MARCH 2015

HONOLULU COMPLETE STREETS IMPLEMENTATION STUDY LOCATION REPORT

Papipi Road at Ewa Beach Elementary School (DRAFT III)

City & County of Honolulu

Department of Transportation Services

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Summary: Pāpipi Road at ʻEwa Beach Elementary School

ʻEwa Planning Area, ʻEwa Beach Sub-Area, Council District 9

NEED FOR PROJECT

Pāpipi Road connects residents of ʻEwa Beach and Ocean Pointe to schools and Oneʻula Beach Park. Despite posted speeds of 25 mph, vehicle speeding is a chronic concern. Pāpipi Road features no bike lanes and a sidewalk exists only on the mauka side of the road. These conditions are a barrier that discourages students from walking or biking to school.

Applying Complete Streets to this location will: 1) encourage walking and biking to school, 2) reinforce the posted speed limit, 3) create safer street crossings, and 4) strengthen the sense of arrival to ʻEwa Beach Elementary School and into the ʻEwa Beach Neighborhood.

SUMMARY OF RECOMMENDATIONS

The recommendations for Pāpipi Road at ʻEwa Beach Elementary School are aimed at creating a street environment that is inviting, safe, and emphasizes pedestrian activities. The proposed improvements are designed to slow vehicle speeds to comply with the posted speed limit of 25 mph. Recommendations include:

- Install raised table crossings with medians at the two marked crossings in front of ʻEwa Beach Elementary School
- Build a roundabout at the intersection of Pāpipi Road and Kapolei Parkway
- Install curb extensions on Pāpipi Place, Ihupani Place, and Laukona Loop to reduce crossing widths and turning radii
- Build a shared-use pedestrian and bicycle path on Pāpipi Road opposite the school
- Install street trees and landscaping along the shared use path
- Reduce driveway crossing widths at ʻEwa Beach Elementary School and nearby commercial properties

COST BREAKDOWN

Total: $5,130,223.62

Design: $290,390.02

Construction: $4,839,833.60

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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.

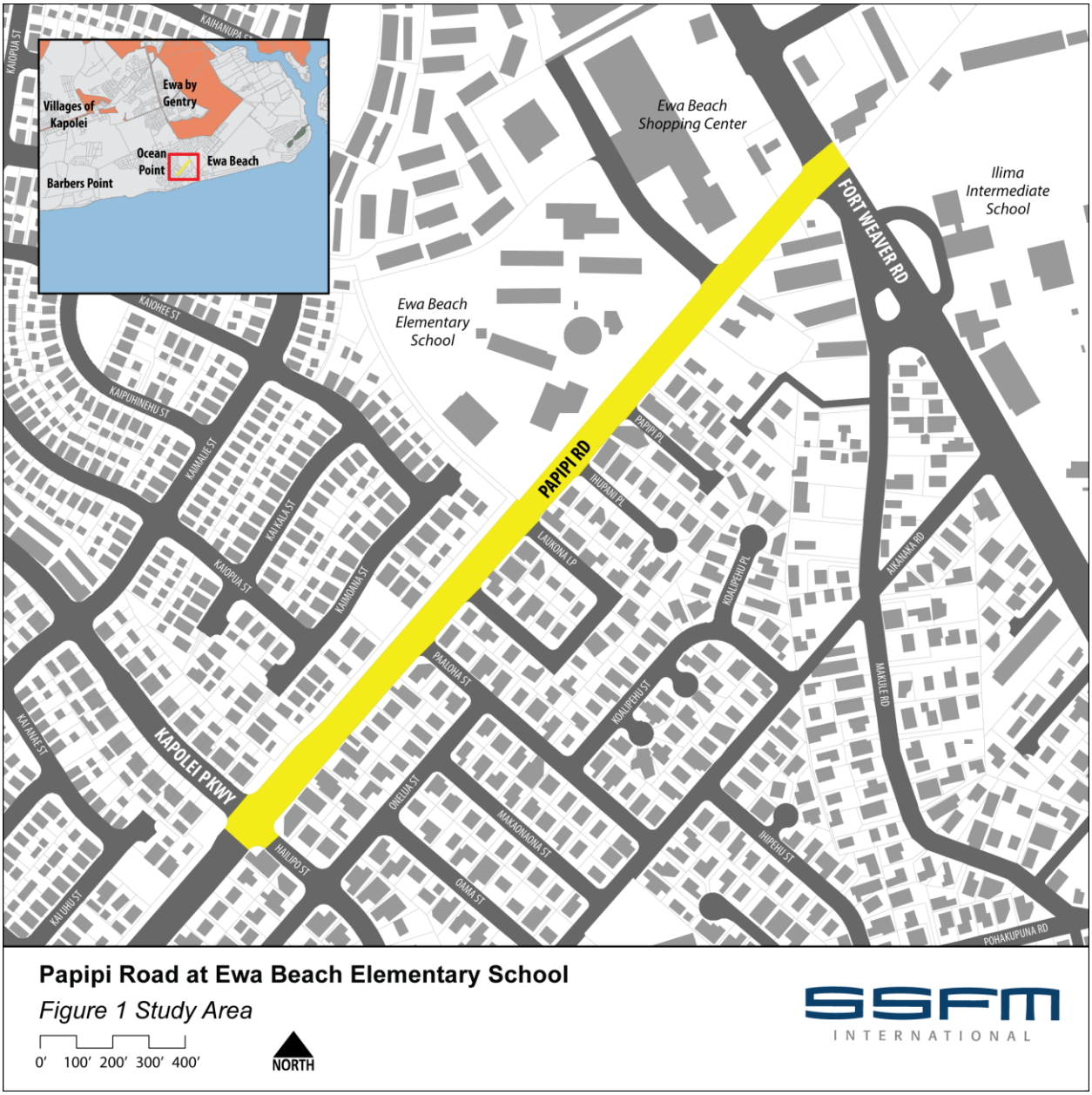
The State of Hawaiʻi adopted Complete Streets in 2009 and required each County to follow suit. In May 2012, the Honolulu City Council adopted a "Complete Streets" policy and passed Ordinance 12-15. The City and County of Honolulu is now taking aggressive steps to implement Complete Streets by updating policies, guidelines during maintenance and paving projects, and designing projects in specific locations. The City and County of Honolulu selected fourteen sites across the island of Oʻahu 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 Pāpipi Road near ʻEwa Beach Elementary School (Figure 1). It is located in the ʻEwa Planning Area, Sub-Area of ʻEwa Beach, in City Council District 9. Pāpipi Road is a key connector and collector street used by residents who live off Pāpipi Road and in the Ocean Pointe residential development. Pāpipi Road also provides access to ʻIlima Intermediate School, James Campbell High School, and Pohakea Elementary School, near the intersection of Fort Weaver Road and Pāpipi Road. Oneʻula Beach Park is located at the western end of Pāpipi Road.

