

MAY 2015

# HONOLULU COMPLETE STREETS IMPLEMENTATION STUDY LOCATION REPORT

## Aumoe Road and Awakea Road from Kailua Road to Wanaao Road (FINAL)



City & County of Honolulu  
Department of Transportation Services

Prepared by  
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# Summary: Aumoe Road and Awakea Road from Kailua Road to Wanaao Road

*Koolaupoko Planning Area, Kailua Sub-Area, Council District III*

## NEED FOR PROJECT

Aumoe Road and Awakea Road are residential streets that travel on either side of a small neighborhood park. The roads also provide a connection between residential neighborhoods and Kailua Beach Park, both of which are high trip generators of children. Problems noted along the roads are similar to many of those reported along neighborhood roads in communities throughout the island and include: vehicles using the roads as a cut-through; high proportion of speeding vehicles making it unsafe for bicycles and pedestrians; lack of dedicated sidewalks/pedestrian facilities; and vehicles illegally parked in the unimproved sidewalk. Other issues specific to these roads are that the skewed intersections are overbuilt, resulting in an increase in speeding and creating an unsafe and confusing crossing point for road users. All of these issues detract from the quiet neighborhood's walkability/bikeability and safety of users accessing the park and beach

Applying Complete Streets to this location will: 1) provide a safe link for pedestrians and bicyclists to the neighborhood park and beach, 2) discourage cut-through traffic, 3) slow vehicle speeds, 4) provide a bike friendly route to be considered as a future bicycle boulevard, and 5) add dedicated walking facilities on all roads in line with Complete Streets best practices.

## SUMMARY OF RECOMMENDATIONS

The recommendations create safe and attractive neighborhood streets with low vehicle speeds and sidewalks connecting residents to neighborhood amenities. Recommendations include:

- Add street trees to calm traffic and form a neighborhood transition.
- Connect sidewalk along Kailua Road to new sidewalk along Aumoe Road.
- Along Aumoe Road and Pouli Road, maintain an 18' two-way road with no centerline.
- Install 5' asphalt sidewalks buffered with 3' planted landscapes.
- Install mini-circles at all intersections.
- Along Awakea Road install curb extensions and stripe for 12' wide travel way.
- Stripe crosswalk on all legs of the intersection of Wanaao Road and Awakea Road.
- Along Wanaao Road at Awakea Road, move westbound bus stop to the near side of the intersection.
- Add placemaking features to Kaelepulu Mini Park.



## COST BREAKDOWN

Total: \$930,093.40

Design: \$84,553.95

Construction: \$845,539.45

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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 care 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 Hawaii 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, applying 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 Oahu for in-depth study to illustrate how Complete Streets can be applied in specific locations. This report describes one of the selected sites and presents recommendations to implement Complete Streets at that location.

## **STUDY AREA**

The subject of this assessment is Aumoe Road and Awakea Road which are residential streets that run parallel to the mauka-makai section of Kailua Road, in the Kailua Sub-Area (Figure 1). Aumoe and Awakea Roads serve residential neighborhoods and travel on either side of a small neighborhood park with playground, resulting in an area that has high usage by children walking and riding bikes. However, these roads also provide a way to bypass the congested traffic signal at Wanaao Road and Kailua Road. Input from stakeholders and observations in the field confirmed that the streets are heavily used by high-speed, cut-through traffic. The streets are also well-used by neighborhood residents on foot and bicycle accessing nearby destinations such as schools, Kaelepulu Mini Park, Kailua Beach Shopping Center, and Kailua Beach Park. Many people on bicycles use these roads in lieu of Kailua Road which has a higher volume of vehicle traffic and limited dedicated space for bicycles. The lack of paved sidewalks on Aumoe and Awakea Roads means that people walking and bicycling are forced to use the street.



## NEED FOR PROJECT

Complete Streets treatments often focus upon retail or commercial corridors; however, trips start and end at home. Residential neighborhoods also need Complete Streets so people feel comfortable walking, bicycling, and playing on their streets. This location was selected because it serves a dense (10,000 sq-ft lots) residential neighborhood, and contains a popular neighborhood amenity (Kaelepulu Mini Park).

Aumoe Road spans approximately 1,700 feet (~0.3 miles) from the intersection with Kailua Road to Wanaao Road. Awakea Road is approximately 1,400 feet long. Both Aumoe and Awakea Roads lack sidewalks. Walking facilities in the residential context make short trips (for errands, visiting friends, etc.) feasible by foot, increase community health, and connect people to neighboring roads like Kailua Road that contain retail and commercial uses and connect to major destinations such as schools and the beach.

Residential streets that parallel collectors are often prone to cut-through traffic and speeding. Because of its location in the network, Aumoe Road in particular is heavily used by cut-through traffic (3,500 ADT) heading toward the beach. Vehicles turn right from Wanaao Road onto Aumoe Road, winding through until it intersects with Kailua Road. Similarly, Awakea Road (900 ADT) is an extension of Ka Awakea Road, providing an alternative mauka-makai connection to the Enchanted Lake neighborhood.

