

**MARCH 2015**

**HONOLULU COMPLETE STREETS  
IMPLEMENTATION STUDY LOCATION REPORT**

**Kipapa Drive at Mililani Waena Elementary  
School (DRAFT II)**



City & County of Honolulu  
Department of Transportation Services

Prepared by  
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# Summary: Kīpapa Drive at Mililani Waena Elementary School

*Central O‘ahu Planning Area, Mililani Town Sub-Area, Council District 2*

## NEED FOR PROJECT

Kīpapa Drive at Mililani Waena Elementary School was selected due to reported high levels of speeding, vehicle-to-vehicle, and vehicle-to-student/pedestrian conflicts at the intersection of Kīpapa Drive and Ho‘okelewa‘a Street. Area schools are also interested in, and working on, ways to increase the number of students walking and bicycling to school.

## SUMMARY OF RECOMMENDATIONS

- Create an intersection at Kīpapa Drive and Ho‘okelewa‘a Street that is compact, creates a sense of place, and emphasizes pedestrian safety, using a domed mini-circle
- Redesign Kīpapa Drive for a target speed of 25 mph by narrowing travel lanes
- Reconfigure cross-section of Kīpapa Drive, installing pavement marking for narrowed travel lanes and designated bike lanes
- Enhance marked pedestrian crossings of Kīpapa Drive
- Address parking and school loading zone along Ho‘okelewa‘a Street to improve pedestrian access and safety
- Reduce the driveway crossing at Mililani Waena Elementary School to reduce vehicle-pedestrian conflicts



## COST BREAKDOWN

Total: \$776,820.66

Design: \$70,620.06

Construction: \$706,200.60

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# Part One: Introduction, Study Area, & Need for Project

## WHAT ARE COMPLETE STREETS?

Complete Streets is a transportation policy and design approach that aims to create a comprehensive, integrated network of streets that are safe and convenient for all people whether traveling by foot, bicycle, transit, or automobile, and regardless of age or ability. Complete Streets moves away from streets designed with a singular focus on automobiles towards a design approach that is context-sensitive, multi-modal, and integrated with the community's vision and sense of place. The end result is a road network that provides safe travel, promotes public health, and creates stronger communities.

Implementing Complete Streets requires integrating transportation with community planning. Changes are brought about by transforming the built environment. Engineers, planners, architects, landscape architects, and urban design professionals work along with health providers, business leaders, elected officials, community organizations, and residents to promote Complete Streets implementation. Actively engaged community members in Complete Streets are important participants and stakeholders. They help to ensure that efforts are relevant to the community's use, values, and priorities for the neighborhood.

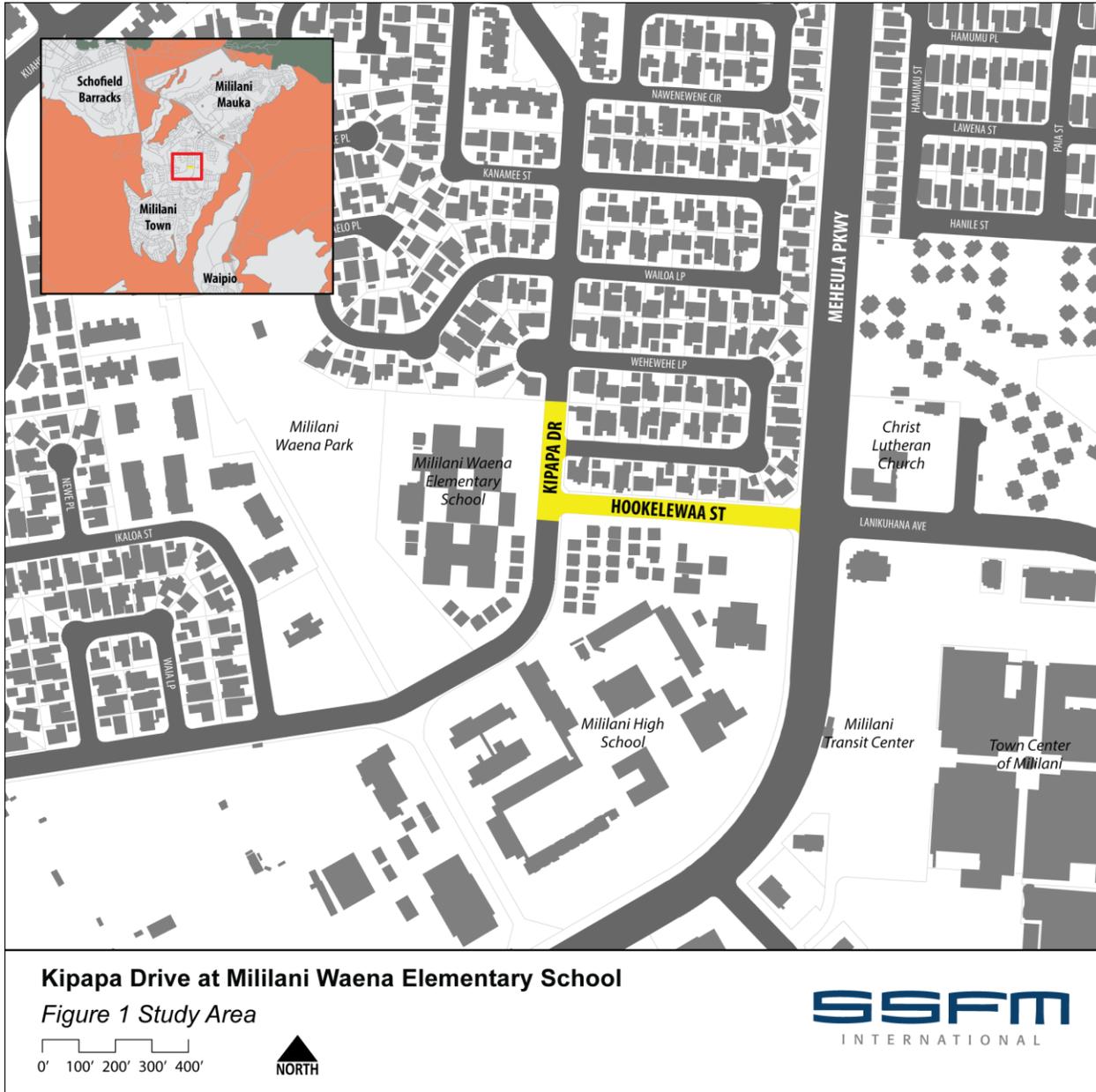
The State of Hawai'i adopted Complete Streets in 2009 and required each County to follow suit. In May 2012, the Honolulu City Council adopted a "Complete Streets" policy and passed Ordinance 12-15. The City and County of Honolulu is now taking aggressive steps to implement Complete Streets by updating policies, guidelines during maintenance and paving projects, and designing projects in specific locations. The City and County of Honolulu selected fourteen across the island of O'ahu for in-depth study to illustrate how Complete Streets can be applied in a specific location. This report describes one of the selected sites and presents recommendations to implement Complete Streets at that location.

