HAWAII VULNERABLE ROAD USER SAFETY ASSESSMENT

Hawai‘i Vulnerable Road User Safety Assessment

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Prepared for
State of Hawai‘i
Department of Transportation

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List of Acronyms

AADT	Average Annual Daily Traffic
ACS	American Community Survey
BAC	Blood Alcohol Concentration
BPH	Bike Plan Hawai‘i
CEJST	Climate & Economic Justice Screening Tool
CIP	Capital Improvement Program
COH	County of Hawai‘i
DPW	Department of Public Works
EMS	Emergency Medical Services
ETC	Equitable Transportation Community
FARS	fatality analysis reporting system
FHWA	Federal Highway Administration
FY	Fiscal Year
g/dL	grams per deciliter
GIS	Geographic Information System
HDOT	State of Hawai‘i, Department of Transportation
HSHSP	Hawai‘i Strategic Highway Safety Plan
HSIP	Highway Safety Improvement Program
IIJA	Infrastructure Investment and Jobs Act
mph	Miles per hour
MPO	Metropolitan Planning Organization
MPVH	Multi-Purpose Vehicles
MVAR	Motor Vehicle Accident Report
NHSTA	National Highway Traffic Safety Administration
NRSS	National Roadway Safety Strategy

OHHS	Office on Homelessness and Housing Solutions
PIT	Point in Time
PMP	Statewide Pedestrian Masterplan
PSC	Proven Safety Countermeasures
SAC	Stakeholder Advisory Committee
STEP	Safe Transportation for Every Pedestrian
SUV	Sports Utility Vehicle
TAC	Technical Advisory Committee
U.S.C.	United States Code
US-DOT	U.S. Department of Transportation
VRU	Vulnerable Road User
VRUSA	Vulnerable Road User Safety Assessment

SECTION ONE

INTRODUCTION

1 Introduction

In November 2021, the Bipartisan Infrastructure Law, also known as the Infrastructure Investment and Jobs Act (IIJA), was passed by Congress with the intent to rebuild the nation's aging infrastructure. One of the transportation focuses of the IIJA is to repair and rebuild roads and bridges with a focus on climate change mitigation, resilience, equity, and safety for all users, particularly vulnerable road users. The IIJA amended 23 United States Code (U.S.C.) Section 148 to include a requirement for all states to develop a Vulnerable Road User Safety Assessment (VRUSA) as part of their Highway Safety Improvement Program (HSIP).

In 2020, an estimated 38,680 people were killed in motor vehicle crashes nationwide. An estimated 6,236 were pedestrians and 891 were bicyclists.[1] Compared to 2019, nationwide bicyclist fatalities increased by 10.3% and pedestrian fatalities increased by 4.7% in 2020. Nationally, the increasing rate of pedestrian fatalities was further demonstrated in 2021 where there were 7,388 pedestrian fatalities, marking the highest number of fatalities in 40 years when 7,837 pedestrians died in traffic crashes in 1981.

A pedestrian was killed every 71 minutes in traffic crashes in 2021

In comparison to national statistics, the State's total traffic fatalities in 2020 was 85. Pedestrians accounted for 21 of those fatalities, while bicyclists accounted for 4 of the fatalities. Compared to 2019, pedestrian fatalities decreased by 43.2% and the number of bicyclist fatalities remained the same. Hawai'i has seen decreases in pedestrian and bicyclist fatalities in recent years, however the number of fatalities has been increasing on average since 2010. In recent years, the highest number of bicyclist fatalities occurred in 2017 with 6 bicyclist fatalities, and the highest number of pedestrian fatalities occurred in 2018 with a total of 44 pedestrian fatalities.

To combat the increasing trend of vulnerable road user serious injuries and fatalities across the State, the VRUSA will assess the State's roadway safety performance and identify a program of projects and strategies to increase the safety of vulnerable road users.

Definition of a Vulnerable Road User

Within the context of this assessment, a vulnerable road user (VRU) is a non-motorist, including pedestrians, bicyclists, pedalcyclists (cycles other than with two wheels), other cyclists, rollers (e.g., skates, scooter, skateboard, etc.), and persons on personal conveyance. A VRU encompasses people walking, biking, or rolling, but does not include motorcyclists.

[1] U.S. Department of Transportation. "The Roadway Safety Problem." February 2, 2023.

1.1 National Guidance

Federal Requirements

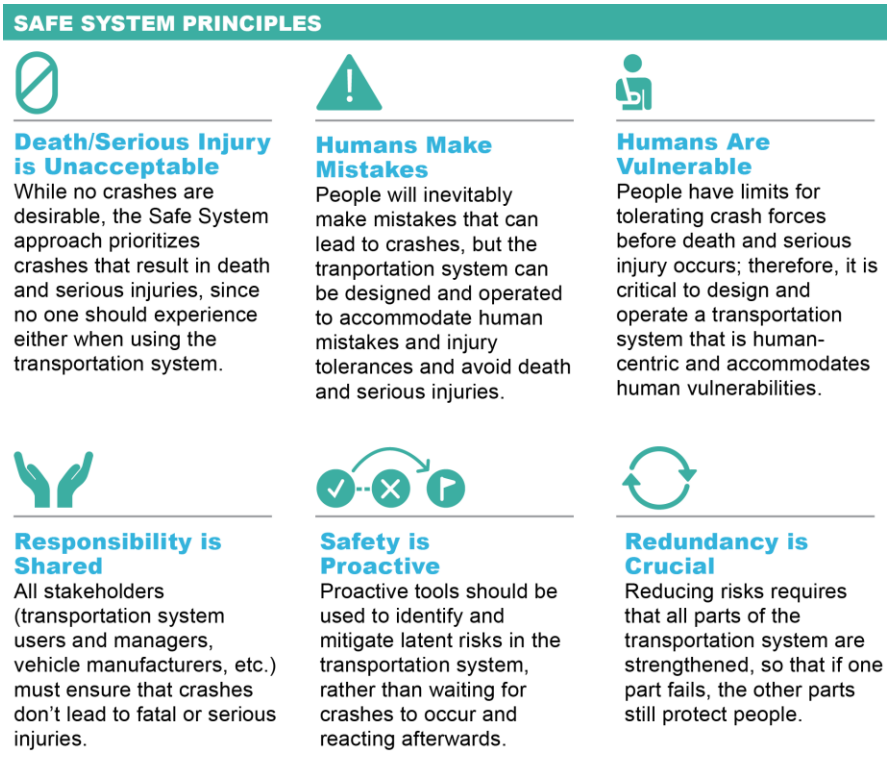
This assessment was conducted in accordance with 23 U.S.C. 148(l), which requires that all VRUSAs:

1) Use a data-driven process to identify areas of high-risk for vulnerable road users,
2) Consult with local governments, metropolitan planning organizations, and regional transportation planning organizations that represent a high-risk area,
3) Take into consideration a Safe System Approach, and
4) Develop a program of projects or strategies to reduce safety risks to vulnerable road users in areas identified as high-risk.

The data-driven process requires that VRUSAs conduct a quantitative analysis of VRU fatalities and serious injuries from the most recent 5-year period for which crash data is available that includes information such as location, roadway functional classification, speed limit, and time of day of the crash, and considers the demographics of the locations of fatalities and serious injuries, including race, ethnicity, income, and age. This VRUSA will analyze the safety performance of the State across all roadway jurisdictions.

Safe System Approach

The U.S. Department of Transportation's (US-DOT) National Roadway Safety Strategy (NRSS) is responding to the current trend in traffic fatalities. At the core of the strategy is the adoption of the Safe System Approach. The Safe System Approach aims to improve safety culture, increase collaboration across all stakeholders, and refocus transportation system design and operation on anticipating human mistakes and lessening impact forces to reduce crash severity and save lives. The approach has been embraced by the transportation community as an effective way to address and mitigate the risks within our transportation system by employing



Source: FHWA_SafeSystem_Brochure_V9_508_200717

multiple layers of protection to prevent crashes and lessen the severity of crashes when they do occur. In following the Safe System Approach, safety programs focus on infrastructure, human behavior, responsible oversight and emergency response.

The six Safe System Approach "principles" are the fundamental beliefs that the approach is built on. A successful Safe System Approach weaves together all six principles, which are described in the graphic on page 3.

The Safe System Approach also includes five "elements" through which the approach is implemented. Making a commitment to zero deaths means addressing crash risks through all of the five elements.

SAFE SYSTEM ELEMENTS

Making a commitment to zero deaths means addressing every aspect of crash riskes through the five elements of a Safe System, shown below. These layers of protection and shared responsibility promote a holistic approach to safety across the entrie transportation system. The key focus of the Safe System approach is to reduce death and serious injuries through design that accommodates human mistakes and injury tolerances.

Safe Road Users
The Safe System approach addresses the safety of all road users, including those who walk, bike, drive, ride transit, and travel by other modes.

Safe Vehicles
Vehicles are designed and regulated to minimize the occurrence and severity of collisions using safety measures that incorporate the latest technology.

Safe Speeds
Humans are unlikely to survive high-speed crashes. Reducing speeds can accomodate human injury tolerances in three ways: reducing impact forces, providing additional time for drivers to stop, and improving visibility.

Safe Roads
Designing to accommodate human mistakes and injury tolerances can greatly reduce the severity of crashes that do occur. Examples include physically separating people traveling at different speeds, providing dedicated times for different users to move through a space, and alerting users to hazards and other road users

Post-Crash Care
When a person is injured in a collision, they rely on emergency first responders to quickly locate them, stabilize their injury and transport them to medical facilities. Post-crash care also includes forensic analysis at the crash site, traffic incident managment, and other activities.

THE SAFE SYSTEM APPROACH VS. TRADITIONAL ROAD SAFETY PRACTICES

Traditional		Safe System
Prevent crashes	→	Prevent deaths and serious injuries
Improve human behavior	→	Design for human mistakes/limitations
Control speeding	→	Reduce system kinetic energy
Individuals are responsible	→	Share responsibility
React based on crash history	→	Proactively identify and address risks

Whereas traditional road safety strives to modify human behavior and prevent all crashes, the Safe System approach also refocuses transportation system design and operation on anticipating human mistakes and lessening impact forces to reduce crash severity and save lives.

Source: FHWA_SafeSystem_Brochure_V9_508_200717

Other FHWA Requirements

In October 2022, the US-DOT Federal Highway Administration (FHWA) published a VRUSA Guidance memorandum that provides further details on the requirements of the assessment. The memorandum also outlines other requirements and considerations that should be addressed by the VRUSA, including:

- Equity: Reduce inequities across our transportation systems and the communities they affect. Support and engage people and communities to promote safe, affordable, accessible, and multimodal access to opportunities and services while reducing transportation-related disparities, adverse community impacts, and health effects.

- Climate and Sustainability: Reduce greenhouse gas pollution in the transportation sector and improve the resilience of transportation infrastructure, to prepare for hazards exacerbated by climate change. Support environmental justice commitments, fiscally responsible land use, and transportation efficient design.

Changing weather conditions and climate-related hazards should be considered when planning improvements to enhance pedestrian and bicycle facilities.

- FHWA's Proven Safety Countermeasures (PSC): The FHWA's collection of countermeasures and strategies is effective in reducing fatalities and serious injuries on our Nation's highways. Transportation agencies are encouraged to consider widespread use of the PSCs to achieve safety goals.

- Complete Streets Principles: Follow the State's Complete Streets policies that prioritize the safety of all users in transportation network planning, design, construction, and operations, including the careful consideration of measures to set and design for appropriate speeds; separation of various users in time and space; improvement of connectivity and access for pedestrians, bicyclists and transit riders, including for people with disabilities; and addressing safety issues through implementation of safety countermeasures.

- Accessibility: Support accessibility of pedestrian facilities in the public right-of-way, such as curb ramps, sidewalks, crosswalks, pedestrian signals, and transit stops in accordance with applicable regulations and Americans with Disabilities Act transition plans.

- Transportation System Access: Safety risks to vulnerable road users should not be mitigated through efforts that reduce opportunities for, or the attractiveness of, walking, bicycling, rolling, or accessing transit.

- Access to Transit: Consider transit access while developing the program of projects or strategies for the Vulnerable Road User Safety Assessment. Regardless of how a person began their trip, they walk, bike, or roll to access transit. Transit agencies and roadway owners both play critical roles in improving the safety of pedestrians and bicyclists.

1.2 Relevant Plans and Documents

One of the initial steps in the VRUSA process was to review relevant State and County pedestrian, bicycle, and transportation safety plans, studies, and other documents related to vulnerable road users. This allowed our team to build upon the work and community outreach that has already been done. The goals and objectives, areas of concern, strategies, recommendations, and public engagement and consultation efforts of the plans were reviewed to help inform the methodologies to identify high-risk areas and the program of projects and strategies. Consultation with the VRUSA's technical and stakeholder advisory committees was also conducted during the review of relevant plans and documents.

The table below provides a summary of the relevant content derived from each document. The areas of concern or opportunities, noted from the plans and studies, that were identified to also be near the high-risk areas (which are discussed and shown in Section 3) are included in the table. A detailed review of each document and its application to the VRUSA can be found in Appendix A.

In addition, throughout the development of the VRUSA, stakeholders provided additional plans, resources, walk audits, and Vision Zero efforts, which were all used to inform the program of strategies and projects.

Table 1: Plans and Documents Relevant to the VRUSA

Plans and Documents	Goals/ Objectives/ Emphasis Areas	Areas of Concern	Strategies/Action Items/ Recommendations	Public Engagement/ Consultation
Hawai'i Strategic Highway Safety Plan (HDOT, 2019)	Improve traffic safety, data collection, safety awareness		-Context-sensitive speeds -Pedestrian/bicycle facilities - Programs to increase safety for all modes - Children walking/biking to school -Enforcement -Data/performance measures -Education	Collaboration of >150 traffic safety experts and stakeholders
Statewide Pedestrian Master Plan (HDOT, 2013)	Improve pedestrian mobility, accessibility, and safety; improve connectivity of the network; encourage walking to reduce overall energy and greenhouse gas use	- Farrington Highway near Nanakuli and Waianae (Improvements completed since publication of plan) - Ward Avenue and Ala Moana Boulevard - Liliha Street at Kukui Street intersection (Improvements completed since publication of plan) - Ala Moana Boulevard at Hobron Lane (Improvements completed since publication of plan) - Fort Weaver Road in the vicinity of Ilima Middle School (Improvements completed since publication of plan)	- Location for proposed improvements identified - Hawai'i Pedestrian Toolbox - guide for project implementation throughout the state	Convened a Technical Advisory and Citizen Advisory Committee, conducted public workshops, and maintained a project website

Plans and Documents	Goals/ Objectives/ Emphasis Areas	Areas of Concern	Strategies/Action Items/ Recommendations	Public Engagement/ Consultation
		- Queen's Lei path in North Kona - Kuhio Highway at Kawaihau Road intersection (Improvements completed since publication of plan)		
Bike Plan Hawai'i Refresh Priorities and Implementation Plan (HDOT, 2022)	Integrate bicycling into the state's transportation system by accommodating and promoting bicycling	- Kailua-Kona along Highways 19 and 11 (Queen Kaahumanu shoulder bikeway signing & Hawai'i Belt Road/Mamalahoa Highway shoulder bikeway) - Nanakuli along Route 93 (Farrington Highway path & shoulder improvements) - Ewa Beach along Route 76 (Fort Weaver Road in the vicinity of Papipi Road bike lane/buffer/path improvements) - Windward along Route 83 (Kahekili Highway east of Valley of the Temples Memorial Park bikeway improvements with other projects)	- Location for proposed improvements identified	- Public survey via online platform collected 1,100 responses statewide. - Virtual meetings with bicycle stakeholder groups in each region.
Highway Safety Plan FFY 2023 (HDOT, 2023)	- Performance target for pedestrian fatalities: 5-year average at 29 fatalities for fiscal year (FY) 2022 and 2023		- Pedestrian and bicycle projects approved for FY 2023 - Education countermeasures - Outreach and communications strategies	The HSHSP Core Committee was made up of traffic safety, emergency medical services, bike/pedestrian advocacy groups, engineers, law

Plans and Documents	Goals/ Objectives/ Emphasis Areas	Areas of Concern	Strategies/Action Items/ Recommendations	Public Engagement/ Consultation
	- Performance target for bicycle fatalities: 5-year average at 3 fatalities for FY 2022 and 6 fatalities for FY 2023 (external factors such as increase in e-bikes and e-scooters)		- Public education events	enforcement, attorneys, and other stakeholders
Triennial Highway Safety Plan (3HSP) (HDOT, 2023 - in progress)		Walk audits conducted at: - Nimitz Hwy at Sumner Lane - Nimitz Hwy, Puuhale Rd to Sand Island Access Rd - Kapolei Parkway in Ewa Beach - Hilo	- Community outreach - Training - Resources - Continued education - Enforcement of speeding and distracted driving - Enforcement related to pedestrian safety around the schools - Follow-up with bringing "safety chick" and VISTA to Kaua'i to conduct walk audits	Walk audits were conducted at areas of concern, and interviews conducted with key stakeholders to capture area context for Nimitz Hwy and Kaua'i.
Maui Vision Zero Action Plan (Maui Metropolitan Planning Organization, 2021)	- Eliminate impaired driving - Create safer speeds - Eliminate distracted driving - Create a safety culture - Build safe streets for everyone - Institutionalize Vision Zero - Improve data to support decisions		- Create "Malama Zones" in priority areas - Traffic safety education for schools - Develop best practice messaging materials - Implement the Hele Mai Maui 2040 Transportation Plan - Apply Complete Streets principles - Improve facility maintenance for all modes - Develop and adopt a policy to prioritize and provide access	- Consultation with County and State agencies - Consultation with community groups and members

Plans and Documents	Goals/ Objectives/ Emphasis Areas	Areas of Concern	Strategies/Action Items/ Recommendations	Public Engagement/ Consultation
			to pedestrians, bicyclists, and transit riders - Support and implement the State of Hawai'i Physical Activity & Nutrition Plan actions	
Hawai'i Island Vision Zero Action Plan (County of Hawai'i, Planning Department, 2020)			- Coordination with Safe Routes to School program - Prioritize safety in areas of concern - Adoption of policies for safety of multimodal users - Conduct safety reviews of the transportation networks - Provide bicycling education programs - Encourage events such as National Walk to School Day - Provide bicyclist and pedestrian awareness training to officers	Vision Zero Task force consisted of state and county agencies and Hawai'i Island community groups
Honolulu Vision Zero (Internal Memos, City and County of Honolulu, Department of Transportation Services, 2022 – in progress)		Identification of intersections and corridors based on the following criteria: - High injury corridor – 3 or more Vision Zero Focus crashes per mile per year - High injury intersection – 1 or more Vision Zero Focus crashes per year		One public workshop conducted to date and a public survey currently being conducted and available online

Plans and Documents	Goals/ Objectives/ Emphasis Areas	Areas of Concern	Strategies/Action Items/ Recommendations	Public Engagement/ Consultation
		Resulted in the identification of 63 corridor segments and 93 intersections.		
Safe Routes to School 2022 Traffic Survey (City and County of Honolulu, Department of Transportation Services, 2022)			- Driver education and awareness program implementation - Speed evaluations - Speed enforcement (if applicable) - Congestion relief through staggered schedules, increase in queuing capacity, and encouraging mode shifts - Infrastructure improvements (sidewalks, bike lanes, sightline/crosswalk improvements) - Coordination with school traffic/safety administrators in conjunction with roadway projects adjacent to schools	80 O‘ahu schools provided responses to an online school traffic survey
O‘ahu Pedestrian Plan (City and County of Honolulu, Department of Transportation Services, 2022)	Making O‘ahu’s transportation environment safe & healthy, sustainable, responsive and equitable		- Cost of over $2.6 billion to provide missing walkways on O‘ahu - Overarching strategies identified for signalized intersections, uncontrolled crossings, and system-wide.	Public engagement coordinated with the O‘ahu Bike Plan update and Complete Streets implementation projects (public meetings, participatory mapping, social media, and stakeholder meetings)
O‘ahu Bike Plan 2019 Update (City and County of	Vision of the plan: “O‘ahu is a bicycle friendly community where bicycling is a safe,		- Commit to Vision Zero	Technical Advisory Group included City and County of Honolulu Department of

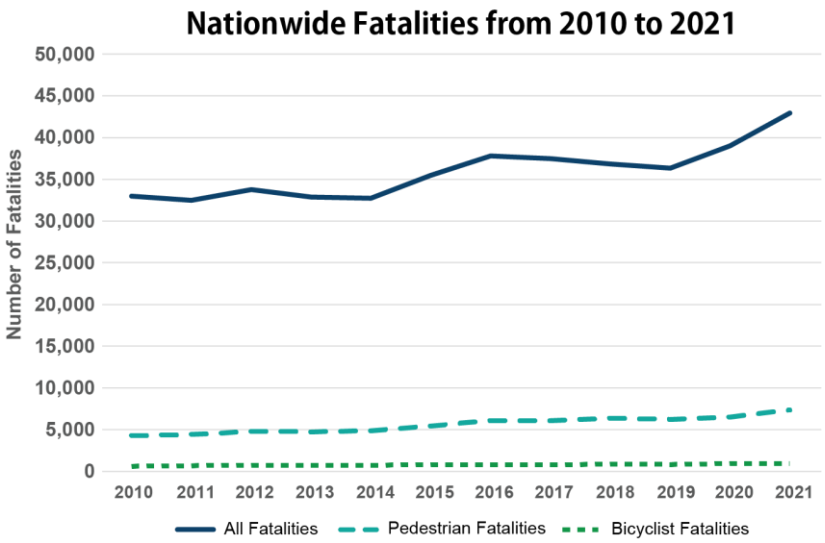
Plans and Documents	Goals/ Objectives/ Emphasis Areas	Areas of Concern	Strategies/Action Items/ Recommendations	Public Engagement/ Consultation
Honolulu, Department of Transportation Services, 2019)	viable, and popular travel choice for residents and visitors of all ages and abilities."		- Develop seamless connections between bikes and transit - Expand encouragement and education efforts - Establish a comprehensive bikeway maintenance program - Implement a consistent signage and wayfinding program - Evaluate bicycle facilities and programs - Project recommendations would add 575 miles of new bikeways. Projects were split into three priority levels; priority 1 focused on dedicated bike lanes and paths, and priorities 2 and 3 focused on bike lanes, shoulders, and shared facilities.	Transportation Services, State of Hawai'i Departments of Transportation and Health and the Honolulu Bicycle League. Community engagement conducted through stakeholder meetings, community workshops, online surveys, and an interactive crowdsource map.

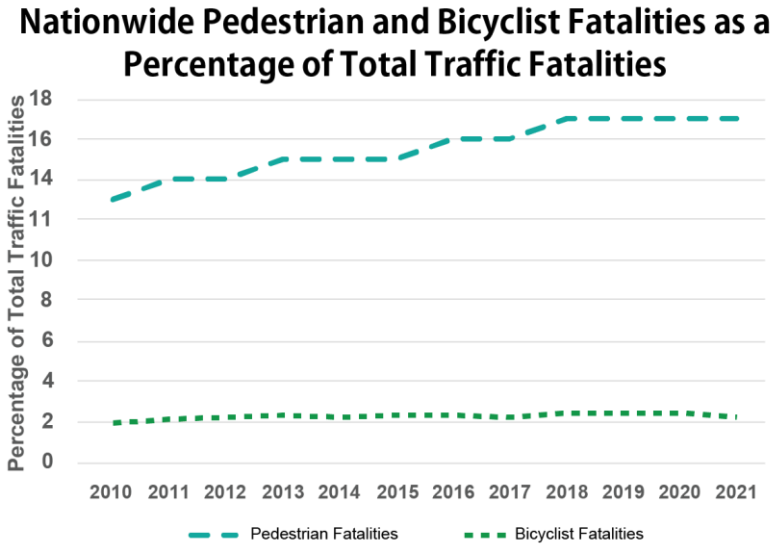
SECTION TWO

OVERVIEW OF VULNERABLE ROAD USER SAFETY PERFORMANCE

2 Overview of Vulnerable Road User Safety Performance

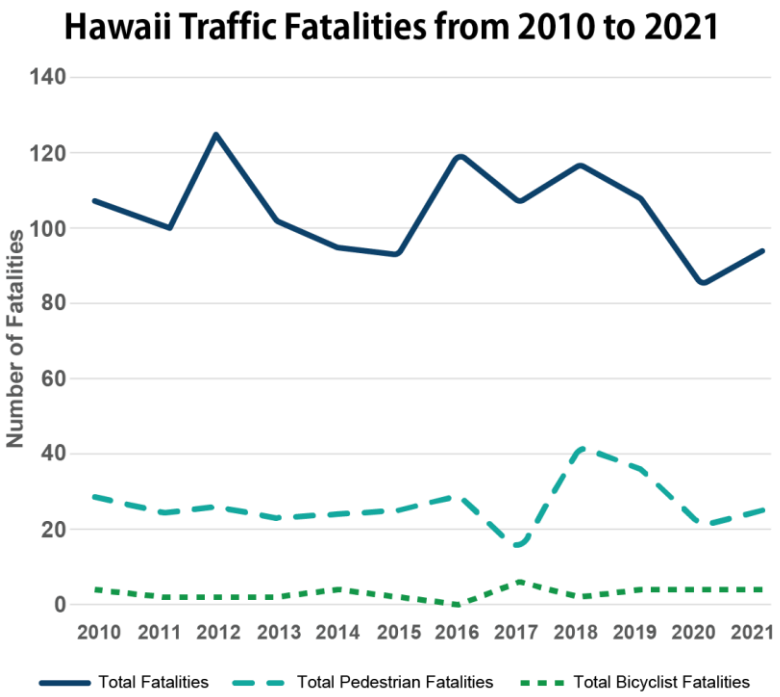
Across the nation, traffic fatalities have been increasing and vulnerable road users have been accounting for an increasing share of roadway fatalities, claiming the lives of more pedestrians, bicyclists, and rollers in recent years. In 2010, there was a total of 32,999 traffic fatalities, which encompassed 4,302 pedestrian fatalities and 623 bicyclist fatalities. As illustrated in the graph on the right, total fatalities, including pedestrian and bicyclist fatalities, have been following an increasing trend from 2010 to 2021. In 2021, there were 42,939 traffic fatalities, of which 7,388 were pedestrian fatalities and 966 were bicyclist fatalities. Compared to 2010 fatality numbers, the number of traffic fatalities increased by 30%, pedestrian fatalities increased by 72%, and bicyclist fatalities increased by 55% in 2021.



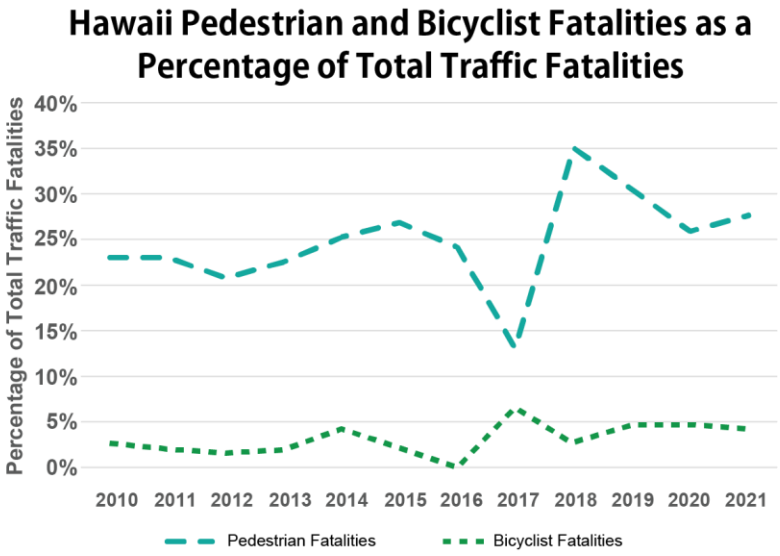


Since 2010, pedestrian and bicyclist fatalities as a percentage of total fatalities have only increased. Pedestrian fatalities accounted for 13% of total fatalities in 2010 and 17% of total fatalities in 2021. Bicyclist fatalities have been increasing at a slower rate compared to pedestrian fatalities, where bicyclist fatalities accounted for 1.9% of total fatalities in 2010 and 2.2% of total fatalities in 2021.

In Hawai‘i, pedestrian and bicyclist fatalities have seen a higher average annual increase rate compared to total traffic fatalities between 2010 to 2021. Total traffic fatalities have seen an annual decrease of 0.4% on average, while pedestrian and bicycle fatalities have seen an average annual increase of 9.5% and 0.6%, respectively. In 2010, there were 113 traffic fatalities, of which 26 were pedestrian fatalities and 3 were bicyclist fatalities. In comparison, there were 94 traffic fatalities, 26 pedestrian fatalities, and 4 bicyclist fatalities in 2021.



Similar to national statistics, pedestrians and bicyclists have been accounting for a greater share of total traffic fatalities, even as total traffic fatalities have been decreasing on average. Pedestrian and bicyclist fatalities as a percentage of total fatalities have increased at an annual rate of 25% and 3% on average between 2010 and 2021, respectively.



2.1 Pedestrian Crashes

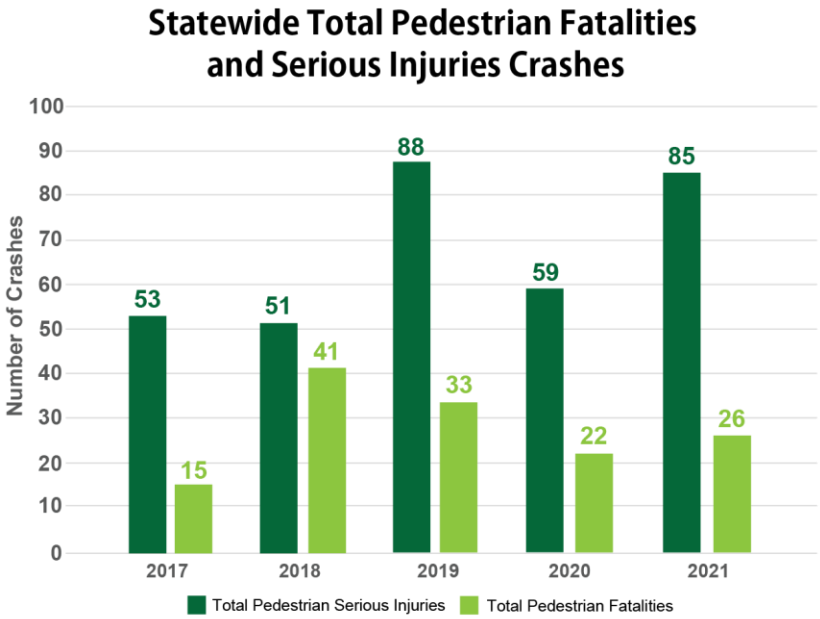
Across the state, a total of 36,564 traffic crashes occurred during the 5-year period from 2017 to 2021. Crashes involving pedestrians accounted for 7.5% of the total crashes, with 2,736 pedestrian crashes. Of those crashes, 137 resulted in a fatality and 336 resulted in a suspected serious injury. A suspected serious injury is defined as any injury other than fatal resulting in one or more of the following:

- Severe laceration resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood
- Broken or distorted extremity (arm or leg)
- Crush injuries
- Suspected skull, chest, or abdominal injury other than bruises or minor lacerations
- Significant burns (second and third degree burns over 10% or more of the body)

- Unconsciousness when taken from the crash scene
- Paralysis[2]

Fatalities and suspected serious injuries crashes represent the most severe injury types in the State of Hawai'i Motor Vehicle Accident Reports (MVAR).

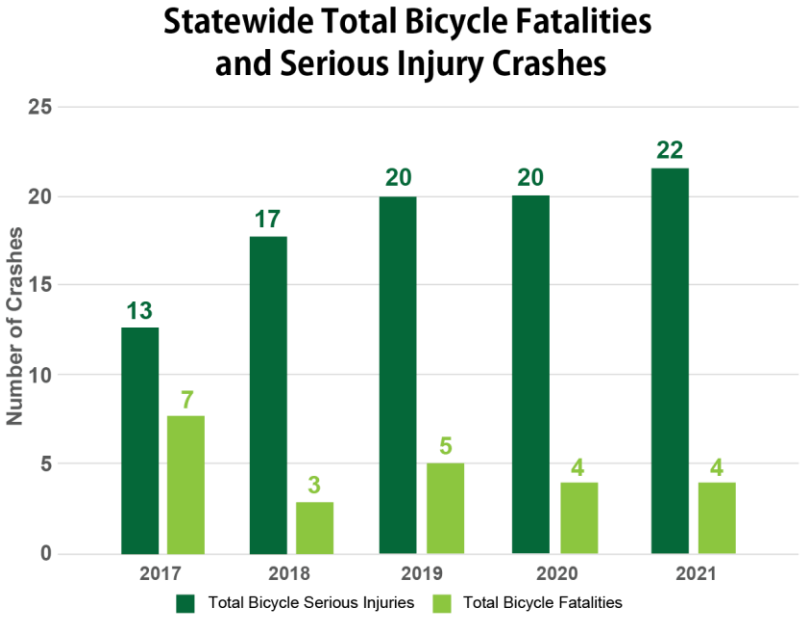
Over the 5-year period, there has been a reduction in the total number of crashes involving pedestrians. However, the severity of the pedestrian crashes has been increasing on average. Pedestrian fatalities have increased by 35% and serious injury crashes have increased by 20% on an average annual basis.



Source: HDOT 2017 - 2021 Crash Data

2.2 Bicyclist Crashes

During the same 5-year period from 2017 to 2021, crashes involving bicyclists accounted for 3.3% of all crashes statewide. Of those crashes, 23 resulted in a fatality and 92 resulted in a serious injury. Like the pedestrian crashes, there has been a decrease in the total number of bicycle crashes, however the severity of the crashes has been increasing. Bicyclist serious injury crashes increased by 15% on an average annual basis. Within the 5-year period, the highest number of bicyclist fatalities occurred in 2017 with 7 fatalities. While the number of fatalities decreased in 2018 to 3 bicyclist fatalities, the number of fatalities have increased from 2019 to 2021.



Source: HDOT 2017 - 2021 Crash Data

[2] U.S. Department of Transportation, National Highway Traffic Safety Administration. "The National Definition for Serious Injuries, MMUCC 4th Edition".

2.3 Progress Towards Safety Performance Targets for Non-Motorized Modes

Based on the US-DOT FHWA's State Highway Safety Report, Hawai'i has met the performance target for non-motorized fatalities and serious injuries for 2021 and 2022, which are based on 5-year averages. Performance targets are determined using a linear trend line based on 5-year averages from 2012 to 2021 data, and an analysis of external factors, including the recently updated Hawai'i Strategic Highway Safety Plan (HSHSP), Vision Zero Plans, planned roadway infrastructure safety improvement projects, and safety impacts of proposed grants.[3]

Table 2: Number of Non-Motorized Fatalities and Serious Injuries

	2021	2022
5-Year Average	135.2	124.0
Target (5-Year Average)	136.8	134.1
Target Achieved	Yes	Yes

The Maui Metropolitan Planning Organization (MPO) and O'ahu MPO are also required to establish safety targets for non-motorized fatalities and serious injuries. The Maui MPO adopted the same targets as the State of Hawai'i Department of Transportation (HDOT), which has met the targets. The O'ahu MPO has chosen to set their own target. The table below provides the actual numbers for the years 2017 to 2021 and targets for 2022 and 2023. Updates to the O'ahu MPO's Highway Safety Performance Targets can be found on their website at the following link: https://oahumpo.org/performance-management/.

Table 3: O'ahu MPO Safety Targets

Safety Measure	Actual					Targets	
	2017	2018	2019	2020	2021	2022	2023
Non-motorized fatalities and serious injuries	78	80	127	105	110	90	86

[3] U.S. Department of Transportation, Federal Highway Administration. "State Highway Safety Report (2021) – Hawai'i."

Pedestrian and Bicycle Improvements

Pedestrian Improvements Completed

In 2013, HDOT completed the Statewide Pedestrian Master Plan (PMP) which focuses on improving pedestrian safety on the State Highways System and evaluating ways to enhance pedestrian mobility and accessibility. The plan identified a priority list of projects and programs to address the needs of the Statewide pedestrian system. A list of the priority projects completed since the publication of the PMP is listed in Appendix A.

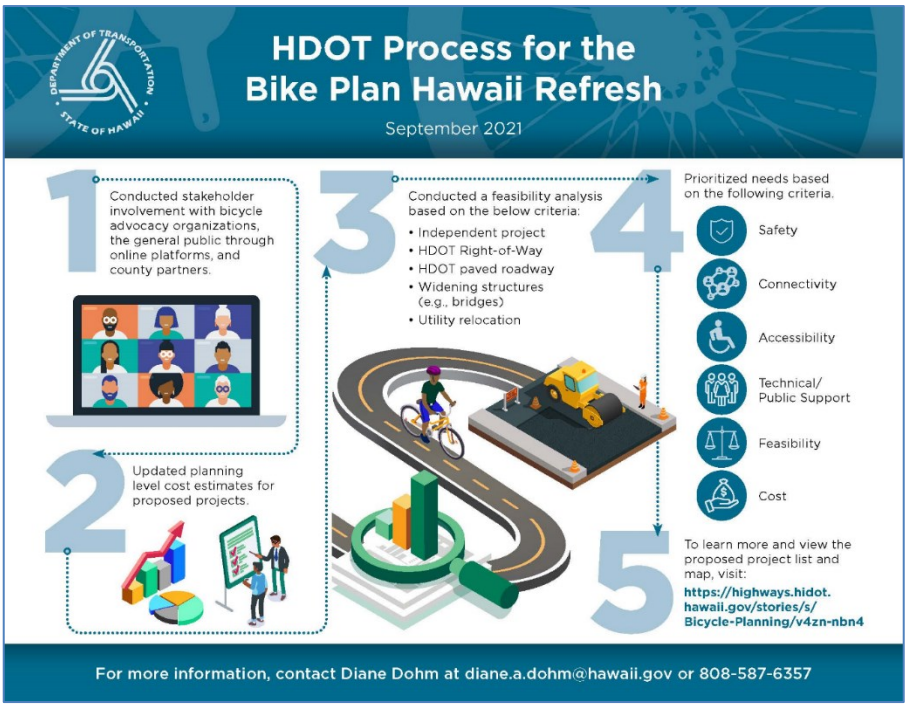
Bicycle Improvements Completed

In 2003, HDOT published Bike Plan Hawai'i (BPH), which was the State's master plan that identified existing and proposed bicycle facilities, policies, and programs. A list of the Priority 1 projects completed since the publication of the plan is included in Appendix A.

Ongoing/Proposed Improvements

In accordance with Act 125 (Session Laws of Hawai'i, 2021), the HDOT maintains a priority list of proposed statewide pedestrian improvements using the projects identified in the Statewide Pedestrian Master Plan as a basis. Additional pedestrian improvements have also been identified through public input and safety and planning analyses, and have been vetted through the same criteria used in the Statewide Pedestrian Master Plan. A list of the proposed projects is included in Appendix A.

HDOT completed the Bike Plan Hawai'i Refresh, Priorities & Implementation Plan 2022 to update the existing inventory of facilities, update project lists and maps, reanalyze the bicycle network, and reevaluate proposed projects from the 2003 BPH to establish priorities and assess feasibility for implementation. The BPH Refresh includes an updated list of prioritized near-term and mid-term implementation projects identified for each island.



In 2022, HDOT reported over 290 active projects with pedestrian and/or bicycle improvements. An active project is a project that has been programmed and funded to start the environmental review and design process. The 290 active projects are likely in different phases of implementation: environmental, design,

or construction. In the same year, 41 projects to improve existing facilities (e.g., repaving shoulders and roadways and restriping shoulders and crosswalks) and 14 projects to build new facilities (e.g., sidewalks, curb ramps, raised crosswalks, shared use paths, bridges, etc.) were completed. The new facilities built amounted to an additional 5.1 miles of sidewalks and shared use paths.

In HDOT's most recent Capital Improvement Program (CIP), there were more than $37 million in funds requested for pedestrian and bicycle improvement projects, which are projected to start within the next three years. These improvements are stand-alone projects funded in the pedestrian program or bicycle program only and are not part of larger transportation projects.[4] As part of the HDOT's Complete Streets policy, pedestrian and bicycle needs and facilities are considered on all of their projects. The $37 million does not include pedestrian and bicycle improvement projects that have been incorporated into other CIP projects.

Well-designed pedestrian walkways, shared use paths, and sidewalks improve the safety and mobility of pedestrians. Pedestrians should have a direct and connected network of walking routes to desired destinations without gaps or abrupt changes. In some rural or suburban areas, where these types of walkways are not feasible, roadway shoulders provide an area for pedestrians to walk next to the roadway, although these are not preferable.

Transportation agencies should work towards incorporating pedestrian facilities into all roadway projects unless exceptional circumstances exist. It is important to provide and maintain accessible walkways along both sides of the road in urban areas, particularly near school zones and transit locations, and where there is a large amount of pedestrian activity. Walkable shoulders should also be considered along both sides of rural highways when routinely used by pedestrians.

At the County level, the City and County of Honolulu has a dedicated bikeway fund line item in the CIP for bikeway improvement projects, and a sidewalk improvements bulk fund for pedestrian improvements. In the most recent adopted CIP for the City and County of Honolulu for FY 2024, $1,059,000 was obligated to the bikeway fund line item. While the County of Hawai'i (COH) does not have dedicated CIP funding for pedestrian and bikeway improvements, the addition of pedestrian and bicycle facilities are carried out through the COH Department of Public Works (DPW) and can be incorporated in roadway improvement projects. The COH DPW's has two upcoming planned projects for pedestrian and bicycle facility improvements. One project is to improve the shoulders along Kawili Street and will include adding bicycle lanes and concrete sidewalks from the University of Hawai'i at Hilo's main entrance to the end of Kanoelehua Avenue. Another upcoming project will improve the sidewalks along Kilauea Avenue. Similar to the COH, the County of Maui incorporates pedestrian and bicycle facilities into their CIP projects, such as the Waiale Road Extension Project (new shared-use path, sidewalks, and shoulder bikeways) and the Liloa Street Extension, Phase 1 (new shared-used path).

[4] State of Hawai'i, Department of Transportation. Act 100 Report, "Multi-Modal Integration". 2022.

2.4 VRU Safety Special Rule

In addition to the requirement to prepare a VRUSA, the IIJA established a new VRU Safety Special Rule under the HSIP codified under 23 U.S.C. Section 148(g)(3) that states "If the total annual fatalities of vulnerable road users in a State represents not less than 15 percent of the total annual crash fatalities in the State, that State shall be required to obligate not less than 15 percent of the amounts apportioned to the State under section 104(b)(3) for the following fiscal year for highway safety improvement projects to address the safety of vulnerable road users." Per FHWA policy and guidance, the annual total number of fatalities and VRU fatalities will come from the US-DOT National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS). Highway safety improvement projects implemented under the VRU Safety Special Rule must be on a public road consistent with the State's SHSP and correct or improve a hazardous road location or feature or address a highway safety problem.[5]

As provided in the memorandum, the following table shows the year of available fatality data that will be used in the determination of the applicability of the VRU Safety Special Rule, and the fiscal year for which the rule would apply.

Table 4: Timeline of VRU Safety Special Rule Determination

Annual Data	FHWA Notifies State DOT if VRU Safety Special Rule Applies	Fiscal Year that VRU Safety Special Rule Would Apply
2020	By March 2022	FY 2023 Oct. 1, 2022 to Sept. 30, 2023
2021	By March 2023	FY 2024 Oct. 1, 2023 to Sept. 30, 2024
2022	By March 2024	FY 2025 Oct. 1, 2024 to Sept. 30, 2025
2023	By March 2025	FY 2026 Oct. 1, 2025 to Sept. 30, 2026

The FHWA notified the HDOT that the 2021 State safety performance target assessment and the FY 2024 HSIP Special Rules determinations were conducted and the VRU Safety Special Rule will apply for FY 2024, as the percent of VRU fatalities per total fatalities was 31% for 2021. Per the VRU Safety Special Rule, the HDOT is required to obligate not less than 15% of the amount apportioned under the HSIP for highway safety improvement projects to address the safety of VRUs for FY 2024.

[5] 23 U.S.C. Section 148(a)(4)(A) and FHWA Memorandum on 23 U.S.C. 148(g) Highway Safety Improvement Program Special Rules Guidance

SECTION THREE

SUMMARY OF QUANTITATIVE ANALYSIS

3 Summary of Quantitative Analysis

This section summarizes the quantitative analysis conducted on vulnerable road user crashes during the 5-year period between 2017 to 2021 for the State of Hawai‘i. The analysis included the collection of data such as crash data, traffic volumes, transit service routes and stops, existing and proposed pedestrian facilities and bikeways, land uses, demographics and environmental justice data, and data on natural and climate hazards. High-crash areas and corridors were identified from the vulnerable road user crash data from 2017 to 2021, and these areas were used to inform trends and characteristics for high-risk areas. A list of the locations of the high-risk areas are provided in Appendix D, along with maps showing the locations of the pedestrian clusters, bicycle crashes, and high-crash corridors.

3.1 Data Collected

Crash Data

This assessment analyzed crash data recorded on MVARs for the 5-year period between 2017 to 2021. A MVAR is a summation of information recorded at the scene of a crash that is provided by County police departments. A copy of a MVAR is provided in Appendix B. The bicyclist and pedestrian fatality and serious injury crashes were excerpted from the crash data and mapped in ArcGIS. For the purposes of this assessment, it is assumed that other non-motorized modes (i.e., skateboards, scooters, etc.) are recorded under the bicyclist and pedestrian fields in the MVAR as the form does not include specific fields for these modes.

Other data under categories such as traffic volume, transit service routes and stops, pedestrian facilities, bikeways, land uses, natural and climate-related hazards, and demographics and environmental justice were also collected and is described below. This data was used to inform the high-crash area and corridor characteristics and trends, which is further described in Section 3.3.

Traffic Volume and Transit Service Routes and Stops

Traffic volume data including average annual daily traffic (AADT) for 2017 to 2021 was sourced from the Hawai‘i Statewide Geographic Information System (GIS) Program Database. Feature layers depicting the location of bus stops on Maui and bus routes for O‘ahu, Kaua‘i, and the Big Island were also sourced from the Hawai‘i Statewide GIS Program Database.

Pedestrian Facilities and Bikeways

The Hawai‘i Statewide GIS Program Database was accessed to collect feature layers for existing and proposed pedestrian facilities and bikeways. The available layers include existing facilities such as State sidewalks and paths, State crosswalks, raised crosswalks, and State bikeways. Available layers for proposed or planned facilities include raised crosswalks, City and County of Honolulu bike facilities, and Maui County bikeways.

