

Big Lake Road Pedestrian Study

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Existing and Forecasted Conditions Report

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Abbreviations

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
AMATS	Anchorage Metropolitan Area Transportation Solutions
CAR	Critical Accident Rate
DOT&PF	Alaska Department of Transportation and Public Facilities
GIS	Geographic Information System
HCM	Highway Capacity Manual
HSIP	Highway Safety Improvement Program
KE	Kinney Engineering, LLC
LRTP	Long Range Transportation Plan
MEV	Million Entering Vehicles
MOA	Municipality of Anchorage
MSB	Matanuska Susitna Borough
MVT	Million Vehicle Miles Traveled
NCHRP	National Cooperative Highway Research Program
PGDHS	A Policy on the Geometric Design of Highways and Streets
PTR	Permanent Traffic Recorder
SRTS	Safe Routes to School
TMV	Turning Movement Volume

Definition of Terms

Access: Ability to physically enter and exit a given location from a public roadway.

Annual Average Daily Traffic (AADT): A measurement of the number of vehicles traveling on a segment of highway each day, averaged over the year.

Off-Highway Vehicles (OHV): A motorized vehicle designed for off-road transportation. Examples of OHVs common to Alaska are: Snow machines, 4-wheelers, dirt bikes, 3-wheelers, Argos, in addition to any other tired, tracked or skied vehicle designed for off-road travel.

Desire Path: A commonly used route emerging as a result of constructed routes not being direct, not being continuous, or not being available. A desire path is likely to be the most navigable or shortest route between two points as evident through multiple repeat uses. Desire paths are paths created by numerous users over a long period of time, and not a single use.

Peak Hour: Hour-long period during which traffic volumes are higher than all other hours within a specified time period. Morning, midday, and evening periods are often used for analysis, although peak hours may occur at other times, such as school dismissal. Peak hour volumes are often adjusted to reflect peak 15-minute period conditions.

Permanent Traffic Recorder (PTR): Permanently installed device that counts all vehicles on a given roadway. The device may record other information as well, such as vehicle classification. Also known as Continuous Count Station (CCS).

Perception Reaction Time: The time it takes a driver to detect an object, identify the object, decide on a response, and initiate a response, such as for braking or entering a road from a driveway. For pedestrians, perception reaction time is the time it takes to look both ways, identify a gap, and initiate a crossing.

Executive Summary

Kinney Engineering, LLC (KE) has been subcontracted by R&M Consultants, Inc to observe and summarize pedestrian and bicycle operation along 2.5 miles of Big Lake Road between Beaver Lake Road and Echo Lake Drive, and project future travel demand and recommend options for addressing future nonmotorized travel needs. Conflicts with off-highway vehicles (OHVs) were also studied. The study corridor is comprised of 3 zone types: commercial, civic, and recreational, and includes an elementary school, a public library and a mall that attract pedestrians. In addition to counting pedestrians and bicyclists, desire paths were also observed.

KE performed a desire path study in May 2017 to locate pathways pedestrians, bicycles, or OHVs are using along Big Lake Road. Of particular concern are OHV trails and conflicts, since OHVs are not permitted to use the paved pathway on the west side of the corridor. Desire pathways mainly used by OHVs were located on the East side of Big Lake Road, and on either side of the road south of the Fish Creek Bridge where the paved pathway on the west side terminates. Desire paths were also identified in several locations where pedestrians, bicycles, and OHVs are accessing the trails along Big Lake Road from adjacent developments and land uses.

Pedestrians, bicycles, and OHVs were counted along six corridor segments. Observations were made for an hour each, twice per segment. The greatest number of pedestrians, 18 an hour, was observed on the segment between the Big Lake Public Library and Big Lake Elementary School. The greatest number of bicyclists, 8 an hour, was observed on the segment containing Big Lake Public Library and East Lake Mall. OHV counts were consistent along the entire study corridor; between 2 and 5 OHVs were observed per hour per segment. No pedestrians or bicycles were observed on the southernmost segment of the study corridor between the Big Lake South Recreation Site and Echo Lake Drive, where no paved pathway facilities exist.

A crash analysis was completed using 10 years of crash data from 2003 to 2012. Along the study corridor, 2 crashes involving bicycles were recorded: one on the Fish Creek Bridge and one at the intersection of Big Lake Road and Beaver Lake Road. Neither crash resulted in an incapacitating injury or fatality. A fatal crash occurred on the paved pedestrian trail between North Shore Drive and Hollywood Road when a single snowmobiler hit a galvanized pole. Additionally, a vehicle-pedestrian crash was recorded just outside of the study corridor on Big Lake Lodge Road resulting in an incapacitating injury.

The intersection of Big Lake Road with Hollywood Road/Big Lake Lodge Road has a crash rate above the most recently published state averages (found in the Highway Safety Improvement Handbook) for similar facilities, as does the segment of Big Lake Road between Beaver Lake Road and North Shore Drive. A fatal head-on crash was recorded on this segment. No pedestrian or bicycle related crashes were recorded at these locations. Crash patterns may change in this area due to the recently constructed roundabout at the intersection of Big Lake Road with North Shore Drive.

Traffic volumes were forecast using an adjusted 2040 Anchorage Metropolitan Area Transportation Solutions (AMATS) travel demand model, which includes Anchorage and the Mat-Su Borough. Volumes on Big Lake Road are projected to grow at a rate of approximately 2.0% per year from the Parks Highway to Hollywood Road. Big Lake Road south of Hollywood Road is forecasted to grow at approximately 5.0% based on projected development on the south side of

Big Lake. The model does not currently include a Knik Arm Crossing or a Parks Highway Alternative Corridor.

Pedestrian crossing operations were evaluated along the study corridor using HCM 2010 methodologies to calculate expected pedestrian delay. Delay was calculated using existing and forecasted traffic volumes. The AM peak, after school, and PM peak periods were evaluated during three different months. In terms of expected delay, the segments of Big Lake Road from Beaver Lake Road to North Shore Drive and North Shore Drive to Hollywood Road/Big lake Lodge Road perform similarly. Currently pedestrians experience an average delay of 25 seconds or less during the peak hours, which is typically an acceptable amount of delay for any and all types of user. Forecasted pedestrian delay on these segments is expected to rise to a maximum of approximately 40 seconds in the future, which is still typically acceptable in similar communities.

Pedestrian crossing delay on the segment in front of Big Lake Elementary is expected to also be acceptable. The much lower volume on this segment results in AM crossing delay of 5 seconds currently, which is expected to grow to 10 seconds by 2040, during the month of September when traffic volumes are highest during a time period while school is in session. The after-school period crossing delay for this same location is 9 seconds currently, growing to 20 seconds in the future. Observations during the pedestrian count study and estimates from school staff indicate that less than 10 children cross at the cross walk near the school at arrival and dismissal times. There is currently no crossing guard on duty. The Alaska Traffic Manual recommends that the school district consider a crossing guard at this location for grades Kindergarten through 4th grade. It is also recommended that the marked crosswalk between the school and Aero Lane be considered for relocation as part of a walking routes study.

Pedestrian crossings of Big Lake Road are identified as “marginal candidates” for marked crosswalks in the Alaska Traffic Manual. Crosswalks are “recommended” to be installed only on roads with speed limits or measured speeds of less than 35 mph for the forecasted volumes on Big Lake Road. This requires more evaluation than just changing speed limit signs. If the speed limit or measured speeds were less than 35 mph based upon an engineering study of field conditions, then the crossing location would also have to meet the threshold for pedestrian demand, which is 20 pedestrians (or 15 child pedestrians) per peak hour. Projected pedestrian crossing demand is not expected to increase above a maximum of 10 per hour on any segment prior to 2040.

A speed limit study conducted by DOT&PF in the study area is described in this report. Current speed limits on Big Lake Road through downtown Big Lake are 45 mph. The community has requested reducing the speed limit to 35 mph. This reduction over a 1.5-mile length of Big Lake Road would delay through traffic by an additional 30 seconds in either direction. A reduction in vehicle speeds would make midblock crossings more feasible. However, results are showing a majority of motorist speeds are declining compared to the speed limit. The average measured speed of most users is at or near 40 mph, suggesting some increased development could be affecting speed. With the plan for a second roundabout at Hollywood Road and Big Lake Road, it is expected this band of speeds would decrease to at or near 35 mph.

1 Introduction

The Alaska Department of Transportation and Public Facilities (DOT&PF) is studying pedestrian behavior along Big Lake Road located within the Matanuska-Susitna Borough (MSB). Kinney Engineering, LLC (KE) was subcontracted by R&M Consultants, Inc to prepare this Existing and Forecasted Conditions Report for the Big Lake Road Pedestrian Study. The project area is shown in Figure 1.

Big Lake, Alaska, is a community of approximately 3,300 people according to the 2010 census. The community counsel area is centered around the water body of Big Lake which is a major recreational attraction in the MSB and the State of Alaska. The community supports numerous recreation activities in the area such as boating, watersports, camping, hunting, fishing, hiking, Off-Highway Vehicle (OHV) use, and airplane flying. Additionally, the area supports many winter activities such as snow machining and ice sports; therefore, activity in the area peaks both mid-summer and mid-winter.

Between the 2000 census and the 2010 census there was a 2.43% growth in local population which is a trend that is expected to continue as the community becomes more accessible through projects like the Parks Highway expansion between Wasilla and Big Lake Road, possible expansion of Hollywood Road and numerous parcel developments which are currently being considered in the undeveloped areas south of Big Lake. Much of the parcels in the community are vacant and available for development.

This study is tasked with examining the conflicts, operation and safety history of the pedestrian, bicycle, and OHV routes in the core downtown segments of the Big Lake community, adjacent to Big Lake Road. The study area extends from Beaver Lake Road on the north to Echo Lake Drive on the south as shown in Figure 2.

The project study area extends a distance of just under 2.5 miles. The area includes a single-lane roundabout at the intersection of Big Lake Road and North Shore Drive, built in 2016. There is also a major 4-leg intersection at Big Lake Road and Hollywood Road/Big Lake Lodge Road. The layout of that intersection is shown in Figure 3.



