6 COMPLETE STREETS IN KAKA`AKO

Standard Street Elements


Planters and street trees


Bike parking

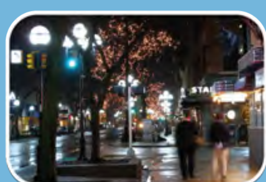

High visibility crosswalk markings


ADA-compliant curb ramps


Curb extensions (with parking)


Far-side transit stops
(on transit streets)


Street furniture


Pedestrian-scaled lighting


Clearly defined sidewalk zones
(using paving techniques, special materials, etc.)


Interpretive design and public art


Pedestrian countdown signals


Redevelopment setbacks


Transit-bicycle integration features
(on priority transit and
bicycle streets)

Optional Street Elements


Pedestrian priority signalization
(Barnes Dance)


Pedestrian refuge island


Raised median/Center turn lane


Bike Share Stations


Rapid flashing beacons


Bus bulb out


In-street bicycle corral


Transit stop-building integration


Dedicated bicycle facilities
(bike lanes)


On-street parking


Guideway column


Dedicated bicycle facilities
(cycle track)


Stormwater management


Bollards


Bicycle facilities (sharrows)


Mid-block crossing


Dedicated loading zones


Vertical deflection
(e.g., speed humps)


Transit lanes


Pro-time parking/
Peak hour bus lanes


Transit lanes

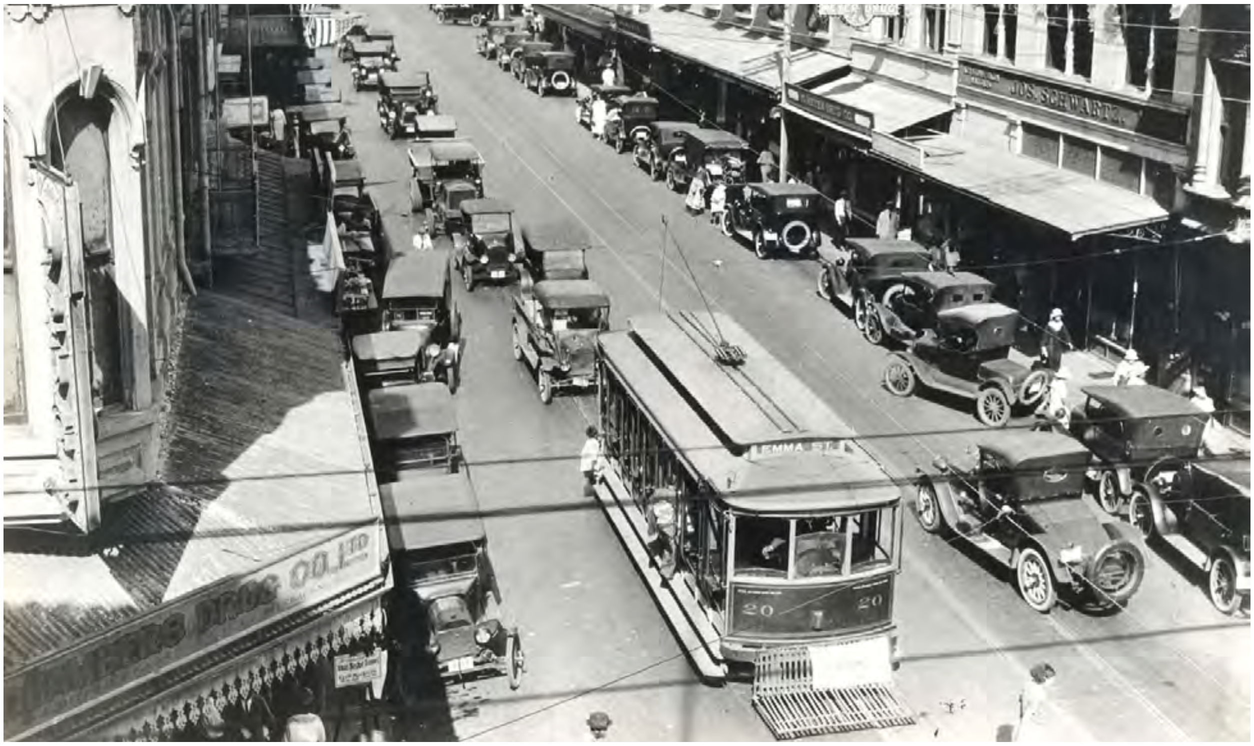
6 COMPLETE STREETS IN KAKA`AKO

CREATING MULTI-PURPOSE STREETS

As the famous urbanist, Jane Jacobs reminds us, “nobody enjoys sitting on a stoop or looking out a window at an empty street. Almost nobody does such a thing. Large numbers of people entertain themselves, off and on, by watching street activity.” Streets are the lifeblood of an urban community. They don’t simply provide a way to travel, but are our largest public space, providing the “living room” of any neighborhood–a place to socialize, recreate, and to move about.

The relationship between buildings and the street is the essential linkage between residents and their community. Done well, this linkage creates a vibrancy that will encourage engagement, health and quality of life in Kaka`ako. Streets designed primarily for the private automobile deliver monotonous, and unsecure public spaces that discourage public interaction. Most streets in Kaka`ako are currently auto-oriented – the types of places a pedestrian would hurry to pass through rather than linger and enjoy.

This chapter provides a framework and principles to develop a more balanced, vital, and community-serving street system in the KCDD.



King Street in 1930 accommodated pedestrians, streetcar, automobiles, and even bicycles. This corridor once operated as a slow, pedestrian-oriented street.
Image from State of Hawai`i

Image from Nelson\Nygaard

DESTINATION-BASED COMPLETE STREETS

Streets are the backdrop of daily life and commerce in Kaka`ako. Today, people use the District's streets to get to work, park, walk to the bus, or to make a delivery. Few people chose to walk the streets for non-utilitarian purposes. When the HCDA TOD Overlay Plan is realized, a key measure of success will be the number of people that come to Kaka'ako to enjoy its streets. Making KCDD streets livable will require providing opportunities for social interaction and commerce, developing spaces for leisure and recreation, as well as improved functionality for all users. Below are some examples of exemplary destination streets that expand the traditional definition of "street."

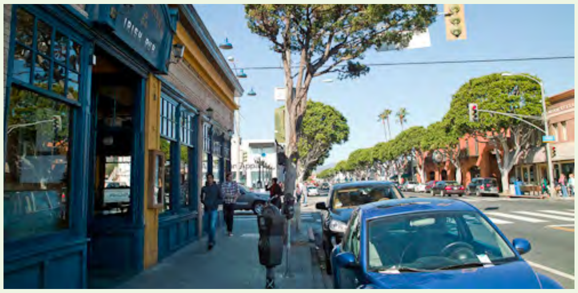
Kalakaua Avenue, Waikiki, HI

A prime of Honolulu street prioritized for pedestrians and retail access
Image from All Hawaii News

Lincoln Road, South Beach, Miami

World class shopping street.
Image from Miami City Diggs

Main Street, Santa Monica, CA



A warm weather retail street
Image from Gary Kavanagh

NW 13th Avenue, Portland, OR

Redevelopment district street retains light-industrial feel and slow-mixed operations
Image from Nelson\Nygaard

Yaletown Blocks, Vancouver, B.C.

Redevelopment district street retains light-industrial feel and slow-mixed operations
Image from Yaletown Blog

Third Street Promenade, Santa Monica, CA

A renowned pedestrian priority street anchored by frequent transit service and a future light rail transit station.
Image from Nelson\Nygaard

WHY COMPLETE STREETS FOR THE KCDD?

At the most practical level, Complete Streets in the KCDD are necessary to accommodate much greater number of residents, workers, and visitors to the District as surface parking lots and one-story commercial buildings are transformed to residential towers, retail, and busy civic uses. Viewed more broadly, the streets of Kaka`ako are the connective tissue that, if designed well, will make a mere collection of buildings into a vital urban community.

Complete streets in the KCDD will:

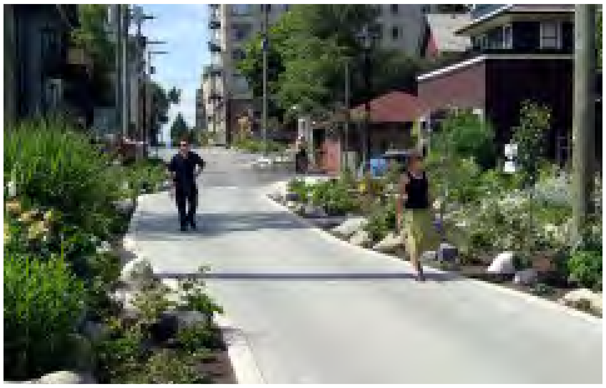
Ensure safety. Streets that manage auto speeds, and provide sidewalks, medians, well-designed crossings, amenities for mobility impaired users, separated bicycle facilities are proven to be safer for pedestrians, motorists, and bicyclists alike.

Encourage active lifestyles. Complete Streets in the KCDD can help support a healthy citizenry and reduce health care related costs. Building streets that support pedestrian and bicycle travel both enables *and encourages* greater levels of physical activity and active transportation.

Extend transportation choice. Providing safe and convenient transportation choices to citizens is an important goal for all communities. Complete Streets is a democratic design and policy framework that ultimately extends resident and employee mobility options. Doing so means KCDD can to meet the needs of different types of users and provide alternatives to traffic congestion and costly trips to the gas pump. Providing a diverse range of time-competitive travel options is particularly important for the large inclusionary housing market planned for the KCDD.

Stimulate and support the local economy. Complete Streets not only expand opportunities to access local retail and employment sites, but also nurture the local economy. Often referred to the "green dividend", enabling walking, bicycling, and transit use can redistribute roughly $9,000 of a person's annual disposable income from operating and maintaining a car to local retail, entertainment, and restaurant expenses.

Create places and destinations. Complete Streets reorganize underutilized roadway space toward economic and social uses. The TOD Overlay Plan envisions a Kaka`ako that is a major destination in Honolulu, not just as a point between downtown and destinations Diamond Head of the district (Ala Moana and Waikiki). Complete Streets provide the gateway to Kaka`ako, but are also the attraction.



