



# CHARACTERISTICS OF OLDER ADULT PEDESTRIAN CRASH DEATHS IN HAWAII



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## Introduction

By 2040, Hawaii's older population (>64 years) is predicted to expand faster than any other age demographic. The most recent estimate of Hawaii's older adults was 17% in 2016 and is predicted to grow to 24% by 2040 ("Census," 2016; "Population and Economic Projections," n.d.). However,

Hawaii's older adults have the most pedestrian traffic crash deaths in the nation (Dangerous by Design, 2014). In addition, these elderly pedestrian victims have the highest mortality rate and consume the most hospital resources (Takanishi et al., 2008). Because of these findings, we investigated the risk factors for older adult pedestrian fatalities in Hawaii.



Population and Economic Projections for the State of Hawaii to 2040 (DBEDT 2040 Series, pp. 5)

## Objectives

- Assess the scope of older adult pedestrian crash deaths in Hawaii (>64 years of age) compared to:
  - older adult pedestrian crash deaths in the United States excluding Hawaii
  - younger pedestrian crash deaths in Hawaii
- Utilize findings so that we may better institute education and prevention strategies



- This retrospective review examined Fatality Analysis Reporting System data for pedestrian traffic deaths between January 1, 2010 and December 31, 2015.
- The study included all subjects who were involved in a pedestrian-related crash, which is defined as a fatal traffic crash between a pedestrian and a motor vehicle, motorcycle, moped, or public transportation (Bus, HandiVan, trolley).
- Data collection included age at injury, crash time, crash location, posted speed limit, number of lanes, alcohol involvement, Hawaii resident or visitor, pedestrian actions, and driver speeding.
- Tests of proportions were performed when necessary for statistical analyses.

## Results

**HI Eld:** Hawaii elderly (n = 55)  
**US Eld:** Elderly in remaining U.S. states (n = 5,696)  
**HI Non:** Hawaii non-elderly (n = 100)  
 \*\* p ≤ 0.01, \*\*\* p ≤ 0.001  
 Risk factors: **temporal, environmental, or behavioral**

