2023-2027 Alaska Strategic Highway Safety Plan

Appendix E: Alaska Vulnerable Road User Safety Assessment

prepared for

Alaska Highway Safety Office, Alaska Department of Transportation and Public Facilities

prepared by

Cambridge Systematics, Inc.

November 15, 2023

Disclaimer: This final assessment report will be formatted and appended to the 2023-2027 Alaska Strategic Highway Safety Plan.

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Transportation and Public Facilities

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November 14, 2023

Mr. Al Fletcher
Federal Highway Administration
709 West 9th St.
Juneau, AK 99802

Re: Alaska Vulnerable Road User Safety Assessment

Dear Mr. Fletcher:

All states are required to develop a Vulnerable Road User (VRU) Safety Assessment under the Bipartisan Infrastructure Law (BIL)/Infrastructure Investment and Jobs Act (IIJA) as described in 23 U.S.C. 148(l). The Alaska Department of Transportation & Public Facilities has completed a VRU Safety Assessment in accordance to the guidance outlined in the October 21, 2022, from the Federal Highway Administration to improve safety for Vulnerable Road Users.

The Alaska VRU Safety Assessment identifies areas of high risk to VRU's and outlines specific safety strategies to be considered for reducing safety risks to VRUs.

The VRU Safety Assessment will be included as an addendum to Alaska's Strategic Highway Safety Plan, which was approved earlier this year. The final VRU SA can be found at: http://aktrafficsafety.com/

As the Governor's Highway Safety representative, I approve Alaska's VRU Safety Assessment.

Sincerely,

Tammy Kramer

Tammy Kramer
Governor's Highway Safety Representative
Alaska Highway Safety Office Manager
Alaska Department of Transportation & Public Facilities

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1. INTRODUCTION

The Bipartisan Infrastructure Law (BIL), signed into law on November 15, 2021, requires all states to develop a Vulnerable Road User (VRU) Safety Assessment as a part of their Highway Safety Improvement Program (23 U.S.C. 148(1)). The Alaska Department of Transportation and Public Facilities (DOT&PF) and the Alaska Highway Safety Office (AHSO) completed the VRU Safety Assessment in alignment with federal requirements, including using a data driven process, consulting with local stakeholders in high-risk areas, and developing a program of strategies to address safety for vulnerable road users.

This appendix describes the analysis methodology, consultation process, common themes that emerged, and the program of strategies. This appendix was added to the SHSP on November 15, 2023.

1.1 WHO IS A "VULNERABLE ROAD USER"?

A vulnerable road user is any person who chooses to walk, bike, or roll on Alaska's roadways. VRUs include, but are not limited to, pedestrians, bicyclists, people in wheelchairs or using mobility assistive devices, people on skateboards or roller skates, children playing, and highway workers on foot in work zones.

Vulnerable road users are considered "vulnerable" because they lack the visibility, protection, and deference given to motor vehicles. The Safe System Approach acknowledges the human body may tolerate only a limited amount of impact force before death or serious injury happens. The Safe System encourages proactive collaboration and a shared responsibility to implement redundant roadway, vehicle, and traffic control designs to protect VRUs.

Furthermore, many people who walk, bike, or roll on our roadways are members of historically underserved or disadvantaged communities. In alignment with Presidential Executive Order 13985[1], underserved communities are groups who have been systematically denied access to safe, reliable, healthy, and equitable mobility options. This may include members in low-income, Environmental Justice, transportation disadvantaged, and rural communities. It also may encompass Alaska Native and American Indian people, people of color, people with disabilities, people experiencing housing insecurity or homelessness, and people with limited English proficiency. By implementing strategies that promote the mobility and safety of vulnerable road users, Alaska also works toward a more equitable transportation system.

The federal definition of "vulnerable road user" is provided in 23 U.S.C. 148(a)(15) as a non-motorist with a Fatality Analysis Reporting System (FARS) person attribute code for pedestrian, bicyclist, other cyclist, person on personal conveyance, or an injured person equivalent to a pedestrian or pedalcyclist as defined in ANSI D16.1-2007. By definition, motorcycle riders are not considered VRUs.

[1] https://www.govinfo.gov/app/details/DCPD-202100054/

1.2 PURPOSE AND PROCESS

The VRU Safety Assessment serves as a dynamic, strategic planning document to guide transportation safety improvement decision-making and investments for vulnerable road users. The VRU Safety Assessment is not intended to identify specific safety projects or obligate funds.

The VRU Safety Assessment builds upon the foundation of ongoing state and local initiatives, including statewide implementation of the Strategic Highway Safety Plan, the infrastructure-based Highway Safety Improvement Program, and the behavior-based Highway Safety Plan. Together, these plans and programs support our ultimate goal *Toward Zero Deaths* and serious injuries on Alaska's public roadways.

Through a data-driven process and local consultation, the VRU Safety Assessment examines Alaska's safety performance for vulnerable road users, as well as identifies strategies to improve their safety. In accordance with FHWA guidance, the VRU Safety Assessment consists of the following steps:

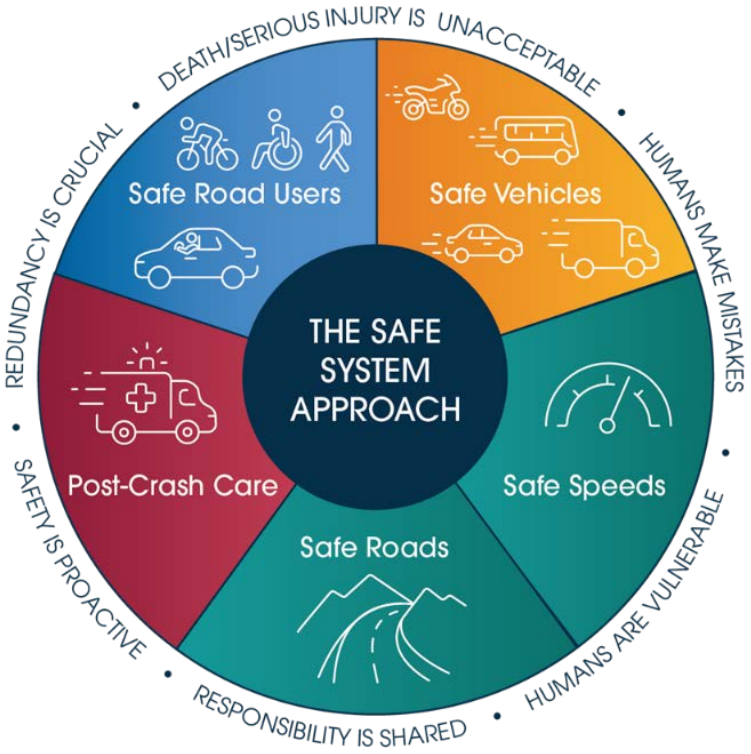
- AHSO identified VRU high-risk areas through a network screening analysis of pedestrian and pedalcyclist deaths and serious injuries on state and local roads. The analysis revealed a series of current high-risk corridors and intersections, as well as prevalent crash characteristics, demographics, and contributing factors.

- Equity was considered throughout the process. The network screening analysis prioritized high-risk locations that overlapped with census tracts representing disadvantaged communities. Local consultation also sought to reach a diverse range of groups, including members of underserved and disadvantaged communities.

- AHSO consulted with local and Tribal governments, metropolitan and regional planning organizations, and community members representing the identified high-risk areas. The consultations provided local knowledge and perspectives on high-risk locations, factors that contribute to safety issues, VRU safety needs, and possible solutions.

- The analysis results and consultation insights were combined to identify key takeaways about VRU safety risks. These common themes informed a program of strategies to improve the safety of VRUs on state and locally owned public roads throughout Alaska.

The Safe System Approach was integrated throughout the VRU Safety Assessment. The six principles lay the foundation for how DOT&PF, AHSO, and our many safety partners will address traffic safety statewide. The stakeholder consultation meetings invited participants in disciplines representing all five elements. Alaska will comprehensively address VRU and other road user safety through the lens of a Safe System as the strategies identified in this VRU Safety Assessment and the SHSP Focus Area action plans are put into action.



1.3 ORGANIZATION

The VRU Safety Assessment is organized as follows:

- Section 1 introduces the VRU Safety Assessment by defining vulnerable road users, sharing the purpose and process, and describing the report organization.
- Section 2 presents the network screening analysis, including identifying data sources, highlighting historical safety trends involving VRUs, and describing the methodology and results of the high-injury network screening analysis.
- Section 3 highlights the objectives, process, and meeting summaries for local consultation meetings held with stakeholders in communities with identified high-priority areas.
- Section 4 draws upon the findings of the network screening analysis and local consultation to identify eight common themes that drive VRU safety in Alaska.
- Section 5 describes the program of strategies that DOT&PF and our safety partners will use to make all public roadways in Alaska safer for vulnerable road users. This includes drawing connections to existing SHSP Focus Area strategies that promote VRU safety and new strategies that target the issues identified through the network screening and local consultation.
- Section 6 contains the list and maps of the top high priority corridors and intersections throughout Alaska.

2. DATA ANALYSIS

As part of the Vulnerable Road User Safety Assessment, Alaska is required to include a data-driven analysis of the state's safety data that ultimately identifies areas as "high-risk" to vulnerable road users. The AHSO performed the following High Injury Network (HIN) analysis:

- AHSO analyzed the location of crashes throughout the state, performing a sliding window safety analysis that mapped crashes to their nearest intersection (if applicable).
- AHSO used publicly available intersection and roadway segment information to understand roadway conditions such as roadway functional classification, design speed, and speed limit.
- AHSO overlaid equity data from the Justice40 initiative to ensure the consideration of disadvantaged demographic groups, which include race, ethnicity, income, and Tribal affiliation.

The analysis concludes with a list of the top selected high-risk corridors and intersections across Alaska. However, AHSO and DOT&PF acknowledge that the high-risk areas only capture crashes across one period: 2016 to 2021. Where crashes happen, infrastructure conditions, and other safety trends may shift over time. Therefore it is important to be flexible and follow where the data may lead us over time.

2.1 DATA SOURCES

DOT&PF used three main sources for this analysis.

- **Alaska CARE Crash Data:** This dataset contains georeferenced crashes with tags for crash attributes such as severity, location, collision type, and more. The latest dataset available at the time of analysis was for the years 2016 to 2021. This was the main source of data for this crash analysis. Total crash numbers for the time period analyzed may be different for each figure or table below as each crash may not have all relevant crash attributes tagged.
- **OpenStreetMap**: AHSO used this free geographic database to pull roadway information, in order to map crashes to an underlying road network with associated characteristics. While not exhaustive, OpenStreetMap is a trusted database maintained by a community of volunteers via open collaboration.
- **Climate and Economic Justice Screening Tool:** This dataset (referred to as Justice40) is from the White House's Council on Environmental Quality and their Justice40 initiative, which is an initiative to provide 40 percent of overall benefits of certain Federal investments to disadvantaged communities.[2] This tool was used to identify underserved census tracts in Alaska.

[2] https://screeningtool.geoplatform.gov/en/#3/64.97/-159.68

2.2 VULNERABLE ROAD USER SAFETY TRENDS

First, it is beneficial to understand historical safety trends for vulnerable road users statewide. This section breaks down fatalities and serious injuries to non-motorized users by year, location, person type, circumstances surrounding the crash, suspected alcohol and drug usage, lighting conditions, race/ethnicity, and Justice40 areas. These analyses show patterns in non-motorized crash data and reveal trends that help tailor the recommended strategies in Section 5 to most effectively reduce fatalities and serious injuries in Alaska and ultimately achieve the state's goal of *Toward Zero Deaths.*

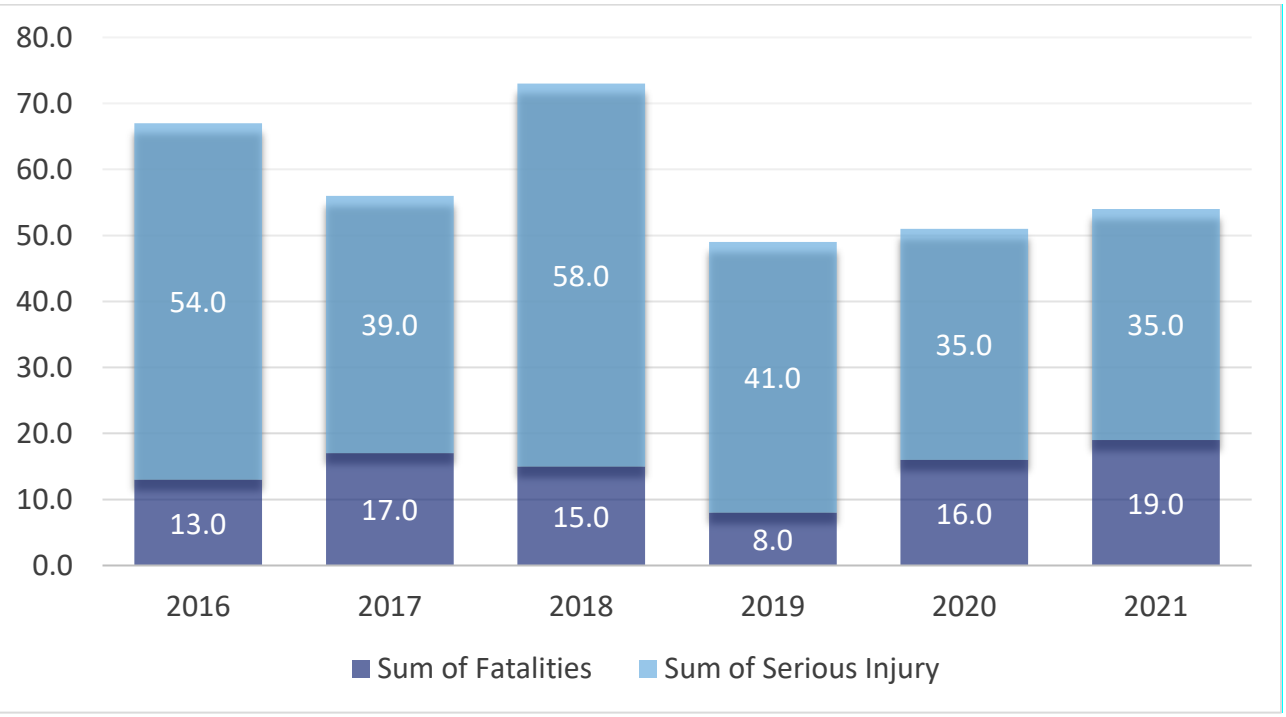
For this analysis, a pedestrian is defined as any person on foot, walking, running, jogging, hiking, sitting, or laying down. A pedalcyclist is defined as a bicyclist or other cyclist including two-wheel non-motorized vehicles, tricycles, and unicycles.

2.2.1 Historical Safety Trends

Figure 1 shows the annual number of non-motorized fatalities and serious injuries between 2016 and 2021. The five-year rolling average of combined non-motorized fatalities and serious injuries is one of five standard safety performance targets tracked in the SHSP and HSIP.

An improvement in the number of non-motorized serious injuries can be observed from the first three years (2016-2018) compared to the last three years (2019-2021). The average number of non-motorized fatalities per year hovered around 14.7 per year, with 2019 reaching an unusually low fatality count of eight. The most recent year of available data, 2021, was the deadliest for VRUs, with a fatality count of 19.

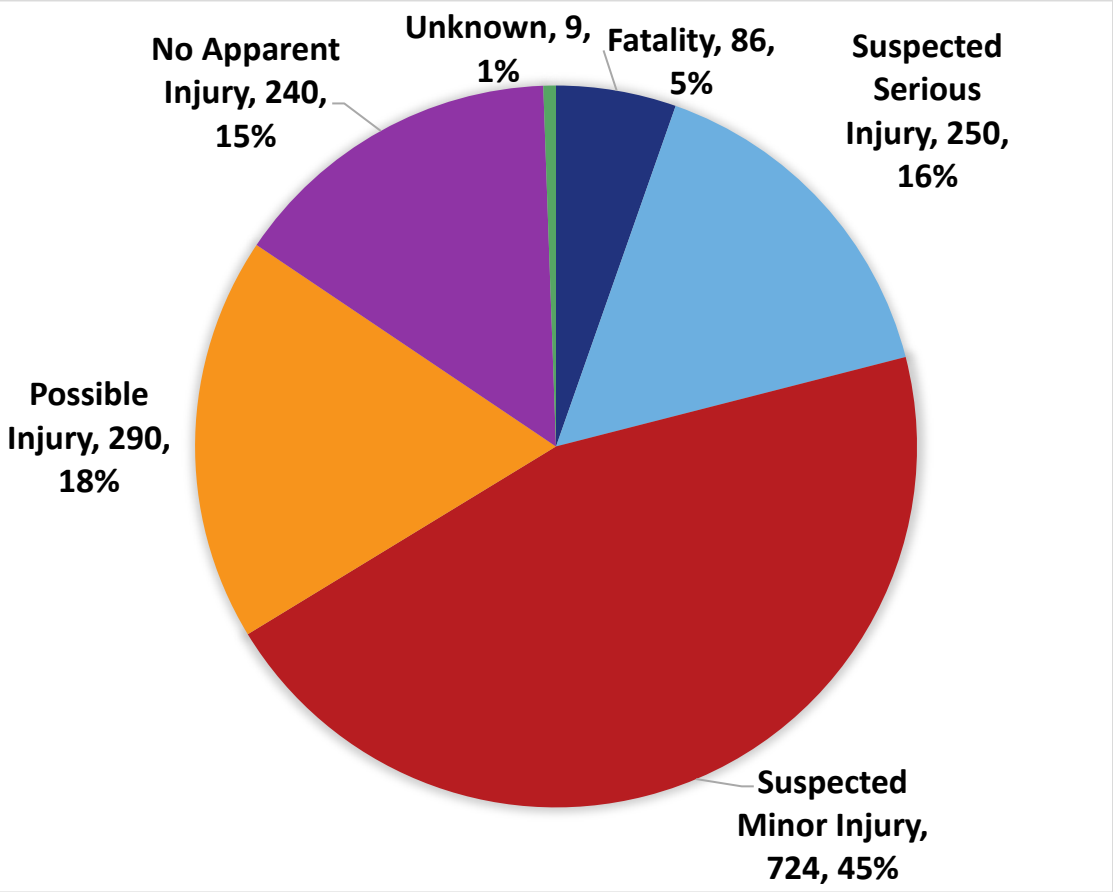
FIGURE 1: NON-MOTORIZED FATALITIES AND SERIOUS INJURIES (2016-2021)



Source: Alaska CARE and FARS, 2016-2021.