A calmed street in Vancouver, B.C.
Image from Dan Burden

A shared street in San Francisco, CA.
Image from Nelson\Nygaard

A main street in Santa Barbara, CA.
Image from Nelson\Nygaard

Lower the cost of street maintenance and construction. Building new streets or reconstructing existing streets using Complete Streets principles is more economical than constructing auto-centric roads. Complete Streets move more people with less space, thereby limiting the need for future roadway expansion and ensuring more space is dedicated to civic uses. Increased walking and bicycling reduces wear-and-tear on roads, which can extend the lifetime of Kaka`ako's streets and reduce annual preventative maintenance costs.

Improve transportation efficiency & network capacity. Complete Streets improve roadway efficiency and capacity for all users by moving more people in the same amount of space. More informed metrics of success that measure person carrying capacity rather than traditional vehicle-oriented performance measures are often used to determine successful use of limited roadway space.

Automobiles require much greater capacity to move the same amount of people than buses, bicyclists, and pedestrians.
Image from City of Muenster, Germany

Building Community, Not Auto-Capacity

The street network serving Kaka`ako includes both highly congested regional arterials such as Ala Moana Boulevard, Kapiolani Boulevard, and King Street. On the other hand, local district streets like Queen Street, Cooke Street, and Ward Avenue are underutilized, with more pavement width than is necessary to carry current traffic volumes. As currently designed, they don't support active retail uses, or an active and healthy street life.

Many streets designed in the last 50 years were designed around a single principle – the need to minimize auto traffic congestion. It is important to understand that congestion is not simply the result of a road that does not have enough capacity for cars, but is also a result of overreliance on one mode (auto travel) over other modes (walking, bicycling, and transit use). A more important measure of the success of a street grid is the person-moving capacity, considering all modes of travel. Moreover, as roadway capacity is added to address congestion, space is taken away from bicycling, walking and fast moving transit. Adding roadway capacity may reduce traffic congestion in the short term, but ultimately, new capacity attracts new auto demand, and the cycle begins again.

Focusing entirely on auto capacity is counter-productive to HCDA's efforts to develop a vibrant, pedestrian-oriented, urban district—even as Kaka`ako faces exceptional population and employment growth. A multimodal approach to street design and operation is the solution to simultaneously address congestion, maximize use of existing right-of-way, help build a transit-oriented community, and facilitate district access.

To implement this multimodal approach, HCDA will adopt a Complete Streets framework and rethink how street performance is measured. Doing so will ensure the KCDD:

- Becomes a mixed-use district that allows residents to meet their needs locally, reducing the need to make cross-island or inter-neighborhood trips by car. This requires an integrated land use strategy (see Chapter 3).
- Makes the most efficient modes of transportation – walking, biking, transit, carpooling, and car-sharing – more attractive than driving alone. Making these modes more competitive allows the street network to move more people and unlock transit efficiencies.

Vanderbilt Avenue in New York City is a true multimodal street that expands person capacity while strengthening the retail corridor.
Image from Paul Carlos

- Influences mode choice by reducing or eliminating parking subsidies (see Chapter 8 for more information on parking management).
- Allows roads to be congested during peak demand hours even as the district increases density. Alleviating congestion with roadway widening negatively impacts all other modes, as well as impacting downstream signals or internal neighborhood streets. Adding capacity typically encourages "latent demand"[1] for roadway space, resulting in increased and prolonged congestion issues.

1 New vehicle trips enabled by the temporary lessening of delay.

RETHINKING CONGESTION

Congestion is an inevitable reality of urban redevelopment in the KCDD, and catering to more auto trips will only degrade the multimodal transportation system, reduce user safety, and—perhaps most salient to HCDA—limit the district's quality of redevelopment.

What may be seen as counter-intuitive, congestion is a necessary component of a strong, dynamic economy where people move between their home and job site, residents and visitors access retail to spend their discretionary income, and freight facilitates commerce. Traffic congestion is merely a sign of economic success. In fact, the only successful cases where congestion was eliminated through increasing roadway capacity are Rust Belt cities facing economic decline and population loss.

Image from Flicker Casey Serin

Strategy CS1 Preserve current levels of auto mobility on major regional thoroughfares

The KCDD can accommodate substantial amounts of residential and commercial growth over the next 25 years and still provide streets that comfortably move people between district destinations. To achieve the optimal balance between growth and people movement, two key actions must be achieved.

Action CS1.1 Increase district access using spatially efficient modes such as walk, bike, and transit

With the addition of new street and pedestrian connections proposed in Chapter 5, Kaka`ako's street network contains the necessary person capacity to keep the KCDD moving and bustling with life. In order to achieve this, clear street design principles and multimodal street types should be established to guide design decisions and strategically reprioritize KCDD streets for the movement of people on foot, on bicycles, and on transit.

Most destinations in the KCDD are within a walkable distance from each other. Kaka`ako should be designed to be a true pedestrian district.
Image from Nelson\Nygaard

Action CS1.2 Focus on the right kind of development, in the right locations, with the right system, parking, and demand management tools in place

Redevelopment of TOD sites, master planned sites, and other areas of KCDD must simultaneously employ strategies that reduce auto trip demand, while establishing district streets that are walkable and complete. The end result should be to maintain or slightly increase auto access compared with current levels while accommodating most new trips on foot, by bicycle, on transit, or other sustainable travel options.

Strategy CS2 Limit right-of-way expansion to new street connections, redevelopment setbacks, and additional dedications for special pedestrian realm uses

For the most part, existing KCDD streets are built out. Limited land exists to widen roads to accommodate single-occupant vehicle demand, transit only lanes, or dedicated bicycle facilities. Thus, roadway improvements should generally occur within the existing right of-way and should never narrow the existing pedestrian realm, *even to accommodate turn lanes*. Depending on the corridor, new modal facilities may have to come at the expense of a travel lane or parking based on a particular street's land use context and function.

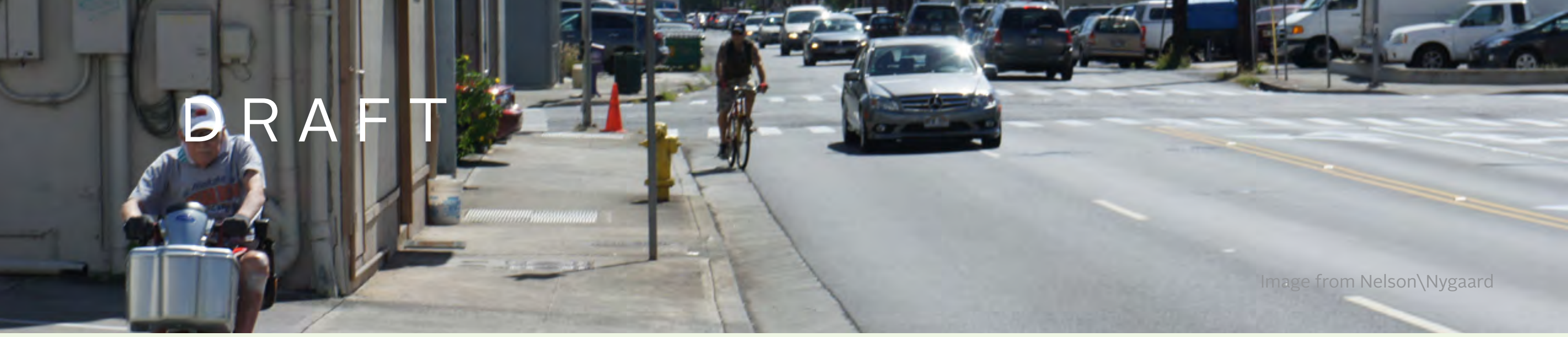


Image from Nelson\Nygaard

COMPLETE STREETS: A PRIMER

WHAT ARE COMPLETE STREETS?

Complete Streets is a shorthand term for streets that have been planned, designed and operated with consideration to needs of all travelers including people of all ages and abilities whether they are walking, riding a bicycle, taking public transportation, or driving. Complete Streets offer an overarching strategy for communities to meet their economic, social, and environmental goals. Every street, the land uses it supports, and topographic context differ; actual implementation of Complete Streets principles will change in the local context. The only constant tenet of Complete Streets is the provision of safe facilities for all users.

Complete Streets should never be formulaic. There is no one size fits all design.

The term Complete Streets in the context of the KCDD TOD Overlay Plan means both a process and a product. The process is the steps and decisions that lead to a specific street or intersection design; the product being the on-the-ground result of this process and the range of street designs that can be used on similar street types in Kaka`ako.

Most importantly, Complete Streets are a partnership between the agencies that plan, design and maintain them – including the HCDA, the City and County of Honolulu DTS, and HDOT – and the communities and businesses that they serve.

Complete Streets are not:

- Focused solely on auto mobility
- Focused solely on one street—a Complete Network is as important as a Complete Street!
- A specific design prescription
- A mandate for an immediate retrofit
- A silver bullet solution for all transportation issues

When should Complete Street designs and principles be applied?

- New street construction
- Street or sidewalk reconstruction
- Street or sidewalk rehabilitation
- Street resurfacing
- Maintenance
- Operations
- When new development is required to build street and pedestrian facilities
- Public-private ventures

Most Complete Streets projects in KCDD will be retrofits of existing roadways, like this bikeway retrofit of Third Street in Long Beach, CA.
Image from LA Streetsblog

Exceptions to this rule include use of redevelopment tools such as setbacks or dedications for specific uses like bike share stations and new narrow street or pedestrian only connections.

INTEGRATING LAND USE AND STREET DESIGN

The many benefits of locating new development near high capacity transit are described in Chapter 3 of the TOD Overlay Plan. Based on transit-oriented development literature, by locating development near future HART stations and other frequent transit service hubs, the KCDD's peak period vehicle trips can be cut by roughly 20-40%, compared to the traffic it would generate elsewhere.

The TOD Overlay Plan concentrates future growth in the KCDD neighborhoods that are within comfortable walking and bicycle distance of HART stations, destinations, and services. In addition, the plan establishes strategies to improve pedestrian and bicycle connectivity and safety, thus making walking and bicycling attractive, safe, and efficient modes of travel. The combined effect of rail proximity, integrated land use development, a high quality active transportation network, a wealth of local businesses proving needed personal services, and mobility alternative to the private auto (i.e., bicycle sharing, car sharing, etc.) will reduce per capita vehicle trip making.

Portland's Pearl District integrates a mix of dense commercial and residential land uses with narrow streets, wide sidewalks, and frequent transit service (streetcar and bus).
Image from Nelson\Nygaard

Strategy CS3 Integrate Land Use and Building Form with Street Design and Programming

Designing Complete Streets requires attention to context of the street and the land uses it serves. Street design must integrate the needs of the surrounding environment, built or natural. Main streets often feature on-street parking to support street retail uses and accommodate business access for driving customers. Dense, urban streets feature expansive sidewalks with street furniture to accommodate high pedestrian volumes, workers seeking lunchtime or post-work repose on a bench, and even space for food carts or other uses that make a district street lively and active.