## STUDY AREA

The subject location of this assessment is Kīpapa Drive at Ho'okelewa'a Street (Figure 1). It is located in the Central O'ahu Planning Area, Mililani Town Sub-Area, within Council District 2. Mililani Waena Elementary School and Mililani High School are both located on Kīpapa Drive. Kīpapa Drive is the only road that serves both of these schools, the park, and all of the residential housing in the neighborhood. Ho'okelewa'a Street is one of three main entry points acting as a gateway into the neighborhood.

Most vehicle trips to area schools intersect at the intersection of Kīpapa Drive and Ho'okelewa'a Street, before motorists return to one of the major regional roads: Meheula Parkway or Kamehameha Highway. In the 2012-2013 school year, the enrolled student populations of Mililani Waena Elementary and Mililani High School were approximately 646 and 2,445, respectively.

Figure 1 Study Area



## NEED FOR PROJECT

This location was selected for Complete Streets because it presents opportunities to benefit two large Central O’ahu schools and their surrounding communities by calming traffic, improving pedestrian crossings, and generally contributing to safer commutes to and from area schools. Safe Routes to School is a concern due to the lack of street connectivity, large regional six-lane roads, high vehicle speeds, and buildings that do not “watch over” the street, including the schools, which have large setbacks, and some residential properties that back-up to the sidewalk and are separated by walls. The effects of a street designed primarily for vehicles are seen in the numbers: eighty percent of Mililani Waena Elementary students are currently driven to school. Complete Streets improvements can be made that will increase safety and remove barriers for some students to walk or bicycle to school.

The project area and surroundings are characteristically suburban. Residential neighborhoods are accessed by one main road with widely spaced cul-de-sac streets branching off. Residences are turned away from main streets like Kīpapa Drive, and in some places, such as along Ho’okelewa’a Street, many backyards are secured with walls.

Access to commercial areas and major institutions is by high speed, high volume regional road corridors. Within the project area, Meheula Parkway and Kamehameha Highway are two of these major corridors. Pedestrians and bicycles navigating these roadways to reach the project area are faced with long crossing distances, vehicles traveling at high speeds, and lack of natural surveillance or “eyes on the street.”

Within the project area, the intersection of Kīpapa Drive and Ho’okelewa’a Street is of particular concern. It is the main entrance into the residential area, Mililani Waena Elementary School and Mililani High School, and one of the intersection legs serves as the ‘exit’ driveway out of the Elementary School. During school morning arrival and afternoon departure, this intersection becomes congested with vehicles and pedestrians with large vehicle queues in all directions. Over the years, there have been many studies and conversations among the City, Honolulu Police Department, State Department of Education, community members, and elected leaders regarding how to improve the safety of the intersection for all street users.

Anecdotal accounts and accident data shows that speeding and reckless driving is a concern in the project area. Traffic-calming treatments were installed in 2002 on Kīpapa Drive near Mililani Waena Park to help address this, including curb extensions and landscaped medians. Neighborhood Board minutes between 2009 and 2014 reflect concerns about the impact and inconvenience of these traffic calming measures, including calls for their removal. It was noted that some community members do not support additional measures being installed here.

The schools support existing traffic calming devices because they have helped to create a safer environment for students walking to and from school. It is the schools’ position that more could be done to increase safety and encourage walking and biking. Dale Castro, Principal of Mililani Waena Elementary School and Fred Murphy, Principal of Mililani High School wrote to the City expressing the need to find a safer way to get students to school and improve commuting for all users—motorists, pedestrians, bicyclists, and transit or school bus riders. The continued occurrences of speeding and reckless driving, even after the traffic calming measures were installed, suggest additional action is needed.

## **EXISTING LAND USE, TRANSPORTATION FACILITIES, AND USAGE PATTERNS**

### ***Land Use, Transportation Facilities and Traffic Accidents***

Figure 2 depicts existing land use, transportation facilities, and traffic accident data within the study area. Within the study area, Kīpapa Drive is bordered by single-family residential uses to the east. Mililani Waena Elementary School is on the west side of the road. Mililani High School exists just southeast of the Kīpapa-Ho'okelewa'a intersection.

Two bus routes provide service on Kīpapa Drive: PH2 (Mililani Town-Pearl Harbor Express, 2 trips daily), and 84 (Mililani Express-North, 8 trips). In addition, seven routes provide service on Meheula Pkwy: Routes 52, 84, 84A, 98A, 501, 503, and 504. There are no bus stops within the study area; however they exist just outside the study area to the north and south.

Sidewalks with grass buffers are present on both sides of Kīpapa Drive for the entire length of the study area. Crosswalks exist across Kīpapa Drive at the southern end of its intersection with Ho'okelewa'a, and near the intersection with Wehewehe Loop. Additional crossings exist parallel to Kīpapa Drive at its intersections with Ho'okelewa'a Street and Wehewehe Loop.

Accident records indicate that between 2007 and 2014, there were four car/truck accidents at the intersection of Ho'okelewa'a Street and Kīpapa Drive. There were four car/truck accidents and one bike accident at Meheula Parkway and Ho'okelewa'a Street during that same period.