ʻEwa Beach Elementary School on Pāpipi Road has a current enrollment of approximately 800 students, all of whom reside within a two-mile radius of the school. According to the school administration, more than half of the students walk or bike to school, and about 50 students take TheBus. No school bus service is currently provided. ʻEwa Beach Elementary School is rapidly growing, adding 450 students over the last seven years. It expects to reach 1,000 students within the next two years.

Figure 1 Study Area



NEED FOR PROJECT

This location was selected for Complete Streets treatment because of its traffic volume, proximity to key destinations, existing design issues, safety concerns, and a lack of multimodal facilities. The posted speed limit is 25 mph, but speeding is a chronic concern. The road is a long and straight corridor with few trees or visual cues for motorists to slow their speed.

Pāpipi Road provided a direct route to ʻEwa Beach Elementary School once the connection with Kapolei Parkway was completed for residents living off Kapolei Parkway in the Ocean Pointe residential development. It also became a major connector to other nearby schools and commercial areas. As a result, daily traffic counts along Pāpipi Road have increased by nearly 50% within the last five years. As of the 2010 census, Ocean Pointe was home to 8,361 people in an area of just over 2 square miles, and housing continues to be added.

The proximity of the school to its student population creates an ideal opportunity for walking or bicycling to school, yet Pāpipi Road features no bike lanes, and a sidewalk exists only on the mauka side of the road (there is a grassy shoulder and AC footpath on the makai side). Vehicles regularly veer onto the unimproved makai shoulder of the roadway to circumvent left-turning vehicles, creating a safety issue for pedestrians walking on that side.

Many barriers exist for walking including long crossing distances, major intersections, and lack of sidewalks along one side of Pāpipi Road. This places them at risk and increases their exposure to potential conflicts with motorists.

This stretch of Pāpipi Road has seen an increase in accidents within the last five years. One student pedestrian accident and one student bicyclist accident occurred in 2014 alone. Safety concerns create a barrier that discourages students and families from choosing to walk or bike to school, which contributes to traffic congestion.

Providing trees, pedestrian facilities and amenities, and safe crossings in keeping with the Complete Streets approach will not only increase safety and reinforce posted speed limits but will create an inviting gateway and sense of arrival to pedestrians entering the school and to the ʻEwa Beach neighborhood. Area residents and administrators at ʻEwa Beach Elementary School have indicated support for Complete Street treatments to improve safety for children and other residents.

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. Pāpipi Road is bordered by single-family residential uses for most of its length. As it approaches Fort Weaver Road at the eastern end of the study area, uses transition to institutional and commercial. ‘Ewa Beach Elementary School is located on the mauka side of the road east of Laukona Loop. The ‘Ewa Beach Shopping Center and other business are clustered near the intersection of Fort Weaver and Pāpipi. ‘Ilima Intermediate School is located just across Fort Weaver from Pāpipi Road’s eastern terminus.

There is an existing bus route along the study segment. Three bus stops are within the study area, two on the makai side and one on the mauka side. Two additional bus stops (one on the mauka side and one makai) are located just outside the study area to the south. Sidewalks exist only on the mauka side of the road, and span the full extent of the study area. An unimproved path exists on the makai side. Crosswalks exist across Pāpipi Road near the intersections with Pāpipi Place and Ihupani Place. Additional crossings exist parallel to Pāpipi Road on the makai side where smaller roads intersect.

Accident records indicate that a motorcycle/moped crash occurred at the northern end of the study area, and two more have been recorded just outside the study area to the north and south. According to the elementary school, several other bike and pedestrian accidents have occurred in recent years and may not have been reported to the police.

Usage Patterns

Pāpipi Road is well used by area residents accessing nearby commercial areas by bus, car, and on foot. ‘Ewa Beach Shopping Center is close enough to be easily accessed by bike and on foot if sidewalks and bike lanes are provided. Table 1 describes existing usage patterns by pedestrians, bicyclists, motorists, and transit users in the study area. Data on pedestrian use is not available, however a walking audit conducted in the summer of 2014 indicated anecdotally that there is a high level of pedestrian use along Pāpipi Road. School was not in session, yet the study team noted many children and adults walking along the road in the early afternoon.

Bicycle count data is not available for the study area, although counts from nearby intersections provide some indication of volume. According to Hawaii Bicycling League, peak period three-day average count data from 2013, 79 bicycles were observed at the Fort Weaver Road and Renton Road intersection, and 128 at the intersection of Kapolei Parkway and Geiger Street.

38 buses operate on Pāpipi Road daily. Data from TheBus indicates that public transit use along Pāpipi Road is high, with the most riders boarding at Pāpipi Rd opposite Pāpipi Pl (147 riders), adjacent to ‘Ewa Beach Elementary School, and Pāpipi Rd at Ft Weaver Road (106 riders), within ‘Ewa Beach Shopping Center. The remaining bus stops are used by a handful of riders daily.

2011 traffic count data indicated average daily vehicular volumes of 7,643 vehicles per day between Pohakupuna Road and Aikanaka Road, which is located southwest of Pāpipi Road’s intersection with Kapolei Parkway. No traffic counts exist for the area east of Kapolei Parkway after it was opened to vehicles, but it can be inferred that current traffic volumes are substantially higher.

