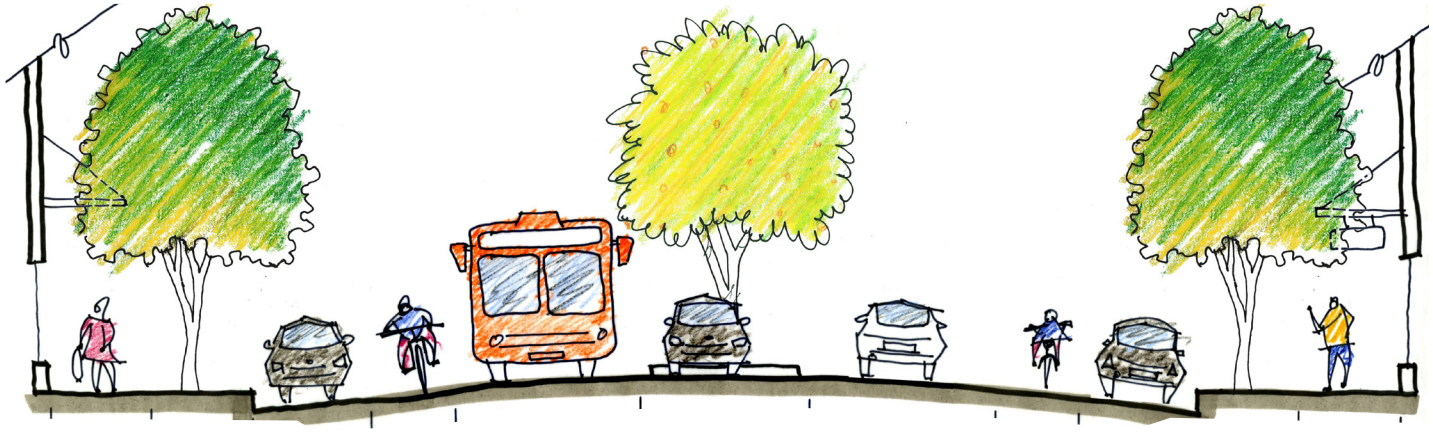
Tacoma Mixed-Use Centers

Complete Streets

Design Guidelines

City of Tacoma

November 17, 2009



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DAVID EVANS AND ASSOCIATES INC.

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Acknowledgements

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City Council Resolution Number 37916 adopted November 17, 2009:

"A RESOLUTION relating to the City's street design; endorsing the creation and ongoing development of Tacoma's Complete Streets Design Guidelines; and directing the City Manager to implement the Mixed-Use Centers Complete Streets Design Guidelines and the Residential Complete Streets Design Guidelines."

Complete Streets Team and Community Participants:

Community Partners:
Pierce Transit
Puget Sound Energy
Tacoma-Pierce County Health Department
Community Stakeholders Focus Group

City Participants:
City Council Environment and Public Works Committee
Planning Commission
Tacoma Area Commission on Disabilities
City Manager's Office
Community and Economic Development Department
Public Works Department
Tacoma Public Utilities
Tacoma Fire Department
Tacoma Police Department

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Chapter 1

Background & Existing Conditions

1.1 Introduction

The purpose of this document is to provide specific guidance for adopting Complete Street policies and practices for Mixed-use Centers within the City of Tacoma. Tacoma defines a Complete Street as a street that safely and comfortably accommodates all users and travel modes, fosters livability, neighborhood identity and character and incorporates features that reduce environmental impacts. The Complete Streets concept focuses not just on individual roads but on changing the decision-making and design process so that all users are routinely considered during the planning, designing, building and operating of all roadways. Not all Complete Streets are the same, but some basic components of a Complete Street may include: sidewalks, bicycle lanes, crosswalks, medians, special transit lanes, raised crosswalks, audible pedestrian signals, curb extensions, trees and landscaping, green stormwater features, and more.

These guidelines are intended to inform and build upon the efforts of Tacoma's Public Works Department to update its Design Manual to be more consistent with the established vision and regulations for Mixed-use Centers. Mixed-use Centers are intended to be "urban villages"—places that are distinctive, attractive, and rich in amenities and that provide more convenience and choice for residents and employees. Developing Complete Streets that accommodate a range of transportation choices while also providing public amenities is a critical component to achieving the City's vision. Complete Streets will not only accommodate all street users safely and comfortably and facilitate transportation choice, they will also improve the experience of street users and foster an active street life—benefits that support the overall prosperity and livability of the Center.

This document is organized into three chapters. Chapter one provides an analysis of Mixed-use Center streets, including existing sections and street features, and seeks to broaden the discussion of how streets should function and accommodate users within Mixed-use Centers. It provides a comparison of street sections based on the Public Works Design Manual, existing street sections, and preferred street sections that incorporate Complete Streets components. Preferred street sections are intended to illustrate how Mixed-use Center streets may be transformed into Complete Streets, thus serving as a guide for revising the

existing street standards found in the Public Works Design Manual. Chapter two discusses the elements of Complete Streets and presents four Complete Street typologies that are intended to respond to differing right-of-way conditions and adjacent land uses within Mixed-use Centers. Each typology includes illustrative street sections and plans that show how Complete Street elements are accommodated within typical rights of way. Chapter 2 also includes a discussion of elements that contribute to or complement the Complete Street concept, including bicycle boulevards, low impact development, and green streets. Chapter three discusses the issues around Complete Street implementation, including key policy considerations. It also provides a feasibility analysis and offers options and recommendations for Complete Street implementation. Included in the Appendices to this document are a table of existing characteristics of Mixed-use Center Pedestrian Streets and a list of supporting Comprehensive Plan policies.

Specifically, this document seeks to:

- Provide an articulated vision of how different street types found in Tacoma can be retrofitted in accordance with goals expressed in the Comprehensive Plan and other city policies
- Provide a set of principles and design guidelines to ensure that future development of public rights-of-way in Tacoma's Mixed-use Centers meets the city's vision for vibrant, healthy urban neighborhoods
- Ensure that Pedestrian Streets meet the spatial and functional needs of all transportation modes,
- Introduce a toolkit of strategies for improving the environmental performance of streets
- Provide a series of illustrative plans and sections that will guide street design in Tacoma's Mixed-use Centers, as well as assist planners, developers and community members in advocating for quality street design
- Provide a feasibility analysis and implementation options

1.1.1 Why Complete Streets?

Currently streets in most U.S. cities, including Tacoma, have been designed primarily to optimize access and capacity for automobiles. The Complete Streets concept and movement recognizes that this approach has limited transportation choices for many people and is not consistent with many contemporary community planning initiatives. While Complete Streets still accommodate the automobile, the emphasis is on providing more transportation choices by designing streets to safely and conveniently accommodate pedestrians, bicyclists, transit and other users. Complete Streets improve mobility and urban livability by providing safe and comfortable transportation choices for people of all ages and abilities and enhancing the public realm with the incorporation of amenities such as vegetation, lighting, and other streetscape improvements. They also play an integral role in addressing a range of issues that many cities, including Tacoma, are currently concerned with, including reducing the use of single occupancy vehicles, improving mobility, reducing greenhouse gas emissions and other air pollutants, enhancing pedestrian safety, promoting active lifestyles and healthy communities, revitalizing business districts, improving water quality and maximizing the use of scarce resources and funds.

Through the process of developing these Guidelines and through other adopted policies, Tacoma has made Complete Streets our own. While Complete Streets is a national movement, each community overlays the concept with its own priorities and values, crafting its own Complete Streets definition. In Tacoma, a Complete Street is a street that safely, comfortably and appropriately accommodates all users and travel modes, fosters livability, neighborhood identity and character and, whenever feasible, incorporates features that reduce environmental impacts.

1.1.2 Other Cities and States

The Complete Streets movement has been gaining momentum over the past 10-15 years. Numerous cities, counties, and states have adopted Complete Streets policies and begun planning, designing, building and operating Complete Streets. A wide range of cities have adopted policies and begun implementing Complete Streets, including Seattle, Pierce County, Charlotte, St. Louis, San Diego, Sacramento, Colorado Springs, and Decatur, GA. Most notably, the City of Portland, OR has developed a series of street design guidelines that embody Complete Streets principles, and has been implementing Complete Streets for a number of years. In addition, the states of Massachusetts, Florida, Illinois, Oregon and California all have some form of Complete Streets policy. More and more communities are recognizing the benefits of Complete Streets and are adopting Complete Streets policies.

1.2 Goals and Guiding Principles for Complete Streets in Tacoma

The following goals and guiding principles provide a framework on which to develop a Complete Streets policy and update existing street standards.

1.2.1 Complete Streets Goals

1. Make transportation mode shift possible by safely and efficiently accommodating bicycles, transit, pedestrians, and automobiles.
2. Design streets to accommodate larger vehicles such as buses, fire service vehicles, and freight delivery trucks without compromising pedestrian and bicycle safety.
3. Support the livability of Mixed-use Centers by providing transportation choices and integrating amenities that create a safe and inviting pedestrian environment.
4. Support the City's efforts to reduce environmental impacts.
5. Allow for design flexibility to better respond to different street functions and neighborhood contexts.
6. Consider all users and transportation modes in the planning, design, building, and operating of streets within Mixed-use Centers.
7. Use infrastructure to create or contribute to neighborhood character and identity.

Portland, OR has seen large increases in bicycle ridership since it began implementing Complete Streets.

1.2.2 *Guiding Principles for Design and Implementation of Complete Streets*

- Complete Streets balance the needs of all users of the public right-of-way by providing safe and convenient travel and access for bicyclists, transit riders, freight and motor vehicle drivers, and people of all ages and abilities.
- Complete Streets contribute to livable Mixed-use Centers by providing public open space that integrates amenities including street trees and landscaping, street and sidewalk lighting, transit facilities, street furniture, water features, and public art work.
- Complete Streets promote neighborhood vitality through infrastructural improvements that attract private investment and encourage pedestrian activity.
- Complete Streets promote active living by providing safe and attractive conditions for walking and biking.
- Complete streets provide safe and comfortable access for persons with disabilities.
- Complete Streets improve local air quality by reducing automobile use (emissions) and incorporating trees and vegetation.
- Complete Streets improve water quality through the integration of low impact development techniques that both reduce stormwater runoff and remove pollutants.
- Complete Streets promote the use of transit by improving the efficiency of transit systems and creating safe and attractive walking environments.
- Complete Streets are implemented through a coordinated approach among city departments, and the leveraging of city assets and programs.
- Complete Streets are enhanced by encouraging adjacent new development to contribute Complete Street amenities through applicable city development standards and bonus programs.
- Complete Streets within Mixed-use Centers are designed to be integrated with a future comprehensive city-wide network of Complete Streets.

1.3 Complete Streets and Existing Plans and Policies

The City of Tacoma has a variety of directives and policies that support the implementation of Complete Streets practices. Table 1.1 lists 29 policies and strategies found in the City's Comprehensive Plan and in the Recommendations of the Green Ribbon Climate Action Task Force. The policies support Complete Streets in various ways. Most commonly, they promote transit-oriented development (TOD), and Low Impact Development (LID), which include practices such as high-density zoning and green building. The policies also promote the planting of street trees and other vegetation, the construction and maintenance of non-motorized transportation facilities, general support for transit, and streetscape improvements. Finally, three policies specifically promote the implementation of Complete Streets practices. The complete language of these policies is included in Appendix A.

In addition to substantial policy support within its Comprehensive Plan, the City has several planning efforts underway that complement the Complete Streets concept.

1.3.1 Streetcar

The City of Tacoma is in the process of planning a streetcar system that will focus on providing connections between Mixed-use Centers and the downtown area. It is anticipated that the streetcar will increase transit options for non-drivers, promote economic development, and contribute to the City's environmental goals by reducing vehicle miles traveled. Numerous potential routes were planned based on historic routes, proximity to designated Mixed-use Centers and other points of interest, and the existing transit system.

Though over ten routes were considered, three routes were preliminarily selected for initial construction: the Sixth Avenue Line (6.32 miles), the Downtown Line (10.36 miles), and the Portland Line (Salishan) (5.12 miles), for a total of 21.9 track miles. All three lines follow historic routes and intersect with transit and non-motorized routes at multiple locations. They run within or proximate to the following four Mixed-use Centers: Sixth Avenue, MLK, Stadium, and Lower Portland.

1.3.2 Non-Motorized Transportation Plan

The City's non-motorized transportation plan emphasizes safety, access and connectivity (the City is currently developing a Mobility Master Plan, which will place a much stronger emphasis on non-motorized transportation than previous plans). Particularly stressed are access to designated centers, transit, ferries, routes to schools and school bus systems. Though multiple trails and bike lanes have already been completed, additional trails and lanes have been planned to achieve greater safety, access and connectivity. Existing non-motorized facilities, including bicycle lanes or multi-use trails, lie within, or are proximate to, the following nine centers:

- Westgate (on-street facility and multi-use trail)
- Proctor (on-street facility and multi-use trail)
- Narrows (on-street facility)
- James Center (on-street facility)
- Sixth Avenue (on-street facility)
- Tacoma Mall (on-street facility and multi-use trail)
- 56th & South Tacoma Way (on-street facility)
- Stadium (on-street facility)
- 38th & G (on-street facility)

In addition, the following planned non-motorized facilities lie within, or are proximate to the following centers:

- 72nd & Portland (on-street facility)
- 72nd & Pacific (on-street facility)
- Tacoma Central (on-street facility and multi-use trail)
- Lower Portland (on-street facility)
- McKinley (on-street facility)
- 34th & Pacific (undefined "planned connection")
- MLK (on-street facility)

Complete streets accommodate all transportation modes and provide safe access for people of all ages and abilities.

All users, including persons with disabilities should be considered in the design of Complete Streets.

Table 1.1: Supporting Policies

Comprehensive Plan Policies		Topic Addressed
LU-MUCD-5	Public Transit Support	Transit
LU-MUCD-7	Circulation	Non-Motorized Transportation
LU-MUCD-11	Transit-Oriented Development	Land Use
LU-MUP-1	Parking	Land Use
LU-MUD-6	Pedestrian and Bicycle Design	Non-Motorized Transportation
LU-MUD-9	Green Infrastructure and Streetscape Improvements	Streetscapes and Open Space
LU-MUD-15	Pedestrian Streets in Core Area	Land Use
LU-MUUC-0	Tacoma Mall Subarea Planning	Complete Streets
CF-EDNR-7	Facilities in Mixed-use Centers	Land Use
T-LUT-3	Centers and Corridors	Transit
T-LUT-5	Accessibility	Transit
T-MS-2	Roadway Capacity	Transit-Oriented Development
T-MS-10	Complete Streets	Complete Streets
T-NT-1	Identification of Projects	Non-Motorized Transportation
T-ES-4	Stormwater Management	Low-Impact Development
T-ES-5	Urban Design	Streetscapes
OS-GI-2	Green Streets	Low-Impact Development
OS-GI-5	Tree Planting and Maintenance	Planting
OS-GI-7	Sustainable Development Practices City-Wide	Low-Impact Development
OS-GI-8	Streetscape Improvements	Low-Impact Development
OS-HA-7	Sustainable Development Practices Within Corridors	Low-Impact Development
OS-MUC-8	Public Streets and Urban Parks	Streetcapes and Open Space
Recommended Climate Action Plan Strategies		
#6	Convert street lights to more efficient technologies	Low-Impact Development
#14	Comprehensive citywide bicycle & pedestrian system	Non-Motorized Transportation
#25	Implement Smart Growth Principles	Land Use
#26	Increase tree planting requirements or incentives	Planting
#27	Increase tree planting of City property	Planting
#44	Encourage transit-oriented development	Land Use
#60	Incorporate applicable Complete Streets principles	Complete Streets
#67	Establish and maintain trees on ROWs	Planting

1.4 Existing Street Classifications and Standards

While the Comprehensive Plan provides strong support for Complete Streets, there are gaps currently in the guidance and standards needed to implement them. This section provides an overview of the street classifications and Public Works standards for streets, sidewalks, utilities and other infrastructure within the right-of-way, and provides an analysis of how well these policies and standards support achievement of Complete Street goals.

1.4.1 Transportation Element

A road classification system that accounts for pedestrians, bicyclists and transit riders is an important step in implementing Complete Streets practices. Currently, Policy T-TSM-1 of the Comprehensive Plan states that the City should "adhere to nationally recognized arterial functional class standards to help differentiate roads designed to carry high volumes of traffic and those designed for residential use." To satisfy this policy, the City classifies the streets into residential streets and arterials. The arterials are further divided into three categories: Principal Arterials, Minor Arterials and Collector Arterials. Finally, several of the principal arterials are recognized as "connecting corridors" between designated Mixed-use Centers.

That the classification criteria for the City's roads is based on their ability to "carry high volumes of traffic" is an indication that the street classification system accounts primarily for automobiles, and not pedestrian or bicycle traffic. Furthermore, the policy emphasizes measuring volumes of "traffic," or vehicles, as opposed to individual travelers, which would more appropriately account for transit, bicycle and pedestrian trips. A consideration of sidewalk capacity, the presence of bicycle lanes and transit stops, and the overall capacity for individual travelers rather than vehicles, would support and emphasize the need for Complete Streets in the City's transportation system.

The Complete Streets policy that the City of Tacoma has recently adopted within the Transportation Element of the Comprehensive Plan calls for the needs of all users to be considered when evaluating transportation projects. It is included here:

T-MS-10 Complete Streets

Apply the Complete Streets guiding principle(1), where appropriate, in the planning and design for new construction, reconstruction and major transportation improvement projects (2), to appropriately accommodate all users, moving by car, truck, transit, bicycle, wheelchair, or foot to move along and across streets. The Complete Streets guiding principle shall also be used to evaluate potential transportation projects, and to amend and revise design manuals, regulations, standards and programs as appropriate to create over time an integrated and connected network of Complete Streets that meets user needs while recognizing the function and context of each street.

(1) The Complete Streets guiding principle is to design, operate and maintain streets to enable safe and convenient access and travel for all users – pedestrians, bicyclists, transit riders, and people of all ages and abilities, as well as

Several streets in Tacoma have bicycle lanes, but there is not yet a complete bicycle network.

freight and motor vehicle drivers – and to foster a sense of place in the public realm.