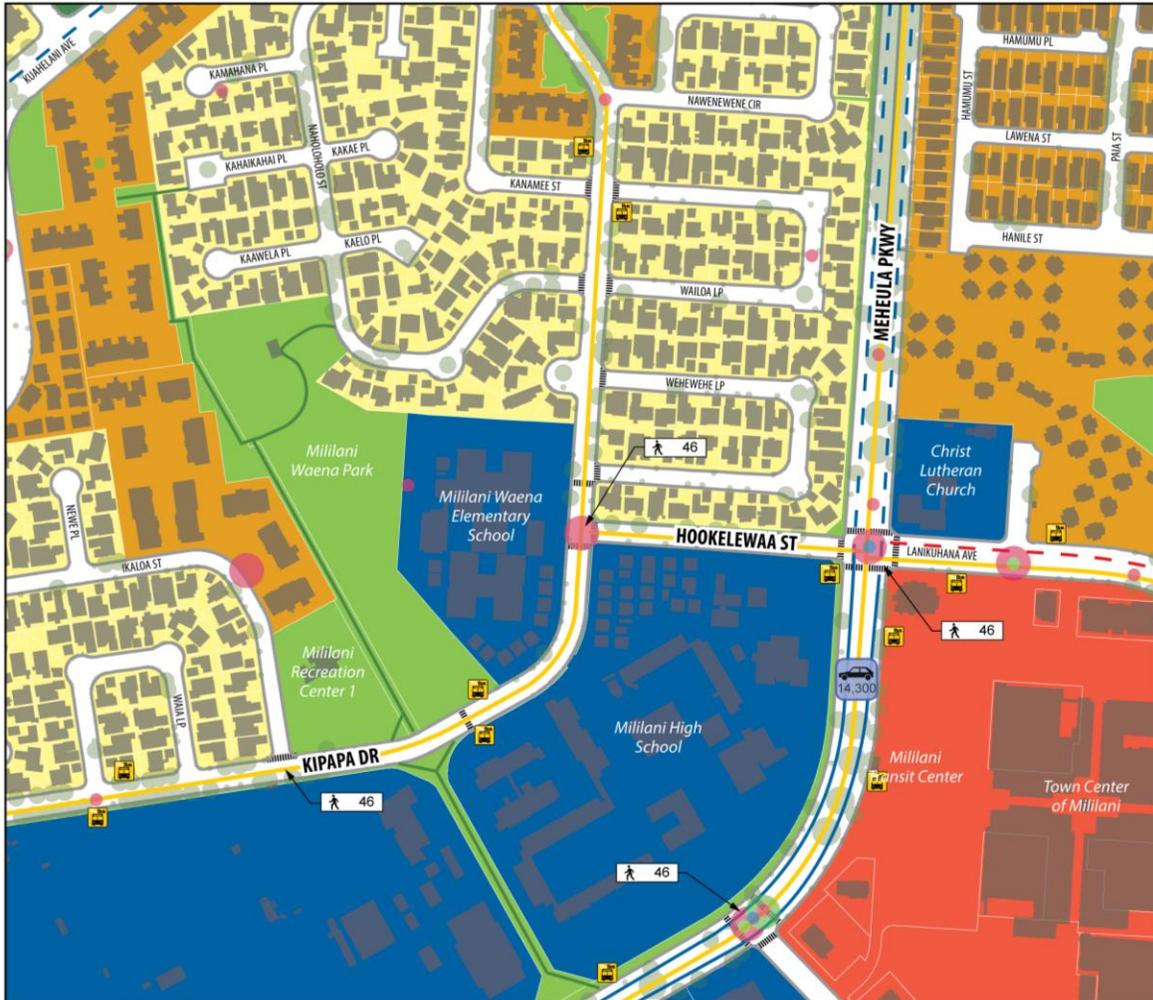
### ***Usage Patterns***

Table 1 describes existing usage patterns by pedestrians, bicyclists, vehicles, and transit users in the study area. Data on pedestrian and bicycle use is not available, however a walking audit conducted in the summer of 2014 indicated anecdotally that there is very low use of the area by pedestrians and cyclists. Additional review of the site during school drop-off noted moderate pedestrian use although low bicycle use which is more reflective of the issues facing the schools.

Traffic count data is not available for Kīpapa Drive or Ho'okelewa'a Street. 2012 traffic count data from the State Department of Transportation indicated average daily vehicular volumes of 16,557 ADT on Meheula Parkway between Lanikuhana Avenue and Makaimoimo Street.

There are 10 bus stops within ¼ mile of the site, including two stops at the Mililani Transit Center, which receive an average of 352 alightings and 424 boardings daily. Three other stops in this area have shelters and benches.

Figure 2 Existing Land Use, Transportation Facilities, and Accidents in the Study Area



0' 100' 200' 300' 400' NORTH

Source: City and County of Honolulu, Department of Planning & Permitting, Honolulu Land; \*www.walkscore.com



### Kipapa Drive at Millilani Waena Elementary School

<p><b>Bicycle Facilities</b> Existing=Solid, Proposed=dashed</p> <ul style="list-style-type: none"> <li> Lane</li> <li> Path</li> <li> Route</li> <li> Bicycle Racks</li> </ul>	<p><b>Traffic Accidents</b></p> <ul style="list-style-type: none"> <li> 1 crash</li> <li> 2 crashes</li> <li> 3-9 crashes</li> <li> 10+ crashes</li> </ul> <p>Red = Car/Truck, Orange = Motorcycle/Moped, Blue = Bicyclist, Green = Pedestrian</p>	<p><b>Existing Land Use</b></p> <ul style="list-style-type: none"> <li> Apartment</li> <li> Business</li> <li> Institutional</li> <li> Park/Open Space</li> <li> Residential</li> </ul>
<p><b>Transit Facilities</b></p> <ul style="list-style-type: none"> <li> Bus Route</li> <li> Bus Stop</li> </ul>	<p><b>Traffic Counts</b></p> <ul style="list-style-type: none"> <li> Average Daily Traffic</li> </ul>	<p><b>Pedestrian Facilities</b></p> <ul style="list-style-type: none"> <li> No Sidewalk</li> <li> Sidewalk</li> <li> Crosswalk</li> </ul>
<p><b>Walk Scores</b></p> <ul style="list-style-type: none"> <li> Walk Score</li> </ul>	<p><b>Street Trees</b></p> <ul style="list-style-type: none"> <li> Canopy Diameter</li> </ul>	

