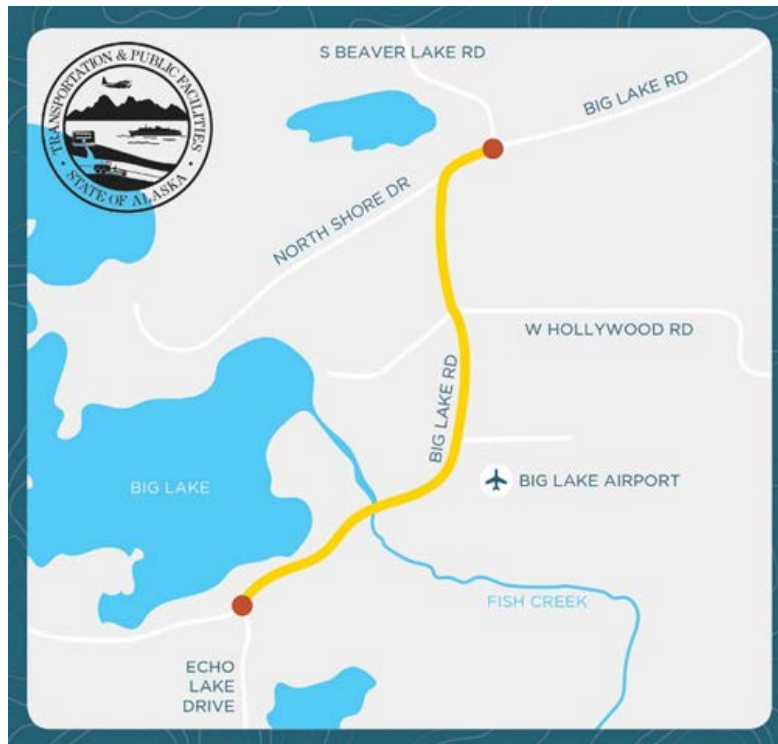


DOT&PF BIG LAKE ROAD PEDESTRIAN IMPROVEMENTS STUDY

Project No. Z589720000

DRAFT RECOMMENDATIONS REPORT



Prepared by:

R&M Consultants, Inc.
9101 Vanguard Drive
Anchorage, Alaska 99507

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PROJECT TEAM

DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES

Melanie Nichols, Project Manager

Melanie.nichols@alaska.gov 907.269.0509

R&M CONSULTANTS, INC.

Van Le, AICP, Project Manager

vle@rmconsult.com 907.646.9659

Marc Frutiger, PE, PTOE, Civil Engineer

mfrutiger@rmconsult.com 907.646.9661

Taryn Oleson, Planner & Public Involvement Coordinator

toleson@rmconsult.com 907.646.9645

Emily Bentti, Planner

ebentti@rmconsult.com 907.646.9658

KINNEY ENGINEERING, LLC

Jeanne Bowie, PE, PhD, PTOE, Traffic Analyst

jeannebowie@kinneyeng.com 907.344.7585

ACKNOWLEDGEMENTS

ADVISORY GROUP MEMBERS

Bill Haller

Chris Sawyer

John Rush

Jennifer Tews

Margaret Billinger

EXECUTIVE SUMMARY

The Department of Transportation and Public Facilities (DOT&PF) is conducting the Big Lake Road Pedestrian Improvements Study to 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). Funding for the Study is through a State grant that was requested in 2014 and allocated in 2015. The Final Recommendations Report will be used by the Big Lake community, DOT&PF and MSB to consider capital projects, identify projects for inclusion in the Long Range Transportation Plan (LRTP), and to allocate funding to enhance safety for non-motorized users.

For the purposes of the Study and the supporting Traffic Analysis, the project area has been divided into three sections: the commercial segment from Beaver Lake Road to Hollywood Road, the civic segment from Hollywood Road to the Fish Creek Bridge, and the recreational segment from Fish Creek to Echo Lake Drive. Major destinations include the Big Lake Public Library, Big Lake Recreation Center, Jordan Lake Park, and the East Lake Mall (commercial segment), Big Lake Elementary School and Fish Creek Park (civic segment), and Big Lake South State Recreation Site and the private marina (recreational segment). An Existing Conditions Report of these segments has been compiled and guiding area plans and policies including the Big Lake Comprehensive Plan, the MSB Long Range Transportation Plan, and the MSB Safe Routes to School Plan were reviewed for potential opportunities of improving walkability in the Big Lake Town Center (Appendix B. Existing Conditions Report).

To support this study, Kinney Engineering, LLC (Kinney) conducted a series of analyses in the spring of 2017 to observe and summarize pedestrian, bicycle, and OHV conditions along the study area of Big Lake Road (Appendix C. Kinney 2017). Kinney conducted pedestrian and bicycle counts, observed desire paths, a crash analysis, and a traffic volume forecast. Pedestrian crossing operations and delay times were also evaluated.

Public involvement and outreach has occurred throughout the development of the draft study. A Citizen Advisory Group has served as a community sounding board supporting the project team, providing essential local knowledge and guiding the goals and objectives of the study. Two public open houses and business stakeholder meetings have been held to date, and the Big Lake Community Council reviewed and discussed the draft recommendations at a regular meeting in December 2017, where a motion passed to send a letter in support of the recommended signage and lighting improvements, pathway extensions, and a crossing on Big Lake Road at a location to be determined between North Shore Drive and Hollywood Drive.