(2) Major transportation improvement projects include but are not limited to street and sidewalk construction; street and sidewalk lighting; street trees and landscaping; street amenities; drainage, pedestrian and bicycle safety improvements; access improvements for freight; access improvements, including compliance with the Americans with Disabilities Act; and public transit facilities accommodation including, but not limited to, pedestrian access improvements to transit stops and stations.

1.4.2 Public Works Design Manual

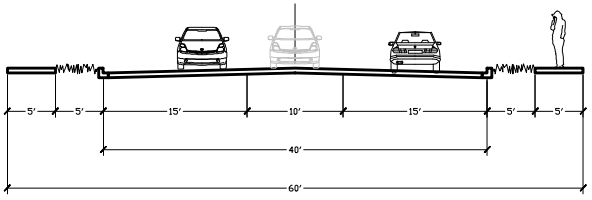
The City of Tacoma Design Manual is a critical component of Tacoma's approach to directing public infrastructure improvements. The Design Manual, last updated in April of 2004, articulates the city's expectations for improving municipal infrastructure within the public right-of-way. It contains engineering standards, and covers everything from placement of sanitary sewer pumps to benefits of sidewalk bulbs. To implement a Complete Streets approach, the Design Manual will need to be reviewed and updated.

While the Design Manual succeeds in clarifying the City's engineering protocols, it fails to articulate a broader vision for how the street system should function as a whole. It also does not align with the City's vision for Mixed-use Centers as amenity-rich pockets of urban density and vibrant walking environments built on distinct community assets and character. Streets within Mixed-use Centers, in particular designated Pedestrian Streets, should perform multiple functions in addition to moving traffic. Mixed-use Center streets should provide ample space for retail and commerce, comfortable spaces for people to walk, recreate, gather and linger, and aesthetic features that contribute to the neighborhood's distinctive character. Moreover, most of the Pedestrian Streets need to accommodate bus, and in some cases, future streetcar operations, as well as safe and comfortable non-motorized facilities.

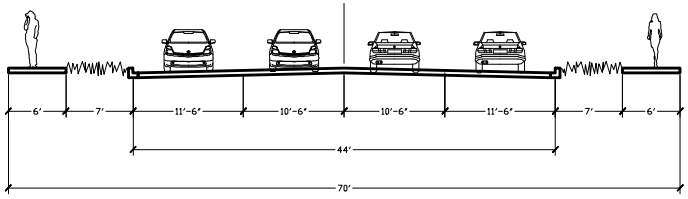
The Design Manual addresses the space between the curbs with little attention given to the pedestrian realm. For example, in the streets chapter, the Design Manual provides some technical street cross-sections that illustrate the city's preferred traffic lane widths and configuration. The cross-sections that are most applicable to streets within Mixed-use Centers are illustrated in Figure 1.1. The Design Manual provides little discussion of sidewalks, street trees and plantings, on-street parking lanes, mid-block crossings, or crosswalks. The standard sidewalk and planter strip section is five feet, however the illustrations show six feet sidewalks and planter strips for the purposes of presenting typical right-of-way widths, i.e. 80 feet, 70 feet. Another gap in the Design Manual is bicycle infrastructure, including bicycle lanes, street paint markings such as sharrows and lane striping, bicycle parking and intersection treatments.

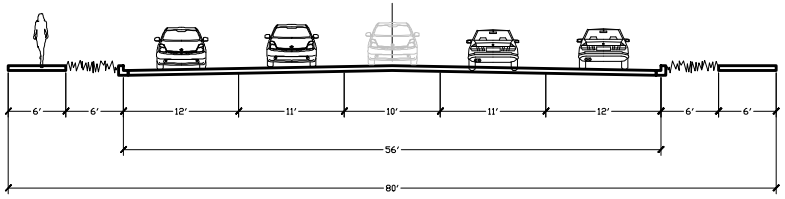
Another factor not addressed in the Design Manual is ecological design. Cities are increasingly asking developers to build projects that incorporate "sustainable" or "green" building strategies. By employing these low impact development strategies in the public right-of-way, the City sends a message that its commitment to green design is more than lip service. Street trees, rain gardens, bioswales, pervious

Figure 1.1: Illustrations of Public Works Design Manual Standards



These illustrations are intended to depict the lane width standards found within section 4.040 B of the Public Works Design Manual. The lane configurations shown are based on what is possible within a given right-of-way width, and does not necessarily represent the typical existing condition of streets within the City of Tacoma. These illustrations also reflect the absence of desired Complete Street elements within the current Design Manual standards.





Martin Luther King Jr. Way has two travel lanes, a continuous center turn lane, and on-street parking, which is typical of most Pedestrian Streets within Neighborhood Centers.

paving materials and the like can enhance local habitat, reduce the urban heat island effect, and reduce storm water runoff while adding beauty and a sense of place to the overall design of the urban landscape. This topic is discussed in more detail in Chapter two.

1.5 Existing Character of Mixed-use Center Pedestrian Streets

As mentioned above, these Complete Street guidelines place a strong emphasis on designated Pedestrian Streets within Mixed-use Centers. These Pedestrian Streets are defined and designated in Tacoma's Comprehensive Plan. Pedestrian Streets are the primary commercial streets within Mixed-use Centers, and are intended to provide access to businesses within a safe and comfortable pedestrian environment. The analysis of existing conditions, and hence the Complete Street guidelines, focus on Pedestrian Streets because they are considered key to the development and future form of Tacoma's Mixed-use Centers and the fact that they present the most complex combination of functional needs and issues. Streets that are perpendicular to Pedestrian Streets, and function more as residential streets, were also examined in several Mixed-use Centers. These streets present a range of different conditions.

The designated Pedestrian Streets in Tacoma fall into different categories depending on right-of-way width and development context. Those streets in older parts of the city, which were developed before the automobile was in wide use, are different from those located in areas which were developed in more recent times. These different street types are discussed below.

1.5.1 Pedestrian Streets in Neighborhood Centers

Of the sixteen designated Mixed-use Centers, nine are classified as "Neighborhood Centers". These Centers represent the city's traditional commercial districts. The commercial development in these areas was built around streetcars and is designed with walking and window shopping in mind. These areas were developed with grid block patterns. Buildings are built up to the sidewalk and surface parking is typically accessed from side streets or alleys at the rear or side of buildings. On-street parking is present in all Neighborhood Centers. Many of these Centers have seen some new development in recent years.

These Centers are:

6th & Pine
34th & Pacific
McKinley
Proctor
Tacoma Narrows
38th & G
56th & S. Tacoma Way
MLK
Stadium

Most of the designated Pedestrian Streets through these centers are classified as Principal Arterials or Collector Arterials and have 80-foot right-of-ways. Many of these streets have on street parking and slower moving traffic. A few streets like Division Ave in the Stadium District MUC and South Tacoma Way in the 56th and STW MUC have 100-foot right-of-ways though these streets have other features like wider sidewalks, landscaped center medians or parallel parking to slow traffic. Appendix B includes a more complete description of the existing Pedestrian Street character and features.

1.5.2 Pedestrian Streets in Community Centers

Of the sixteen designated Mixed-use Centers, six are classified as “Community Centers”. These Centers tend to be areas that were developed more recently, where suburban land-use patterns dominate. The urban form consists of large blocks and includes more big box chain stores than the Neighborhood Centers. Commercial developments in these neighborhoods tend to be set back from the street and fronted by parking lots.

The six Community Centers include:

James Center
72nd & Pacific
Westgate
Tacoma Central
2nd & Portland
Lower Portland

The streets in the Community Centers were designed to move higher volumes of traffic and often have more pavement area, i.e. more and wider lanes, than their counterparts in the neighborhood centers. Many of the designated Pedestrian Streets have fast moving traffic, narrow sidewalks and long blocks–the cumulative effect of which is to discourage walking. In addition, these areas are typically uninviting and unsafe for bicyclists due to high traffic volumes and lack of bicycle infrastructure, although there are bicycle lanes along some arterials within, or serving Community Centers.

1.5.3 Pedestrian Streets in Urban Centers

The final center, Tacoma Mall, is a designated Urban Center. Urban centers were created under the State Growth Management Act and are recognized as locations where cities are encouraged to direct future employment and residential growth. Tacoma Mall has two designated Pedestrian Streets. The first, Steele Street, is a major arterial adjacent to the mall itself. The other Pedestrian Street is South 47th/South 48th Street, is a minor arterial that meanders through a nearby residential neighborhood.

The large block pattern and general lack of pedestrian amenities and connections discourages pedestrian activity, and bicycle facilities are for the most part absent in this Urban Center. It is worth noting that the Tacoma Mall Mixed-use Center will someday house significant residential and employee populations. Accordingly, the street system here should support a comfortable urban environment for future residents and employees to live and work and get around using a variety of modes.

48th Street within the Tacoma Mall Urban Center.

Community Centers occur along, and at intersections of major arterial streets, some of which move high volumes of traffic.

Chapter 2

Design Objectives and Guidelines

2.1 Complete Street Guidelines

2.1.1 Purpose and Methodology

The guidelines within this chapter are intended to provide a broad vision for streets within Mixed-use Centers in the City of Tacoma. These guidelines offer recommendations and direction for the incorporation of Complete Street principles and practices in the updating of the Public Works Design Manual, other standards, code, and practices, as well as through specific street designs. Although these guidelines are focused on Complete Street implementation within Mixed-use Centers, they may also have wider application throughout the City.

Research and analysis of practices in other cities, including Portland, Charlotte, and Seattle, as well as guidance documents published by professional organizations, including the American Association of State Highway and Transportation Officials (AASHTO) and the Institute of Transportation Engineers (ITE) also helped to inform these guidelines. These guidelines are not intended to address all factors and unique circumstances that may determine the most appropriate design nor replace well-established engineering principles.

This chapter is organized to first give a general overview of Complete Street design objectives and considerations, and then to address the finer details of how Complete Streets may be implemented on typical streets within the City of Tacoma.

- Section 2.2 discusses the various zones that comprise a typical street, including the pedestrian/amenity zone, parking zone, bicycle zone, and vehicle zone, and how Complete Street objectives should be generally met within each of these zones.
- Section 2.3 contains the typologies for Complete Street implementation. These typologies were developed to more specifically meet Complete Street objectives and considerations. The Complete Street typologies respond to existing roadway and right-of-way widths, adjacent land uses, and other considerations. They are intended to illustrate the preferred right-of-way allocation for typical existing roadway and right-of-way widths.
- Section 2.4 discusses additional elements such as street trees and low impact development techniques that may be considered as part of Complete Street design and implementation. These additional elements may address other city goals and objectives while also

achieving Complete Street objectives of creating livable and walkable streets.

Details about implementation, costs, and phasing of Complete Streets are discussed in detail in Chapter 3.

2.1.2 Background

Implementation of Complete Streets is not a one size fits all approach. The guidelines presented here are intended to illustrate how all travel modes can be balanced within an existing right-of-way with an underlying goal to minimize modification of the curb and drainage system, and hence minimize cost of implementation. At the same time the guidelines offer preferred dimensions and treatments that may only be applicable when a roadway is being rebuilt. Understanding that every situation where Complete Streets are implemented will present unique challenges and opportunities, these guidelines are intended to supplement and provide a baseline for decision-making on a case-by-case basis using the professional judgment of the designer.

2.1.3 Applying These Guidelines

The City Council has directed that these Guidelines be implemented through the City's design and review of proposed street improvements (as well as through corresponding code, standard and process changes). The following points provide a framework for City staff, and the public, to understand how and when to put the Guidelines into practice.

- The Guidelines' stated objectives and intent are the key considerations:

These Guidelines outline the City's default approaches, providing a starting point for project design. They must be tailored to the specific objectives of the project, taking into account professional judgment, community input, City Council direction and other factors. If other approaches are identified that better meet the Complete Streets objectives and intent, they should be implemented. If a decision is made to depart from the Guidelines, however, project designers must "show their work"—demonstrating why the alternative approach was chosen and how it is more effective for meeting Complete Streets objectives. Over time, this will result in innovations that should be incorporated into the Guidelines.

- When the Guidelines are to apply:

Generally, new and substantially rebuilt streets or street sections, whether built by the City or as part of private development, are to follow the applicable Guidelines (refer to thresholds in City code and procedures for when improvements are required). Maintenance and minor alterations to the right-of-way do not require full implementation as Complete Streets. However, such actions must not make conditions worse (depart further from Guidelines), and should incorporate incremental improvements as practicable.

- Which typologies and sections of the Guidelines to apply:

The Guidelines contain direction organized by subject, as well as by typology. Both are applicable, as appropriate to the project scope and objectives. The discussion of each typology provides general direction for when that typology

may be appropriate. Project designers are to document the process and reasoning behind the design choices made.

- The Guidelines set a baseline:

The Guidelines outline the essential features and characteristics of each typology, as well as optional features and considerations. Such optional features may be added when appropriate, when desired by the community and when resources are available.

- Balancing Complete Streets objectives:

These Guidelines provide a range of feasible, cost-effective approaches to achieving Complete Streets objectives. In practice, a specific design may more strongly emphasize some Complete Streets objectives while providing baseline treatments for others. Project decisions will continue to be made through the combination of expert and community input, City Council direction, available resources, site conditions and other factors. Opportunities to reduce environmental impacts should be routinely considered, along with other project objectives. Broadly speaking, the City will seek to cost-effectively maximize the benefits to the public, to distribute street improvements equitably and to serve all members of the community.

- How the Guidelines relate to other standards and regulations:

The Guidelines are to be used in conjunction with applicable sources of professional guidance, federal and state laws, and City policies, code and standards. Tacoma's land use regulations pertaining to abutting property in some cases would affect street designs, particularly in the sidewalk and amenity zones. Implementation of the Guidelines will include changes to pertinent code and standard sections. Additional work in the future will address issues related to, but outside the public right-of-way, such as driveways and parking standards and regulations.

For more background information about the Complete Street concept and how Complete Streets relate to city goals and objectives see Chapter 1.

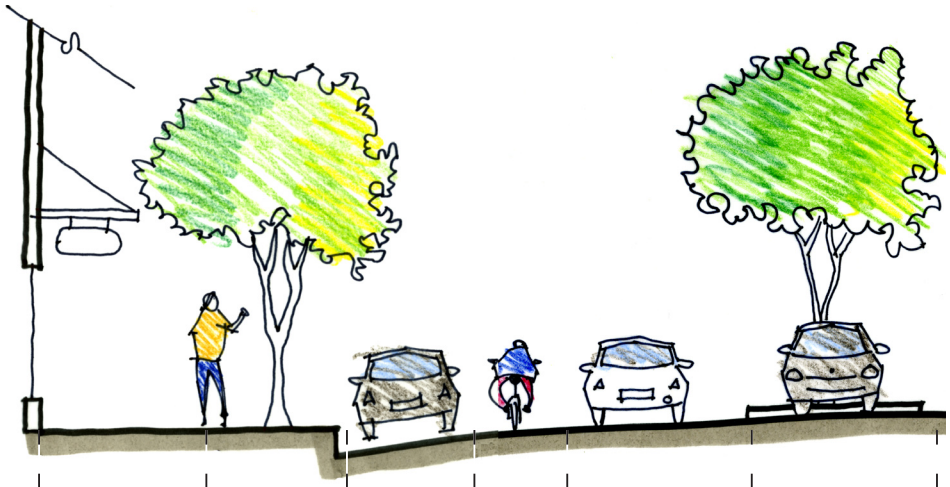
2.2 Complete Street Design Objectives

This Section is intended to give a general overview of Complete Street design objectives and considerations as they pertain to the various zones that comprise a typical Mixed-use Center street, including the pedestrian/amenity zone, parking zone, bicycle zone, and vehicle zone. Figure 2.1 shows the zones that comprise a typical Complete Street cross-section. These objectives focus on allocating the right-of-way so that there is a balance for all travel modes, and should generally be met for all streets designed and built as Complete Streets.

2.2.1 Sidewalk and Amenity Zone

The sidewalk and amenity zones are the two areas within the right-of-way that contribute to the pedestrian environment. A safe, comfortable, and attractive pedestrian environment is vital for successful commercial districts and vibrant neighborhoods. Pedestrian safety and comfort are

Figure 2.1: Complete Street Zones



Zone	Sidewalk	Amenity	Parking	Bicycle	Travel/Transit	Median
Function	pedestrian movement, business interface, cafe seating, signage, planters	street furnishings, street trees, utilities, low-impact development features, clear zone for parked cars, bicycle parking, bus stop, traffic signage	on-street parking, bulb-outs, landscape islands, bus lane, on-street bicycle parking	safe bicycle travel	movement of vehicles including streetcar	restrict turn movements, accommodate trees/LID, reduce perceived width of street; provide a refuge for pedestrians crossing the street (particularly at identified mid-block crossings)
Character	unobstructed path for 2-3 abreast walkers, distinctive paving	hard surface except where LID; pervious pavers or tree grates for healthy tree growth	extension of travel/transit zone	visible markings indicating separate or shared lane	minimize width while accommodating larger vehicles such as emergency, freight, transit	landscaped or hard surface where needed to accommodate clear zone for emergency vehicles

related to the width of the sidewalk, the amount of buffering from traffic, illumination, and amount of pedestrian activity. The interface between building facades and the sidewalk also contributes to the pedestrian environment, but is beyond the purview of these guidelines. Together the sidewalk and amenity zones should do the following:

- Provide an unobstructed, continuous, and safe circulation system that serves the same destinations as are served by the road system
- Provide convenient access to local land uses, urban parks and open spaces, and transit
- Provide a buffer for pedestrians and adjacent properties from the traffic and noise from the street
- Provide visual interest and support community interaction through open space and other public activity space
- Safely accommodate people of all ages and abilities, including persons with disabilities.
- Support environmental goals through the integration of green infrastructure

Sidewalk Zone

Sidewalks are a critical transportation component in a community. Sidewalks often serve multiple functions, and it is important that they are designed to support the activity and features that can be expected within vibrant Mixed-use Centers. At a minimum, sidewalks need to provide a continuous, relatively straight line of clearance of 5 ft. to meet ADA requirements for wheelchairs. However, within Mixed-use Centers, where businesses and residences are envisioned to generate large amounts of pedestrian traffic,

a minimum sidewalk width of 10 - 12 ft. is preferred. A narrower sidewalk (7 ft. minimum) is acceptable in constrained situations. Special pavement treatments may add visual interest to the sidewalk zone, and could include pervious pavement. Please see below for a discussion on pedestrians at intersections and Section 2.2.6 for more in-depth guidance on accommodating persons with disabilities.