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

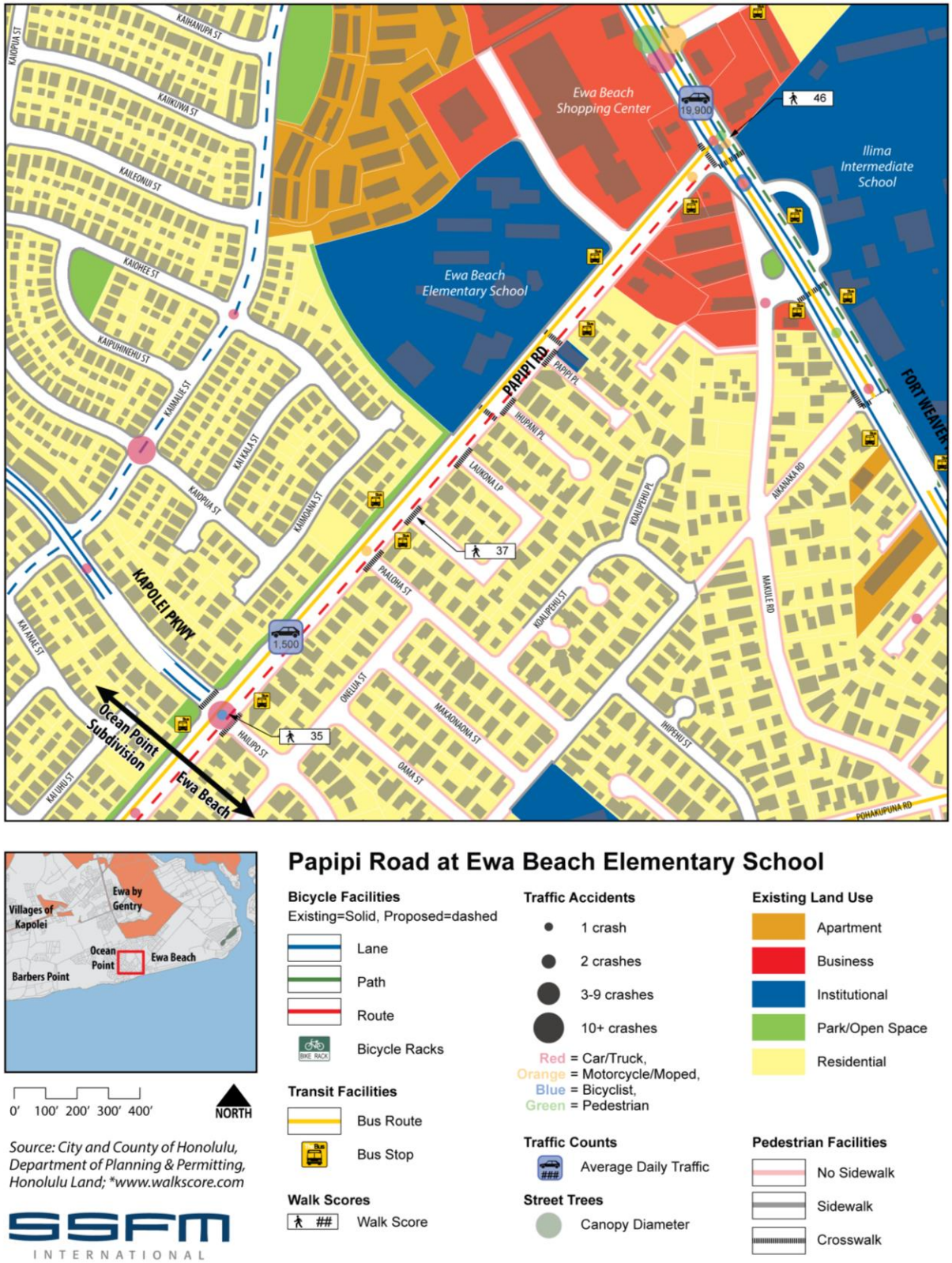


Table 1 Existing Usage Patterns along Pāpipi Road

Pedestrian use	High, during the walking audit, which took place in the early afternoon and during the summer when school was not in session many people—children to older adults—were observed walking.
Bicycle use (Source: Hawaii Bicycling League peak period three-day average daily bicycle counts, 2013)	On Fort Weaver Rd at Renton Rd: 79 On Kapolei Parkway at Geiger St: 128
Transit use (Average daily boardings + alightings) (Source: *Global Stop Summary by Trip*, TheBus, 2012)	<u>Stops:</u> Ft Weaver Rd + OPP Kuhina St: 1013 average daily ridership (ADR) Ft Weaver Rd + OPP Pāpipi Rd: 113 ADR Ft Weaver Rd + Kuhina St: 491 ADR Pāpipi Rd + Hailipo St: 0 ADR Pāpipi Rd + Laukona Lp: 3 ADR Pāpipi Rd + Pāpipi Pl: 0 ADR Pāpipi Rd + Ft Weaver Rd: 106 ADR Pāpipi Rd + OPP Pāpipi Pl: 147 ADR Pāpipi Rd + OPP Pa‘aloha St: 2 ADR Pāpipi Rd + OPP Hailipo St: 3 ADR <u>Boadings and Alightings by Route:</u> Route 41: 200 ADR Route 42: 575 ADR Route 44: 412 ADR Route E: 485 ADR Route 91: 149 ADR Route W1: 58 ADR Total: 1879 ADR
Daily Vehicular Volumes (Source: *Historical Traffic Station Maps*, HDOT, 2013-2009)	Pāpipi Road: Aikanaka Road to Pohakupuna Road (2011) – 7,700 Pāpipi Road: Aikanaka Road to Pohakupuna Road (2013) – 1,600 Fort Weaver Road between Kaimaile Street and Hanakahi Street at fire hydrant (2013) – 23,700
Use by trucks or large vehicles (Source: *Historical Traffic Station Maps*, HDOT, 2013)	37 buses operate on Pāpipi Rd daily. Truck use is low, about 12 trucks per day.
Peak periods (Source: *Historical Traffic Station Maps*, HDOT, 2013)	Pāpipi Rd: 07:15 AM to 08:15 AM, and 03:30 PM to 04:30 PM Ft Weaver Rd: 07:00 AM to 08:00 AM, and 03:30 PM to 04:30 PM
Accident History Sources*: State of Hawai‘i Motor Vehicle Accident Reports,* Honolulu Police Department, Records Division, 2011-2014	Between 2007 and 2014, there was 1 bike crash, 10 car/truck crashes, 2 motorcycle crashes, along Pāpipi Rd between Fort Weaver Rd and Kapolei Parkway. According to ‘Ewa Beach Elementary School Vice Principal, Robert Hurley, there were several bike/pedestrian accidents in front of the school in recent years, which may not have been reported to HPD.

Part Two: Field Work and Key Findings

A walking audit brought together 23 leaders from the City and County of Honolulu, State agencies, and community stakeholders including 'Ewa Beach Elementary School and Hawaii Bicycling League.

STAKEHOLDER INPUT

The findings of this report are informed by input received from community stakeholders that participated in a walking audit along Pāpipi Road near 'Ewa Beach Elementary School. SSFM International, Inc., and a team of national consultants, including Dan Burden, national walkability expert, led the walking audit on July 17, 2014. The following stakeholder groups participated in the walking audit:

- City and County of Honolulu Department of Transportation Services (DTS): Mark Garrity, Kelly Cruz, Layden Akasaki, Shawn Butler, Ezra Kao, Jay Hara, Diane Overland, Chris Sayers, Jay Egusa, Lorine Jaena, and Paul Texeira;
- Hawaii State Department of Health (DOH): Heidi Hansen-Smith;
- 'Ewa Beach Elementary School: Principal Sherry Kobayashi, Vice Principal Robert Hurley;
- Hawaii Bicycling League (HBL): Daniel Alexander;
- Councilmember Ron Menor, represented by Dennis Galolo; and
- Consultant Team: Mike Packard, Alan Fujimori, and Michael Motoki of SSFM, Dan Burden and Samantha Thomas of Blue Zones, Gary Toth of Gary Toth Associates, and Evan Corey of Nelson Nygaard.

The walk audit group discussed conditions that affect active living, social connectivity, access to daily needs, and Safe Routes to School for 'Ewa Beach Elementary School. The participants observed vehicles traveling at speeds higher than posted. They observed the lack of sidewalks, and motorists driving onto the makai shoulder behind kids walking in order to bypass left-turn queued cars. An overarching need was identified to address pedestrian safety and create safer routes to school. "We will be very supportive of what we can do to help our children," stated Sherry Kobayashi, Principal at 'Ewa Beach Elementary School.

