



COMPLETE STREETS APPLICATIONS IN HONOLULU:

Making Liliha Street and Nuuanu Avenue More
Multimodal

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I. Introduction, Study Area, Crash Study

WHAT ARE COMPLETE STREETS?

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

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

The Complete Streets Phase 2 project on Liliha Street and Nuuanu Avenue supports the City and County of Honolulu - Department of Transportation Services’ intent to implement Complete Streets principles into all projects that impact the public right-of-way. In 2009, Hawaii passed legislation that required each county to enact its own complete streets policy. [Section 264-20.5, Hawaii Revised Statutes (Act 54 SLH 2009)]. In May 2012, the Honolulu City Council adopted a Complete Street policy. [Ordinance 12-15, City and County of Honolulu]. Resulting from the initiative, the *Honolulu Complete Streets Design Manual* provides ongoing guidance on design principles.

The Honolulu Complete Streets Ordinance established policy for the City and County of Honolulu. The policy reads: *“the City hereby expresses its commitment to encourage the development of transportation facilities or projects that are planned, designed, operated, and maintained to provide safe mobility for all users. Every transportation facility or project, whether new construction, reconstruction, or maintenance, provides that a context sensitive solution process and multi-modal approach be considered in all planning documents and for the development of all city transportation facilities and projects.”* The policy and principles consist of ten objectives:

- Improve safety
- Apply a context sensitive solution process that integrates community context and the surrounding environment, including land use
- Protect and promote accessibility and mobility for all
- Balance the needs and comfort of all modes and users
- Encourage consistent use of national industry best practice guidelines to select complete streets design elements
- Improve energy efficiency in travel and mitigate vehicle emissions by providing non-motorized transportation options

- Encourage opportunities for physical activity and recognize the health benefits of an active lifestyle
- Recognize complete streets as a long-term investment that can save money over time
- Build partnerships with stakeholders and organizations statewide
- Incorporate trees and landscaping as integral components of complete streets

Recommendations from this Complete Streets project will “improve the safe mobility for all users” of Liliha Street and Nu’uanu Avenue and affirm the objectives above.

STUDY AREA (FIGURE 1)

The project study area includes Liliha Street and Nuuanu Avenue from School Street to Wyllie Street.

CRASH STUDY

HPD and The City and County of Honolulu Department of Transportation Services provided 3 years of crash reports for Liliha Street and Nuuanu Avenue from School Street to Wyllie Street (2014 to 2016). In the three years 2014-2016, there were 18 crashes on Liliha Street and 24 crashes on Nuuanu Avenue between School Street and Wyllie Street.

- 11 involved pedestrians (1 fatal and 10 resulting in injury)
- 3 involved bicycles (1 fatal and 2 resulting in serious injury)
- 19 involved 1 or more moving vehicles (11 resulting in injury)
- 4 were fixed object crashes (moving vehicles hitting a brick wall/gate, traffic signal poles and utility poles)
- 5 involved a moving vehicle hitting a parked car (1 resulting in injury)

