

MARCH, 2015

HONOLULU COMPLETE STREETS IMPLEMENTATION STUDY LOCATION REPORT

Kamehameha IV Road & Kahauiki Street Near Fern Elementary School (FINAL)



City & County of Honolulu
Department of Transportation Services

Prepared by
SSFM International

SSFM
INTERNATIONAL

With:
Blue Zones
Nelson Nygaard
Gary Toth Associates

This page has been left blank intentionally.

Summary: Kamehameha IV Road from Kahauiki Street to North School Street

Primary Urban Center Planning Area, Kalihi Sub-Area, Council District 7

NEED FOR PROJECT

Kamehameha IV Road from Kahauiki Street to N. School Street was selected due to the high percentage of students (80 percent) who walk to Fern Elementary School along Kamehameha IV and Kahauiki Street. Both of these roads do not adequately accommodate pedestrians. It presents an opportunity for the application of Complete Streets principles, and to support Safe Routes to School best practices.

By applying the Complete Streets treatments recommended in this report, the neighborhood can become more traversable to all roadway users, improving its sense of place and overall livability.

SUMMARY OF RECOMMENDATIONS

- Encourage motorists to drive 15 to 20 mph by narrowing the travel lanes and enhancing on-street parking.
- Reduce corner radii and create more compact side street crossings.
- Improve intersection treatments at Kahauiki Street and Kamehameha IV Road by constructing a domed mini-circle.
- Improve intersection treatments at Kamehameha IV Road and Rose Street by constructing a domed mini-circle.
- Build sidewalks for Safe Routes to School.



COST BREAKDOWN

Total: \$772,627.24

Design: \$70,238.84

Construction: \$702,388.40

Table of Contents

Part One: Introduction, Study Area, & Need for Project	1
What are Complete Streets?.....	1
Study Area.....	1
Need for Project.....	3
Existing Land Use, Transportation Facilities, and Usage Patterns	4
Land Use, Transportation Facilities and Traffic Accidents	4
Usage Patterns	4
Part Two: Field Work and Key Findings	7
Stakeholder Input	7
Findings	11
Part Three: Recommended Application of Complete Streets Concepts.....	15
Complete Streets Recommendations	15
Description of Recommendations	15
Part Four: Implementation	21
Part Five: Cost Sheet	25

List of Figures

Figure 1 Study Area.....	2
Figure 2 Existing Land Use, Transportation Facilities, and Accidents in the Study Area	5
Figure 3 Concepts for Kamehameha IV Road from Kahauiki Street to North School Street	19

List of Tables

Table 1 Existing Usage Patterns along Kamehameha IV Road.....	6
Table 2 Proposed Design Changes to Kamehameha IV Road	17

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 result is a road network that provides safe travel, promotes public health, and creates stronger communities.

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

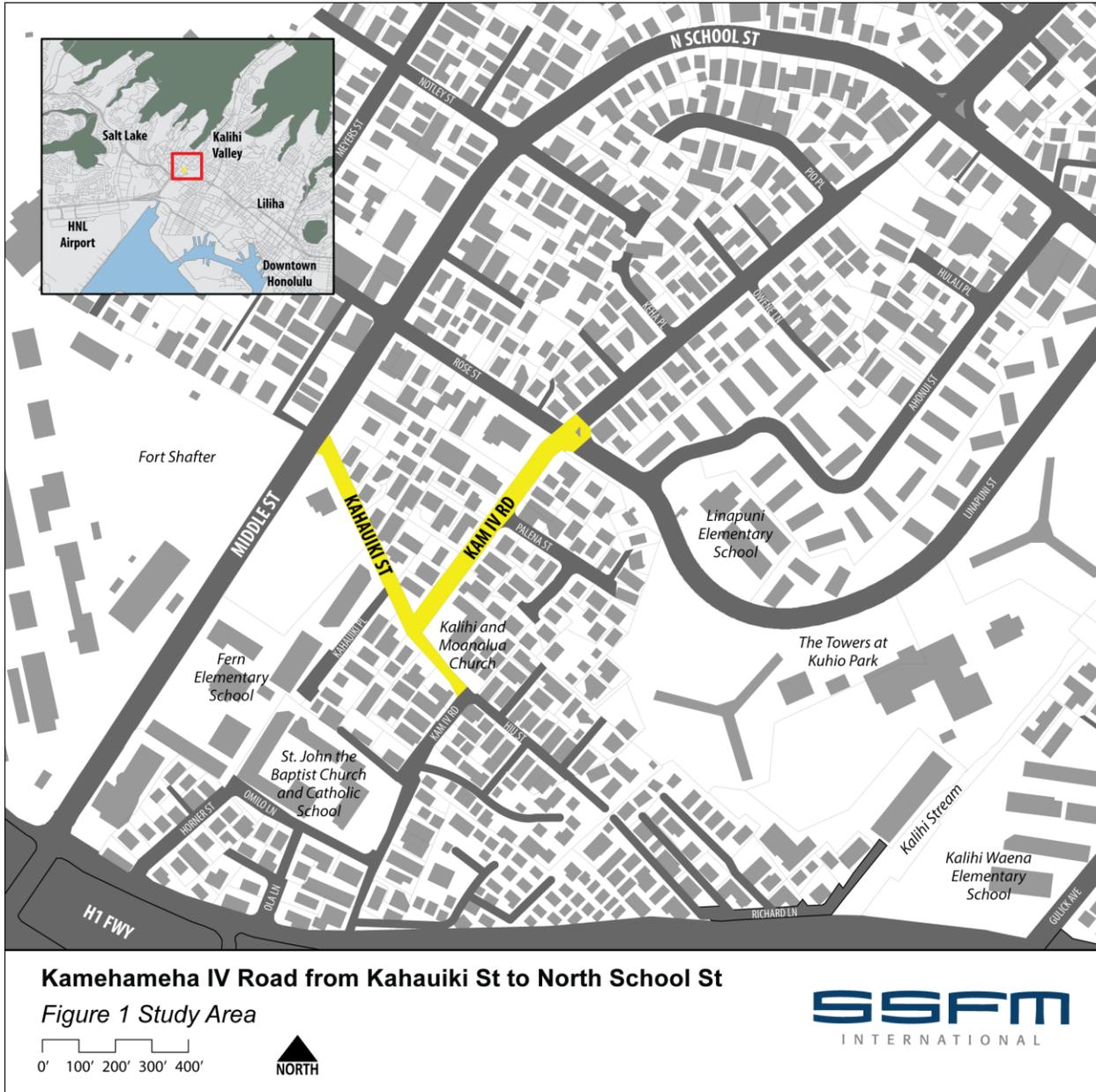
The State of Hawai'i adopted Complete Streets in 2009 and required each County to follow suit. In May 2012, the Honolulu City Council adopted a "Complete Streets" policy and passed Ordinance 12-15. The City and County of Honolulu is now taking aggressive steps to implement Complete Streets by updating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