Figure 2 shows non-motorist crashes by the worst severity type in each crash. It is observed that 86 of the 1,599 total crashes reported (5.4 percent) resulted in fatalities; 250 (15.6 percent) of crashes resulted in suspected serious injuries. Still many more crashes resulted in minor or no apparent injuries. (*Note:* these numbers do not represent the total fatalities or serious injuries, instead they represent total crashes by the worst severity inflicted on a non-motorist.)

FIGURE 2: NON-MOTORIZED CRASHES BY WORST SEVERITY TYPE (2016-2021)



Source: Alaska CARE and FARS, 2016-2021.

Table 1 shows non-motorist fatalities and serious injuries by borough or municipality between 2016 and 2021. Anchorage Municipality had 220 vulnerable road user fatalities and serious injuries (62.9 percent of the statewide total), the largest in the state by far. While it is unsurprising that Anchorage took the top spot as the state's largest urban sector and economic engine, Anchorage Municipality experiences a disproportionate share, given that approximately 40 percent of the Alaskan population lives in Anchorage.[3] Larger urbanized areas generally have more people walking and biking due to higher land use and population densities, accompanying public transportation, and existing or improved pedestrian- and pedalcyclist-specific infrastructure.

Other municipalities and boroughs throughout Alaska also experienced vulnerable road user deaths and serious injuries. Matanuska-Susitna Borough had 35 non-motorized fatalities and serious injuries, followed by Kenai

[3] https://www.census.gov/quickfacts/fact/table/AK/PST045222

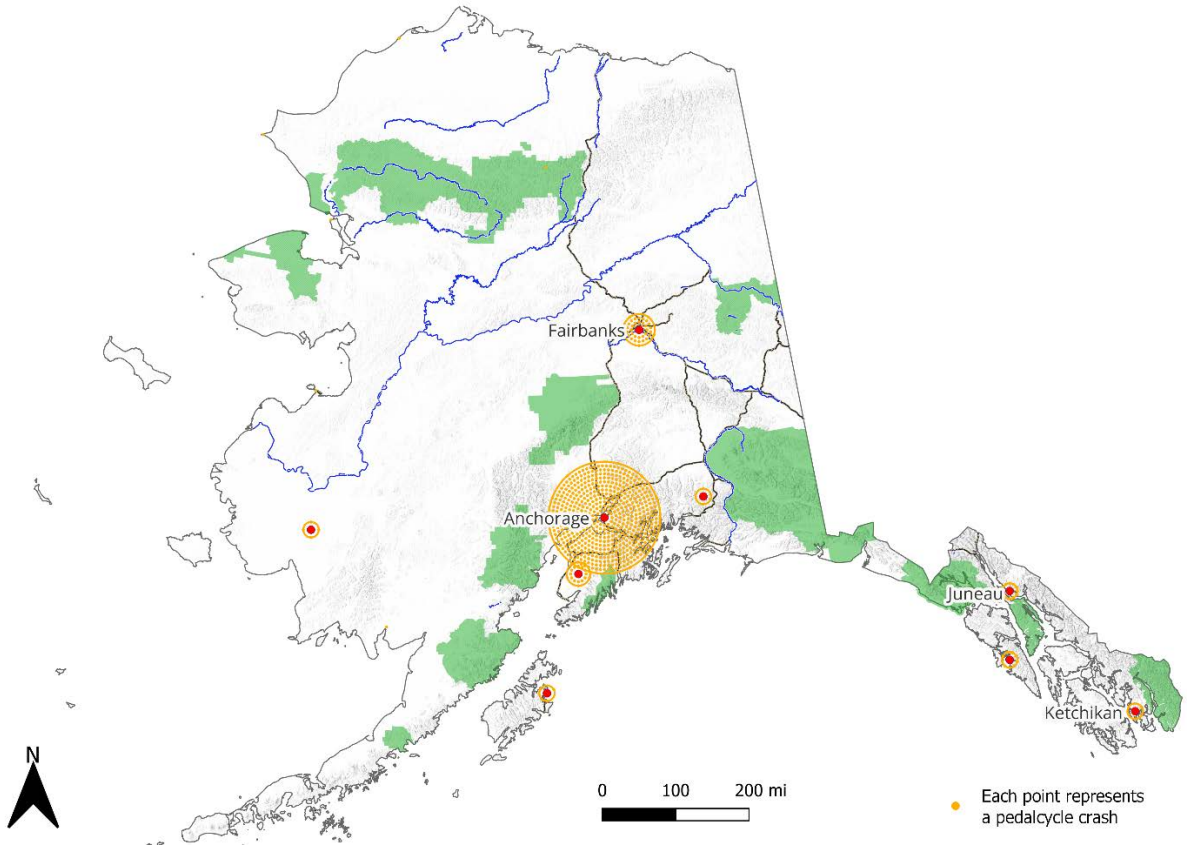
Peninsula with 14 fatalities and serious injuries. Fairbanks North Star Borough and Juneau City and Borough each had 12 fatalities and serious injuries, followed by Ketchikan Gateway Borough with 10. An additional 28 non-motorized fatalities and serious injuries took place in unorganized boroughs. Figure 3 shows the distribution of pedalcyclist fatalities and serious injuries across Alaska between 2016 and 2021, while Figure 4 shows the distribution of pedestrian fatalities and serious injuries.

TABLE 1: NON-MOTORIST FATALITIES AND SERIOUS INJURIES BY BOROUGH (2016-2021)

BOROUGH OR MUNICIPALITY	FATALITIES	SERIOUS INJURIES	SUM OF FATALITIES & SERIOUS INJURIES	PERCENT OF STATEWIDE TOTAL
ANCHORAGE MUNICIPALITY	52	168	220	62.9%
MATANUSKA-SUSITNA BOROUGH	9	26	35	10.0%
UNORGANIZED BOROUGH	9	19	28	8.0%
KENAI PENINSULA BOROUGH	2	12	14	4.0%
FAIRBANKS NORTH STAR BOROUGH	3	9	12	3.4%
JUNEAU CITY AND BOROUGH	5	7	12	3.4%
KETCHIKAN GATEWAY BOROUGH	2	8	10	2.9%
SITKA CITY AND BOROUGH	1	4	5	1.4%
NORTH SLOPE BOROUGH	0	5	5	1.4%
NORTHWEST ARCTIC BOROUGH	2	1	3	0.9%
BRISTOL BAY BOROUGH	2	0	2	0.6%
KODIAK ISLAND BOROUGH	0	2	2	0.6%
PETERSBURG BOROUGH	0	1	1	0.3%
DENALI BOROUGH	1	0	1	0.3%
YAKUTAT CITY AND BOROUGH	0	0	0	0.0%
SKAGWAY MUNICIPALITY	0	0	0	0.0%
GRAND TOTAL	88	262	350	100.0%

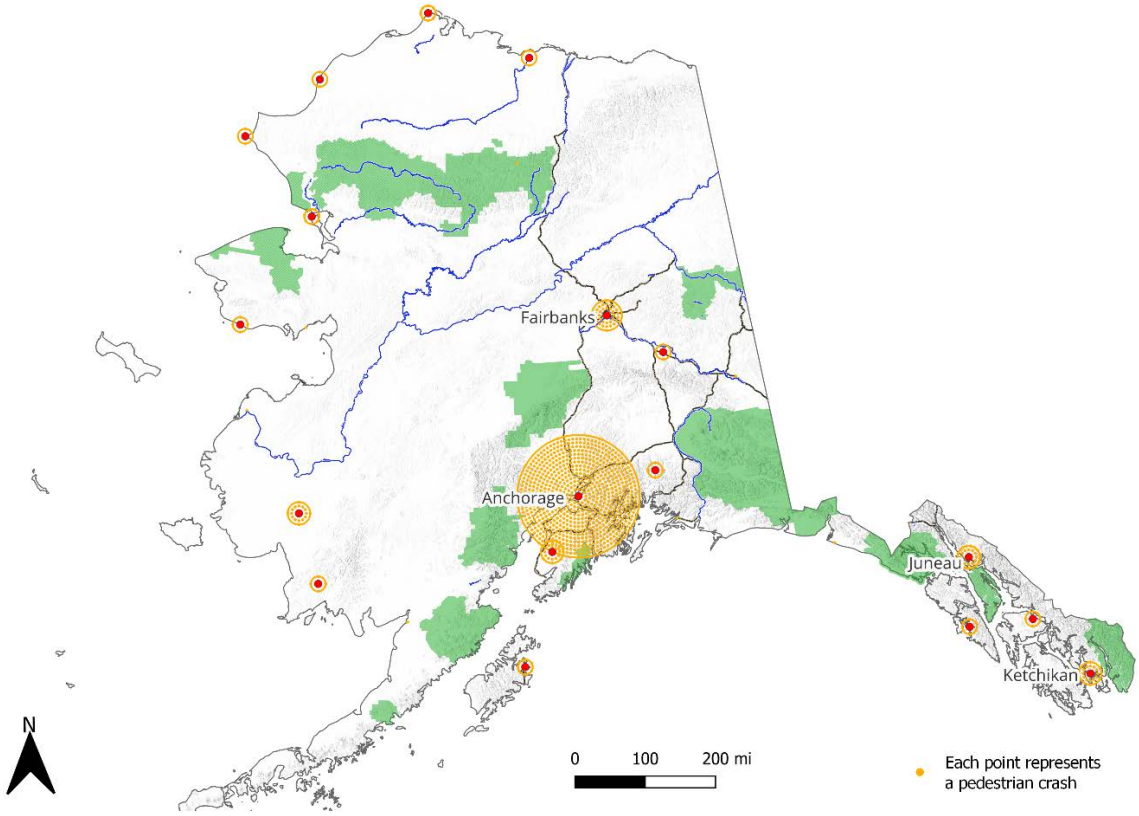
Source: Alaska CARE and FARS, 2016-2021.

FIGURE 3: STATEWIDE MAP OF PEDALCYCLE CRASHES



Source: Alaska CARE and FARS, 2016-2021; Cambridge Systematics; Inc.

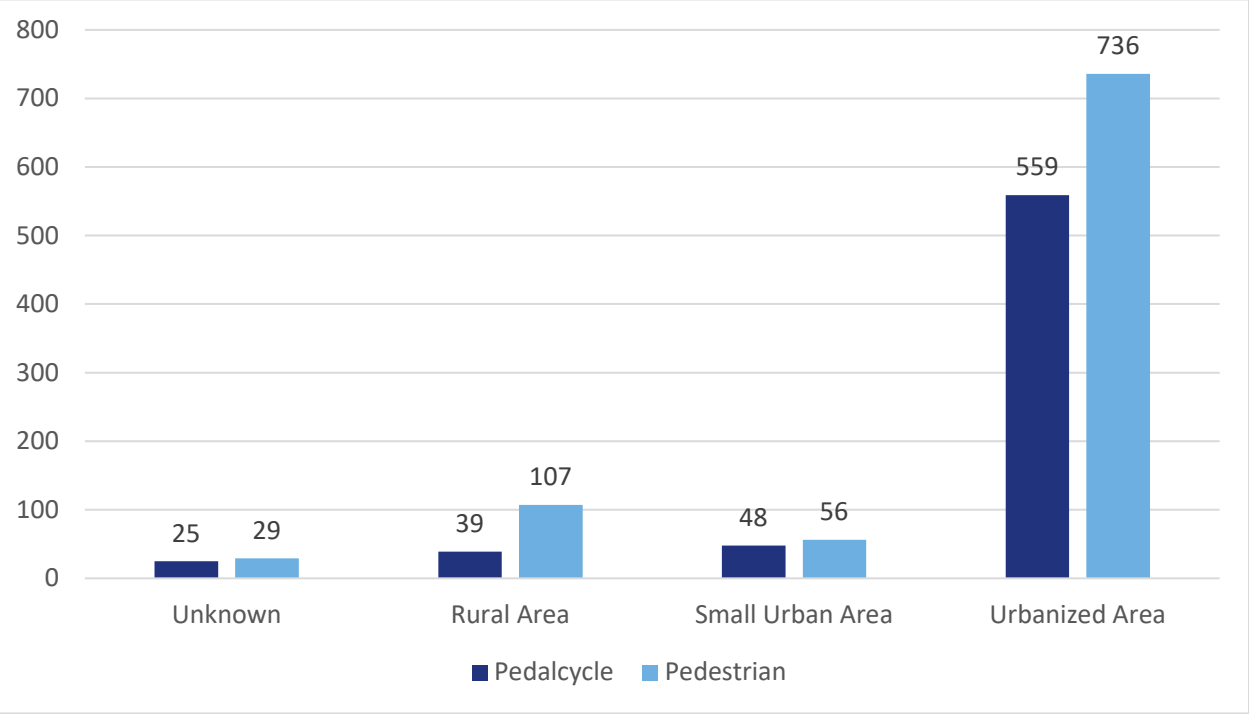
FIGURE 4: STATEWIDE MAP OF PEDESTRIAN CRASHES



Source: Alaska CARE and FARS, 2016-2021; Cambridge Systematics, Inc.

Although crashes involving vulnerable road users are more likely to occur in urban environments, rural and small urban areas are also impacted. Figure 5 illustrates that between 2016 and 2021, 107 of 928 total pedestrian crashes (11.5 percent) and 39 of 671 pedalcyclist crashes (5.8 percent) occurred in a rural region of Alaska. This highlights the need to deploy VRU safety strategies that are appropriate for a given location's context, such as population demographics and surrounding land uses and density. This concept is further explored in Section 5.

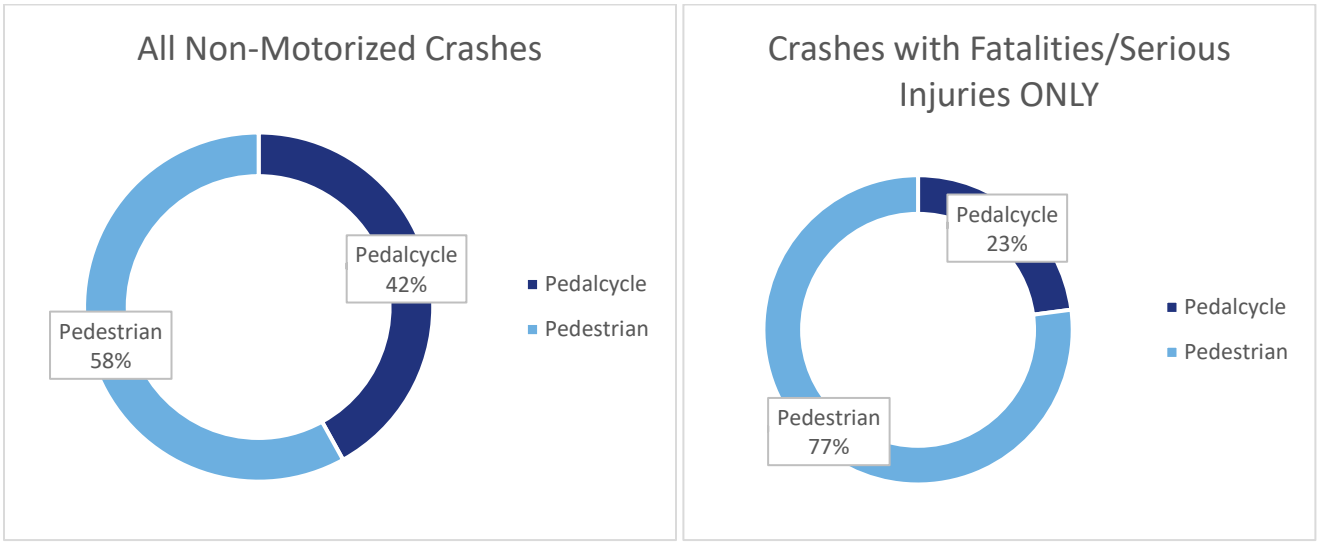
FIGURE 5: TOTAL CRASHES BY AREA TYPE, 2016-2021



Source: Alaska CARE and FARS, 2016-2021.

Figure 6 compares the distribution between pedalcyclists and pedestrians for all crash severities (left) and for fatal and serious injury crashes only (right). About 58 percent of all non-motorized crashes between 2016 and 2021 involved a pedestrian, while 42 percent involved a pedalcyclist. In comparison, for crashes that resulted in fatalities or serious injuries, this distribution skewed greatly towards pedestrians, with 77 percent seriously injuring or killing a pedestrian and 23 percent seriously injuring or killing a pedalcyclist.