The posted speed limit is 25 mph on Aumoe Road and 20 mph on Awakea Road, but vehicle speeding is a chronic concern. The roads have segments that are long and straight with few street trees or visual cues for motorists to slow their speed. The skewed angle of Aumoe Road results in large irregular intersections (90 feet of pavement at the widest section). Appropriately spaced traffic calming designs can reduce travel speeds to the desired speed limit, and make cut-throughs less attractive to drivers. Even though accident data does not point to a chronic safety issue, removing the barriers to walkability and bikeability would increase multimodal travel.

Adding sidewalks, reducing curb radii, and installing traffic calming measures such as speed humps, curb extensions, and mini-circles will create a pleasant neighborhood street, linking the community to community amenities and slowing through traffic. Improving amenities at Kaelepulu Mini Park will provide a greater sense of place for the community to embrace the adjacent roads.



*Aumoe Road and Awakea Road lack sidewalks and are narrow, meaning drivers must get into the center of the road to pass people on foot or bicycle. Aumoe Road's angle cutting across the street grid results in large intersections.*

## 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 crash data within the study area.

The 0.3-mile long study area, from the short section of Kailua Road connecting to Aumoe Road down Aumoe Road and Awakea Road to Wanaao Road is narrow, with 20' of paved surface and bi-directional traffic. Neither road includes walking facilities; people currently walk in vehicle lanes. This is consistent with the relatively low walk scores, which suggest the area is not very conducive to walking<sup>1</sup>. Both roads are zoned entirely as residential. Neither is a designated bicycle route per the current version of the Oahu Bicycle Plan, but are included in the Bike Plan Hawaii as a bike route.

The makai side of the study area begins at Kailua Road. This large intersection has free right turns and high speeds. Traveling along Aumoe Road mauka-bound, the street passes through single-family home land uses. The asphalt edge of the paved way is quite high at certain points. The intersections at Awakea Road and Pouli Road meet Aumoe at skewed angles, creating large triangular intersections.

Both Awakea Road and Aumoe Road intersect Wanaao Road, but Aumoe Road experiences much higher volumes. Two bus routes run along Wanaao Road, with a stop at the intersection with Awakea Road.

### *Usage Patterns*

Table 1 describes existing usage patterns by pedestrians, bicyclists, vehicles, and transit users in the study area. Data on pedestrian use is not available, however a walking audit conducted in the summer of 2014 revealed moderate levels of pedestrian activity mid-day. Area schools report that 10-30% of students walk to school, meaning pedestrian levels are likely high in the morning and afternoon.

Bicycle count data is not available for the study area, although data from Kailua Intermediate School (less than 0.5 miles away) reports that more than 1/3 of their 700 students bike to school.

Two bus routes, the 57 and 85, run along Wanaao Road connecting Kailua to Honolulu. Ridership is fairly low, with 84 total daily boardings and alightings.

The quiet residential context of both streets would suggest there would be low vehicle volumes and low speeds; however, their role in the transportation network running parallel to Kailua Road means Aumoe Road, in particular, is used by non-local traffic. Drivers turn off of Wanaao Road onto Aumoe Road to avoid the congested signalized intersection of Kailua Road and Wanaao Road. This cut-through pattern becomes evident when examining vehicle volumes – Aumoe Road carries more than 3,500 vehicles per day (high for a residential street) while Awakea, which serves the same residential density, carries just 900 vehicles per day. Speeding has also been an issue on Aumoe Road, as evidenced by speed humps previously installed to calm traffic.

Seven collisions occurred over a three-year period from 2011-2014 near the study area. Of those seven collisions, two occurred on Aumoe Road. The others occurred on Kailua Road and Wanaao Road.

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<sup>1</sup> Walk score is an index of walkability based on proximity to amenities and destinations (e.g., grocery stores, schools, parks, and retail), and is developed by “Walk Score” a private company (<https://www.walkscore.com/>).