STUDY AREA

The subject location of this assessment is Kamehameha IV Road from Kahauiki Street to North School Street, in the proximity of Fern Elementary School (see Figure 1). It is located in the Primary Urban Center Planning Area, Kalihi Sub-Area, and Council District 7. The area is mostly residential, and has multiple schools and religious institutions.

Kamehameha IV Road and Kahauiki Street is the main road that connects the community to Fern Elementary School and Linapuni Elementary School. The area contains three public housing developments across from Linapuni Street: the Towers at Kūhiō Park, KPT Low-Rises, and Kūhiō Homes. In 2014, there were 1,542 housing units in the Kūhiō Park Neighborhood, of which 49 percent (748 units) are public housing. According to U.S. Census 2010, almost 40 percent of residents are under 19 years old, which is 17 percentage points higher than for the Urban Honolulu CDP. In the 2013-2014 school year, there were 530 students enrolled in Fern Elementary School and 191 in Linapuni Elementary School.

Figure 1 Study Area



NEED FOR PROJECT

Kamehameha IV Road from Kahauiki Street to N. School Street was selected due to the high percentage of students (80 percent) who walk to Fern Elementary School along Kamehameha IV Road and Kahauiki Street. Both of these roads do not adequately accommodate pedestrians. Application of Complete Streets principles at this location will bring down travel speeds, benefit a large number of pedestrian users, and support Safe Routes to School.

The area's affordability, diversity of ethnic groups, and proximity to jobs both in Downtown and in Waikīkī are key factors that draw many new immigrants to Hawai'i to this area. Many live in the Kūhiō Park Terrace located on Linapuni Street. Many of Fern Elementary's students walk to school, but the lack of sidewalks or protected pedestrian paths along Kamehameha IV Road and Kahauiki Street make walking to school, the playground, transit, and local services awkward to navigate, due to the lack of separation between people walking and moving vehicles. During a walking audit conducted for this analysis, many motorists were observed parking on the pedestrian path and disregarding signs that prohibit parking. Lack of enforcement of parking regulations appears to be an issue throughout the study area. There is a need to calm these neighborhood streets with additional infrastructure, greenery, and pedestrian safety measures to ensure safe routes to school, work, and play for residents.

The intersection of Kahauiki Street and Kamehameha IV Road is a T-intersection with wide corner radii. This encourages higher-speed turning movements that can put pedestrians at risk. The intersection of Kamehameha IV Road and Rose Street features a channelized right-turn lane coming out of the Kūhiō Park Terrace. This allows for high motorist speeds and results in long crossing distances and more exposure to people walking.

By applying the Complete Streets treatments recommended in this report, the neighborhood can improve the safety to all users, improving its sense of place and overall livability.

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. Kamehameha IV Road is in the midst of a dense residential area with three schools and three churches. Fern Elementary School is located on the makai side of Kahauiki Street with a frontage along Middle Street. St. John the Baptist Church and Catholic School is located just to the east of Fern Elementary. Linapuni Elementary School is located mauka of Linapuni Street off of Kamehameha IV Road.

There are no bus stops along Kamehameha IV Road or Kahauiki Street within the study area, but there are nine bus stops located nearby. Four are located mauka of Kamehameha IV Road. These serve local lines that connect this area and downtown to Waikīkī area. There are five bus stops along N School Street and Middle Street. These connect to lines serving the downtown/Waikīkī area, as well as lines traveling mauka-makai.