Each KCDD street should be designed and operated to support the land uses it immediately serves. Land uses are defined in Chapter 3 of this plan. Take Commercial Avenues as an example. Commercial Avenues, such as Ward Avenue, Pensacola Street, and Piikoi Street, need to attract and accommodate a customer base by providing reliable vehicle access, but ensuring that priority is given to the pedestrian. This become particularly important as new retail orients to the street, rather than being setback behind surface parking. Commercial avenues provide access by a variety of modes and benefit from on-street parking to provide access for short-stay customers and to buffer busy sidewalks from traffic. Busy commercial areas in Kaka`ako should prioritize transit and pedestrians.

STREET DESIGN PRINCIPLES

A two-part process was used to establish a conceptual Complete Street typology:

- Establish a balance between four basic design principles or factors – livability, access and mobility, demand, and safety, described below
- Determine modal priorities to allocate limited right-of-way

The four principal design factors used to develop the Complete Streets typology include **Livability**, **Access and Mobility**, **Demand**, and **Safety**. These factors ensure the Complete Streets typology organizes a calculated design response to the specific, local context of each street. Future work by the HCDA will develop detailed design guidance and local application of the Complete Street types defined in this plan.

Livability. Livability is a central theme of the KCDD Overlay Plan and it is interconnected with the three other design principles. Livability requires that the broadest possible array of users are being served: motorists, pedestrians, bicyclists and the auxiliary needs of land uses that may extend into the street right-of-way. Livable street design uses lane configurations and dimensions that balance different street uses and ensures aesthetics, plantings, and furnishings which transform a streetscape into a usable public space.

Demand. The demands that redevelopment will have on KCDD streets must be addressed in the design of district streets. Neighborhoods within the district that will experience the largest increases in residential and commercial growth need to be supported by streets that can move the most people, rather than the most cars. Assuming that the right-of-way of streets will remain constant, the combination of redesigned multimodal streets and new street connections will need to carry the load of additional travel demand within and through the KCDD.

Access and Mobility. The City's current functional classification typology is based on defining different streets with respect to their general function in the transportation system—consisting of minor arterials, collector streets, and local streets. This remains important for the street types defined in this chapter, with cross sections designed to meet access and mobility needs.

Safety. Safety is the most important factor when designing streets. Some streets in particular feature adjacent uses or have certain user needs that require special safety accommodations. Accommodating mobility as described above does not require designing for high speed traffic; keeping pedestrians and bicyclists safe often requires slowing traffic down. Transit facilities (including bus stops and future HART stations), schools, hospitals, religious sites, and other community-oriented land uses that generate pedestrian traffic often require special treatments or even a cross section design that emphasizes narrower lanes and design elements that further reduce vehicle speeds. This is most critical at intersections and mid-block crossings, where conflicts between pedestrians, bicyclists and motorists are at their highest concentration.

Designing for Multiple Modes

Designing a complete, truly multimodal street requires proper allocation of street space and investment for different modes in the KCDD. Figure 6-1 reaffirms the "Pedestrian First" hierarchy described in Chapter 5.

This hierarchy represents a major change in thinking in Honolulu. While such change is often met with frustration at first, motorists who drive sensibly, slowly, safely, and respectfully are rewarded in a Complete Streets approach. A Pedestrian First hierarchy adheres to the performance standard of optimizing streets to move people, rather than vehicles. The following section provides basic street design principles for each mode in the Pedestrian First hierarchy.

Figure 6-1 KCDD Modal Hierarchy

Pedestrians First

People make cities great. Success of the TOD Overlay Plan will mean a major increase in pedestrian traffic in the KCDD. Most trips begin and end on foot; in dense mixed-use urban neighborhoods many trips are made solely on foot. The TOD Overlay Plan envisions a KCDD filled with residential and commercial life. Developing a world-class pedestrian environment is a key to the implementing this vision.

A pedestrian-first design is a safety-first design, designed with the intent of keeping pedestrians of all ages and abilities feeling safe and comfortable on the street. Pedestrians, particularly those that are old, adolescent, or experiencing a mobility impairment are vulnerable to injury and death by vehicles. Be it a sidewalk, crosswalk, pedestrian signal, or transit passenger facility, all pedestrian facilities must comply and exceed design requirements established by the Americans with Disabilities Act (ADA) as HCDA strives to retrofit Kaka`ako's streets as universally accessible.

BALANCING THE DESIGN FACTORS

The four design factors on the left guide the development of representative cross section options for each street type (displayed in street type sheets later in this chapter). One of the four design factors will serve as the predominant consideration for each cross section.

This is not to suggest that this is the only factor that should be considered in street design, but it does emphasize this one factor as the reason a given type of street is distinct from others (and therefore why a variety of cross sections is necessary to respond to the complex land use environments in the KCDD).

	Primary Factor	Ancillary Factor
Livability		X
Access & Mobility	X	
Demand		X
Safety	X	

Note: Safety is a primary design factor for all streets.
Source: Nelson\Nygaard


Image from Nelson\Nygaard

The Pedestrian First focus of the KCDD is particularly supportive of our island culture. There is a strong focus on multi-generational family living on O`ahu. The ability of the KCDD to support multi-generational families to live comfortably in an urban environment is paramount and must be reflected in the design of Kaka`ako's streets and public spaces.

Image from Nelson\Nygaard

Transit-Oriented

Buses and, eventually, rail rapid transit will extend the range of activity for Kaka`ako's residents and vastly improve the speed and quality of access to and from the KCDD. Premier access to transit is and will increasingly be a selling point for people relocating to the KCDD. Bus operations and access to transit must be considered in the design of the travelway—for bus/rail access, as well as for those that walk, bike or get dropped off at the station. Transit's influence on street design include lane width, intersection design (corner radius), transit-priority lanes (and queue jump lanes), signal timing (often adjusted to give transit an advantage, transit-signal priority), pedestrian access (street crossings at bus stops), sidewalk design (making room for bus shelters and large passenger queues), and bus stop placement and design (farside/nearside at intersections, bus pullouts, or bulb outs). Access and volumes at HART stations must interface well with street design, especially where there are large volumes of pedestrians. These considerations are detailed in Chapter 7.

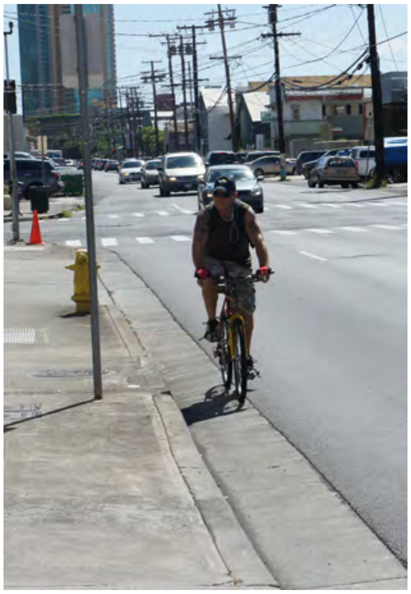


Image from Nelson\Nygaard

Bicycle Streets for Different Bicyclists

Bicycling is a critical element of fostering safe and livable streets in Kaka`ako. Bicyclists, along with pedestrians, are vulnerable users who benefit from reduced traffic speed and dedicated facilities. Because bicyclists vary in skill level, age, and comfort levels (as they relate to speed and operating behavior), KCDD must provide a broad variety of facility options to allow the range of current and future bicyclists to comfortably reach their destinations in the district and beyond. This includes shared lanes, bike lanes, buffered bike lanes, cycle tracks, off-street multi-use paths, and the assortment of intersection treatments that enhance safety at major and minor junctures.

In addition to the traditional notion of bicycles as a transportation and recreational tool, bicycling is a social activity, and people often ride side-by-side or in groups. Likewise, bicycles are increasingly being used in urban environments to make local deliveries, possibly addressing a missing link in Kaka`ako's freight network. The design must take into account the diversity of activities and potentially types of bicycles being used in Kaka`ako (e.g. a standard road bike is distinguished by vastly different spatial needs than a larger cargo bike).

In the end, bicycle facility selection must consider street conditions including available right of way, parking availability and turnover, bicycle volumes, auto volumes and speeds, and freight and transit volumes and routes, among others. Refer to the North American City Transportation Official's (NACTO) Urban Bikeway Design Guide for specific criteria.

DRAFT

Image from Nelson\Nygaard

Sensible and Balanced Private Auto Accommodation

Private autos are an integral part of both the regional and central Honolulu circulation system. Even though private autos are considered the lowest priority in KCDD's modal hierarchy, they still must be accommodated, albeit within the constraints of lower speeds and safer, more observant driving. More flexibility is given to large delivery trucks, as the efficient delivery of goods is paramount to supporting a healthy economy and meeting needs of KCDD's current and future businesses.

FREIGHT AND DELIVERIES

Freight and goods delivery is vital component part of any urban city's street network. Freight is not in the modal hierarchy because goods movement may be carried out by a variety of modes, including:

- Trucks (auto)
- Bike trailer or cargo bike (bicycle)
- Delivery person (pedestrian via auto)

Currently, most freight movement is delivered by medium- and large-sized trucks. Thus, mode priorities established for specific streets in Chapter 5, especially those within light industrial areas and along streets that carry regional through traffic, consider larger truck vehicles, which suggest slightly higher priority for automobiles.