Amenity Zone

The amenity zone and sidewalk zone often complement one another and should be thought of as a system. Amenity zones help to buffer pedestrians from traffic, and may contain many of the amenity features that contribute to an attractive and vibrant streetscape; including water features, street furniture, pedestrian lighting, street trees and vegetation, bicycle parking, loading/unloading room for on-street parking, kiosks, and public art. In constrained situations where the preferred sidewalk width is not achievable, the amenity zone can widen and enhance the sidewalk zone both visually and physically. Amenity zones may vary in width depending on available right-of-way; however a minimum width of 4 ft. will minimize encroachment into the sidewalk zone when accommodating features such as street furniture, lighting and tree pits. Widths in the range of 6- to 8 ft. may accommodate a larger range of street features and truly contribute to an attractive and comfortable streetscape. The principles of Crime Prevention Through Environmental Design (CPTED) should be considered as part of all streetscape designs.

Trees are an essential component of every streetscape and should be included in all projects. Trees need adequate room to grow and thrive. If only the minimum 4 ft-wide amenity zone can be provided, then tree pits may encroach into the sidewalk zone as long as tree grates are used and/or there is a minimum 5-ft clear walk zone provided. Further discussion and guidance on street trees and landscaping within the right-of-way is provided in Section 2.4.3.

The amenity zone will in some cases provide appropriate locations for the inclusion of green stormwater features, which are discussed in Section 2.4.2.

Access for Persons with disabilities needs to be safe and convenient. The following are guidelines addressing accommodating persons with disabilities within the amenity/sidewalk zone:

- A minimum 5’ by 8’ clear area must be provided at Transit stops placed within the amenity/sidewalk zone to meet ADA standards.
- Where load zones for accessible transportation and/or handicapped parking spaces are provided, the amenity zone should be clear of obstacles that might impede the loading, unloading, and movement of persons with disabilities.
- Objects and landscaping placed in the amenity zone should not encroach upon the sidewalk zone, causing interference and unsafe conditions for the visually impaired – a minimum 5 feet clear walk zone should be provided within the sidewalk zone.

Street trees, special pavement treatments, bicycle racks, and cafe seating for adjacent land uses help create a comfortable pedestrian environment.

The parking lane should be defined by a solid painted line to ensure an orderly alignment of cars when adjacent to a bicycle facility.

The parking zone may accommodate bicycle parking.

Consistent and durable street furniture can contribute to neighborhood identity and a comfortable pedestrian environment.

Street Furniture

Street furniture such as benches, kiosks, newspaper stands, lighting, bicycle racks, etc. play a major role in creating an inviting and comfortable pedestrian environment, and can also contribute to, or establish, a neighborhood's identity and character. Several Neighborhood Business Districts have developed streetscape design plans that identify a street furniture palette, which should be referred to when making streetscape improvements. Where such a plan has not been developed, this should typically be done first before street furniture is installed.

2.2.2 Parking Zone

On-street parking is currently available in all Neighborhood Centers and in a few Community Centers. Given that on-street parking currently is an important component to creating vibrant commercial areas, and adds to the activity of the street, it is assumed that it should typically be provided in all Mixed-use Centers. In addition to providing motorists access to businesses, the parking zone provides an important buffer between traffic and the pedestrian realm and effectively calms traffic. The Parking Zone may not only contain space for parked cars, but also freight loading zones, bulb-outs containing trees or other vegetation, curb extensions for pedestrian crossings, and bicycle parking. The following guidelines apply to the parking zone:

- The preferred width for the on-street parking lane is 7 ft. On higher speed (> 30 mph) arterials the preferred width is 8 ft.
- Avoid angled parking on heavily traveled streets. Angled parking is more appropriate, and may be more easily accommodated, on less traveled streets off of the Pedestrian Streets within Mixed-use Centers. The decision as to whether angled parking is appropriate will depend on a number of factors, including bicycle safety, slopes, vehicle speeds, and available right-of-way. Angled parking should be back-in in most cases to enhance bicycle safety. On steeply sloped streets angled spaces should be angled downhill so that cars roll into the curb.
- For parallel parking, the parking lane should be defined by a solid painted line in order to ensure an orderly alignment of cars, keeping them out of the bicycle zone.
- Curb extensions for pedestrian crossings and transit stops should be extended to 6 ft. if the parking lane is 7 ft. wide, or 7 ft. if the parking lane is 8 ft. wide to ensure pedestrians are visible and to improve accessibility.
- Accessible spaces should be provided where on-street parking is provided, or where there are uses that require such spaces, per ADA requirements.
- Accessible load zones for people with disabilities that use accessible transportation, i.e. paratransit, should be provided. Where such zones are provided, the amenity zone should be clear of obstacles that might impede the loading, unloading, and movement of persons with disabilities.
- Left over space where parking cannot be accommodated, or space where on-street parking is not needed, should be considered for bicycle parking, landscaping and trees and/or green features as opportunities arise.

On-street parking cannot by itself meet all of the demand created by adjacent land use. Metered parking should be considered in all Mixed-use Centers to encourage short-term parking, discourage unnecessary driving associated with finding an available parking space, and to raise revenues that can go towards road and streetscape improvements within Centers.

2.2.3 Bicycle Zone

The bicycle zone is that area within the roadway that is designated for exclusive or preferential use by bicyclists. Most often the bicycle zone will occur between the vehicle zone and the parking or amenity zone, but may occur within the vehicle zone as in the case when there is a shared lane and sharrows (shared lane pavement markings) are used. The bicycle zone is intended to make bicyclists visible to vehicles while clearly defining how bicyclists should use the roadway. No bicycle lane or route should exist in isolation. It should be the City's goal to create a continuous, well-connected network of bicycling facilities that are safe for bicyclists of all skill levels, and provide direct travel routes to major destinations and between neighborhoods. The City's Mobility Master Plan effort will be developing additional and more detailed guidance on bicycle infrastructure and issues.

Bicycle Lanes

Bicycle lanes are the preferred bicycle facility design because they separate bicyclists from vehicles by defining an area of the roadway that is to be used exclusively by bicyclists. Some general guidelines for bicycle lanes are:

- The minimum bicycle lane width adjacent to onstreet parking is 6 feet. The minimum bicycle lane width adjacent to the curb is 5 feet. Six feet is the preferred width.
- Always use storm drain inlets that have openings that are perpendicular to direction of travel, provide curb inlets whenever possible.
- Provide consistent signing and pavement markings along the entire length of bicycle lanes, and to the extent possible, within the entire network.
- Avoid placing bicycle lanes adjacent to front-in angled on-street parking. If angled parking is desired, then it should typically be back-in only, to allow drivers to more easily see if bicyclists are present.
- Where roadway or right-of-way constraints don't allow bicycle lanes on both sides of the street on steep grades, a lane should be provided on the uphill direction of the street if at all possible.
- Buffer the bicycle lane by adding pavement markings that delineate the "door zone" on bicycle lanes that are adjacent to high turnover parking, on steep roadways where higher bicycle speeds can be expected, or where there are a high number of dooring complaints.
- Bicycle lanes may be accompanied by signs reminding drivers to "look for bikes" when opening their doors.
- Regular maintenance and street sweeping is required along all bicycle routes.

Shared Lanes (Sharrows)

Where bicycle lanes are not possible due to right-of-way constraints and on-street parking needs, sharrow pavement markings can help better accommodate bicyclists on the

Bicycle lane marking.

Sharrow marking.

Curb-separated bikeways, or cycle tracks, may be considered in certain situations where the number of driveways are limited and major intersection conflicts will not result. Such bikeways should be a minimum of 10 ft. wide and may occur within the roadway or within the roadside. Connectivity to adjacent land uses and other bicycle facilities is an important factor to consider when planning a bikeway. Clear signage and street paint markings should indicate where bikeway begins and ends and how it connects to other bicycle facilities. The specific design and selected routes for separated bikeways should be considered as a part of the city's non-motorized planning.

roadway network. Sharrows may also be the most appropriate bicycle treatment in certain situations. Sharrows are most appropriate on facilities where speed differentials between motor vehicles and bicycles are small. Sharrows should not be placed on facilities with vehicle speeds greater than 35 mph.

Sharrows let motorists know to expect bicyclists on the street, and remind them to give bicyclists adequate room when passing. Sharrows also show bicyclists where to ride in the lane and remind them not to ride too close to parked cars. A shared lane should be wide enough to allow an average size motor vehicle to pass a bicyclist without crossing over into the adjacent lane. Several cities, including Portland and Seattle, use a 14 ft. standard for shared lanes, however, where this width is infeasible, they have departed from this standard. For example, Seattle has painted sharrows on lanes as narrow as 12.5 ft. for short segments where there are right-of-way constraints. In such constrained situations removal of on-street parking should be considered to allow more room for bicyclists. As a general rule the volume of traffic and frequency of parking turnover should determine the degree to which a 14 ft. standard should be departed from, i.e. higher traffic volume situations are less appropriate candidates for a departure from the standard. As a general rule, the center of the sharrow marking should be a minimum 11 ft. from the curb face. So given a 7 ft. parking lane, the center of the sharrow marking is 4 ft. from parked cars, providing 4 ft. of maneuverability for bicycles while allowing 9-10 ft. of room for cars to pass to the left of the bicyclist.

Please see below for a discussion on bicycles at intersections.

Parallel Routes

Providing a parallel bicycle route within a quarter mile of the designated Pedestrian Street within a Mixed-use Center, or other corridor connecting major destinations, may be desirable and appropriate in some cases. However, every effort should be made to safely accommodate bicycles in some manner on all Mixed-use Center Streets. Parallel bicycle routes design options may include bicycle lanes, bicycle boulevards and multi-use paths. Bicycle Boulevards are discussed in more detail later in this document. The following are guidelines developed by Portland Metro[2] for determining when and how a parallel route should be provided:

- On streets where the Average Daily Trips (ADT) is greater than 10,000 and bicycle lanes are not possible due to right-of-way constraints or on-street parking needs, a parallel bicycle route should be provided.
- Provide bicycle facilities without gaps to special destinations such as schools, parks and commercial areas.
- Provide uniformity in facility design, signs and pavement markings for bicyclist and motorist's safety.
- Provide an interconnected street system to increase directness and efficiency and encourage more bicycle trips.

2 Creating Livable Streets Street Design Guidelines, Portland Metro, June 2002

- Provide bicycle parking along all routes on development sites and at major transit facilities.

Other Considerations

If curb extensions for pedestrian crossings or bus bulbs for in-lane bus stops are installed, they should be installed in the parking lane, and should not extend into the bicycle lane. Bicycle lanes or sharrows can still be provided on streets containing bulb-outs as the bus would stop in the bicycle lane at the bus stop allowing the bicyclist to pass the bus by using the left part of the right-most travel lane.

Consider the location of streetcar tracks when designing bicycle facilities. If the streetcar cannot be aligned in the center of roadway, providing adequate maneuvering room for bicyclist to avoid getting tires caught in parallel tracks, then a parallel bicycle route or the use of rubber flange filler inside the track bed should be considered. See the Transit Priority typology in Section 2.3.3.

2.2.4 Vehicle Zone

The vehicle zone consists of all elements devoted to motor vehicle movement, including travel and turn lanes, medians, and intersections. It should be designed to emphasize safe travel for all modes and provide access to emergency and other oversized vehicles such as buses and freight trucks in some situations. A general goal for Complete Streets is to minimize the overall width of the vehicle zone in order to allow for safer pedestrian crossings and reduce vehicle travel speeds. However, implementation of Complete Streets involves striking a balance between the needs of overall street function and traffic capacity and the needs of bicyclists and pedestrians, which can often be done through thoughtful design choices. It should be noted that as vehicle lanes are narrowed, there is an increased likelihood that additional width may be required at some point in the road alignment so that the vehicle lane can be widened to accommodate vehicle off-tracking for large vehicles at horizontal curves.

Medians

Center medians are used to restrict turn movements, reduce vehicle conflicts, increase roadway capacity, accommodate pedestrian refuges, and can provide aesthetic value with trees, landscaping and other urban design features. As Centers develop it is envisioned that there will be fewer curb cuts for driveways on the Primary Pedestrian streets, which would improve the overall functionality of roadways where medians are installed. Many of the arterials serving Tacoma's Mixed-use Centers have continuous center left turn lanes. These center left turn lanes may be used to construct medians, which could contain a number of elements, depending on the design intent and needs, including landscaping, mid-block crossings with pedestrian refuge, potentially low impact development elements, streetcar station platforms, as well as left turn pocket lanes where needed.

An access management strategy that consists of driveway consolidation/elimination and a system of controlled turn movements at intersections, i.e. alternating u-turns, no left turn, left turn signal, should accompany median construction. Narrow raised medians (4 to 10 feet wide) can be

This median in the Lower Portland Mixed-use Center restricts turn movements, reduces vehicle conflicts, and visually enhances the roadway.

Median with mountable curb and pedestrian refuge.

Curb extensions, or bulb-outs, constructed within the Proctor Mixed-use Center.

applied on street segments with infrequent driveways and intersections where left turn movements are restricted. On segments with frequent driveways and intersections, wider medians (10 to 16 feet wide) may be used to accommodate alternating left turn bays at intersections.[3]

Constructing medians in existing roadways where there may be width constraints may result in issues related to the desired clear zone for emergency vehicles. The Tacoma Fire Department has stated that it requires a 17 ft. clear zone and a break in the median every 100 ft. in order to provide access for its emergency vehicles. The desired clear zone may be accommodated in the design in many cases, but often at the expense of other roadway elements such as on-street parking, bicycle lanes, or the median width. In other cases special treatments such as a mountable curb, distinctive pavement used for a portion of the median to discourage vehicles, and frequent breaks in the median may be used to provide emergency vehicle access. The frequency of median breaks should be determined by block length, i.e. the 100 ft. standard should be deviated from when block lengths are short (<350 ft.).

The following are general principles and considerations for medians offered by the Institute of Traffic Engineers:

- Avoid changes in median width along the corridor if possible. A uniform median width minimizes the need for shifting tapers in the through lanes.
- Avoid providing overly wide medians at the expense of unreasonably narrowing the sidewalk and amenity zone, which should take higher priority.
- If the median will not be landscaped, consider using pavers, colored stamped concrete, stone, or other contrasting material to create visual interest and aesthetic appearance.
- Use an appropriate design vehicle for left- and U-turns when designing median width.
- Plants in medians should be trimmed to not more than 2.5 ft. maximum height, and trees should have no branches in sight lines lower than 8 ft. from the ground. A 6-ft. wide median is adequate for healthy growth of small caliper trees, but a minimum 10 ft. wide median should be used for larger caliper trees. Trees should be be a minimum of 14 feet at maturity over the vehicle zone.
- In constrained rights of way where narrower medians are required, consider using attractive hardscape and urban design features in lieu of planting.

2.2.5 *Intersections*

The design of intersections is usually done on a case-by-case basis due to the unique context and multitude of factors that need to be taken under consideration such as street types, design speed, vehicle capacity, and pedestrian, bicycle and large vehicle requirements. The designer must consider the tradeoffs between maintaining or increasing vehicular capacity and improving pedestrian and bicycle mobility and safety. The following is general guidance for intersections, which will require follow-up on a case-by-case basis:

3 Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, Institute of Transportation Engineers, 2006.

Pedestrians

How intersections accommodate pedestrians is just as important as what happens in the sidewalk and amenity zones. To ensure the intersections contribute to a safe and comfortable walking environment, the following guidelines should be followed:

- Shorten crossings to the extent possible using curb extensions, reduced curb turn radii (10-25 ft. maximum, 40 ft. where high truck/bus traffic), reducing number of lanes. Median refuges are appropriate on wider roadways (3 lanes or more) with higher volumes of traffic and speed, and where there may be sight distance issues.
- Enhanced pavement/markings used to delineate crosswalks, i.e. zebra stripes instead of outline
- Provide a separate walk phase for traffic signals in high pedestrian volume locations
- Provide adequate time for slower moving pedestrians (children, elderly, disabled). The walk phase should be calibrated to meet ADA standards.
- Consider installing pedestrian countdown heads, and where appropriate incorporate audible pedestrian signals and vibrotactile push buttons. More in-depth guidance on accommodating persons with disabilities is included in Section 2.2.6.
- Provide enough illumination to light all four corners of urban intersections

Bicycles

- Due to the complexity and activity of intersections it is important that clear visual cues are provided to tell bicyclists how to safely proceed through the intersection, and motorists to be aware of bicyclists.
- Extend bicycle lanes/sharrows up to intersection stop bars, bike box, or crosswalk, where possible. If a right turn lane is required, and there is not enough room to extend the bicycle facility up to intersection, then use signage that indicates for bicyclists to move to the far left of turn lane or remain in through lane.
- Where there is adequate room within the intersection to continue a bicycle facility use consistent markings through intersection, i.e. if sharrow used on roadway, then sharrow should be continued across intersection
- Where it is not possible to continue bicycle facility through intersection, continue the facility at far side of intersection and use signage to indicate the continuation of the faculty.
- Install bicycle loop detectors or video detection at intersections. Provide pavement markings showing bicyclists where they can be detected.
- Provide a bicycle box or advanced stop bar to allow bicyclist to get out in front of stopped cars, improving their visibility and allowing them to get a head start through the intersection

Special pavement treatments such as stamped concrete help to clearly define the crosswalk and add visual interest.

Curb extensions, bollards, and special pavement treatments contribute to a safe and comfortable intersection for pedestrians.

Where there is adequate room, bicycle facilities (lanes or sharrows) should be continued through the intersection.

Roundabouts may be considered for intersections, and may serve as gateway features for Mixed-use Centers.

Bike boxes improve visibility and safety of bicyclists at intersections by clearly defining the bicycle and vehiicle zones and allowing bicyclists to get a head start across the intersection.

A painted intersection at 6th Ave and Pine St. expresses neighborhood character while also serving as a traffic-calming device.