**Table 1 Existing Usage Patterns along Kīpapa Drive at Ho’okelewa’a Street**

Pedestrian use	Low to Moderate: Most Mililani streets have sidewalks. However, according to Mililani Waena Elementary School vice principals, not many students in the area walk to school.
Bicycle use	Low
Transit use (Average daily boardings + alightings) (Source: <i>Global Stop Summary by Trip, TheBus, 2012</i> )	There are 10 bus stops within ¼ mile of the site, including two stops at the Mililani Transit Center, which receive an average of 352 alightings and 424 boardings daily. Three other stops in this area have shelters and benches. Two routes provide service on Kīpapa Drive: PH2 (Mililani Town-Pearl Harbor Express, 2 trips daily), and 84 (Mililani Express-North, 8 trips). In addition, seven routes provide service on Meheula Pkwy: Routes 52, 84, 84A, 98A, 501, 503, and 504.
Daily Vehicular Volumes (Source: <i>Historical Traffic Station Maps, HDOT, 2012</i> )	16,557 ADT on Meheula Parkway : Lanikuhana Avenue to Makaimoimo Street
Use by trucks or large vehicles	Low
Peak periods (Source: <i>Historical Traffic Station Maps, HDOT, 2012</i> )	Meheula Parkway – 07:15 AM to 08:15 AM, and 04:15 PM to 05:15 PM
Accident History (Sources: <i>State of Hawai’i Motor Vehicle Accident Reports, Honolulu Police Department, Records Division, 2011-2014</i> )	Between 2007 and 2014, there were 4 car/truck accidents at the intersection of Ho’okelewa’a Street and Kīpapa Drive; and 1 bike and 4 car/truck accidents at Meheula Pkwy and Ho’okelewa’a Street.
Other	Some students in Mililani Waena Elementary School’s boundary must cross Kamehameha Highway and/or Meheula Parkway

## Part Two: Field Work and Key Findings

### STAKEHOLDER INPUT

The findings of this report are informed by input received from community stakeholders that participated in a walking audit along Mililani Waena Elementary School along Kīpapa Drive and Ho’okelewa’a Street. SSFM International, Inc., and a team of national consultants, including Dan Burden, national walkability expert, led the walking audit on July 17, 2014. It is important to note that the schools—Mililani Waena Elementary School and Mililani High School—were not in session during the walking audit. However, on November 12, 2014 a team consisting of members from DTS and SSFM returned to observe morning drop-off and talk further with the Mililani Waena Elementary School principal and vice principal. The following stakeholder groups participated in the walking audit:

- City and County of Honolulu Department of Transportation Services (DTS), including Mark Garrity, Paul Teixeira, Kelly Cruz, Layden Akasaki, Jay Hara, Ezra Kao, Shawn Butler, Chris Sayers, Jay Egusa, and Craig Chung;
- City and County of Honolulu Department of Facility Maintenance (DFM), including Roger Dona, Shane Brandley, and Ryan Mayedn;
- Hawai’i State Department of Health (DOH), Heidi Hansen-Smith;
- Mililani Waena Elementary School Vice Principals, Barron Iwamura and Robert Hurley;
- Mililani Neighborhood Board Chair, Richard Poirier;
- Elected Leaders, including State Representative Lauren Matsumoto and Stephanie Burgess staff to Representative Fujimoto;
- Hawai’i Bicycling League (HBL), Daniel Alexander; and
- Consultant Team: Mike Packard, Alan Fujimori, Michael Motoki, and Noah Baron from SSFM, Dan Burden and Samantha Thomas from Blue Zones, Gary Toth from Gary Toth Associates, and Evan Corey from Nelson Nygaard.



*The walking audit brought together 24 leaders on July 17, 2014 from the City and County of Honolulu staff, Mililani Waena Elementary School vice principal, several state elected leaders, and the Mililani Neighborhood Board chair.*

The group discussed conditions that affect active living, social connectivity, access to daily needs, and safe routes to school for Mililani Waena Elementary School along Kīpapa Drive and Ho’okelewa’a Street. The participants noted the traffic congestion during morning and afternoon school arrivals and departures,

observed vehicles traveling at higher than posted speeds during off peak times, and noted that more students should be able to safely walk or bicycle to school. There was consensus around neighborhood traffic-calming measures and the need to address traffic circulation and management during the peak morning and afternoon school arrival and departure times. However, the neighborhood board chair, Richard Poirier, voiced concern over the acceptance of traffic-calming tools, such as curb extensions. As this project moves forward, it will be key to include community members in the education and participation process.

The return visit by SSFM and DTS staff in November 2014 confirmed many of the observations and input gathered during the walking audit. The majority of school drop-offs were observed to occur within a 10-minute period (7:40-7:50) each morning; a similarly narrow pick-up window exists in the afternoon, leading to significant vehicle congestion at peak drop-off and pick-up times. This high volume of vehicles creates safety issues for children.



*Children and parents were observed crossing Kīpapa Drive with and without crosswalk assistance during morning school drop-off hours on November 12, 2014. Long queues of cars were observed along Kīpapa Drive during this time.*

Although the principals of Mililani Waena Elementary School, Dale Castro; and Mililani High School, Fred Murphy, were not able to attend the walking audit, both provided input to the City in a joint letter.