Existing pedestrian facilities and bikeways were also verified using Google Earth.

Land Uses

Feature layers for infrastructure and land uses, including hotels, hospitals, preschools and early childcare centers, public and private schools, postsecondary institutions, assisted living facilities, adult day care centers, adult day health centers, hospice facilities, skilled nursing facilities, State and County parks, and State libraries were collected from the Hawai'i Statewide GIS Program Database. Shopping centers, retail and commercial land uses, activity centers, and attractions surrounding crash sites were identified using Google Earth.

Natural and Climate-Related Hazards

The Hawai'i Statewide ArcGIS REST Services was accessed to collect feature layers depicting natural and climate-related hazard zones, including flood hazard zones, tsunami evacuation zones, lava flow hazard zones, fire risk areas, and sea-level rise exposure areas using a 3.2 ft. scenario.

Demographics and Environmental Justice

Demographic and environmental justice data was sourced from the US-DOT's Equitable Transportation Community (ETC) Explorer interactive web application. The US-DOT's ETC Explorer was created in support of the Justice 40 initiative created through Executive Order 14008 Tackling the Climate Crises at Home and Abroad to confront and address decades of underinvestment in disadvantaged communities. The ETC Explorer uses 2020 Census data at the Census Tract level to assess the cumulative burden communities experience as a result of underinvestment in transportation.

The table below shows the data used from the ETC Explorer to measure the social vulnerability of a community. The tool analyzes social vulnerability using indicators of socioeconomic status such as unemployment, educational attainment, poverty, housing tenure, access to the internet, insurance coverage, Gini index, housing cost burden, and household characteristics such as age, disability status, and English proficiency, all of which are sourced from the American Community Survey (ACS) 5-Year Estimates dataset from 2016 to 2020.

Table 5: Social Vulnerability Indicators

Subcomponent	Indicator Description
Socioeconomic Status	Percent of population with income below 200% of poverty level
	Percent of people age 25+ with less than a high school diploma
	Percent of people age 16+ unemployed
	Percent of total housing units that are renter-occupied

Subcomponent	Indicator Description
	Percent of occupied houses that spend 30% or more of their income on housing with less than $75k income
	Percent of population uninsured
	Percent of households with no internet subscription
	GINI Index
Household Characteristics	Percent of population 65 years or older
	Percent of population 17 years or younger
	Percent of population with a disability
	Percent of population (age 5+) with limited English proficiency
	Percent of total housing units that are mobile homes

In addition to the Social Vulnerability Indicators from the US-DOT's ETC Explorer, the "households with no vehicle available" data was also analyzed using the ACS 5-Year Estimates dataset from 2016 to 2020, Table S0802.

3.2 Data Limitations and Insufficiencies

Throughout the analysis, there have been limitations identified when analyzing pedestrian and bicyclist crash data that have led to insufficient or inconsistent data reporting. Examples of the data limitations and insufficiencies are provided below.

- **Unknown and "Blank" Data:** Various fields of data have been left blank by the reporting officer on the MVAR forms. In addition, certain fields include an "Unknown" option when the information is not available or provided to the officer at the time of the crash. This VRUSA used the 2017 to 2021 crash data that was provided to the HDOT from the County police departments. Police officers fill out the MVAR at the scene of a crash, and often times more information is not provided or available until a later time.
- **VRU Identification:** The MVAR form does not include separate fields to identify other types of VRU (e.g., rollers) except for pedestrians and bicyclists. Other VRUs are reported under the pedestrian and bicyclist fields, but cannot be represented or identified when analyzing crash trends and characteristics due to the insufficient reporting of these other users.
- **Frequency of Crashes:** Crashes involving bicyclists and pedestrians occur less often than motor vehicle crashes. Typical safety analyses would include identifying hot spots with high frequencies of crashes and statistically significant trends. This assessment identified

high-crash areas but with a smaller dataset (only serious injury and fatal VRU crashes) compared to those used for safety plans analyzing crashes with motor vehicles or all modes of transportation. Thus, the high-crash areas and the high-crash characteristics and trends identified in this assessment may differ from those identified in other safety plans.

- **Inconsistent Data:** Although protocols are implemented and training is conducted for officers filling out crash reports, there may still be inconsistencies or errors in the reporting. Some fields on the MVAR are also based on the information provided by those involved in the crash (notably Field 106 "Human Factors" and Field 108 "Other Factors"), which may not be reported accurately.
- **Demographics of VRUs:** While the MVAR includes fields to note the home address of those involved in the crashes, it does not include a separate field to report whether a houseless person was involved in a crash. Additional follow-up with police departments is needed to understand the houseless population's involvement in VRU crashes. In addition, the MVAR's Field 106 "Human Factors" and Field 108 "Other Factors" do not include options to note whether mental illness was a contributing factor to the crash. Reporting of the houseless and mentally ill populations involved in VRU crashes may lead to different results and more targeted strategies to reduce the risk to these vulnerable populations.

3.3 Pedestrian and Bicycle Crash Characteristics from the Crash Reports

From the 2017 to 2021 crash data, there were a total of 473 crashes involving pedestrians that resulted in a fatality or serious injury, and 115 crashes involving bicyclists resulting in a fatality or serious injury. The pedestrian and bicycle crashes were analyzed to identify crash characteristics and potential risk factors. The numbers represented in the following graphs are reflective of the data recorded in the MVARs. As such, the numbers and totals may not be consistent across all of the graphs as not all crash records include data for each of the fields listed in Table 6 below, and the number of pedestrians, bicyclists, and drivers involved vary across the different crash reports.

Table 6: MVAR Fields Analyzed for Crash Trends

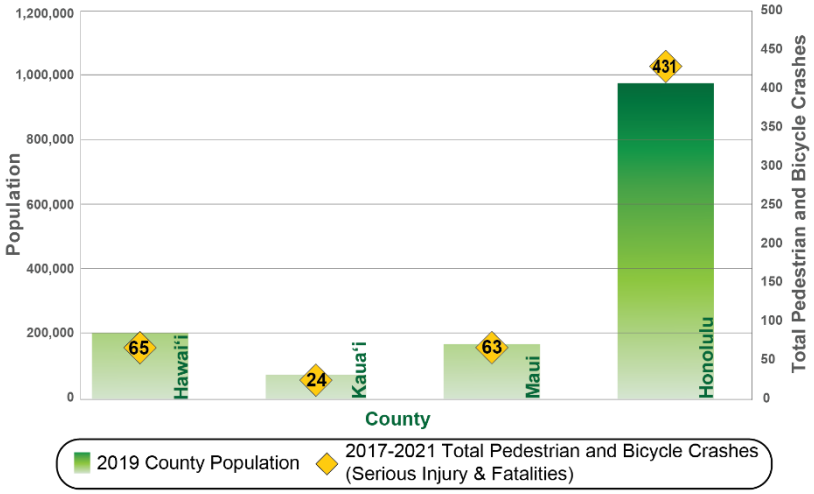
Field Number	Field Name	Report Level
2	County	Crash Level
19	Lighting	Crash Level
25	City/Town	Crash Level
117B	Speed Limit	Crash Level

Field Number	Field Name	Report Level
2	County	Crash Level
119	Intersection Type	Crash Level
34	Unit Class	Unit Level
35	Race	Unit Level
97	Vehicle Maneuver (of both bicycles + vehicles)	Unit Level
99	Traffic Controls	Unit Level
103	Bike Facility	Unit Level
106	Human Factors (of vehicle drivers and pedestrians/bicyclists)	Unit Level
108	Other Factors (of vehicle drivers and pedestrians/bicyclists)	Unit Level
45	City	Person Level
120c	Age (of pedestrian/bicyclists)	Person Level
120d	Sex (of pedestrian/bicyclists)	Person Level

Distribution by County

The distribution of the fatal and serious injury pedestrian and bicycle crashes by County is shown in Figure 1. The number of crashes were found to be fairly proportional to the population distribution.

Figure 1: Total Pedestrian and Bicycle Crashes and 2019 Population



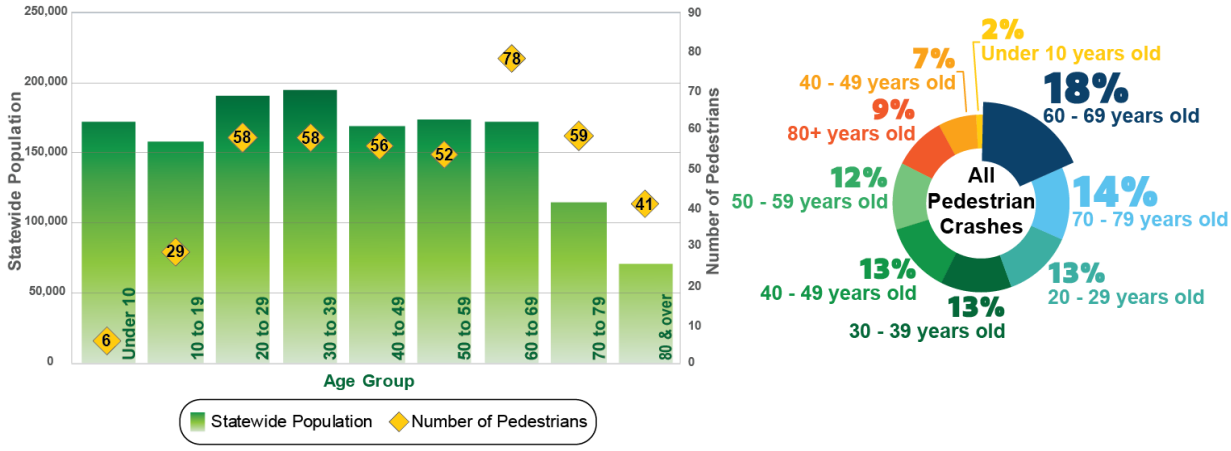
Age of VRUs

The age group of the pedestrians that were involved in the greatest number of crashes were within the 60 to 69-year-old age group, followed by the 70 to 79-year-old age

group. Figure 2 shows the number of crashes in age group categories as well as 2019 statewide population.

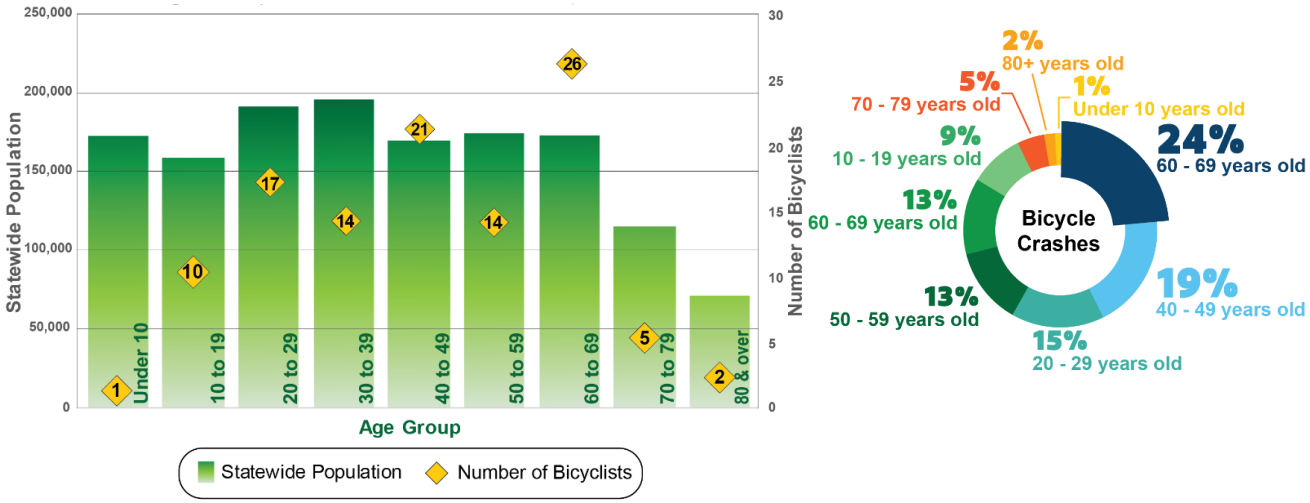
This aligns with statistics at the national level where the highest percentage of pedestrian traffic fatalities in 2021 were the 60 to 64 and 65 to 69-year-old age groups, with each group accounting for 23% of the fatalities.

Figure 2: Age of Pedestrians and 2019 Population



The age group of bicyclists involved in the most crashes is the 60 to 69-year-old age group, which is also the most overrepresented age group in proportion to the 2019 statewide population. A portion of this age group, those ages 60 to 64, is also represented in national statistics as the group with the largest number of bicyclist fatalities in 2021. The 40- to 49-year-old age group is the second most common age for bicyclists involved in the VRUSA crashes.

Figure 3: Age of Bicyclists and 2019 Population



Gender of VRUs

Figures 4 and 5 show the number of pedestrians and bicyclists that were seriously or fatally injured by sex in comparison to the 2019 statewide population. The 2019 statewide population shows a nearly equal amount of males and females, however there were slightly more pedestrians involved in crashes that were male.

Figure 4: Gender of Pedestrians and 2019 Population

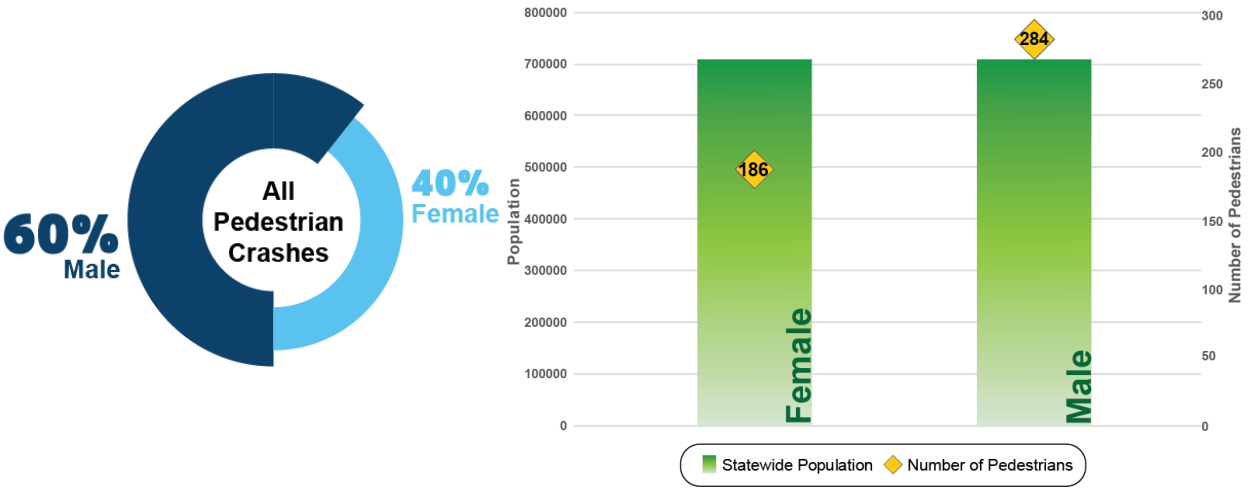
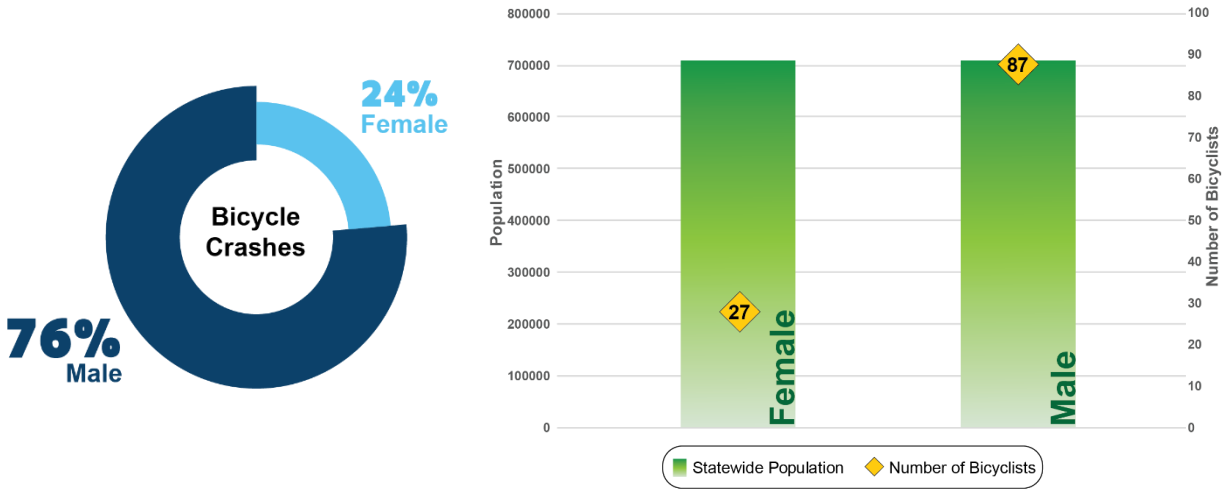


Figure 5: Gender of Bicyclists and 2019 Population



The number of male bicyclists involved in crashes were much higher than the number of females. Both trends are in line with national statistics, which show that for 2021, males made up the majority of pedestrians killed (70%) and also had the highest injury rate per population at 21 compared to females at 15 per 100,000 people.[6] Males also made up the majority of

[6] U.S. Department of Transportation, National Highway Traffic Safety Administration. "Traffic Safety Facts 2021 Data". June 2023.

bicyclists killed (86%), and also had an injury rate 4 times higher than females (21 compared to 5 for females per 100,000 people).

Race of VRUs

For pedestrian crashes, the most commonly indicated field under race was “Unknown” or “Other”. It has not been determined what the “Other” category represents in the crash reports, but in regards to the 2019 statewide population the “Other” category represents races that have relatively small populations in Hawai‘i, such as Pacific Islanders, American Indian/Alaskan Native, and other Asian races. The second most commonly indicated race for pedestrians was “White”, followed by Hawaiian. It should be noted that the statewide population numbers represent those who indicated only one race in the ACS 5-Year Estimates for 2016 to 2020.

For bicycle crashes, the most common race of the bicyclists involved was White, followed by Hawaiians. White, Hawaiian, and Samoan are disproportionately represented in relation to the statewide population for bicyclist crashes.

Figure 6: Race of Pedestrians and 2016 - 2020 Population

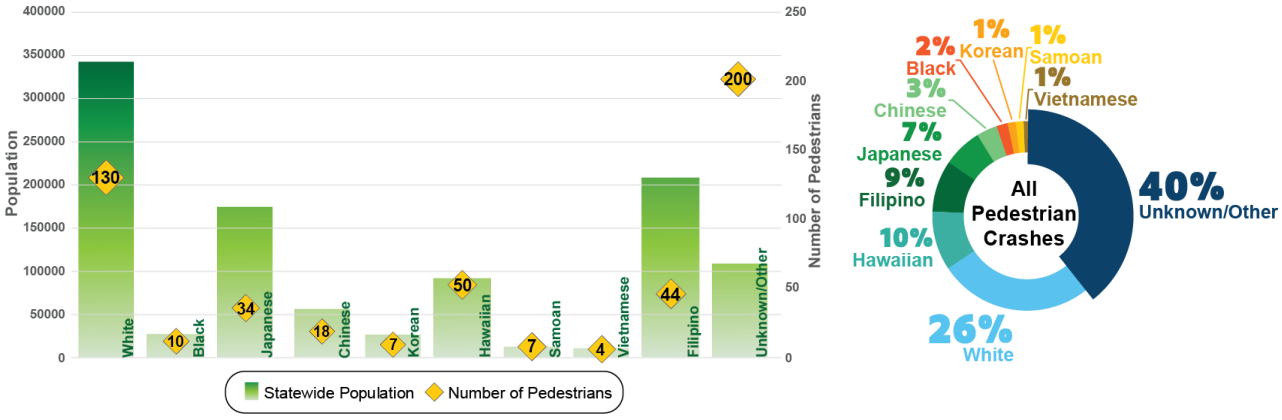
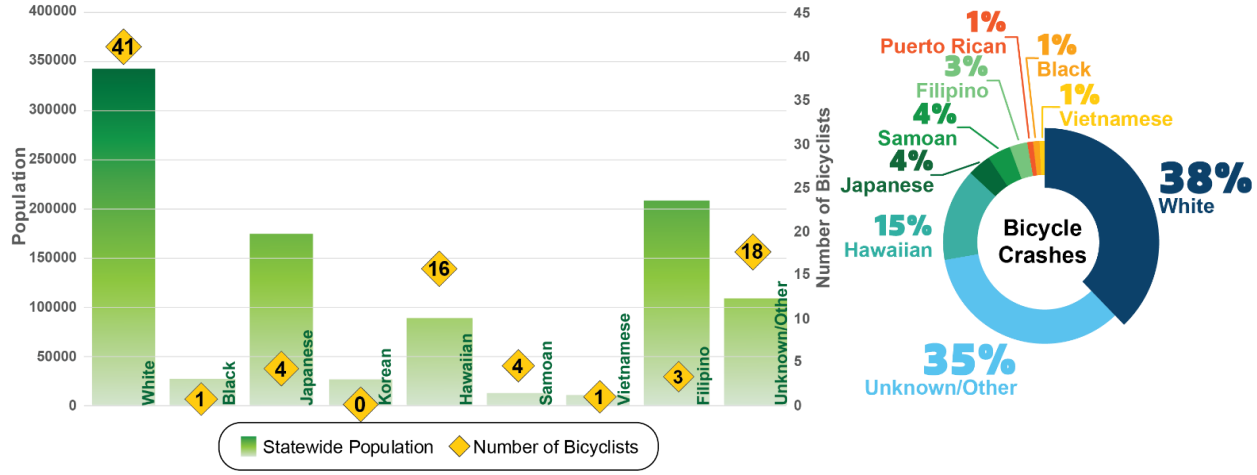


Figure 7: Race of Bicyclists and 2016 - 2020 Population

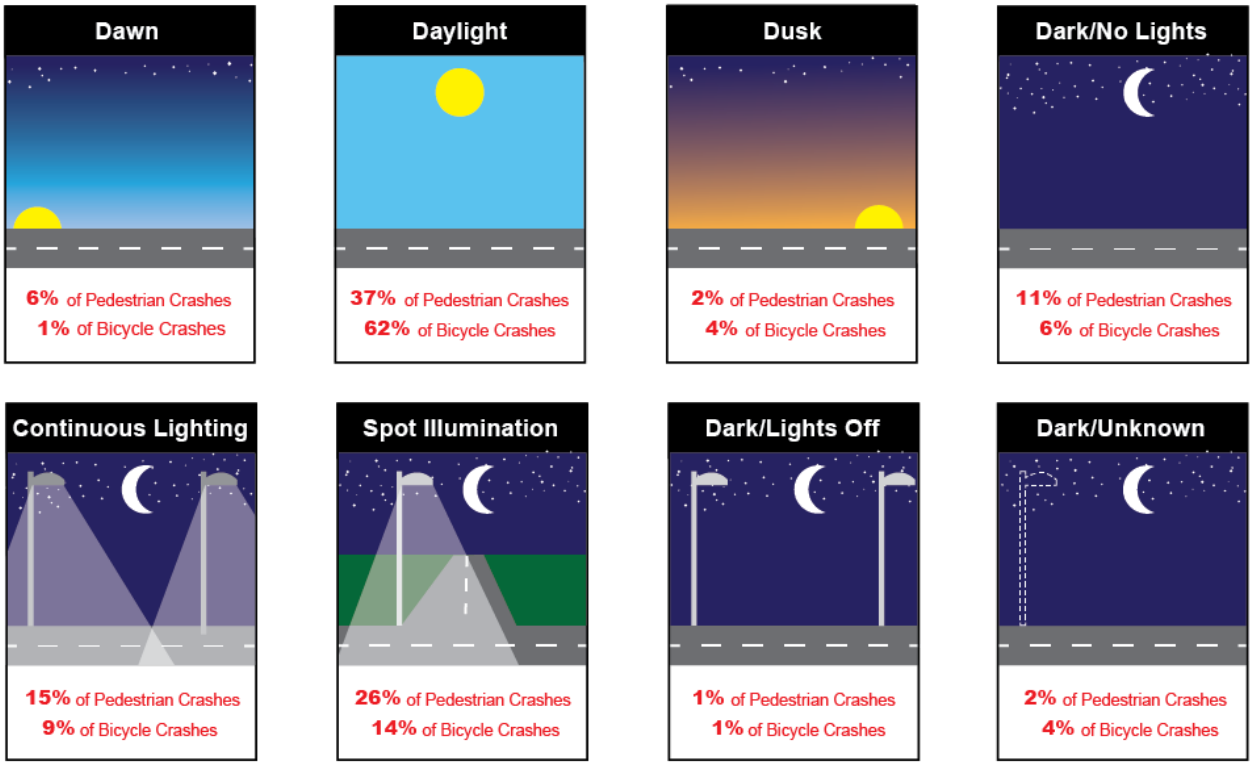


Lighting Conditions

A majority of pedestrian and bicycle crashes occurred during daylight conditions. The second most common lighting condition for pedestrian and bicycle crashes was spot illumination.

In comparison to national statistics for 2021, a majority of fatalities (77% for pedestrians and 52% for bicyclists) occurred in the dark.

Figure 8: Lighting of Pedestrian and Bicyclist Crashes

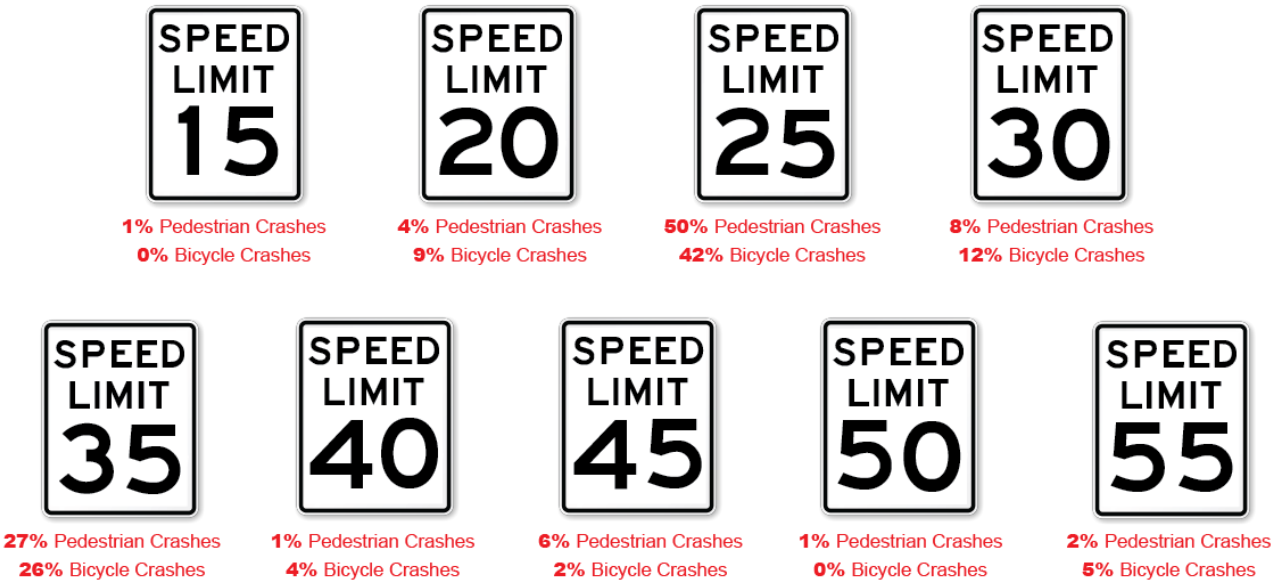


Speed Characteristics

A majority of both the pedestrian and bicycle crashes occurred on roadways where the posted speed limit was 25 miles per hour (mph). Roadways with a posted speed limit of 35 mph were the second most common location for pedestrian and bicycle crashes to occur.

Though excessive speeding was not identified as a contributing factor in the VRU crash reports, review of actual travel speeds along the crash corridors with posted 25 mph and 35 mph speed limits was conducted. The crash corridors are discussed in Section 3.5, and listed in Appendix D. Data provided by Google for a one-week period in April 2023 showed that out of the 14 corridors reviewed, 4 were characterized by a mean 85th percentile speed within 5 mph higher than posted speed, 3 within 10 mph of the posted speed and 1 over 10 mph of the posted speed. It should be noted that the Google speed data identifies speeds for only a portion of the traffic along a corridor. This should only be used as a high-level tool to identify potential speeding issues.

Figure 9: Posted Speed Limit of Pedestrian and Bicyclist Crashes

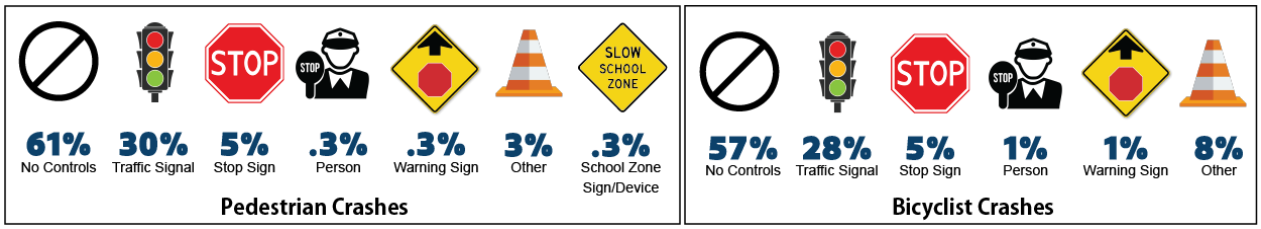


Traffic Controls

More than half of the pedestrian and bicycle crashes occurred at locations where there were no existing traffic controls, followed by locations where a traffic signal was present.

74% of the total bike crashes occurred in areas where there were no existing bike facilities, followed by locations where there was a separated path or bike lane.

Figure 10: Traffic Controls

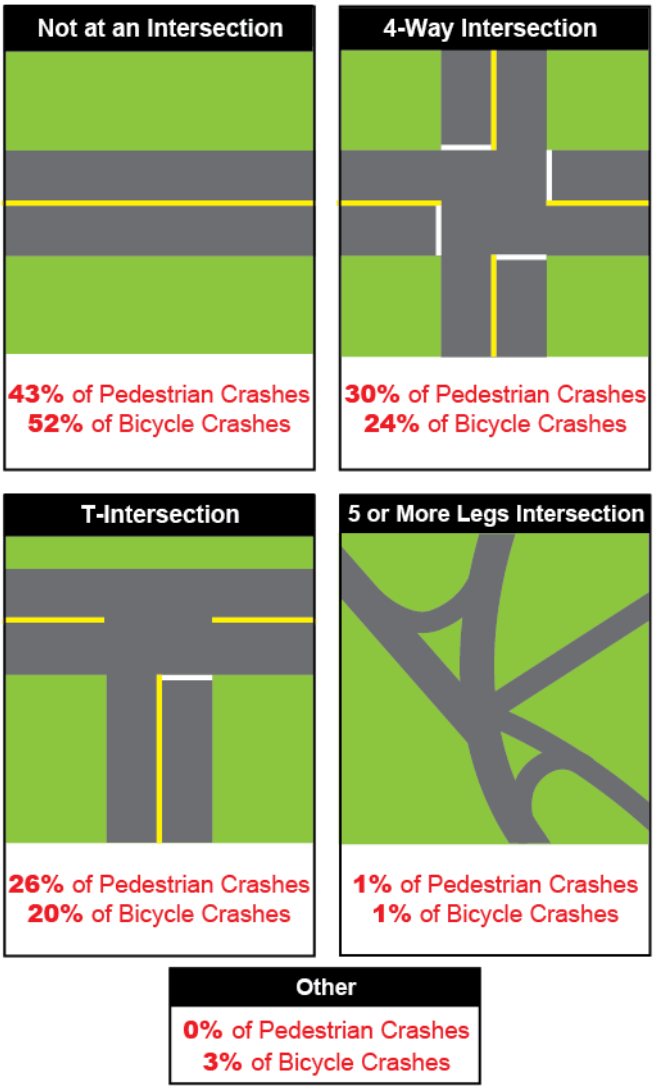


Intersection Type

A majority of pedestrian crashes (43%) did not occur at an intersection. 4-way intersections were the second most common type of intersection where pedestrian crashes occurred. This is in line with national results on pedestrian fatalities, which indicates that 75% of pedestrian fatalities did not occur at an intersection.

Bicycle crashes mostly occurred at locations that were not at an intersection. The second most common location where bicycle crashes occurred was at 4-way intersections. This aligns with national statistics for bicyclist fatalities, which indicates that 62% of fatalities did not occur at an intersection.

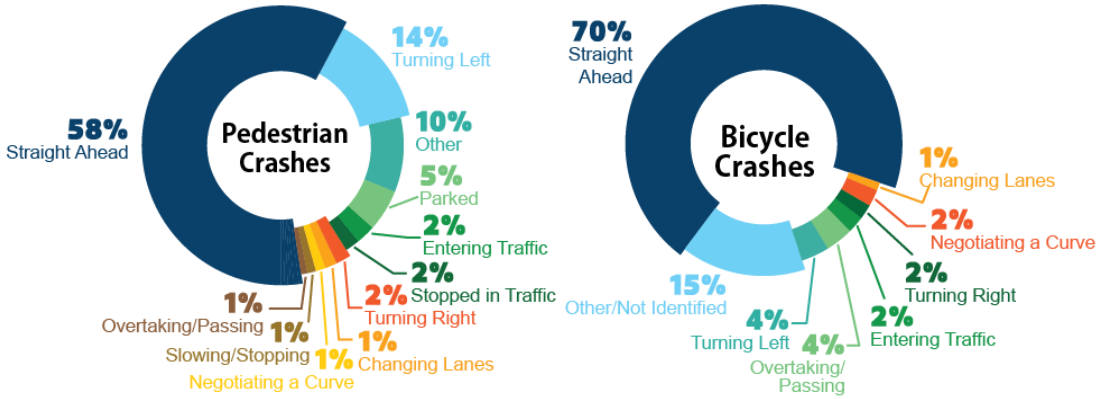
Figure 11: Intersection Type Where Pedestrian and Bicycle Crashes Occurred



Vehicle Maneuver

Driving straight was the most common maneuver for vehicle drivers involved in pedestrian and bicycle crashes. It was also the most common maneuver indicated for bicycle riders involved in the crashes. The second most common maneuver for vehicles involved in pedestrian crashes was turning left. For bicycle crashes, vehicles turning left and overtaking/passing were tied for the second most common maneuver contributing to crashes.

Figure 12: Vehicle Maneuver

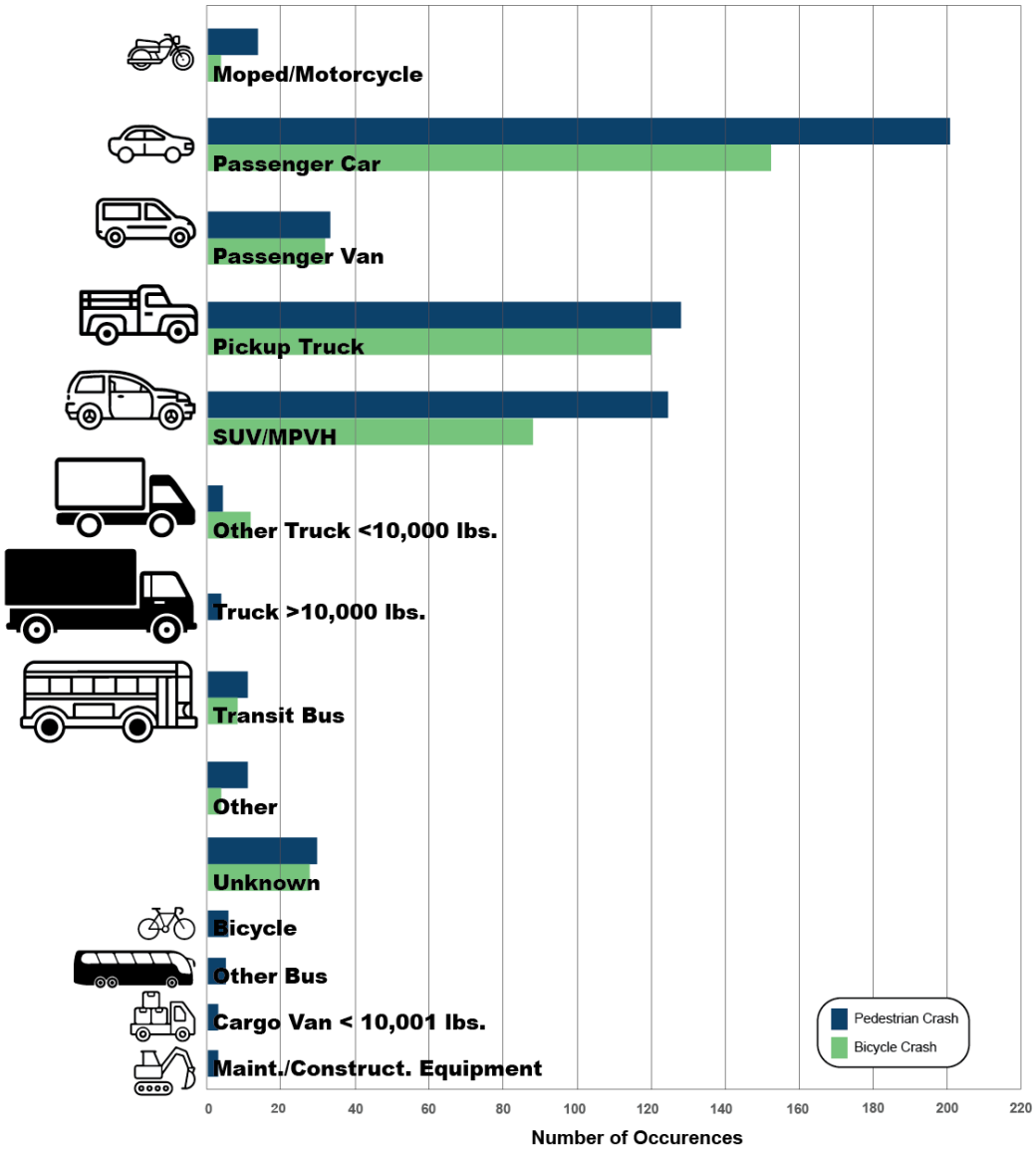


Vehicle Type

Passenger cars were the most common vehicle type involved in pedestrian crashes, followed closely by pickup trucks. This is similar to national statistics on pedestrian fatalities in 2021, which show that passenger cars were involved in 35% of pedestrian fatalities. However, national statistics show that sports utility vehicles (SUVs) were the second most common vehicle type involved in pedestrian crashes accounting for 24% of pedestrian fatalities.

For bike crashes, passenger cars were the most common vehicle type involved in crashes, followed closely by pickup trucks. According to national statistics, passenger cars were involved in 35% of bicycle fatalities and SUVs were involved in 22% of fatalities, followed closely by pickup trucks which accounted for 20% of fatalities in 2021.

Figure 13: Vehicle Types Involved in Fatalities and Serious Injury Pedestrian and Bicycle Crashes



Human Factors (for Vehicle Drivers)

The most common human factor indicated for vehicle drivers involved in both pedestrian and bicycle crashes was “none”, followed by inattention and misjudgment.

The US-DOT’s NHTSA Traffic Safety Facts for 2021 Data reports on alcohol involvement for drivers, pedestrians, and bicyclists. Based on national statistics, a majority of pedestrian fatalities did not involve the consumption of alcohol by either the driver or pedestrian (51% of crashes). These results are similar to those for bicyclists, where a majority of bicyclist fatalities involved no alcohol in the driver or bicyclist (64%).

Figure 14: Human Factors for Vehicle Drivers Involved in Pedestrian Crashes

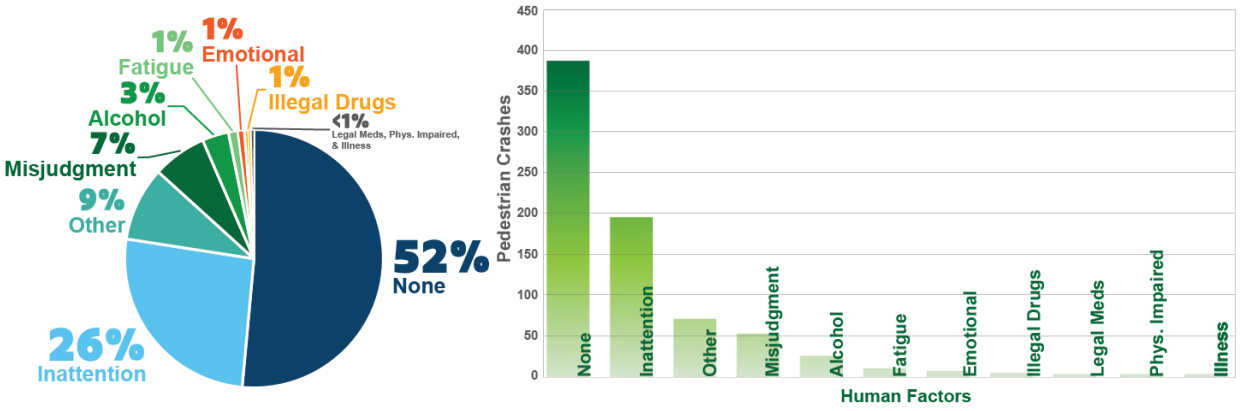
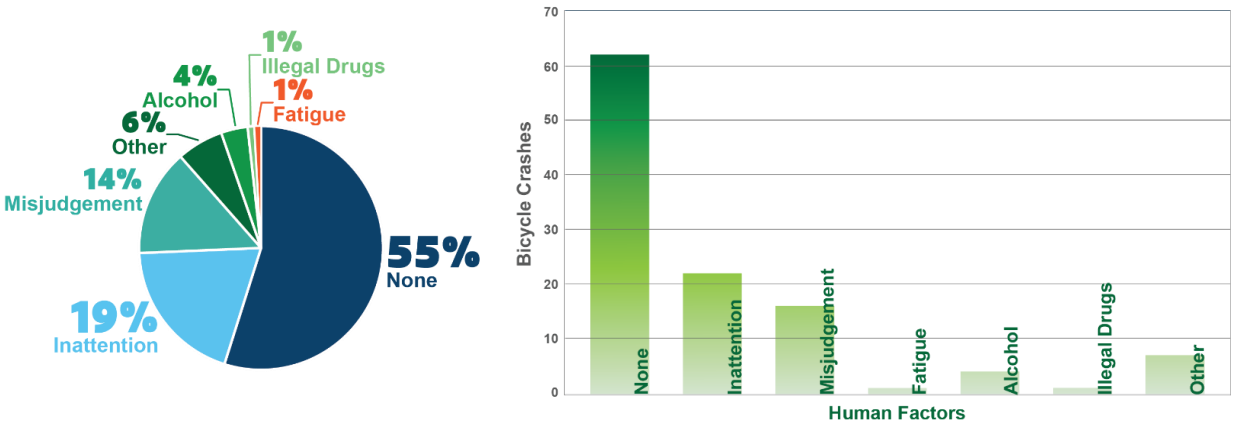


Figure 15: Human Factors for Vehicle Drivers Involved in Bicycle Crashes



Human Factors (for Pedestrians and Bicyclists)

The most common human factor indicated for pedestrians and bicyclists involved in the crashes was “none”, followed by inattention.

Based on national statistics for 2021, pedestrian fatalities where the driver had “no alcohol” (a blood alcohol concentration (BAC) of .00 grams per deciliter (g/dL)) and the pedestrian had a BAC of .08 g/dL or greater accounted for 22% of crashes (1,636 crashes), which is the second most common occurrence after fatalities where no alcohol was present in both drivers and pedestrians. Bicyclist fatalities where the driver had no alcohol and the bicyclist had a BAC of .08 g/dL or greater was the second most common occurrence (14%, 132 crashes), followed closely by fatalities where the driver had a BAC of .08 g/dL and the bicyclist had no alcohol (12%, 118 crashes). The most common occurrence for bicyclist fatalities involved no alcohol present in both the drivers and bicyclist.

Figure 16: Human Factors for Pedestrians

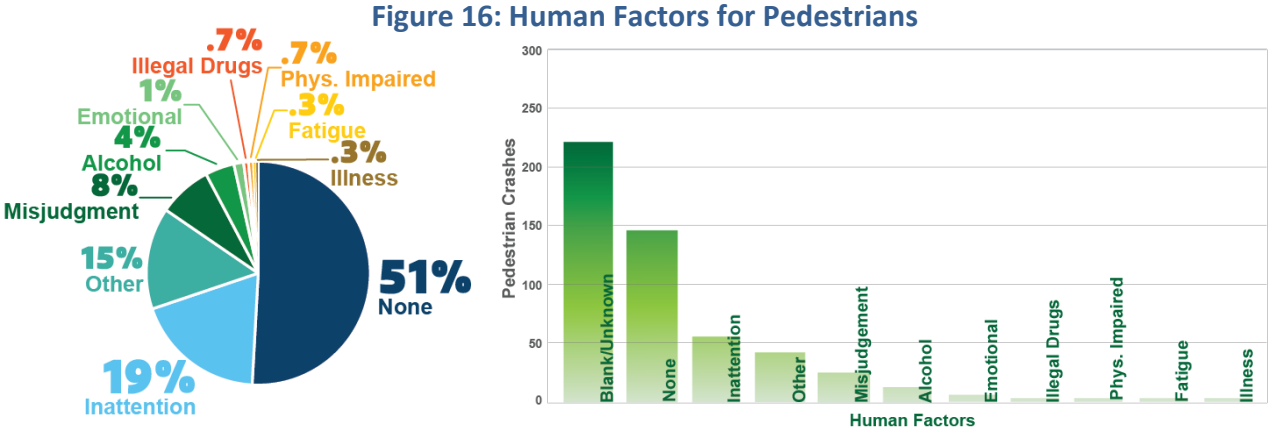
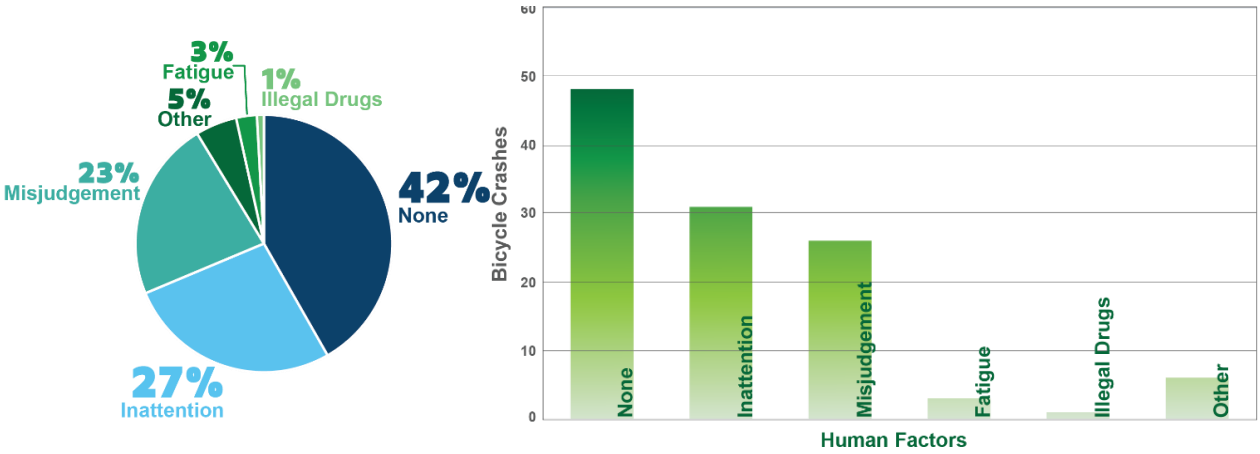


Figure 17: Human Factors for Bicyclists



Other Factors (for Vehicle Drivers)

For both pedestrian crashes, the most common factor under the “Other Factors” Field 108 of the MVAR indicated for the vehicle drivers involved in the crashes was “No Improper Action” followed by “Pedestrian Violation” and “Failure to Yield”. For bicycle crashes, the most common factor for the vehicle drivers involved in the crashes was “No Improper Action”, followed by “Unknown/None Provided” and “Failure to Yield”.

