

BIG LAKE ROAD PEDESTRIAN IMPROVEMENTS STUDY

Project No. Z589720000

DRAFT EXISTING CONDITIONS REPORT

Prepared for:



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INTRODUCTION

PROJECT OVERVIEW

The Alaska Department of Transportation and Public Facilities (DOT&PF) is conducting a study to identify and plan for pedestrian and other non-motorized user safety on Big Lake Road, within the unincorporated community of Big Lake in the Matanuska-Susitna Borough (MSB). Big Lake is a growing community within the MSB, seeing growth in the emerging Town Center area, as designated in the 2009 Big Lake Comprehensive Plan. A state grant was requested in 2014 and allocated in 2015 to begin scoping the development of a study aimed at identifying safety needs for increasing pedestrian and bicycle movements along Big Lake Road within commercial core of the community. See Figure 1 Vicinity Map.

This planning led study will analyze current conditions and make recommendations for solutions to support walkability and economic development in Big Lake's commercial center, prioritizing capital projects to enhance safety for non-motorized users. As the town centers grow, the local city/borough has a statutory responsibility to preserve road function. As the Big Lake area builds out, it will be important to anticipate future development to preserve Big Lake Road's function as a minor arterial to move people, goods and services from, to, and through Big Lake to the rest of the MSB, while balancing adjacent property growth and development. The study will recommend policies supporting future transit opportunities and traffic increases as both the Big Lake area and Port Mackenzie continue to develop.

This project will emphasize planning and development of recommendations to prioritize a safe, accessible and constructible corridor for pedestrians and other non-motorized users. The project goals are to:

- Promote year-round walking within the Big Lake core as an attractive, affordable and viable travel option by providing safe, barrier-free and all weather facilities to improve community cohesion.
- Reduce conflicts between motorized and non-motorized traffic.

To achieve these goals, the objectives of this project are to:

- Engage with and survey residents to gain an understanding of the issues facing non-motorized traffic.
- Study the existing non-motorized infrastructure to identify deficiencies and opportunities for improvements.
- Develop short-term and long-term recommendations for improving non-motorized facilities.

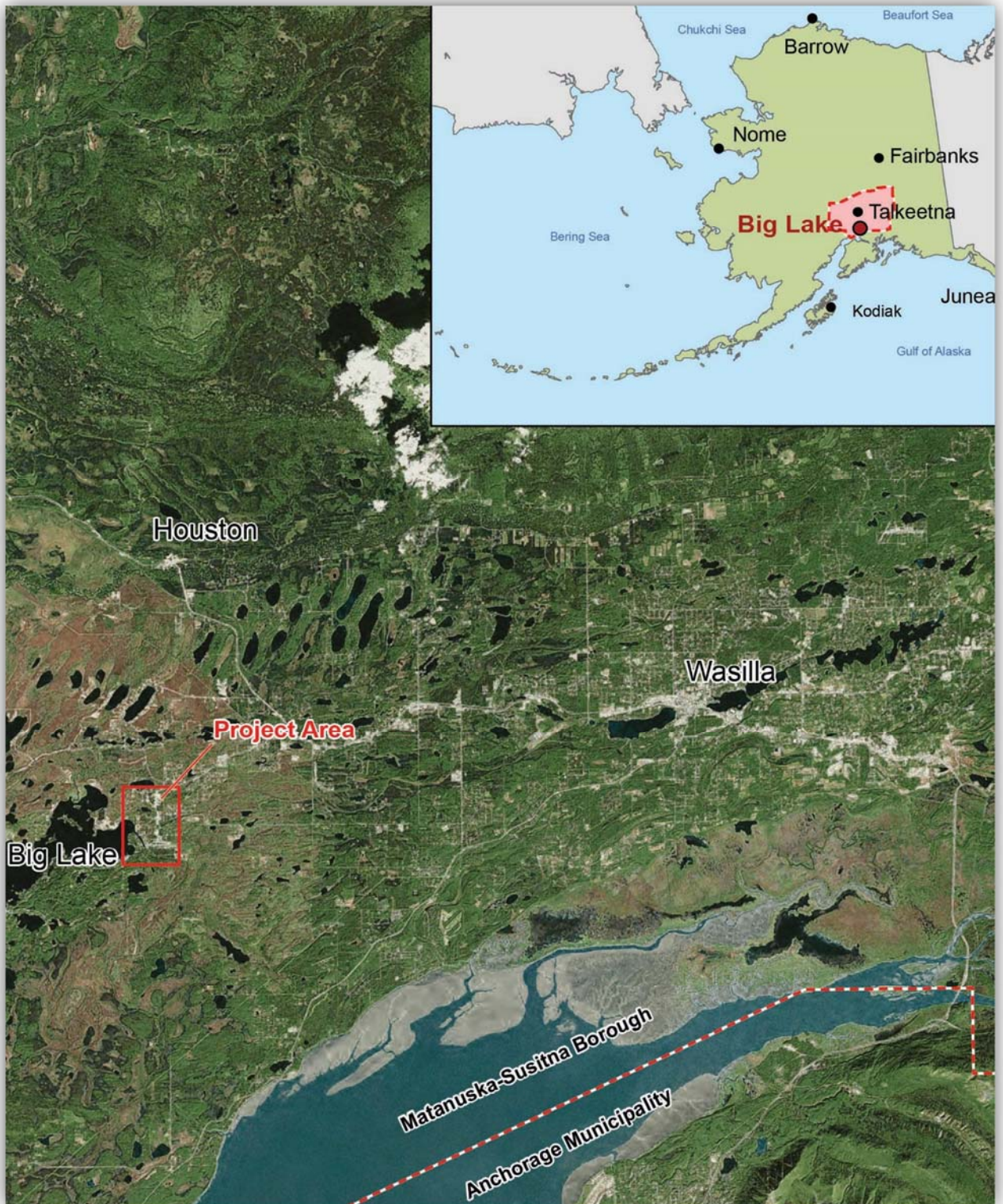


FIGURE 1. PROJECT VICINITY MAP

PROCESS AND SCHEDULE

The Big Lake Pedestrian Improvements Study is being conducted from the spring of 2017 through June 2018. See Figure 2 Schedule.

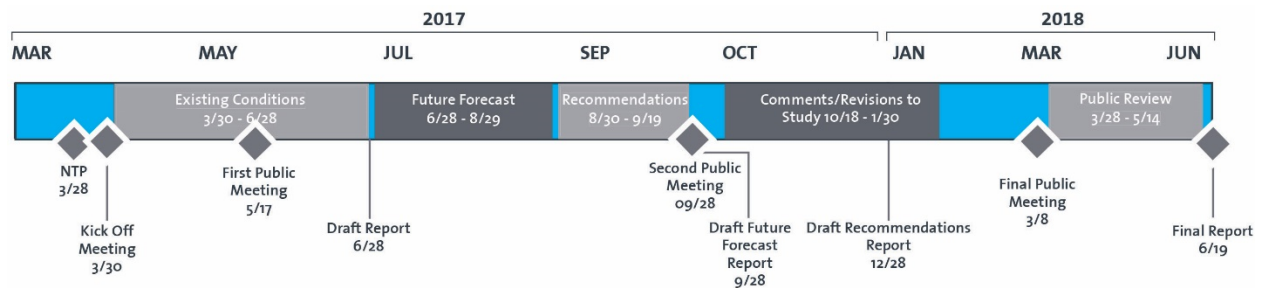


FIGURE 2. PROJECT SCHEDULE

BIG LAKE COMMUNITY

Big Lake, Alaska is located within the Matanuska-Susitna Borough (MSB) and is an unincorporated community of approximately 3,300 people, according to the 2010 census. It is centered on the water body of Big Lake which is a major recreational attraction in the Matanuska-Susitna Valley (MSV) and Southcentral Alaska. The community supports numerous recreation activities in the area such as boating, watersports, camping, hunting, fishing, hiking, ATV (off-road vehicle) 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, 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 vacant parcel developments which are currently in proposal or pre-development considerations. Many of the parcels in the community are vacant and available for development.

This study is tasked with examining the pedestrian and bicycle operation and safety history in the core downtown segments of the Big Lake community, adjacent to Big Lake Road. The study area is along Big Lake Road, starting at Echo Lake Drive to south and Beaver Lake Road on the north. See Figure 3 Study Area Map.



FIGURE 3. STUDY AREA MAP

GUIDING AREA PLANS AND POLICIES

The following area planning documents were considered in the analysis and public processes and will be used as a basis for future design recommendations.

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 was 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.

The 1996 version of the comprehensive plan included recommendations for multipurpose trails along Big Lake Road all the way to the South Big Lake State Park, as well as on Hollywood Road, Big Lake Lodge Road, Beaver Lake Road, and on North Shore Drive. Pathways have since been constructed along Big Lake Road as far as Fish Creek Park, terminating at the bridge, and along North Shore Drive.