Based on the analysis of current conditions, stakeholder interviews, feedback from public involvement, and traffic forecasting, the draft recommendations include facility improvements to crossings, signing, and lighting, new pathway additions and extensions, intersection improvements, design, maintenance and operations considerations, improved area circulation with roadway extensions, land use and development policies, education and enforcement opportunities, and new pedestrian amenities. After draft implementation strategies have been reviewed with the advisory group, the third and final public meeting will occur on April 19th, 2018 to review the recommendations and strategies. Following the last phase of stakeholder input, the study will be revised accordingly and finalized. The Report will be presented to the MSB's Transportation Advisory Board and Assembly for review and approval.

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STUDY OVERVIEW

The Alaska Department of Transportation & 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). This project, funded through a state grant allocated in 2015, emphasizes planning and development of recommendations to prioritize a safer, more accessible, and constructible corridor for pedestrians and other non-motorized users. The Final Recommendations Report will assist the MSB in prioritizing capital projects to enhance safety for non-motorized users. The Final Recommendations Report will also include recommended policies to support future transit opportunities and traffic increases as Big Lake's town center, the Big Lake community, and the greater Port Mackenzie area continues to develop.

The following sections include a summary of existing conditions, traffic analysis, forecasting, and public involvement and outreach to support the draft recommendations. These recommendations have been developed to encourage walkability and economic development in Big Lake's commercial center. A table of recommendations and implementation considerations can be found in [Appendix A](#).

CONTEXT & EXISTING CONDITIONS

PROJECT LOCATION

The project study area encompasses approximately 2.5 miles of Big Lake Road, from Beaver Lake Road to Echo Lake Drive. The corridor includes a single lane roundabout at the intersection of Big Lake Road and North Shore Drive, and a major four-leg intersection at Big Lake Road and Hollywood Road/Big Lake Lodge Road.

SEGMENT AND PATHWAY USE

For the purposes of the Pedestrian Improvements Study and Traffic Analysis, the project area has been divided into three sections: the commercial segment to the north, the civic segment, and the recreational segment to the south (Figure 1. Project Area and Context Map).

COMMERCIAL SEGMENT: BEAVER LAKE ROAD TO HOLLYWOOD ROAD

The commercial segment is a moderately developed commercial zone extending from the beginning of the project south to Hollywood Road. Businesses, gas stations, restaurants, the Big Lake Public Library, the Big Lake Fire Station, and the Big Lake Lion's Club Recreation Center are all located within this segment. Residential areas are set back from the roadway through the corridor, which supplies regular local traffic. A single lane roundabout with pedestrian crossings at all four legs guides traffic through the intersection of Big Lake Road, Arlene Lane, and North Shore Drive.

A separated paved pathway originates approximately 670 feet southeast of the Parks Highway (outside the study area for this project) and continues on the north and west sides of Big Lake Road through the commercial and civic segments before terminating at Casey Drive, just before the Fish Creek Bridge. An unofficial dirt path of varying width extends through the entire project corridor on the east side of the roadway, and is used by off-highway vehicles (OHV).

CIVIC SEGMENT: HOLLYWOOD ROAD TO FISH CREEK BRIDGE

The civic segment includes Big Lake Elementary School, the Big Lake Airport, and access to light residential developments as well as large tracts of vacant land, some of which were former natural resource extraction sites that may be repurposed for future development.

RECREATIONAL SEGMENT: FISH CREEK TO ECHO LAKE DRIVE

The final segment of the study area is of rural, recreational nature, with access to the Big Lake South State Recreation Site and a private marina on the lake. Big Lake Road continues around the lake, accessing other boat launch and park facilities outside of the study area. This supports a dominant recreational use in this segment for vehicle traffic, pedestrians, bicyclist, and OHVs (such as four wheelers, dirt bikes, and snow machines). The Fish Creek Bridge is 35 feet wide, with approximately 4-foot wide shoulders between the edge of travel way and the bridge guardrail.

In addition to the lack of dedicated pedestrian facilities in this segment, narrow road widths with varying vertical and horizontal curvature, lack of dedicated shoulders, steep embankments, and a noticeable volume of motorized traffic render this segment unappealing to pedestrians and non-motorized traffic ([Appendix B](#)).

