

# TOOLBOX SECTION

# 1

## Thinking about Pedestrians from the Start— Creating Pedestrian-Friendly Communities





*Pedestrian-friendly communities are often the most desirable places to live, work, and visit.*

# CREATING PEDESTRIAN-FRIENDLY COMMUNITIES

This first section of the Hawaii Pedestrian Toolbox provides an overview of important considerations related to planning and general design of facilities for pedestrians. Creating pedestrian-friendly communities is an important focus of this section, and addressing pedestrians' needs as part of every planning effort and project is encouraged. Best practices guidance that can be applied at a district, community, or regional level to improve conditions for pedestrians in Hawaii is provided.

## Why Planning for Pedestrians is Important

### *Promoting Pedestrian Travel*

Pedestrians are an important and integral part of Hawaii's transportation system and every transportation project, whether planning or design, should consider the needs of pedestrians from the start. This is consistent with the State's Complete Streets Policy, which requires

consideration of all modes and users on all public highways, roadways, and streets statewide.

Research has shown that well planned, designed, and maintained pedestrian facilities encourage walking and promote higher levels of pedestrian travel. When pedestrian access is expanded and existing conditions for pedestrians are improved, higher numbers of pedestrians can be expected to use the system. This not only applies to development of new facilities, but also to improvement and retrofit of existing facilities for pedestrian use.



*Pedestrians' needs should be considered as part of all planning and design projects.*

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- *WHY PLANNING FOR PEDESTRIANS IS IMPORTANT*
- *GENERAL DESCRIPTION OF PEDESTRIAN FACILITIES*
- *DEVELOPING PEDESTRIAN PLANS*
- *EFFECTIVE EDUCATION, ENFORCEMENT, ENCOURAGEMENT, EVALUATION, AND EQUITY PROGRAMS*
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- *PROJECT-LEVEL CONSIDERATIONS*
- *PHASING OF PEDESTRIAN IMPROVEMENTS WITH DEVELOPMENT*
- *PEDESTRIAN LEVEL OF SERVICE ANALYSIS AND MODELING*
- *OTHER RESOURCES*

## Considering Pedestrians' Needs in Planning

The need for pedestrian facilities should be considered at the inception of all public and private projects, and projects should address pedestrian needs as part of the total transportation solution. Various types of planning activities where pedestrian needs should be evaluated and addressed include the following:

- Island-wide/county-wide and city-wide comprehensive plans and transportation plans
- Community development plans
- Specific area and neighborhood plans/special district studies
- Corridor plans and studies
- Transportation network plans with pedestrian circulation as a critical element
- Transit access studies and intermodal facilities plans
- School walk route plans and safety plans
- Development-related transportation impact studies

- Project alternatives development

Planning for pedestrians from the onset, whether as part of a community-wide planning effort or a specific project allows potential conflicts between transportation modes related to safety and level of service to be resolved early on. This avoids problems associated with pedestrians being an afterthought.

## Considering the Setting

The character and setting of the area, nearby land use densities, origins, and destinations can influence the level of pedestrian use. Consider the potential for increases in use that may occur when pedestrian facilities or pedestrian generating improvements (such as transit) are installed. Often, decisions not to install pedestrian facilities are short-sighted, based on the perception that an area with



*Pedestrians are a fundamental part of the transportation system.*

low pedestrian use doesn't need improvement. In reality, pedestrians are probably not using the system because it is not adequately meeting their needs under existing conditions. Sometimes land uses can change and facilities need to be upgraded to serve more intensive pedestrian travel. After conditions are improved for pedestrians and the level of walking increases, multiple benefits can be realized, including:

- Walking as a transportation mode can reduce reliance on motor vehicles and reduce the number of motor vehicle trips and total vehicle miles traveled.
- This in turn can reduce greenhouse gas emissions and other motor vehicle-related environmental impacts (such as traffic congestion, noise, and pollution).
- Pedestrian facilities connect people to transit and increased transit use also brings the benefits described above.
- Walking is healthy and can improve fitness and enhance the quality of life in the islands.
- The best and safest communities and the most desirable places to live, work, and visit are pedestrian-friendly.

## General Description of Pedestrian Facilities

The types of facilities that serve pedestrians' needs include far more than just sidewalks. Pedestrian facilities include a wide array of improvements and treatments, such as:

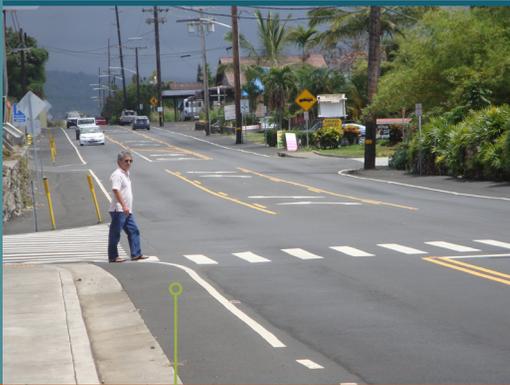
- Sidewalks, walkways, and other pedestrian facilities within the right-of-way
- Paths and trails outside the right-of-way
- Facilities on sites (including pedestrian spaces around buildings and through parking areas)
- Intersections and traffic control, including crosswalks, pedestrian signals and actuation, signs, etc.
- Curb ramps
- Mid-block crossing treatments
- Curb extensions (bulb outs) and median refuge islands, which reduce the crossing width for pedestrians
- Grade separations (such as underpasses and overpasses)
- Wide, delineated shoulders (although not



*Pedestrians enjoying a walk in Hanalei, Kauai*

*Pedestrian facilities connect people to and from transit.*





*Pedestrian crossing the Mamalahoa Highway on the Big Island*

*Pedestrians strolling along the water in Honolulu*



designed as pedestrian facilities, these may be used by pedestrians, particularly in rural areas). See more discussion about shoulders in Toolbox Section 2.

- Transit waiting areas, shelters, and amenities
- Streetscape furnishings and elements that create a safe, inviting pedestrian-friendly atmosphere (such as benches, landscaping, pedestrian-oriented lighting, public art, etc.)
- Other technology, design features, and strategies intended to encourage and enhance pedestrian travel (such as traffic calming features, speed limit warning signs, and other devices)

## Developing Pedestrian Plans

The Statewide Pedestrian Master Plan has been developed for Hawaii, and this toolbox is a companion document to the master plan. Additional pedestrian plans or master plans can be developed at the island-wide, community-wide, city-wide, county-wide, neighborhood, or resort scale. Pedestrian plans provide opportunities to assess and focus on local needs. These plans can be created

independently from other plans or as an integral part of comprehensive plans or transportation plans being developed. Common elements found in pedestrian plans include the following.

- Policy framework: vision, goals, policies, and actions
- Interdepartmental coordination within agencies and jurisdictions, as well as coordination between agencies and jurisdictions
- Collection and analysis of pedestrian crash data, including high crash/accident locations
- Pedestrian design criteria (tailored to local context and needs)
- Assessment of Americans with Disabilities Act (ADA) compliance and accessibility design guidelines
- Pedestrian and transportation improvement projects, defined and prioritized
- Funding, phased to match prioritized needs
- Recommendations and funding for education and safety programs
- Public involvement and community outreach

## Effective Education, Enforcement, Encouragement, Evaluation, and Equity Programs

Good planning and design are important factors in incorporating pedestrians into Hawaii's transportation system. But good planning and design can't be expected to solve all pedestrian-related problems. Effective education, enforcement, encouragement, evaluation, and equity programs are other important tools that heighten awareness of pedestrians and their needs. Community equity in improving

the pedestrian environment is important. The diverse needs of all pedestrians must be addressed—this includes pedestrians of all ages, abilities, ethnicities, races, religions, economic levels, or other cultural characteristics.

