

TOOLBOX SECTION

11

Safety in Work Zones and Maintenance





Pedestrians should feel safe and secure when traveling near work zones, and they need to be provided with clear, designated routes through and around work zones.

SAFETY IN WORK ZONES AND MAINTENANCE

Pedestrian Safety in Work Zones

Pedestrian safety is an important issue in and around work zones. Pedestrians travel at slower speeds than other modes of transportation and are more susceptible to the impacts of access, dirt, noise, and fumes from construction areas. Temporary access and detours should be provided to ensure safe, unimpeded pedestrian travel in and around work zones. Access to pedestrian facilities, such as bus stops, crosswalks, and links between origins and destinations, should be provided. Pedestrians should feel safe and secure when traveling near work zones.

Urban and suburban settings have the highest volume of pedestrian traffic, and construction projects are most likely to impact pedestrians in these areas. Pedestrians may ignore a detour that is out of the direction of their travel. Safe and convenient passage through or around work zones should be provided.

Local jurisdictions responsible for traffic safety in work areas should train construction inspection staff to recognize improper and unsafe pedestrian facilities during construction.

Protective Barriers

Near work zones where higher volumes of pedestrian traffic or school children exist, pedestrian fences or other protective barriers may be needed to prevent pedestrian access into a construction area. Pedestrian fences need to be high enough to discourage pedestrians from climbing over the fence. Considerations for encouraging safety in work zones are highlighted on the next page.



Pedestrian fences or other protective barriers may be needed to prevent pedestrian access into construction areas.

IN THIS SECTION

- PEDESTRIAN SAFETY IN WORK ZONES
- ONGOING PEDESTRIAN FACILITY MAINTENANCE
- OTHER RESOURCES



CONSIDERATIONS FOR PEDESTRIAN SAFETY IN WORK ZONES

- *Separate pedestrians from conflicts with construction vehicles, equipment, and operations.*
- *Separate pedestrians from conflicts with traffic traveling around or through the construction area.*
- *Provide a safe, convenient, and accessible route that maintains the direction and character of the original route.*
- *Minimize work vehicles crossing pedestrian routes by minimizing the number of construction access points.*
- *Communicate construction activity and pedestrian impacts through local media and pedestrian interest groups.*
- *Avoid using delineating materials that are difficult to recognize by people with impaired vision.*

Source: Based on ITE Design and Safety of Pedestrian Facilities; adapted and expanded for this Guidebook

Covered Walkways

For construction of structures adjacent to sidewalks, a covered walkway may be required to protect pedestrians from falling debris.

Covered walkways should be designed to provide:

- Sturdiness
- Adequate light for nighttime use and safety
- Proper sight distance at intersections and crosswalks
- Adequate and impact-resistant longitudinal separation from vehicles on higher speed streets; for work zones adjacent to high speed traffic, wooden railings, chain link fencing, and other similar systems are not acceptable.



