MAY 2015

# HONOLULU COMPLETE STREETS IMPLEMENTATION STUDY LOCATION REPORT

## Kapahulu Avenue from Kaimuki Avenue to Date Street (FINAL)

City & County of Honolulu

Department of Transportation Services


Prepared by
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# Summary: Kapahulu Avenue from Kaimuki Avenue to Date Street

*Primary Urban Center Planning Area, Kapahulu Sub-Area, Council District V*

## NEED FOR PROJECT

Kapahulu Avenue acts as a major artery connecting Waikiki and H-1. It also functions as the main street in a high-density neighborhood with high levels of bicycle and pedestrian activity. With additional streetscaping, lower vehicle speeds, and consolidated driveways, Kapahulu Avenue can become an exemplary Complete Street.

Applying Complete Streets to this location will: 1) encourage walking, 2) lower vehicle speeds, 3) create safer street crossings, and 4) strengthen the role of Kapahulu Avenue as a commercial district main street.

## SUMMARY OF RECOMMENDATIONS

The recommendations for Kapahulu Avenue create a green, inviting walking environment. The proposed improvements are designed to slow vehicle speeds to 20 mph. Recommendations include:

- Encourage lower speeds by reducing the posted speed limit to 20 mph
- Remove driveways where possible and encourage pedestrian-oriented driveway design
- Realign intersections to be perpendicular to Kapahulu Avenue
- Create public spaces and mini plazas in recovered land
- Reduce turning radii and add curb extensions to reduce crossing distance and driver speed
- Add stop lines at existing uncontrolled crosswalks
- Close right turn slip lane at Date Street
- Enable shared parking to reduce parking supply and driveway demand


## COST BREAKDOWN

Total: $5,097,548.90

Design: $288,540.50

Construction: $4,809,008.40

# Table of Contents

Part One: Introduction, Study Area, & Need for Project ..... 1
What are Complete Streets? ..... 1
Study Area ..... 1
Need for Project ..... 4
Existing Land Use, Transportation Facilities, and Usage Patterns ..... 5
Land Use, Transportation Facilities and Traffic Crashes ..... 5
Usage Patterns ..... 5
Part Two: Field Work and Key Findings ..... 9
Stakeholder Input ..... 9
Findings ..... 12
Part Three: Recommended Application of Complete Streets Concepts ..... 17
Complete Streets Recommendations ..... 17
Conceptual Illustrations of Recommendations ..... 17
Description of Recommendations ..... 17
Part Four: Implementation ..... 29
Part Five: Cost Sheet ..... 31

# List of Figures

Figure 1 Makai Study Area from Date Street to Olu Street ..... 2
Figure 2 Mauka Study Area from Olu Street to Waialae Avenue ..... 3
Figure 3 Existing Land Use, Transportation Facilities, and Accidents in the Study Area from Date Street to Olu Street ..... 6
Figure 4 Existing Land Use, Transportation Facilities, and Accidents in the Study Area from Olu Street to Waialae Avenue ..... 7
Figure 5 Concepts for Kapahulu Avenue from Kaimuki Avenue to Olu Street ..... 21
Figure 6 Concepts for Kapahulu Avenue from Mokihana Street to Winam Avenue ..... 23
Figure 7 Concepts for Kapahulu Avenue from Winam Avenue to Kamuela Avenue ..... 25
Figure 8 Concepts for Kapahulu Avenue at Date Street ..... 27

# List of Tables

Table 1 Existing Usage Patterns along Kapahulu Avenue ..... 8
Table 2 Proposed Design Changes to Kapahulu Avenue ..... 19

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

## WHAT ARE COMPLETE STREETS?

Complete Streets is a transportation policy and design approach. It 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 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 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 Kapahulu Avenue from Date Street to Kaimuki Avenue. The site lies in the Primary Urban Center Planning Area, in the Kapahulu Sub-Area, which is part of Council District V. Kapahulu Avenue is a major mauka-makai connection running from the Diamond Head (east) side of Waikiki to H-1. The section under discussion in this project runs through dense residential neighborhoods and is lined with small-scale retail. One major shopping center, between Paliuli and Olu Streets, contains a Safeway grocery store and parking structure, which attracts a high number of trips. Figures 1 and 2 show the study area.

