City of Stamford

Complete Streets Manual

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Complete Streets Manual

David Martin, Mayor

Last updated December 29, 2020

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Acknowledgments

This document was produced by the City of Stamford Transportation, Traffic & Parking Bureau. We thank the City of New Haven for their leadership in Complete Streets policy and implementation, and for allowing us to use their guide book as a baseline for the creation of this manual.

This document is intended as an interim manual to comply with the requirements of Stamford's Complete Streets Ordinance. A new Complete Streets Manual will be developed in the near future.

Technical Consultation and Plan Preparation by FHI. Unless otherwise specified, all images used in this document are property of the City of Stamford.

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Complete Streets Ordinance

1. Complete Streets Ordinance

The Stamford Board of Representatives adopted the Complete Streets Ordinance in 2015. The full text of the ordinance is below:

Added Jan. 5, 2015 by Ord. No. 1181 .

Sec. 231-78. - Title.

This Article shall be entitled the Complete Streets Ordinance.

Sec. 231-79. - Definitions

As used in this Article, the following terms shall have the meanings indicated:

Complete Streets. Roadways that are designed and operated to provide safe and convenient access to all Users.

Users. Are all people that use roadways, including pedestrians, bicyclists, public transportation riders, and motorists and includes people of all ages and abilities, including children, seniors and individuals with disabilities.

Transportation Improvement Project. Any public or private investment within the public right-of-way, regardless of funding source, including, but not limited to, new construction, reconstruction, alteration and maintenance inclusive of road resurfacing, except that a Transportation Improvement Project shall not include routine upkeep such as cleaning, sweeping, plowing or spot repair.

Sec. 231-80. - Implementation

This Article shall require the implementation of Complete Streets in appropriate locations within the City of Stamford by the Office of Operations, as follows:

(a) The Office of Operations shall review all Transportation Improvement Projects being designed for implementation within the City limits and explore opportunities to meet the

needs of all Users. including but not limited to motorists. pedestrians. bicyclists. and transit vehicles.

(b) All Transportation Improvement Projects located within 1,000 feet of a school, commercial center, or bus stop shall include infrastructure designed to accommodate pedestrians.

(c) The requirements of this Article shall not apply to Transportation Improvement Projects:

(1) where specific users are prohibited by law (e.g. interstate highways or pedestrian-only paths); or

(2) where the cost of the accommodations necessary to implement Complete Streets is excessively disproportionate to the need or probable use; provided, however, that the Director of Operations must document the rationale for exemption from the Complete Streets Ordinance in such cases.

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Stamford Context

2. Stamford Context

The City of Stamford is committed to creating a safe and sustainable transportation system for all of its residents, visitors and businesses. The Complete Streets Manual reflects this commitment and our priority emphasis on education, enforcement and physical change to city streets.

Stamford streets are public spaces. Thousands of people walk through the downtown area and our neighborhoods every day. Likewise, bicycles have replaced the car for many residents and cyclists are on city streets at every hour of the day.

Shifting demographic patterns, combined with the rising cost of fuel and the tremendous growth in downtown all suggest that even more people will be walking and cycling on city streets in the coming years.

2.1 Infrastructure

The City of Stamford encompasses an area of a little more than 52 square miles. We have 350 miles of streets. We also have 11.5 miles of bike lanes built and 14 miles planned. Because it is an older city with a street system mostly laid out prior to the advent of the automobile, Stamford is in many ways ideal for walking and cycling. The terrain is not too hilly, and many of the city's streets have reasonably short blocks and relatively narrow roadways compared with surrounding communities.

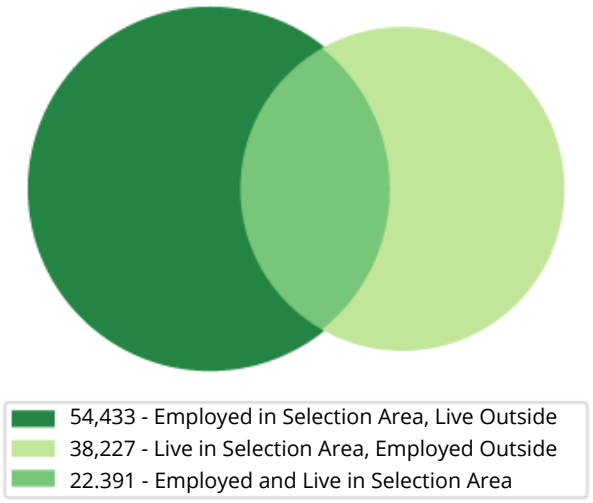
Parts of downtown Stamford were reshaped by mid-20th century urban renewal projects, which demolished older, smaller buildings and streets to make way for larger structures and superblocks. Nevertheless, though our street design and management has for many years prioritized motorized transportation, we have a strong foundation on which to create Complete Streets.

2.2 Demographics and Journey to Work

Stamford's current population is 129,775 (2018 ACS estimate), with a daytime population of approximately 200,000. Compared to other large cities in New England, Stamford has a lower percentage of residents who walk to work (5.1%). The percentage of residents who use non-motorized means to journey to work (15.1%) is similar to that of nearby cities such as New Haven. This is undoubtedly due in some cases to necessity, but Stamford's poverty rate of 9.3% is low relative to other large cities in Connecticut, indicating that may residents who use non-motorized means of transportation do so by choice.

As of 2016, the Stamford Transportation Center has an annual ridership of over 8.4 million for Metro-North and 410,600 passengers on Amtrak. The Stamford station is the second busiest station in the entire Metro-North Railroad network, after Grand Central Terminal, and makes up 21% of ridership on the New Haven Line.

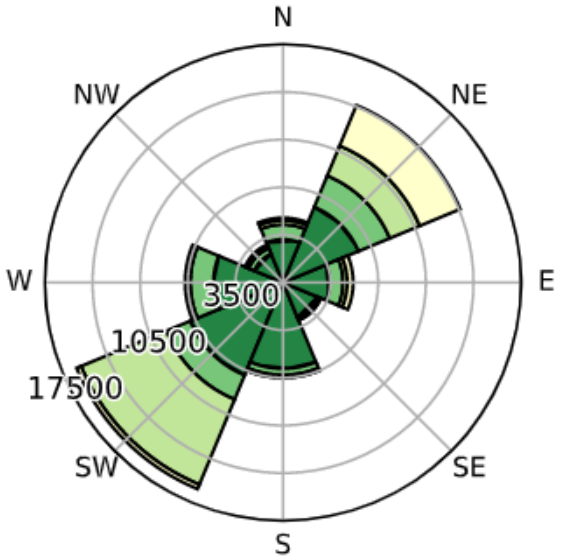
JOB INFLOW/OUTFLOW IN 2017



Source: US Census Bureau, Center for Economic Studies (onthemap.ces.census.gov)

HOW FAR, AND IN WHICH DIRECTION, DO STAMFORD RESIDENTS TRAVEL TO GET TO WORK?

	2017 Count	2017 Share
Total All Jobs	60,618	100.0%
Less than 10 miles	36,452	60.1%
10 to 24 miles	9,208	15.2%
25 to 50 miles	10,409	17.2%
Greater than 50 miles	4,549	7.5%



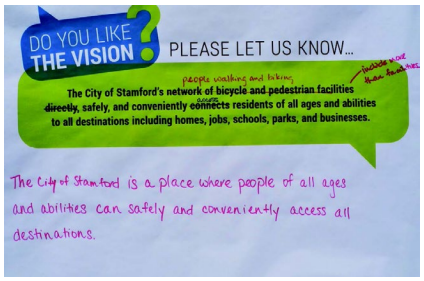
2.3 Safety Concerns and Community Involvement

The Complete Streets Ordinance and Design Manual are part of the City of Stamford's response to community alarm over the number and severity of traffic accidents. In the three year period of 2016-2018, there were a total of 17 crashes involving bikes (including one fatality) and 267 crashes involving pedestrians (including six fatalities). Furthermore, Route 1 in Stamford ranks as the most dangerous state-owned corridor for both bikes and pedestrians across an analysis of all state-owned roads.[1]

The City has been making great strives in improvements to safety. In 2019, the City only had one pedestrian fatality; however, one is too many and Stamford is committed to reducing all deaths on its roadways.

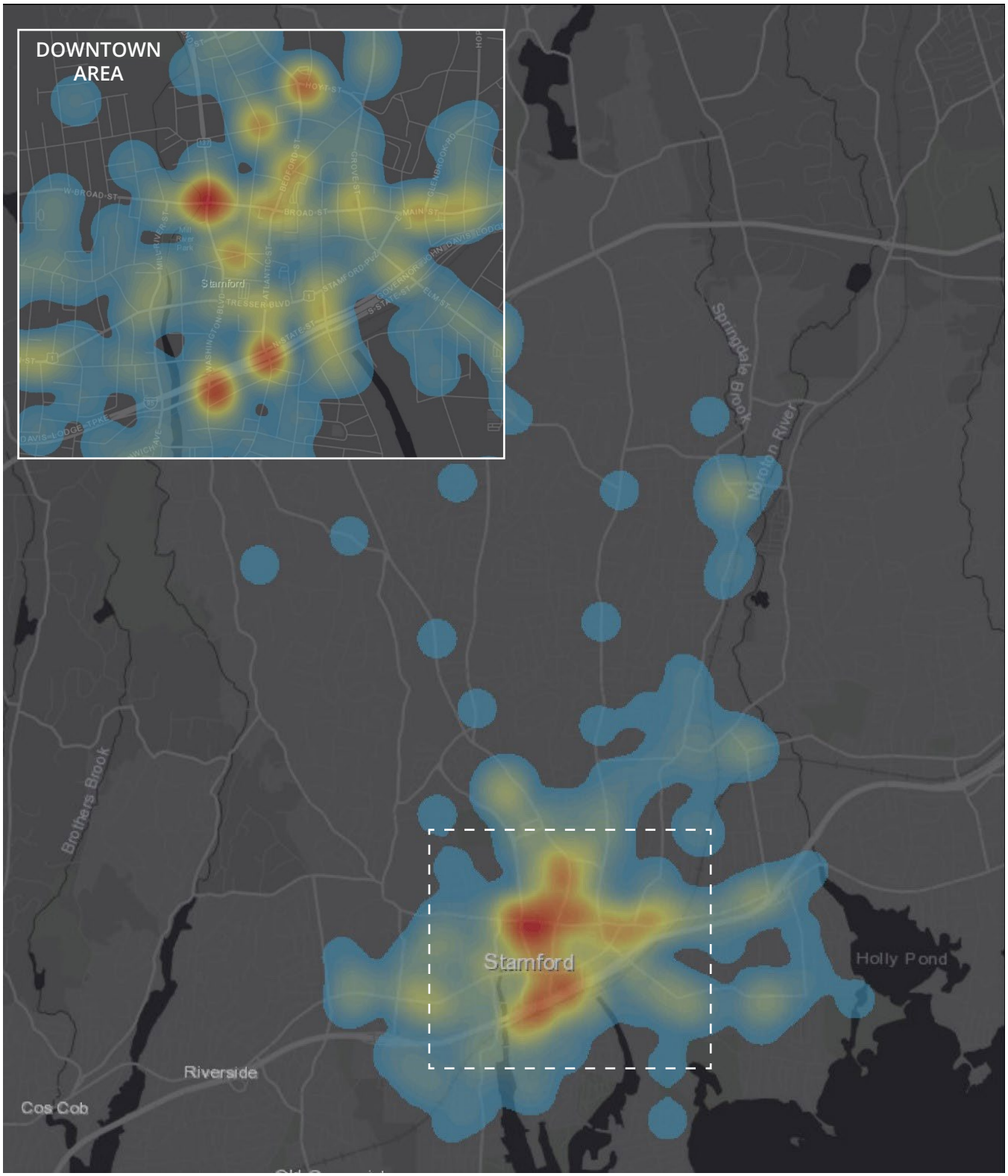
In addition, the City recently completed the Stamford Bicycle and Pedestrian Plan with the help of a Technical Advisory Committee and Community Advisory Committee made of up Stamford residents. Community outreach was an important part of developing the Bicycle and Pedestrian Plan and included open houses and public meetings, an informational website, and a survey to gather community feedback. Details on the community engagement process, as well as the plan itself, can be found on the City of Stamford's website.[2]

1 Connecticut Active Transportation Plan, CT Department of Transportation, 2019.
2 www.stamfordct.gov/parking-and-transportation



Community engagement for the Bicycle and Pedestrian Plan included a series of open house events and public meetings.

HEATMAP SHOWING LOCATION OF BIKE/PEDESTRIAN CRASHES IN STAMFORD (2016-2018)



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3

What Are Complete Streets?

3. What Are Complete Streets?

Streets are for people, and Complete Streets are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Complete Streets may look different and contain different elements depending on the location. In urban communities like Stamford, the concept of Complete Streets goes beyond safety, tying in with issues of human health, equity, aesthetics, economic development, environmental protection, and livability, all within a specific neighborhood context.

Complete Streets represents a paradigm shift in traditional road construction philosophy. Instead of a reactive attempt to accommodate bicycle- and pedestrian-friendly practices in projects, Complete Streets policies require all road construction and improvement projects to begin by evaluating how the right-of-way serves all who use it.

3.1 Complete Streets are Public Spaces

Above any specific need by an individual or group of users, the city street is a public space. Due to Stamford's density and pre-automobile neighborhood layouts, our streets are literally our front yards.

At their best, streets:

- Create space for social interaction and physical activity.
- Provide a clean and attractive framework for economic development.
- Embrace the vernacular of a place thereby defining a unique identity.
- Provide for the safe and efficient movement of goods and people of all ages and abilities.

3.2 Complete Streets and Land Use

In more urban neighborhoods of Stamford, the comparatively short distances between people and services due to compact development make walking, cycling and transit use reasonable travel choices. The density of habitation provides important commercial opportunities. For us, street design that is inherently safe for all users, that encourages the use of non-motorized transportation, and that creates a varied and lively streetscape is essential to our social and economic success.

3.3 Complete Streets as Multi-Modal Transportation Network

Complete Streets provide a choice of mobility options that are viable over the lifetime of a user, including facilities that make walking, cycling and transit use comfortable, attractive, and efficient transportation options. They provide connectivity between destinations and travel modes, as well as redundant travel routes to make pedestrian circulation easier.

Complete Streets are streets where all users coexist in a controlled, low-speed environment. These users may include:

- Pedestrians of all ages and abilities, including children, who are small, hard to see, and may be impulsive, as well as seniors and disabled individuals, who may be unable to move quickly
- Cyclists – utility and recreational users of all ages
- Transit users and vehicles, including public and school buses
- Emergency access for Police, Fire and Ambulance services
- Commercial trucks and vehicles for delivery of goods and services
- Private motor vehicles and their drivers
- FHVs, zipcar, bike share, etc.

Key Demographics

- ☑ Elderly residents
- ☑ Disabled residents
- ☑ Child residents and/or nearby schools
- ☑ Low to moderate income households
- ☑ Households without access to a car

3.4 Demographic Context

Complete Streets are designed to take into consideration the context of their location, including social and demographic factors that influence who is likely to use the street and how. For example, low income families and those without their own car are likely to need a robust pedestrian network that connects to important destinations and allows them to travel by foot safely and efficiently. They also need plentiful access to transit and bicycle facilities.

According to census data, 10.3% of households in Stamford lack access to a vehicle[1], and 4.1% have a mobility impairment.[2] Likewise, elderly residents may be highly dependent on pedestrian travel and also need special consideration in crosswalks, such as longer crossing times.

1 US Census Bureau, https://factfinder.census.gov/bkmk/table/1.0/en/ACS/17_5YR/B08201/1600000US0973000
2 US Census Bureau, https://factfinder.census.gov/bkmk/table/1.0/en/ACS/17_5YR/B18105/1600000US0973000

4

Why Complete the Streets?

What are the Societal Costs of existing transportation System?

- air pollution
- crashes & injuries
- climate change
- cost of car ownership
- decline in civic behavior (road rage)
- energy insecurity
- increasingly sedentary lifestyle & deteriorating human health
- local capital
- lower productivity from congestion
- maintenance costs
- noise
- operations costs
- parking
- sprawl & inefficient urban land use
- water pollution

4. Why Complete Streets?

4.1 The Status Quo

The City of Stamford is committed to a safe and sustainable transportation system for all of its residents, visitors and businesses. The City is also committed to supporting and encouraging the use of non-motorized transportation. These goals, however, exist in the context of a street system that, despite being mostly laid out prior to the advent of the automobile, has since been engineered to facilitate and prioritize the movement of people and goods in and out of the city via motor vehicles, resulting in the subordination of non-motorized transportation and related land uses such as shopping, recreation, residential uses and other social activities.

It has become clear that maintaining and furthering this current transportation model is costly to our community in many ways. The sidebar lists some specific societal costs associated with the current transportation system.

4.2 Benefits of Complete Streets

By rethinking commonly applied planning and design practices, and orienting our street design and management toward Complete Streets, we intend to alter the balance of power in ways that impress upon users that the street has many purposes and is not simply a travel corridor dedicated exclusively to motor vehicle traffic.

At the same time, we can improve the driving environment for motorists by encouraging more cooperative sharing from pedestrians and cyclists, improving the quality of travel through the reduction of unwarranted stops, and smoothing flow in a way that lowers stress and anxiety while encouraging slower and safer travel speeds.

The National Complete Streets Coalition has identified the following benefits of Complete Streets:[1]

- Wide, attractive sidewalks and well-defined bike

1 Smart Growth America and the National Complete Streets Coalition, *Complete Streets Help Create Livable Communities*, https://smartgrowthamerica.org/app/uploads/2016/08/cs-livable.pdf

routes, where appropriate to community context, encourage healthy and active lifestyles among residents of all ages.

- Complete Streets can provide children with opportunities to reach nearby destinations in a safe and supportive environment.
- A variety of transportation options allow everyone – particularly people with disabilities and older adults – to get out and stay connected to the community.
- Multi-modal transportation networks help communities provide alternatives to sitting in traffic.
- A better integration of land use and transportation through a Complete Streets process creates an attractive combination of buildings – houses, offices, shops – and street designs.
- Designing a street with pedestrians in mind – sidewalks, raised medians, better bus stop placement, traffic-calming measures, and treatments for travelers with disabilities – may reduce pedestrian risk by as much as 28 percent.
- A livable community is one that preserves resources for the next generation: Complete Streets help reduce carbon emissions and are an important part of a climate change strategy.

4.3 Vision Zero

The ultimate measure of Complete Streets in Stamford is the number of traffic-related injuries and fatalities. The City of Stamford rejects the assumption that traffic crashes are inevitable in a mobile society and will work to develop a street network that can tolerate mistakes without risking human life.

In the words of Claes Tingvall, Sweden's Director of Traffic Safety and the architect of Sweden's Vision Zero Policy: "The Vision Zero policy is not a figure; it is a shift in philosophy. Normal traffic policy is a balancing act between mobility benefits and safety problems. The Vision Zero policy refuses to use human life and health as part of that balancing act; they are non negotiable."

The City of Stamford's Transportation, Traffic & Parking Bureau embraces the Vision Zero policy. We are pursuing the adoption of a Vision Zero ordinance and will work towards achieving and maintaining the goal of zero traffic related injuries and fatalities in our city.

4.4 Guiding Principles for Stamford Complete Streets

Safety & slow vehicle speeds	Traffic injuries and fatalities are predictable and often preventable, and there is a direct correlation between vehicle speeds and injury/fatality rates. Stamford streets should be designed with safety of all users as a priority, and vehicle speeds limited, with the goal of reducing injuries and fatalities.
Connectivity	Connectivity is essential if non-motorized transportation is to be a viable and desirable option. Stamford streets should be designed to provide connectivity that satisfies travel needs with redundant routes in an intact network system.
Human health	Stamford streets should be designed to increase opportunities for active transportation (walking, cycling, etc.) and to decrease air pollution and particulate levels caused by motor vehicles.
Livability	Livable cities are characterized by a built environment that enhances quality of life, strengthens community ties, encourages civic engagement, and promotes health. Stamford public spaces (streets) should be designed with livability in mind, with the goal of enhancing quality of life in our city.
Context	Stamford streets should be designed to respect and enhance the distinctive identity of our city, its urban character, and its cultural and historical context.
Equity	As public spaces, streets should be designed for equality by providing for the needs and safety of all users, particularly people with disabilities, the elderly, children, and people who cannot afford a private vehicle.
Aesthetics	Aesthetically pleasing surroundings – such as public art, well-maintained landscaping, and human-scale architecture – enhance the experience of using a street and make it a place where people want to be. Stamford streets should be designed with consideration for aesthetic elements, including materials, lighting, landscaping, street furniture, and maintenance.
Economic Development	Well-designed streets support economic vitality by drawing customers to businesses and providing access and transportation options for reaching businesses. Stamford streets should be designed to support Stamford's framework for current and future development and contribute to the city's economic vibrancy.
Environment	Stamford streets should be designed to support and encourage non-motorized transport, thereby decreasing vehicle miles traveled (VMT), leading to reductions in both air pollution and carbon emissions and better management of storm water runoff.