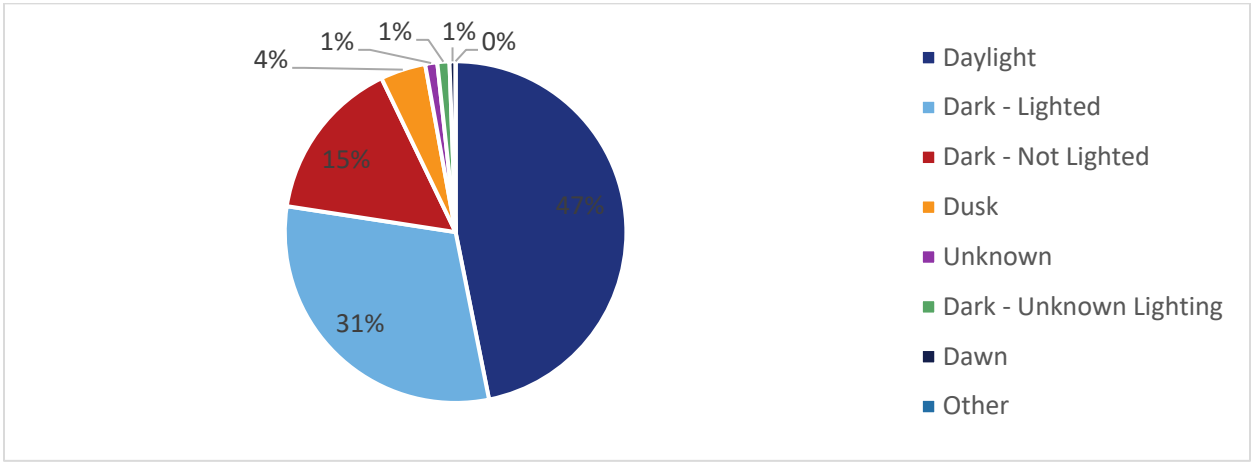
FIGURE 6: DISTRIBUTION OF NON-MOTORIZED CRASHES BY MODE TYPE



Source: Alaska CARE and FARS, 2016-2021.

Non-motorized users are particularly vulnerable during nighttime hours and in dark lighting conditions. Often pedestrians and bicyclists do not have any lights on their person or lighting the roadway to indicate their presence to drivers. Furthermore, due to its northerly latitudes, Alaska experiences much longer nights than other states during the winter. Figure 7 shows total fatalities and serious injuries by the lighting condition at the time of each crash. Over half occurred during nighttime, dusk, or dawn hours, with 15 percent occurring in a location with no external roadway lighting. Given that more non-motorized users typically walk, bike, or roll during daylight hours, it is significant how many deaths and serious injuries take place at night, highlighting how important well-lit environments are to vulnerable road user safety.

FIGURE 7: TOTAL FATALITIES & SERIOUS INJURIES BY LIGHTING CONDITION



Source: Alaska CARE and FARS, 2016-2021.

2.2.2 Equity & Vulnerable Road User Safety

Data from White House Justice40 Initiative was used to analyze non-motorist safety for groups who may disproportionately experience roadway harm. Within the Justice40 framework, there are eight ways a census tract can be considered "disadvantaged":[4]

- **Climate Change:** The burdens in this category aim to measure expected agricultural value, building value, and population loss due to climate-related natural hazards, as well as projected wildfire risk and projected flood risk due to climate change.
- **Energy:** The burdens in this category aim to measure the energy cost as well as energy-related pollution within a census tract.
- **Health:** The burdens in this category aim to identify areas facing high rates of asthma, diabetes, heart disease, and low life expectancy within a census tract.
- **Housing:** These burdens aim to measure the housing cost, the degree of lead paint exposure in housing, historic underinvestment due to redlining, lack of green space, and the share of homes without indoor plumbing or kitchens within a census tract.
- **Legacy Pollution:** These burdens aim to measure how legacy, current, and potential pollution a census tract has through proximity to hazardous waste, Superfund sites (otherwise known as National Priorities List), Risk Management Plan facilities, abandoned mine land, and Formerly Used Defense Sites.
- **Transportation:** This burden measures the transportation-related pollution, transportation barriers, and traffic-related noise and proximity to a census tract.
- **Water and Wastewater:** This measures the census tract's proximity to toxicity-weighted wastewater discharges and underground storage tanks that may leak.
- **Workforce Development:** This burden aims to identify census tracts that would benefit from greater workforce development, such as areas with low median income as a percentage of area median income, percent of households in linguistic isolation, percent of the workforce experiencing unemployment, and percentage of a census tract's population in households where the household income is at or below the federal poverty level.

A census tract can be marked as disadvantaged for meeting any one of these burdens, but multiple burdens may be applicable for a particular census tract.

The equity dataset was incorporated via the mapping component of the high-injury corridor identification methodology. Justice40 maps were used to differentiate corridors with similar total crash scores respective to the sliding windows. For example, a corridor in a disadvantaged community was prioritized over a corridor of a similar

[4] White House Council on Environmental Quality. Version 1 of the CEJST: Technical Support Document. Available at https://static-data-screeningtool.geoplatform.gov/data-versions/1.0/data/score/downloadable/1.0-cejst-technical-support-document.pdf.

total crash score in a non-Justice40 community. As another example, several corridors were extended to reach nearby disadvantaged census tracts.

Table 2 lists the total population residing in Justice40 communities throughout the state by each disadvantaged focus area, the total number of non-motorized fatalities and serious injuries, as well as the corresponding index per one million residents. Over 10,000 people live in transportation-disadvantaged communities. 23 deaths and serious injuries to vulnerable road users took place in transportation-disadvantaged communities between 2016 and 2021. Transportation disadvantaged communities have a rate of fatalities and serious injuries **five times higher** than non-disadvantaged census tracts throughout Alaska.

TABLE 2: ALASKAN NON-MOTORIST FATALITIES AND SERIOUS INJURIES BY JUSTICE40 AREA (2016-2021)

JUSTICE40 AREA	DISADVANTAGED POPULATION	NON-MOTORIZED FATALITIES AND SERIOUS INJURIES	NON-MOTORIZED FATALITIES + SERIOUS INJURIES PER 1 MILLION PEOPLE
Housing	73,574	65	883.5
Workforce Development	65,866	61	926.1
Climate Change	60,744	65	1,070.1
Pollution	58,729	19	323.5
Health	56,581	58	1,025.1
Energy	47,106	16	339.7
Transportation	10,341	23	2,224.2
Water & Wastewater	9,840	36	3,659.5
All Justice40 Areas	**130,764**	**107**	**818.3**
All Non-Justice40 Areas	**598,054**	**241**	**403.0**

2.3 HIGH-INJURY CORRIDORS AND INTERSECTIONS

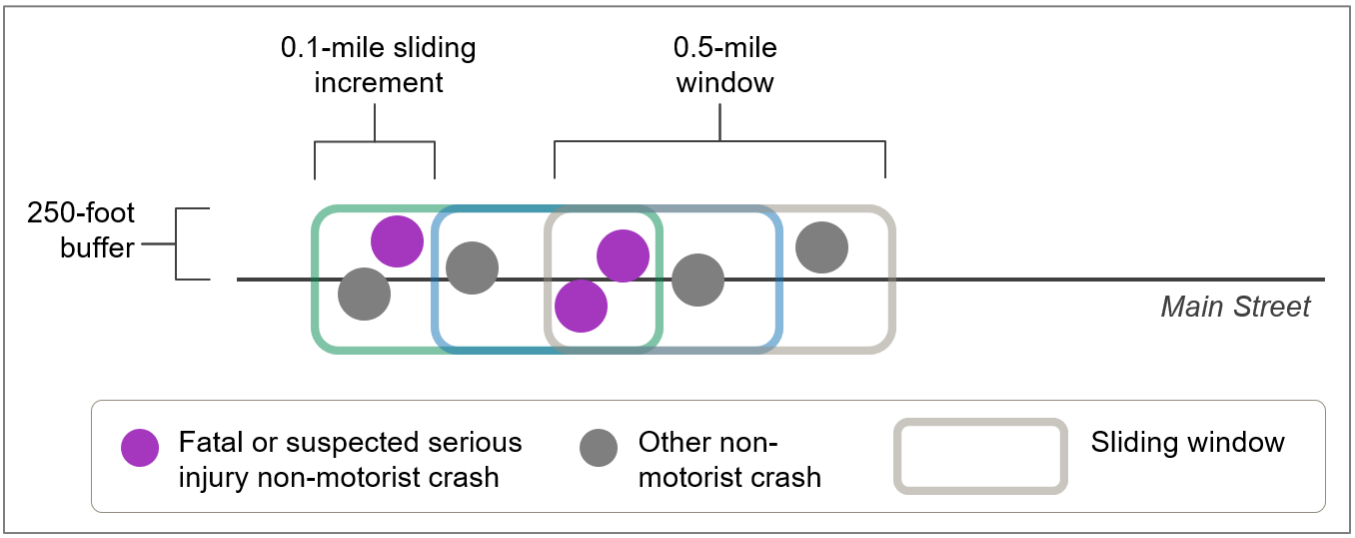
This section outlines the methodology and results of identifying VRU-specific high-injury corridors and intersections throughout Alaska. A sliding window analysis identified HINs with a weighting process to prefer corridors and intersections with a higher concentration of severe or fatal crashes involving vulnerable road users.

Crashes that resulted in a fatality or severe injury were weighted three times greater than all other crash severities. Each crash received a “crash score,” in which crashes with fatalities or serious injuries were assigned three points, and all other crash severities were assigned one point. For instance, a segment with three crashes at approximate geographic coordinates that each resulted in a minor injury (three one-point crashes) would have the same crash score as a different segment with one crash that resulted in a fatality (one three-point crash).

2.3.1 High-Injury Corridor Identification: Sliding Window Analysis

This analysis utilized a sliding window approach, a recognized method supported by FHWA in the *Guidebook on Identification of High Pedestrian Crash Locations* (Chapter 7 Supplemental Materials)[5]. This approach has been widely used in Vision Zero studies to identify High Injury Networks where urgent attention and targeted safety interventions are needed to mitigate the risks faced by vulnerable road users and enhance overall road safety.

FIGURE 8: GRAPHIC DETAILING SLIDING WINDOWS ANALYSIS



Source: Cambridge Systematics, Inc.

The sliding windows analysis is a technique employed to smooth out errors in crash location reporting and improve the accuracy of crash reporting by examining crashes within short segments along roadways. This process involves creating roadway segments, or "windows," that cover the transportation road network, with each window offset by a short distance from the previous one. The analysis is repeated until the entire road network is covered.

Within the context of this study, 0.5-mile windows were built along all U.S., state, and local public roads with the same name, functional class, and proximity to each other. The windows were offset, or stepped, along the network in 0.1-mile increments. The analysis leveraged all crashes with geolocation information between 2016 and 2021. The road network layer used in this analysis was extracted from OpenStreetMap, providing comprehensive geospatial data with a high level of detail, including street names and functional classification. OpenStreetMap is a collaborative and open-source mapping platform that allows individuals and organizations to contribute and access detailed geographic data to create accurate and freely available maps for various purposes.

All crashes within 250 feet were assigned a severity-weighted score for each window segment (three points for fatal and severe crashes; one point for all other crash severities). Window segment scores were thoroughly

[5] Federal Highway Administration. *Guidebook on Identification of High Pedestrian Crash Locations.* Available at https://www.fhwa.dot.gov/publications/research/safety/17106/17106.pdf.

reviewed by the project team to verify accuracy. Using the results from the sliding windows analysis, the project team identified high injury corridors across different jurisdictions and location types throughout Alaska.

2.3.2 High-Injury Intersection Identification: Point Analysis

In addition to a sliding window analysis to identify high-injury corridors, a point analysis was used to identify high-injury intersections. The OpenStreetMap layer was imported to the analysis software and crashes were mapped to their nearest intersection (rather than the nearest sliding window segment). Crashes were determined to be within an intersection's area of influence if within 150 feet of the intersection centroid. Only crashes within this distance of any intersection on the road network were included in this analysis. The same crash score weighting system as the sliding windows analysis was applied to the point analysis, and a total crash score was calculated for each intersection in the entire state.

2.3.3 Anchorage and Non-Anchorage Stratification

Following the completion of the sliding window and point analyses, AHSO mapped and ranked the high-injury corridors and intersections throughout the state. It became clear that a separate process would have to be developed for Anchorage versus the remainder of the state, as 49 of the 50 highest-injury intersections and all 50 highest-injury corridors were located in the Municipality of Anchorage.

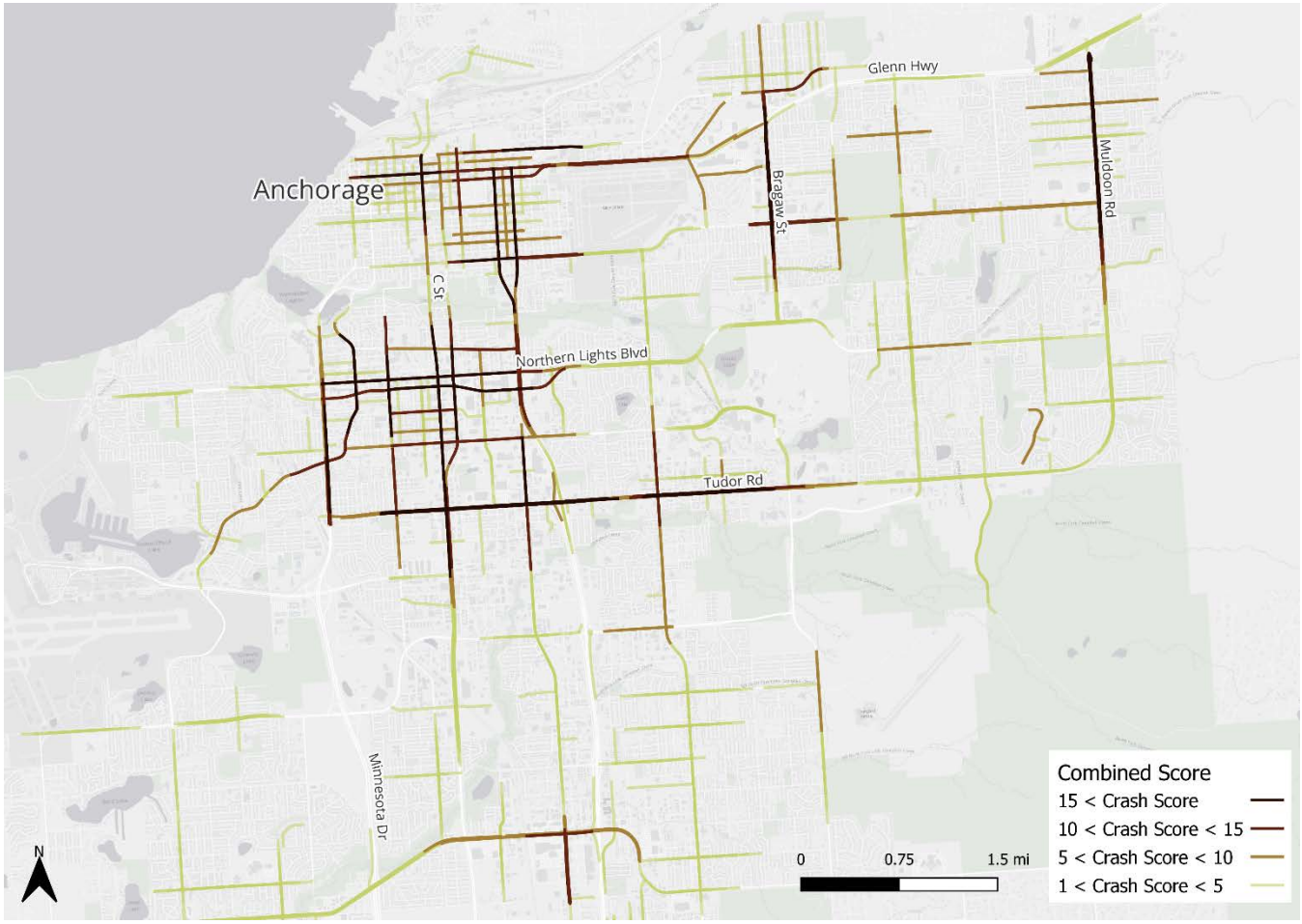
The purpose of this Vulnerable Road User Safety Assessment is to identify high-injury networks throughout the state – not solely in Anchorage – leading to a stratification of the dataset into Anchorage and Non-Anchorage geographies. A stratum of a non-Anchorage geography allowed other high-risk networks in the state to be identified across many Alaskan cities, towns, and rural areas.

2.3.4 Identified High-Injury Corridors and Intersections

As the result of the network screening analysis, AHSO identified the top 16 high-injury corridors and top 15 high-injury intersections across Alaska. Ultimately, AHSO selected the top seven high-injury corridors and eight high-injury intersections located in Anchorage, as well as the top one or two high-injury intersections and corridors each within the communities of Fairbanks, Ketchikan, Palmer, Juneau, Wasilla, Sitka, and Bethel. For the list of the top selected VRU high-injury corridors and intersections, refer to Section 6.