**Table 1 Existing Usage Patterns along Aumoe Road and Awakea Road**

<p>Pedestrian Use</p>	<p><b>Moderate pedestrian usage.</b> Residents and visitors use these streets to get to and from Kailua Beach Park and Kaelepulu Mini Park. A high percentage of students walk to school: ~60 (out of 600) Kailua Intermediate School students, ~108 (out of 360) Kailua Elementary School students.</p>
<p>Bicycle Use</p>	<p><b>Moderate bicycle usage.</b> This road serves as a lower-speed alternative to the higher volume/speed Kailua and Wanaao Roads for travel between the Keolu Drive bike lanes and the Kailua Beach Park bike path. A high percentage of students bike to school: ~210 (out of 600) Kailua Intermediate School students, ~36 (out of 360) Kailua Elementary School students. These students may use Aumoe Road or Awakea Road to get to school.</p>
<p>Transit Use (Average Daily Ridership. Source: <i>Global Stop Summary by Trip, TheBus, 2012</i>)</p>	<p><u>Bus Stops</u> Wanaao Road + Awakea Road: 37 Average daily ridership (ADR) Wanaao Road + Pouli Road (eastbound): 8 ADR Wanaao Road + Pouli Street: 9 ADR Wanaao Road + Kailua Road: 33 ADR</p> <p><u>Boardings and Alightings by Route</u> Route 57 (Kailua - Waimanalo - Sea Life Park): 76 ADR Route 85 (Windward Express): 8 ADR</p>
<p>Daily Vehicular Volumes (Source: <i>Historical Traffic Station Maps, HDOT, 2013-2009</i>)</p>	<p>Aumoe Road (makai) between Awakea Road and Kailua Road (2014) - 4,000 Aumoe Road (mauka) between Awakea Road and Wannao Road (2014) - 3,500 Awakea Road between Aumoe Road and Wannao Road (2014) - 1,000</p>
<p>Use by Trucks or Large Vehicles (Source: <i>Historical Traffic Station Maps, HDOT, 2013</i>)</p>	<p>Current use by trucks as a cut-through to bypass the traffic signal at the intersection of Kailua Road and Wanaao Road.</p>
<p>Peak Periods (Source: <i>Historical Traffic Station Maps, HDOT, 2013</i>)</p>	<p>Awakea Road: Wanaao Road to Auwinala Road (2011) - 7:30 AM to 8:30 AM, 4:30 PM to 5:30 PM Aumoe Road (makai) between Awakea Road and Kailua Road (2014) - 7:15 AM to 8:15 AM, 4:30 PM to 5:30 PM Aumoe Road (mauka) between Awakea Road and Wannao Road (2014) - 7:00 AM to 8:00 AM, 4:30 PM to 5:30 PM Awakea Road between Aumoe Road and Wannao Road (2014) - 7:15 AM to 8:15 AM, 4:30 PM to 5:30 PM</p>
<p>Accident History (Sources: <i>State of Hawai'i Motor Vehicle Accident Reports, Honolulu Police Department, Records Division, 2011-2014</i>)</p>	<p>Aumoe Road and Mahealani Place intersection: 1 bicycle collision Aumoe Road between Awakea Road and Pouli Road: 1 motorcycle collision Wanaao Road and Aumoe Road intersection: 1 car collision Kainalu Drive and Kailua Road intersection: 1 bicycle collision Kailua Road and Mahealani Place intersection: 1 motorcycle collision Kailua Road and Wanaao Road intersection: 1 bicycle and 1 car collision</p>

## Part Two: Field Work and Key Findings



*The walking audit brought together 13 stakeholders on Sept. 17, 2014 from the City and County of Honolulu, the Department of Transportation Services, and neighborhood leaders.*

### STAKEHOLDER INPUT

Community stakeholders participated in a walking audit on Wednesday, Sept. 17, 2014. SSFM International, Inc., and a team of national consultants, including Dan Burden, national walkability expert, led a walking audit with 13 members of the community and Department of Transportation Services (DTS). The following stakeholder groups participated in the walking audit:

- City and County of Honolulu (DTS), including Mark Garrity, Li Jaena, Yamato Milner, Randall Kurashige, Craig Chung, Jay Egusa, Paul Texeira, and Diane Overland;
- Representatives from state agencies, including Heidi Smith from the Department of Health;
- Neighborhood leaders including Daniel Alexander from the Hawaii Bicycling League;
- Local residents and community activists from the Kailua Urban Design Task Force including Barrie Morgan and Sarah Shanahan;
- Representatives from political offices, including Jennifer Bara from the Office of Senator Thielen;
- Consultant Team: Mike Packard, Alan Fujimori, Juanita Wolfgramm, and Mike Motoki from SSFM, Dan Burden and Samantha Thomas from Blue Zones, Stephanie Wright from Nelson\Nygaard.

Together, the group identified conditions that affect active living, social connectivity, access to daily needs, and safe routes to school, work and play. The key issues identified by participants included:

- No dedicated walking facilities throughout the study area.
- For a residential neighborhood during mid-day, observers noticed medium-high levels of vehicle traffic.
- Many drivers cut through the neighborhood to avoid the Kailua Road and Wanaao Road signal.
- There are no traffic controls along Aumoe Road, resulting in high vehicle speeds.



*Participants shared barriers and opportunities for Complete Streets along Aumoe Road and Awakea Road.*

**Photo descriptions:** Top row – Participants create a human mini-circle; Resident walking through the neighborhood; Middle row - Members of the walk audit including Dan Burden of Blue Zones; Bottom row – Walking audit participants share thoughts during and after the tour.



*During the walking audit, several people were observed walking and bicycling through the area. **Photo descriptions** clockwise from top left: Cyclist riding along Aumoe Road adjacent to cars parking in the unimproved sidewalk; Jogger on Aumoe Road; Jogger running on the grass in the unimproved sidewalk area; Woman pushing a stroller alongside of road; Playground at Kaelepulu Mini Park; Children riding tricycles and playing on skateboards along Awakea Road.*

## FINDINGS

This section summarizes key findings based on observations made by the consultant team with input from DTS staff and community stakeholders who participated in the walking audit. These inform the recommendations summarized in the next section.

*Finding: No walking facilities connecting Kailua Road to Aumoe Road.*

Kailua Road acts as the main mauka-makai route, providing a connection between Kailua Town and the beach. It also has commercial uses at the Kailua Beach Shopping Center just north of Aumoe Road. No walking connections exist along this short stretch of road. Turning vehicles coming from Kailua Road and Aumoe Road have limited visibility of people who may be walking along this section of roadway.