5

Engineering Considerations

5. Engineering Considerations for Complete Streets

The Complete Streets program is part of a fundamental shift in the way the City of Stamford approaches street design. For Complete Streets to be successful, every road project for every type of roadway should be evaluated for compliance with the Complete Streets policy and guiding principles. Road projects range from minor crack sealing and preventative maintenance to milling and paving to new or realigned roads. Road types range from industrial arterials carrying high volumes of traffic to low volume roads carrying residential traffic only.

The modification of the road or transportation system must be thoughtfully considered based on proven and accepted criteria; furthermore, techniques applied in one location may not be suitable in another. All designs must be professionally driven and approved by the Traffic Engineer to ensure that they meet the criteria of safety, feasibility, and proper application. Below are some of the factors that must be taken into consideration in the course of all roadway designs.

5.1 Guidelines

In order to provide consistency and reduce the potential for conflicts, roadway projects must be designed with consideration for nationally and regionally recognized guidelines and standards. The City of Stamford has adopted criteria for signage, lanes widths, pavement marking dimensions, turning radii and other road characteristics for many roadway design treatments. Standard details for some of these treatments are included in the Appendix, and others are available from the Traffic Engineering Office. "Pilot" geometry or any other proposed designs that deviate from accepted standards will be evaluated on a case by case basis, and will in all cases be subject to the judgment of the Traffic Engineer.

Below is a list of sources that provide commonly accepted guidance for street design. These resources provide references to engineers but generally allow for considerable flexibility.

American Association of State Highway and Transportation Officials (AASHTO):

- "Geometric Design of Highways and Street"
- "Guide for Achieving Flexibility in Highway Design"
- "Guide for the Planning, Design, and Operation of Pedestrian Facilities"
- "Guide for the Development of Bicycle Facilities"**The Federal Highway Administration (FHWA):**
- "Manual on Uniform Traffic Control Devices (MUTCD)"
- MUTCD Interim Approvals[1]
- Proven Safety Countermeasures
- "Traffic Calming ePrimer"
- "Separated Bike Lane Planning and Design Guide"
- "Bikeway Selection Guide"

NACTO:

- "Urban Street Design Guide"
- "Urban Bikeway Design Guide"[2]

Institute of Transportation Engineers (ITE):

- "Designing Urban Walkable Thoroughfares: A Context Sensitive Approach"[3]

US Access Board:

- "Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way"
- "Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way; Shared Use Paths (Supplemental Notice)"

1 https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/mutcd/
2 Supported by FHWA through a memo on Bicycle and Pedestrian Design Flexibility https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_flexibility.cfm
3 Supported by FHWA through a memo on Bicycle and Pedestrian Design Flexibility https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_flexibility.cfm

5.2 Roadway Classification System

Like most jurisdictions in the United States, Stamford's streets have been categorized in order to better understand how they serve motor vehicle traffic. Each road's classification has been determined by the state using guidelines developed by AASHTO. Complete Streets projects must take into consideration this roadway classification as it helps determine how the road and network needs to be treated to handle the traffic volumes and other conflicts that may arise as a result of design changes. It is also often used in determining Federal or State funding criteria when improvements are needed. The road classifications for Stamford are as follows:

Principal Arterials – Serve a large percentage of travel between cities and other activity centers, especially when minimizing travel time and distance is important. For this reason, Arterials typically are roadways with high traffic volumes and are frequently the route of choice for intercity buses and trucks. Examples include I-95 and the Merritt Parkway, as well as Route 1, Long Ridge Road, High Ridge Road, and Washington Boulevard.

Minor Arterials – Provide service for trips of moderate length, serve geographic areas that are smaller than their higher Arterial counterparts and offer connectivity to the higher Arterial system. Examples include North State Street, Broad Street, Newfield Avenue, and Stillwater Road.

Collectors – Serve a critical role in the roadway network by gathering traffic from Local Roads and funneling them to the Arterial network. Examples include Westover Road, Glenbrook Road, Dock Street, and Hubbard Avenue.

Local Roads – Account for the largest percentage of all roadways in terms of mileage. They are not intended for use in long distance travel, except at the origin or destination end of the trip, due to their provision of direct access to abutting land. They are often designed to discourage through traffic.

See Appendix for Stamford Roadway Classification Map.

5.4 Vehicle Target Speed

Lowering vehicle speeds directly impacts the severity and number of crash related injuries and fatalities and is a primary goal for Complete Streets.

Vehicle target speed is the 85th percentile speed that is desired for a given street. Target speed can be achieved through a combination of engineering treatments, driver education, and police enforcement.

Design speed is a selected speed used to determine the various geometric features of the roadway. Streets should be designed with target speeds and speed limits that are appropriate for both their current and future context, including roadway classification and street type, as well as adjacent land uses and user demand.

Specific design treatments are capable of achieving predictable speed and volume reductions, though their benefits must be balanced with the potential impacts on parking and emergency vehicles. On local roads and in school zones, target speeds should be set at or below 20 MPH in order for pedestrian safety to be maximized.

PROACTIVE URBAN STREET DESIGN

Target Speed = **Design Speed** = **Posted Speed**

5.5 Design Vehicles, Emergency Access, Sanitation

A design vehicle is the vehicle type that must regularly be accommodated on a roadway for the purpose of designing the road. The design vehicles used for geometric street designs should reflect the predominant intended users of the street in question. In addition, all street designs must meet minimum standards for fire department and other emergency vehicle access and must consider the needs of sanitation vehicles used for street cleaning, refuse collection, and snow clearing.

5.6 Intersections

Intersections are statistically the most dangerous part of the street network as they are complex environments where a variety of users are negotiating the same space. Since the chance for conflict between users is highest at intersections, special care must be taken to implement design elements that control vehicle speed and minimize conflict points.

The use of the smallest possible turning radii, raised intersections, crosswalks, lighting, textured pavement, roundabouts and other speed mitigating design elements should be prioritized whenever possible to improve the safety for all users.

5.7 On-Street Parking

In Stamford, on-street parking offers a number of important benefits. The availability of the appropriate amount of on-street parking is an important factor for many residential streets where historical homes did not allocate space for vehicles. On-street parking is also necessary for supporting businesses in Downtown Stamford and neighborhood 'main street' business districts. On-street parking is more efficient than off-street parking as on-street spaces are more likely to be shared by a number of users.

When properly oriented, on-street parking can also have a traffic calming effect by slowing vehicle speeds. For instance, when combined with chicanes, on-street parking can break up straight stretches of roadway. Throughout the city, there are opportunities to substantially increase the number of parking spaces available while simultaneously narrowing the roadway by striping the parking spaces in the roadway.

The benefits of on-street parking should only be implemented with the use of appropriate design elements to avoid negative consequences. Cars parked on the street can block access to crosswalks and impede sightlines for other users. The space that is dedicated to parking cannot be used for bike lanes and the very presence of parking encourages driving; therefore, parking needs to be carefully managed and incorporated into a larger complete streets plan. One important management tool is ensuring, wherever appropriate, that on-street parking be properly priced through meters, kiosks, or residential parking permits.

5.8 Pedestrian & Bicycle Use

The Complete Streets policy requires that all roadway designs take into consideration use by pedestrians and bicyclists of all ages and abilities. Factors that contribute to a good environment for walking include the following:

- Pleasant visual environment
- Continuous and connected pedestrian facilities separated from vehicle traffic movements
- Short street crossing distances
- A good mix of land uses
- Pedestrian scale lighting
- Slow and controlled motor vehicle movements

Factors that contribute to a good environment for cycling include the following:

- A well-connected network of bicycling facilities
- Safe travel routes
- Direct travel routes, particularly when bicycling for purposes other than strictly exercise or recreation
- Slow and controlled motor vehicle movements

The following data should be considered in order to evaluate and prioritize needs and choose appropriate design treatments:

- Speed – High vehicle speeds are incompatible with safe pedestrian and bicycle environments.
- Existing pedestrian and/or bicycle volumes – Volume counts, or observations over time are useful.
- Major pedestrian/bicycle generators – Schools, hospitals, shopping areas, parks, transit points, libraries and centers of neighborhood interest often generate pedestrian traffic. Also consider new or planned developments which may generate pedestrian/bicycle

traffic not reflected in existing volume counts.

- Accident Data – Higher than average numbers of pedestrian or bicycle accidents with vehicles often indicate the need for traffic calming measures and/or pedestrian/bicycle improvements.
- Street Classification – The purpose of the road and the volume of vehicle traffic combined with heavy pedestrian or bicycle movements requires careful planning, particularly on arterials.

Other considerations include school walking zones, transit routes, commercial areas, neighborhood characteristics, and development.

5.9 Public Transportation

Public transportation and Complete Streets are naturally complimentary. Transit vehicles operating on Stamford's street serve people who live, work, shop and recreate in the city. Not only must transit vehicles interface with general traffic, but passengers are also pedestrians for a portion of their trip. Also, Complete Streets are those which facilitate intermodal transfers and prioritize the needs of many different users.

Road projects in the city should consider the presence of transit vehicles, stops, and locations where passengers must cross the roadway or use sidewalks to access the system. Traditional road construction projects can exclude the needs of transit users in the design phase, so the Complete Streets process will provide opportunity to prioritize transit improvements in such projects.

Incorporating transit more effectively in road projects may increase the usage of the transit system over time. Safety, convenience and comfort are important considerations for transit users. Well designed streets can improve the pedestrian or bicycle interface with the transit system and encourage more people to use alternative modes of transportation. Complete Streets that prioritize transit can also improve the running time of buses which can make transit more competitive with cars.

5.10 Pedestrian Access In Construction Zones

Complete Streets require that protected pedestrian facilities are maintained during all phases of construction projects that encroach upon the public right of way. The Transportation, Traffic & Parking Bureau reviews right-of-way and encroachment permit applications. As part of that effort, the department's policy is to maintain safe pedestrian access at construction zones. If pedestrian traffic is directed across a street, temporary controls, including ADA accessible mid-block ramp systems, are often required to reduce pedestrian travel delay.

5.11 Environmental Design

Roadway designs should enhance both the environmental quality and aesthetic appeal of streets. Elements such as landscaping and street trees accomplish both of these goals, reducing air pollution and improving stormwater control, while contributing to a pleasant and appealing environment for street users.

A tree belt is recommended between the curb and the project property line whenever possible. The width of the tree belt should be as wide as possible. A minimum width of 5' is desired unless site conditions do not make this width feasible. Lawn is the preferred surface within the tree belt to maximize the soil volume and to promote tree growth and vitality. If lawn is not feasible as a surface within the tree belt, then adequate openings within paved areas should be provided for placement of soil to support tree growth.

Drainage plans should incorporate elements such as bioswales, which are landscaped depressions between sidewalks and streets. Bioswales detain water and allow it to be absorbed into the ground, reducing runoff into the sewer system, while at the same time providing space for aesthetic enhancement landscaping. Stormwater runoff can also be reduced through the use of permeable paving materials. The use of these materials should be prioritized whenever possible.

Appropriate city agencies and abutting neighbors should be engaged in the design process to ensure that street elements can be properly maintained.

More information on environmental design can be found in the City of Stamford's Streetscape Guidelines, which include Site Design Criteria, Soil Types, Tree Base, Tree Selection and Plant Protection requirements. The Stamford Streetscape Guidelines can be found in the Appendix.

5.12 Land Use Context

Street designs should take into consideration the context of adjacent land uses. Designs appropriate for low-density residential neighborhoods are not likely to be well-suited for the downtown core, which has a much higher number of pedestrians and transit users.

Likewise, industrial areas with large volumes of truck traffic generally need wider travel lanes and larger curb radii, elements which should be avoided in commercial and residential areas. In such locations, however, speed reducers and other engineering treatments can be employed while accommodating the needs of large vehicles.

6

How to Complete the Streets

6. How to Complete the Streets

A variety of design treatments can be employed to create Complete Streets, each with varying degrees of community involvement, engineering and education necessary for successful implementation. Following is a list of treatments that are most likely to be applicable to Stamford streets.

This manual presents them as options in the form of a "toolbox", and it is expected that all roadway projects – whether initiated by the city, state or community groups, or private organizations (i.e. developers) – will employ the toolbox as a starting point. The toolbox does not prescribe which specific tools must be used in a given situation. Instead, it offers users guidance in determining which elements are most appropriate and feasible given the context and goals of the particular project, and given the Complete Streets policy and guiding principles outlined in the manual.

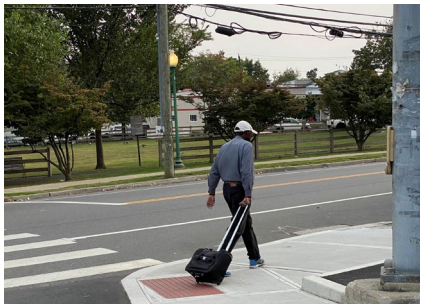
6.1 Complete Streets Toolbox

6.1.1 SIDEWALK WIDENING $$$

ADA standards specify a minimum of 5 feet clear path width to accommodate two wheelchairs passing each other. However, wider sidewalks may be more appropriate in busier context and may allow for street furniture and wider buffers between edge of traffic. Generally, sidewalks should be as wide as possible to accommodate foot traffic, given available street width. No existing sidewalks should be reduced in the course of street widening projects. Opportunities for widening sidewalks and narrowing streets should be considered whenever roads are reconstructed.

6.1.2 ADA-COMPLIANT CURB RAMPS $$$

Access for all users is an important part of any Complete Street. Per ADA guidelines, CTDOT Highway Design Manual, and City of Stamford ordinance, wheelchair ramps with detectable warning strips should be installed wherever a sidewalk crosses a curb, and existing ramps should be upgraded to meet current ADA guidelines.



6.1.3 STREET FURNITURE $$$

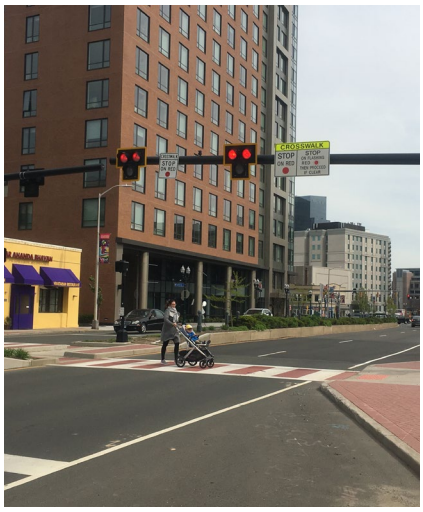
Functional and aesthetically pleasing street furniture contributes to a pleasant walking environment and supports the use of the street as a public space. Examples of street furniture include benches, lighting, bike racks and shelters, bus stop shelters, newsstands, informational signs and kiosks, and waste receptacles. Proper design and application is essential to maintain functionality and accessibility of the sidewalk.

6.1.4 CROSSWALKS AT SIGNALIZED INTERSECTIONS $$$ – $$$

Pedestrian crossings at intersections can be an especially hazardous location for pedestrians. For a standard four-leg intersection, a pedestrian crossing an intersection faces conflict points from six separate turning movements. To improve pedestrian safety at intersections, it is recommended that the city consider the following strategies:

- High-visibility crosswalk markings
- Bump-outs
- Pedestrian refuge islands
- Pedestrian signal heads with countdown timers
- Fully protected left-turn phasing (e.g. red left-turn arrow) to limit left-turn conflicts
- High-visibility No-Turn-on-Red signage to limit right-turn conflicts
- Leading Pedestrian Interval (LPI)
- Exclusive pedestrian phasing for intersections with unique geometry or heavy turning traffic
- Shorter signal cycle lengths when feasible to avoid jay-walking due to unnecessary delay

6.1.5 CROSSWALKS AT MID-BLOCK LOCATIONS $$$ – $$$



Crosswalks at mid-block locations can be especially important in areas of high pedestrian demand. While mid-block crosswalks can improve pedestrian accessibility, appropriate design is critical. Generally, marked crosswalks can be installed on any two-lane street with operating speeds less than 40 mph and with an ADT of 12,000 vehicles per day or less. Multi-lane streets, streets with speeds 40 mph or greater, or streets with an ADT of 12,000 vehicles per day may receive a mid-block crosswalk, but the City should consider design interventions such as:

- Signage
- Yield markings
- Chokers to reduce crossing length
- Refuge island to reduce crossing length and allow a two-stage crossing
- Rectangular Rapid Flash Beacon (RRFB)
- High-Intensity Activated Crosswalk Beacon (HAWK)
- Traditional traffic signal

6.1.6 TREE BELT ENHANCEMENTS $$$

Street trees and other landscaping not only provide aesthetic enhancements to a street, but also help mitigate air pollution, leading to better air quality and lower asthma rates. They also help increase walkability by providing shade and lower temperatures and contribute to speed reduction. Street trees reduce environmental impact by improving stormwater control.

Proper maintenance is key to the success of planted areas. Opportunities for widening tree belts, planting more trees, and narrowing streets should be considered whenever roads are reconstructed.

6.1.7 ROADWAY SURFACE TREATMENTS $$$

Roadways are typically paved in asphalt or concrete. However, other surface treatments such as pavers or stamped/imprinted concrete or asphalt may be used in certain locations to enhance aesthetic character, improve stormwater control through permeability and/or delineate space for various street users. When stamped concrete or asphalt is used for crosswalks, standard continental style crosswalks should also be marked to improve visibility. Maintenance is an important consideration for any unconventional surface treatment.

6.1.8 PAVEMENT MARKINGS $$$

A variety of pavement markings can be employed to improve street safety and functionality for all road users. Some examples include directional arrows, school zone warning signs, and stop bars. Several types of markings are discussed in more detail in this toolbox, including crosswalks (above) and road narrowing and bike lanes (below). Roadway pavement markings typically follow guidelines set forth in the Manual on Uniform Traffic Control Devices (MUTCD).

6.1.9 TRAFFIC CALMING ON SEGMENTS $$$ – $$$

Traffic calming (or speed management) can be a useful tool to create a street that is safer for all users. Traffic calming can be particularly useful in areas with high pedestrian and bicyclist demand since safety of these users is highly correlated with vehicular speeds. Studies have shown that as speeds rise from 20 MPH to 40 MPH, the chance of fatality given that a pedestrian is involved in a collision increases from 5% to 85%. Speed reduction can also be beneficial for bicyclists when there is less separation provided – since the comfort to bike on these facilities is highly dependent on traffic speeds as well as traffic volume.

Traffic calming interventions typically fall within one of three categories:

1. Cross-Sectional Measures
2. Horizontal Control Measures
3. Vertical Control Measures

In general, the City of Stamford will first consider cross-sectional and horizontal control measures. Vertical control measures will be considered only if other interventions are found to not be feasible or inadequate.

FHWA Traffic Calming ePrimer and *NACTO Urban Street Design Guide (2013)* should be consulted for additional guidance on traffic calming measures as necessary.

Cross-Sectional Measures

Cross-sectional measures are interventions that are applied over the course of a roadway segment and does not rely on the principals of horizontal curvature to be effective. These should be considered first since unlike horizontal and vertical control measures, they are not installed at a single point, but rather throughout an entire section of the street.