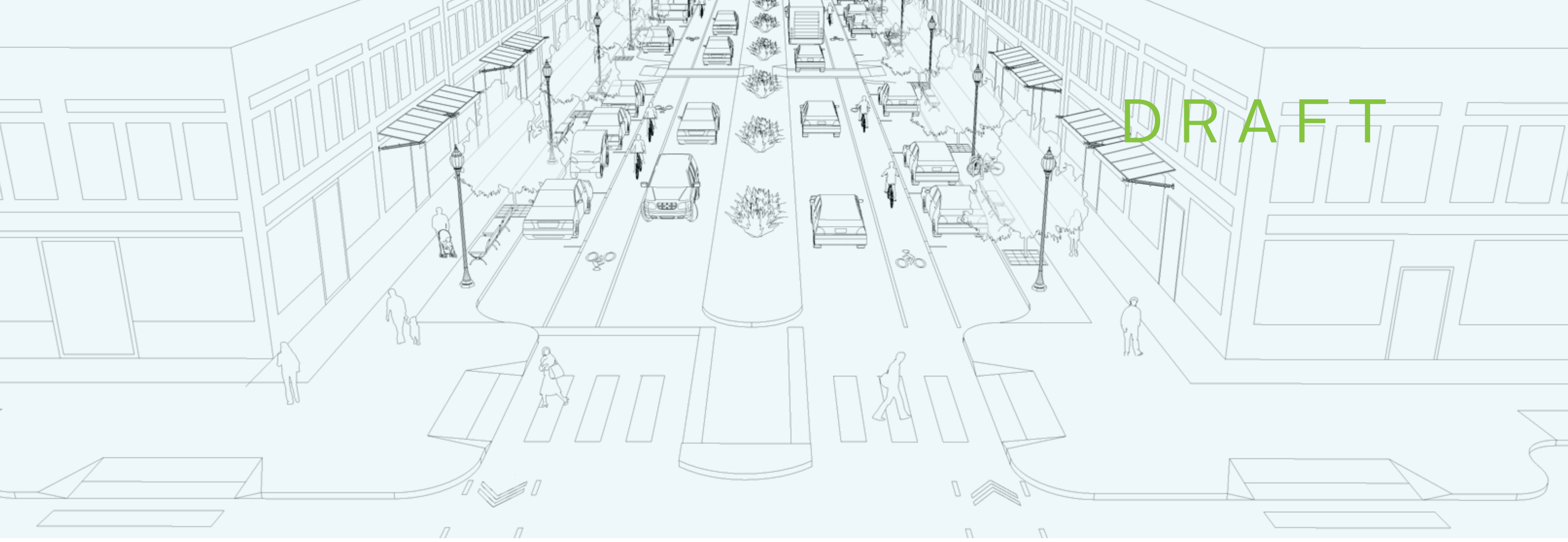
As a working district with many light industrial uses, light-freight and delivery functions will continue to be of critical importance and considered in design and street priority.

Image from Peter Hvizdak

GENERAL MULTIMODAL DESIGN PARAMETERS

The table below presents basic design considerations that are applied contextually when developing Complete Streets. Additional detail beyond these considerations will be established in KCDD Complete Street Design Guidelines to be developed through a future process.

Element	Design Consideration/Parameter
General purpose travel lanes	Ten to twelve foot travel lanes can safely and effectively accommodate vehicle travel. A travel lane on truck or bus route should be 11-12 feet wide in the travel lane typically used by buses and large trucks (almost always the outside or curb-tight travel lane).
On-street bicycle dedicated facilities and buffering	The widths of dedicated bicycle facilities depend entirely on street conditions such as travel speeds and volumes as well as the anticipated level of demand for each particular facility. Generally, bike lanes should be no less than 6 feet wide. Striped buffers are strongly recommended to be paired with bike lanes, particularly on high speed/volume streets (necessitating a 2-3 foot buffer between the bike facility and the adjacent travel lane) or with on-street parking (necessitating a 1-2 foot buffer from the center of the parking lane stripe). Cycle tracks should range between 6-7 feet in width (not including a 3-foot minimum raised median or bollard-protected striped buffer). If the cycle track is to operate bi-directionally the width could range between 10 and 14 feet with a minimum 3-foot raised or striped buffer.
Parking	Generally, parallel parking stall widths are recommended to range between 7.5 and 8 feet. Seven-foot parking stalls are acceptable in low density residential environments. The combination of travel and parking lane next to one another should be no less than 18 feet in width (11-foot travel and 7-foot parking or 10-foot travel and 8-foot parking).
Shared lanes	Shared auto/bike lanes should be targeted for widths of 12 feet, but may be as low as 10 feet wide. Placement of shared lane markings should be located appropriately to allow for safe passing movements by motorists and to locate cyclists outside of the door zone along streets with on-street parallel parking.
Transit stop accommodations	Street design should optimize operational efficiency, rider convenience, multimodal safety. Street types that accommodate on-street parking should integrate bus bulb outs—large curb extensions that house bus stops in order to extend passenger comfort, expand pedestrian capacity, and allow for inline boarding. In general, bus pull-out lanes are not recommended here as they are expensive (additional right-of-way costs), infringe on the pedestrian realm, and are inefficient for bus operations. Buses experience greater difficulty and delay re-entering traffic when required to use pull-outs. Establishing stops at the far side of intersections is also recommended so that street and intersection design can be consistent throughout Kaka`ako. Far-side stops: • Reduce intersection delay for right turn movements • Minimizes operational delay for buses by allowing a bus accelerating after making a stop to continue moving and not have to wait through a signal cycle. • Eliminate the chance of multiple threat collisions with passengers departing the bus and crossing the street.
Bicycle-bus facility integration	Where bicycles and transit vehicles interact at transit stops, dedicated bicycle facilities should wrap around transit shelters or transit shelters should extend into the parking lane. This configuration should only occur at far-side transit stop locations, never at near-side stops. Mixing zones (behind the transit shelter) should be designed with continental crosswalk markings and/or special paving features. Signs should warn pedestrians and bicyclist of these mixing zones. In addition, transit shelters should be transparent to enhance visibility between pedestrians and bicyclists passing around the shelter.
Curb extensions at intersections and mid-block locations	Any street with on-street parking should include curb extensions at intersections. A curb extension should be 1-2 feet less the width of the parking lane. Where a curb extension opportunity exists on a street with a cycle track, pedestrian refuge islands will serve as the "extension". Where the curb extension occurs at a mid-block location (to facilitate mid-block crossings), the facility should extend one foot past the parking lane to preserve sightlines for pedestrians and motorists.



COMPLETE STREET TYPES

Streets in Kaka`ako serve many purposes. Kaka`ako streets move pedestrians of all ages and abilities, transport and store bicycles, keep transit flowing and provide comfortable places for passengers to wait and board, transport freight and provide space for deliveries, and move and store autos. Streets are an integral component of the district's urban fabric. They make up large portions of the neighborhood serving as open space for socializing and recreation as well as civic and economic space. A Complete Street typology will help balance competing demands on Kaka`ako streets and will ensure that the design of streets builds on and supports the TOD Overlay Plan's goals for livability and neighborhood quality of life.

Strategy CS5 Establish a Complete Streets Typology and Design Guide

This strategy suggests a framework for KCDD street and intersection types and supports further development of specific Complete Steets guidelines for the various streets in our district. Street types should be developed based on the relationship of adjacent land uses to the street (see Chapter 5 for more information on street priorities). This typology offers detailed guidance for the needs of each mode, including walking, bicycling, transit and automobiles. Some streets, like Kapiolani Boulevard, must allow transit to maintain reliable, competitive operations and to allow vehicles to progress at a rate that ensures through-trips are not diverted to internal district streets and commercial avenues. While all street types must accommodate pedestrians comfortably, some streets will require a great level of concentrated investment to ensure pedestrian safety and comfort along and across the street can be achieved.

The street types described below establish the basis for setting design parameters by land use context (summarized in Figure 6-3) and provide guidelines for managing difficult multimodal trade-off decisions. Future street design guidelines should identify the specific

STREET TYPES IN THE KCDD

The street types listed below frame the design of KCDD streets and should be used to determine which design elements are appropriate for the district various land use contexts.

- **COMMERCIAL BOULEVARDS AND AVENUES**
  - Regional Boulevard
  - Transit Boulevard
  - Commercial Avenue
- **DISTRICT STREETS**
  - Residential Street
  - Commercial/Light Industrial Street
- **LOCAL STREET**
- **DISTINGUISHED STREETS**
  - Rapid Transit Street
  - Promenade

design treatments that will be applied to these street types. Figure 6-2 designates a conceptual street type on each KCDD street.

Further development of the KCDD Complete Street typology and specific design guidance will consider roadway design standards and the existing system of functional classifications upheld by the City and County of Honolulu Department of Transportation Services (DTS). The development of Complete Street design guidance will be completed in close coordination with the DTS, Hawai`i DOT, emergency service providers, and other district and regional stakeholders to ensure balanced, context-sensitive design is achieved.

Figure 6-2 KCDD Complete Street Typology

Figure 6-3 KCDD Street Type – Land Use Relationship

STREET TYPE BY LAND USE	GENERAL LAND USE CONTEXT	
Commercial Boulevards & Avenues		
	Regional Boulevard	**Primary:** Civil support, Civic, Office, Goods & Services **Secondary:** Automotive, Residential
	Transit Boulevard	**Primary:** Civil support, Civic, Office, Goods & Services **Secondary:** Residential
	Commercial Avenue	**Primary:** Office, Goods & Services **Secondary:** Residential
District Streets		
	Residential Street	**Primary:** Residential **Secondary:** Educational, Civic, Goods & Services
	Commercial/Light Industrial Street	**Primary:** Office, Goods & Services, Industrial **Secondary:** Civic, Residential
Local Streets		
	Local Street	**Primary:** Residential, Automotive (parking only; no drive-thrus, auto sales, etc.) **Secondary:** Civic, Office, Goods & Services, Educational, Civil support
Distinguished Streets		
	Rapid Transit Street	**Primary:** Residential, Office, Goods & Services **Secondary:** Educational, Civil Sup-port
	Promenade	**Primary:** Goods & Services **Secondary:** Residential, Office

Note: Land use mix will vary by neighborhood.

INTERSECTION DESIGN PRINCIPLES

To make streets accommodative, comfortable, and safe for all users, attention also needs to be given to the places where streets intersect. Since these are the places where users meet, interact, and cross, intersections are the points of greatest conflict and the places where users are most likely to feel threatened. Intersections exhibit several common elements regardless of their type or category. Figure 6-4 on the following page offers a basic summary of these elements.

This section offers basic principles of complete intersection and crossing design. It also suggests intersection and crossing types for which HCDA will develop more detail design guidance in the future.

Strategy CS6 Establish Intersection Design Guidance

When designing and retrofitting intersections, the pedestrian should not be characterized as a single individual but rather a range of users—children, seniors, people pushing or pulling strollers and delivery carts, people using a wheelchair or scooter, or those traveling with a cane or a service animal. The street and pedestrian environment at intersections must function effectively for each of these "pedestrian" types while accommodating throughput for other modes.

One simple tenet of intersection design should be adhered to in any case: Intersections should be designed and operated as simply and as compact as possible.