For pedestrian travel to be effective, efficient, and safe, motorists and pedestrians must follow important traffic rules and laws. Breaking these rules and laws puts pedestrians and other roadway users at risk and is inconsistent with the Statewide Pedestrian Master Plan's objective

to enhance the quality of the pedestrian environment, increase pedestrian activity levels, and improve safety. Efforts must continue to encourage a culture of respect and shared use among motorists and pedestrians alike.

Best practices related to education, enforcement, encouragement, and evaluation programs are provided in Toolbox Section 10.

## The “Bigger Picture”—Creating Pedestrian-Friendly Communities

There are many good sources of information about how to plan and design pedestrian-friendly communities, as listed at the end of this toolbox section. Common characteristics of pedestrian-friendly communities are listed in Exhibit 1.1.

## Context-Based Planning

Context-based planning has become a best practice across America. Development of context sensitive solutions is strongly encouraged by the Hawaii Department of Transportation, the Federal Highway



Citizens Advisory Committee working together on the Statewide Pedestrian Master Plan.

Administration, and other local, state, and federal agencies. The principles of context sensitive solutions promote a collaborative, interdisciplinary process that involves all stakeholders in planning and design. For pedestrians, context-based planning focuses on improving the environment for pedestrians based on the surrounding context—land uses, the transportation network, environmental characteristics, and other factors. Context-based planning is often the first step to creating or enhancing a walkable community.

The Rural to Urban Transect (Exhibit 1.2) on page 1-8, often referenced by urban planners and designers, shows various context zones and the types of transportation facilities that generally exist in these zones. In context zones that are more urban, there are typically greater and more diverse transportation facilities and pedestrian networks and a greater intensity of street networks. This diagram is a generalization. Contexts can vary widely, and in Hawaii there are many rural villages, town centers, resorts and recreational areas with pedestrian needs that are just as important as those in urban areas.

### EXHIBIT 1.1 Common Characteristics of Pedestrian-Friendly Communities

<b>Pedestrians are an Integral Part of the Transportation System</b>	Pedestrians' needs are considered from the start in all planning and design projects, whether private or public, and pedestrian travel is viewed as a fundamental component of the transportation system and the pedestrian mode is closely coordinated with other modes. All streets are designed with pedestrians' needs in mind.
<b>Policy-making Supports Pedestrians</b>	Proactive statewide, regional, and local policy development sets the stage for establishing a stronger focus on pedestrian issues and encouraging communities to better meet pedestrian needs.
<b>Close Coordination between Jurisdictions</b>	Close coordination between jurisdictions results in seamless connections between communities and a sufficient level of pedestrian facilities in place to meet current and future needs.
<b>Pedestrian-oriented Land Uses and Pedestrian-supportive Land Use Patterns</b>	Land uses attract and accommodate pedestrian activity. Land use patterns, such as grid street networks, shorter blocks, and compact "village-oriented" mixed use development of adequate density enhance pedestrian mobility.
<b>Linkages to a Variety of Land Uses/ Regional Connectivity</b>	Pedestrian circulation and access is provided to shopping malls, transit, downtown, schools, parks, offices, mixed-use developments, and other community origins and destinations, as well as other communities within the region.
<b>Continuous Systems/ Connectivity</b>	A complete system of interconnected streets, pedestrian walkways, and other pedestrian facilities is provided to increase pedestrian travel.
<b>Shortened-Trips and Convenient Access</b>	Connections are provided between popular origins and destinations, between dead-end streets or cul-de-sacs, or as shortcuts through open spaces.
<b>Continuous Separation from Traffic</b>	Buffers from motor vehicles and separation of uses are provided.
<b>Designated Space</b>	Pedestrian facilities are well delineated, signed, and marked.
<b>Security and Visibility</b>	Planning and design to ensure a secure environment for pedestrians is important. Lighting, increased visibility, open sight-lines, access to police and emergency vehicles, and locating pedestrian facilities adjacent to neighborhoods and businesses can increase safety. Pedestrian activity during all hours of the day enhances security.
<b>Reduced Conflicts between Pedestrians and Traffic</b>	Driveway crossings are minimized and well defined. Street crossings are reduced in width as much as possible and pedestrian refuge areas are provided.

**EXHIBIT 1.1 Common Characteristics of Pedestrian-Friendly Communities, Continued**

<b>Reduced Speeds and Traffic Calming</b>	High speed vehicle travel is discouraged either by original design or retrofitted traffic calming measures. Neighborhood traffic calming methods are provided such as trees, traffic circles, curb extensions (bulbs), neck-downs, and other techniques to lower vehicle speeds and create safer conditions for pedestrians.
<b>Parking Supply and Location</b>	Parking supply is reduced or managed using methods that encourage walking. Parking is screened from pedestrian areas. Pedestrians have direct access from parking to buildings and other destinations. On-street parking provides a buffer between roadway/street travel lanes and the pedestrian travel zone.
<b>Accessible and Appropriately Located Transit</b>	Siting of transit facilities adjacent to work, residential areas, shopping, and recreational facilities is provided to encourage pedestrian trips. Transit stops and centers are conveniently located. Adequate pedestrian facilities to access transit are provided, which is essential to their success as alternative modes of travel.
<b>Lively Public Spaces</b>	Secure, attractive, and active spaces provide focal points in the community where people can gather and interact. Pedestrian pocket parks and plazas are examples.
<b>Character</b>	Character attractive to pedestrians is preserved or created. Design is focused on human scale. Preservation of important cultural, historic, and architectural resources strengthens community heritage and character. Streetscape enhancements and public art also enhance character.
<b>Scenic Opportunities</b>	Attractive environments and scenic views, which encourage pedestrian use, particularly when facilities are oriented toward them, are provided.
<b>Pedestrian Furnishings</b>	Furnishings, such as benches, restrooms, drinking fountains, artwork, wayfinding signage, and other elements create a coherent, attractive, and functional environment for pedestrians.
<b>Street Trees and Landscaping</b>	Street trees are provided, bringing human scale to the street environment. Trees, landscaping, flowers in planting strips, containers, and other areas soften surrounding hard edges of buildings and parking lots, and add shade, life, color, and texture to the pedestrian's field of vision. Adding green to the urban environment also cools ambient temperatures, reducing the heat island effect.
<b>Design Requirements</b>	Guidelines and adopted standards are followed and, if deviated from, justified and documented.
<b>Well-functioning Facilities</b>	Adequate width and sight distance, accessible grades, and alignment to avoid blind corners are provided. Common problems, such as poor drainage, are avoided.
<b>Proper Maintenance</b>	Frequent cleanup and repair on a regular basis ensures ongoing, consistent use. High quality design and materials can minimize this need.