This allows for more consistent traffic calming interventions. Interim cross-sectional measures can be implemented with delineators. Examples of cross-sectional measures that can be implemented include:

- **Centerline Removal:** Studies have shown that removal of a centerline can reduce traffic speeds between 5-9 MPH . The MUTCD only requires centerlines on streets above 6,000 ADT . Centerline removal should be considered on neighborhood street below 6,000 ADT per the judgement of the Traffic Engineer.
- **On-Street Parking:** On-street parking can narrow travel lane widths and create a buffer for pedestrians between moving vehicles and the sidewalk. On-street parking has also been shown to reduce vehicle speeds.
- **Yield Streets:** Yield streets are two-way streets where on-street parking is allowed and on-coming vehicles must yield. Streets with low-demand for parking should have parking permitted on one-side of the street and be about 20-feet wide. On streets with high-demand for parking, parking should be permitted on both-sides and streets should be 24-28 feet wide. Yield streets should be considered on streets only serving residential uses (single or multi-family) with an ADT less than 1,200.
- **Narrow Lane Width:** 11-foot lane widths should be standard on any street, and 10-foot lane widths should be considered on any street without significant heavy vehicle volumes. 12-foot or wider lane widths should be avoided when possible.
- **Medians:** Medians can be effective at reducing the perceived with of the roadway for motorists and create a refuge for pedestrians crossing.
- **Chokers:** Chokers should be used when marked on-street parking lanes are provided, but utilization is not heavy at all times of the day. When on-street parking is provided, but is empty, it effectively widens the roadway for motorists. Chokers maintain a consistent narrower roadway regardless of parking utilization.
- **Street Trees:** Street trees create a sense of enclosure for motorists and work to reduce vehicular speeds by reducing the field of view for motorists. This promotes walkability and helps create a sense of place. Traditional engineering recommendations based on Clear Zone guidance is not typically applicable in urban environments and should be used cautiously as justification to remove street trees in the City.
- **Bump-outs:** (also known as curb extensions or

6.1.9 CONT.

6.1.9 CONT.

neckdowns) are an expansion of the curb line into the adjacent roadway (typically a parking lane) either at a corner or mid–block. Two bump-outs can be located on either side of a street to create a choker. When used at an intersection where bus operations or financial considerations is a concern, a single bump-out should be installed on the near-side of an intersection with the bus stop provided on the far-side. Bicyclist accommodations should also be considered when installing bump-outs as these may impact the space bicyclists have to navigate an intersection. Bump-outs have many potential benefits including the following:

- Narrowing the roadway both physically and visually
- Slowing turning vehicles
- Shortening crossing distance and reducing potential conflicts between vehicles and pedestrians
- Making pedestrians more visible to drivers
- Highlighting the presence of the crosswalk and discouraging illegal parking within crosswalk
- Providing additional pedestrian space, which can help reduce crowding at bus stops and for queueing at crossings, as well as location for street furniture
- Can discourage illegal parking in front of hydrants
- Can discourage truck turns onto local streets

Horizontal Control Measures

In contrast to cross-sectional measures, horizontal control measures utilize the principals of horizontal deflection to slow vehicular speeds at a specific control point. Since these control measures are placed at a specific point, the spacing of these design interventions are critical. FHWA Traffic Calming ePrimer suggests spacing of not more than 500-feet between control measures. Horizontal control measures are generally preferable to vertical control measures when feasible since they may be appropriate on streets with higher volumes, be designed to better accommodate emergency response vehicles, be designed to accommodate transit and/or other heavy vehicles. Examples of horizontal control measures include:

- **Lane Shift:** A lane shift, or a lateral shift, works by shifting travel lanes within the current curb-to-curb with. Typically, this is done with curbing or alternating the side of the street parking is provided on if there is parking only on one-side of the street. Taper rates should be determined based on the target speed and MUTCD guidance.
- **Chicane:** A chicane is a series of lateral shifts that forces a motorist to steer back and forth. This motion requires that motorists reduce speed to safely navigate the feature. A raised median may be considered to discourage motorists from cutting across the centerline. Taper rates and design details should be determined based on the target speed and MUTCD guidance.
- **Pinch Point:** Pinch points are locations where motorists must yield to on-coming traffic to pass the control point. These differ from chokers as there is not enough horizontal clearance for motorists to pass. These should be considered on streets only serving residential uses (single or multi-family) with an ADT less than 1,200 when there is not enough parking demand to create an effective yield street.

6.1.9 CONT.

6.1.9 CONT.

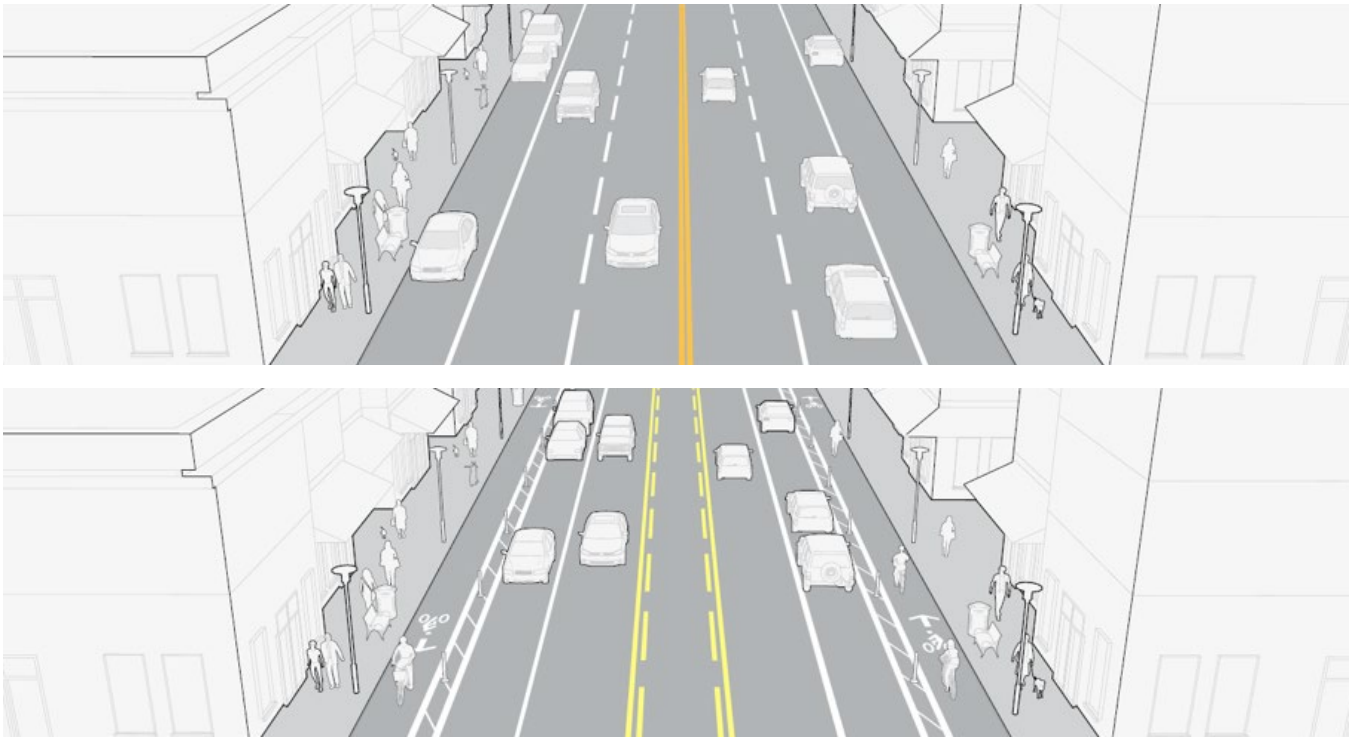
Vertical Control Measures

Vertical control measures should be considered only if cross-sectional or horizontal control measures are found to not feasible or inadequate. Since these control measures are placed at a specific point, the spacing of these design interventions are critical. FHWA Traffic Calming ePrimer suggests spacing of not more than 500-feet between control measures. Examples of vertical control measures include:

- **Speed Humps:** Speed humps are typically a 12-foot long, 3-inch high mound in pavement surface which slows vehicles down so they may safely traverse the speed humps. The lateral placement of a speed hump should be considered so that motorists do not avoid a speed hump with an unutilized parking lane or a wide bicycle lane. Speed humps can increase emergency vehicle response times. Speed humps are largely only applicable on local roads and not on roads with speed limits greater than 30 MPH.
- **Speed Table with Raised Pedestrian Crossing:** Speed tables with raised pedestrian crossings are similar to speed humps, except they feature a flat top which is wide enough for a crosswalk. These can be particularly useful in locations where there is high-pedestrian volumes crossing at a mid-block location.

6.1.10 TRAFFIC PATTERNS $$$ – $$$

Traffic patterns are sometimes changed to ease vehicle traffic flow, but they can also be adjusted to provide safety improvements or increase transportation mode options. Some examples include conversion of a street from one-way to two-way operation, or installation of center left turn lanes. When warranted, traffic patterns can also be altered by installation of a signal or other traffic control device. When accompanied by a new crosswalk, such devices increase circulation options and safety for pedestrians. Multi–leg or skewed angle intersections should be redesigned (to the extent possible) to simplify operations and reduce conflicts. Any changes in traffic patterns require careful assessment of potential impacts on all road users, and proposed designs are subject to the professional judgment of the Traffic Engineer. Redesigning complicated intersections, however, should be done carefully to avoid increasing vehicle speeds and/or destroying the unique geometries that are part of the history and charm of a neighborhood.



Source: NACTO. Urban Street Design Guide (2013)

6.1.11 BUS TRANSIT $$$ – $$$

City streets must accommodate public transit. Proper design of city transit stops can improve street operations and enhance safety for all users. Furthermore, proper street design can improve the transit experience for patrons. The city should consider the following when designing streets:

- **Bus-Stop shelters and maintenance** are the responsibility of the Stamford Transit District
- **Bus-Stop Location:** Far-side bus stops are preferable. Far-side bus stops allow for pedestrians to cross behind the bus and improve pedestrian visibility. Furthermore, far-side bus stops allow for a bump-out to be constructed on the near-side of an intersection when parking is provided, preferable to a far-side bump-out due to visibility improvements of pedestrians and turning speed reduction from the major-street for right-turning vehicles.
- **Bus-Stop Design:** A bus-bulb should be considered on multi-lane streets where heavy traffic would substantially delay bus schedules and where a bus layover is not required. Conversely, a bus-pullout should only be designed when route performance will not be significantly degraded by the additional delay for a bus to pull back into traffic.
- **Bus-Stop Features:** All bus stops should include adequate bus pad to meet ADA standards to allow wheelchair boarding and disembarkation. The ADA pad should connect to the sidewalk network. At transit stops with high boarding numbers, additional amenities such as shelters, benches, route information, lighting, and garbage bins should be considered.

6.1.12 BICYCLE INFRASTRUCTURE $$$ – $$$

Bicycle and pedestrian facilities have evolved from serving as "alternative transportation" facilities to filling a critical gap in communities' transportation networks. For many years, the approach to bicycle facility design for roadways placed people riding bicycles in or directly adjacent to vehicular travel lanes. While this approach met the needs of confident cyclists, it did not create new users or encourage a broader bicycling culture. This can be seen in Stamford where the use of shared-lane markings, or "sharrows" were placed on some high-speed roadways near the Stamford transit station, but have not resulted in an increase in cycling to the station.

Today, over 50% of people indicate that they are "interested but concerned" about bicycling and would like to ride more often but are concerned about their safety riding in traffic. Over 50% say they are worried about being hit by a car and nearly 50% say they would more likely ride a bike if physical separation were provided between motor vehicles and bicycles. Similarly, pedestrians prefer to be placed further away from the curb and/or have a buffer between themselves and motor vehicle traffic.

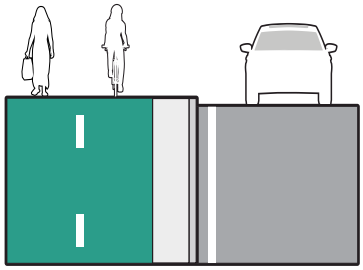
Design professionals are paying attention and designing facilities, such as buffered and separated bike lanes, and trails, that create a greater separation between bicyclists and high-speed high-volume roadways.

In addition, there is greater understanding of the relationship between vehicle speeds and traffic fatalities. On low-volume streets with limited right-of-way, comfortable bicycle routes may be established by addressing speed using traffic calming measures. Bicycle lanes also help drivers by narrowing and demarcating the travel lanes and reduce congestion by offering other modes of transportation for travel.

In Recent years, the City has added a significant number of bike lanes and has seen an increase of cycling activity. With the investment and expansion of bicyle facilties, 2019 saw the lowest number of bicycle crashes since 2010.

6.1.12 CONT.

Trail/Shared Use Path



Trail/Shared Use Paths[1]

Trails or Shared Use Paths are separated facilities providing two-way travel for walking, bicycling, jogging and skating activities.

GUIDANCE

- The minimum width of a shared use path is 10 ft but should be wider based on the anticipated user volume (12 ft is preferred).
- A 2 ft clearance from vertical objects such as poles, signs, landscaping, etc. should be included on each side.
- Ideally, a graded shoulder area of 3 to 5 ft. should be included on each side.

CONSIDERATIONS

- Shared use paths are attractive to a wide range of people. Good design includes:
- Intuitive and safe intersection crossings.
- Adequate widths to enable side-by-side travel and passing.
- Separation between pedestrians and bicyclists in areas with higher levels of use.
- Direct and seamless connections to destinations and other bicycle and pedestrian facilities.

Separated Bike Lane

Separated Bike Lanes/Cycle Tracks[2]

Separated Bike Lanes are an exclusive bikeway facility that combines the user experience of a trail with the on-street infrastructure of a bike lane. They are physically separated from motor vehicle traffic and distinct from the sidewalk and benefit pedestrians by shortening crossing distances.

TYPICAL APPLICATION

Separated bike lanes should generally be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or greater.
- Posted speed limit: 30 mph or higher.
- Average Daily Traffic: 6,000 vehicles or greater.
- Parking turnover: frequent.
- Streets that are designated as truck or bus routes.

1 References: MassDOT. Separated Bike Lane Planning and Design Guide. 2015; AASHTO. Guide for the Development of Bicycle Facilities. 2012.
2 References: MassDOT. Separated Bike Lane Planning and Design Guide. 2015; NACTO. Urban Bikeway Design Guide. 2nd Edition.

GUIDANCE

Separated bike lanes can provide different levels of separation:

- Flexible delineator posts ("flexposts") offer the least separation and are appropriate as an interim solution.
- On-street parking offers a high-degree of separation, but may require raised buffer treatments at intersections.
- Raised buffers provide the greatest level of separation from traffic, but will often require road reconstruction.

CONSIDERATIONS

- More comfortable to a wider range of bicyclists than striped bikeways on higher volume and higher speed roads.
- Eliminates risk of a bicyclist being hit by an opening car door.
- Prevents motor vehicles from driving, stopping or waiting in the bikeway.
- Provides greater comfort to pedestrians by separating them from bicyclists.

6.1.12 CONT.

Buffered Bicycle Lanes[3]

Buffered Bike Lanes are bicycle lanes with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane or parking lane to increase the comfort of bicyclists.

TYPICAL APPLICATION

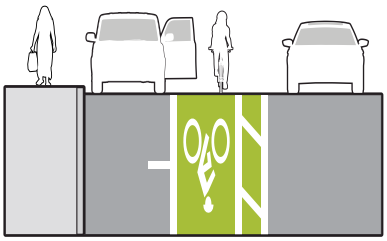
Buffered bike lanes should generally be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or fewer.
- Posted speed limit: 30 mph or lower.
- Average Daily Traffic: 9,000 vehicles or fewer.
- Parking turnover: infrequent.
- Bike lane obstructions: likely to be infrequent.
- Where a separated bike lane is infeasible or not desirable.

GUIDANCE

- The minimum width of a buffered bike lane adjacent to parking, exclusive of the buffer, is 5 feet. A desirable width is 6 feet.
- The minimum buffer width is 18 inches. There is no maximum. Diagonal cross hatching should be used for buffers less than 3 feet in width.
- Chevron cross hatching should be used for buffers greater than 3 feet in width.

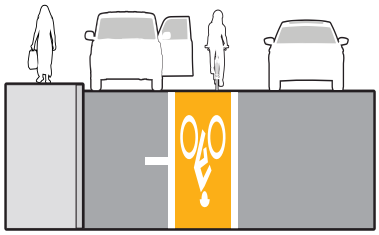
Buffered Bike Lane



3 References: AASHTO. Guide for the Development of Bicycle Facilities. 2012; NACTO. Urban Bikeway Design Guide. 2nd Edition; Portland State University, Center for Transportation Studies. Evaluation of Innovative Bicycle Facilities: SW Broadway Cycle Track & SW Stark/Oak Street Buffered Bike Lanes FINAL REPORT. 2011.

6.1.12 CONT.

Bike Lane



CONSIDERATIONS

- Recommended as an alternative where separated bicycle facilities are not feasible.
- Should be provided in lieu of a standard bike lane at locations where 7 foot bike lanes are feasible.
- When not curb-adjacent, place buffer next to the parking lane where there is commercial or metered parking (i.e. higher parking turnover) and next to the travel lane where speeds and traffic volumes are higher.
- Research has documented buffered bicycle lanes increase the perception of safety.

Bicycle Lanes[4]

A bicycle lane is a portion of a street designated for the exclusive use of bicycles distinguished from traffic lanes by striping, signing and pavement markings.

TYPICAL APPLICATION

Bicycle lanes should generally be considered on any road with one or more of the following characteristics:

- Posted speed limit: 30 mph or lower.
- Average Daily Traffic: 9,000 vehicles or fewer.
- Parking turnover: infrequent.
- Bike lane obstructions: likely to be infrequent.
- Where a separated or buffered bike lane is infeasible or not desirable.

GUIDANCE

- The minimum width of a bike lane adjacent to parking is 5 feet, a desirable width is 6-7 feet.
- The minimum width of a bike lane adjacent to a curb is 5 feet exclusive of the gutter; a desirable width is 6 feet.

CONSIDERATIONS

- Typically installed by reallocating existing street space.
- Stopping, standing and parking in bike lanes may be problematic in areas of high parking demand and deliveries especially in commercial areas.

4 References: AASHTO. Guide for the Development of Bicycle Facilities. 2012; NACTO. Urban Bikeway Design Guide. 2nd Edition.

Evolution of a Bike Lane[5]

6.1.12 CONT.

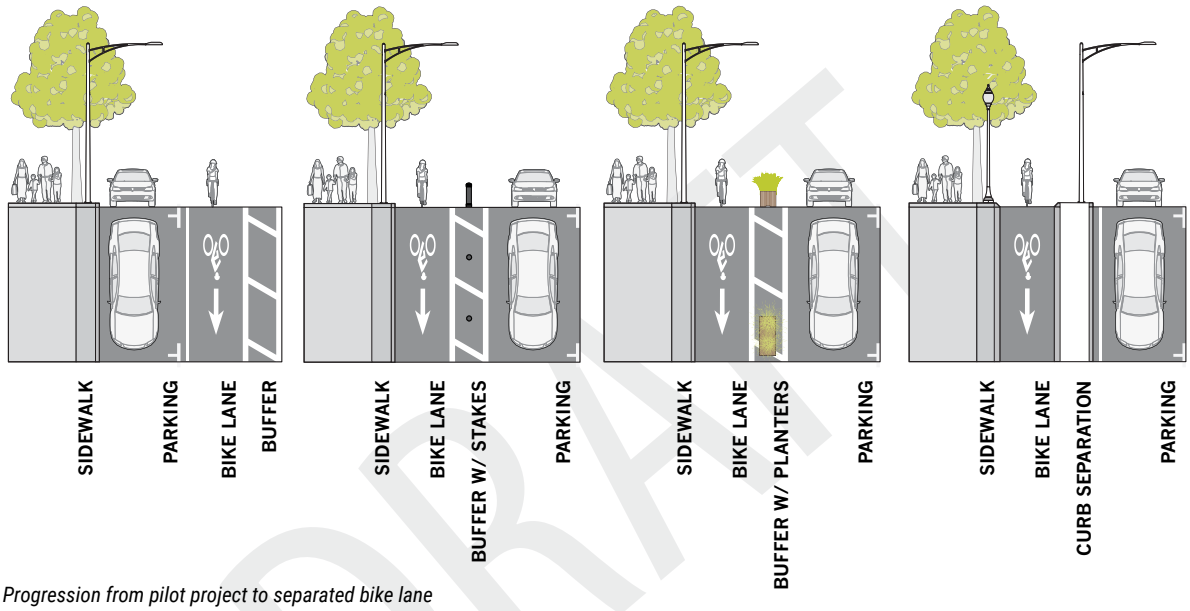
Bicycle facilities can be implemented incrementally - starting with a bike lane, moving to a buffered bike lane, adding physical separators in the buffer, and finally developing a permanent separated facility. A phased approach allows troubleshooting to occur before permanent materials and expensive infrastructure is installed.

CONSIDERATIONS

Separated bike lanes have been implemented in many cases as low-cost retrofit projects (e.g. using flex posts and paint within the existing right-of-way). More permanent forms of separation, such as curb-protected bike lanes, cost more and are less flexible once implemented. A phased implementation approach, where "pilot" projects transition to permanent protected bike lanes may solve both of these problems, by implementing the facility slowly and troubleshooting before permanent materials and high costs are necessary.

Lower-cost retrofits or demonstration projects allow for quick implementation, responsiveness to public perception and ongoing evaluation. Separation types for short-term separated bike lane designs often include non-permanent separation, such as flexible delineator posts, planters or parking stops. Pilot projects allow the agency to:

5 AASHTO Guide for the Development of Bicycle Facilities (2012). NACTO Urban Street Design Guide (2013) - Curb Extensions



Progression from pilot project to separated bike lane

6.1.12 CONT.

- Test the separated bike lane configuration for bicyclists and traffic operations
- Evaluate public reaction, design performance, and safety effectiveness
- Make changes if necessary
- Transition to permanent design

GUIDANCE

Permanent separation designs provide a high level of protection and often have greater potential for placemaking, quality aesthetics, and integration with features such as green stormwater infrastructure. Agencies often implement permanent separation designs by leveraging private development (potentially through developer contribution), major capital construction, and including protected bike lanes in roadway reconstruction designs. Examples of permanent separation materials include rigid bollards, raised medians and grade-protected bike lanes at an intermediate or sidewalk level.

Neighborhood Bikeway[6]

Neighborhood bikeways are streets with low motorized vehicle traffic volumes and speeds, designated and designed to give walking and bicycling priority. They use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles. Neighborhood bikeways feature comfortable crossings of busy arterial streets.

TYPICAL APPLICATION

Neighborhood bikeways should generally be considered on residential streets or streets:

- with low vehicle volumes and speeds.
- that provide either cross-town connections or create access to specific destinations.