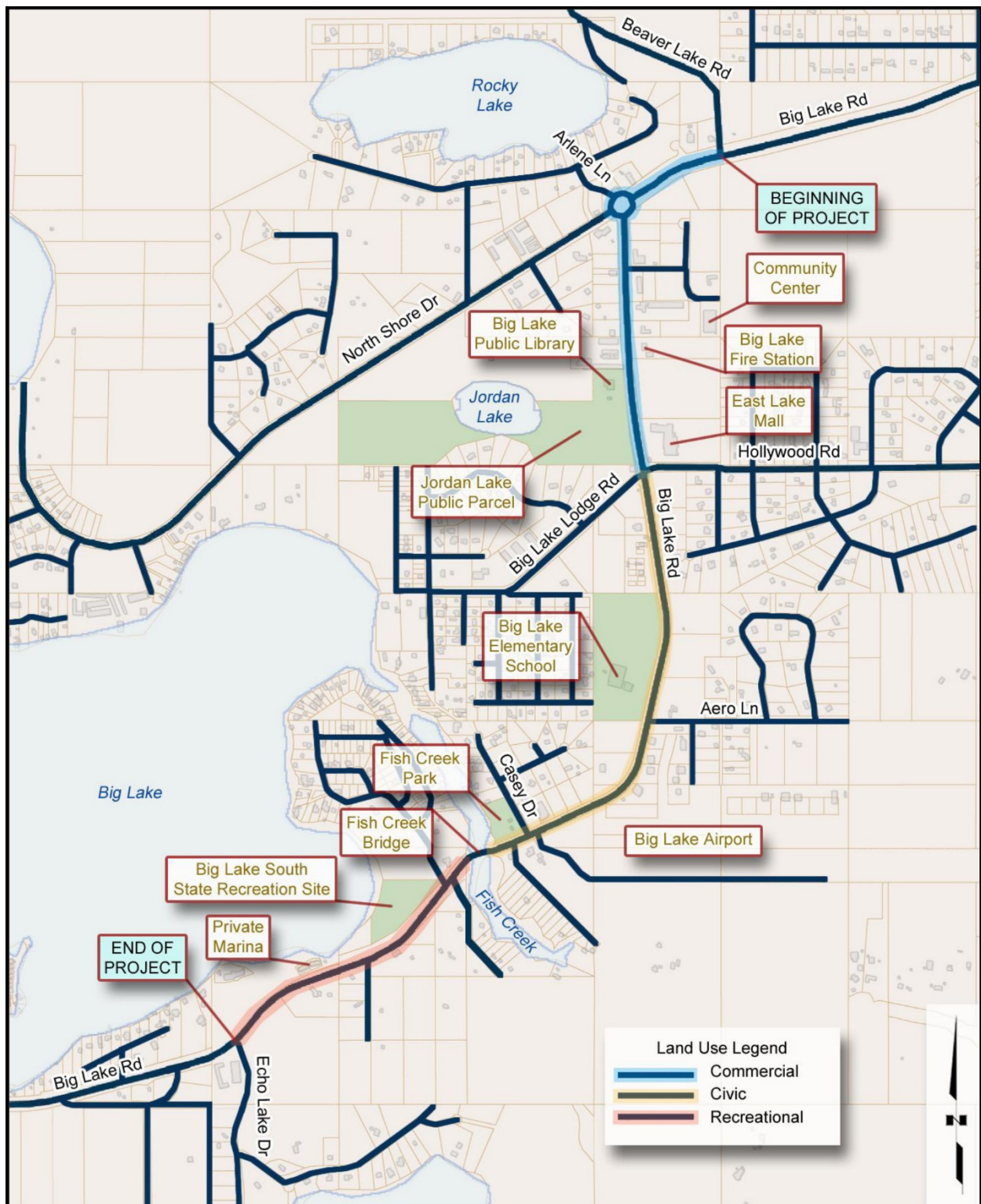


FIGURE 1. PROJECT AREA AND CONTEXT MAP

VOLUMES, SAFETY ANALYSIS, & FORECASTED CONDITIONS

Kinney Engineering, LLC (Kinney) conducted a series of analyses in the spring of 2017 to observe and summarize pedestrian, bicycle, and OHV conditions along the 2.5 mile study area of Big Lake Road (Appendix C, Kinney 2017). Following the three segment approach discussed above, Kinney counted pedestrians and bicyclists within the study corridor, observed desire paths, and conducted a crash analysis and traffic volume forecast. Pedestrian crossing operations and delay times were also evaluated.

PEDESTRIAN AND BICYCLIST VOLUMES

Traffic volumes are an indicator of overall population growth, travel demand, and the distribution of transportation needs (Kinney, 2017). Pedestrians, bicycles, and OHVs were counted along six corridor segments (Appendix C) in late April, 2017. School was still in session during the time of these counts. Popular pedestrian attractions in the project corridor were Beaver Lake Road, the Tesoro Station, North Shore Drive, and the liquor store just south of the roundabout at North Shore and Big Lake Drive. Observations were made for an hour each, twice per segment. The greatest rate of pedestrian traffic, 18 per hour, was observed on the segment between the Big Lake Public Library and Big Lake Elementary School. The greatest number of bicyclists, eight per hour, was observed on the segment containing Big Lake Public Library and East Lake Mall. 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.

CROSSINGS

Pedestrian crossing operations were evaluated along the study corridor using the Highway Capacity Manual (HCM) 2010 methodologies to calculate expected pedestrian delay. 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 delays across Big Lake Road are anticipated to remain acceptable by the 2040 model year, based on standards set in the Alaska Traffic Manual. The Alaska Traffic Manual identified pedestrian crossings of Big Lake Road as “marginal candidates” for marked crosswalks. Crosswalks are recommended to be installed only on roads with physical improvements and conditions supporting speed limits less than 35 miles per hour (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 hour. Projected pedestrian crossing demand is not expected to increase above a maximum of 10 per hour on any segment prior to 2040, based on the travel demand model. If significant residential and/or commercial development occurs within or adjacent to the project area, this projected pedestrian crossing demand may increase.

PATHWAYS

A Desire Path Study was performed in May 2017 to locate pathways used by pedestrians, bicycles, or off-highway vehicles (OHVs) 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 used primarily by OHVs were located on the east side of Big Lake Road, and on both sides 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.