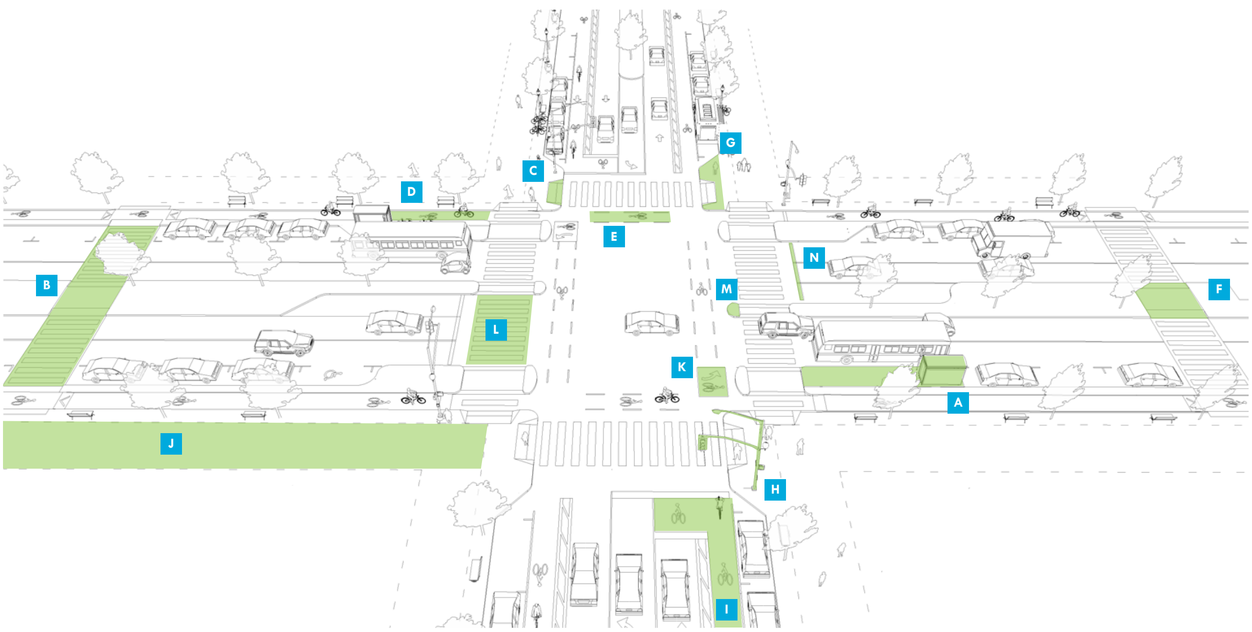
The following principles help to achieve complete, accessible, functional, and safe intersections.

- All corners follow universal design principles and match state of the practice accessibility standards (PROWAG)
- Signals are responsive to needs of visually-impaired pedestrians
- Movement of each mode is predictable to all users
- Intersection geometry is compact as feasible
- The number of approach and receiving through lanes are equal and align with no skew
- Perpendicular intersections are better than skewed
- 3-4 approaches are better than 5 or more
- Vehicle speeds are managed, especially for turn movements
- Crossing distances are minimized by reducing pavement and including pedestrian refuges
- Crossings match pedestrian desire lines, whether at intersections or mid-block locations
- Crossings and pedestrian staging areas are located within sight triangles
- Transit stops are organized to limit transfer distances and facilitate safe crossings
- Far-side transit stops are better than near-side transit stops
- Bicycle movements are made as visible and predictable as possible
- Priority is given to cyclists over turning autos
- Signal phasing is predictable and prioritizes pedestrians, bicyclists, and transit (in that order)
- Person delay is minimized
- Signal timing safely accommodates harried and leisurely walkers
- Non-auto or bicycle space is reallocated to sidewalk or refuge islands by default

- Landscaping, street trees, and furniture are integrated, but never restrict sight lines between modes
- All intersections are illuminated per Crime Prevention through Environmental Design (CPTED) guidance

Figure 6-4 shows common intersection elements and Figure 6-5 illustrates common urban intersection types.

Figure 6-4 Common Intersection Elements



A Far-side stops/Bus bulbouts
Far-side stops minimize operational delay and allow buses to move out of the intersection, so that turn movements behind them can continue to occur. Bus bulbouts move passenger shelters or queuing areas away from the pedestrian zone and reduce pedestrian crossing distances.

C Accessible curb ramps
Curb ramps safely and seamlessly connect mobility impaired individuals between the sidewalk and street. Curb ramps are tactile to ensure legibility for site-impaired users.

E Intersection bicycle crossing
Intersection markings indicate the safe, direct, and visible path of bicyclists traveling through an intersection or driveway conflict zone.

G Curb extensions
Curb extensions continue the sidewalk into the parking lane at intersections or mid-block locations to improve visibility of pedestrians waiting to cross, reduce crossing distances, and provide additional space for placemaking features.

B Mid-block crossing
Mid-block crossings provide direct walking routes and reduce the effective length of the block.

D Bike-transit integration
Bicycle and transit facilities are designed to reduce conflicts between bikes, transit vehicles, and pedestrians.

F Pedestrian refuge islands
Refuge islands reduce crossing distances, improve pedestrian visibility, and facilitate crossings across longer crosswalks.

H Signalization
Traffic signals control vehicle and pedestrian movement at intersections or mid-block crossings.

I Colored bike boxes
Designated priority queuing areas for bicycles that help clear an intersection quickly and help reduce right-hook collisions.

K Two-stage turn queue boxes
Turn facility allowing cyclists to safely and comfortably exit cycle tracks or bike lanes that require bicyclists to negotiate difficult lane merges.

M Median nose
Median noses provide additional protection for crossing pedestrians and slow left turn movements.

J Sidewalks
Spacious, clearly defined, and continuous sidewalks are requisites for Complete Streets and transit-oriented neighborhoods.

L Crosswalks
Highly visible and defined crosswalk facilities ensure safe and comfortable crossings.

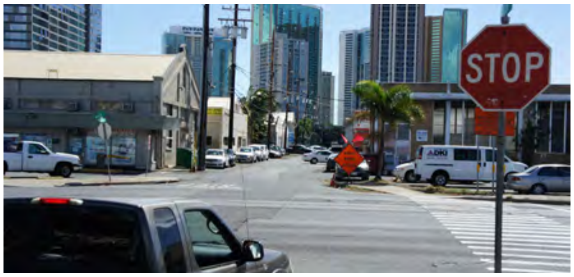
N Advanced stop bars
Stop bars increase automobile stopping distances from crosswalks, thereby improving crossing comfort.

Source: Nelson\Nygaard

Figure 6-5 Common Intersection and Crossing Types

Signal	All-way stop
3 or 4-way traffic signal controlled intersections	3 or 4-way intersections where all legs of the intersection are controlled by stop signs
Features	**Features**
Complete signals address all modes and are ADA compliant. Left-turns should include permitted phases (not permissive) and pedestrian, bicycle, and transit signal priority phases should be integrated, where necessary.	Stop signs are typically installed to manage auto traffic, which may have an impact on bicycle travel. Stop signs should be limited on secondary bikeways. Advanced stop bars should provide a comfortable space between pedestrians and waiting vehicles.

Two-way stop	Uncontrolled
One-way or two-way intersections where the major street is uncontrolled, but the minor street is controlled by a stop or yield sign	Intersections without traffic control devices (stop sign, signal)
Features	**Features**
Without dedicated stops controlling major streets, these locations may act as a barrier to some cyclists. Additional provisions may be necessary to facilitate bicycle/pedestrian crossings, such as half signals or median barriers with pedestrian refuges. Advanced stop bars should provide a comfortable space between pedestrians and waiting vehicles.	Uncontrolled intersections often at low volume, low speed locations. Efforts need to be made to ensure speeds are slow (through traffic calming) and bicycle and pedestrian crossings are clearly marked and visible.



Mid-block crossing	Enhanced bicycle and pedestrian crossing	Driveways
Formal street crossing between intersections.	A signal or stop-controlled overlay intersection with bicycle/pedestrian priority features	An accessway offering motor vehicle access to public or private property Accesses to private property are considered an intersection as auto traffic intersects the sidewalk and dedicated bikeways.
Features	**Features**	**Features**
People generally cross at the most convenient location. Mid-block crossings help to facilitate pedestrian desire lines. Mid-block crossings should include designated crossing facilities like crosswalk markings and pedestrian refuges. Traffic control devices may or may not be used depending on the number of travel lanes, volumes, speeds, and a variety of other factors.	Intersections that include design or operational features to enhance and/or prioritize bicycle and pedestrian crossing movements. Features may include rapid flashing beacons, priority signalization phases, bike boxes, two-stage turn boxes, median barriers with pedestrian refuges, among others. See Figure 6-8 for proposed enhanced bicycle and pedestrian crossing overlay locations.	These include signal controlled driveway accesses into major destinations like Ala Moana Center. Driveways should always be designed as subservient to the sidewalk. Keep the driveway as small as possible, including width and corner radii. Driveways should be designed for 10 mph and oriented 90 degrees to the Street. Intersection bicycle crossing treatments appropriate for street intersections may apply.

DRAFT

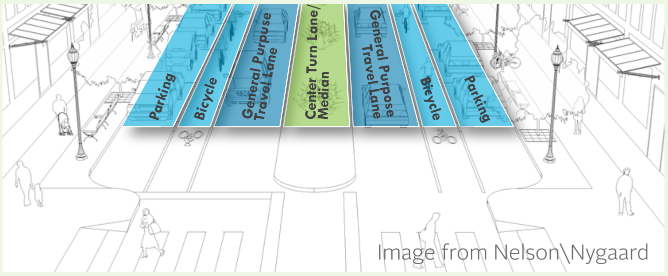
ELEMENTS OF THE COMPLETE STREET CROSS SECTIONS

Complete Street design considers two main “environments: the Throughway (between the curbs) and the Pedestrian Zone (from the curb to lot line/building front).

THE THROUGHWAY

The principal part of the street for vehicles is the throughway, consisting of all space between the curbs of the street. It is composed of up to six main elements: the general purpose travel lanes/priority lanes, the center turn lanes/medians, buffers, bicycle space, parking, and drainage. Not all throughway elements are used in each cross section. The graphic representation of an all-inclusive throughway pictured below helps to distinguish the role that each element plays and to point out primary concerns that a street designer should keep in mind.