GUIDANCE

Neighborhood bikeways prioritize bicycles and optimize the street for bicycle traffic by:

- Installing vehicle traffic calming and traffic reduction measures.
- Adding bicycle-specific signage and pavement markings.
- Developing bicycle-focused intersection treatments.

6 References: IPBI, Alta Planning + Design, Portland State University. Bicycle Boulevard Planning and Design Guidebook. 2009; NACTO. Urban Bikeway Design Guide. 2nd Edition; Portland Bureau of Transportation. Neighborhood Greenway Assessment Report. 2015.

Advisory Bike Lanes[7]

Advisory bicycle lanes (ABLS) function as bicycle lanes, but are designed to allow motorists to enter them while they yield to approaching traffic in a narrowed travel lane.

TYPICAL APPLICATION

Advisory bikeways should generally be considered on streets too narrow for bike lanes and with one or more of the following characteristics:

- Total traffic lanes: 2 lanes or fewer.
- Posted speed limit: 30 mph or lower.
- Average Daily Traffic: 2,000-4,000 vehicles per day desirable, 6,000 vehicles per day or 300 vehicles or fewer maximum during the peak hour.

GUIDANCE

- The minimum width of an advisory bike lane adjacent to parking is 5 feet; a desirable width is 6 feet.
- The minimum width of the unlaned motorist space is 16 feet between the bike lanes.
- The minimum width of an advisory bike lane adjacent to a curb is 4 feet exclusive of a gutter; a desirable width is 6 feet.

CONSIDERATIONS

- Requires FHWA permission to experiment.
- For use on streets too narrow for bike lanes and normal width travel lanes.
- Two-Way Traffic warning sign (W6-3) may increase motorists understanding of the intended two-way operation of the street.

6.1.12 CONT.

7 References: AASHTO. Guide for the Development of Bicycle Facilities. 2012; FHWA. Bicycle Facilities and the Manual on Uniform Traffic Control Devices – Dashed Bicycle Lanes. 2015.

6.2 Other Complete Streets Tools

Many other design treatments have been successfully employed around the country and the world in the creation of Complete Streets. This manual is not intended to provide an exhaustive list of all potential designs. A good list of resources for additional information about Complete Streets and potential design treatments can be found on the website of the American Planning Association at planning.org/research/streets.

6.3 Street Design Process

The citizens of the City of Stamford have a vested interest in the changes that occur in the public spaces of their communities, including their streets. The City has a history of working with community groups to address traffic safety problems, and will continue to do so. The Transportation, Traffic & Parking Bureau encourages community participation and input on all transportation projects to the extent possible.

This Complete Streets Manual does not intend to formalize a process for community participation in the street design process. Currently, Stamford residents can utilize the FixIt Stamford Portal to provide feedback, report traffic and pedestrian issues, etc. In the future, we intend to add a Complete Streets Suggestion Form to the portal, allowing residents to make suggestions and/or request Complete Streets projects.

Additionally, the Transportation, Traffic & Parking Bureau staffs the Traffic Advisory Committee (TAC) which include meetings that are open to the public.

6.4 What NOT To Do

Sometimes street design treatments intended to solve a traffic or safety problem have unintended impacts. An example is the conversion of two-way streets into one-way operation. Despite the benefits of reducing some turning conflicts and cut-through traffic, one-way streets run at cross purposes with most of the Complete Streets guiding principles. As a general principle, conversion from two-way to one-way operation should be avoided, and conversion from one-way to two-way operation should be considered when appropriate and feasible (see "Traffic Patterns" section 7.1.15 above).

Stamford street designs should embrace the principle that quality road design

greatly reduces the need for instructional signage for drivers. A properly designed roadway will elicit the proper behavior from drivers without cluttering the right-of-way with unattractive signage. Road design is an exercise in behavioral engineering and the City of Stamford commits to harnessing this knowledge to improve sharing and compliance to road rules by all users of the street. This may include minimizing unwarranted stop signs or multiple regulatory and/ or warning signs placed closely together and minimized usage of center lane striping on local streets with preference given to shared lanes that encourage more careful driving.

Finally, street designs should solve problems rather than merely shifting traffic or other negative impacts from one street to another or one neighborhood to another. Particular care should be taken to avoid negative impacts on federally protected populations.

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7

Measurement: Making it Count

7. Measurement: Making It Count

The continued measurement and evaluation of the overall use of the transportation system is an essential part of creating Complete Streets. This entails determining who is using the street network in Stamford, how they are using it, how usage changes over time, and establishing the adequacy of the street network as it pertains to each of the major modes of transportation utilized within the city of Stamford.

7.1 Why Measure?

The purpose of the Complete Streets Design Manual is to ensure that all streets are designed to provide a safe and comfortable environment for all roadway users. It is essential, therefore, that the quality of the transportation system, and the users' experiences of that system, are measured and evaluated continually to ensure that any changes and improvements facilitate the achievement of the program's objectives. Additionally, by measuring the effects of each roadway improvement, we can fine tune our approach to street design while providing residents with quantifiable results. Specifically, the measurement and evaluation program is necessary in order to:

- Provide baseline data to determine trends, evaluate effects, determine where improvements are most needed, and provide the information necessary for grant applications

- Determine the overall level of travel demand by mode
- Determine changes in travel speed brought about by changes to the roadway
- Determine the benefits of different types of transportation improvements
- Calculate performance measures for each travel mode including walking, cycling, transit, and driving
- Assist in the data collection necessary for the continued application for, and receiving of, state and federal grants
- Assist in the allocation of funding for transportation projects

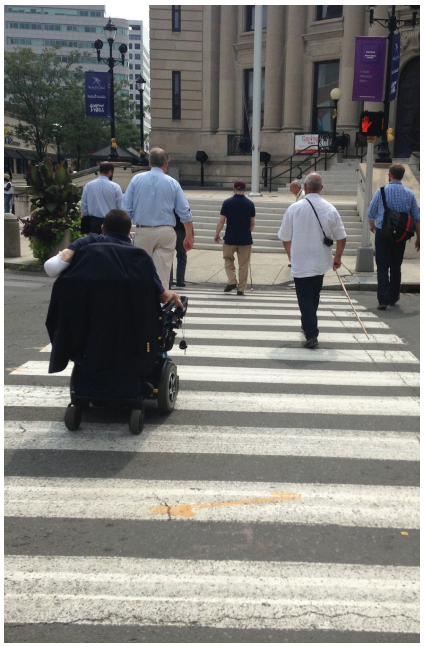
7.2 Who to Measure?

Complete Streets safely and comfortably accommodate all roadway users. In order to move toward a transportation system where all users count, all users must first be counted. Until recently however, data collection for transportation planning has focused largely on counting the number of automobiles on a roadway and, to a lesser extent, the number of transit riders on a particular route.

Many cities like Stamford, despite having a large number of cyclists, transit users and pedestrians, are "flying blind" when it comes to planning for these groups. While estimates may be available through the data compiled by the U.S. Census or the Federal Highway Administration (FHWA), travel behavior as it pertains to cyclists, transit users and pedestrians remains largely unknown. Even the most detailed FHWA data, the National Household Travel Survey (NHTS) is obtained infrequently and often at irregular intervals.

Because of the need for empirical data to measure the success of roadway projects, the City of Stamford routinely gathers data on all roadway users, including pedestrians, bicyclists, bus and train riders, motorists, and multimodal users. The City of Stamford will continue to gather this data to the extent possible. Independent traffic studies shall also include all roadway users.

By ascertaining the travel demand and travel behavior of all roadway users, the City will be able to serve each travel mode efficiently, effectively, and equitably. Particular attention should be given to how different modes of transportation may be used together for a single trip or series of trips.



Subjective Data

- Purpose of trip
- Choice of travel mode
- Choice of route
- Level of satisfaction with existing service/facilities
- Perceived gaps or deficiencies
- Desired improvements
- Barriers to transportation
- Reported modal split

7.3 What to Measure?

Measurement and evaluation of the transportation system should focus on the collection of both objective and subjective data.

7.3.1 Objective Data

Objective data includes the volume of users, the number and rate of traffic accidents, travel speeds, and the demographics of roadway users. Objective data may be obtained using a variety of methods and sources including manual counts, automated counts, user surveys, and accident reports. In order to ensure that all roadway users are counted, it should be a requirement that pedestrians, cyclists, and transit users are counted whenever automobile counts are undertaken. In other words, all traffic counts must count all traffic.

In addition to collecting data, it is important to make use of objective performance measures for each major mode of transportation, including automobile, bicycle, pedestrian, transit and multimodal levels of service (LOS). Much of the current imbalance in our transportation system has come about in part as a result of overreliance on automobile LOS as a metric for the quality of a given roadway segment, intersection, or corridor. Recognizing that all transportation modes must be provided for, the five measures mentioned above should be reported in the course of all major studies and projects, allowing for a comprehensive and thorough summary of the quality of the transportation network.

7.3.2 Subjective Data

Recognizing that users' experiences of the transportation system cannot always be captured by objective measures, user surveys will be administered at regular intervals and integrated with the city's transportation planning and engineering projects. Surveys can be administered in a variety of different ways including intercept surveys, take-home surveys and web-based surveys. This subjective data focuses on the attitudes and beliefs of those individuals using the transportation system.

7.4 When & Where to Measure

As mentioned above, a large amount of data is generally obtained at irregular intervals during the course of transportation plans and studies. This data provides important snapshots of how the transportation system is used; however, for measurement and evaluation of the transportation network to be maximally effective, it should be standardized and undertaken at regular intervals. Below are data collection best practices for measurement and evaluation:

- Counts and user surveys should be done annually.
- Counts should reflect a typical weekday and typical weekend with particular emphasis on peak periods of travel demand.
- A set of permanent count locations should be established so that trends and changes may be observed and measured.
- Counts should be taken when Stamford public schools are in session.
- Counts should not be undertaken during inclement weather or during holidays, festivals or special events.
- User surveys should be kept relatively constant so that results from different survey years may be compared. While new survey questions can and should be introduced, this should be done carefully and sparingly.

In order to understand the effects and benefits of improvements made to the transportation system, it is essential to conduct before and after studies, obtaining data on volumes, modal split, travel speed, and accident experience. By doing this, we can determine which improvements are maximally effective, discontinue improvements that are ineffective, and demonstrate the overall return on investment to taxpayers.

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8

Future Strategy

8. Future Strategy

8.1 Funding

The City of Stamford recognizes that local funding sources are limited relative to our citywide mission. However, our funding strategy going forward is layered and includes guidance for the more appropriate use of existing funding streams and capital programs of the city, state and federal governments.

8.1.1 City of Stamford

The City of Stamford administers the following programs which relate specifically to Complete Streets and transportation investments. For each program, the City is responsible to screen individual projects for consistency with the policies and principles of the Complete Streets Design Manual.

- Roadway Management
- Reconstruction & Paving
- Roadway Surface Repairs
- Sidewalk Construction & Repairs
- Traffic & Pedestrian Signals
- Signs & Lines

For all such progams, Complete Streets should not be 'an addition' to how projects are managed, but rather an integral part of these projects.

To better ensure that each of these programs is consistent with the manual, the managing departments will coordinate their work on a monthly basis.

The Transportation, Traffic & Parking Bureau (TTP) works closely with the Land Use Bureau during the site plan review process. TTP reviews and comments on all applications that appear before the Stamford Zoning Board as well as the Stamford Zoning Board of Appeals. As part of the review process, TTP works to ensure that all new developments and redevelopments reduce their impact on the local road network as much as possible and that they contribute to a more efficient transportation network with a focus on bicycle and pedestrian facilities. TTP also reviews and comments on streetscape improvements related to developments, internal site circulation, and parking amount and configuration to ensure the safety of vehicles and pedestrians.

8.1.2 State of Connecticut / Western Connecticut Council of Governments

The City works closely with the Connecticut Department of Transportation and the Western Connecticut Council of Governments (WestCOG) on the planning and implementation of state and federally funded transportation projects in the City. For these projects, the City will work with project planners and engineers to review specific projects from a Complete Streets perspective. While the City generally must work within the parameters of these larger programs, it is the responsibility of City staff to (1) brief the State's project managers on the Complete Streets program; (2) select projects which enhance bicycle and pedestrian access / safety; and (3) seek design exceptions and waivers as necessary to create a Complete Street.

For general maintenance work, the City will arrange an annual review meeting with the Connecticut District 3 and District Engineers to review work plans on state highways and seek to enhance bicycle and pedestrian safety, reduce travel speed and improve safety at key intersections.

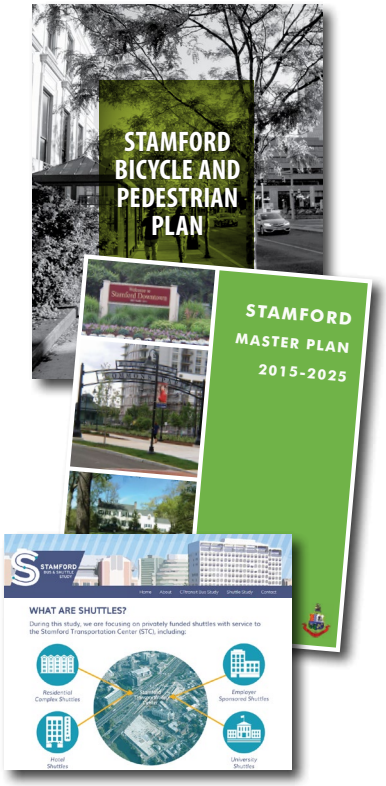
8.2 Related Projects

Often, projects that affect the ROW do not involve road reconstruction but are disruptive and result in reestablishing much of the road. Such is the case with major sewer or drain

replacement projects that are managed by the WPCA or related work that DOT is doing to improve its roadway. As these projects come forward, it is often a good time to incorporate Complete Street criteria as part of the project. In some cases, it may be necessary to provide some supplemental funds that would allow this to happen. In doing so, savings are realized.

In most cases, mobilization costs, paving costs, and traffic control costs are made part of the eligible work which would otherwise be tagged to a separate project. Leveraging other project work to satisfy needs of the complete streets work can be considered when reviewing plans involving other work that disturbs the city ROW.

8.3 Planning Framework



The Stamford Master Plan, the WestCOG Regional Long Range Transportation Plan/ Metropolitan Transportation Plan, the Stamford Bus & Shuttle Study, and the Stamford Bicycle & Pedestrian Plan along with many neighborhood plans provide the foundation for long-term investments. These plans provide guidance for the more specific implementation efforts found in municipal development plans, development agreements, neighborhood-based and commercial district improvement plans and other programs.

Additional plans that could be impacted by Complete Streets policy include the following:

- Stamford Transportation Center Master Plan
- Developer Agreements (Transportation improvements as part of development projects)
- Glenbrook & Springdale TOD Study
- Long Ridge Road & High Ridge Road Corridor Study

In addition, the City will work closely with WestCOG to design and schedule Complete Streets projects as part of the regional work program. This includes both planning projects ("urban work program") as well as the regional plan for federal transportation funds, known as the Transportation Improvement Program (TIP). The City will aggressively pursue funding through smaller programs, including the Transportation Enhancement Program (for bike and public transit projects), the Local Transportation Capital Improvement Program, Community Connectivity programs, and the Safe Routes to School Program for school-based investments.

Complete Streets goals can also be supported by Stamford's zoning ordinances. Currently, the City's zoning includes various Design Districts, such

as South End Redevelopment Districts North and South, Multi-family- High Density District, Village Commercial District, and the Neighborhood Mixed-Use Design District whose regulations encourage Complete Streets-friendly development. These districts contribute to a robust urban environment with provisions for wide sidewalks, ground floor retail, high densities, and Transit Oriented Development. Furthermore, the City is undergoing an Omni-bus Zoning Text change that is adding provisions for bicycle parking, electric vehicle parking, sidewalk construction, and changes to the parking minimums.

Finally, in order to encourage inter-departmental cooperation and a comprehensive approach to Complete Streets, this document will be distributed to various City departments and bodies, including:

- Board of Representatives
  - » Land Use & Urban Redevelopment Committee
  - » Transportation Committee
- Planning Board
- Traffic Advisory Committee (TAC)
- Zoning Board

8.4 Enforcement of Traffic Violations

Enforcement efforts are a crucial component to achieving safe, complete streets in Stamford. Without the cultural expectation of compliance to traffic laws, even a perfectly engineered complete street will be insufficient.

8.5 Stamford Street Smart Initiative

The Stamford Street Smart Initiative, launched in September 2014, is a citywide public safety and awareness campaign in the City of Stamford. The initiative is focused on the three key areas of enforcement, engineering and education.

The initiative is being led by the Transportation, Traffic & Parking Bureau in collaboration with the Mayor's office, Police Department, Operations Department, Stamford Public Schools, and community organizations.

8.5.1 Enforcement

As part of the Street Smart Initiative, the Stamford Police Department (SPD) will be focusing on the enforcement of existing state and local laws to ensure motorists, cyclists and pedestrians travel safety on our streets. Beginning with a crackdown on distracted driving during the month of September, enforcement programs will also include patrol by the SPD Traffic Enforcement Unit to catch speeding, distracted and drunk drivers, and efforts to reduce drivers failing to yield the right of way to pedestrians and jaywalking on city streets.

8.5.2 Engineering

Ensuring the safety of our streets requires that signs, lines and signals are allies of all those who share our roadways. As part of the initiative, the City will be evaluating all intersections and taking action to ensure that motorists, cyclists and pedestrians have the tools they need to be as safe as possible while traveling on our streets. Everything from the design of our crosswalks to the location of “no right turn on red” signs to the synchronization of our traffic signals will be examined.

8.5.3 Education

Educating residents, visitors and students on how to travel safely and protect the safety of others is a key component of the Street Smart philosophy. Through partnership with community organizations and promotional activities of the Street Smart Initiative, we hope to make progress through education.

8.6 Periodic Review Process

The Stamford Transportation, Traffic & Parking Bureau publishes an Annual Report that includes an overview of completed and ongoing roadway projects. The TT&P Bureau will continue to develop this Report and will provide information on how Complete Streets elements were included in roadway projects.

In addition to the Annual Report, the TT&P Bureau will convene an annual meeting with stakeholders and other interested parties to discuss Complete Streets and plan for the future of the program. This meeting could take the form of a presentation to the Transportation Committee of the Board of Representatives/ full Board of Representatives or a legislative meeting.

Invitees could include:

- City agency staff
- Police representatives
- Board of Representatives members
- State/Federal delegation

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Appendix

Appendix A: City of Stamford Streetscape Guidelines

Appendix B: Stamford Roadway Classification Map

Appendix C: City of New Haven Speed Hump Detail

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Streetscape Guidelines

City of Stamford

May 2003

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INTRODUCTION

Streets are used for many activities such as driving, parking, walking and bicycling. Most are designed to balance the demands of different users and to create an atmosphere that is safe, accessible, economically viable and lively.

Each street has many functions. For example, curbs define the edge of the roadway, improve safety by separating pedestrians from vehicles, and channel excess water to storm drains.

Streetlights increase our ability to see and be seen after dark. Signs orient us to locations, warn us about upcoming obstacles or changing conditions and regulate vehicle, pedestrian or bicycle movements.

Right-of-way
The street right-of-way (ROW) is the publicly owned area adjacent to private property. The ROW is normally divided between the vehicular zone and the sidewalk area.

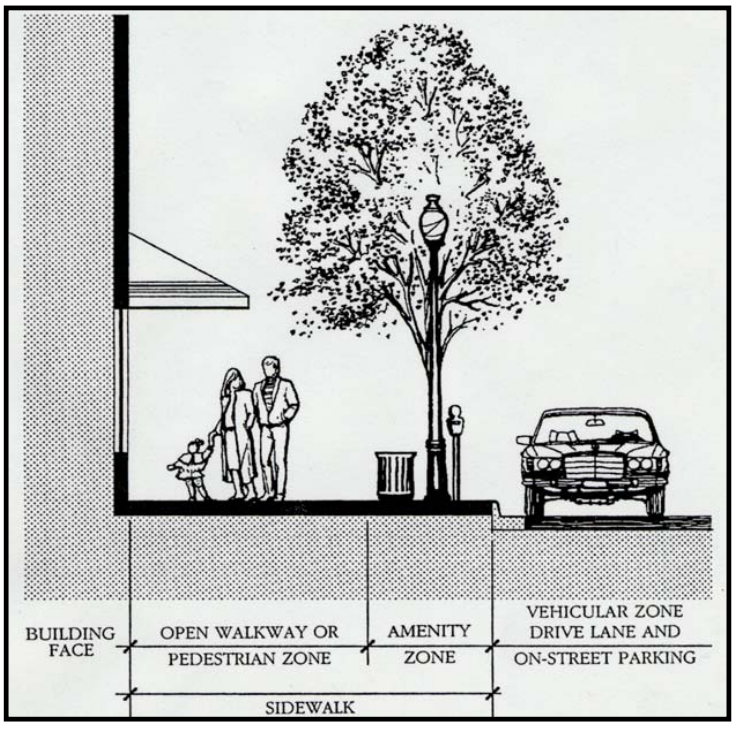
Vehicular Zone
The vehicular zone normally includes vehicle travel lanes, paved shoulder, parking and bicycle lanes.