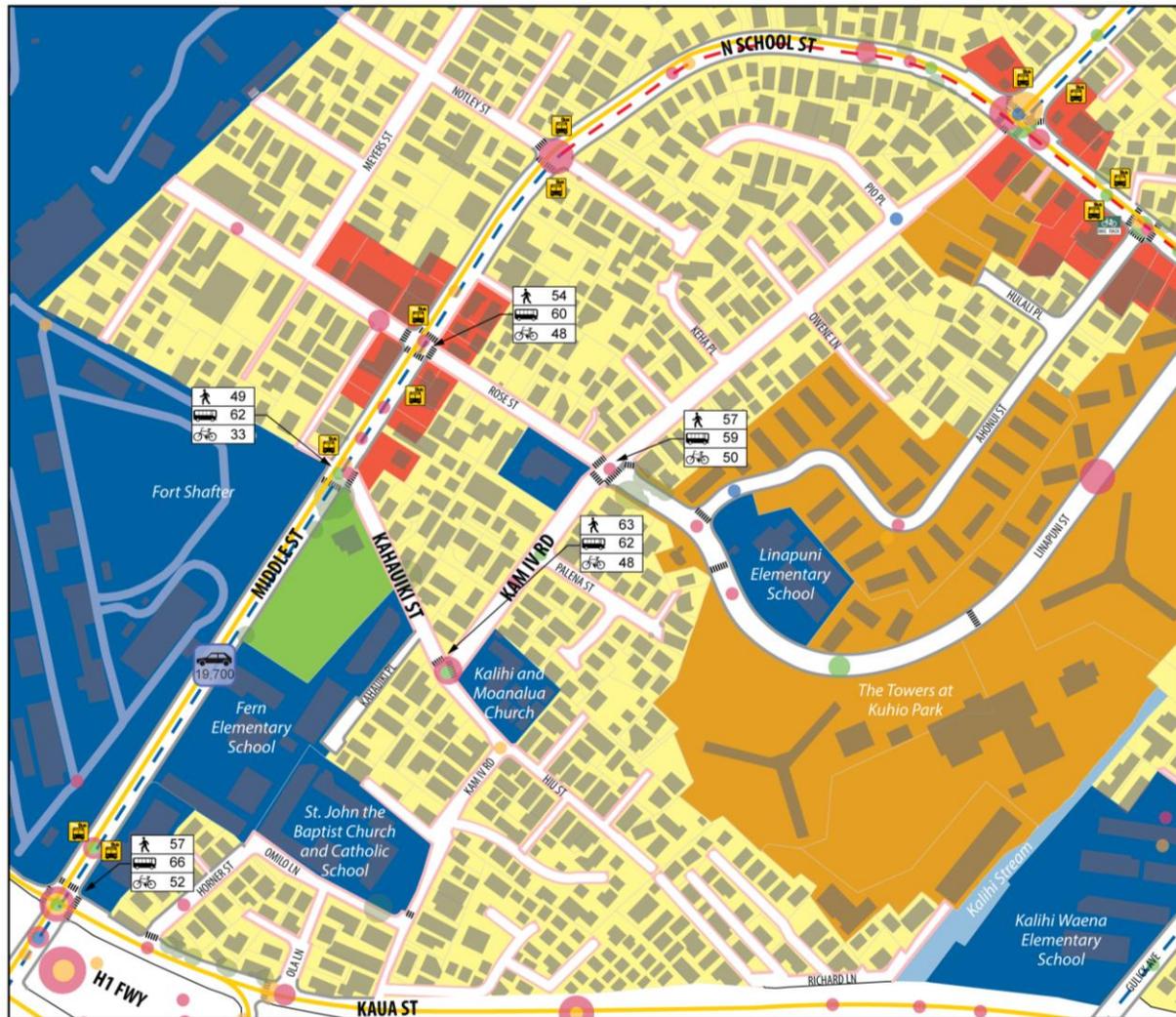
There are no sidewalks along Kamehameha IV Road and Kahauiki Street. There are marked crossroads in the intersection of Kamehameha IV Road and Rose Street, and Kamehameha IV Road and Kahauiki Street.

Accident records indicate there were three car/truck accidents at the intersection of Kamehameha IV Road and Kahauiki Street. On Kamehameha IV Rd, at various locations within a quarter mile of the project site, there were four car/truck, and two pedestrian accidents. At the intersection of North School St and Kamehameha IV Rd, there were two bicyclist, eight car/truck, one moped, and four pedestrian accidents.

Usage Patterns

Table 1 describes existing usage patterns by pedestrians, bicyclists, vehicles, and transit users in the study area. Pedestrian use is moderate, with a high proportion of walkers being schoolchildren. 80 percent of Fern Elementary Students walk to school and many traverse through the study area on their way to and from school. According to the Hawaii Bicycle League three-day average count data from 2013, bicycle use of this road is low. Buses operate along the streets adjacent to the study area daily. Daily ridership for each route is listed in Table 1. In total, there are 3,925 transit trips a day in the study area and environs. 2011 traffic count data indicated average daily vehicular volumes of 19,089 on North School Street between Kahauiki Street and Kaua Street. North School Street between Amelia Street and Kino Street had average daily vehicular volumes of 16,417.