**CONTEXT SENSITIVE SOLUTIONS**

- *Meet the needs of communities and stakeholders – the users of the system/facility;*
- *Are compatible with their setting and preserve scenic, aesthetic, historic and environmental resources;*
- *Respect design objectives for safety, efficiency, multi-modal mobility, capacity, and maintenance; and*
- *Integrate community objectives and values related to compatibility, livability, equity, sense of place, urban design, cost, and other environmental considerations.*



Pedestrian on Kauai

Pedestrians enjoy walking in areas that are designed with the human scale in mind.

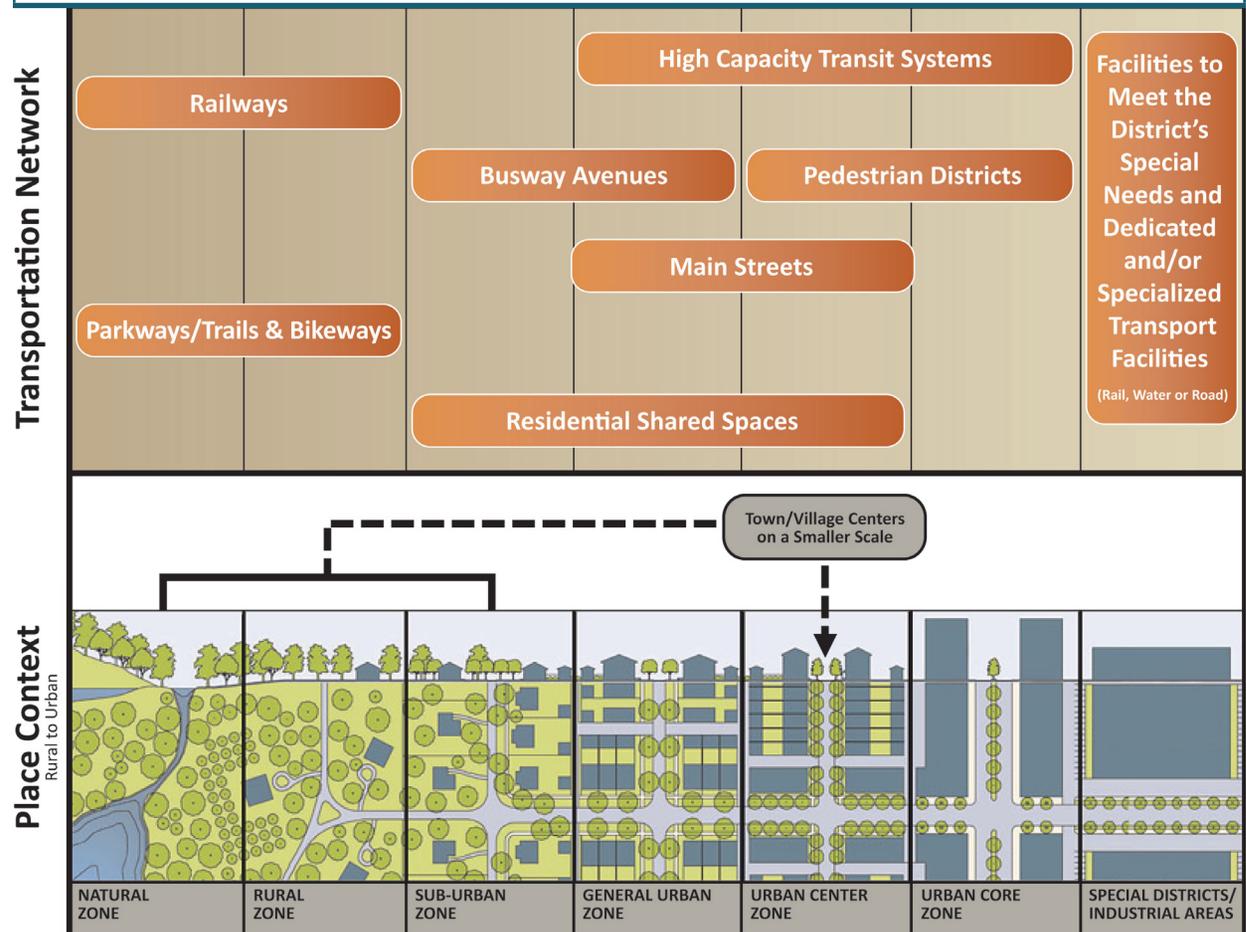


## Connectivity

Pedestrians want facilities that are continuous, well-connected, safe, attractive, convenient, and easy to use. If designed properly, the

best public pedestrian facilities will also be the most durable and the easiest to maintain. Poor design of pedestrian facilities can lead to perpetual problems and actually discourage

EXHIBIT 1.2 Context-Based Planning—Rural to Urban Transect



Adapted from matrix by Smart Code v. 9.2 ([smartcodecentral.com](http://smartcodecentral.com)) and Lawrence Aurbach, "Towards a Functional Classification Replacement"

use if pedestrians are not well connected in the transportation system. Inadequate, disconnected, unattractive, and poorly designed and maintained facilities can be viewed as a waste of money and resources and a hindrance to community vitality.

Connectivity is often cited as a measure of livable and walkable communities. Typically, the more connected a community or setting is, the more walkable it is. Connectivity is represented by the level of links and nodes of a transportation network that are interconnected in a grid-like and/or web-like pattern. For pedestrians, this translates to an interconnected system of sidewalks, walkways, paths, and other facilities, as well as intersection and crossing improvements. Higher connectivity allows pedestrians to travel more easily to and from various points in the community. It also offers a higher degree of route choice to pedestrians, encouraging them to walk more. Good connectivity benefits all modes of transportation, not just pedestrians.

Conventional development patterns often resulted in networks of widely spaced arterial roads and large blocks with limited to poor

### EXHIBIT 1.3 Connectivity Examples



(A) Conventional suburban hierarchical network

**POOR PEDESTRIAN CONNECTIVITY**



(B) Traditional urban connected network

**GOOD PEDESTRIAN CONNECTIVITY**

*Adapted from Designing Walkable Urban Thoroughfares, ITE, 2010; Original Source: Kimley-Horn and Associates and Digital Media Productions.*

#### EXHIBIT 1.4 Measuring Network Connectivity and Accessibility for Walkability

Connectivity can be measured in various ways. Planning, design, and engineering practitioners have developed a variety of indices for network connectivity and accessibility:

**Links and nodes (index):** Roadway (or modal) links or segments divided by the number of nodes (intersections). Ranges from 1.0 (poorest level; all cul-de-sacs) to 2.5 (full grid). Minimum index for a walkable community is 1.4 to 1.6.

**Intersection ratio:** The ratio of intersections divided by intersections and dead ends, expressed on a scale from 0.0 to 1.0 (US EPA 2002). An index of more than 0.75 is desirable.

**Average intersection spacing and block length:** For walkability, a maximum distance of 660 feet; with desirable spacing at less than 400 feet. Block length in urban centers and village cores should ideally not exceed 400 feet and preferably be 200 to 300 feet to support pedestrian activity.

**Intersection density:** The number of surface street intersections in a given area, such as a square mile. The more intersections, the greater degree of connectivity.

**Blocks per square mile:** For walkability this index should be at least 100.

**Directness (index):** Actual travel distance divided by direct travel distance. Ideal index is 1.0. For walkability, this index should be 1.5 or less.