2007 MAT-SU BOROUGH LONG RANGE TRANSPORTATION PLAN

The 2007 Long-Range Transportation Plan (LRTP) assesses growth in the MSB to 2025 and recommends improvements for various transportation modes to support the growth. Two traffic models were developed for this plan, one that considered the possible construction of the Knik Arm Bridge and one that did not. The LRTP reveals that within the study area, Big Lake Road would operate at LOS (Level-of-Service) C by 2025 under the No Knik Arm Bridge model.

The LRTP provides a list of roadways that need improvements by 2015 to relieve traffic for the next 10 years. Big Lake Road from Northshore Drive to Parks Highway was identified as needing improvements by the 2015 forecasted traffic volumes. The proposed improvement would increase the number of lanes on the Big Lake Road segment from two lanes to four lanes.

The LRTP also mentions a Statewide Transportation Improvements Program separated pathway project to improve pedestrian facilities on Hollywood Road from Big Lake Road to Knik-Goose Bay Road.

SAFE ROUTES TO SCHOOL PLAN

The 2014 MSB Safe Routes to School (SRTS) plan identifies deficiencies at elementary and middle schools and recommends improvements for students walking or biking to school. Recommended improvements are implemented after route planning occurs and is adopted by the Mat-Su Borough as a walking route. 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.

BIG LAKE INTERSECTIONS TRAFFIC STUDY

The Big Lake Intersections Traffic Study 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 conflicted unsignalized intersections monitoring list for the Central Region 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 at the intersections were expected to operate at acceptable levels of service under the three alternatives. However, seasonal daily traffic counts were estimated to indicate the potential benefit of each intersection alternative and it was recommended that a roundabout be constructed at the North Shore Drive intersection at Big Lake Road first, while funds were available. The study also recommends re-evaluating alternative improvements for the Big Lake intersection at Hollywood Road/Big Lake Lodge.

A possible roundabout has been discussed for the intersection of Big Lake Road and Hollywood Road. The construction of a roundabout at the Big Lake Road and North Shore Drive intersection was completed in 2016.

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 9.

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.

CONTEXT

PROJECT LOCATION

The project study area extends a distance of just under 2.5 miles of Big Lake Road, from Beaver Lake Road to Echo Lake Drive. The area includes a single lane roundabout at the intersection of Big Lake Road and North Shore Drive. There is also a major four-leg intersection at Big Lake Road and Hollywood Road/Big Lake Lodge Road.

LAND USE AND EXISTING CONDITIONS

COMMERCIAL SEGMENT: BEAVER LAKE RD TO HOLLYWOOD RD

The study area can be divided into three land use contexts. This segment is a moderately developed 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. Additionally, there are residential areas back from the roadway throughout this zone that supply regular local traffic.

A single lane roundabout was constructed in 2016 with pedestrian crossings at all four legs of the intersection. The roundabout appears to function as intended with passenger car and tractor-trailer traffic flowing smoothly.

CIVIC SEGMENT: HOLLYWOOD RD TO FISH CREEK BRIDGE

This segment is the civic context and includes Big Lake Elementary School, and the Big Lake Airport, as well as access to more, light residential developments. There are large tracts of vacant land some of which are former natural resource extraction sites that may be repurposed for other land use developments in the future.

RECREATIONAL SEGMENT: FISH CREEK TO ECHO LAKE DR

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 segment, 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, pedestrians, bicyclists, and ATVs (such as four wheelers, dirt bikes, and snow machines). There is a separated paved pathway on the north and west sides of Big Lake Road that begins approximately 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 are used by ATVs.

The road alignment through this segment features extensive vertical and horizontal curvature, a typical section devoid without shoulders, and with steep embankments. Motorized traffic (including dump trucks) on the roadway were observed at a noticeable volume. These observations, along with a lack of non-motorized facilities, makes this segment unappealing to pedestrians.

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. The bridge includes white warning signs informing pedestrians not to stand on the bridge. South of the Fish Creek Bridge to the end of the project area the

paved shoulders vary from 4-feet wide to no paved shoulder, possibly due to erosion from ATVs, which use the gravel shoulder and ditch as a pathway on either side of the road along this segment.

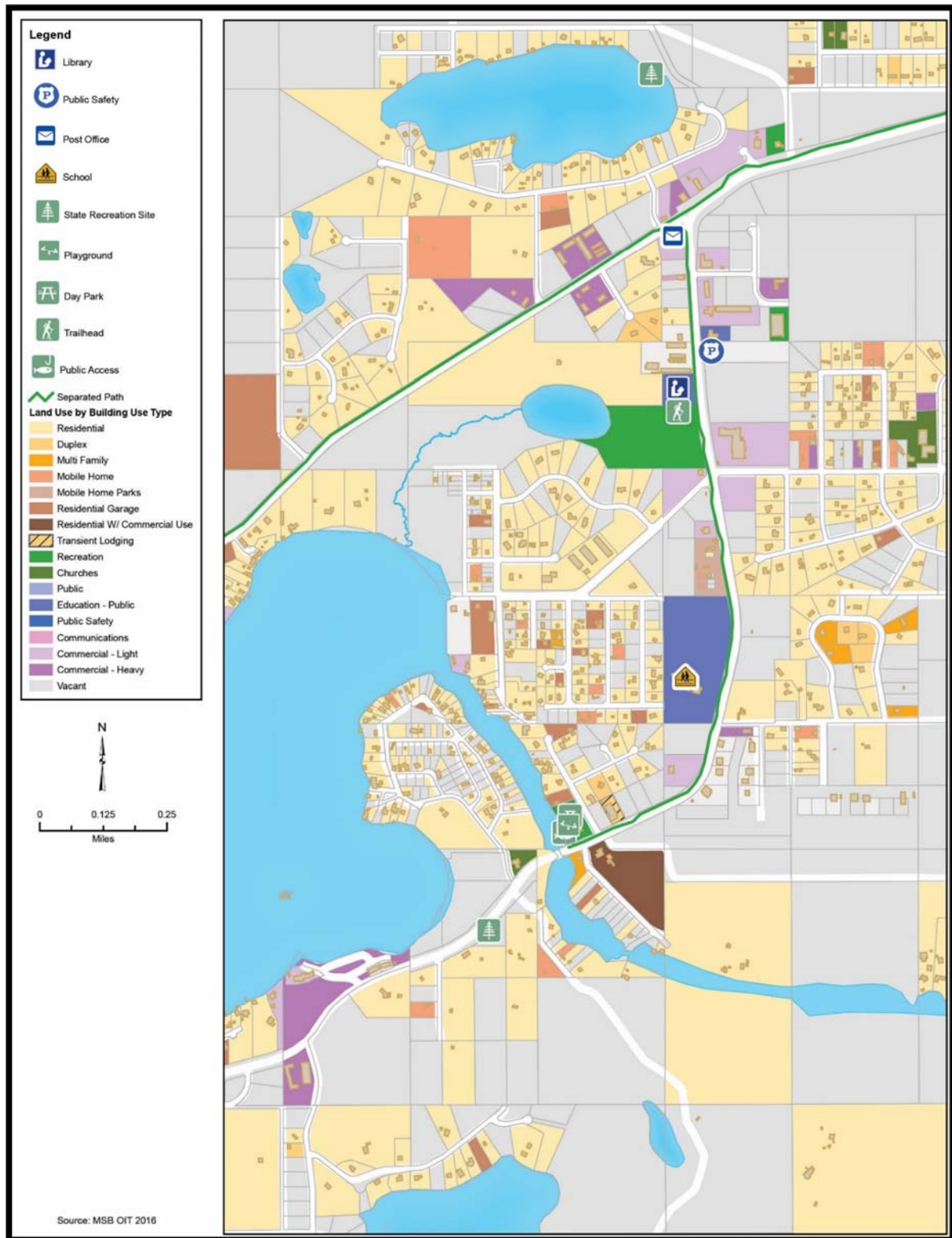


FIGURE 4. EXISTING LAND USE (MSB DATA 2016)

UNOFFICIAL PATHWAYS STUDY

In May of 2017, Kinney Engineering conducted a planning level survey of the unofficial pathways along Big Lake Road and on cross streets. The purpose of this study was to locate where motorized vehicles are operating and to identify any locations where pedestrians, bicycles or other users might be accessing the pathways from nearby properties.

A paved pathway on the west side of Big Lake Road extends through most of the study area and is used by pedestrians, bicyclists, and other non-motorized users. Unofficial ATV trails adjacent to Big Lake Road have not been designed. It is illegal for ATVs to use the paved path since it contains pedestrian and bicycle traffic. ATVs therefore drive on unofficial pathways in the ditch section or side slope of the right-of-way either next to the paved pathways, or more commonly, on the opposite side of the road. See Figure 5 for a Map of the pathways which were identified in this study.

In general, the ATV trails are on the east side of Big Lake Road. They are often only a single lane, however occasionally the path widens out to either a single 15-foot rutted dirt area, or 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 are an attraction to ATV traffic. 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 ATV trail. There are several paths connecting to the powerline trail from the area of the East Lake Mall.

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 of North Shore Drive.

The subdivision just south of Hollywood Road has a paved pathway that runs along a property line and connects to the unofficial trail just north of the Elementary School parcel. The terminus of the paved path intersects the unofficial pathway on the east side of Big Lake Road.