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



0' 100' 200' 300' 400'



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



Kamehameha IV Road from Kahauiki St to North School St

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

Table 1 Existing Usage Patterns along Kamehameha IV Road

Pedestrian use	Moderate; 80 percent of Fern Elementary students walk to school.
Bicycle use	Low
Transit use (Average daily boardings + alightings) (Source: <i>Global Stop Summary by Trip</i> , TheBus, 2012)	<p><u>Stops</u></p> <p>North School St + Kamehameha IV Rd ('Ewa bound): 923 average daily ridership (ADR)</p> <p>North School St + Notley St: 184 (ADR)</p> <p>Middle St + Rose St: 557 (ADR)</p> <p>Middle St + OPP Kahauiki St: 172 (ADR)</p> <p>Middle St + Kahauiki St: 495 (ADR)</p> <p>Middle St + OPP Notley St: 508 (ADR)</p> <p>North School St + Kamehameha IV Rd (Diamond Head bound): 822 (ADR)</p> <p>Kamehameha IV Rd + North School St (mauka bound): 150 (ADR)</p> <p>Kamehameha IV Rd + North School St (makai bound): 115 (ADR)</p> <p>Total: 3,925 unlinked transit trips a day in this area.</p> <p><u>Boardings and Alightings by Route</u></p> <p>Route 13: 46 ADR</p> <p>Route 2: 3136 ADR</p> <p>Route 2L: 255 ADR</p> <p>Route 7: 452 ADR</p> <p>Route W3: 36 ADR</p>
Daily Vehicular Volumes (Source: <i>Historical Traffic Station Maps</i> , HDOT, 2012)	<p>North School Street between Kahauiki Street and Kaua Street (2012) – 19,089</p> <p>North School Street between Amelia Street and Kino Street (2012) – 16,417</p>
Use by trucks or large vehicles	North School Street between Amelia Street and Kino Street (2012) – 1,841
Peak periods (Source: <i>Historical Traffic Station Maps</i> , HDOT, 2012)	<p>North School Street between Kahauiki Street and Kaua Street (2012) - 07:15 AM to 08:15 AM and 03:30 PM to 04:30 PM</p> <p>North School Street between Amelia Street and Kino Street (2012) - 07:15 AM to 08:15 AM and 04:15 PM to 05:15 PM</p>
Accident History Sources: <i>State of Hawai'i Motor Vehicle Accident Reports</i> , Honolulu Police Department, Records Division, 2011-2014	<p>Kamehameha IV Rd at various locations within quarter mile of project site on: 4 car/truck, 2 pedestrian</p> <p>Kamehameha IV Rd and Kahauiki Street St: 3 car/truck</p> <p>North School St and Kamehameha IV Rd: 2 bicyclist, 8 car/truck, 1 moped, 4 pedestrian</p> <p>North School St at various locations within quarter mile of project site: 3 car/truck</p> <p>Total: 2 bicyclist, 18 car/truck, 1 motorcycle/moped, 6 pedestrian</p>

Part Two: Field Work and Key Findings



The walking audit brought together 20 leaders on July 16, 2014 from the City and County of Honolulu, Fern Elementary School, and Hawai'i State Department of Health.

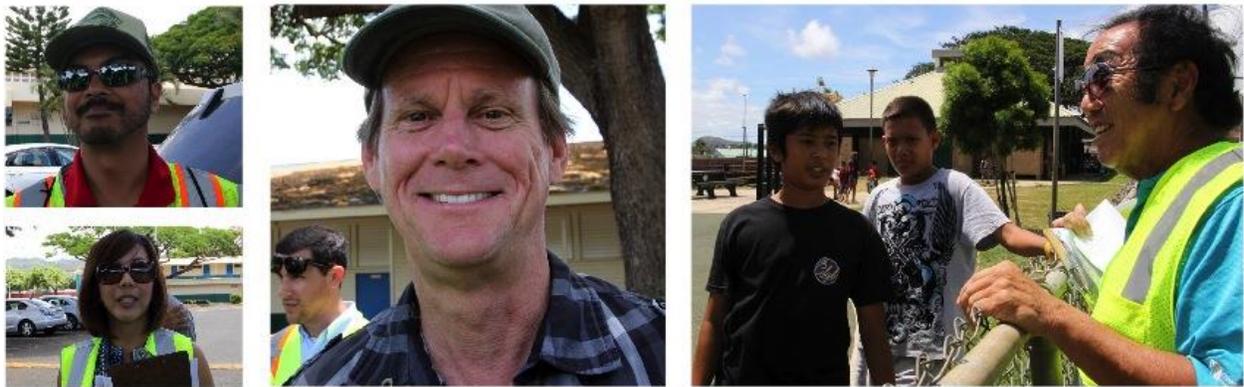
STAKEHOLDER INPUT

The findings of this report are informed by input received from community stakeholders that participated in a walking audit along Kamehameha IV Road from Kahauiki Street to N. School Street. SSFM International, Inc., and a team of national consultants, including Dan Burden, national walkability expert, led the walking audit on July 16, 2014. The following stakeholder groups participated in the walking audit:

- City and County of Honolulu Department of Transportation Services (DTS), including Mark Garrity, Kelly Cruz, Craig Chung, Randall Kurashige, Shawn Butler, Erron Redoble, Rika Uechi, Chris Sayers, Greg Tsugawa, Darin Anbe, Tammy Nakajo, Leon Lau and Peggy Ho;
- Hawai'i State Department of Health (DOH), Heidi Hansen-Smith;
- Fern Elementary School Leaders, including Blake Kalama and Kelli Taboada; and
- Representatives for Councilmember Manahan, including Demmi Arakaki and Mitchel Catreros;
- The Michaels Organization, on behalf of The Towers at Kūhiō Park, Anni Peterson;
- Consultant Team: Mike Packard, Alan Fujimori, and Michael Motoki from SSFM, Dan Burden and Samantha Thomas from Blue Zones, Gary Toth from Gary Toth Associates, and Even Corey from Nelson Nygaard.