*Adapted from: Texas Transportation Institute, Donohue, Nick, "Secondary Street Acceptance Requirements," Office of the Secretary of Transportation, Commonwealth of Virginia, 2008. "Smart Growth Index Model," US EPA 2002*

connectivity, particularly in communities, suburban areas, and neighborhoods developed between the 1950s and the 1990s. Exhibit 1.3 illustrates a conventional suburban hierarchical network compared to a more connected network. Many well-connected grid and web networks developed throughout the US in the 1800s and early 1900s are common in urban and town centers. Neo-traditional and new urbanism planning practices often focus on returning to well-connected networks as a key component of livable, walkable communities. Planners can measure connectivity in a number of ways. See Exhibit 1.4.



Shared use path on Kauai

## Creating a Continuous Pedestrian System

The pedestrian transportation system in Hawaii should be consistent across jurisdictional boundaries and public and private developments. Regional and local pedestrian systems need to be planned, designed, and constructed to provide a comprehensive network of travel options for pedestrians.

The guidelines throughout this toolbox encourage more consistent planning and design of pedestrian facilities throughout the state, and the responsibility to develop and support a seamless pedestrian transportation network lies with everyone, including the public- and private-sector.

Under current state law, local jurisdictions have the authority to require property owners and developers to provide safe pedestrian accommodations such as sidewalks, paths, or other means of access.

Targeting public funding so that strategically located projects can be designed and built to fill in the gaps between private development is one way to help improve the overall system.



*All of us are pedestrians at some point in the day.*

# WALKABLE COMMUNITIES

*Compact, pedestrian-scaled villages, neighborhoods, town centers, urban centers, and other areas where walking, bicycling, and transit are encouraged. These areas are well-connected with a network of complete streets that serve all travel modes, but with pedestrians treated as a high priority.*

Retrofit of existing areas where pedestrian facilities are not accessible is another important step. The development of a seamless pedestrian system will be the result of both public and private investment throughout communities and neighborhoods.

Coordination between agencies, governments, and private entities is critical to the success of regional pedestrian systems. School districts, utility companies, private corporations, and local agencies need to work together at the onset of transportation and development projects to reach the best solutions for all interests involved.

Considering the needs of pedestrians throughout project planning, design, and development processes at all levels will increase pedestrian safety and mobility and improve the pedestrian network overall.

## Analyzing Walkability

In addition to the use of a context-based planning analysis and connectivity indices described above, there are various types of tools and techniques available for measuring walkability.

### *Walk Score*

Various online resources and computer programs have been developed to assist walkability analysis. One example, Walk Score, is a free, user-friendly program that can be used online to measure walkability of many locations. Walk Score measures the walkability of places based on walking distance and pedestrian connectivity. Each location is given a score from 0 to 100. The most walkable places score from 90 to 100 (Walker's Paradise) and the least walkable places score from 0 to 24 (Car-Dependent). Visit [www.walkscore.com](http://www.walkscore.com) for more information.

### *Walkability Audits*

A walkability audit is an unbiased evaluation of the pedestrian environment to identify concerns for pedestrians related to safety, access, comfort, and convenience. In addition to identifying problems, audits can be used to identify potential solutions (such as engineering treatments, policy changes, or education and enforcement measures). Walkability audits can be geared toward examining one or many specific types of facilities (crosswalks, intersections, bus stops, school zones, sidewalks, etc.). Audits can be performed at many



## HOW WALK SCORE WORKS

*Walk Score is a number between 0 and 100 that measures the walkability of any address. You type in the address and characteristics of the place you want to measure and the program outputs a score.*

WALK SCORE	DESCRIPTION
90–100	<b>Walker's Paradise</b> — Daily errands do not require a car.
70–89	<b>Very Walkable</b> — Most errands can be accomplished on foot.
50–69	<b>Somewhat Walkable</b> — Some amenities within walking distance.
25–49	<b>Car-Dependent</b> — A few amenities within walking distance.
0–24	<b>Car-Dependent</b> — Almost all errands require a car.

different stages of the walking environment's development, including planning and design, during construction, and for completed or established facilities.

Informal audits can be performed by any individual or community group. More formal audits (e.g., those that follow a standardized set of audit procedures) are often performed by a multidisciplinary team of trained professionals, including engineers, planners, transportation researchers, pedestrian and bicycle specialists, and/or others. Audits are typically performed by a person or group that is independent of the person or agency responsible for the design, development, or maintenance of the facility audited. This is to ensure that the audit is conducted with "fresh eyes" and that the results of the audit are unbiased. It also helps prevent potential conflicts of interest. If a review/evaluation of a facility is conducted by the same group responsible for it, this process is an assessment—there is value to having an assessment, but it is not the same as an audit. Walkinginfo.org provides links to various types of walkability audits. <http://www.walkinginfo.org/problems/audits.cfm> (May 2013).

# WALKING DISTANCES

*For planning purposes, it is common practice to apply the following distances in analyzing walkability.*

DISTANCE	TIME	TO/FROM AND OTHER CONSIDERATIONS
¼ mi 400 m	5 min	Major activity centers, campuses, urban hubs, and other key destinations (including those listed below with the ½ mile distance); this is the most common metric used in walkability and pedshed analyses
½ mi 800 m	10 min	Neighborhood scale, shopping areas, parks, schools, transit stations, bus stops, community centers, recreation areas
1 mi 1600 m	20 min	People often walk further in nice weather and for recreational purposes, particularly when well-connected, complete pedestrian networks are available

# HOW FAR WILL PEOPLE WALK?

The distance people are willing to walk can vary greatly depending on context, obstacles to pedestrian travel, safety, security, convenience, directness, attractiveness of the route and other factors. Ongoing research provides important information about how far people will walk and how distance choice is influenced by various factors. A study completed in 2007 suggests the distance people will walk to transit may be less a function of length than of the obstacles they find along the way. Major findings of the study, indicate:

- Pedestrians say their primary concern in choosing a route is minimizing time and distance.
- Secondary factors influencing route choice (but still indicated as influencing factors) are safety, attractiveness of the route, sidewalk quality, and the absence of long waits at traffic lights.
- Pedestrian walk farther to access light rail stations than previously assumed (a mean distance of about a half mile rather than the common assumption of a quarter to a third of a mile).

The US Department of Health and Human Services Centers for Disease Control and Prevention offers a downloadable *Walkability Audit Tool* that can be used to measure walkability in communities or neighborhoods.

## Examples of Connectivity and Walkability

Aerial photos are provided for several locations on the pages 1-16 and 1-17, and the Walk Score rating for each is indicated. The most walkable places tend to be those with a well-connected grid with sidewalks and pedestrian facilities, as well as walking-distance access between destinations. The least walkable places tend to have barriers to connectivity, incomplete pedestrian facilities, and longer walking distances between destinations.