There were pathways observed behind the Elementary School and another running up a powerline directly across from the school.

ATVs were observed riding up the shoulder of Aero Lane; however, further south the cross streets are low volume enough that ATVs users appear to drive in the roadway, rather than next to it.

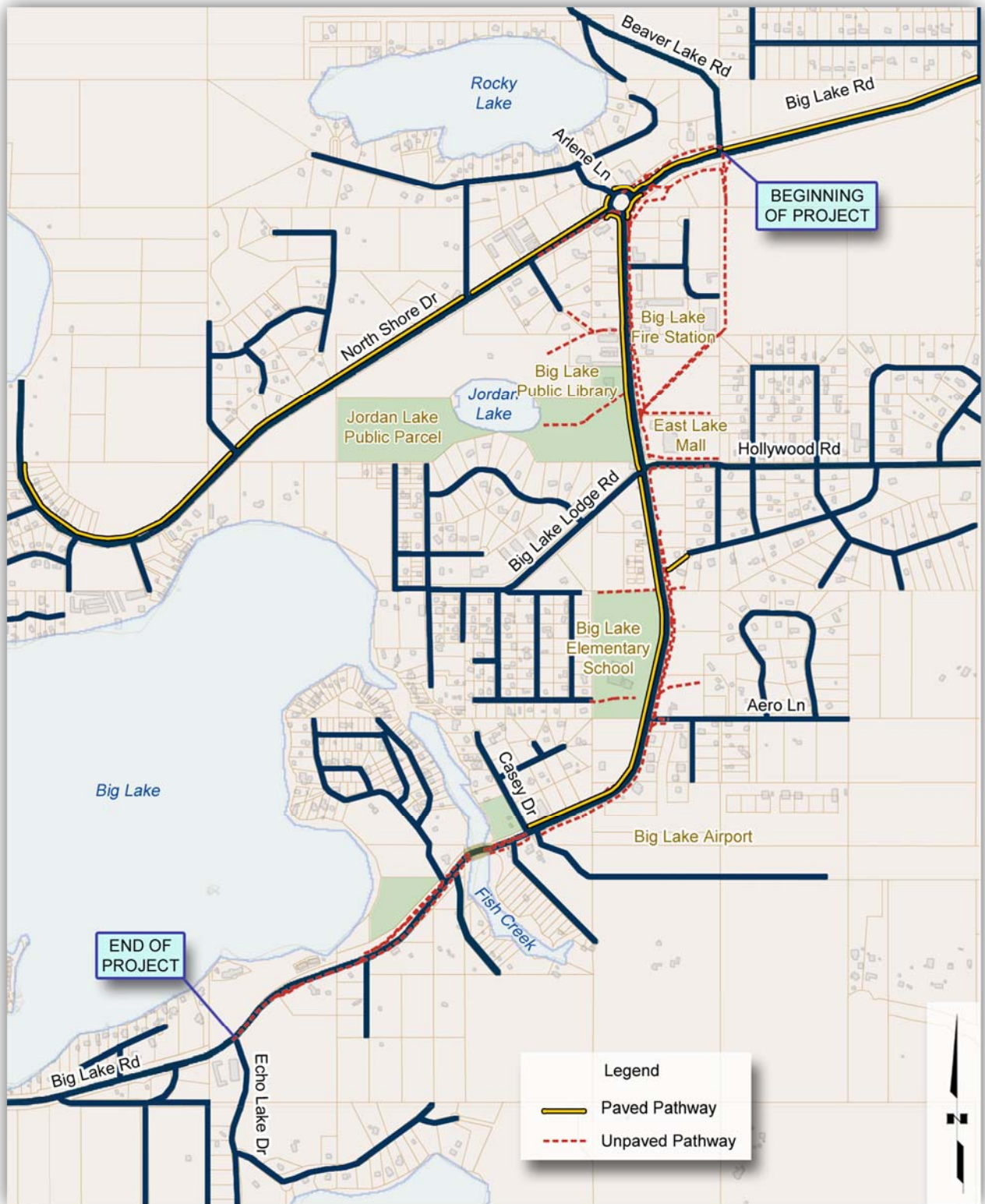


FIGURE 5. UNOFFICIAL PATHWAY MAP

TRAFFIC AND PEDESTRIAN VOLUMES

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.

Figure 6 shows the volume history from 2003 to 2015 on Big Lake Road segments and Figure 7 show the volumes history on intersecting side streets.

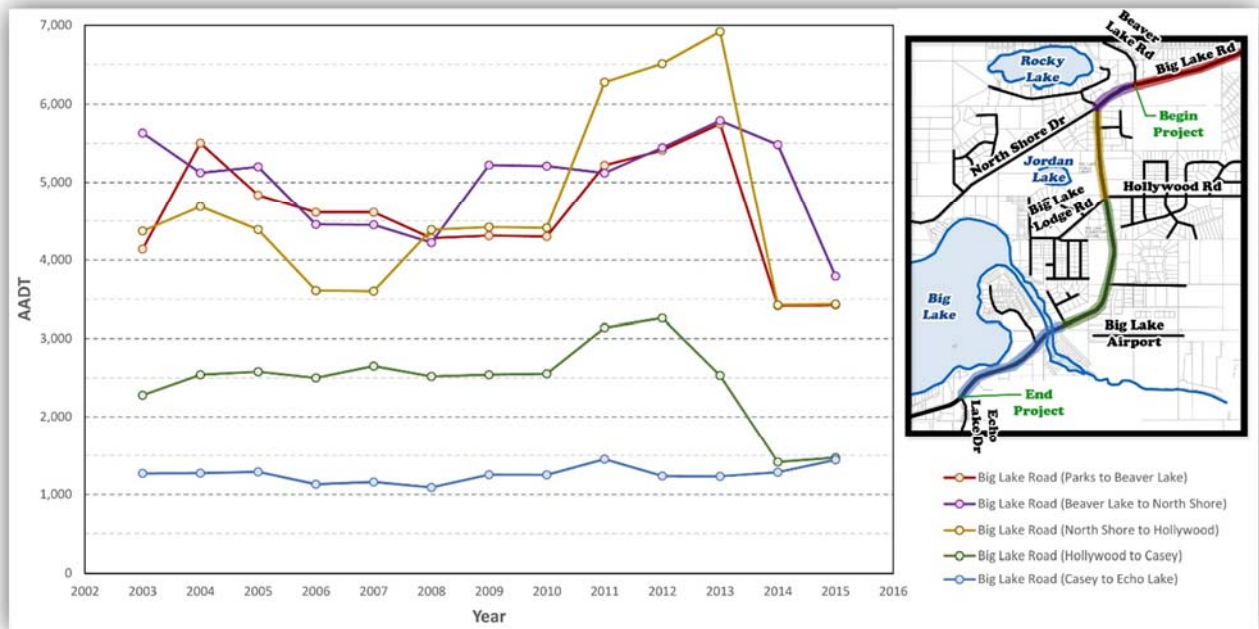


FIGURE 6. HISTORICAL VOLUMES – BIG LAKE ROAD

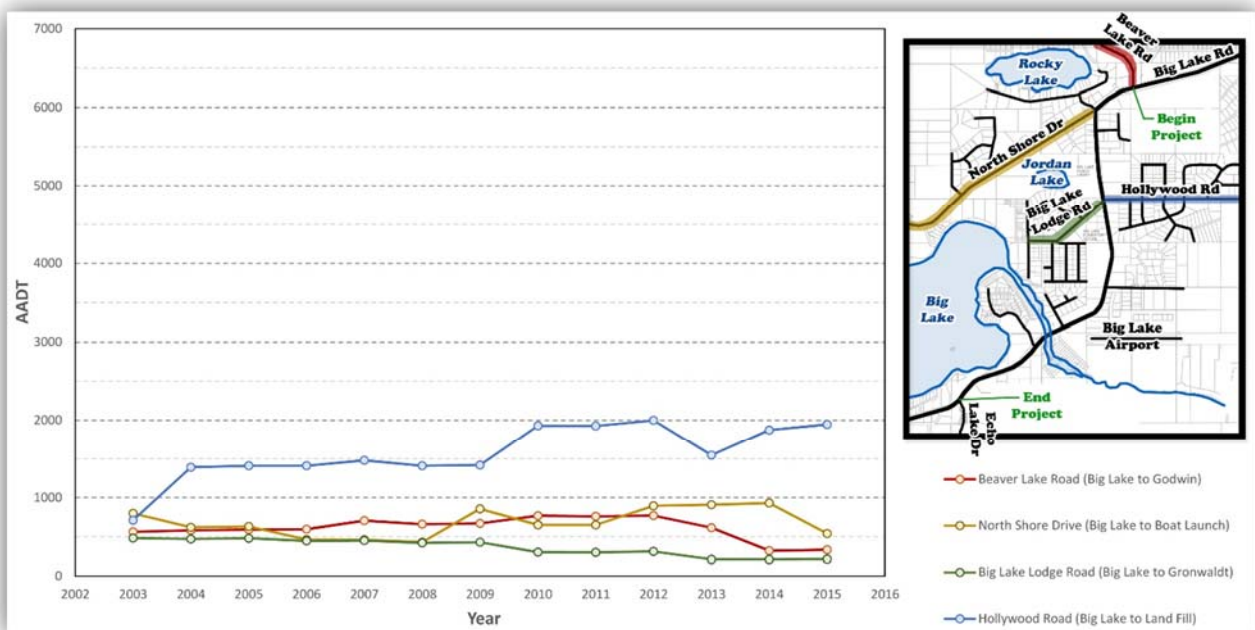


FIGURE 7. HISTORICAL VOLUMES – CROSS STREETS

In addition to DOT&PF annual traffic volumes, the MSB traffic counts were collected in our analysis. The MSB publishes counts from throughout the Matanuska Susitna Valley. In July and August of 2012 the MSB took week long counts along Big Lake Road. 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 VOLUME COUNTS ALONG BIG LAKE ROAD

Location	2012-Count 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, AADT volumes on the first half of the project area, north of Hollywood Road, are approximately double that measured on the road segments to the south.