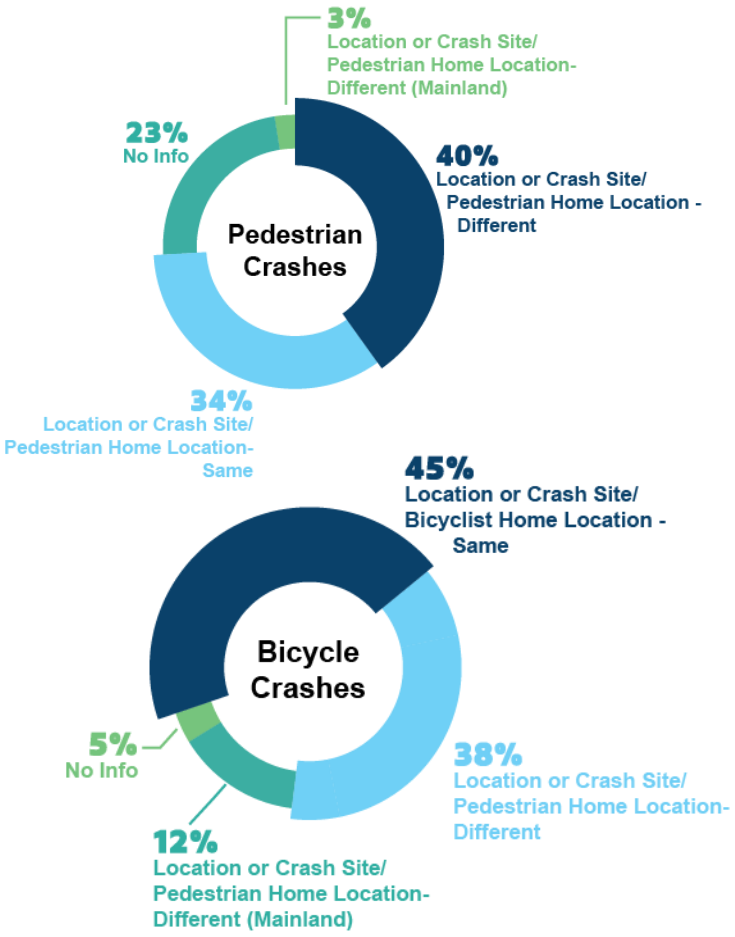
Other Factors (for Pedestrians and Bicyclists)

"No Improper Action" was the most indicated factor under the "Other Factors" Field 108 for pedestrian and bicycle crashes. The second most common factor involved in both pedestrian and bicycle crashes were pedestrian and bicycle violations. Although further details on the pedestrian and bicycle violations are not provided in the crash data, the additional "Other Factors" and "Human Factors" fields for these crashes show that improper crossing, inattention, alcohol, and illegal drugs were involved.

Location Where Crash Occurred vs. Pedestrian/Bicyclist Home Location

Although the crash data did not include the zip codes of the residences of the pedestrians and bicyclists, the home city was provided and used to assess whether the crashes were occurring generally in the same city or area where the pedestrians and bicyclists live. When comparing the location of where the pedestrian is from versus where the crash occurred, less than half of the crashes occurred in a different city from where the pedestrian is from, while 34% of crashes were in cities or locations that were the same as the pedestrian's home city/location. For bike crashes, a little less than half of the crashes occurred in the same city where the biker was from, while 38% occurred in a different city/location from where the biker was from. Approximately 12% of crashes involved bikers who were from the mainland. The data suggests that pedestrians and bicyclists involved in these crashes are mostly traveling to, from, or near their residences. This aligns with the trend identified for bicyclists in the previous subsection that shows bicycle crashes were most commonly occurring in residential areas.

Figure 18: Location Where Crash Occurred vs. Pedestrian/Bicyclist Home Location



3.4 High-Crash Area Methodology

The following subsections summarize the methodology used to identify high-crash areas from the 473 total pedestrian crashes and 115 total bicycle crashes during the study period from 2017 to 2021.

High-crash areas were used to further examine characteristics and trends through the Systemic Approach, allowing for identification of the Program of Strategies that may be proactively implemented. High-crash areas were also used to inform the high-risk locations that were further evaluated in the development of the Program of Projects. The Program of Strategies and Projects are discussed in Section 5.

Identification of High-Crash Areas for Pedestrian Crashes

An ArcGIS geoprocessing tool called the "cluster tool" was utilized to identify high-crash areas from the 473 total pedestrian crashes used in this assessment. The cluster tool analyzes point features to identify a "cluster" of where points occur according to proximity and number of occurrences. Clusters were created using distances of 100-, 500-, and 1,000-ft. where a minimum of two crashes were required to be located within the defined distances to form a cluster. Based on the results, the 100-ft. cluster distance was used to narrow down the assessment of high-crash areas on Oʻahu due to the high number and density of crashes on the island. The 1,000-ft. cluster distance was used on the islands of Maui, Kauaʻi, and Hawaiʻi Island due to the fewer number of crashes and densely populated areas on the islands.

Using the 100-ft. cluster distance for Oʻahu resulted in the identification of a total of 18 crash clusters that contained 37 crashes. The 1,000-ft. cluster distance resulted in the identification of 4 clusters on Hawaiʻi Island that contained 9 crashes, 5 clusters on Maui that contained 10 crashes, and 3 clusters on Kauaʻi that contained 6 crashes. The islands of Lānaʻi and Molokaʻi did not have any fatality or serious injury pedestrian crashes from 2017 to 2021. Out of all the clusters across the State, only one cluster located on Oʻahu contained three or more crashes. This cluster site is located at the intersection of South King Street and Kalakaua Avenue, where a total of three crashes occurred: one crash in 2018 and two crashes in 2021. The cluster locations are listed in Appendix D and shown in Figures 29 to 32.

Table 7: Total Pedestrian High-Crash Areas/Clusters by Island

Island	Pedestrian High-Crash Areas/Clusters	Total Number of Pedestrian Crashes in Clusters
Oʻahu	18	37
Hawaiʻi Island	4	9
Maui	5	10
Kauaʻi	3	6
Total	**30**	**62**

Figure 19: O‘ahu Pedestrian Crash Clusters

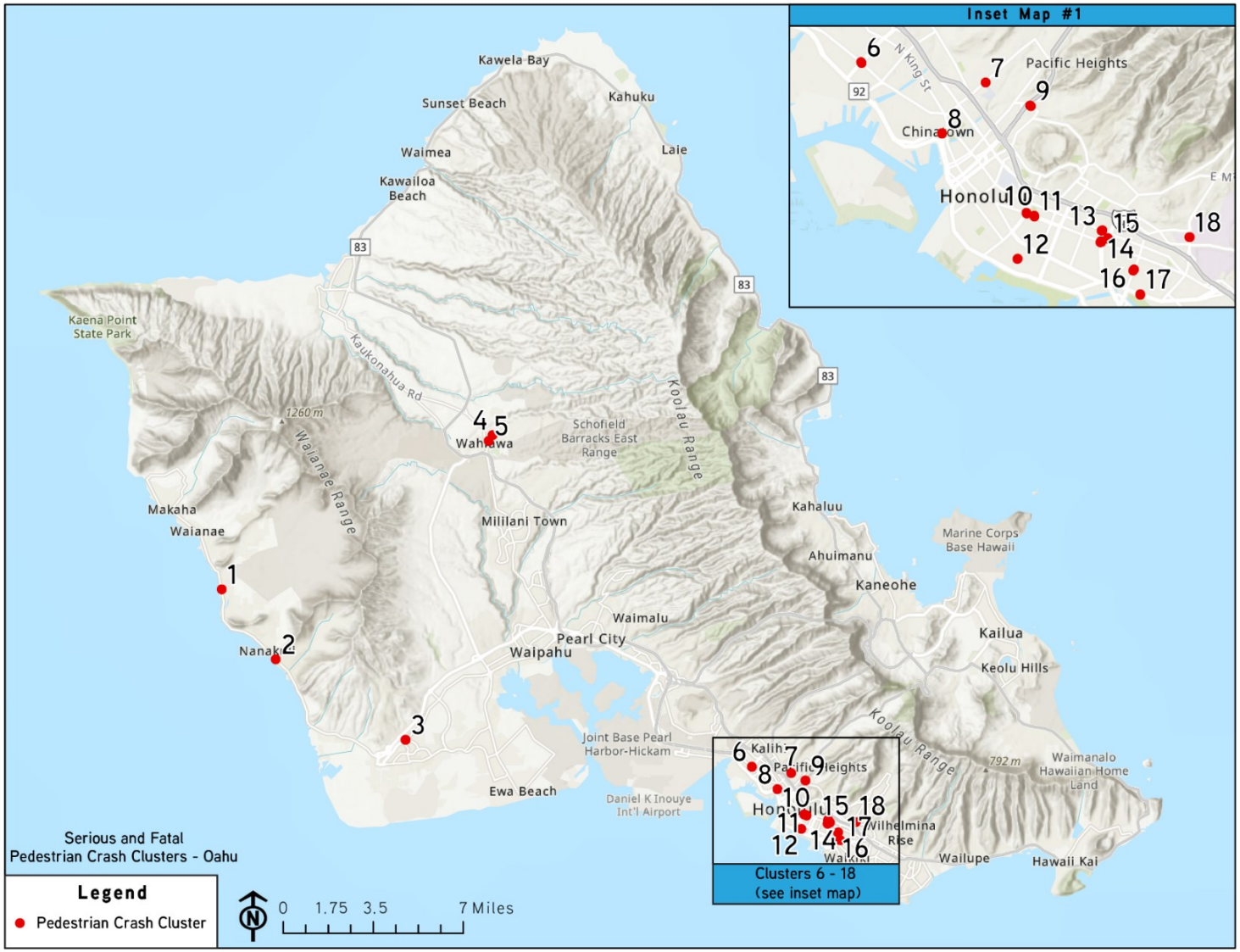


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Figure 20: Kauaʻi Pedestrian Crash Clusters

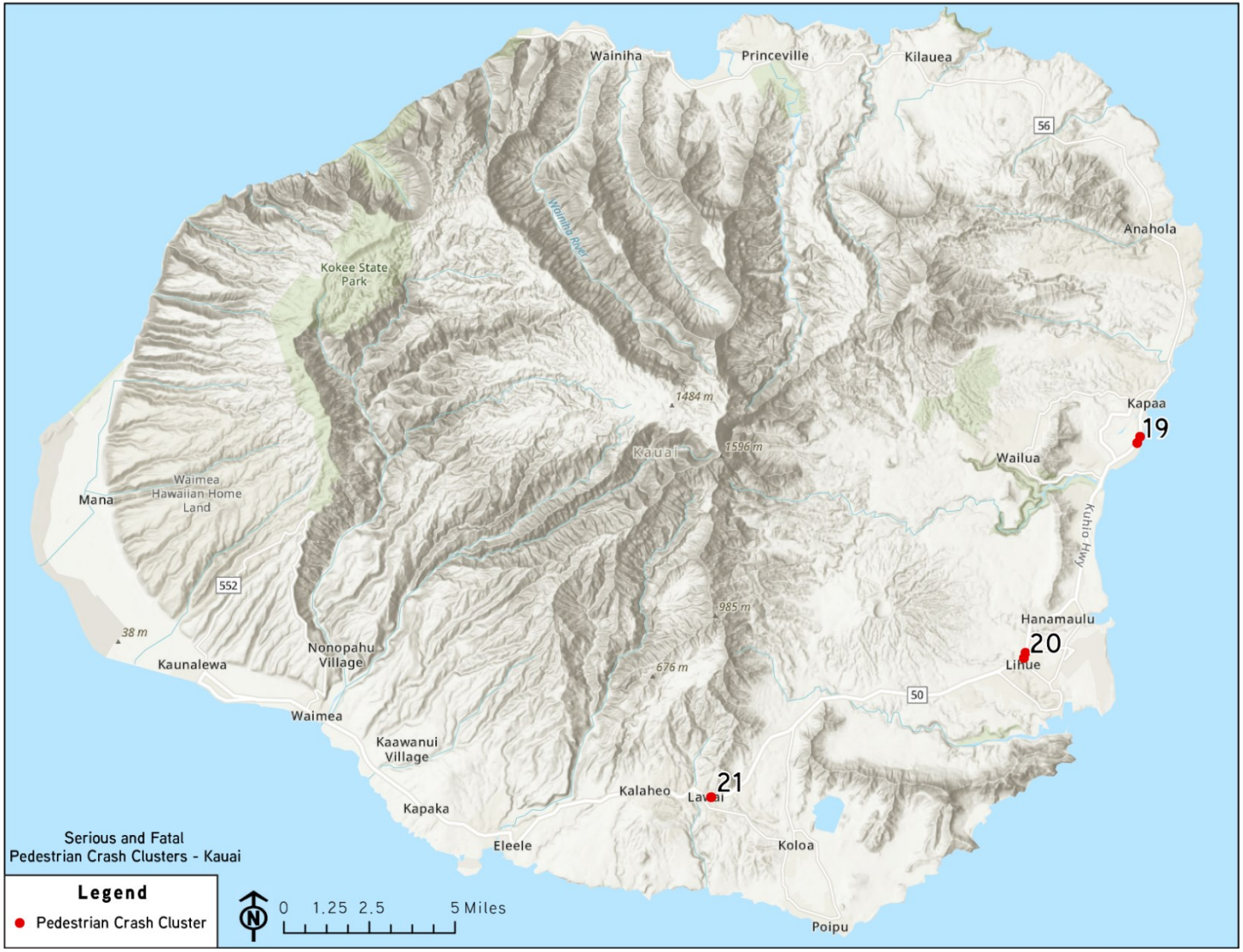

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Figure 21: Maui Pedestrian Crash Clusters

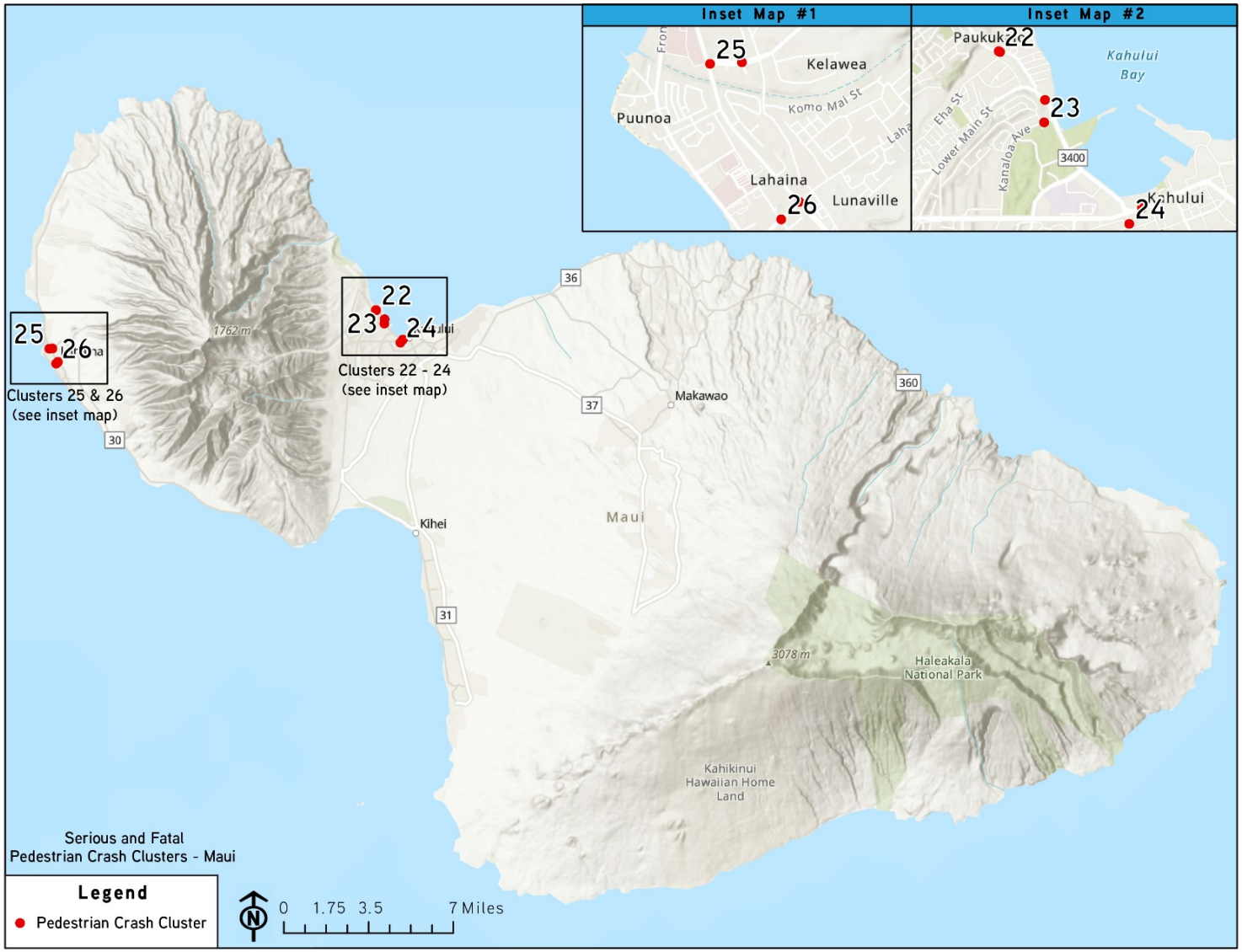

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Figure 22: Hawai'i Island Pedestrian Crash Clusters

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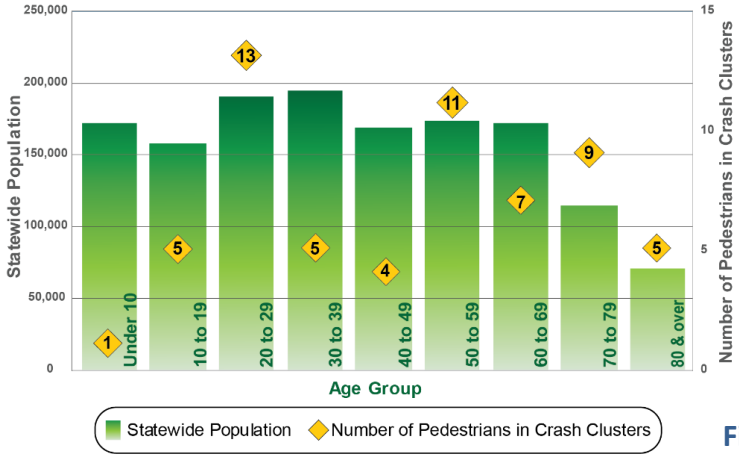
Crash Characteristics for Pedestrian High-Crash Areas

Crash characteristics from the MVAR report were also analyzed for pedestrian high-crash areas. This subsection provides a summary of the crash characteristics and trends for pedestrian high-crash areas that differed from the results of the trends for all the pedestrian crashes presented in Section 3.3.

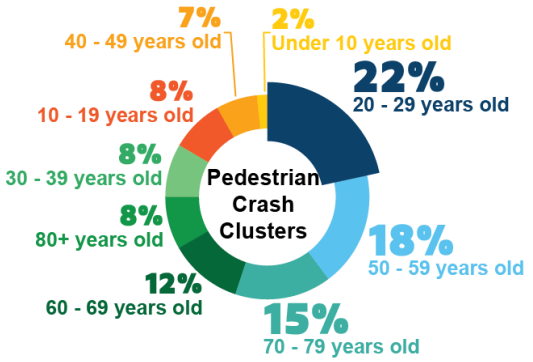
The age group involved in the most pedestrian crashes were those in the 60 to 69-year-old age group, followed by the 70 to 79-year-old age group. Both groups represented a disproportionately high number of pedestrian deaths compared to the 2019 population. In comparison, the crashes in the pedestrian clusters represent a disproportionately high number of pedestrian deaths for young adults in the 20 to 29-year-old age group, older adults in the 50 to 59-year-old age group, and elderly adults 70 years and older.

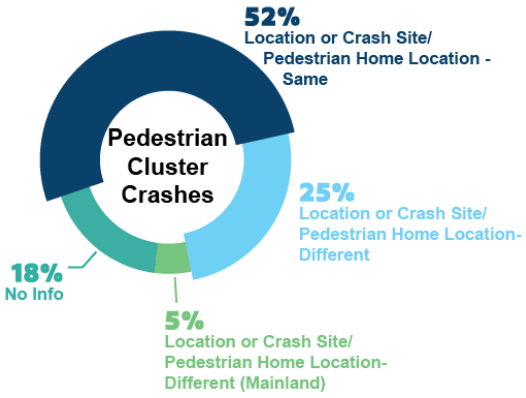
Figure 24: Age of Pedestrians in Crash Clusters and 2019 Population



Approximately 40% of all the pedestrian crash locations occurred in a different city from where the pedestrian was from. This differs from the pedestrian crash cluster locations, which show that a majority of the crashes occurred in the same city from where the pedestrian was from.

Figure 23: Location Where Crash Occurred vs. Pedestrian Home Location (Crash Clusters)





Most of the pedestrian crashes occurred at locations where there were no traffic controls present, followed by locations where a traffic signal was present. For the pedestrian crash clusters, most crashes occurred where a traffic signal was present followed by locations where a stop sign was present.

Figure 26: Traffic Control Devices in Pedestrians Crashes and Pedestrian Crash Clusters

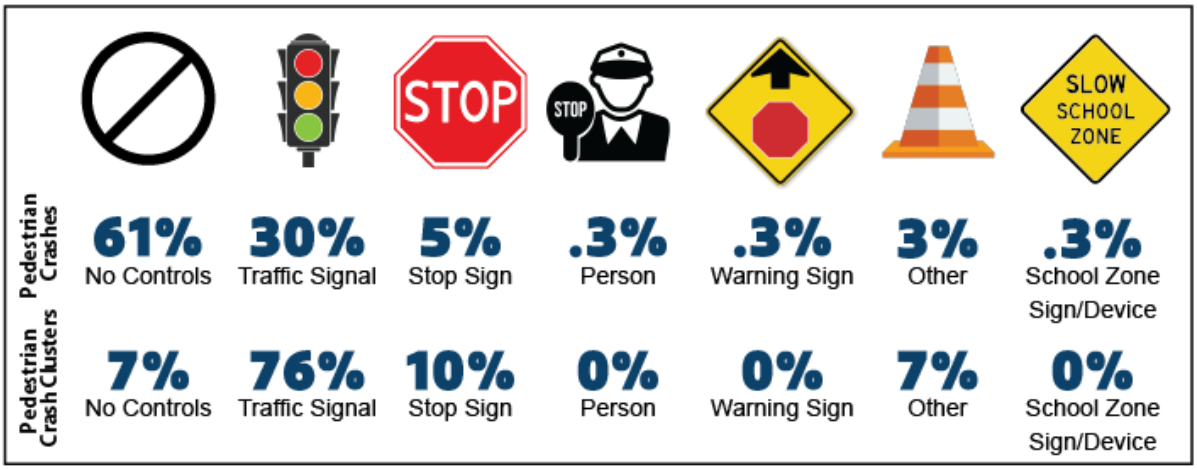
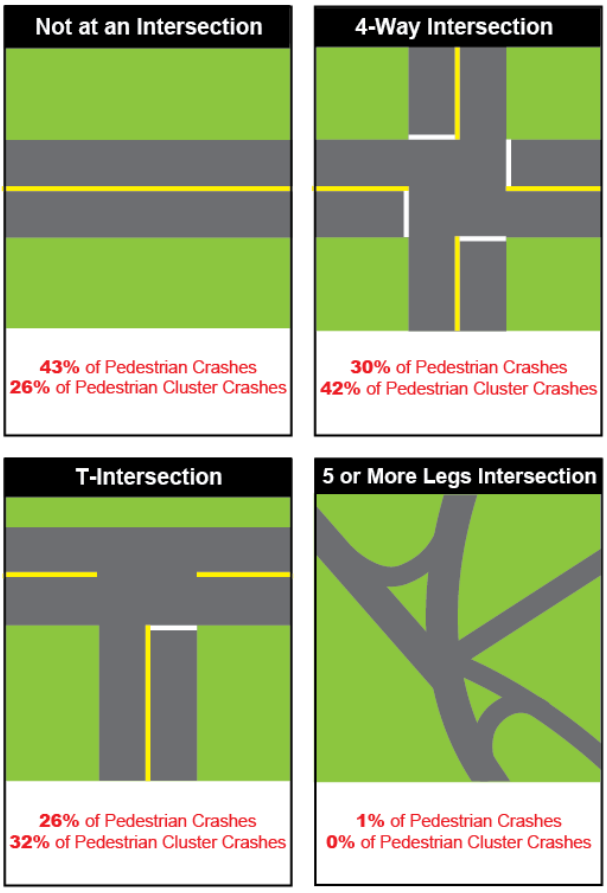


Figure 25: Intersection Type Where Pedestrian Crashes and Pedestrian Cluster Crashes Occurred



A majority of all pedestrian crashes occurred at locations that were not at an intersection, followed by 4-way intersections. This differs from the pedestrian crash clusters which show that most crashes occurred at 4-way intersections, followed by T-intersections.

Identification of High-Crash Areas for Bicycle Crashes

The bicycle crashes were analyzed using the same clustering process as the pedestrian crashes. The result of the analysis showed a lack of clusters at even the greatest defined distance of 1,000-ft.; only one cluster on Hawai‘i Island and eight clusters on O‘ahu were found using the 1,000-ft. distance. Due to the lack of clusters found across all of the islands, all 110 bicycle crashes were analyzed to identify potential trends or risk factors for the purposes of the assessment, which is discussed in later sections. Table 8 provides a breakdown of the total number of bicycle crashes by island, and Figures 33 to 36 show the locations of the crashes. No fatal or serious injury bicycle crashes occurred on the islands of Lāna‘i and Moloka‘i from 2017 to 2021.

Table 8: Total Bicycle Crashes by Island

Island	Total Bicycle Crashes
O‘ahu	75
Hawai‘i Island	15
Maui	4
Kaua‘i	16
Total	**110**

Identification of High-Crash Corridors

High-crash corridors were identified using all the pedestrian and bicycle crash locations that resulted in a serious injury or fatality. For O‘ahu, high-crash corridors were identified if a minimum of three pedestrian or bicycle crashes occurred within a ½-mile distance. This resulted in the identification of 30 corridors. For the islands of Maui, Kaua‘i, and Hawai‘i Island, a minimum of three crashes per 1-mile were used to identify high-crash corridors. This resulted in the identification of one corridor each on Kaua‘i and Hawai‘i Island and two corridors on Maui.

Table 9 provides a breakdown of the total high-risk corridors and total number of crashes in the corridors for each island. The corridor locations are listed in Appendix D and shown in Figures 37 to 40.

Table 9: Total High-Crash Areas and Corridors by Island

Island	High-Crash Corridors (All Pedestrian and Bike Crashes)	Total Number of Crashes in Corridors
Oʻahu	30	119
Hawaiʻi Island	1	3
Maui	2	10
Kauaʻi	1	3
Total	**34**	**135**

High-Crash Corridor Characteristics/Trends

To identify trends for the high-risk corridors, physical factors of the corridors were analyzed, such as number of through lanes, sidewalks, and type of bikeways. The functional classification of the high-risk corridors was also evaluated.

As shown in the following graphs, most of the high-risk corridors were along roadways with four lanes and sidewalks on both sides, and along roads where no bikeway was present. Most of the high-risk corridors were also along roads classified as principal arterials.

Figure 27: High-Crash Corridor Trends

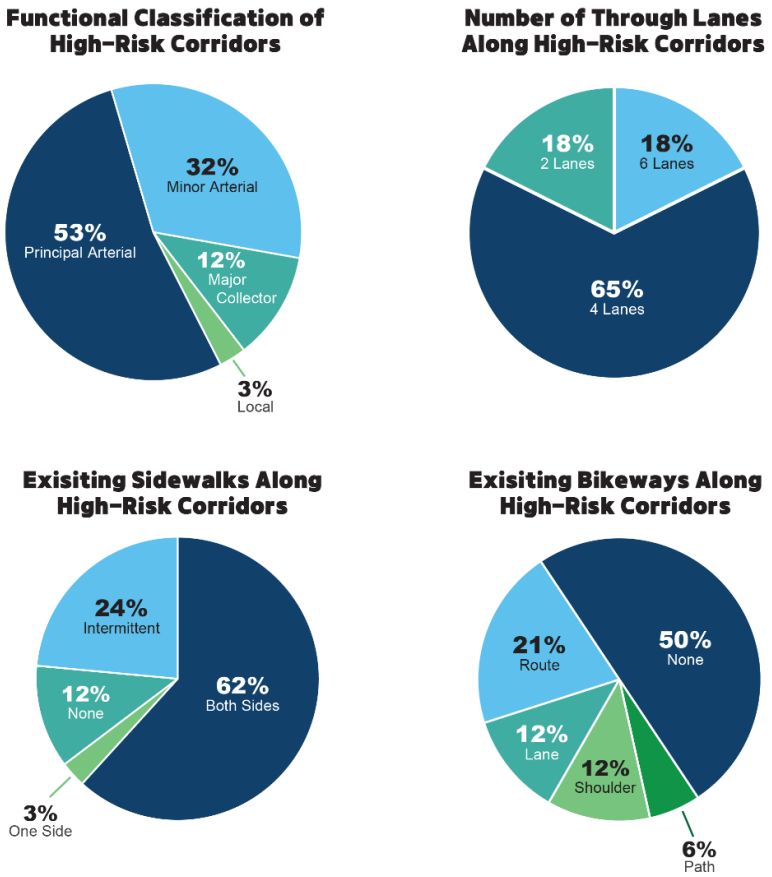


Figure 28: O‘ahu Bicycle Crash Locations

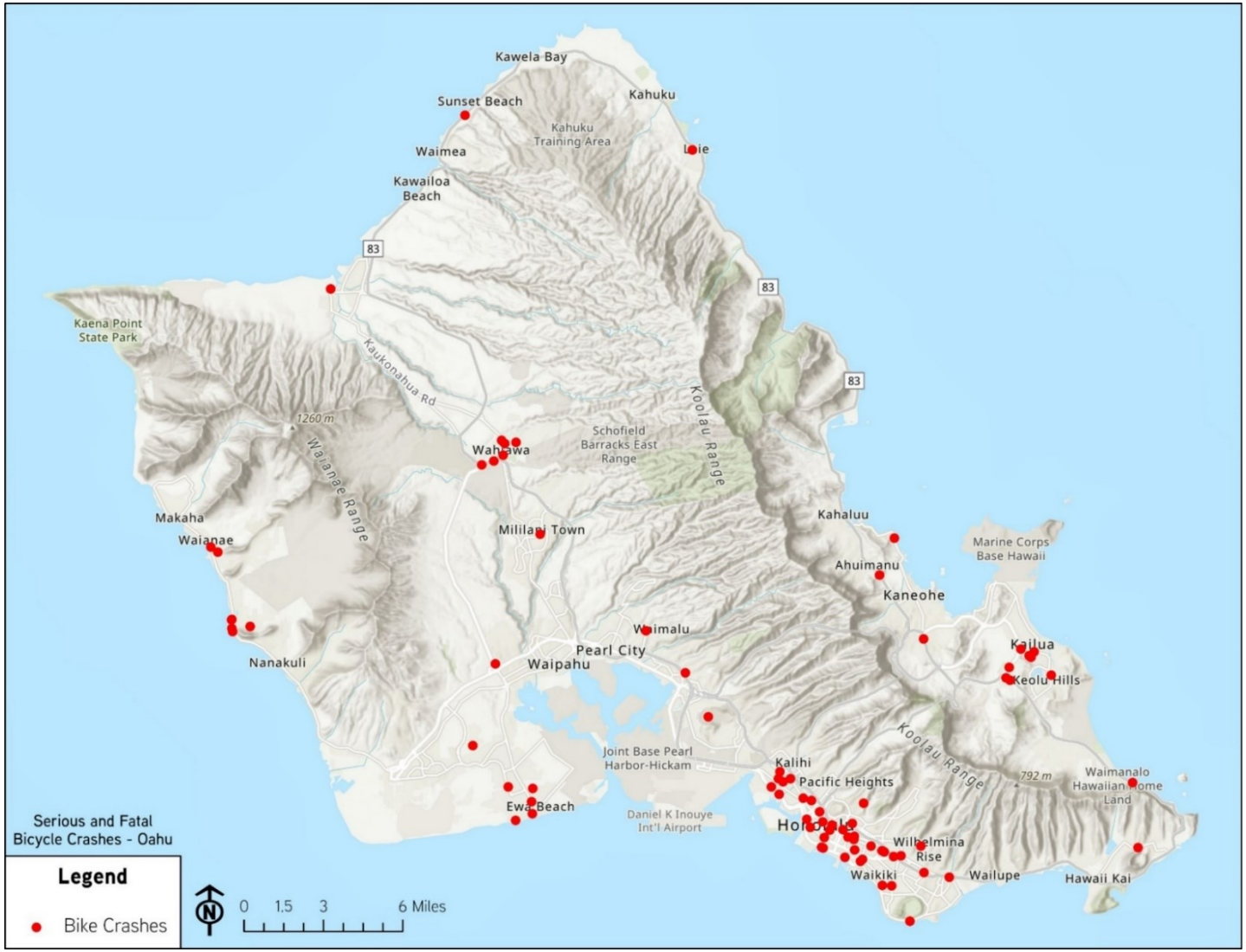


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Figure 29: Kaua‘i Bicycle Crash Locations

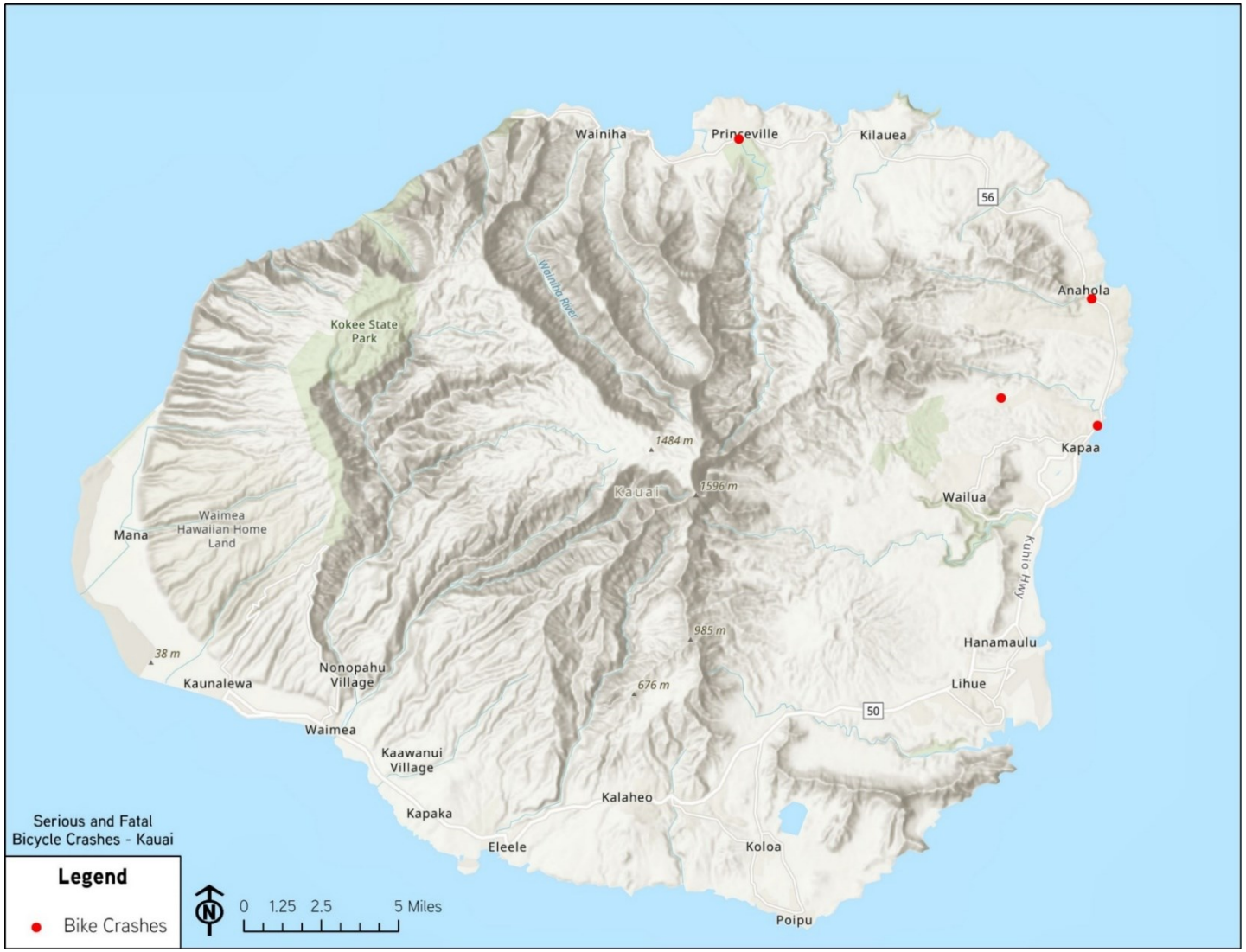

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Figure 30: Maui Bicycle Crash Locations

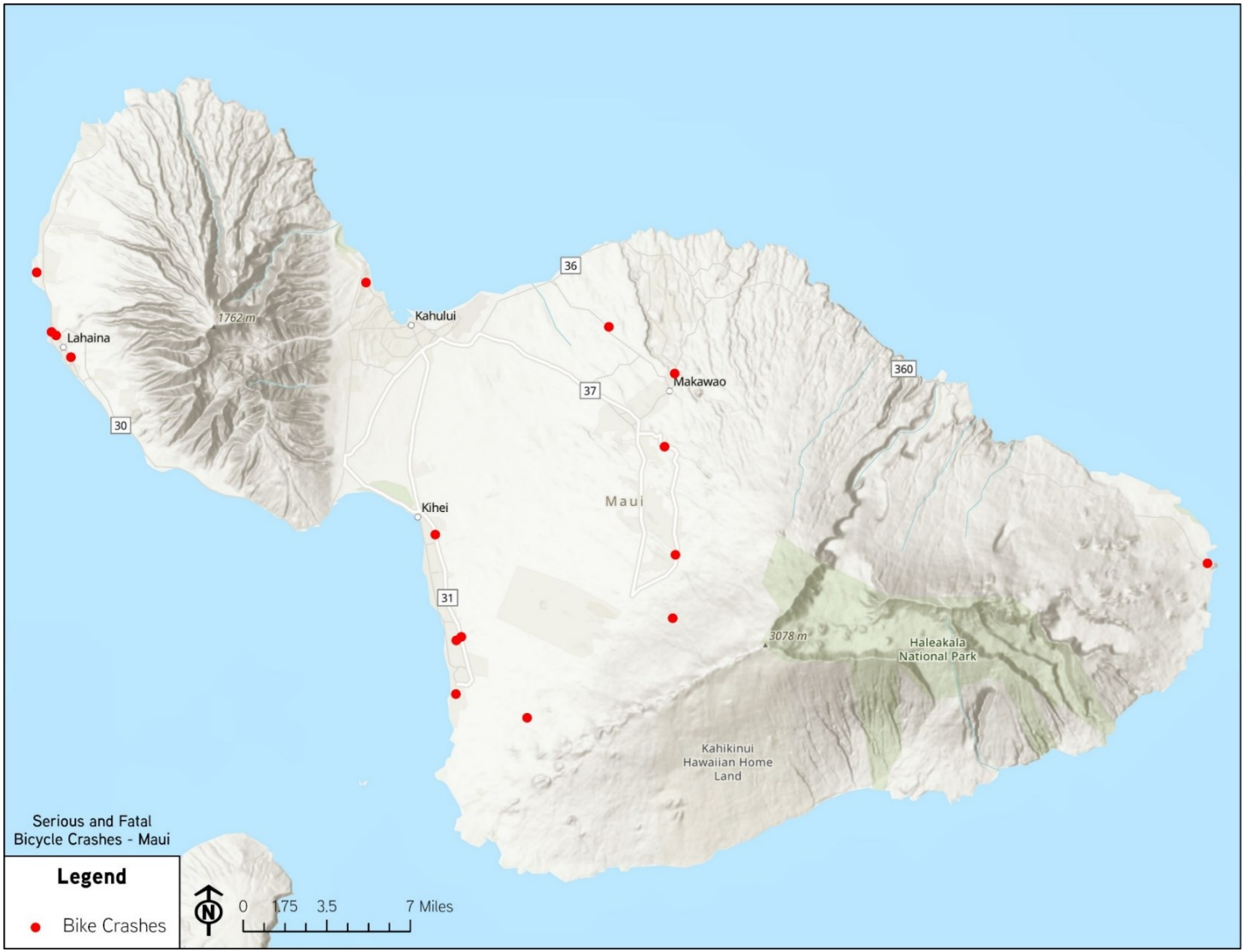

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Figure 31: Hawai'i Island Bicycle Crash Locations

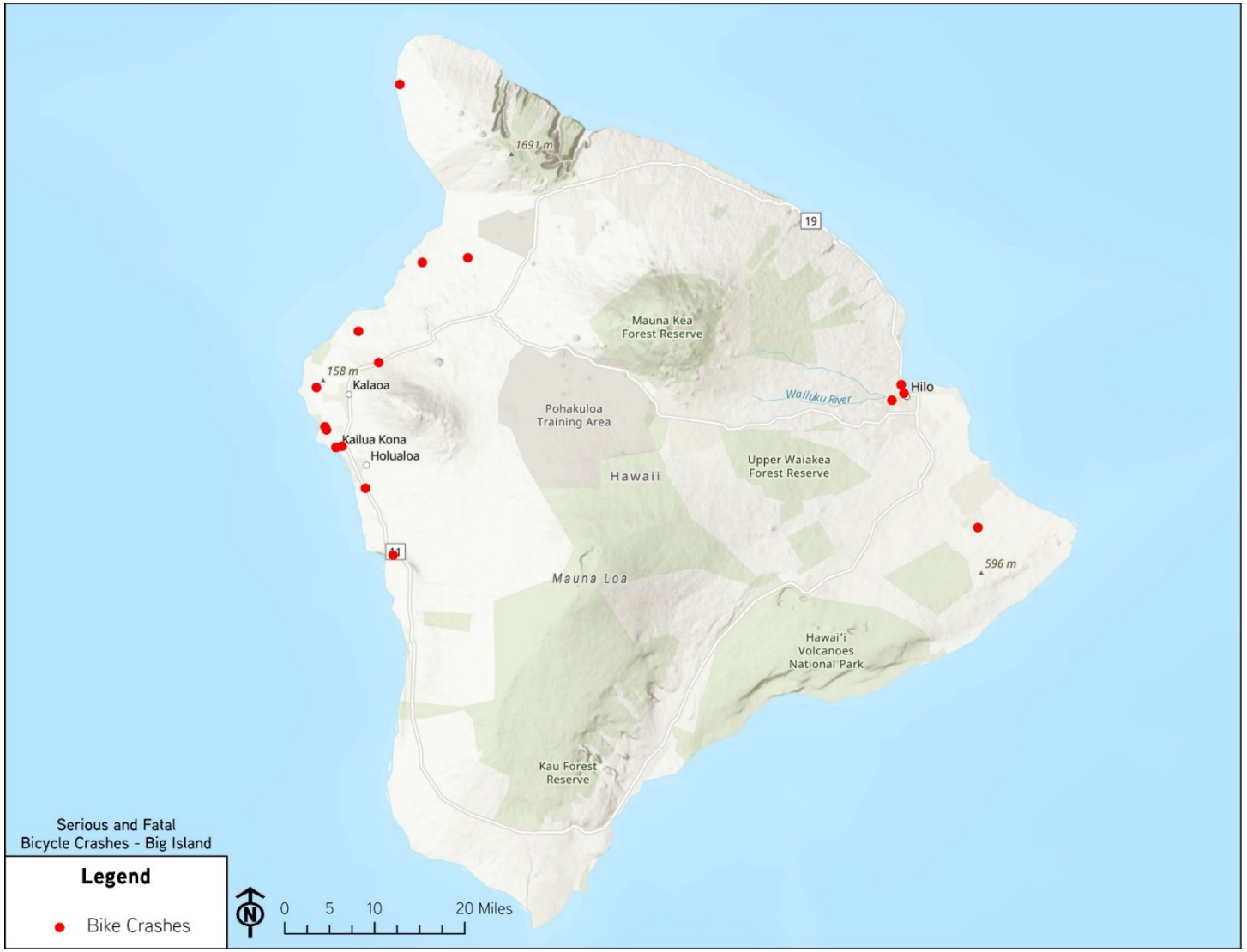

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Figure 32: O‘ahu High Crash Corridors

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Figure 33: Kaua'i High Crash Corridors