Principal Murphy wrote:

*Please know that I feel strongly that something needs to be done at this dangerous intersection [Kīpapa Drive and Ho’okelewa’a Street] for the students of Mililani Waena Elementary School, as well as Mililani High School (MHS) students that cross this intersection twice each school day. My primary concern is that there is a magnification of traffic. Many folks that come through the intersection go through the intersection, drop off their children and then double back through the intersection to exit the area. The intersection needs to be able to move vehicles through efficiently. Perhaps a rotary intersection would allow for vehicles from all directions to flow simultaneously. Pedestrian traffic would still interrupt flow, as it does now, however more vehicles could get through the intersection between pedestrian interruptions. I would gladly give up MHS land adjacent to the intersection to contribute to a solution.*

Principal Castro wrote:

*Continuing the sentiments of Mr. Murphy...I put together a chronology of all the actions tried, surveys conducted, community forums, sign waving attempts and communications done of the many different entities wanting to help. The list is vast! At the end of the day, the results that matter are ones that keep people safe. Therefore, my school has re-routed school bus pick-up, designated clearer traffic patterns within our campus boundaries, and have focused on educating students and their families of safe practices through community projects and classroom lessons. These practices have made some difference, but it is the intersection of Kīpapa Drive and Ho’okelewa’a Street that remains out of our school’s scope of control and is a major problem that needs to be addressed. I’m very hopeful that the “near misses” that occur every day will be something that can be permanently addressed so that we ALL can know that our efforts resulted in a safer commute.*



*Participants shared their vision, barriers, and opportunities for complete streets along Kīpapa Drive at Mililani Waena Elementary School. The goal of the walking audit was to discuss possible treatments for Kīpapa Drive in front of the school in order to improve pedestrian and vehicle safety and accessibility.*

**Photo descriptions** (clockwise from top left: neighborhood board chair, Richard Poirier, on bike; DTS staff; the walk audit group demonstrating bulbouts at the corner of Kīpapa Drive and Ho’okelewa’a Street; Dan Alexander of HBL addressing the group.



**Photo descriptions** (clockwise from top left): Entrance signage at Mililani-Waena Elementary School; traffic calming devices on Kipapa Drive near Mililani-Waena Park; single family residential area with fences and garages facing the street; signage reminding vehicles to watch for pedestrians; a bicyclist near Meheula Parkway; part of the Mililani-Waena school campus.

## FINDINGS

This section summarizes findings based on observations made by the consultant team with input from Department of Transportation Services staff, school administration, elected State Representatives, and other community stakeholders who participated in the walking audit. These inform the recommendations summarized in the next section.

*Finding: Overly wide driveway crossings create long crossings for pedestrians, increasing their exposure and risk of conflict*



*Overly wide driveway at Mililani Waena Elementary School entrance.*

The Mililani Waena Elementary School driveways operate as one-way access. Both driveway aprons are 40 feet wide. The exit driveway feeds directly into the Kīpapa Drive and Ho’okelewa’a Street intersection. These conditions encourage drivers to make higher speed turns and to prioritize navigation of the intersection over yielding to pedestrians on the sidewalk. The entrance driveway to the school is also one lane that is 40 feet wide. During peak hours, vehicles can be observed treating it as a two-lane entrance. Wide driveways increase the potential for conflicts between people walking and people in cars by increasing exposure time to vehicle traffic and

encouraging higher driver speeds. This can be ameliorated by narrowing one-way driveway aprons to 14 feet in width or less and two-way or two-lane driveways to 28 feet or less.

*Finding: Travel lanes are wide, which contributes to increased motorist speeds*

Kīpapa Drive in front of the Elementary School is 40 feet wide. There are no pavement markings to indicate lane edges and few visual obstructions along this stretch of road. These conditions provide cues to motorists that encourage higher speeds. It is recommended that the default lane width be reduced to 11 feet along the transit routes. Narrowing the travel lanes helps to lower vehicle speeds and provides physical space for sidewalk improvements, bike lanes, or wider buffers between sidewalks and passing vehicles.

*Kīpapa Drive has wide, unmarked, travel lanes in front of Mililani Waena Elementary School.*



*Finding: Crosswalks fronting the Elementary School are long, increasing the exposure and potential conflict of a pedestrian with a motorist*

The marked crossing in front of Mililani-Waena Elementary School is 40 feet long. The length of the crossing can be daunting to slow-moving pedestrians such as children, and the crossing time unnecessarily results in more exposure to potential pedestrian-vehicle conflicts and increased waiting periods for yielding motorists. Installing raised median refuges provides a protected space for pedestrians to wait, only requiring the crossing of one-direction of travel at a time.



*Marked crosswalks in front of Mililani Waena Elementary School are long.*

*Finding: The intersection of Kīpapa Drive and Ho'okelewa'a Street has wide corner radii and experiences safety and efficiency issues during school arrivals and departures.*

The intersection of Kīpapa Drive and Ho'okelewa'a Street is a four-way intersection, with one of the legs the 'exit' driveway of Mililani Waena Elementary School. This adds a layer of complexity to the intersection, especially during school drop-off and pick-up times. In addition, wide corner radii at this intersection encourage higher speed turns. Intersection treatments, such as a mini-circle, could increase safety, reduce traffic delays, and help to prevent crashes. Mini-circles can also act as gateways, creating a sense of arrival (place) into the school and neighborhood while effectively controlling speeds. The photos above show a vehicle navigating the intersection where walk-audit participants demonstrate a traffic circle.



*Vehicle shown navigating around human traffic circle at intersection.*

*Finding: Sidewalk widths meet minimum standards, but are not able to accommodate two parents walking side-by-side with strollers.*

Sidewalks are four feet wide on both sides of Kīpapa Drive and Ho’okelewa’a Street. This is the minimum width requirement for sidewalks in a residential neighborhood. Four feet, however, does not allow two parents with strollers to walk side-by-side. Ideally, sidewalks around schools should be at least eight feet wide. The existing sidewalks feature a “furniture zone,” or landscape strip that includes trees. This helps create a buffer between people walking and moving vehicles. Over the long term, sidewalks should be widened to eight feet.