Sidewalk Area
The sidewalk area consists of the pedestrian zone (open walkway area) and the amenity zone.

Pedestrian Zone
The pedestrian zone is normally paved and the pedestrian domain. The walkway area must be clear of obstructions. It is important to retain as much effective walkway width as possible so that pedestrians could move freely and others have room to navigate.

Amenity Zone
The amenity zone is the area between the curb and the walkway area and is reserved for street furniture, utility poles, planting areas for landscaping and trees, and signs. All street furniture or landscaping should be arranged in the amenity zone so that pedestrians have adequate space to maneuver.

Enhancing the safety, comfort and convenience of our streetscape will create a pedestrian-friendly environment, and an efficient multi-modal transportation network.



PURPOSE

The purpose of the streetscape guidelines is to make the design of streets clear. If this purpose is fulfilled, Stamford will become a more desirable, livable city for residents, business people, shoppers, and visitors.

WHO SHOULD USE THIS MANUAL

Property owners, elected officials, neighborhood leaders, planners engineers and architecture designers, developers, business people, merchants, designers, and city staff are charged with applying these guidelines to all design and construction efforts in the public right-of-way. Every new improvement should comply with or respond to these guidelines appropriately. Not covered here are roadway design standards and projects that are covered under separate guidelines or plans approved by the City of Stamford.

The guidelines apply to all activities in the City of Stamford. Unified application of the guidelines will insure consistent streetscape design of future projects located within the public right-of-way.

HOW TO USE THE GUIDELINES

The guidelines are a tool for expanding the legacy of beautiful streets in Stamford.

It is important that each new project or design effort consider the role of the street in the overall system: What is the function and operation of the Street? Is it a through street, which connects neighborhoods, districts, destinations, or parks? Does the street have any unusual characteristics? Are their existing streetscape elements, which should be continued? Does the street have a residential, commercial, industrial or retail character?

The design effort should be extended to define the best solution for the entire length of the street in the district. In such cases it is important to work closely with the Stamford Department of Operations prior to commencing design.

The guidelines do not encompass improvements within private property; however, on commercial streets the manual will influence landscaping elements such as plants, street furniture, screens, and walls outside the edge of the right-of-way.

It is important to determine if other planning has been performed in the area prior to beginning new design. Neighborhood, commercial, or historic district plans may be in place, or goals and objectives may have already been established. Generally speaking, projects within the Downtown and special districts require review, based upon established guidelines. These plans may provide more detailed or specific information about local improvements, but the spirit of beauty and quality of the urban design identified here should be applied everywhere. This document is a foundation for all streetscape projects, whether or not they are within special districts. Its design and technical principles underlie streetscape design throughout the city. Each project should examine local conditions and apply the guidelines within that context. Improvements to commercial streets should occur in a coordinated fashion, involving all the owners on a block or within the commercial district to create the most unified image possible.

GUIDELINES VS. STANDARDS

As a guideline document, this handbook is not all-inclusive and is not intended to preclude the designer's creativity. Nor may it be possible to meet every condition in the manual. However, it is possible to find design solutions, which meet its intent. And while every condition is not addressed, design concepts and materials are defined. The majority of the guidelines in the manual are strongly recommended and should be followed whenever possible. When specific conditions are not covered here, contact the Department of Operations. Any design should address fundamental quality of life issues of safety, and the development of a clean and comfortable environment.

RELATED DOCUMENTS

Other guidelines may affect the design of any specific project. Contact the Land Use and Engineering Bureau's prior to starting your design for a list of other related documents.

Vision

Committed to controlled growth, looking beyond problems to causes, and developing precise solutions for the development of a successful city.

DESIGN GUIDELINES

I. Street Network

A. Roadway Classification

The roadway classification defines the function of each street and the standard to which it should be designed and used. Many factors determine a roadway's classification, including travel demand, street right-of-way width, and access to adjacent properties, neighborhood character, adjacent land uses, and connection to the regional transportation system. The City of Stamford has five different roadway classifications, Regional Highways, Major Arterials, Minor Arterials, Collectors, and Local Streets.

1. Regional Highways

A highway varies in width from four to eight or more lanes. Its purpose is to carry through traffic, and is fully access controlled by grade separations and ramp connections. The regional highways are maintained by the State and are constructed to State design standards. Interstate 95 is a major north-south freeway with six travel lanes. The Merritt Parkway (Route 15) has four lanes, two in each direction. The Merritt Parkway has grade separations and ramp connections, is a park like driving environment with unique ornamental bridges. The Merritt Parkway has guidelines for general maintenance. Transportation improvement projects are reviewed by the Merritt Parkway Advisory Committee and subject to local review.

2. Major Arterials

Major arterials vary from two to six lanes in width and are designed to carry large volumes of traffic. Their purpose is to carry through traffic and to provide a network connecting to the state highway system, with limited access from abutting properties. Major arterials in Stamford include High Ridge Road/Washington Boulevard, Long Ridge Road, Hope Street, Grove Street/Strawberry Hill Avenue/Newfield Avenue, Courtland Avenue/Hoyt, and Route 1.

3. Collectors

A collector street is a two or four lane wide roadway, depending on traffic volumes. Its purpose is to provide for local traffic movement and access to abutting properties, and also for movement between local and business streets and streets of higher classification. A collector street often "collects" traffic from local streets and carries it to minor and major arterials.

4. Local Streets

A local street is usually a two-lane facility. Its purpose is to provide for local traffic movement and direct access to abutting residential properties. It may be a two-lane cul-de-sac, or a one-lane alley.

Developing livable and walkable communities requires streets were pedestrians feel safe, and where the walking environment is enjoyable.

B. Transit Routes

CTTransit operates local bus routes, commuter service routes and express bus routes in the Stamford region. All Stamford buses are equipped with bicycle racks.

Greyhound operates interstate and intrastate bus route to and from Stamford. The Stamford Transportation Center is the transfer point for all routes. Contact CTTransit for bus route information.

C. Bicycle Routes

The City of Stamford has three categories of bicycle facilities. The categories are shared use paths, bicycle lanes and bicycle routes.

Shared Use Path

Shared use paths are facilities that are physically separate from motorized vehicular traffic within an independent right-of-way. The minimum recommended width is eight

feet for bicycle only facilities, if shared with pedestrians ten feet, and twelve feet at major recreation facilities.

On-street facilities consist of bicycle lanes or bicycle routes.

Bicycle Lanes
Bicycle lanes have a portion of the roadway that has been designated by striping, signing and pavement markings for exclusive or preferential use by bicycles. The minimum recommended width is five feet.

Bicycle Routes
Bicycle routes are roadways that are designated for bicycle use through the installation of directional and informational signage. Bicycle routes may incorporate wide outside lanes, shoulders and shared lanes. When it is not possible to provide a bicycle lane, provide a 15 feet shared curb lane.

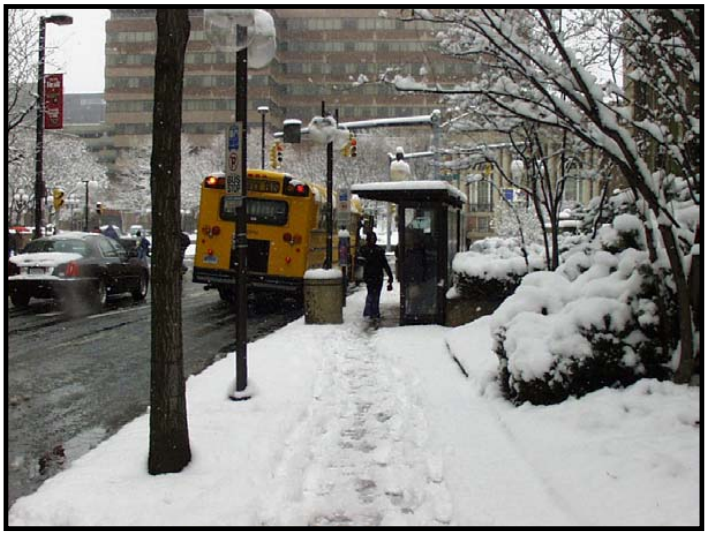
Bicycle Design Standards
Any roadway designated for bicycle use shall meet the minimum design standards called for in the American Association of Highway and Transportation Officials, Guide to the Development of Bicycle Facilities. All bicycle related pavement markings and signage shall conform to the Federal Highway Manual on Uniform Traffic Control Devices. Contact the Land Use Bureau for a map of proposed bicycle facilities.

D. Traffic Calming
The Traffic Calming program is an integrated program of education, enforcement and engineering measures to affect the speed and volume of traffic on residential streets. Also, these measures are utilized to improve pedestrian connections and to promote alternative modes of transportation.

Typical traffic calming measures include: speed humps; curb extensions; raised crosswalks; traffic circles; and edge markings.

E. Snow Emergency Routes
The City of Stamford has designated snow emergency routes. A snow emergency situation occurs when actual or expected snowfall/icing conditions require all vehicles to be removed from main roads to allow for effective plowing, sanding and salting.

Signs displaying a snowflake on a red background are posted on snow emergency routes. Notice of a snow emergency is made three hours before the emergency becomes effective. The emergency remains in effect until the Mayor cancels the snow emergency.



II. Street Operations

A. Travel Lanes

The width of the street section will determine the number of lanes, if parking can or will be installed or if bicycle lanes are appropriate. Travel lanes require a minimum of ten feet.

The Stamford Fire and Rescue Departments require fourteen feet of clear area on streets in order to deploy emergency apparatus equipment.

In order to install parking on both sides of a one-way street, the width must be twenty-nine feet, fourteen feet of clear space and fifteen feet (seven feet six inches on each side) for parking.

B. On-street Parking

Parking lanes are desirable in most neighborhoods or business districts. On-street parking lanes provide high customer appeal, and provide protection for pedestrians from moving vehicles. On-street parallel parking spaces should be a minimum of twenty-two feet in length by seven feet six inches in width. Handicapped spaces shall be a minimum of twenty-two feet by seven feet six inches and must be designated by pavement markings and above grade signage.

On street ninety degree parking stalls shall be a minimum of eight feet six inches in width by eighteen feet in length. On street angle parking stalls shall be a minimum of eight feet six inches in width by eighteen feet in length.

C. Signage

All regulatory and parking signage shall be .080-gauge aluminum with sheeting applied that meets the Manual on Uniform Traffic Control Devices (MUTCD) guidelines, including color and size. All signage shall be attached to utility poles or to sign posts.

D. Street Name Signs

Street name signs shall be .080-gauge aluminum, nine inches high by various lengths and shall have 3-M micro prismatic lens sheeting applied (3990VIP). Applied to the sheeting shall be 3-M electro Cut Film, 1177 green. The font shall be Highway Gothic C, with upper and lower case characters. The Upper case shall be six inches in height. The extensions, (Ave., St., Rd.) shall be in upper and lower case, with the upper case character three inches in height.

Street name signs in the Central Business District shall be twelve inches in height and shall be covered with 3-M electro cut film, 1175 blue. The Upper case character shall be eight inches in height and the extensions shall have an upper case height of four inches. The street name signs in the CBD shall be mounted overhead when possible (on mast arms or span wire).

E. Design Speed

The Manual on Uniform Traffic Control Devices requires that an engineering study be prepared to determine the speed limit for a roadway. Normally, this is the 85th-percentile speed rounded to the nearest (5 mph) increment. Road characteristics, roadside development, parking practices, pedestrian activity and reported crash history should also be considered when establishing the speed limit.

III. Sidewalk and Paving System

There are many factors to consider in laying out a sidewalk area. The sidewalk area consists of the open walkway area (pedestrian zone) and the amenity zone. Existing elements such as curb cuts, trees, storefronts, and signage significantly influence the final layout. Uniform street lighting is critical on a commercial or arterial street; the uniform spacing of lights may be the determining factor for where all the elements are placed. The best layout should be a balance of existing constraints and the uniform placement of new elements.

A. Paving

Paving is an important unifying element in streetscape design. Paving can guide movement, define spaces, and provide variety. When designing a pedestrian zone paving patterns, colors, and textures should be complementary to surrounding elements. Well-designed paving creates order, scale, and identity on the street. Once established, the paving pattern should become the organizing framework for furnishings, trees, plantings, and lighting.

B. Sidewalk Design

Sidewalks give pedestrians access along streets. Walkway areas outside of Downtown Stamford have traditionally been detached from the curb. This provides for an amenity zone that is primarily a tree lawn area with room for street trees adjacent to the curb. Where a sidewalk is required by zoning, a detached walkway area is strongly preferred. Sidewalk areas enhance the beauty, safety, and shared common space in the neighborhood.

Concrete is the preferred paving material, although interlocking concrete unit paving, brick paving, and bituminous concrete, may be acceptable in neighborhoods where these materials are prevalent. Special paving in tree lawn areas is recommended in residential streets only where pedestrian use is heavy and tree lawns cannot support turf or ground covers.

C. Sidewalk Guidelines

Paving is the best way to unify the street. Over-designed patterns may become chaotic or dated. Pattern and color should be subdued and avoid sharp contrasts with surrounding paving. Pattern should relate to the size and shape of the space and should create a sense of order in the placement of other street furnishings and plant materials.

1. Maintain a clear continuous unobstructed walkway path. In downtown Stamford, 10 feet width is required where possible. Sidewalk Cafes should not obstruct the natural extension of the walkway areas. In other areas, 10 feet width is desired but as little as 5 feet may be allowed in constrained locations. A 5 feet width is the minimum for residential areas. When walkways are adjacent to

travel lanes the walkway area should be at least six feet wide.

2. Detached sidewalks should include a tree lawn area of 5 feet minimum, planted with trees and groundcover or sod. Where groundcover or sod is not practical, as in retail streets, tree grates (around trees), and a hard surface of pavers or concrete is appropriate.

D. Sidewalk Pavements

Concrete, including gray, integral colored concrete and special finishes is acceptable. Concrete walkways shall have a square score pattern to compliment the surrounding neighborhood. Sidewalk areas designated as "Rail Trail" must use a 20"x20" square scoring pattern. Each square shall be finished with a smooth tooled edge and deep broom surface. The dimensions of the square can be adjusted slightly as necessary to fit the available sidewalk width.

Concrete should be a minimum of 5 inches thick, meeting industry standards for concrete mix, finishing, curing, and sealing, with a 2% slope to roadside. Once installed, all pedestrian walks must be safe for pedestrians with no gaps or joints larger than ¼ inch.

Care should be taken when using integral pigmented colored concrete. Select subdued and earth tone colors, which will complement natural materials. Rich or bright colors will draw more attention than desired. The City must approve color and patterns.

Use only paving bricks specifically designed for sidewalk use according to industry standards. Brick pavers must be set on a concrete slab with sand joints and on a 1½ inch sand base.

Concrete pavers are a durable and decorative choice for pavements in the amenity zone. The pavers must be set on a sand base with tight sand joints according to manufacturer's recommendations, or on a concrete slab with motor joints.

Precast concrete pavers may be installed using finish and color guidelines as discussed under concrete pavement above. These pavers may be installed on a sand base or on a concrete slab with mortar joints.

Flagstone pavers are only recommended in historic areas, where they originally existed. Installation may be on a sand base with sand joints or on a concrete base with mortar joints as approved by the City.

E. Sidewalk Curb

1. Concrete Curb

Concrete curbing materials and construction methods shall conform to the provisions of Connecticut Department of Transportation Specifications, Form 814A, 1995, Articles 8.11.02 and 8.11.03 for concrete curbing and M03.01, for class "C" concrete.

Crushed stone base material and method of construction shall conform to applicable Conn-Dot Specifications, Form 814A, 1995 and M01.01. Maximum size of stone shall be one and one-quarter inch (1 ¼").

Concrete curbing methods shall conform to Conn-Dot form 814A, Section 4.01.03 sub article 13 for Curing and Protection.

Note:
No poured in place concrete, i.e., curbing, sidewalks, slabs, foundations, etc., will be constructed between December 15 and March 15, without prior written approval of the City Engineer.

2. Granite Curb

Granite curb shall be hard and durable granite of light color and uniform texture neither stratified nor laminated. It shall be free from seams and evidence of weakening or disintegration and shall be of a good, smooth splitting appearance. A sample of the type of curb proposed for use and the name of the quarry from which it originates, must be approved for the project.

The finish and surface dimensions shall conform to the Detail Drawing for Granite Curbing. Contact the Engineering Department for a copy of the Granite Curb Detail.

The top surface of the granite shall not be pointed, hammered, or sawed. The face shall be smooth quarry split, free from drill holes in the exposed face. The ends of all stones shall be square with the planes of the top and face, and so finished that, when stones are placed end to end as closely as possible, no space more than one half inch (1/2") shall show in the joint for the full width of the top or down on the face for eight inches (8").

If sawed, the curbstones shall be thoroughly cleaned of any iron rust or iron particles. For straight curbing, the stone shall be furnished in lengths not less than six feet (6'), except where necessary for closeness, when no piece shall be less than four feet (4') in length. Holes shall, unless otherwise shown on the plans, be provided through curbs for existing drains. Radius for radius curb shall be as shown on the plan. Granite curbing shall be Mount Airy light gray curbing, split face 0.25" variation, sawed top.

Place a concrete base, Class "C", 3000 PSI, under the Granite curbing. The mortar for granite curbing shall be mixed at one part cement to two parts sand.

F. Curb Ramp and Curb Cut Guidelines

The construction and reconstruction of all walkway areas in the city should include curb ramps at all intersection corners to enable the safe and convenient movement of pedestrians. Curb ramps should align with curb ramp locations across the street. Ramps shall be constructed to current ADA and City standards. Curb ramps are required anywhere the walkway area crosses a curb. Any deviation from the City standards must be approved by the Department of Operations prior to construction.

G. Crosswalk Pavements

Crosswalks are generally painted at signalized intersections in most areas of the City. In commercial areas, the crosswalk materials and pattern can be an important unifying feature of the district.

Guidelines

Within a neighborhood, it is important to treat each street intersection the same in terms of size of curb radius, location and type of curb ramps, signage location, and paving within crosswalks. Crosswalk pavement should contrast with the adjacent street pavement through color or texture. Drivers need to know where to stop or look for pedestrians and pedestrians need to know where they can rely on crossing the street safely.

Even if the crosswalk is distinguished in terms of color and texture, it is still necessary to install "stop bars" using paint or vinyl street marking material as determined by the Traffic Maintenance Department.

Recommended Crosswalk Paving

1. Painted lines on the street are the most inexpensive solution and are the most visible marking.

2. Concrete paving can be used as a contrasting material in asphalt streets, but it must be augmented by painted or vinyl stop bars.

3. Unit pavers and brick pavers can be used with cautions. They are expensive,

the contrast between paver and asphalt may not be sufficient and painted stop bars might be necessary.

H. Entry Walks

Entry walks are those walks that extend out from the home and/or detached sidewalk and lead to the curb. They are appropriate in the tree lawn, where there is a functional need for them. Three feet is the recommended width for entry walks, with a maximum of 5 feet allowed. They may be used in conjunction with step-out strips as a way of giving access from parked/stopped vehicles to the walkway area. Concrete is the preferred material, although interlocking concrete unit paving and brick paving are acceptable in neighborhoods where these materials are prevalent.

I. Paving Not Recommended

1. Stamped concrete is not permitted on walkways or elsewhere in public rights-of-way because of appearance, difficulty of snow removal, poor durability, and future repair difficulties.

2. Seeded concrete and epoxy concrete are not acceptable because of appearance, poor durability, and future maintenance problems.

3. Any glazed product or smooth, slippery surface product should not be used in pedestrian traffic areas for pedestrian safety.

4. Any thin set material should not be used because of future maintenance problems.

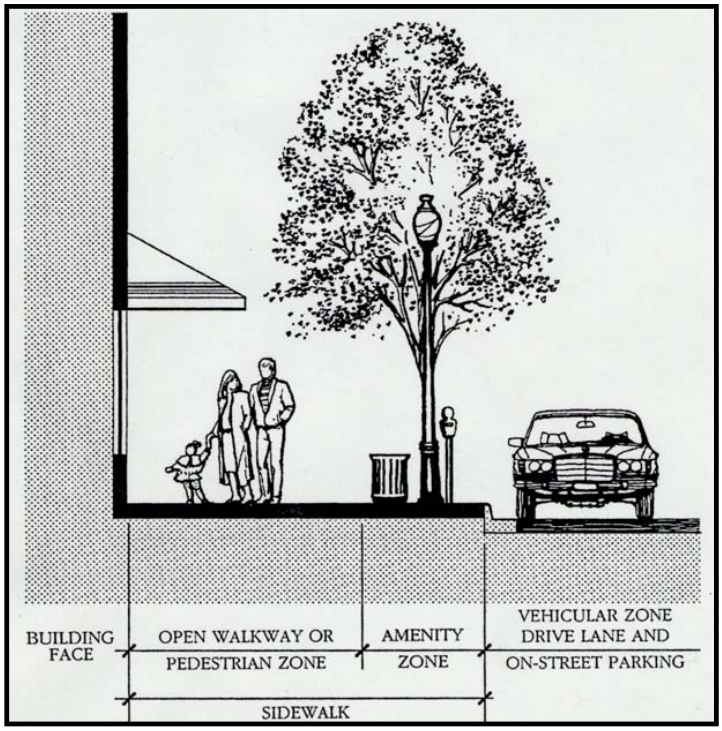
5. Any clay brick product, other than paving brick, should not be used because it may be difficult to maintain and the product's resistance to freeze-thaw damage may not be adequate.