Source: Matanuska-Susitna Borough Jordan Lake Parcel Master Plan, 2004

Figure 1. Project Vicinity Map

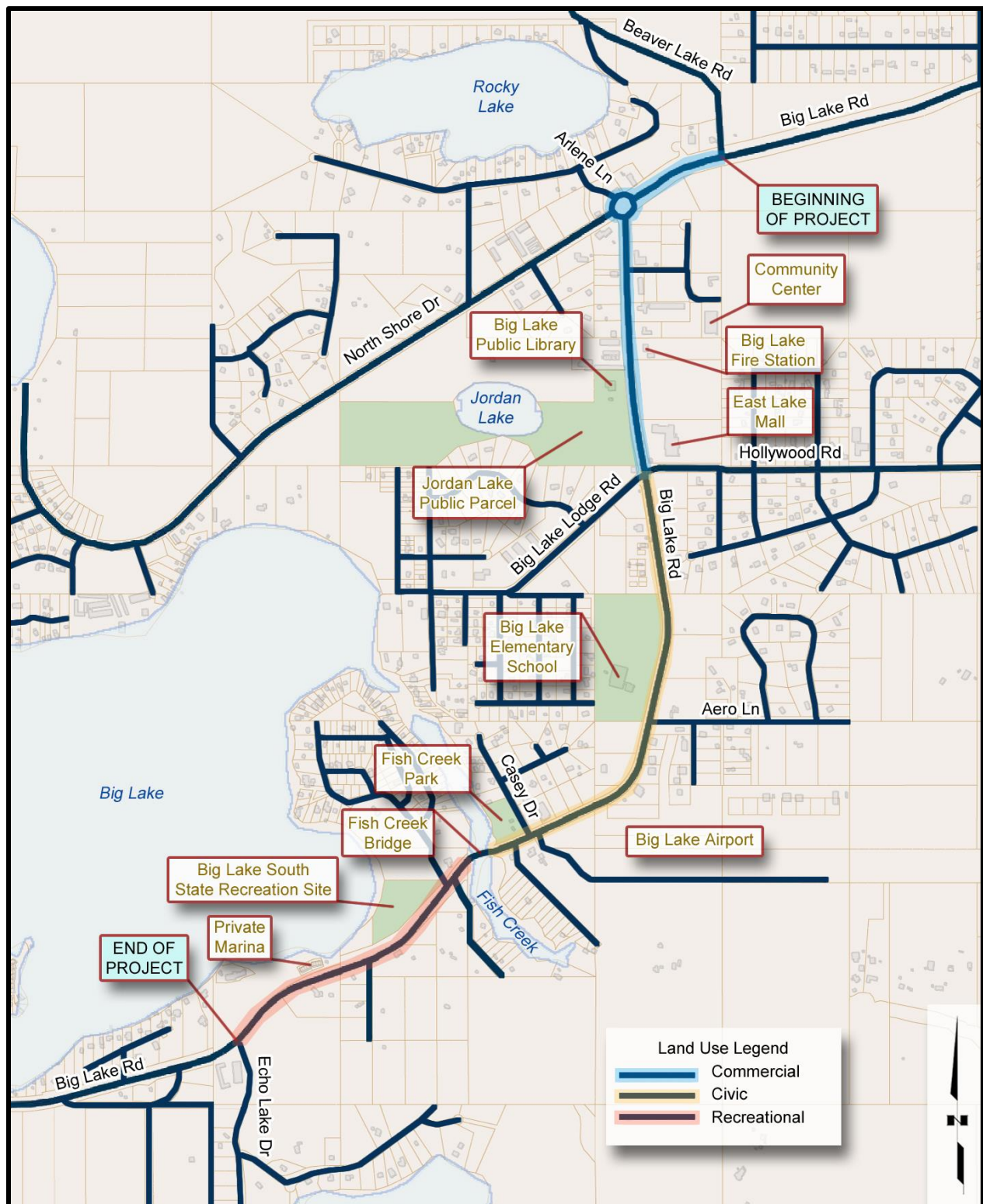


Figure 2. Project Location Map



Figure 3. Intersection Layout of Big Lake Rd and Hollywood Rd/Big Lake Lodge Rd

Note that both Big Lake Lodge Road and Hollywood Road approach Big Lake Road at skewed angles, and the two intersections are offset by approximately 100 feet. There is a new gas station on the southeast quadrant of this intersection and the vacant lots to the south of this gas station are expected to be developed into a bulk goods grocery store sometime in the future.

All intersections, other than the roundabout, are currently two-way stop-controlled with free movements on Big Lake Road. Just prior to Beaver Lake Road, heading west into the study area, the speed limit on Big Lake Road decreases from 55 mph to 45 mph. The speed limit within the study area is 45 mph for the whole length. There is a school zone bracketing Big Lake Elementary School with flashing lights that activate during arrival and dismissal times and reduce the speed to 20 mph.

As seen in Figure 2, the study area can be divided into three basic land use classes. First, there is a moderately developing commercial zone that extends from the beginning of the project to Hollywood Road. In this area there are businesses, gas stations, restaurants, as well as the Big Lake Public Library and the Big Lake Fire Station, and a new community center at the end of Lion's Court. Additionally, there are residential areas back from the roadway throughout this zone

that supply regular local traffic. The second zone is labeled “Civic” and extends south of Hollywood Road and continues to the Fish Creek Bridge. This zone contains Big Lake Elementary School, and the Big Lake Airport, as well as access to more light-residential developments. The final segment of the study area is more recreational in nature and extends from the Fish Creek Bridge to the end of the study area at Echo Lake Road and beyond. In this region, there is access to the Big Lake South State Recreation Site and a private marina on the lake, just inside the study area. Big Lake Road continues around the lake accessing other boat launch and park facilities further on, which create a dominant recreation use in this segment for vehicle traffic, but also pedestrians and OHVs, such as 4-wheelers, dirt bikes, and snow machines.

There is a separated paved pathway on the north and west sides of Big Lake Road that begins about 670 feet south east of Parks Highway, outside the study area, and continues through the study area before terminating at Casey Drive just before the Fish Creek Bridge. On the east side of the roadway there is an unofficial unpaved dirt path of varying width which is used by OHVs. This pathway was mapped in the field, as described in section 2 on page 17.

Figure 4 shows the Fish Creek Bridge facing south. The bridge spans a distance of 35 feet with 175-foot-long guardrail sections on either side. The shoulders are approximately 4-foot-wide between the edge of travel way and the guardrail, on the bridge. The bridge includes white warning signs informing pedestrians not to stand on the bridge; however, the 4-foot shoulders are designed to allow pedestrian travel. A significant salmon run occurs here, therefore anadromous fish passage is a critical feature of the design.

South of the Fish Creek Bridge the paved shoulders vary from 4-feet wide to no paved shoulder, possibly due to erosion from OHVs which use the gravel shoulder and ditch as a pathway on either side of the road along this segment, to the end of the project area.



Source: Google Maps

Figure 4. Photo: Fish Creek Bridge Facing South

1.1 Project Background

1.2 Area Plans

Several plans with desired and proposed recommendations affecting pedestrian facilities in the Big Lake area have been published. The following area planning documents were used as a basis for the design or were considered in the analysis process.

1.2.1 MSB LRTP

The Long-Range Transportation Plan (LRTP) forecasts growth in the MSB and recommends improvements for various transportation modes to support the growth. The LRTP is currently being updated but a final draft has yet to have been published as of the publication of this report.

1.2.2 2009 Big Lake Comprehensive Plan

The Big Lake Comprehensive Plan provides recommendations within the vicinity of the study area:

- Construct a bypass route east of Big Lake Road for through traffic to bypass the downtown area, separating them from local traffic.
- Improve Hollywood Road to a four-lane roadway with shoulders, bike lanes, and grade reductions.
- Improve the road network by constructing the collector roads identified in the MSB Official Streets and Highway Plan.
- Develop a pedestrian and bicyclist friendly street network.
- Develop a transportation system that considers transit operations and a transit station located in downtown Big Lake.

In addition, the construction of a community center is recommended as a public use facility to hold community meetings and public events. There are four potential locations for the building, all on Big Lake Road. Since the publication of this plan, a community center has been built on Lions Court off of Big Lake Road.

1.2.3 Safe Routes to School

The 2014 MSB Safe Routes to School (SRTS) plan identifies desirable infrastructure towards adopting of a School District Walking Route Plan. This could then guide students walking or biking to school at elementary and middle schools using improvements targeted to meet walking and crossing needs. The SRTS recommends the following improvements within the project study area:

- Construct a paved and lighted multi-use path on Hollywood Road from Big Lake Road to Klutina Drive.
- Construct a paved multi-use path on Aero Lane from Big Lake Road to Holly Loop.
- Install a midblock crossing on Big Lake Road at Hollywood Road.
- Create a separate driveway access for buses on Big Lake Road, separating bus traffic from parent-vehicle traffic.

Suggested projects indicate a desire for pedestrian facilities in the area; however, engineering studies should be completed before any projects are implemented. A complete walking route analysis specifically reviews the trip to and from homes to school. The entire route from point A to B needs to be found acceptable before adoption to travel for school attendance. Roadway

crossings are only a part of this analysis and are dependent upon desirable routes to and from the crossing in place. Once a Walking Route Plan is adopted for school attendance, it can be officially promoted to students and parents as a Safe Route to School.

1.2.4 Big Lake Intersections Traffic Study

The MSB Big Lake Intersections Traffic Study, published in March of 2016, analyzed Big Lake Road at two intersections:

1. Big Lake Road and North Shore Drive, and;
2. Big Lake Road and Hollywood Road/Big Lake Lodge Road

These intersections were ranked 54th (Hollywood Road) and 55th (North Shore Drive) of the top 100 higher-volume, higher-conflict unsignalized intersections in Central Region of the DOT&PF.

The study analyzed the existing and future operations of the intersections under three alternatives: a no-build alternative, a roundabout alternative, and a signal alternative. Traffic volumes in this study were seasonally adjusted, indication that these intersections were candidates for further consideration as all—way stops or roundabouts. Traffic at the intersections was expected to operate at acceptable levels of service under the three alternatives. However, the study recommended that a roundabout be constructed at the North Shore Drive intersection at Big Lake Road first while funds were available. The construction of a roundabout at the Big Lake Road and North Shore Drive intersection was completed in 2016.

The study also recommended re-evaluating alternative improvements for the Big Lake intersection at Hollywood Road/Big Lake Lodge.

1.2.5 Jordan Lake Parcel Master Plan, 2003

The Jordan Lake Parcel Master Plan was developed in 2003. It is a development plan that focusses on a 44-acre parcel of land in the heart of the Big Lake community. The goal of the parcel's development is to promote open space for recreational opportunities as well as provide space for improved community facilities such as an expanded public library and community center. This parcel is shown in Figure 2 on page 11.

The plan recommended three phases of development. The first phase was scheduled for 2003-2005 and included basic enhancements to existing trails and facilities. The second phase was scheduled for 2005-2010 and emphasized landscaping and garden development, community gathering spaces and building new amenities that make the site into a community park or a village green space. The final phase was not given a date, but was planned to be the full build out of the plan, which would include a community center expansion of the public library facility and fully implemented trails.

1.2.6 Big Lake Community Impact Assessment, 2014

The MSB undertook this community impact assessment to determine the impacts of an improved highway connection between the Point MacKenzie/Ayrshire Road intersection and the Parks Highway. (Also known as the Port to Parks Highway Study.) The study identified potential alternative routes for the Port to Parks Highway and the impacts to the Big Lake community of the various alternatives. Some of the alternatives considered would travel along Big Lake Road in the study area. The proposed highway would be built first as a two-lane road, but would expand to a four-lane undivided highway as traffic volumes increased over time, with limited pedestrian facilities and optional frontage roads. If the Port to Parks Highway route were located along Big

Lake Road, it would significantly change the character and conflicts of the existing road through the study area. The change would likely promote more through traffic with a desire for higher mobility and speed through the corridor, and increase the percentage of heavy vehicles on Big Lake Road.

2 Desire Pathways Study

In May of 2017 Kinney Engineering conducted a planning level survey of the desire paths along Big Lake Road and on cross streets. The purpose of this study was to identify any locations where pedestrians, bicycles, are traveling on unpaved routes. A secondary purpose of this study was to locate where OHVs are operating.

There is currently a paved pedestrian pathway on the west side of Big Lake Road along most of the study area, from Beaver Lake Road at the beginning of the study area to Casey Drive, just north of the Fish Creek bridge. South of Casey Drive, a 4-foot paved shoulder is available for pedestrian and bicycle travel. However, in some areas, the shoulder has degraded due to OHV use, making it unusable for this purpose.

OHVs are discouraged from driving on the paved path since it is intended for foot and bicycle traffic. OHVs were observed driving on desire paths in the ditch section or side slope of the right-of-way either next to the paved pathways, or more commonly, on the opposite (East) side of the road.

Figure 5 shows a map of the pedestrian pathways and OHV desire paths which were identified in this study.

In general, the OHV desire paths are on the east side of Big Lake Road. They are often only a single lane, however occasionally the path widens out to a single 15-foot wide rutted dirt area and sometimes splits into two separate pathways. In the south-east quadrant of the Big Lake Road intersection with North Shore Drive, there are vacant lots which have been cleared. These lots appear to be used by OHVs. Additionally, there is a powerline that runs north-south on the south side of Big Lake Road across from Beaver Lake Road. The powerline area has been cleared and it is currently being used as an OHV trail. There are several dirt paths connecting to the powerline trail from the area of the East Lake Mall.