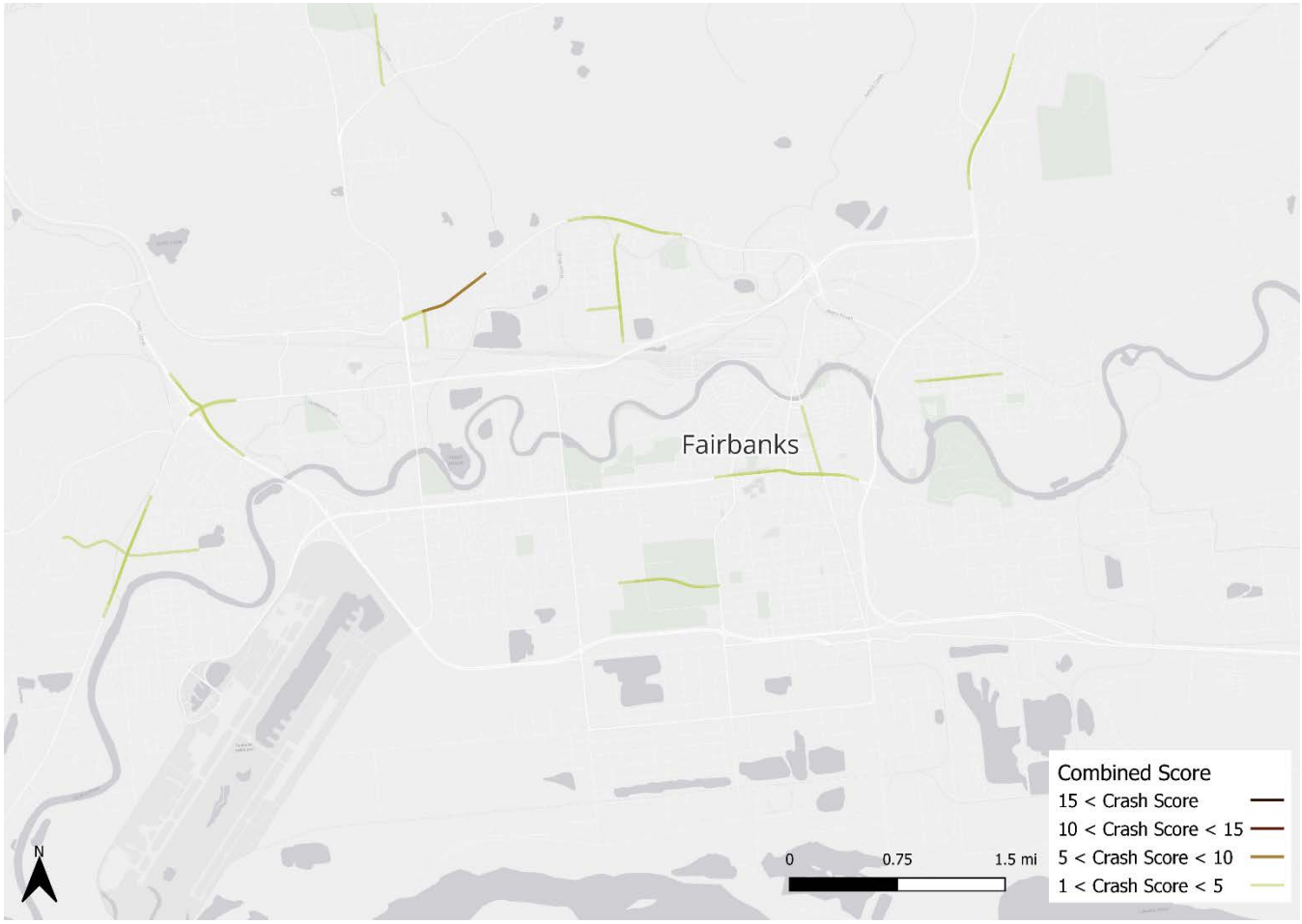
The final selection of high-injury corridors and intersections included post-processing. The output of the sliding window analysis was a geographic list of polylines that can be ranked by the total combined pedestrian and pedalcyclist crash score. AHSO evaluated the sliding windows mapped interactively in QGIS – along with the Justice40 layer – in addition to this ranked list. As examples, Figure 8 and Figure 9 show the sliding window analyses for Anchorage and Fairbanks.

FIGURE 9: MAP OF ANCHORAGE SLIDING WINDOWS ANALYSIS WITH COMBINED CRASH SCORE



Source: Alaska CARE and FARS, 2016-2021; Cambridge Systematics, Inc.

FIGURE 10: MAP OF FAIRBANKS SLIDING WINDOWS ANALYSIS WITH COMBINED CRASH SCORE



Source: Alaska CARE and FARS, 2016-2021; Cambridge Systematics, Inc.

Initially, 15 high-injury corridors were identified through this process. Given the state population breakdown, AHSO selected the top-ranked seven corridors within the Municipality of Anchorage and the top-ranked eight corridors outside of Anchorage, which included Fairbanks, Ketchikan, Palmer, Juneau, Wasilla, and Sitka. AHSO selected one additional top high-injury corridor representing a rural community with a majority of Alaska Native and American Indian residents, which was also an identified Justice0 community: Bethel.

The high-injury corridors in Anchorage were primarily arterials with higher vehicular speeds and thus higher risk for serious injuries or fatalities. Outside of Anchorage, corridors were either arterials, places with high localized VRU volumes, or main town thoroughfares.

For the selection process for intersections, a ranked list was produced in the same manner as the corridors, with the intersections with highest pedestrian and pedalcyclist crash scores rising to the top. The Justice40 layer was geographically joined to each high-scoring intersection to incorporate equity.

Only seven intersections outside of Anchorage received a weighted crash score of four points or greater. Wanting to prevent arbitrary tie breaking methods amongst the many intersections with three points, the analysis team chose these top seven non-Anchorage high-injury intersections. The eight top-ranked high-risk intersections in Anchorage were also selected; in general, intersections in Anchorage had much higher combined crash scores than non-Anchorage intersections. The top 15 high-injury intersections are located along identified high-risk corridors, frequently where two busy roads meet or where there may be limited or no marked crossing infrastructure.

It is crucial to note that the roads identified in this study are not the only ones where safety improvements for vulnerable road users should be implemented. The purpose of identifying these roads is to identify common factors that pose a risk to vulnerable road users. For instance, many of these local roads pass through downtown areas with land uses conducive to neighborhood shops and services, while many of the state roads are located along arterials with suburban-style land uses. It is also important to note that sample size in the crash data is a concern in many smaller Alaskan towns. AHSO emphasizes it is not sufficient to base funding decisions on this type of analysis alone.

Furthermore, this analysis captured high-risk areas based on crash data between 2016 and 2021. AHSO and DOT&PF acknowledge that flexibility is needed to follow where future data may lead; future HIN analyses using newer years of crash data may result in a different set of high-risk areas.

3. LOCAL CONSULTATION

For the VRU Safety Assessment, the AHSO conducted local consultations with stakeholders representing VRU high-risk areas identified by network screening. This section summarizes outreach objectives, the consultation process, and key takeaways from each meeting.

3.1 OBJECTIVES

While data are useful for identifying historical trends and risk factors, crash reports and demographics alone can't tell the whole story. The people who live, work, and play in a community are the best people to discuss its challenges and successes. By consulting with local and Tribal governments, transportation and planning organizations, and community groups and individuals, AHSO gained valuable perspective and first-hand knowledge of VRU safety issues and context-sensitive solutions.

The objectives of consultation with local stakeholders included:

- Providing an overview of the VRU Safety Assessment purpose, requirements, and process, including the network screening methodology.
- Showing VRU safety performance and trends in Alaska, and how existing SHSP strategies seek to address these trends.
- Reviewing initial findings from the network screening analysis, gaining confirmation on the identified high priority corridors and intersections, and identifying contributing factors and similar locations experiencing VRU safety risks.
- Listening to local insights about the challenges communities experience, additional data and available information such as local safety plans and solutions already being implemented, and specific challenges faced by VRUs in underserved communities.
- Identifying possible strategies that address each unique community's needs in order to reduce VRU deaths and serious injuries.

3.2 PROCESS

The network screening analysis resulted in a list of the top 16 corridors and top 15 intersections that represent the greatest risks for vulnerable road users (see Section 2 for methodology and summary results, and Section 6 for the location lists). These locations spanned across Anchorage, Palmer, Wasilla, Fairbanks, Sitka, Ketchikan, Juneau, and Bethel, representing a diversity of communities throughout Alaska.

The Alaska Highway Safety Office leveraged our network of safety partners to invite community representatives to participate in virtual consultation meetings for their communities. Participants spanned local governments, Tribal governments and organizations, metropolitan planning organizations, law enforcement, academia, transit providers, non-profit and advocacy organizations, and community members.

AHSO discussed the network screening methodology and results with participants. Representatives shared verbal and written feedback, including using the polling software Mentimeter. Participants offered invaluable insights, personal knowledge, and local perspectives about VRU safety challenges in their communities, as well as ongoing and planned solutions, projects, and related plans. Meeting discussions are summarized in the following section.

After all consultation meetings were conducted, the stakeholders' input informed common themes (described further in Section 4) and strategies to increase VRU safety (Section 5).

3.3 MEETING SUMMARIES

The team held five virtual consultation meetings for different regions across Alaska, covering Anchorage (two meetings); Palmer, Wasilla, and Fairbanks; Sitka, Ketchikan, and Juneau; and Bethel. Almost 500 people participated in one or more meetings to share their insights and experiences. Community representatives included:

- Fairbanks Area Surface Transportation (FAST) Planning
- University of Alaska, Fairbanks
- Fairbanks Safe Rider Program
- Anchorage Metropolitan Area Transportation Solutions (AMATS)
- Municipality of Anchorage
- Anchorage Police Department
- Bike Anchorage
- Center for Safe Alaskans
- Anchorage School District
- City of Ketchikan
- City of Sitka
- Sitka Tribe of Alaska
- Capital Transit
- Bethel Fire Department
- Alaska DOT&PF
- Alaska Department of Public Health

The meetings are summarized in the next section, including discussions of common VRU safety challenges, network screening results, additional locations experiencing similar issues, and recent projects and successes. For the complete list of network screening high-risk corridors and intersections for each location, please refer to Section 6.

3.3.1 Anchorage – Spring 2023

The Anchorage region experienced the vast majority of VRU deaths and serious injuries in Alaska between 2016 and 2021. For both the VRU Safety Assessment and for Public Participation and Engagement as a part of the Highway Safety Plan, the AHSO partnered with the Anchorage Metropolitan Area Transportation Solutions (AMATS) in May 2023 to host a virtual safety forum. Engagement from this community was determined to be critical because of the continual increase in VRU fatalities in recent years.

The forum featured live polling and focused on the work of the Bicycle and Pedestrian Advisory Committee (BPAC) and AMATS Safety campaign and plan. The forum also provided an opportunity for residents to ask questions and share their experiences and insights. In total, 444 people participated in the event with relatively even age and gender distribution representing residents of over 12 neighborhoods in the area. Approximately 80 percent of participants identified as white, five percent American Indian or Alaska Native, and three percent Hispanic, Latino, or Spanish.

Respondents indicated 82 percent of the time they drive, 13 percent of the time bike, three percent of the time walk, and two percent of the time take public transportation for where they need to go. Many residents do not feel safe when biking or walking, particularly when it is dark outside or on busy streets. Participants expressed the desire for greater enforcement of traffic laws and better education on the importance of transportation safety. Almost 85 percent of respondents wished for roads designed to support surrounding land uses (i.e., slower speeds, separated pathways for non-motorized travel, and more crosswalks). Maintenance of roads, sidewalks, and multiuse pathways in all seasons was ranked as the top challenge to transportation safety, followed by unsafe driving behaviors, lack of separation from vehicles, lack of bike lanes, and lack of crosswalks.

3.3.2 Anchorage – Fall 2023

In fall 2023, AHSO held a second, virtual local consultation meeting with representatives of organizations and communities in Anchorage. Participants highlighted three top challenges for VRU safety:

- **Inadequate winter weather maintenance** and snow storage blocks non-motorized facilities including sidewalks, bus stops, and bike lanes. Poorly maintained pathways create dangerous and slippery walking and biking conditions. Often, ice and snow force pedestrians and bicyclists to travel in the road instead, placing them in conflict with passing vehicles. This danger is amplified during the prolonged periods of darkness in winter in areas without lighting.

- **Roads are designed for cars,** not VRUs. Many key corridors are “stroads”: roads that serve both as a high-flow, high-speed vehicle facility and a high-access, local facility with many driveways and destinations. These types of roads do not prioritize the safety and movements of pedestrians and bicyclists, and often lack adequate sidewalks, bicycle lanes, pedestrian-scale lighting, and designated crossings.

- **Dangerous driving behaviors** represent serious risks for VRUs, such as speeding, inattentiveness and distracted driving, aggressive driving, and driving under the influence of alcohol or drugs. Participants

identified a lack of enforcement addressing dangerous driving behaviors, especially in areas with many people walking, biking, and rolling to key destinations such as schools, community centers, and retail.

When discussing the high-priority corridors and intersections, representatives expressed that nearly every arterial road in Anchorage represents a danger zone for vulnerable road users. While network screening primarily identified east-west-oriented corridors, participants shared that north-south corridors (and associated intersections) also experience these same challenges. Examples include C Street, Seward Highway, Gambell Street, Ingra Street, Lake Otis Parkway, Airport Heights Drive, and Minnesota Drive/Walter J. Hickel Parkway.

Stakeholders identified that increasing and maintaining dedicated VRU infrastructure (shared use paths, sidewalks, walkways, bike lanes, and crossings) would have the greatest impact on improving VRU safety in the Anchorage area. Additionally, deploying self-enforcing roadways, road diets, increased lighting, curb extensions, and pedestrian crossing signals (such as pedestrian hybrid beacons and all-phase-stop signals) would greatly benefit VRU safety. Participants suggested linking available crash datasets to hospitalized injury databases and the Alaska Trauma Registry.

AMATS, the Municipality of Anchorage, and their partners are proactive in addressing the safety of vulnerable road users. The AMATS *Non-Motorized Plan* (2021)[6] identifies existing conditions, network development, prioritization, and six locations with preliminary concept-level designs. The *Non-Motorized Plan* also promotes non-motorized facility design best practices. Additionally, AMATS is currently developing the *Safety Plan*, an implementable framework identifying behavioral and engineering solutions to reduce severe crashes.

Alaska DOT&PF has multiple HSIP projects in design/construction or planning stages to increase VRU safety in the Anchorage region. These include LED lighting increases on corridors with many night-time VRU crashes (including Muldoon Road, Seward Highway, Gambell Street, Minnesota Drive, and Tudor Road); shortening pedestrian crossings at the C Street intersections with Tudor Road and Dimond Boulevard; and Seward Highway parking and pathway improvements. Alaska DOT&PF is also considering further ways to improve connectivity of VRU facilities, improve enforcement tools for hit-and-run drivers, continue improving lighting conditions, install spot improvements at high crash locations, and establish urban safety corridors.

3.3.3 Palmer, Wasilla, and Fairbanks

Representatives from Fairbanks, Palmer, and Wasilla identified similar top VRU challenges as Anchorage participants, including lack of winter maintenance on non-motorized facilities; congested “stroads” with high-volume, high-speed vehicles but also many driveways cutting across sidewalks or pathways; and dangerous driving behaviors such as impaired driving.

Stakeholders also identified the following critical issues:

- **Lack of lighting** is a significant risk for the safety, security, and visibility of VRUs. Given how far north Alaska is (and in particular Fairbanks), it is dark for the majority of the day during wintertime.

6 https://www.muni.org/Departments/OCPD/Planning/AMATS/Documents/Nonmotorized/update_2020/20221019_Anchorage_Non_Motorized_Plan_Final%20Document.pdf

» **Poor visibility in crosswalks and infrequent crossing locations** put pedestrians and other VRUs at risk when crossing the road. Locations where people frequently want or need to cross the road do not have marked, visible crosswalks. Sight distance issues (such as vegetation, buildings, or fences blocking drivers' views) and poorly marked crosswalks (lacking appropriate pavement markings, signs, or lighting) limit drivers' awareness of VRUs in the roadway.

Participants shared examples of long distances between marked crossing locations. In Fairbanks, there is over a mile between marked crosswalks along College Road between University Avenue and Aurora Drive. Following the recent closure of a pedestrian bridge due to deteriorating conditions, stakeholders expressed concern that nearby high school students may run across Geist Road, rather than walk the far distance to the nearest intersection crossing.

Representatives agreed with the identified high-priority corridors and intersections, which often have narrow sidewalks, poor VRU infrastructure, and no marked crosswalks. Participants suggested additional locations with similar issues in Fairbanks, including the Mitchell Expressway/Parks Highway/Route 3 corridor and extending the Geist Road corridor eastward to University Avenue. Another area of concern is the GARS Intersection, a complex intersection where Gaffney Road, Airport Way, Richardson Highway, and Steese Highway meet. This area recently underwent improvements and a new traffic pattern, yet the community is struggling to navigate its new configuration, including how pedestrians move through the intersection.

South Fairbanks, bounded by Lathrop Street, Parks Highway, and Cushman Street, has many low-income and transportation disadvantaged community members. Residents rely on walking and biking year-round to reach everyday places like grocery stores and schools. Although FAST Planning (the Fairbanks MPO) has performed improvements, more could be done to enhance VRU safety throughout the neighborhood.

Infrastructure-based enhancements such as lighting, medians, pedestrian refuge islands, pavement markings, rectangular rapid flashing beacons, road diets, and curb extensions are essential solutions that enhance the visibility of VRUs. Participants also emphasized that VRU safety education is essential for all road users, including both vehicle drivers and vulnerable road user groups. Performing corridor safety studies on identified locations presents an opportunity to identify site-specific problems and engage with community members.

Regarding winter weather maintenance, the City of Fairbanks and FAST Planning developed a priority map for non-motorized route clearance, indicating which sidewalks should be cleared first and in priority order. Stakeholders representing cities throughout Alaska exchange best practices and ideas to sustainably prioritize and fund winter maintenance for both motorized and non-motorized facilities.

Matanuska-Susitna Borough (often referred to as Mat-Su), which contains both Wasilla and Palmer, developed the 2023 *Bicycle and Pedestrian Plan* to improve the Borough's non-motorized transportation network through near, medium, and long term infrastructure, policy, and program recommendations.[7] Examples of recommendations include developing a Complete Streets policy, developing a snow-clearing policy, conducting a level of service assessment for bicyclists and pedestrians, and conducting annual counts at key locations, in addition to a wealth of site-specific safety improvements.

[7] https://matsugov.us/projects/bike-pedestrian-plan

Stakeholders also suggested the need to plan ahead for the growing numbers of electric bikes and other electric-assist mobility devices. As e-bikes grow in popularity, local and state governments must consider how these devices interact with non-motorized facilities. The University of Alaska, Fairbanks is drafting a policy for e-bike use on sidewalks, pathways adjacent to roadways, and off-road trails.

3.3.4 Sitka, Ketchikan, and Juneau

Located on the Southeast coast of Alaska, Sitka, Ketchikan, and Juneau are popular tourism destinations, each with growing numbers of cruise passengers and other visitors. These cities experience similar challenges to other Alaskan regions, such as dangerous driving behaviors, lack of marked crossings and sidewalks, poor VRU visibility, insufficient lighting, and lack of winter maintenance. These issues are common along corridors and intersections frequently traveled by VRUs to reach essential retail, grocery, social, and employment locations.