Traffic volumes from 2013 to 2015 showed a remarkable drop in volume along Big Lake Road segments on the north side, and on Beaver Lake Road and North Shore Drive. However, volumes on Hollywood Road increased slightly during this same period. The cause of this decrease in traffic is not entirely clear. It may have partially been a result of the construction of the roundabout at Big Lake Road and North Shore Drive which was completed in 2016.

OBSERVED TURNING MOVEMENT VOLUMES

As part of the Big Lake Intersection Traffic Study, 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 (TMCs) were collected in half hour intervals during two two-hour intervals on June 5, 2014 and July 29, 2014, although on which day which intersection was counted is not specified. Counts were taken approximately between 7:30 AM – 9:30 AM and 4:00 PM to 6:00 PM at both locations. Figure 8 shows the 2014 Turning Movement Counts. These volumes were used to estimate peak period vehicles per hour to calculate pedestrian crossing delays. The peak period vehicles per hour estimated are approximately a quarter of a typical high volume single lane approach to an intersection at peak hour in Anchorage.

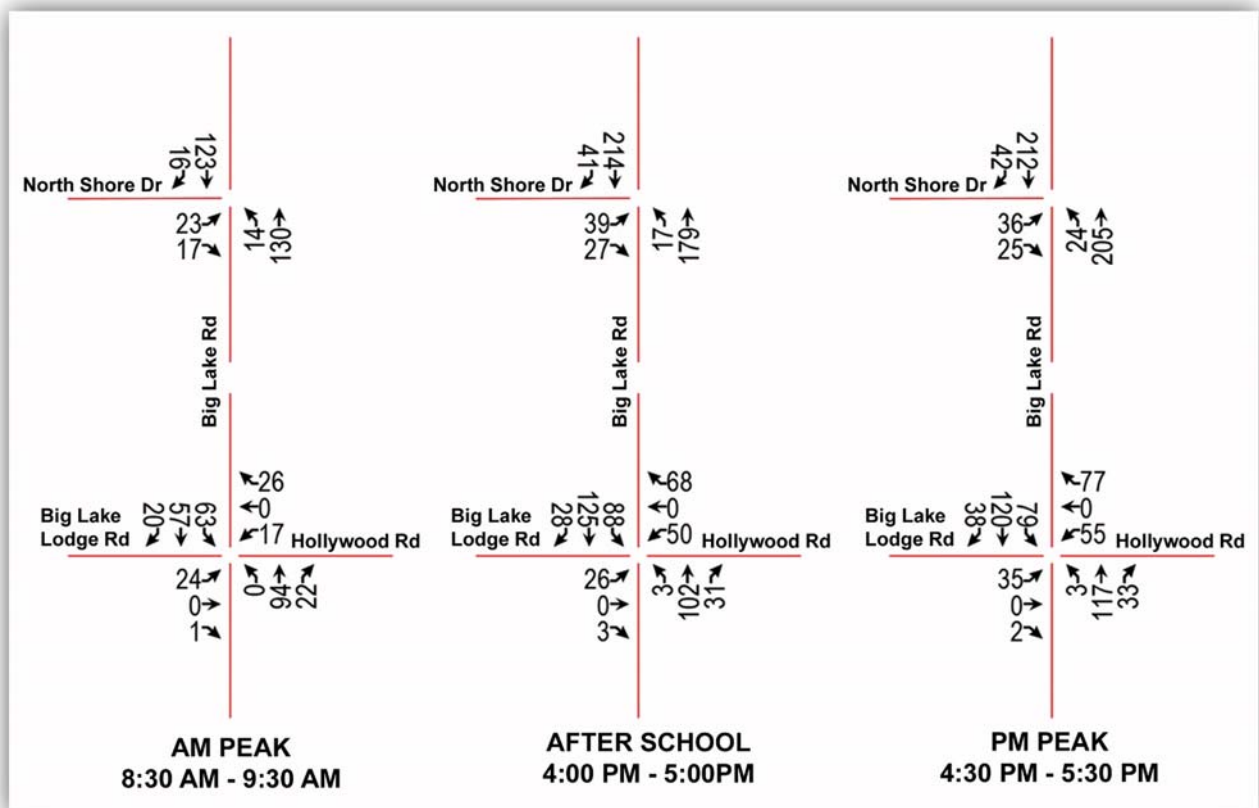


FIGURE 8. 2014 TURNING MOVEMENT COUNTS ON BIG LAKE ROAD

HEAVY VEHICLE CLASSIFICATION DATA

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

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 ATV traffic levels during critical 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 in May of 2017. The purpose of the walk-through study was to map the unofficial dirt pathways, however non-vehicular origin and destinations were documented.

Observations were made in six different locations. The segmentation used in the pedestrian study is shown in Figure 9.

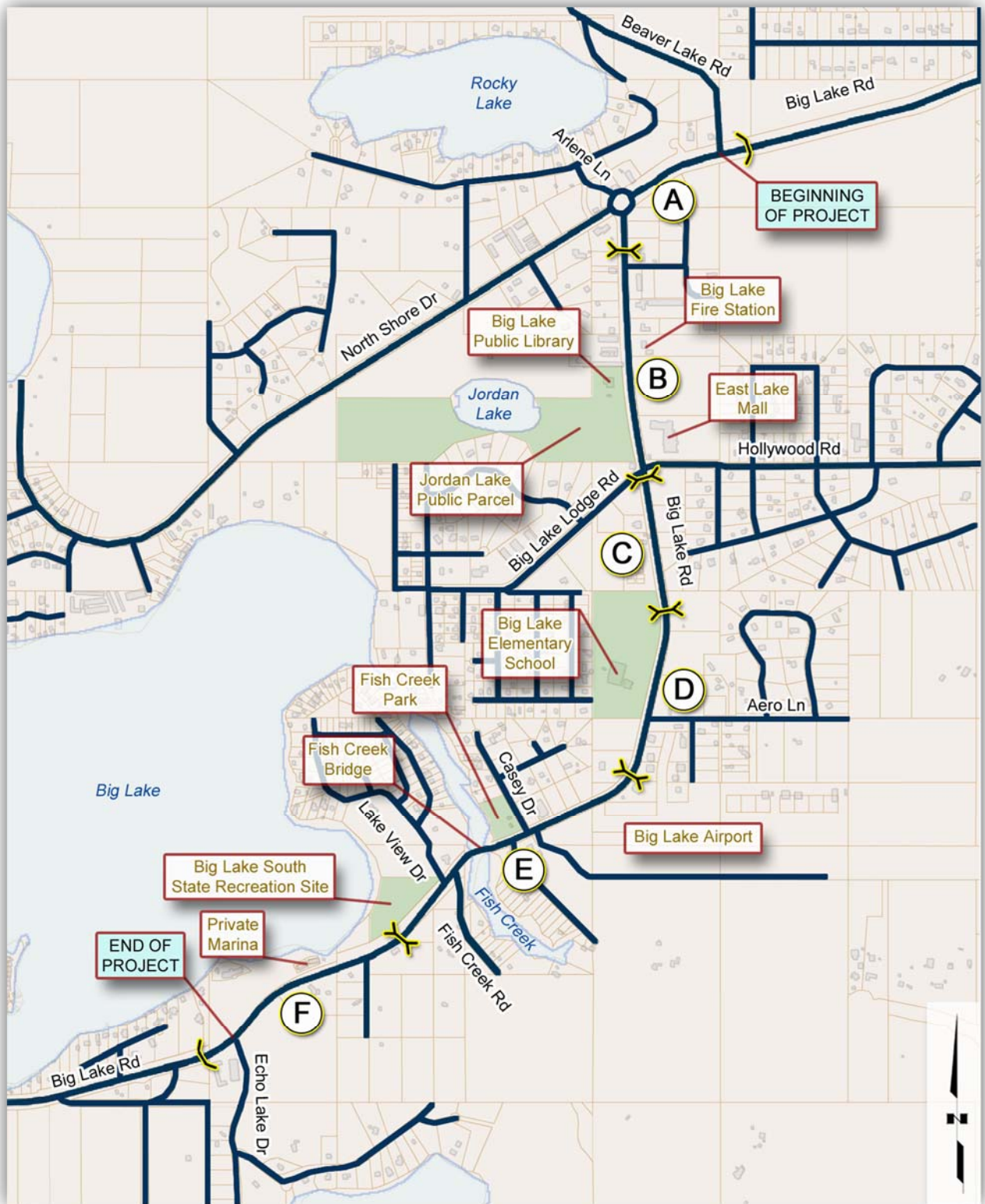


FIGURE 9. PEDESTRIAN STUDY COUNT LOCATIONS MAP

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 ATV 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 ATV traffic was seen on the paved pathway, there is evidence that ATV 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 10 shows the maximum pedestrians per hour that were counted in either of the two hour-long periods that were included in the segment. Bicycle traffic was the dominant use, especially in the segment between the North Shore Drive and Big Lake Elementary School. During the periods of this study, 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. ATV traffic is relatively consistent throughout the study area and appears to be undeterred by the road cross section design north of the bridge. ATV traffic seemed to take longer trips than pedestrians and bicyclists.