*Four-foot wide sidewalks align both sides of Kīpapa Drive in front of the school.*

*Finding: The neighborhood design creates a lack of transparency and ‘eyes on the street.’*

Buildings and homes should “front” the street—instead of being set back, far away from the street and hidden with tall walls—to create a pedestrian-scale landscape and to put “eyes on the street” so that people feel watched over. While it is beyond the scope of this study to recommend changes of this nature, it is important that the built environment evolve over time to be more compatible with complete streets principles. This may include changes to zoning to establish maximum allowable setbacks for homes and commercial buildings in places of emphasis; or encouraging placement of buildings, homes so that they create natural surveillance, and maximize opportunities for people to meet or say hello. This practice is especially important near schools and parks.



*Walls and fences separate the sidewalk from residences along Ho’okelewa’a Street.*

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## Part Three: Recommended Application of Complete Streets Concepts

This section describes the recommended application of Complete Streets concepts for Kīpapa Drive at Mililani Waena Elementary School. It includes a written description of recommendations accompanied by illustrative drawings. The Complete Streets principles incorporated are:

- Encourage multiple modes of transportation, particularly walking and biking
- Promote safety for all modes of transportation
- Promote safer street crossings, and
- Implement traffic calming measures to lower the average speed and promote efficient traffic flow

### COMPLETE STREETS RECOMMENDATIONS

#### *Conceptual Illustrations of Recommendations*

Figure 3 shows how Complete Streets principles can be applied to transform Kīpapa Drive within the study area. These are summarized in Table 2. The improvements depicted in Figure 3 support the following recommendations.

#### *Description of Recommendations*

The improvements depicted in Figure 3 support the following recommendations.

- A. Encourage motorist to drive 15 to 25 mph along Kīpapa and Ho’okelewa’a Streets by narrowing the travel lanes, and enhancing marked crossings.**
- Narrow travel lanes on Kīpapa Drive and Ho’okelewa’a Street to 11 feet in both directions.
  - Install bike facilities on both sides of Kīpapa Drive (see recommendation E) where community supports on-street parking removal.
  - Install ‘shark teeth’ or zigzag stripes along approaches to draw motorists’ attention to the school zone.
  - Install a raised pedestrian crossing island at Wehewehe Loop and Kīpapa Drive to enhance the crossing directly in front of the school and lower speeds. Include street trees to bring speeds down further.
  - Install a landscaped median with street trees on both approaches of Kīpapa Drive and Ho’okelewa’a Streets.

**B. Create a safer intersection at Kīpapa Drive and Ho’okelewa’a Street.**

- Install a domed mini-circle.
  - Mini-circles are often used at residential street intersections, where vehicles navigate around a small island (8 to 15 feet in diameter) that is either slightly domed or raised. If raised, mini-circles should be visible from hundreds of feet away, creating the feeling of a small park. Landscape materials may be used to add to the traffic calming effect.
  - A domed mini-circle design will better accommodate large vehicles—fire trucks and buses—that need to access Kīpapa Drive. Mini-circles improve the capacity at overloaded intersections by slowing, but not stopping traffic and thus moving traffic more efficiently through the intersection.
  - Mini-circles have been found to reduce vehicle crashes by an average of 90 percent in Seattle, according to a case study from U.S. Department of Transportation, Federal Highway Administration.
- Install curb extensions on all corners of the intersection to reduce pedestrian crossing distances, improve sight lines, and calm traffic. Curb extensions provide the opportunity to add additional landscaping features.

**C. Enhance on-street parking to encourage motorists to drive at a target speed of 15 to 25 mph along Ho’okelewa’a Street while also designating a space for off-site drop-off/pick-up zones.**

- The off-site drop-off/pick-up zone would encourage parents to drop their child off and walk the rest of the way to school, which should help relieve peak hour drop-off/pick-up traffic.
- Paint curb red and add signage to designate a loading zone area on Ho’okelewa’a Street.
- Install curb extensions on Ho’okelewa’a Street to inset parking and slow traffic.
- Install pavement markings to define on-street parking areas.

**D. Narrow the school driveway crossing.**

- Narrow Mililani Waena Elementary School driveways to 14’ to improve pedestrian crossings and reduce motorist entry and exit speeds.
- Simplify turning movements by restricting entry and exit to one-way in and out.

**E. Address connectivity of Mililani and identify built environment opportunities to support more children and family safely walking and biking to school.**

- Option 1:
  - Install 6’ bike lanes and 3’ striped buffers with vertical delineators in both directions of travel on Kīpapa Drive.
- Option 2:
  - Install 7’ parking, 3’ striped buffer, and 5’ northbound bike lane on the northbound side of Kīpapa Drive.
  - Install 5’ southbound bike lane on the southbound side of Kīpapa Drive.