Vehicles

- To the extent possible minimize the number of lanes and lane width while ensuring acceptable levels of traffic flow.
- Advanced stop bars or bike box to keep cars from encroaching on crosswalks, allow space for cars turning from intersecting roadway, provide room for bicycles out in front
- Where there is no left turn lane consider restricting left turns during peak hours or within the Center, or manage left turns with a system that permits left and/or u-turns every other, or every third intersection, especially along transit corridors
- Enhanced pavement treatments or painted designs function as traffic-calming devices and can contribute to neighborhood identity.

Transit

- Bus stops should typically be located at the far side of the intersection to minimize intersection delay.
- Provide well-marked pedestrian crossings at all transit stops using striped crosswalk, pedestrian refuges and curb extensions, as appropriate.
- Use a priority signal where appropriate.
- Use Pierce Transit standards for length of bus stops or bus stop on a curb extension.
- Curb radii and curb extensions should be designed to avoid conflicts with buses and ensure safe turns for buses and other larger vehicles.

Roundabouts

- Roundabouts may be considered for intersections, and may serve as a gateway features for Mixed-use Centers. Roundabouts have been shown to increase intersection capacity under certain situations. However, as with all intersection design, the decision to install a roundabout should be based on thorough traffic analysis as well as an analysis of the conditions for each transportation mode. Roundabouts decrease vehicular speeds, and decrease pedestrian crossing distances. Roundabouts have been shown to improve intersection safety, and they can help improve pedestrian safety and mobility. Roundabouts with more than one circulating lane, however, may need special attention to ensure adequate accommodation of pedestrians.

2.2.6 Other Important Considerations

Persons with Disabilities

Complete Streets provide a safe, comfortable, and convenient environment for pedestrians and persons with the full range of disabilities. Public Rights-of-Way Accessibility Guidelines (PROWAG) and Americans with Disabilities Act (ADA) standards, as updated, should routinely be incorporated. The following guidelines should be incorporated into design, maintenance and operation of all Mixed-use Centers streets (additional guidance is provided for each typology):

- Complete Streets within Mixed-use Centers will incorporate ample sidewalks (see the discussion within

each typology). At no point should walkway clearance be reduced below 5 feet in width, unless a true hardship exists.

- Directional curb ramps should be installed at all crossing points to improve accessibility and walkability. Curb ramps should have a maximum grade of 8.3% to accommodate people with disabilities. In situations where there is not adequate width in the amenity/ sidewalk zone to accommodate this grade, then curb extensions should be considered.
- Intersections should typically have no more than 2% cross slope to the back of the crossing area. Exceptions may be necessary due to topography. Street crossings should be discouraged in steeply sloped areas (greater than 5%) and alternative crossings in less steeply sloped locations should be identified and clearly marked.
- When the sidewalk crosses driveways and alley approaches, maintain a maximum of 2% cross slope unless topography or other site specific conditions dictate a different approach for safety reasons.
- Utility plates within the sidewalk should be slip resistant and result in a minimum change in grade. Vertical protruding objects that act as barriers to pedestrian passage should be avoided.
- Crosswalks are standard at intersections and midblock crossing points. Crosswalks should be designed to minimize vibration and to have slip resistant utility plates.
- Detectable warnings should be incorporated into the walkway or accessible route where it crosses a public street or alley, or higher usage driveways.
- Curb extensions at intersections should be considered in order to shorten crossing distances and increase pedestrian visibility.
- The selection of sidewalk surface treatments should take into consideration that some patterns and joints may cause vibrations that are uncomfortable for wheelchair users.
- Accessible Pedestrian Signals (APS) should be installed at intersections and other crossing points. APS communicates information about the WALK phase in audible and vibrotactile formats. APS should be used at arterial intersections, particularly where major facilities are present, to assist people to cross safely.
- Handrails and landings should be provided along steep grades.
- Adequate tread height and length is required for stairways.
- The amenity zone should be differentiated from the sidewalk path for the visually impaired. This will also help to keep landscaping clear of the minimum 5 ft. walking path.
- Benches should be provided for persons with disabilities to rest.
- Careful planning will be required to ensure that the proposed streetcar system and loading platforms are accessible to all people and to prevent the streetcar tracks themselves from becoming barriers to crossing movements by people with disabilities.

Persons with disabilities need to be considered in all complete street designs.

Utilities

The Complete Streets concept is intended to create a safe and comfortable place for vehicles and pedestrians while improving neighborhood livability and aesthetics. A part of any neighborhood is the infrastructure and facilities that support the utilities necessary to make a neighborhood livable.

Utilities of all kinds need to be accommodated within the public right-of-way, whether in the roadway or the sidewalk and planting strip. The following points should be considered:

- Alleys provide an invaluable opportunity to open up the street for improvements. Whenever feasible, above ground utilities and municipal services should take place within alleys.
- Utility poles and other utility-related structures should typically be placed within alleys, or within the sidewalk and amenity zone. A minimum of 5 ft. unobstructed sidewalk should be maintained.
- Utility vault covers and manhole covers should have non-slip surfaces; all features should meet ADA requirements.
- Utility structures such as switch boxes, poles, etc. should be visually integrated into the streetscape.

These Guidelines support the conversion of overhead power lines to an underground system to improve the aesthetics of residential areas. Overhead wires visually clutter the streetscape and typically detract from the overall aesthetic experience; therefore underground locations are preferable to overhead in most cases for electrical, telephone and communication wires. This is particularly relevant along Mixed-use Center Pedestrian Streets where it is very important to create an attractive space. They can also be a barrier to higher density development (upper stories may reach eye level with power lines), and place limitations on the choice of street trees.

While underground locations are clearly preferred, there are both policy and practical issues related to converting existing overhead to underground facilities. All new roadways within developments are installed underground in accordance with the current Tacoma Municipal Code. Currently, there are no set thresholds or triggers that initiate the conversion of an existing overhead system to an underground system. Existing overhead systems need to be carefully evaluated on a case by case basis in order to determine if conversion is a viable option that is in the best interest of the customers who are funding the conversion and the customers who will pay for the maintenance of the system over time.

The first factor that must be considered is right-of-way width. Under the ground there is competition for space. Sewer mains, water mains, storm water, natural gas, and planting strips (bio-retention swales, rain gardens, tree roots, etc), all compete for a limited amount of space. The preferred location for power facilities such as transformers and switch vaults is in easements on private property. Many parcels have built “property line to property line” and do not allow for above ground structures, which then require very large underground vaults.

Where right-of-way space is available for underground utilities, the next factor to consider is the cost of the conversion. The cost to convert a power system varies extensively due to system requirements, property and right-of-way availability, restoration costs and the funding mechanisms implemented. The costs of conversions funded through the Local Improvement District process are shared between the customer and Tacoma Power at a percentage set in the current Tacoma Power Customer Service Policy.

Additional factors to consider when evaluating overhead to underground conversions are the reliability of the system and maintenance costs. Underground systems are less susceptible to environmental interruptions. In the Northwest wind storms can cause outages to overhead systems that do not affect the underground systems. Operationally, the cost of underground systems is higher than overhead and maintenance on the overhead system is far easier than underground systems.

As an alternative when undergrounding is not practicable, the length of poles can in some cases be heightened to further remove wires from the visual field of people on the street and within adjacent buildings. If space is available another alternative would be to relocate existing overhead utilities to alleys where the utilities are less visible.

Alleys

Alleys are a tremendous asset that supports the provision of Complete Streets features by redirecting utilities, services and vehicular access away from streets and thereby making room for Complete Streets features and fostering a more pedestrian-oriented and aesthetic streetscape. Tacoma benefits from a broadly extended regular street grid that incorporates alleys for access to the rear of lots. Where they exist, alleys should be the preferred location for vehicular access, utilities and services. Alleys should also be given consideration in the development of new streets.

Reducing Environmental Impacts

The opportunity to reduce environmental impacts by incorporating green features should be routinely considered for every project. Project designers should base their decision process on their expertise, community input, cost-benefits analysis of various potential approaches and other pertinent factors. They should document the decision process, and show their work demonstrating why the specific design was selected. More in-depth discussion and guidance regarding strategies to reduce impacts and improve environmental conditions is provided in Sections 2.4.2 (Low Impact Development Strategies) and 2.4.3 (Street trees and landscaping).

Road Diets

Many of the arterials serving Tacoma's Mixed-use centers have excess capacity both within the existing roadway configuration and the right-of-way. The typical arterial serving Community (Mixed-use) Centers has five lanes (four travel lanes plus a continuous center turn lane) while Neighborhood (Mixed-use) Centers are typically served by three lane arterials (two travel lanes plus a continuous center turn lane). In order to "complete the street" and accommodate bicycle facilities, on-street parking, safe pedestrian cross-

ings, and wider sidewalks it may be possible and desirable to implement a "road diet" by reducing the number of lanes on many of these arterials while maintaining adequate capacity. The ability to reduce the number of lanes will depend on the volume of traffic, function of the street, and the intensity of adjacent land use. A five-lane arterial may be reduced to four or three lanes and accommodate the same volume of traffic in many cases. Successful examples of "road diets" include 6th Ave (between Orchard and Sprague Streets), N. Union (between 6th Ave and 30th St), Rainier Ave S (south of Rainier Beach in Seattle) and 12th Ave (by Seattle University in Seattle). A similar approach consists of reducing the width of existing travel lanes (lane diets). Road and lane diets can be an effective way to reduce traffic speeds because they encourage motorists to proceed more cautiously, especially if there is visual "friction" created by parked cars, street trees, bulb-outs or other features. The City should analyze street capacity citywide and identify opportunities to implement road and lane diets.

Signage

Signage is an essential component of complete streets for providing wayfinding, as well as visual cues that indicate how the street is to be used by each mode. A number of sign standards are applicable within the City, including the American Association of State Highway and Transportation Officials (AASHTO), City standards, and Business District standards. Additional standards for signage related to bicycles and pedestrians may also be developed through the current Mobility Master Plan effort. These standards should be incorporated as appropriate.

2.3 Typologies for Complete Street Implementation

Based on analysis there are several key findings that generally characterize the existing condition of the Pedestrian Streets within Mixed-use Centers. These include:

- Wide variety of roadway and right-of-way widths mixed among functional classifications
- All travel modes may be accommodated within existing rights-of-way and without having to move the curb out (away from center of street) or make changes to existing drainage in most cases
- In several cases there is room to expand the pedestrian zone while accommodating all modes in a narrower roadway
- Streetcar transit streets are most constrained in terms of safely accommodating all modes

Despite there being a wide range of existing conditions among Pedestrian Streets within Mixed-use Centers, there are predominant roadway and right-of-way widths. The Complete Street typologies shown in this section are based upon these predominant conditions, and are intended to illustrate the preferred condition for implemented Complete Streets.

In general, streets within Neighborhood Centers are the most constrained in terms of being able to accommodate all priority Complete Street elements. The Mainstreet typology responds to the generally more constrained rights of way, as well as the typical land uses, found within Neighborhood Centers. Streets within Community Centers tend to have excess capacity, and therefore more opportunities for accommodating all priority Complete Street elements. The Avenue typology responds to the right-of-way capacity found in the typical Community Center, and also to the land use pattern that is envisioned for these Centers. The Transit Priority typology emphasizes transit access and the pedestrian environment, and is similar to the Mainstreet typology in that it responds to conditions that are typical within Neighborhood Centers where potential streetcar routes are being planned. The Transit Priority typology may also apply to major bus corridors such as near transit stations or where bus rapid transit may be planned. While the Complete Street typologies in this document reflect the constraints and opportunities that stem from typical existing conditions, they also convey the preferred situation for those situations that involve a major road rebuild. The implementation of Complete Streets will require a tailored approach for each situation using the best judgment of the practitioner and these typologies as a guide.

Table 2.1 provides a summary of the four Complete Street typologies developed for Pedestrian Streets within Mixed-use Centers.

Pedestrian Streets within Community Centers such as Tacoma Central typically are 5-lane arterial streets. The Avenue Complete Street typology may be applicable to such roadways.

Pedestrian Streets within Neighborhood Centers such as 6th and Pine typically are 3-lane arterial streets with on-street parking. The Mainstreet or Transit Priority Complete Street Typologies may be applicable to such roadways.

Pedestrian Streets within the Tacoma Mall Urban Center are 5-lane arterial streets. The Avenue or Transit Priority Complete Street Typologies may be applicable to such roadways.

Table 2.1: Summary of Complete Street Typologies

	Land Use	Objective	Attributes
Mainstreet	■ High-density, people-intensive uses ■ Local-serving retail/ mixed use ■ May be destination for specific niche markets ■ Buildings oriented toward and pulled up to street, parking in rear	■ Walking is primary emphasis ■ High quality, attractive pedestrian environment, including widened sidewalks, vegetation, seating, public art, etc. ■ Accessible features are to be systematically distributed ■ Congestion is accepted as a positive traffic-calming effect ■ Frequent and convenient transit service ■ Bicycles accommodated in bicycle lanes or shared lanes	■ Two travel lanes (potential center median with turn pockets) ■ On-street parking both sides ■ Generous sidewalks & amenity zones ■ Curb extensions at intersections ■ Short blocks (300'-400') ■ Driveways are minimized ■ Separate bicycle lanes preferred approach. Sharrows appropriate in some cases ■ Consistent street trees ■ Maximum posted and design speed 25 mph
Avenue	■ Wide-range of medium to high density uses, including commercial (shopping centers and office, institutional, mixed-use ■ Buildings oriented toward, and pulled up to street, parking to side or rear	■ Balance safety, comfort, and service for all modes ■ Perform an important mobility function in larger network ■ Vehicle capacity not to be expanded/some congestion expected ■ High quality, attractive pedestrian environment, including widened sidewalks, vegetation, seating, public art, etc. ■ Accessible features are to be systematically distributed ■ High levels of transit accessibility ■ Bicycles accommodated in bicycle lanes	■ Three to five travel lanes ■ On-street parking both sides in most cases ■ Separate bicycle lanes preferred approach. ■ Mid-block crossings on long blocks (500'-600') ■ Driveways allowed, but minimized ■ Curb extensions or small curb radii at intersections ■ Medians on long segments with turn pockets ■ Posted and design speed 30-35 mph ■ Consistent street trees
Transit Priority	■ High-density, people-intensive uses ■ Local-serving retail/mixed use ■ Buildings oriented toward street, & pulled up to street, parking in rear ■ May be destination for specific niche markets ■ Connetcts key destinations, i.e. hospitals, major employers, downtown, schools	■ Convenient, frequent transit service is primary emphasis ■ High quality, attractive pedestrian environment, including widened sidewalks, vegetation, seating, public art, etc. Accessible features are to be systematically distributed ■ Vehicles are provided access, but flow is regulated/ deterred by frequent transit stops and pedestrian crossings ■ Bicycles accommodated in bicycle lanes, shared lanes, or on parallel route	■ Two shared travel lanes (potential center median, restricted turns) ■ On-street parking both sides ■ Generous sidewalks & amenity zones ■ Curb extensions at intersections and transit stops ■ Driveways are minimized ■ Bicycles have separate lane where enough ROW and no conflicts with transit. Sharrows appropriate in some cases ■ Consistent street trees ■ Maximum posted and design speed 25 mph on streetcar routes, 30-35 mph elsewhere
Urban Residential	■ Multi-family residential ■ Limited retail commercial or professional offices in mixed-use buildings within close proximity to primary pedestrian street ■ Parking lots and/or structures	■ Provide livable streets for residents within MUCs ■ Support enhanced pedestrian environment, including wider sidewalks, vegetation, seating, public art ■ Accessible features are to be systematically distributed ■ Support opportunities for low impact development techniques ■ Provide on-street parking for visitors of residents and customers of nearby businesses ■ Safely accommodate bicycles	■ 2 travel lanes 10' minimum, slow travel speeds ■ Angled/90o/parallel parking on at least one side of street ■ Wider sidewalks where possible ■ Pedestrian amenities, e.g. lighting, seating, gardens ■ Bicycle lanes, or sharrows in some cases ■ Ample parking ■ LID - Bioretention swales, rain gardens, additional street trees, pervious pavement

2.3.1 *Mainstreet*

Objective

- Walking is primary emphasis
- High quality pedestrian environment
- Congestion is accepted as a positive traffic-calming effect
- Frequent and convenient transit service
- Bicycles are accommodated in some manner, preferably separated from vehicles in bicycle lanes wherever feasible
- Support businesses through right-of-way design

Typical Land Use Attributes

- High density, people-intensive uses
- Local-serving retail/mixed use
- May be destination for specific niche markets
- Mixed-uses with emphasis on retail, multi-family residential
- Buildings oriented toward, and pulled up to street, off-street parking in rear

Priority Elements

- Narrow roadway
  - Two 11- to 12 ft. lanes is preferred (allows clear distance for parked car doors, commercial and emergency vehicles) Vehicle speeds controlled by narrowed lane width and streetscape "friction"
  - Continuous center left turn lane not typical, but if left turn lane needed, then should be integrated with median that includes landscaping and mid-block crossings on blocks >600 ft.
- Bicycle Facilities
  - 5 - 6 ft. bicycle lanes where there is adequate right-of-way.
  - Shared lanes with sharrows if not adequate room in right-of-way.
  - On-street parking (7 ft. preferred to minimize street width)
  - Curb extensions at intersections and mid-block that extend one foot shy of the width of the parking lane
- Sidewalk
  - 10 - 12 ft. sidewalks preferred,
  - 8 ft. minimum in constrained situations (no utilities or other obstructions in sidewalk zone)
- Amenity Zone
  - 6 - 8 ft. amenity zone is preferred for accommodating trees, furnishings, lighting, transit amenities, utilities (if present);
  - 4 ft. in constrained situations. Tree pits may encroach slightly into sidewalk to allow larger tree species.
- Driveways are restricted
- Maximum posted and design speed = 25 mph
- Median (also see Section 2.2.4)
  - The decision to install a center median should be weighed against goals to minimize roadway width, provide room for priority elements, and provide adequate clear zone for emergency vehicles.
  - Provide a mountable curb and hardscape where appropriate if portion of median is needed to provide required clear zone for emergency vehicles

The Proctor Mixed-use Center has a high quality pedestrian environment.

Generous sidewalks, pedestrian lighting, street trees and other vegetation, special pavement treatments, and a mid-block crossing contribute to a comfortable and safe pedestrian environment along a Mainstreet.