*Kailua Road sidewalks end at Aumoe Road.*

*Finding: No dedicated walking or bicycling facilities exist along Aumoe Road or Awakea Road.*

Aumoe Road and Awakea Road are narrow (20' total) with high asphalt edges in places. Vehicles often park illegally in the unimproved sidewalk. Pedestrians and cyclists must therefore travel in vehicle lanes. The neighborhood park and nearby schools result in many children walking along (or are carried along) these roads.



*The lack of paved sidewalks along Aumoe Road and Awakea Road force pedestrians and cyclists to use vehicle lanes. Photo descriptions: pedestrians in the travelway of Aumoe Road*

*Finding: The intersection of Aumoe Road and Mahealani Place is wide which results in high-speed turning vehicles.*

For drivers coming from Kailua Road turning right onto Aumoe Road and drivers on Aumoe Road turning left toward Kailua Road, no traffic control exists. According to stakeholders, many drivers use Aumoe Road as a cut-through to avoid the signal at Kailua Road and Wanaao Road. The drivers turn from Wanaao Road and travel on Aumoe Road, then cut back over onto Kailua Road at this intersection.

The intersection of Aumoe Road and Mahealani Place is overly wide. The turning radii are large, which permit motorists to make turns extremely fast. This increases the chance that a motorist may fail to anticipate a pedestrian crossing the street or a cyclist sharing the road at this intersection. Excess asphalt, moderates low vehicle traffic volumes (3,800 ADT), and many people walking—especially children—can make this a key intersection to apply neighborhood traffic-calming tools.

One possible solution to the issues described above is a small island called a mini-circle. The walking tour participants felt the width of the intersection could accommodate a mini-circle that would slow drivers. Mini-circles add an extra curve into a driver’s movements, whether traveling straight or turning. Drivers approaching the human mini-circle slowed down and took extra time navigating the turn.



*Walking tour participants create a makeshift human mini-circle.*

*Finding: The skewed intersections of Aumoe Road at Awakea Road and Aumoe Road at Pouli Road exacerbate speeding.*

Pouli Road and Awakea Road meet Aumoe Road at a skewed angle, resulting in large triangular intersections (90' of pavement at the widest section). The way Aumoe Road widens out at these intersections gives a visual signal to drivers that causes an increase in speed (the speed limit is 25 mph). No marked crossings exist connecting residents across these intersections and to the park.



*Aumoe Road and Pouli Road.*



*Aumoe Road and Awakea Road.*

*Finding: Kaelepulu Mini Park is a local asset to the surrounding community but lacks amenities such as shade and safety.*

Kaelepulu Mini Park is well used by children, families, sports teams, dog owners, and recreational sports enthusiasts. During the middle of the day, the lack of shade trees results in low use. At night, the lack of lighting results in a place prone to vandalism and illegal activity.



*Finding: The town has previously tried to address speeding issues.*

Speed humps installed along Aumoe Road (500' apart) are evidence of prior neighborhood concerns about speeding and attempts to calm traffic. Speed humps also exist on Kakahiaka Street, the road running parallel to the east of Aumoe Road. Anecdotal information from longtime residents suggest that former requests and signed petitions for added measures along Aumoe Road and Awakea Road were dismissed. Added traffic volumes along the roads has exacerbated this condition, degrading the local residents' livability in favor of faster vehicle speeds.



*Speed humps along Aumoe Road.*

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## Part Three: Recommended Application of Complete Streets Concepts

This section describes application of Complete Streets concepts to Aumoe Road and Awakea Road with written description and 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 on Aumoe Road and 20 mph on Awakea Road
- Promote safer street crossings
- Improve community ownership and sense of place

### COMPLETE STREETS RECOMMENDATIONS

#### *Conceptual Illustrations of Recommendations*

Figures 3, 4, 5, and 6 graphically show how Complete Streets principles can be applied to transform Aumoe Road and Awakea Road within the study area. The conceptual drawings depict the recommended improvements along three segments of the road:

- Aumoe Road at Mahealani Place (Figure 3)
- Aumoe Road from Awakea to Pouli Roads (Figure 4)
- Awakea Road at Wanaao Road (Figure 5)
- Aumoe Road at Wanaao Road (Figure 6)

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

#### *Description of Recommendations*

The recommendations in Figures 3-6 are summarized below.

##### **A) Add street trees to calm traffic and form a neighborhood transition.**

- Along the segments of Aumoe Road and Awakea Road, from the intersection at each road, mauka to Wanaao Road, add street trees to calm traffic and create a gateway.

##### **B) Connect sidewalk along Kailua Road to new sidewalk along Aumoe Road.**

- Add an asphalt sidewalk on the mauka side of the segment connecting Kailua Road to Mahealani Place.