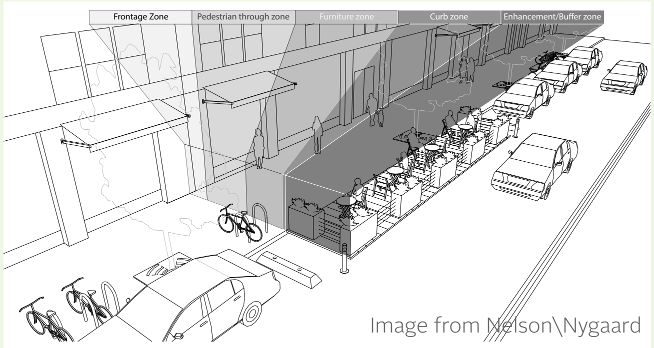
- General purpose travel lanes/priority lanes are the primary area for vehicle traffic circulation and refer to the lanes for through movement. Their design should incorporate a consideration of the primary vehicles that will be using a street: if this is larger vehicles, the dimensions of these lanes need to reflect that vehicle type. If the primary user of the street is passenger automobiles, the dimensions of these lanes can be narrowed to allow other components of the throughway and the street in general to serve a greater range of functions.



- Center turn lane/median is the auxiliary space separating general purpose lanes in each travel direction to allow the storage of turning vehicles. The general principle used in this guide is that either a median or a turn lane will constitute this space, if it is used, but not both.
- Buffers refer to the non-operable space that provides added separation between bicycles and adjacent travel lanes or parking. As shown below, not all dedicated bicycle facilities include buffers.
- Bicycle space refers to any dedicated space for bicycles including bike lanes, bike lane buffers. In shared lane environments, bicycles operate in general purpose travel lanes.
- Parking is provided as storage for cars that are not in operation and unloading/loading zones for delivery trucks and other private autos (e.g. taxis). Not all streets in KCDD provide for on-street parking, but is generally provided along streets serving commercial land uses or where private properties do not provide substantial space for off-street parking.

PEDESTRIAN ZONE

The fundamental organization of the space between the curb and the lot line, or pedestrian zone, is essential to a Complete Street. The pedestrian zone includes the following five elements or zones:



- Frontage zone: Area between the property line and pedestrian through zone that provides opportunities for temporary signs, planters, business-maintained plantings, and café seating.
- Pedestrian through zone: The primary passing and circulating area for pedestrians. This zone should be completely clear of permanent objectives (street furniture, utilities, street trees, etc.).
- Furniture zone: The first line of buffering between pedestrians and adjacent travel lanes. This is the appropriate areas to locate transit passenger facilities, street trees, utilities, planters/landscaping, sign poles, and additional street furniture (including bike share docking stations).
- Curb zone: A 6-inch wide curb.
- Enhancement/Buffer zone: Any instance where a parking lane may be flexibly used for expanded transit passenger facilities, in-street bicycle parking or bike share docking stations, landscaping/stormwater features, parklets, and curb extensions. Curb extensions effectively serves as additional furniture zone.

QUALITY OF SERVICE PERFORMANCE STANDARDS

KCDD's tools for measuring the success of its transportation system should follow from the larger goal and objectives of the TOD Overlay Plan. The TOD Overlay Plan, and the decision to pursue Complete Streets in Kaka`ako, recognizes that transportation is a means to ensure HCDA and the community realize quality of life, health, economic, and various other principles and objectives established in Chapter 2 of the Plan. It is imperative that Kaka`ako's Complete Streets strategy measures the various ways the network of district streets supports broader KCDD goals and objectives. Using traditional measures of auto delay is counter-intuitive for urban Complete Streets and does not address the goals of the TOD Overlay Plan to accommodate more people and jobs in a dense urban district where people can walk, bike, and use transit. Success of this plan will decrease per capita demand for auto travel and put priority on the quality of service in the pedestrian and bicycle realms. Traditional vehicle level of service models were developed for application in suburban areas where auto was the assumed mode of access for all land uses.

The KCDD TOD Overlay Plan emphasizes quality of service for all modes in addition to level of service (delay) for vehicles.

Strategy CS7 Establish performance measures/standards and decision tools that will incorporate Complete Streets

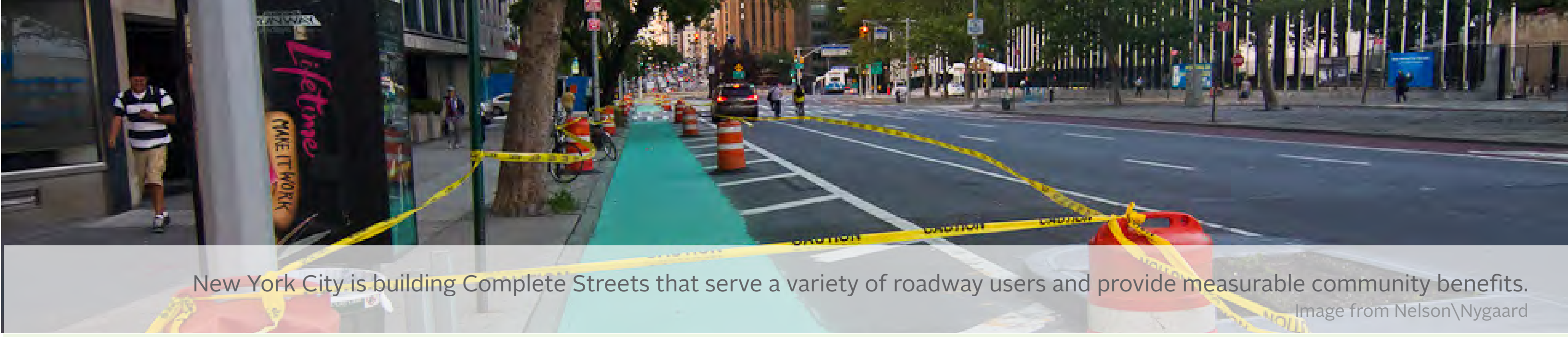
In conjunction with future work to develop a comprehensive set of Complete Streets design standards, the HCDA will work with our partners (particularly DTS and HDOT) to establish a process that combines existing tools for measuring transportation performance (largely oriented toward measuring vehicle delay, volume, and capacity) with multimodal analysis tools. This performance measurement framework should balance quantitative tools with qualitative tools that reflect transportation outcomes and ensure that transportation investments contribute to vibrant, healthy, and economically productive streets.

A number of alternative performance measurement tools exist as a supplement or replacement to vehicle level of service (VLOS). Responsibility for setting performance standards should be a joint process between HCDA and the City and County of Honolulu. Examples of potential decision tools include:

- Site/project level performance measures (Multimodal Level of Service, checklists, crash and injury data)
- Transportation system level measures (annual counts, including miles of bicycle lanes added or repainted, blocks of new or repaired sidewalks, number of new or reconstructed accessible curb cuts, number of new street trees per year)
- Measurement (post-performance measure such as % reduction in crashes or reduced vehicle speeds in residential neighborhoods)
- Community-wide, long-term measures (mode shift, satisfaction surveys, health outcomes)

Action CS7.1 Work with DTS to adopt transportation quality and level of service metrics that reflect the development of a walkable, multimodal transportation network

VLOS standards historically are focused solely on vehicle delay times and may therefore have a detrimental effect on the implementation of safe, vibrant, walkable, community-oriented streets. Often, improvements or additions of non-vehicle capacity projects (such as widening sidewalks by reducing curb-to-curb width) may trigger a potential decline in modeled VLOS. If improvements that encourage people to travel in ways other than driving are always rejected because they will slow down motorists, then it will not be possible to encourage people to get out of their cars and HCDA may not



New York City is building Complete Streets that serve a variety of roadway users and provide measurable community benefits.
Image from Nelson\Nygaard

NEW YORK CITY DOT:
MEASURING THE STREET: NEW METRICS FOR 21ST CENTURY STREETS

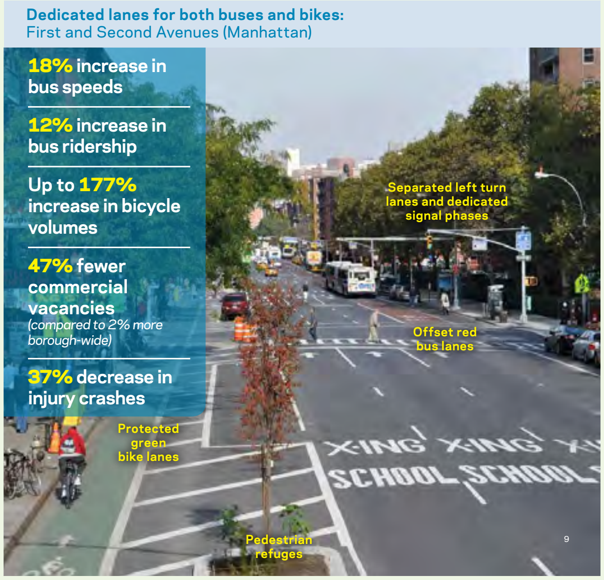
New York City's current DOT has gained a reputation for the most innovate and successful repositioning of its transportation infrastructure to vibrant, economically successful, and safe urban streets and public spaces. And if New York City DOT can successfully reprioritize space on Manhattan streets for pedestrians, bicycles, parklets, and street cafes, the rest of the nation's cities have to ask – "can't we do the same?"

Part of the New York success story is the adoption of a radically new way of viewing performance, based not just on how autos move and operated, but on how transportation investments affect users of all modes and the businesses and property owners that front city streets. Measuring the Street: New Metrics for 21st Century Streets categorizes strategies and metrics under goals to:

- Design for safety
- Design for all users of the street
- Design great public spaces

Metrics to measure success include public health benefits and economic return on investment for retail users in commercial corridors.

The full report can be found at: http://www.smartgrowthamerica.org/documents/cs/impl/ny-nyc-measuring.pdf



Images from NYC DOT

achieve its land use and economic goals for the KCDD. For example, the nation's most successful retail streets are often congested. This is both a sign of success – people want to be there – and a benefit to retailers since people in slow moving cars can better view shopping opportunities.

National practice in measuring transportation performance is evolving. The most recent Highway Capacity Manual (HCM) has made significant changes from previous editions, including a chapter dedicated to urban street facilities that couples level of service standards for automobiles, pedestrians, bicycles and transit users. Increasingly cities are looking to measure *quality* of the pedestrian and cycling experience and to measure street performance by capacity and delay for *people*, not vehicles.

Among the most important actions that many jurisdictions are now taking is to simply exempt development within dense, mixed-use districts from compliance to minimum vehicular level of service standards. In some cases, additional multimodal level of service standards are developed, in others an impact fee is assessed based on the size and/or trip generation from that development. These fees are then put toward completing the city or district's transportation plan. This strategy has the benefit of ensuring that a single, coordinated approach to managing transportation is taken and that capital projects are implemented in the most beneficial order of priority.