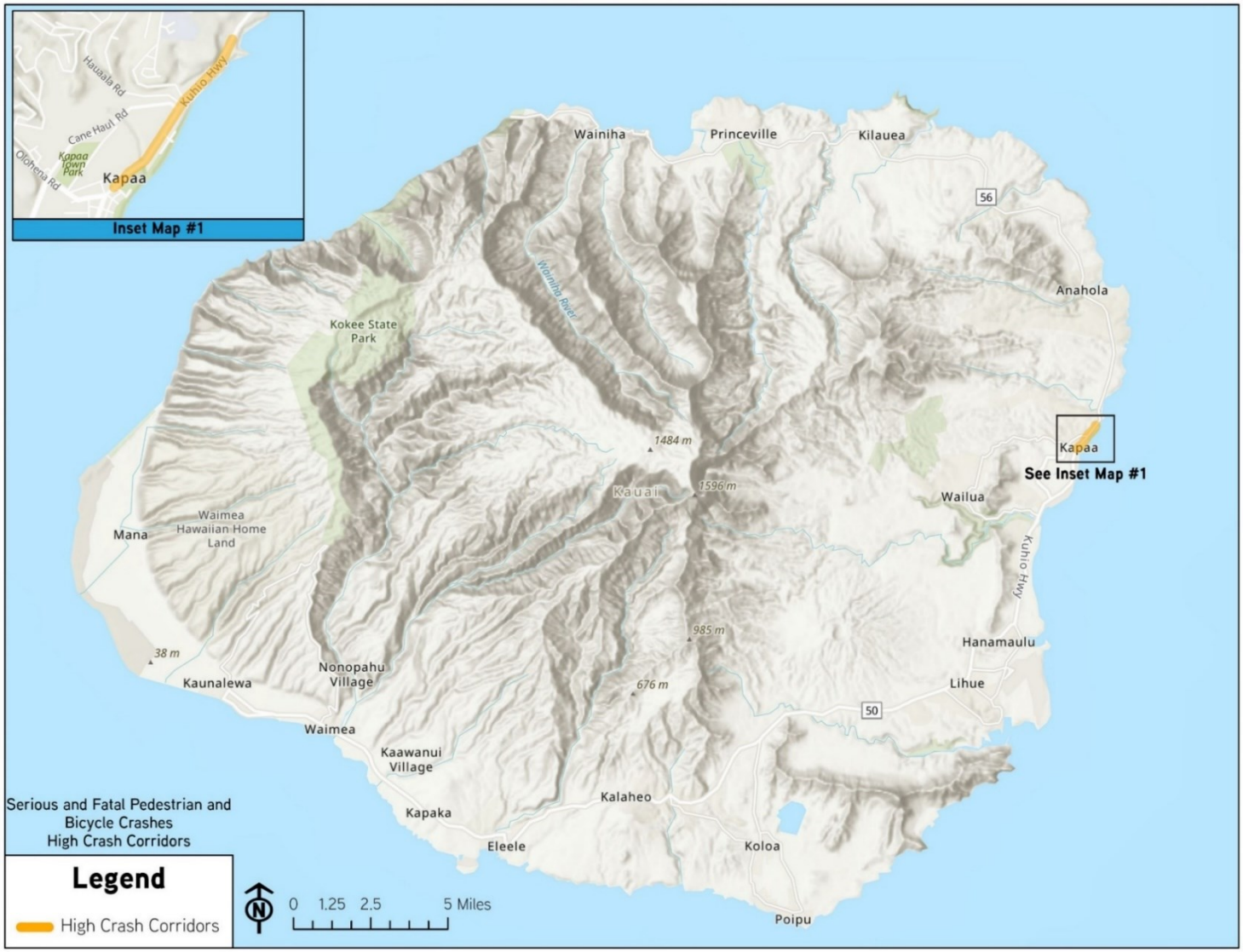

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Figure 34: Maui High Crash Corridors

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Figure 35: Hawai'i Island High Crash Corridors

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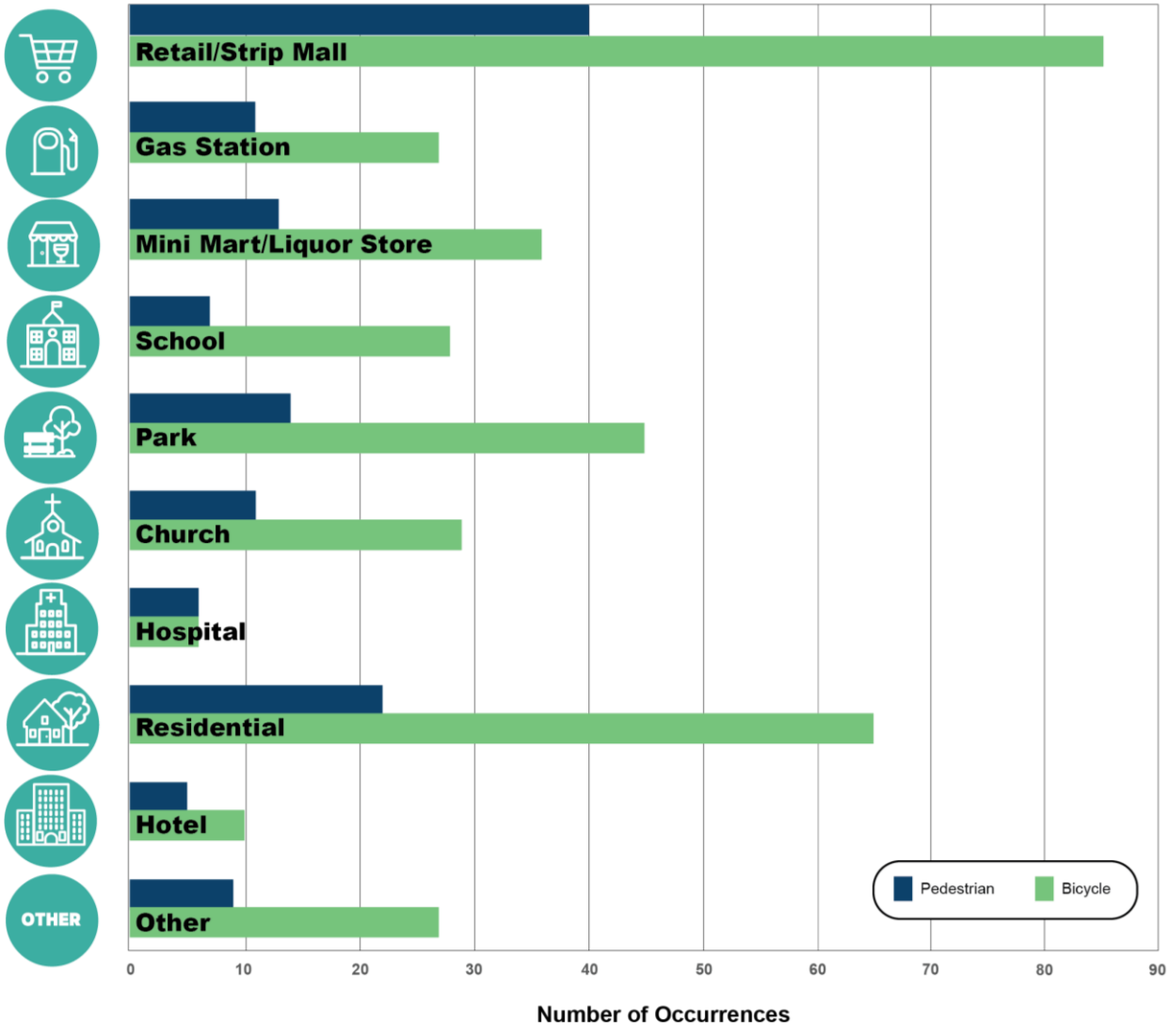
3.5 Other Crash Characteristics Analyzed for Pedestrian Clusters and Bicycle Crashes

Surrounding Land Uses

When reviewing the land uses surrounding the pedestrian cluster crashes and bicycle crashes, a majority of crashes occurred near retail uses. The second most common land use type near both pedestrian and bicycle crashes were residential land uses. The "Other" category presented in these graphs includes land uses such as libraries, golf courses, government buildings, and other uses that weren't commonly found near the crash sites.

The US-DOT's NHTSA's Traffic Safety Facts for 2021 Data does not include the same breakdown of land use categories for pedestrian and bicyclist fatalities, but instead provides statistics on

Figure 36: Land Uses Surrounding Fatal and Serious Injury Pedestrian Clusters and Bicycle Crashes



whether fatalities occurred in urban or rural areas. A majority of pedestrian (84%) and bicyclist fatalities (85%) occurred within urban areas.

Social Vulnerability

The US-DOT's ETC Explorer sums up the Social Vulnerability Indicators listed in Table 5 to create a composite score. The tool then uses percentile ranking to measure each Census Tracts' component score against all other Census Tracts nationwide. The ETC Explorer considers a Census Tract to be experiencing a disadvantage if it is ranked in the 65% or higher range. The 65% mark was chosen to be consistent with the Climate & Economic Justice Screening Tool (CEJST), which prioritizes tracts at the 65th percentile or above for CEJST's low-income indicator.

Census Tracts where a pedestrian cluster or bicycle crash occurred were reviewed to determine if they are experiencing a disadvantage based on the Social Vulnerability Indicators listed in Table 5. Table 10 shows a list of the Census Tracts by island that are considered disadvantaged and where a pedestrian cluster or bicycle crash occurred. Figures 25 to 28 show the maps labeled with the disadvantaged Census Tracts where a pedestrian cluster or bicycle crash occurred.

Table 10: Disadvantaged Census Tracts Based on Social Vulnerability Indicators

Island	Disadvantaged Census Tracts
O'ahu	Waianae Valley Maili Beach Park Lualualei Transmitter Wahiawa District Park Wahiawa General Hospital Medical Arts Clinic Wahiawa Wheeler-East Range Aliamanu Makai Kalihi Waena Umi Street Mokauea Street Farrington High School Waiakamilo Road Iwilei/Anuenue Mayor Wright Housing Lanakila Aala Civic Center Queen's Medical Center Kakaako Waterfront Park Academy of Arts Ward Village Shops

Island	Disadvantaged Census Tracts
	Shriners Hospital for Children Ahana Street Kaheka Street-Makaloa Street Bingham Tract Lower Pawaa Ala Wai-Niu Street Moiliili Hongwanji-Mission Koa Avenue Kaimuki High School Kaimuki: 6th Avenue Lower Palolo
Maui	Honokowai Lahainaluna Lahaina Liholiho St. (Wailuku) Spreckelsville Hana
Kauaʻi	Haena-Hanalei Omao-Kukuiula
Hawaiʻi Island	Waikoloa-South Kohala Kealakehe Hilo: Pueo – Downtown Hilo: Villa Franca – Kaikoo Kilauea-Pahoa

Figure 37: O‘ahu Disadvantaged Census Tracts

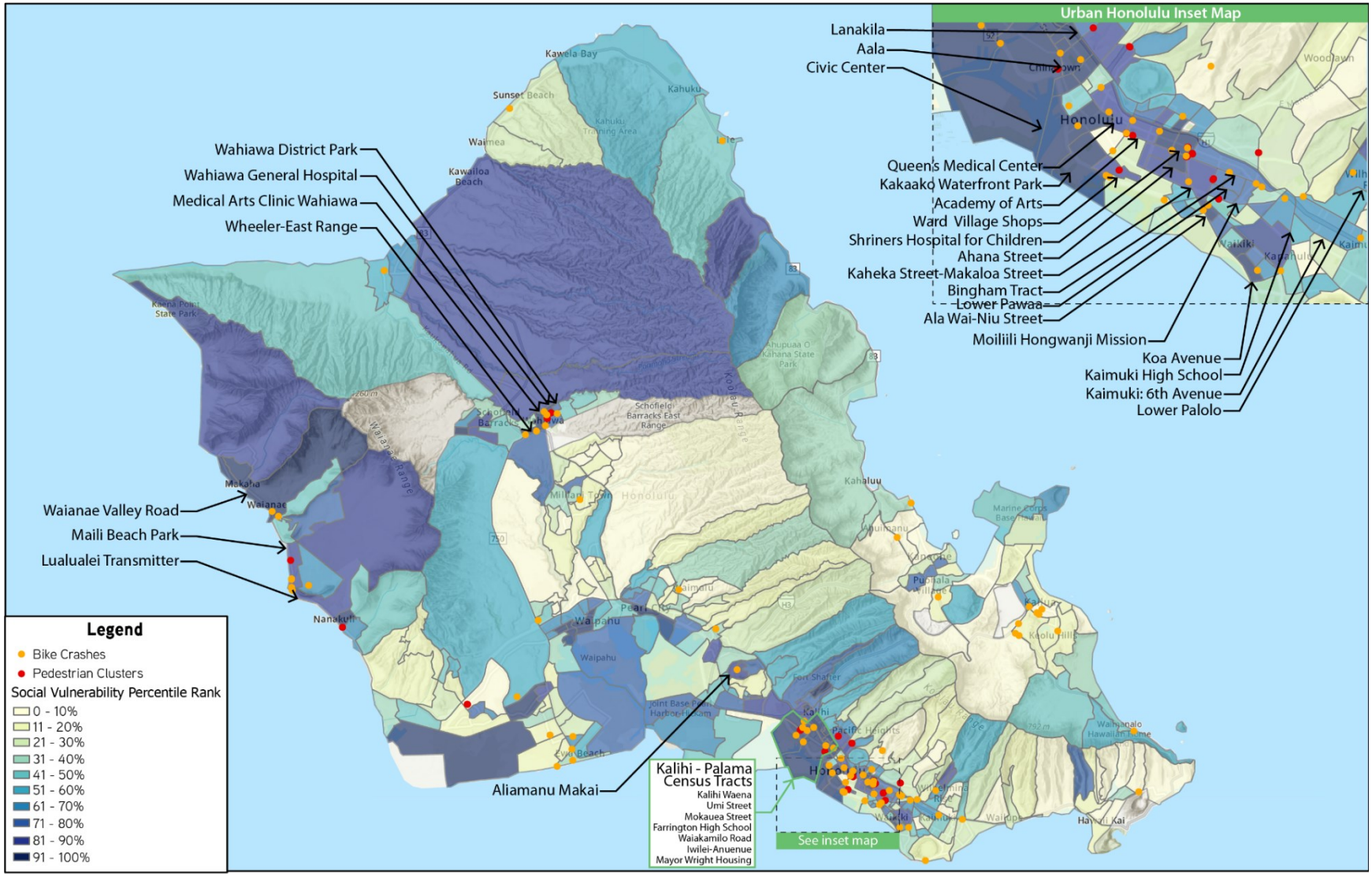


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Figure 38: Kaua‘i Disadvantaged Census

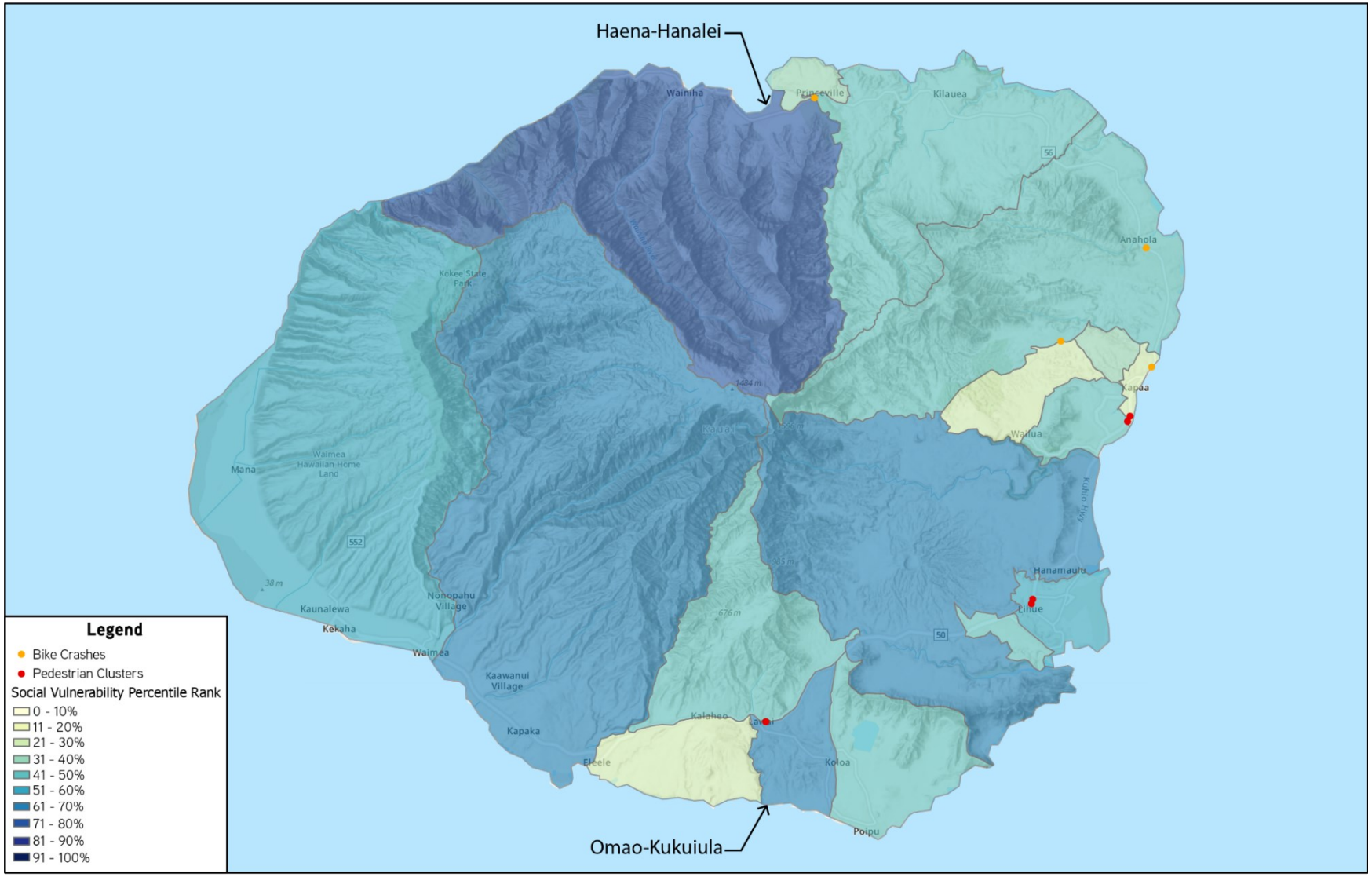

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Figure 39: Maui Disadvantaged Census Tracts

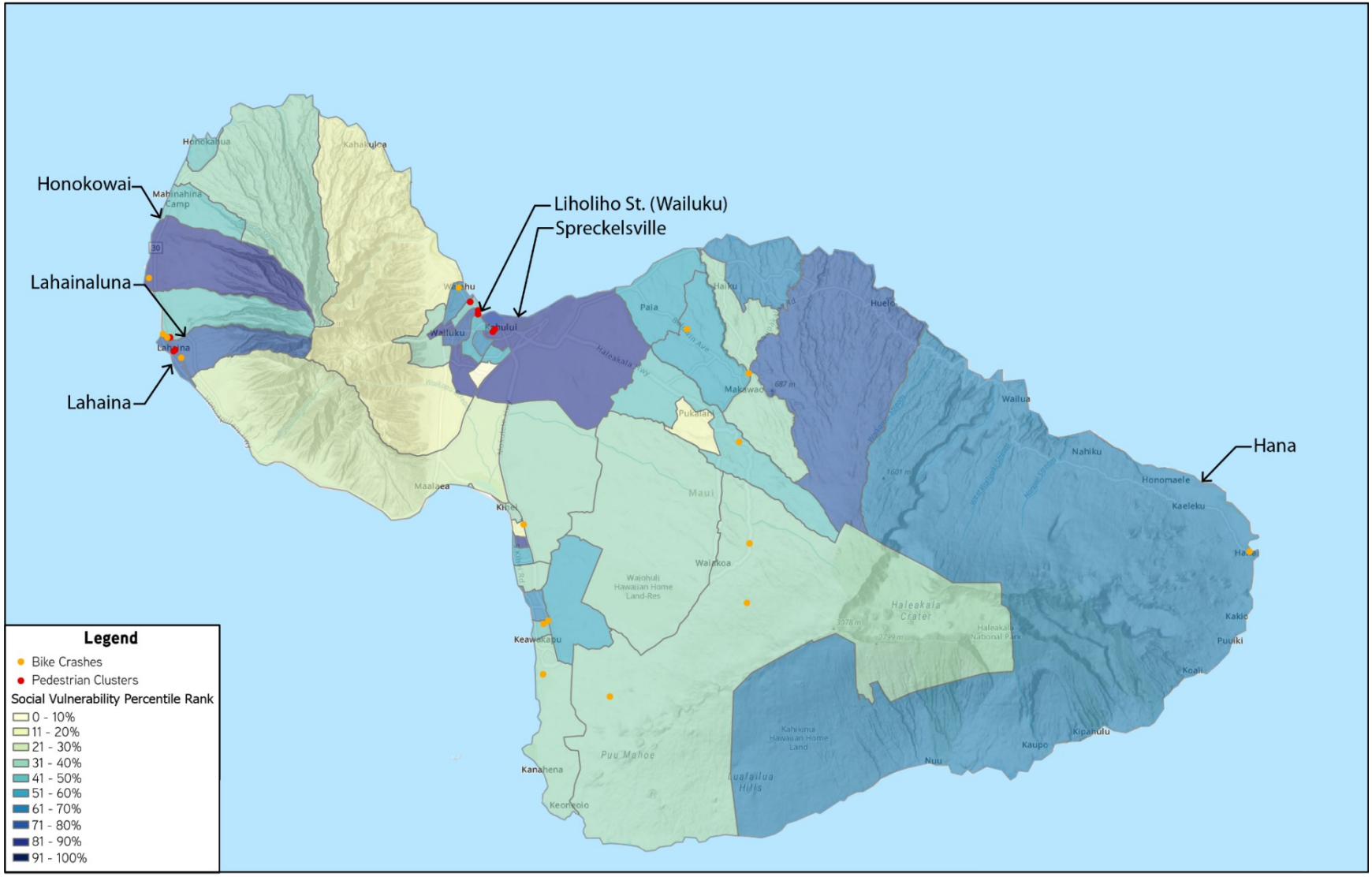

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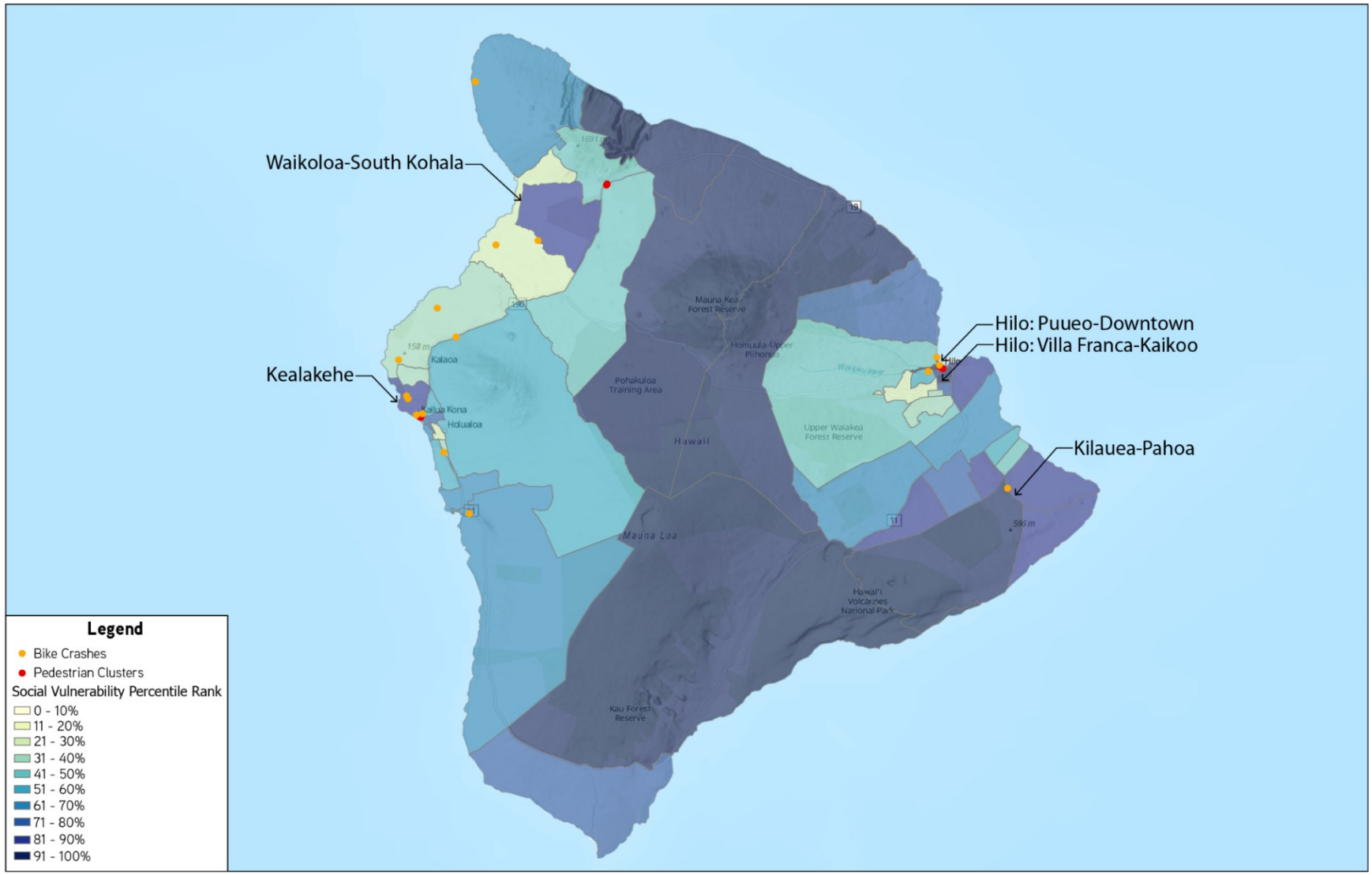
Figure 40: Hawai‘i Island Disadvantaged Census Tracts



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In addition, the Census Tracts where a pedestrian cluster or a bicycle crash occurred were analyzed against the "households with no vehicle available" data from the ACS 5-Year Estimates dataset from 2016 to 2020 to analyze whether vehicle availability correlates to an increase in pedestrian or bicycle crashes due to the reliance on other means of transportation. For the islands of Kaua'i, Maui, and Hawai'i, the number of households without a vehicle available were relatively low compared to the numbers on O'ahu. The highest number of households without a vehicle on the neighbor islands ranged from four to seven, while Census Tracts on O'ahu in areas such as Waianae, Wahiawa, and Urban Honolulu ranged from 15 to 41.7 households. A pedestrian crash cluster or high crash corridor were identified within these Census Tracts.

Maps labeled with the Census Tracts indicating a high number of households without a vehicle available and where a pedestrian cluster or bicycle crash occurred are included in Appendix C.

Although the houseless population's involvement in VRU crashes was not available for the 5-year period of this assessment, HDOT provided pedestrian and bicyclist fatalities that involved the houseless population for 2022, as shown in Table 11.

Table 11: 2022 Houseless Pedestrian and Bicyclist Fatalities

	Total Pedestrian Fatalities	Houseless Pedestrian Fatalities	Houseless % of Total Pedestrian Fatalities	Total Bicyclist Fatalities	Houseless Bicyclist Fatalities	Houseless % of Total Bicyclist Fatalities
Statewide	28	12	43%	7	5	71%
Honolulu	16	8	50%	4	3	75%

Houseless population numbers are recorded by the Statewide Office on Homelessness and Housing Solutions (OHHS) using the Point in Time Count (PIT Count), which is a federally mandated census count from the Department of Housing and Urban Development. The PIT Count provides a snapshot of the houseless population on the street and in shelters on a single night. The information provided in Table 12 is provided from the PIT Count.

Table 12: Houseless Population from PIT Counts

Year	Houseless Population (Sheltered and Unsheltered)			
	O'ahu	Hawai'i Island	Kaua'i	Maui
2017	4,959	953	412	896
2018	4,495	869	293	873
2019	4,453	690	443	862
2020	4,448	797	424	789

Source: Ka Mana O Na Helu and Partners in Care
Note: PIT Counts were not conducted in 2021 due to the COVID-19 pandemic.

3.6 High-Risk Areas

The outcome of the analysis of the pedestrian cluster crashes and bicycle crashes resulted in the identification of high-risk areas based on the characteristics and trends, as well as input received through stakeholder consultation. A high-risk area is a location that has characteristics that are similar to the results of the systemic approach (described in Section 5) or an opportunity identified through stakeholder consultation. The high-risk locations including the pedestrian cluster crashes, bicycle crashes, and high-risk corridors are shown in Figures 19 to 22 and 28 to 35. A full list of high-risk area locations identified through stakeholder consultation is included in Appendix D. Section 5 will discuss the methodology on how these high-risk areas will be screened to develop a prioritized list of projects.

SECTION FOUR

SUMMARY OF CONSULTATION

4 Summary of Consultation

As part of the assessment, two stakeholder groups were convened to solicit feedback throughout the entire process: the Technical Advisory Committee (TAC) and the Stakeholder Advisory Committee (SAC). Consultation was also held with the County police departments and first responder agencies. This section provides a summary of the meetings conducted, key findings from the input received from the stakeholders, and recommendations made to be integrated into the VRUSA.

4.1 Technical Advisory Committee (TAC)

The Technical Advisory Committee (TAC) consisted of Federal, State, and County transportation, transit, planning, and public works agencies that were used to provide technical advice and recommendations on the assessment process. A total of five TAC meetings were held throughout the VRUSA process. The following agencies were invited to participate in the TAC:

- Federal Highways Administration (FHWA)
- HDOT Highways
    - District Engineers for Oʻahu, Kauaʻi, Maui, and Hawaiʻi Island
    - Traffic Branch
    - Planning Branch
    - Motor Vehicle Safety Office
    - Bicycle and Pedestrian Coordinator
- State of Hawaiʻi, Department of Health
- City and County of Honolulu
    - Department of Transportation Services – Complete Streets
    - Department of Transportation Services – Public Transit
    - Department of Transportation Services – Transportation Planning
    - Department of Transportation Services – Transportation Engineering
    - Department of Planning and Permitting
- County of Kauaʻi
    - Department of Public Works
    - Transportation Agency
    - Planning Department
- County of Maui
    - Department of Public Works
    - Department of Transportation
    - Planning Department
- County of Hawaiʻi
    - Department of Public Works
    - Mass Transit Agency
    - Planning Department
- Oʻahu MPO
- Maui MPO

The roles and responsibilities of the TAC included the following:

- Advise HDOT on safety-related priorities, issues, projects, and funding needs.
- Serve as a forum for discussion regarding HDOT decisions affecting vulnerable users and road safety.
- Communicate and coordinate priorities with stakeholder organizations.
- Promote the sharing of information between the private and public sectors on vulnerable road users.
- Provide advice regarding the development of the VRUSA.
- Serve as a conduit to their constituents and peers by disseminating information regarding the VRUSA and obtaining input that can be shared with the HDOT.

A total of five TAC meetings were held throughout the VRUSA process. Table 13 below provides a brief overview of each meeting.

Table 13: Technical Advisory Meetings and Purpose

Meeting No.	Date and Time	Meeting Purpose
1	July 12, 2023 1:30 pm	• Provide an introduction to VRUSA • Review of the high-risk area methodology • Review of initial crash trends • Get feedback on high-risk locations
2	August 10, 2023 1:30 pm	• Share updated crash trends based on feedback from the TAC • Provide a recap on the SAC Meeting #1 • Share updates on the high-risk characteristics • Get feedback on program of strategies • Share prioritization methodologies
3	August 30, 2023 1:30 pm	• Review of systemic approach strategy identification • Review of screening criteria and project selection • Provide the draft VRUSA report outline • Provide the Safe System Approach overview
4	September 26, 2023 1:30 pm	• Share the results of the initial screening and evaluation • Overview of the draft VRUSA report
5	November 1, 2023 1:30 pm	• Share the comments received on the draft VRUSA report • Share the final VRUSA report • Go over recommendations

4.2 Stakeholder Advisory Committee (SAC)

The Stakeholder Advisory Committee (SAC) consisted of human services agencies and organizations that support programs for walking, bicycling, and healthy/active lifestyles that were used to solicit feedback from industry stakeholders and the community. The following agencies and organizations were invited to participate in the SAC:

- AlohaCare
- Get Fit Kauaʻi
- Institute for Human Services, Inc.
- Kauaʻi Path, Inc.
- City and County of Honolulu, Department of Transportation Services, Safe Routes to School Program Coordinators
- County of Maui, Safe Routes to School
- County of Kauaʻi, Safe Routes to School
- PATH Hawaiʻi
- Ulupono Initiative
- Walk Wise Hawaiʻi
- Hawaiʻi Bicycle League
- Maui Bicycle League
- HDOT Homeless Coordinator
- HDOT VRUSA Vista
- AARP
- Hawaiʻi Energy Office
- Department Of Hawaiian Homelands
- Kauaʻi Skate ʻOhana
- Hawaiʻi Public Health Institute
- Transportation Equity Hui (Na Makawai)
- Papa Ola Lokahi
- Pacific Gateway Center
- K-VIBE
- Guide Dogs of Hawaiʻi
- Hoʻopono Services for the Blind

The roles and responsibilities of the SAC included the following:

- Representing and communicating the interests of SAC members' agencies or jurisdictions.
- Providing technical support, information, insight, and reviews.
- Communicating project progress to directors, elected or appointed officials, and to agency or jurisdictional colleagues as needed.
- Reviewing recommendations from HDOT, TAC members, industry stakeholders, and the public.

- Reviewing project materials.
- Providing informed and comprehensive recommendations.
- Attend and participate in SAC and/or other stakeholder meetings.

A total of three SAC meetings were held throughout the VRUSA process. Table 14 below provides a brief overview of each meeting.

Table 14: Stakeholder Advisory Meetings and Purpose

Meeting No.	Date and Time	Meeting Purpose
1	August 9, 2023 1:30 pm	• Provide an introduction to VRUSA • Review of the high-risk area methodology • Review of initial crash trends • Get feedback on high-risk locations
2	September 5, 2023 1:30 pm	• Share updated crash trends based on feedback from the TAC • Share updates on the High-Risk Characteristics • Get feedback on program of strategies • Share prioritization methodologies
3	September 28, 2023 1:30 pm	• Share the results of the initial screening and evaluation • Give an overview of the draft VRUSA report

4.3 Key Findings

Questions, comments, and suggestions were recorded throughout the consultation process including input received during the TAC and SAC meetings and follow-up emails from committee members. These consultations help to provide local knowledge and perspectives throughout the development of this VRUSA. This section provides a summary our key findings from the consultations. In addition, as mentioned in Section 1.2, the extensive consultations from the relevant State and County pedestrian, bicycle, and transportation safety plans, studies, and other documents related to vulnerable road users allowed our team to build upon the work and community outreach that has already been done.

Crash Data

The methodology to identify high-risk areas in this VRUSA uses the most recent 5-year period of crash data available. This is in compliance with FHWA's guidance as provided under 23 U.S.C 148 (l)(3). Stakeholders shared concerns with trying to identify high-risk areas when crash locations are random. It was shared that this effort would look for common trends or characteristics that occur at crash locations rather than the specific locations themselves. For

pedestrian crashes, both crashes from high-risk locations and all crashes were reviewed for trends. No high-risk locations were identified for bicyclists, so all crashes were reviewed.

Crash Characteristics and Data Analyzed

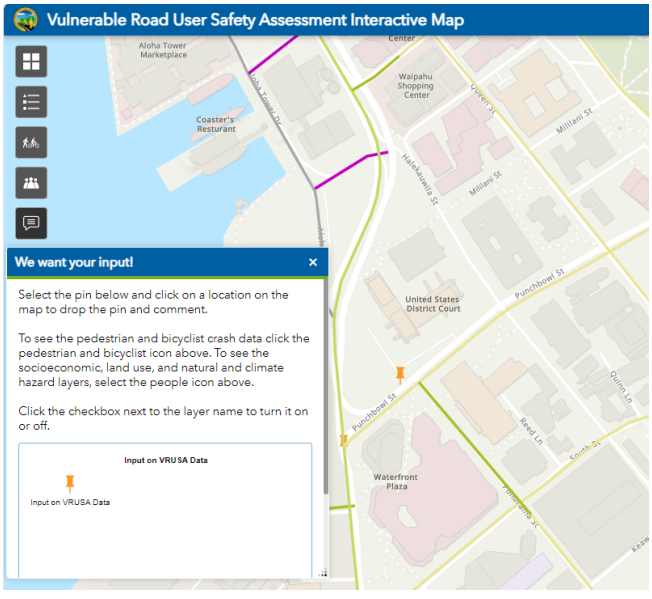
Stakeholders assumed that speeding was a key cause of the fatalities and serious injuries. However, the results from the data recorded under the "Human Factors" and "Other Factors" fields in the MVAR did not show that excessive speeding was a factor involved in a majority of the crashes analyzed in this assessment. In addition, the speed data provided by Google was also reviewed for a one-week period in April 2023, which showed that out of 14 corridors reviewed, only 3 corridors reflected speed within 10 mph of the posted speed and 1 over 10 mph of the posted speed.

Recommended Strategies and Areas of Concern

During consultation meetings, stakeholders provided feedback on recommended strategies -

- *Presentations and campaigns on the dangers of speeding and increasing awareness of VRUs.*
- *There should be more enforcement on drivers failing to yield to pedestrians and speeding.*
- *There should be more questions and education on pedestrian and bicyclists' right of way on the driver's permit and licensing tests.*
- *Rumble strips should incorporate bicycle-friendly designs.*

The TAC and SAC committees were also provided a link to an ArcGIS online web map tool to provide their feedback on locations or areas of concern. Using an interactive map, stakeholders were able to turn on different layers of data (i.e., VRU crash locations, socioeconomic data, climate hazards, etc.) and place pins in locations where they thought an area of concern existed. The tool also shows the locations of the pedestrian crash clusters and bicycle crashes, as well as other layers of data identified in Section 3.1.



The locations that were provided by the TAC and SAC were included in a comprehensive list of locations and opportunities to be further reviewed and assessed.

Data Collection

Lastly, the TAC and SAC provided recommendations for better data collection. Section 3.3 of the report identifies the data limitations and insufficiencies identified during this assessment.

Section 5 of the report provides recommendations for better data collection for future VRUSA efforts.

4.4 Focus Group/Consultation Meetings

Police Departments

The County police departments were consulted during a Safe Transportation for Every Pedestrian (STEP) meeting held on September 13, 2023. A brief presentation of the VRUSA was provided to inform the police departments of the purpose of the assessment, methodology used to identify high-risk areas, analysis of crash data trends and characteristics, and the identification of strategies to reduce safety risks. Feedback on the education, enforcement, and encouragement strategies were solicited from the police departments to gather additional recommendations and suggestions.

The feedback received during the STEP meeting suggested that educational strategies should continue to be a focus for bicyclists as not all riders are aware of the bicycle laws, especially those regarding rules of the road and required equipment. This is particularly an issue for police officers running enforcement operations for bicyclists where they come across juvenile riders who are biking without a helmet. Education on bicycle laws should be increased and implemented through various strategies to ensure bicyclists are aware of the traffic and equipment laws to reduce safety risks and violations.

"No person under sixteen years of age shall operate a bicycle upon a street, bikeway, or any other public property unless that person is wearing a properly fitted and fastened bicycle helmet that has been tested by a nationally recognized agency such as the National Highway Traffic Safety Administration, the National Safety Council, or the Children's Safety Network, and is designed to fit the user and protect against head trauma. This requirement also applies to a person who rides upon a bicycle while in a restraining seat that is attached to the bicycle or who rides in a trailer towed by the bicycle."

Hawai'i Revised Statutes, Chapter 291C, Section 150, "Bicycle helmets."

SECTION FIVE

PROGRAM OF PROJECTS AND STRATEGIES

5 Program of Projects and Strategies

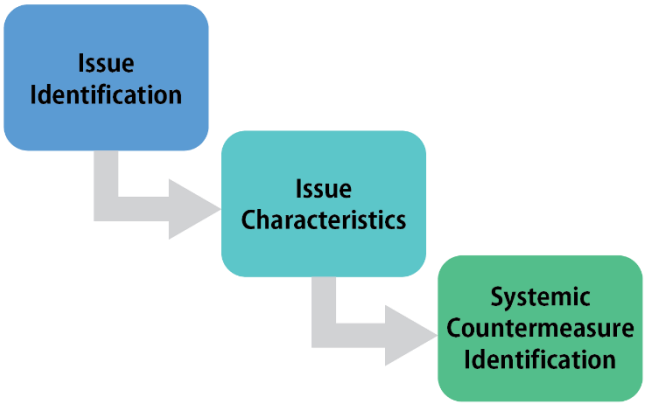
Based on the quantitative analysis and the input received from stakeholders, a program of strategies and projects has been created to reduce the safety risks for vulnerable road users in high-risk areas. This section discusses the methodologies used to identify the programs of projects and strategies, the recommended strategies and prioritized list of projects to address safety risks, and the application of the Safe System Approach to this assessment. It should be noted that the VRUSA is a planning level document, and additional efforts are necessary to further develop the projects and strategies identified in this section as part of HDOT's and County agencies' transportation planning processes.

5.1 Systemic Approach to Strategy Identification

The systemic approach to safety involves identifying low-cost engineering strategies that may be widely implemented based on high-risk characteristics correlated with specific severe crash types. The approach provides a more comprehensive method for safety planning and implementation that supplements and complements site analysis.

The Systemic Approach applied to this VRUSA included:

- Identification of an issue based on systemwide data.
- Identification of characteristics (e.g., geometry, volume, or location) frequently present in severe and fatal crashes. These characteristics, also known as risk factors, can be used to identify and prioritize locations with few or no crashes that could be potential candidates for safety investments.



- Identification of one or more low-cost countermeasures to address the underlying circumstances contributing to crashes on a majority of roads.

Systemic Approach to Bicycle Strategies

The issue or focus crash type for bicyclists included those where the vehicle was driving straight ahead and also those where the vehicle was overtaking the bicyclist. Based off the review of the data trends, these accounted for 75% of all the fatal and serious injury bicycle crashes during the study period.

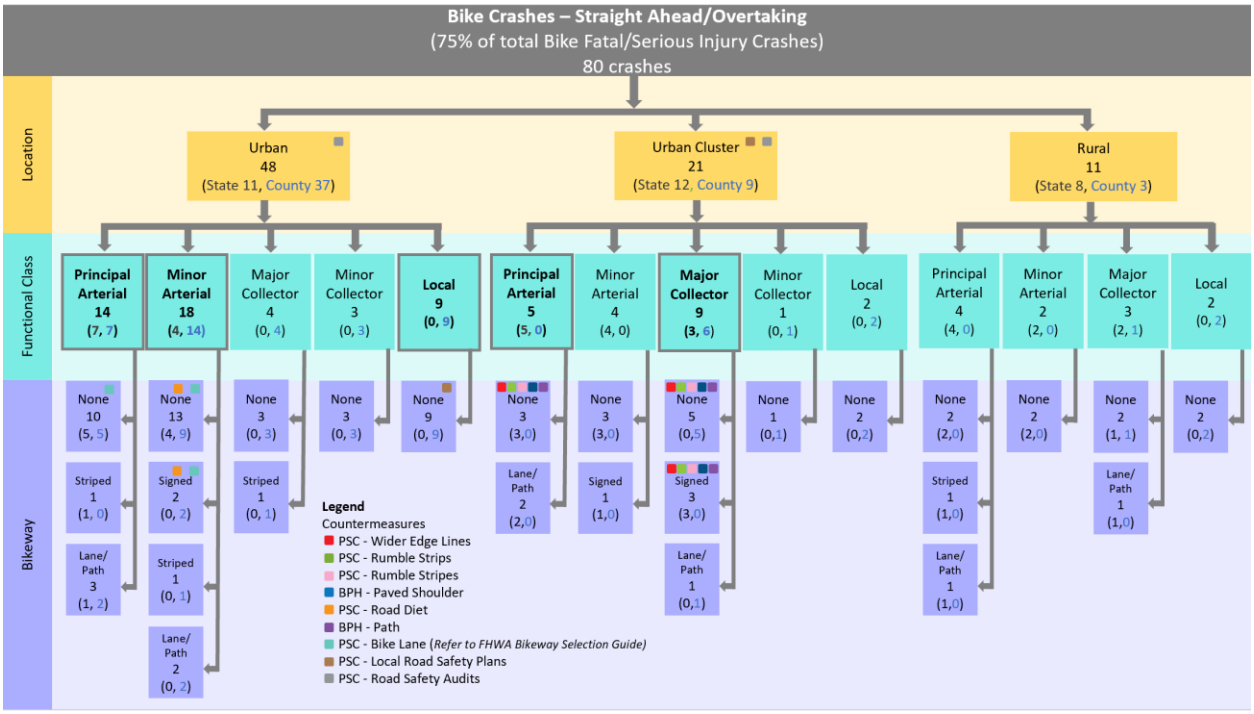
The characteristics that were considered to further systemically characterize the crashes include roadway jurisdiction, area type (based off of the Hawai'i Statewide GIS Program),

functional classification and type of bikeway facility. These are illustrated in a tree diagram in Figure 41.

The outlined boxes indicated the 'heavier' branches of the tree – or higher risk areas based on the higher number of crashes. The heavier branches within urban areas include both principal and minor arterials as well as local roads. Urban cluster branches include principal arterials and major collectors.

For these branches, countermeasure options are identified. Multiple countermeasure options are provided based upon the facility characteristics. These are the basis of the identification of the Program of Strategies. For the noted areas and facilities, agencies should consider these countermeasure strategies for safety projects and/or integration within other programmed projects. It should be noted that not all countermeasure strategies are appropriate in all situations, rather this approach allows proactive attention to be made to high-risk characteristics.

Figure 41: Systemic Approach to Bicycle Strategies



Countermeasures were identified from the FHWA's Proven Safety Countermeasures as well as recommended facilities from the 2003 Bike Plan Hawai'i. The countermeasure strategies included:

- Wider Edge Lines (6 inches) – Enhances visibility of the travel lane boundaries and decreases lane departures.
- Rumble Strips/Stripes (designed to be compatible with bikes) - Milled or raised edge or centerline strips/stripes alerts drivers from roadway departures and drifting. Stripes may also provide better striping visibility.

- Paved Shoulders (from Bike Plan Hawai‘i) – Adding and/or improving paved shoulders is often the best way to accommodate bicyclists in rural areas.
- Road Diet – Converting a four-lane undivided roadway to a three-lane with a two-way left turn lane. The road diet provides an opportunity to reduce vehicle crashes, and add bike lanes, pedestrian crossing refuge areas, and traffic calming.
- Path (from Bike Plan Hawai‘i) – Shared use path may be acceptable where space is limited and land use contexts where both walking and/or bicycling volumes are relatively low (since there is no separation of bicyclists and pedestrians).
- Bike Lane – Dedicated facilities for bicyclists. Configurations may vary – refer to FHWA Bikeway Selection Guide – and may include striping, offsets with or without buffers, etc.
- Local Road Safety Plans (LRSP) – Provides a framework for identifying, analyzing, and prioritizing roadway safety improvements for local roads, issues, and/or needs. FHWA guidance available for creating and implementing an LRSP (https://safety.fhwa.dot.gov/LRSPDIY/)
- Road Safety Audits – Performed by a multidisciplinary team independent of a project. Considers all road users, human factors, and user capabilities.