**C) Along Aumoe Road and Pouli Road, maintain an 18' two-way road with no centerline and a 1' wide white stripe along the road edge.**

- Currently, these roads measure 20' from pavement edge to edge. To better delineate the travel way and to protect the new asphalt sidewalk, stripe a 1' high-visibility white stripe on each side of the road.
- The paved section will remain 20' wide, but visually the street through zone for drivers narrows to 18' – still plenty of room for two drivers to pass each other.
- Remove the centerline. Wider lanes and wider streets result in higher speeds (despite the posted speed). Many communities promote removing the centerline on residential streets to reduce speeds by softening the appearance of the roadway.<sup>2</sup> The Manual on Uniform Traffic Control Devices also states that centerlines are not needed on urban roads with ADT below 6,000 (which is true for all three roads).<sup>3</sup>

**D) Install 5' asphalt sidewalks buffered with 3' planted landscaping strips.**

- Along Aumoe Road, create an asphalt sidewalk on both sides of the street from Mahealani Place to Awakea Road, and on the Lanikai side of the street between Awakea Road and Pouli Road. The facility would resemble the existing sidewalk along Kailua Road.
- Along Awakea Road, install a sidewalk on the Lanikai side of the street.



*Kailua Road asphalt sidewalk.*

**E) Install sharrow markings to increase utilization of the area by people on bicycles.**

- Sharrows remind bicyclists to ride further from parked cars to prevent “dooring” collisions, and show bicyclists the correct direction of travel
- Sharrows also increase the visibility of bicyclists and make motorists aware of bicycles potentially in the travel lane.

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<sup>2</sup> For one example of a residential traffic calming program, see <http://www.acgov.org/pwa/programs/traffic/measures.htm#1A>.

<sup>3</sup> <http://mutcd.fhwa.dot.gov/htm/2009/part3/part3b.htm>

**F) Install mini-circles intersections at Aumoe Road and Mahealani Place, Awakea Road, and Pouli Road.**

- Mini-circles or mini-roundabouts are used as traffic calming devices in many communities. Since there are no signals over the 0.3 mile study area of Aumoe Road, mini-circles will help slow both through and turning traffic.



*Mini-circle along a Bike Boulevard in Portland, OR*

**G) Along Awakea Road, install curb extension to add greenery, slow drivers, provide on-street parking, and stripe for 12' wide travelway.**

- Create a yield street along Awakea Road, which will provide natural pedestrian crossing points, and provide a midblock curb extensions. Curb extensions can be landscaped to enhance greenery and add minimal impervious surface to the street.
- Extend curb at Wanaao Road and Awakea Road to reduce turning speed.



*Yield street with sharrows and parking on one side of Coyne Street, Honolulu.*



*Curb extensions visually narrow the street and add locations for landscaping.*

**H) Stripe all legs of the intersection of Wanaao Road and Awakea Road.**

- Stripe all four legs of the intersection to improve pedestrian connectivity to neighborhoods and bus stops.

**I) Along Wanaao Road at Awakea Road, move westbound bus stop to the near side of the intersection.**

- The bus stops along Wanaao Road have very narrow waiting areas. Moving the bus stops to the near side of the intersection will provide a larger waiting area.
- As the bus stop with the highest boardings and alightings in the project area, this stop should have additional amenities such as a bench, trashcan, and shelter to make a more comfortable waiting area.

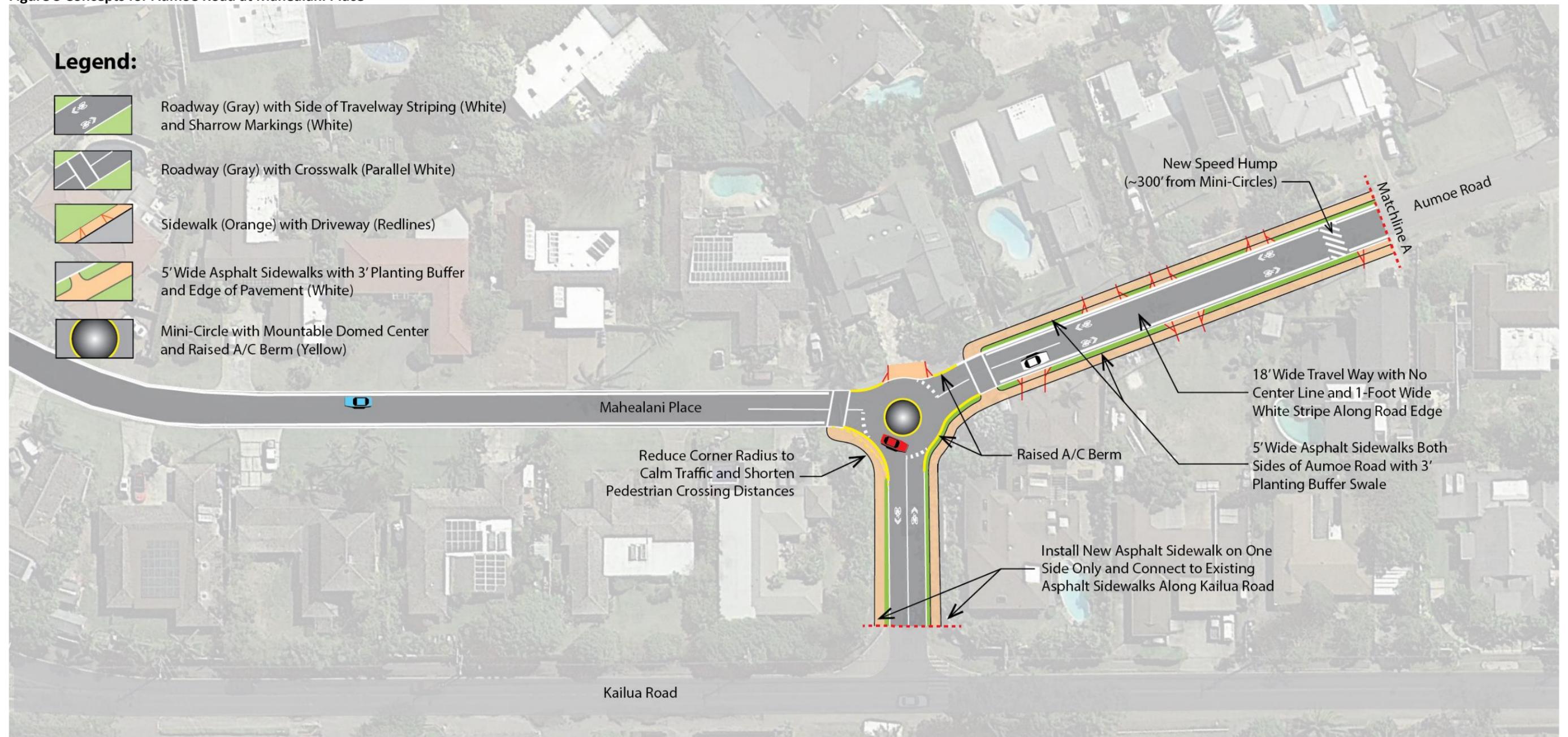
**J) Add placemaking features to Kaelepulu Mini Park to improve neighborhood space and discourage vandalism and illegal activities.**