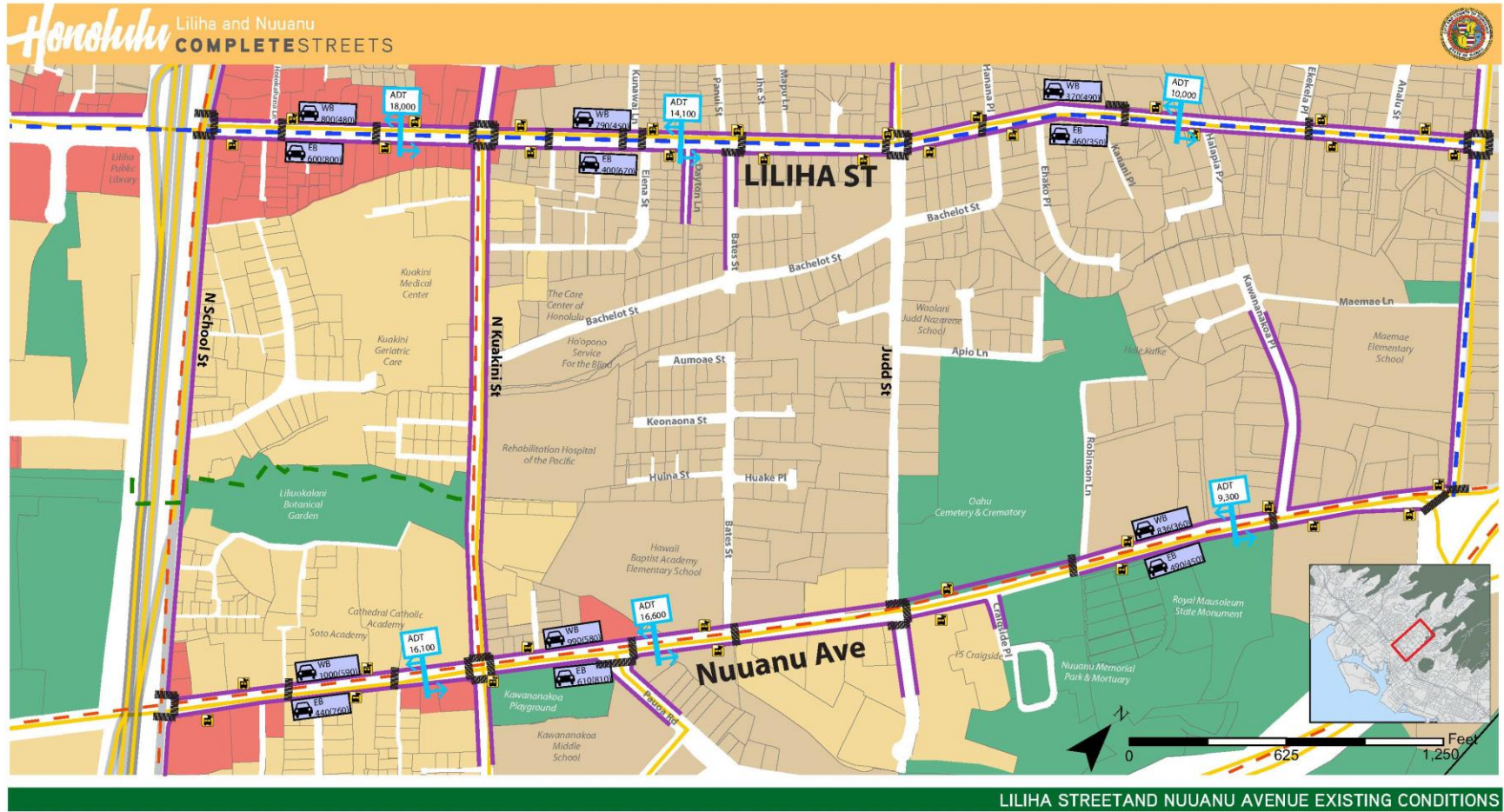
CRASH MITIGATION MEASURES

In general, many of the crashes (noted by Inattentive Driving, Misjudgment or Failure to Yield right of way) suggest that drivers are not being attentive to the traffic signals or yielding the right of way. There are some simple, low cost countermeasures that can be utilized to increase traffic signal conspicuity and have been proven effective at reducing crashes¹:

- Installing backplates to signal heads and adding 3” yellow retroreflective tape around signal backplate [15% crash reduction - all crashes]
- Converting signal posts to mast arm signals [29-51% crash reduction - all crashes, 41% crash reduction - rear end crashes, 74% crash reduction – angle crashes]
- Increasing all red interval [3-20% crash reduction, all crashes]
- Adding flashing yellow arrow for left turns [11-31% crash reduction - all crashes, 50-65% crash reduction – left turn crashes]
- Stepping up enforcement, citing violators for failure to yield right of way, inattentive driving, running red lights, DUI, etc.
- New paint and signage at crosswalks. Add “Left turn yield on green” signs at problem locations.