The group identified conditions that affect active living, social connectivity, Safe Routes to School, and access to daily needs along Kamehameha IV Road from Kahauiki Street to N. School Street.

The participants noted vehicles traveling at higher speeds than posted speeds along Kamehameha IV Road. They also commented on the amount of people, especially children, walking in the street due to the lack of sidewalks, and cars parked on the pedestrian path. Overall, participants expressed a need to address pedestrian safety and create a safe route to schools. Participants were enthusiastic about ideas that would slow down vehicles but maintain efficient traffic flow, such as gateway treatments and mini-circles.



Participants shared visions, barriers and opportunities for Complete Streets and Safe Routes to School along Kahauiki Street and Kamehameha IV Road. The goal of the walking audit was to discuss possible treatments for Kamehameha IV Road and its intersections in order to improve pedestrian safety and accessibility. Fern Elementary School representatives provided insight on the school’s vision and desire to address the many barriers to walking and biking to school.

Photo descriptions: *Top row: DTS and community representatives participate in creation of human mini-circle; Middle row: DTS and school representatives share project findings; Bottom row: school representatives participate in post-audit briefing of findings.*



During the hour walking audit of Kamehameha IV Road from Kahauiki Street to N. School Street many children and families were observed playing and walking and bicycling to and from home, the park, and neighborhood convenience stores. **Photo descriptions** (clockwise from top left): Fern Elementary School Students; the playground at Fern Elementary; a street corner market; students and parents walking home from school; pedestrians on area sidewalks; students using street benches.



Sidewalks are missing, yet many children and families were seen walking along Kahauiki Street and Kamehameha IV Road.

The lack of sidewalks or protected pedestrian paths along Kamehameha IV Road and Kahauiki Street make walking to transit, school, the playground, and local services more difficult and at times undesirable due to the lack of separation between people walking and moving vehicles. A Safe Routes to School program called “Walking School Bus” was created at Fern Elementary School to help create more safe, convenient, and fun opportunities for children to walk and bicycle to and from school. This program has helped raise awareness that additional infrastructure, greenery, and pedestrian safety measures are needed to ensure safe routes to school, work, and play for residents in Kūhiō Park Terrace.

There is not only a need, but also a desire by the local community to have a built environment that promotes a healthy and active-living lifestyle, which fully supports and connects all people, regardless of their mode choice, to local and regional amenities, services, and businesses. Residents identified a need to celebrate “the history and cultural backgrounds of new and old residents, embracing the ‘Aloha Spirit’ that is characteristic of the islands, making connections to surrounding investments like the future rail stations, and continuing to increase the real and perceived safety of the community through resident-powered initiatives and infrastructure improvements, to creating improved access to neighborhood amenities” (*Kūhiō Park Neighborhood Transformation Plan, 2014*).

FINDINGS

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

Drivers respond to the cues the street provides. In Kūhiō Park Terrace, the design speed of many streets is higher than the posted speed limit. Kamehameha IV Road is long and straight with few visual cues to help slow motorists. Intersections are wide and are four-way or three-way stops, which can encourage quick acceleration between intersections. In addition, adjacent to Fern Elementary School, the design of Middle Street is such that it does not provide visual clues to drivers that they have arrived into the neighborhood and into a school zone. Middle Street is an undivided four-lane road carrying 19,089 vehicles a day.



Speed limit sign next to Fern Elementary School.

Finding: Dedicated pedestrian, bicycle, and transit facilities are lacking

Kamehameha IV Road and Kahauiki Street are key neighborhood routes to school, play, work and transit, yet dedicated pedestrian facilities are non-existent. Since the goals set forth by the community in the Kūhiō Park Neighborhood Transformation Plan are to promote healthy and livable lifestyles with improved infrastructure to improve access to community destinations, a redesign is in order.



Pedestrians walking on the street without sidewalks.

Finding: Travel lanes appear wide, which contributes to higher motorist speeds

Kahauiki Street lacks visual cues such as signage, marking, curbs, or roadside delineation. This makes the design speed of the street higher than the posted speed limit, which is 25 mph. Due to low traffic volumes, there is no centerline painted, and this works in favor of encouraging lower speeds. Additional measures to lower speed may include narrowing the road and improving edge markings.



Kahauiki Street lacks pavement markings and is relatively narrow, at 20 feet wide.

Finding: Parked cars and other obstacles often block existing pedestrian paths

Parking enforcement needs continued focus to maintain the pedestrian right of way. Where 'footpaths' do exist, they were observed to be blocked by parked cars, littered with trash, or very narrow (varying along Kamehameha IV Road from three feet to five feet). The designated footpath along the park on Kahauiki Street is striped to be 10 feet or less along Kamehameha IV Road, and many motorists use it as a parking area.



Blocked footpath in front of the park along Kahauiki St.

Finding: The intersection of Kahauiki Street and Kamehameha IV Road encourages high vehicle turning speeds and does not serve as a gateway

Improved intersection treatments are needed at the intersection of Kahauiki Street and Kamehameha IV Road. This T-intersection is overly wide. The turning radii are large, and motorists can make turns extremely fast and fail to anticipate a pedestrian. Excess asphalt, low vehicle traffic volumes, and many people walking—especially children—can make this a key intersection to apply neighborhood traffic-calming tools. One possible solution can be a small island called a mini-circle.