- Benches, lights, and shade trees can be used to enhance the neighborhood environment and community sense of ownership.

**Table 2 Proposed Design Changes to Aumoe Road and Awakea Road**

	CURRENT	AFTER RECOMMENDATIONS ARE IMPLEMENTED
Type of Facility	Local Street	No Change
Street Width	Aumoe Road: ~20' Awakea Road: ~20'	Aumoe Road: marked for 18' Awakea Road: marked for 12' (with traffic calming devices)
Speed Limit	Aumoe Road: 25 mph Awakea Road: 20 mph	Aumoe Road: 20 mph (with traffic calming) Awakea Road: 20 mph
Crosswalk Length (longest)	Awakea Road and Wanaao Road: 62' (unmarked)	Awakea Road and Wanaao Road: 37' (marked)
Number of Lanes	One mauka-bound (10'); One makai-bound (10')	18' two-way roadway, no centerline
Distance to Side Streets	Along Aumoe Road: ~700' between Wanaao Road and Pouli Road, 450' between Pouli Road and Awakea Road, and ~450 between Awakea Road and Mahealani Place	Same
Driveways	Residential area with driveway access along Awakea Road and Aumoe Road	Same
Parking	Parking on unimproved sidewalk. No parking along Kaelepulu Mini Park from 8:00PM to 6:00AM	No parking on paved sidewalks
Sidewalks	No improved sidewalks in project area	5' asphalt sidewalks along one side of Aumoe Road and Awakea Road with street trees lining road
Transit Routes, Stops, Shelters	Four stops along Wanaao Road within the project area. Eight additional stops within 1/8 mile of the project area.	Relocated eastbound bus stop at intersection of Awakea Road and Wanaao Road to near-side of intersection
Proximity to Future Rail	Not in close proximity to the future rail	Same
Bicycle Features	No bicycle facilities on Aumoe Road or Awakea Road.	Future use as bicycle boulevard along Aumoe Road/Awakea Road/Ka Aeakea Road/Pouli Road/Wanaao Road
Nearby Schools	Kailua Intermediate School and Kailua Elementary School	Same
Nearby Institutions	Kailua Town Center (1/4 mile), Kaelepulu Mini Park, Kailua Beach Park (1/4 mile)	No change

Figure 3 Concepts for Aumoe Road at Mahealani Place



### Task 5: Application Sites

Aumoe Road and Awakea Road, Kailua, Oahu  
 SSFM International, Inc.