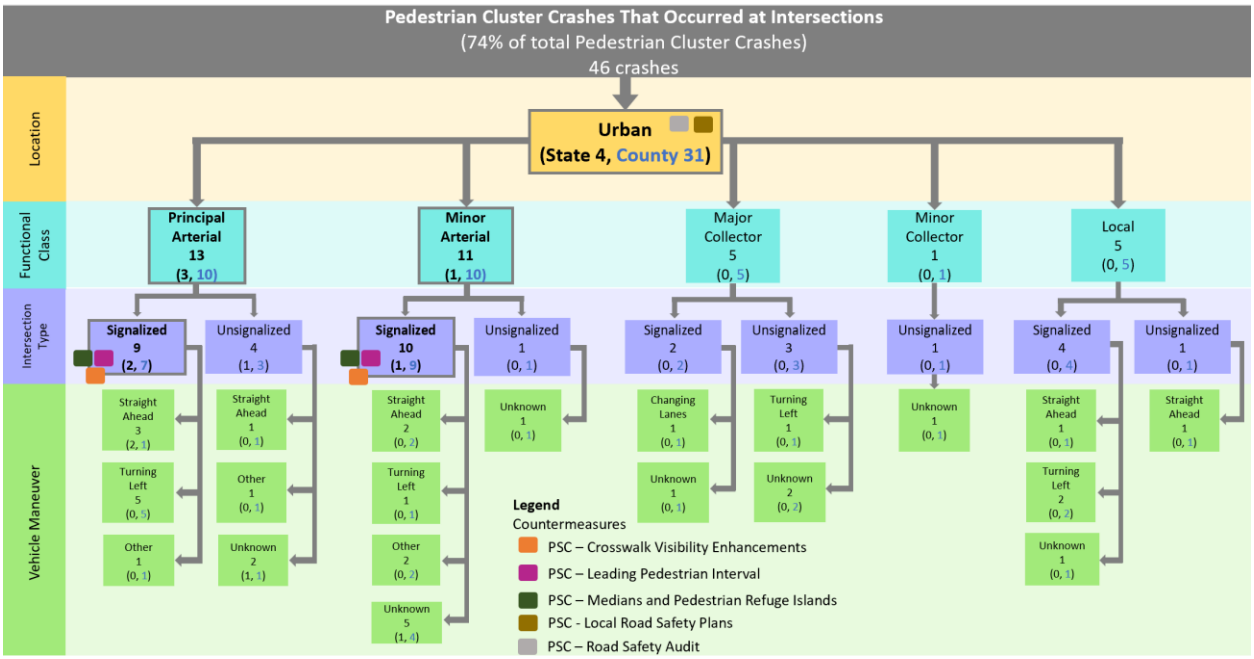
Systemic Approach to Pedestrian Strategies

The cluster analysis identified the high-crash locations associated with pedestrians. From the cluster data, the issue or focus crash type for pedestrians related to crashes that occurred at intersections. Based off the review of the high-risk data trends, these accounted for 74% of all the fatal and serious injury pedestrian cluster crashes during the study period.

The characteristics that were considered to further systemically characterize the crashes include roadway jurisdiction, area type, functional classification, intersection type and vehicle maneuver. These are illustrated in a tree diagram in Figure 42.

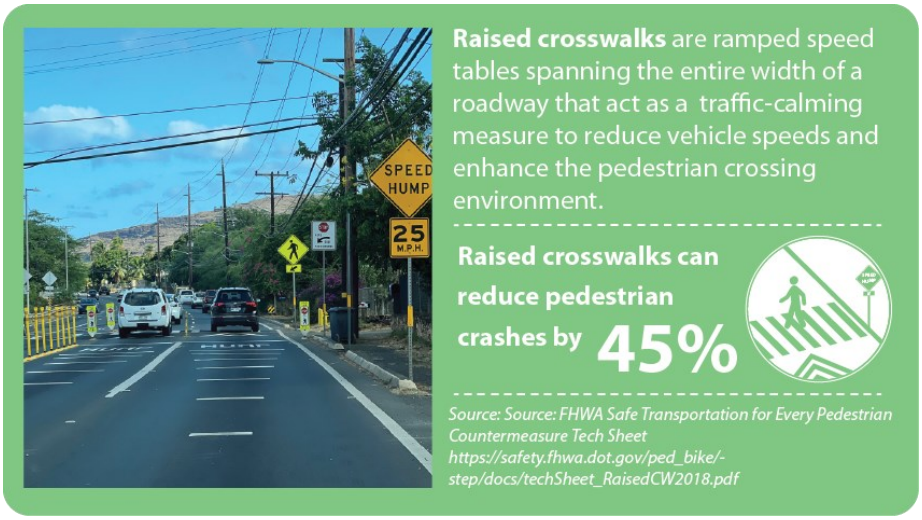
Figure 42 summarizes the Urban crashes. The heavier branches within urban areas include both principal and minor arterials and show more frequency of crashes at signalized intersections. Within urban cluster areas, there were 11 crashes that were spread out among roadway functional classifications. No systemic areas were identified in this area type. Rural areas did not have crashes associated with this review as there were no pedestrian cluster crashes that occurred in rural areas.

Figure 42: Systemic Approach to Pedestrian Strategies



Countermeasures were identified from the FHWA's Proven Safety Countermeasures. The countermeasure strategies included:

- Crosswalk Visibility Enhancements – High-visibility crosswalks (striping materials/patterns), improved lighting and/or enhanced signing, and pavement markings.
- Leading Pedestrian Interval – Allows pedestrians to begin crossing before vehicle green phase starts – typically 3 to 7 seconds. This provides the opportunity to establish presence prior to allowed vehicle/turning movements (may be paired with restricting right turns on red).
- Medians and Pedestrian Refuge Islands – May include pavement markings, areas, or islands. May allow pedestrians to cross one direction of traffic at a time (especially along urban/suburban



multilane facilities with a mixture of pedestrian/vehicle use).

- Local Road Safety Plans – Provides a framework for identifying, analyzing, and prioritizing roadway safety improvements for local roads, issues, and/or needs. FHWA guidance available for creating and implementing an LRSP (https://safety.fhwa.dot.gov/LRSPDIY/)

- Road Safety Audits – Performed by a multidisciplinary team independent of a project. Considers all road users, human factors, and user capabilities

Recommendation

The strategies for high-risk areas and characteristics identified by the Systemic Approach should be considered by the agencies having jurisdiction as widely implemented countermeasure options for safety projects and/or integration within other programmed projects along the noted facility types. Not all countermeasure strategies are appropriate in all situations, but this approach allows proactive attention to be made to high-risk vulnerable road user crash and facility characteristics.

5.2 Program of Projects

The identification of the program of projects is a critical step in prioritizing locations where there may be an area of concern or to allow for proactive attention for locations that have the high-risk vulnerable road user crash and facility characteristics. The VRUSA process resulted in three groups of projects or locations that form the program of projects:

1. Systemic Approach for Bicycles
2. Systemic Approach for Pedestrians
3. Evaluation Criteria for all the other locations and/or projects

Bicycle Systemic Approach Results

As reflected in the bicycle systemic approach, the majority of crashes involved vehicles that were driving straight ahead and also those where vehicles were overtaking the bicyclist. The facilities that these crashes were occurring were typically on principal arterials, minor arterials and local roads within urban areas. Within urban cluster areas, the crashes were on principal arterials and major collectors. Table 15 lists the roadway facilities that matched the noted high-risk characteristics. Design solutions should provide a balance of protecting the safety of bicyclists, improving accessibility and mobility, considering area and land use context, and meeting the needs of all transportation modes.

Implementing the PSCs identified in Section 5.1 may potentially reduce future fatalities and serious injury crashes for bicyclists. Additionally, implementation of the bicycle master plans will help to create a comprehensive and connected network of facilities. In all cases, an engineering analysis should be conducted for each location on a case-by-case basis. In addition to the PSCs, typical recommendations for improvements to address the bicycle the following:

- Visibility Enhancements – Install high-visibility markings (striping materials/patterns), improved lighting and/or enhanced signing, and pavement markings.
- Maintenance Program – Along bikeway facilities, maintain markings, clear surface debris and plant overgrowth, and maintain smooth riding pavement.
- Education/Encouragement – Education and outreach programs can be a powerful tool for changing behavior and improving safety skills. Education for all road users may be appropriate especially when located near bicycle routes and bicycle intensive land use.
- Enforcement – Enforcement programs can be used to help change the behavior of all road users. It is best when used in combination with education and other tools. Coordinated efforts between law enforcement, traffic engineers and public health/safety organizations can focus the limited resources available on areas with the greatest impacts.

Table 15: Bicycle Systemic Approach Results

Island	Jurisdiction	Road	Vicinity Reference	Area Type & Functional Classification	Bikeway Type (from MVAR)
O'ahu	State	Kamehameha Hwy	Luluku Rd	Urban Principal Arterial	None
O'ahu	State	Vineyard Blvd	Aala St	Urban Principal Arterial	None
O'ahu	State	Ala Moana Blvd	Kalakaua Ave	Urban Principal Arterial	None
O'ahu	State	Farrington Hwy	Guard St	Urban Principal Arterial	None
O'ahu	State	Kalanianaole Hwy	Bell St	Urban Principal Arterial	None
O'ahu	State	Kalanianaole Hwy	Ulupuni St	Urban Principal Arterial	Striped
O'ahu	State	Farrington Hwy	Kaukama Rd	Urban Principal Arterial	Lane/Path [1]
O'ahu	County	Ward Ave	Waimanu St	Urban Principal Arterial	None
O'ahu	County	S King St	University Ave	Urban Principal Arterial	None
O'ahu	County	S King St	Kalakaua Ave	Urban Principal Arterial	None
O'ahu	County	Bishop Street	Queen St	Urban Principal Arterial	None
O'ahu	County	Kapiolani Blvd	S King St	Urban Principal Arterial	None
O'ahu	County	Ward Ave	S King St	Urban Principal Arterial	Lane/Path
O'ahu	County	King St	Poha Ln	Urban Principal Arterial	Lane/Path

Island	Jurisdiction	Road	Vicinity Reference	Area Type & Functional Classification	Bikeway Type (from MVAR)
Oʻahu	County	King St	Poha Ln	Urban Principal Arterial	Lane/Path
Oʻahu	State	Liliha St	N King St	Urban Minor Arterial	None
Maui	State	Waiehu Beach Rd	Wailupe Dr	Urban Minor Arterial	None [1]
Oʻahu	State	Kunia Rd	Wilikina Dr	Urban Minor Arterial	None
Oʻahu	State	Kalihi St	Nimitz Hwy	Urban Minor Arterial	None
Oʻahu	County	Ala Wai Blvd	Niu St	Urban Minor Arterial	None [1]
Oʻahu	County	Kalihi St	Ahuula St	Urban Minor Arterial	None
Oʻahu	County	Diamond Head Rd	Poka St	Urban Minor Arterial	Signed Route [1]
Oʻahu	County	Hawaiʻi Kai Dr	Maunanani St	Urban Minor Arterial	None [1]
Oʻahu	County	Waialae Ave	Kilauea Ave	Urban Minor Arterial	None
Oʻahu	County	Punchbowl St	Halekauwila St	Urban Minor Arterial	None
Oʻahu	County	Kalakaua Ave	Fern St	Urban Minor Arterial	Signed Route
Oʻahu	County	St Louis Dr	Waialae Ave	Urban Minor Arterial	None [1]
Oʻahu	County	Waiakamilo Rd	N King St	Urban Minor Arterial	None [1]
Oʻahu	County	N King St	Kalihi St	Urban Minor Arterial	None
Oʻahu	County	Piikoi St	Kinau St	Urban Minor Arterial	None
Oʻahu	County	Keeaumoku St	S King St	Urban Minor Arterial	Lane/Path [1]
Oʻahu	County	Hamakua Dr	Hahani St	Urban Minor Arterial	Lane
Oʻahu	County	Hamakua Dr	Aoloa St	Urban Minor Arterial	Lane
Oʻahu	County	Kaiwiula St	McNeill St	Urban Local	None
Oʻahu	County	Lauhala St	Beretania St	Urban Local	None [1]
Oʻahu	County	Kaahumanu St	Komo Mai Dr	Urban Local	None
Oʻahu	County	Pohakupuna Rd	Ihipehu St	Urban Local	None
Oʻahu	County	Kainehe St	Kihapai St	Urban Local	None
Oʻahu	County	Tantalus Dr	Aaliamanu Pl	Urban Local	None
Oʻahu	County	Kewalo St	Wilder Ave	Urban Local	None
Oʻahu	County	Keahumoa Pkwy	Maweke St	Urban Local	None
Hawaiʻi	State	Kuakini Hwy	Viewpoint Entrance	Urban Cluster Principal Arterial	None [1]
Maui	State	Piilani Hwy	Manao Kala St	Urban Cluster Principal Arterial	None [1]
Hawaiʻi	State	Queen Kaahumanu Ext	Henry St	Urban Cluster Principal Arterial	None [1]
Maui	State	Piilani Hwy	Alanui Ke Alii Dr	Urban Cluster Principal Arterial	Lane/Path
Oʻahu	State	Kamehameha Hwy	Sunset Elementary	Urban Cluster Principal Arterial	Lane/Path
Maui	State	Kekaulike Ave	Hapapa Rd	Urban Cluster Major Collector	Signed Route

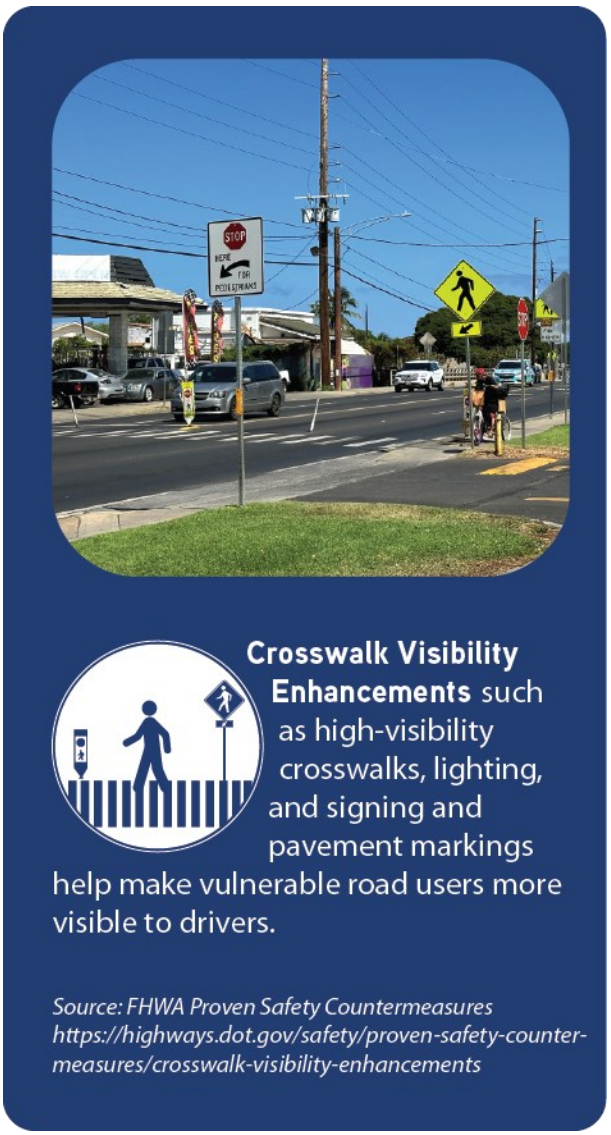
Island	Jurisdiction	Road	Vicinity Reference	Area Type & Functional Classification	Bikeway Type (from MVAR)
Hawai‘i	County	Paniolo Ave	Lua Kula St	Urban Cluster Major Collector	None
Hawai‘i	County	Napoopoo Rd	Aka Ala St	Urban Cluster Major Collector	None
Maui	County	Front St	Kapunakea St	Urban Cluster Major Collector	None
O‘ahu	County	Goodale Ave	Waialua Beach Rd	Urban Cluster Major Collector	None
Hawai‘i	County	Kaumana Dr	Wiliwili St	Urban Cluster Major Collector	None
Maui	County	Makawao Ave	Kee Rd	Urban Cluster Major Collector	Lane/Path [1]

[1] Current conditions have changed bikeway types from the MVAR noted facility

Pedestrian Systemic Approach Results

As reflected in the pedestrian systemic approach, the heavier branches were aligned with principal and minor arterials, within urban areas, and with more frequency of crashes at signalized intersections. Table 16 lists the locations of the high-risk clusters that fell within this category. Intersection design requires consideration of all roadway users, especially pedestrians, who are the most vulnerable while crossing. Design solutions should provide a balance of protecting the safety of pedestrians, improving pedestrian accessibility and mobility, and meeting the needs of bicyclists and motorists. Sometimes the best design solution for pedestrians does not work well for bicycles, and vice versa. The needs of all intersection users must be considered.

Intersections can be made more pedestrian-friendly by implementing designs that improve the crossing conditions and visibility, reduce crossing distances, and minimize the conflicts between pedestrians, bicyclists, and motor vehicles. In all cases, an engineering analysis should be conducted for each location on a case-by-case basis. Typical recommendations for improvements at signalized intersections include the following:



- Crosswalk Visibility Enhancements – High-visibility crosswalks (striping materials/patterns), improved lighting and/or enhanced signing, and pavement markings are all important safety countermeasures.
- In-lane rumble strips with raised pavement treatments can be placed in advance of crosswalks to alert the approaching driver of the upcoming crosswalk.
- Medians and Pedestrian Refuge Islands – May include pavement markings, raised areas, or islands. May allow pedestrians to cross one direction of traffic at a time (especially along urban/suburban multilane facilities with a mixture of pedestrian/vehicle use).
- Curb Bulb-Outs and Extensions – Curb bulb-outs and extensions extend the curb and sidewalk into the street area and shorten the crossing distance, reducing the crossing time, and makes the pedestrian more visible.
- Leading Pedestrian Interval – Allows pedestrians to begin crossing before vehicle green phase starts – typically 3 to 7 seconds. This provides the opportunity to establish presence prior to allowed vehicle/turning movements (may be paired with restricting right turns on red).
- All-Pedestrian Crossing – In locations where a lot of pedestrians are out and about due to land use, exclusive timing can be used. This is very useful where there are more than 1,200 pedestrian crossings per day and should be used in conjunction with “no right turns on red”.

- Right-Turn Slip Lanes – In general the use of right-turn slip lanes should be minimized. They should be designed to provide a low-angle right-turn to reduce vehicle speeds and improve the visibility of the pedestrian.
- Education – Education and outreach programs can be a powerful tool for changing behavior and improving safety skills. Many of the intersections listed in Table 16 have highly visible crosswalks with a protected walk signal phase. Education for all road users may be appropriate especially when located near pedestrian intensive land use.

Curb Extensions (also known as bulb-outs) extend the sidewalk or curb to narrow the roadway and reduce the pedestrian crossing distance. It also improves the ability of pedestrians and motorists to see each other.

- Enforcement – Enforcement programs can be used to help change the behavior of all road users. It is best when used in combination with education and other tools.

Table 16: Pedestrian Systemic Approach Results for High-Risk Clusters

Cluster ID	Island	Jurisdiction	Road	Segment	Number of Pedestrian Crashes	Functional Classification
2	O‘ahu	State	Farrington Hwy	Farrington Hwy near Haleakala Ave	2	Urban principal arterial
3	O‘ahu	State	Farrington Hwy	Farrington Hwy between Kealanani Ave and Makakilo Dr	2	Urban principal arterial
6	O‘ahu	County	Dillingham Blvd	Kalihi St and Dillingham Blvd	2	Urban minor arterial
7	O‘ahu	County	Kuakini St	Liliha St and N Kuakini St	2	Urban major collector
8	O‘ahu	County	Nimitz Hwy spur near Iwilei Rd	Nimitz Hwy/Iwilei Rd	2	Urban minor collector
9	O‘ahu	County	Pauoa Rd	Pauoa Rd/Pacific Heights Rd	2	Urban minor arterial
10	O‘ahu	County	Ward Ave	S King St/Ward Ave	2	Urban principal arterial

Cluster ID	Island	Jurisdiction	Road	Segment	Number of Pedestrian Crashes	Functional Classification
11	Oʻahu	County	King St	S King St/Victoria St	2	Urban principal arterial
12	Oʻahu	County	Queen St	Queen St/Kamakee St	2	Urban minor arterial
13	Oʻahu	County	Beretania St	S Beretania St/Kalakaua Ave	2	Urban principal arterial
14	Oʻahu	County	Kalakaua Ave	S King St/Kalakaua Ave	3	Urban minor arterial
15	Oʻahu	County	Punahou St	Punahou St/Young St	2	Urban principal arterial
16	Oʻahu	County	McCully St	McCully St/Citron St	2	Urban minor arterial
19	Kauaʻi	State	Kuhio Hwy	Kuhio Hwy near Kauaʻi Village Shopping Center and Waipouli Beach Resort Driveways	2	Urban principal arterial
20	Kauaʻi	State	Kuhio Hwy	Kuhio Hwy between Kali Rd and Hardy St	2	Urban principal arterial
22	Maui	County	Waiehu Beach Rd	Waiehu Beach Rd and Eha St/Nukuwai Pl	2	Urban minor arterial
23	Maui	County	Kahului Beach Rd	Kahului Beach Rd near Nisei Veterans Memorial Center Driveway and Kanaloa Ave	2	Urban minor arterial
24	Maui	County	Kaahumanu Ave	W Kaʻahumanu Ave near Lono Ave and S Kane St	2	Urban principal arterial
27	Hawaiʻi	County	Kilauea Ave	Kilauea Ave/Pauahi St	2	Urban minor arterial
29	Hawaiʻi	State	Mamalahoa Hwy	Mamalahoa Hwy/Pukalani Rd	2	Urban principal arterial

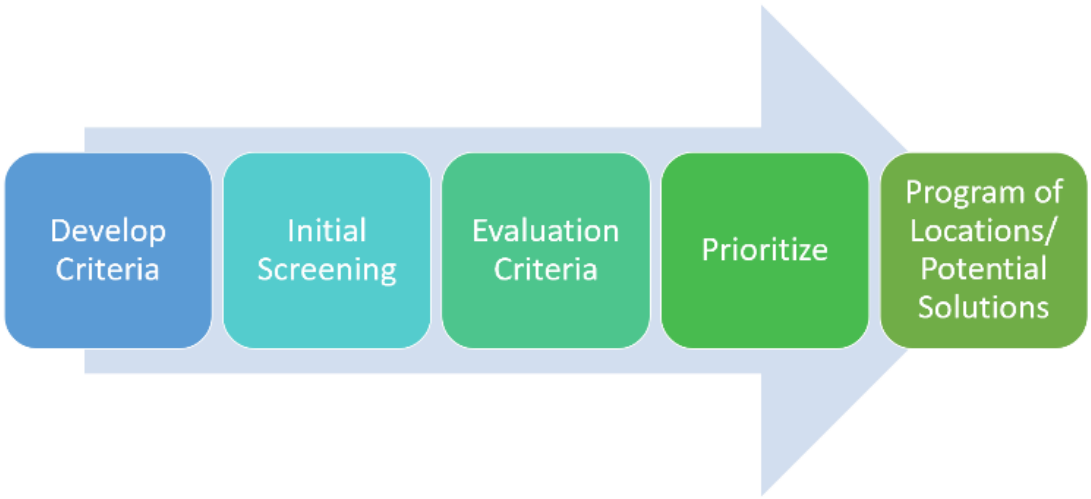
Methodology and Evaluation Criteria for Other Areas of Concern and/or Projects

Other than the systemic approach of reviewing crash trends to develop high-risk characteristics, the project team relied on input from the TAC and SAC to identify locations and other areas of concern that they may be aware of. Feedback was provided in meetings, through email, and through the online GIS tool. In addition, the recommendations and output from the review of plans and walk audits were also compiled and added to the area of concern list. Some locations were identified as opportunities, while others were identified as areas of concern.

Methodology

With a growing list of opportunities and areas of concern, the project team developed a process to screen and evaluate the locations. A stepped process was created, so as not to bias the outcome and to be as transparent as possible. Criteria was developed to be consistent with the Safe System Approach through the review of crash trends and the FHWA's requirements for the VRUSA. Figure 43 illustrates the overall development process for this Program of Projects and the refinement of the prioritized areas of concern list.

Figure 43: Program of Projects Development Process



To identify the need for VRU improvements, factors were defined at the beginning of the areas of concern development process. They were based on technical knowledge of best practices and reflect current important criteria for this vulnerable road users' assessment. An initial screening of the locations was conducted to validate all the data and input collected. Table 17 shows the criteria that were used for the initial screening. The criteria were selected based on consistency with the VRUSA objectives.

Table 17: Initial Screening Criteria

Fatality/Serious Injury Trends	
Crash Locations	Is the location in the vicinity of a VRUSA crash cluster or corridor?
Crash Trends	Does the project meet the crash trend characteristics?
Equity	
Social Vulnerability	Is the location within an area identified with high social vulnerability index? (refer to Table 5 for social vulnerability indicators)
Access to Transportation	Is the project within an area identified with no access to vehicles?
Land Use/Vulnerable User Generators	
Land Use	Is the location near the top identified land uses (residential, parks, strip mall, shopping centers) surrounding crashes?
Climate Change	
Climate Hazard	Is the location outside of an identified natural or climate hazard zone?

The locations of the high-risk clusters, locations identified by the TAC and SAC, plan review priority locations, and high-risk corridors were all compiled. Each location was assessed on the initial screening criteria in Table 17. A point was given for each screening criteria that was met. Out of 81 compiled, a total of 55 areas of concern or opportunities passed through the initial screening process. Locations that received a score of 5 or higher passed through the screening.

In the next step, the areas of concern or opportunities were evaluated based on the criteria in Table 18, which continues an assessment of vulnerable road users' needs.

Table 18: Evaluation Criteria

Complete Streets/Sustainability	
Non-motorized modes	Does the location or potential solution encourage non-motorized modes?
Complete Streets	Does the location or potential solution consider Complete Street principles?
Environment	Does the location or potential solution avoid environmentally or culturally sensitive areas?
Equity	
Access to Transit	Does the location or potential solution improve access to transit?

Accessibility	Does the location or potential solution improve ADA accessibility?
Safe System Considerations	
Speed	Is the existing posted speed limit inconsistent with the land use and/or multi-modal users?
Proven Safety Countermeasure	Does the potential solution utilize a proven safety countermeasure?
Feasibility	
Project Incorporation	Can the location be incorporated with another planned project (within another program)?

Each potential area of concern solution was reviewed and scored. One point was given for each criterion met. Scoring using the evaluation criteria helps prioritize or rank the outcomes by determining the areas where there is a greater need to address the safety of vulnerable road users. Areas of concern and opportunities that scored 6 or better are shown in Table 19. This prioritized list of areas or projects should be considered for further development and incorporated in other planned safety projects and/or improvements. The full list of areas of concerns scored are in Appendix D.

Table 19: Other Areas of Concern and/or Projects

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution
2	O'ahu	State	Waialae Avenue	Pathway along Waialae Avenue under the H-1 viaduct and parallel to the H-1 off-ramp (Exit 26 Waialae Ave)	This pathway dead-ends near the H-1 off-ramp and directs peds/bikes onto the roadway or sidewalk.	Widen the existing sidewalk along Waialae Avenue for shared use by narrowing the travel lanes; improve asphalt/concrete pathway connection to the existing sidewalk
4	O'ahu	County	Ward Ave and Ala Moana Blvd		Statewide Pedestrian Master Plan, 2013	Reduce the curb radii at the southeast corner to reduce the pedestrian crossing distances and lower vehicle speeds around the right turn.
13	O'ahu	State	N Nimitz Hwy	H-1 to Kapalama Drainage Canal	High-Risk Corridor; limited bike facility; Priority Freight Route	Nimitz Highway is designated by FHWA as a Primary Freight Highway. It could be a concern to have bicycles and large trucks share space within the limited right-of-way. Look at appropriate bike networks on Dillingham Boulevard, which runs parallel to the Nimitz corridor, which is more appropriate from a Complete Street system
14	O'ahu	State	Farrington Hwy	West of canal (87-746 Farrington Hwy) to East of Kaukama Rd	High-Risk Corridor; per the Google data, cars are traveling approx. 5 mph over the posted speed limit, with higher speeding occurring at night/early morning	Build O'ahu BP 1-124: Shoulder Bikeway; Conduct a road safety audit; Farrington Study recommends (short-term): speed feedback signs, intersection improvements, and streetlight improvements
15	O'ahu	State	Farrington Hwy	West of Maliona St to Linakola St	High-Risk Corridor; per the Google data, cars are traveling approx. 5 mph over the posted speed limit, with higher speeding occurring at	Build O'ahu BP 1-124: Shoulder Bikeway; Conduct a road safety audit; Farrington Study recommends (short-term): Use speed feedback signs, intersection improvements, and streetlight improvements

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution
					night/early morning	
16	Kaua'i	State	Nawiliwili Rd	Nawiliwili Rd from Waapa Rd to Pikake St	Bicycle and pedestrian facilities	Build new bicycle and pedestrian facilities
17	Kaua'i	State	Kuhio Hwy	Kuhio Hwy from Wilcox Hospital to Hanamaulu Rd	Bicycle and pedestrian facilities	Build new bicycle and pedestrian facilities
18	O'ahu	County	Punchbowl St	Uncontrolled crosswalk Punchbowl St near Pohukaina St	Very active pedestrian crossing area, 4 fast lanes of traffic.	Install a raised crosswalk to improve visibility; consider rapid flashing beacons
19	O'ahu	State	Nimitz/Ala Moana Blvd	Nimitz/Ala Moana Blvd passing thru Iwilei, Downtown, and Kakaako	Nimitz/Ala Moana Blvd is a barrier between active origins and destinations; there are only limited pedestrian crossings; no protected bike infrastructure.	Two protected pedestrian overcrossings are planned 1. Kaka`ako and Fisherman's Wharf 2. Skyline Downtown Station
20	O'ahu	State	Kalanianaole Hwy	Ulupuni St to Olomana Fire Station	Speed humps have helped reduce speeds in spot areas, but speed remains excessive in other areas, with little protected pedestrian or bicycle infrastructure	Pave the shoulders to provide more space; Use speed feedback signs, and streetlight improvements
21	O'ahu	County	Kailua Rd	Kailua Rd/Kailua District Park driveway	This is a busy marked crosswalk but drivers generally do not yield or slow down. Raised crosswalk? Additional markings?	Install a raised crosswalk to improve visibility; Consider rapid flashing beacons
27	O'ahu	State	Ala Moana Blvd	East of Ward Ave to Kamakee St	High-Risk Corridor; no excessive speeding; Sidewalks exist	Two protected pedestrian overcrossings are planned 1. Kaka`ako and Fisherman's Wharf

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution
						2. Skyline Downtown Station
28	O'ahu	State	Ala Moana Blvd	Holomoana St to East of Hobron Ln	High-Risk Corridor; no excessive speeding; sidewalks exist	All pedestrian crossing phase was installed at Ala Moana Blvd and Hobron Lane. Consider education (Hotels can hand out flyers to their guests) and enforcement
32	Maui	State	Waiehu Beach Rd/Lower Main St	Wailupe Dr to Go For Broke Pl	High-Risk Corridor	Consider crosswalk visibility enhancements; Address sidewalk/curb return gaps
33	O'ahu	State	Farrington Hwy	West of Auyong Homestead Rd to Haleakala Ave	High-Risk Corridor; speeding occurs at night/early morning	Address the sidewalk gaps, install crosswalk visibility enhancements, Complete the Farrington Study (short-term safety): S1 intersection improvements; S2 streetlight improvements; S3 speed feedback signs; O'ahu BP 1-124: Shoulder Bikeway

Depending on the jurisdiction, the State, City, and Counties should prioritize the implementation of the Program of Projects. In addition, using the systemic approach, any planned project that meets the high-risk characteristic trends identified should consider taking a closer look at the surrounding land use, social vulnerability index, and vulnerable user needs in design.

5.3 Program of Strategies

The Safe System Approach is comprehensive and addresses vulnerable user safety in numerous ways. An important part of pursuing strategies and solutions is to look beyond engineering to address road safety.

- **Education**—Programs and approaches that teach motorists, bicyclists, pedestrians, and rollers about their responsibilities and traffic rules.
- **Enforcement**—Engagement of law enforcement to focus efforts in problem areas and increase community awareness of safety issues.
- **Encouragement**—Programs and approaches that develop awareness and build enthusiasm for walking, biking, and rolling.

All of these approaches need to be applied together to create the most effective transportation system for our vulnerable road users. The non-engineering strategies can help to address

specific travel and safety issues and help all road users be aware of each other's needs in the right-of-way.

Locally, these strategies are being implemented by organizations and government agencies at multiple levels – statewide, countywide, and locally.

Education

Education and outreach programs are powerful tools and are needed on an ongoing basis to support a healthy transportation system for all vulnerable road users. It can be very useful for changing behavior and improving safety skills and should be targeted and tailored for different audiences.

The 10th Edition of the US-DOT NHTSA's Countermeasures That Work: Highway Safety Countermeasure Guide for State Highway Safety Offices provides guidance to assist State Highway Safety Offices in selecting effective, science-based traffic safety countermeasures for major highway safety problems, including pedestrian and bicyclist safety.[7] In the guide, the use of the countermeasures are summarized along with their effectiveness, cost, and implementation time. The guide includes countermeasures that have the most evidence of effectiveness based on research and individual studies and are those most regularly used by State Highway Safety Offices.

Based on the NHTSA's Countermeasures That Work guide, educational programs and strategies are shown to be the most effective in increasing pedestrian and bicyclist safety for school-aged children. As an example, one of the educational programs used nationwide is the Safe Routes to School program, which is focused on increasing the amount of bicycling and walking trips to and from school while also increasing safety for children. The program uses a comprehensive approach including education of children, school personnel, parents, and community members, as well as enforcement and engineering strategies to improve traffic safety around the school. Programs that included specific implementations focused on site-appropriate engineering changes have shown behavioral improvements for pedestrians, bicyclists, and motorists.[8] All 50 states across the nation have initiated Safe Routes to School programs.

While adults 18 years and older represent most of the pedestrians and bicyclists involved in crashes analyzed in this VRUSA, the NHTSA's Countermeasures That Work guide does not provide sufficient information to measure the effectiveness of educational strategies for adult pedestrians and bicyclists. Educational strategies to increase pedestrian and bicyclist safety for adults could include educational material, tip sheets, and other safety and rules of the road materials that could be passed out at bike shops and bike rental establishments. The use of educational materials could provide a comprehensive approach to inform pedestrians and

[7] U.S. Department of Transportation, National Highway Traffic Safety Administration. "Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices." 10th Edition, 2020.
[8] NHSTA "Countermeasures That Work".

bicyclists of enforcement strategies and campaigns (see Table 21) and encouragement strategies (see Table 22). Educating adult pedestrians and bicyclists about the rules of the road and safety tips may also increase the dissemination of information to children and young adults.

To increase education of pedestrian and bicyclist safety for new drivers, the HDOT will be providing Safe Systems 101 training to the State's lead driver's education instructor trainers to teach instructors of what a Safe System is and how it can be applied into driver's education courses. HDOT acknowledges that along with traffic laws and roadway design changes, it's appropriate to also provide ongoing training to ensure new drivers receive updated information on new pedestrian and bicycle infrastructure, signage, and roadway design configurations or special designs applicable to Hawai'i's roads.

Table 20: Recommended Educational Strategies

Educational Strategies		
Suggested Training Activities and Topics to be Addressed	**VRU High-Risk Characteristic Addressed**	**Example Programs**
DRIVERS		
Training that encourages drivers to: • Think Safety First – Drive the speed limit and avoid aggressive maneuvers. • Be Aware – Watch for pedestrians at all times and always stop for them. • Be Patient – Use extra caution when driving near children playing along the street or older pedestrians who may not see or hear you. • Speeding Wrecks Lives: Speed Safety Awareness	Inattention as a common human factor involved in VRU crashes. Potential concerns with speeding	HDOT media campaigns
Additional questions related to pedestrian and bicyclist safety on driver's license and permit tests, and more pedestrian and bicyclist safety	Inattention and misjudgment as a common human factor involved in VRU crashes.	Safe Systems 101 trainings provided by HDOT

Educational Strategies		
Suggested Training Activities and Topics to be Addressed	**VRU High-Risk Characteristic Addressed**	**Example Programs**
education in driver's education classes.		
ADULTS		
Training through community outreach: • Pedestrian safety messages in public relations (i.e., news releases, fact sheets for local events, social media) Encourage bike shops to provide "Share the Road" and other bicycle safety and rules of the road materials with bicycle owners and tourists who rent bikes.	Pedestrian and bicyclist violations as other factors involved in VRU crashes, inattention and misjudgment as a common human factor involved in VRU crashes, and age groups 18+ years old as the majority involved in pedestrian and bicycle crashes.	• Hawai'i Bicycle Month – Share the Road Safely • National Pedestrian Safety Month (DTS)
CHILDREN		
Training that develops child/student awareness of: • Pedestrian and bicyclist safety and laws. • Personal safety. • Benefits of walking and bicycling.	Pedestrian and bicyclist inattention and misjudgment as a common human factor involved in VRU crashes.	• BikeEd (program for 4th grade students, HBL) • Be Safe Be Seen Halloween (DTS) • K-VIBE • Safe Routes to School

Enforcement

Enforcement programs can be used to help change the behavior of motorists, pedestrians, bicyclists, and all road users and to educate them about applicable traffic laws. It is best used with city, county, or state officials in combination with law enforcement officers in a public safety campaign.

Bicycle helmet laws for children and adults are rated as the most effective countermeasures to improve bicycle safety in the NHTSA's Countermeasures That Work guide. As previously mentioned, Hawai'i has existing helmet laws for children codified under Hawai'i Revised Statutes Chapter 291C, Section 150, but has not enacted helmet laws for adults. The NHTSA's Countermeasures That Work guide notes that a meta-analysis of 40 studies found that helmet

use by bicyclists was associated with 33% to 69% reduction in the odds of facial, head, and fatal injuries, and a 42% reduction in the risk of a non-fatal head injury. The effectiveness of this countermeasure is also backed by 21 empirical studies from Australia, Canada, New Zealand, and the United States that found that all-age helmet laws were effective in reducing serious head injuries by 35% for cyclists of all ages.[9] While no states have enacted statewide bicycle helmet laws for adults, there are currently 49 jurisdictions across the United States that require people of all ages to wear helmets when bicycling.

One of the perceived downsides of enacting all-age helmet laws is that it will discourage bicycling and reduce ridership. Some research has found that laws on mandatory helmet use is not associated with the likelihood that children will cycle, and that implementing legislation is not associated with changes in the number of cyclists as a percentage of the population.[10]

Other effective enforcement strategies listed in NHTSA's Countermeasures That Work guide include publicized sobriety checkpoints, speed enforcement, and traffic enforcement focused on pedestrian and driver safety. Publicized sobriety checkpoints are an extremely effective strategy if they are highly visible and publicized, conducted on a regular basis, and part of an ongoing program as they deter driving after drinking by increasing the perceived risk of arrest. Speed enforcement may be a more effective strategy than reducing speed limits if the speed limit has proven to be compatible with the roadway design and the surrounding environment, but is routinely ignored and exceeded by drivers. Traffic enforcement focused on pedestrian and driver safety was found to be effective as it reinforces pedestrian and driver behavior and raises the expectation that failure to comply would result in legal consequences. As noted in the guide, all these enforcement strategies should be extensively publicized to increase effectiveness.

[9] NHSTA "Countermeasures That Work".
[10] NHSTA "Countermeasures That Work".

Table 21: Recommended Enforcement Strategies

Enforcement Strategies		
Description	**Pros**	**Cons**
Enforce bicycle, pedestrian, and motor vehicle violations	If enforcement is highly visible and publicized, it can deter unsafe driver, pedestrian, and bicyclist behaviors.	Enforcements targeting pedestrians and bicyclists viewed as a strategy that would discourage walking and bicycling, and is also not equitable.
Equip vehicles with in-car breathalyzer	Reduce crashes and fatalities from driving under the influence (DUI).	Cost to implement and install in vehicles.
Publicize and increase the frequency of sobriety checkpoints	Deter driving after drinking	Dependent on available law enforcement personnel and funding.
Require all riders of all ages to use helmets	Reduce serious and fatal head injuries for children and adults.	Viewed as a potential risk to level of ridership.
Remove all debris from the roadway shoulders prior to leaving the collision scene, especially along bike lanes and paths	Prevent more injuries and crashes or bicyclists	Extended lane or road closures.
Use speed and red-light cameras	In locations that have speed and red-light camera programs in place have been effective in reducing speeds (fewer drivers running red lights and a decline in crashes)	Practice can be controversial, but it has raised awareness about speeding and consequences

Encouragement

Encouragement tools can come in a variety of forms, such as media campaigns and strategies, pedestrian and bicycle advocacy, and events. These programs are best used with educational programs that exist and are similar in nature.

Most of the encouragement countermeasures identified in the NHTSA's Countermeasures That Work guide are rated on the lower end of the effectiveness scale as the strategies have not been determined to be effective either because there has been limited or no high-quality evidence, or because effectiveness is still undetermined based on available evidence. The only

countermeasure that is rated as likely to be effective is encouraging and/or enhancing conspicuity for both pedestrians and bicyclists through the use of retroreflective materials and lights or illumination devices. Enhancing conspicuity for pedestrians and bicyclists increases the opportunity for drivers to see and avoid collisions with pedestrians and bicyclists especially at night or in low-light conditions.

Table 22: Recommended Encouragement Strategies

Encouragement Strategies

• Coordination between agencies to achieve master plan goals.
  ○ National Pedestrian Safety Month
  ○ National Bike Month
  ○ Recruit a Pedestrian Safety Media Coordinator (HDOT)
  ○ Mothers Against Drunk Driving (MADD)
• Land use and developer partnerships.
• Encourage safe pedestrian and bicyclist behaviors.
  ○ Looking both ways before crossing the street.
  ○ Enhancing conspicuity by wearing retroreflective materials and using lights or other illumination devices.
• Promote walking and bicycling events.
  ○ Walkwise Hawai'i educational campaign
  ○ Fun runs/rides

5.4 Safe System Approach

The Safe System Approach was at the core of the development of the VRUSA. Making a commitment to zero deaths means addressing crash risks through all of the five elements. A summary of the Safe System Approach is described below:

- Safe Roads
  - Systemic Approach (engineering strategies) – Crash data trends were utilized to identify systemic crash and roadway characteristics. Proven safety countermeasures were recommended to provide a widespread, proactive strategy program to increase the safety of roadways for all users.

Source: FHWA

- Safe Speeds
    - Actual speed data along select corridors were reviewed from Google Data. Average and 85th percentile speeds along these corridors were assessed over a typical one-week period to identify corridors with inconsistencies between posted and travel speeds. Speed management recommendations were made for the high-risk crash corridors that had higher 85th percentiles speeds, although the majority of the corridors had an average 85th percentile speed within the posted speed limit and speed did not appear to be a significant contributing factor to the crashes.
    - FHWA has developed a Safe System Approach for Speed Management. Developing a speed management program can help to address excessive speeding moving forward. There is a five-stage framework to this approach:
        - Establish a vision and building consensus for speed management.
        - Collect and analyze speed and safety data.
        - Prioritize locations for speed management proactively.
        - Select speed management countermeasures.
        - Conduct ongoing monitoring, evaluation, and adjustment.[11]
    - In the State of Hawai'i, the state and counties comply with Hawai'i Revised Statute §291C-107 Speed limits; Factors to consider. The statute requires an engineering study that considers the following:

        (1) Roadway characteristics including but not limited to shoulder condition grade, alignment, sight distance, and lane widths;

        (2) Roadside development and environment, including the following:

            (A) Number and types of side road access including signalized or unsignalized intersections;

            (B) Pedestrian activity and facilities;

            (C) Parking practices and activity; and

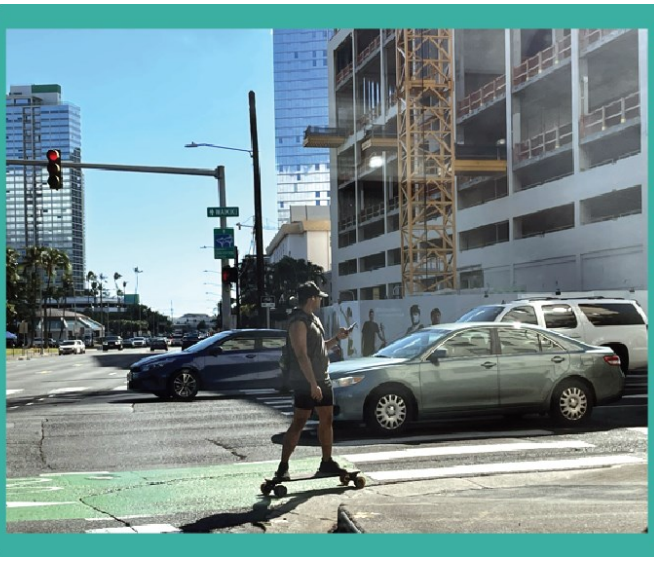
            (D) Type of bicycle accommodations and facilities;

            (3) Motor vehicle crashes resulting in deaths or injuries; and

            (4) Prevailing speeds as determined by traffic engineering measurements.

[11] U.S. Department of Transportation, Federal Highway Administration. "Safe System Approach for Speed Management." May 2023.

- Safe Vehicles
    - Vehicle types involved in VRU crashes were reviewed to identify any differing trends or results compared to national data.
    - Complement and support vehicle safety features (e.g. maintenance of pavement markings for drive assist features). Installing breathalyzers in vehicles to reduce the risk of crashes and fatalities caused from driving under the influence has also been listed as a recommended enforcement strategy.
- Safe Road Users
    - Safety of all road users equitably addressed – socioeconomic data was reviewed to identify disadvantaged communities and communities that have a high number of households with no vehicles available. This was used as criteria in the initial screening of projects and areas of concern to prioritize safety improvements in communities with a high social vulnerability index.
    - Education strategies are recommended to take a proactive approach to teach road users safe pedestrian and bicyclist behaviors and laws, as well as awareness of personal safety.
    - Input from law enforcement was solicited regarding existing and potential enforcement strategies that may be successful in increasing safety for all road users. Other recommended enforcement strategies were provided by stakeholders and also sourced from the NHSTA's Countermeasures That Work guide.
    - Recommended encouragement strategies were suggested by stakeholders and include existing programs and events that encourage people to walk and bike while also providing safety education.