Wide radius at the intersection of Kahauiki St. and Kamehameha IV Rd.

Finding: The intersection of Kamehameha IV Road and Rose Street is overbuilt for vehicle use, which increases pedestrian crossing distances and encourages high-speed turning movements



Right turn lane and marked crosswalk in the intersection of Kamehameha IV Rd. and Rose St.

The intersection at Kamehameha IV Road and Rose Street has an overly wide channelized right turn lane. A pedestrian has to cross 66 feet, increasing their exposure to a potential threat and holding stopped motorists back longer. A low-volume neighborhood street such as Kamehameha IV Road should be a maximum of 28 feet wide. Intersection treatments such as a roundabout will increase safety, reduce traffic delays, and reduce the risk of crashes at this intersection. A roundabout can also reduce fuel consumption, air pollution, and construction and maintenance costs. Roundabouts enhance the beauty of the intersection and effectively control speeds.

This page has been left blank intentionally.

Part Three: Recommended Application of Complete Streets Concepts

This section describes the recommended application of Complete Streets concepts for Kamehameha IV Road from Kahauiki Street to N. School Street. 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 improved street crossings, and
- Strengthen the sense of arrival

COMPLETE STREETS RECOMMENDATIONS

Conceptual Illustrations of Recommendations

Figure 3 graphically shows how Complete Streets principles can be applied to transform Kamehameha IV Road and Kahauiki Street within the study area. Table 2 is a summary list of all recommendations, the before and after effect.

Description of Recommendations

The recommendations in Figure 3 are summarized below.

A) *Encourage motorists to drive 15 to 20 mph by narrowing the travel lanes and enhancing on-street parking.*

- Narrow travel lanes to ten feet in both directions on Kamehameha IV Road.
- Narrow travel lanes to nine feet in both directions on Kahauiki Street.
- On Kahauiki Street along the Fern Elementary School Park side, better organize the parallel on-street parking with tree wells, or bulb-outs. Inset the parking. Help to green the street by providing a place for a street tree or human-scale street light feature.
- On Kamehameha IV Road mark parking spaces along the 'Ewa side, near the intersections of Kamehameha IV Road at Kahauiki Street and Kamehameha IV Road at Rose Street, to allow for 'head-out,' or reverse-in, angled parking.
- On Kamehameha IV Road (Diamond Head side) near Palena Street create a choke point, (aka a yield point). Do this by building a curb extension planted with a street tree to calm traffic and design the road to encourage motorists to drive between 15 and 20 mph.

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

- Reduce crossing widths, turning radii, and improve sight lines. Further calm traffic by installing curb extensions on Kahauiki Place, the intersection of Kahauiki Street and Kamehameha IV Road, Palena Street, and the intersection of Kamehameha IV Road and Rose Street. A curb extension would remove the right-turn lane on Rose Street from the KPT Housing Complex. The curb extension would create space, allowing for a landscaped gateway or pocket park entry into KPT.

C) Re-design intersection treatment at Kahauiki Street and Kamehameha IV Road

- Construct a domed mini-circle. Mini-circles are often used at residential street intersections, where vehicles navigate around a small island—8 to 15 feet in diameter—that can be either lightly domed or raised. They should be designed to reduce speeds to 15 to 18 mph at each intersection.

D) Re-design intersection treatments at Kamehameha IV Road and Rose Street

- Construct a domed mini-circle.

E) Build a sidewalk.