- Provide a periodic break in the median to allow emergency access and/or accommodate mid-block pedestrian crossings. The frequency of breaks may depend on block length, frequency of driveways and design objectives and should be determined on a case-by-case basis.
- Median may extend through crosswalk to a create a pedestrian refuge

Other Elements to Consider

- Roundabouts may be used as gateway feature to a neighborhood or commercial area. Multi-lane roundabouts should typically be avoided where pedestrians are likely because they can be difficult for pedestrians and cyclists to traverse.

Required Right-of-Way

- 76 ft. = minimal functional ROW width, accommodating minimum dimension of all priority elements (86 ft. with 10 ft. center median). If a shared lane with sharrows is used instead of separated bike lanes, this width may be reduced to approximately 70 ft.
- 88 ft. = ROW width (98 ft. with 10 ft. center median) to accommodate preferred dimension of all priority elements

Goals per Travel Mode

Pedestrians

- Safe, short and convenient crossings
- Comfortable and attractive streetscape
- Generous sidewalks
- Amenities such as trees, furnishings, lighting
- On-street parking to insulate pedestrian-zone from vehicle zone

Bicycles

- Where adequate space can be allocated within the roadway for a bicycle lane one should be provided, but in certain cases a shared lane with sharrows may be used, under the following conditions:
  - Adequate lane width is provided to avoid conflict with opening car doors and provide room for bicycles to travel adjacent to moving vehicles
  - Slow posted and design speeds (25 mph)
  - Signage and/or sharrows (in-lane pavement markings)
  - If ADT > 10,000 and there is not adequate room for bicycle lanes, then sharrows should typically not be used and a parallel bicycle route should be considered.

Transit

- High levels of accessibility
- Distinctive, comfortable stops
- Bus stops where practical, based on density and demand

Vehicles

- Provide access to businesses
  - On-street parking (short-term metered parking to encourage parking turnover)
  - Additional parking in rear of buildings
  - Angled parking may be provided in adjacent sidestreets
  - Moderate convenience
  - Slow travel speeds/congestion
  - Flow interrupted by transit, frequent intersections and pedestrian crossings

6th Ave in the 6th and Pine Mixed-use Center.

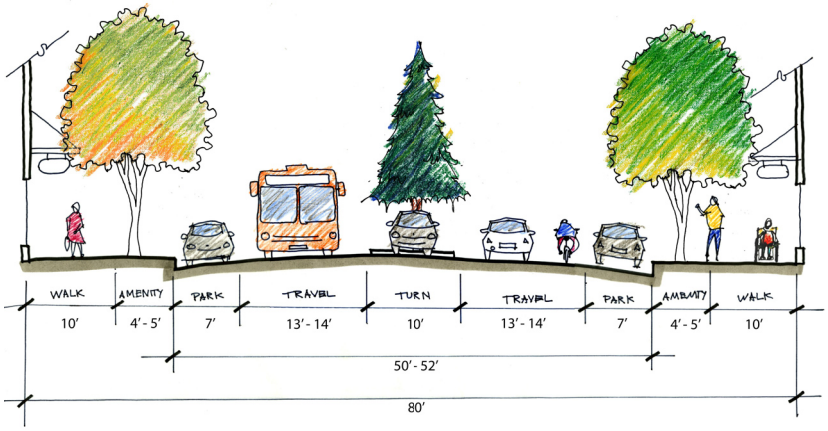
Examples of Potential Mainstreets

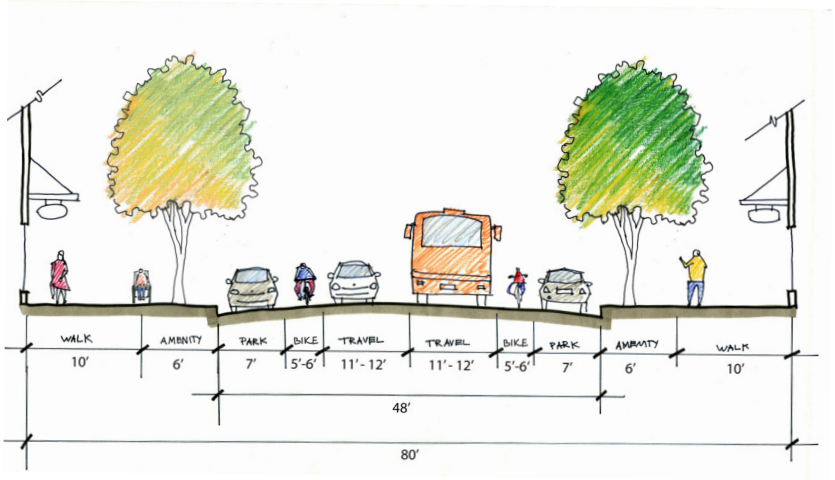
- Tacoma Ave (Stadium)
- N. 1st St. (Stadium)
- Division Ave (Stadium)
- N. Proctor Ave (Proctor)
- N. 26th St (Proctor)
- McKinley Ave (McKinley)
- S. 38th St. (38th & G)
- S. 11th St. (MLK)
- S. 12th St. (MLK)
- S. G St (38th & G)
- Yakima Ave (38th & G)
- 6th Ave (Narrows and 6th and Pine)

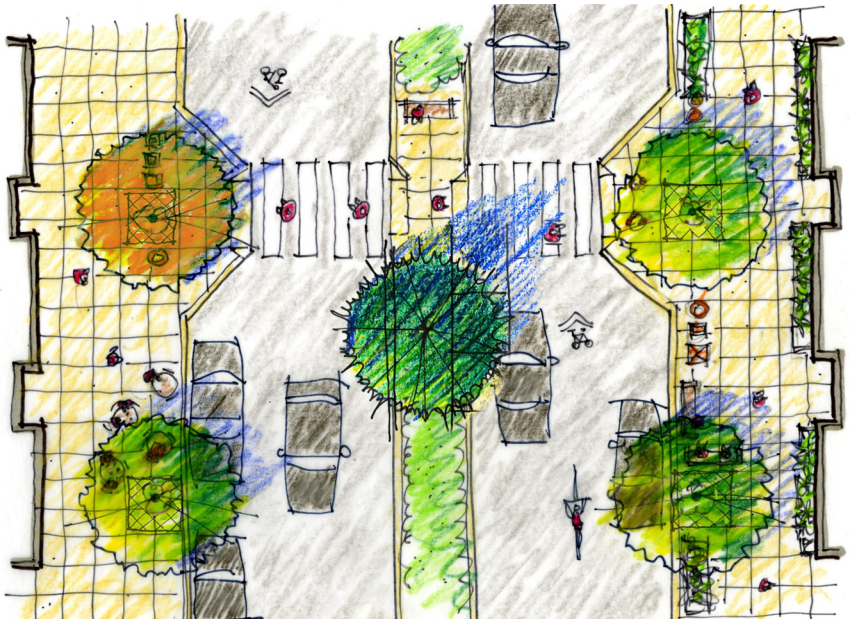
The Mainstreet typology may be applicable on other streets not listed above.

S. 38th St in the 38th & G Mixed-use Center.

Figure 2.2: Mainstreet Typology, 2 - and 3 - lane







Drawings are for illustrative purposes only

Current channelization standards require that the combined parking and bicycle lane provide a minimum of 13 feet in width.

2.3.2 *Avenue*

Objective

- Balance safety, comfort, and service for all modes
- Perform an important mobility function in larger network
- Vehicle capacity not to be expanded/some congestion expected
- High-quality pedestrian environment
- High levels of transit accessibility
- Bicycles are accommodated separate from vehicles
- Opportunity to enhance wider avenues with additional green, bicycle or pedestrian features

Typical Land Use Attributes

- Wide range of medium to high density uses, including commercial (retail and office), institutional, big box mixed-use, lower densities in areas between MUCs
- Buildings oriented toward, and pulled up to street, parking in rear, direct pedestrian access to streetfront

Priority Elements

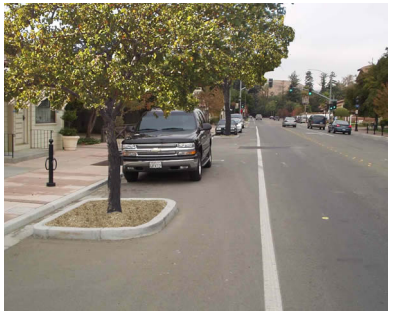
- 2-4 travel lanes
  - 10 - 11 ft. width preferred
  - 12 ft. outside lane if no on-street parking or bicycle lane to allow clearance
- 10 ft. center turn-lane for access and to reduce accidents
- On-street parking (7 ft. preferred or 8 ft. if speeds exceed 30 mph)
  - May be restricted during peak hours
  - In some cases where parking demand is low and/ or there is a higher priority for providing bicycle lanes while maintaining vehicle capacity, parking may be reduced or eliminated. Road diets should be considered as an an alternative scenario.
- Bicycle lanes should be provided due to higher vehicle speed
  - 6 ft. preferred with on-street parking, 5 ft. acceptable
  - Wide outside lane with painted fog line may be considered in constrained situations
- Sidewalk
  - 10 - 12 ft. desirable in areas planned to be pedestrian-oriented, mixed-use
  - Minimum 7 ft. unobstructed in constrained situations
- Amenity Zone/Planting Strip
  - 6 - 8 ft. amenity zone is preferred for accommodating trees, furnishings, lighting, transit amenities, utilities, bicycle parking, etc.
  - 4 ft. in constrained situations- Tree pits may encroach slightly into sidewalk to allow larger tree species, or
  - trees placed in bulb-outs in parking lane if not enough room in amenity zone
  - Amenity zone is replaced by planting strip outside Center
- Bus stops
  - Preferred locations at major cross streets or mid-block crossings if long blocks (>500 -600 ft.)
  - Transit amenities within amenity zone

S. 56th St. within the 56th and South Tacoma Way Mixed-use Center.

S. Mildred St. within the James Center Mixed-use Center.

N. Pearl St. within the Westgate Way Mixed-use Center.

The Avenue Complete Street typology emphasizes "road diets", or reducing the typical 5-lane cross-section to 3 or 4 lanes where functionally feasible.



Tree bulbs may be placed in the parking zone where there is not enough room in the amenity zone.

- Curb extensions
  - At intersections or mid-block crossings to shorten pedestrian crossings
  - To accommodate trees where there is a constrained amenity zone
  - Can't be used where parking lane is used as travel lane during peak hours
  - Extend one foot shy of the width of the parking lane
- Median (also see Section 2.2.4)
  - The decision to install a center median should be weighed against goals to minimize roadway width, provide room for other priority elements, and provide adequate clear zone for emergency vehicles.
  - Use medians as part of overall corridor access management strategy to reduce vehicular conflicts, increase capacity and prevent accidents, or to provide aesthetic or pedestrian safety benefits.
  - Use mountable curb and hardscape where appropriate for portion of median needed to provide required clear zone for emergency vehicle access.
  - Provide a periodic break in the median to allow emergency access and/or accommodate mid-block pedestrian crossings. The frequency of breaks may depend on block length, frequency of driveways and design objectives and should be determined on a case-by-case basis.
  - Median may extend through crosswalk to a create a pedestrian refuge

Other Elements to Consider

- Block length ideally not more than 400 ft., not to exceed 600 ft. without mid-block crossing. In Neighborhood Centers block length is more or less fixed due to the established urban form. Community Centers may have new through streets built as development occurs.
- Mid-block crossings for blocks 500- 600 ft. or greater
  - Pedestrian-activated signal or flasher
  - Curb extension
  - Pedestrian mid-block refuge if 3 lanes or greater
  - High visibility markings
- Driveways are allowed, but should be minimized along Pedestrian Streets, especially within Centers

Required Right-of-Way

- 70 ft. = minimal functional ROW width (2 travel lanes + 10 ft. center median)
- 98 ft. = ROW width to accommodate all priority elements (2 travel lanes + 10 ft. center median)
- 100 ft.= minimal functional ROW width (4 travel lanes + 10 ft. center median)

Goals per Travel Mode

Pedestrians

- Safe, short and convenient crossings
- Comfortable and attractive streetscape
- Generous sidewalks
- Amenities such as trees, furnishings, lighting

- On-street parking desirable to insulate pedestrian-zone from vehicle zone

Transit

- High levels of accessibility
- Distinctive, comfortable stops
- Reliable and efficient local and express service between key destinations
- Priority signals where appropriate

Bicycles

- Separate bicycle lanes due to higher vehicle speeds
- 6 ft. preferable with on-street parking, 5 ft. acceptable
- Where ADT > 10,000 and bicycle lanes are not possible, a parallel bicycle route should be developed
- If Avenue is a bicycle route, consider a curb-separated bikeway. Curb-separated bikeways, or cycle tracks, may be considered in certain situations where the number of driveways are limited and major intersection conflicts will not result. Such bikeways should be a minimum of 10 ft. wide and may occur within the roadway or within the roadside. Connectivity to adjacent land uses and other bicycle facilities is an important factor to consider when planning a bikeway. Clear signage and street paint markings should indicate where bikeway begins and ends and how it connects to other bicycle facilities. The specific design and selected routes for separated bikeways should be considered as a part of the city's non-motorized planning.

Vehicles

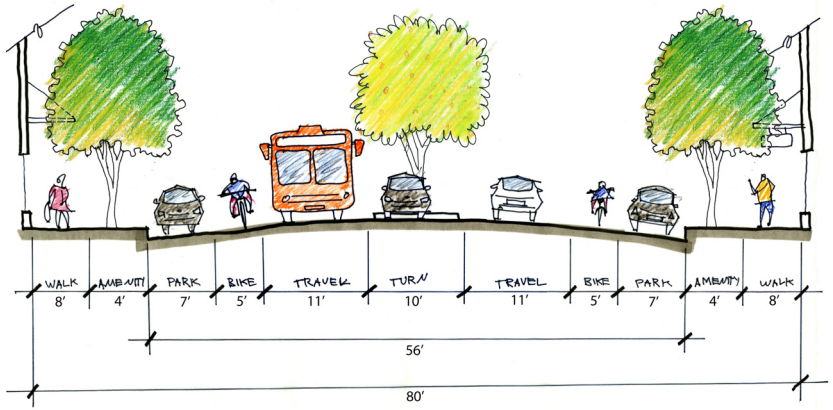
- Vehicle mobility important, but some congestion to be expected
- Provide access to businesses
  - On-street parking
  - Additional parking in rear of buildings

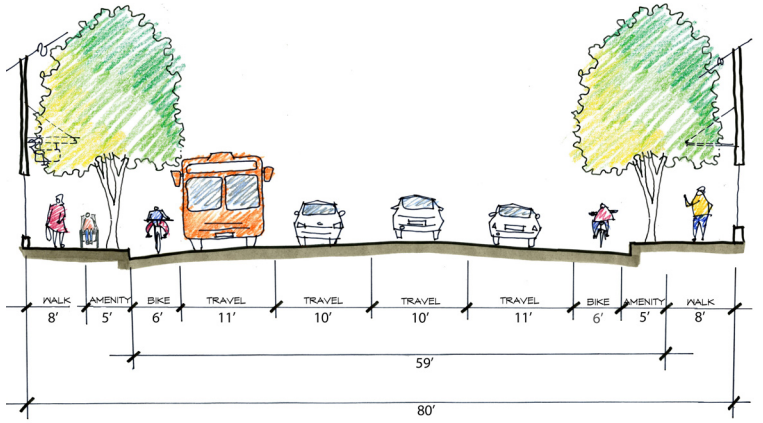
Examples of Potential Avenues

- S. Steele Street (Tacoma Mall)
- S. 19th Street (James Center)
- S. Tacoma Way (56th & STW)
- S. 56th St. (56th & STW)
- Pearl St. (Westgate)
- N. 26th St (Westgate)
- Portland Ave (72nd and Portland)
- Union Ave (Tacoma Central)
- E. 32nd St (Lower Portland)E. 29th St (Lower Portland)

The Avenue Typology may be applicable on streets other than those listed above.

Figure 2.3: Avenue Typology - 80 Foot Right-of-way, 3 - and 4 - lane (no parking)

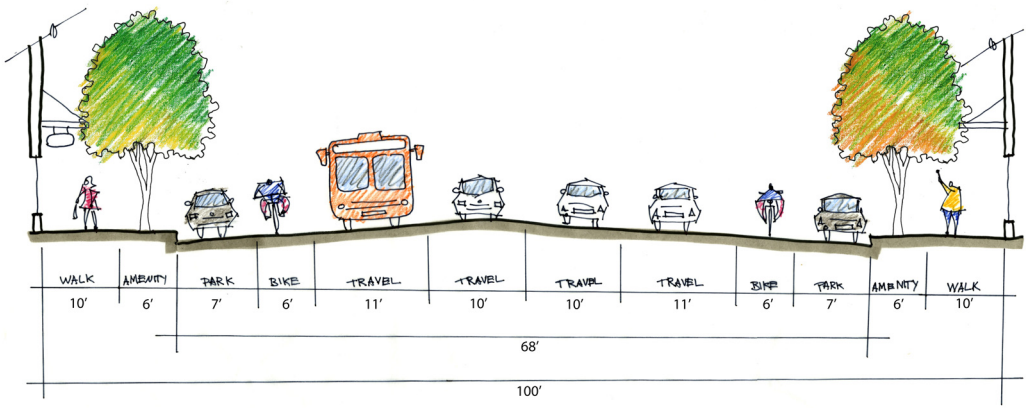


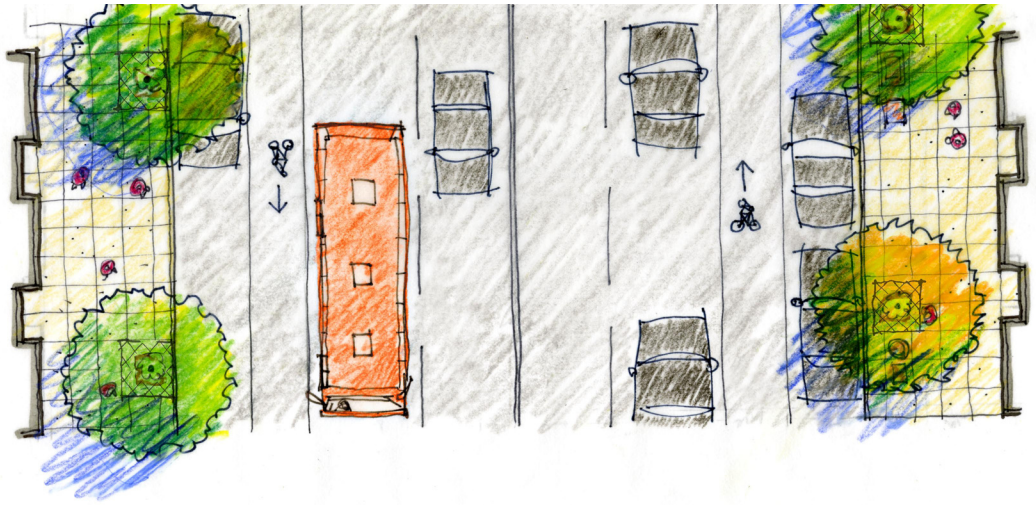


Drawings are for illustrative purposes only

Current channelization standards require that the combined parking and bicycle lane provide a minimum of 13 feet in width.