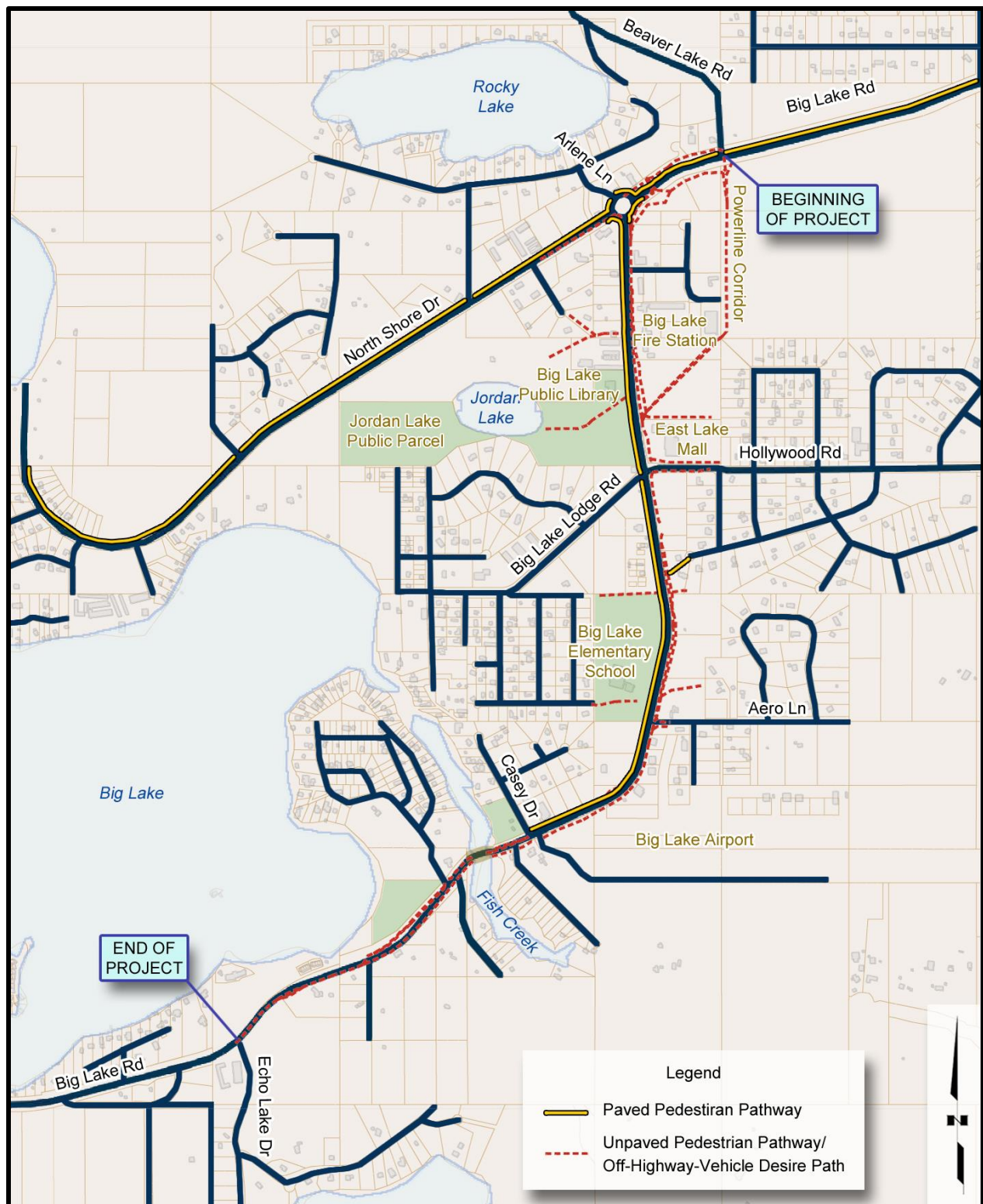


Figure 5. Desire Pathway Map

Behind the Big Lake Library is the Jordan Lake Public Parcel. This parcel includes some public trails and there are several paths that connect the paved pathway to these trails as well as to residential lots off North Shore Drive.

The subdivision just south of Hollywood Road has a paved pathway that runs along a property line and connects to the north-south desire paths on the east side of Big Lake Road, just north of the Elementary School parcel. Figure 6 is a photo of the terminus of the paved path as it intersects the desire paths on the east side of Big Lake Road. Between this paved pathway and the road is a steep gravel slope and an approximately 20-foot wide OHV trail that is heavily used.



Figure 6. Photo: Paved Pathway Accessing Subdivision from Unpaved Desire Path Near Big Lake Elementary School, Facing North-East

There were pathways observed behind the elementary school and another running along a powerline directly across from the school.

OHVs were observed riding on the shoulder of Aero Lane; however, further south, the cross streets have low enough volume that OHV more OHV users were observed to drive in the roadway, rather than next to it.

3 Traffic and Pedestrian Volumes

3.1 Traffic Volume History

Traffic volumes are an indicator of overall population growth, travel demand, and the distribution of transportation needs. As a part of this study, traffic volumes were used to calculate the expected amount of delay a pedestrian will experience at an unmarked crossing of Big Lake Road.

3.1.1 DOT&PF Data

Historical traffic volume data for roads in the Big Lake area is published in DOT&PF's Annual Traffic Volume Reports through 2013 and volumes for 2014 and 2015 are published in a GIS database accessible through the DOT&PF website.

Existing year, 2016, traffic volumes were calculated based on the published DOT&PF traffic volumes. However, the published volume data shows a drop in volumes from 2013 to 2015 along Big Lake Road segments on the north side, and on Beaver Lake Road and North Shore Drive. However, published volumes on Hollywood Road increased slightly during this same period. The cause of the decrease in traffic, particularly on Big Lake Road, is not entirely clear. The change may be linked to the construction of other road projects in the area, such as the Parks Highway, which began in 2014. In the case of Big Lake Road from North Shore Drive to Hollywood Road, the traffic volume is shown to have decreased around 50% from 2013 to 2014. With no clear reason or explanation for such decreases in traffic volumes along Big Lake Road, DOT&PF data for 2014 and later was not used in this analysis to estimate 2016 existing year volumes. Existing year volumes are estimated to be at least equal to 2013 volume levels.

3.1.2 MSB Data

The MSB takes irregular counts of Average Daily Traffic (ADT) volumes on various roads within the Borough. These volumes are different from AADTs in that they have not been adjusted to account for fluctuation of traffic volumes throughout the year and therefore do not represent the annual average but rather a single reference point within a given month. They are used in this report as a further validation of DOT&PF traffic volumes and the monthly distribution of the AADT that exists in a particular month. The MSB collected daily traffic data on Big Lake Road in July and August of 2012. Three locations are within the Big Lake Road study area:

- 200 yards north of North Shore Drive
- 100 yards north of Hollywood Road
- 200 yards south of Hollywood Road

Table 1 gives MSB counts and traffic volumes. These volume results agree with those collected by the DOT&PF.

Table 1. MSB 2012 Daily Volume Counts along Big Lake Road

Location	2012-Daily Volume
200 yards north of North Shore Drive	5,548
100 yards north of Hollywood Road	5,048
200 yards south of Hollywood Road	3,348

In general, ADT volumes north of Hollywood Road, are approximately double the volume south of Hollywood Road.

3.2 Future Traffic Volume Forecasts

Future traffic forecasts are estimated using a preliminary version of the AMATS 2040 travel demand model. This model includes forecasting data for the MSB and the Municipality of Anchorage. The base year model was calibrated for 2013. A comparison of the published 2013 volume counts and the traffic volumes produced by the 2013 model in the Big Lake area validates the model outputs on key segments. The validation was performed by drawing a cordon line around the study area which crossed Big Lake Road north of the project area, Hollywood Road east of the project area, and Big Lake Road south of the project area. A comparison of the traffic on these three segments reveals a difference of only 0.3% in the sum of the model volumes compared with the sum of observed traffic. There was, however a larger difference in traffic inside the study area on the Big Lake Road segment between North Shore Drive and Hollywood Road, where the 2013 model is reporting 3,000 AADT less than observed counts indicate. This difference is due to having too few traffic generation nodes in the Big Lake area. To correct for this, the model was modified to include a higher number of traffic nodes, which improved the internal circulation of the traffic in model.

The 2040 AMATS model is still in final development. The base 2013 model has been calibrated and validated, and future 2040 socio-economic forecasting data has been generated; however, the 2040 road network, which will complete the 2040 AMATS model, has not been officially produced. The 2040 road network will reflect the recommendations of the 2035 MSB LRTP and the 2040 MTP for Anchorage. To use the model for 2040 in Big Lake, KE obtained a list of likely roads expansions that will be included in the 2035 MSB LRTP and included them in the road network. The final 2040 AMATS model may, therefore, vary slightly as projects may have changed between the draft and the final.

The volume history from 2003 to 2015 and the projected segment volume growth through 2040 are shown in Figure 7 for Big Lake Road segments and Figure 8 for intersecting side streets.

Growth rates on Big Lake Road segments are approximately 2% north of Northshore Drive, 1% from Northshore Drive to Hollywood Road, and 4% south of Hollywood Road, growing to as high as 6.5% south of the study area. The growth rate on cross streets is an average of 5%. The higher growth rate of traffic volumes south of the project area are a result of increased residential and commercial development projected for that region in 2040. Note that there are higher growth rates on lower volume roads where minor changes in volume have a great effect on the total volume numbers.

The 2040 model does not currently include a Knik Arm Bridge Crossing, which would likely further increase the through traffic volumes within the study area. Determining the impacts of the Knik-Arm Bridge were outside the scope of this study.