**Figure 1 Makai Study Area from Date Street to Olu Street**

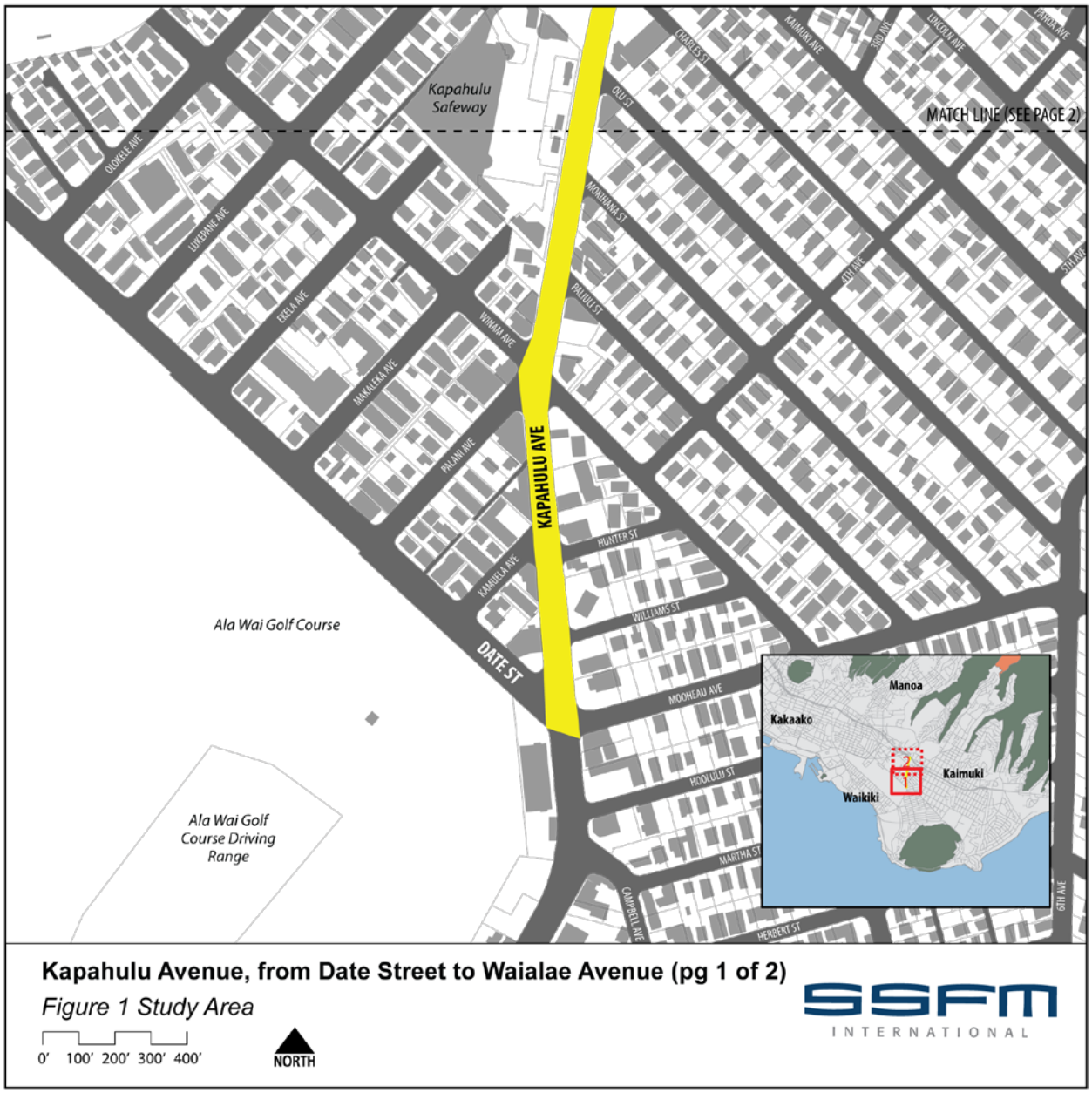


**Figure 2 Mauka Study Area from Olu Street to Waialae Avenue**


Kapahulu Avenue serves a high number of pedestrian trips, including visitors and residents in Waikiki along the makai (oceanside) end and residents accessing neighborhood retail along the rest of the corridor. Some areas of the street contain wide sidewalks and trees, while other portions, especially in the mauka (mountainside) section, have narrow sidewalks running adjacent to travel lanes and are exposed directly to vehicle traffic. Since no direct mauka-makai route runs parallel to Kapahulu Avenue, it is well-used by cyclists, but there are currently no dedicated or marked bicycling facilities.

## NEED FOR PROJECT

This location was selected for Complete Streets treatment because of its key location in the mobility network for all users, high traffic volume, presence of major destinations, safety concerns, and streetscaping needs. The street is heavily used by motorists en route to H-1 or to Waikiki, and also serves as a neighborhood main street.

Kapahulu Avenue's commercial land uses make it a great candidate for a multimodal Complete Street. No parallel facilities mirror Kapahulu Avenue's path, thus it serves as the primary route for cyclists, drivers, and people on foot. Today, all these users compete for limited street space within the 40-54 foot travel way.

Challenges to walkability include large skewed intersections that result from the diagonal orientation of Kapahulu Avenue, lack of streetscaping or buffering from traffic along the mauka end of the street, and the presence of separate driveways for nearly every parcel, resulting in frequent interruptions in the walking network.

*Many unprotected and uncontrolled crosswalks impede safe walking on Kapahulu Avenue. Here, pedestrians must rely upon five lanes of traffic coming to a stop in order to cross safely.*

*Many older adults and people with mobility devices use Kapahulu Avenue.*

During a walking audit conducted in summer 2014, older adults and people using mobility devices were commonly seen traversing Kapahulu Avenue. Making streets safe for these vulnerable users means upgrading curb ramps, minimizing crossing distances, and aligning curb ramps with crosswalks.

Challenges to bicycle use include the high volume of vehicle traffic, which makes dedicating space for cyclists difficult. While experienced cyclists may feel comfortable riding in traffic, many cyclists choose to use the sidewalk instead, creating conflicts with pedestrian traffic.

Adding street trees, protecting crosswalks with advanced stop lines, reducing the number of driveways, and reducing turning radii will create more space for walking, calm traffic, and make Kapahulu Avenue a more pleasant commercial main street.

# EXISTING LAND USE, TRANSPORTATION FACILITIES, AND USAGE PATTERNS

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

Figures 3 and 4 depict existing land use, transportation facilities, and traffic accident data within the study area. Kapahulu Avenue is entirely zoned for commercial use. Behind the commercial uses on the Diamond Head side, uses are primarily single-family residential. Multi-family residential exists behind businesses on the Ewa side. Major destinations include the Ala Wai Golf Course, Waikiki-Kapahulu Public Library, University of Hawaii, Chaminade University, St. Louis High School, the shared use path at Date Street, Safeway, and Crane Community Park. Walk scores, transit scores, and bike scores are all around the low to mid 60s, which indicate a moderately favorable environment for these modes of transportation[1].

In general, Kapahulu Avenue consists of two lanes per direction. In some areas, a dedicated left turn lane also exists. Pockets of on-street parking are scattered along the street, although parking is lightly used since many properties have dedicated off-street parking.

The diagonal alignment of Kapahulu Avenue results in several skewed intersections with excess space, including at Date Street, Kamuela Avenue, and Charles Street. One large five-leg intersection exists at the junction of Winam Avenue, Palani Avenue, and Kapahulu Avenue.

Marked crosswalks are generally appropriately spaced, with crossing opportunities every 300-400 feet. Not all marked crosswalks are controlled with stop signs or signals, meaning pedestrians must wait for four lanes of heavy bi-directional traffic to stop at uncontrolled locations before crossing.

During a four-year period, 82 total accidents have occurred along the study area. Of these 82 accidents, 11 involved bicycles, and 10 involved pedestrians. The most traffic accidents have occurred at Kapahulu Avenue and Date Street, a high-volume skewed intersection at the edge of Waikiki.

### *Usage Patterns*

Table 1 describes existing usage patterns by pedestrians, bicyclists, vehicles, and transit users in the study area. Pedestrian count data was not available, but during a field audit conducted in the summer of 2014, a high number of pedestrians were observed during the morning peak and late morning hours. Closer to Waikiki, large groups of pedestrians were seen on Kapahulu Avenue, indicating usage by residents and tourists. The Safeway also exhibited a steady stream of pedestrian activity.

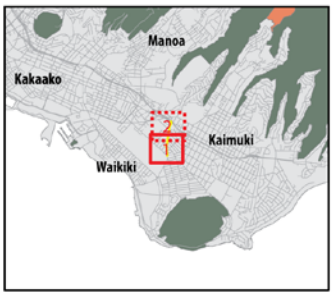
Data from counts by the Hawaii Bicycling League show a high average daily use by cyclists – 324 – using Kapahulu Avenue.

Nearly 1,000 transit users board or alight along Kapahulu Avenue every day, with the primary activity occurring at Olu Street, the location of the Safeway.

Traffic volumes along Kapahulu Avenue are between 33,000-35,000 vehicles per day. Volumes are higher at the mauka end, which is closer to H-1.

[1] Walk, transit, and bike scores are an index of walkability, transit accessibility, and bikeability (respectively) based on proximity to amenities and destinations (e.g., grocery stores, schools, parks, restaurants, and retail). Walk scores are developed by “Walk Score” a private company (https://www.walkscore.com/).