¹ SOURCE: Crash Modification Factor clearinghouse website <http://www.cmfclearinghouse.org> USDOT, FHA

Figure 1 Existing Land Use and Transportation Facilities in the Study Area



The vulnerability of pedestrians – especially in the school zones - cannot be overstated. Special attention should be given to making the crosswalks highly conspicuous and accessible and attended by crossing guards before and after school if feasible. Although traffic congestion on Liliha Street and Nuuanu Avenue has been a cause for complaints by road users, it has kept average speeds slower than the speed limit during the peak hours and has effectively prevented higher speeds that can have tragic consequences.

Vehicle speed is a primary concern for pedestrians due to the fact that slower vehicle speeds have direct correlation to the survival rate of a pedestrian hit: 90% of pedestrians hit by a vehicle traveling at 20 mph survive, 50% of pedestrians hit by a vehicle traveling at 30 mph survive, and 10% of pedestrians hit by a vehicle traveling at 40 mph survive.

The most notable elements missing from the Liliha Street and Nuuanu Avenue corridors are ADA compliant sidewalks and bicycle facilities. Providing safe sidewalks, crossings and bicycle accommodations are mitigation measures in and of themselves.

II. Advisory Group, Public Outreach, Walk Audits and Findings

ADVISORY GROUP

As a major effort of the Complete Streets Phase 2 – Liliha Street and Nuuanu Avenue project, SSFM included a Context Sensitive Solutions process to ensure the final results of the project reflect the needs and desires of the people who will use the corridors the most. Considerable effort was expended on identifying stakeholders and involving them in small group and public meetings and inviting them to the walk audits. DTS and SSFM contacted the elected officials from the City Council and Hawaii government House and Senate in the Liliha and Nuuanu neighborhoods to request their input on (1) what issues they would like addressed for their constituents in the Complete Streets project and (2) which organizations and individuals should be included on the stakeholder list. An Advisory Group was formed with 38 groups represented, invited to participate in the audits, and included in group updates.

PUBLIC OUTREACH

The Public Outreach for this Complete Streets project included:

- Four meetings with the Advisory Group (including the Walk Audits)
- Stakeholder Involvement – website and flyers to notify the community about the project and opportunities to get involved
- Website with information on the project and contact information and a link to contribute comments
- Presentations at Neighborhood Board meetings: 2 for Liliha NB and 2 for Nuuanu NB
- Two Community meetings

WALK AUDITS



The walking audit brought together 16 stakeholders on Sept. 6, 2017 from the City and County of Honolulu, local community representatives, several key partners, and the Consultant Team, led by Mark Fenton, engineer and walkability expert.

FINDINGS OF THE 2017 WALK AUDITS AND ADVISORY GROUP MEETINGS

Liliha Street:

- Advisory group had sentimental attachment to their neighborhood and how they valued the traditional old feel of the streets, buildings and businesses.
- Many sidewalk deficiencies were noted: uneven surfaces, changing materials, varied textures, unauthorized uses (pavers, etc.), blockage by parked cars in driveways, utility and sign poles, encroachment by walls and fences, overgrown vegetation, trash cans. Curb ramps are missing in places or non-ADA compliant.
- Queueing occurs at Wyllie Street intersection, causing drivers to cut through neighborhoods to find alternate routes.
- Bicyclists feel unsafe due to parked cars and vehicles maneuvering in and out of parking spaces and opening/closing their car doors.
- Poor visibility and sightlines at intersections. Vision is blocked by hedges, trees, signposts, etc.
- Unpredictable parking – drivers are unsure when or whether they can use the outer lanes.
- Peak hour driving conditions are perceived to be congested, especially at Wyllie Street, Judd Street, N. Kuakini Street and School Street intersections.
- Abandoned stores/empty storefronts are uninviting and not contributing to the vitality of the neighborhood commercial center.

Nuuanu Avenue:

- Pavement condition is poor
- There are no bicycle facilities. Bicyclists sometimes use the sidewalk.
- Sidewalks, especially at the mauka end, are narrow, missing in long segments, jog unexpectedly, have various textures and materials (asphalt or unpaved paths), have no setbacks from the curb in places, and are blocked or encroached upon by signs, bus stop amenities, utility poles and overgrown vegetation.
- At the mauka end of Nuuanu Avenue there is a lack of shade and trees.
- Speeding is a problem, especially for makai bound (westbound) vehicles as they go downhill.