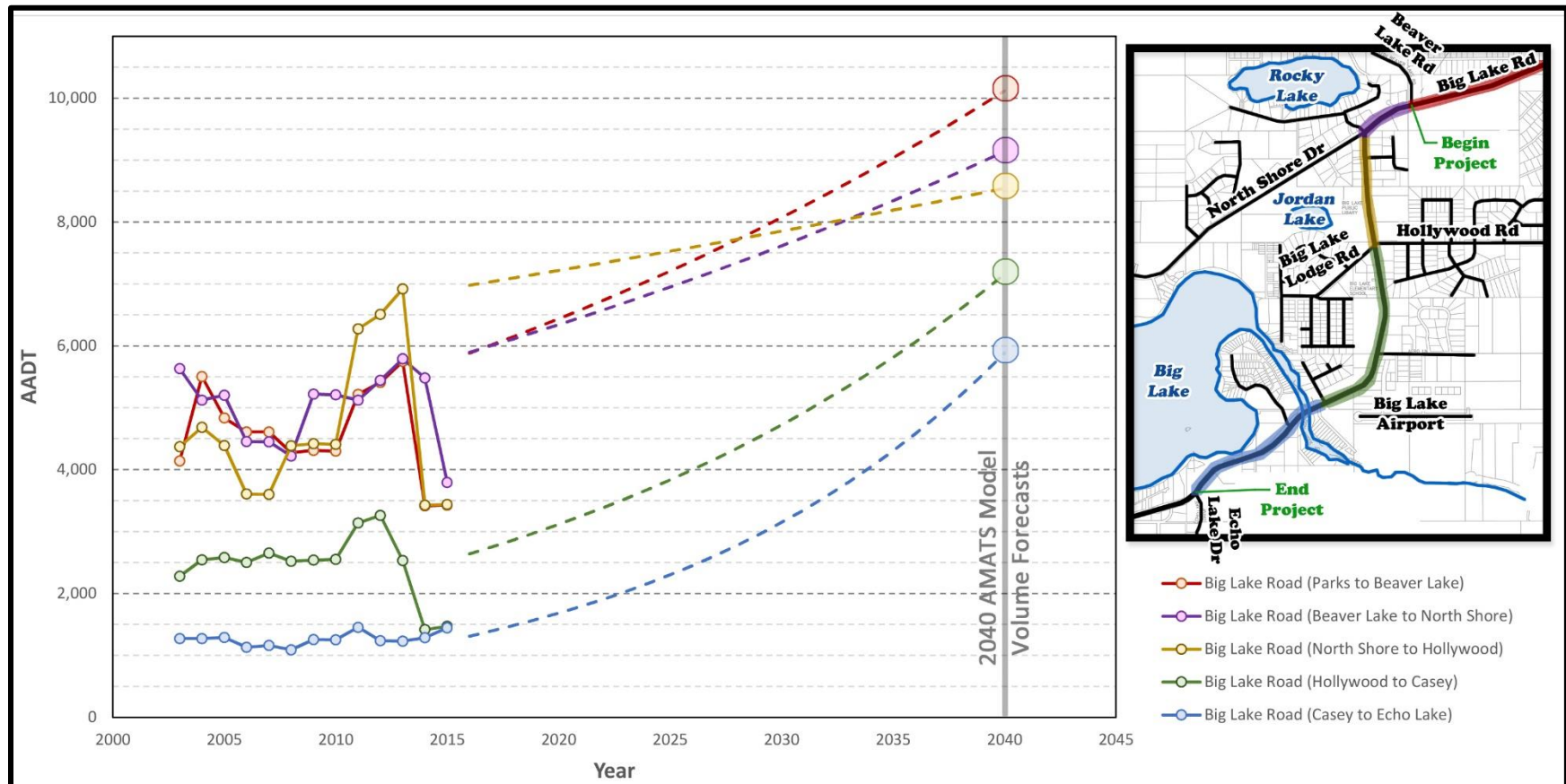


Figure 7. DOT&PF Historical AADT Volumes - Big Lake Road

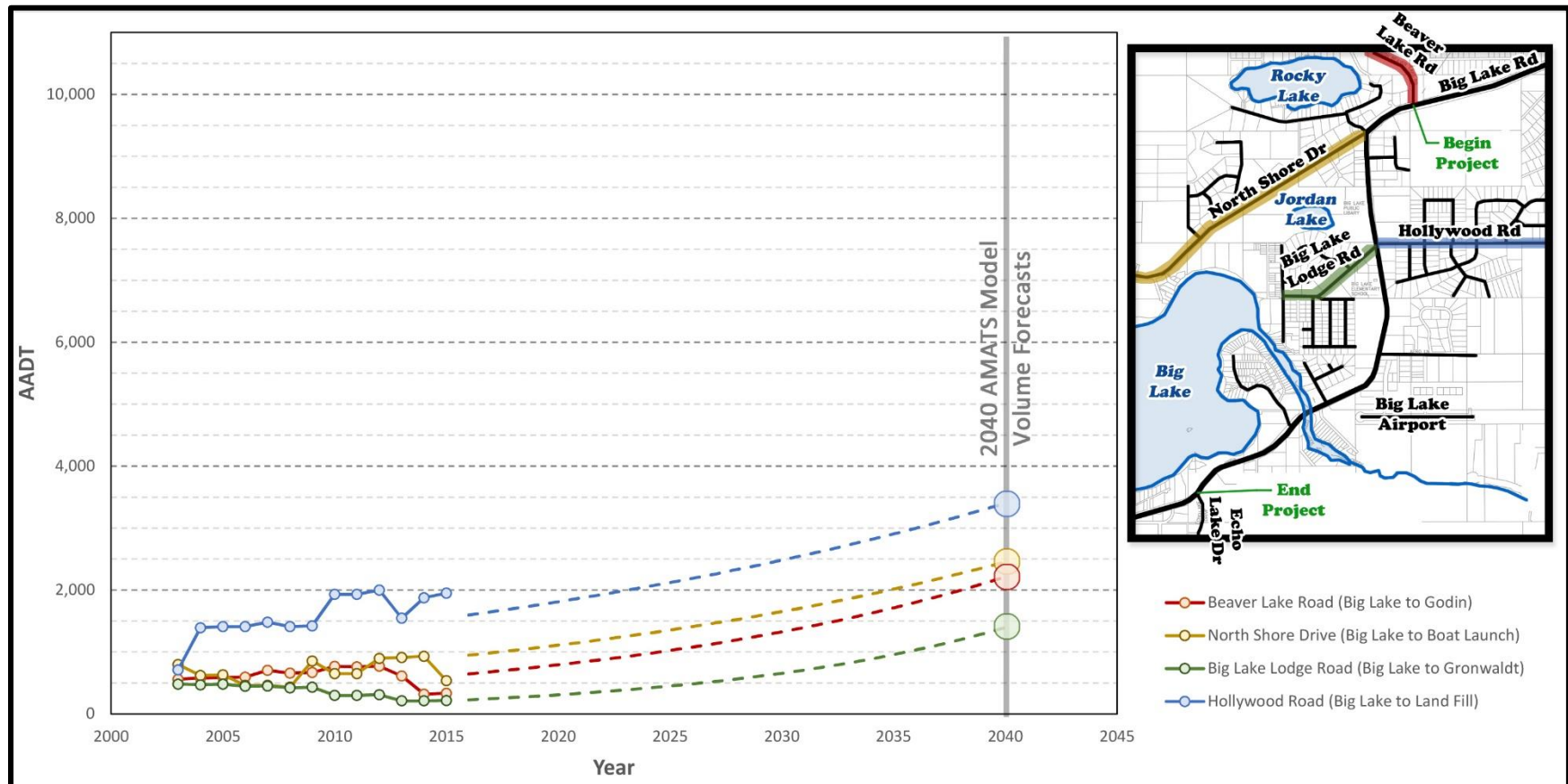


Figure 8. DOT&PF Historical AADT Volumes - Cross Streets

3.3 Observed Turning Movement Volumes

As part of the MSB's Big Lake Intersection Traffic Study in 2014, HDR counted turning movements at the intersection of Big Lake Road with North Shore Drive and Big Lake Road with Hollywood Road/Big Lake Lodge Road. Turning Movement Counts (TMC) were collected in half-hour intervals on June 5, 2014 and July 29, 2014. Counts were taken during the morning, after school dismissal, and evening peaks. Figure 9 shows the results of the study.

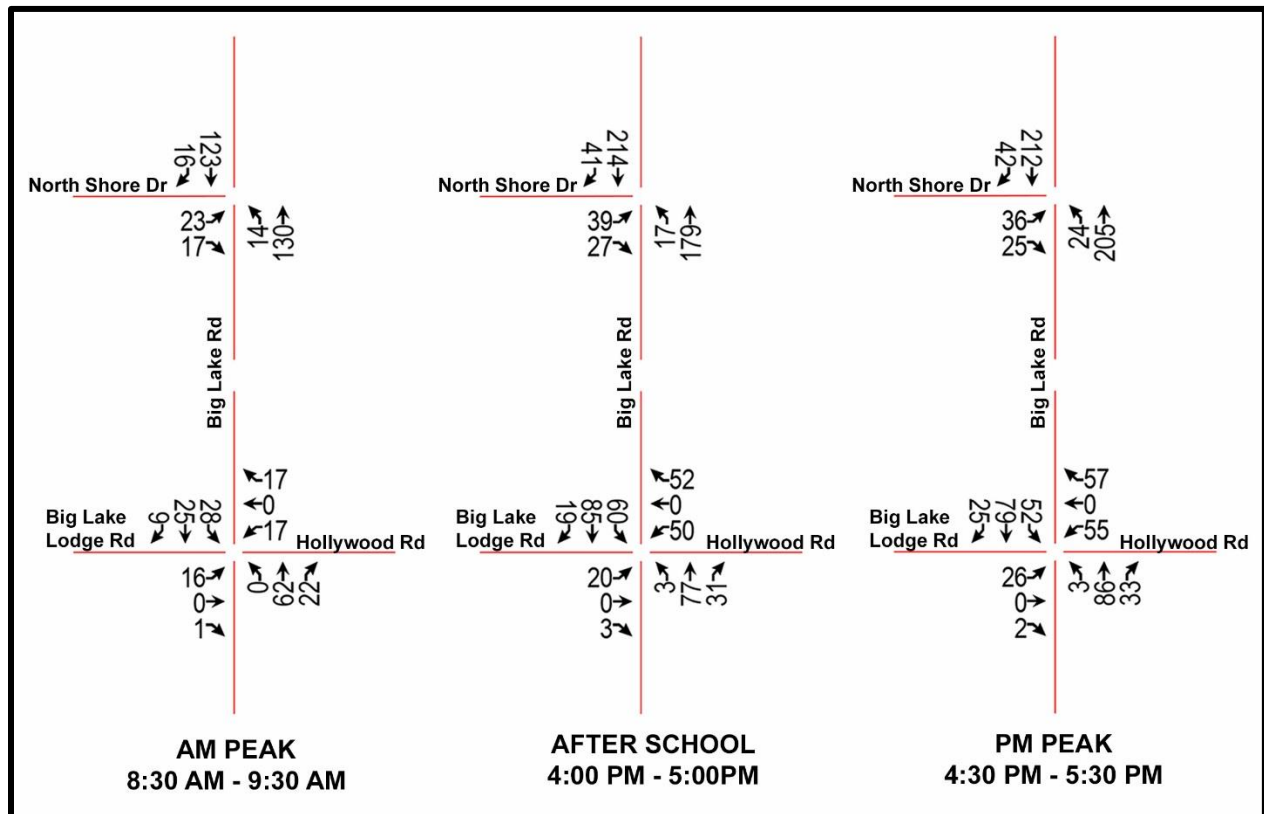


Figure 9. 2014 Turning Movement Counts on Big Lake Rd at North Shore Dr and Hollywood Rd

3.4 Heavy Vehicle Classification Data

DOT&PF published classification data collected in July of 2013 on the segment south of Big Lake Elementary. Northbound heavy vehicle percentages were found to be 10% and southbound heavy vehicles were found to make up 13% of the fleet.

3.5 Pedestrian Volume Study

Kinney Engineering conducted a pedestrian count study in late April of 2017. School was still in session during the time of these counts. The purpose of the study was to estimate the pedestrian, bicycle, and OHV traffic levels during higher-volume times of the day (specifically during the peak hour of the traffic volumes along Big Lake Road, and during school dismissal). Observations were also made concerning the origin and destinations of the traffic. In addition to the hour-long studies, non-vehicular users were observed during a walk-through study which mapped desire paths currently being used to pedestrian, bicycle and OHV traffic.

Observations were made on six different segments. The segments were chosen based on the ability of one person to observe all of the activity on the segment at one time. The segmentation used in the pedestrian volume study is shown in Figure 10.

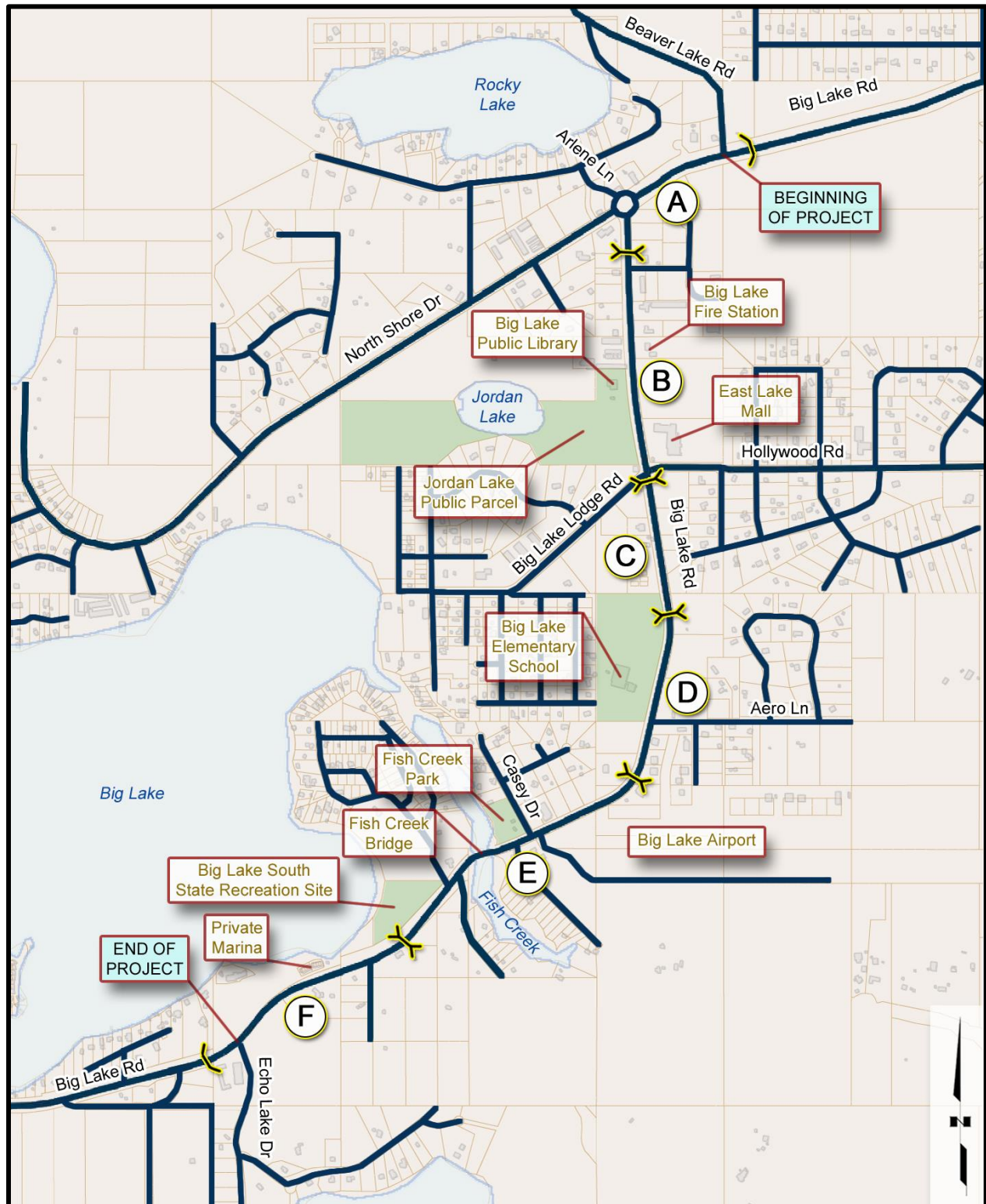


Figure 10. Pedestrian Count Locations Map

Segments A and B are within the region identified as Commercial, where vehicle traffic was seen to be the highest. Segments C, D, and E are in the “Civic” land use area. Part of Segment E and all of Segment F are in the final “Recreation” land use area.