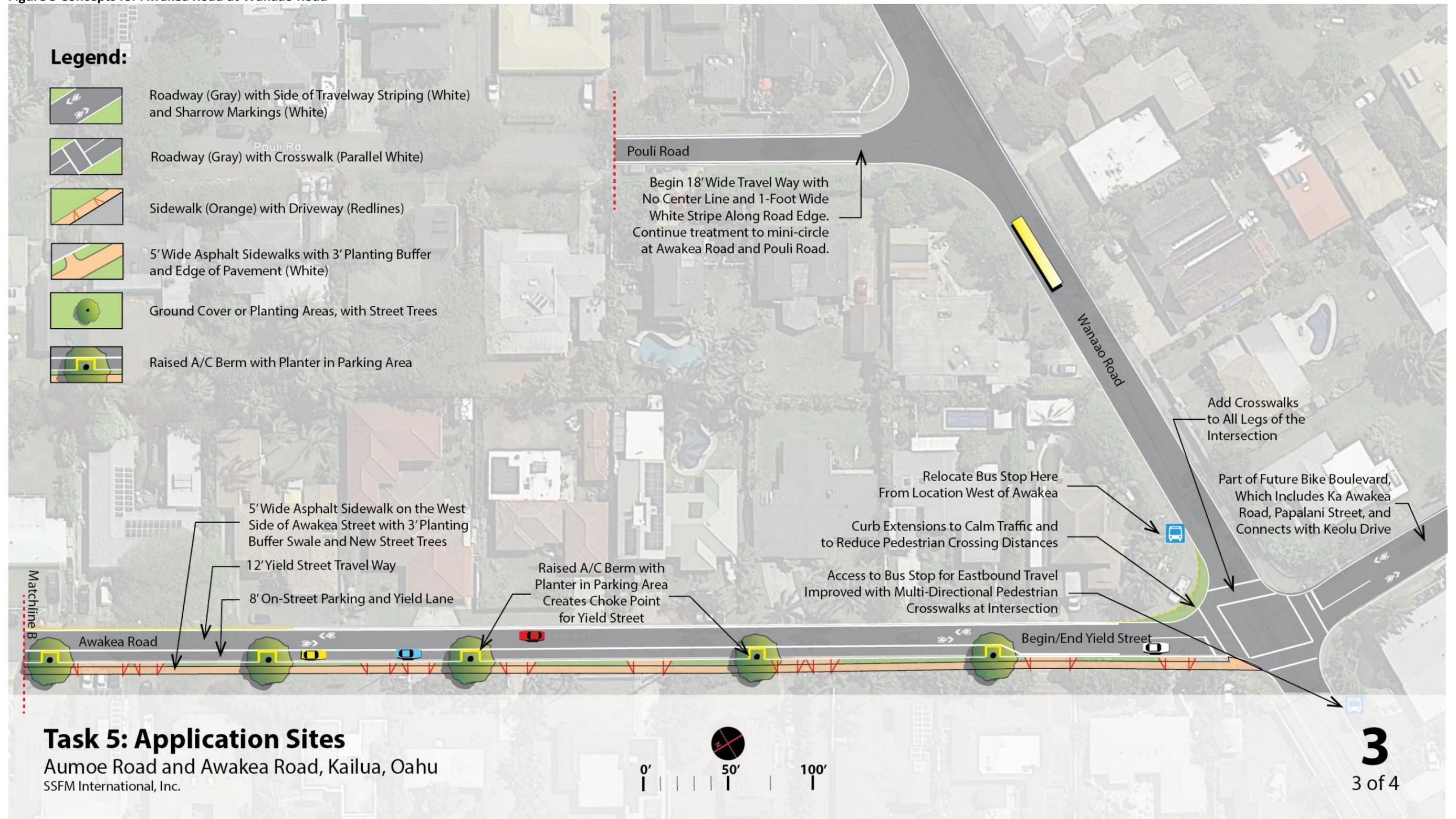
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Figure 4 Concepts for Aumoe Road from Awakea to Pouli Roads



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Figure 5 Concepts for Awakea Road at Wanao Road



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Figure 6 Concepts for Aumoe Road at Wanaao Road



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## Part Four: Implementation

This section presents a timeline for actions that supports 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 an even longer planning horizon (5 years and beyond).

### **Near-Term Actions (0-1 year):**

- A) Add street trees to calm traffic and form a neighborhood transition.**
  - Identify shade tree with low impact root base
- B) Connect sidewalk along Kailua Road to new sidewalk along Aumoe Road.**
  - Remove unpermitted vegetation and structures from public right-of-way
- C) Along Aumoe Road, Awakea Road, and Pouli Road, maintain an 18' two-way road with no centerline and a 1' wide white stripe along the road edge.**
  - Remove the centerline and install 1' edge striping
- D) Install 5' asphalt sidewalks buffered with 3' planted landscaping strips.**
  - None
- E) Install sharrow markings to increase utilization of the area by people on bicycles.**
  - Install sharrow markings and associated bike signage
- F) Install mini-circles with mountable centers at Aumoe Road and Mahealani Place, Awakea Road, and Pouli Roads.**
  - Install mini-circles using striping and raised pavement markers to delineate the edge of roadway, the center island, and appropriate pavement markings
  - Install associated signage such as yield signs (R1-2), and roundabout signs (R6-5P)



*Mini-circle created using striping and raised pavement markers at an intersection in California. Project for Public Spaces labels this type of solution as “Lighter, Quicker, Cheaper,” referring to the ability to easily implement an idea, assess, and then tweak it based on the community's response.*

- G) Along Awakea Road, install curb extension to add greenery slow drivers, provide on-street parking, and stripe for 12' wide travelway**
  - Install concrete planters on the side of the road to create choke points and to inset parking
  - Install 1' edge striping for 12' wide yield road
- H) Stripe all legs of the intersection of Wanaao Road and Awakea Road**
  - Stripe crosswalks on all four legs of the intersection
- I) Along Wanaao Road at Awakea Road, move westbound bus stop to the near side of the intersection**
  - Move the bus stops to the near side of the intersection
- J) Add placemaking features to Kaelepulu Mini Park to improve neighborhood space and discourage vandalism and illegal activity**
  - Install park benches in appropriate places