Representatives also identified several additional VRU safety challenges:

- **Roads with narrow right-of-way** have limited capacity to accommodate bicyclists or widen sidewalks. Sidewalks are often narrow (if present at all), and some have utility poles placed in the middle. In town centers, buildings often extend to the edge of the public right-of-way, limiting sight distances and preventing road widening.

- **Seasonal swells of out-of-town visitors** amplify all of the aforementioned challenges. High volumes of pedestrians in summertime have to travel along narrow sidewalks. Tourists may cross roads in locations without marked crosswalks. There is a general increase in vehicle congestion, accelerating wear and tear on roadway infrastructure. Tourism buses, shuttles, and other large commercial vehicles (which have large blind spots) often share curb-side space with pedestrians and bicyclists, and traverse along roadways where pedestrians may be crossing.

Meeting participants agreed with the high-priority locations identified by the network screening analysis and shared additional locations that experience the aforementioned challenges. Participants shared that the Glacier Highway in the Lemon Creek area of Juneau has recently received many improvements, including a roundabout, new traffic signal, and sidewalks on both sides of the roadway.

In Ketchikan, similar locations include the intersection of Deermount Street and Stedman Street; the corridor where Front Street becomes Mill Street and intersects with Stedman Street; around Ward Cove on N Tongass Highway, which has a major cruise port but no non-motorized infrastructure connecting to nearby locations; and near the Saxman Community Center along S Tongass Highway. The main identified corridor, Tongass Highway, represents a challenge for the City of Ketchikan. Because Tongass Highway is a state-owned road, Ketchikan may not implement safety improvements without approval from DOT&PF. Ketchikan representatives have also experienced challenges with DOT&PF regarding who is responsible for installing, owning, and maintaining traffic signals.

In Sitka, additional locations include the O'Connell Bridge on Harbor Drive, which is a particular risk for bicyclists; Halibut Point Road, which includes the cruise ship port near its northern end; and the Sawmill Creek Boulevard corridor. Halibut Point Road has experienced several bicyclist serious injuries and one fatality in the last several years. The *2023 Sitka Trail Plan*[8], currently in development, recommends creating a separate pathway along the length of Halibut Point Road and a marked crossing facility near the cruise terminal. Additionally, the Sitka Tribe of Alaska manages and operates the area's public transit, fixed-route system, which sees high volumes along Sawmill Creek Boulevard during tourist season. The *2023 Sitka Trail Plan* recommends a pedestrian underpass on Sawmill Creek Road at Fortress of the Bear.

Juneau's Tourism Best Management Practices (TBMP) program is a cooperative effort of tour operators, cruise lines, transportation providers, and the City and Borough of Juneau to minimize the impacts of tourism while enhancing visitors' experiences.[9] The program publishes guidelines for its members, including transportation and safety best practices. The City of Sitka Tourism Task Force and Ketchikan Visitors Bureau are currently in the process of establishing similar guidelines. Both the City of Ketchikan and the City and Borough of Juneau hire crossing guards in summer to help keep people in crosswalks along the downtown corridors.

Participants identified the growing challenge of electric bike ridership, especially e-bike rentals as a part of the tourism industry. E-bike riders require education about where and how to safely ride e-bikes and interact with pedestrians and vehicles. The *2023 Sitka Trail Plan* recommends establishing an e-bike policy addressing speed, behavior, potential off-limit areas, and bike use on trails.

3.3.5 Bethel

The City of Bethel is the largest rural community in western Alaska, perched on top of tundra and permafrost. Bethel community members experience similar challenges as identified in other consultation meetings: in particular, inadequate winter weather maintenance and insufficient lighting during prolonged periods of darkness. The City of Bethel's 2020 *Long Range Transportation Plan* identifies several high priority safety concerns affecting VRUs, including lack of streetlights and street signs, speeding, impaired driving, and distracted driving.[10]

Participants shared several more challenges that affect VRU safety:

- **Impaired driving** is a significant factor for crashes, including a pedestrian who was fatally struck by an impaired driver in August 2023. This includes both alcohol- and drug-impairment, which have increased since the allowance of alcohol sales in Bethel in 2012 and the statewide legalization of recreational cannabis use in 2015.

- **Staffing shortages and seasonal weather maintenance and damage** combine to create routine maintenance backlogs, such as painting bike lanes and crosswalks or filling in potholes. For example, the main bike lane through town has faded markings, and drivers often use the bike lane as a vehicle turning lane. There is possible danger to nearby VRUs when vehicle drivers swerve to avoid potholes.

[8] https://sitkatrailworks.org/2023-trail-plan/

[9] https://www.traveljuneau.com/tbmp/

[10] https://tundra-ridge.com/documents/Bethel%20Long%20Range%20Transportation%20Plan%202020_sm.pdf

Representatives concurred that Chief Eddie Hoffman Highway is a high-risk corridor for VRUs. Many pedestrians travel along Hoffman Highway to and from neighborhood subdivisions and common destinations. These areas do not have lighting, including around the U.S. Post Office, Salmonberry Street in the Blueberry Subdivision, and near the neighborhood along Raven Road, Our Own Road, and Hoffman Road.

Participants also identified Watson's Corner as a dangerous location. This intersection of Hoffman Highway, Third Avenue, and Ridgecrest Drive does not have a traffic signal, despite being the busiest intersection in town. There are marked crosswalks across Third Avenue and Ridgecrest Drive, but not across Hoffman Highway. Stakeholders suggested that some intersections and crossings would benefit from enhanced traffic control, such as stoplights, signalized crossing with high visibility crosswalks, and enhanced lighting.

Additionally, many residents rely on snowmachines as their main mode of transportation in winter, including members of low-income populations. There is one official snowmachine crossing of Hoffman Highway near Akiak Drive, close to Watson's Corner. There is also a second unofficial crossing near Hoffman Road by the trailer court. Residents also commonly travel by riverboats and all-terrain vehicles during summer months.

4. COMMON THEMES

Common themes emerged across the network screening results and stakeholder consultation meetings. This section describes common themes and key takeaways, which informed the strategies in Section 5.

4.1.1 VRUs Cannot Safely Reach Their Everyday Destinations

Vulnerable road users cannot safely reach their everyday destinations. Everyday destinations are the places of interest that people routinely travel to and from: their homes, schools, community centers, places of employment, post offices, grocery stores and retail, medical care and hospitals, social services, recreation, places of worship, and more. This greatly affects members of disadvantaged and underserved communities, who are more often reliant on walking, biking, and taking transit to their destinations. Even in more secluded or rural areas, walking and biking may be some people's only options.

Many issues underlie the fact there may be no safe, connected, and protected routes for vulnerable road users. There may be inadequate infrastructure dedicated to the safe passage of pedestrians and bicyclists. Historically, roadways were designed for motor vehicle throughput – getting cars where they need to go as quickly as possible. Sidewalks may be in poor condition, narrow, not compliant with Americans with Disabilities Act (ADA) standards or missing entirely. Routes may lack sufficient pedestrian-scale lighting. Crossing locations may be few and far between, poorly marked, or difficult for drivers to see. Limited public right-of-way may restrict plausible improvements. Drivers may choose to drive in dangerous ways, such as using their phone, speeding, or under the influence of drugs or alcohol. In winter, large volumes of snow or ice may force pedestrians to walk in the roadway.

Each high-risk location has a unique combination of factors heightening the risk of serious injury or death for a pedestrian or bicyclist. Safety risks should be addressed within the context and purpose of a specific route. Several of these factors are explored further in the following sections.

4.1.2 Road Design and Adjacent Land Use Create a Dangerous Combination

Stakeholders repeatedly noted that roads prioritize vehicles, not non-motorized road users. This is most prevalent on arterial and collector roads with frequent access points to retail, neighborhoods, workplaces, and other destinations. These "stroads" serve both as high-volume corridors for fast-moving vehicles and as connections to many places of interest. Sidewalks and bike lanes (if existing) may be frequently interrupted by vehicles entering or existing driveways or turning at intersections. Corridors may lack adequate sidewalks, protected bicycle lanes, pedestrian-scale lighting, and high visibility crossings. Drivers' sight distance may be blocked or restricted by turning or parked vehicles, fences, signs, vegetation, buildings, and more.

This mix creates dangerous conflict points for VRUs trying to access their everyday destinations. When combined with dangerous driving behaviors such as speeding or running a red light, the results may be deadly. Stakeholders felt there was inadequate enforcement for unsafe drivers.

4.1.3 Crossing Locations are Infrequent and Poorly Marked

People want to cross the road where it is convenient. However, convenient crossings may not be safe crossings, especially in areas with fast-moving vehicles, poor sight distances, low visibility or lighting, and long crossing distances. There may not be a marked crosswalk in a location where people desire to cross the street. In many cases, the nearest designated crossing may be a significant distance away – over a quarter mile or more. Many intersections do not have marked crosswalks or pedestrian crossing signals. Where crosswalks do exist, pavement markings or painting may be faded due to regular wear and tear or winter maintenance (for example, snowplows may degrade pavement markings over time). Infrequent and poorly marked crossings inhibit vulnerable road users from safely reaching their everyday destinations.

4.1.4 It's Dark Outside and There Are No Lights

Given Alaska's northern latitude, many communities experience extended hours of darkness in the winter. At the same time, most streets and roads do not have any roadway lighting, much-less pedestrian scale lighting. Pedestrian scale lighting is smaller-scale and more frequently spaced street lighting that emphasizes pedestrian movements. Lighting increases the night-time visibility of non-motorized road users and increases vehicle drivers' awareness of VRUs in and adjacent to the roadway.

It is not feasible or desirable to install lighting everywhere, throughout every community, on every single road. Lighting requires a power supply connection to existing electric utilities, which may be a challenge in rural or isolated communities. However, lighting may be installed along main roads and intersections where vulnerable road users frequently travel, including key routes connecting residential areas to everyday destinations.

4.1.5 Inadequate Winter Maintenance Forces People into the Roadway

The lack of timely, efficient, and widespread winter weather maintenance on non-motorized facilities was a unanimous challenge identified by stakeholders. All Alaskan communities experience winter weather including snow and ice. Non-motorized facilities often receive lower priority than roadway facilities for snow and ice clearance. Sidewalks, pathways, bike lanes, and bus stops may be impassable or have slippery conditions. This can be exacerbated by excessive snowfall or snowplows pushing tall snowbanks out of the roadway.

When sidewalks and other non-motorized facilities are blocked by snow and ice, pedestrians and bicyclists are forced to travel in the roadway. This places vulnerable road users in conflict with moving vehicles in potentially slippery or low-visibility road conditions. The safety risks to VRUs increase when other risk factors are present, such as lack of lighting or dangerous driving behaviors.

4.1.6 Dangerous Driving Behaviors Threaten VRUs

Motor vehicles represent the most significant threat to vulnerable road users. The human body can withstand only a limited amount of impact force from a vehicle before death or injury occurs. It is the shared responsibility of all vehicle drivers to drive in a safe, responsible, and respectful way.

Dangerous driving behaviors include speeding and driving under the influence of drugs or alcohol. It is dangerous to drive while distracted, drowsy, or inattentive, which includes texting or using a handheld device, eating, talking to passengers, or any action that takes the driver's eyes of the road, hands off the wheel, or mind off the task of

driving. Driving in an aggressive manner toward another vehicle, motorcycle, bicyclist, pedestrian, or other road user puts everyone on the road at risk. Not obeying traffic laws (including running a stop sign or red light) is dangerous, especially to vulnerable road users.

Stakeholders expressed that enforcement does not adequately address dangerous driving behaviors in their communities. In a transportation system designed to prioritize vehicles, this is especially felt in areas where people frequently walk, bike, and roll to their everyday destinations.

4.1.7 Seasonal Tourism Volumes Increase VRU-Vehicle Conflicts

Many cities, such as communities along Alaska's Southeast Coast, have growing destination tourism, which increases congestion and wear and tear on roadways. The seasonal influx of visitors exacerbates other VRU safety risks described above. With higher volumes of pedestrians, there may be increases in crossings at non-designated locations. There may be increased conflicts between pedestrians and tourism buses and shuttles.

Additionally, some tourism hubs such as cruise ports may be secluded, lacking non-motorized infrastructure connections to nearby locations. In these situations, the only option is for cruise passengers to load onto buses or other vehicles – no opportunities exist to bike, walk, or roll to nearby destinations.

4.1.8 E-Bikes Are Speeding into The Future

Stakeholders emphasized the need to prepare for growing numbers of electric bikes and other electric-assist mobility devices on Alaska's roadways – both for personal use and as a part of the tourism industry. Certain classes of e-bikes may travel up to 28 miles per hour, which presents a safety risk to pedestrians and other vulnerable road users. Communities may consider regulating where and when e-bikes are allowed on non-motorized facilities. It is important to educate e-bike riders on safe riding practices, wearing helmets, interacting with pedestrians and bicyclists, and other rules of the road.

5. VRU STRATEGIES

The primary outcome of the data-driven analyses and local consultations is a program of strategies to reduce the safety risks to vulnerable road users, both statewide and specifically in high-risk areas. This section describes both existing SHSP strategies that increase VRU safety and new strategies that address common themes affecting VRU safety risks and high-priority areas.

The program of strategies is built with the principles and elements of the Safe System Approach to make progress *Toward Zero Deaths* and serious injuries on Alaska's public roadways. The existing SHSP and new VRU strategies comprehensively and collaboratively build redundant protections for VRUs into the transportation system. The stakeholders who will implement these strategies demonstrate the shared responsibility to accommodate and minimize the impacts of people's mistakes, which will happen.

Strategies address all five elements of the Safe System Approach through the inherent organization of the SHSP: Safe Road Users, Safe Roads and Safe Speeds, Safe Vehicles, and Post-Crash Care. Through a combination of engineering, enforcement, and education, the strategies seek to **remove severe conflicts** where possible; **manage conflicts by separating different road users in time**; **reduce vehicle speeds** in locations where VRUs are often present; and **increase drivers' attentiveness and awareness** of nearby VRUs.

5.1 HOW WILL THESE STRATEGIES BE IMPLEMENTED?

These planning-level strategies may be implemented systemically or in specific high priority corridors and intersections to reduce the risk of VRU fatalities and serious injuries. The program of strategies does not identify location-specific improvements; rather, regional and local jurisdictions may implement the strategies that best meet the needs of their communities. The high-priority locations identified in this assessment will require additional evaluation to develop and program context-sensitive VRU projects.

A wide range of Alaskan safety partners will collaborate to implement these strategies, including DOT&PF, AHSO, MPOs, city and Tribal governments and transportation departments, non-profit organizations, law enforcement, first responders, medical and public healthcare workers, and more.

Strategies will come to fruition by many avenues – through existing and new initiatives, state and local efforts, and a range of policies, plans, programs, and projects. This document is not the end of the VRU Safety Assessment; rather, this process represents the first step in a continual effort to increase VRU safety. DOT&PF, AHSO, and our partners will revise the program of strategies as needed. The SHSP Focus Area teams will incorporate the VRU Safety Assessment findings into the implementation of their own Action Plans, listed in Appendix B. The SHSP Tribal Advisory Committee, composed of members of Alaska's Tribes and Nations, will also guide the implementation of VRU strategies moving forward.

5.2 SUMMARY OF STRATEGIES

The below table captures 14 VRU Safety Assessment strategies and 11 existing SHSP Focus Area strategies that will reduce the risk of VRU fatalities and serious injuries on Alaska's public roadways. The existing SHSP Focus Area strategies are labelled with the corresponding strategy number in their respective action plans. These strategies are explored further in the subsequent sections.

Source	Strategy #	Strategy
New VRU Strategies		
VRU Safety Assessment	1	Conduct VRU Safety Audits and other types of safety studies in identified high-risk corridors and intersections.
VRU Safety Assessment	2	Deploy proven and innovative safety countermeasures to support the mobility of underserved communities.
VRU Safety Assessment	3	Install and maintain crossing infrastructure in locations where people commonly cross the road.
VRU Safety Assessment	4	Install pedestrian scale lighting along routes frequently traveled by VRUs.
VRU Safety Assessment	5	Separate VRUs in space from adjacent motor vehicle traffic.
VRU Safety Assessment	6	Deploy proven and innovative countermeasures on arterials with high volumes of high-speed vehicles, driveways, and VRUs.
VRU Safety Assessment	7	Continue to perform community engagement and education about VRU safety.
VRU Safety Assessment	8	Promote knowledge-sharing about transportation safety best practices for the tourism industry.
VRU Safety Assessment	9	Deploy crossing guard programs and increase crossing visibility in tourism destination areas.
VRU Safety Assessment	10	Continue to provide ADA-accessible facilities to support safe and equitable mobility for all pedestrians.
VRU Safety Assessment	11	Explore best practices for electric bike use on non-motorized facilities.
VRU Safety Assessment	12	Continue to collaborate with law enforcement about VRU safety.
VRU Safety Assessment	13	Develop a process to monitor progress of VRU safety in identified high-risk areas.
VRU Safety Assessment	14	Continue to research and incorporate new and emerging VRU and Safe System Approach strategies and countermeasures.
Existing SHSP Strategies		
Pedestrians and Bicyclists Focus Area	1	Implement best practices and proven countermeasures and incorporate into state and local policies and manuals to support safe travel for pedestrians and bicyclists.
Pedestrians and Bicyclists Focus Area	2	Educate pedestrians, bicyclists, and other vulnerable road users about "rules of the road" and safety equipment.
Pedestrians and Bicyclists Focus Area	3	Develop and implement a statewide active transportation safety action plan and data collection plan.
Dangerous Driving Focus Area	1	Explore and implement best practices and policies to address dangerous driving behaviors.