6. Any material that is so textured or patterned that it may cause a tripping hazard should not be used.

SIDEWALK AREA				
Total Width Available	Pedestrian Zone		Amenity Zone	
	Residential	Retail/Com	Residential	Retail/Com
5'	5'	5'	NA	NA
6'	6'	6'	NA	NA
7'	5'	5'	2' Grass	2' Bricks, Lights
8'	5'	5'	3' Grass, Trees	3' Bricks, Lights, Trees
9'	5'	5’	4' Grass, Trees	4' Bricks, Lights, Trees
10'	5'	6’	5' Grass, Trees	4' Bricks, Lights, Trees
11'	5'	7’	6' Grass, Trees	4' Bricks, Lights, Trees
12'	5'	8’	7' Grass, Trees	4' Bricks, Lights, Trees
13'	5'	8’	8' Grass, Trees	5' Bricks, Lights, Trees
14'	5'	8’	9' Grass, Trees	6' Bricks, Lights, Trees
15'	5'	9’	10' Grass, Trees	6' Bricks, Lights, Trees
Notes:				
Grass may be used in place of brick in the amenity zone, where there is no on-street parking.				
Granite curb must be used in the Downtown Special Service District area.				

J. The Amenity Zone

The amenity zone is the area where trees, plantings, furnishings, and lighting should be organized. The amenity zone is usually a brick paved area between the curb and the walkway area in a commercial or retail area. In residential areas the amenity zone is usually a tree/lawn area with space for lighting and utility poles. In the Downtown District and in other retail areas around the City, paving in the amenity zone will vary depending on the width of the amenity zone and the location. Ample clear space must be provided between furnishings in the amenity zone for pedestrian circulation.



IV. Furnishings

Street Furnishings such as seating, newspaper racks, bicycle racks, bollards, and trash receptacles are important functional elements and amenities, especially in the Downtown streetscape. Furnishings should be designed to be attractive and unified within any given district. Maintenance, safety, and comfort are primary considerations in the design and placement of street furnishings. All furnishings placed in the right-of-way should be high quality, designed for outdoor use, and require minimum maintenance.

In general, street furnishings should be located at least 2 ½ feet from the curb face where on-street parking occurs, and 3 ½ feet where travel lanes adjoin the curb. All furnishings should be located in the amenity zone.

A. Neighborhood Entry Monuments & Signs

Distinct, identifiable neighborhoods may desire to have monuments places at key points of entry or at the center of the neighborhood. Entry monuments can be a source of pride for residents and give identity to the neighborhood.

Guidelines

Entry monuments or signs should only occur where a distinguishable entry along a street already occurs. In some neighborhoods, clear points of entry are difficult to find, yet identity monuments or signs at key locations may be appropriate to help create a sense of place and to reinforce the neighborhood identity.

Monuments or signs should reinforce the character appropriate to the neighborhood.

1. Entry monuments or signs should be integrated into a total design of typical elements such as trees, ornamental lighting, paving patterns, median planting, walks, and buildings.

2. The scale, character, shape, materials, and location of entry monuments or signs must be planned and consistent for an entire neighborhood. This does not mean that all entries should have monuments or signs. If too many are placed or if they occur in inappropriate locations, the strength of the entry will be diminished. Ad-hoc placement and design of entry monuments or signs is not acceptable.

3. Provisions must be made for the maintenance of entry monuments and signs. The most effective way to address their maintenance is to have a neighborhood association committed to their upkeep. Their design should be durable and as maintenance–free as possible. All monuments and signs must be approved by the Department of Operations prior to construction.

4. Appropriate scale and proportion are critical to the sense of arrival and entry. Monuments and signs must be effective at the pedestrian and

vehicular scale. A range of scales will also create a sense of movement at the point of entry. Monuments and signs must be located a certain distance away from a street intersection and should not create any sight visibility restrictions.

5. Monument and sign design should embody elements of form and detail, which represent and identify the neighborhood. The monument or sign should make a reference to the character of the shared vision of the district it serves.

6. All entry monuments or signs should fit comfortably into the family of existing gateway monuments in Stamford.

B. Commercial District Gateway Markers

Gateway markers may be used to define a commercial district. They are recommended only where a coordinated district plan includes markers as an important element to be unified with the overall district design.

Guidelines

The site and surrounding elements of markers are important. Lighting, planting, and signs related to the markers should be carefully designed to reinforce the gateway. The design of the markers should be coordinated with the materials and details of other elements in the district and should embody the characteristics that identify the area.

1. Scale and proportion are critical to the design of the gateway. The scale of the markers should relate to street width and the size of the buildings nearby and must be effective at the pedestrian and vehicular scale, meaning they must be attractive and interesting from the street and sidewalk.

2. Entry markers must not interfere with driver sight lines at corners.

3. Some districts may have a primary gateway and secondary points of entry. A hierarchy of gateways should be developed if secondary entries are to receive markers.

C. Walls and Screens

Walls and screens may be included in a streetscape to direct or screen a view or to provide changes of grade. The height and material selected should relate to building architecture and the character of the district. Walls and screens can be important in creating a continuous sidewalk edge that unifies the street space.

D. Seating

Seating may be provided when space allows for a clear pedestrian walking zone and separate seating areas. Seating expands opportunities for people to use the street, especially in commercial streetscapes. Seating may be provided by benches, planter walls, edges, steps, or moveable chairs. The Downtown standard is Victor Stanley model CR-96, cast ductile iron.

Guidelines

1. Seating surfaces should be 16 to 18 inches high and should have a minimum depth of 16 inches for seats without backs, 14 inches for seats with backs.

2. Walls, ledges, and steps that are available for seating should be between 12 and 20 inches high and 16 inches wide wherever possible. Walls used for seating on both sides should be a minimum of 30 inches wide.

3. Seating should be durable and comfortable. Avoid sharp edges and poorly designed fabricated furniture. Metal and wood are the preferred materials.

4. Seating design should complement the style of the surrounding architecture and other furnishings.

5. Except for moveable chairs, seating should be secured

permanently to paved surfaces for safety and to avoid vandalism.

6. Seating should not interfere with plant materials or pedestrian circulation and should be placed for psychological comfort.

7. Comfortable seating should provide a sense of having protection from behind and something interesting to look at, such as a scenic view, shop fronts or pedestrians.

E. Tree Grates

Tree grates are an attractive way to protect trees planted in paved areas. Other options such as modular blocks, brick pavers, flagstone, and ground covers may be used upon approval of the Office of Operations.

Guidelines

Tree grates are the recommended method for tree planting in paved areas. Contact the Land Use Bureau for approval of Tree Grates.

1. Open tree grates should be designed to meet the planting area. Minimum tree planting areas should conform to architectural design standards. Gate openings should be no more that ¼ inch in width. The size and shape of tree grates should relate to the paving pattern. They should be designed to allow for tree trunk growth, constructed of ductile iron, and unpainted or painted a dark color with a durable, factory applied finish.

2. Irrigation systems within grates are preferred, but dry wells may be allowed with a written maintenance agreements from the owners. The irrigation system should be on a zone separate from all other landscape zones and should be reviewed by the Tree Warden.

3. If string lights are anticipated in the trees, electrical outlets should be provided in the tree grate area. If up lighting is desired, then the designer must select a tree grate to support the light.

F. Fencing & Railings

Fencing within a commercial streetscape can be provided to enhance a neighborhood characteristic, while in residential districts it helps create a definition of the front yard. Railings may be necessary as a safety feature or as a functional support rail (leaning rail) for people to lean against. Railings and fences can help define the street space.

Guidelines

Fences and railings should have an ornamental character as well as utilitarian function. Where railings or fences in a particular neighborhood or district contribute to the overall image of the area, try to use the same or similar design details to reinforce that character.

1. Fences and railings must not interfere with pedestrian safety by blocking access from the street to the sidewalk.

2. In certain situations a railing is required to protect the public against potentially hazardous grade changes. Pedestrian safety railings at grade changes shall meet AASHTO standards. For more information contact the City Engineer.

3. Fences and railings should be between 32 inches and 48 inches tall, except railings on bike routes, which must be 54 inches tall to meet AASHTO standards.

G. Trash Receptacles

Trash receptacles should be easily accessible for pedestrians and trash collection. Their design should relate to other site furnishings as well as building architecture. They must be carefully placed to be unobtrusive yet effective.

Guidelines

Trash receptacles should be designed to fit anticipated use and frequency of maintenance. They should be firmly attached to paving when necessary to avoid vandalism. Covered tops and sealed bottoms should be included to keep the contents dry at all times.

Trash receptacles should be designed in two pieces. The inner container should ensure easy trash pickup and removal and an outer shell should blend aesthetically with the other streetscape elements. They should be conveniently placed near benches, bus stops and other activity nodes, and arranged with other streetscape elements into functional compositions. They should not be placed directly adjacent to benches. The Downtown standard is Victor Stanley model S-42, 36-gallon capacity with metal liner, VS bronze color.

H. Bollards

Bollards are generally used to create a low barrier that separates auto and pedestrian traffic, highlight, protect a special feature, emphasize the historical character of the area or direct circulation patterns.

Guidelines

Select a bollard design that is architecturally and aesthetically appropriate to the area and other streetscape elements. Bollards can be used to provide low-level lighting to pedestrian paths.

1. Bollards should be between 28 and 42 inches high.

2. Bollards should be set a minimum of 18” from curb face to face of bollard.

3. Clearance between bollards or between bollard and any other structure or pole must be at least 36 inches.

4. Bollards may be chained or cabled together if provided with attachments as an integral part of the design.

5. Standard pipe filled with concrete is not acceptable in pedestrian locations.

6. Utilize removable bollards where service vehicles need periodic access.

I. Planting Pots and Planters

Planting pots provide an added dimension and color to streetscape planting. They also direct pedestrian traffic, create focal points, and provide pedestrian resting areas. Large pots are preferred instead of fixed planter boxes because of potential conflicts with vehicles and maintenance. The Downtown standard is Wausau Tile modal #TF4230, round, cast concrete with fluted sides.

Guidelines

1. Planting pots should be planted with annual flowers or with ground covers. Pots should occupy a surface area of at least four square feet and should not block other elements such as streets, signs, meters, or streetlights.

2. If planter boxes are used, trees or any woody shrubs should not be planted in them. Their survival rate is generally very low because the roots often freeze in the winter. Only annual flowers or groundcovers should be planted in boxes.

Planters that are to be used for seating should be between 12 and 20 inches in height, with a rim of at least 8 inches in width, wider if seating is intended on the edge. Plants materials should not interfere with the seating. Provisions must be made for ensuring adequate watering and drainage. Staining of paving from planter drains should be considered in planter location.

J. Newspaper Racks

Appropriately designed newspaper racks should serve the public without compromising pedestrian circulation and the appearance of the street.

Guidelines

1. Cluster newspaper racks together wherever possible. Screening should also be considered to minimize views of the racks with other elements to create an organized streetscape. Newspaper racks must be bolted in place.

2. Racks should be painted a neutral background color so that they do not stand out.

3. Racks should be placed at least 2 ½ feet from the curb face, making sure that there is adequate width on the sidewalk between racks and adjacent buildings. If possible, place racks against the building wall and leave the rest of the sidewalk clear for pedestrians.

4. Racks should be placed as close as possible to pedestrian activity nodes. They shall not be located where they will obstruct the view of drivers at intersections or block views of business displays or signs. Racks shall not be chained to poles or placed in areas that obstruct pedestrian circulation. At intersections, no racks shall be placed within the curb returns.

K. Bicycle Racks & Lockers

There are two types of parking facilities for bicycles. These are bicycle racks and bicycle lockers. Bicycle racks should be provided within commercial streetscapes to encourage bicycle use. Bicycle lockers should be provided at major generators such as transportation centers, retail centers and commercial buildings.

Guidelines

1. Avoid placing bicycle racks or lockers in areas where they may endanger the safety of pedestrians or cyclists.

2. Select racks and lockers that are permanently mounted structures, designed in a simple style, and easy to use. The rack must allow the frame and both wheels to be locked. These racks are typically inverted “U” type construction. Racks that

allow for the locking of only one wheel are not acceptable.

3. Place bicycle racks where they are near entrances or gathering places. Avoid placement that creates a tripping hazard. Locate the bicycle rack so that they do not block bus stops, sidewalks, pedestrian crossings and other facilities. If possible, place the racks where the parked bicycles will be visible from inside the adjacent building. Ideally, bicycle parking should be more convenient than automobile parking.

4. Bicycle lockers are intended for long-term storage. Bicycle lockers provide protection for the bike from theft, the elements and security for the bicycle components such as the lights, pump and other bicycle gear.

L. Kiosks

Kiosks are intended to serve as information points, to direct pedestrian traffic and to organize outdoor spaces. They should be used sparingly and only when needed to impart community information.

Guidelines

Kiosks should be carefully positioned in conjunction with other elements of street furniture such as benches, lighting, and landscaping. They should be focal points in open areas, and may be combined with other elements like business directories, telephones, mailboxes, and newspaper racks. The design should be compatible with and complementary to the surrounding architecture and other furnishings.

1. Kiosks should facilitate the posting of notices and their removal and cleaning.

2. Kiosks should be easily accessible from all sides and adequately illuminated.

3. Kiosk designs require review by the Office of Operations, and if Downtown, also by the DSSD.

4. Kiosks should be designed so that they are easy to maintain.

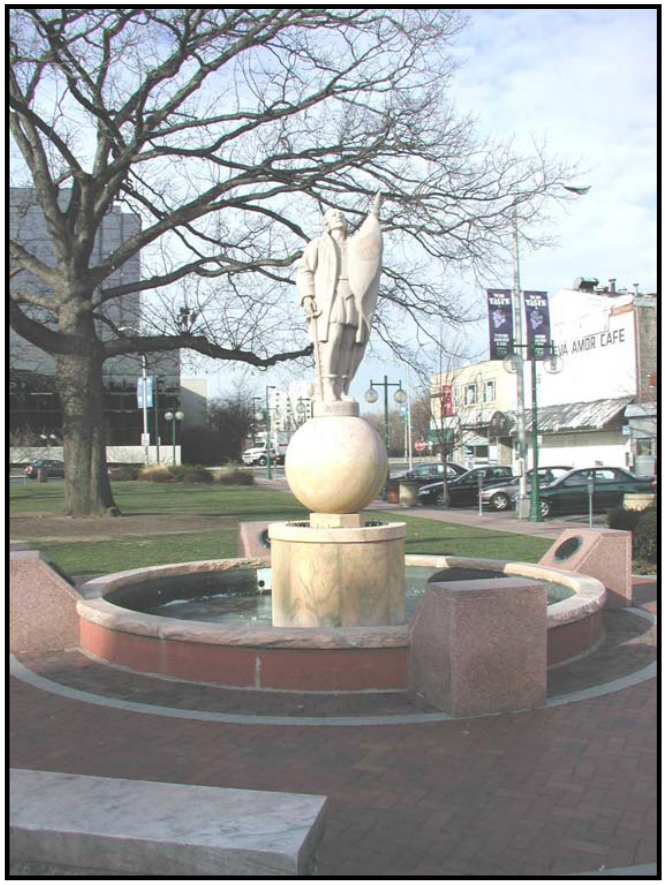
M. Fountains
A fountain provides moving water that masks noise, cools and humidifies the air, increasing comfort and beauty in a space. Fountains can also be used to define space or provide an interesting focal point.

Guidelines
1. The rim around the fountain or pool should be between 12 and 20 inches in height and 16 inches in width, if used for seating.

2. Fountain design should respond to wind direction, building location, pedestrian circulation, potential ice build-up in winter and the appearance of the fountain and its basin when not operating.

3. Fountains should include a recirculating pump for conservation purposes.

4. Maintenance is crucial to the success of all fountains. The owner should be committed to maintenance prior to beginning design.



N. Parking Meters

The location of parking stalls and meters should be coordinated to minimize clutter. Meters should be aligned with other furnishings where possible. They should be placed adjacent to the pavement marking for the parking stall guidelines.

Parking meters should be located 18 inches behind the curb, twenty-two feet on center or as approved, and one per stall. Parking meters shall be placed as to create a minimum number of pipes installed. Place two-meter heads on one pole where practical. Parking meters shall be P.O.M. iron housing and vaults, with electronic APM-E type mechanism. Mechanisms shall have card slots for future use with smart cards. Parking meter supports shall be two inch galvanized steel pipe and shall have escutcheons at the base. Decorative sleeves and bases need approval from the Director of Operations.

O. Utilities

Coordinate the location of all proposed utility boxes and meters, including irrigation controls, with the proposed locations of site furnishings, trees, signs and lighting. Boxes and meters should be located 2 ½ feet from the curb face and should not be interfering with pedestrian movement.

There are several kinds of utility cabinets that may need to be accommodated, including cabinets for electric meters, water meters, water/irrigation controllers, backflow preventers, traffic signal switching equipment, and Public Service Company switching gear and transformers.

Guidelines

1. Utilities should not be located under walkways or where they might interfere with or preclude street trees.

2. Traffic signal switching gear cabinets are of a standard design. They must be located near the signals they control, with care not to block pedestrian access at the street corner or in walkway zones.

3. Electric meters, water meters, and irrigation controllers can be handled individually or consolidated into one cabinet. Public Service Company transformer vaults and switch cabinets are larger and should be located as inconspicuously as possible.

4. Any cabinet must be accessible, with room to swing the doors open and space to get the necessary equipment in position for service. Check with the appropriate utility for specific access requirements.

5. Before finalizing the design of any streetscape or utility project, existing overhead and underground utilities must be located and sized with the assistance of the various city departments and utility agencies. Contact and sign-off from all utility companies is required prior to final design.

P. Bus Stops

Standard bus shelters are placed by The Transit District at stops where there is a clear need. If a different type of shelter is desired, it must be approved by The Transit District. Any additional costs and maintenance become the responsibility of the adjacent property owner, maintenance district or business improvement district.

Benches are not placed by The Transit District. Neither the City nor The Transit District normally makes funds available to purchase or install benches. Call The Transit District for more information on bus shelter placement.

Q. Public Art

Public art should capture and reinforce the unique character of a place. It can interpret the community by revealing its culture, history, or character. Art that invites participation and interaction, and that adds local meaning is preferred.

Guidelines

Art should add beauty and interest. It may feature humor, water, seating, and opportunities for children to play. The setting for public art is significant to the experience of the art itself. The place's impact on the art may be as great as the art's impact on the place. The two together enrich the place and make it memorable.

1. When considering placement of freestanding pieces of art or sculpture, avoid locations where it would compete with a storefront, obstruct a pedestrian path, create a traffic hazard, or compete with another sculpture.

2. Murals or bas-relief may be used to enliven otherwise blank walls.

3. Construct public art using durable materials and finishes such as stone or metal.

V. Lighting

Lighting can play an important role in the character, function, and security of a streetscape. Scale, style, lighting effect, cost and maintenance affect fixture selection. Street lighting is owned and maintained by the City of Stamford.

A. Pedestrian-Lighting

Pedestrian lighting consists of fixtures less than 14 feet high and is not provided by Connecticut Light & Power. It is generally not recommended in front of residences except at bus stops or where a comprehensive neighborhood or district plan calls for it. Various programs in the city may provide pedestrian lighting through a grant to a neighborhood association..

Pedestrian-scaled light posts and luminaries play a vital role in developing the unique character of commercial districts throughout the City. Pedestrian lights illuminate the sidewalk and provide a feeling of security at night. Fixtures should relate to the image and history of the individual area and to fixtures in similar districts in the City.

Spacing and Location

Locate lights as part of an overall system that organizes other street elements such as trees, benches, and paving.

1. Place lights at least 2 feet from the back of the curb to allow room for car bumpers and door swings. Align with street trees where possible.

2. Place lights at least 5 feet from the edge of the curb transition point nearest the driveway, curb cut, or alley and at least 20 feet from the extended flow line of the nearest intersection.

3. Space lights at least 50 feet apart, 60 to 115 feet is preferable in most cases to provide a pleasing effect and to ensure room for street trees and other furnishings. Closer spacing can also cause uncomfortable glare.

4. Install luminaries a maximum of 14 feet and a minimum of 10 feet above sidewalks to avoid glare into upper windows. Avoid placing lights directly in front of residences to avoid disturbing inhabitants.

Style and Materials
Select lighting styles to integrate with the architectural or historical character of the area.