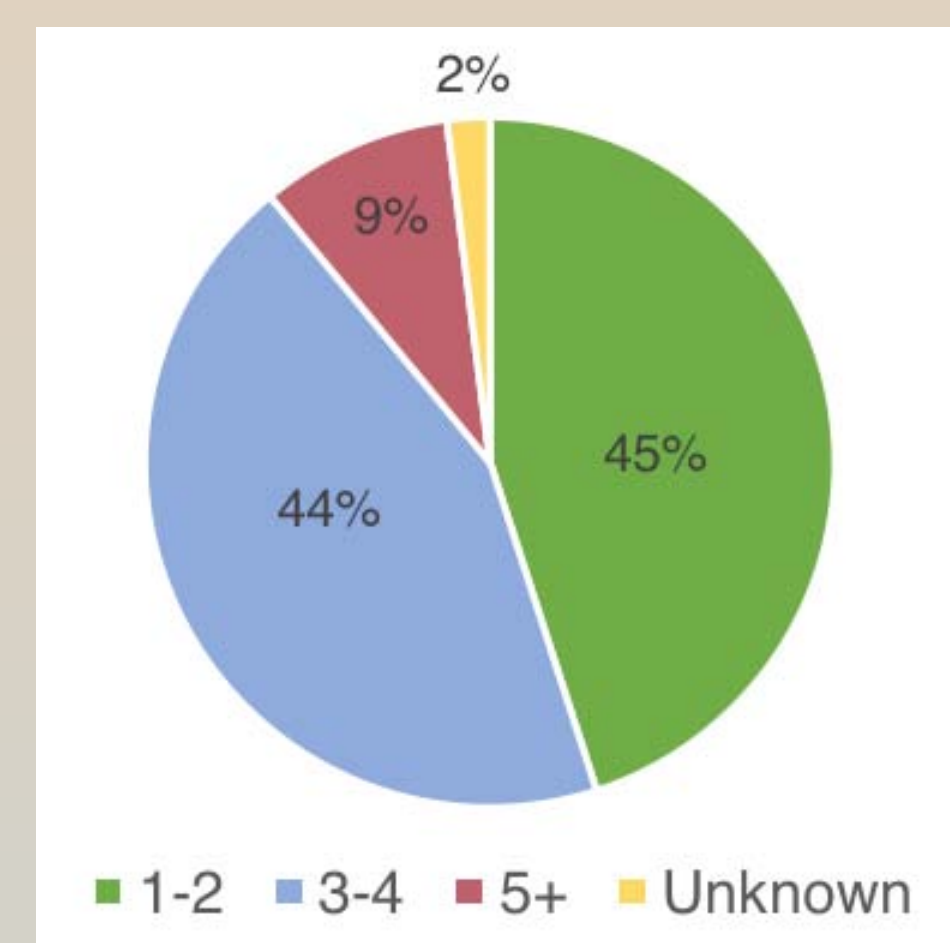


Figure 1. Most fatal elderly pedestrian crashes in Hawaii occurred on 1-4 lane roads.

**Table 3.** Pedestrian and driver behaviors reveal contributing factors in fatal pedestrian traffic crashes.

Outcome	HI Eld	US Eld	HI Non
<b>Pedestrian actions</b>			
Jaywalking	26%	17%	19%
In roadway improperly	2%	9%	26%
Not visible	6%	12%	8%
<b>Driver speeding</b>	7%	6%	17%

**Table 1.** Temporal description suggests a relationship between the time of year and fatal pedestrian traffic crashes. Q1 of Hawaii's older adults is significantly different than Q2, Q3, and Q4 (p = 0.0002, p = 0.0097, p = 0.0002).

Outcome	HI Eld	US Eld	HI Non
<b>Quarter of the year</b>			
Q1: Jan-Mar	47%	37%	33%
Q2: Apr-Jun	***15%	16%	21%
Q3: Jul-Sep	**24%	17%	25%
Q4: Oct-Dec	***15%	30%	21%
<b>Weekend</b>	16%	28%	25%
<b>Time of crash</b>			
6:30am-8:29am	7%	9%	4%
8:30am-6:29pm	46%	47%	22%
6:30pm-6:29am	47%	44%	74%
Unknown status	0%	0%	2%