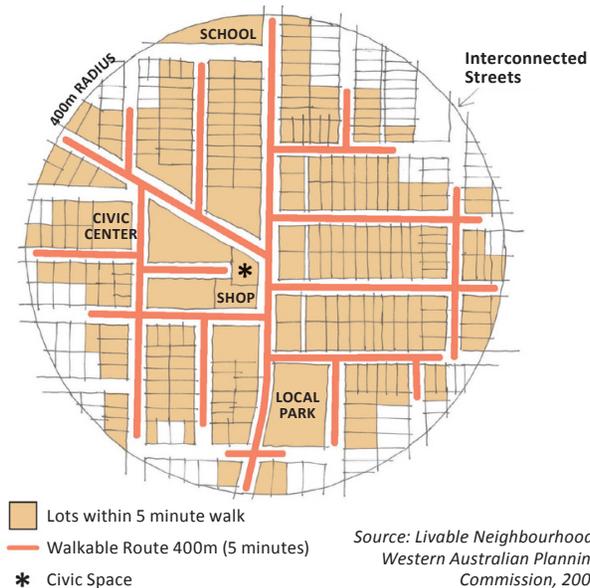
## GIS and Pedshed Analysis

Exhibit 1.5 illustrates typical pedshed analyses at a neighborhood and district scale. The use of geographic information systems (GIS) mapping and planning technologies can greatly aid analysis of walkability in specific geographic areas at various scales (statewide, regional, local). A Pedshed Analysis is a specific

EXHIBIT 1.5 Pedshed Analysis Examples



Source: Tsix Urbanists, Inc.



Source: Livable Neighbourhoods, Western Australian Planning Commission, 2009

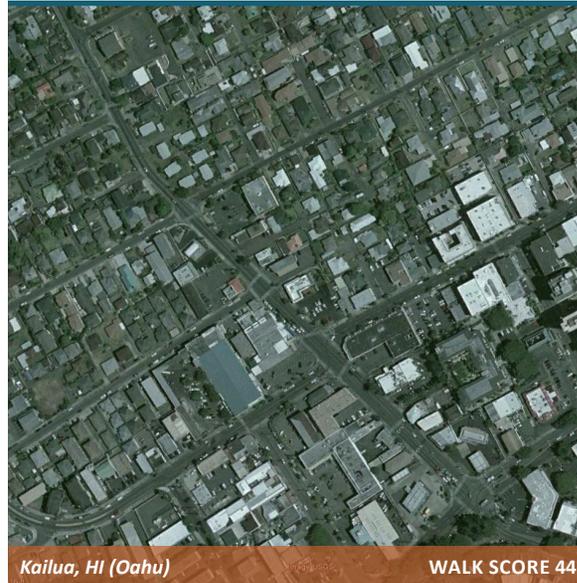


*Pedestrian-friendly public places often serve a healthy and diverse population of all ages, cultures, and interests.*



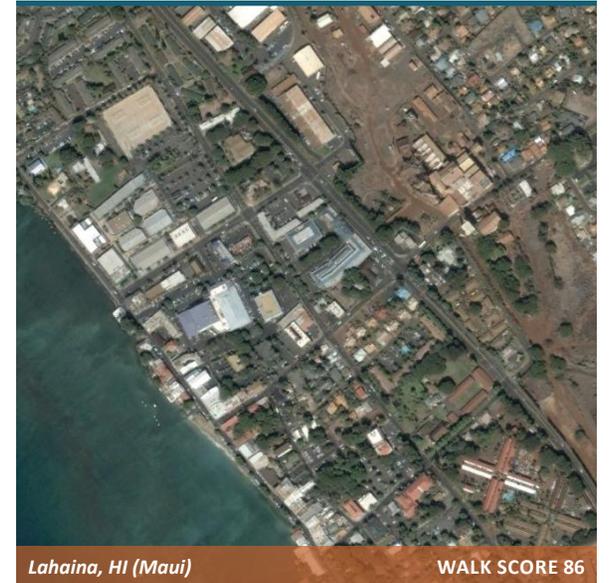
*Kaīmuki - Honolulu, HI (Oahu)*

WALK SCORE 66



*Kailua, HI (Oahu)*

WALK SCORE 44



*Lahaina, HI (Maui)*

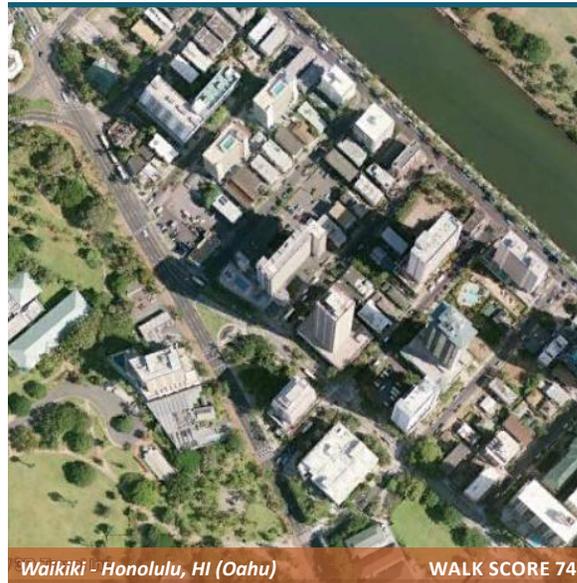
WALK SCORE 86

## Connectivity Examples—Hawaiian Islands



*Waipahu, HI (Oahu)*

WALK SCORE 57



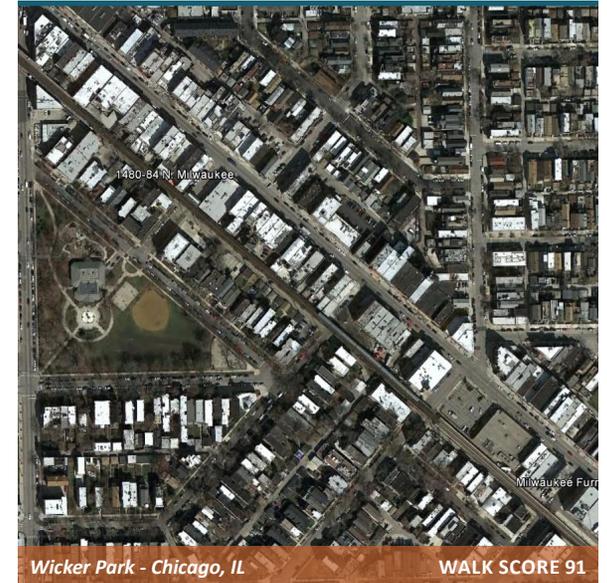
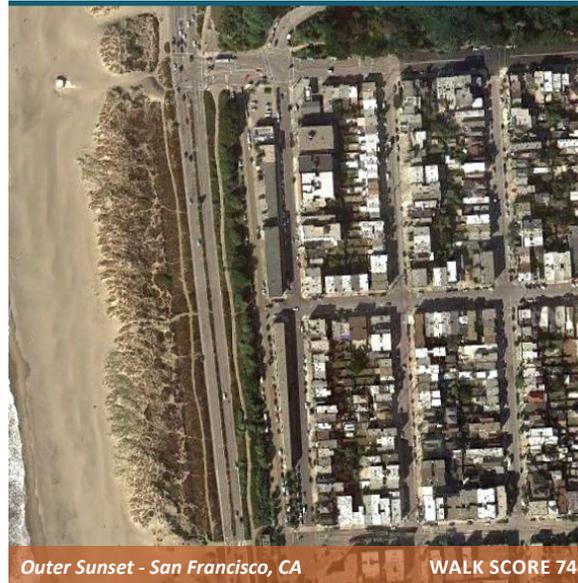
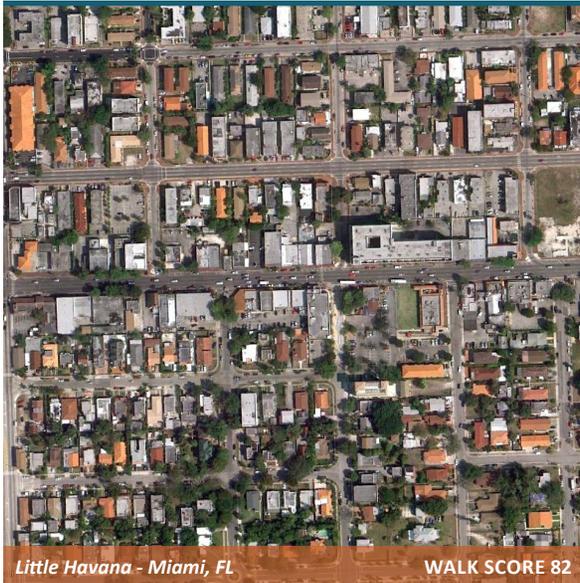
*Waikiki - Honolulu, HI (Oahu)*