**Figure 3 Existing Land Use, Transportation Facilities, and Accidents in the Study Area from Date Street to Olu Street**


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

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## Kapahulu Avenue, from Date Street to Waialae Avenue (pg 1 of 2)

**Bicycle Facilities**
Existing=Solid, Proposed=dashed
- Lane
- Path
- Route
- Bicycle Racks

**Transit Facilities**
- Bus Route
- Bus Stop

**Walk Scores**
- ## Walk Score
- ## Transit Score
- ## Bike Score

**Traffic Accidents**
- 1 crash
- 2 crashes
- 3-9 crashes
- 10+ crashes

Red = Car/Truck,
Orange = Motorcycle/Moped,
Blue = Bicyclist,
Green = Pedestrian

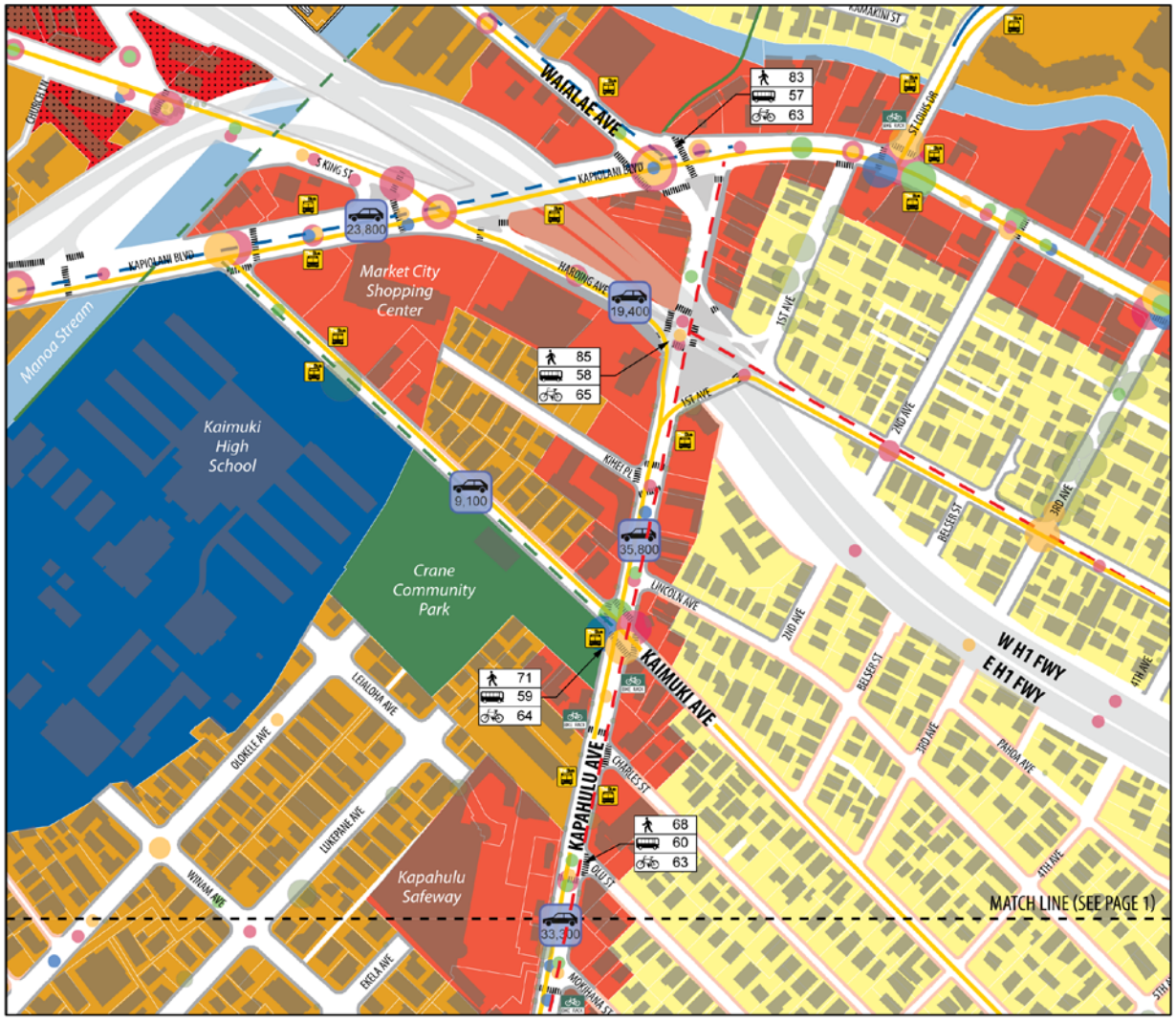
**Traffic Counts**
- ### Average Daily Traffic

**Street Trees**
- Canopy Diameter

**Existing Land Use**
- Apartment
- Business
- Institutional
- Park/Open Space
- Residential

**Pedestrian Facilities**
- No Sidewalk
- Sidewalk
- Crosswalk

**Figure 4 Existing Land Use, Transportation Facilities, and Accidents in the Study Area from Olu Street to Waialae Avenue**





0' 100' 200' 300' 400'

NORTH

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

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## Kapahulu Avenue, from Date Street to Waialae Avenue (pg 2 of 2)

**Bicycle Facilities**
Existing=Solid, Proposed=dashed
- Lane
- Path
- Route
- Bicycle Racks

**Transit Facilities**
- Bus Route
- Bus Stop

**Walk Scores**
- ## Walk Score
- ## Transit Score
- ## Bike Score

**Traffic Accidents**
- 1 crash
- 2 crashes
- 3-9 crashes
- 10+ crashes

Red = Car/Truck,
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**Traffic Counts**
- ### Average Daily Traffic