TRAFFIC SPEED

A speed limit study was previously conducted by DOT&PF over a 1.5-mile length of the study area. Current speed limits on Big Lake Road through downtown Big Lake are 45 mph. The community has requested a reduction in the speed limit to 35 mph. The reduction over the 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 show a majority of motorist speeds are already less than the posted speed limit. The average measured speed of most users is at or near 40 mph, suggesting some increased development could be affecting speed, and that increased development may further affect 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 without a formal change to the posted speed limit.

CRASH ANALYSIS

A crash analysis was completed using 10 years of crash data from 2003 to 2012. Along the study corridor, two crashes involving bicycles were recorded: one on the Fish Creek Bridge and one at the intersection of Big Lake Road and Beaver Lake Road. A fatal crash occurred on the paved pedestrian trail between North Shore Drive and Hollywood Road when a single snowmobiler hit a galvanized pole. The intersection of Big Lake Road with Hollywood Road/Big Lake Lodge Road experiences a crash rate above (worse than) the state average for similar facilities, as does the segment of Big Lake Road between Beaver Lake Road and North Shore Drive, where a fatal head-on crash was recorded.

FORECASTED VOLUMES

Traffic volumes were forecast using an adjusted 2040 AMATS travel demand model. Volumes on Big Lake Road are projected to grow at a rate of approximately 2% per year from the Parks Highway to Hollywood Road. Big Lake Road south of Hollywood Road is forecasted to grow at approximately 5% based on projected development on the south side of Big Lake. The model does not currently include a Knik Arm Crossing for a Parks Highway Alternative Corridor.

PUBLIC INVOLVEMENT AND OUTREACH

As of the date of this report, existing conditions have been fully evaluated, including public input through two open houses and citizen advisory group meetings, as well as the traffic analysis. In order to finalize the recommendations and inform implementation strategies, a final public meeting and review period will be held in the spring of 2018. Following the final period of public input, final recommendations and implementation strategies will be incorporated into the Final Report in June 2018.

DRAFT RECOMMENDATIONS OPEN HOUSE

The draft recommendations presented in this report for improving pedestrian safety in Big Lake were first presented to the Big Lake Pedestrian Study Advisory committee in September 2017 and then refined for the second public open house in October 2017 ([Appendix D](#)), after analysis of the existing conditions and traffic projections, and after hearing concerns expressed by area residents and Big Lake Road users during the first public and stakeholder engagement meetings. The draft recommendations were also shared on the project website, through the online survey, and published in the Big Lake Times.

At the draft recommendations open house in October, community members and project staff discussed the new roundabout at North Shore Drive and Big Lake Road and the recommended improvements to the bridge over Fish Creek, where the need for a safe viewing area at the Fish Creek Bridge was noted. One resident of the Big Lake Community indicated he uses the separated pathway for cross country and roller-skiing and recognizes the need for improved pedestrian facilities, especially for the safety of school-aged children. He recalled any instances of motorized vehicles such as all-terrain-vehicles traveling fast down the separated pathway, spraying rocks and sometimes nearly colliding with pedestrians.

Resident and Big Lake Road stakeholders in attendance were supportive of the project and agreed the recommendations presented would provide safer pedestrian access to the commercial core of Big Lake as well as a start to improved access to the rest of the Big Lake Community.

ONLINE COMMUNITY SURVEY

The Online Community Survey ([Appendix E](#)) was administered to collect data on the draft recommendations for improving pedestrian safety on Big Lake Road. The online community survey was posted in December 2017 and remained active for completion through January 25, 2018. The survey was advertised on the project website, distributed to the project email list, and advertised on the Big Lake Times website. Thirty two individuals responded to the survey, more than twenty of which were not included in our project email contact list (new participants in the study).

The survey directly reflected the draft recommendations presented at the second public meeting ([Appendix E](#)), and provided an opportunity for area residents to engage and provide input in an efficient, direct way. The nine question survey asked respondents to rate statements on their level of agreeableness or support, and indicate their preferences on multiple design or facility based recommendations. Each question had the option of providing additional open ended comments.

Based on the questions presented and open comments received, respondents generally fell into one of two overall positions on pedestrian safety recommendations for Big Lake. The first position generally agreed there is a need for improvements and support pedestrian safety in Big Lake. The second position generally disagreed there is a need for pedestrian safety improvement.

The open ended comment section of each question provided opportunity for respondents to clarify or further explain their answer. Some respondents used this space to voice their opinion or disagreement with the pedestrian oriented study, expressing the existing off-road motorized users (OHVs) are a primary user group that should be receiving more attention. This is reflected in the multiple choice style questions in the survey, where consistently approximately 25% of respondents “*disagreed or strongly disagreed*” with statements supporting the draft recommendations for increased pedestrian safety.

BIG LAKE COMMUNITY COUNCIL

The Big Lake Community Council held a regular meeting on December 12, 2017 where the Big Lake Road Pedestrian Improvements Study draft recommendations were discussed. A motion was made and passed to send a letter in support of the recommended crossing between North Shore Drive and Hollywood Drive, signage, lighting, and pathway extension to connect subdivisions on the east side of Big Lake Road, South Recreation Site, East Lake Mall, Big Lake Recreation Center, Fish Creek Bridge, and intersection improvements accordingly. The Council also discussed a desired need for speed limit reduction for this corridor to safely accommodate pedestrian-friendly/non-vehicle crosswalk traffic.