In general, all observed pedestrian and bicycle traffic was seen on the paved pathway, and all OHV traffic was observed using the unofficial dirt path on the opposite side of the road. The exceptions to this situation were for short distances when users were forced to use the opposite pathway to reach a destination or to travel to a crossing location. Although no significant OHV traffic was seen on the paved pathway, there is evidence that OHV users do so, based on tracks on and near the pathway, and the eroding edge of pavement on both the pathway and Big Lake Road.

Additionally, all bicycle traffic was observed using the paved pathways and was not seen using the road or riding on the shoulder. No pedestrians or bicycles were observed on the road, shoulders or pathways south of the Fish Creek Bridge.

Figure 11 shows the maximum pedestrians, bicycles, and OHVs per hour during either of the two hour-long count periods for each segment. Bicycle traffic was the dominant use, especially in the segment between the North Shore Drive and Big Lake Elementary School (segments B and C). During the study periods, pedestrian and bicycle traffic was significantly higher on segments B and C in the core area of Big Lake. Pedestrians and bicyclists numbers taper off south of the elementary school and drop to zero south of the Fish Creek Bridge which marks the end of the paved pathway. The number of OHVs observed per segment is relatively consistent, with an equal number observed on segments E and F as there were on segments A, B, C and D. Since OHV traffic travels on unpaved pathways which are the same for each segment, this suggests that there is possible demand for pedestrian and bicycle traffic south of the end of the pathway that was not seen because it is not being served.

Additionally, OHV traffic was observed taking longer trips than pedestrians and bicyclists.

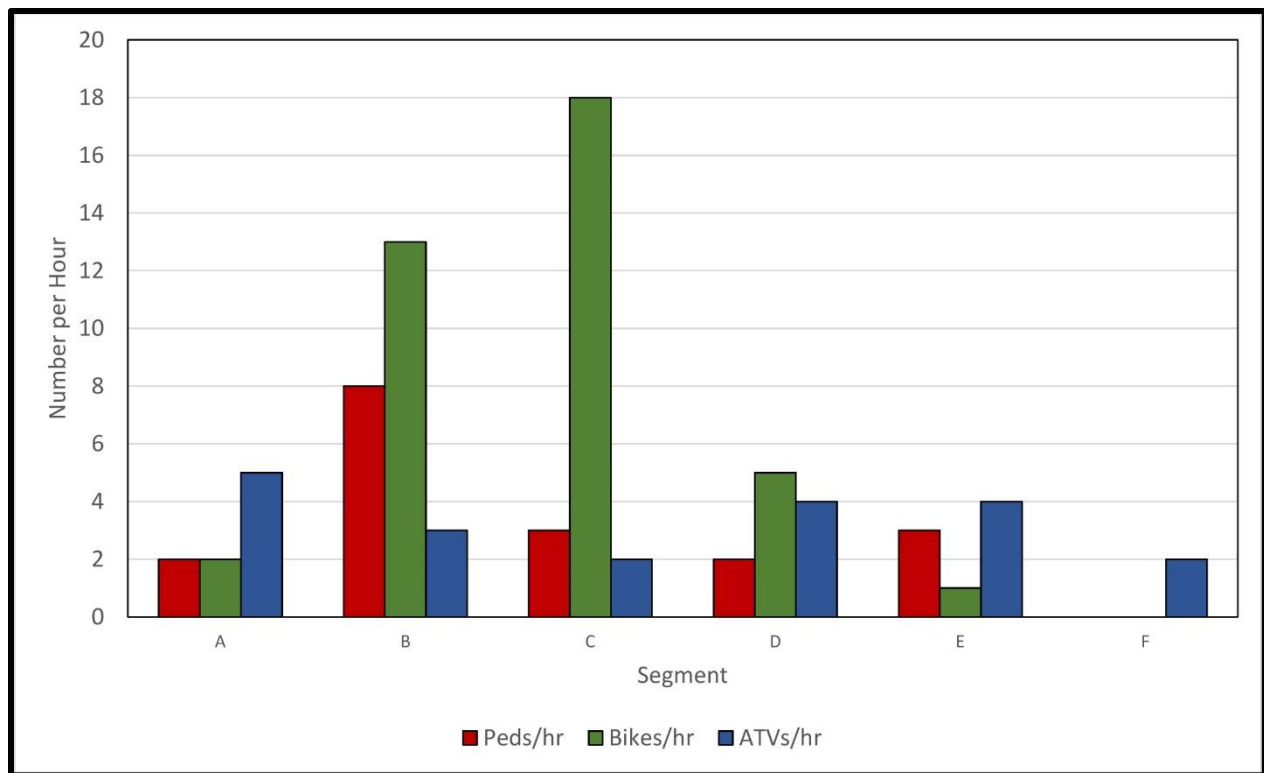


Figure 11. Average Non-Vehicular Traffic Per Hour

3.5.1 Segment A Pedestrian Volumes

Segment A starts at Beaver Lake Road and ends 300 feet south of the roundabout at Big Lake Road and North Shore Drive. The observation time periods and observed number of users are shown in Table 2.

Table 2. Observed Non-Vehicular Traffic on Segment A

Date	Time Period	Number of Observed Users	
25-Apr	12:30 to 1:30	Peds	2
		Bikes	2
		OHVs	1
27-Apr	2:00 to 3:00	Peds	1
		Bikes	0
		OHVs	5
11-May	5:50 to 6:00	Peds	0
		Bikes	3
		OHVs	0

Several crossings were observed in the area. The most common crossing was at Beaver Lake Road which accesses an unofficial path along the powerlines directly south of Beaver Lake Road. Other crossings were observed at the Tesoro Station driveway 400 feet west of Beaver Lake Road just east of the roundabout. There is evidence in the dirt opposite the gas station that would suggest

that this is a popular location to cross, as shown in Figure 12. Additionally, all pedestrian and bicycle crossings at the roundabout were observed to pass through the center, either walking over the center island or maneuvering through the roundabout on the apron, as opposed to using the cross walks.



Figure 12. Photo: Evidence of OHV crossings opposite Tesoro Driveway, Facing South

Popular pedestrian attractions in this area were Beaver Lake Road, the Tesoro station, North Shore Drive, and the liquor store just south of the roundabout. OHVs were attracted to the vacant lots in the southeast corner of the roundabout intersection which was currently being used as a defacto motocross park at the time of this study.

3.5.2 Segment B Pedestrian Volumes

Segment B starts 300 feet south of the roundabout at Big Lake Road and North Shore Drive and extends to the south side of the intersection of Big Lake Road and Hollywood Rd/Big Lake Lodge Rd. The time periods and observed number of users are shown in Table 3.

Table 3. Observed Non-Vehicular Traffic on Segment B

Date	Time Period	Number of Observed Users	
26-Apr	2:15 to 3:15	Peds	7
		Bikes	3
		OHVs	2
26-Apr	3:45 to 4:45	Peds	8
		Bikes	13
		OHVs	3
11-May	5:40 to 5:50	Peds	6
		Bikes	19
		OHVs	2

Crossings were observed at nearly all points in this segment. The number of crossings were less than 10 per hour. The most frequent crossings were the Big Lake Fire Station, the Big Lake Public Library, the north driveway to the East Lake Mall, and at the intersection of Big Lake Road and Hollywood Road/Big Lake Lodge Road.

The greatest attractions in this segment were the East Lake Mall and the Big Lake Public Library. Pedestrians were seen using pathways behind the library to access the Jordan Lake Public Parcel, which further magnified the importance of this location as a pedestrian generator. OHVs used a path that cuts through a property just north of the East Lake Mall. The desire path connects to the path that follows the powerline corridor that runs north-south and crosses Big Lake Road near the intersection of Beaver Lake Road. Figure 13 shows the pathway through the vacant lot. On the right side of the photo is the alley on the north side of the East Lake Mall.



Figure 13. Photo: OHV Pathway Through Vacant Lot, North of East Lake Mall, Facing East

Segment B was the most heavily used segment in the project for both pedestrians (as shown in Figure 11 on 27) and vehicle traffic (as shown in Figure 7 on page 22). Often pedestrians were observed several times within the same period as they traveled back and forth along the segment, as shown in Figure 14.



Figure 14. Photo: Bicyclists Observed on the Pathway Along Segment B, Facing West

Note that, the maximum bicycles per hour on this segment shown in Figure 11 on page 27 is 13; however, 19 bicyclists were observed along this segment in a ten-minute period during a walk-through of the project corridor while conducting the desire paths study a few weeks later.

3.5.3 Segment C Pedestrian Volumes

Segment C starts south of the intersection of Big Lake Road and Hollywood Rd/Big Lake Lodge Rd and extends to a point north of Big Lake Elementary School. The time periods and observed user numbers are shown in Table 4.

Table 4. Observed Non-Vehicular Traffic on Segment C

Date	Time Period	Number of Observed Users	
25-Apr	1:45 to 2:45	Peds	2
		Bikes	1
		OHVs	1
27-Apr	4:45 to 5:45	Peds	3
		Bikes	18
		OHVs	2
11-May	5:30 to 5:40	Peds	4
		Bikes	1
		OHVs	1

This segment had the highest hourly bicycle volume from any of the hourly counts (not counting the ten-minute count of segment B that saw 19 cyclists). The difference in the April 25th count of with only one bicycle and the April 27th count of 18 may indicate a desire to ride later in the evening. (The 19 cyclists observed on Segment B were also traveling in the 5:00 PM hour.)

There were no crossings observed on this segment during the study period, other than crossings on the south side of the Big Lake Road intersection with Hollywood Road/Big Lake Lodge Road.

The major attraction in this area is the residential area, north of Big Lake Elementary School, which produced walking and biking traffic on and off the paved pathway which runs adjacent to those properties.

OHVs in this area were observed on dirt paths on the east side of the road where paths have been created in and out of the right-of-way. Figure 15 shows a photo of the dirt pathway conditions, including the erosion of the paved shoulder, and multiple branching pathways that travel along the road side to avoid power lines.



Figure 15. Photo: OHV Trail on East Side of Segment C, Facing North

3.5.4 Segment D Pedestrian Volumes

Segment D starts north of Big Lake Elementary School and ends south of the school on the curve approaching the airport. Segment D closely matches the limits of the School Zone flashing beacons. The time periods and observed traffic numbers are shown in Table 5.

Table 5. Observed Non-Vehicular Traffic on Segment D

Date	Time Period	Number of Observed Users	
25-Apr	3:15 to 4:15	Peds	0
		Bikes	5
		OHVs	4
27-Apr	3:30 to 4:30	Peds	2
		Bikes	1
		OHVs	1
11-May	5:20 to 5:30	Peds	1
		Bikes	6
		OHVs	2

Counts were collected during school dismissal times and during after school activities; however very few pedestrians were observed leaving the school via Big Lake Road pathways. While a few children were observed leaving the school campus to the west via trails, a comprehensive count of all pedestrian traffic to and from the school was not performed.

The major attractions in this segment are the elementary school and also Aero Lane. Pedestrians and OHVs were seen going to and from Aero Lane and crossing Big Lake Road at Aero Lane. In all of these cases the traffic volumes were low, and the pedestrians did not use the painted crossing at the south school driveway, choosing instead to walk diagonally from the intersection of Aero Lane to the school driveway to access the paved path. Pedestrian volumes were not observed during the school arrival.

