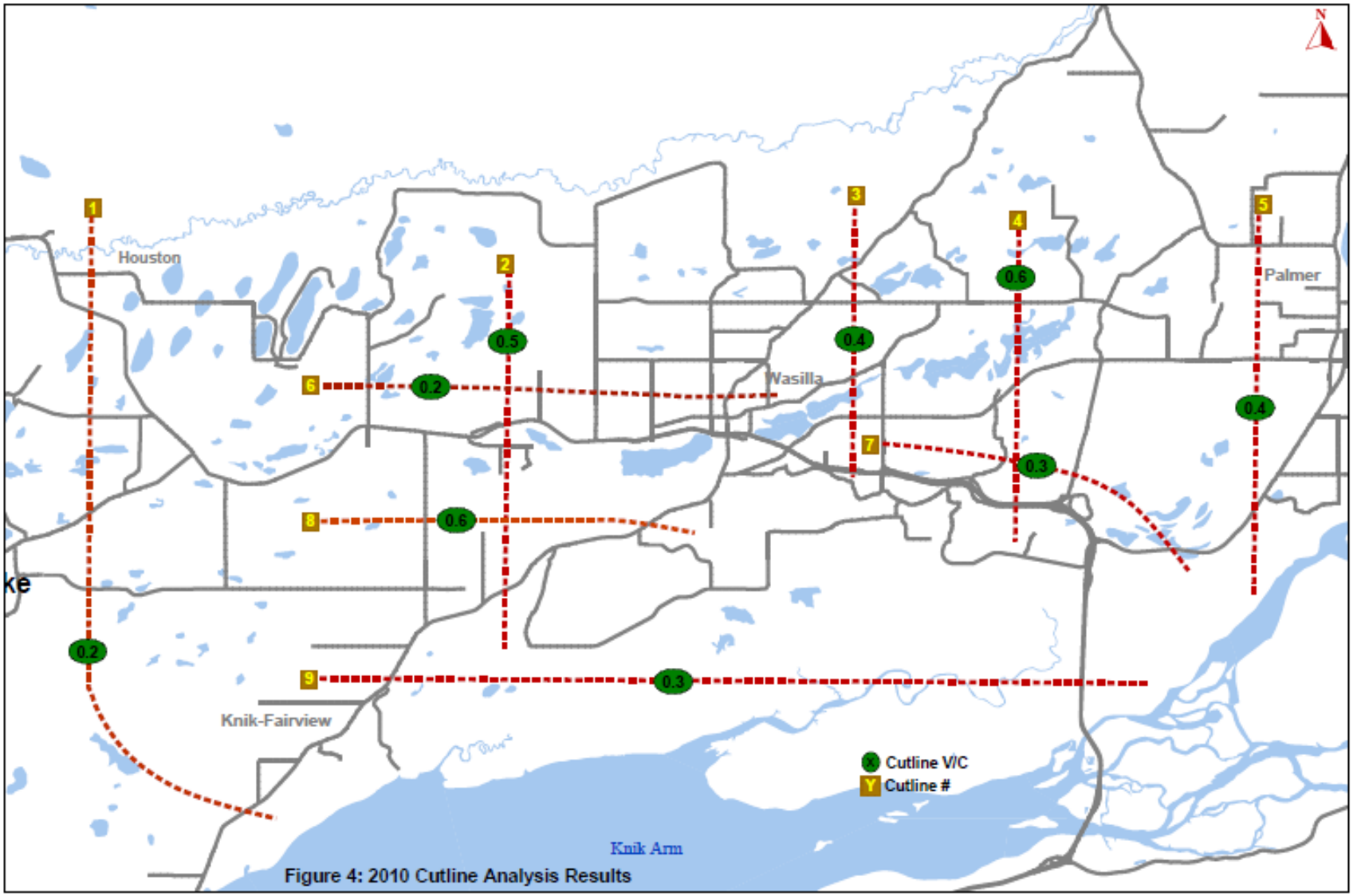


Figure 4: 2010 Cutline Analysis Results

Assignment Scatterplots

Pearson's product-moment correlation coefficient (R) is a standard statistical measure that reflects how linear the relationship is between two data sets. Scatterplots of modeled traffic volumes versus observed traffic volumes can be useful tool in model validation. While there are no hard and fast guidelines for R-Squared results, the closer the values are to 1 the more linear the relationship between the two data sets. Figure 4 shows a scatterplot comparing model estimated daily traffic volumes compared to observed traffic counts. Model results show an R-Squared value of 0.96 indicating a high degree of correspondence between model volume estimates and observed traffic volumes.