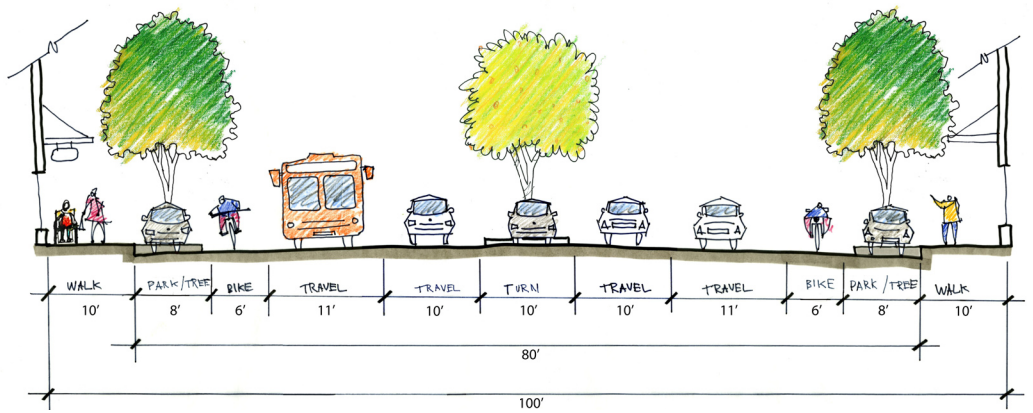
Figure 2.4: Avenue Typology - 100 Foot Right-of-way, 4 - lane with Parking

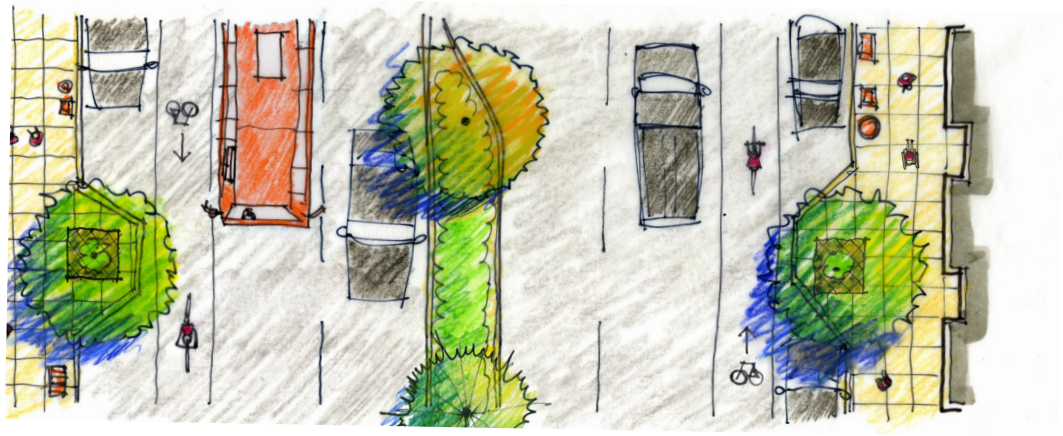




Drawings are for illustrative purposes only

Figure 2.5: Avenue Typology - 100 Foot Right-of-way, 4-lane with Median/Turn Lane





Drawings are for illustrative purposes only

2.3.3 Transit Priority

The Transit Priority typology applies to streets that currently have, or are planned to have, frequent bus service, street-car routes, or other form of high occupancy transit such as bus rapid transit.

Objective

- Convenient, frequent and attractive transit service receives highest emphasis
- High quality pedestrian environment
- Vehicles are provided access, but flow is regulated/ deterred by frequent transit stops and pedestrian crossings
- Bicycles are accommodated in some manner

Typical Land Use Attributes

- High density, people-intensive uses
- Local-serving retail/mixed use
- May be destination for specific niche markets
- Mixed-uses with emphasis on retail, multi-family residential,
- Buildings oriented toward, and pulled up to street, parking in rear
- Connects key destinations, i.e. hospitals, major employers, schools, downtown

Priority Elements

- Narrow roadway
  - Two 11- 12 ft. lanes (allows clear distance for parked car doors, commercial and emergency vehicles); wider lanes (13 – 14 ft) where there is not adequate room for bicycle lanes, and bicycles are accommodated in sharrows are met (see further below).
  - Continuous center left turn lane not typical, but if left turn lane needed, then should be integrated with median that includes landscaping, mid-block crossings on blocks >600 ft, and possibly center-loading transit platforms.
- Bicycle Facilities
  - 5 - 6 ft. bicycle lanes where there is adequate right-of-way and conflicts between transit, particularly streetcars and streetcar tracks, can be minimized.
  - Shared lanes with sharrows if not adequate room in right-of-way.
- On-street parking (7 ft. preferred to minimize street width, 8 ft. ok if all travel modes accommodated)
- Streetcar tracks and stops
- Sidewalk
  - 10 -12 ft. sidewalk preferred
  - 8 ft. minimum in constrained situations (no utilities or other obstructions in sidewalk zone)
- Amenity Zone
  - 8 ft. amenity zone is ideal for accommodating trees, furnishings, lighting, transit amenities, utilities, bicycle parking, etc.
  - 4 ft. in constrained situations – small caliper trees only in 4 ft. tree wells
- Driveways are restricted
- Maximum posted and design speed = 25 mph
- Left turns are restricted if no turn lane

Curb extensions and transit shelters define transit stops and provide safe and comfortable conditions for riders.

- Medians (also see Section 2.2.4)
  - The decision to install a center median should be weighed against goals to minimize roadway width, provide room for other priority elements, and provide adequate clear zone for emergency vehicles.
  - Use medians as part of overall corridor access management strategy to reduce vehicular conflicts, increase capacity and prevent accidents, or to provide aesthetic or pedestrian safety benefits.
  - Use mountable curb and hardscape where appropriate for portion of median needed to provide required clear zone for emergency vehicle access.
  - Provide a periodic break in the median to allow emergency access and/or accommodate mid-block pedestrian crossings. The frequency of breaks may depend on block length, frequency of driveways and design objectives, and should be determined on a case-by-case basis.
  - Median may extend through crosswalk to a create a pedestrian refuge

Required Right-of-Way

- 76 ft. = minimal functional ROW width, accommodating minimum dimension of all priority elements (86 ft. with 10 ft. center median). If a shared lane with sharrows is used instead of separated bike lanes, this width may be reduced to approximately 70 ft.
- 88 ft. = ROW width (98 ft. with 10 ft. center median) to accommodate preferred dimension of all priority elements

Goals per Travel Mode

Pedestrians

- Safe, short and convenient crossings with curb extensions or small curb radii
- Comfortable and attractive streetscape
  - Generous sidewalks
  - Amenities such trees, furnishings, lighting
  - On-street parking to insulate pedestrian-zone from vehicle zone

Bicycles

Where adequate space can be allocated within the roadway for a bicycle lane one should be provided, but in certain cases a shared lane may be used under the following conditions:

  - Adequate lane width (13 -14 ft.) is provided to avoid conflict with opening car doors and provide room for bicycles to travel adjacent to moving vehicles
  - Slow posted and design speeds (25 mph)
  - Signage and/or sharrows (in-lane pavement markings)
  - If there is not adequate room for bicycle lanes and ADT > 10,000, then sharrows should typically not be used and a parallel bicycle route should be considered.
  - Parallel bicycle routes preferred where streetcar alignment would not provide adequate maneuvering room for bicycles and creates unsafe conditions for bicycles.

- Minimize safety issues associated with bicycles crossing streetcar tracks
  - Direct bicycles onto parallel routes where one has been established
  - Prohibit bicycles from making left turns
  - Utilized rubber "flange fillers" where bicycles are to cross tracks

Vehicles

- Provide access to businesses
  - On-street parking
  - Additional parking in rear of buildings
  - Angled parking may be provided on adjacent side streets
- Moderate convenience
  - Slow travel speeds/congestion
  - Flow interrupted by transit, frequent intersections and pedestrian-crossings
  - Restricted turns

Transit

- High levels of accessibility
- Distinctive, comfortable stops
- Reliable and efficient local and express service between key destinations
- Priority over vehicles, Priority signals where appropriate
- Bus Rapid Transit Corridors
- More likely to occur on Avenues
- Similar to streetcar corridors in terms of pedestrian environment
- Loading could be similar to streetcar options
- May accommodate streetcar in long-term

Examples of Potential Transit Priority Streets

- MLK (between 6th and 19th) – Potential streetcar
- Tacoma Ave/Division Ave/1st Ave (Stadium) – Potential streetcar
- 6th Ave (6th & Pine) – Potential streetcar
- Portland Ave (Lower Portland) – Potential streetcar
- Mildred St. (James Center)
- S. 72nd St. (72nd and Pacific, 72nd and Portland)
- S. 47th/48th St. (Tacoma Mall)
- Pacific Ave (34th & Pacific, 72nd and Pacific) – Potential BRT

Streetcar Loading

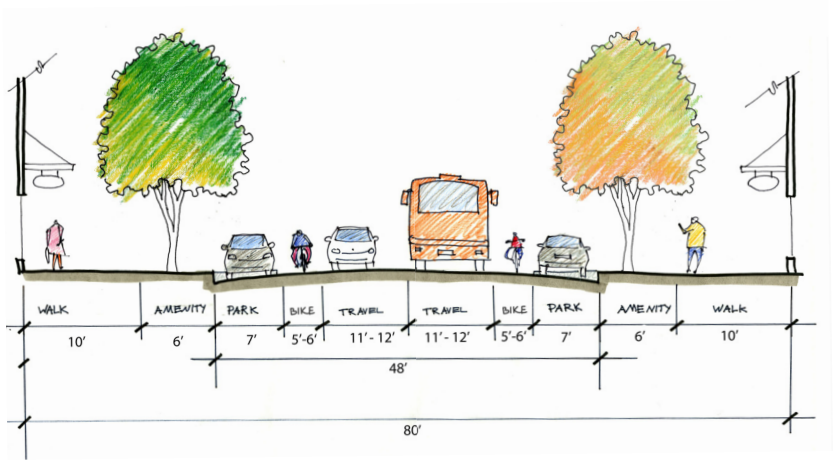
The City of Tacoma's streetcar planning and design should be compatible with Complete Street objectives. The streetcar loading options discussed in this section and shown in Figure 2.7 show how streetcars may affect certain Complete Street elements such as on-street parking and bicycle facilities. These options are based upon the Czech made Škoda Streetcar (w: 8 ft. L: 66 ft.), which is the streetcar that is currently in use on Tacoma's Link rail line and Seattle's South Lake Union Streetcar, and are for discussion purposes only and would require further engineering analysis.

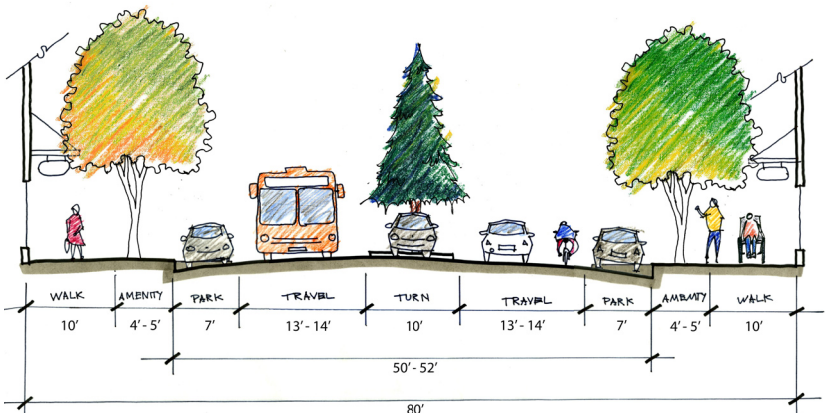
- Center-loaded
  - 10 ft. wide center platform, 70 ft. long
  - Maintains on-street parking for entire platform length
  - Works well with bicycles

Adequate bicycle parking should be provided along transit priority streets for the convenience of transit riders using bicycles.

- In-street platform
  - 7 ft. wide platform, 70 ft. long
  - Requires removing on-street parking for length of platform
- Curb extension
  - 70 ft. long
  - Requires removing on-street parking for length of platform
  - Contributes to generous sidewalk/pedestrian space
  - Special treatment required for bicycles
- Separate bikeway with curb extension
  - 70 ft. long
  - Requires removing on-street parking for length of platform
  - Includes grade separated 2-way bicycle trail
  - May only be appropriate on Avenues with rights-of-way greater than 80 ft.
  - Buses and streetcars may share station platforms/ stops.

Figure 2.6: Transit Priority Typology, 2- and 3-lane





Drawings are for illustrative purposes only

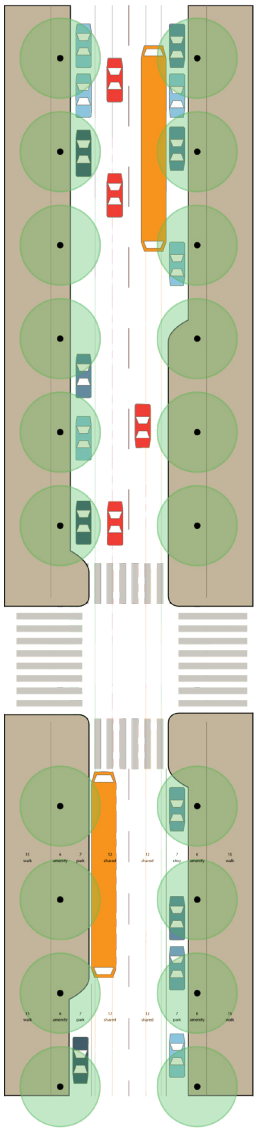
Current channelization standards require that the combined parking and bicycle lane provide a minimum of 13 feet in width.

Figure 2.7: Potential Streetcar Loading Options

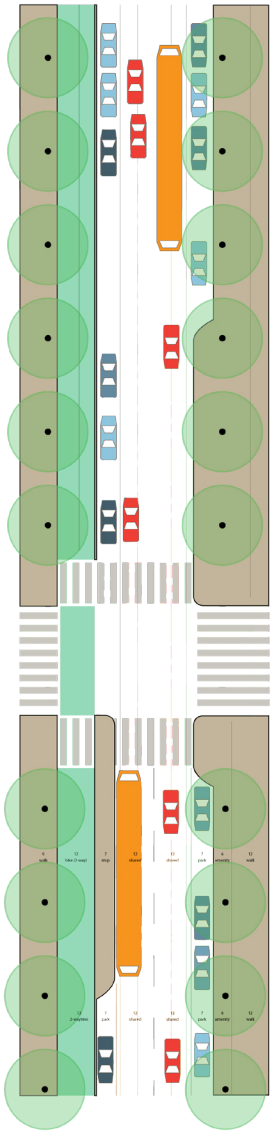
Center-loading platform.

Curb extension platforms can create hazardous conditions by forcing bicycles riding on the right

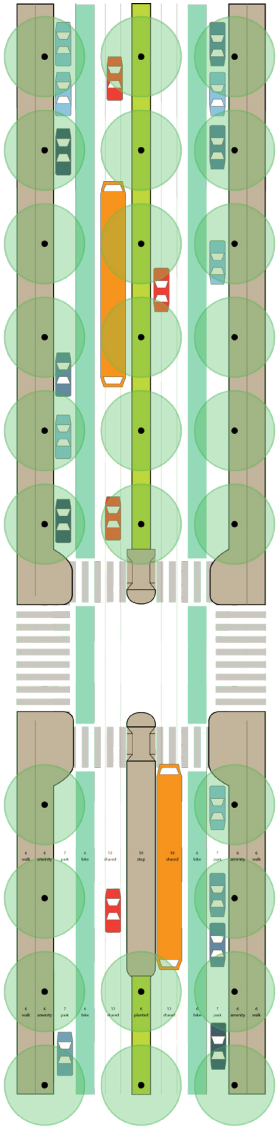
The City of Portland has designed a grade-separated bicycle lane that circumvents streetcar stops in order to address conflicts that result from curb extension platforms where there are bicycle facilities.