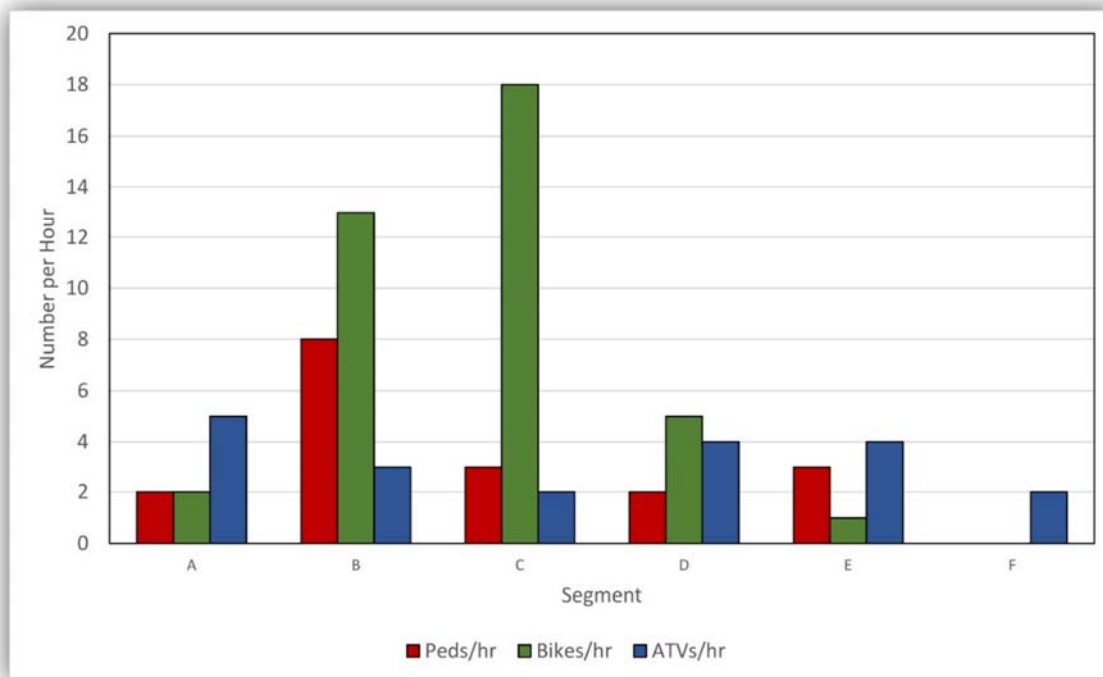


FIGURE 10. AVERAGE NON-VEHICULAR TRAFFIC PER HOUR

The increase in ATV use south of the bridge may indicate a pedestrian and bicycle demand which is not being served and is shifting to other modes of non-vehicular traffic; however, this data is based on very limited observations within

a very brief period of time and should not be used as a full intensive study for the purpose of design. Observations per segment were made on different days and slightly different times of day.

The following sections will discuss the details of the pedestrian volume analysis per segment.

SEGMENT A: BIG LAKE ROAD TO NORTH SHORE DRIVE

Segment A starts at Beaver Lake Road and ends 300 feet south of the roundabout at Big Lake Road and North Shore Drive. The observed non-vehicular traffic numbers and time periods are shown below.

TABLE 2. OBSERVED NON-VEHICULAR TRAFFIC SEGMENT A

Date	Time Period	Number of Observed Users	
25 – April 2017	12:30 pm to 1:30 pm	Peds	2
		Bikes	2
		ATVs	1
27 – April 2017	2:00 pm to 3:00 pm	Peds	1
		Bikes	0
		ATVs	5
11 – May 2017	5:50 pm to 6:00 pm	Peds	0
		Bikes	3
		ATVs	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 driveway 400 feet west of Beaver Lake Road, at the Tesoro Station just before the roundabout. There is evidence in the dirt opposite the gas station that would suggest that this is a popular location for ATVs to cross. 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.

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. ATVs were attracted to the vacant lots in the southeast corner of the roundabout intersection which was currently being used as an unofficial motocross park at the time of this study. None of the documented volumes for crossings in this segment are high enough to meet the DOT&PF requirement for a designated crossing, per 3B.18 and 4A.100. However, Figure 10. Average Non-Vehicular Traffic per Hour, suggests there is potential for higher use and with future growth and development in the area, it may affect future pedestrian

and bicycle crossing demand.

SEGMENT B: NORTH SHORE DRIVE TO HOLLYWOOD ROAD

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 Road/Big Lake Lodge Road. The observed non-vehicular traffic numbers and time periods are shown below.

TABLE 3. OBSERVED NON-VEHICULAR TRAFFIC SEGMENT B

Date	Time Period	Number of Observed Users	
26 – April 2017	2:15 pm to 3:15 pm	Peds	7
		Bikes	3
		ATVs	2
26 – April 2017	3:45 to 4:45 pm	Peds	8
		Bikes	13
		ATVs	3
11 – May 2017	5:40 pm to 5:50 pm	Peds	6
		Bikes	19
		ATVs	2

Crossings were observed at nearly all points in this segment. 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 attraction in this segment was the East Lake Mall, as well as the Big Lake Public Library. Pedestrians were seen using pathways behind the library, access the Jordan Lake Public Parcel, which further magnified the importance of this location. ATVs were attracted to a path that cuts through a property just north of the East Lake Mall. The unofficial pathway connects to the path that runs north-south across the street from Beaver Lake Road.

Segment B was the most heavily used segment in the project for both pedestrians and vehicle traffic (as shown in Figure 10 on page 21). Pedestrians were often observed several times within the same period as they traveled back and forth along the segment. Note that the maximum bicycles per hour on this segment is 13, as shown in Figure 10, however 19 bicyclists were observed along this segment in a ten-minute period while conducting the unofficial pathway study a few weeks later.

SEGMENT C: HOLLYWOOD RD TO BIG LAKE ELEMENTARY SCHOOL

Segment C starts south of the intersection of Big Lake Road and Hollywood Road and extends to a point north of Big Lake Elementary School. The observed non-vehicular traffic numbers and time periods are shown below.

TABLE 4. OBSERVED NON-VEHICULAR TRAFFIC SEGMENT C

Date	Time Period	Number of Observed Users	
25 – April 2017	1:45 pm to 2:45 pm	Peds	2
		Bikes	1
		ATVs	1
27 – April 2017	4:45 pm to 5:45 pm	Peds	3
		Bikes	18
		ATVs	2
11 – May 2017	5:30 pm to 5:40 pm	Peds	4
		Bikes	1
		ATVs	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 count difference on April 25th of 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 present in the 5:00pm hour.

There were no crossings observed on this segment during this study, 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.

ATVs in this area were observed 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 due to ATV use, and multiple branching pathways that wind along the topography to avoid power lines.

SEGMENT D: SCHOOL ZONE LIMITS

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 School Zone flashing beacons. The time periods and observed traffic numbers are shown below.

TABLE 5. OBSERVED NON-VEHICULAR TRAFFIC SEGMENT D

Date	Time Period	Number of Observed Users	
25 – April 2017	3:15 pm to 4:15 pm	Peds	0
		Bikes	5
		ATVs	4
27 – April 2017	3:30 pm to 4:30 pm	Peds	2
		Bikes	1
		ATVs	1
11 – May 2017	5:20 pm to 5:30 pm	Peds	1
		Bikes	6
		ATVs	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. A few children were observed leaving the school campus to the west via trails.

The major attractions in this segment are the elementary school and also Aero Lane. Pedestrians and ATVs 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. There were no observations during the school arrival.

Access to the painted crosswalk in front of the school is from the unofficial pathway, which 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.

SEGMENT E: BIG LAKE AIRPORT TO FISH CREEK BRIDGE

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 relatively narrow shoulders with deep ditches. However, very few pedestrians were observed, even on the paved pathway prior to the bridge. The time periods and observed traffic numbers are shown below.