Participants shared visions, barriers, and opportunities for Complete Streets and safer routes to school along Pāpipi Road. Participants envisioned ideas that would slow vehicles and improve safety for roadway users, including buffered walking and bicycling paths and gateway treatments to create a sense of arrival to the school.

Photo descriptions: *Top row - Members of DTS, including the Region 2 traffic engineer, and other participants; Middle row - Members of DTS including the City bicycle coordinator; Dan Burden of Blue Zones speaks to the group; Bottom row - Consultant and 'Ewa Beach Elementary School representative examine and discuss the study area map.*

During the hour walking audit of Pāpipi Road at ʻEwa Beach Elementary School many people were observed walking, bicycling and using transit.

Photo descriptions *(clockwise from top left): Pedestrians of all ages utilized the unimproved makai side of Pāpipi Road; Pedestrians in one of the Pāpipi Road Crosswalks; Some pedestrians choose to walk in the street rather than on the unimproved makai shoulder; Transit users frequent a bus stop; The mauka sidewalk along Pāpipi Road features shade trees and a curb to prevent vehicles from utilizing it; A bicyclist making a grocery run; A skateboarder using the sidewalk; A bicyclist on the sidewalk; A pedestrian walking on the sidewalk.*

FINDINGS

This section summarizes key findings based on observations made by the consultant team with input from Department of Transportation Services staff, ‘Ewa Beach Elementary School principals, and community stakeholders who participated in the walking audit. These inform the recommendations summarized in the next section.

Finding: The built design speed is higher than the posted speed

Pāpipi Road is a two-lane road. A 2006 traffic count showed about 5,550 vehicles per day on Pāpipi Road between Fort Weaver Road and Kapolei Parkway. Since then, Kapolei Parkway opened as a through street. In a 2013 traffic count, 1,600 vehicles a day traveled on Pāpipi Road southwest of the intersection of Kapolei Parkway. No counts exist for the portion of the road east of Kapolei Parkway since the road opened.

Pāpipi Road has a 25 mph posted speed limit although has few obstacles to encourage driving this speed.

Pāpipi Road is long and straight. The road is 26 feet wide with no lane edge marking, and there are few trees and other visual barriers. The lack of visual cues encourage motorists to drive at higher speeds. The posted speed limit on Pāpipi Road is 25 mph. However, the design of the road encourages higher speeds. This can be ameliorated by providing additional visual clues to drivers signaling that they have arrived into the neighborhood and into a school zone.

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

The school-side travel lane is 14 feet wide and the makai travel lane is 12 feet wide. There is room to narrow both lanes to 11 feet to encourage lower vehicle speeds while still accommodating school bus and transit vehicles. Narrowing would involve minimal materials and disturbance, would add to vehicular efficiency and performance, and would create an opportunity to provide space for wider sidewalks, bike lanes, or buffers between sidewalks and passing vehicles.

Travel lanes along Pāpipi Road are wide which contribute to motorist speeding.

Finding: Wide driveway crossings at the school create long crossings for pedestrians, increasing their exposure and risk

'Ewa Beach Elementary School's two driveways are 56 and 45 feet wide. Both are one-way driveways. A one-way driveway should typically not exceed 14 feet, and a two-way driveway 28 feet. Wider driveways encourage higher-speed turns and create longer crossings for pedestrians. This is a concern in areas with high pedestrian traffic and where children and disabled persons are required to cross.

'Ewa Beach Elementary School exit driveway is extremely wide.

Finding: Corner radii are wide, encouraging high-speed turns and creating long crossing distances for pedestrians

Residential street crossings along Pāpipi Road are very long due to wide corner radii. The crossing at Ihupani Place is 85 feet, Pāpipi Place is 40 feet, and Laukona Loop the crossing is 104 feet. All of these streets are residential cul-de-sac style streets. Large corner radii encourage high speed turns, increase the crossing distance for a pedestrian, and fail to provide an edge to the street. Curb extensions or 'bulb-outs' can narrow the turning radii, making the intersection more compact, safe and efficient for all users.

Marked crosswalk across Ihupani Place at Pāpipi Road is extremely long.

Finding: The intersection of Pāpipi Road and Fort Weaver Road is very wide, which creates long pedestrian crossings mixed with high-speed vehicle movements

There is only one crosswalk at Pāpipi Road and Fort Weaver Road (on makai side of the intersection) that crosses Fort Weaver Road. Fort Weaver is a State owned, wide and busy road, with vehicles traveling at high speeds. These conditions are daunting to many pedestrians. Those traveling on the mauka side of Pāpipi Road, where sidewalks exist, often elect to cross over to the unimproved makai side before the Fort Weaver intersection to avoid having to cross this busy intersection twice. Improvements may recommend narrowing the pedestrian crossings, but as Fort Weaver is State-owned, work would need to be coordinated with the State Department of Transportation.

Wide intersection of Pāpipi Road and Fort Weaver Road.

Finding: The intersection of Pāpipi Road and Kapolei Parkway is too wide, and it fails to serve as an attractive gateway into the neighborhood

Intersection treatments are needed at the intersection of Pāpipi Road and Kapolei Parkway. This intersection is overly wide with a dedicated right-turn lane from Pāpipi Road onto Kapolei Parkway. The right-turn lane extends 274 feet back from the intersection. The intersection is complex due to multiple turning movements and wide crossings. Choosing safer intersection treatments, such as a roundabout or more compact intersection, is recommended.

The intersection of Pāpipi Road and Kapolei Parkway is wide.

Finding: Street connectivity is broken by cul-de-sacs and walls, affecting the walkability of the neighborhood

For students and families living in the residential areas off of Kapolei Parkway, Pāpipi Road is the only route to the elementary school. Walking audit participants were told by the school that the housing association adjacent to the school wanted another access to the school, but the school and State Department of Education could not allow it for security reasons. Creating a trail access to the school from the adjacent housing association should be revisited, especially if a shared goal is to provide students with a safer and more direct route to school.

Wall separating Ocean Point development and 'Ewa Beach Elementary School.

Finding: Commercial buildings are set far back from the street with drive-through features.

The commercial area along both Pāpipi Road and Fort Weaver Road has large setbacks and driveways, detracting from the walkability of the street. This is in contradiction to Complete Streets principles that recommend that buildings "front" the street, create a pedestrian-scale landscape, and provide a sense of security. However, the large setback allows for off-street improvements without infringing on the building footprint. The area offers mostly fast foods, and lacks stores with healthy food options. Many youth were seen walking with large sodas from fast food chains and the gas station.

Fast food restaurants set far back from street.

Finding: The existing sidewalk on the makai side of Pāpipi Road, outside the school frontage, is cluttered with signage, which hampers its usability.