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

- A) Add street trees to calm traffic and form a neighborhood transition**
  - Install planters or work with community to plant appropriate tree species
- B) Connect sidewalk along Kailua Road to new sidewalk along Aumoe Road**
  - Construct an asphalt sidewalk on the mauka side of the segment connecting Kailua Road to Mahealani Place
- C) Along Aumoe Road, Awakea Road, and Pouli Road, maintain an 18' two-way road with no centerline and a 1' wide white stripe along the road edge**
  - None
- D) Install 5' asphalt sidewalks buffered with 3' planted landscaping strips**
  - Construct an asphalt sidewalk along Aumoe Road from Mahealani Place to Awakea Road, and on the Lanikai side of the street between Awakea Road and Pouli Road
- E) Install sharrow markings to increase utilization of the area by people on bicycles**
  - None
- F) Install mini-circles with mountable centers at Aumoe Road and Mahealani Place, Awakea Road, and Pouli Roads**
  - Install mini-circles using A/C berms (or similar) to delineate the edge of travelway and striping to delineate the center island
- G) Along Awakea Road, install curb extension to add greenery slow drivers, provide on-street parking, and stripe for 12' wide travelway**
  - Install A/C berm (or similar) curb extensions to protect planters
- H) Stripe all legs of the intersection of Wanaao Road and Awakea Road**
  - None
- I) Along Wanaao Road at Awakea Road, move westbound bus stop to the near side of the intersection**
  - Install additional bus stop amenities such as benches and trashcans
- J) Add placemaking features to Kaelepulu Mini Park to improve neighborhood space and discourage vandalism and illegal activity**
  - Install shade trees in park

***Longer-Term Actions (5 years and beyond):***

- A) Add street trees to calm traffic and form a neighborhood transition.**
  - Install tree wells to protect A/C sidewalk and roadway from root damage
- B) Connect sidewalk along Kailua Road to new sidewalk along Aumoe Road.**
  - Install pedestrian scale lighting to improve the safety of the pathway and to encourage night time usage
- C) Along Aumoe Road, Awakea Road, and Pouli Road maintain an 18' two-way road with no centerline and a 1' wide white stripe along the road edge.**
  - None
- D) Install 5' asphalt sidewalks buffered with 3' planted landscaping strips.**
  - Install pedestrian scale lighting to improve the safety of the pathway and to encourage night time usage
- E) Install sharrow markings to increase utilization of the area by people on bicycles.**
  - None
- F) Install mini-circles with mountable centers at Aumoe Road and Mahealani Place, Awakea Road, and Pouli Roads.**
  - Construct mountable center island with landscaping area that can accommodate a large street tree
- G) Along Awakea Road, install curb extension to add greenery slow drivers, provide on-street parking, and stripe for 12' wide travelway**
  - None
- H) Stripe all legs of the intersection of Wanaao Road and Awakea Road.**
  - None
- I) Along Wanaao Road at Awakea Road, move westbound bus stop to the near side of the intersection.**
  - Space permitting, construct a bus shelter
- J) Add placemaking features to Kaelepulu Mini Park to improve neighborhood space and discourage vandalism and illegal activity**
  - Add low level lighting to discourage night time vandalism and illegal activity

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## 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>				
Remove existing pavement striping	Lin. Ft.	1200	\$ 3.00	\$ 3,600.00
Demolish existing Pavement	Sq. Ft.	4604	\$ 8.00	\$ 36,832.00
Erosion Control	L.S.	1	\$ 10,000.00	\$ 10,000.00
<b>Site improvements</b>				
<b>Roadway</b>				
Curb Extension	Sq. Ft.	1090	\$ 20.00	\$ 21,800.00
5' Asphalt Concrete Sidewalk	Lin. Ft.	3394	\$ 60.00	\$ 203,640.00
3' Planting Buffer Swale	Lin. Ft.	2944	\$ 15.00	\$ 44,160.00
Raised Planter	Sq. Ft.	576	\$ 15.00	\$ 8,640.00
Speed Humps	each	3	\$ 1,200.00	\$ 3,600.00
Drainage works	Lin. Ft.	9	\$ 14,000.00	\$ 126,000.00
4" Stripe (white/Yellow)	Lin. Ft.	530	\$ 6.00	\$ 3,180.00
12" Edge stripe (white)	Lin. Ft.	5210	\$ 9.00	\$ 46,890.00
12" Stripe	Lin. Ft.	230	\$ 9.00	\$ 2,070.00
Striping Symbols	each	14	\$ 300.00	\$ 4,200.00
<b>Intersection</b>				
Mini Single Lane Roundabout	each	3	\$ 15,000.00	\$ 45,000.00
<b>Landscaping</b>				
Trees	each	39	\$ 1,000.00	\$ 39,000.00
<b>Misc.</b>				
Traffic Control	L.S.	1	5%	\$ 29,930.60
Mobilization 10%	L.S.	1	10%	\$ 59,861.20
Contingency - 25%			25%	\$ 157,135.65
<b>Design</b>				
Design Cost			10%	\$ 84,553.95
<b>TOTAL CONSTRUCTION</b>				<b>\$ 845,539.45</b>
<b>TOTAL COST</b>				<b>\$ 930,093.40</b>