Relocation of the school crossing should be considered as part of a walking route plan with a detailed evaluation and adoption of routes.

Figure 16 shows the view from Aero Lane looking at the painted crosswalk in front of the school. Access to the crosswalk from the desire paths requires navigation of a relatively steep ditch, therefore use of the crosswalk would require walking along the unpaved shoulder, which is approximately 5 feet wide.



Figure 16. Photo: Painted Crosswalk at Big Lake Elementary School, Facing North

3.5.5 Segment E Pedestrian Volumes

Segment E starts north of Big Lake Airport and extends to the State Park Access south of the Fish Creek Bridge. The northern portion of this segment includes paved pathways as far as the bridge. After the bridge, there are no paved paths and pedestrians and bicyclists must use the shoulder. Very few pedestrians were observed in this segment, even on the paved pathway prior to the bridge.

The time periods and observed traffic numbers are shown in Table 6.

Table 6. Observed Non-Vehicular Traffic on Segment E

Date	Time Period	Number of Observed Users	
25-Apr	4:30 to 5:30	Peds	3
		Bikes	1
		OHVs	3
26-Apr	1:00 to 2:00	Peds	0
		Bikes	0
		OHVs	4
11-May	5:10 to 5:20	Peds	2
		Bikes	2
		OHVs	0

Some of the destinations that were observed in this segment were the airport, Casey Drive, Fish Creek Park on the north side of the bridge, and Lake View Loop and Fish Creek Road, two side roads that intersect Big Lake Road on the curve south of the bridge.

Although relatively few pedestrians were counted in this area, the ones that were observed were seen crossing at numerous locations, generally near a residential area, most notably at Casey Drive and at Lake View Loop and Fish Creek Road. Note that horizontal and vertical curves restrict the pedestrian sight distance in this area. Pedestrians crossings in this area would be less feasible than on segments further north, and a more detailed study of actual sight distances would need to be evaluated before a crossing is established to ensure that pedestrian sight distance and stopping sight distance were available.

3.5.6 Segment F Pedestrian Volumes

Segment F is the final segment of the study area and extends to Echo Lake Drive. This segment has several low-volume side streets and a private marina. The shoulders are 4-feet wide, and OHVs use pathways in ditches on either side of the roadway, sometimes riding so low over the side slope that they are not visible to vehicles on the road.

The time periods and observed traffic numbers are shown in Table 7.

Table 7. Observed Non-Vehicular Traffic on Segment F

Date	Time Period	Number of Observed Users	
26-Apr	5:00 to 6:00	Peds	0
		Bikes	0
		OHVs	0
27-Apr	12:45 to 1:45	Peds	0
		Bikes	0
		OHVs	2
11-May	5:00 to 5:10	Peds	0
		Bikes	0
		OHVs	0

Only two OHVs were observed on this segment during the periods studied. The OHVs were riding together and crossed Big Lake Road near the driveway access to the marina. From the appearance of the dirt path, this seems to be a common location to switch sides of the road. The OHV traffic passed through the segment and did not access any of the cross streets or the marina.

3.6 Existing and Forecasted 2040 Crossing Volumes

The maximum number of observed pedestrian crossings, on foot and on bike, in generally one location is 5 pedestrians per hour. This demand occurred at the North Shore Drive roundabout, in the vicinity of Lions Court/Big Lake Public Library, and at Hollywood Road. A maximum of two crossings per hour were observed at Big Lake Elementary School, neither used the designated cross walk.

Pedestrian growth is expected to track with traffic volume growth, as development expands. This means that pedestrian volumes could at a maximum double by 2040. Meaning, the highest crossing demand at an uncontrolled pedestrian crossing in the study area would be at Hollywood Road and midblock somewhere north of Hollywood Road, and the crossing demand would be expected to be approximately 10 crossing pedestrians per hour.

3.7 Existing and Forecasted Transit Use

There is currently a Valley Mover commuter bus that stops at the East Lake Mall in the morning with service to Anchorage. There are two separate return trips in the evening. No other additional transit operates within the study area. Valley Mover does not currently have plans to expand service to Big Lake, either through additional stops or additional busses.

Daily ridership values were not observed for this study, but in total Valley Mover serves approximately 300~400 riders a day on all commuter transit between the Valley and Anchorage.

4 Safety Analysis

A crash analysis was performed on Big Lake Road within the study area to identify intersections or segments with higher incidences of crashes, or with crashes involving pedestrians and bicyclists. The Highway Safety Improvement Program (HSIP) methodology was used to evaluate crash rates along the project corridor.

The analysis is based on crash data obtained from the DOT&PF from 2003 to 2012.

There are 10 intersections and 9 segments that were analyzed.

The 10 intersections are as follows:

- Big Lake Road and Beaver Lake Road
- Big Lake Road and North Shore Drive
- Big Lake Road and Lions Court
- Big Lake Road and Big Lake Lodge Road/Hollywood Road
- Big Lake Road and Aero Lane
- Big Lake Road and Hughes Homestead Road/ Casey Drive
- Lake View Loop/Fish Creek Road
- Big Lake Road and Gracie Circle
- Big Lake Road and Tammy Yunti Court
- Big Lake Road and Echo Lake Road

The 9 Big Lake Road segments are as follows:

- Beaver Lake Road to North Shore Drive
- North Shore Drive to Lions Court
- Lions Court to Hollywood Road/Big Lake Lodge Road
- Hollywood Road/Big Lake Lodge Road to Aero Lane
- Aero Lane to Casey Drive/Hughes Homestead Road
- Oscar Anderson to Lake View Loop/Fish Creek Road
- Lake View Loop/Fish Creek Road to Gracie Circle
- Gracie Circle to Tammy Yunti Circle
- Tammy Yunti Circle to Echo Lake Drive

Figure 17 presents a map of the project area with the crash locations and types. Tables giving intersection crashes are highlighted in blue, while segment crashes are highlighted in red.

Big Lake Road Pedestrian Study
Existing and Forecasted Conditions Report
December 2017

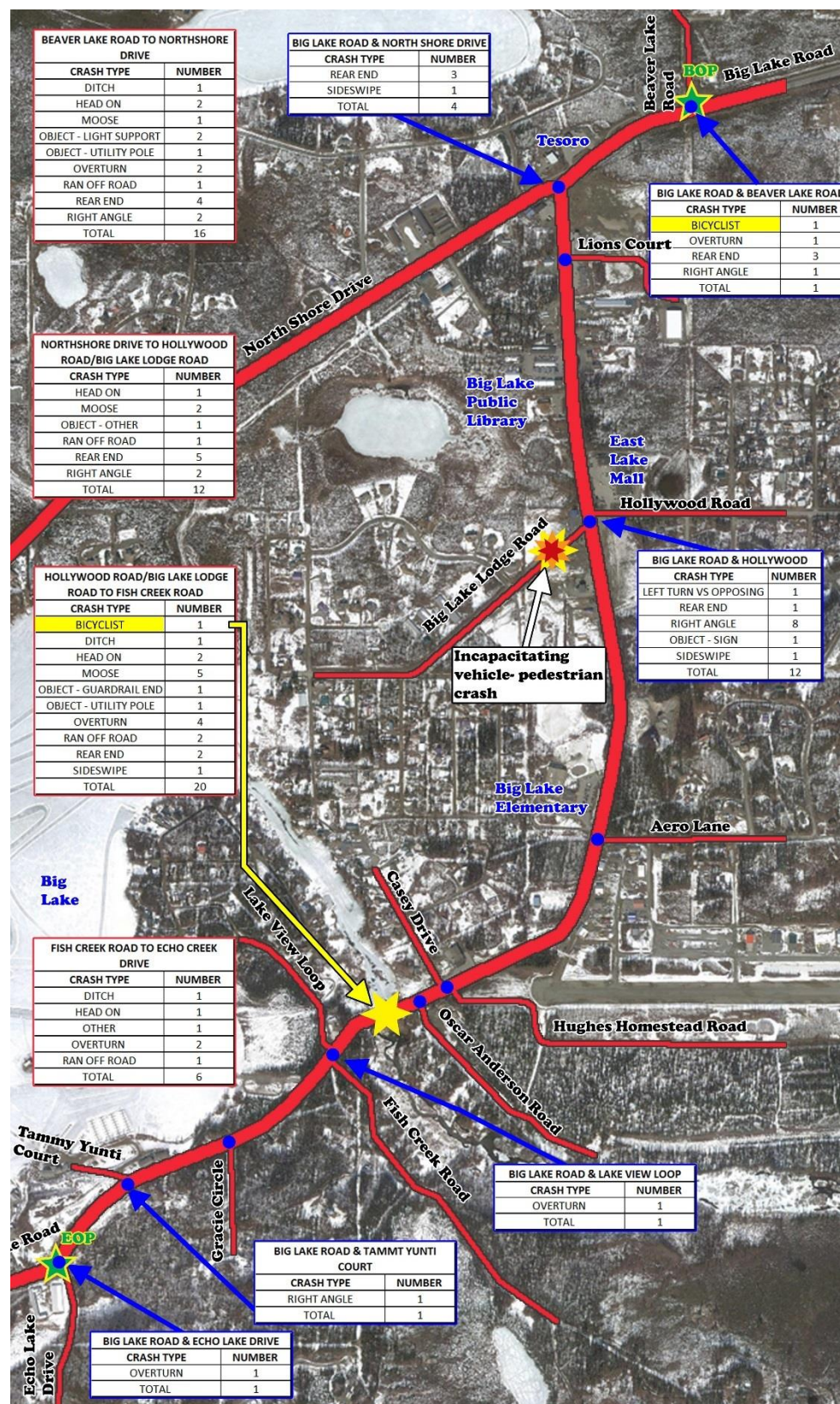


Figure 17. Crash Type and Crash Location Along Big Lake Road for Beaver Lake Road to Echo Lake Drive between 2003 and 2012

Between 2003 and 2012 there were two crashes in the study area involving bicycles and one involving a pedestrian. One bicycle crash involved a cyclist turning left and crashing into an oncoming car at the intersection of Big Lake Road and Beaver Lake Road. The crash resulted in property damage only. A second bicycle crash was recorded on the Fish Creek Bridge. The crash was a head-on crash, resulting in non-incapacitating injuries.

One pedestrian crash resulting in incapacitating injuries was recorded on Big Lake Lodge Road within the study period.

Table 8 shows observed crash rates, given in crashes per million entering vehicles (MEV), at intersections along the project corridor and compares the observed rates to state average rates and HSIP critical accident rates (CAR).

The HSIP methodology compares the observed crash rate to a CAR where the CAR is a calculated threshold that indicates a crash rate that is above average due to a characteristic of a design and not by chance. CARs are a function of the average crash rate of a facility type, the number of entering vehicles, and a confidence factor indicating the amount of certainty in the statistical analysis. A 95% confidence factor was used for analysis.

Table 8. Crash Rate and Crash Severity at Intersections

Street Intersecting with Big Lake Road	PDO	Min	Maj	Fat	Total	Crash Rate (MEV)	State Average Crash Rate (MEV)	CAR (MEV)
Beaver Lake Rd	3	3	0	0	6	0.35	0.52	0.81
Northshore Dri	3	1	0	0	4	0.44	0.52	0.81
Lions Crt	0	0	0	0	0	-	0.52	0.83
Hollywood Rd/Big Lake Lodge Rd	8	3	1	0	12	0.83	0.55	0.88
Aero Ln	0	0	0	0	0	-	0.52	0.94
Hughes Homestead Rd/Casey Dri	0	0	0	0	0	0.19	0.55	0.98
Lake View Lp/Fish Creek Rd	1	0	0	0	1	0.12	0.55	1.04
Gracie Cir	0	0	1	0	1	0.19	0.52	1.13
Tammy Yunti Crt	1	0	0	0	1	0.22	0.52	1.19
Echo Lake Rd	1	0	0	0	1	0.37	0.52	1.12

The state crash rate is exceeded at the intersection of Big Lake Road and Hollywood Road/Big Lake Lodge Road. However, this intersection does not exceed the CAR. There were 12 crashes documented at this intersection from 2003 to 2012. Of these 12 crashes, 8 were right-angle crashes and 1 was a left turning versus opposing traffic crash. One right-angle crash resulted in an

incapacitating injury, all other crashes resulted in minor injuries or property damage only. None of the crashes at this location involved a pedestrian.