Table 6. Observed Non-Vehicular Traffic Segment E

Date	Time Period	Number of Observed Users	
25 – April 2017	4:30 pm to 5:30 pm	Peds	3
		Bikes	1
		ATVs	3
26 – April 2017	1:00 pm to 2:00 pm	Peds	0
		Bikes	0
		ATVs	4
11 – May 2017	5:10 pm to 5:20 pm	Peds	2
		Bikes	2
		ATVs	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, the ones that were observed were seen crossing at numerous locations. Most notably at Casey Drive and at Lake View Loop and Fish Creek Road. The later crossings are especially concerning since the horizontal and vertical curves of the road restrict sight distance in this area.

SEGMENT F: FISH CREEK BRIDGE TO ECHO LAKE DR

Segment F extends from the south point of Fish Creek Bridge to the end of the study area at Echo Lake Drive. This segment has several low volume side streets and a private marina. The shoulders are narrow, and ATVs use pathways on either side of the roadway, sometimes riding so low over the side slope that they are invisible to vehicles on the road. The time periods and observed traffic numbers are shown below.

TABLE 7. OBSERVED NON-VEHICULAR TRAFFIC SEGMENT F

Date	Time Period	Number of Observed Users	
26 – April 2017	5:00 pm to 6:00 pm	Peds	0
		Bikes	0
		ATVs	0
27 – April 2017	12:45 pm to 1:45 pm	Peds	0
		Bikes	0
		ATVs	2
11 – May 2017	5:00 pm to 5:10 pm	Peds	0
		Bikes	0
		ATVs	0

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

SAFETY ANALYSIS

CRASH ANALYSIS

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

The HSIP methodology compares the observed crash rate to a critical crash rate where the critical crash rate is a calculated threshold that indicates a crash rate that is above average due to a characteristic of a design and not by chance. Critical crash rates 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.

The analysis is based on crash data obtained from the DOT&PF from 2003 to 2012. For the complete analysis, please see [Appendix A. Big Lake Pedestrian Study, Existing Conditions Report, by Kinney Engineering.](#)

INTERSECTION ANALYSIS

There are 10 intersections and 9 segments that were analyzed.

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

Figure 11 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.

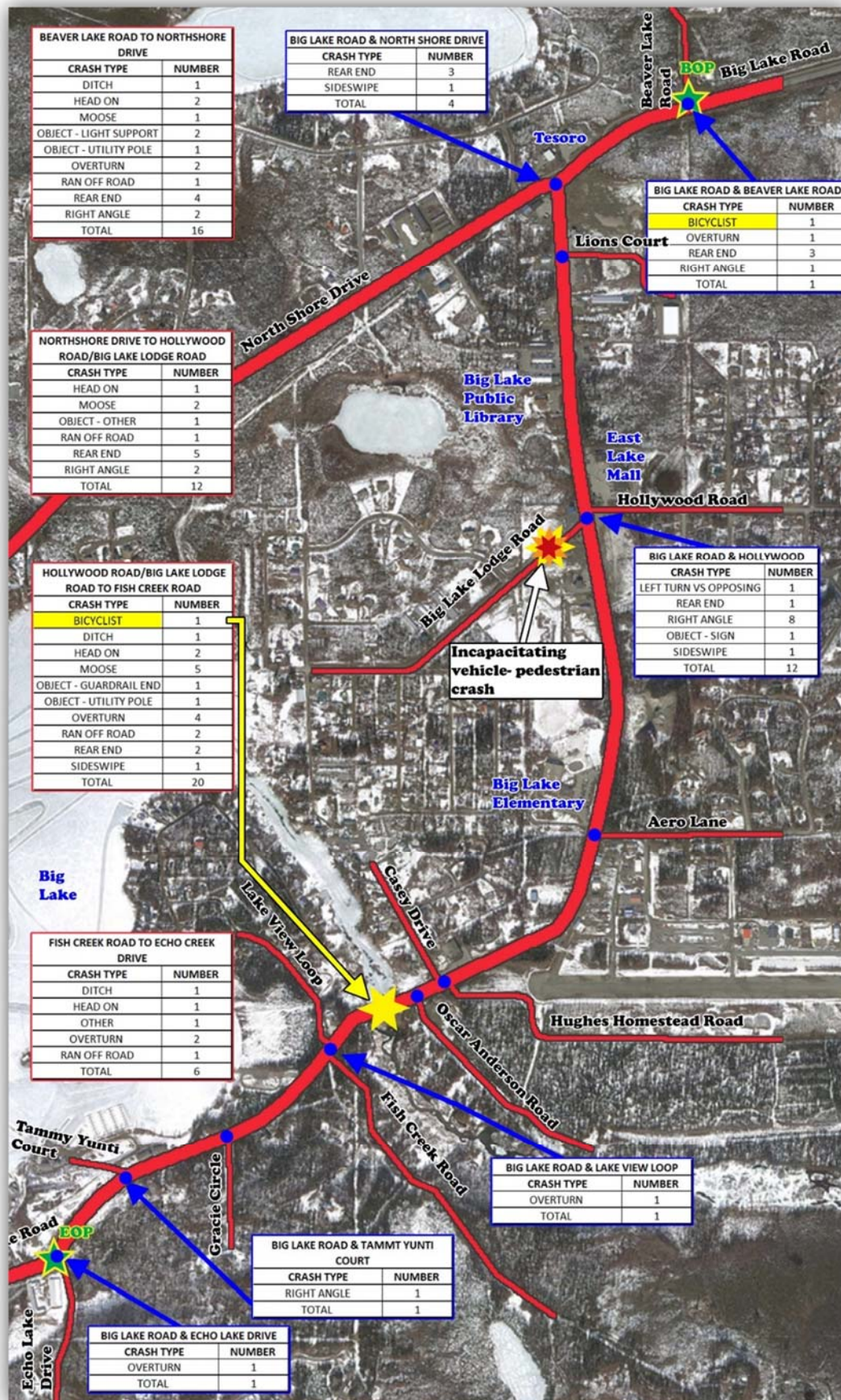


FIGURE 11. CRASH TYPE AND CRASH LOCATION BETWEEN 2003 AND 2012

Between 2003 and 2012 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. While no pedestrian crashes were recorded in the study area, a pedestrian crash resulting in incapacitating injuries was recorded on Big Lake Lodge Road within the study period.

There were two fatal accidents in the study area, one involving an ATV. On December 10, 2010, a snowmobiler traveling northbound on the paved pathway parallel to Big Lake Road between Beaver Lake Road and North Shore Drive crashed into a bollard. The driver was wearing a helmet.

The second fatal accident also occurred in 2010 and was a head-on collision involving two vehicles resulting from a vehicle crossing the centerline on ice between Beaver Lake Road and North Shore Drive.

PEDESTRIAN CROSSING OPERATION

Pedestrian crossing operation is calculated on three segments of Big Lake Road (see Figure 12):

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.

The methodology for pedestrian crossing delay is based on the traffic volume per hour of the road being crossed, and the width of the roadway. The per hour volume for Big Lake Road was estimated using the Turning Movement Count (TMC) data presented earlier in Figure 8 on page 19 by balancing the volumes and applying conversion factors from a local permanent traffic recorder.

Table 8. Pedestrian Crossing Delay along Big Lake Road

		Delay (seconds per pedestrian)		
		January	August	September
Segment 1	AM Peak	7	10	10
	After School	13	21	19
	PM Peak	15	25	23
Segment 2	AM Peak	7	10	9
	After School	13	20	17
	PM Peak	14	23	20
Segment 3	AM Peak	4	6	5
	After School	7	11	9
	PM Peak	8	13	11

Pedestrian delay for each crossing location for the northern most segment, between Beaver Lake Road and North Shore Drive is an expected 7 to 25 seconds per pedestrian, with more than one gap every minute. This is dependent on the month and time of day. This expected delay is a desirable and acceptable level of delay and does not trigger the need to consider added traffic control devices under DOT&PF standards per 3B.18 and 4A.100.

Big Lake Road pedestrian crossing delay on the segment from North Shore Drive to Hollywood Road is expected to increase during the summer peak, but regular gaps of a frequency of greater than one minute would be expected. A decrease in traffic volumes results in slight decrease to average pedestrian delay.

As the traffic volumes decrease to the south, the segment crossing delay continues to improve. South of Hollywood Road/Big Lake Lodge Road, the crossing delay decreases to 12 seconds during the summer peak. During the school year pedestrians should expect very little delay when crossing Big Lake Road.

Under existing conditions, pedestrian crossing operation along Big Lake Road is, at worst, an average delay of 24 seconds per pedestrian in the summer. Moving south along Big Lake Road, as traffic volumes decrease, crossing delay decreases. During the school year, the largest crossing delays are around 21 seconds per pedestrian.

Pedestrian refuges were installed on the roundabout at the intersection of Big Lake Road and North Shore Drive. A pedestrian refuge increases the pedestrian crossing experience by reducing average pedestrian delay which in turn reduces the likelihood of risk taking behavior. A pedestrian refuge allows a pedestrian to cross a road in two stages, each stage requiring a smaller gap than compared to a pedestrian crossing a facility without a refuge. An analysis of the crossings at the roundabout shows an average delay of 4 seconds or less on all approaches.