**Street Trees**
- Canopy Diameter

**Existing Land Use**
- Apartment
- Business
- Institutional
- Park/Open Space
- Residential

**Pedestrian Facilities**
- No Sidewalk
- Sidewalk
- Crosswalk

**Table 1 Existing Usage Patterns along Kapahulu Avenue**

| | |
|---|---|
| Pedestrian Use | High |
| Bicycle Use (Source: Hawaii Bicycling League three-day average daily bicycle counts, 2013) | On Kapahulu Ave at Paki Ave: 324 |
| Transit Use Average Daily Ridership (Source: *Global Stop Summary by Trip*, TheBus, 2012) | <u>Stops</u><br>Kaimuki Ave + Kapahulu Ave: 59 average daily riders (ADR)<br>Kapahulu Ave + Opp Olu St: 347 ADR<br>Kapahulu Ave + Winam Ave: 84 ADR<br>Kapahulu Ave + Date St: 67 ADR<br>Kapahulu Ave + Mooheau Ave: 88 ADR<br>Kapahulu Ave + Paliuli St: 100 ADR<br>Kapahulu Ave + Olu St: 244 ADR<br>Kapahulu Ave + Harding Ave: 0 ADR<br><br><u>Boardings and Alightings by Route</u><br>Route 13: 834<br>Route 14: 82<br>Route 18: 23<br>Route 24: 53 |
| Average Daily Traffic (Source: *Historical Traffic Station Maps*, HDOT, 2013-2009) | Kapiolani Blvd: King Street to Waialae Ave (2011) - 23,800<br>Date Street: Laau Street to Olokele Ave (2011) - 19,900<br>Kapahulu Ave: Kuhio Ave to Paki Ave (2013) - 19,900<br>Kapahulu Ave: Winam Ave to Paliuli Street (2013) - 33,300<br>Kapahulu Ave: Lincoln Ave to Kihei Place (2011) - 43,300<br>Harding Ave: Kapahulu Ave to Kapiolani Blvd (2011) - 19,400<br>Kaimuki Ave: Kapiolani Blvd to Kapahulu Ave (2011) - 9,100<br>Mooheau Ave: Kapahulu Ave to Winam Ave (2013) - 7,400 |
| Use by Trucks or Large Vehicles (Source: *Historical Traffic Station Maps*, HDOT, 2013) | Kapahulu Ave: Winam Ave to Paliuli Street (2013) - 7.27% heavy vehicles |
| Peak periods (Source: *Historical Traffic Station Maps*, HDOT, 2013) | Kapiolani Blvd (2011) - 7:00-8:00 AM, 3:00-4:00 PM<br>Date Street (2011) - 7:00-8:00 AM, 4:30-5:30 PM<br>Kapahulu Ave: Kuhio Ave to Paki Ave (2013) - 7:30-8:30 AM, 4:30-5:30 PM<br>Kapahulu Ave: Winam Ave to Paliuli Street (2013) - 7:30-8:30 AM, 4:00-5:00 PM<br>Kapahulu Ave: Lincoln Ave to Kihei Place (2011) - 7:30-8:30 AM, 4:00-5:00 PM<br>Harding Ave (2011) - 7:30-8:30 AM, 5:00-6:00 PM<br>Kaimuki Ave (2011) - 7:15-8:15 AM, 4:45-5:45 PM<br>Mooheau Ave (2013) - 7:30-8:30 AM, 4:00-5:00 PM |
| Accident History (Source*: Motor Vehicle Accident Reports,* Honolulu Police Department, 2011-2014) | Between 2007 and 2011, 82 total crashes occurred along Kapahulu Avenue. The locations with the most crashes were intersections of Date Street at Kapahulu Ave (20 crashes) and Waialae Ave at Kapahulu Ave (21 crashes). Ten bicyclists and 11 pedestrians have been involved in crashes. |

# Part Two: Field Work and Key Findings

*The walking audit brought together stakeholders on September 15, 2014 from the City and County of Honolulu, Hawaii State Capital, and Hawaii Bicycling League and the Consultant Team.*

## STAKEHOLDER INPUT

The findings of this report are informed by input received from participants in a walking audit along Kapahulu Avenue. SSFM International, Inc., and a team of national consultants, including Dan Burden, national walkability expert, led the walking audit on September 15, 2014. The following stakeholder groups participated in the walking audit:

- City and County of Honolulu Department of Transportation Services (DTS): Mark Garrity, Craig Chung, Kelly Cruz, Jack Patterson, Shawn Butler, Randall Kurashige, Chris Sayers, Rika Uechi, Yamato Milner;
- Hawaii State Capital office representative Scott Nishimoto;
- Community members: Rose Pon, Daisy Murai;
- Hawaii Bicycling League (HBL): Daniel Alexander;
- Consultant Team: Mike Packard, Alan Fujimori, and Michael Motoki of SSFM, Dan Burden and Samantha Thomas of Blue Zones, and Stephanie Wright of Nelson Nygaard.

The walking audit group discussed conditions that affect walkability along Kapahulu Avenue. Participants observed numerous intersections with overly wide turning radii, resulting in long crossing distances and high-speed turns. The importance of Kapahulu Avenue in terms of mobility, in contrast with its lack of bicycle facilities, was also discussed. In the section of Kapahulu Avenue approaching H-1, participants observed a lack of greenery, vehicles traveling faster than the posted 25 mph speed limit, and narrow sidewalks. In comparison, participates noted that the makai end of Kapahulu Avenue was well-landscaped and more pleasant for walking.






*Participants shared visions, barriers, and opportunities for Complete Streets and safer routes to school along Kapahulu Avenue. Participants generated ideas that would slow vehicles and improve safety for roadway users, including wider sidewalks, new street trees, and curb extensions.*

*Photo descriptions: Top row - DTS, community members, as well as the consultant team presenting existing conditions and constraints; Middle row – State representative and DTS staff share observations; Bottom row – Participants walked along Kapahulu Avenue, which is heavily used by people with disabilities.*


*During the walking audit of Kapahulu Avenue, many people were observed walking, bicycling, and using transit. Photo descriptions clockwise from top left: Woman waiting at a transit stop with amenities such as a covered shelter, bench, newsstands, and trash receptacle near Safeway; Pedestrians crossing at a signalized marked crosswalk location; Group of teenage pedestrians observed at Date Street; Person using a wheelchair along the street; Numerous commercial businesses fronting the sidewalk along Kapahulu Avenue; Person riding a bicycle on the sidewalk.*

## FINDINGS

This section summarizes key findings based on observations made by the consultant team with input from the Department of Transportation Services staff, 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.*

The posted speed limit is 25 mph. Although in some sections Kapahulu Avenue is narrow (40 feet) the distance between signalized intersections is long, especially along the mauka end. This results in the perception of a high-speed travelway.


*Vehicles travel faster than the posted speed limit as a result of the built environment.*

### *Finding: The street is well used by pedestrians.*

During the walking audit, a steady stream of pedestrian traffic was observed. Pedestrian activity was lighter closer to H-1, but otherwise the street is well-used by those on foot. Complete Streets aims to leverage this current activity through street improvements that bring about more walking activity, economic development, and community health.

*Many pedestrians frequent Kapahulu Avenue and its crosswalks (Photo taken at Kapahulu Avenue and Mooheau Avenue).*

### *Finding: The street is heavily used by older adults and people with mobility devices.*

More so than in other walk audits conducted, a notable frequency of older adult users and people in wheelchairs or using other mobility devices was observed. In areas with high pedestrian usage, ADA-compliant curb ramps (two per corner), tactile warning strips at intersections, and safe street crossings are a higher priority. This is especially true if many pedestrians are elderly or disabled. In addition, elderly and disabled take more time to cross the street and therefore require longer pedestrian phases.

*Elderly and disabled pedestrians crossing in the marked crosswalk at Kapahulu Avenue and Olu Street.*

*The placement of tactile warning strips at driveways and curbs help direct the visually impaired.*

### *Finding: Certain marked crosswalks lack features such as traffic control, median refuge islands, or stop lines.*

At Charles Street, Mokihana Street, and Hunter Street, uncontrolled marked crosswalks exist, meaning there are no traffic signals or stop controls. Pedestrian warning signs are present but there is no indication that motorists must stop per Hawaii law. Pedestrians must wait until four lanes of traffic (sometimes five, if a turn lane is present) all come to a stop before crossing.