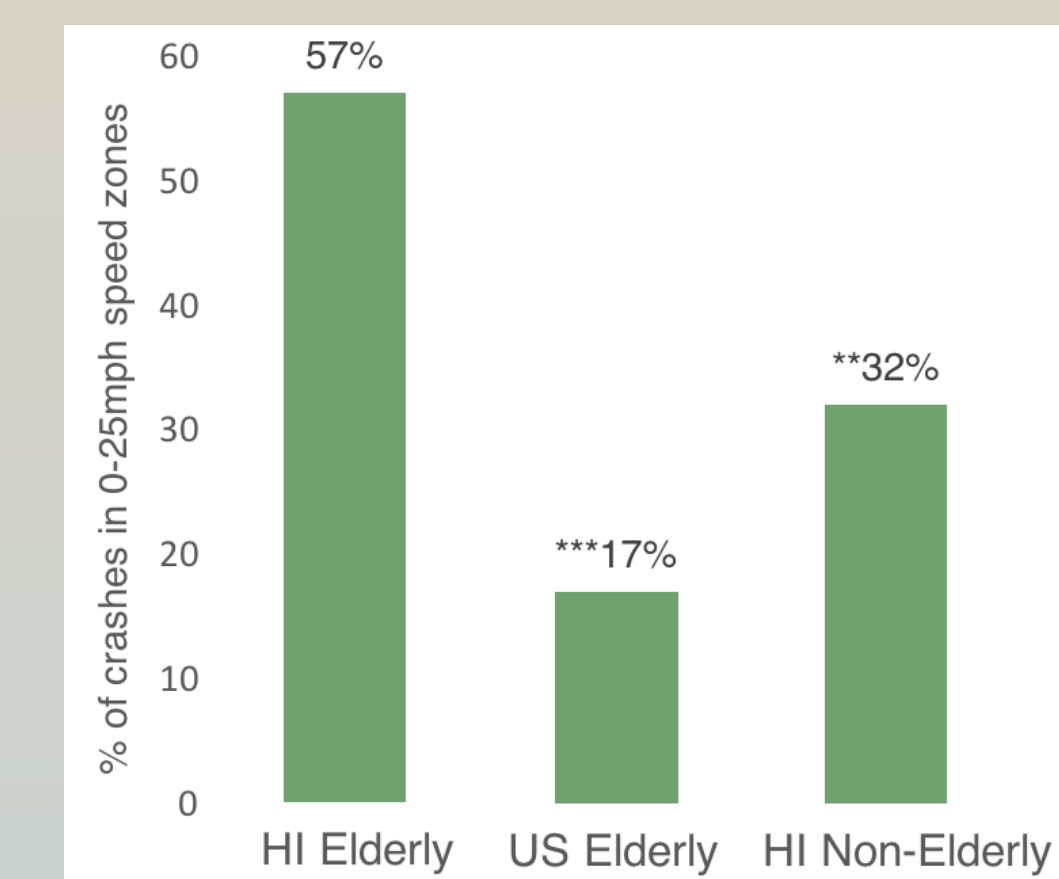


Figure 2. High percentage of elderly pedestrian fatalities occurred at low speed zones in Hawaii. The Hawaii elderly group is significantly different than both the U.S. elderly and Hawaii non-elderly groups (p < 0.0001 and p = 0.0032 respectively).

**Table 2.** Description of location where pedestrians were hit reveals potential environmental risk factors.

Outcome	HI Eld	US Eld	HI Non
Intersection, crosswalk	21	1035	11
	38%	18%	11%
Intersection, not crosswalk	5	707	6
	9%	12%	6%
Non-intersection, crosswalk	7	112	5
	13%	2%	5%
Non-intersection, not crosswalk	17	2964	52
	31%	52%	52%
Off road/shoulder	1	192	18
	2%	3%	18%
Not a roadway	2	219	3
	4%	4%	3%
Unknown	2	467	5
	4%	8%	5%

**Table 4.** Involvement of alcohol was a notable factor in pedestrian traffic deaths. Note: data table includes only the pedestrians and drivers who were tested for alcohol.

Outcome	HI Eld	US Eld	HI Non
<b>Pedestrian</b>			
Positive	9%	15%	40%
Negative	91%	86%	60%
<b>Driver</b>			
Positive	24%	13%	30%
Negative	76%	87%	77%

## Recommendations

### EDUCATION

- Continue efforts to educate older adults on pedestrian safety (holding events at retirement homes, community centers, etc.)
- Educate the general driving population on pedestrian safety, specifically when approaching intersections

### ENGINEERING

- Increase protected left turns and rectangular rapid flashing beacons
- Lengthen crosswalk timers
- Relocate bus stops and crosswalks in high risk areas
- Move stop bars farther away from crosswalks

### ENFORCEMENT

- Increase law enforcement to monitor driver speeds particularly in urban locations
- Increase law enforcement to detect distracted driving and walking especially in January through March
- Increase efforts to penalize impaired driving and jaywalking