Source	Strategy #	Strategy
Dangerous Driving Focus Area	2	Implement media campaigns and educational trainings to discourage dangerous driving behaviors.
Speed Management Focus Area	1	Conduct high-visibility enforcement and awareness campaigns to reduce speeding.
Speed Management Focus Area	2	Develop model policies and implement and innovative practices to reduce speeding.
Roadways Focus Area	2	Perform timely and adequate winter weather maintenance for all road users.
Young Drivers and Older Drivers Focus Area	1	Conduct outreach and education to encourage young drivers to practice safe driving behaviors amongst their peers.
Vehicle Safety Focus Area	2	Update and share safe driving best practices with tourism commercial vehicle operators and owners.
Emergency Response Focus Area	2	Protect first responders at crashes through tools, techniques, technology, and information-sharing practices.

5.3 EXISTING SHSP STRATEGIES

The 2023-2027 Alaska Strategic Highway Safety Plan includes many strategies that both directly and indirectly improve VRU safety. The SHSP is organized around the Safe System Approach by Emphasis Areas. Within each Emphasis Area, Focus Areas will implement action plans between now and 2027 to support a Safe System throughout Alaska. This section draws high-level connections to those existing strategies and actions. Refer to SHSP Appendix B to view all Focus Area action plans.

Note: The Focus Area action plans are living documents. This means over time, Focus Area teams will update, add, and improve the strategies and actions within. The action language below is up to date as of November 2023 and may differ slightly from Appendix B.

5.3.1 Pedestrians and Bicyclists Focus Area

Foremost, the SHSP has a **Pedestrians and Bicyclists Focus Area** within the Safe Road Users Emphasis Area. Collectively, this Focus Area's strategies and actions seek to expand available data about VRUs, create inclusive policies and guidance (including a statewide Complete Streets policy), provide public education, and build roadways designed inclusively for pedestrians and bicyclists.

The Pedestrians and Bicyclists Focus Area action plan has three strategies, each with actions directly relevant to the VRU Safety Assessment:

- **Strategy 1: Implement best practices and proven countermeasures and incorporate into state and local policies and manuals to support safe travel for pedestrians and bicyclists.**
  - Action 1.1: Review existing state and municipality administrative codes, policies, and manuals to identify gaps and update them as needed to include pedestrians, bicyclists, and other active transportation users.

- Action 1.2: Leverage the federal revisions to the Safe Routes to School program to revitalize and expand Alaska's infrastructure and non-infrastructure projects offered under the program and coordinate with school districts.
- Action 1.3: Develop and implement a statewide Complete Streets construction, design, and maintenance policy that considers local-level Complete Streets policies.
- Action 1.4: Research and implement low-cost, quick-build engineering solutions and pedestrian-focused lighting pilot projects at roadway crossings for active transportation users.
- Action 1.5: Develop the Pedestrian Standards section of the Alaska Highway Preconstruction Manual.

» **Strategy 2: Educate pedestrians, bicyclists, and other vulnerable road users about "rules of the road" and safety equipment.**

- Action 2.1: Develop model language and fact sheets for statewide "stop for pedestrians in crosswalks" and "no right turn on red" policies.
- Action 2.2: Develop and evaluate the effectiveness of comprehensive education campaigns targeting pedestrians, bicyclists, and other active transportation users in Alaskan communities on topics including "rules of the road" and using helmets, high-visibility gear, and other protective equipment.

» **Strategy 3: Develop and implement a statewide active transportation safety action plan and data collection plan.**

- Action 3.1: Develop a strategic data collection plan to obtain pedestrian and bicycle counts, including researching methods to crowdsource count data.
- Action 3.2: Develop a DOT statewide active transportation safety action plan in coordination with municipal and Metropolitan Planning Organization plans.

5.3.2 Dangerous Driving and Speed Management Focus Areas

The SHSP has several Focus Areas that address unsafe driving behaviors and speeding vehicles, which both present risks to VRUs. These actions promote safer and slower driving through roadway design, education, and enforcement, thereby reducing the likelihood and severity of potential crashes with VRUs.

The **Dangerous Driving Focus Area** (Safe Road Users Emphasis Area) focuses on unsafe driving behaviors such as aggressive, distracted, and drowsy driving. Similarly, the AHSO Impaired Driving Task Force seeks to reduce both alcohol-impaired and drug-impaired driving. Preventing these types of dangerous driving behaviors may both increase driver awareness and attentiveness on the roadway and lower risks to VRUs.

The Dangerous Driving Focus Area action plan contains Action 1.1 to develop criteria and a data-driven process for establishing urban traffic safety corridors. These types of safety corridors may have lower posted speed limits, require hands-free device use only, and enact higher fines. Similarly, Action 1.3 builds the foundation for future "hands-free devices only" policies in work zones, active school zones, and safety corridors. These actions support safer environments for students, children, and work zone workers, among others.

The Dangerous Driving Focus Area lists Action 1.4 to revise the *Alaska Driver Manual* and incorporate best practices about safe driving behaviors. This is an opportunity to emphasize pedestrian- and bicyclist-specific considerations and remind drivers of their shared responsibility within a Safe System.

The SHSP also has the **Speed Management Focus Area** (Safe Roads and Safe Speeds Emphasis Area). Similar to other dangerous driving behaviors, speeding is a significant risk to VRUs, particularly when combined with other factors such as poor lighting, lack of marked crossings, or winter weather conditions. This Focus Area encourages vehicle speeds that are appropriate for a given area and surrounding land uses, i.e., slower speeds in areas with higher volumes of people walking, biking, and rolling. This includes surrounding the places and services that people use most often, such as schools, grocery and retail, community centers, medical and hospital services, employment centers, and tourism destinations.

The Speed Management Focus Area has Action 2.1 to develop a model urban speed limit setting policy that is consistent across the state. The policy would promote selecting speed limits that reflect a road's purpose and explicitly consider all road users, including VRUs.

High visibility enforcement and corresponding media campaigns are actions for both the Dangerous Driving Focus Area (Action 2.3) and the Speed Management Focus Area (Actions 1.1 and 1.2). Enforcement is a key component in promoting safe driving behaviors and safe speeds.

5.3.3 Roadways Focus Area

The **Roadways Focus Area** (Safe Roads and Safe Speeds Emphasis Area) has one strategy that directly addresses the safety concerns and risks VRUs experience with snow and winter weather maintenance. This strategy seeks to establish consistent, sustainable, and prioritized snow removal from non-motorized facilities. Clearing sidewalks and bike lanes of snow and ice in a timely fashion will eliminate the risks pedestrians and bicyclists face when ice and snow forces them into the roadway.

» **Strategy 2: Perform timely and adequate winter weather maintenance for all road users.**

- Action 2.1: Identify DOT&PF Maintenance and Operations Lead to coordinate winter weather maintenance needs and secure and prioritize sustainable funding for weather maintenance of service for all road users.
- Action 2.2: Coordinate with local agencies, jurisdictions, and community stakeholders to develop a priority system and plowing sequence on routes for winter maintenance on motorized and non-motorized facilities.

5.3.4 Other Focus Areas

Other SHSP Focus Area action plans indirectly support VRU safety. For example, the **Young Drivers and Older Drivers Focus Area** (Safe Road Users Emphasis Area) contains actions for peer-to-peer education programs to promote safe driving, walking, and riding to young people, which is a critical intervention point to increase driver awareness and attentiveness.

The **Vehicle Safety Focus Area** (Safe Vehicles Emphasis Area) has a strategy to update and share safe driving best practices with tourism commercial vehicle operators and owners in the City and Borough of Juneau (Action 2.1). This action is an opportunity to promote safer driving behaviors for tour bus and shuttle drivers, as well as information about safe walking around tourism destinations that drivers/operators may pass along to their passengers. In the next section, a new VRU strategy builds upon this action to promote knowledge-sharing amongst visitor and tourism bureaus, owners, and operators throughout Alaska.

The **Emergency Response Focus Area** (Post-Crash Care Emphasis Area) contains a strategy (Strategy 2) to protect first responders at crash sites through tools, techniques, technology, and information-sharing. When first responders or vehicle passengers step outside of their parked vehicle, they too become pedestrians. This strategy can help prevent secondary crashes from occurring when first responders and crash victims are roadside.

The **Motorcycles, All-Purpose Vehicles, and Snowmachines Focus Area** (Safe Road Users Emphasis Area) examines and expands on policies, guidance, and education for all-terrain vehicle and snowmachine riders. Many Alaskans rely on snowmachines and all-terrain vehicles to reach their everyday destinations. Although snowmachine riders are not considered VRUs, these Focus Area actions address safety risks raised by local stakeholders during consultation.

5.4 NEW VRU STRATEGIES

The VRU Safety Assessment identified VRU barriers and challenges, as well as contributing factors, road facility types, and other risks to VRU safety. This section describes new strategies to supplement the SHSP Focus Area action plans and address thematic issues both statewide and in high-priority areas. These strategies provide a planning framework for DOT&PF, AHSO, MPOs, local and Tribal governments, and other safety stakeholders to implement solutions that best fit within the context of their community. Across all strategies, DOT&PF encourages stakeholders to implement both proven safety countermeasures and innovative solutions.

5.4.1 Strategy 1: Conduct VRU Safety Audits and other types of safety studies in identified high-risk corridors and intersections.

Both this VRU Safety Assessment and other ongoing state and local initiatives have identified corridors and intersections with significant risks for VRUs. A safety study is the first step to developing improvement projects. Site-specific safety studies will identify key infrastructure barriers, behavioral challenges, VRU needs, and context-sensitive design alternatives. There are many types of safety studies, depending on the location and need: for example, road safety audits, walk audits, corridor studies, or sight distance reviews. Road safety audits may be eligible non-infrastructure projects for HSIP funding.

Performing a safety study provides community members and organizations with the opportunity to share their experiences, needs, and future vision for safer roads and places. Safety studies may also engage with a wide variety of safety partners, including local and Tribal governments, law enforcement, maintenance, public health, first responders, and the public.

5.4.2 Strategy 2: Deploy proven and innovative safety countermeasures to support the mobility of underserved communities.

Many people are dependent on walking, biking, and rolling to reach their everyday destinations. When performing safety studies or improvement projects, planners and engineers should take into account the demographics of surrounding communities and places of interest. Nearby populations of older individuals, children, individuals with disabilities, zero-vehicle households, or other underserved communities increase the need for VRU countermeasures to support the ability of VRUs to access essential goods and services.

Infrastructure and behavioral solutions should fit the roadway's context and purpose, including functional class, facility type, speed limit, vehicle and non-motorized traffic volumes, adjacent land uses, nearby transit routes, and surrounding demographics.

The Federal Highway Administration (FHWA) promotes Proven Safety Countermeasures[11] such as bicycle lanes, walkways, road diets, pedestrian signals, lighting, pedestrian refuge islands, and crosswalk visibility enhancements. The federal PEDSAFE and BIKESAFE Safety Guide and Countermeasure Selection Systems offer a wealth of enforcement, education, and engineering treatment options.[12,13] FHWA shares Roadway Safety Noteworthy Practices being implemented across the nation, including topics about equity, vulnerable road users, and Tribal, local, and rural road safety.[14] FHWA also encourages roadway owners to pilot innovative and emerging solutions, which may require coordination and approval from the FHWA Alaska Division Office.

5.4.3 Strategy 3: Install and maintain crossing infrastructure in locations where people commonly cross the road.

Safe roadway crossings should provide convenient, safe, accessible, and highly visible crosswalks for people to access their everyday destinations. In locations with far distances between designated crossings, planners and engineers may consider how and where additional crossing locations can both meet the needs of VRUs and fit within the roadway context. Ongoing, routine maintenance will ensure that crossing locations remain visible, accessible, and safe.

Pedestrian and bicyclist crossings may employ crosswalk visibility enhancements including high-visibility crosswalk markings, enhanced lighting, signing, and pavement markings (such as advance stop or yield lines). On wide roads with long crossing distances, crosswalks may use medians or pedestrian refuge islands to protect VRUs and shorten crossing distances. Curb extensions, removal of nearby parking, and other sight distance improvements can improve the visibility of VRUs to approaching motorists. Pedestrian signals at intersections may prioritize VRUs, such as countdown timers, Leading Pedestrian Intervals, or all-phase-stop pedestrian crossings. At unsignalized or mid-block crossings, beacons such as Pedestrian Hybrid Beacons and Rectangular Rapid Flashing Beacons draw drivers' attention towards VRUs in the roadway. All crossings should meet ADA

[11] https://highways.dot.gov/safety/proven-safety-countermeasures

[12] http://www.pedbikesafe.org/pedsafe/index.cfm

[13] http://www.pedbikesafe.org/bikesafe/index.cfm

[14] https://highways.dot.gov/safety/learn-safety/noteworthy-practices

accessibility standards, including curb ramps and audiovisual cues. See the previous strategy for a list of countermeasure resources.

5.4.4 Strategy 4: Install pedestrian scale lighting along routes frequently traveled by VRUs.

Pedestrian scale lighting is smaller-scale, frequently placed lighting to increase the visibility, safety, and security of vulnerable road users. This type of lighting illuminates pedestrians and bicyclists on and adjacent to the roadway, increasing drivers' awareness of nearby VRUs. Both roadway and pedestrian-scale lighting are critical to VRU safety, particularly during Alaska's prolonged hours of darkness or when snow and ice force VRUs to travel in the roadway.

Lighting should be installed on key routes frequently traveled by pedestrians and bicyclists to their everyday destinations – connecting residential neighborhoods to schools, food, employment, and other essential goods and services. Lighting is essential at intersections and other locations with designated pedestrian crossings. Lighting should complement other countermeasures to increase VRU visibility and priority.

5.4.5 Strategy 5: Separate VRUs in space from adjacent motor vehicle traffic.

Where possible, the best option is to remove conflicts by separating vulnerable road users in space from vehicle traffic. Planners and engineers may consider integrating VRU separation into routine maintenance, when rehabilitation or replacement occurs, and as road design and right-of-way allows. This may include installing and maintaining sidewalks, shared use paths, and/or separated bicycle lanes on corridors where pedestrians and bicyclists frequently travel. It may also mean widening shoulders to create a buffer zone. All sidewalks and shared use pathways should meet ADA accessibility standards.

5.4.6 Strategy 6: Deploy proven and innovative countermeasures on arterials with high volumes of high-speed vehicles, driveways, and VRUs.

Roads with high-speed vehicles and dense nearby land use represent a serious risk to vulnerable road users trying to reach their destinations, particularly in Anchorage. Driveways frequently intersect with sidewalks or bike lanes (if they exist), creating conflict points between pedestrians, bicyclists, and turning vehicles. These roads may have infrequent or low-visibility crossings.

Corridor studies may help identify context sensitive solutions that meet the roadway's purpose and the surrounding community's needs. Planners and engineers should also consider driveway and access management in the planning and zoning stages for new development or reconfigurations.

FHWA Proven Safety Countermeasures, PEDSAFE, and BIKESAFE promote countermeasures to increase the visibility, priority, and safety of VRUs along arterials while slowing vehicle speeds.[15,16,17] For example, road diets, narrowed travel lanes, and other design elements of self-enforcing/self-explaining roadways encourage motorists

[15] https://highways.dot.gov/safety/proven-safety-countermeasures

[16] http://www.pedbikesafe.org/pedsafe/index.cfm

[17] http://www.pedbikesafe.org/bikesafe/index.cfm

to drive at slower speeds.[18] This provides drivers with more time to perceive and react to nearby VRUs, while also reducing impact forces if a crash occurs. These solutions may also reclaim space in the right-of-way for dedicated VRU infrastructure like sidewalks, medians and refuge islands, and bike lanes. A community may install gateway treatments, which are physical landmarks that signal to drivers that they are entering a residential, commercial, or business district and should slow down.

For mid-block and intersection pedestrian crossings on arterials, use countermeasures such as high visibility crosswalks, lighting, curb extensions, and pedestrian beacons and signals. Rectangular Rapid Flashing Beacons can increase VRU visibility at mid-block crossings on roads with speed limits of 35 miles per hour or less; Pedestrian Hybrid Beacons promote safe VRU crossings mid-block on multi-lane roadways with speed limits of 40 miles per hour or greater. See Strategy 3 also.

5.4.7 Strategy 7: Continue to perform community engagement and education about VRU safety.

The AHSO, DOT&PF, and our partners perform community outreach and education as a part of the SHSP and Highway Safety Plan. Outreach and communication amplify the *Toward Zero Deaths* vision, SHSP mission and goals, and messages about the shared responsibility among all roadway users, owners, and operators to build a Safe System. In alignment with Public Participation and Engagement in the AHSO Highway Safety Plan, DOT&PF will:

- Maintain and strengthen coordination with key safety partners statewide.
- Encourage a continuous feedback loop of input from State and local partners.
- Enhance convenient opportunities for all interested members of the public to provide input and feedback on current safety initiatives and potential new initiatives.
- Continually identify and engage members of communities most affected by crashes that may have been previously overlooked.
- Meet citizens where they are at by seeking to enhance collaborations with nonprofits, faith-based organizations, community, and civic associations.
- Provide early and continuous opportunities for public input and take their needs and preferences into account when developing and implementing safety countermeasures.

The AHSO welcomes local and Tribal agencies, community organizations, and interested parties to participate on the SHSP Focus Area teams, including the Pedestrian and Bicyclist Focus Area.

[18] https://www.fhwa.dot.gov/publications/research/safety/17098/17098.pdf

5.4.8 Strategy 8: Promote knowledge-sharing about transportation safety best practices for the tourism industry.

Alaskan cities with tourism destinations find unique and adaptive ways to enhance visitor experiences while mitigating congestion and other negative impacts. Each city's government, tourism/visitor's bureau, and tourism operators/owners collaborate to accommodate seasonal swells of visitors.