**Table 2 Proposed Design Changes to Kīpapa Drive at Ho’okelewa’a Street**

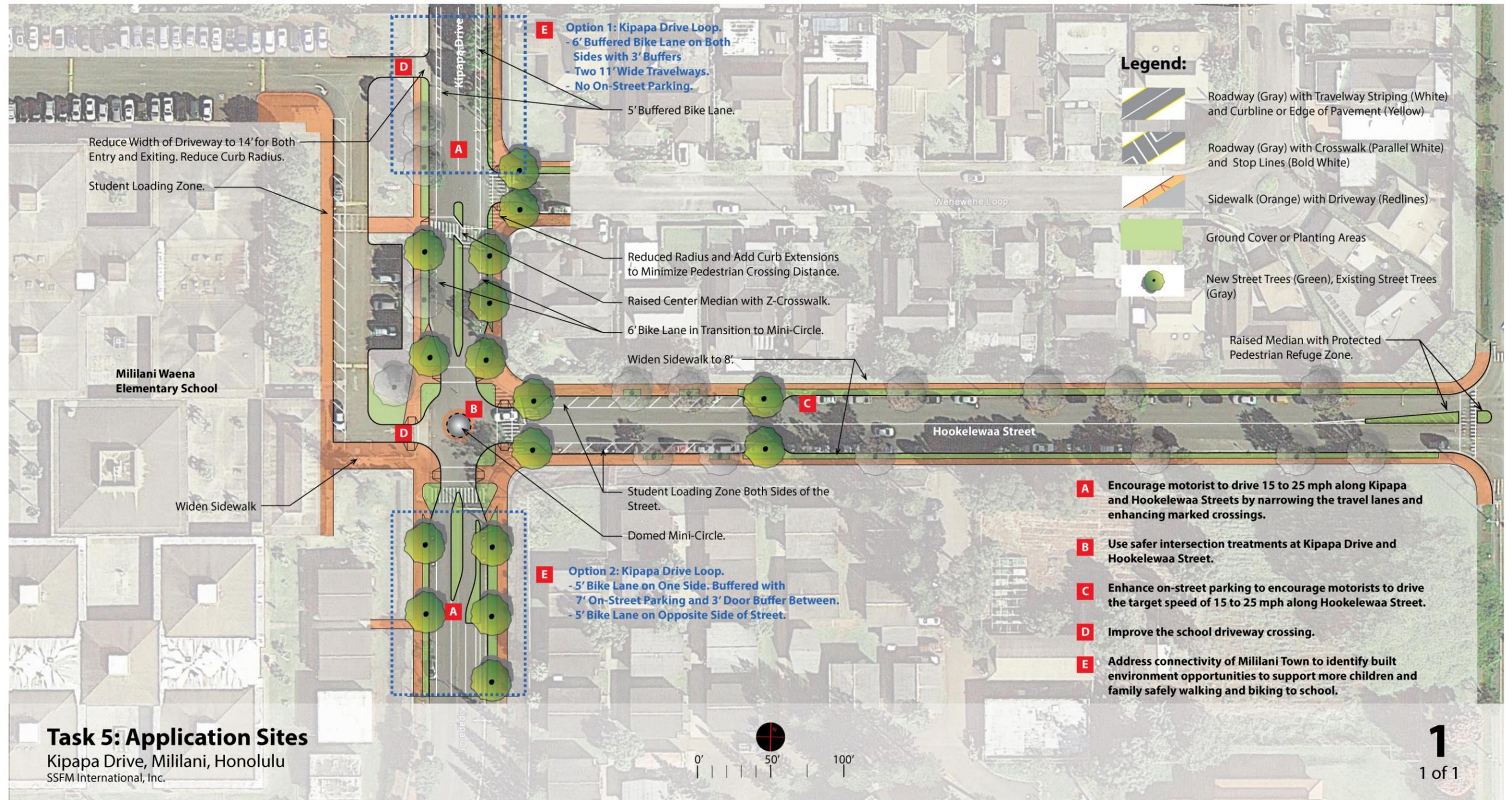
	CURRENT	AFTER RECOMMENDATIONS ARE IMPLEMENTED
Type of Facility	Kīpapa Drive is a minor collector, which connects to Meheula Pkwy (minor arterial) by way of Ho’okelewa’a Street (local street).	No change
Street Width	Kīpapa Drive is 40’: one 20’ northbound lane, one 20’ southbound lane Ho’okelewa’a Street is 40’: one 20’ eastbound lane, one 20’ westbound lane	Curb extensions at Kīpapa Drive and Ho’okelewa’a Street intersection to reduce street width and slow motorist turning speeds. Kīpapa Drive: one northbound (11’), one southbound (11’) Ho’okelewa’a: one eastbound (11’), one westbound (11’)
Speed Limit	Kīpapa Drive: 25 mph Ho’okelewa’a Street: 25 mph	No change
Crosswalk Length (longest)	Kīpapa Drive and Ho’okelewa’a Street (east leg): 46’	Kīpapa Drive and Wehewehe Loop (south leg): 40’
Number of lanes	Kīpapa Drive = two vehicular travel lanes (on in each direction) Ho’okelewa’a Street = two vehicular travel lanes (one in each direction)	Same number of vehicular travel lanes, as well as bike lanes on Kīpapa drive.
Distance to side streets	~130’ from Wehewehe Loop (to the north) ~700’ from Meheula Pkwy (to the East) ~1,100’ from Ikaloa St (to the south)	No change
Driveways	40’ Mililani Waena Elementary School ingress and egress.	Reduce Mililani Waena Elem School both ingress and egress to one 14’ lane.
Parking	On street parking permitted on Ho’okelewa’a Street (restricted during school hours). On street parking permitted on Kīpapa Drive (restricted during school hours).	Remove parking on Kīpapa Drive in front of the Elementary School to allow for a bicycle lane. It was noted by the Vice Principals that people rarely park there due to the parking restriction during school hours. If community is in support, remove parking along Kīpapa Drive to enable the installation of dedicated bike lanes along the entire corridor.
Sidewalks	4’ sidewalks with 4’ landscaped planting areas are present on all streets.	Sidewalks widened to 8’
Transit Routes, Stops, Shelters	There are 10 bus stops within ¼ mile of the site, including two stops at the Mililani Transit Center.	No change

HONOLULU COMPLETE STREETS PROJECT IMPLEMENTATION STUDY

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	CURRENT	AFTER RECOMMENDATIONS ARE IMPLEMENTED
Proximity to future rail	Not in close proximity to the rail line. No current plans to extend rail system into Mililani. Increased bus service between the rail and Mililani Transit Center is very likely.	No change
Bicycle features	Bike lane on Meheula Parkway (Southbound). Bike lane on Meheula Parkway is shown on the O'ahu Bicycle Plan, but not present in the field.	Bike lanes on both sides of Kīpapa Drive where parking removal is acceptable.
Nearby Schools	Mililani High School, Mililani Waena Elementary School	No change
Nearby Institutions	Mililani Town Center, Mililani Waena Park, Christ Lutheran Church	No change

Figure 3 Concepts for Kipapa Drive and Ho'okelewa'a Street



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## Part Four: Implementation

This section presents a recommended timeline for actions that support implementation of the Complete Streets recommendations. Recommendations are numbered according to how they were presented in the preceding section, with actions bulleted beneath. Near-term actions are those that may be taken between 1 to 5 years. Longer-term actions are those that may require or warrant a longer planning horizon due to logistical, financial, or other considerations.