Heavy traffic on 5th Avenue in New York City does not deter shoppers from around the world
Image from Nelson\Nygaard

Bicycle counters like these in Copenhagen are increasingly being used in the US to measure bicycle demand on major travel corridors. Image from James Scridland

MEASURING MULTIMODAL STREET PERFORMANCE

The San Francisco County Transportation Authority (SFCTA) proposed replacing the current LOS measure with a measure based on the net automobile trips generated (ATG) by a project, paired with a transportation impact mitigation fee (TIMF) program designed to mitigate the systemwide impacts of added vehicle trips. This methodology offers a citywide approach to measuring and mitigating traffic impacts, rather than looking at one project and one intersection at a time. Because there is traffic congestion throughout San Francisco's street network, any project that adds a single vehicle trip would be determined to have a significant traffic impact.

Projects that do not add vehicle trips, like a rail line, bike lane or sidewalk widening, would not be considered to have any traffic impact, even if the project reduced vehicle capacity in a specific location or corridor. The ATG methodology is currently under evaluation and it is unclear if and when it will be implemented. The proposed methodology and fee structure would need to be adopted by the Planning Commission through an ordinance that replaces auto LOS as a measure of environmental impacts with the ATG measure, coupled to the TIMF program.

Other places that have relaxed minimum standards for VLOS or adopted multimodal level of service standards include:

- Livermore, CA
- Redwood City, CA
- San Jose, CA
- San Francisco, CA
- Fort Collins, CO
- Montgomery County, MD
- Fairfax County, VD
- Cambridge, MA
- Massachusetts DOT
- Oregon DOT
- Florida DOT

The table on the following page describes other measures of transportation performance being used to measure performance of our streets and transportation networks.

MULTIMODAL TRANSPORTATION PERFORMANCE MEASURES

Feature	Definition	Indicators
Delay	Consider person delay rather than vehicular delay	▪ Aggregate delay of all transportation users in a corridor or corridor segment during a set time period
Capacity	Capacity for a street to move people or intersection to accommodate person throughput	▪ Capacity of a street cross section in terms of persons moved per hour (can exclude pedestrians) ▪ Intersection person throughput at a peak hour (can exclude pedestrians)
Network continuity and connectivity	Whether sidewalks and paths exist, and connect throughout an area	▪ Portion of streets with non-motorized facilities ▪ Length of path/non-motorized facility per capita ▪ Network connectivity and density (intersections per square mile)
Network quality	Whether sidewalks and paths are properly designed and maintained	▪ Sidewalk and path functional width ▪ Portion of sidewalks and paths that meet current design standards/in good repair
Road crossing and intersection design	Safety and speed of road crossings	▪ Road crossing widths ▪ Motor vehicle traffic volumes and intersection design speeds ▪ Average pedestrian crossing time ▪ Quantity and quality of crosswalks, signals and crossing guards
Pedestrian and bicycle protection from traffic	Separation of non-motorized traffic from motorized traffic, particularly high traffic volumes and speeds	▪ Distance between traffic lanes and sidewalks or paths ▪ Presence of physical separators, such as trees and bollards ▪ Speed control
Congestion and user conflicts	Whether sidewalks and paths are crowded or experience other conflicts	▪ Functional width of sidewalk and non-motorized paths ▪ Peak-period density (people per square foot) ▪ Clearance from hazards, such as street furniture and performers within the right-of-way ▪ Number of reported conflicts among users ▪ Facility management to minimize user conflicts
Sense of Security	Perceived threats of accidents, assault, theft or abuse	▪ Reported security incidents ▪ Quality of visibility and lighting ▪ Hours of street activity and/or retail establishments
Wayfinding	Guidance for navigating within the station and to nearby destinations	▪ Availability and quality of signs, maps and visitor information services
Weather protection	User protected from sun, wind, and rain	▪ Presence of shade trees and awnings ▪ Frequency and design of waiting and resting places
Cleanliness	Cleanliness of facilities and nearby areas	▪ Litter, particularly potentially dangerous objects ▪ Graffiti on facilities and nearby areas ▪ Effectiveness of sidewalk and path cleaning programs
Attractiveness	The attractiveness of the facility, nearby areas and destinations	▪ Quality of facility design ▪ Quality of nearby buildings and landscaping ▪ Air and noise pollution experienced by cyclists and pedestrians ▪ Community cohesion (quantity and quality of positive interactions among people in an area) ▪ Number of parks and recreational areas accessible by non-motorized facilities
Economic vitality	Ability to retain, support, and advance retail and commercial performance	▪ Retail sales per square foot ▪ Sales tax revenue generated ▪ Commercial vacancies ▪ Number of visitors
Public health	Health benefits achieve from increased physical activity (active transportation), safety improvements, and reduced emissions	▪ Collisions and injuries to motorists and other vehicle occupants, pedestrians, cyclists, and motorcyclists ▪ Number of ADA compliance projects constructed annually ▪ Worker absenteeism, efficiency, and productivity (obtained through employer surveys) ▪ Increased walking and bicycling levels ▪ Air quality monitoring

Adapted from multiple sources including: NYCDOT's Measuring the Street: New Metrics for 21st Century Streets (2012) and Victoria Transport Policy Institute's Multi-Modal Level-of-Service Indicators Tools For Evaluating the Quality of Transport Services and Facilities (December 2012)

STRATEGIES AND TOOLS
TO IMPLEMENT COMPLETE STREETS AND INTERSECTIONS

Strategy CS8 Reallocate street space to better move people and activate KCDD pedestrian spaces

The success for the TOD Overlay Plan relies on an effective partnership between HCDA and DTS to identify and implement projects that reallocate street space for more multimodal and livable uses. Several street design tools should be considered to achieve Complete Street design objectives in Kaka`ako, including road diets/lane reconfiguration, shared street design, and repurposed parking lanes. The effectiveness of these tools will be evaluated in appropriate contexts in future transportation analysis in the KCDD.

ROAD DIETS

Case Study: Along St. Louis' South Grand Blvd., traffic volumes ranged between 19,500-29,000vpd prior to a road diet and streetscape project. Before and after analysis of traffic showed very little change in volume, but noticeable speed and noise reductions.
Image from Nelson\Nygaard

Focusing on existing infrastructure, road diets, or lane reconfiguration projects, suggests the idea that some roads carry more 'weight,' or vehicular capacity, than they need to be functional and livable. Road diets improve multimodal safety by converting underutilized vehicle space in a fixed right-of-way to space serving other users of the street, such as parking vehicles, bicyclists, and pedestrians. Road diets typically convert four-lane cross sections (i.e. four lanes with no median between the two directions of travel) to three lane sections (one travel lane in each direction with bike lanes and either a two-way left turn lane or a similar amount of space to provide left turn storage lanes as needed).

Not all Kaka`ako streets should be considered as road diet candidates. The 4-to-3 conversion is most effective on roads with average daily traffic of up 15,000-20,000 vehicles per day (vpd) and those that have a high potential to induce vehicular travel. This threshold is increased to 25,000 (vpd) for 5-lane cross sections. Based on existing volumes and the anticipated function and demand of KCDD streets, Ward Avenue and potentially Auahi Street (Diamond Head of Ward Avenue) should be considered for lane reallocation.

SHARED STREET DESIGN

Image from Nelson\Nygaard

Shared streets, also referred to as woonerfs, slow zones, or home zones, are narrow, often curbless street connections that reduce or remove segregation between pedestrians, bicyclists, cars, and delivery trucks. Vehicular traffic is calmed to low speeds (10mph speeds or less) by placing trees, planters, parking areas, and other obstacles in the street's common space. HCDA should implement shared street designs on streets serving delivery and parking access traffic and in areas of the district where heavy pedestrian volumes are expected and auto traffic is de-emphasized. The TOD Overlay Plan suggests this approach on many of the Local Streets, particularly on new streets serving mixed use developments.

ACTIVATED ENHANCEMENT/BUFFER ZONES

Image from Flickr user Shelley Mags

The parking lane provides opportunities to expand the pedestrian realm, especially streets that will not be rebuilt or extensively landscaped. At strategic locations, use of the parking lane for parklets, seating, landscaping, restaurant use, bike share docking stations or in-street bicycle parking corrals can be used to provide visual interest, resting areas for pedestrians, and additional transportation-related storage. HCDA will work with DTS to reprogram a limited number of parking stalls with more active uses.

SAN FRANCISCO'S PARKLET PROGRAM

Since 2010, the City of San Francisco's Pavement to Parks Program has pioneered the conversion of parking lane space to "parklets". A parklet repurposes part of the street into a space for people, making the street more beautiful and provide public space, even when permanently widening sidewalks is not an option. They can provide space for seating, landscaping, public art and other amenities. They are typically paid for and maintained by nearby residents, businesses, or community organizations.