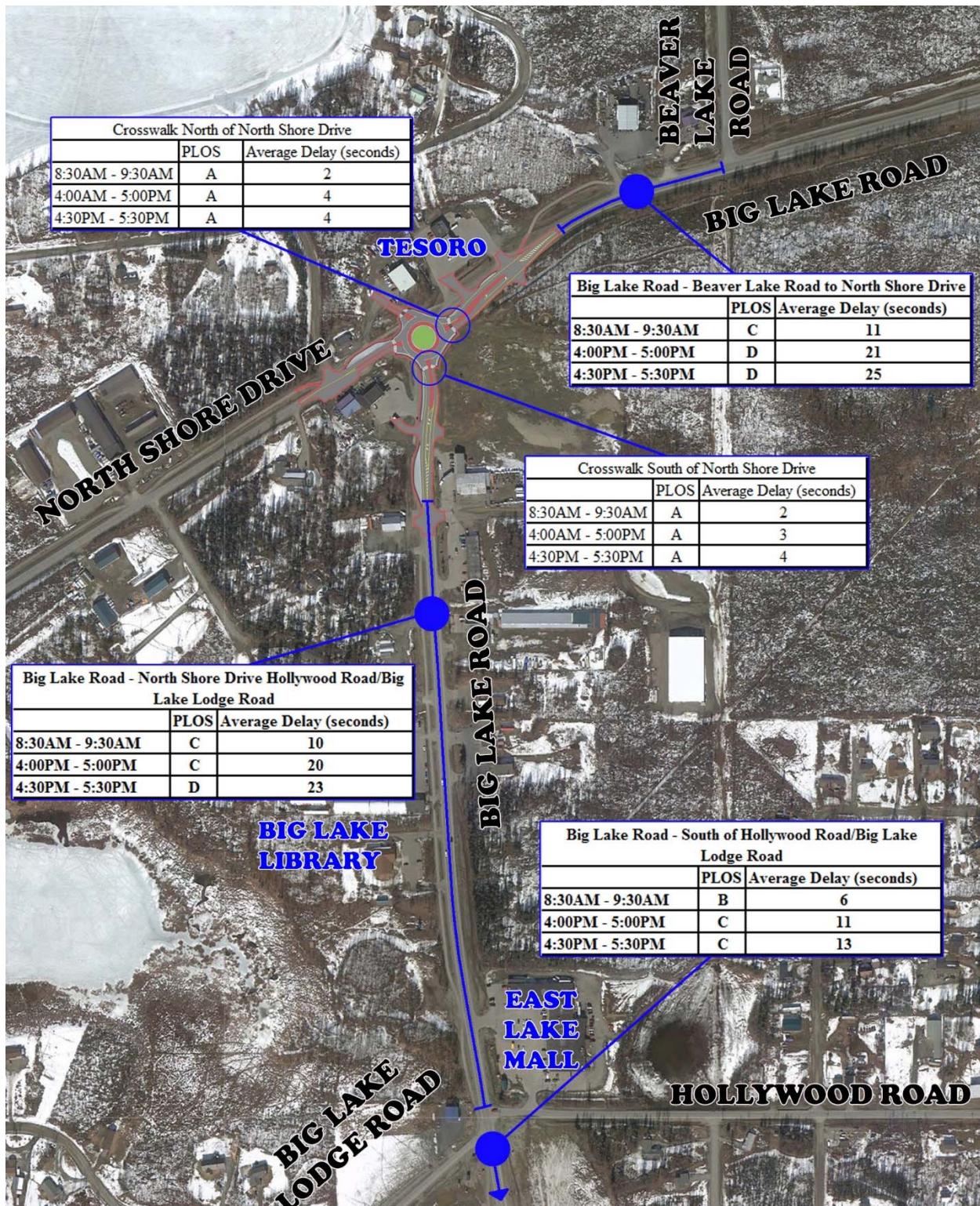


FIGURE 12. SUMMARY OF CROSSING DELAY ON BIG LAKE ROAD

STAKEHOLDER ENGAGEMENT

The community and stakeholder engagement for the study began on April 26, 2017 with the first of three Advisory Group meetings planned. A business stakeholder roundtable was held on May 11, 2017 to provide an opportunity for the commercial businesses along Big Lake Road to identify issues and opportunities for improving Big Lake Road for non-motorized safety and for business opportunities. A public community workshop was held on May 17, 2017. The following is a summary of the comments heard and issues identified through public and stakeholder engagement. See Appendix A Public Involvement Summary for additional details.

ADVISORY GROUP MEETING #1

- Roundabout at Big Lake Road and North Shore Drive
- Hollywood Road is problematic:
 - Traffic volumes are high at fast speeds and with the hill/slope of the roadway sight lines are poor
 - There are no pedestrian facilities
 - People have to walk on the road because of the swamp/marsh on either side of the road
- ATVs and snow machines use the side of the road without the pathway. Sometimes they use the pathway which is a problem because of conflicts with walkers and bicyclists
- New development on vacant parcels will need to be considered for vehicle traffic as well as pedestrian traffic
- Availability of utilities and the location of environmental limitations are very important considerations/limitations for Big Lake community planning
- Big Lake Comprehensive Plan has vague language describing Beaver Lake Road to Fish Creek as the Town Center with a walkable feel
- Church on Hollywood Road is a destination and has a private elementary school in it
- Big Lake By-Pass study and the Community Impact Assessment for the Port to Parks Hwy should be taken into consideration for this study
- Floatplanes come from the airport storage areas, across Big Lake Road, and into the gated lake access portion of the park
- MSB project for a proposed roundabout at Hollywood and Big Lake Road

BUSINESS STAKEHOLDER ROUNDTABLE MEETING #1

- Roundabout is problematic for pedestrians, especially kids to cross – they don't know where to cross or when
- Businesses do not necessarily prioritize or care about 'walkability', but they would be very interested in the study if it were going to address or change the ATV and snow machine activity in the area
- Community members who live down Hollywood Road have the hardest time getting to Big Lake Road and to the East Lake Mall due to the lack of facility

- Street lighting at the intersection at Beaver Lake Road has been requested by the community council to DOT.
 - New lighting for an existing facility would come from the DOT Maintenance budget which may be difficult to obtain under the current economic state
- Liquor consumption is high in the community and that's part of the reason why we came to tonight's meeting – the proposed bar is problematic and could be compromising for the safety of pedestrians and bicycle users on the pathway
- Businesses in Big Lake are required, or at least they seem to think that they are, to put the parking lots in front of the businesses, putting the buildings farther away from the road. Talkeetna is nice with the businesses right off the road
 - Site development and land use is part of the study, but the Borough is the decider for where parking is required
- Kids ride together to school and they have to be on the road, which is especially problematic at the Fish Creek Bridge because it is so narrow
- A lot of users travel down Big Lake Road to the creek where the biggest issue currently is the motorized vehicles on the pedestrian pathway because of the conflicts between those users and pedestrians/bicyclists. ATVs use the driveways as jumps and fly down the 'trail' adjacent to the roadway
 - Ideal thing to do would be to dedicate a pathway for pedestrians and bicyclists and another dedicated for AVT/snow machine use
 - People ride their ATVs next to the bike path here too and that can be just as dangerous
 - Rules on the pathway for ATVs is unclear, there is no signage saying they cannot be on the pathways. Troopers will throw their lights on and pull people over if they are using the bike path, but enforcement is minimal. Signage for the pathway to dedicate it as non-motorized would be helpful
 - Visual cues and signage may work for addressing the lack of education to always look for non-motorized users – add stop lines on the pavement and driveways
- The trail/pathway should extend down to the campground
 - North Shore Campground is on the bike path, but South Shore is not on the trail system, so even our own parks are very disjointed and not friendly to pedestrians and visitors
- Traffic speeds are high. The roundabout forces drivers to slow down on Big Lake Road already, would a speed reduction for the remainder of the road through the Big Lake city center be significant?
 - DOT&PF traffic study conducted on Big Lake Road concluded the affected change in travel time for a speed reduction from 45 to 35 mph would be 14 seconds. This study will consider the function of the corridor for all modes of travel.
 - Members in the community were really pushing to get the speed limit reduced, but there is skepticism if that would really achieve what the community wants – a new speed limit number may not actually change driver behavior
- Three Bears is building a new building across the street to the south side of Hollywood Rd.
- Motorized vehicles do not check for pedestrians and bicyclists on the pathway when coming out of driveways. The post office driveway is terrible and Floaters is a bad spot as well