The sidewalk on the school side is six feet wide with a three to four foot buffer strip, and raised A/C berms. After the school, heading makai, the sidewalk transitions to an attached sidewalk. There is no parking allowed on this side of the street, as noted by the signs that are adding visual clutter to the street and narrowing the effective 'walk-talk' zone—the walking space where two people can comfortably walk side by side—of the sidewalk.

Multiple street signs existing in the frontage zone of the six-foot Pāpipi Road sidewalk.

Finding: The residential side of Pāpipi Road is without sidewalks, negatively affecting Safe Routes to School.

The residential side of Pāpipi Road has no sidewalk. Many people, including students, walk on this side of the street. They face many obstacles including parked cars that block the minimal path that exists. The City owns the right-of-way and therefore has the jurisdiction needed to implement improvements.

The residential side of Pāpipi Road has no paved sidewalks although multiple children were observed walking.

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Part Three: Recommended Application of Complete Streets Concepts

This section describes the recommended application of Complete Streets concepts for Pāpipi Road at ‘Ewa Beach 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
- Adjust the design speed of the road to match and reinforce the posted speed limit of 25 mph
- Promote safer street crossings, and
- Strengthen the sense of arrival

COMPLETE STREETS RECOMMENDATIONS

Conceptual Illustrations of Recommendations

Figures 3 through 5 graphically show how Complete Streets principles can be applied to transform Pāpipi Road within the study area. The conceptual drawings depict the recommended improvements along three segments of the road:

- Pāpipi Road at the intersection of Kapolei Parkway (Figure 3)
- Pāpipi Road at ‘Ewa Beach Elementary School (Figure 4)
- Pāpipi Road from ‘Ewa Beach Elementary School to Fort Weaver Road (Figure 5)

These recommended changes are described in the following section and summarized in Table 2.

Description of Recommendations

The recommendations in Figures 2-4 are summarized below.

A) Encourage motorists to drive 15 to 25 mph by narrowing the travel lanes on Pāpipi Road and enhancing marked crossings.

- Narrow travel lanes to 11 feet in both directions.
- Install raised speed table crossings with medians at the two marked crossings in front of ‘Ewa Beach Elementary School. Raised speed table crossings are designed to restrict vehicle through speeds to 15-25 mph, 24 hours a day.

B) Re-design the intersection at Pāpipi Road and Kapolei Parkway by adding a roundabout

- Design for livability by creating an intersection at Pāpipi Road and Kapolei Parkway that works for all roadway users with a modern roundabout. Modern roundabouts are safer for all transportation modes than four-way stop controlled or signalized intersections. They reduce the number and severity of personal injury and fatal crashes up to 90 percent, helping to calm traffic while moving 30 to 50 percent more traffic. Roundabouts also create a gateway into the community.

C) Reduce corner radii and create more compact side street crossings.

- Reduce crossing widths, turning radii, and improve sight lines, and further calm traffic by installing curb extensions on Pāpipi Place, Ihupani Place, and Laukona Loop. Curb extensions are an important traffic calming tool. They reduce crossing distance, improve safety for pedestrians and motorists by increasing both users' visibility, reduce speed of turning vehicles, and encourage pedestrians to cross at designated locations.
- Install bollards at intersections to slow vehicular turning movements and provide a safer walking/bicycling environment.

D) Reduce the driveway crossing width at 'Ewa Beach Elementary School and neighboring commercial properties.

- Enhance the pedestrian environment and walkability along Pāpipi Road by reducing the width of the driveways. A 14 foot width is often adequate for all size vehicles for one-way operation, or 28 feet for two-way. This will have to be done in partnership with the property owner.

E) Construct a shared-use pedestrian and bicycle path along Pāpipi Road.

- Complete Pāpipi Road and create safer routes to school by building a shared-use walking and biking path on the side opposite the school. The path should be a minimum of 10 feet wide and include a 5 to 6 foot planting strip with street trees to buffer users from moving vehicles. Vertical walls of green create a sense of enclosure, help to hold down vehicle speeds, and create a nice walking and biking environment as they calm and cool the street.

F) Create a sense of place by better connecting 'Ewa Beach Elementary School to the street.

- In partnership with the school, create a gateway entrance into the school by creating a pedestrian entrance with a plaza. Activate the space with art, benches, or a school "Little Free Library."

G) Incorporate placemaking features at the intersections of Pāpipi Place, Ihupani Place, Laukona Road and Kapolei Parkway

- Install pedestrian scale lighting to improve pedestrian safety and experience.

Table 2 Proposed Design Changes to Pāpipi Road

	CURRENT	AFTER RECOMMENDATIONS ARE IMPLEMENTED
Type of Facility	Pāpipi Road is a minor collector, providing access to Ft. Weaver Rd (principal arterial), and Kapolei Parkway (minor arterial)	No change
Street Width	Pāpipi Rd = 26’	Pāpipi Rd = 22’
Speed Limit	25 mph	25 mph
Crosswalk Length (longest)	26’ at Pāpipi Rd, 85’ at Ihupani Pl, 40’ at Pāpipi Pl, and 104’ at Laukona Lp.	11’ at Pāpipi Rd (2), ~28’ crossings at side streets (Ihupani Pl, Pāpipi Pl, Laukona Lp).
Number of lanes	One eastbound (12’), One westbound (14’)	One eastbound (11’), One westbound (11’)
Distance to side streets	Ft Weaver to Kapolei Pkwy along Pāpipi Rd = 0.45 miles. Block spacing between Ihupani Pl, Kaukona Lp, and Paaloha St is about 200’	No change
Driveways	Makai side of Pāpipi Rd: Egress and ingress into front parking lot of ‘Ewa Beach Elem School. Egress and ingress into back parking lot of ‘Ewa Beach Elem School. Driveway access to residential lots on Makai side of Pāpipi (22 lots). Egress and ingress for Taco Bell, Pizza Hut Mauka side of Pāpipi Rd: drive access to ‘Ewa Beach Shopping Center	Reduced driveway widths to 14’ for one-way operation and 28’ for two-way operations
Parking	Street parking prohibited on mauka side of Pāpipi Rd. Parking on unimproved sidewalk common on makai side of Pāpipi Rd.	Street parking prohibited on mauka side of Pāpipi Rd. Fifteen on-street parking stalls on makai side.
Sidewalks	Mauka side of Pāpipi Road: 6’ wide sidewalk with 4’ buffer strip. Makai side of Pāpipi Road: no sidewalk	10’ shared ped/bike path buffered by 5-6’ planting strip. Painted pedestrian path from sidewalk to school.
Transit Routes, Stops, Shelters	On Pāpipi Road: Seven stops; one stop has a shelter and a bench. One route, Route 44 provides service on Pāpipi Road. On Ft. Weaver Road: Three stops adjacent to Pāpipi Rd. Six routes provide service on this portion of Ft. Weaver Rd (41, 42, 44, 91, E, and W1)	No change
Proximity to future rail	Not in close proximity to rail, but people have access with current bus routes.	No change
Bicycle features	Existing bike lanes on both sides of Ft Weaver. Oahu Bike Plan has a proposed route on Pāpipi Rd.	Shared use path on Makai side of Pāpipi Rd (see sidewalks)
Nearby Schools	‘Ewa Beach Elementary School, ‘Ilima Intermediate School, Pohakea Elem School, James Campbell High School	No change
Nearby Institutions	‘Ewa Beach Shopping Center	No change