The Community Council notice of the motion with a previous Council request from 2016 was provided by the Community Council president is included as Appendix F.

FACILITY RECOMMENDATIONS

This planning led study is aimed at identifying safety goals for increasing pedestrian and bicycle movements along Big Lake Road within the commercial core of the community. Based on the analysis of current conditions, stakeholder interviews, feedback from public involvement, and traffic forecasting, the following recommendations support walkability and economic development in Big Lake's commercial center.

The reference table of recommendations (Appendix A.) includes a description of each recommendation, the identified issue(s) the recommendation addresses, a time frame and strategy for implementation, and recommendations for inclusion in the next Long Range Transportation Plan (LRTP), where applicable. Adoption into the MSB LRTP allows for projects to be prioritized in conjunction with area wide needs and funding availability. The MSB LRTP does not include a list of non-motorized projects or improvements. Separated paths and trails are typically built as part of larger DOT&PF and MSB arterial roadway improvement projects. The 2035 MSB LRTP supports the continued development of an active transportation work plan to strategically align non-motorized, human-powered transportation with other modes of transportation. This recommendation includes continued coordination with MSB School District regarding the Safe Routes to Schools program, and proactive support of coordinating non-motorized transportation provisions with highway facility improvements. All facility upgrades and additions shall be designed for accessibility and will comply with most recent American Disabilities Act (ADA) design standards adopted by DOT&PF.

CROSSINGS

This study originated from a request by the Big Lake Community Council to the DOT&PF to install a crosswalk on Big Lake Road. Several potential locations have been discussed and analyzed based on origination and destination of pedestrians and non-motorized traffic, perception of safety and desired of Big Lake residents, and results from the traffic analysis.

Findings from the traffic analysis (Kinney 2017) indicate the estimated delay for pedestrian crossing is highest on the northernmost segments of the study area, between Beaver Lake Road and North Shore Drive. Since there are no marked pedestrian crossings along the two northernmost 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 and crossed; therefore longer gaps would generally be more acceptable on these segments than on the segment south of Hollywood Road. Pedestrian refuges are provided on the roundabout at the intersection of Big Lake Road and North Shore Drive, which allows a pedestrian to cross a road in two stages, with each stage requiring pedestrians to only interact with one direction of travel, reducing the crossing time. It was observed that users desiring less delay may use the crossings at the roundabout instead of waiting for mid-block crossings.

The delay at the marked crosswalk serving the Big Lake Elementary has been determined as most critical by the study, as gap judgements are likely made by younger users who are less experienced in judging safe crossing gaps; this was also a concern raised by members of the public during this study. However, the purpose of the existing "20 MPH when flashing" sign is to assist motorists and children in judging conflicts during required times of usage for school attendance. Consideration of a mid-crossing pedestrian

island is recommended to improve crossing times if the Big Lake community advocates for its needs and will need to obtain agreement from DOT&PF Maintenance and Operations for implementation. 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. The Safe Routes to School (SRTS) also recommends a pedestrian crossing at Hollywood Road.

While there is a clear desire by the community to provide additional pedestrian crossings, the roadway characteristics and pedestrian crossing demand do not currently meet the crosswalk warrant as stipulated in the Alaska Traffic Manual (ATM). However, factors such as new residential developments on Lion's Court or additional commercial development on vacant parcels along Big Lake Road could increase the pedestrian crossing demand to the point where a marked crossing would be warranted per the ATM.

If a traffic signal or roundabout is determined to be the best solution for the intersection of Big Lake Road and Hollywood Road, consideration should be given to designating marked pedestrian crossings on all legs. A crossing at this location would fulfill the desires of the SRTS plan and further reduce the demand for crossings elsewhere. A crossing at Lion's Court should also be considered after adequate pedestrian facilities are installed on Lion's Court, to support pedestrian access to the Big Lake Recreation Center. A second roundabout is considered to potentially impact and reduce vehicular speed between roundabouts. This may allow further consideration of a potential marked crossing in the area of Jordan Lake Park.

While not currently supported by applicable engineering warrants, a marked pedestrian crossing is nevertheless desired and recommended at Hollywood Road and/or Lion's Court. Implementation of this recommendation is contingent upon increased crossing demand (e.g. residential development on Lion's Court), changes in roadway speed, or associated with other roadway improvements (e.g., roundabout or signal at Hollywood intersection), and an agreement with DOT&PF Maintenance and Operations.

Realignment or other improvements to the existing marked crossing near Aero Lane and Big Lake Elementary School are recommended as it currently terminates in the shoulder on the east side of Big Lake Road, and not at an established pedestrian route or facility. The Mat-Su Borough SRTS recommends the construction of a 1,600-foot paved multi-use path on the north side of Aero Lane from W Holly Loop Road to Big Lake Road, to provide an established pedestrian route at the marked Aero Lane crossing.

SIGNAGE

The installation of additional signage on the existing pedestrian pathway prohibiting use by motorized vehicles is recommended. Signing upgrades are typically installed as part of capital improvement projects and is an ongoing region-wide effort by DOT&PF. Conflicts between permitted non-motorized users and prohibited motorized users on or adjacent to the existing paved pathway was identified as a significant issue by area residents and Big Lake Road users. Passive efforts to enforce the prohibition of motorized vehicles on the pathway are more likely to be implemented than active deterrence or enforcement efforts, but comments received through the online community survey expressed skepticism of their effectiveness.