Safe Systems Approach: Safe Road Users

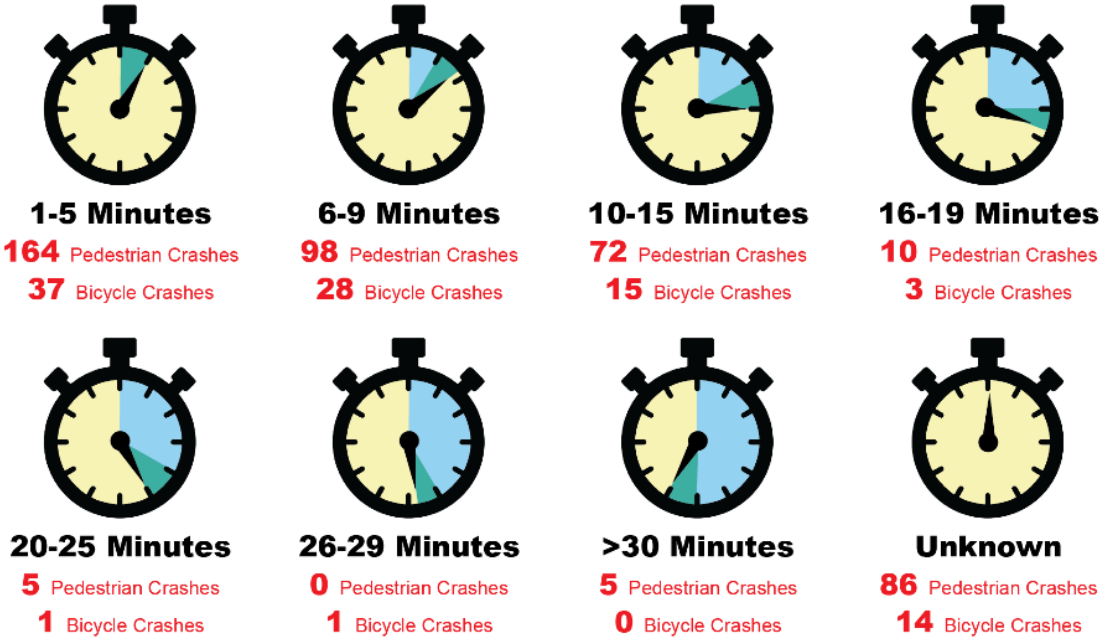
The Safe System Approach targets the safety of all road users, including those who walk, bike, drive, ride transit, and travel by other modes. All road users should have the opportunity to travel safely, regardless of how they travel. At the same time, road users have a responsibility to operate, to the best of their ability, within the expectations and boundaries of the transportation system. Everyone shares ownership of the road system and all share responsibility for maintaining a Safe System.

Education and training on safe road behaviors comprise the cornerstones of promoting safe road users. Reinforcing positive behaviors are key, such as reminding motorcyclists to use proper safety gear and vehicle occupants to use proper adult and child restraints, and to deter dangerous behaviors (including impairment, distracted and/or inattentive road use).

Post-Crash Care

- Incident response times for all bicycle and pedestrian fatalities and serious injury crashes were reviewed, and most of the response times fell within 1 to 5 minutes, followed by 6 to 9 minutes.

Figure 44: EMS Response Times for All Pedestrian and Bicycle Fatalities and Serious Injury Crashes



- Improvements that can improve first responder capabilities for traffic-related crashes is to expand Emergency Medical Services (EMS) capacity to meet the population and community demand. On O'ahu, the targeted response time is 10 minutes. This can be achieved by conducting a statewide workforce study and identifying gaps by county, finding funding, and assessing options to improve 911 ambulance response times.
- Collaborate with all agencies to improve the availability and quality of EMS data.

5.5 Recommendations for Implementation

In this VRUSA, the Safe System Approach guided the development of a comprehensive program of strategies and projects using engineering solutions, education, enforcement, encouragement, coordination, and changes in safety related laws.

Program of Strategies

- Systemic Approach – Bicycle and high-crash pedestrian areas were reviewed through the systemic approach to identify high-risk facility characteristics and associated countermeasure strategies. Implementation of countermeasure strategies are

recommended to be proactively integrated within projects along facilities with the noted high-risk characteristics.

- Education, Enforcement and Encouragement – Non-engineering educational, enforcement and encouragement strategies are recommended to be implemented on an ongoing basis to emphasize the Safe Road User characteristics and support a safe transportation system for all vulnerable road users.

Program of Projects

- Crash Data – Fifty-three (53) bicycle and twenty (20) pedestrian cluster crash locations that are representative of the high-risk characteristics from the systemic approach assessment were identified as locations to implement the countermeasure strategies.
    - Bike: 17 State, 36 City/County
    - Pedestrian: 5 State, 15 City/County
- Other Input – Previous plan review recommendations, high-crash corridors and stakeholder input were assessed to identify potential project locations. Screening criteria consistent with the Safe Systems Approach was applied to filter and prioritize projects, resulting in fifteen (15) project locations (12 State, 3 County) and potential solutions recommended for implementation.

These recommendations will be on-going and implemented over time by State/County agency partners and stakeholder groups supporting vulnerable populations. Future updates of the VRUSA can build upon this initiative and should include additional assessment to address the dynamic nature of traffic safety issues.

The most efficient way for the State, City, and Counties to implement the Program of Projects is to integrate and include the recommendations with planned projects in the same locations. In addition, using the systemic approach, any planned project that meets the high-risk characteristic trends identified should consider taking a closer look at the surrounding land use, social vulnerability index, and vulnerable user needs in design.

Additional data to analyze as well as data recommended to be collected by agencies have been identified by the VRUSA stakeholders. These recommendations can be continued by the City, Counties, and the State to continue to further improve safety for vulnerable road users.

Recommended data to analyze:

- All pedestrian and bicycle crash data – The VRUSA and Safe Systems Approach focuses on addressing fatality and serious injury crashes. Input from stakeholders expressed that limiting the assessment to fatal and serious injury crashes may miss some high-risk behaviors and characteristics.
- Longer period of crash data – The annual number of pedestrian and bicycle crashes in Hawai‘i, specifically on the neighbor islands, is low. Expanding the data set to up to 10 years

would capture additional crash history and may support identification of high-risk areas. A drawback of extending the data period is that both transportation systems and land use change over time, a longer period may highlight areas that have changed leading to incorrect trend assumptions.

- Crash data review – Vehicle maneuvers were reviewed for crash trend characteristics in this assessment. Specific maneuvers reviewed in conjunction with specific roadway characteristics could further identify trend characteristics of driver behaviors. Situations that were identified include:
    - Yielding at uncontrolled crosswalks
    - Yielding of left-turn vehicles to pedestrians at signalized crosswalks
    - Red-light running
- Houseless coordination – there appears to be a growing number of crashes that involve houseless pedestrians. Coordinate efforts with the Institute of Human Services and HDOT's Houseless coordinator.

Recommended data to be collected by agencies:

- Standardization of data collection – Standards and guidance for data collection should be established through coordination amongst various State and County agencies to ensure the data collected is consistent across jurisdictions.
- Pedestrian and bicycle volumes – Identification of pedestrian and bicycle demands may provide additional insight on potential high-risk areas. Agencies should consider this data collection to inform any future non-motorized plans and projects.

- Pedestrian and bicycle facilities (County-wide level) – Publicly available GIS layers identifying the location of pedestrian and bicycle facilities would provide more accuracy in determining whether VRU crashes are occurring in areas where pedestrian and bicycle facilities do not exist and would provide better insight into recommended strategies and countermeasures to implement at high-risk areas.
- Analyze if vehicular volumes are a factor in VRU crashes – Volume levels could also be a trend/systemic characteristic of high-risk roadways. Average annual daily traffic volumes are currently not available along all roadways in the state. Agencies should review their data collection program and tools.
- Trip origin and destination – Identification of pedestrian and bicycle trip origins and destinations may provide additional insight on potential high-risk areas. Agencies should consider this data collection to inform any future non-motorized plans and projects.
- Vehicle weight involved in collision comparison to vehicle weight distribution in the State to analyze whether vehicle weight is a factor in crash severity – Larger vehicle

weight may transfer more kinetic energy to VRUs in a crash. Tracking of this data will inform if vehicle weight may or may not be a trend/systemic crash characteristic.

- EMS response times – Tracking emergency response times, could inform agencies of emergency service gaps and could also identify roadway infrastructure needs to support service providers.
- Number of fatalities and serious injury crashes involving houseless population – With houseless populations growing along roadsides statewide, crashes involving this demographic have been identified as an issue. The HDOT began tracking this crash statistic for fatalities in 2022. Continuing to track this will better inform decision making in the future.

Source: FHWA

A data driven approach to the VRUSA allows policymakers and traffic safety experts to understand the scope and nature of the fatality and serious injury VRU crashes throughout our state. Having the appropriate data helps us to understand the nature of the crashes, identify high-risk areas, and develop evidence-based interventions to address them. This VRUSA report is just one tool to help reduce the number of fatalities and serious injuries in the State. Safety issues and needs will continue to change and evolve over time. Continued assessment is necessary to improve safety and make informed investment decisions. Moving forward, the VRUSA will be integrated with the HSHSP updates.

APPENDICES

Appendix A: Plan Review

HDOT Vulnerable Road User Safety Assessment Plan Review

The State of Hawaii Department of Transportation (HDOT) Vulnerable Road User Safety Assessment (VRUSA) will build upon relevant plans related to vulnerable road users with a focus on walkers, bikers, and rollers (excluding motorcyclists). The plan review summarizes the engagement, consultation efforts, and outcomes of these plans developed by the HDOT and local agency partners.

Consultation with the VRUSA's technical and stakeholder advisory committees was completed to develop this comprehensive plan review. The information from the review will be incorporated into the VRUSA's methodologies to identify high-risk areas and a program of projects and strategies.

1. Statewide Plans

The following plans primarily address safety of vulnerable roadway users with a focus on the state highway system were examined:

1) Hawaii Strategic Highway Safety Plan 2019-2024
2) Statewide Pedestrian Master Plan
3) Bike Plan Hawaii Refresh Priorities and Implementation Plan 2022
4) Highway Safety Plan FFY 2023
5) Triennial Highway Safety Plan – initial public engagement

1.1. Hawaii Strategic Highway Safety Plan 2019 – 2024 (HDOT Highways Division, 2019)

Purpose and Content

The *Hawaii Strategic Highway Safety Plan 2019-2024* (HSHSP) addresses issues related to improving traffic safety, data collection, increasing traffic safety awareness, and other crucial traffic safety issues. The vision of the HSHSP is to have all of Hawaii's road users arrive safely at their destinations. The goal of the HSHSP is to reduce the fatality rate from 7.2 to 6.5 fatalities per 100,000 population, or less, by 2024, with the ultimate goal of zero traffic deaths.

The plan identified the following seven emphasis areas that are particularly pertinent and pressing in Hawaii:

- Speeding
- Impaired driving
- Vehicle occupant protection
- Pedestrians and bicyclists
- Motorcycle, motor scooter, and moped safety
- Roadway design
- First responder capabilities, data, and safety management systems

Consultation and Engagement

The HSHSP is the product of a collaborative effort among more than 150 traffic safety experts and stakeholders, including the Federal Highway Administration, Hawaii Department of Transportation,

Hawaii State Department of Health, county transportation departments, Federal Motor Carrier Safety Administration, Hawaii State Judiciary, county prosecutors, local law enforcement agencies and various community coalitions.

The project steering committee identified traffic safety partners and existing committees/meetings aligned with each emphasis area and incorporated the HSHSP update into their respective agendas. Thus, the various committees took ownership of the HSHSP strategies and action plans as well as developed alignment of their own initiatives with the plan updates.

Outcomes and Recommendations

The HSHSP provides a background for each of the seven emphasis areas and suggests key policy strategies and action items that address these issues through legislation, funding, enforcement, data needs, transportation and land use planning, education and community action, and engineering strategies. The strategies and action items related to pedestrian and bicyclist safety include:

STRATEGY #1: Evaluate and implement context-sensitive speeds that consider adjacent land use and population to decrease fatalities and serious injuries.	
1a	Create "kūpuna zones" and "keiki zones" to reduce speeds in areas where there is a concentration of kūpuna and keiki.
1b	Designate lower speed limits in school zones. Design roadways with schools for lower speeds.
1c	Review and revise design standards regularly, especially when new national guidance is released (e.g., MUTCD, AASHTO Bike Guide, AASHTO Pedestrian Guide, etc.). Revisions should reflect best practices in safe roadway design to implement complete streets and traffic calming design.
1d	Evaluate speeds in areas where there are pedestrians and bicyclists (e.g., high-crash area, school zones, hospitals, community centers, etc.), and implement countermeasures.
1e	Provide speed design flexibility guidance to prioritize bikeways, traffic calming, bicycle boulevards, and lower target speeds.

STRATEGY #2: Expand, improve, and maintain state and local pedestrian and bicycle facilities and networks.	
2a	Utilize and prioritize proven safety countermeasures such as road diets, bulb-outs, pedestrian hybrid beacons, rectangular rapid flashing beacons, pedestrian refuge islands, raised crosswalks, and crosswalk visibility enhancements (e.g., FHWA Safe Transportation for Every Pedestrian, and FHWA Proven Safety Countermeasures). Use interim, pilot and quick-build projects to implement countermeasures.
2b	Continue to educate transportation partners and decision-makers/elected officials on (1) how to incorporate safe pedestrian and bicycle design into transportation projects, and (2) proven safety countermeasures that reduce crashes for pedestrians and bicyclists without inhibiting pedestrian and bicyclist access and mobility of the transportation system.
2c	Revise and update design standards to improve safety measures for pedestrians and bicyclists.
2d	Build and maintain a network of low-stress bikeways; utilize road diets to build protected bikeways.
2e	Build and maintain a network of ADA-compliant pedestrian infrastructure.
2f	Provide training and communication on proven safety countermeasures that reduce crashes for pedestrians and bicyclists without inhibiting the pedestrian and bicyclist access and mobility of the transportation system.
2g	Install wayfinding signage for pedestrians and bicyclists.
2h	Build and maintain intersections and crossings that safely accommodate pedestrians and bicyclists.
2i	Work with existing Vision Zero Task Forces (or similar groups) to develop a list of corridors, intersections, or specific locations for systemic design improvements that increase safety for pedestrians and bicyclists

STRATEGY #3: Implement Complete Streets, Vision Zero, and other policies and programs to increase safety for all modes of transportation.	
3a	State and counties identify and track projects that include the types of pedestrian and bicyclist infrastructure and miles/feet of that infrastructure.
3b	Create Vision Zero Task Force to identify policy/program support areas. Identify key measures to monitor safety issues, such as key dangerous behaviors, locations, and other data.
3c	Educate and train transportation partners and decision-makers/elected officials about Complete Streets, Vision Zero, and other policies and programs (e.g., bring experts to the islands and host training workshops).

STRATEGY #4: Improve safety for children walking and bicycling to school.	
4a	Enforce vehicle traffic laws in school zones (e.g., red light running, speeding, distracted driving, and stopping for pedestrians in crosswalks, etc.; explore automated enforcement).
4b	Prioritize pedestrians and bicyclists by building and improving existing pedestrian and bicycle facilities near schools. Design roadways and intersections with a pedestrian-friendly and bicycle-friendly focus.
4c	Continue to work with schools and community advocates to implement Safe Routes to School programs.
4d	Encourage pedestrian and bicycle safety countermeasures in school zones (Resources: FHWA Safe Transportation for Every Pedestrian, Proven Safety Countermeasures, Bikeway Selection Guide, Countermeasures That Work, etc.).
4e	Educate all road users about their rights and responsibilities (i.e., rules of the road) in school zones (work with school, PTA, law enforcement, etc.). Focus on traffic the rights and responsibilities that have the most impact on safety, such as speeding.
4f	Continue to complete pedestrian and low-stress bicycle networks and fill in gaps around schools and bus stops.

STRATEGY #5: Improve enforcement in high-crash areas involving people walking and bicycling.	
5a	Conduct crash analyses to better understand the underlying characteristics of crashes involving pedestrians and bicyclists. Utilize data from crash analyses to implement targeted and data-driven enforcement.
5b	Work with state legislators to adopt state legislation to allow the use of automated enforcement.
5c	Prioritize speed enforcement in school zones and other locations where there is a high density of kūpuna (senior centers, community centers, libraries, hospitals, etc.).
5d	Work with law enforcement to establish enforcement strategies that save lives, with a focus on high-risk behaviors like speeding, impaired driving, and distracted driving in areas with high pedestrian and bicycle activity.

STRATEGY #6: Improve data and performance measures.	
6a	Set pedestrian and bicycle performance measures. Track pedestrian and bicycle performance measures. Provide information on a publicly accessible online web page.
6b	Collect data on pedestrian and bicycle use [e.g., ped/bike miles traveled, ped/bike hours traveled, Average Annual Daily Pedestrian Traffic (AADPT)/ Average Annual Daily Bicycle Traffic (AADBT), etc.]. Establish a pedestrian-bicyclist count program.
6c	Establish a statewide database for pedestrian and bicycle data (demand, use, infrastructure, proposed projects, etc.).
6d	Use analysis tools (e.g., Pedestrian and Bicycle Crash Analysis Tool - PBCAT) to assist agencies to analyze all pedestrian and bicyclist crashes (not only fatal crashes).
6e	Establish a system to share data among agencies (e.g., Hawaii Department of Transportation, county transportation departments, county police departments, Hawaii Department of Health, Hawaii Department of Education, etc.) to assist state and local transportation professionals in analyzing roadways, corridors, and intersections for future improvements.
6f	Collect and evaluate crash data to determine causes and contributing factors to implement countermeasures. Identify roadway characteristics of high-crash corridors and intersections to determine systemic design solutions.

STRATEGY #7: Educate all road users to take responsibility for road safety.	
7a	Update the driver's education manual and exam to contain more detail of laws and driver responsibility for pedestrian and bicycle safety.
7b	Educate students on safe walking and bicycling (e.g., Safe Routes to School). Have certified instructors (League Certified Instructors "LCI") lead bicycle safety classes in schools.
7c	Create fact sheets (or brochures) of Hawaii Traffic Laws for all new and renewing applicants for the Hawaii Driver's License. Sample language includes, "In the last 5 years, the State of Hawaii has added the following laws: No person shall operate a motor vehicle while using a mobile phone (HRS 291C-137), and the 3-feet law - driver of a vehicle must give at least 3-feet of separation when passing a bicyclist (HRS 291C-43).
7d	Create a campaign to improve public attitudes and change social norms about walking, bicycling, and sharing the road.
7e	Promote safety messages and promote laws (e.g., 3-feet law, vulnerable road users, etc.) through various campaigns (e.g., videos, social media, etc.).

STRATEGY #8: Maximize the opportunity to use existing funding.	
8a	Educate transportation partners and decision-makers/elected officials on funding options.
8b	Evaluate data to determine high-crash areas and prioritize funding in these areas.
8c	Ensure that the Federal Safe Routes to School funding and the Transportation Alternatives Program (TAP)/Transportation Alternatives Set-Aside Program Federal funding programs are fully expended. This action item may include training workshops to help local applicants understand how to apply for and use Federal funding.

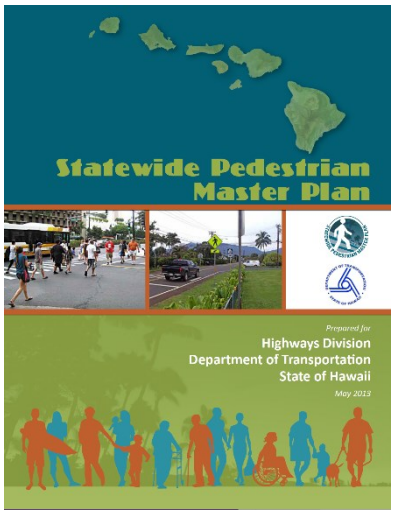
Source: https://hidot.hawaii.gov/highways/files/2021/03/Pedestrian-Bicycle-Safety-Action-Plan-rev.pdf

Application to the VRUSA

The HSHSP strategies and actions identified for the pedestrian and bicycle emphasis area will be referenced while developing prioritization criteria, as well as the recommendations for the program of strategies and priority projects. The VRUSA will be in alignment with the HSHSP and will focus on the recommendations that address the identified high-risk areas, trends and characteristics.

1.2. Statewide Pedestrian Master Plan (HDOT Highways Division, 2013)

Purpose and Content



The *Statewide Pedestrian Master Plan* focuses on improving pedestrian safety on the state highways system statewide and evaluates ways to enhance pedestrian mobility and accessibility. It identifies the most critical needs of the statewide pedestrian system (including safety improvements or repairs), prioritizes projects and programs to address the needs, and provides strategies to implement the recommendations.

The vision of the pedestrian master plan is that "Hawaii's integrated and multi-modal transportation system provides a safe and well-connected pedestrian network that encourages walking among all ages and abilities. The system:

- Promotes a positive pedestrian experience
- Promotes environmental, economic and social sustainability
- Fosters healthy lifestyles
- Conserves energy

More people in Hawaii choose to walk for both transportation and recreation as a result of enhanced walking environments, mobility, accessibility, safety, and connectivity throughout the transportation system."

Goals of the plan included:

- Improve pedestrian mobility and accessibility

- Improve pedestrian safety
- Improve connectivity of the pedestrian network
- Promote environmental benefits of walking
- Encourage walking to foster healthy lifestyles
- Enhance communities and economic development by creating pedestrian-oriented areas and positive pedestrian experiences.
- Promote and support walking as an important transportation mode that reduces overall energy use.

Consultation and Engagement

The Pedestrian Master Plan was formulated in a stepped process designed to gain validation by key stakeholders as the plan was developed. Technical Advisory and Citizen Advisory Committees (TAC and CAC) as well as public workshops were integrated throughout this stepped process to build upon stakeholder engagement and input.

The TAC included technical staff of the federal, state, and local agencies, and jurisdictions with pedestrian interests. The CAC was organized through an advertised application process. The CAC provided a balanced representation of stakeholder interests, affected communities, geographic areas, ages, and diverse populations.

A website was also maintained throughout the planning process to maintain plan information and allow the public to provide input and comments.

Outcomes and Recommendations

The Pedestrian Master Plan developed a list of 31 areas of concern. The key factors used to establish these areas included gaps in the pedestrian facilities, areas with a high concentration of pedestrians (elderly, youth, low-income, and households with no access to vehicles), areas experiencing pedestrian crashes, and areas needing accessibility improvements to pedestrian attractors (schools, shopping centers, employment centers, community centers, hospitals and tourist destinations).

Areas of concern were vetted against prioritization criteria which included pedestrian connectivity, pedestrian safety, environment, property impacts, cost, funding availability, and pedestrian oriented populations.

As a companion to the *Pedestrian Master Plan*, the *Hawaii Pedestrian Toolbox* was developed as a guide for project implementation throughout the state. The toolbox provides guidance for planning, design, and operation of pedestrian facilities presenting best practices through a compilation of adopted guidance tailored to the characteristics and context of Hawaii. The link to this resource is https://hidot.hawaii.gov/highways/files/2013/07/Pedest-Tbox-Hawaii-Pedestrian-Toolbox-Low-Res.pdf

Application to the VRUSA

The Pedestrian Master Plan's key factors in identifying areas of concern as well as prioritization criteria will be referenced while developing the methodologies for development of the VRUSA quantitative analyses. The identified project priorities will be considered in the identification of potential strategies or projects.

Projects identified in the following locations overlap with one or more of the fatal and serious injury pedestrian crash clusters or crash-corridors within the VRUSA crash data period:

- The Statewide Pedestrian Master Plan identified Farrington Highway near Nanakuli and Waianae as Areas of Concern, which are near two clusters on Oahu – Farrington Highway near Linakola

Street (Maili) and Farrington Highway near Haleakala Avenue (Nanakuli). Additionally, five high-crash corridor segments are located along Farrington Highway between Nanakuli and Waianae towns. Since the publication of the Pedestrian Master Plan, the following projects and improvements have been made:

  - Farrington Highway in Nanakuli – Constructed a shared use path along Farrington Highway from Nanakuli Avenue to Hakimo Road; path was completed between Nanakuli Avenue to Helelua Street (PMP No. O-5)
  - Farrington Highway in Waianae - Restriped faded crosswalks, installed advanced stop bars and signage, and implemented Walk Wise Hawai'i (PMP No. O-6)

- The Ward Avenue and Ala Moana Boulevard intersection was identified an Area of Concern, which is near the King Street and Ward Avenue cluster.
- The Liliha Street at Kukui Street intersection was identified as an Area of Concern, which is located within the high-crash corridor along Liliha Street. The following project from the Pedestrian Master Plan was completed:
  - Liliha Street at Kukui Street – Installed traffic signal to provide pedestrians with a dedicated crossing phase (PMP No. O-8)
- The Ala Moana Boulevard at Hobron Lane intersection was identified as an Area of Concern, which is located within the high-crash corridor along Ala Moana Boulevard. Since the publication of the Pedestrian Master Plan, the following project had been completed:
  - Ala Moana Boulevard at Hobron Lane Intersection – Conducted a traffic study to determine feasibility to modify existing signal timing to lengthen pedestrian crossing time to cross Ala Moana Boulevard (PMP No. O-10)
- Fort Weaver Road in the vicinity of Ilima Middle School was identified as an Area of Concern, which is located within the high-crash corridor along Fort Weaver Road. The following project from the Pedestrian Master Plan was completed:
  - Fort Weaver Road at Ilima Intermediate School – Conducted a traffic study to verify the need for a traffic signal and the location of crosswalks; additional signage and raised crosswalk were installed in 2020 (PMP No. O-4)
- The Queen's Lei path in North Kona area was identified as an area of concern, which overlaps with a high-crash corridor along Queen Kaahumanu Highway near Honokohau.
- The Kuhio Highway at Kawaihau Road intersection in Kapaa was identified as an area of concern, which overlaps with a high-crash corridor along Kuhio Highway. The following project from the Pedestrian Master Plan was completed:
  - Kuhio Highway at Kawaihau Road Intersection – Installed new crosswalk across Kuhio Highway for communities along Cane Haul Road, Hauaala Road, and Kawaihau Road (PMP No. K-1)

Additional improvements that have been completed since the publication of the Pedestrian Master Plan include the following:

- <u>Kaua'i</u>
  - Kaumualii Highway at Papalina Road Intersection – Installed pedestrian countdown timers at signal and advanced pedestrian warning signs (PMP No. K-5)
- <u>O'ahu</u>
  - Kamehameha Highway at Pualalea Street in Kahuku – Installed a crosswalk, advanced signing, and stop bars to warn drivers of the potential presence of pedestrians (PMP No. O-1)
  - Waialae Avenue at Hunakai Intersection – Replaced traditional pedestrian walk signals with new pedestrian countdown timers (PMP No. O-3)

- Ala Moana Boulevard between Bishop Street and Richards Street – Installed sidewalks on makai side of Ala Moana Boulevard between Bishop Street and Richards Street (PMP No. O-12)
- Kalihi Street between North King Street and Dillingham Boulevard – Installed five raised crosswalks at existing uncontrolled crosswalks by King David Kalakaua Middle School (PMP No. O-13)

- Maui
  - Hāna Highway at Paia Youth Center – Filled the sidewalk gap between Paia Town and the shared use path at Paia Youth Center and installed pedestrian signs at the existing crosswalk (PMP No. M-3)
  - Haleakala Highway, Kula Highway near Makawao – Constructed a shared use path along Haleakala Highway and Kula Highway between Makawao Avenue and Aapueo Parkway (PMP No. M-4)
  - Piilani Highway at Moi Street Intersection – Partially completed the installation of advance signing and advance stop bars; a study is planned to determine if a traffic signal is warranted (PMP No. M-5)
  - Main Street at Church Street and High Street Intersections – Modified traffic signal and reduced the curb radii to reduce vehicle speeds around the corners and shorten the crossing distance (PMP No. M-7)
- Hawai‘i Island
  - Hawai‘i Belt Road at Paauilo Elementary School – Installed additional school signs (PMP No. H-1)

In accordance with Act 125 (Session Laws of Hawai‘i, 2021), the HDOT maintains a priority list of proposed statewide pedestrian improvements using the projects identified in the Statewide Pedestrian Master Plan as a basis. Additional pedestrian improvements have also been identified through public input and safety and planning analyses, and have been vetted through the same criteria used in the Statewide Pedestrian Master Plan. The following is a priority list of proposed statewide pedestrian improvements:

Kaua‘i

- Rice Street from Nawiliwili Harbor to Kapule Highway – Community request to conduct a pilot project sidepath on the furthest right lane (Ref. No. 2021 – K001)
- Kuhio Highway from Kaloloku Road to Waikaea Canal Bridge – Pave shoulder or install a sidewalk; install directional bike sign to direct bicyclists to County path.

O‘ahu

- Farrington Highway at Makaha Bridge – Community request to have an ADA compliant pedestrian bridge (Improvements completed)
- Farrington Highway from Nanakuli Avenue to Hakimo Road – New sidewalk on the mauka side of the highway.
- Coral Sea Road from Roosevelt Road to the end of the road – Community request for pedestrian lighting (Ref. No. 2021 – O025)
- Kualakai Parkway from Kapolei Parkway – Community request to install “No Right Turn on Red” signs (Ref. No. 2021 – O020)
- Fort Weaver Road from Geiger Rd/Iroquois Rd to Keoneula Boulevard – Community request to fill in gaps in the sidewalk network on Fort Weaver Road (Ref. No. 2021 – O030)

- Fort Weaver Road from Puuloa Beach Park to Kilaha Street – Community request for a shared use path; path added to Bike Plan Hawai‘i Refresh to complete cost estimates, feasibility, and priority.
- Kamehameha Highway from Meheula Parkway to Lanikuhana Avenue – Community request to fill in gaps in the sidewalk network (Ref. No. 2021-O035)
- Whitmore Avenue from Ihiihi Avenue to Whitmore Community Center – New sidewalk on the mauka side of the highway.
- Kamehameha Highway from Waimano Home Road to Acacia Road – Community request for a sidewalk (Ref. No. 2021-O065)
- Nimitz Highway – Community request to repave Nimitz pathway. (Ref. No. 2021 – O064)
- Nimitz Highway between Libby Street and Kalihi Street – Community request to construct a sidewalk between the bus stop and Libby Street (Ref. No. 2020 – O025)
- Vineyard Boulevard from Palama Street to Queen Emma Street – Community request for safety improvements at crosswalks (Improvements completed)
- Ala Moana Boulevard at Ward Avenue – Community request for long pedestrian interval or increase in crossing time for pedestrians across Ala Moana Boulevard (Improvements completed)
- Ala Moana Boulevard at Kamakee Street – Community request for curb extension/bulbout, long pedestrian interval, or pedestrian scramble (Ref. No. 2022 – O004)
- Kalanianaole Highway – Community request to fill in gaps in sidewalk network in Waimānalo (Ref. No. 2021 – O029)
- Kalanianaole Highway at Maunawili Elementary School – Community request for a raised crosswalk (Improvements completed)
- Kāne‘ohe Bay Drive from Kawa Stream Bridge to Mokulele Street – Community request for a sidewalk from the bridge to Mokulele Street (Ref. No. 2021 – O059)
- Kahekili Highway from Hui Iwa to Kamehameha Highway/Hygienic Store – Community request for a shared use path (Ref. No. 2022 – O001)
- Kamehameha Highway from Waihee Road – Extend the roundabout path to Waihee Road

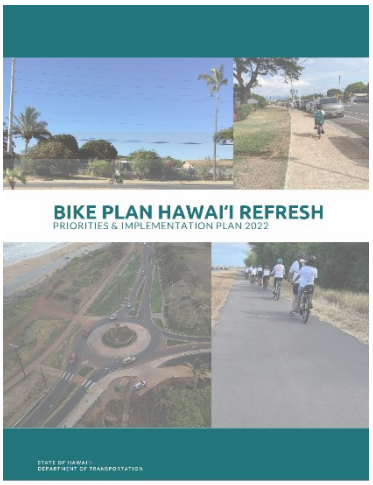
<u>Maui</u>

- Kahekili Highway – Community request to implement speed reduction strategies to maintain slower speeds through Waihee (Improvements completed)
- Kahului Beach Road from Ka‘ahumanu Avenue to Kanaloa Avenue – Community request to construct a sidewalk or path on the makai side of Kahului Beach Road (Ref. No. 2021-M006)
- Honoapiilani Highway from County Park to Front Street – Community request for shoulder enhancements (i.e., buffer, delineators, etc.) between the shoulder and travel lane (Ref. No. 2022-M001)

<u>Hawai‘i Island</u>

- Bayfront Highway at Kamehameha Highway intersection – Community request to add a new crosswalk (Ref. No. 2021-H001)
- Volcano Highway – Improve existing shoulder with quick-curb protection for pedestrians and bicyclists.
- Mamalahoa Highway near Hoolala Road intersection – Install quick-curbs to add protection for a shoulder walkway path.

1.3. Bike Plan Hawaii Refresh Priorities and Implementation Plan 2022 (HDOT Highways Division, 2022)



Purpose and Content

The HDOT completed Bike Plan Hawaii in 2003. This master plan outlined how the state would accommodate and promote bicycling within the state's transportation system. In 2013, the HDOT developed project assessment reports as the next phase of implementation. In 2022, the *Bike Plan Hawaii Refresh* process updated the existing inventory of bicycle facilities, updated project lists and maps, reanalyzed the bicycle network, and reevaluated the proposed projects.

The purpose of the refresh was to update the list of priority projects and to reanalyze the feasibility of the projects for implementation.

Consultation and Engagement

Stakeholder and public engagement for the refresh was performed through online platforms and through virtual meetings with bicycle stakeholder groups.

One of the stakeholder engagement methods included a public survey. The survey was conducted to understand the bikeway needs, priorities, and challenges. More than 1,100 responses were submitted statewide.

Outcomes and Recommendations

Technical feasibility analyses were performed based on the following characteristics: whether it is a standalone project, availability of right-of-way, improvements within the paved right-of-way, and impacts to structures and utilities.

The final prioritization of projects was vetted against criteria including safety, connectivity, accessibility, equity, technical/public support, feasibility, and cost.

Application to the VRUSA

The *Bike Plan Hawaii Refresh's* feasibility analysis, as well as prioritization criteria will be referenced while developing the methodologies for development of the VRUSA. The identified project priorities will be considered in the identification of potential programs or projects.

Projects identified in the following locations overlap with one or more of the fatal and serious injury bicycle crashes or high-crash corridors within the VRUSA crash data period:

- Kailua-Kona along Highways 19 and 11 (Queen Kaahumanu shoulder bikeway signing & Hawaii Belt Road/Mamalahoa Highway shoulder bikeway)
- Nanakuli along Route 93 (Farrington Highway path & shoulder improvements)
- Ewa Beach along Route 76 (Fort Weaver Road in the vicinity of Papipi Road bike lane/buffer/path improvements)
- Windward along Route 83 (Kahekili Highway east of Valley of the Temples Memorial Park bikeway improvements with other projects)

Since the publication of Bike Plan Hawai'i in 2003, the HDOT completed the following Priority I projects that were identified in the plan:

Kaua'i

- Bike Lane on Ahukini Road from Kuhio Highway to Kapule Highway (BPH No. 20a)
- Signed Shared Road—Nawiliwili Road from Kaumualii Highway to Lala Road (BPH No. 34)

O'ahu

- Bike Lane on Meheula Parkway through Mililani and Mililani Mauka and Bike Lane Striping and Signage at the H-2 Mililani Interchange (BPH Nos. 8 and 9)
- Kawainui Levee Path (BPH No. 84a)

Maui

- Bike Lane on Wakea Avenue from Kaahumanu Avenue to Onehee Avenue (BPH No. 11a)
- Bike Lane on Onehee Avenue from Wakea Avenue to Papa Avenue (BPH No. 12)
- Bike Lane on Papa Avenue from Puunene Avenue to Hina Avenue (BPH No. 13b)
- Bike Lane on Lono Avenue from Kaahumanu Avenue to Kamehameha Avenue (BPH No. 14a)
- Bike Lane on Lono Avenue from Papa Avenue to Laau Street (BPH No. 14b)
- Signed Shared Road—Makawao Avenue from Kokomo Road to Makani Road (BPH No. 34)
- Pull-out Areas along Haleakala Crater Road (BPH No. 45)
- Kihei Greenway—Shared use path from Kaonoulu Street to East Waipulani Road, and from East Lipoa Street to Kilohana Drive (BPH Nos. 56a and 56b)
- Signed Shared Road—East Welakahao Road from South Kihei Road to Piilani Highway (BPH No. 57)

Moloka'i

- Signed Shared Road—Farrington Avenue and Puupeelua Avenue (BPH Nos. 4 and 5)

Lāna'i

- Signed Shared Road—Kaumalapau Highway from Lanai Airport to Lanai Avenue (BPH No. 2)

Hawai'i Island

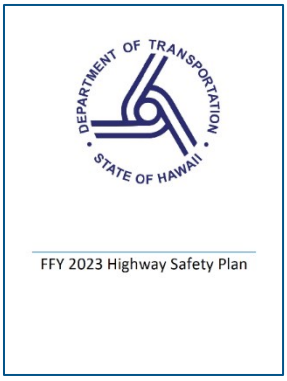
- Bike Lane on Kamehameha Avenue from Waianuenue Avenue to Wailoa River Bridge (BPH No. 15b) – partially complete from Pauahi Street to Kanoelehua Avenue

1.4. Highway Safety Plan FFY 2023 (HDOT Highways Division, 2023)

Purpose and Content

The Highway Safety Plan is an annual plan, created under the umbrella of the 5-year Strategic Highway Safety Plan. It is one of the tools to assess and implement safety conditions to achieve the long-term performance target goals.

An assessment of the FFY 2022 5-year safety performance targets indicated where the State was meeting/falling short of long-term goals, allowing for refocusing of efforts and countermeasures, as well as setting current goals.



The performance target for pedestrian fatalities set a 5-year average target at 29 for FFY 2022. The data indicated not meeting the target (average of 30). The FFY 2023 target was set at 29 fatalities.

The performance target for bicycle fatalities set a 5-year average target at 3 for FFY 2022. The data indicated that this target will be met. The FFY 2023 target was set at 6 fatalities, based on linear trends and external factors such as increases in e-bike and e-scooter crashes.

Consultation and Engagement

The HDOT staff worked with their traffic safety partners to establish performance targets, countermeasures, and identify projects to improve highway safety. These partner agencies and groups included the SHSP Core Committee, Hawaii Traffic Records Coordinating Committee, Hawaii Drug and Alcohol Intoxicated Driving working group, EMS Advisory Committee, Statewide Occupant Protection/Child Passenger Safety Committee, Walk Wise Hawaii, bike/pedestrian advocacy groups, and Traffic Commanders from local law enforcement, county prosecutors, engineers, DOH, HDOT and traffic safety advocates.

Outcomes and Recommendations

The assessment of traffic-related fatalities was characterized by an overrepresentation of speeding related, motorcyclist, pedestrian, and distracted driving crashes. Based on the data assessment, the programs that are the most critical in addressing traffic safety in Hawaii include:

- Reducing impaired driving
- Reducing aggressive driving and excessive speeding
- Reducing pedestrian injuries and fatalities
- Increasing use of seat belts and child restraints
- Reducing motorcycle, motor scooter and moped crashes
- Enforcing speeding, occupant protection, impaired driving, and distracted driving
- Improving data/records system

Planned activities for pedestrian and bicycle safety were based upon NHTSA's Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, with a focus on:

- Elementary-age Child Pedestrian Training
- All Pedestrians
  - Enforcement Strategies
  - Conspicuity Enhancement
  - University Educational Campaign

The following four pedestrian and bicycle projects were approved for FFY 2023.

Countermeasure #1 Education

- DTS Pedestrian Safety Education – conduct safety education, purchase visibility safety devices, and attend the Lifesavers Conference

Countermeasure #2 Pedestrian Safety Outreach and Communications

- HDOT Pedestrian Safety Outreach and Communications – play PSAs during Hawaii's Pedestrian Safety Month and throughout the year. Hire a safety media contractor for a safety media campaign. Provide support for enforcement initiatives.

Countermeasure #3 Enforcement

- HPD pedestrian and bicycle enforcement – at least 2 pedestrian safety public education events quarterly & bicycle engagement events in fatality/problem areas.

Program Management

- HDOT management of Pedestrian Management Program

Application to the VRUSA

The *Highway Safety Plan's* analysis of pedestrian and bicycle fatality data, performance, and performance targets will be utilized in the development of strategies and projects. The identified Program priorities and FFY 2023 projects will inform the VRUSA prioritization and recommendations.

1.5. Triennial Highway Safety Plan (3HSP) (HDOT Highways Division, 2023 in progress)

Purpose and Content

The Triennial Highway Safety Plan update is one of the tools to assess and implement safety conditions to achieve the long-term performance target goals. The update is currently in progress. Initial data from the public outreach and walk audits were provided to inform this VRUSA plan.

Consultation and Engagement

The HDOT conducted a statewide Highway Safety Survey that focused on travel modes, enforcement, education, infrastructure, and engineering.

Walk audits were also conducted with agency and community partners.

- Nimitz Highway at Sumner Lane – Homeless outreach provider, Pedestrian Safety Community Outreach, HDOT Highway Safety Staff, and Highway Safety Manager
- Nimitz Highway, Puuhale Road to Sand Island Access Road – Highway Safety Manager, HDOT Traffic Branch, City and County of Honolulu Department of Transportation Services, businesses, and community members
- Kapolei Parkway in Ewa Beach – Highway Safety Manager, Highway Safety Specialist, and community members
- Hilo – Hawaii County Police Department, Highway Safety Manager, and Highway Safety Specialist

Interviews were also conducted with key stakeholders to capture area context.

- Nimitz Highway - OahuMPO, Addiction Specialist, and HDOT Homeless Coordinator
- Kauai – Highway Safety Manager, Kauai Get Fit Leader, Kauai District Health Officer, and Trauma Coordinator at Wilcox Memorial

Outcomes and Recommendations

The survey received over 1460 responses. Six communities were identified through zip code correlations to 2023 ALICE and Socio Needs Index data. Comments encompassed enforcement, planning, engineering, and communications.

The Nimitz Highway/Sumner Street Walk audit was conducted due to SHACA and FARS crash history as well as being located in one of the highest-ranking communities by ALICE. The issues that were identified include speeding, the houseless population and correlation to substance abuse, community/social services and shelters. Recommendations focus on community outreach, training, and resources. Partnerships with the HDOT homeless coordinator, HWY-T, and OahuMPO will be coordinated to develop traffic safety solutions.

The Nimitz Highway/Puuhale Road to Sand Island Access Road Walk audit was conducted due to SHACA and FARS crash history as well as being located in one of the highest-ranking communities by ALICE. The

issues that were identified include sidewalk continuity, sight distance exiting Sand Island Access Road, violent behaviors in the area and the proximity of homeless shelters, a substance abuse treatment center, and a prison. The area is also characterized by high transit demand. Recommendations focus on community outreach, training, and resources. Partnerships with the HDOT homeless coordinator, HWY-T, and OahuMPO will be coordinated to develop traffic safety solutions.

A Walk Audit was conducted on Kapolei Parkway in Ewa Beach as a result of speeding, distracted driving, and a hit-and-run crash in an ALICE threshold area and an area used by students to walk and bike to school. Recommendations include continued education and enforcement of speeding and distracted driving.

Three walk audits were performed in the Hilo area. These areas were identified in the ALICE report and also ranked high on the SNI. Speeding, distracted driving, occupant protection and pedestrian safety were identified as issues. Recommendations include continued education and enforcement related to pedestrian safety around the schools.

The Kauai stakeholder interview identified rural and recent rise in pedestrian crashes in Kapaa. Recommendations included following up with bringing "safety chick" and VISTA to Kauai to conduct walk audits.

Application to the VRUSA

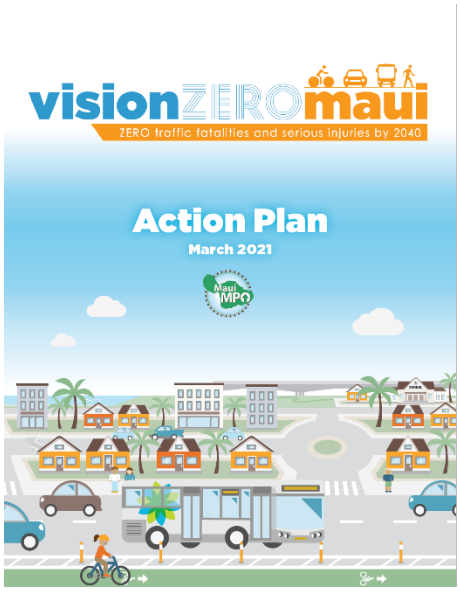
The VRUSA will build upon the stakeholder outreach and the identified issues from the *3HSP* traffic survey, walk audits, and interviews. The areas that overlap with the crash clusters, crash corridors, and high-risk characteristics will be aligned with the *3HSP* recommendations.

2. Local Agency Plans and Policies

The following plans and policies primarily addressing safety of vulnerable roadway users conducted by the metropolitan planning organizations and city/counties were examined:

1) Maui Vision Zero Action Plan
2) Hawaii Island Vision Zero Action Plan
3) Oahu Vision Zero (Internal Memos)
4) Safe Routes to School 2022 Traffic Survey
5) Oahu Pedestrian Plan 2022
6) Oahu Bike Plan 2019 Update

2.1. Maui Vision Zero Action Plan (Maui MPO, 2021)



Purpose and Content

Vision Zero Maui is based upon Vision Zero philosophy which states that no loss of life due to traffic collisions is acceptable. The philosophy recognizes that people make mistakes, however, no one should die or be seriously injured as a result of these mistakes.

2014 through 2018 data trends relating to socioeconomic characteristics and contributing factors to crashes were identified. Note that most of the following data was not disaggregated by vulnerable road user modes.

- Driver impairment was a contributing factor in 42% of fatalities.
- Speed was a contributing factor in 30% of fatalities.
- Inattention/distraction was a contributing factor in 21% of fatalities.
- Red light running was a contributing factor in 26% of fatalities.
- Thirty-five (35) percent of fatal crashes occurred in areas that score high on the Transportation Equity Index (Wailuku and Kihei areas)
- Victims in the 25–29-year-old age group were overrepresented in fatal crashes. Males were more likely to be in a fatal collision. The 20–24-year-old female category was also overrepresented in fatalities.
- Pedestrians and bicyclists were involved in 6 and 3 percent of all crashes respectively. They represented 19 and 2 percent of fatalities.