Goals of the program include:

- Providing a fast and cost-effective way to beautify the streetscape and improve the public realm
- Encourage walking by enhancing the pedestrian environment
- Providing space to sit, relax, and plan
- Supporting local business

More information on the Parklet Program is available in the San Francisco Pavement to Parks Program Parklet Manual and the Business/Resident Application to Request a New Parklet

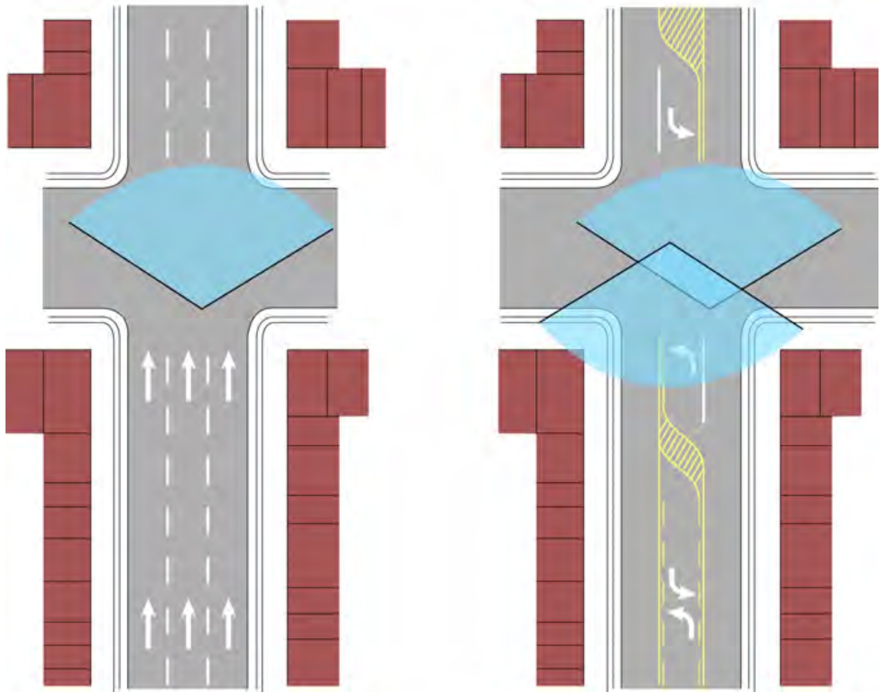
Two examples of parklets in San Francisco's Mission District. Parklets extend the pedestrian realm and help to enliven communities and their retail spaces.
Images from Nelson\Nygaard

Strategy CS9 Strategically convert key multimodal streets from one-way to two-way operation

Converting vehicular flow of one-way streets to two-way operations is another method of designing streets to be safer and offer improved access to destinations in Kaka`ako. Historically, two-way streets were converted to one-way operations to increase vehicle-moving capacity—particularly during peak travel periods. The primary modal beneficiary of this approach is auto movement at the expense of other modes and uses. For 20-22 hours of the day, the need to move large traffic volumes is not as urgent; yet one-way streets continue with one-way flow and only allow one direction of visibility, as illustrated in Figure 6-6. One-way streets are less conducive to successful business corridors, largely because they limit visibility to a single direction and at a given time of day offer less exposure to businesses. One-way streets tend to have faster vehicle traffic speeds, which means motorists spend less time observing the environment around them and more time "zipping by" the retail corridor. Conversion is desirable from a safety standpoint, as well, as two-way streets operate at appropriate speeds for urban environments where there are higher volumes of bicyclists and pedestrians—especially along segments of Kaka`ako streets that will experience substantial residential growth.

To achieve roadway facilities that offer a balance of mobility, access, and accommodations that establish more attractive, safe and livable conditions, HCDA will coordinate with DTS to evaluate the viability of converting certain one-way streets to two-way operations. For example, the Pensacola/Piikoi couplet is identified as a possible corridor for future conversion pending an in depth evaluation.

Figure 6-6 Visibility Impacts of One-Way and Two-Way Roadway Operation



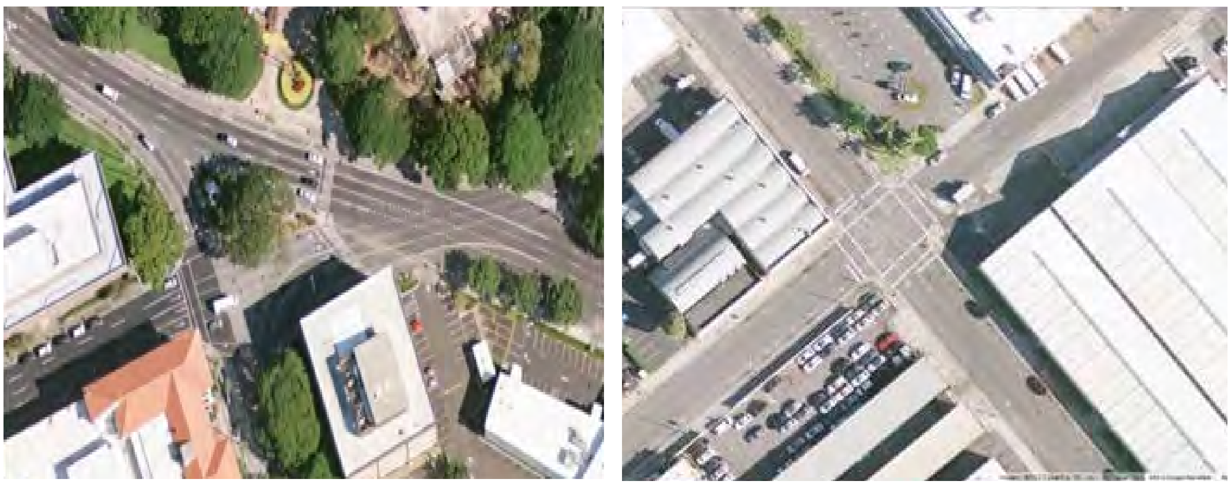
One-way streets allow only one principal direction of visibility for motorists on a street (left), meaning that businesses will not be seen from an opposite direction as they would on two-way streets (right).
Image from Nelson\Nygaard

Strategy CS10 Redesign and operate intersections to accommodate all modes and reduce conflicts

Action CS10.1 Design intersections to be compact and limited in complexity, where possible.

As shown in Figure 6-7, intersections in Kaka`ako range between in size and complexity. In a complete streets environment, compact intersections with tight geometries are preferable to complex intersections, to reduce conflicts between pedestrians, bicyclists and auto drivers. Ideally intersections should have three or four approaches (or legs), each generally forming a right angle with the street it connects into. Complex intersections might have raised medians and turn lanes, but the defining features of that make complex intersections less attractive from a safety and operations standpoint are multiple legs (over 4) and skewed angles.

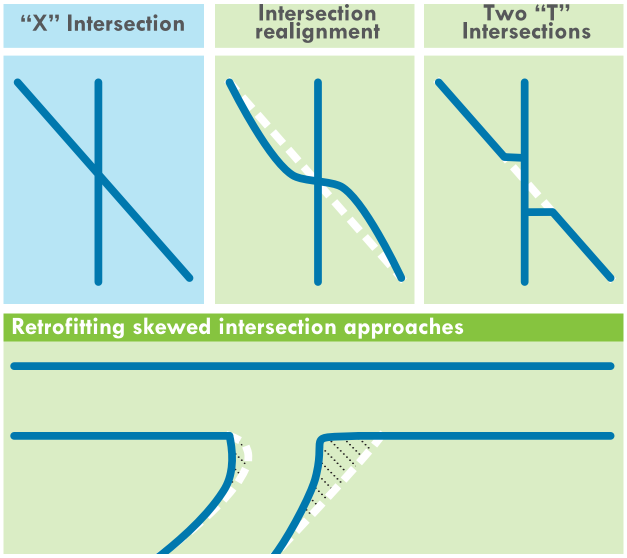
Figure 6-7 Range of Intersection Size in Kaka`ako



Examples of the range of intersection geometries in the KCDD at Punchbowl/Kapiolani (left) and Coral/Auahi (right).
Image from Google

Intersections should be easily negotiated by pedestrians and bicycles, and traffic approach speeds should be managed, where possible. Complex intersections are not unalterable, and more complete intersection designs can be achieved throughout Kaka`ako. A mixture of pedestrian refuge islands, curb extensions, signal improvements, and signs can help to break up crossing distances and limit the number of possible concurrent conflicts. Skewed intersections like Auahi and Ward can be realigned or re-networked into simplified junctures or a series of T-intersections. Y-junctions can also be squared off into a T-intersection as well. These techniques are summarized in Figure 6-8.

Figure 6-8 Different Approaches to Simplifying Complex Intersections



Source: Nelson\Nygaard

Action CS10.2 Ensure crossings throughout the KCDD are as short, direct, and level as possible.

Whether at an intersection or a mid-block location, crossings should be as short and as direct as possible. Human nature will result in pedestrians taking the shortest and most direct route across an intersection, regardless of the traffic engineer's intent – it is therefore essential that the direct path be made the safest path in intersection design. Curb extensions, mid-block crossings, pedestrian refuge islands and any other facilities that break crossings into more manageable crossing distances will improve the pedestrian experience.

Pedestrian crossings in Kaka`ako should be made at grade wherever possible. Grade-separated crossings are almost always unsuccessful at moving people across the street in the most direct path, except under one of four conditions:

- Crossing over or under a freeway or divided highway
- Connecting directly to specific land uses
- Providing a trail crossing where the trail is roughly perpendicular to the road
- Connecting on at least one side to a location where people want to be at the elevation of the structure (e.g. where one end is an elevated rail station)

Unless they specifically satisfy one of these four conditions, bridges and underpasses simply do not work to get people from the sidewalk on one side of the street to the sidewalk on the other side of the street. Fences and barricades can improve behavior, but are often ignored or modified to maintain the most direct route to a destination.

Action CS10.3 Apply principles of universal design to ensure street environments and junctures are legibly and comfortably designed for pedestrians of all ages and abilities.

Universal design is a design that is comfortable for users of all ages and abilities, including persons with disabilities. Universal design principles applied to street design include street crossings that can be comfortably navigated by older and slower walkers, curb cuts that can accommodate baby strollers, rolling suitcases, and a variety of mobility devices, and wayfinding that is clear and intuitive to all users. All streets in Kaka`ako will be designed with principles of universal design. Additional detail on universal accessibility is discussed in Chapter 5.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

The following rules changes are recommended for various roadway and pedestrian design elements of the Mauka/Makai Rules. Additional rule changes will be proposed upon completion of HCDA's forthcoming Complete Streets Design Standards.

- **Regulation CS5.1:** Incorporate the Complete Street types as part of §15-217-38 through 39: The Thoroughfare Plan rules currently focus heavily on the pedestrian realm, so the rules should reflect street types design options, modal trade-offs, and general design guidelines.
- **Regulation CS5.2:** §15-217-39-D-1-7 updated to include allowances and design guidance for the "shared street" designs as part of the Local Streets street type (completed following completion of future HCDA Complete Streets design guide).
- **Regulation CS5.3:** To ensure predictable traffic movement and limit conflicts with pedestrians, parking access lanes, alley or any other Local Street types should be permitted to operate as one-way connection. Additional language should be added to §15-217-63 to clarify this provision.
- **Regulation CS7.1:** In a new section of the Rules, HCDA and DTS should jointly adopt and implement transportation quality and level of service metrics and data collection processes to track the benefits and impacts of implementing the Complete Streets strategy (completed following development of HCDA Complete Streets design guide)..
- **Regulation CS8.1:** Amend §15-217-39-D-1-7 to include the enhancement/buffer zone as part of the sidewalk zone nomenclature and include design elements and programming such as parklets, bike share docking stations, and in-street bike parking corrals.
- **Regulation CS10.3:** Include a new section in the Rules that specifies universal design guidelines based on the recently completed Public Rights-of-way Accessibility Guidelines (PROWAG).