Conflicts at pathway approaches to driveways and intersections with Big Lake Road were identified by the public as a safety concern, especially when sight lines are restricted. Clearing sight lines by removing/relocating vegetation, landscaping, etc. is the primary remedy. Alternatively, the installation of

YIELD to path signs or STOP signs on the pathway could be installed to increase awareness and visibility of the potential area users. DOT&PF capital improvements to side street intersections with pathways will be designed and constructed according to DOT&PF standards (CR-T-01.10), which include number and location of signs, clearance distances, striping requirements, and “no motor vehicles” signage.

LIGHTING

To increase visibility of pedestrians and bicyclists for both motorized and non-motorized users, additional or improved lighting along Big Lake Road is recommended. Children who walk to school or other area destinations do so year-round and improved visibility during the winter months is a recommended safety improvement. Current DOT&PF policy limits lighting to high conflict areas or facilities with high nighttime crash rates. As such, additional lighting along Big Lake Road would require a local funding source and an agreement with DOT&PF Maintenance and Operation for installation and maintenance. Big Lake Town Center illumination is an existing project in the MSB Fiscal Year 2018 – 2023 Capital Improvements Plan, and this study recommends the project be carried forward until complete.

PATHWAY EXTENSION

A successful non-motorized network connects pedestrians and bicyclists from where they most commonly originate to major destinations. The Big Lake Road study identified the following as major locations the separated pathway should connect: residential subdivisions on the east side of Big Lake Road, Big Lake South Recreation Site and the South Port Marina, the East Lake Mall, and Big Lake Recreation Center.

To establish a more effective, connected non-motorized network, the following pathway extensions or new spurs are recommended (Figure 2. Big Lake Pedestrian Study Recommendations):

- *New pathway on the east side of Big Lake Road* from the roundabout at North Shore Drive to the existing pathway spur at Norcross Street. Currently, an unofficial pathway extends the length of Big Lake Road in the study area and is primarily used by OHVs.
- *New pathway on West Hollywood Road.* As Knik-Goose Bay Road is developed to connect to Big Lake through Hollywood Road, traffic volumes are expected to increase and the need for pedestrian amenities will become more apparent. This facility addition is identified by stakeholders as a much needed improvement. An elementary school is in operation at the Church on West Hollywood Road and there is currently no pedestrian facility, as well as narrow roadway shoulders and limited sight distances due to the vertical roadway variations. Additionally, the Mat-Su Borough Safe Routes to School Plan, 2014 recommends the construction of a lit multi-use path on Hollywood Road from Big Lake Road to Klutina Drive to provide a safer walking route which will connect to the existing bike path along Big Lake Road (dependent on installation of a crossing on Big Lake Road).
- *Improve the bridge across Fish Creek to include a dedicated non-motorized facility* supporting creek and fish viewing. The crash history at the bridge including a bicycle and vehicle collision, narrow roadway shoulders, lack of pedestrian facility, and proximity to popular destinations support this recommendation.

INTERSECTIONS

Intersections with Big Lake Road were identified through the public process and traffic analysis as an opportunity for improvement. It is recommended that driveway delineation be improved through the installation of reflectors, landscaping, grading or other design interventions to increase visibility of the motorized and non-motorized users.

Consolidation of the over 40 driveways onto Big Lake Road within the project limits is recommended, where possible, to limit potential non-motorized and motorized conflict as well as improve safety for through traffic on Big Lake Road. Disjointed and skewed driveway alignments create more complicated and potentially difficult areas for pedestrians, bicyclists and motorists to safely navigate. It is recommended to reduce skewed driveway alignments and to realign the offset and skewed approaches, especially at the intersection at Big Lake Lodge Road and West Hollywood Road. It has been noted that a new gas station on the southeast quadrant of this intersection and the vacant lots south of this gas station are expected to be developed into a bulk goods grocery store in the near future, likely to increase both motorized and non-motorized traffic volumes and turning movements at this intersection.



FIGURE 2. BIG LAKE PEDESTRIAN STUDY RECOMMENDATIONS

DESIGN & MAINTENANCE INTERVENTIONS

The design and maintenance of a facility can have a significant impact on the use of the facility and the user's experience. Interventions can be made to the existing non-motorized network in Big Lake to improve the user experience and longevity of facilities. Maintenance intervention recommendations include controlling the growth of roadside vegetation to improve and maintain sight distances and visibility, removing tree roots on the pathway to maintain pathway serviceability, and maintaining the right-of-way on the east side of Big Lake Road with less erodible materials to reduce dust.

Design intervention will be required to reduce OHV and non-motorized user conflicts. Design strategies to reduce conflict may include locating pathways to allow minimum legal OHV pathway crossover, as well as leaving outer right-of-way (ROW) space for utilities and slopes that support OHV use. Recommendations to improve pedestrian safety include the installation and maintenance of additional signage on the pathway (west side of Big Lake Road) to discourage OHV use of the pathway, install and maintain a vegetated separation between the road and pathway to increase non-motorized user comfort and provide adequate snow storage, and the use of reduced roadside slopes where possible to improve maintenance in the east ROW where off road vehicles are allowed.