- Judd Road is misaligned.
- Sightlines for vehicles exiting Craigside Place are obstructed by parked cars and inadequate, especially for those turning left and crossing at least 2 lanes.
- The intersection of N Kuakini Street has heavy traffic use, a lot of queueing, and high pedestrian use by school children attending Kawanānakoā Middle School.
- There are high numbers of access points for retail and residential driveways, with no standard for widths. Many properties have more than one access.

Both:

- Vehicles have narrow lanes, especially on the mauka end. Lanes are not wide enough for buses.
- Utility poles and wires are a dominant and unattractive feature of the view on Liliha Street.
- On street parking is in high demand

III. Multimodal Assessment

The project team conducted assessments for the pedestrian, bicycle, transit and vehicle facilities on the Liliha Street and Nuuanu Avenue corridors.

Bicycles

HCS was used to quantitatively determine the bicycle LOS at the intersections and along the segments between signalized intersections. Segment LOS was D to F. The low LOS on the segments is due to poor pavement conditions, absence of dedicated bike lanes, narrow lanes and high number of access points. One significant challenge for bicyclists on both corridors is the uphill grade of 2 to 7 percent in the mauka direction. Another challenge is negotiating around cars that are maneuvering into or out of parking spots, or parked cars with drivers opening or closing their doors. Also related to the significant grade, downhill bicyclists can pick up significant speed, which requires more reaction time from vehicles that may be crossing their path.

Pedestrians

Both corridors are heavily used by pedestrians. There are numerous businesses that attract customers on foot. There are dozens of bus stops, which generate pedestrian traffic coming from and going to the buses. There are also churches, preschools, clinics and dentist offices, medical centers, six schools and multiple churches and cultural centers on the corridors. Right across the H1 Freeway are a library, the Dillingham commercial area, Honolulu Community College shopping centers, Chinatown and Downtown Honolulu. The mauka end of Liliha Street is mostly lined with single family homes whose residents may opt to walk to these destinations.

HCS was used to quantitatively determine the pedestrian LOS at the intersections and along the segments between signalized intersections. HCS determines pedestrian LOS using the following input variables: presence and width of sidewalk, pedestrian volume, distance to signal and the effective width due to fixed objects narrowing the usable sidewalk. Intersection LOS was B or D. Segment LOS ranged from C to F. As part of the pedestrian analysis, SSFM also completed a crosswalk assessment on Liliha Street and Nuuanu Avenue to compare existing conditions to Complete Streets standards.

Transit

Liliha Street is serviced by 2 Bus Routes. On a typical weekday, the 22 bus stops on Liliha Street between School Street and Wyllie Street have about 1540 boardings and 1757 alightings. The 22 bus stops on Nuuanu Avenue have about 716 boardings and 710 alightings. HCS was used to quantitatively determine the transit LOS along the segments between signalized intersections. HCS determines transit LOS using the following input variables: number of transit stops, dwell time and proportion of stops with benches and shelters, among other variables. Transit segment LOS ranged from A to D.

Vehicle

SSFM built a Synchro model and input 2017 AM and PM peak hour volumes. The Liliha Street corridor has four signalized intersections, which were all found to have overall intersection LOS of C or better during the AM and PM peak hours in 2017, with all movements ranging from LOS A to C. Of the three stop-controlled intersections studied, both the St Francis driveway and Kunawai Lane have all movements LOS C or better. The Bates Street northbound movement has LOS D in the AM peak hour.