Consultation and Engagement

The Vision Zero Advisory Group consisted of a mixture of county and state agencies and Maui County community members and groups. The agencies involved included the County Council, Office of the Mayor, Prosecuting Attorney, Planning, Public Works, Fire & Public Safety, and Police Departments, State Departments of Health, Transportation, and the Council on Developmental Disabilities. Community members and groups were represented by the American Association of Retired Persons, Mothers Against Drunk Driving, Maui Bicycling League, Maui High School's drivers' education, a social worker, and a Molokai community member.

Community engagement was accomplished to both inform and solicit feedback regarding safety concerns and opportunities. Focus groups, social media channels, virtual town halls, and an online survey were the engagement tools employed. The focus groups included people that are dependent on public transportation, Native Hawaiian/Pacific Islanders, youth, elderly, disabled, and those from remote locations on Maui.

Outcomes and Recommendations

The Vision Zero actions are identified as short-term (within two years) actions that address the following 7 goals:

- Eliminate impaired driving
- Create safer speeds
- Eliminate distracted driving
- Create a safety culture
- Build safe streets for everyone
- Institutionalize Vision Zero
- Improve data to support decisions

Actions address all modes of transportation; excerpts of the actions specifically addressing vulnerable road users include:

- Create "Malama Zones" in priority areas such as school zones, parks, commercial areas, and areas with a high concentration of seniors, through engineering and enforcement.

- Work with schools to promote safe, active transportation through education, school policies, and pick-up and drop off transportation procedures
- Develop best practice messaging materials for local media to move away from victim blaming and encourage a more balanced framing of and reporting on crashes involving bicyclists or pedestrians.
- Implement the Hele Mai Maui 2040 Transportation Plan to promote safe transportation options for people of all ages and abilities.
- Apply Complete Streets principles systematically by focusing safety improvements to address high-risk roadway features throughout Maui's road network.
- Improve facility maintenance for all modes, particularly pedestrians and bicycles (e.g. crosswalk and bike lane restriping, brush cutting of vegetation along shoulder areas)
- Develop and adopt a policy to prioritize and provide access to pedestrians, bicyclists, and transit riders in temporary work zone areas.
- Support and implement the State of Hawaii Physical Activity & Nutrition Plan actions, including increasing bicycle and pedestrian infrastructure and changing land use policies to support active transportation.

Application to the VRUSA

The data and trend analysis gives the VRUSA information regarding the context of Maui County. Contributing factors, especially those that indicate disproportionate characteristics, will be considered through the development of the high-risk area trends. Actions will also be utilized while developing strategies to address high-risk areas.

2.2. Hawaii Island Vision Zero Action Plan (County of Hawaii, 2020)

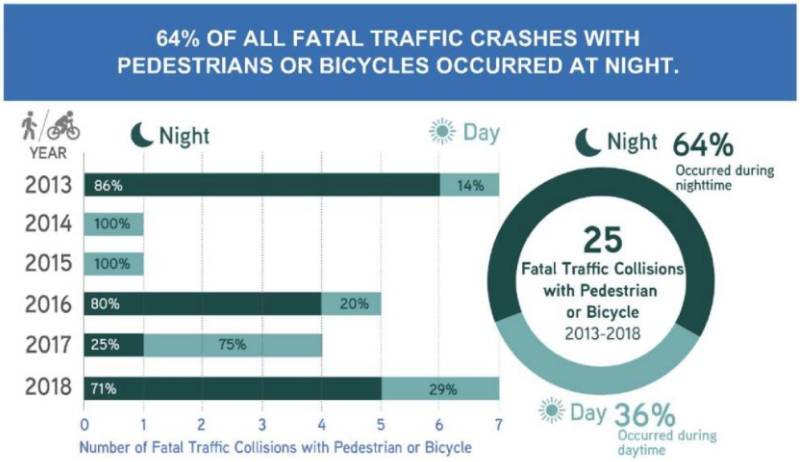
Purpose and Content

The mission statement for the *Hawaii Island Vision Zero Action Plan* is *"Working together, we can eliminate all traffic fatalities and severe injuries while increasing safe, healthy, and equitable mobility for all."* The plan is a roadmap that shifts transportation emphasis on Hawaii Island to preservation of life over convenience of traveling.

Data trends on Hawaii island were identified for characteristics including equity, mode, and fatality crashes. Trends relating to contributing factors to crashes were also identified. Note that most of the following data was not disaggregated by vulnerable road user modes.

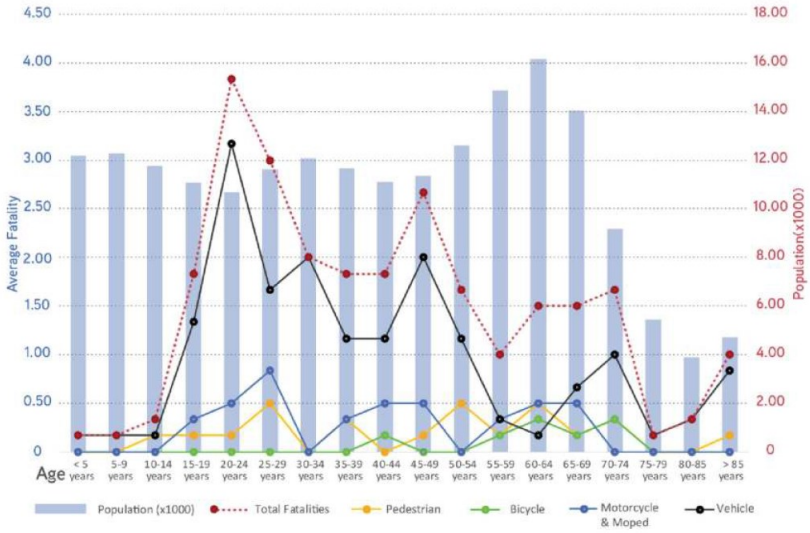
- Seven communities were ranked as having the highest socioeconomic disparities based on household income, language, unemployment, and education: Pahoa, Pahala, Kurtistown, Naalehu, Papaaloa, Ookala, and Mountainview. (Source: 2019 SocioNeeds Index, Hawaii Department of Health)
- Native Hawaiians and Pacific Islanders were disproportionately represented in overall traffic fatalities between 2013 and 2017.

- During the same timeframe, zip codes experiencing the highest number of traffic fatalities include 96720 (Hilo), 96740 (Kona), and 96738 (Pahoa).
- The 2017 commuter travel mode identified biking and walking as 0.44% and 2.3% of travelers respectively. Fatalities for these modes were 5% and 16% of all traffic deaths.
- Speed was a contributing factor in 41% of fatalities. This is on par with the State of Hawaii's 42%, but above the nationwide 27%.
- Driver impairment was a contributing factor in 56% of fatalities.
- Roadway visibility was a contributing factor in 51% of fatal crashes, in line with the 47% national average. 64% of all pedestrian and bike fatal crashes occurred at night.



- Fatalities by age were found to differ from the overall traffic fatality trend. Pedestrian fatalities were spread out across all age groups, while bicyclists between 40 and 74 were represented by fatal crash occurrences:

FIGURE 18. TRAFFIC CRASH FATALITIES BY AGE/MODE (YEARS 2013-2018)



- Distracted driving was found to be a factor in 25% of fatal crashes
- Roadside crashes (hitting a stationary object outside of the travelway) was a factor in 28% of fatal crashes.
- Light trucks and vans were involved in the greatest number of fatal crashes, while motorcyclists had the highest percentage.

Consultation and Engagement

The Vision Zero Task force consisted of a mixture of county and state agencies and Hawaii Island Community Groups. The agencies involved included County Fire, Information Technology, Liquor, Mass Transit, Planning, Police, and Public Works Departments, State Departments of Education, Health, Transportation, and the University of Hawaii. Community Groups included Blue Zones Project, Liquor Commission, Mayor's Active Living Advisory Committee, and Peoples Advocacy for Trails Hawaii.

Outcomes and Recommendations

The Vision Zero actions are identified as short-term (two years), mid-term (five years), and long-term (ten years). The recommended actions address the following categories:

- Reducing potential for conflicts between users
- Slowing motor vehicle speeds
- Reducing driving, bicycling and walking under the influence
- Encouraging safer practices among people driving, bicycling and walking
- Improving data collection processing and analysis
- Supporting an institutional commitment to Vision Zero.

Actions address all modes of transportation; excerpts of the actions specifically addressing vulnerable road users include:

- Prioritize the safety of school aged children by working with Safe Routes to School teams on engineering solutions.
- Define and prioritize multimodal safety improvements in communities of concern.
- Develop and adopt a policy to prioritize the safety of pedestrians, bicyclist and transit riders.
- Conduct safety reviews of the transportation networks in school areas and communities of concern on a four-year cycle. Develop education and engineering recommendations to improve safety for all modes of school travel and prioritize sidewalk infill and maintenance in urban areas.
- Provide bicycling education programs, including a school program to reinforce and encourage safe cycling to school and a program for adult cyclists at all skill levels.
- Encourage events such as National Walk to School Day.
- Provide bicyclist and pedestrian awareness training to officers.

Application to the VRUSA

The data and trend analysis gives the VRUSA information regarding the context of Hawaii Island. Contributing factors, especially those that indicate disproportionate characteristics, will be considered through the development of the high-risk area trends. Actions will also be utilized while developing strategies to address high risk areas.

2.3. Honolulu Vision Zero Action Plan (City & County of Honolulu, in progress)

Purpose and Content

The *Honolulu Vision Zero Action Plan* is currently being developed by the City and County of Honolulu Department of Transportation Services. The plan is a multi-faceted strategy to eliminate traffic deaths and serious injuries on our streets by 2035.

Three memos were provided for the VRUSA team's preliminary review (for internal use only).

High Crash Network Framework (June 2022)

Case studies of five jurisdictions were conducted to identify the methodologies used to create their respective High Crash Network. Based upon the review, these recommendations were made to identify Honolulu's High Crash Network.

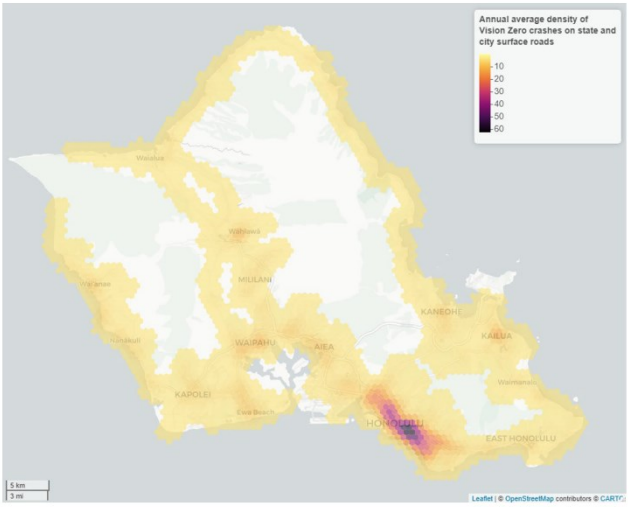
1. Analysis of corridors only
2. City/County jurisdictions only (including intersections with State roads)
3. Crashes
    a. 5 years of data
    b. Fatal and sever injury crashes only (no weighting by severity)
    c. All modes in a single network (no weighting by mode), however, provide modal networks for internal planning use only
    d. Equity data used for prioritization (not used for defining the network)
4. Sliding window analysis for corridor definition
5. Normalize crashes per mile, use a threshold of 50% of fatal and severe crashes to define the network

Existing Conditions Crash Analysis (February 2023)

Crash data were reviewed from 2015 through 2020. All fatality and serious injury accidents were reviewed, as well as any injury accident involving pedestrians, bicyclists, and people using a mobility device. All city and state surface streets were included.

- The block groups with the highest rates of pedestrian/bicycle traffic injury crashes per person include Ala Moana, Kapolei, Civic Center, Waikiki Beach, and Academy of Arts
- The block groups with the highest rates of pedestrian/bicycle injury crashes per centerline mile include Academy of Arts, Ala Wai-Niu Street, Ahana St, Ala Moana, and Upper Pawaa.
- 115 pedestrians and 12 bicyclists were killed.
- 160 bicyclists and 456 pedestrians were hospitalized for non-fatal injuries

Figure 6 Annual Average Density of Fatal and Serious Injury Crashes Involving Pedestrians or Bicyclists on All Roads, 2015-2020



Data Source: Hawai'i Department of Transportation SHACA. The State of Hawaii, Department of Transportation, has provided this crash information under the protection of 23 USC 407. This information may not be used in any Federal or State court proceeding in any action for damages arising from any occurrence at a location mentioned or addressed in the information provided.

- Walkers and bikers are involved in 23% of all injury crashes but represent 34% of fatal and serious injury crashes.
- Pedestrians in a crosswalk, being hit by a vehicle turning left or going straight are the most common crash types (vehicles going straight are more likely to result in a higher crash severity)
- 44% of fatal and serious injury pedestrian crashes occur when the pedestrian is crossing in a crosswalk (66% of crashes occurred on roads with 4 or more lanes)
- 20% of fatal and serious injury pedestrian crashes are outside of a crosswalk (or not crosswalk is present)
- Right turn on red was reported in 4 serious pedestrian crashes
- Over 60% of fatal and serious injury bicycle crashes occurred on roads with no bike facilities
- Motor vehicles going straight ahead or crossing a road are the most common bicycle crashes (vehicles going straight ahead were involved in 47% of fatal and serious bicycle crashes)
- Right turn on red was reported in three serious injury or fatal bike crashes

High Injury Corridors and Intersections Methodology and Summary (June 2023 draft)

The methodology uses crash thresholds normalized by year for intersections and year/distance for corridors. The thresholds are defined as:

- High injury corridor – 3 or more Vision Zero Focus crashes per mile per year
- High injury intersection – 1 or more Vision Zero Focus crashes per year

The webmap is located at the following link: https://nelsonnygaard.shinyapps.io/hnl-vz-hin/

The methodology resulted in 63 corridor segments (40.4 miles) and 93 intersections (66 overlap with a corridor).

Measure	High Injury Corridors	High Injury Intersections
Threshold Used	3 crashes per mile per year	1 crash per year
# of Corridor Segments or Intersections	63	93
Miles of Corridor	40.4	N/A
Crashes Included (% of all Vision Zero Focus Crashes)	1,248 (27.8%)	781 (17.4%)
Proportion of All Corridor Miles	2.0%	N/A
Avg. Crashes per Mile per Year (corridors) or Avg. Crashes per Year (intersections)	5.2	1.4

Table - Summary of High Injury Corridors and Intersections

Consultation and Engagement

The first Vision Zero public workshop occurred on December 12, 2022. The initial meeting gave an introduction to Vision Zero, discussed serious and fatal traffic crashes on O'ahu, and presented a Safe Streets Toolkit.

A public survey is currently being conducted at the following link: O'ahu Vision Zero Action Plan Survey (surveymonkey.com).

The second public workshop is planned for mid-2023.

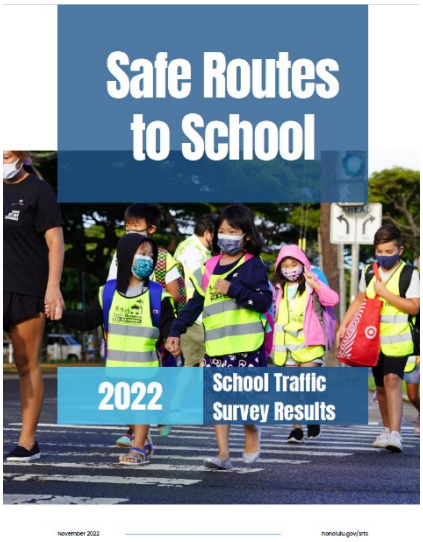
Outcomes and Recommendations

The *Honolulu Vision Zero Action Plan* has not been developed to date. The existing conditions data and methodology were reviewed for this effort.

Application to the VRUSA

The data and methodology from the *Honolulu Vision Zero Action Plan* provide the VRUSA information regarding the context of Oahu Island. Continued collaboration with the Honolulu Vision Zero team will help to inform concerns, trends, and strategies for the high-risk areas.

2.4. Safe Routes to School 2022 School Traffic Survey Results (City and County of Honolulu Department of Transportation Services, 2022)



Purpose and Content

The City and County of Honolulu's Department of Transportation Services Safe Routes to School (SRTS) Program implemented a school traffic survey to gauge traffic issues in the vicinity of Oahu public schools. The survey responses were provided by the school personnel in charge of traffic issues. This report summarizes the results of the online survey.

Consultation and Engagement

A distribution letter with a link to the online survey was provided to the State Department of Education, Office of Facilities and Operations. Schools were also notified of the survey via their Complex Area Superintendent.

Outcomes and Recommendations

Eighty Oahu schools provided responses to the survey.

The top three traffic safety concerns that deter students from walking and biking include driver behavior (speeding and ignoring traffic rules/signs), traffic congestion, and infrastructure (lack of pedestrian/bicycle facilities and sight line issues). Recommendations to address driver behavior issues include driver education and awareness program implementation, speed evaluations, and (if applicable) speed enforcement. Congestion relief could be achieved through staggered schedules, increasing queuing capacity, and encouraging mode shifts. Infrastructure improvements include sidewalks, bike lanes, and sightline/crosswalk improvements. Additionally, coordination with the school traffic/safety administrators should be performed in conjunction with roadway projects adjacent to schools.

Application to the VRUSA

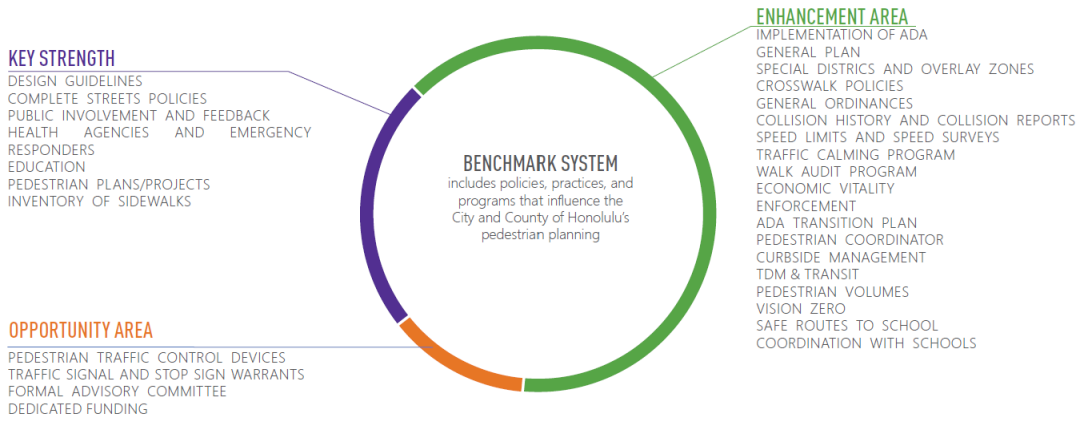
Partnerships between the schools and agencies that have jurisdiction over the roadways, operations and enforcement are important to holistically approach walking/biking safety for our children. The VRUSA will use the input provided by the survey to inform concerns, trends, and strategies for the high-risk areas surrounding school properties.

2.5. Oahu Pedestrian Plan (City and County of Honolulu Department of Transportation Services, 2022)

Purpose and Content

The City and County of Honolulu's Department of Transportation Services developed a long-term plan to create safe and accessible streets on Oahu. The four goals of the plan focus on making Oahu's transportation environment safe, healthy, sustainable, responsive, and equitable. The objectives focus on the goals and mirror the Honolulu Complete Streets, with an emphasis on pedestrians.

Existing policies and programs were benchmarked against best practices, resulting in identification of strengths, areas of enhancement, and opportunities. These benchmarks were used to focus the plan recommendations and resource utilization.



Existing travel mode split, pedestrian demands, and pedestrian facility inventories were reviewed to identify current usage and characteristics. 2014 through 2018 crash data, facility characteristics, and related socioeconomic data were also reviewed to identify locations and trends related to pedestrian safety.

Consultation and Engagement

The public engagement was coordinated with the Oahu Bike Plan update and Complete Streets implementation projects. A combination of public meetings, participatory mapping, social media, and stakeholder meetings were held.

Outcomes and Recommendations

Common roadway characteristics at the high crash locations were identified for corridors, signalized and uncontrolled crossings:

- Corridors – arterials with 4 or more lanes, >30mph, lack of frequent crossings
- Signalized Intersections – on arterials with 4 or more lanes, >30 mph, turning vehicle conflicts, missing a pedestrian crossing leg (or channelized right turn)

- Uncontrolled crossings – 4 or more lanes, marked crosswalks only, lack of medians/curb extensions/other crossing enhancement

Overarching strategies were identified to address the safety needs of pedestrians:

Signalized Intersections

- Reduce crossing distance
    - Curb extensions
    - Crossings on all legs
    - Crossing refuge on wide streets
- Reduce pedestrian-motorist conflicts with signal phasing
    - Pedestrian scramble
    - All-pedestrian phase
    - Leading pedestrian interval
    - Protected left-turns
    - Protected right-turns
    - Prohibit right turns on red
- Reduce speed of turning vehicles
    - Eliminate channelized right turns
    - Raised crossings at channelized right turns
    - Tight turning radius
    - Protected intersections
- Maximize opportunities for walking in signal phase
    - Pedestrian recall
    - Rest-in-walk along major streets
    - Additional crossing time
    - Short signal cycles
- Convert intersection to roundabout
- Red light enforcement cameras
- Street lighting at intersections

Uncontrolled Crossings

- Reduce crossing distance

2.6. Refuge islands
2.7. Curb extensions
2.8. Lane reconfiguration

- Increase visibility of crossing

2.9. Rectangular rapid flashing beacon
2.10. Pedestrian hybrid beacon
2.11. In-street pedestrian crossing signs
2.12. Parking restrictions on crosswalk approach
2.13. Advanced stop bar
2.14. Lighting
2.15. Solid lane line treatment

- Reduce speeds of approaching motorists

2.16. Raised crosswalks
2.17. Raised intersections
2.18. Speed humps
2.19. Tight turning radius
2.20. Narrow lanes/edge of lane line/parking line
2.21. Neighborhood traffic circles

- Relocate or consolidate crossings
- Provide adequate walkways
- Provided well-designed crossings
- Implement lane reconfigurations

2.22. Road diets
2.23. Turn lane removal

- Implement low-traffic, low-speed neighborhood streets

2.24. Speed-humps
2.25. Diverters

- Limit driveway exposure

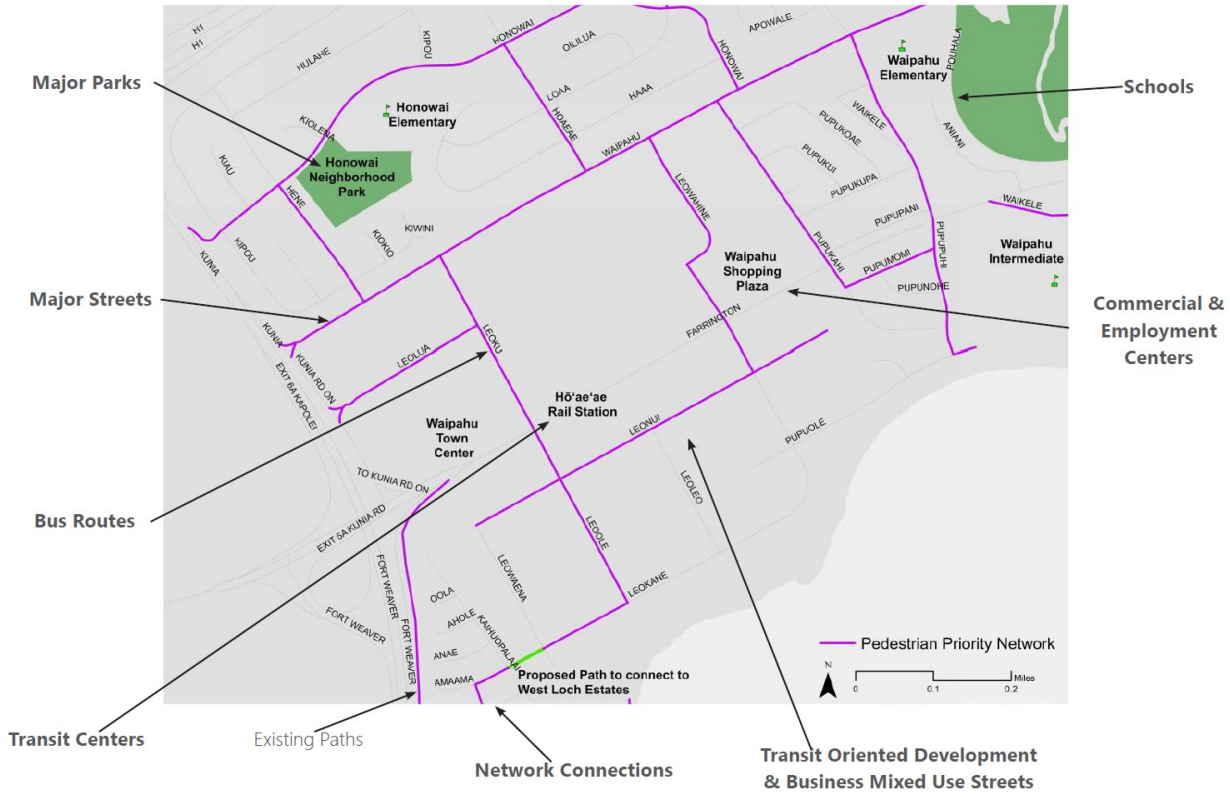
2.26. Limit driveway width and number of driveways
2.27. Restrict left turn into/out of driveways on multi-lane streets

System Wide

- Design and retrofit for target speeds
- Reduce speed limits
    - Reduce speed limits on major urban streets to 25 mph
    - Reduce default speed limit to 20 mph

Pedestrian priority network needs, strategies, and actions were also identified. These include streets/paths under City jurisdiction that provide key connectivity to transit, schools, employment, commercial centers, and other major destinations.

FIGURE 4: WHAT FORMS THE PEDESTRIAN PRIORITY NETWORK?



Strategies to address the pedestrian network and environment include:

- Construct sidewalks to complete gaps in the pedestrian priority network on major streets
- Construct walkways with cost-saving strategies to complete gaps in the pedestrian priority network on non-major streets
    - At-grade walkways
    - Shared-use paths
- Implement low-cost improvements
    - Paved shoulders
    - Advisory shoulders
    - Bike lanes
    - Shared streets

Provide clear sidewalks

- Require placement of utilities to provide preferred pedestrian zone width
- Place bike parking, bus shelters, and seating outside of the pedestrian zone.

Upgrade Walkways

- Widen sidewalks in high pedestrian traffic areas
- Upgrade existing walkways to meet accessibility standards
- Provide buffers to separate pedestrians from motorists
    - Landscaped buffer with trees to maximize separation
    - Parking or bike lane to provide greater separation

Enhance the pedestrian environment

- Provide protection from the elements
  - Trees
  - Awnings
- Provide bus shelters/seating

Pedestrian-oriented development

- Provide a high level of pedestrian connectivity
- Provide safe and convenient pedestrian site connections to transit
- Avoid development-based road widening
- Orient sites to the sidewalk
- Provide primary entries directly from the sidewalk
- Provide active and inviting facades on high pedestrian traffic streets
- Shield parking, vehicular circulation areas, and utilities from the sidewalk
- Provide seating in commercial areas
- Promote the development of neighborhood sized schools

Additionally, education campaigns, encouragement, and enforcement efforts were outlined to integrate with the engineering solutions.

Application to the VRUSA

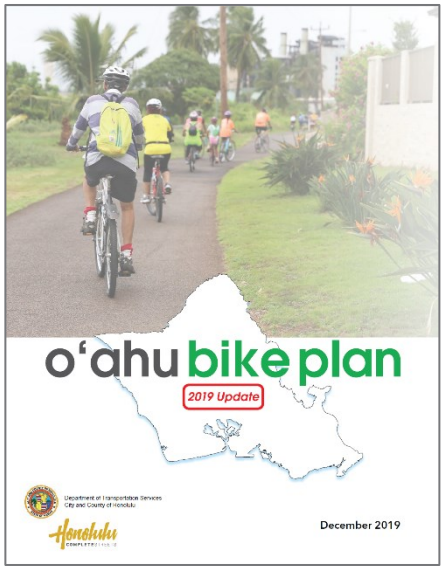
The *Oahu Pedestrian Plan's* strategies will be referenced as the statewide strategies are developed for the VRUSA. The identified crash data, and safety and network priority needs will be assessed and integrated with the statewide pedestrian trends and projects/strategies.

2.28. Oahu Bike Plan 2019 Update (City and County of Honolulu Department of Transportation Services, 2022)

Purpose and Content

The City and County of Honolulu's Department of Transportation Services Oahu Bike Plan 2019 Update builds off of the 2012 plan and focuses on projects, policies, and programs aimed to expand facilities and ridership.

The vision of the plan is: Oahu is a bicycle friendly community where bicycling is a safe, viable, and popular travel choice for residents and visitors of all ages and abilities.



Consultation and Engagement

The Technical Advisory Group consisted of a mixture of county and state agencies and a bicycle group. The agencies involved included the City and County of Honolulu Department of Transportation Services, State of Hawaii Departments of Transportation and Health and the Honolulu Bicycle League.

Community engagement was accomplished in a variety of methods. Stakeholder meetings, community workshops, online surveys, and an interactive crowdsource map. The stakeholder groups included input from universities, military installations, non-profit advocates, and the Honolulu Authority for Rapid Transportation.

Outcomes and Recommendations

Six key recommendations arose from the plan, laying out program and policy recommendations:

- Commit to Vision Zero
- Develop seamless connections between bikes and transit
- Expand encouragement and education efforts
- Establish a comprehensive bikeway maintenance program
- Implement a consistent signage and wayfinding program
- Evaluate bicycle facilities and programs

Specific project recommendations would add 575 miles of new bikeways to the transportation system. Recommendations were split into priority 1, 2, and 3 categories: with priority 1 projects focusing on dedicated bike lanes and paths and priority 2 and 3 focusing on lanes, shoulders and shared facilities.

Application to the VRUSA

The *Oahu Bike Plan 2019 Update*'s program and policies will be referenced as strategies are developed for the VRUSA. The identified project priorities will also be considered in the identification of potential programs or projects.

3. References

State of Hawaii Department of Transportation (HDOT). 2013. *Statewide Pedestrian Master Plan*. https://hidot.hawaii.gov/highways/files/2013/07/Pedest-Plan-PedMP.pdf

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State of Hawaii Department of Transportation (HDOT) Highways Division. 2019. *2019 – 2024 Hawaii Strategic Highway Safety Plan.* November. https://hidot.hawaii.gov/highways/files/2019/11/SHSP-2019-booklet-1k-hr-single-pgs.pdf.

Appendix B: State of Hawai‘i Motor Vehicle Accident Report

STATE OF HAWAII MOTOR VEHICLE ACCIDENT REPORT

Page 1 of _____ DOT-1-174A (HWY-T) Rev. 8/18 Report Number:_____

(1) Crime Code	(2) County	(3) District	(4) Beat	(5) Watch	(6) Date/Time/Day Occurred			(7) Date/Time/Day Reported		

(8) Report Type	(9) Total Involved					(10) Number Of			(12) Hit & Run	(13) Fire	(14) Photo	(15) Location	
	MV	MC	MOP	BC	PED	WITN	KILLED	INJ					
○ Major (01) ○ Minor (02)									○ No (01) ○ Yes (02	○ No (01) ○ Yes (02	○ No (01) ○ Yes (02)	○ None (00) ○ Bridge (01)	○ Tunnel (02) ○ Ramp (03)

(16) Times Police		(17) Times EMS	
Sent	Arrive	Sent	Arrive

(18) Weather Conditions (Select up to 2)

○ Clear (01) ○ Hazy, Fog, Smoke (04) ○ Snow (07)
○ Cloudy (02) ○ Windy, Severe Crosswind (05) ○ Blowing Sand/ Soil/Dirt (08)
○ Rain (03) ○ Sleet/Hail (06) ○ Unknown (09)

(19) Light/Lighting

○ Daylight (01) ○ Spot Illumination (04) ○ Dark/No Lights (07)
○ Dawn (02) ○ Continuous Lighting (05) ○ Dark/Unknown (08)
○ Unknown (09)
○ Dusk (03) ○ Dark/Lights Off (06) ○ Other (10)

(20) Location Class

○ School (01) ○ Recreational (05)
○ Business (02) ○ Farm/Fields (06)
○ Residential (03) ○ No Development (07)
○ Industrial (04) ○ Other (08)

(21) Traffic Level

○ Light (01)
○ Medium (02)
○ Heavy (03)

(22) Trafficway Description

○ 2-Way, Undivided (01) ○ 2-Way, Divided, Median Barrier (04)
○ 2-Way, Undivided with Cont. Left Turn Lane (02) ○ 1-Way Trafficway (05)
○ 2-Way, Divided, Unprotected Median (03) ○ Other (06)

(23) GPS Location

Latitude

Longitude

LOC

(24) Name of Street or Highway	(25) City/Town	(26) Work Zone
		○ No (01) ○ Yes (02)

(27) Route No.	(28) Mile Post Marker	(29) Distance and Direction	(30) Refer (Mile Marker, Intersection, Etc.)

(31A) Location of First Harmful Event

Intersection
01 Intersection Area
02 Driveway Access

On Roadway - Not at Intersection
10 Left or Inner Lane
11 Right or Outer Lane
12 Other Main Lane
13 Merge/Transition Lane
14 Acceleration Lane
15 Deceleration Lane
16 Left Turn Lane
17 Right Turn Lane
18 Bikeway
19 Bus/HOV/Zipper Lane

Off Roadway
20 Left Shoulder
21 Right Shoulder
22 Left Roadside
23 Right Roadside
24 Median

Off Roadway (Cont.)
25 Median Crossover
26 Outside ROW (Trafficway)

Off Roadway - Other
30 Driveway
31 Private Road
32 Parking Lot

Other Roadway
40 Entrance/Exit Ramp
41 Railway Crossing
42 Midblock Crosswalk
43 HOV Crossover Lane
44 Gore
45 Separator
46 Parking Lane
47 Emergency Escape Ramp
48 Other (Specify in Synopsis)

☐ Enter the Location of the FIRST HARMFUL EVENT (31A)

(31B) Action

Non-Collision
01 Overturn/Rollover on Roadway
02 Overturn/Rollover off Roadway
03 Submersion
04 Fire/Explosion
05 Jackknife
06 Ran Off Roadway
07 Cargo/Equipment Loss or Shift
08 Fell/Jumped from Motor Vehicle
09 Downhill Runaway
10 Separation of Units
11 Cross Median
15 Cross Centerline
12 Equipment Failure
13 Thrown or Falling Objects
14 Other Non-Collision (Specify in Synopsis)

Collision with Object/Animal
20 Overhead Cables
21 Guardrail Face
22 Guardrail End
23 Culvert
24 Ditch
25 Bridge Overhead Structure
26 Bridge Pier or Support
27 Bridge Rail
28 Building
29 Tunnel
30 Curb

Collision with Object/Animal (Cont.)
31 Embankment/Retaining Wall
32 Fence
33 Utility Pole/Light Support
34 Traffic Signal
44 Traffic Sign Post
35 Other Post/Pole/Support
36 Impact Attenuator/Crash Cushion
37 Concrete Traffic Barrier
45 Cable Barrier
38 Other Traffic Barrier
39 Tree (Standing)
40 Hydrant
41 Mailbox
42 Animal
43 Other (Specify in Synopsis)

Collision with Person
50 Unknown
51 Crossing in Crosswalk
52 Crossing Outside Crosswalk
53 Crossing no Crosswalk
54 Darting Out
55 Walking in Roadway
56 Playing/Exercising in Roadway
57 Directing Traffic
58 Pushing/Working on Vehicle
59 Getting On/Off Vehicle
60 Roadwork
62 Walking Off Roadway
61 Other (Specify in Synopsis)

Collision with Bicycle or Moped
70 Unknown
71 Riding in Bikeway
72 Riding Outside of Bikeway
73 Riding in Road/No Bikeway
74 Riding off Roadway
75 Crossing Roadway
76 Fell In/On Roadway
77 Other (Specify in Synopsis)

Collision with MV in Transport (Except Moped)
80 Head On
81 Rear End
82 Sideswipe - Same Direction
83 Sideswipe - Opposite Direction
84 Angle - Same Direction
85 Angle - Opposite Direction
86 Angle - Not Specified
87 Broadside
88 Rear to Side
89 Rear to Rear
91 Rear to Front
90 Other (Specify in Synopsis)

Collision with MV - Other
100 MV in Other Roadway
101 Railway Vehicle (Train/ Engine)
102 Parked MV
103 Work Zone/Maintenance Equip.

(31) Sequence of Events

#	Unit	Unit/0	(31B) Action	#	Unit	Unit/0	(31B) Action

☐ Enter the Sequence Number of the FIRST HARMFUL EVENT (31C)

☐ Enter the Sequence Number of the MOST HARMFUL EVENT (31D)

Officer's Rank and Name	Officer's ID Number	Date/Time	Supervisor's Rank and Name	Supervisor's ID Number	Date/Time

This report is prepared for the State of Hawaii Department of Transportation federally mandated 23 USC148, Highway Safety Improvement Program

STATE OF HAWAII MOTOR VEHICLE ACCIDENT REPORT

Report Number:_____

UNIT INFORMATION

(32) Unit No. | (33) No. of Occ.

(34) Unit Class

- ○ Passenger Car (01)
- ○ Passenger Van (02)
- ○ Pickup Truck (03)
- ○ SUV/MPVH (04)
- ○ Cargo Van < 10,001 lbs. (05)
- ○ Other Truck < 10,001 lbs. (06)
- ○ Truck > 10,000 lbs. (07)
- ○ Transit Bus (08)
- ○ School Bus (09)
- ○ Other Bus (10)
- ○ Motorcycle (11)
- ○ Motor Scooter (12)
- ○ Moped (13)
- ○ Bicycle (14)
- ○ Pedestrian (15)
- ○ Maint./Construct. Equipment (16)
- ○ Farm Vehicle/Equipment (17)
- ○ Motor Coach (18)
- ○ Motor Home (19)
- ○ Recreational Vehicle (20)
- ○ Other (21)
- ○ Unknown (22)

(35) Race

- ○ White (01)
- ○ Black (02)
- ○ American Indian (03)
- ○ Chinese (04)
- ○ Japanese (05)
- ○ Korean (06)
- ○ Puerto Rican (07)
- ○ Hawaiian (08)
- ○ Samoan (09)
- ○ Tongan (10)
- ○ Vietnamese (11)
- ○ Filipino (12)
- ○ Unknown (13)
- ○ Other (14)

(36) Last Name | (37) First Name | (38) MI | (39) Sex | (40) DOB

○ M (01) ○ F (02)

(41) Street No. | (42) Street Name | (43) St., Pl., Blvd., Etc. | (44) Apt/Suite Number

(45) City | (46) State | (47) Zip Code | (48) Home Phone Number

( ) -

(49) Occupation

- ○ Unemployed (00)
- ○ U.S. Army (01)
- ○ U.S. Navy (02)
- ○ U.S. Air Force (03)
- ○ U.S. Marines (04)
- ○ U.S. Coast Guard (05)
- ○ Other Military (06)
- ○ Fed. Govt. Civ. (07)
- ○ State Govt. (08)
- ○ County Govt. (09)
- ○ Foreign Govt./Civ. (10)
- ○ Retired (11)
- ○ Student - Elem. (12)
- ○ Student - Inter. (13)
- ○ Student - H.S. (14)
- ○ Student - Col. (15)
- ○ U.S. Tourist (16)
- ○ Foreign Tourist (17)
- ○ Police Officer (18)
- ○ Other (19)
- ○ Not Stated (20)

(50) Employer/Company Name

(51) Work Phone Number | ( ) -

(52) Other Phone/Pager Number | ( ) -

(53) Driver's License Number | (54) St./Juris. | (55) Class | (56) Restrict. | (57) Endorse.

(58) CDL Type

- ○ Non-CDL (01)
- ○ Non-CDL/Restricted (02)
- ○ CDL (03)

(59) Driver's License Status

- ○ Valid (01)
- ○ Not Licensed (02)
- ○ Canceled (03)
- ○ Denied (04)
- ○ Expired (05)
- ○ Revoked (06)
- ○ Suspended (07)
- ○ Provisional (08)
- ○ Permit (09)
- ○ Disqualified [CDL] (10)

(85) SFST Given

- ○ No (01)
- ○ Yes (02)
- ○ Refused (03)

(86) Suspected Impairment

- ○ Alcohol (01)
- ○ Drug (02)
- ○ Both (03)
- ○ None (04)

(87) Alcohol Test Results

(87A) Status	(87B) Type	(87C) Results
○ None (00)	○ Blood (01)	○ Value (01)
○ Refused (01)	○ Breath (02)	
○ Given (02)	○ Other (03)	○ Pending (02)

(88) Drug Test Results

(88A) Status	(88B) Type	(88C) Results
○ None (00)	○ Blood (01)	○ Positive (01)
○ Refused (01)	○ Urine (02)	○ Negative (02)
○ Given (02)	○ Other (03)	○ Pending (03)

(60) Insurance Policy Number | (61) Exp. Date | (62) Insurance Carrier

(63) Registered Owner Name | (64) Phone Number | ( ) -

(65) Str. No. | (66) Street Name | (67)St., Pl. | (68) Ste. #

(69) City | (70) State | (71) Zip Code

(72) Vehicle Body Type

- ○ 2-DSD (01)
- ○ 4-DSD (02)
- ○ 2-DCV (03)
- ○ 2-DSW (04)
- ○ 4-DSW (05)
- ○ P/U Truck (06)
- ○ SUV/MPVH (07)
- ○ Van (08)
- ○ Truck (09)
- ○ Bus (10)
- ○ PCMC (11)
- ○ M-Scooter (12)
- ○ Moped (13)
- ○ Bicycle (14)
- ○ Other (15)

(73) Vehicle Year | (74) Veh. Color (Top/Bottom) | (75) Vehicle Make | (76) Vehicle Model | (77) Lic. Plate No. | (79) Lic. Plate St. | (78) Trailer Plate

(80) Vehicle VIN Number | (81) Emer. Veh. In Use | (82) Vehicle Stolen

(81) ○ No (01) ○ Yes (02) (82) ○ No (01) ○ Yes (02)

(83) Special Use

- ○ None (00)
- ○ Driver Trng. (01)
- ○ Construction/ Maintenance (02)
- ○ Taxi (03)
- ○ Fire Truck (04)
- ○ Tow Truck (05)
- ○ Ambulance (06)
- ○ Police-On Duty (07)
- ○ Police-Off Duty (08)
- ○ Military (09)
- ○ Government (10)
- ○ Farm Use (11)
- ○ U-Drive (12)
- ○ School Bus (13)
- ○ Other Bus (14)
- ○ Other (15)

(84) Trailer/Cargo Type

- ○ None (00)
- ○ Boat (01)
- ○ Flatbed (02)
- ○ Horse (03)
- ○ Livestock (04)
- ○ House (05)
- ○ Van/Encl. Box (06)
- ○ Dump (07)
- ○ Veh. Tow Veh. (08)
- ○ Other (09)
- ○ N/A (10)

Officer's Initials:

Supervisor's Initials:

STATE OF HAWAII MOTOR VEHICLE ACCIDENT REPORT

Report Number: _____

Unit No.

UNIT INFORMATION (Cont.)

(89) Citations

Citation Number	Offense Code (H.R.S./R.O. Section No.)