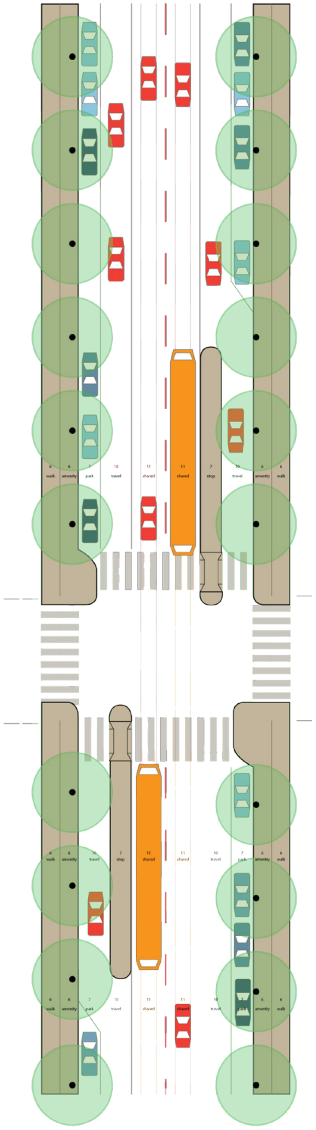
CURB EXTENSION



CURB EXTENSION W/ SEPERATE BIKEWAY



CENTER-LOADED



IN-STREET PLATFORM

2.3.4 *Urban Residential*

Objective

- Provide livable streets for residents within Mixed-use Centers, which may serve additional goals based on specific circumstances, including one or more of the following:
- Support enhanced pedestrian environment, including wider sidewalks, vegetation, seating, public art
- Support opportunities for low impact development techniques
- Provide extra on-street parking for visitors of residents and customers of nearby businesses
- Safely accommodate bicycles
- Explore innovative concepts for developing shared space or “woonerfs” for low speed vehicles, bicycles, and pedestrians

Typical Land Use Attributes

- Multi-family residential
- Limited retail commercial or professional offices in mixed-use buildings within close proximity to primary pedestrian street
- Parking lots and/or structures

Priority Elements

- 2 travel lanes, 10 ft. wide preferred, unless angled parking
- Parking (back-in angled or parallel) on at least one side of street
- Generous vegetation
- Wider sidewalks where possible
- Pedestrian amenities such as seating, lighting, open space
- Bicycle parking

Potential Elements

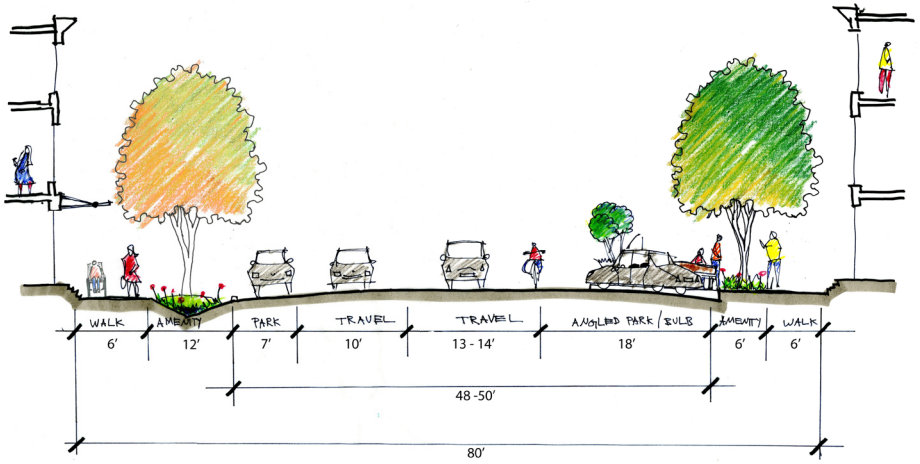
- Bicycle lanes
- Low impact development strategies - Stormwater planters, rain gardens, additional street trees, pervious pavements
- Shared space or “woonerf” features used to blur the vehicle and pedestrian zones such as special pavement treatments, bollards, etc.

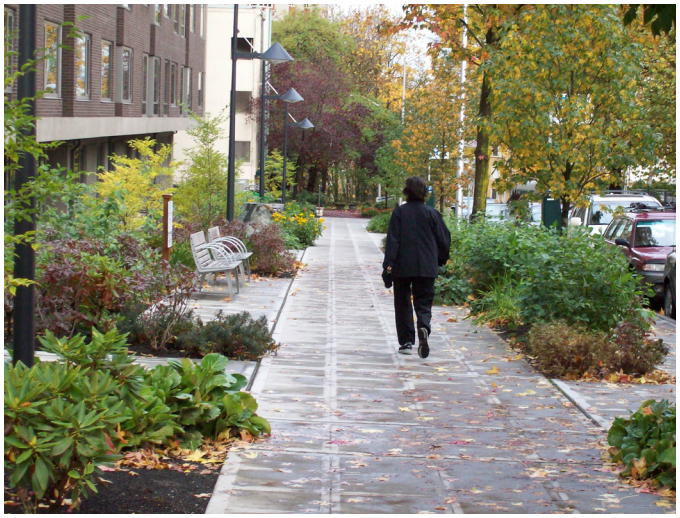
Eighty foot rights-of-way are the most common widths among residential streets within Mixed-use centers. 80 ft. widths provide opportunities for accommodating all of the elements listed above to one degree or another. Smaller right-of-way widths of 60 ft. and 66 ft. also occur within Mixed-use Centers. For instance, within the Tacoma Mall Mixed-use Center, 66 ft. rights-of-way are common among the residential streets. The same objectives would apply to these rights-of-way; however there is less opportunity for incorporating all of the elements listed above.

Ninety degree parking in the Proctor Mixed-use Center.

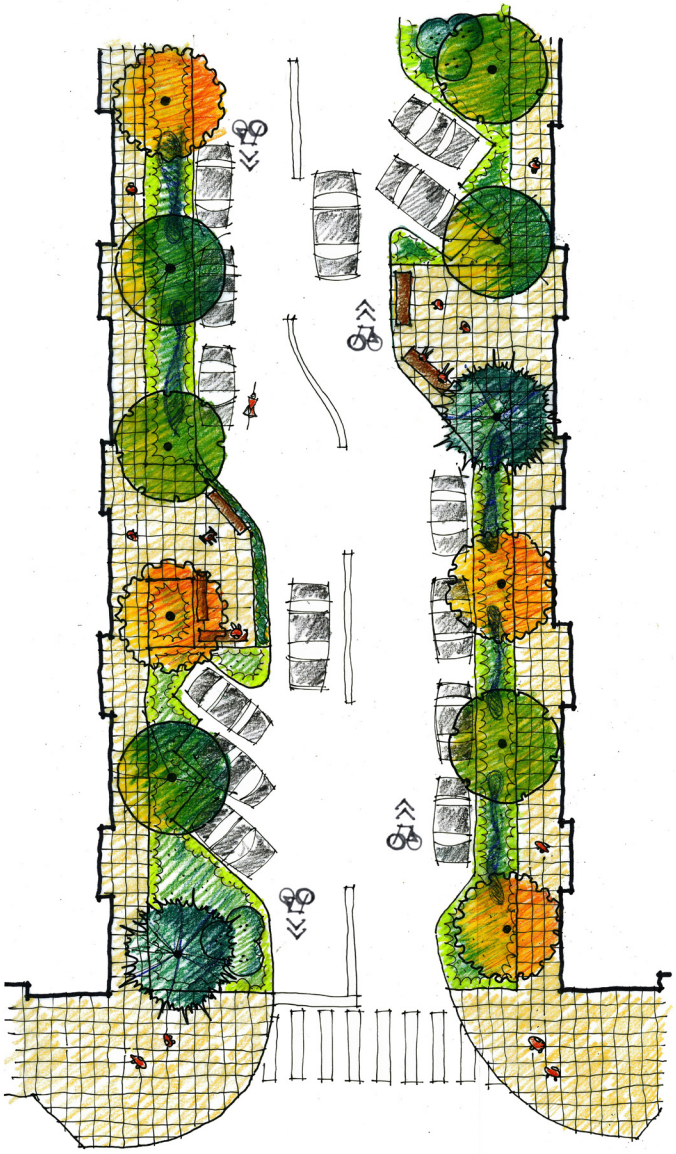
Vegetation and creative rainwater catchment features can add interest to a streetscape and help to address stormwater run-off.

Figure 2.8: Urban Residential Typology





Urban Residential streets should have generous sidewalks, seating, on-street parking, additional vegetation, and could potentially have gardens and other features that help to create livable urban spaces for residents.



2.4 Additional Complete Street Elements

2.4.1 Bicycle Boulevards

Bicycle boulevards may be appropriate where a parallel bicycle route is required due to right-of-way constraints or traffic conditions on Mainstreets, Transit Priority Streets, or Avenues, or where a connection is needed within the bicycle network. Bicycle Boulevards should be planned as part of a city-wide bicycle system. The purpose of bicycle boulevards is to improve bicycle safety and circulation by having or creating one or more of the following conditions:

1. Low traffic volumes and vehicle speeds
2. Discouragement of non-local motor vehicle traffic
3. Free-flow and efficient travel for bikes by assigning the right-of-way to the bicycle boulevard at intersections wherever possible;
4. Traffic control to help bicycles cross major streets (arterials);
5. A distinctive look and/or ambiance such that cyclists become aware of the existence of the bike boulevard and motorists are alerted that the roadway is a priority route for bicyclists;
6. A safe bicycling environment for people of all bicycling abilities; and
7. Alternate, parallel route to major arterials or severely constrained “mainstreet” or “transit priority” streets.

Bicycle boulevards are intentionally designed to be distinctive and recognizable both to bicyclists and motorists. When designing a bicycle boulevard the following objectives should be considered:

81. Design bicycle boulevards to be visually unique from surrounding streets and to be part of a citywide bicycle network.
2. Invite safe, easy bicycling that is appealing to all ages and abilities.
3. Utilize traffic-calming devices that do not significantly inhibit access of emergency vehicles.
4. Seek ways to improve neighborhood livability through reduced through traffic and increased green space.
5. Develop cost effective strategies for implementing bicycle boulevards
   6. Minimize changes to existing traffic patterns.
7. Incorporate pedestrian safety elements near schools, parks and at other major pedestrian crossings.

A bicycle boulevard design may utilize an array of elements to calm traffic, provide visual cues, and enhance safety. Such elements may include:

Traffic-calming

- Traffic circles
- Chicanes
- Bulb-outs
- Diagonal Diverter
- Stop/Yield signs

Signage

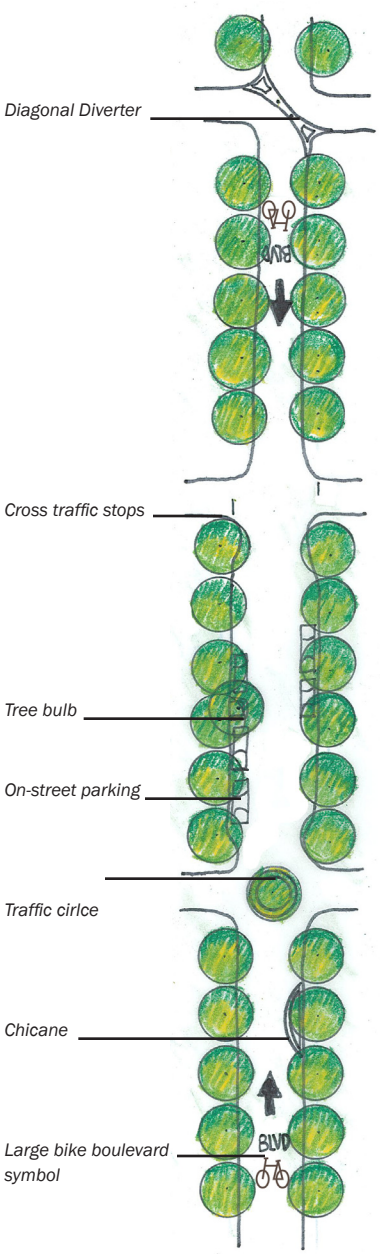
- Large chevron/bicycle accompanied by “Bike Blvd” painted on street
- Distinctive roadside signage, i.e. distinctive color, shape, symbol
- Wayfinding signage on other streets directing bicyclists to boulevard

Bicycle boulevards should have distinctive signage.

A diagonal diverter.

Chicanes and traffic circles are traffic-calming elements that can be used along bicycle boulevards.

Figure 2.9: Bicycle Boulevard



Minor street crossings

- Stop sign on streets perpendicular to bike blvd (with or without yield sign on bike blvd)
- Distinctive paving or street paint that defines the intersection and provides visual cues that induces drivers to slow down

Major Arterial Crossings

- Traffic signal
- Bicycle detectors at traffic signal
- Traffic signal with turn restrictions for motor vehicles

Pedestrian Safety

- High visibility crosswalk, i.e. raised crosswalk, distinctive pavement or paint
- Bulb-outs (mid-block, intersections)
- Pedestrian-crossing signage

A bicycle boulevard in Berkeley, CA.

2.4.2 Green Streets and Low Impact Development Strategies

Incorporating Low Impact Development Techniques into Complete Streets

The goal of low impact development (LID) is to prevent measurable harm to streams, lakes, wetlands, and other natural aquatic systems from stormwater runoff coming from commercial, residential, or industrial development and associated roadways and other paved surfaces. LID strategies for stormwater management (both water quality and flow control) emphasize the use of existing natural site features integrated with distributed, small-scale stormwater controls to more closely mimic natural hydrologic patterns. LID techniques may be applied within Complete Streets if the conditions are right, and may include the use of bioretention swales, rain gardens, tree box filters, and pervious pavements (pervious concrete, asphalt and pavers). Above all, the most effective LID technique is to minimize impacts to begin with. The degree to which LID techniques can be incorporated into a right-of-way depends on the width of the right-of-way, adjacent land uses, functional needs of the right-of-way, underlying soils, and location of utilities.

The benefits of LID include improved water quality, reduced stormwater runoff into stormwater conveyance systems, potential habitat, reduced heat island effect, and enhanced aesthetic quality of the urban environment. Because LID emphasizes the use of natural hydrologic systems rather than a purely structural approach, it often is a lower cost approach to stormwater management, especially over the life cycle of infrastructure. The benefits derived from low

impact development techniques may be limited in parts of the city due to poor soil infiltration. Furthermore, stormwater flow and water quality requirements vary in different parts of the city, and will also vary depending what is being done to a street, i.e., widening, resurfacing, etc. However, by employing low impact development strategies in the public right-of-way when feasible, the city sends a message that it is committed to green design, and is leading the way to more sustainable development.

Below are descriptions of various LID techniques and other components that may be considered for Complete Street application, and particularly along designated Green Streets. These LID approaches should be considered part of the template of options for addressing stormwater issues, and implemented when found to be appropriate to the situation and reasonably feasible, effective and economical.

Bioretention (Rain Gardens)

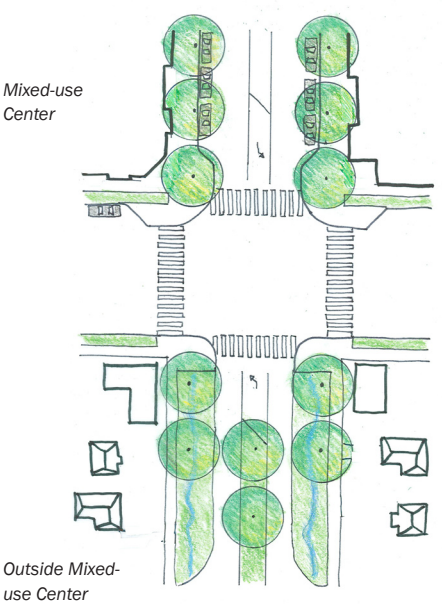
Bioretention areas, or rain gardens, may be applied in various settings, but generally have the following characteristics:

- Shallow landscape depressions with designed soil mix and plants adapted to the local climate and soil moisture conditions that receive stormwater from a small contributing area.
- Healthy soil structure and vegetation promotes infiltration and attenuation of storm water flows, and provide water quality benefits
- Typically small-scale, dispersed facilities that are integrated into the site as a landscape amenity.
- Bioretention areas may be designed to retain and infiltrate stormwater in place (rain garden or bioretention cell). Rain gardens are shallow depressions with a designed planting soil mix and a variety of plant material, including trees, shrubs, grasses, and/or other herbaceous plants. Rain gardens may function as a landscape amenity and a stormwater quality and/or flow control practice and can be applied within rights of way along roads or within adjacent properties abutting the right-of-way.

Stormwater Planter

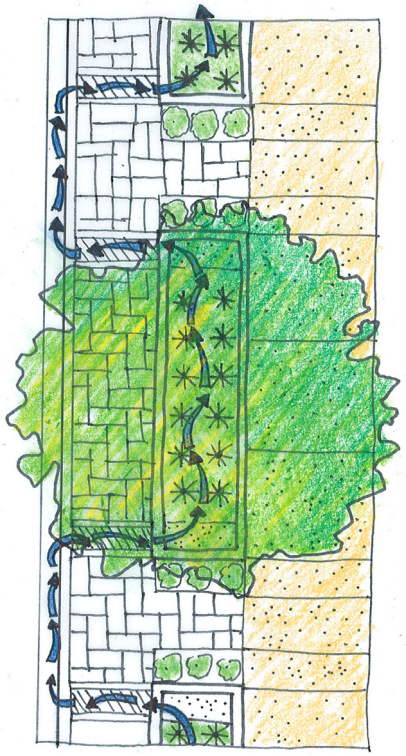
A stormwater planter is a small, contained vegetated area that collects and treats stormwater using bioretention. Bioretention systems collect and filter stormwater through layers of mulch, soil and plant root systems, where pollutants such as bacteria, nitrogen, phosphorus, heavy metals, oil and grease are retained, degraded and absorbed. Treated stormwater is then infiltrated into the ground as groundwater (Infiltration Planter) or, if infiltration is not appropriate, discharged into a traditional stormwater drainage system (Flow-Through Planter). Alternatively, multiple stormwater planters may be linked so that the non-infiltrated stormwater from one planter flows into a subsequent planter as has been done along SW 12th Ave in Portland, OR. Stormwater planters do not require a large amount of space and can add aesthetic appeal and wildlife habitat to city streets, parking lots, and commercial and residential properties. Stormwater planters typically contain native, hydrophilic flowers, grasses, shrubs and trees.

Pervious concrete and rain gardens can help to manage stormwater runoff.



Low Impact Development elements such as bioswales, and additional streets trees and vegetation can provide "green gateways" to Mixed-use Centers.

A stormwater planter in Portland, OR.



Stormwater Planter

Pervious Concrete and Asphalt

Pervious pavements allow water to infiltrate rather than run into storm drains. Along a right-of-way, pervious pavement may be most appropriate when used for sidewalks, driveways, and parking areas. Benefits of pervious concrete can include mitigation of first flush pollutants, recharging groundwater (if not designed with underdrains), minimizing need for expensive stormwater collection and detention systems, and reducing surface temperatures and associated heat island effect. Pervious pavements have been used for a number of years; however, there are still questions about its long-term durability and maintenance costs.

Tree Box Filter Systems

Tree box filters are buried concrete vaults filled with a special media designed to provide water quality. A bush or tree is typically installed in the media filled vault. These features are designed to provide water quality and also provide flow attenuation. These features can be distributed throughout the site. The system consists of a container filled with an engineered soil mixture, a mulch layer, under-drain system and a shrub or tree. Tree box filters can be used in a variety of situations.