*Some marked crosswalks across multi-lane roadways lack pedestrian safety facilities such as median refuge islands or advanced stop lines.*

*Placing traffic control devices, median refuge islands, or stop lines will greatly improve pedestrian safety (Kapahulu Avenue at Mokihana Street).*

### *Finding: Given the lack of bicycling facilities and the high vehicle volumes, many cyclists were observed riding on the sidewalk.*

More than 300 cyclists traverse Kapahulu Avenue each day. Given the high vehicle volumes and speeds, only fearless cyclists share the road with motorists. Instead, most cyclists choose to use the sidewalk. In areas with heavy pedestrian travel, cyclists were generally observed riding slowly to avoid conflicts. As a major direct route, Kapahulu Avenue should have dedicated bicycle facilities. This will help attract more cyclists and make sidewalks safer for pedestrians. Enhanced bikeway infrastructure such as bike lanes or protected bike lanes should be considered as a part of future improvements along the whole corridor however the constraints of this project area do not lend themselves to spot improvements that aren't connected to existing bike facilities.

*High vehicle volumes and speeds discourage cyclists from riding in the road.*

### *Finding: The diagonal alignment of Kapahulu Avenue results in skewed intersections; many have very long crossing distances or result in large intersections.*

Streets that meet at 90-degree angles result in the shortest possible crossing distances at all four legs; however, street networks follow their own unique layout based upon history and numerous other factors. Kapahulu Avenue contains several non-rectilinear intersections, such as at Paliuli Street and Kamuela Street. At obtuse angles, drivers can take turns quickly due to the wide turning radii. At crosswalk legs with obtuse angles, the design also means the crosswalk is much longer than at the other legs. This increases the time it takes a person to cross that leg of the intersection.

*The crosswalk at the intersection of Kapahulu Avenue and Kamuela Avenue is more than 80' long.*

*Channelization islands reduce pedestrian exposure to vehicle traffic (Kapahulu Avenue and Winam Avenue).*

### *Finding: Numerous driveways cut across the sidewalk, interrupting the walking environment.*

Kapahulu Avenue is a commercial district lined with small and large businesses. Most parcels have dedicated off-street parking for customers and a separate driveway. Driveways introduce conflicts for all users including drivers. They cut across the sidewalk zone and reduce the space for pedestrian amenities such as street trees, benches, public art, wayfinding signage, and other amenities. In many cases, driveways are so close together or so wide that they appear dominant over the sidewalk.


*The Tesoro Gas Station driveway on Kapahulu Avenue is about 50' wide.*

### *Finding: On-street parking can be reduced since most parcels have dedicated off-street parking.*

In several locations along Kapahulu Avenue, the sidewalk is cut in to provide metered on-street parking. Since most businesses along the street provide customer-specific free parking, this metered parking is not crucial for businesses. Some parking spaces could be reallocated to streetscaping, parklets, or bike corrals. In the long-term, if driveway consolidation and additional development produces more parking demand, stalls can be retained for customer parking.

*In many locations, on-street parking stalls are cut into the sidewalk (Photo taken at Kapahulu Avenue and Kamuela Avenue).*

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# Part Three: Recommended Application of Complete Streets Concepts

This section describes the recommended application of Complete Streets concepts for Kapahulu Avenue. It includes a written description of recommendations accompanied by illustrative drawings. The Complete Streets principles incorporated are:

- Increase safety for all modes of transportation
- Reconfigure the road for a 20 mph design speed for a more pedestrian-friendly environment
- Enable safer street crossings
- Strengthen connections to community amenities

## COMPLETE STREETS RECOMMENDATIONS

### *Conceptual Illustrations of Recommendations*

The recommendations for Kapahulu Avenue are described below and shown on Figures 5 through 8. Table 2 is a summary list of all recommendations, the before and after effect. Drawings of the proposed changes are presented for four segments of Kapahulu Avenue:

- From Kaimuki Avenue to Olu Street (Figure 5)
- From Mokihana Street to Winam Avenue (Figure 6)
- From Winam Avenue to Kamuela Avenue (Figure 7)
- At Date Street (Figure 8)

### *Description of Recommendations*

The recommendations in Figures 5-8 are summarized below.

**A) Increase safety for all modes of transportation traveling along corridor**

- Lower posted speed limit to 20 mph, and reconfigure roadway for design speed of 20 mph.
- Provide signage and sharrow markings to improve bike safety and to encourage bike usage.
- Reduce turning radius through curb extensions where on-street parking is present on side streets.
- Provide added safety measures for marked crosswalks.
- Inset on-street parking using curb extensions and convert on-street parking stalls to parklets, bike corrals, or other public uses.

**B) Reduce impact of driveways on walkability**

- Enhance walkability by closing driveways in cases where one land use has more than one driveway.
- Enable shared off-street parking to reduce parking supply and driveway demand.
- Ensure that driveway design makes the sidewalk dominant over the driveway by keeping the sidewalk at sidewalk level (rather than sloping down), maintaining concrete sidewalk pattern across the driveway, and minimizing driveway width. For a one-way driveway, ensure width is no greater than 14’. For two-way driveways, ensure width is no greater than 24’.

**C) Reconfigure intersection alignment for reduced conflicts and placemaking opportunity**

- Realign Charles Street, Mokihana Street, Paliuli Street, and Kamuela Avenue so that side streets meet Kapahulu Avenue at a right angle, reducing pedestrian crossing distance and exposure to motor vehicle traffic.
- Close right turn slip lane at Date Street, reducing complexity and conflicts at intersection.
- Create seating areas and landscaped public space in the areas recovered by realigned intersections. Unique elements reflecting area history or famous residents adds an additional placemaking element. Local business owners may be willing to maintain the spaces.

*Pedestrians cross an appropriate driveway design in front of Safeway on Kapahulu Avenue.*

Table 2 Proposed Design Changes to Kapahulu Avenue

| | CURRENT | AFTER RECOMMENDATIONS ARE IMPLEMENTED |
|---|---|---|
| Type of Facility | Minor Arterial | No change |
| Street Width | 40 to 54 | No change |
| Speed Limit | 25 mph | 20 mph |
| Crosswalk Length (longest) | Kapahulu Ave and Kamuela Ave: 85 | Kapahulu Ave and Kamuki Ave: 70 |
| Number of lanes | 4 lanes (typical), 5 lanes at some intersections | No change |
| Distance to side streets | Block spacing along the Diamond Head side of the street is ~240; 4th Ave is the nearest parallel street, which is 400 to 1200 from Kapahulu Ave | No change |
| Driveways | ~22 driveways on the Diamond Head side of the street. 14 driveways on the Ewa side of the street, 3 of which are major driveways (Safeway) | Reduced driveway widths to 14 for one-way access and 24 for two-way access |
| Parking | Metered, 1 hr street parking in some areas (8 Diamond Head stalls, 20 Ewa stalls). Several off-street parking lots (e.g., Leonard's Bakery, Safeway) | Street parking prohibited at bus stops |
| Sidewalks | Roughly 10' sidewalks in areas with commercial frontage and no street parking; Width narrows in areas with street parking | Extend sidewalks where noted in the conceptual design |
| Transit Routes, Stops, Shelters | 8 stops on Kapahulu in project area (4 on each side); 2 stops on Date Street; 4 on Waialae Ave/Kapiolani Blvd. 1 stop on Moheau Ave | No change |
| Proximity to future rail | The initial rail alignment ends at Ala Moana Shopping Center; A Waikiki Circulator route is proposed to link rail to Waikiki | No change |
| Bicycle features | Proposed sharrows on Kapahulu; Connections to multi-use path on Date Street, and bike lanes on Waialae and Kapiolani | No change |
| Nearby Schools | Kaimuki High School, Hawaii School for the Deaf and Blinde | No change |
| Nearby Institutions | Ala Wai Golf Course, Waikiki-Kapahulu Public Library, University of Hawaii, Chaminade University, St. Louis High School, Jefferson Elementary School | No change |