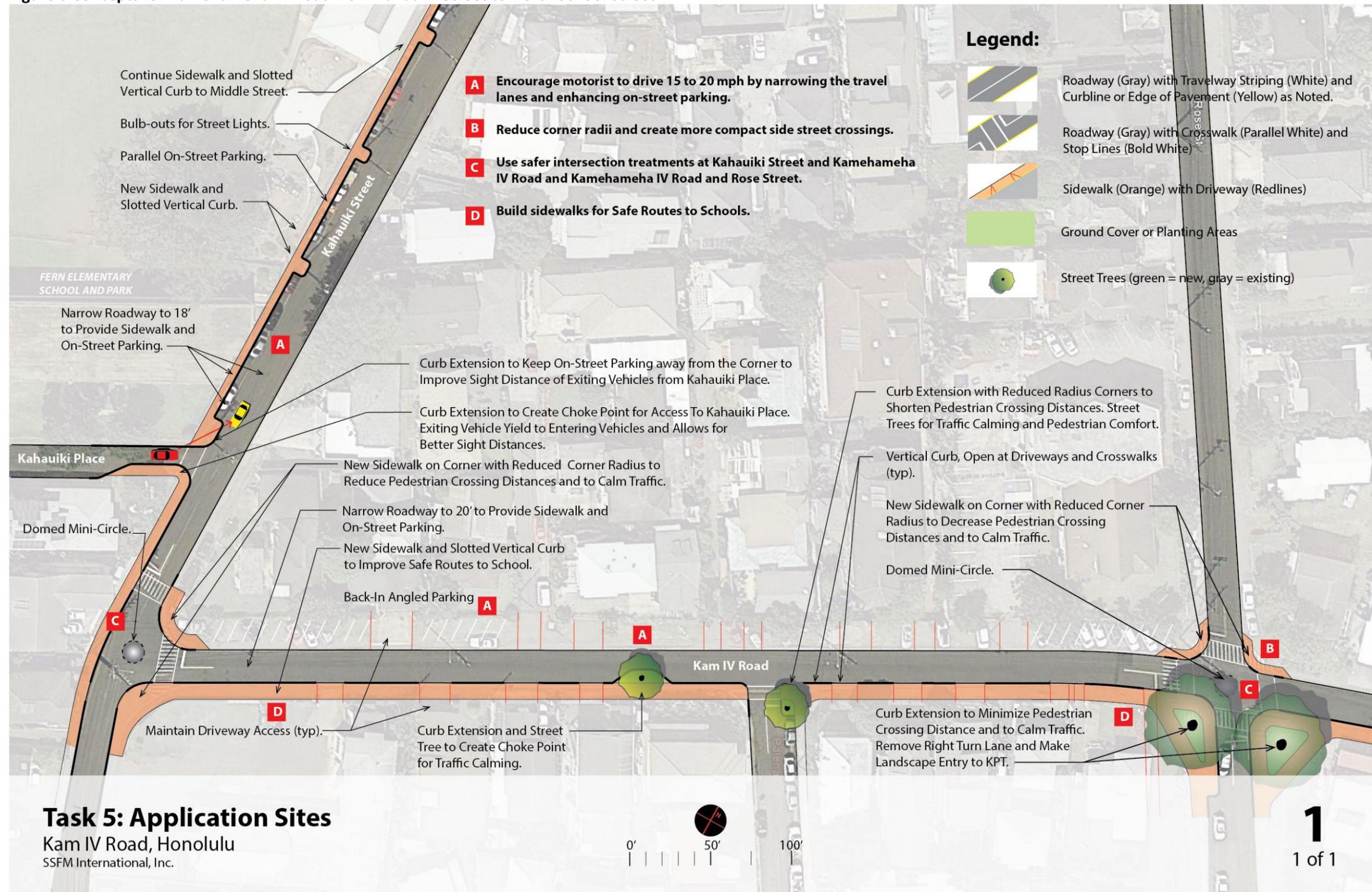
- Build a sidewalk on the Diamond Head side of Kamehameha IV Road and the Fern Elementary School Park side of Kahauiki Street. The sidewalk should be a minimum of 5 feet wide, but since it is near a school, it should ideally be 6 to 8 feet wide. To reduce drainage costs and constraints, install a slotted A/C berm to function as a vertical curb. This allows for a separation to the sidewalk so cars cannot interrupt the walking space by parking on the sidewalk, while still allowing water to flow naturally without the high cost of drainage inlets and utilities.

Table 2 Proposed Design Changes to Kamehameha IV Road

	CURRENT	AFTER RECOMMENDATIONS ARE IMPLEMENTED
Type of Facility	Major collector that connects to minor arterial (North School Street)	No change.
Street Width	Kamehameha IV Rd: 20' to 22', Kahauiki St: ~23'	Kamehameha IV Rd: 20' Kahauiki St: 18'
Speed Limit	25 mph	15 mph
Crosswalk Length (longest)	Kahauiki St and Rose St: 44'	Kahauiki St and Rose St: 25'
Number of lanes	Kamehameha IV Rd: 2 lanes, Kahauiki St: 2 lanes	No change.
Distance to side streets	Block spacing on Kamehameha IV: >300'	No change.
Driveways	Residential driveways on Kamehameha IV and Kahauiki St	No change.
Parking	No on-street parking, however parking on unimproved sidewalk is prevalent	Marked reverse-in angled parking along Kamehameha IV Road. Marked parallel parking along Kahauiki Street.
Sidewalks	Marked pedestrian paths along Kamehameha IV Rd and Kahauiki St	Widen pedestrian path and separate from vehicular traffic with raised A/C berm.
Transit Routes, Stops, Shelters	Within the project area, no City transit bus stops/routes on Kahauiki St or Kamehameha IV Rd, however there are several stops on North School Street	No change.
Proximity to future rail	The Middle Street rail station is proposed to be >0.5 miles from the site.	No change.
Bicycle features	The O'ahu Bike Plan includes proposed bike lane on Middle Street/North School Street.	Traffic calming features and placemaking should aid people on bikes to share the road along Kamehameha IV Road.
Nearby Schools	Fern Elementary School, Linapuni Elementary School, Dole Middle School (<0.5 miles from site)	No change.
Nearby Institutions	Fort Shafter, Kūhiō Park Terrace	No change.

This page has been left blank intentionally.

Figure 3 Concepts for Kamehameha IV Road from Kahauiki Street to North School Street



This page has been left blank intentionally.