### ***Near-Term Actions (Within 1 year):***

- A)** *Encourage motorist to drive 15 to 25 mph along Kīpapa and Ho’okelewa’a Streets by narrowing the travel lanes, and enhancing marked crossings.*
- Narrow travel lanes on Kīpapa Drive and Ho’okelewa’a Street to 10 to 11 feet in both directions.
  - Conduct community outreach to determine whether on-street parking removal would be accepted.
  - Install bike facilities on both sides of Kīpapa Drive (see Recommendation E) where parking removal is approved.
  - Install ‘shark teeth’ or zigzag stripes along approaches to draw motorists’ attention to the school zone.
- B)** *Create a safer intersection at Kīpapa Drive and Ho’okelewa’a Street.*
- Create a demonstration project with a temporary mini-circle using cones or rubber curbing to help people become comfortable with them. Evaluate the results, then adapt, build, and expand the program as appropriate.
- C)** *Enhance on-street parking to encourage motorists to drive at a target speed of 15 to 25 mph along Ho’okelewa’a Street while also designating a space for off-site drop-off/pick-up zones.*
- Near the intersection of Kīpapa Drive on both sides of Ho’okelewa’a Street paint curb red and add signage to designate a loading zone area, encouraging parents to drop their child off and walk the rest of the way to school.
- D)** *Narrow the school driveway crossing.*
- Use cones or large potted plants to narrow driveway widths as a demonstration project.
- E)** *Address connectivity of Mililani and identify built environment opportunities to support more children and family safely walking and biking to school.*
- Install sharrow markings or install bike lanes on Kīpapa Drive.

### ***Mid-Term Actions (1 to 5 years):***

- A)** *Encourage motorist to drive 15 to 25 mph along Kīpapa and Ho’okelewa’a Streets by narrowing the travel lanes, and enhancing marked crossings.*
- Install a pedestrian crossing island using concrete or A/C berm at Wehewehe Loop and Kīpapa Drive to enhance the crossing directly in front of the school and lower speeds.

- B) *Create a safer intersection at Kīpapa Drive and Ho’okelewa’a Street.***
  - Calm the street and better organize on-street parking along Ho’okelewa’a Street by adding bulbouts using concrete or A/C berms and planters at every third parking spot.
- C) *Enhance on-street parking to encourage motorists to drive at a target speed of 15 to 25 mph along Ho’okelewa’a Street while also designating a space for off-site drop-off/pick-up zones.***
  - None
- D) *Narrow the school driveway crossing.***
  - Use concrete or A/C berm to narrow driveway widths.
- E) *Address connectivity of Mililani and identify built environment opportunities to support more children and family safely walking and biking to school.***
  - None

***Longer-Term Actions (5 Years and Beyond):***

- A) *Encourage motorist to drive 15 to 25 mph along Kīpapa and Ho’okelewa’a Streets by narrowing the travel lanes, and enhancing marked crossings.***
  - Install a raised pedestrian crossing island at Wehewehe Loop and Kīpapa Drive to enhance the crossing directly in front of the school and lower speeds. Include street trees to bring speeds down further.
  - Install a landscaped median with street trees on Kīpapa Drive in front of the High School and the Elementary School.
- B) *Create a safer intersection at Kīpapa Drive and Ho’okelewa’a Street.***
  - Green the street, calm the street, and better organize on-street parking along Ho’okelewa’a Street by adding tree wells at every third parking spot.
- C) *Enhance on-street parking to encourage motorists to drive at a target speed of 15 to 25 mph along Ho’okelewa’a Street while also designating a space for off-site drop-off/pick-up zones.***
  - None
- D) *Narrow the school driveway crossing.***
  - Enhance the pedestrian environment and contribute to Safe Routes to School by reducing the width of the school’s driveways to one standard sized lane, 14 feet in width.
- E) *Address connectivity of Mililani and identify built environment opportunities to support more children and family safely walking and biking to school.***
  - Review the school boundaries with schools, State Department of Education, State Department of Transportation, elected leaders and other key stakeholders to identify barriers to children walking and biking to school. Conduct a sub-area study for Mililani Town to address greater connectivity issues. Identify and prioritize infrastructure and street treatments to support children and families walking and biking to school, work, shop or play.
  - Widen sidewalks to 8’ along Kīpapa Drive.

## Part Five: Cost Sheet

<i>ITEM</i>	<i>UNIT</i>	<i>QUANTITY</i>	<i>UNIT COST</i>	<i>TOTAL COST</i>
<b>Removals/Demo</b>				
Demolish existing sidewalk	Sq. Ft.	4534	\$ 5.00	\$ 22,670.00
Demolish existing Pavement	Sq. Ft.	7966	\$ 8.00	\$ 63,728.00
Erosion Control	L.S.	1	\$ 10,000.00	\$ 10,000.00
<b>Site improvements</b>				
<b>Roadway</b>				
Mill and Overlay existing AC pavement	Sq. Ft.	17361	\$ 6.00	\$ 104,166.00
Full depth roadway construction	Sq. Ft.	6865	\$ 17.00	\$ 116,705.00
Curb Gutter and Sidewalk	Lin. Ft.	3938	\$ 20.00	\$ 78,760.00
Drainage works	each	7	\$ 7,000.00	\$ 49,000.00
Raised Median	Sq. Ft.	650	\$ 20.00	\$ 13,000.00
4" Stripe (white/Yellow)	Lin. Ft.	1000	\$ 6.00	\$ 6,000.00
12"stripe (white)	Lin. Ft.	600	\$ 9.00	\$ 5,400.00
<b>Intersection</b>				
Mini-Circle with Mountable Domed Center	each	1	\$ 15,000.00	\$ 15,000.00
<b>Landscaping</b>				
Trees	each	20	\$ 1,000.00	\$ 20,000.00
<b>Misc.</b>				
Traffic Control	L.S.	1	5%	\$ 25,221.45
Mobilization	L.S.	1	10%	\$ 50,442.90
Contingency - 25%			25%	\$ 126,107.25
<b>Design</b>				
Design Cost			10%	\$ 70,620.06
<b>TOTAL CONSTRUCTION</b>				<b>\$ 706,200.60</b>
<b>TOTAL COST</b>				<b>\$ 776,820.66</b>