Construction barrier in Paia, Maui

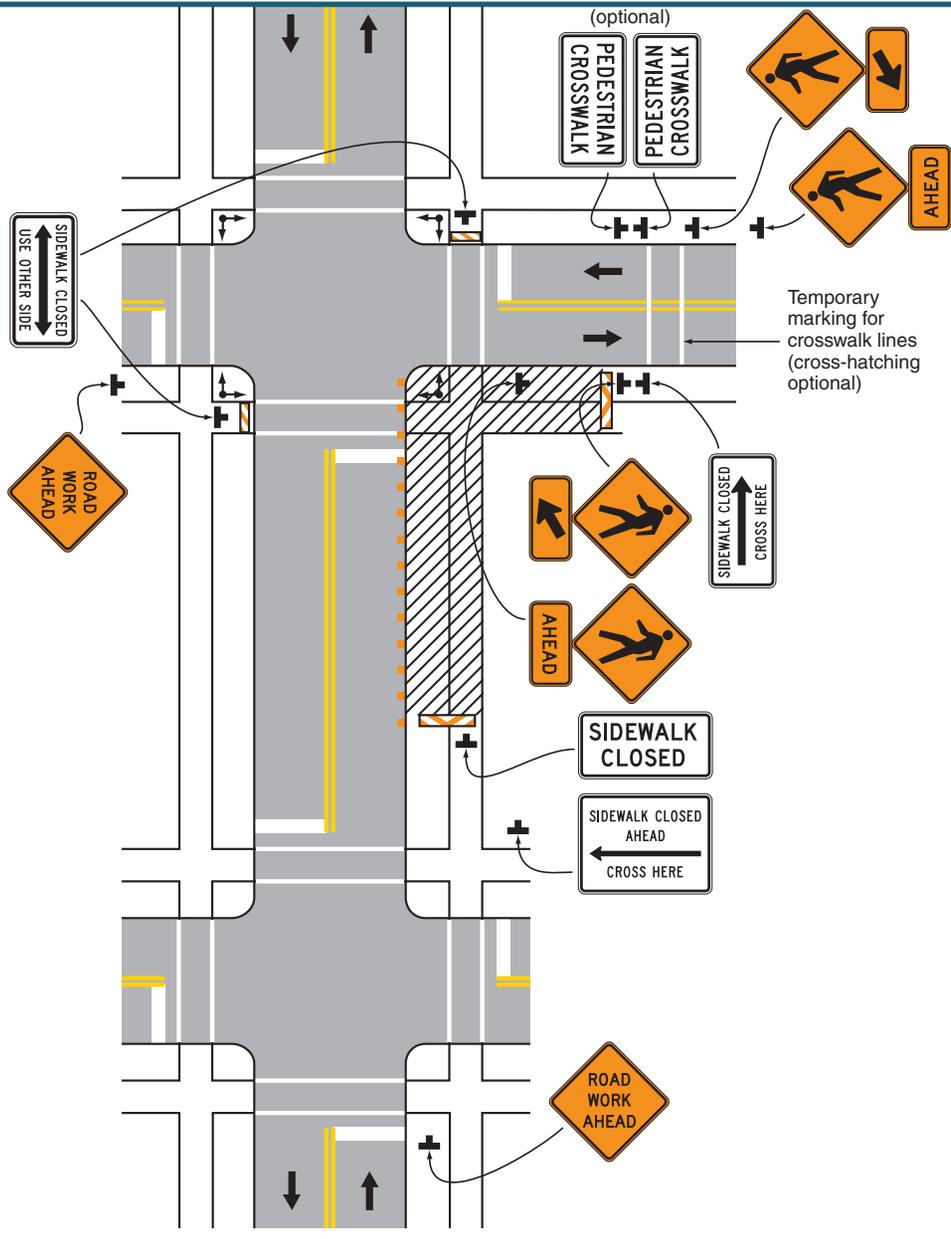
Sidewalk Closure During Construction

It is undesirable to close sidewalks or pathways during construction. If unavoidable, consider:

- Using barricades and cones to create a temporary route
- Clearly defining any detour routes
- Maintaining a route that complies with the Americans with Disabilities Act (ADA) design requirements
- Protecting pedestrians from vehicle traffic
- Protecting pedestrians from hazards, such as holes, debris, dust, and mud

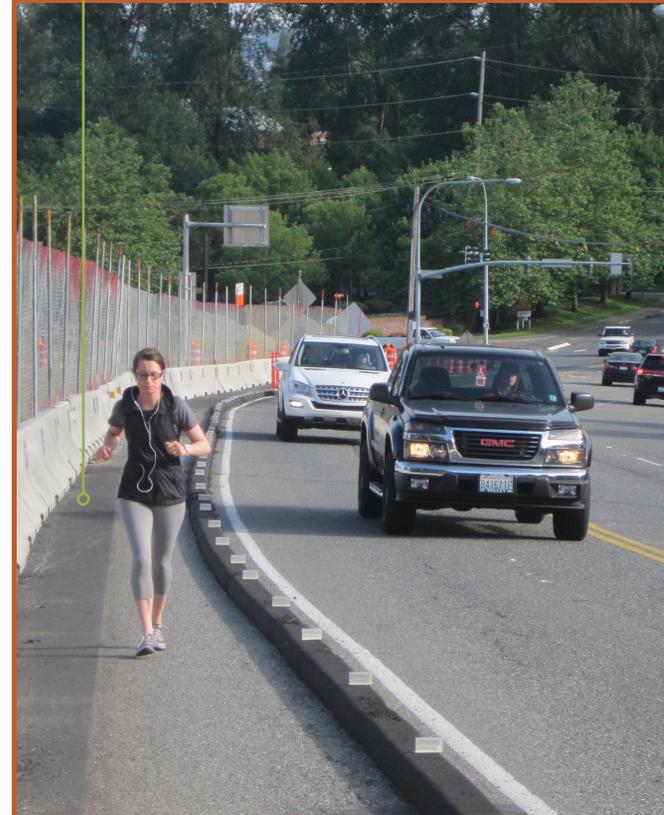
If a temporary route is created in the roadway adjacent to the closed sidewalk, the parking lane or one travel lane may be used for pedestrian travel, with appropriate barricades, cones, and signing, as illustrated in Exhibits 11.1 and 11.2. When a parking lane or travel lane is not available for closure, pedestrians must be detoured with advance signing in accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD). Signs should be placed to avoid blocking the path of pedestrians.