No other intersection crash rates exceed the state average crash rate or CAR along the study corridor.

Table 9 shows observed crash rates at intersections along the project corridor and compares the observed rates to state average rates and CARs. Crash rates along segments are given in crashes per million vehicle miles traveled (MVT).

Table 9. Crash Rate and Crash Severity on Segments

Segment Limits	PDO	Min	Maj	Fat	Total	Crash Rate (MVM)	State Average Rate (MVM)	CAR (MVM)
Beaver Lake Road to North Shore Drive	9	5	1	1	16	3.54	2.30	3.58
North Shore Drive to Hollywood Road/Big Lake Lodge Road	4	6	1	1	12	1.36	2.30	3.20
Hollywood Road/Big Lake Lodge Road to Lake View Road/Fish Creek Road	14	4	2	0	20	2.01	2.30	3.14
Lake View Road/Fish Creek Road to Echo Lake Drive	5	0	1	0	6	1.19	2.30	3.51

The crash rate on the segment from Beaver Lake Road to North Shore Drive is statistically above the state average. One fatal crash involving alcohol occurred on the segment in 2010; a driver crossed the center line and crashed into a vehicle traveling the opposite direction. An incapacitating crash was recorded on the segment as well.

A second fatal crash involving an OHV occurred on December 10, 2010. A snowmachiner traveling northbound on the paved pathway parallel to Big Lake Road between Lions Court and Hollywood Road/Big Lake Lodge Road crashed into a bollard. The driver was wearing a helmet. Alcohol was involved in this crash.

Between 2003 and 2012 there was at least one incapacitating crash per segment.

Changes in crashes are expected to occur at or near North Shore Drive as a result of the roundabout at the intersection of Big Lake Road and North Shore Drive which was constructed after the most recent crash data was published.

5 Pedestrian Crossing Operational Performance

Pedestrian crossing operational performance is calculated on three segments of Big Lake Road. The segments used for analysis are as follows:

1. Beaver Lake Road to North Shore Drive
2. North Shore Drive to Hollywood Road/Big Lake Lodge Road
3. Hollywood Road to Echo Lake Drive

Pedestrian crossing delay was analyzed for the months of January, August, and September. January is the month with the lowest recorded traffic volumes of the year. August is the month with the highest recorded traffic volumes of the year. September is the highest traffic volume month in which school is in session for the entire month; children traveling to and from school at various times of the day are most critical during this month.

5.1 Existing and Future Pedestrian Crossing Delay

Pedestrian delay per segment was computed using HCM 2010 methodology. Computations were based on 2016 existing hourly vehicle traffic volumes and 2040 forecast hourly traffic volumes. For a seasonal per hour analysis, volume on Big Lake Road was estimated by applying monthly conversion factors from a local permanent traffic recorder to convert AADTs into design month hourly volumes.

Crossing delay varied per segment, month, and time of day. All periods analyzed resulted in greater than 1 gap per minute in both 2016 and 2040.

The results of the analysis are summarized in Figure 18 through Figure 20.