SSFM built a Synchro model for Nuuanu Avenue and input 2017 AM and PM peak hour volumes. The Nuuanu Avenue corridor has five signalized intersections, all which had overall intersection LOS D or better, and all movements had LOS D or better, with the exception of the eastbound left turn movement at School Street, which had LOS E and F in the AM and PM peak hours. It was just over capacity in the PM peak hour, with a v/c ratio of 1.02. Kuakini Street has overall intersection LOS F in the AM and PM peak hours. The southbound left turn movement from Kuakini is 2-4 times over capacity. If no improvements are made to the intersections, in 2037, the Nuuanu Avenue signalized intersections are still expected to have LOS D or better in the AM and PM peak hours, except at Kuakini Street, where drivers are expected to experience even longer average wait times of almost five minutes in the AM peak hour and three minutes in the PM peak hour. The consistently failing southbound left turn movement suggests that a left turn arrow is needed.

IV. Recommended Application of Complete Streets Concepts

The Complete Streets principles incorporated in the recommended improvements are:

- Encouraging multiple modes of transportation, particularly walking and biking
- Promoting safety for all modes of transportation, particularly safer street crossings.
- Adjusting the design speed of the road to match and reinforce the posted speed limit of 25 mph

A) Implement road diet, transitioning street from four to three vehicle lanes

- Restripe Liliha Street's vehicle lanes to one lane per direction plus a two-way left turn lane.
- Along stretches without driveways, install medians in the center turn lane.
- At busy intersections, stripe exclusive left turn lanes in the center lane.
- Maintain parking when possible.
- Stripe bicycle climbing lane on Liliha Street and shared lanes elsewhere.

B) Improve bike facilities

- Install a 5' bicycle climbing lane on the uphill/mauka bound (Diamond Head) side of Liliha Street

and indicate a shared lane on the downhill/makai bound (Ewa) side of Liliha Street.

- On Nuuanu between School Street and Kuakini Street, install a 5' bicycle lane on the mauka bound side, and indicate a shared lane on the makai bound side.
- On Nuuanu between Kuakini Street and Wyllie Street, indicate shared lanes for both directions.
- On Nuuanu at Judd Street, add signage for mauka bound Nuuanu vehicles turning left at Judd Street "Left Turners Yield to through vehicles and bikes" to raise awareness of the potential conflict of fast-moving downhill bikes with left turning vehicles. Add lighting on Nuuanu Avenue uphill from Judd Street to raise visibility of bikes traveling downhill at night.
- Add bike parking to the streetscape and/or to curb extensions.
- Place green paint in bicycle lanes at intersections and high-conflict driveways.

C) Build 8-foot-wide sidewalks (or 5' sidewalks plus landscape strips) along both sides

- Also inform residents and property owners that they must remove any encroaching walls, fences, trash cans, landscaping, parked cars and other items to keep the sidewalk clear.
- Build a paved sidewalk on the Diamond Head side of Nuuanu Avenue, mauka of Craigside Place, to replace 3' unpaved path.

D) Reconfigure the Kuakini Street intersection at Nuuanu Avenue

- Widen the intersection about 4-5 feet on Nuuanu to accommodate turning trucks and buses.
- Utilize stamped and colored concrete or brick pavers on crosswalks to give drivers powerful cues that this is a special intersection and to slow down and watch for pedestrians
- Consider strategic placement of bollards to protect school children waiting at curb ramps.
- Stripe southbound Kuakini Street to have an exclusive left turn lane. Provide a left turn arrow phase for this movement.

E) Improve crossings to include ADA compliant curb ramps at both ends of each crossing. Add raised pedestrian crossings to slow right turners at key Nuuanu crosswalks

F) Add curb extensions to shorten crossing distance. Plant trees in curb extensions to add shade

G) Protect crosswalks with signage and safety enhancements

- Add pedestrian refuge islands to provide pedestrians with a safe place to wait and cross one direction of traffic at a time.
- Install Rectangular Rapid Flashing Beacons (RRFB) at key unsignalized crosswalks.

H) Offset road to maintain on-street parking

- The design includes on-street parking alternating from the Ewa side to the Diamond Head side between School Street and Judd Street.

I) Evaluate the feasibility of burying segments of utilities on at least one side of the street

- Obtain cost estimates from utility companies

J) Establish a TIF district or other incentives for commercial building owners to invest in updating and renovating the properties along lower Liliha Street.