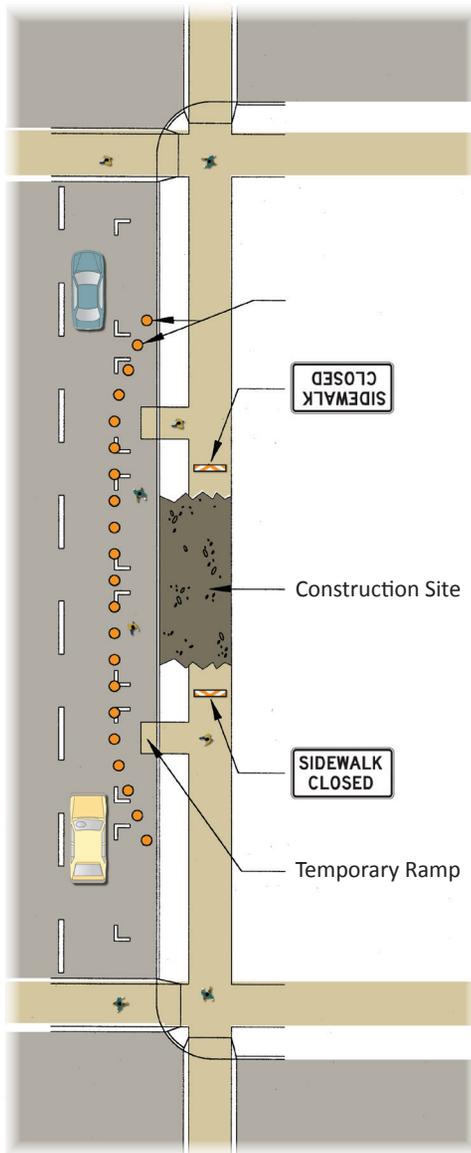
EXHIBIT 11.1 *Crosswalk Closures and Pedestrian Detours*



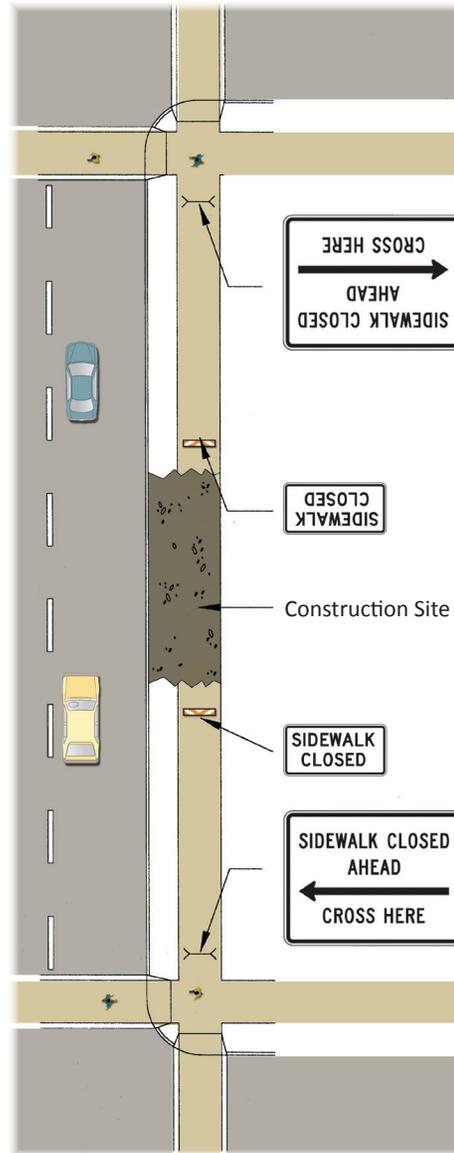
A path is provided for pedestrians and bicyclists during road closure.