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**Figure 5 Concepts for Kapahulu Avenue from Kaimuki Avenue to Olu Street**

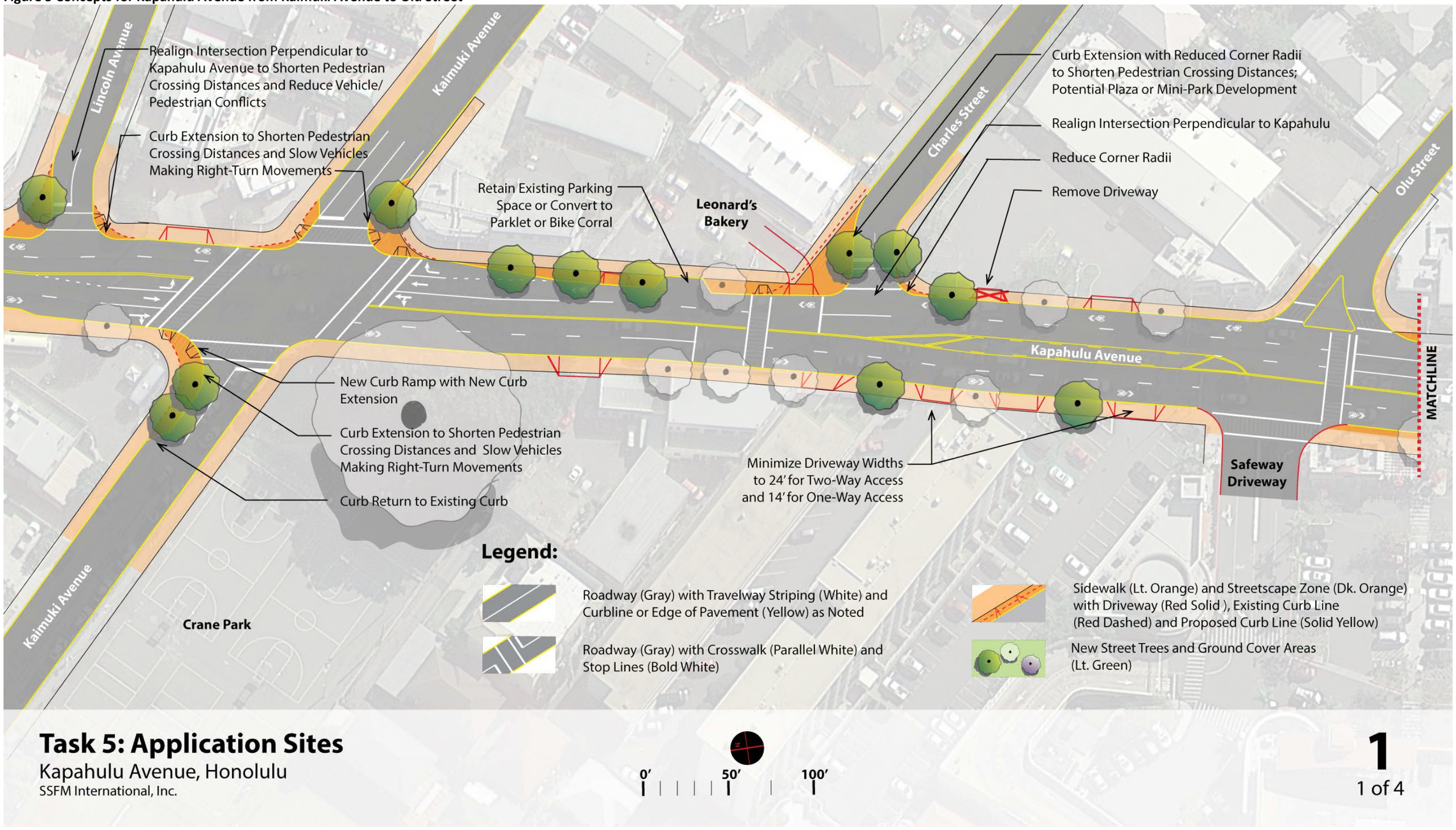

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**Figure 6 Concepts for Kapahulu Avenue from Mokihana Street to Winam Avenue**