There are opportunities for knowledge sharing and networking between cities about transportation safety best practices. For example, the Juneau Tourism Best Management Practices program publishes guidelines; the SHSP Vehicle Safety Focus Area has an action to incorporate guidelines specifically addressing transportation safety topics. The City of Ketchikan deploys seasoning crossing guard programs (described further in Strategy 9). Cities could share these tourism transportation safety best practices with each other in peer exchanges or other networking opportunities.

5.4.9 Strategy 9: Deploy crossing guard programs and increase crossing visibility in tourism destination areas.

In areas with high volumes of tourists, cities and boroughs may deploy crossing guard programs along busy corridors. Crossing guards may help keep people in marked crosswalks, manage the flow of traffic, and draw drivers' attention to VRUs. Locations may include near cruise ports, bus terminals, trailheads, retail and historic districts, and other key tourism destinations. Crossing locations should have high visibility crosswalks, crossing signals, lighting, and other visibility-enhancing features as outlined in Strategy 3.

5.4.10 Strategy 10: Continue to provide ADA-accessible facilities to support safe and equitable mobility for all pedestrians.

Alaska DOT&PF and local road owners will continue to alter existing facilities or construct new facilities as necessary to comply with Americans with Disabilities Act requirements. DOT&PF will continue to implement the *Alaska Americans with Disabilities Act Transition Plan*, which guide's DOT&PF's efforts to provide an accessible transportation system program.[19] This strategy interplays with many other strategies in the VRU Safety Assessment.

5.4.11 Strategy 11: Explore best practices for electric bike use on non-motorized facilities.

DOT&PF and local communities may explore national best practices for electric bike and other electric-assist mobility device use on non-motorized fatalities. Facility types include sidewalks, shared use paths, and bicycle lanes. Stakeholders may evaluate how other states and regions choose to regulate where, when, and how e-bikes may operate. Additional topics may include protective equipment requirements (such as helmets) and safe distance passing laws (for example, some states require a minimum passing width distance vehicles driving around bicycles). Stakeholders may also explore existing educational opportunities and messaging to educate e-bike riders on side riding practices and rules of the road.

[19] https://dot.alaska.gov/cvlrts/pdfs/ADA_Transition_Plan.pdf

5.4.12 Strategy 12: Continue to collaborate with law enforcement about VRU safety.

Law enforcement agencies are key partners in roadway safety. Law enforcement help reduce dangerous driving behaviors such as speeding, impaired driving, and distracted driving, which are significant safety risks to VRUs sharing the roadway. DOT&PF and local safety partners will continue to collaborate with state, regional, and local law enforcement to perform high visibility enforcement and corresponding media campaigns. Law enforcement will target vehicles and the offenses drivers may commit that make the road less safe for vulnerable road users.

Additional opportunities may include providing training to law enforcement on bicycle/pedestrian laws, educating law enforcement on accurately identifying non-motorized crash details on crash reports, and sharing crash analysis results with law enforcement to target enforcement efforts in high-risk areas.

5.4.13 Strategy 13: Develop a process to monitor progress of VRU safety in identified high-risk areas.

The VRU Safety Assessment identified high-risk corridors and intersections throughout Alaskan communities based on crash data between 2016 and 2021. DOT&PF may explore the development of a monitoring process for VRU safety in identified high-risk areas. Monitoring trends over time can draw connections between investments in safety improvements (both infrastructure and behavioral) and crash trends. This process may include identifying state- and local-programmed projects in or near identified locations.

5.4.14 Strategy 14: Continue to research and incorporate new and emerging VRU and Safe System Approach strategies and countermeasures.

Transportation safety is not static. New strategies, countermeasures, and devices are being explored and implemented every day. DOT&PF and AHSO will continue to research, pilot, and incorporate new technologies, tools, infrastructure design, Crash Modification Factors (CMFs), and other countermeasures into VRU projects. DOT&PF will draw on available research and resources as they become available, such as through FHWA publications, FHWA Noteworthy Practices, the national CMF Clearinghouse, or other States.

6. HIGH RISK CORRIDORS AND INTERSECTIONS

This section contains the lists and maps of the top 16 high-injury corridors and top 15 high-injury intersections throughout Alaska, identified through the network screening analysis during crash data between 2016 and 2021.

Note: The tables list locations in alphabetical order, not ranked order. The numbers on the maps do not indicate any sort of order, they are listed for visual identification of place names only.

TABLE 3: TOP 16 IDENTIFIED HIGH-INJURY CORRIDORS

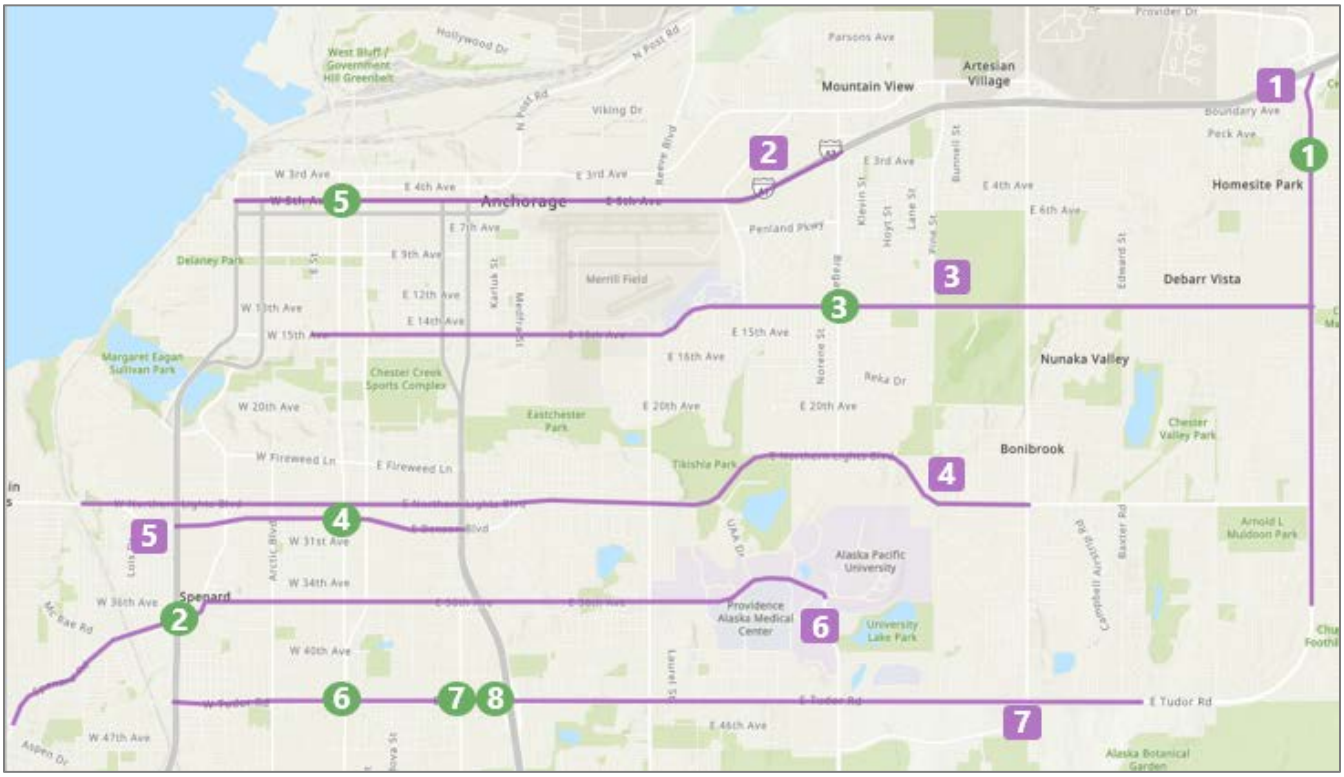
Municipality	Corridor	Cross Street (Westernmost, Southernmost)	Cross Street (Easternmost, Northernmost)	Crosses Justice40 Community?
Anchorage	5th Ave / Glenn Hwy	L St	Bragaw St	Yes
Anchorage	Benson Blvd	Minnesota Dr	Seward Hwy	Yes
Anchorage	Debarr Rd / 15th St	E St	Muldoon Rd	Yes
Anchorage	Muldoon Rd	36th Ave	Glenn Hwy	Yes
Anchorage	Northern Lights Blvd	Forest Park Dr	Pine St	Yes
Anchorage	Spenard / 36th Ave / Providence Dr	Wisconsin St	Elmore Rd	Yes
Anchorage	Tudor Rd	Minnesota Dr	Kingston Dr	Yes
Bethel	Chief Eddie Hoffman Hwy	Cranberry St	3rd Avenue	Yes
Fairbanks	College Road	University Ave	Harriet Ave	Yes
Fairbanks	Geist Road	Riverstone Way	Kyle Ct	No
Juneau	Glacier Hwy	Short St	Alaway Ave	No
Ketchikan	Tongass Ave	Cambria Dr	Water St	No
Palmer	Bogard Rd/Arctic Ave	Anna St	Gulkana St	No
Palmer	East Palmer-Wasilla Hwy	Felton St	Valley Way	No
Sitka	Lincoln Street	Harbor Rd	Kelly Ave	No
Wasilla	East Parks Hwy	Crusey St	Sun Mountain Ave	No

TABLE 4: TOP 15 IDENTIFIED HIGH-INJURY INTERSECTIONS

Municipality	Intersection (East/West and North/South)	Number of Approaches	Within Justice40 Community?
Anchorage	West Tudor Road & C St	4	No
Anchorage	West 5th Avenue & C St	4	Yes
Anchorage	East Tudor Road & Old Seward Hwy	4	No
Anchorage	East Tudor Road & Homer Drive	4	No
Anchorage	Spenard Road & Minnesota Dr	4	No
Anchorage	West Benson Blvd & C St	4	No
Anchorage	Duben Avenue & Muldoon Rd	4	No
Anchorage	Debarr Road & Bragaw St	4	Yes
Bethel	Old Hospital Road & Chief Eddie Hoffman Hwy	3	Yes
Fairbanks	College Road & Hess Ave	4	No
Fairbanks	Geist Road & Parks Hwy NB Off-Ramp	4	No
Ketchikan	Tongass Avenue & Heckman St	3	No
Palmer	East Palmer Wasilla Hwy & Glenn Hwy	4	No
Palmer	West Bogard Road & Glenn Hwy	4	No
Wasilla	East Parks Hwy & Palmer-Wasilla Hwy	4	No

6.1 ANCHORAGE

FIGURE 11: HIGH-INJURY CORRIDORS AND INTERSECTIONS IN ANCHORAGE



HIGH-INJURY CORRIDORS

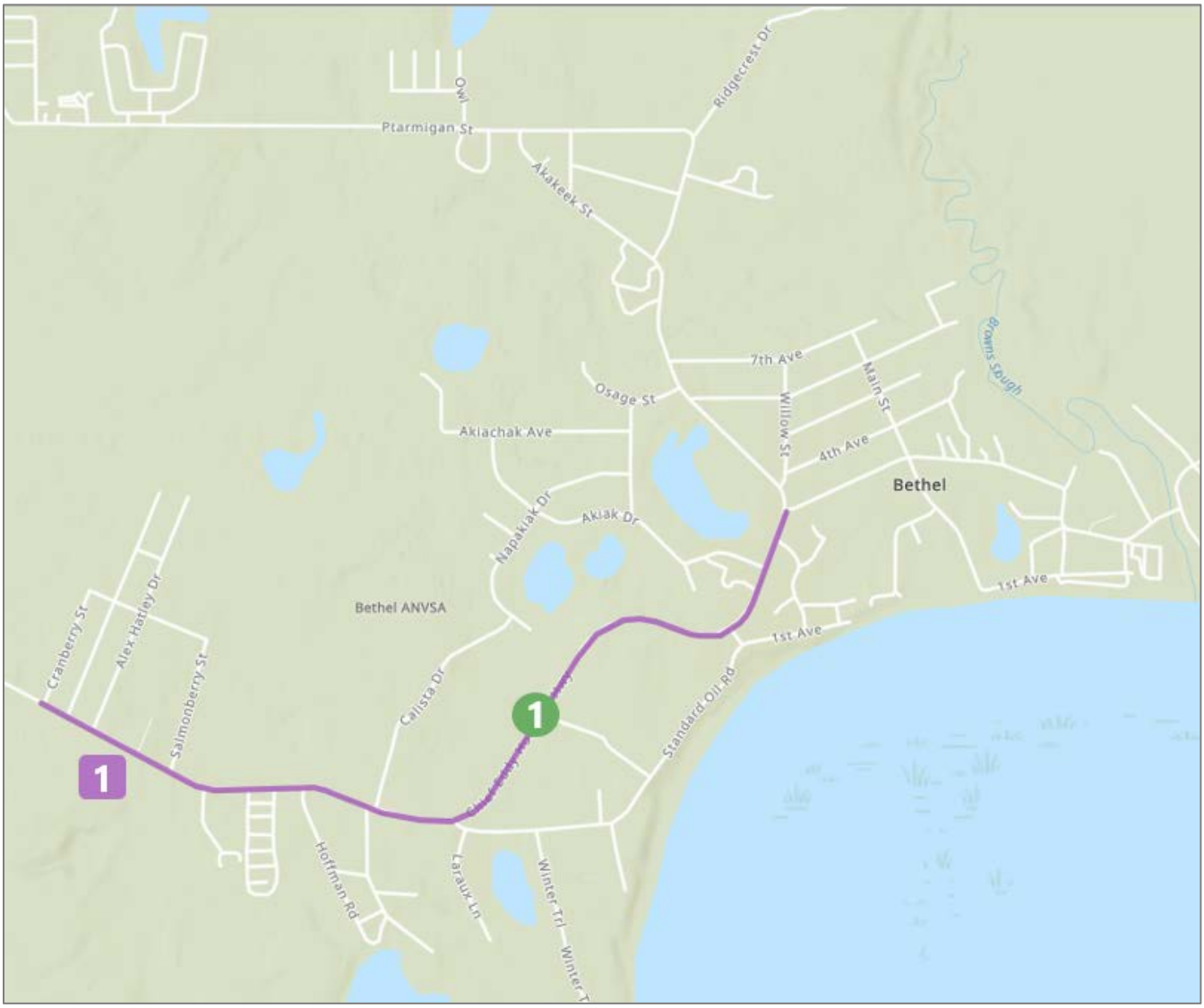
1. Muldoon Rd
2. West 5th Ave / Glenn Hwy
3. Debarr Rd / 15th Ave
4. Northern Lights Blvd
5. Benson Blvd
6. Spenard / 36th Ave / Providence
7. Tudor Rd

HIGH-INJURY INTERSECTIONS

1. Duben Ave & Muldoon Rd
2. Spenard Rd & Minnesota Dr
3. Debarr Rd & Bragaw St
4. Benson Blvd & C St
5. West 5th Ave & C St
6. Tudor Rd & C St
7. Tudor Rd & Old Seward Hwy
8. Tudor Rd & Homer Dr