This boulevard shoulder is transformed into a walkway with an extruded curb, concrete barrier and fencing.





Note: Parking lane used for pedestrian travel.



Note: If travel or parking lane is not available, detour pedestrians with advanced signing.

Intersections and Crossings Near Work Zones

- At intersections, avoid closing crosswalks.
- At signalized intersections, mark temporary crosswalks if they are relocated from their previous location. Maintain access to pedestrian push buttons.
- Include pedestrian phases in temporary signals.

Place advanced signing at intersections to alert pedestrians of mid-block work sites and direct them to alternate routes.

Utility Coordination

Construction and installation of utility lines and elements should be coordinated between the utility company and local agency with jurisdiction over the street system. Interruptions to pedestrian travel need to be minimized, and construction should avoid damage to pedestrian facilities. In some cases, it may be possible to improve conditions for pedestrians as part of an overall utility project. Such a project may create the opportunity to relocate a utility pole or box outside the pedestrian travel way, and even relocate utility lines along underground trenches.

Work Zone Maintenance

Pedestrian facilities in and adjacent to work zones should be maintained to provide safety and functionality. Proper maintenance will maximize the effectiveness and life of work zone pedestrian facilities. Poor maintenance can result in increased crashes and incidents in work zones. Exhibit 11.3 summarizes recommended maintenance activity for pedestrian facilities in and adjacent to work zones.

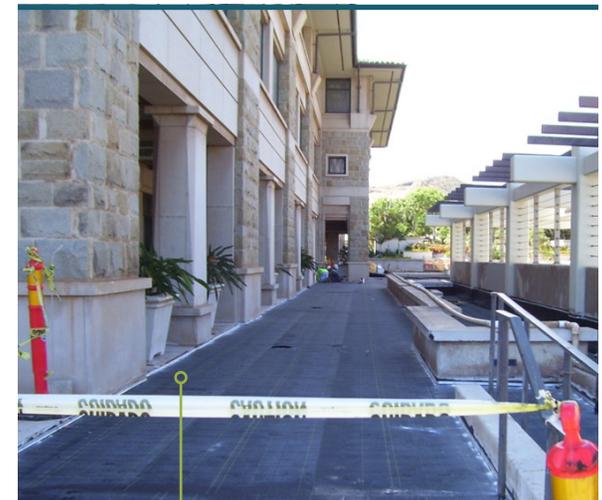
Ongoing Pedestrian Facility Maintenance

Clear and level surfaces are essential for pedestrians, particularly for people in wheelchairs, people who are blind or have impaired vision, older adults, and young children. Pedestrian facilities require regular maintenance to reduce the damages over time from weather and use. Local jurisdictions are responsible for maintaining facilities and traffic control elements at intersections and mid-block crossings.

Many maintenance issues can be reduced if properly addressed in the planning and designing phases before construction begins.

EXHIBIT 11.3 Work Zone Maintenance

WORK ZONE MAINTENANCE	
CONCERN	RECOMMENDED MAINTENANCE
Temporary pathways constructed of inexpensive, short-life materials	Pathway surfaces should be inspected regularly; surface materials should be treated with nonslip materials; surface materials with holes, cracks, or vertical separation should be replaced.
Detour pedestrian paths increase volumes of pedestrians on detour roadway	Detour pathway should be inspected regularly for adequacy of signal timing, signing, and pedestrian traffic hazards.
Construction material debris on pathway	Require contractor to maintain clear pathways.
Changing pedestrian route during construction	Inspect pedestrian signing regularly to ensure a clearly understood pathway.
Damaged traffic barriers	Replace and reevaluate adequacy for pedestrian safety.



Examples of restricted pedestrian access in Honolulu; in general it is a preferred practice to provide alternative access to pedestrians and bicyclists during construction, rather than fully blocking access as shown in these examples.