- Driveway conflicts usually are a problem because drivers pull up too fast and do not see pedestrians/bicyclists on the pathway
- Pulling in and out of the library is difficult with non-motorized users – the natural driver tendency is to yield to flow into traffic instead of a complete stop. There are no stop signs on the pathway for bicyclists at the driveways or intersections
- Multiple driveways for one business is a big issues and is dangerous for both non-motorized users and drivers as well – the Quick Store has double driveways that are really dangerous
 - Driveway consolidation is something that will be considered through this process
- Kids, walkers and joggers use both sides of the road since there are residential neighborhoods and destinations on either side of Big Lake Road
 - Dog walkers typically only use the pathway or neighborhood streets because the residential roads are more comfortable
 - Pathways on both sides of Big Lake Road are needed. If there were paved on either side it would reduce dust kicked up significantly
 - This will increase conflicts with ATVs and may increase ATV and bicycle/pedestrian accidents
- People who are elderly require more time to cross the road, but typically there are not too many issues
- ATVs kick up a lot of dust which makes walking the area really unpleasant
- School zone flashing lights to reduce speeds during school hours seems long
 - They are only on for 15 minutes in the morning and 15 minutes in the afternoon when school lets out
- What is the future of the By-Pass Route? Would it come up through the corridor and is it going to be considered as part of this study?
 - The By-Pass is still in the preliminary planning phase and the Port-to Parks roadway route alternative through Big Lake will be part of the research and planning assumptions made during this study since, if it were to be built, would impact the Big Lake community's safety.
- The study should extend all the way out to the Parks Highway since the bike pathway extends the majority of the way to it

COMMUNITY MEETING #1 PLACE AUDIT WORKSHOP

- Improve pathway at roundabout and on Big Lake Road
- Move Tesoro driveway to roundabout
- Evaluate speed limit to see if 45 is the appropriate speed
 - Speed limit reduction and traffic calming
- Signage
 - Pathways should have stop signs at intersections
 - Signage at business driveways so cars stop ahead of pathway

- Signs should be well-lit
- Signage for “No motorized vehicles” on pathway
- Need Welcome sign at the roundabout
- Need delineators for driveways (reflective tabs)
- Education needed for all modes: ATV, pedestrian/bike and vehicles
- Would like to be able to walk to the rec center and mall
- Shoulders needed on Hollywood:
 - Landscape (tree roots) to the south of the school ruins the pavement
 - Ditch along bike path is full of weeds
- Bike path walk is not ‘exciting or pleasant’
 - No benches, viewpoints or landscaping – need to add benches along the pathway
 - Clearing/cleanup and improvement of pathway -More cleanups
- Remove ATV traffic from the pedestrian/bike paths
 - Gravel (more formalized) trail for ATVs on the Big Lake Road side opposite of the bike path
- Walkway along both sides of Hollywood Road needed. Shallower, better maintained shoulders and ditches (everywhere) to bring the pedestrian facility more level with the roadways
- Improved internal circulation
 - Connect side streets to Big Lake Road
 - Add connectivity from the creek to Echo Lake Drive
 - Extend pathway to make a loop to the 4 corners (S. Susitna, Lake Marion, near the road).
 - Extend the pathway to the Church on Hollywood.
- Improve maintenance year-round. Summer maintenance is inadequate.
- Lack of crossing at Fish Creek – if it were improved the audit scores for the recreation segment would improve fish viewing platform at bridge to see

SITE VISIT

A site visit was performed by the project team on June 6, 2017. The purpose of the site visit was to gather information on the existing pedestrian infrastructure, including the identification of existing issues and the reconnaissance of opportunities for inclusion in the Pedestrian Study. Weather conditions were overcast, with a temperature around 55 degrees.

1. Observations

a. Echo Lake Road to Fish Creek

There was evidence of prevalent activity by All-Terrain-Vehicles (ATV), resulting in loss of vegetation, damage to the pavement edge, and drainage problems along the roadway. ATVs appear to travel in both ditches, skirting around obstructions such as larger trees and utility poles.

b. Fish Creek Bridge

The visible components of the bridge did not exhibit any major damage. Deficient items noted were the bridge rail, outdated/insufficient approach guard rail, damaged signage, and most significantly, a lack of dedicated pedestrian facilities. People appear to access Fish Creek over unimproved trails.

c. Fish Creek to West Hollywood Road

The existing separated pathway begins immediately east of Fish Creek and continues along the north (or west) side of Big Lake Road to the end of project. The paved top width of the pathway is between 8' and 10', with a roadway separation ranging from 0' to 30'. At public and higher volume driveways, the pathway was aligned to allow for crossings to occur ahead of stopped vehicles. This practice was likely based on anticipated use during the design, but does not appear to match the current usage at every location.

The pavement of the pathway exhibits various degrees of distress, with roots protruding above the surface in several locations.



FIGURE 13. ATV TRACKS AND DRAINAGE ISSUES OBSERVED ON BIG LAKE ROW



FIGURE 14. FISH CREEK BRIDGE

Reduced separation between the road and path results in reduced ditch capacity, as was evident near Big Lake Elementary School. As the ditches filled up with sediment, maintenance of the ditches caused steep foreslopes and subsequent erosion.



FIGURE 16. PATHWAY PAVEMENT DAMAGE



FIGURE 15. LOCATION OF PATHWAY SPUR

South of West Hollywood Road, an existing paved pathway spur extends from Norcross Street (a cul-de-sac) to the east Big Lake Road Right-of-Way (ROW), as shown below.

However, the pathway spur is cut-off by the existing ATV tracks and is on the opposite side of the road as the pathway.



FIGURE 17. PATHWAY SPUR LOOKING TOWARDS BIG LAKE ROAD

At the southeast corner of West Hollywood Road and Big Lake Road, a recently constructed convenience store likely acts as a major traffic generator, for both motorized and non-motorized users.

d. West Hollywood Road to North Shore Drive

Most of the pedestrians were encountered on this segment, likely due to the numerous destinations (e.g., East Lake Mall, Library, Jordan Park, Valley Mover bus stop, and Rec Center). West Hollywood Road, serving as the gateway to several neighborhoods, lacks any form of pedestrian facilities. The absence of a defined shoulder forces people to walk on the traveled way (speed limit = 40 mph) or in the ditch. Either choice is less than desirable.

ATV tracks are prevalent throughout this segment, with two parallel tracks in spots along the east side of the road. Based on visible property markers, some of the tracks encroach onto adjacent property.



FIGURE 19. DUAL ATV TRACKS



FIGURE 18. WEST HOLLYWOOD ROAD LOOKING EAST

ATV tracks were found on both sides of the roadway, including the likely source of erosion/damage to the pathway, as shown below in Figure 20.

The existing pathway crosses several unused or unusually wide driveways, exposing pedestrians to through traffic and/or high-speed turns.



FIGURE 20. EROSION AND DAMAGE TO PATHWAY EDGE ALONG BIG LAKE ROAD.

E. Roundabout at Big Lake Road/North Shore Drive

A single lane roundabout was constructed in 2016 with pedestrian crossings at all four legs of the intersection. The roundabout appears to function as intended with passenger car and tractor-trailer traffic flowing smoothly. Steep V-ditches in some quadrants are forcing ATVs to traverse paths likely in conflict with pedestrians using the pathway and crosswalks. It appears that ATVs were not considered during the design of the roundabout.

F. North Shore Drive to South Beaver Lake Road

Along this segment, the pathway-to-roadway separation varies greatly, from 0' to almost 70'. ATV tracks are evident along the connected segments of the pathway, since the topography is conducive and nothing is present to dissuade them. It would make sense that ATVs follow the same paths as pedestrians, since ATVs are likely most often used for inter-community travel.



FIGURE 22. ATV TRACKS AT BIG LAKE ROAD AND NORTH SHORE DRIVE ROUNDABOUT.



FIGURE 21. WIDE ATV TRACKS ON BIG LAKE ROAD LOOKING EAST TOWARDS SOUTH BEAVER LAKE ROAD.

There were two main issues identified during the site visit:

1. Lack of connectivity between residential, commercial, and recreational areas which reduces the safety for pedestrians by increasing conflicts with arterial traffic and access points.
2. Erosion generated by ATV use.

A few potential solutions to these issues were identified during the site visit:

- Provide pathway connections and crossings to major destinations such as subdivisions on the east side of Big Lake Road, Big Lake South Rec Site, East Lake Mall, and the Big Lake Rec Center
- Connect to existing and provide new pathway spurs on the east side of Big Lake Road such as the existing one at Norcross Street and potential new ones at West Hollywood Road and to the Big Lake Rec Center
- Maintain a vegetated separation between the road and path
- Provide an appealing location, using flatter roadside slopes where possible, for ATVs to ride along the east side of Big Lake Road and away from the paved pathway limiting potential conflicts with non-motorized users. In addition, discourage ATVs to ride in the ditch on the pathway side and road shoulders by using unappealing surface treatments and design features
- Coordinate Mat-Su Borough and DOT&PF efforts in the project area, such as any planning documents, design work, and local knowledge

NEXT STEPS

The Big Lake Pedestrian Improvements Study will provide recommendations in subsequent tasks based on continued community engagement, agency coordination, traffic forecasts and engineering analysis.

APPENDIX A

Public Involvement Summary

APPENDIX B.

Site Visit Memo

APPENDIX C
Existing Conditions Traffic Analysis 2017