AREA CIRCULATION

Connectivity and the ability to travel through the project area with relative ease is an important element for a transportation network. To improve area circulation for vehicles and pedestrians, increased connectivity is recommended between the neighborhood and side streets to Big Lake Road. An important pedestrian and bicyclist connection identified through this study is a pathway along West Hollywood Road at least to the Church. An elementary school is in operation at the Church and school children and parents walk on the roadway or its narrow shoulder, when available. Preserving adequate ROW is recommended for improving area circulation for all modes of transportation. Connectivity for OHV use is highly dependent on adequate roadway ROW and when DOT&PF facilities consume most of the ROW, connectivity is eliminated and can create more conflict.

In the northeast portion of the study area, an extension of South Beaver Lake Road to the south of Big Lake Road to connect with South Lions Court would increase connectivity and provide a more complete network (Figure 2. Big Lake Pedestrian Study Recommendations). This would alleviate the dependency on Big Lake Road for motorized and non-motorized traffic traveling to the Big Lake Recreation Center. Potential future residential development would benefit from this access as well.

LAND USE, FUTURE DEVELOPMENT & POLICY

Land use and transportation are interdependent and both must be considered when analyzing current and future development plans. The Big Lake Comprehensive Plan identified walkability and development within the town center, the commercial core of Big Lake, as a priority. To achieve the goal of a walkable town center, all successful future development applications should support walkability within the Big Lake commercial core.

Future developments can support walkability within the commercial core in the following ways: establishing parking behind buildings instead of between the roadway and the building, limiting building setbacks from Big Lake Road to improve pedestrian scale of the built environment, and managing frequency of driveway access onto Big Lake Road to reduce potential non-motorized and vehicle conflict. In order to implement these development recommendations, the MSB would need to adopt the new policies and amend its land use code. Shared parking agreements for adjacent businesses are also recommended to reduce the number of access points onto Big Lake Road.

EDUCATION & ENFORCEMENT

Education for all modes of transportation is a timeless recommendation. Avoiding potential conflicts, preventing trespass onto private property, and general awareness is essential to improving safety. Education for pedestrians and bicyclists on visibility of clothing and bicycles during low light seasons and how and where to ride on roadways and non-motorized facilities should be a part of educational efforts.

Executing educational campaigns will likely require leadership and partnership with established community organizations, such as the Mat-Su Borough Safe Routes to School (SRTS), MSB School District, Big Lake Lions Club, and the Big Lake Community Council. Strategies for expanding education on non-motorized safety could include the development and implementation of a targeted messaging campaign to specific audiences through social media or at community events, and the incorporation of bike/pedestrian and traffic safety education into K-12 programs (similar to the Anchorage Trail's Schools on Trails program). The MSB School District could also partner with local and borough governments to establish walking route plans to support SRTS and withstand loss of dedicated funding to that program. Passive educational efforts may include placing bicycle, pedestrian, OHV and driver information on existing laws and safe practices in places frequented by the Big Lake community, such as the Post Office, Big Lake Recreation Center, local DMV, auto body shops, etc. Placing additional appropriate signage, including guide and regulatory signs, throughout Big Lake and on existing non-motorized facilities can also provide consistent availability of bike, pedestrian and OHV laws.

Enforcement of existing policies and regulations is recommended, especially enforcement of the prohibition of motorized vehicles on the paved, non-motorized pathway. Coordination and strategic planning with Alaska State Troopers on existing and planned patrols in Big Lake will be needed. Local and state partnerships for funding of enforcement and/or educational campaign efforts are encouraged.

AMENITIES

Pedestrian and bicyclist amenities can improve the user experience and attract more positive users. Bike parking is an important amenity for a community to encourage more bicycling and non-motorized modes of transportation. Dedicated bike parking at major destinations in the corridor is recommended including at Jordan Lake Park, Fish Creek Park, the South Site Maria, Big Lake South State Recreation Site, commercial retailers, restaurants, and the East Lake Mall. Benches and signage (wayfinding) is recommended along the pathway and at major destinations to make the pathway itself more interesting, inviting, and easily navigable for residents and visitors alike.

A bike shelter and seating area is recommended for the Big Lake Park and Ride to encourage use of the commuter transit system.

NEXT STEPS

After draft implementation strategies have been reviewed with the advisory group, the third and final public meeting will occur to review the recommendations and strategies. Following the last phase of stakeholder input, the study will be revised accordingly and finalized. The Report will be presented to the MSB's Transportation Advisory Board and Assembly for review and approval.

Recommendation implementation may occur through a range of funding sources and agency and community stakeholders. The following projects within the Big Lake Pedestrian Improvements Study boundaries are identified in the Matanuska-Susitna Borough's 2018-2023 Capital Improvements list and may have a potential impact on the recommendations and future implementation.