EXHIBIT 11.4 Maintenance Recommendations for Sidewalks

MAINTENANCE RECOMMENDATIONS FOR SIDEWALKS	
CONCERN	MAINTENANCE ACTIVITY
Tree roots cracking and heaving sidewalk	Remove failed sidewalk, cut roots and install new sidewalk. A local arborist should be contacted prior to removing large roots. Install root barriers or use a root box/structural soil system beneath the trees to promote deep root growth.
Section pop-up of vertical height greater than 0.5 in (13 mm)	Replace defective sections or provide temporary asphalt shim or grind pop-up.
Separation of expansion and construction joints greater than 1/4 in (6 mm)	Fill joints with hardening expansion compound.
Trash, loose sand, oil and grease on walkways and sidewalks	Send notice to abutting landowners to clean and maintain sidewalks.
Materials, signs, vending machines, etc. restricting effective sidewalk width	Require responsible parties to remove obstructions.
Low hanging tree limbs, bushes, weeds, and other foliage growing into the sidewalk and/or posing obstructions	Enact and enforce local regulations requiring abutting land users to perform timely clearance activity. Hire private contractor to clear sidewalk and assess cost to abutting land users.

ADA Title II implementing regulations require the maintenance of accessible features. General sidewalk maintenance recommendations are listed in Exhibit 11.4.

Walkway Surface

Pedestrian travel surfaces must be maintained to ensure that an even and unobstructed horizontal surface is maintained and in safe operating condition for all users at all times. Walkway surfaces that have settled or heaved over time can be a significant barrier for pedestrians.

Public works departments should have a program for routine maintenance checks of walkways, and they also should have a process in place to quickly respond to citizen reports of damaged surfaces, particularly along high-priority routes, so that pedestrians with mobility impairments do not have to seek alternate routes.

Surface Water Drainage

Drainage systems should be kept in good working order to avoid accumulation of water over pedestrian walking areas. Debris should be cleaned out from all gutters and drains. Litter should be removed from any low impact design facilities.

Signs, Signals, and Pavement Markings

Pedestrian and wayfinding signs need to be maintained to ensure that they are clear and legible, kept at the correct height and angle to the street, unobscured by tree branches and updated or replaced so that the information they provide remains valid. It is strongly recommended that a pedestrian sign plan be developed and maintained by local jurisdictions, detailing the content of each sign so that updates and maintenance can be managed.

Crosswalks and pavement markings should be added to a regular inspection and maintenance schedule, so that they are clearly visible at all times.

Traffic control devices, signals, and actuators also should be inspected on a regular basis to ensure that they are functioning properly.

Utility Provider Responsibilities

When work is undertaken for existing or new utilities, it is the responsibility of the utility provider to reinstate any and all disturbed elements within the pedestrian realm to their original quality.

Government agencies supervising the work should ensure that the placement of at- or above-grade utility assets does not detract from the public realm, impair pedestrian and vehicular sight lines, and/or obstruct pathways.

Trees and Plantings

Landscaping should be designed to last at least twenty years or longer, avoiding the need for frequent replacement. The placement and type of trees should be evaluated ahead of time, whenever possible. Trees and planting areas require regular trimming and maintenance to ensure that they are kept clear of debris and rubbish and that foliage does not obstruct sight lines or lighting. Care should be taken to prevent vegetation from encroaching into walkways. Dead and dying trees and plants can be a safety issue if limbs and branches fall into the traveled way or obstruct pedestrian areas.

When trees lack ample space for development, roots will often heave and crack sidewalks. Several alternatives have proved successful when planting trees near sidewalks. First, it is important that the variety of tree be suited to the site. Next, if the area has compacted soils



Keep the pedestrian realm clear and free of obstructions.

Workers replace a section of sidewalk. (www.leesburgva.gov)





Crosswalks and pavement markings should be added to a regular inspection and maintenance schedule.

Plants encroach the shoulder along this highway. (Barbara Gossett)



with low permeability rates, it is best to remove the existing soil and provide structural soil for the tree to grow freely. In order for a tree to reach maturity, there should be enough room for the tree's trunk to expand. Root barriers, grates with removable sections and larger sidewalk openings can prevent trees from heaving a sidewalk. The use of root boxes and structural soil box systems can also promote deep root growth.