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Figure 3 Concepts for Pāpipi Road at Kapolei Parkway

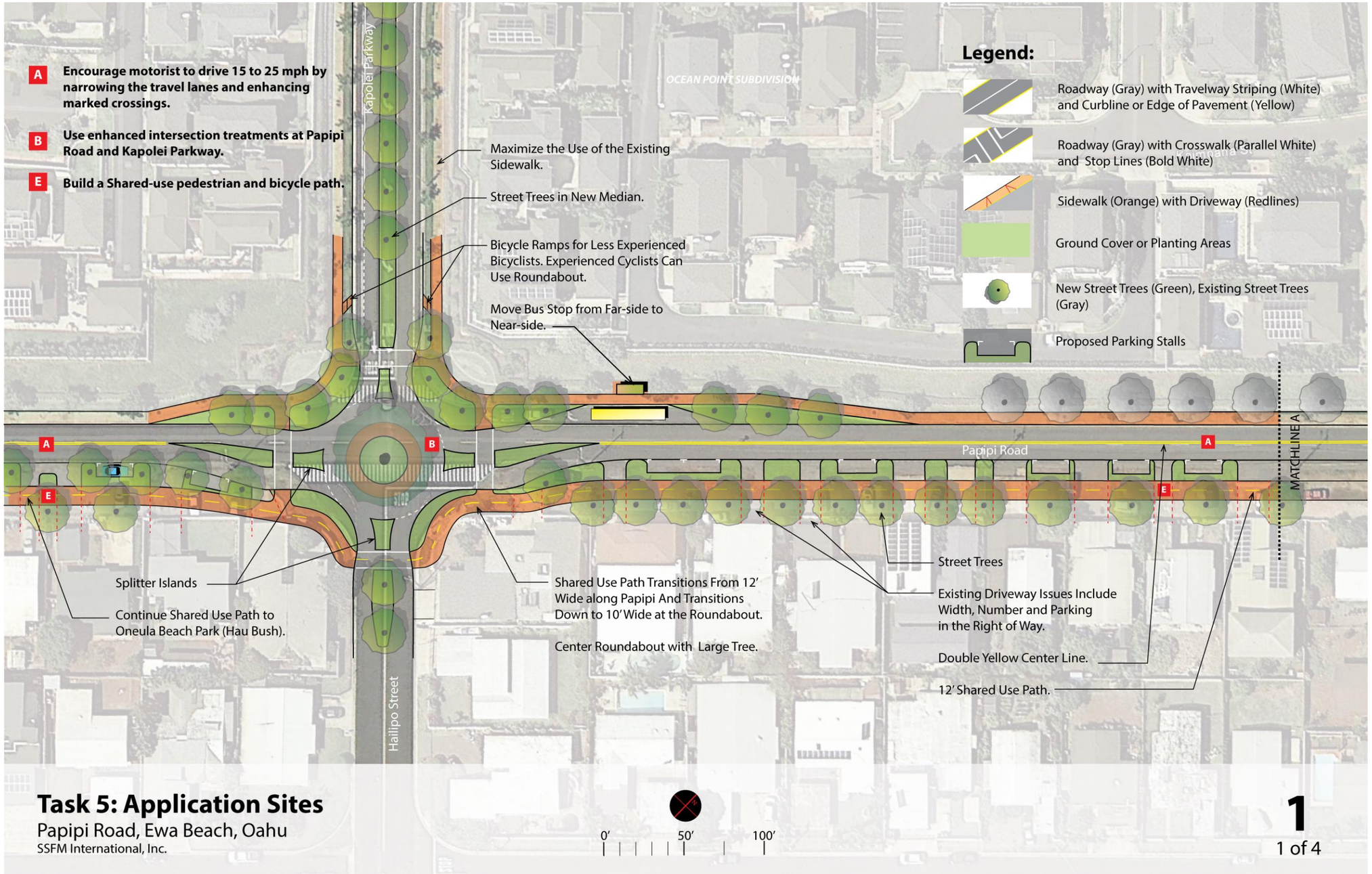

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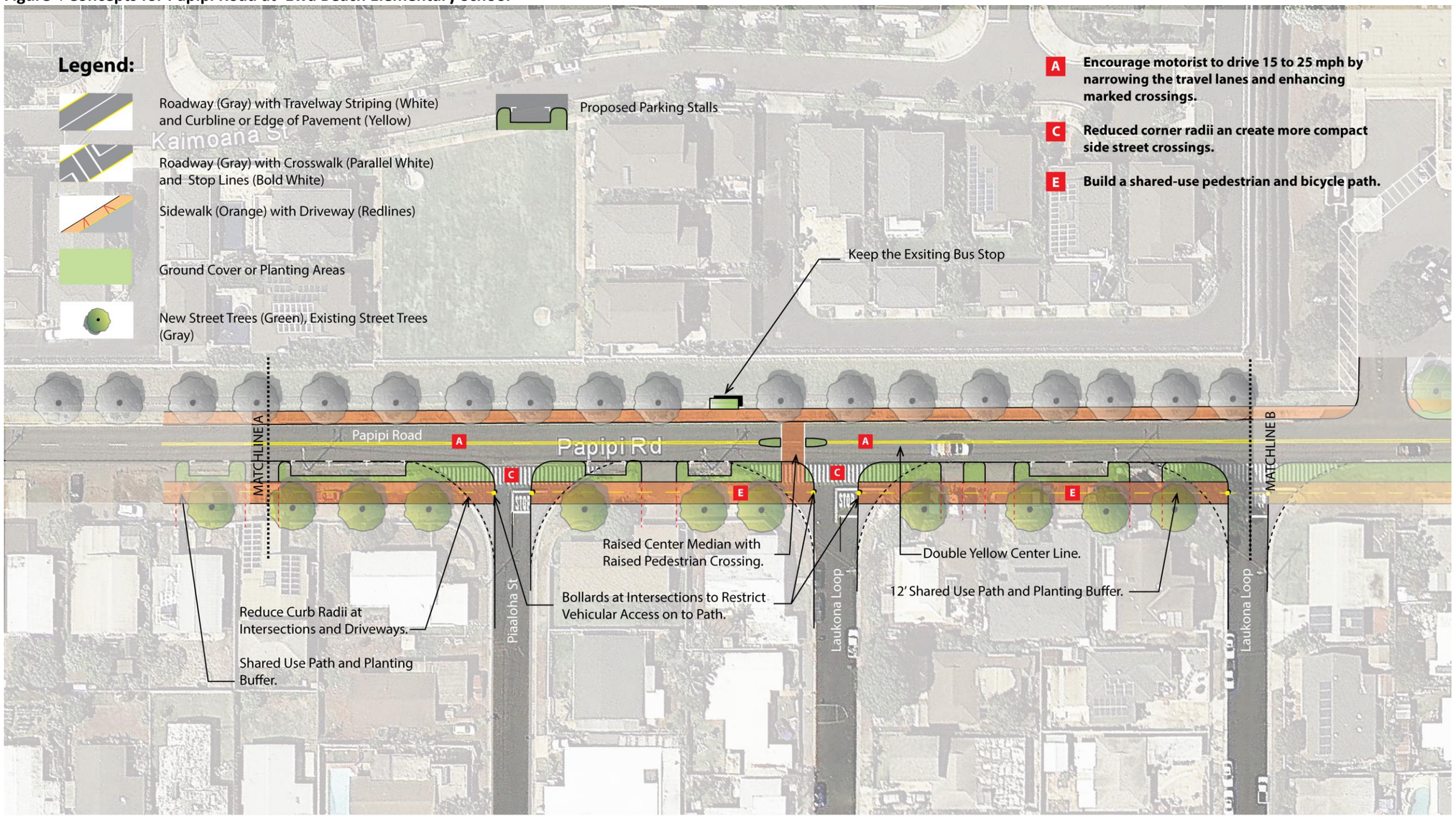
Figure 4 Concepts for Pāpipi Road at ʻEwa Beach Elementary School