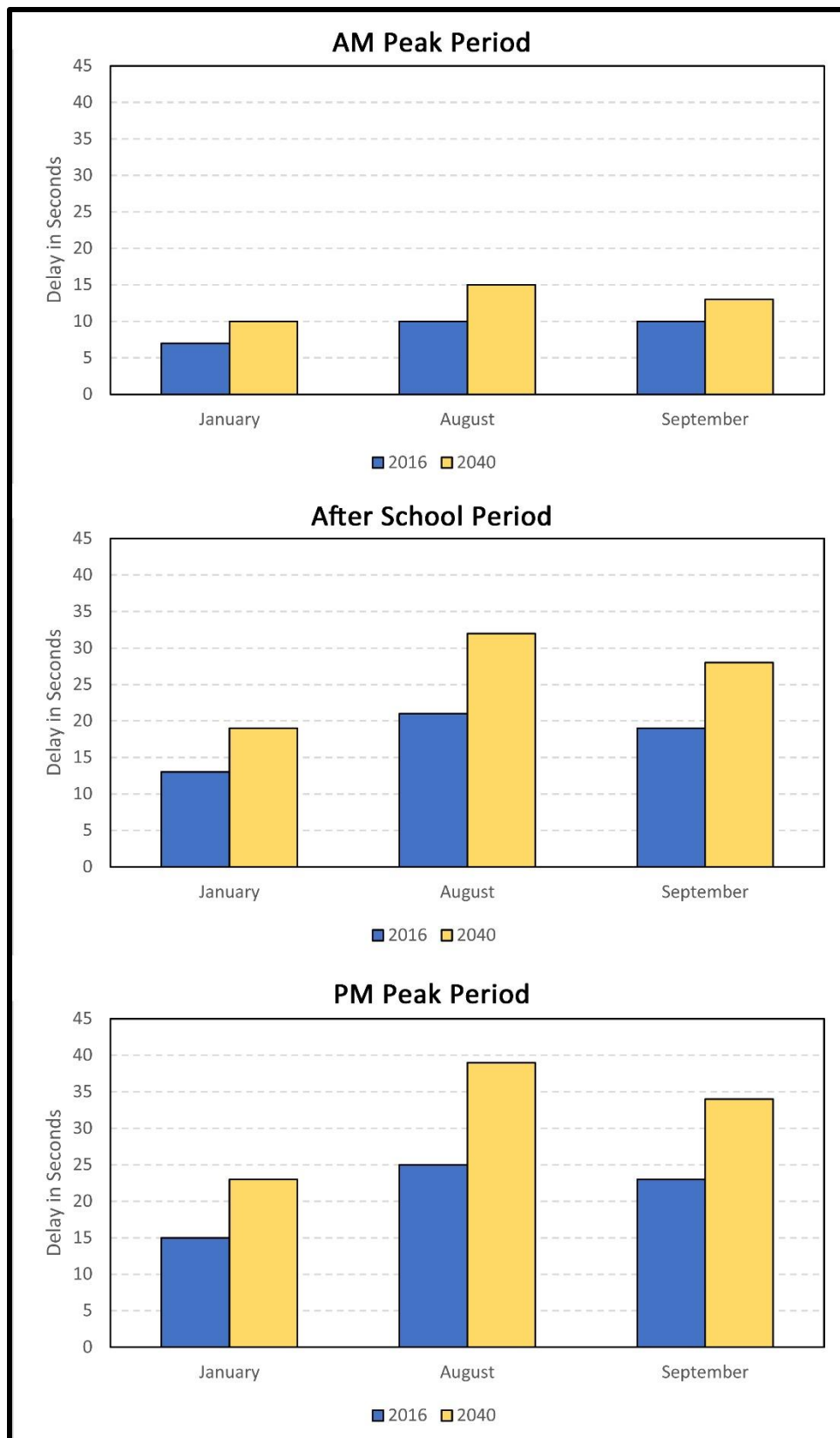


Figure 18 - Pedestrian Crossing Delay – Beaver Lake Rd to North Shore Dr

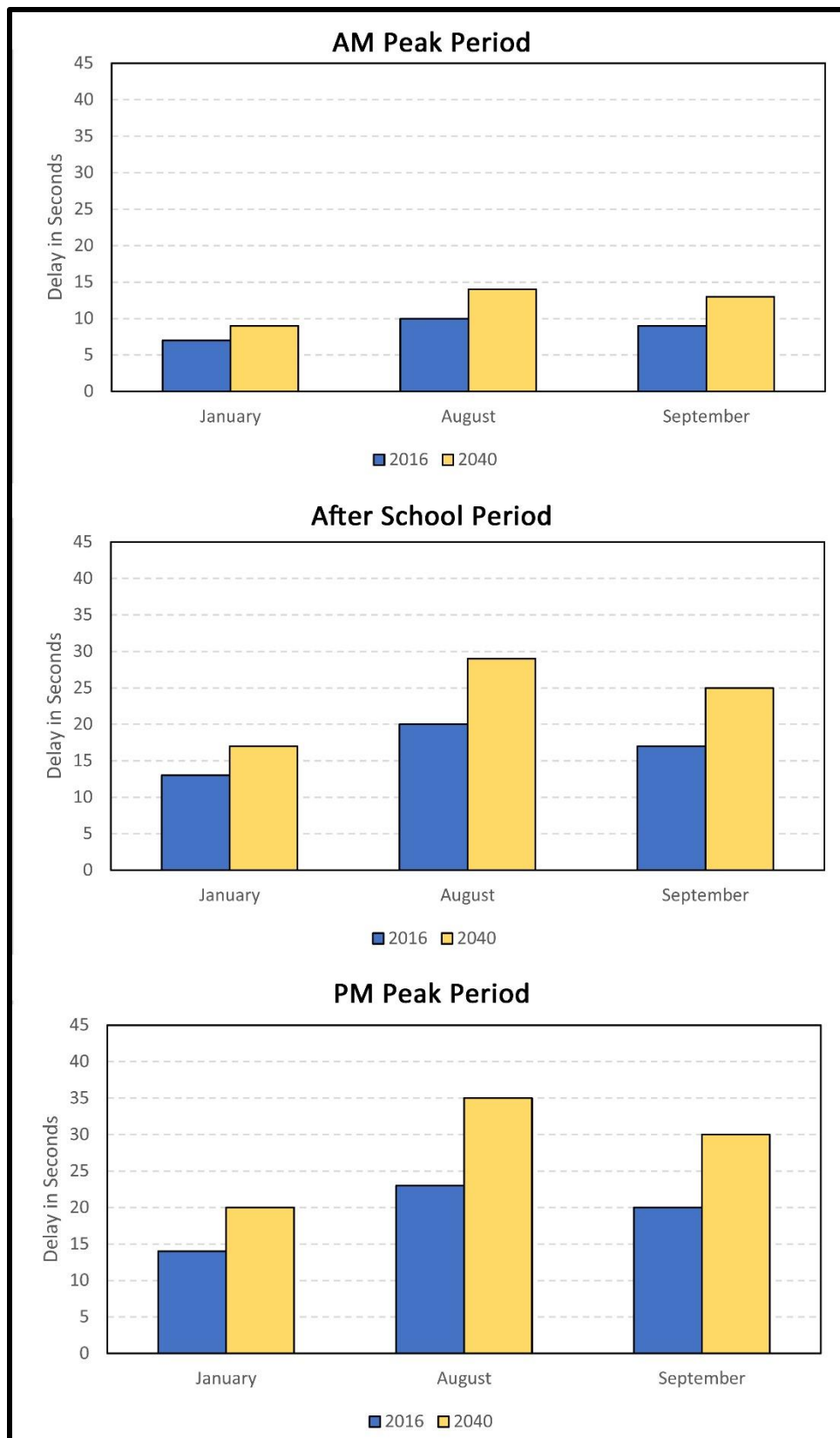


Figure 19 - Pedestrian Crossing Delay – North Shore Dr to Hollywood Rd

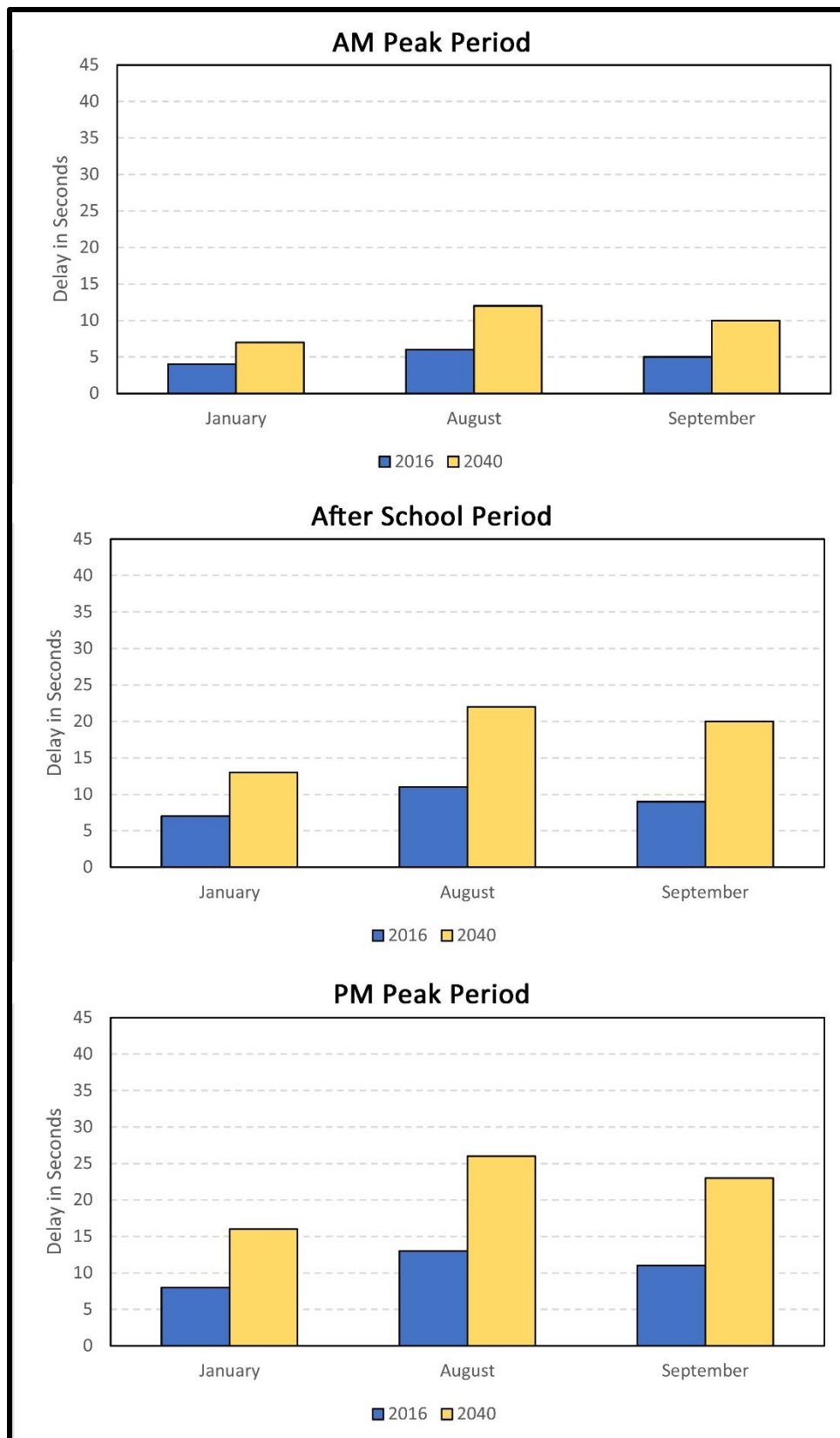


Figure 20 - Pedestrian Crossing Delay – Hollywood Rd to Echo Lake Dr

The estimated delay is highest on the northernmost segments of the project, between Beaver Lake Road and Northshore Drive, and between Northshore Drive and Hollywood Road. The delay in the AM peak period is less than 15 seconds even during the month of August with 2040 volumes. However, the August and September peaks in the afternoon and evening are near 20 seconds in 2016 and this increases to around 30 seconds in 2040. The highest calculated delay is north of North Shore Drive in 2040 during the August PM period where the delay is 39 seconds. This delay is generally acceptable to pedestrians. Paired with good visibility between pedestrians and drivers, pedestrians and drivers can typically react to each other under these conditions.

Since there are no marked pedestrian crossings along the two northern most segments, it was observed that pedestrians desiring to cross rarely waited for gaps, but rather proceeded along the pathway in the desired direction until a gap became available, then they would cross at whatever location they were at and continued on; therefore, longer gaps would generally be more acceptable on these segments than on the segment south of Hollywood Road.

Pedestrian refuges are installed on the roundabout at the intersection of Big Lake Road and North Shore Drive. A pedestrian refuge improves the pedestrian crossing experience by allowing a pedestrian to cross a road in two stages, each stage requiring pedestrians to only interact with one direction of travel. An analysis of the crossings at the roundabout shows an average delay, which is the sum of the delay of crossing both lanes, of 4 seconds or less on all approaches in 2016 and less than 10 seconds of delay in 2040. Therefore, users desiring less delay may use the crossings at the roundabout instead of waiting for mid-block crossings.

The delay at the marked cross walk that serves the elementary school is more critical, as gap judgements will likely be made by younger users that are less experienced in judging safe crossing gaps. On this segment, delay currently ranges from 4 to 13 seconds by time of day and season. The future delay is expected to increase to a delay ranging from 7 to 26 seconds. The after-school crossing period during the month of September is projected to experience 20 seconds of crossing delay, which is typical for an unsignalized crossing in an Alaskan community such as Big Lake.

6 Pedestrian Crossing Options and Other Considerations

The 2016 Alaska Traffic Manual (ATM) is the state supplement to the Manual on Uniform Traffic Control Devices (MUTCD) which is the federal policy governing the use of traffic control on public roadways. All signage, signal control, and striping should conform to MUTCD and ATM standards.

ATM standards for pedestrian crossings consider several primary factors in choosing traffic control mitigation – including pedestrian demand, pedestrian safety history (including crashes), pedestrian sight distance/visibility, and available pedestrian crossing gaps which represents delay to pedestrians.

The users of greatest concern in the Big Lake study area are school children traveling to and from Big Lake Elementary School and other adjacent pedestrian generators. This is of particular concern since the pedestrian pathway along Big Lake Road is on the west side of the road and many of the existing and future pedestrian generators are on the east side of the road. Therefore, safe and efficient crossing of Big Lake Road is highly desirable.

Major pedestrian generators for school age children in the study area are Big Lake Elementary School, the Big Lake Public Library, the East Lake Mall, residential developments to the east on Aero Lane and on Hollywood Road, and the Community Center at the east end of Lion's Court. The 2014 MSB Safe Routes to School plan identified a desire for paved multi-use pathways on Aero Lane and Hollywood Road, which would create connectivity with the paved pedestrian pathway on Big Lake Road. Additionally, the plan recommended investigating a pedestrian crossing at the intersection of Big Lake Road and Hollywood Road. Note that, this study found that a roundabout at this location would adequately provide pedestrian crossing opportunities.

Recently, public comments have identified a desire for a crossing somewhere between North Shore Drive and Hollywood Road, possibly at Lion's Court, so elementary school students can have a safer route to the community center. Lion's Court does not currently have a pedestrian pathway, and although it currently is a relatively low volume commercial roadway, a future residential development is planned to the east, which would likely access Big Lake Road via Lions Court, increasing the volume of vehicle traffic. If the roadway is upgraded to handle this increase in traffic volume, consideration should be given to providing pedestrian facilities along Lions Court, as well. Note that there is not a 100% safe route, instead, there are degrees of safety relative to the combination factors, such as infrastructure, conflicts with other vehicles and user groups, the behavior of pedestrians and other users, all combining to increase or reduce risk. It is not reasonable to conclude all risk can be eliminated.

Traffic Control for rural school areas should conform to Section 7A.100 of the ATM. Per the ATM, crossing guards should be considered where students are required to cross major streets, such as at the designated crossing near Aero Lane, if adequate gaps are not available. Currently no crossing guard is being used, and calculated gaps in the arrival and dismissal periods are relatively low compared to other locations and times along the corridor, as well as other communities. The school should consider implementing a crossing guard at this location, and the possibility of relocating the pedestrian crossing should be considered in a walking route plan.

Additional midblock or intersection crossings should comply with Table 3B-101 of the ATM. The ATM recommended practice for crosswalk markings on uncontrolled approaches or at midblock locations are based on speed, vehicle and pedestrian volumes, number of lanes, and median types.

Pedestrian crossings of Big Lake Road are identified as “marginal candidates” for marked crosswalks. Crosswalks are “recommended” to be installed only on roads with speed limits less than 35 mph for the forecasted volumes on Big Lake Road. If the speed limit were less than 35 mph, then the crossing location would have to meet the threshold for pedestrian demand, which is 20 pedestrians (or 15 child pedestrians) per peak hour.

Crossings at Hollywood Road, or a crossing further north at Lions Court would not currently meet ATM guidance since the crossings would not be connecting existing pathways and observed and forecasted pedestrian crossing demand is not greater than 15 children or 20 pedestrians an hour at any one location during the peak hour. However, this threshold for demand could possibly be reached and accepted if higher demand pedestrian generators are built in the study area and demand for through connectivity routes increases.

If a signal or roundabout were to be constructed at the intersection of Big Lake Road and Hollywood Road, consideration should be given to designating pedestrian crossings with marked pedestrian crosswalks on all legs. A crossing at this location would fulfill the desires of the SRTS plan and further reduce the demand for crossings elsewhere.

If events are frequently planned at the community center and young pedestrians were to regularly be drawn at a rate of 15 per hour or greater crossing Big Lake Road from the east, then a pedestrian crossing could be considered. To meet this demand, a crossing at Lion’s Court could be considered after adequate pedestrian facilities are installed on Lion’s Court. Alternatively, a crossing could be considered at the Big Lake Fire Station if a pathway were constructed into the community center on the south side of the property.

7 Speed Limit Considerations

In response to a Big Lake Community Council request to lower the speed limit to 35 mph, DOT&PF performed a speed study evaluation of Big Lake Road between Beaver Lake Road and Hughes Homestead Road. A spot speed study was performed on the afternoon of November 6, 2013, which observed vehicles traveling on Big Lake Road near Lions Court. The speed study found a median speed of 40 mph, 85th percentile speed of 45 mph, and a 10-mph pace of 34 to 43 mph. These speeds are consistent with the existing speed limit of 45 mph. The measured speeds reflect moderate development conflicts and are somewhat lower than the posted speed limit compared to other roadways. Beyond measured speeds, driveway density, land use, presence of parks and pedestrians, and other factors are also weighed in setting the speed limit.

DOT&PFs evaluation found that the lowest speed limit allowed given existing conditions is 40 mph, but suggested that new data be collected after construction of the roundabout at North Shore Drive.

In addition to serving the local community traffic, Big Lake Road also serves long distance traffic traveling between areas south of Big Lake, such as Point MacKenzie, and locations in either direction along the Parks Highway. As such, Big Lake Road is currently an important freight route for the State of Alaska. There is currently a study underway to determine the best location for a high-speed route to connect Port MacKenzie to the Parks Highway (known as the Port to Parks study). Some of the proposed routes travel along Big Lake Road through the study area.

KE considered the impacts to overall travel time for the Port to Parks Highway route if the segment from Beaver Lake Road to Hughes Homestead Road (a distance of about 1.5 miles) were reduced in speed limit to 35 mph. A variety of possible routes were considered between Fairbanks, AK and Port MacKenzie. Based on the speed limits shown in Table 10, the total travel time along these routes is 5.5 to 6 hours, as shown in Table 11. In comparison, travel time for a 1.5-mile segment of Big Lake Road takes only 0.5 minutes longer at a speed limit of 35 mph, as compared to the existing speed limit of 45 mph.

Note that incremental delays along a major corridor are smaller within communities, but can accumulate along longer principal corridors connecting multiple communities. This can be detrimental to the statewide performance of the economy. The overall goal is to enable the most jobs, commerce and recreation by connecting ports and cities at speeds and times that serve the economy and public interaction on a larger level. The national goal is 50 mph or greater from port-to-port, city-to-city on principal arterials, especially the Interstate system. The State goal is 60 mph for the Interstate highways in Alaska. Because Big Lake Road is not an Interstate route, but does connect Port MacKenzie and the community to other communities, it is important to balance the travel speed on roads within the community against statewide needs leading to and from the community and to and from economic hubs beyond the community.

Table 10. Speed Limits

Road/Highway	Speed (mph)
George Parks Highway	55
South Johnsons Road	35
West Hollywood Road	35
Vine Road	35
S Knik Goose Bay Road	55
Point Mackenzie Road	55
Big Lake Road	30 to 55
Burma Road	gravel
S Purinton Parkway	gravel

Table 11. Travel Times

Parks Highway (Intersection with Cripple Creek Road), Fairbanks to Port Mackenzie		
Distance (mi)	Time (hr)	Route
332	5.6	Parks > S Johnsons > W Hollywood > Vine > S Knik Goose Bay > Point Mackenzie
337	5.8	Parks > Big Lake > W Hollywood > Vine > S Knik Goose Bay > Point Mackenzie
325	5.8	Parks > Big Lake > Burma > Point Mackenzie
325	5.9	Parks > Big Lake > S Purinton > Burma > Point Mackenzie

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