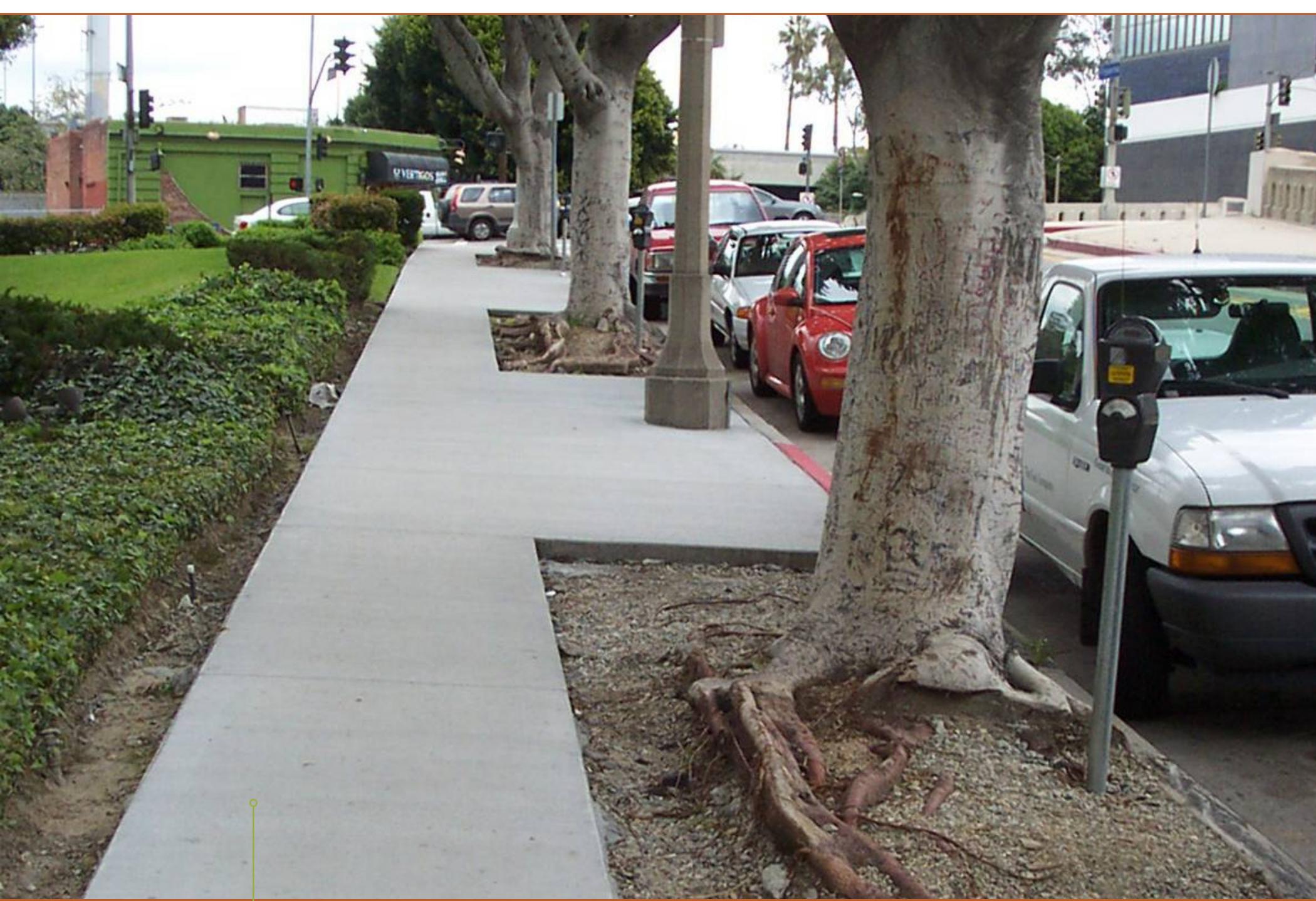
A regular maintenance program needs to be established with suitably qualified staff inspecting and maintaining the health and suitability of planted areas.

Street Furniture

When street furniture is provided as part of street design and construction, it is important to ensure that these furnishings are maintained to a suitable standard to meet the purposes for which they were installed.

Other Resources

- American Association of State Highway and Transportation Officials. *Guide for the Planning, Design, and Operation of Pedestrian Facilities*. 2004.
- Federal Highway Administration. *Manual on Uniform Traffic Control Devices*, 2009.
- Institute of Traffic Engineers. *Design and Safety of Pedestrian Facilities*. 1998.
- New York State Department of Transportation. *Tree Selection Criteria*. Website: https://www.nysdot.gov/divisions/engineering/design/landscape/trees/rs_selections (May 2013).



Sidewalk cutouts provide a larger growing space for trees. Keep in mind that a minimum 4 ft horizontal clearance shall be provided along pedestrian access routes. (American Public Works Association)