WALK SCORE 74

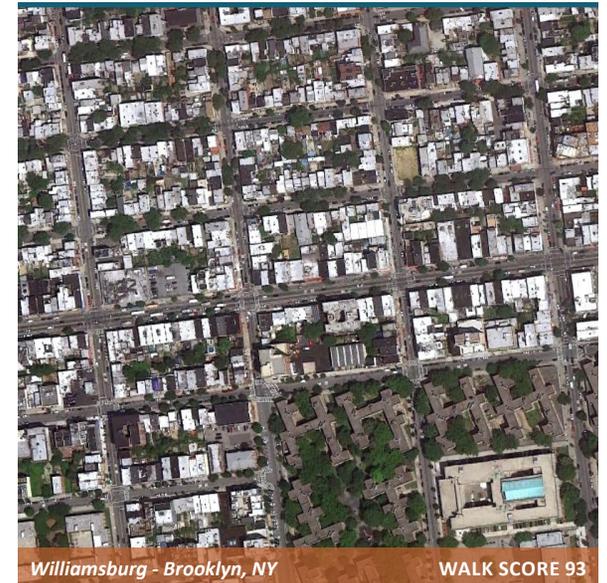
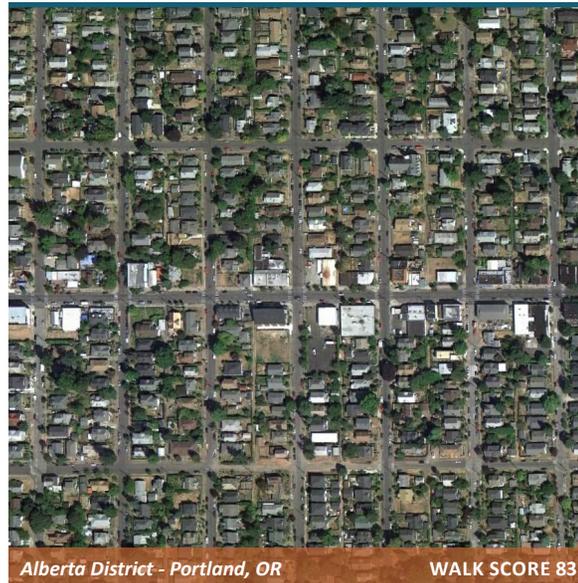
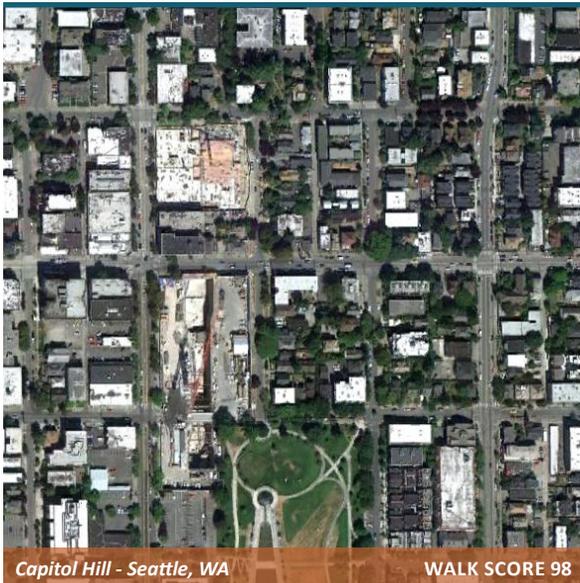


*Hilo, HI (Big Island)*

WALK SCORE 30



## Connectivity Examples—Other Places in the United States



See page 1-12 for more information about Walk Score  
Source for aerial photos: Google Earth

approach that looks at the walking environment surrounding and between various origins and destinations. A specific center of activity is defined and then the walking routes (existing and proposed) to and from that center are mapped and analyzed. The walkable catchment area shown surrounding the center of activity is the resulting “pedshed.” A five- to ten- minute walking distance to/from major destinations (quarter mile to half mile) is often used to define the pedshed.

## Creating an Effective Pedestrian System

Pedestrian systems and facilities need to be functional and effectively used by pedestrians. Pedestrian facilities both encourage people to walk and improve pedestrian safety. The facilities must be well-designed and maintained to be effective. In communities, neighborhoods, and districts, there are a number of elements that contribute to an effective pedestrians system, such as:

- Widened, delineated paved shoulders to allow safer travel for pedestrians

- Sidewalks, paths, or walkways that are of sufficient width, clear of obstructions, and separated from traffic lanes
- Proper design and operation of traffic and pedestrian signals, including placement of pedestrian push buttons, where appropriate
- Planting buffers, raised curbs or other treatments that physically separate pedestrians from motor vehicle traffic at selected locations
- Facilities for persons with disabilities, including curb ramps, audible pedestrian signals, and longer intervals for slower pedestrian walking speeds
- Signing and marking, including pavement edgelines and pedestrian warning signs where needed

In some cases, an effective pedestrian system may include grade separated pedestrian crossings. But these must be clearly justified and carefully implemented, since such facilities may go unused or create illegal street crossing behavior by pedestrians if not properly planned, designed, and located. The best practice is to

work to make the street level environment as complete, safe, and accessible for pedestrians as possible. Pedestrian exclusive areas, such as pedestrian malls may also be provided, but these also must be well-planned with respect to commercial development, traffic circulation, and visual appeal to be effective. See Toolbox Section 9—Special Pedestrian Districts and Site Design for Pedestrians for more specific design guidelines related to site development.

Exhibit 1.6 on page 1-19 provides guidance for designing effective pedestrian facilities.