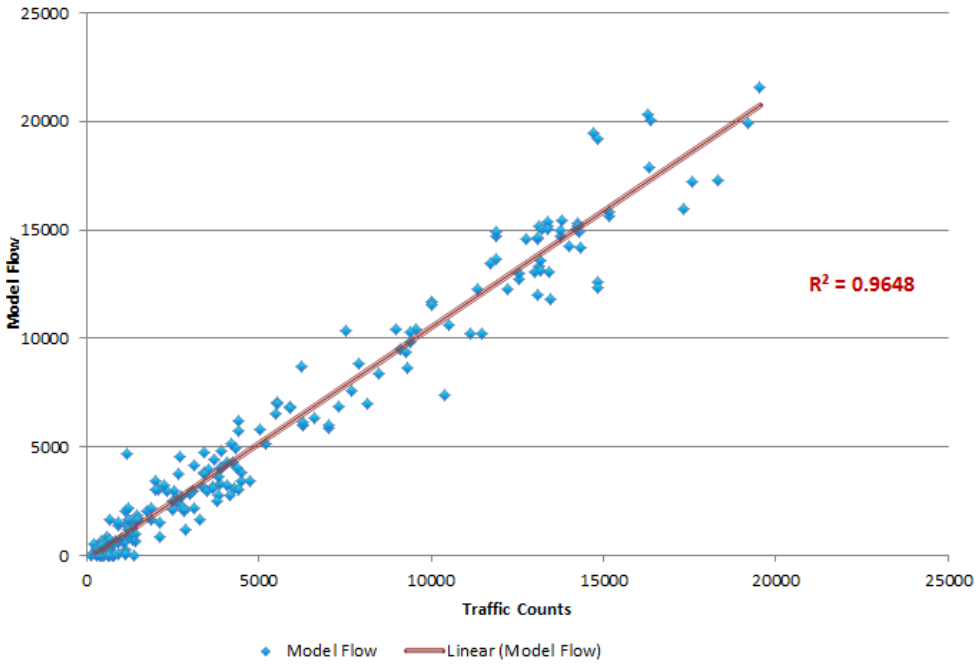


Figure 4: Daily Traffic Volume Scatterplot

Percent Root Mean Squared Error

Percent Root Mean Squared Error (RMSE) is a measure of the accuracy of the traffic assignment that shows the average error between the observed and modeled traffic volumes on links with traffic counts. Percent RMSE is summarized by link volume group. The Ohio Certified Traffic Manual identifies acceptable ranges of percent RMSE by directional link volume group.

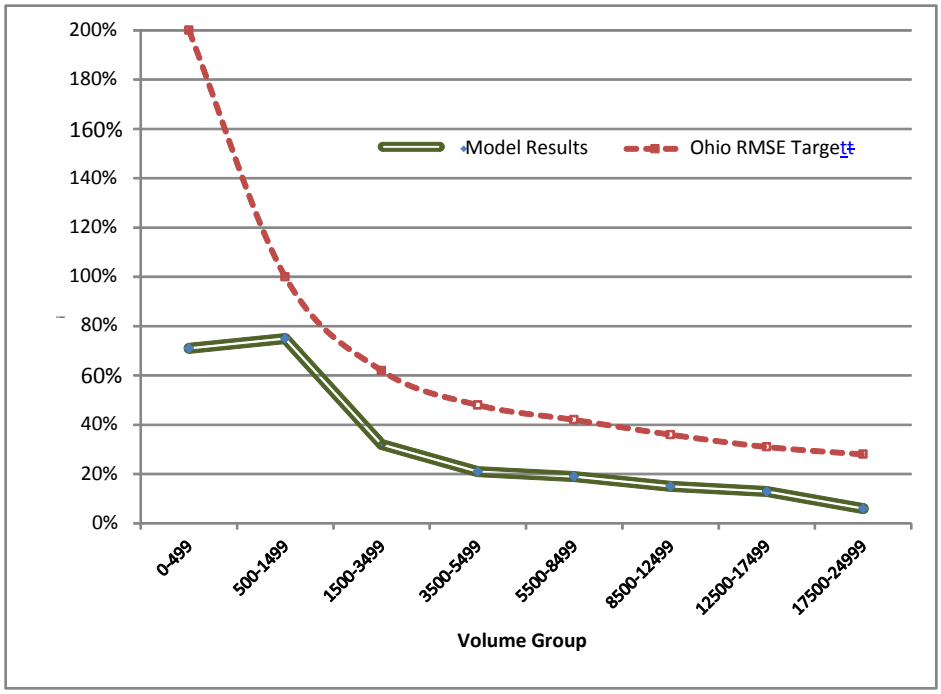


Figure 5: Percent RMSE by Volume Group

The Ohio percent RMSE targets by volume group are shown graphically in Figure 5. The figure shows that modeled traffic volumes are within acceptable ranges of the observed traffic counts. The overall percent RMSE for daily traffic volume is 21.

Reasonableness by Functional Class

The deviation between the traffic counts and model volumes by roadway functional class was measured against the Ohio Certified Traffic Manual guidelines. Table 3 shows the comparison of model results and traffic counts. The table shows that modeled traffic volumes are within acceptable ranges of the observed traffic counts by various roadway functional classifications.

Table 3: Percent Assignment Error by Functional Class

Functional Classification	Traffic Counts	Model Flow	%-Difference	Suggested Range by Ohio Manual
Freeways/Expressways	456,413	481,132	5%	+7%
Principal Arterials	165,567	163,370	1%	+10%
Minor Arterials	190,738	193,731	2%	+10%
Collectors	172,759	164,305	5%	+15%
All Links	**985,477**	**1,002,538**	**2%**	**+5%***

**Ohio Manual does not have specific criteria under this category. Florida DOT Guideline has been used in stead.*
Source: HDR Engineering, Inc., May 2014

Conclusions

The model validation and reasonableness checking measures show that the model is satisfactorily predicting observed traffic volumes, and that the model is suitable for use in future roadway improvement needs analyses for the MSB LRTP.