Task 5: Application Sites

Papipi Road, Ewa Beach, Oahu

SSFM International, Inc.

2

2 of 4

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Figure 5 Concepts for Pāpipi Road from ʻEwa Beach Elementary School to Fort Weaver Road

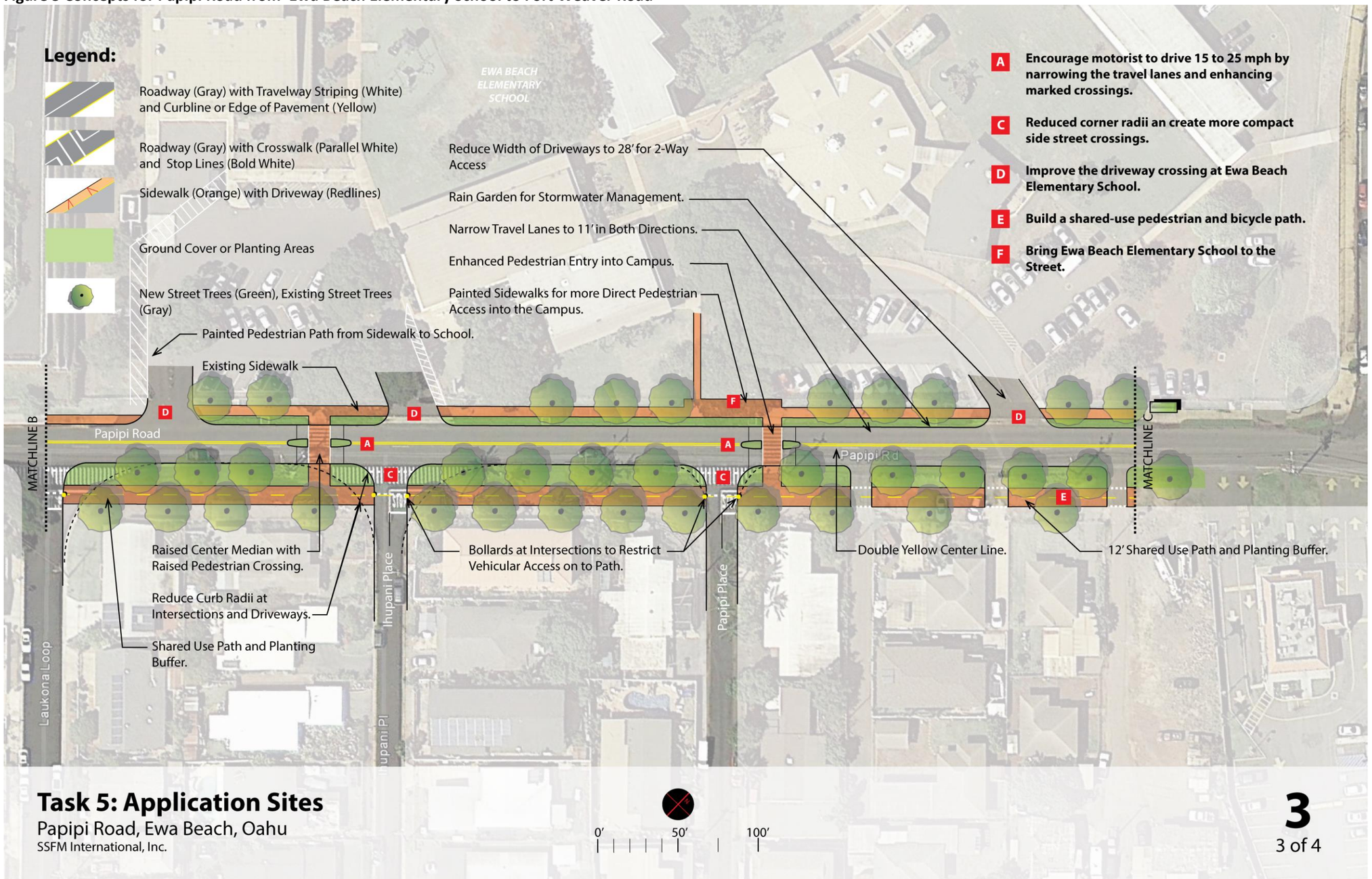

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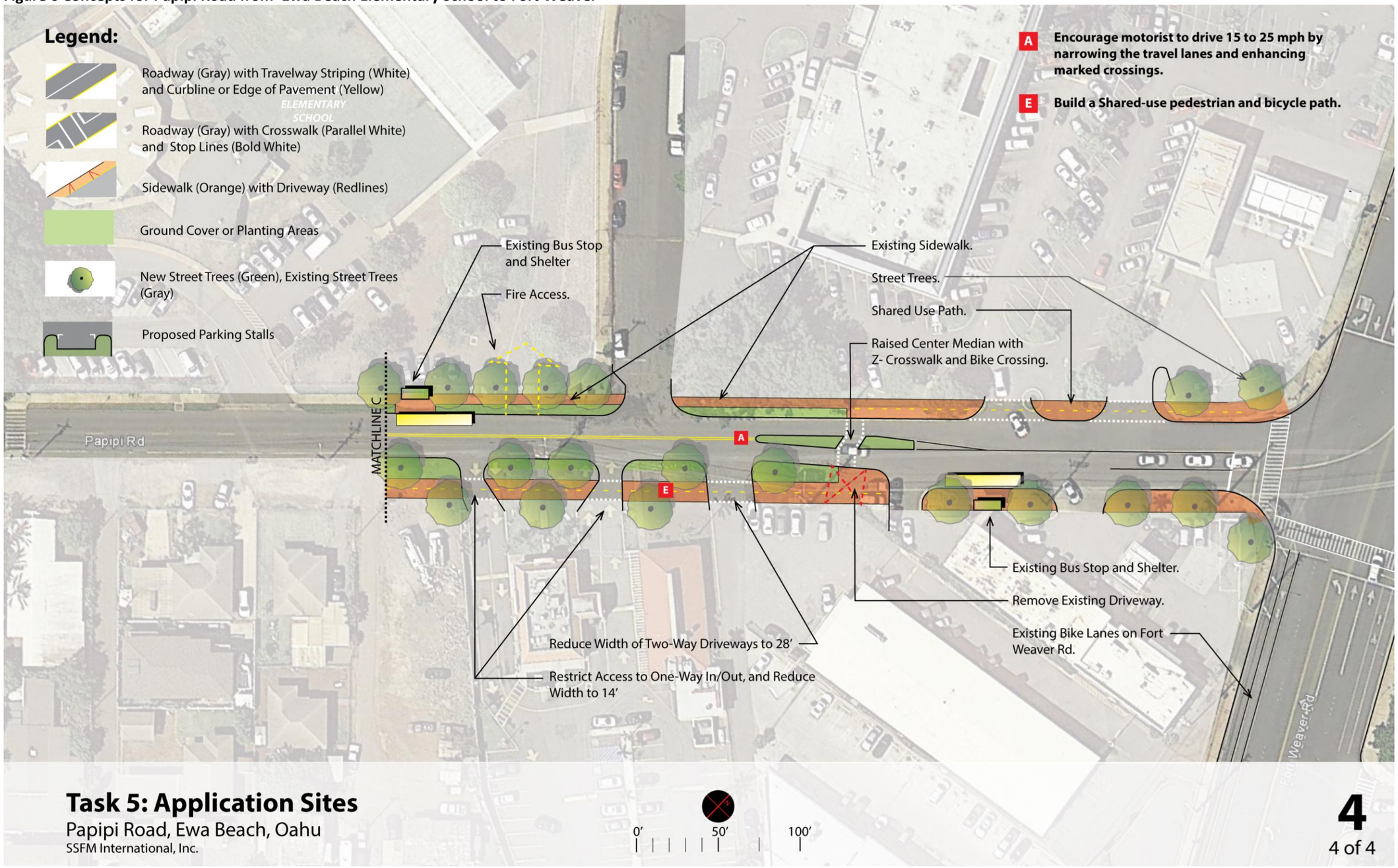
Figure 6 Concepts for Pāpipi Road from ʻEwa Beach Elementary School to Fort Weaver



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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 implemented immediately through incorporation into existing City paving, marking, or signage projects or maintenance funding. Mid-term actions are those that may require or warrant a longer planning horizon (1 to 5 years) due to logistical, financial, or other considerations. Longer-term actions are those that may require or warrant a longer planning horizon (5 years and beyond) due to logistical, financial, or other considerations.

Near-Term Actions (0-1 year):

A) *Encourage motorists to drive 15 to 25 mph by narrowing the travel lanes on Pāpipi Road and enhancing marked crossings.*

- Complete roadway restriping.

Mid-Term Actions (1 to 5 years):

A) *Encourage motorists to drive 15 to 25 mph by narrowing the travel lanes on Pāpipi Road and enhancing marked crossings.*

- Install raised speed table at crossings as a part of roadway repaving or as a stand-alone project.

C) *Reduce corner radii and create more compact side street crossings by installing curb extensions on Pāpipi Place, Ihupani Place, and Laukona Loop.*

- Complete all recommended work.

D) *Reduce the driveway crossing width at ʻEwa Beach Elementary School and neighboring commercial properties.*

- Work with the school to reduce their driveways to one lane, 14 feet, by installing AC berms.
- Paint a pedestrian path along the edge of the driveway closest to makai.

F) *Create a sense of place by better connecting ʻEwa Beach Elementary School to the street.*