MAT-SU BOROUGH CAPITAL IMPROVEMENTS 2018-2023

TRANSPORTATION PLANNING: BIG LAKE COMMUNITY IMPACT ASSESSMENT – PORT TO PARKS ROUTE, PHASE 2, EIS

The Big Lake CIA – Port to Parks Route, Phase 2, EIS (CIP #160) was nominated by the Big Lake Community Council. *The Big Lake Comprehensive Plan identified the desire to have the major traffic corridor/route from Point MacKenzie to the Parks Highway routed around the town center of Big Lake. The community of Big Lake successfully lobbies the State of Alaska for fund a Community Impact Study, with a scope of work that included the identification of three routes and a subsequent community impact assessment of each route, specifically for the impact to the Big Lake town center area identified in the Big Lake Comprehensive Plan. The Community Council nominates this project to help ensure decision makers are aware of the study, the need for continued planning, and for future funding. Phase II of the Big Lake CIA would work toward route selection and the completion of an EIS in order to meet the requirements for federal funding as this road is intended to be a highway. Funding needs are yet to be determined.*

This project is listed as the first priority project under Transportation Planning, but is tied for the first priority with the Port to Parks Highway at Houston project (CIP ID #253) that also examines a road route from Port MacKenzie to Houston, but following the new Alaska Railroad extension.

ALASKA HIGHWAY SYSTEM: BIG LAKE INTERSECTION IMPROVEMENTS

The Big Lake Intersection Improvements (STIP #23233; CIP ID #23) was nominated by the Big Lake Community Council. *Two intersections in the downtown Big Lake area and a left turn lane at Hollywood and Big Lake Road were a part of the 2011 MSB Road Bond Package. The community council nominates this project upon the recommendation of Re. Neumann in case of a funding shortfall. Construction of a roundabout accessible from four roads is anticipated to being in summer, 2016. The anticipated funding needed is \$2 million.*

Since this project was not put forward during the previous CIP, it is being carried forward on the 2018-2023 CIP as the first priority project under the Alaska Highway System projects.

MINOR ARTERIALS NEEDS: BIG LAKE TOWN CENTER - STREET ILLUMINATION

The Big Lake Town Center – Street Illumination (CIP ID #122) was nominated by the Big Lake Community Council. *The project will install street lights to illuminate the town center of Big Lake as defined by the Big Lake Comprehensive Plan. Street lights will be installed on Big Lake Road from Beaver Lake Road through Fish Creek Park. The town center of Big Lake includes an elementary school, public library, post office, family park, supermarket, restaurants, and ice area/recreational center, as well as several other businesses. Illuminating this area will make it safer for foot and vehicular traffic, and will discourage vandalism.* The amount of funding needed is yet to be determined.

As noted earlier, current DOT&PF policy does not support continuous lighting unless certain criteria are met. This improvement would require local funding for installation and maintenance. It is a requirement of all projects before initiating design processes that maintenance and operation needs, abilities, and responsibilities be planned for and agreed to before starting to expand and upgrade the transportation system.

PROPOSED CAPITAL IMPROVEMENT PLAN ADDITIONS

The following recommendations identified in this study are proposed for inclusion in the Mat-Su Borough's Capital Improvements Plan.

CIP Project	Project Description	Funding Needs & Strategies
Design Study & Design Build of Big Lake Road Crossing	Conduct a design study to determine the feasibility and location of a pedestrian crossing on Big Lake Road between Big Lake Elementary School and the North Shore Drive Roundabout. Once a location has been selected, design and construct a crossing on Big Lake Road. This should occur in concurrence with Big Lake Road upgrades, and/or the Hollywood Road intersection improvements project.	
Big Lake Road at Aero Lane Intersection Crossing Improvements	Realign or otherwise improve the marked crossing near Aero Lane, that is within the existing school zone crossing and end in the shoulder on the east side of Big Lake Road. The crossing should be realigned or improvements to	Include in MSB School Access Transportation Bonds (if renewed). Obtain local government, MSB,

	the east side of the road should be made to encourage use of the marked crossing.	DOT&PF maintenance and operations agreement.
Big Lake Road Lighting Improvements *Big Lake Town Center – Street Illumination is CIP ID #122 in MSB FY 2018 – 2023 CIP	Add or improve lighting along Big Lake Road that would illuminate the roadway as well as the non-motorized pathway within the town center of Big Lake, as defined by the Big Lake Comprehensive Plan (Beaver Lake Road through Fish Creek Park).	Local sponsor funding for installation and maintenance (DOT&PF will provide funds for improvements)
Big Lake Town Center Non-Motorized Network Improvements	<p>Improve circulation, access and safety for motorized and non-motorized users of Big Lake Town Center, adopting a more Complete Streets approach, by providing improved existing pathways and adding new pathway connections to decrease the opportunities for user conflicts. Pathway extensions and additions include:</p> <ul style="list-style-type: none"> • Extend pathway on west side of Big Lake Road to at least Big Lake South Recreation Site • Add non-motorized facility on Fish Creek Bridge as part of bridge improvements • Add new pathway on West Hollywood Road from Big Lake Road to at least Kluane Dr. • O Add pathway on east side of Big Lake Road through the Town Center, from Northshore Roundabout to the existing pathway spur at Norcross St. 	Obtain local government, MSB, DOT&PF maintenance and operations agreement.
Big Lake Road, Town Center Corridor Improvements Project	Design/Build project to include crossings study, pathway extensions and additions, illumination improvements, intersection with W Hollywood Rd improvements, driveway consolidation, and Fish Creek bridge improvements, as defined through this study. All facility upgrades and additions shall be designed for accessibility and comply with the most recent American Disabilities Act (ADA) design standards.	MSB Bonds, State Legislative Grants, FHWA