1. Victorian type luminaries are recommended for most commercial streets in order to maintain consistency throughout the City. Avoid selecting different types of lighting for small projects. (HADCO model # R5IBANNIATRR or equivalent)

2. Globe type luminaries are reserved for parks and parkways exclusively.

3. Poles should be well articulated with enough detail to create a range of scale for the pedestrian whether near or far away. Flutes, moldings, or other traditional details are strongly preferred. (HADCO model P-2063-12 FT or equivalent)

4. Alternative fixtures that reflect local architectural or historical character are subject to approval by the Director of Operations.

5. Single luminaries are highly preferred over multiples, which should be considered only for special locations such as gateways or entry points of a district.

6. Pole and base are to be either black or green.

7. Luminaries are to be translucent or glare-free, utilizing poly-acrylic lenses, with an internal full top reflector.

8. Luminaries used in single or multiple pedestrian light fixtures are to use 85 to165 watt inductive lamps to provide consistent light color citywide.

9. Multiple luminaries should not be more than 85 watts in each luminary.

B. Street Lighting
Street lighting plays an important role in the quality and safety of our streets, especially at night. Lighting illumination levels are based on two criteria: the uses along the street (such as commercial or residential) and the volume of automobile traffic. The City of Stamford and Connecticut Light & Power (CL&P) have guidelines for spacing, location, style, and color. Once a site plan has been developed including street trees, pedestrian lighting, and furnishings, the plan should be submitted first to the City of Stamford and then to Connecticut Lighting & Power. CL&P review should include transformer, cabinet, and meter locations. For questions regarding specific design issues such as pole spacing and wattage, contact the City's street lighting administrative engineer.

Spacing and Location
Locate streetlights as part of an overall system including cabinets, transformers, etc.

1. Place lights at least 2 feet from the face of the curb to allow room for car bumpers and door swings.

2. Place lights at least 5 feet from the edge of the curb transition point nearest the driveway, curb cut or alley. At signalized intersections, lights are generally mounted on the signal poles. Where signals do not occur, locate lights near the intersection.

3. Spacing for commercial streets will range from 100 to 150 feet. For residential streets, 150 to 170 feet is appropriate and for special districts, such as downtown, consult the City of Stamford street lighting design engineer.

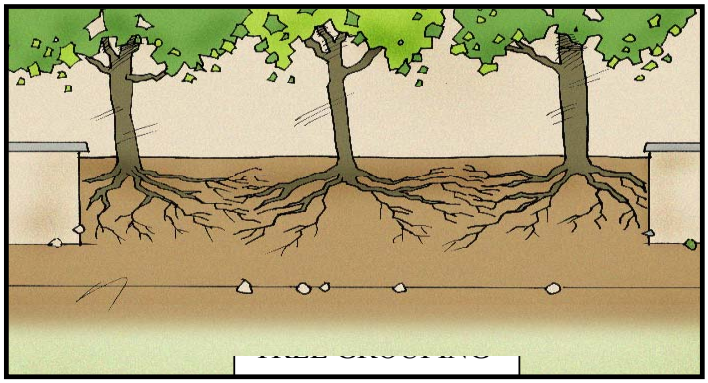
C. Special Effect Lighting
Special effect lighting may include string lighting in trees or up lighting in the tree grate or planting bed. If string lighting is desired, electrical outlets should be included adjacent to each street tree.

If up lighting is desired around trees, tree grates should be used with cutouts for the light. Up lighting should be selected to blend with plantings, be waterproof and directional. Up lighting should use fixtures, which shield the light source from passing motorists.

VI. Landscaping

A. Site Design Criteria

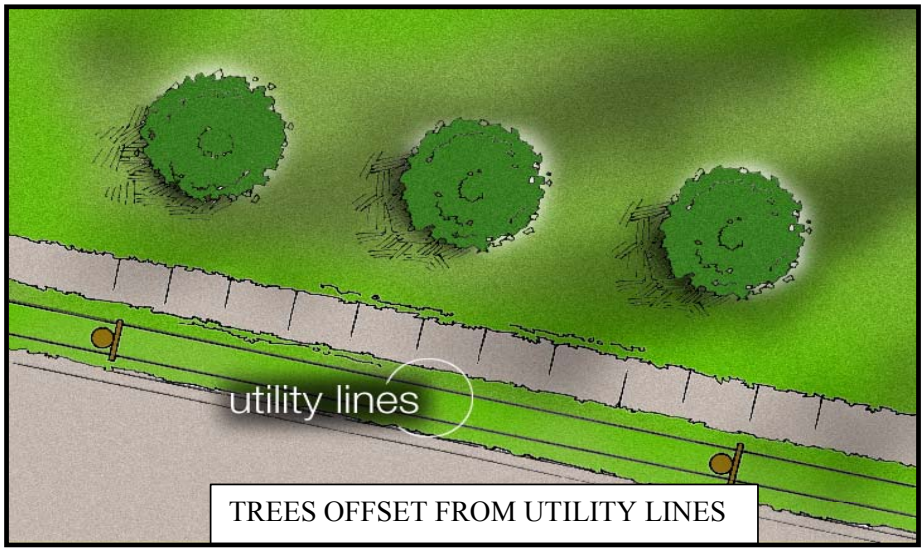
There are specific threshold issues to be considered in the preliminary determination of site-design criteria pertaining to the selection and planting of trees. First and foremost is the available space, particularly the space dedicated to the Amenity Zone component with a minimum of three feet (width from curb to the walkway area) being the enabling threshold for the addition of trees to the streetscape. Other considerations include location and proximity to the underground utilities; presence of on-street parking and orientation of parking; sight lines; maintenance responsibilities (public or private); and long-term expectations.



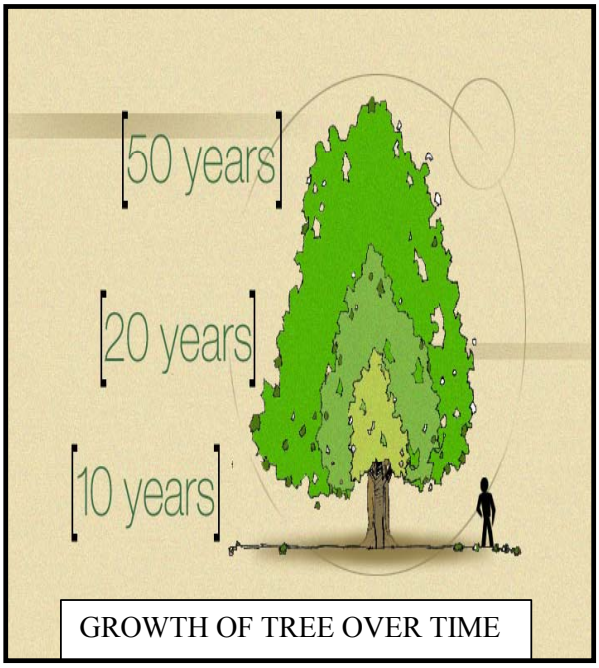
1. Purpose of Planting

If the primary purpose of a particular planting is the providing of an opportunity for a tree species to reach its full potential in terms of growth and longevity, then maximum soil volume and protection from mechanical injury are key design considerations.

Plantings intended for maximum growth and longevity of the individual trees, sited for the greatest potential for success, should be contained within a tree lawn area, and located on the building side of sidewalks when feasible. Trees should be planted with adequate spacing to allow for maximum crown development, symmetry, and full height.



If the primary purpose is to have the tree plantings be amenities to residents and pedestrians by improving the aesthetics of the street, then they may be appropriately viewed as a system, rather than as individuals.



GROWTH OF TREE OVER TIME

Accordingly, the trees become visual connectors, unifiers, and buffers. They may be planted between the curb line and the sidewalk, and they may be contained within either a tree lawn or a tree pit depending upon the width of the Amenity Zone and the presence or absence of on-street parking.

2. Available Growing Space
The space available for tree growth results from a combination of factors including available soil volume, distance from the curb line, proximity of buildings and established existing trees, presence of overhead wires and underground utilities, and proximity to intersections, curb cuts, light poles, and signs. It is important to note that it is the height and width of the mature tree that is the determining factor in calculating growing space requirements.

Trees may be grouped into two categories depending upon the available growing space. **Category I** trees include medium to large trees suitable for locations where adequate soil volumes can be provided (minimum of 1200 cubic feet of well-drained soil), overhead wires are absent, and setbacks from intersections, curb cuts, light poles, and signs can be maintained. **Category II** trees fit more appropriately into restricted growing areas. It is important to recognize that some sites simply do not have sufficient growing space available for the planting of trees.

Minimal spacing for tree plantings range from 35'to55' for Category I trees and 15'to 25' for Category II trees. No plantings closer than 20 feet to light poles and signs, 30' from intersections, 10' from driveways and other curb cuts, 6' from hydrants, and no closer that 8 feet to the front face of the buildings.

3. Overhead and Underground Utilities
The presence of overhead utility lines restricts the choice of suitable trees to those that will reach heights of 35 feet or less at maturity. The presence of underground utilities restricts placement as tree roots may potentially damage piping and conduits, or interfere with maintenance and replacement as necessary.

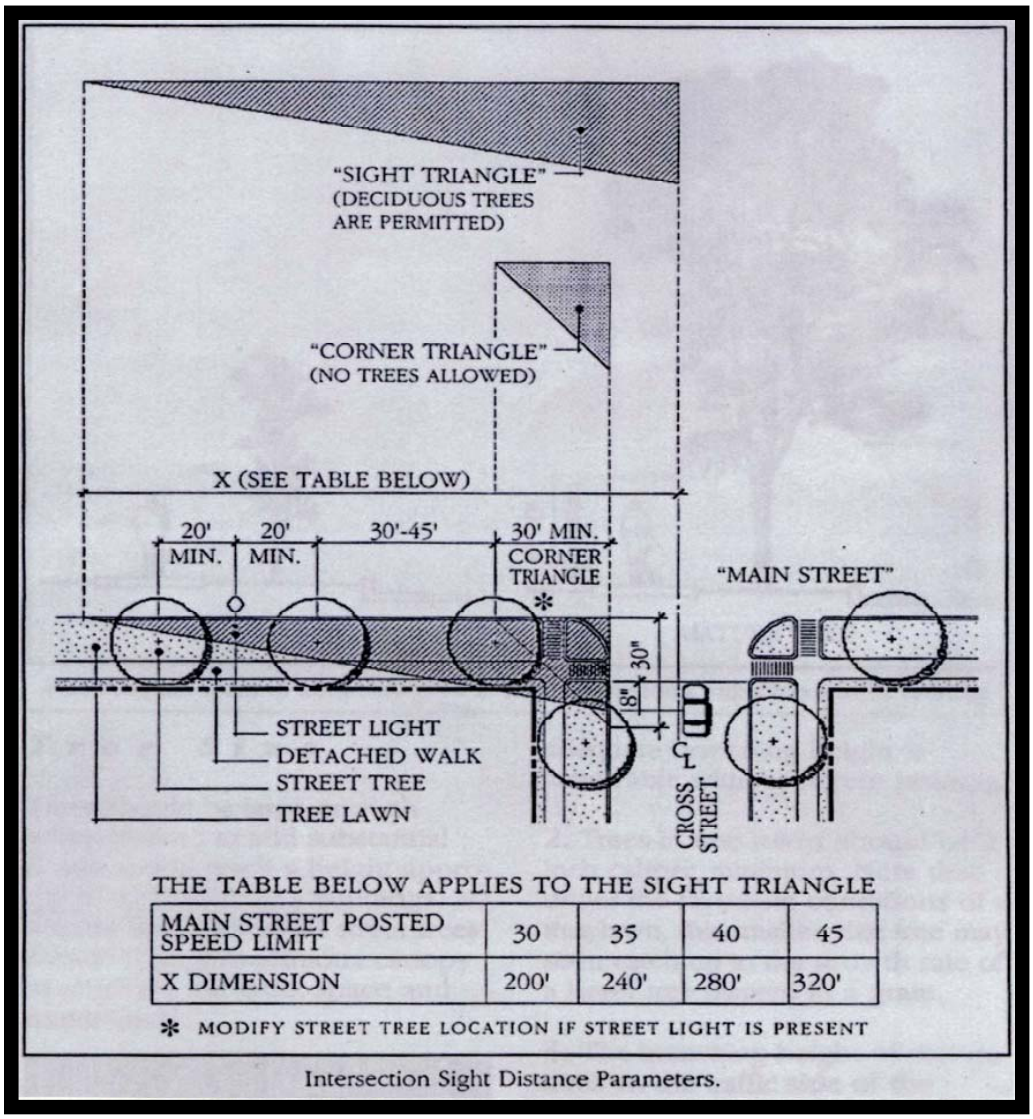
4. Presence and Orientation of On-Street Parking
The presence of on-street parking impacts tree placement and planting specifications. Trees must be placed far enough back from the curb to remain free from obstructing the opening of car doors and/or physical damage to trunks and lower limbs.

Stable surface materials, granite blocks or tree grates, may be necessary to provide a stable walking surface between the parked car and sidewalk and to prevent soil compaction.

Bollards and chain on the street side of the planting pit help reduce mechanical injury and direct pedestrians around planting areas.

Planted "peninsulas" within the parking lane are encouraged as a means of promoting safety and enhancing aesthetics.

5. Sight Lines
Trees should be selected and placed in a manner that does not interfere with vehicular and pedestrian safety. Considerations include proximity to intersections, corners, and curb cuts; proximity to traffic signals and signs; presence on ramps, bus stops, benches, and shelters; proximity to lighting.



Intersection Sight Distance Parameters.

Trees should not be planted closer than 30 feet from the curb face at intersections and street corners within the corner triangle. Review with the Transportation Division to determine specific requirements.

Within the Sight Triangle, no non-plant materials over 32 inches or plant materials over 6 inches high are permitted, except for deciduous trees, traffic control, and lighting devices. Refer to the Intersection Sight Distance Parameters diagram.

Maintain minimum sight triangle and corner triangle distances for safe view of oncoming traffic and pedestrians.

Trees must not interfere with visibility of traffic control devices, especially at intersections. Review with the Transportation Division to determine specific requirements.

At alleys, trees should not be located closer than 10 feet from the projected alley property line.

Trees should be located a minimum of 30 inches from the face of the curb.

For commercial and residential streets, the minimum distance from streetlights is 20 feet for most trees.

At all locations, trees should be adjusted slightly to ensure the driver's visibility of regulatory signs.

Create a clear walking zone between trees and buildings. In downtown, 10 feet should be the clear minimum. Distances as low as 5 feet may be possible where space is very limited, however few tree species will be appropriate in such a small area. Trees must be placed far enough away from buildings to allow them to grow without excessive pruning.

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B. DETAILS

1. Tree Planters/Tree Pits
The urban planting area includes the area containing backfill suitable for tree growth and the opening within which the tree is planted. Minimum recommended tree planting area with prepared planting backfill is 5' X 15' (225 square feet) with a 5' X 5' pavement opening (25 square feet) or some other combination of dimensions equaling the square footage recommendations. Other combinations of planting area, pavement opening, and tree pit volume require review by staff.

2. Surface Treatments for Pavement Openings
In areas where maintenance is the responsibility of the City, the surface of pavement openings shall be 4"X 4"X4" granite block with 3/8" wide sand-filled joints. A two-foot square opening, mulched with shredded bark not to exceed a depth of 3 inches, shall be provided at the base of the tree.

In areas where maintenance is the responsibility of a private entity through a long-term maintenance agreement between the private party and the City, tree grates may be used as long as the maintenance responsibilities include regular inspection and enlargement of the tree grate as needed to accommodate the growth of the tree.

3. Planting backfill
Tree planting areas must be free draining, and must provide underdrainage connected to the nearest permanent drainage structure as necessary.

Recommended backfill material shall be composed of 40 percent coarse sand, 50 percent sandy loam topsoil, and 10 percent compost. Use of so-called structural fill may be encouraged in certain circumstances upon consultation with staff.

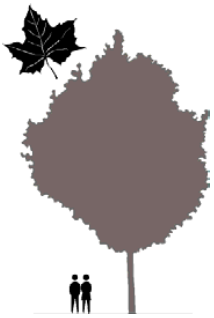
4. Tree Sizes
In residential settings, all trees must be a minimum 2-1/2" to 3" caliper size class. In urban settings, the next larger size class shall be utilized. In all plantings, individual trees must have a single trunk with a minimum lowest branching height of 7 feet.

5. Maintenance Responsibilities
Maintenance responsibilities include routine inspection and pruning; care of tree lawns to encourage healthy turf involving mowing, irrigation, and fertilization as necessary; inspection of tree grates with resetting as needed to prevent tripping hazards and enlargement of tree openings as necessary.

6. Long Term Expectations
Tree selection and placement is influenced by the long-term design expectations for the site. Trees planted to reach maturity require consideration of the space available for root growth (soil volume), and space available for the spread of the crown without the need for extensive pruning.

E. Tree Selection

1. Category I
Trees suitable for sites where overhead wires are not present and ample growing space is available.



Emerald Queen Norway Maple
(Acer platanoides 'Emerald Queen')

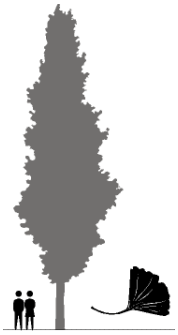
The Emerald Queen Norway maple grows to about 50' high and 40' wide at landscape maturity. The tree will be roughly 25' high and 20' wide when it is about 20 years old. The tree grows well in sun or shade and has a wide tolerance of acid to alkaline soils. It is therefore often planted on city streets and in public parks.

Red Maple
(Acer rubrum)

At maturity, these trees can be as large as 50'-70' tall and 15'-20' wide. The red maple requires moist soil and the thin bark of the young tree is easily damaged.

Green Ash
(Fraxinus pennsylvanica)

The green ash grows to 45'-55' tall and 35'-45' wide.



Ginkgo
(Ginkgo bilba)

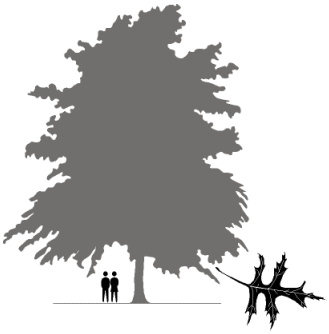
The Ginkgo can grow as large as 55'-65' tall and 25'-30' wide.

Honeylocust
(Gleditsia tricanthos inermis)

The honeylocust grows to about 45’ high and 35’ wide at landscape maturity. The tree grows at the rate of roughly 2’ a year for the first 10 years and prefers full sun.

London Planetree
(Platanus acerifolia)

The London planetree grows to 70’-80’ tall and 55’-65’ wide.

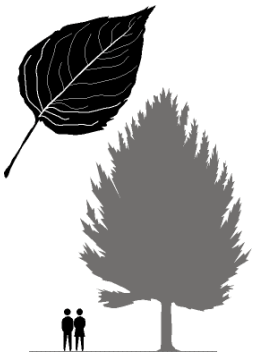


Pin Oak
(Quercus palustris)

The pin oak grows to 55’-75’ tall and 40’-55’ wide. The tree requires full sun and acid soil that is free of limestone.

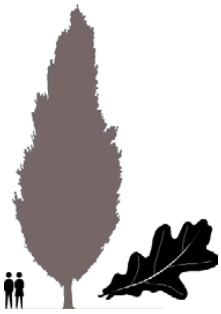
Sweetgum
(Liquidambar styraciflua)

The Sweetgum can grow to 50’-75’ high and 40’-65’ wide. The tree prefers full sun and acid soil.



Callery Pear
(Pyrus calleryana)

The callery pear grows to 35’-45’ tall and 25’35’ wide.



English Oak
(Quercus robur)

The English oak grows to 50’-60’ tall and 15’-20’ wide.

Red Oak
(Quercus rubra)

The red oak grows to 60'-80' tall and 40'-65' wide. The tree prefers full sun and well-drained, acid soil.

Littleleaf Linden
(Tilia cordata)

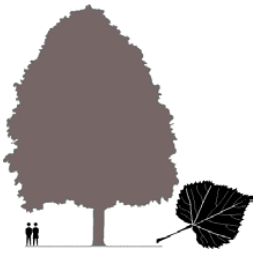
The littleleaf linden can grow as large as 60'-80' tall and 35'-55' wide. The tree is somewhat sensitive to drought and salt.

Japanese Zelkova
(Zelkova serrata)

The Japanese zelkova grows to 50'-60' tall and 50'-60' wide.

Sophora / Pagodatree / Scholartree
(Styphnolobium japonicum)

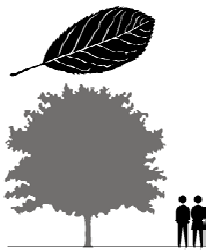
The sophora grows to 40'-70' high and 40'-70' wide at landscape maturity. The tree requires full sun.



Silver Linden
(Tilia tomentosa)

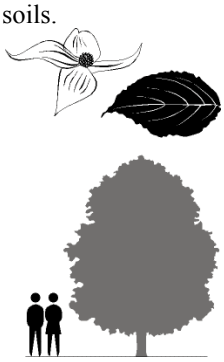
The silver linden can grow as large as 60'-70' tall and 45'-55' wide. The tree is somewhat sensitive to salt.