## Pedestrian-Oriented Development

Pedestrian-oriented development is typically accomplished through a mix of public policy, land use policy, and specific design practices including compact development, mixed-use, traffic calming, pedestrian- and public transit-orientation, and a mix of housing types. While pedestrian-oriented development works well in community centers and downtowns, it also can be applied successfully in rural and suburban areas. Pedestrian- and transit-oriented

EXHIBIT 1.6 *Creating an Effective Pedestrian System*



## KEY

- 1 Locate parking near the buildings they serve, but avoid placing parking lots on all sides of buildings. These are difficult areas for pedestrians to cross through. Locating parking lots to the rear of buildings is a preferred best practice. Provide sidewalks directly adjacent to buildings along street frontages for easy direct access. On-street parking can serve as a buffer between cars and pedestrians.
- 2 Drop-off zones are most convenient when located as close to the primary entrance to the building as possible. Provide accessible passenger loading zones. Walkways should be unobstructed. Access to drop-off areas, parking, and building entries should be direct and convenient.
- 3 Provide site entrances that are visually well-defined and conveniently located in relation to the site and the building.
- 4 Use clear and easy to read signage and wayfinding elements to direct pedestrians to their origins and destinations.
- 5 Provide building entries that are clearly identified and accessible. Locate public facilities (restrooms, phones, drinking fountains) near entryways and accessible routes.
- 6 Locate transit waiting areas within 300 ft (90 m) of building entries for direct access. Overhead shelters or awnings next to buildings provide protection from weather. Provide adequate seating and lighting.
- 7 Provide resting areas where pedestrians must walk long distances. Benches and other furnishings should not encroach on walkways.
- 8 Provide walkways along clear and direct routes throughout sites. Surfaces should be firm, stable, and slip resistant. Accessible curb ramps shall be provided where necessary. Accessible walkways shall be continuous (not dead-ends).
- 9 Locate transit stops in highly visible and convenient areas along the street. Provide streetside pedestrian shelters and transparent wind screens at busy transit stops where awnings and other weather protections are not available.

development can improve quality of life by reducing traffic congestion and air pollution. It can also result in less loss of open space (with compact development) and reduced road construction and maintenance costs (with more uses located within walking distance). By incorporating accessible facilities and pedestrian-oriented development principles, new developments will achieve the following benefits.

### ***Environmental Health***

The level of vehicle miles traveled across the United States has increased three times as fast as the population over the last 30 years. This increase in auto-dependency has created adverse environmental impacts such as air and water pollution, which in turn affect environmental and human health. Land use practices that increase opportunities for pedestrian- and transit-oriented transportation help to reduce these adverse effects.

### ***Human Health***

The way our communities are planned and designed plays a critical role in our ability and willingness to engage in regular physical activity required for a healthy lifestyle. According to the United States Center for Disease Control and

Prevention, “moderate physical activity performed on most days of the week can substantially reduce the risk of dying from heart disease, the leading cause of death in the United States, and can reduce the risk of developing colon cancer, diabetes, and high blood pressure.” Currently, more than 60 percent of American adults are not regularly active, and 25 percent of the adult population is not active at all. Pedestrian-oriented development provides safe, accessible opportunities for integrating physical activity into our lives. For example, sidewalks create safe environments for children to walk to school, and paths located in and near neighborhoods encourage more walking and jogging.

### ***Social Health***

Compact villages and mixed use areas promote social interaction and a healthy economy by combining accessibility, networking, convenience, and creativity into daily routines. Alternative modes of transportation such as walking, biking, and public transit often provide more opportunities for social interaction than personal automobile use. Additionally, these alternative transportation modes allow us to be more aware and appreciate the environment

around us, including our community’s natural areas and resources. This combination of increased social opportunities and appreciation for our surroundings can often encourage people to become more involved in their communities.

### ***Economic Health***

Communities that implement pedestrian-oriented development practices experience less traffic noise, lower traffic speeds and vehicle-generated air pollution than other modern communities, are likely to generate higher property values. Studies show increasing rates of homeowners and businesses choosing to locate in areas with high livability and walkability, as well as walkable community centers. This activity in turn supports local, regional, and state economies.

Additional guidance related to pedestrian-oriented design and pedestrian-oriented districts is provided in Toolbox Section 9.

## **Pedestrian-Friendly Streets**

Design of pedestrian-friendly streets is strongly encouraged by local and regional jurisdictions seeking to enhance the quality of life and safety

of citizens in their communities. The meaning of “pedestrian-friendly” can be interpreted in many ways, but generally, the intent is for street design to incorporate elements that enhance the safety, security, comfort, and mobility of pedestrians. Refer to Toolbox Section 2 for specific guidance related to design of pedestrian-friendly streets.

## Rural and Natural Areas

The beautiful, natural environment is one of the characteristics that inspires people to visit and live in the Hawaiian Islands. There are many natural and rural areas across the islands, and while pedestrian travel in these areas may be more limited than in urban and suburban areas, it does occur. For example, beach-goers and surfers sometimes need to cross rural highways when parking areas are located on one side and key destinations (such as resorts or beaches) on the other side. Pedestrians of all ages and capabilities use highways, roadways, and streets in rural and undeveloped areas across the state. Although people are walking in these areas, many existing streets, roadways, and highways do not adequately support their needs.

## Highways as “Main Streets”

When rural highways enter small towns and crossroad villages, they often become the “main street” used by all modes. When small pockets of population, including tourists and seasonal population and/or employment, exceed approximately 1,000 people per square mile (400 people per square kilometer), the pedestrian design criteria used should generally be the same as for urban areas. In these areas sidewalks and pedestrian facilities should be provided throughout the village center.

Providing facilities for pedestrians with disabilities is just as important in rural areas as it is in urban areas. If a pedestrian route is located within a road or street right-of-way, the pedestrian route must be accessible.

All transportation projects need to consider pedestrians’ needs, including limited access freeways and highways that pedestrians cross or that intersect with streets that serve pedestrians. Because in Hawaii, highways are often the “main streets” of villages and towns, pedestrians often walk along and cross highways. Interchanges, bridges, and underpasses are also examples of



*There are many areas in Hawaii where the highway is the “main street” of the village.*





*Pedestrians crossing the roadway in Paia Town, Maui*



*A jogger uses the shoulder along a Maui highway.*

transportation facilities that need to be designed to facilitate pedestrian movement.

Installation of pedestrian facilities in natural areas requires the same careful planning and design as other transportation facilities; using care to avoid impacts to sensitive natural, cultural, and historical resources while at the same time providing a good design solution that sufficiently serves the needs of all pedestrians. Refer to Toolbox Section 4 for more information.

## Project-Level Considerations

The following guidance applies to planning and considerations related to design and development of specific transportation improvement projects. This includes street and roadway improvements, as well as other types of transportation facilities that pedestrians use.

Consistent with Hawaii’s policy on “Complete Streets,” project-level planning for streets and roadways, transportation corridors, transit, and intermodal facilities shall consider and address pedestrian needs just as much as any other mode. Complete streets policies encourage a

systematic look at integrating pedestrian, bicycle, and transit facilities into the transportation network. For more information about complete streets, refer to Toolbox Section 2.

As discussed earlier in this section, specific projects should be designed in accordance with context-sensitive principles that consider the environmental, scenic, aesthetic, historic, and land use impacts and provide access for all modes of transportation such as pedestrians, transit, and bicyclists. A context-sensitive project addresses the needs of pedestrians as an integral part of the transportation solution.

Specific recommendations for project-level planning that addresses pedestrians include the following.

- Analyze methods for keeping motor vehicle speeds at or below the preferred maximum speeds through design measures and traffic calming techniques.
- Pedestrian access should be provided along the entire length of the project, and the pedestrian realm should be designed to fit the adjacent context/land uses.

- Buffer pedestrians from high-speed and high-volume motor vehicle traffic through treatments such as additional width between the sidewalk and the roadway or appropriate landscape buffers.
- Provide crossing facilities and treatments to ensure frequent and safe opportunities to cross the roadway/street. New construction or altered intersections, crossings, and other pedestrian facilities are required to provide accessibility features.
- Provide aesthetic quality and treatments that encourage walking, such as pedestrian-scale lighting, street trees, landscaping, and other features.
- In rural areas where pedestrians use the roadside shoulders, consider widening the shoulder to provide more space, or improving the roadside to include a sidewalk, walkway, or shared use path.