Part Four: Implementation

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

Near-Term Actions (Within 1 year)

- A) *Encourage motorists to drive 15 to 20 mph by narrowing the travel lanes and enhancing on-street parking.***
- Narrow travel lanes to ten feet in both directions on Kamehameha IV Road with pavement marking.
 - Narrow travel lanes to nine feet in both directions on Kahauiki Street with pavement marking.
 - On Kamehameha IV Road mark parking spaces along the ‘Ewa side, near the intersections of Kamehameha IV Road at Kahauiki Street and Kamehameha IV Road at Rose Street, to allow for ‘head-out,’ or reverse-in, angled parking.
- B) *Reduce corner radii and create more compact side street crossings.***
- Reduce crossing widths, turning radii, and improve sight lines through pavement marking. Further calm traffic by marking hatched curb extensions on Kahauiki Place, the intersection of Kahauiki Street and Kamehameha IV Road, Palena Street, and the intersection of Kamehameha IV Road and Rose Street. A marked curb extension would remove the right-turn lane on Rose Street from the KPT Housing Complex.
- C) *Re-design intersection treatments at Kahauiki Street and Kamehameha IV Road***
- None.
- D) *Re-design intersection treatments at Kamehameha IV Road and Rose Street***
- None.
- E) *Build a sidewalk.***
- Create safer routes to school by using delineators to mark a designated pedestrian space on the Diamond Head side of Kamehameha IV Road and the Fern Elementary School Park side of Kahauiki Street.

Mid-Term Actions (1 to 5 years)

- A)** Encourage motorists to drive 15 to 20 mph by narrowing the travel lanes and enhancing on-street parking.
- On Kamehameha IV Road (Diamond Head side) near Palena Street create a choke point, (aka a yield point). Do this by building a curb extension planted with a street tree to calm traffic and design the road to encourage motorists to drive between 15 and 20 mph.
- B)** *Reduce corner radii and create more compact side street crossings.*
- Further calm traffic by installing curb extensions on Kahauiki Place, the intersection of Kahauiki Street and Kamehameha IV Road, Palena Street, and the intersection of Kamehameha IV Road and Rose Street. A curb extension would remove the right-turn lane on Rose Street from the KPT Housing Complex.
- C)** *Re-design intersection treatments at Kahauiki Street and Kamehameha IV Road*
- None.
- D)** *Re-design intersection treatments at Kamehameha IV Road and Rose Street*
- None.
- E)** *Build a sidewalk.*
- Pave an asphalt path on the Diamond Head side of Kamehameha IV Road and the Fern Elementary School Park side of Kahauiki Street.

Long-Term Actions (5 years and beyond)

- A) *Encourage motorists to drive 15 to 20 mph by narrowing the travel lanes and enhancing on-street parking.***
- On Kahauiki Street along the Fern Elementary School Park side, better organize the parallel on-street parking with tree wells, or bulb-outs. Inset the parking. Help to green the street by providing a place for a street tree or human-scale street light feature.
- B) *Reduce corner radii and create more compact side street crossings.***
- The curb extension would create space, allowing for a landscaped gateway or pocket park entry into KPT.
- C) *Re-design intersection treatments at Kahauiki Street and Kamehameha IV Road***
- Design for livability by creating an intersection at Kahauiki Street and Kamehameha IV Road with a domed mini-circle. Mini-circles are often used at residential street intersections, where vehicles navigate around a small island—8 to 15 feet in diameter—that can be either lightly domed or raised. They should be designed to reduce speeds to 15 to 18 mph at each intersection.
- D) *Re-design intersection treatments at Kamehameha IV Road and Rose Street***
- Design for livability by creating an intersection at Kamehameha IV Road and Rose Street with a domed mini-circle.
- E) *Build a sidewalk.***
- Build a paved sidewalk on the Diamond Head side of Kamehameha IV Road and the Fern Elementary School Park side of Kahauiki Street. The sidewalk should be a minimum of 5 feet wide, but since it is near a school, it should ideally be 6 to 8 feet wide. To reduce drainage costs and constraints, install a slotted A/C berm to function as a vertical curb. This allows for a separation to the sidewalk so cars cannot interrupt the walking space by parking on the sidewalk, while still allowing water to flow naturally without the high cost of drainage inlets and utilities.

This page has been left blank intentionally.

Part Five: Cost Sheet

<i>ITEM</i>	<i>UNIT</i>	<i>QUANTITY</i>	<i>UNIT COST</i>	<i>TOTAL COST</i>
Removals/Demo				
Erosion Control	L.S.	1	\$ 10,000.00	\$ 10,000.00
Site improvements				
Roadway				
Mill and Overlay existing AC pavement	Sq. Ft.	31150	\$ 6.00	\$ 186,900.00
Full depth roadway construction	Sq. Ft.	3400	\$ 17.00	\$ 57,800.00
Sidewalk	Sq. Ft.	16171	\$ 6.00	\$ 97,026.00
Raised Asphalt Concrete Berm	Lin. Ft.	2000	\$ 15.00	\$ 30,000.00
Drainage works	each	10	\$ 7,000.00	\$ 70,000.00
4" Stripe (white/Yellow)	Lin. Ft.	180	\$ 6.00	\$ 1,080.00
12"stripe (white)	Lin. Ft.	400	\$ 9.00	\$ 3,600.00
Intersection				
Mini-Circle with Mountable Domed Center	each	2	\$ 15,000.00	\$ 30,000.00
Landscaping				
Trees	each	4	\$ 1,000.00	\$ 4,000.00
Boulevard Landscape	Sq. Ft.	1130	\$ 10.00	\$ 11,300.00
Misc.				
Traffic Control	L.S.	1	5%	\$ 25,085.30
Mobilization	L.S.	1	10%	\$ 50,170.60
Contingency - 25%			25%	\$ 125,426.50
Design				
Design Cost			10%	\$ 70,238.84
TOTAL CONSTRUCTION				\$ 702,388.40
TOTAL COST				\$ 772,627.24