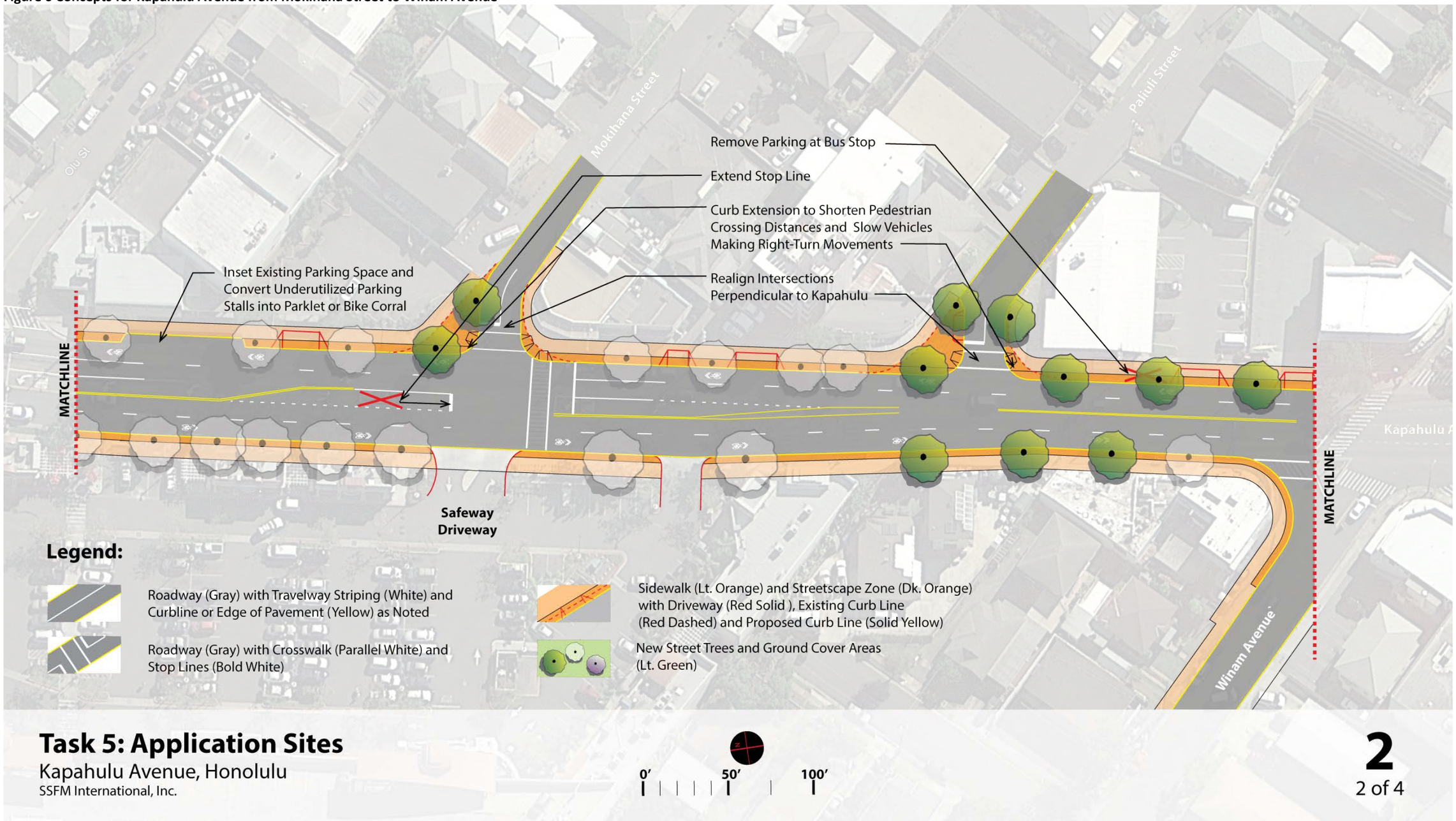

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**Figure 7 Concepts for Kapahulu Avenue from Winam Avenue to Kamuela Avenue**