- Complete all recommended work.

Longer-Term Actions (5 years and Beyond):

B) *Re-design the intersection at Pāpipi Road and Kapolei Parkway by adding a roundabout*

- Complete all recommended work

D) *Reduce the driveway crossing width at ʻEwa Beach Elementary School and neighboring commercial properties.*

- Work with commercial property owners, i.e. Taco Bell, Pizza Hut, and ʻEwa Beach Shopping Center to reduce their driveways to one-lane driveways at 14 feet, or two directional at 28-feet.
- Close driveway of shopping center located on the Diamond Head side of Pāpipi Road.

E) *Construct a shared-use pedestrian and bicycle path along Pāpipi Road.*

- Complete all recommended work.

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Part Five: Cost Sheet

ITEM	UNIT	QUANTITY	UNIT COST	TOTAL COST
Removals/Demo				
Demolish existing Pavement	Sq. Ft.	27500	$ 8.00	$ 220,000.00
Erosion Control	L.S.	1	$ 10,000.00	$ 10,000.00
Site improvements				
Roadway				
Mill and Overlay existing AC pavement	Sq. Ft.		$ 6.00	$ -
Full depth roadway construction (Parking)	Sq. Ft.	5280	$ 17.00	$ 89,760.00
12' wide Shared use path	Lin. Ft.	4200	$ 200.00	$ 840,000.00
Driveway	Sq. Ft.	8525	$ 20.00	$ 170,500.00
Drainage	each	20	$ 7,000.00	$ 140,000.00
Raised Median	Sq. Ft.	2675	$ 20.00	$ 53,500.00
4" Stripe (white/Yellow)	Lin. Ft.	4662	$ 6.00	$ 27,972.00
12"stripe (white)	Lin. Ft.	88	$ 9.00	$ 792.00
Intersection				
Full Single Lane Roundabout	each	1	$ 1,300,000.00	$ 1,300,000.00
includes sidewalk, roadway, striping and lighting				
Traffic Signal Modification	each	1	$ 350,000.00	$ 350,000.00
Landscaping				
Trees	each	106	$ 1,000.00	$ 106,000.00
Landscaping	Sq. Ft.	14850	$ 10.00	$ 148,500.00
Misc.				
Traffic Control	L.S.	1	5%	$ 172,851.20
Mobilization	L.S.	1	10%	$ 345,702.40
Contingency - 25%			25%	$ 864,256.00
Design				
Design Cost			6%	$ 290,390.02
TOTAL CONSTRUCTION				**$ 4,839,833.60**
TOTAL COST				**$ 5,130,223.62**