(90) Est. Damages
- ○ $3,000 or Greater (01)
- ○ Less than $3,000 (02)

(91) Extent of Damage
- ○ None (00)
- ○ Minor (01)
- ○ Functional (02)
- ○ Disabling (03)

(91A) Towed
- ○ No (01)
- ○ Yes (02)

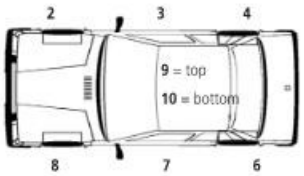
(92) Is this a CMV or Other QUALIFYING Vehicle?
- ○ No (01)
- ○ Yes (02)

If yes, go to CMV SUPPLEMENT

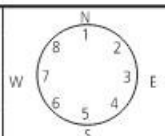
(95A) Object (1) Struck/Damage Description

(96A) Object (2) Struck/Damage Description

(93) Using the Diagram to the Right, Indicate Initial Impact Point in block below:



Circle Damaged Areas



(94) Direction

From	To

(95B) (Object 1) Owner's Name

(96B) (Object 2) Owner's Name

(95C) (Object 1) Owner's Phone Number

( ) -

(96C) (Object 2) Owner's Phone Number

( ) -

(95D) Estimated Damages to Object 1
- ○ $3,000 or Greater (01)
- ○ Less than $3,000 (02)

(96D) Estimated Damages to Object 2
- ○ $3,000 or Greater (01)
- ○ Less than $3,000 (02)

(97) Motor Vehicle Maneuver/Action
- ○ Straight Ahead (01)
- ○ Changing Lanes (02)
- ○ Merging (03)
- ○ Overtaking/ Passing (04)
- ○ Slowing/Stopping (05)
- ○ Backing (06)
- ○ Parking (07)
- ○ Parked (08)
- ○ Start from Parked (09)
- ○ Stopped in Traffic (10)
- ○ Start in Traffic (11)
- ○ Right Turn on Red (12)
- ○ Turning Right (13)
- ○ Turning Left (14)
- ○ U-Turn (15)
- ○ Entering Traffic (16)
- ○ Negotiating a Curve (17)
- ○ Other (18)

(98) Reason for Maneuver
- ○ Intended Maneuver (01)
- ○ Traffic Controls (02)
- ○ Mechanical Failure (03)
- ○ Avoid Other Vehicle (04)
- ○ Avoid Pedestrian (05)
- ○ Avoid Bicycle (06)
- ○ Avoid Obj./ Animal (07)
- ○ Avoid Prior MVA (08)
- ○ Other (09)

(99) Traffic Control Device Type
- ○ No Controls (00)
- ○ Traffic Signal (01)
- ○ Stop Sign (02)
- ○ Yield Sign (03)
- ○ Flashing Red (04)
- ○ Flashing Yellow (05)
- ○ Person (06)
- ○ School Zone Sign/ Device (07)
- ○ Warning Sign (08)
- ○ Railway X-ing Device (09)
- ○ Other (10)

(100) Traffic Control Condition
- ○ Not Applicable (00)
- ○ Functioning Properly (01)
- ○ Knocked Down (02)
- ○ Obscured (03)
- ○ Red Malfunction (04)
- ○ Yellow Malfunction (05)
- ○ Green Malfunction (06)
- ○ Arrow Malfunction (07)
- ○ Lights Not Changing (08)
- ○ Other Malfunction (09)

(101) Guidance/Pavement Markings

	Lft	Rgt		Lft	Rgt
None (00)	○	○	No Passing, Yellow (06)	○	○
Solid Yellow (01)	○	○	Curb/Median, Etc. (07)	○	○
Skip-Dash Yellow (02)	○	○	Bikeway Marking (08)	○	○
Solid White (03)	○	○	Crosswalk Marking (09)	○	○
Skip-Dash White (04)	○	○	Turn Lane (10)	○	○
Solid Double Yellow (05)	○	○			

(102) Delineator Present
- ○ None (00)
- ○ Right (01)
- ○ Left (02)
- ○ Both Sides (03)

(103) Bikeway
- ○ None (00)
- ○ Bike Route [Signed] (01)
- ○ Bike Lane Stripe (02)
- ○ Separate Path/ Lane (03)

(104) Vehicle Factors (Select Up to 2)
- ○ None (00)
- ○ Worn Tires (01)
- ○ Tire Failure (02)
- ○ Brakes (03)
- ○ Headlights (04)
- ○ Taillights (05)
- ○ Signals (06)
- ○ Steering (07)
- ○ Suspension (08)
- ○ Wheels (09)
- ○ Power Train (10)
- ○ Window/Windshield (11)
- ○ Mirrors (12)
- ○ Wipers (13)
- ○ Trailer Coupling (14)
- ○ Other (15)

(105) Vision Obstruction (Select up to 3)
- ○ None (00)
- ○ Trees/Brush/Fence (01)
- ○ Embankment (02)
- ○ Building (03)
- ○ Moving Vehicle (04)
- ○ Parked/Stopped Vehicle (05)
- ○ Glare (06)
- ○ Weather Condition (07)
- ○ Pedestrian (08)
- ○ Animal(s) in Road (09)
- ○ Other (10)

(106) Human Factors (Select up to 3)
- ○ None (00)
- ○ Inattention (01)
- ○ Misjudgment (02)
- ○ Fatigue (03)
- ○ Alcohol (04)
- ○ Illegal Drugs (05)
- ○ Illness (06)
- ○ Legal Meds. (07)
- ○ Emotional (08)
- ○ Phys. Impaired (09)
- ○ Other (10)

(107) Driver Distracted By
- ○ Not Distracted (00)
- ○ Cellular Phone (01)
- ○ Other Elect. Comm. Device (02)
- ○ Other Electronic Device (03)
- ○ Other Inside Vehicle (04)
- ○ Other Outside Vehicle (05)
- ○ Other Occupant (06)

(108) Other Factors (Select up to 4)
- ○ No Improper Action (00)
- ○ Drove too Fast for Conditions (01)
- ○ Exceed Posted Speed Limit (02)
- ○ Disregard Traffic Signals (03)
- ○ Disregard Red Light (04)
- ○ Disregard Other Trfc. Ctrl. Dev. (05)
- ○ Failure to Yield (06)
- ○ Wrong Side/Way (07)
- ○ Crossed Centerline (08)
- ○ Ran Off Road (09)
- ○ Failure to Keep in Proper Lane (10)
- ○ Improper Turn (11)
- ○ Improper Passing (12)
- ○ Improper Backing (13)
- ○ Followed too Closely (14)
- ○ Aggressive, Reckless Driving (15)
- ○ Swerved to Avoid Obstacle (16)
- ○ Over Correcting or Over Steering (17)
- ○ Other Improper Action (18)
- ○ Illegally in Roadway (19)
- ○ Improper Crossing (20)
- ○ Pedestrian Viol. (21)
- ○ Inattention [Talking, Etc.] (22)
- ○ Bicycle Violation (23)
- ○ Clothing not Visible (24)

(109) Roadway Comp.
- ○ Concrete (01)
- ○ Asphalt (02)
- ○ Gravel (03)
- ○ Dirt (04)
- ○ Other (05)

(110) Roadway Surface
- ○ Dry (01)
- ○ Wet (02)
- ○ Mud, Dirt, Gravel (03)
- ○ Debris (04)
- ○ Oil (05)
- ○ Snow (06)
- ○ Slush (07)
- ○ Ice/Frost (08)
- ○ Water (09)
- ○ Sand (10)
- ○ Other (11)

(111) Other Roadway Conditions (Select up to 3)
- ○ None (00)
- ○ Ruts, Holes, Etc. (01)
- ○ No Shoulder (02)
- ○ Low Shoulder (03)
- ○ Soft Shoulder (04)
- ○ High Shoulder (05)
- ○ Loose Material (06)
- ○ Worn, Polished (07)
- ○ Other (08)

(112) Roadway Alignment (Horizontal)
- ○ Straight (01)
- ○ Curve Left (02)
- ○ Curve Right (03)

(113) Roadway Alignment (Vertical)
- ○ Level (01)
- ○ Hillcrest (02)
- ○ Uphill (03)
- ○ Downhill (04)
- ○ Sag (05)

Officer's Rank and Name	Officer's ID Number	Date/Time	Supervisor's Rank and Name	Supervisor's ID Number	Date/Time

DOT-1-174D (HWY-T) Rev. 8/18

STATE OF HAWAII MOTOR VEHICLE ACCIDENT REPORT

Report Number:_____

DIAGRAM

(114) Tire Skid Marks (Feet)

Wheel	Unit 1	Unit 2	Unit 3	Unit 4
Rgt-R				
Lft-F				
Rgt-F				
Lft-R				

(115) REFERENCE POINT

IS _____ (feet) _____ (direction)_____(Object/Landmark)

ALL OBJECTS ARE MEASURED FROM POINT OF REFERENCE

Object	N	S	E	W

(116) Intersection Related

○ No (01) ○ Yes (02)

(117) Main Road

(A) No. of Lanes	(B) Speed Limit

(118) Side Road

(A) No. of Lanes	(B) Speed Limit

(119) Indicate the Type of Intersection (Check one)

○ Not at Intersection (01)
○ 4-Way Intersection (02)
○ "T" Intersection (03)
○ "Y" Intersection (04)
○ Part of Interchange (05)
○ Traffic Circle (06)
○ Roundabout (07)
○ 5 (or more legs) Intersection (08)
○ Other (09)

Place an arrow in the above circle to indicate North.

Draw Object, Directions, Etc. According to Current Practices.

Synopsis (Accident Description. Refer to units by number):

Officer's Rank and Name	Officer's ID Number	Date/Time	Supervisor's Rank and Name	Supervisor's ID Number	Date/Time

STATE OF HAWAII MOTOR VEHICLE ACCIDENT REPORT

Report Number:_____

(120) ALL PERSONS

E - Ejection
00 Not Ejected
01 Ejected, Total
02 Ejected, Partial
03 N/A Non-motorist
04 Unknown

F - Safety Equipment Use
00 Not Present
01 Not Used
02 Shoulder/Lap Belt Used
03 Lap Belt Only Used
04 Shoulder Belt Only Used
05 Not Able to Determine
06 Child Restraint (Forward)
07 Child Restraint (Rear)
08 Booster Seat
09 Child Restraint (Unk. Type)
10 Child Restraint (Improper)
11 Helmet Used
12 N/A (Non-Motorist)
13 Unknown

G - Air Bag Deployed
00 Not Present
01 Not Deployed
02 Deployed - Front
03 Deployed - Side
04 Deployed - Other
05 Deployed - Combination
06 Deployed - Curtain

H - Injury Class
00 None (O)
01 Possible Injury (C)
02 Suspected Minor Injury (B)
03 Suspected Serious Injury (A)
04 Fatal Injury (K)
05 Unknown

I - Injury Area
00 None
01 Head
02 Face
03 Eye
04 Neck
05 Thorax (Chest)
06 Spine/Back
07 Shoulder/Upper Arm
08 Elbow/Lower Arm/Hand
09 Abdomen/Pelvis
10 Hip/Upper Leg
11 Knee/Lower Leg/Foot
12 Entire Body

J - Accident Site Care
00 None
01 First Aid
02 Resuscitation
03 Extrication
04 Both 1 & 2
05 Both 1 & 3
06 Both 2 & 3
07 Other
08 Refused

K - Trans. to Med. Facility
00 Not Transported
01 EMS
02 Police
03 Helicopter
04 Private Vehicle
05 Other

L - Medical Facility

Hawaii County
01 Hilo Medical Center
02 Kona Hospital
03 Kau Hospital
04 Kohala Hospital
05 Honokaa Hospital
06 N. Hawaii Comm. Hosp.

Maui County
07 Kula General Hospital
08 Maui Mem. Med. Ctr.
09 Kaiser Clinic
10 Hana Clinic
31 West Maui Hospital

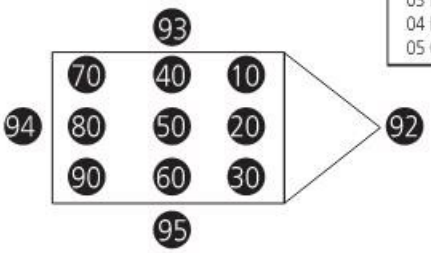
Molokai/Lanai
11 Molokai General Hosp.
12 Lanai Comm. Hospital

Kauai County
13 Wilcox Memorial Hosp.
14 Kauai Vet. Mem. Hosp.
32 Mahelona Med. Ctr.

C&C Honolulu
15 Castle Medical Center
16 Shriner's Hosp. for Children
17 Kahuku Hospital
18 Kaiser Permanente 19 Kaiser Clinic - Honolulu

C&C Honolulu (cont.)
20 Kaneohe State Hospital
21 Kapiolani Medical Ctr.
22 Pali Momi Med. Ctr.
23 Kuakini Med. Ctr.
25 Queen's Med. Ctr. West
26 Queen's Medical Center
27 Straub Clinic & Hosp.
28 Tripler Army Med. Ctr.
29 Wahiawa General Hosp.
30 Waianae Comp. Ctr.

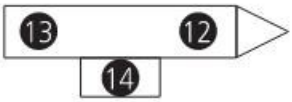
99 Other



Motor Vehicle
For lap positions use 1 in place of 0

B - Position in Unit

Motorcycle/Moped/Bicycle



Pedestrian

15

M - Condition
01 Refused Treatment
02 Released
03 Good, Fair
04 Serious, Guarded
05 Critical
06 Dead on Arrival
07 Dead Other

Name and Address	A Unit	B Posit.	C Age	D Sex	E Eject	F Safety	G Air Bag	H Injury	I Area	J Care	K Trans	L Hosp.	M Cond.	N EMS No.

Officer's Rank and Name	Officer's ID Number	Date/Time	Supervisor's Rank and Name	Supervisor's ID Number	Date/Time

STATE OF HAWAII MOTOR VEHICLE ACCIDENT REPORT

Report Number:_____

Unit No.

Commercial Motor Vehicle Supplement

INSTRUCTIONS:

IF number 1, 2, or 3 apply, **AND** either A, B, or C apply; **THEN** complete this supplement for each CMV or qualifying vehicle.

IF		AND	
1	ANY truck having a gross vehicle weight rating (GVWR) greater than 10,000 lbs., or a gross combined vehicle weight rating (GCWR) greater than 10,000 lbs., OR;	A	ANY person(s) killed in or outside of any vehicle (truck, bus, car, etc.) involved in the crash or who dies within 30 days of the crash as a result of an injury sustained in the crash, OR;
2	ANY Motor Vehicle with seats to transport nine (9) or more people including the driver's seat; OR,	B	ANY person(s) injured as a result of the crash who immediately receives medical treatment away from the crash scene, OR;
3	ANY vehicle displaying a hazardous materials placard regardless of the weight.	C	ANY motor vehicle (truck or truck combination, bus, car, etc.) disabled as a result of the crash and transported away from the scene by a tow truck or other vehicle.

QUALIFYING INFORMATION

(200) This form is being completed because this vehicle is:

- ○ A truck or truck combo. over 10,000 lbs. (GVWR/GCWR) (01)
- ○ A bus with seats for 9 or more, including the driver. (02)
- ○ A vehicle of any type with a Hazardous Materials placard. (03)

(201) Number of

Total involved vehicles in the crash:	
Person(s) sustaining Fatal injury:	
Injured Person(s) Transported for IMMEDIATE Treatment:	
Vehicles towed due to DISABLING DAMAGE:	

(202) At the time of the crash, this vehicle was:

- ○ Operating on a trafficway open to the public. (01)
- ○ Parked On/Off the trafficway. (02)

VEHICLE INFORMATION

(203) Vehicle Configuration

- ○ Passenger Car (Only with Hazardous Materials Placard) (01)
- ○ Light Truck (Only with Hazardous Materials Placard) (02)
- ○ Bus (Seats 9-15 including the driver) (03)
- ○ Bus (Seats 16 or more including the driver) (04)
- ○ Single Unit Truck (2 Axles/6 Tires) (05)
- ○ Single Unit Truck (3 or more Axles) (06)
- ○ Truck/Trailer(s) [Single Unit Truck with Trailer(s)] (07)
- ○ Truck/Tractor (without trailer, bobtail, or saddlemount) (08)
- ○ Tractor/Semi-Trailer (one trailer) (09)
- ○ Tractor/Doubles (two trailers) (10)
- ○ Tractor/Triples (three trailers) (11)
- ○ Other truck over 10,000 lbs. (not listed above) (99)

(204) Cargo Body Type

- ○ Not Applicable/No cargo body (00)
- ○ Bus (seats 9-15 including driver) (01)
- ○ Bus (seats 16 or more including the driver) (02)
- ○ Van/Enclosed Box (03)
- ○ Cargo Tank (04)
- ○ Flatbed (05)
- ○ Dump (06)
- ○ Concrete Mixer (07)
- ○ Auto Transporter (08)
- ○ Garbage/Refuse (09)
- ○ Grain, Chips, Gravel (10)
- ○ Pole (11)
- ○ Vehicle Towing Another Vehicle (12)
- ○ Intermodal Chassis (13)
- ○ Log (14)
- ○ Other Cargo Body Not Listed (98)

(205) GVWR, GCWR (Use GCWR for truck combinations)

- ○ 10,000 lbs., or less (01)
- ○ 10,001 lbs., to 26,000 lbs. (02)
- ○ Over 26,000 lbs. (03)

(206) Bus Use

- ○ Not a Bus (00)
- ○ School [public or private] (01)
- ○ Transit (02)
- ○ Inter-city (03)
- ○ Charter (04)
- ○ Other (05)

(207) Hazardous Materials

HAZMAT Placard Present ○ No (01) ○ Yes (02)

If yes, HM 4-Digit #/Name from Diamond: _____

If yes, HM Class # bottom of Diamond: _____

Was HAZMAT released from vehicle's cargo: ○ No (01) ○ Yes (02)

MOTOR CARRIER INFORMATION

(208) Type of Carrier

- ○ Interstate Carrier (01)
- ○ Intrastate Carrier (02)
- ○ Not in Commerce - Govt. (03)
- ○ Not in Commerce - Other (04) (Over 10,000 lbs. GVWR/GCWR)

(209) Employer/Company Name

(210) Str. No.	(211) Street Name	(212) Apt/Ste	(213) Phone No.

(214) City	(215) State	(216) Zip Code

(217) Carrier Identification No.

○ None

US DOT #: _____

Officer's Rank and Name	Officer's ID Number	Date/Time	Supervisor's Rank and Name	Supervisor's ID Number	Date/Time

Commercial Motor Vehicle Supplement

Vehicle Configuration

Bus (9-15 Seats, Including Driver)

Bus (16 or More Seats, Including Driver)

Single-Unit (2 Axles, 6 Tires)

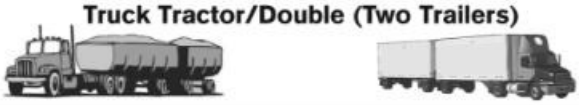
Single-Unit (3 or More Axles)

Truck/Trailer (Single-Unit Truck Pulling a Trailer)

Truck Tractor (Bobtail)

Tractor/Semi Trailer (One Trailer)

Truck Tractor/Double (Two Trailers)



Truck Tractor/Triple (Three Trailers)

Revised 06/05

Federal Motor Carrier
Safety Administration

U.S. Department of Transportation
www.fmcsa.dot.gov

Cargo Body Type

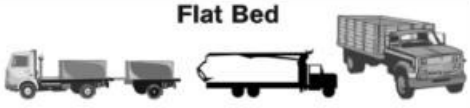
Bus (9-15 Seats, Including Driver)

Bus (16 or More Seats, Including Driver)

Van/Enclosed Box

Cargo Tank

Flat Bed

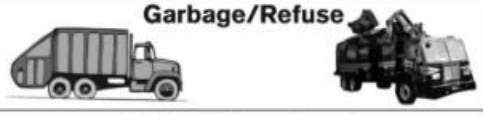


Dump

Concrete Mixer

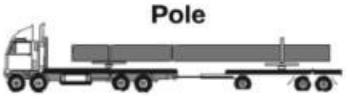
Auto Transporter

Garbage/Refuse



Grain, Chips, Gravel

Pole



Log

Intermodal Chassis

Vehicle Towing Motor Vehicle

No Cargo Body

Federal Motor Carrier
Safety Administration

U.S. Department of Transportation
www.fmcsa.dot.gov

DOT-1-174G (HWY-T) Rev. 8/18

STATE OF HAWAII MOTOR VEHICLE ACCIDENT REPORT

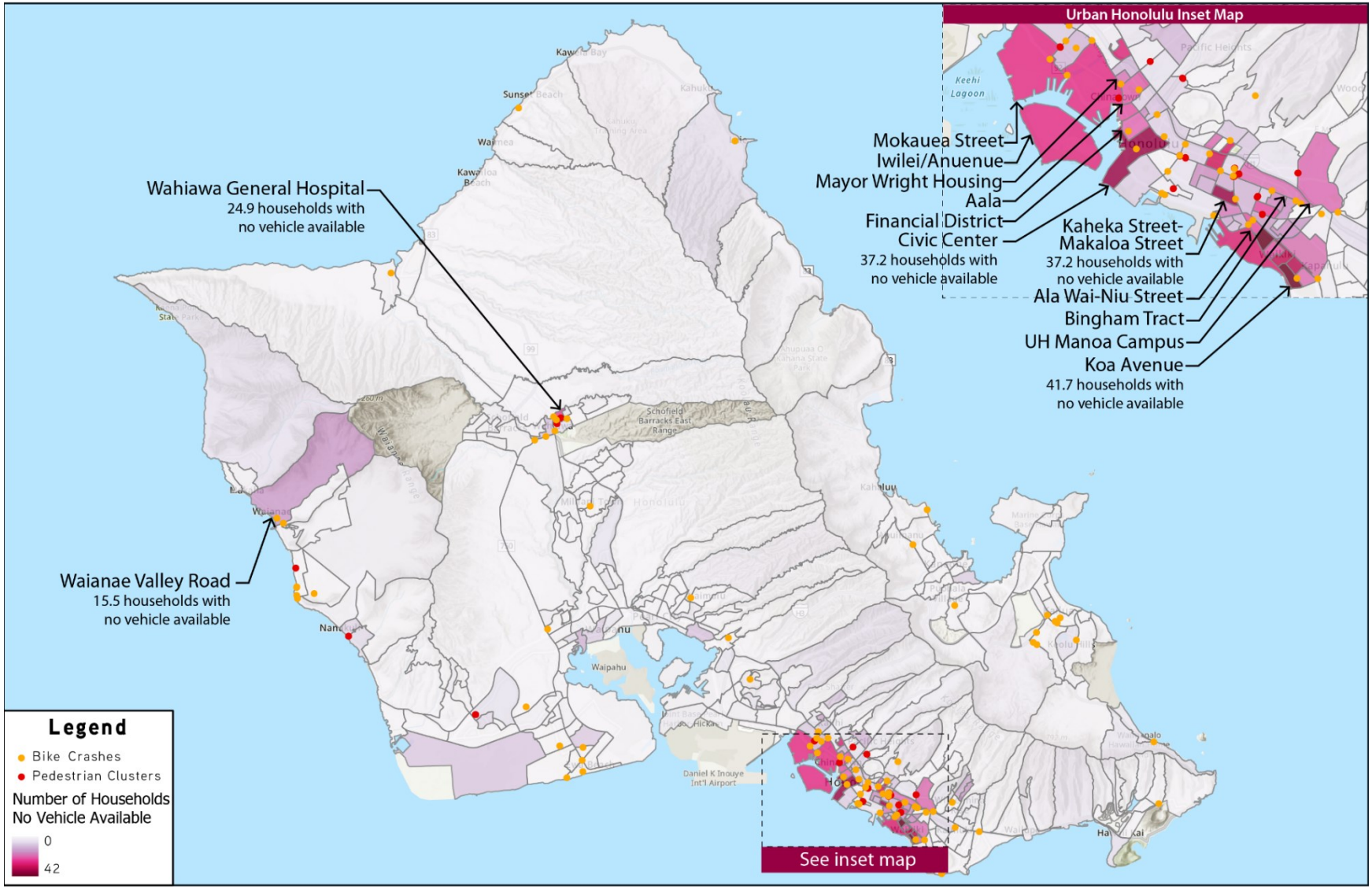
Report Number:_____

Narrative

Officer's Rank and Name	Officer's ID Number	Date/Time	Supervisor's Rank and Name	Supervisor's ID Number	Date/Time

Appendix C: Households with No Vehicles Available Maps

O‘ahu Households with No Vehicle Available – By Census Tracts



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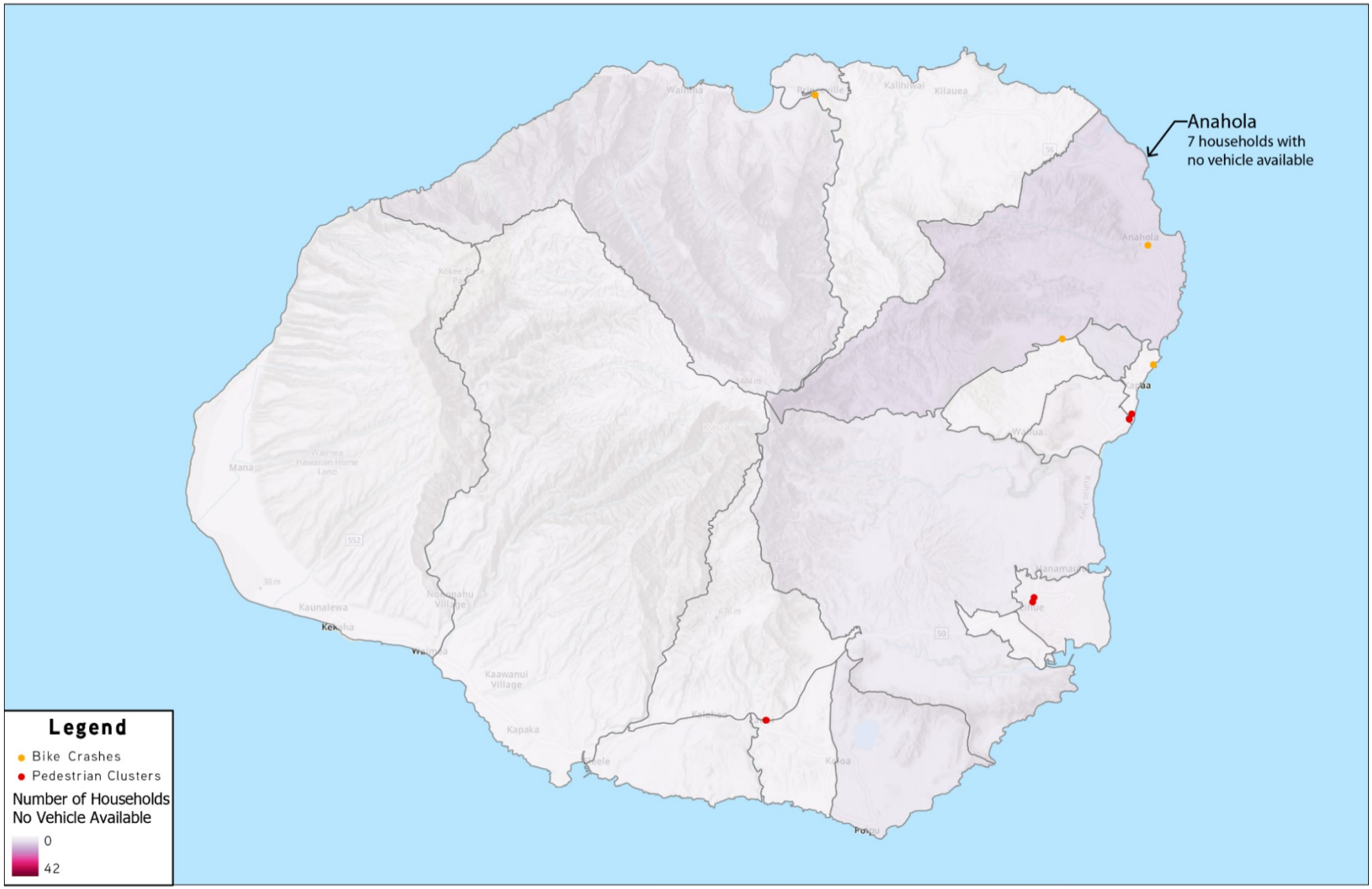
Kaua‘i Households With No Vehicle Available – By Census Tracts



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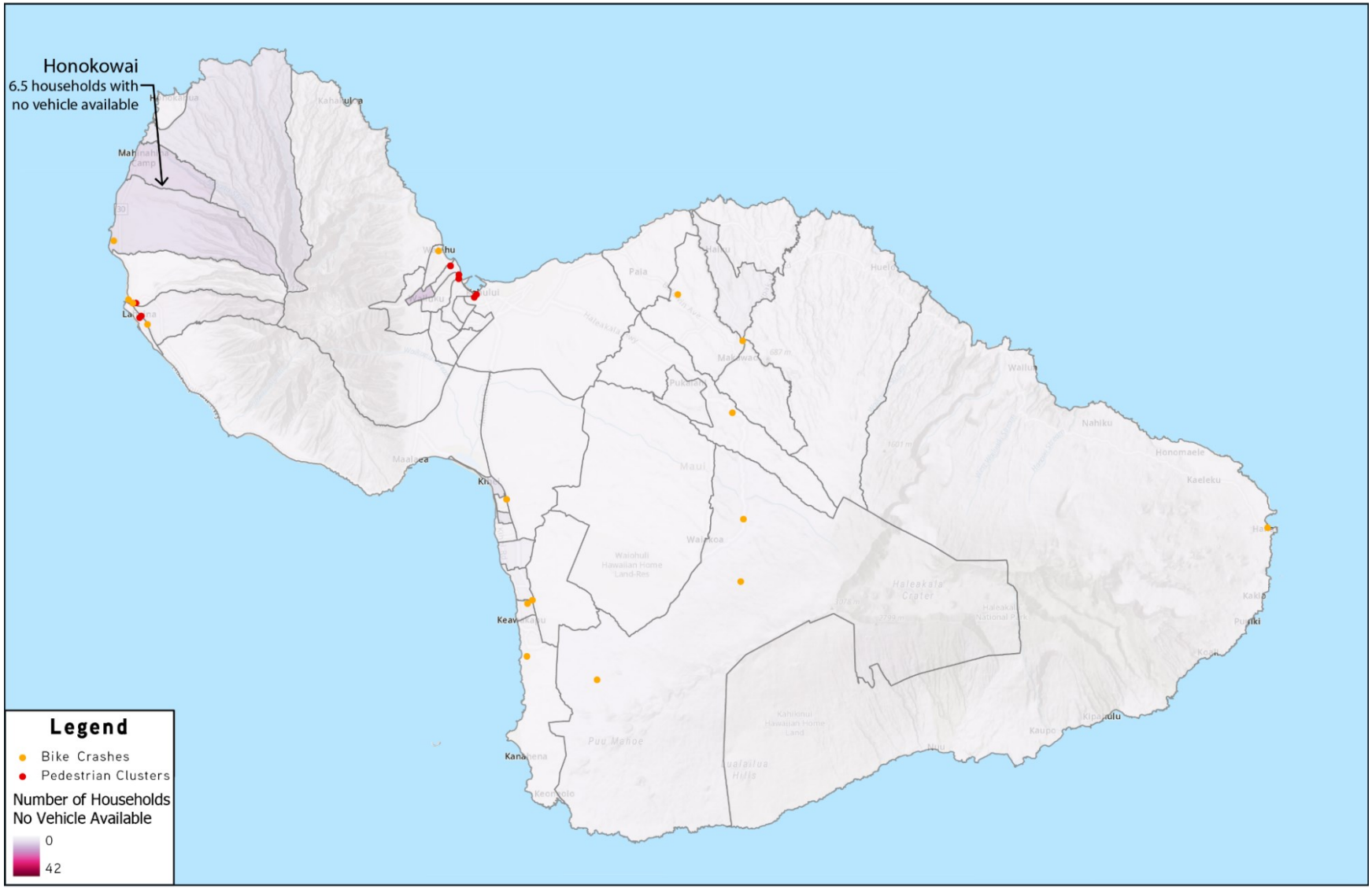
Maui Households with No Vehicle Available – By Census Tracts



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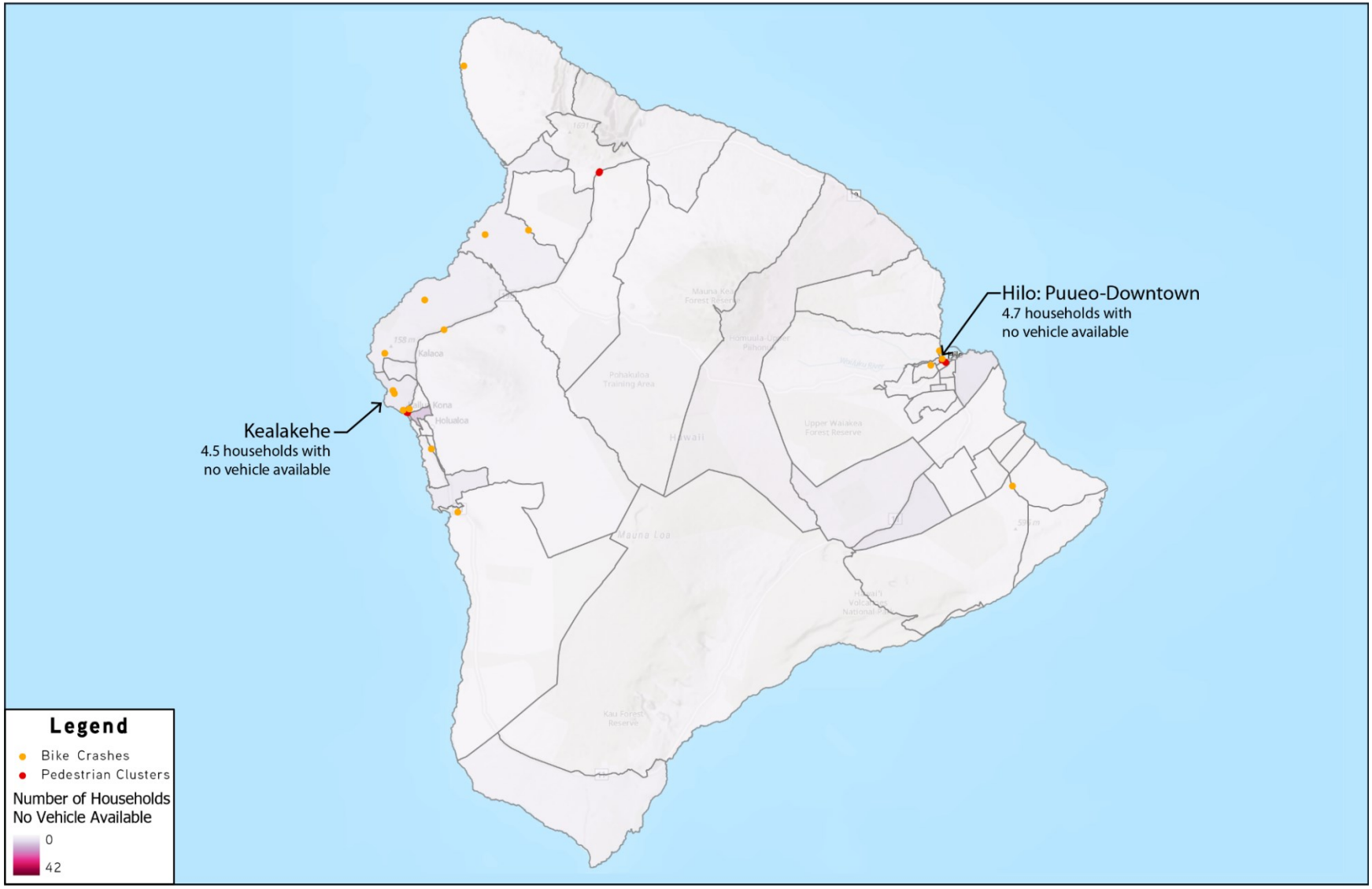
Big Island Households with No Vehicle Available – By Census Tracts



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Appendix D: List of Areas of Concern/Opportunities

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution	Eval Score
2	O'ahu	State	Waialae Avenue	Pathway along Waialae Avenue under the H-1 viaduct and parallel to the H-1 off-ramp (Exit 26 Waialae Ave)	This pathway dead-ends near the H-1 off-ramp and directs peds/bikes onto the roadway or sidewalk.	Widen the existing sidewalk along Waialae Avenue for shared use by narrowing the travel lanes; improve asphalt/concrete pathway connection to the existing sidewalk	7
4	O'ahu	County	Ward Ave and Ala Moana Blvd		Statewide Pedestrian Master Plan, 2013	Reduce the curb radii at the southeast corner to reduce the pedestrian crossing distances and lower vehicle speeds around the right turn.	7
13	O'ahu	State	N Nimitz Hwy	H-1 to Kapalama Drainage Canal	High-Risk Corridor; limited bike facility; Priority Freight Route	Nimitz Highway is designated by FHWA as a Primary Freight Highway. It could be a concern to have bicycles and large trucks share space within the limited right-of-way. Look at appropriate bike networks on Dillingham Boulevard, which runs parallel to the Nimitz corridor, which is more appropriate from a Complete Street system	7
14	O'ahu	State	Farrington Hwy	West of canal (87-746 Farrington Hwy) to East of Kaukama Rd	High-Risk Corridor; per the Google data, cars are traveling approx. 5 mph over the posted speed limit, with higher speeding occurring at night/early morning	Build O'ahu BP 1-124: Shoulder Bikeway; Conduct a road safety audit; Farrington Study recommends (short-term): speed feedback signs, intersection improvements, and streetlight improvements	7
15	O'ahu	State	Farrington Hwy	West of Maliona St to Linakola St	High-Risk Corridor; per the Google data, cars are traveling approx. 5 mph over the posted speed	Build O'ahu BP 1-124: Shoulder Bikeway; Conduct a road safety audit; Farrington Study recommends (short-term): Use speed feedback	7

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution	Eval Score
					limit, with higher speeding occurring at night/early morning	signs, intersection improvements, and streetlight improvements	
16	Kaua'i	State	Nawiliwili Rd	Nawiliwili Rd from Waapa Rd to Pikake St	Bicycle and pedestrian facilities	Build new bicycle and pedestrian facilities	6
17	Kaua'i	State	Kuhio Hwy	Kuhio Hwy from Wilcox Hospital to Hanamaulu Rd	Bicycle and pedestrian facilities	Build new bicycle and pedestrian facilities	6
18	O'ahu	County	Punchbowl St	Uncontrolled crosswalk Punchbowl St near Pohukaina St	Very active pedestrian crossing area, 4 fast lanes of traffic.	Install a raised crosswalk to improve visibility; consider rapid flashing beacons	6
19	O'ahu	State	Nimitz/Ala Moana Blvd	Nimitz/Ala Moana Blvd passing thru Iwilei, Downtown, and Kakaako	Nimitz/Ala Moana Blvd is a barrier between active origins and destinations; there are only limited pedestrian crossings; no protected bike infrastructure.	Two protected pedestrian overcrossings are planned 1. Kaka`ako and Fisherman's Wharf 2. Skyline Downtown Station	6
20	O'ahu	State	Kalanianaole Hwy	Ulupuni St to Olomana Fire Station	Speed humps have helped reduce speeds in spot areas, but speed remains excessive in other areas, with little protected pedestrian or bicycle infrastructure	Pave the shoulders to provide more space; Use speed feedback signs, and streetlight improvements	6
21	O'ahu	County	Kailua Rd	Kailua Rd/Kailua District Park driveway	This is a busy marked crosswalk but drivers generally do not yield or slow down. Raised crosswalk? Additional markings?	Install a raised crosswalk to improve visibility; Consider rapid flashing beacons	6

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution	Eval Score
27	O‘ahu	State	Ala Moana Blvd	East of Ward Ave to Kamakee St	High-Risk Corridor; no excessive speeding; Sidewalks exist	Two protected pedestrian overcrossings are planned 1. Kaka`ako and Fisherman’s Wharf 2. Skyline Downtown Station	6
28	O‘ahu	State	Ala Moana Blvd	Holomoana St to East of Hobron Ln	High-Risk Corridor; no excessive speeding; sidewalks exist	All pedestrian crossing phase was installed at Ala Moana Blvd and Hobron Lane. Consider education (Hotels can hand out flyers to their guests) and enforcement	6
32	Maui	State	Waiehu Beach Rd/Lower Main St	Wailupe Dr to Go For Broke Pl	High-Risk Corridor	Consider crosswalk visibility enhancements; Address sidewalk/curb return gaps	6
33	O‘ahu	State	Farrington Hwy	West of Auyong Homestead Rd to Haleakala Ave	High-Risk Corridor; speeding occurs at night/early morning	Address the sidewalk gaps, install crosswalk visibility enhancements, Complete the Farrington Study (short-term safety): S1 intersection improvements; S2 streetlight improvements; S3 speed feedback signs; O‘ahu BP 1-124: Shoulder Bikeway	6
34	Oahu	City	Keolu Drive		Keolu is signed 25mph but varies widely in characteristics, from narrow with parking to very wide with no parking	See OC2 Bikeway Improvements Keolu Drive Complete Streets	5
35	Oahu	City	Keolu Drive	Keolu between Akumu and Nanialii	There are so many curb cuts in this area that even with sidewalks, it doesn't feel comfortable walking.	SeeOC2 Bikeway Improvements Keolu Drive Complete Streets	5

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution	Eval Score
37	Kauai	State	Route 50, Kaumualii Highway in Kalaheo	Kaumualii Hwy from the Kuhio Highway/Rice Street intersection to Lio Road	Bicycle and pedestrian facilities	New Bicycle and pedestrian facilities	5
40	Oahu	City	Hamakua Drive at Aoloa	Hamakua at Aoloa	This intersection has a parking-protected bike lane and is at the bottom of a hill. Bike users are coming down the hill quickly, and drivers turning from Aoloa to Hamakua creep forward, blocking the crossing and bike lane.	Consider Access Management strategies with the driveway near the corner or install a traffic signal to improve sight distance	5
42	Oahu	State	Kapiolani under H1	Kapiolani under H1	No bicycle connection from King St to Waialae	Continue the bike lane; narrow travel lanes	5
43	Oahu	State	School St/Pali Hwy)	School St/Pali Hwy	Pedestrians can't see oncoming traffic come from the windward side in the slip lane until you are halfway through it.	Raised Crosswalk; Narrow up the slip lane; Priority 1 project	5
44	Oahu	State	Farrington Highway	North of Maipalaoa Rd, at Maipela St., and Kaupuni St.	Improve crosswalks from Type A to Type B with raised medians	Install Type B raised crosswalks	5
48	Oahu	State	Farrington Highway	Maipaloa Rd	Farrington Highway Corridor Study, Priority 1 project	Install “crosswalk ahead” warning sign before bus stop #523 (City) [Maipaloa Rd]	5
50	Oahu	City	Farrington Highway	Move Bus stop #537 closer to Puhano St. (City)	Farrington Highway Corridor Study, Priority 1 project	Move Bus stop #537 closer to Puhano St. (City)	5

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution	Eval Score
51	Oahu	State	Farrington Highway (Route 93)	Near Nanakuli	Bicycle facilities	New Bicycle facilities	5
52	Oahu	State	California Avenue and Kilani Avenue	California from Westervelt to Cane is a high-crash corridor.	listed in the Walk Audit	See #108; Crosswalk visibility enhancements, road safety audit	5
53	Oahu	City	Liliha Street, School to Judd Street, Judd, Nuuanu, Kuakini	#95 High crash corridor goes from Kuakini to Bates (which is only a portion of the noted School to Judd)	listed in the Walk Audit	Crosswalk visibility enhancements; raised crosswalks; and/or leading pedestrian interval; road diet	5
54	Oahu	State	Nimitz Highway at Sumner Lane	Nimitz Highway at Sumner Lane –	The Nimitz Highway/Sumner Street Walk audit was conducted. The issues that were identified include speeding, the houseless population and correlation to substance abuse, community/social services and shelters.	Recommendations focus on community outreach, training and resources.	5

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution	Eval Score
55	Oahu	State	Nimitz Highway	Nimitz Highway, Puuhale Road to Sand Island Access Road	Walk audit was conducted. The issues that were identified include sidewalk continuity, sight distance exiting Sand Island Access Road, violent behaviors in the area and the proximity of homeless shelter, substance about treatment center and prison.	Recommendations focus on community outreach, training and resources.	5
56	Oahu	State	Kapolei Parkway	Near Ewa Beach	A Walk Audit was conducted on Kapolei Parkway in Ewa Beach as a result of speeding, distracted driving and a hit-and-run crash.	Recommendations include continued education and enforcement of speeding and distracted driving.	5
87	Hawaii	County	Hilo area		Three walk audits were performed in the Hilo area. Speeding, distracted driving, occupant protection and pedestrian safety were identified as issues.	Recommendations include continued education and enforcement related to pedestrian safety around the schools.	5
88	Oahu	City	Ward Ave	King Street to Green Street	High-Risk Corridor; no excessive speeding identified	Crosswalk visibility enhancements; road safety audit	5
89	Oahu	City	Kamakee St	Ala Moana Blvd to Kapiolani Blvd	High-Risk Corridor	Crosswalk visibility enhancements; median refuge, raised crosswalks; and/or leading pedestrian interval	5

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution	Eval Score
91	Oahu	City	Kapahulu Ave	Kalakaua Ave to Zoo Parking	High-Risk Corridor	Crosswalk visibility enhancements; raised crosswalks; and/or leading pedestrian interval, enforcement, education	5
92	Oahu	City	Dillingham Blvd/Liliha St	Kaaahi St to King Street; King Street to Vineyard Blvd	High-Risk Corridor	Crosswalk visibility enhancements and/or leading pedestrian interval	5
93	Oahu	City	Liliha St	N Kuakini St to Bates St	High-Risk Corridor	Crosswalk visibility enhancements; raised crosswalks; and/or leading pedestrian interval; road diet	5
94	Oahu	State	N School St	Kino St to Houghtailing St	High-Risk Corridor	Crosswalk visibility enhancements; raised crosswalks; and/or leading pedestrian interval; road safety audit	5
95	Oahu	State	Farrington Hwy	Kapowai Pl to Kealanani Avev	High-Risk Corridor	Crosswalk visibility enhancements; road safety audit	5
97	Oahu	State	Fort Weaver Rd	Kuhina St to Pohakupuna Rd	High-Risk Corridor; no excessive speeding identified	Crosswalk visibility enhancements, Education, Encouragement at schools, Oahu BP 1-26/BPH Refresh O115: Bike Lane; road safety audit	5
98	Oahu	State	Farrington Hwy	West of Hakimo Rd to West of Princess Kahanu Ave	High-Risk Corridor		5
100	Oahu	City	Farrington Hwy	Kaupuni Stream to West of Guard St	High-Risk Corridor; speeding ~5mph over posted, with higher speeding occuring during night/early morning	Crosswalk visibility enhancements, Farrington Study (short-term): S9 streetlight improvements, S10 speed feedback signs; Oahu BP 1-124: Shoulder Bikeway	5

ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution	Eval Score
101	Oahu	State	California Ave	Westervelt St to N. Cane Street	High-Risk Corridor	Crosswalk visibility enhancements, road safety audit	5
102	Hawaii	State	Queen Kaahumanu Hwy	Kaloko-Honokohau Nat'l Historic Park to South of Kealakehe Pkwy	High-Risk Corridor	Wider edge lines, Rumble strips/stripes	5
103	Oahu	City	Kalakaua Ave	S King St to S Beretania St	High-Risk Corridor	Crosswak visibility enhancements, leading pedestrian interval, Road Safety Audit, Oahu BP 1-83: Shared use path	5
104	Oahu	City	Kuhio Ave	Kaiulani Ave to Paokalani Ave	High-Risk Corridor	Crosswak visibility enhancements, leading pedestrian interval, enforcement, education	5
105	Oahu	City	McCully St	Kapiolani Blvd to Citron St	High-Risk Corridor	Crosswalk visibility enhancements, Oahu BP 1-95: Bike Lane (gaps)	5
107	Oahu	City	Kinau St	Ward Ave to Piikoi St	High-Risk Corridor	Crosswalk visibility enhancements, education	5
108	Oahu	State	Farrington Highway	MP 4.4-5.2, 5.9-6.8 and 8.1-9.1	Farrington Highway Corridor Study, Priority 2 project	Change speed limits from 35 mph to 25 mph on segments MP 4.4-5.2, 5.9-6.8 and 8.1-9.1	4
110	Oahu	City	Waialua Bike Path Extension		Need Bike path	bike path extension	4
111	Hawaii	State	Queen Kaahumanu Highway	Queen's Lei path	Need Bicycle facilities	New shared-use path	4
112	Hawaii	State	Queen Kaahumanu Highway		Need Queen Kaahumanu shoulder bikeway signing & Hawaii Belt Road/Mamalahoa	Queen Kaahumanu shoulder bikeway signing & Hawaii Belt Road/Mamalahoa Highway shoulder bikeway	4

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ID	Island	Jurisdiction	Road	Segment	Issue/Need	Potential Safety Improvements/Solution	Eval Score
					Highway shoulder bikeway		
113	Oahu	State	Fort Weaver Road (Route 76)	Fort Weaver Road in the vicinity of Papipi Road	Need bike lane/buffer/path improvements	Bike facility	4
114	Oahu	State	Kahekili Highway (Route 83)	Kahekili Highway, east of Valley of the Temples Memorial Park	Bicycle facilities	Bike facility	4
116	Oahu	State	Punchbowl St	Halekauwila St to Miller Street	High-Risk Corridor; crashes aren't at intersections; no excessive speeding identified	Enforcement and Education; Oahu BP 1-100 Bike Lane/Shared Roadway	3
118	Oahu	State/City (bus stop)	Farrington Highway near Guard Street.	Remove bus stop #621 (City)	Farrington Highway Corridor Study, Priority 1 project	Remove bus stop #621 (City)	2