2. Category II
Trees suitable for sites with overhead wires present and restricted growing space.



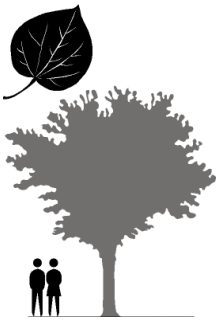
Shadbush/Serviceberry
(Amelanchier canadensis)

The shadbush/serviceberry only grows to 15'-30' high and 15'-25' wide. Therefore, it is ideal for planting under power lines, if the conditions are right for it. The tree is somewhat sensitive to drought, soil compaction, salt, and air pollutants. It recovers slowly after transplanting and prefers well-drained, moist, acid soils.



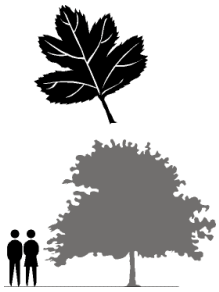
Kousa Dogwood
(Cornus kousa)

The kousa dogwood grows to 20'-30' high and 20-30' wide, making it ideal for planting under power lines as long as the conditions are right for it. The tree is sensitive to soil compaction and drought.



Eastern Redbud
(Cercis Canadensis)

The eastern redbud only grows to 25'-30' high and 25'-35' wide, making it ideal for planting under power lines as long as the conditions are right for it. The tree will maintain its vigor if it is watered when needed and occasionally fertilized.

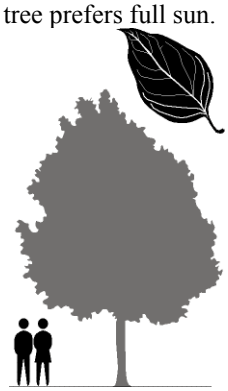


Crimson Cloud English Hawthorn
(Crataegus laevigata 'Crimson Cloud')

The English hawthorn grows to 15'-20' high and 12'-18' wide, making it ideal for planting under power lines as long as the conditions are right for it. The tree prefers full sun.

Winter King Green Hawthorn
(Crataegus viridis 'Winter King')

The Winter King green hawthorn grows to 25'-30' high and 25'-30' wide, making it ideal for planting under power lines as long as the conditions are right for it. The tree prefers full sun.



Japanese Tree Lilac
(Syringa reticulata)

The Japanese tree lilac grows to 20'-30' high and 15'-20' wide. Its small size makes it ideal for planting where there is limited space, such as under utility lines.

Kwanzan Oriental Cherry
(Prunus serrulata 'Kwanzan')

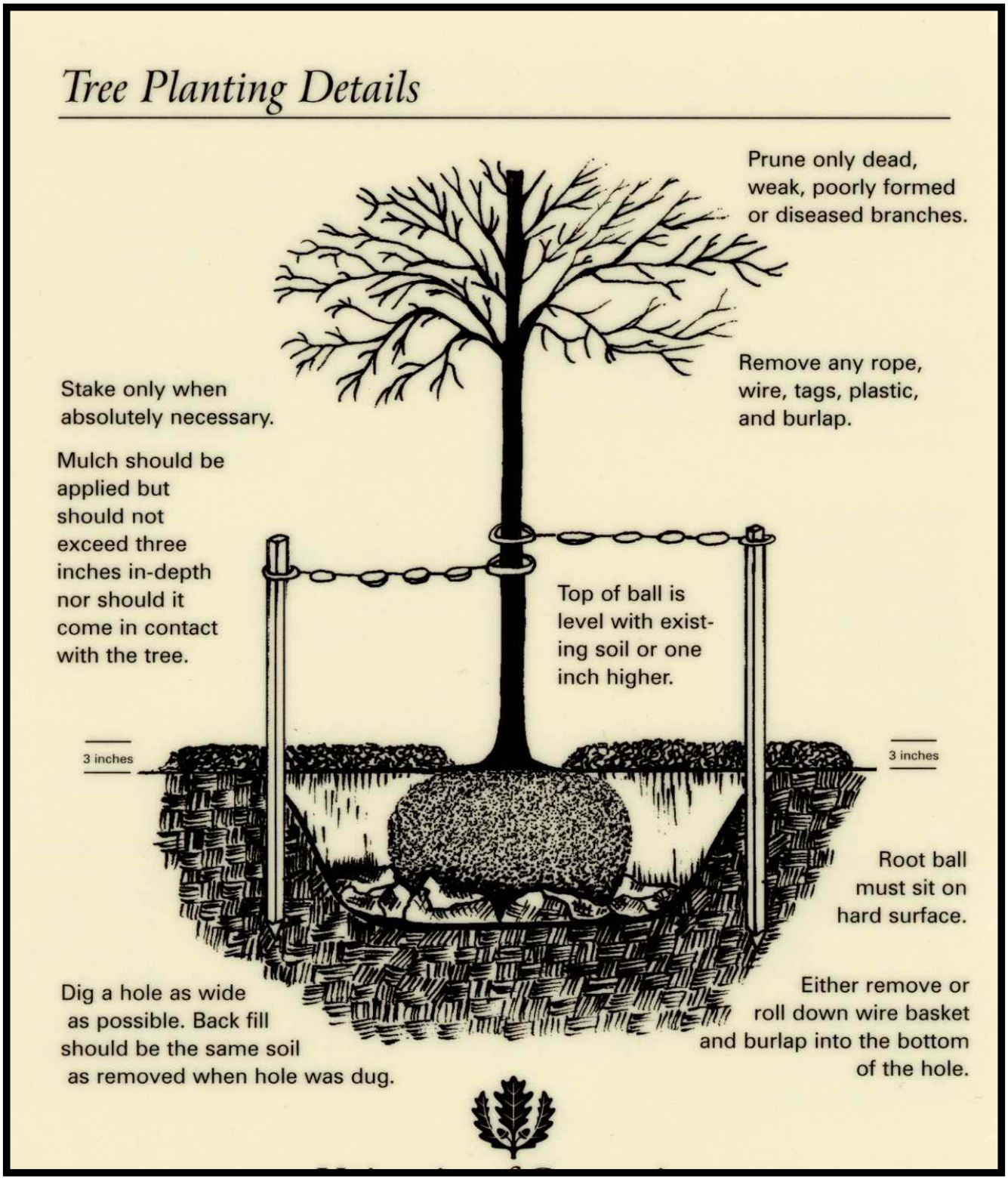
The Kwanzan cherry grows to 25'-35' tall and 20'-25' wide, making it ideal for planting under power lines as long as the conditions are right for it. The tree requires full sun and is moderately sensitive to pollution and soil compaction. It prefers moist soils, but is somewhat drought tolerant.

Yoshino Cherry
(Prunus yedoensis)

The Yoshino cherry grows to about 25' tall and 25' wide, making it ideal for planting under power lines as long as the conditions are right for it. The tree requires full sun and is moderately sensitive to pollution and soil compaction. It prefers moist soils, but is somewhat drought tolerant.

Turkish Filbert/Turkish Hazel
(Corylus colurna)

At maturity, the Turkish filbert will grow to 45'-60' tall and 25'-35' wide. Its excellent formal character makes it ideal for planting along streets. The tree prefers full sun and need to be watered well for the first few summers after it is transplanted. But once it is established, it requires little maintenance.


Tree Planting Details
Prune only dead, weak, poorly formed or diseased branches.
Remove any rope, wire, tags, plastic, and burlap.
Stake only when absolutely necessary.
Mulch should be applied but should not exceed three inches in-depth nor should it come in contact with the tree.
Top of ball is level with existing soil or one inch higher.
3 inches
3 inches
Root ball must sit on hard surface.
Dig a hole as wide as possible. Back fill should be the same soil as removed when hole was dug.
Either remove or roll down wire basket and burlap into the bottom of the hole.

SAMPLE SPECIFICATIONS FOR TREES

Provide healthy, vigorous stock, grown in a recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae and defects such as knots, sun-scald, injuries, abrasions, or disfigurement. Plants shall be nursery grown, with a burlapped root ball (B&B), of first grade quality, conforming to the American Association of Nurserymen Standards (ANSI Z60.1 "American Standard for Nursery Stock") as well as generally accepted best trade practices, and as otherwise specified as follows:

1.Trees should be acquired, when feasible, from nurseries within a radius of 200 miles to Stamford unless otherwise approved.

Trees must fully represent the size category and shall average 2-1/2 inches – 3 inches caliper (suburban) and 3 – 3-1/2" caliper (urban) with straight trunks, balanced tops, and a single leader to a minimum height of at least 7 feet prior to branching unless specified otherwise.

All plant material shall have well finished branch systems together with vigorous fibrous root systems.

All plant material shall be free from all insect pests, plant diseases, disfiguring knots, stubs, sun-scald, abrasions to the bark or any other objectionable disfigurement.

Plants shall not be pruned before delivery.

Clump species, when specified, shall have three or more main stems starting from the ground.

All burlapped root balls shall be compact and tight to the trunk. No broken root balls or root balls with loose trunks will be accepted. All wire baskets must be entirely removed prior to planting.

All trees and shrubs shall be clearly marked or tagged for identification, **including species and variety**, and shall show the date of planting.

All trees and shrubs shall be handled with sufficient care to prevent damage to the root ball, trunk, or branches.

Trees and shrubs shall be protected from desiccation and/or freezing during handling and storage. Planting shall be done according to accepted professional practices, and include but need not be limited to providing adequate space around and under the root ball, and backfilling with suitable prepared planting soil mix where existing soil in planting area is deemed unacceptable.

Burlap shall be untied completely and removed from the upper 1/3 of the root ball. **Wire baskets shall be removed completely, or cut away from the top half of the root ball.**

The root ball shall be positioned so the top of the root collar is at or above the level of surrounding soil. Care shall be taken to insure that the tree is not set too deep.

Watering shall be done during and immediately following planting so as to constitute puddling and draining until the root ball is saturated and settled within the planting hole. A "TREEGATOR" or equivalent shall be provided/installed with each tree at the time of planting.

STAKING AND GUYING **No trees shall be supported with stakes and guy wiring unless otherwise directed.** Stakes, when used, shall be nearly vertical and not pose a hindrance to passersby.

MULCHING - All trees shall be mulched, using a shredded bark mulch to a depth of no more than three inches, and formed for adequate watering. Mulch shall be kept away from the trunk. Mulch shall be organic and free from deleterious materials. It shall be suitable for use as top dressing of trees and shrubs, and shall consist of one of the following materials: shredded hardwood, ground or shredded bark, or wood chips.

"TREEGATORS" – A "Treegator" or equivalent shall be installed at each tree at the time of planting and filled with water to its capacity.

FERTILIZING – All planted trees and shrubs shall be fertilized only as directed.

VII. Maintenance

The property owner is responsible for the proper maintenance of landscaping areas in the right-of-way fronting their property. Maintenance includes mowing; weeding, cleaning, snow shoveling, raking, re-seeding and otherwise repairing all the landscaping and paving materials in the right-of-way including sidewalks and street trees. The only exception to this occurs in the case of designated parkways, where the Parks Department performs landscape maintenance, and downtown where the Downtown Special Service District is responsible for the streetscape.

Landscaping must be maintained continuously. This includes necessary watering, weeding pruning, pest control and replacement of dead or diseased plants. Replacement plants should be the same type as used originally. Replacement time should not exceed one year.

A. Trees, Shrubs and Sod

Proper maintenance can prolong the life and beauty of landscaping. Basic care should include:

1. Maintaining tree spaces and landscaped areas including watering, cleaning, weeding, mulching, mowing, fertilizing and aerating when necessary.

2. Remove grates, paving materials or any other material installed in the tree space when maintenance on the tree or tree roots is necessary, and properly reinstall when finished.

3. Replace grates or paving materials when damaged or destroyed.

4. Property owners are responsible for safely cutting and trimming bushes and trees. Consistent proper maintenance should be maintained adjacent to the City of Stamford right-of-way.

B. Lighting

It is critical that lighting is maintained and that continuous electrical service is provided. The following procedures should be implemented:

1. Maintain lighting control devices including timers, photocells, etc.

2. Replace damaged or missing light poles or parts within 30 days of damage.

3. Replace burned out bulbs or lamps within 10 days of burn out.

4. Perform general maintenance work including regular cleaning and painting when required.

C. Furnishings

Street furnishings must be maintained to remain attractive and functional amenities. Painting, cleaning and repairing will help ensure a more desirable and enduring environment.

D. Sidewalks

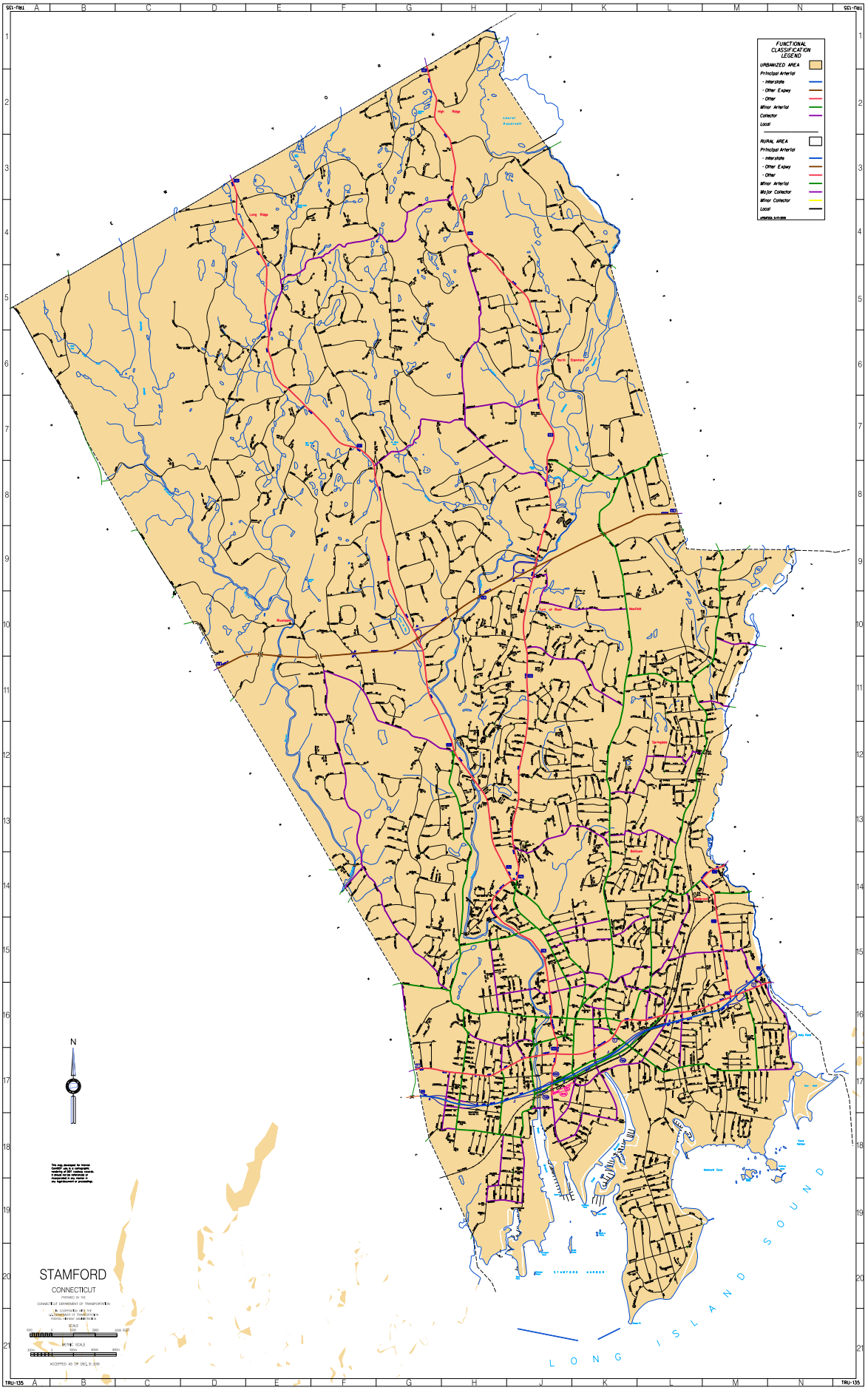
Cracked, broken or missing sidewalk paving is hazardous to public safety. Recommendations for sidewalk upkeep are as follows:

1. Maintain concrete joints and replace sealant when necessary.

2. Remove snow, ice or leaves when necessary.

3. Remove trash on a regular basis.

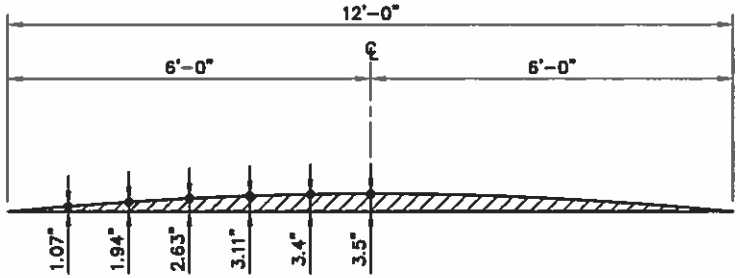
NOTES


FUNCTIONAL CLASSIFICATION LEGEND
URBANIZED AREA
Principal Arterial
- Interstate
- Other Expwy
- Other
Minor Arterial
Collector
Local
RURAL AREA
Principal Arterial
- Interstate
- Other Expwy
- Other
Minor Arterial
Major Collector
Minor Collector
Local
N
STAMFORD
CONNECTICUT
LONG ISLAND SOUND

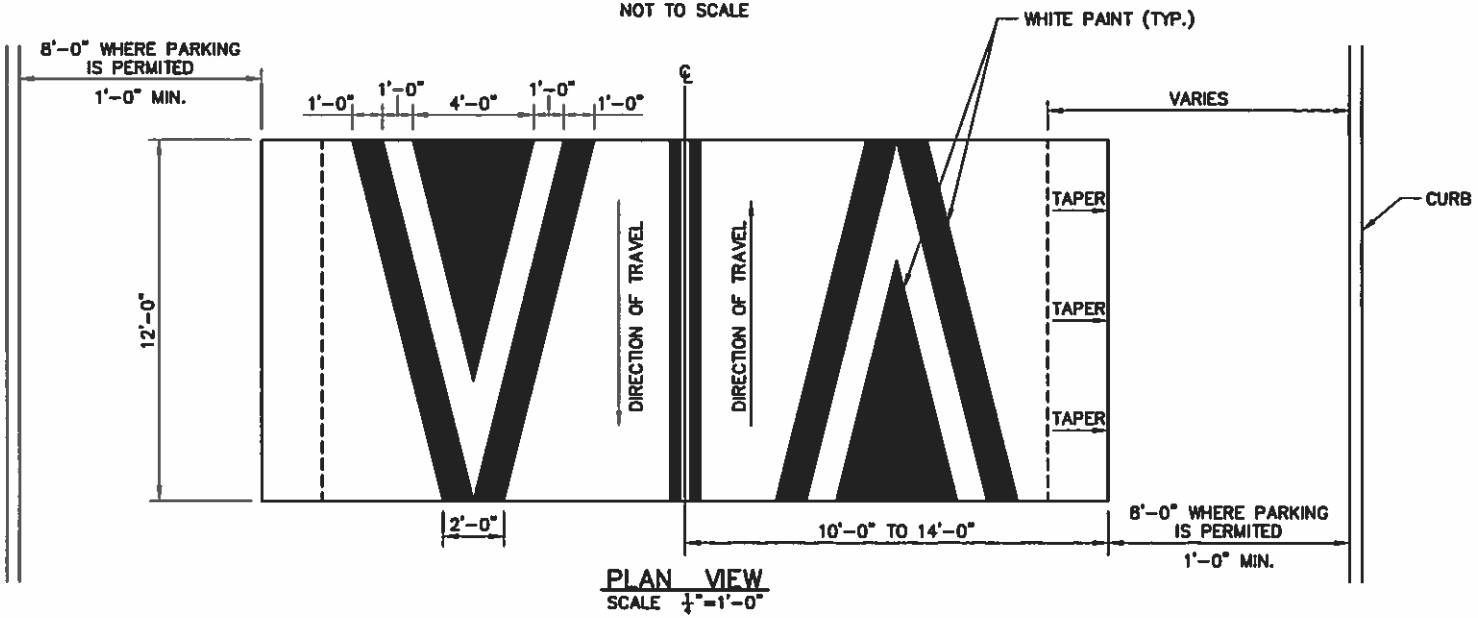
CITY OF NEW HAVEN
DEPARTMENT OF ENGINEERING

RICHARD H. MILLER, P.E., L.S. 9886
CITY ENGINEER

DRIVE: K:\ENGINEER\DWG
FILE: CITISTREETDETAILS\2009 DETAILS
DATE: DEC. 1, 2009
DRAWING NO.: STD-NH-40



CROSS SECTION
NOT TO SCALE



PLAN VIEW
SCALE 1"=1'-0"

SPEED HUMP DETAIL

SCALE: AS NOTED