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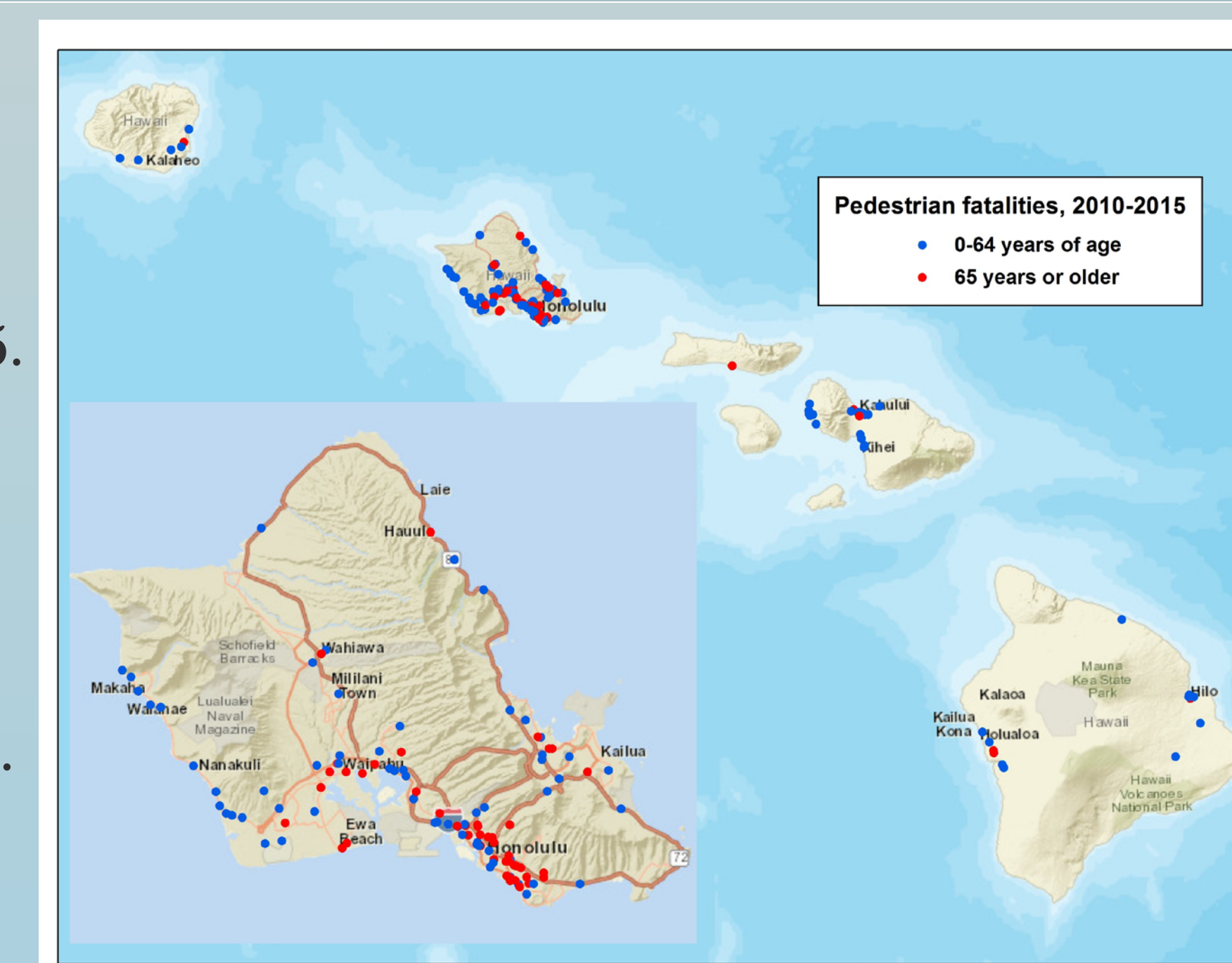


Figure 3. Map from 2010-2015 displays clusters of pedestrian fatalities in urban areas of Hawaii.

## Summary

Summary for Hawaii's older adult pedestrians:

### WHO?

- 55 elderly pedestrians in Hawaii were fatally injured in 2010-2015.
- Elderly pedestrian fatality rate in Hawaii is tied for the highest in the country at 4.2 deaths per 100,000 residents per year.
- 95% (147) of the 155 pedestrians were Hawaii residents.
- All 55 of the elderly victims were Hawaii residents.

### WHEN?

- 47% of pedestrian fatalities occurred between January and March.
- January was the peak month for fatal pedestrian crashes (27%).
- Only 16% of pedestrian collisions occurred on weekends.

### WHERE?

- Majority of pedestrian collisions occurred where the speed limit was between 0 and 25 mph (56%).
- Most crashes occurred on 1-2 (45%) and 3-4 (44%) lane roads.
- 78% of elderly pedestrian crashes were on urban roadways in Hawaii.

### HOW?

- 38% of collisions occurred when pedestrians were on crosswalks at intersections.
- 31% of collisions occurred when pedestrians were at not crosswalk, non-intersection locations.

### WHY?

- 26% of pedestrians were jaywalking.
- 7% of elderly drivers and 17% of younger drivers were speeding at the time of the crash.
- 9% of elderly pedestrians and 28% of all drivers in Hawaii tested positive for alcohol use.