6.2 BETHEL

FIGURE 12: HIGH-INJURY CORRIDORS AND INTERSECTIONS IN BETHEL



HIGH-INJURY CORRIDORS

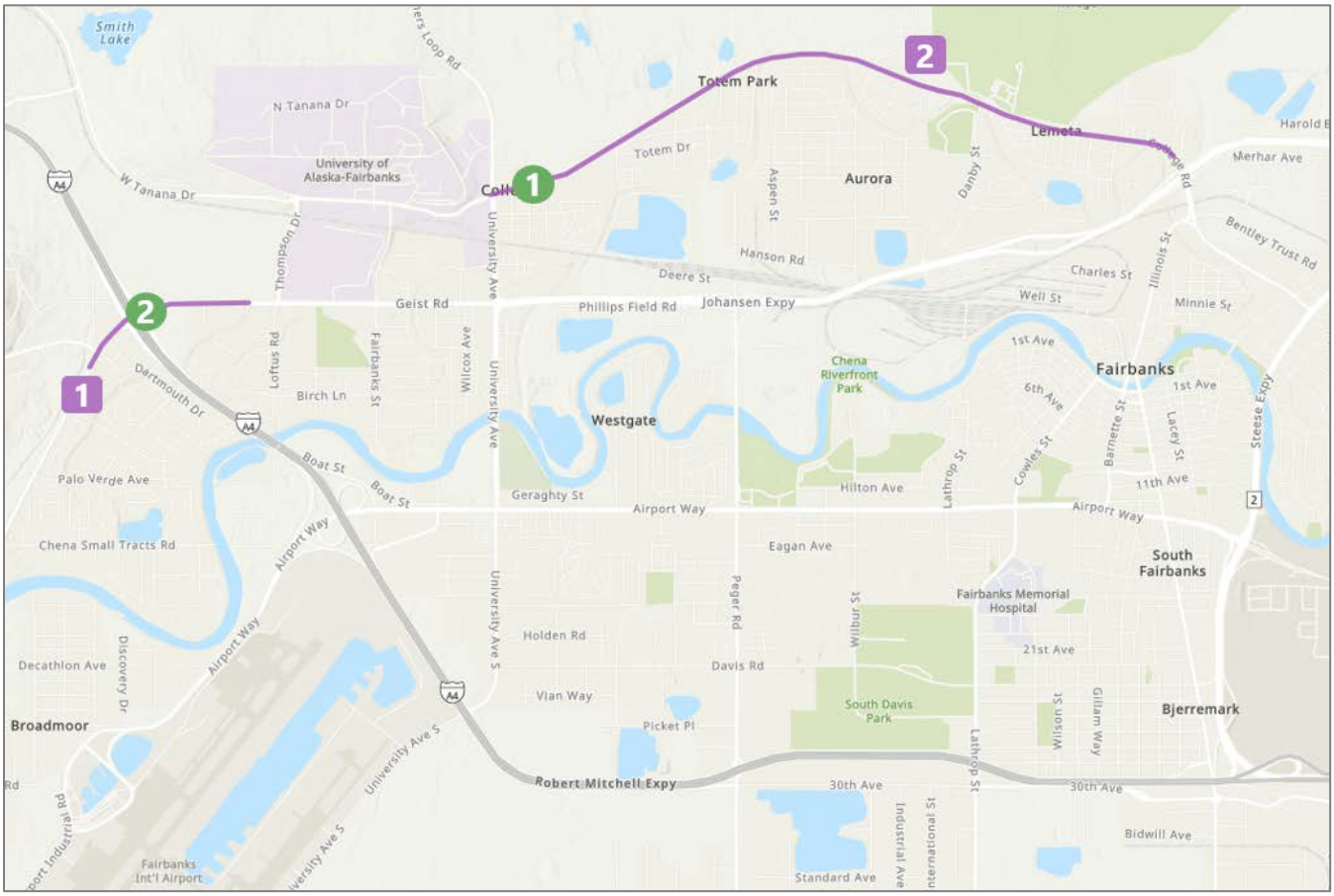
1 Chief Eddie Hoffman Hwy

HIGH-INJURY INTERSECTIONS

1 Old Hospital Rd & Chief Eddie Hoffman Hwy

6.3 FAIRBANKS

FIGURE 13: HIGH-INJURY CORRIDORS AND INTERSECTIONS IN FAIRBANKS



HIGH-INJURY CORRIDORS

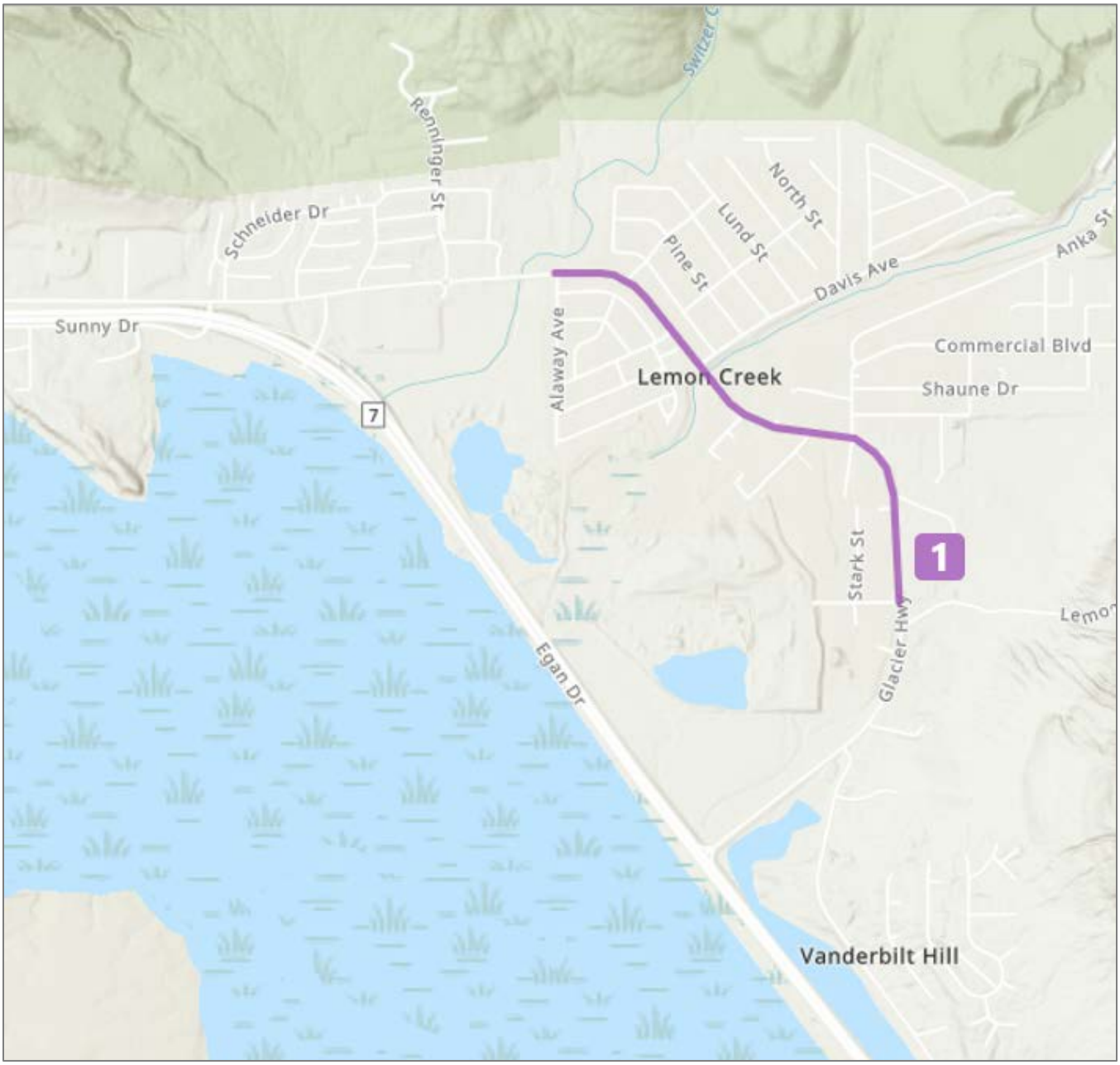
1. Geist Rd
2. College Rd

HIGH-INJURY INTERSECTIONS

1. College Rd & Hess Ave
2. Geist Rd & Parks Hwy

6.4 JUNEAU

FIGURE 14: HIGH-INJURY CORRIDORS AND INTERSECTIONS IN JUNEAU



HIGH-INJURY CORRIDORS

1 Glacier Hwy in Lemon Creek

6.5 KETCHIKAN

FIGURE 15: HIGH-INJURY CORRIDORS AND INTERSECTIONS IN KETCHIKAN

HIGH-INJURY CORRIDORS

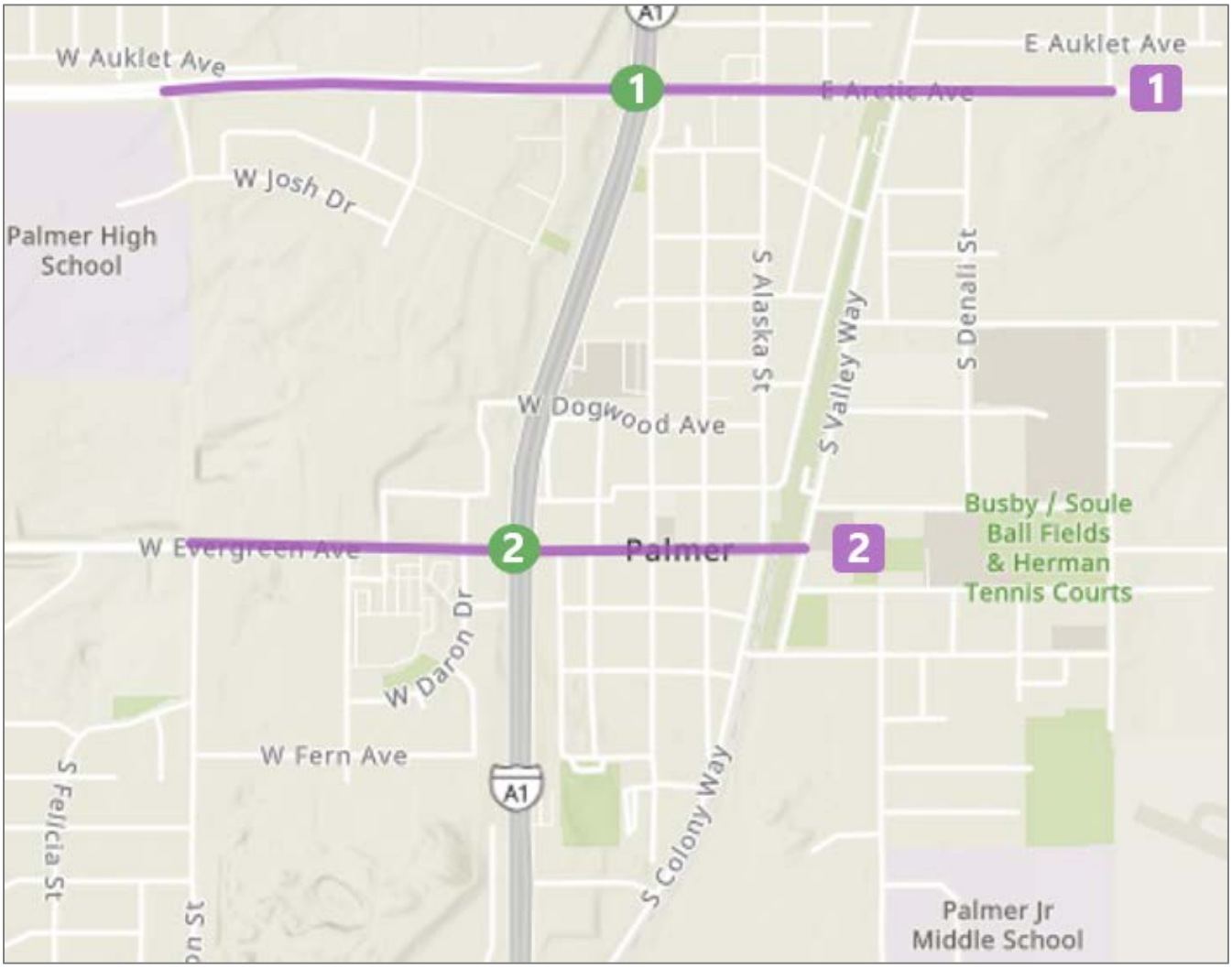
1 Tongass Ave

HIGH-INJURY INTERSECTIONS

1 Tongass Ave & Heckman St

6.6 PALMER

FIGURE 16: HIGH-INJURY CORRIDORS AND INTERSECTIONS IN PALMER



HIGH-INJURY CORRIDORS

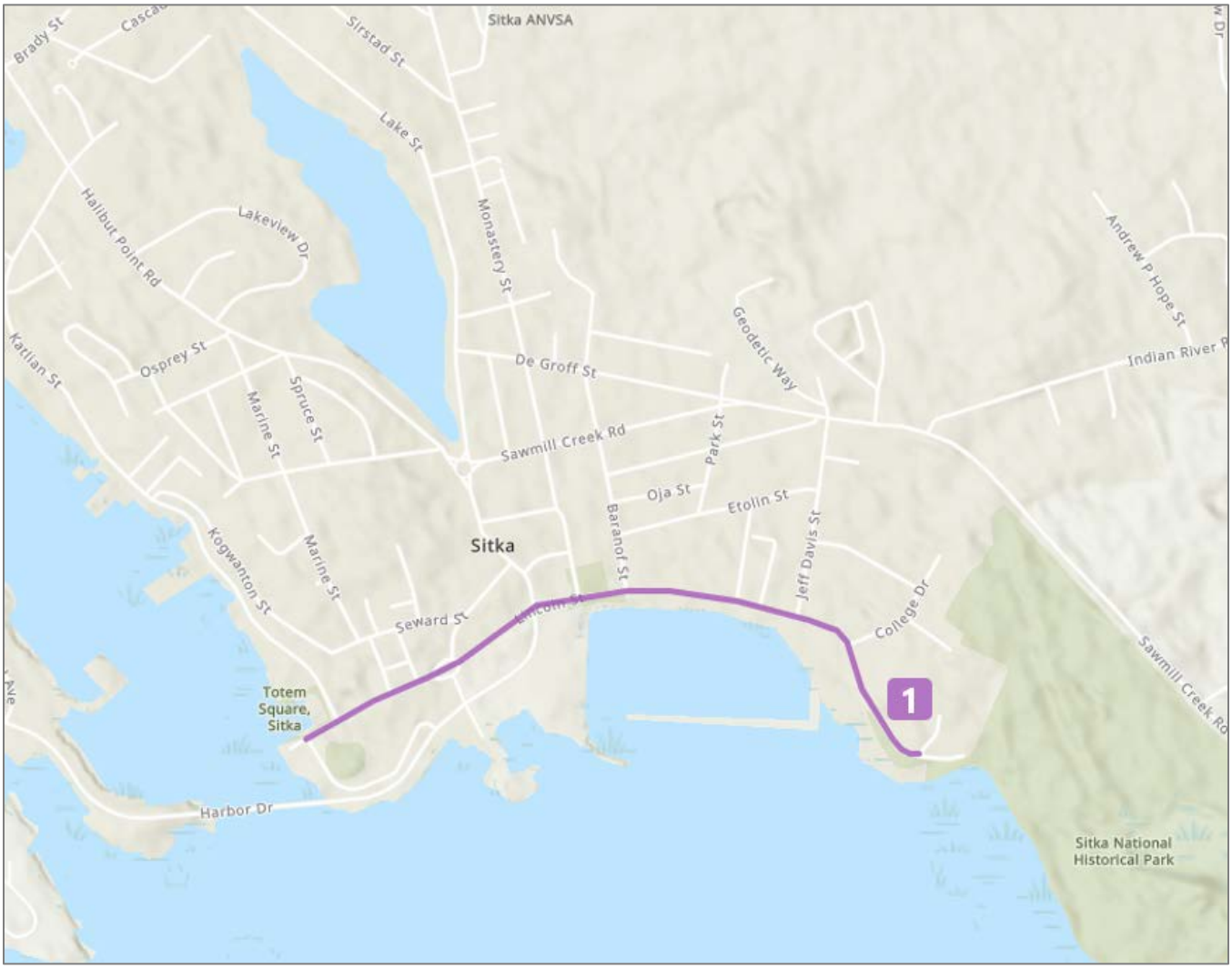
1. Bogard Rd
2. Evergreen Ave

HIGH-INJURY INTERSECTIONS

1. Bogard Rd & Glenn Hwy
2. Evergreen Ave & Glenn Hwy

6.7 SITKA

FIGURE 17: HIGH-INJURY CORRIDORS AND INTERSECTIONS IN SITKA

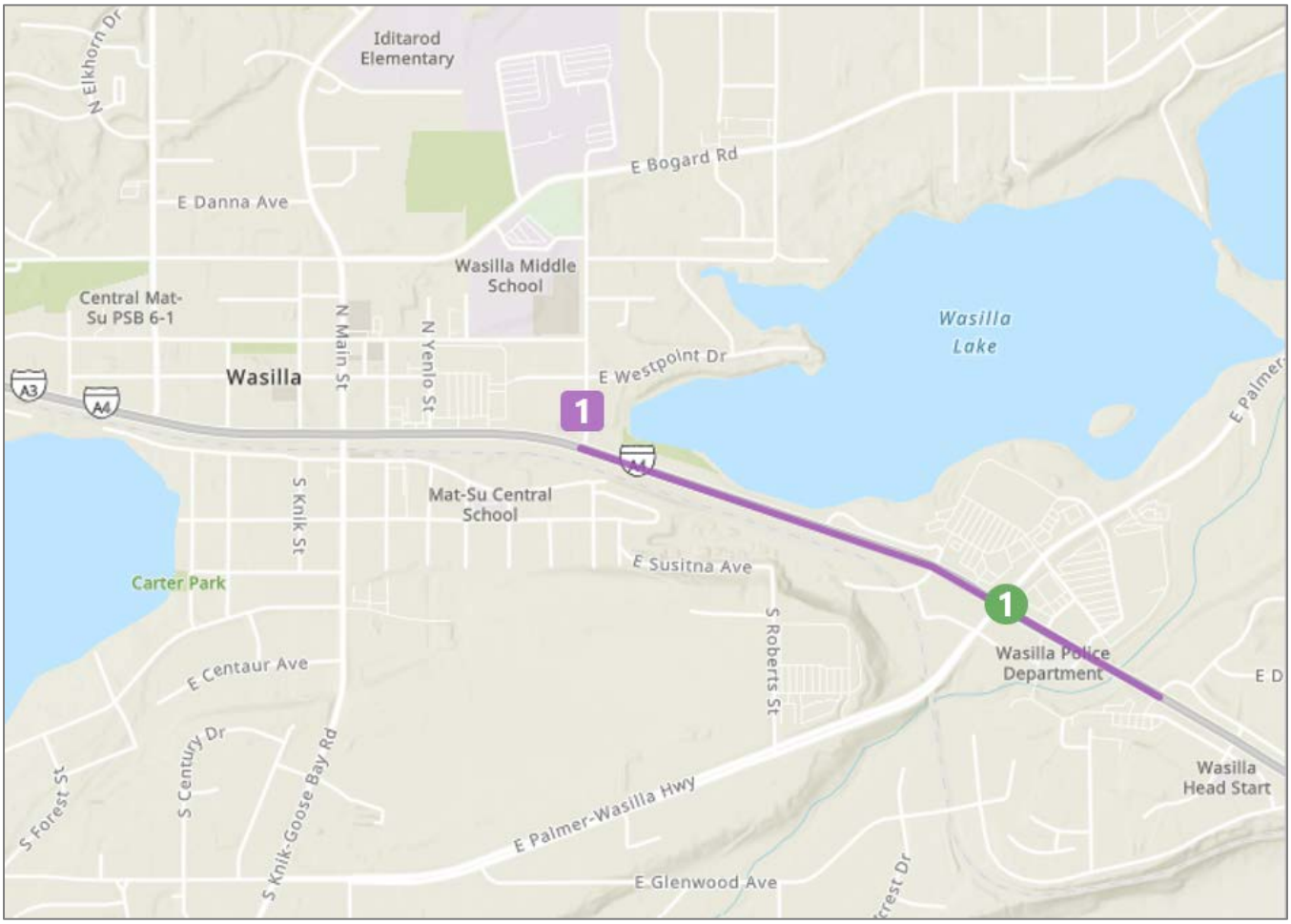


HIGH-INJURY CORRIDORS

1 Lincoln St

6.8 WASILLA

FIGURE 18: HIGH-INJURY CORRIDORS AND INTERSECTIONS IN WASILLA



HIGH-INJURY CORRIDORS

1 Parks Highway

HIGH-INJURY INTERSECTIONS

1 Parks Hwy & Palmer-Wasilla Hwy