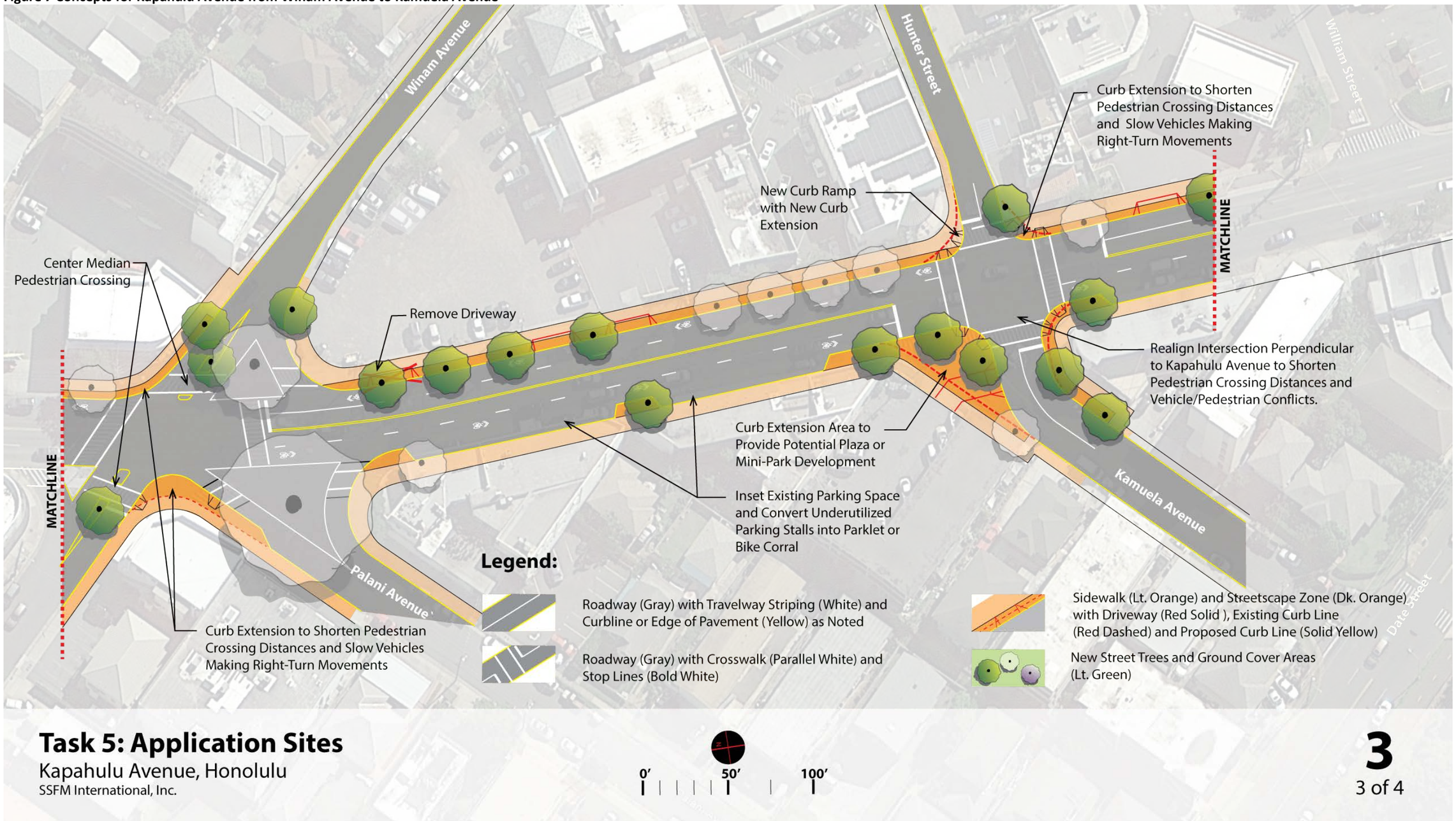

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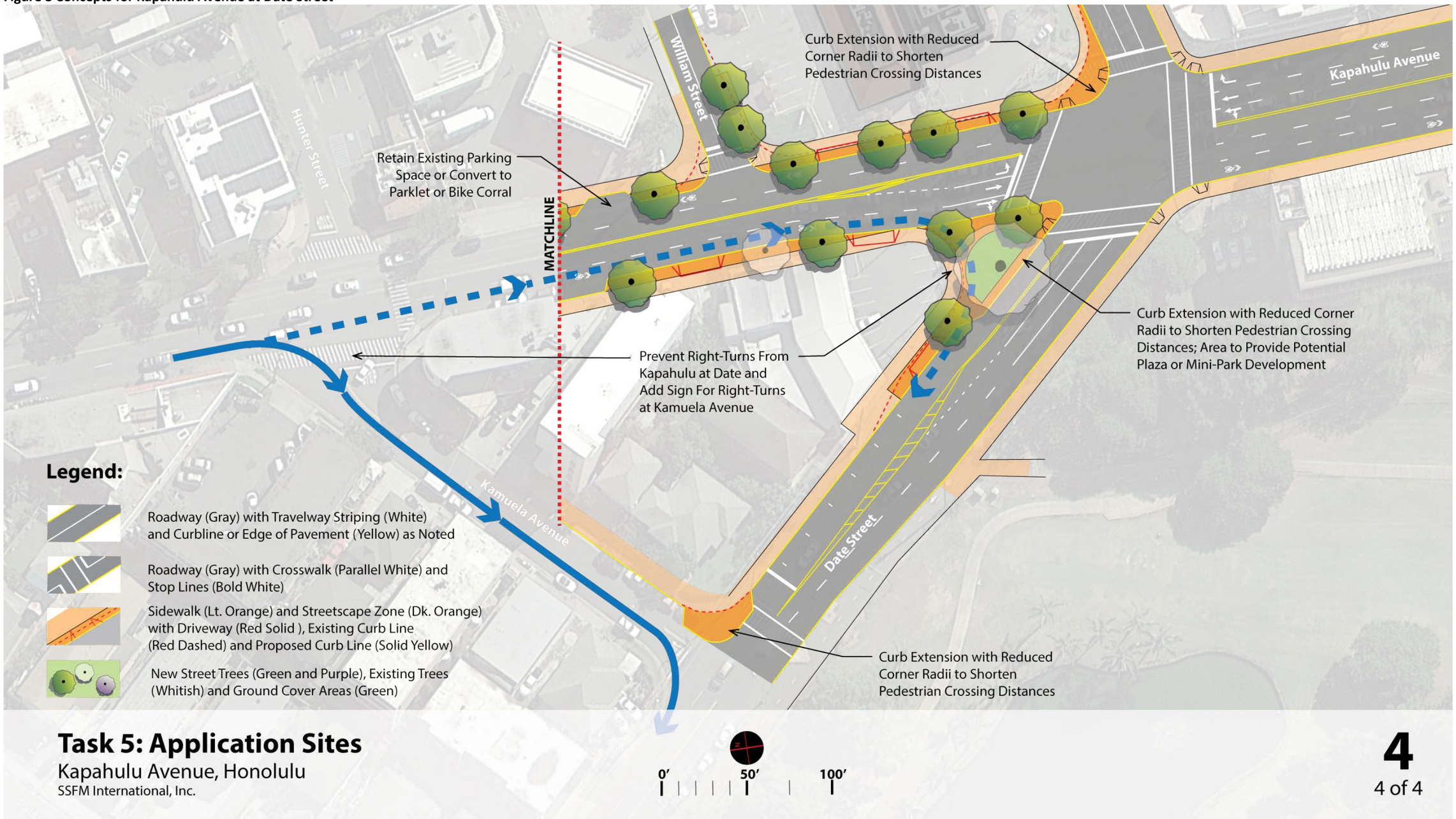
**Figure 8 Concepts for Kapahulu Avenue at Date Street**



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# Part Four: Implementation

This section looks at the recommendations and sorts them according to how soon they can be implemented. 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)*** *Increase safety for all modes of transportation traveling along corridor*

- Review process to change speed limit
- Pilot speed limit reduction for one year; assess results
- Add advanced stop lines and signage at existing uncontrolled crosswalks
- Stripe center median islands at the intersection of Winam Avenue and Kapahulu Avenue to reduce lane widths and create an effectual pedestrian refuge island
- Conduct parklet/bike corral demonstration project

***B)*** *Reduce impact of driveways on walkability*

- Begin communication with business owners to promote benefits of reduced driveways
- Reivew access management standards and which driveways are non-compliant

***C)*** *Reconfigure intersection alignment for reduced conflicts and placemaking opportunity*

- Assess feasibility of removing right turn-slip at Date Street including conducting turning counts at Date Street to understand volumes of right turns

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

***A)*** *Increase safety for all modes of transportation traveling along corridor*

- Reduce turning radii and add curb extensions to reduce crossing distance and driver speed
    - Use asphalt concrete (A/C) berms (or similar) to bulb out curbs
    - Incorporate full-build project into capital improvement or maintenance plan
- Construct physical center median islands using A/C berms (or similar) at the intersection of Winam Avenue and Kapahulu Avenue
- Lower posted speed limit to 20 mph
- When project improvements slow prevailing speeds, install sharrow markings and bike signage

***B)*** *Reduce impact of driveways on walkability*

- Close driveways using planters and bollards where possible.
- Encourage pedestrian-oriented driveway design.

***C)*** *Reconfigure intersection alignment for reduced conflicts and placemaking opportunity*

- Realign intersections to be perpendicular to Kapahulu Avenue
    - Use A/C berms (or similar) to delineate pedestrian refuge islands and channelize vehicle traffic.
    - Add street trees in planters, mini-plazas, or public space amenities in recovered land
- Close right turn slip lane at Date Street
    - Close slip lane using A/C berm
    - Add signage at Kamuela Street for new circulation pattern
- Implement shared parking
    - Work with property owners to convert their parking to shared stalls

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

***A)*** *Increase safety for all modes of transportation traveling along corridor*

- Extend concrete sidewalks to fill curb extensions, and install tree wells for street trees.

***B)*** *Reduce impact of driveways on walkability*

- Reconstruct sidewalk to make former driveways flush with the rest of the sidewalk.

***C)*** *Reconfigure intersection alignment for reduced conflicts and placemaking opportunity*

- Realign intersections to be perpendicular to Kapahulu Avenue
- Encourage property owners to share parking to reduce parking supply and driveway demand

# Part Five: Cost Sheet

| ITEM | UNIT | QUANTITY | UNIT COST | TOTAL COST |
|---|---|---|---|---|
| **Removals/Demo** | | | | |
| Demolish existing sidewalk | Sq. Ft. | 19260 | $ 5.00 | $ 96,300.00 |
| Demolish existing Pavement | Sq. Ft. | 17150 | $ 8.00 | $ 137,200.00 |
| Erosion Control | L.S. | 1 | $ 10,000.00 | $ 10,000.00 |
| **Site improvements** | | | | |
| **Roadway** | | | | |
| Mill and Overlay existing AC pavement | Sq. Ft. | 183151 | $ 6.00 | $ 1,098,906.00 |
| New Streetscape (Boulevard work) | Sq. Ft. | 26010 | $ 20.00 | $ 520,200.00 |
| Curb Gutter and Sidewalk | Sq. Ft. | 11430 | $ 20.00 | $ 228,600.00 |
| Drainage works | each | 9 | $ 14,000.00 | $ 126,000.00 |
| 4" Stripe (white/Yellow) | Lin. Ft. | 13000 | $ 6.00 | $ 78,000.00 |
| 12"stripe (white) | Lin. Ft. | 2600 | $ 9.00 | $ 23,400.00 |
| Striping Symbols | each | 48 | $ 300.00 | $ 14,400.00 |
| **Intersection** | | | | |
| Traffic Signal Modification | each | 3 | $ 350,000.00 | $ 1,050,000.00 |
| **Landscaping** | | | | |
| Trees | each | 52 | $ 1,000.00 | $ 52,000.00 |
| **Misc.** | | | | |
| Traffic Control | L.S. | 1 | 5% | $ 171,750.30 |
| Mobilization | L.S. | 1 | 10% | $ 343,500.60 |
| Contingency - 25% | | | 25% | $ 858,751.50 |
| **Design** | | | | |
| Design Cost | | | 6% | $ 288,540.50 |
| | | | | |
| **TOTAL CONSTRUCTION** | | | | **$ 4,809,008.40** |
| **TOTAL COST** | | | | **$ 5,097,548.90** |