## Phasing of Pedestrian Improvements with Development

Early planning for areas that are experiencing or are projected to experience growth and development is crucial. Retrofitting sidewalks into these areas at a later date is usually more difficult and expensive than installing sidewalks early in the process. Sidewalks may be phased in as development occurs and often are required improvements of developers as part of their projects. With new development, phased implementation of sidewalks should address the following.

- ***Dedicated Space for Future Sidewalks—*** Space for future sidewalks should be secured and/or reserved when a new right-of-way is being created or an existing one is being developed, and when future developments are indicated in land use plans. If existing rights-of-way are not sufficient in width, developers should be required to dedicate additional right-of-way to accommodate sidewalks and other facilities.
- ***Specific Criteria for When Future Sidewalks Will be Required—***In rural areas where

sidewalks may not be installed as part of initial development due to lack of density, guidelines can be adopted to determine when sidewalks will be needed and how they will be funded and installed. For example, sidewalks could be required along residential streets once a certain density of dwelling units per acre is reached or at any time land uses are developed that will generate pedestrian activity (schools, parks, convenience stores, transit service, etc.).

There may be rural or natural areas where existing and proposed land use densities may not support installation of sidewalk improvements, or where installation of curb, gutter, and sidewalk along a higher speed roadway is not allowed. In these areas, if pedestrian use is likely to occur, conditions of approval should require installation of shared use paths separated from the roadway, as well as crossing treatments and other facilities to aid pedestrian travel in the vicinity of the project. Such facilities would need to be designed in compliance with AASHTO clear zone requirements.



The more pedestrians can walk to shops and to run errands, the less they have to drive, reducing traffic congestion on island roadways.



- **Funding for Future Pedestrian Improvements**—If pedestrian improvements are not installed at the time of initial development, there should be clear regulations as to who (developer, property owner, or government agency) will pay for future sidewalks. Transportation impact fee programs, where developers pay in advance for future improvement needs in lieu of making physical improvements at the initial stage of the project can help to off-set the costs of sidewalks, intersection improvements, and other needs that may occur later. With these types of programs, funding often can be set aside specifically for future sidewalk improvements. Without these types of programs, it may not always be feasible or possible to have developers add sidewalks later after the development has been completed.
- **Street Upgrades and Maintenance Projects**—Opportunities to expand or upgrade sidewalks and other pedestrian facilities should be considered as part of routine street upgrade, maintenance, and rehabilitation projects. Case law surrounding

the Americans with Disabilities Act (ADA) has found that resurfacing an existing roadway constitutes an alteration, which requires the addition of curb ramps at intersections where they do not exist.

- **Inter-Agency Coordination and Inter-Departmental Coordination between Infrastructure Projects**—Often, improvements needed for other infrastructure (such as for drainage, utilities, and street lighting) can provide an opportunity to install pedestrian facilities concurrently. Transportation and utility improvement projects should be coordinated to maximize efficient use of funds, leverage multiple funding sources where possible, and avoid conflicts. Removal or relocation of utilities should be carefully coordinated with other pedestrian improvements in order to maintain appropriate sidewalk clear width and avoid obstacles to pedestrians.

Jurisdictional responsibilities for land use and transportation planning are often covered by different agencies. For example, in Hawaii the city and county jurisdictions

are responsible for land use, but HDOT is often responsible for the transportation facilities. Because land use is often an important factor in determining where pedestrian facilities are needed, it is important for the agencies responsible for land use to continue to closely coordinate with the agencies responsible for transportation.

## Pedestrian Level of Service Analysis and Modeling

Pedestrian Level of Service (LOS) is typically an overall measure of walking conditions on a route, path, or facility. Pedestrian LOS is often influenced by the intensity of existing pedestrian use, as well as the density of surrounding land uses. It is typically a measure of pedestrian area occupancy, and planners often reference LOS when evaluating the need for pedestrian improvements. LOS measurements are often heavily influenced by current conditions. The best LOS analysis methodologies consider projected land uses and changes that may encourage pedestrian use in the future.

LOS can be linked directly to factors that affect mobility, comfort, and safety, reflecting pedestrians' perceptions of the degree to which the facility is "pedestrian-friendly." Factors are sometimes organized under three categories: physical characteristics, location factors, and user factors. Various models have been developed that measure LOS factors. These factors can be weighted by relative importance and a LOS scale is typically developed to describe the LOS of pedestrian routes.

When an LOS analysis is conducted, pedestrian conditions are often described through a LOS grade from LOS A (ideal pedestrian condition) to LOS E (unsuitable pedestrian conditions), based on an assessment of the factors affecting LOS. Refer to Toolbox Section 4 for additional information about these factors.

As discussed previously in this toolbox section, there are various new and emerging methods for evaluating walkability and pedestrian service levels. These include GIS-based tools, site surveys, walkability audits, and other approaches. Regardless of the outcome of any model or analysis process, it is always important to apply



### WHAT TO AVOID IN LEVEL OF SERVICE (LOS) ANALYSES

*While various methodologies have been developed for measuring LOS, some of the past models and analyses have used existing pedestrian volumes as a key factor. This can be problematic because research has shown that pedestrian activity can increase substantially after improvements are made in an area. Also, some LOS approaches tend to be macroscopic and not attuned to understanding specific on-the-ground conditions such as differences in pedestrian characteristics, specific land uses and location conditions, and crash types.*

good professional judgment to the results. A scientific or computer-based model may show an outcome that on-the-ground conditions contradict. For this reason, a lot of jurisdictions prefer to analyze various overlapping conditions and make decisions without the aid of high-tech models or tools. Or they use these tools as one point of reference in decision-making, while also relying on other types of analysis and good professional judgment.

### **Study on the State of the Practice**

The Institute of Transportation Engineers (ITE) is in the process of completing a study on the state of the practice related to determining the need for pedestrian improvements and policies/warrants for sidewalk installation. The results of this study may provide additional guidance for determining where and when to provide pedestrian improvements.

## **Other Resources**

The following sources of information are recommended for general planning and design of pedestrian facilities.

- American Association of State Highway and Transportation Officials (AASHTO). *A Policy on the Geometric Design of Highways and Streets, 5th Edition*. 2004.
- American Association of State Highway and Transportation Officials (AASHTO). *A Guide for Achieving Flexibility in Highway Design*. 2004.
- American Association of State Highway and Transportation Officials (AASHTO). *Guide for the Planning, Design and Operation of Pedestrian Facilities*. 2004.
- American Association of State Highway and Transportation Officials (AASHTO). *Roadside Design Guide*. 2002.
- American Planning Association, Wiley & Sons, Inc. publishers. *Planning and Urban Design Standards*. 2006.
- Centers for Disease Control and Prevention, Walkability Audit Tool. [http://www.cdc.gov/nccdphp/dnpao/hwi/downloads/walkability\\_audit\\_tool.pdf](http://www.cdc.gov/nccdphp/dnpao/hwi/downloads/walkability_audit_tool.pdf) (May 2013).
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- Federal Highway Administration. *Pedestrian Facilities Users Guide—Providing Safety and Mobility, Report FHWA RD-01-102*. 2002.
- Federal Highway Administration. *Priorities and Guidelines for Providing Places for Pedestrians to Walk Along Streets and Highways*. 2000.
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