The Green Street Concept

The goal of a Green Street is to enhance neighborhood livability while also providing ecological benefit through improved water and air quality, as well as potential habitat. A Green Street both appears and functions differently from a conventional street due to its emphasis on incorporating low impact development (LID) techniques and other green infrastructure such as street trees and vegetation. Opportunities for additional street trees and other vegetation are sought and/or created within a Green Street corridor in order to take advantage of the air and water quality benefits these provide. Green Streets should be planned and designated as part of a "green infrastructure" system, based on factors including their potential to enhance habitat connectivity with adjacent natural areas, as well as traffic demands and other considerations. Whereas designated Pedestrian Streets within Mixed-use Centers are not likely candidates as Green Streets due to their functional requirements and the intensity of adjacent land uses, other streets within Mixed-use Centers may be appropriate for such treatment.

2.4.3 Street Trees and Landscaping

Street trees are an important component of Complete Streets in that they contribute to a comfortable pedestrian environment and they effectively calm traffic. Street trees also provide broader reaching benefits related to environmental quality, economic vitality of business districts, public health, improved legibility of urban form, and enhanced livability of Mixed-use Centers. The planning and design of Complete Streets should always accommodate street trees and Tacoma's Urban Forestry Policy and Program should be referenced. When choosing the appropriate tree species for a given street segment there are many factors to consider, including maintenance, root growth pattern, foliage texture, growth rate, longevity, canopy spread, resistance to urban pollutants, and tolerance to drought and poor soils.

In addition to individual tree characteristics, and overall ecological performance of the urban forest, the contribution of street trees to street character and urban design is also an important consideration. The urban design aspects of street trees are particularly important to consider in the context of urban, commercial streetscapes such as the Pedestrian Streets within Mixed-use Centers. There are a number of ways in which street trees contribute to street character and urban form, including size, shape, branching structure, foliage color, and how they frame the street. Below is a discussion of how street trees help to define street character and some general considerations that should be made when planting street trees along Complete Streets.

Planting designs should follow the City of Tacoma's Urban Forestry Policy and Program. In addition, the following considerations specific to Mixed-use Centers streets should be considered.

Neighborhood Identity

Street trees and other vegetation can contribute to neighborhood identity in positive ways especially on signature or Pedestrian Streets. By creating a sense of enclosure (discussed below), comfortable walking environments, and a recognizable pattern, street trees can create a memorable experience and establish a positive mental image of a neighborhood for the pedestrian and motorist alike.

Considerations

- Consider using large, stately species that do not block views to storefronts.
- Achieve uniformity through a recognizable pattern of tree species.

Sense of Enclosure

Street trees can help to create spaces in the urban environment where users feel a sense of comfort and enclosure. On streets with tall buildings and narrow rights-of-way, pedestrians may feel claustrophobic or boxed in. On wider streets with lower buildings pedestrians may feel exposed. Street trees are helpful in both situations as they add a human scale and soften the building edge where buildings are tall, and provide a sense of enclosure where buildings are not tall enough to do so. Furthermore, trees provide shade making the walking environment more comfortable for pedestrians during hot summer months.

Considerations

- Larger trees with wider canopy spread are more likely to provide a continuous sense of enclosure, especially where trees are planted wider apart.
- Tree spacing – Trees should be spaced so that they provide a continuous overhead canopy upon maturity.
- Avoid selecting columnar trees as they do not provide a sense of enclosure and do not provide other benefits such as shading and appreciable rain water interception and absorption (discussed further below).

Pattern and Rhythm

From an urban design perspective, regularly planted street trees can help tie a street together providing rhythm, pat-

Street trees provide a sense of enclosure, shade, visual interest, as well as, numerous environmental benefits. Tree species should be chosen, and maintenance should be performed, to maintain visibility to storefronts.

Street trees provide shade to and soften the pedestrian environment.

Street trees add "friction" to the street edge and tend to calm traffic.

These street trees maintain visibility to storefronts and effectively frame the street.

Street trees add seasonal interest.

Trees along S Yakima street are planted in a consistent pattern.

tern and scale to what may otherwise be a chaotic urban form with varying building heights and setbacks, as well as roadway and sidewalk widths. Trees can be used to achieve a sense of design unity at the district scale or across a continuous street corridor.

Considerations

- Diversity of Species – Having a diversity of species provides biodiversity and visual variety, and may help discourage disease and insect infestations. A deliberate and recognizable pattern should be established even when planting a diversity of species.
- Size and Shape – Tree species may vary along a given corridor in order to fulfill goals such as biodiversity and visual variety, however consistency in size and shape of trees is important when attempting to establish a recognizable pattern and rhythm that may be a distinguishing characteristic of an area. To the extent possible tree species that are similar in shape and size at maturity should be chosen. This does not preclude diversity in the age of trees along a given corridor.
- Color –Whether it is seasonal color or the color of a particular species' leaf or trunk, color can be a distinguishing characteristic that can contribute to establishing a pattern and rhythm.

Environmental Benefits

Street trees provide many environmental benefits, including reducing stormwater runoff, providing habitat, reducing the heat island effect, and mitigating air pollution. Tree characteristics such as canopy spread, bark texture, root growth pattern, leaf texture, and foliage persistence all factor into a tree's effectiveness at providing these environmental benefits.

Considerations

- Reducing Stormwater Runoff - Consider tree species with characteristics such as wide canopy spread, rougher bark and leaf texture, and persistent foliage (don't drop leaves early) for more effective stormwater interception and absorption.
- Reducing Heat Island Effect – Consider tree species with characteristics such as wide canopy spread and dense foliage for more effective shading of surfaces that tend to absorb high amounts of solar radiation, thus resulting in the heat island effect. Furthermore, UV light has been found to break down a range of materials, including asphalt. Blocking of UV light from paved surfaces tends to prolong the life of these surfaces.
- Habitat – In general, native trees, or trees already found within the Tacoma city limits, tend to contribute more to urban habitat than exotic species do.
- Carbon Sequestration – Trees absorb carbon dioxide, thus reducing the amount of this greenhouse gas in the atmosphere. The more leaf area a tree has, generally, the more carbon dioxide it is able to absorb.

Economic Benefits

A healthy urban forest is an asset that adds value to the city and its various neighborhoods and commercial districts over time. Studies have shown that residential and com-

mercial land values, consumer patronage rates, and retail occupancy rates are all improved by the presence of street trees. Trees can also save money by offsetting other costs. For example, by providing shade, trees can reduce costs for cooling buildings, maintaining pavements, and managing stormwater. Also, reductions in air pollution attributed to trees can reduce medical costs for people sensitive to asthma and similar diseases.

Considerations

- Visibility – Choose species with shapes and branching structures that allow visibility to storefronts to be maintained.
- Energy Savings – Choose species with wide, dense canopies to shade buildings and reduce costs associated with building cooling. The placement of trees in relation to buildings is an important factor that determines the extent to which they can reduce energy consumption related to cooling. For example, the placement of trees on the west façade of buildings is important for achieving building cooling during the summer months in the Pacific Northwest.

Traffic Calming

Street trees tend to have a traffic calming effect due to the visual interest and the perceived narrowing of the roadway they create. Both of these factors contribute to drivers being more attentive of what is happening at the street edge, causing them to drive slower. This traffic calming effect increases pedestrian safety and generally contributes to the overall comfort and livability of the street.

Considerations

- Spacing – Generally, less spacing between trees, i.e. more trees at the street edge, tends to increase visual interest and "friction" at the street edge, and thus increase the traffic calming effect.
- Tree size – Larger trees, with a wider canopy spread tend to increase the sense of enclosure and the perceived narrowness of the street, thus increasing the traffic calming effect.

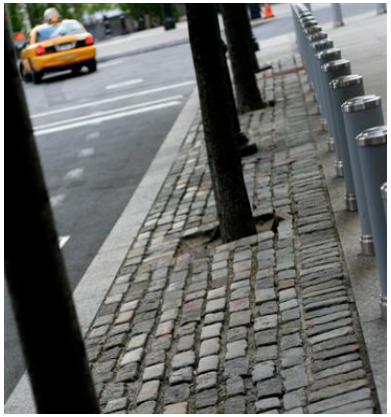
Tree Maintenance and Health

A sound maintenance strategy and dedicated funding will ensure the long-term health of the City's urban forest. Street trees will always need to be maintained, but making careful choices when designing the right-of-way and by selecting appropriate species for appropriate locations can significantly reduce maintenance costs while increasing ecological benefits and public health over time.

Considerations

Provide adequate space for root growth to ensure healthy and structurally sound tree growth. A minimum 4 ft. by 6 ft. planting area should be the goal for all new trees. If smaller tree pits are necessary, ADA-compliant pervious pavers should be used.

- Consider alternative treatments to tree grates such as ADA-compliant modular pervious pavers, mulch, or vegetation such as ground cover or shrubs.
- Choose species that can tolerate the extremes of



Pervious pavement treamtents may be appropriate where there is limited room in the sidewalk/amenity zone for providing optimally sized tree pits. Tree grates may also be used if it is necessary for tree pits to encroach into the sidewalk zone.

The parking zone presents an opportunity for additional landscaping and street trees.

A variety of tree species, including evergreen coniferous trees may be appropriate.

summer drought and winter saturation.

- Choose species that are tolerant of pollution and alkaline soils commonly found in the urban environment.
- Consider using pervious pavement for sidewalks – studies have shown that such pavements allow tree root gas exchange and access to more moisture, thus reducing the tendency for tree roots to push up sidewalks in search of oxygen and other gases.
- Plant a diversity of species to ward against disease and insect infestation.
- Evergreen coniferous species may require more maintenance because they drop foliage throughout the year, requiring more frequent clean-up of the sidewalk for safety and aesthetic reasons, and because of their size and density, they may also require more pruning in order to maintain a safe walking environment and clear views to storefronts.
- Tree selection and maintenance must ensure safety and minimize conflicts with larger vehicles such as buses. Where trees grow over the vehicle zone, they should be maintained to provide 14 feet of clearance.

Tree Type

As mentioned above, there are many factors to consider when choosing appropriate street tree species that achieve both urban design and ecological objectives.

Considerations

- A mixture of evergreen coniferous and broadleaf deciduous trees is appropriate for streets within Mixed-use Centers other than designated Pedestrian Streets.
- Most native evergreen coniferous species have growing requirements (minimum planting area width, soil volumes) that cannot be supported along urban Pedestrian Streets in most cases.
- Broadleaf deciduous trees along Pedestrian Streets more effectively achieve a sense of enclosure, maintain views to storefronts, add seasonal visual interest, and allow light into the pedestrian realm during winter months.
- The effect trees have on the upper stories of buildings where there will be residential or office uses in the future is important to consider. Evergreen coniferous tree species native to the Northwest tend to have dense foliage, which effectively block light from reaching these upper stories throughout the year.
- Evergreen coniferous trees may be appropriate at transition points, where buffers are needed within Mixed-use Centers, on large sites where additional trees can be planted on the development-side of the sidewalk, i.e. not within the sidewalk and amenity zones, or where.
- Native evergreen coniferous tree species would be appropriate along designated Green Streets where the goal is to provide a greener street aesthetic, as well as emphasize low impact development techniques.

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ROAD
WORK
AHEAD

Chapter 3

Implementation

3.1 General

This chapter provides a discussion of implementation issues and recommends actions to ensure that complete streets concepts are refined, integrated into existing processes and standards, and implemented. A reasoned approach to implementation will provide substance to policies and guidelines, set reasonable expectations and optimize the City's investment in Complete Streets.

The implementation actions addressed in this chapter include integrating Complete Streets into existing City processes; identifying and empowering stewards of Complete Streets; developing code changes and design standards to be compatible with Complete Streets; identifying cost and funding issues; and, developing phasing scenarios for consideration by the City. In addition, this chapter summarizes policy questions that the City Council will need to address to realize Complete Streets.

Implementation of a Complete Streets policy in Tacoma will be the first step in establishing comprehensive design standards for improvements within the City's rights-of way. Except for individual examples, such as Dock Street, design of City streets has been predominately determined through the application of engineering standards. Engineering standards of the past have emphasized the role of the single occupant vehicle and the result has produced an existing inventory of streets that is "vehicle-centric" and does a poor job of accommodating the needs of all users of the right-of-way.

Effective street design needs to include full consideration of the pedestrians, bicyclists, transit and utilities that also must share the street. In addition, more consideration must be given to the aesthetic quality of street design. Growth Management and the growing trend toward increasing urban density make it essential that the street provide a comfortable sense of 'place' for the urban population. It must be noted that the City's engineering staff has responded to these trends in recent years and has begun to incorporate design elements to address them.

The design and construction of Complete Streets must be a more inclusive process than historically utilized. It must

integrate the needs of all of the various stakeholders. Within the City that obviously includes design staff that are responsible for translating policy into real infrastructure. Not so obviously included is planning staff that recommend land use actions impacting urban density and quality of life; emergency responders that must rely upon free flowing streets; and the utilities that must use the right-of-way to deliver their services. In addition are outside stakeholders such as cyclists, pedestrians, business owners, and local residents that should have the opportunity to be more engaged in the design process.

As mentioned above, the City's design staff has begun incorporating Complete Streets concepts into projects. Examples include the Broadway Local Improvement District (LID), the D Street Grade Separation, the Foss Waterway redevelopment, and the proposed MLK LID. However, there is not yet a consistent, holistic Complete Streets design approach that is recognized citywide. If it is the desire of the City Council to utilize Complete Streets as the guiding principle, it is recommended that the Council explicitly adopt a Complete Streets policy resolution including the following elements:

- Adoption of the Mixed-use Centers Complete Streets Guidelines
- Establish the Mixed-use Centers, including downtown, as the first priority for implementation
- Direct staff to develop design standards that are consistent with the guidelines
- Direct staff to develop conceptual streetscape plans for the Mixed-use Centers
- Direct staff to develop budget strategies for both the capital and maintenance requirements for implementation
- Direct staff to analyze options for expanding Complete Streets to the entire City
- Adoption of such a resolution is the most effective way to ensure that a Complete Streets policy is recognized by all employees as a priority of the Council and incorporated into the decision-making of all City staff.

3.2 Cross Functional Team

In order to ensure that all elements of Complete Streets are adequately considered, a cross-functional staff team should be formed. As a minimum, the cross-functional team should consist of representatives from Community and Economic Development, Public Works, Fire Department, Tacoma Public Utilities and Pierce Transit. Community and Economic Development should have representation from the Planning and the Neighborhood Business District sections. Public Works should include representatives from Building and Land Use Services, Engineering, Construction and Utility Services. The Fire Department should provide a representative to discuss fire vehicle access issues. Tacoma Public Utilities should provide representatives from Water, Power and Click to address issues related to utility facilities.

The cross-functional team should be assigned the following tasks:

- Develop recommended code changes

The team should review all applicable codes and documents, including but not limited to the Tacoma Municipal Code, International Building Code and Comprehensive Plan, for consistency with the adopted Complete Streets policies. The team should identify any inconsistent provisions and develop proposed policy or code changes for adoption.

- Develop design standards

The team should develop specific design standards and processes which support the Complete Streets policies and code provisions. The design standards should be applicable to all Mixed-use Centers and will lead to the specific conceptual street designs discussed later. At a minimum, design standards should address transportation, utility and low-impact design elements.

  - Transportation elements

The transportation elements should include design standards for vehicle lanes, bicycle lanes, sidewalks, medians, landscaping, illumination, parking, traffic control, signage, pavement markings, transit facilities and emergency vehicle access.

  - Utility elements

The utility elements should include design standards for utilities located within the right-of-way. At a minimum the utility standards should discuss recommended utility locations, above ground treatments and coordination with other elements.

  - Sustainable/Low Impact development elements

The low impact development elements should include design standards for pervious pavements, surface water collection and treatment systems, alternative pavement surface treatments, landscaping treatments and alternative parking treatments.

  - Urban Forestry Policy and Program elements

The team should work to implement the Urban Forestry Policy through providing input on tree and landscaping guidelines, and coordinating trees and landscaping with other activities within the right-of-way.

- Coordinate with stakeholders

The team should coordinate their efforts with all stakeholders impacted by the Complete Streets design standards. During the development of code changes and design standards, stakeholder input should be solicited and incorporated as appropriate.

- Track implementation and update the City Council

The team should periodically review implementation of the Complete Streets policies to ensure that adequate progress is being maintained. The team should revise implementation strategies as necessary and should provide periodic updates to the City Council.

3.3 Integrate Implementation Into Existing Processes

To help ensure the effective implementation of Complete Streets policies, existing City processes should be modified to include consideration of Complete Street policies and practices. Incorporation of Complete Streets into the appropriate existing work groups will allow implementation to begin as the product of routine staff work. The employees that will responsible for implementing Complete Streets are already working together on teams dealing with similar issues. The following are existing committees and work groups that are likely candidates for incorporating implementation:

- Public Works Review Panel – This team is responsible for determining public infrastructure improvements related to building permit requirements for private developers.
- Citywide Infrastructure Team – This team has representatives from the Public Works Department, Tacoma Public Utilities, and private utilities. This group meets to discuss each member's future infrastructure plans to help coordinate construction within the City's right-of-way.
- Public Works Standard Plans Review Team – This team is responsible for reviewing and modifying the Public Works Department standard construction plans.
- Community and Economic Development Ad hoc Comprehensive Plan revision teams – These teams are formed by the Community and Economic Development Department to review and recommend revisions to the City's Land Use Code.
- Mobility Taskforce – This was a group of citizen advisors and City staff that used to meet on a regular basis to discuss mobility and access issues within the City right-of-way. It could be reconstituted to meet quarterly with the express purpose to assist in the implementation of Complete Streets. The membership of each of these teams could easily be modified to include representatives from other affected departments and stakeholders, for the purpose of implementing Complete Streets. This would avoid creating an entirely new team or teams that would have to generate their own momentum, and would easily incorporate implementation into existing routines with the appropriate staff.

A responsible lead should be appointed for the various elements of Complete Streets to coordinate the efforts of multiple departments. Following is a recommended assignment of lead responsibility:

- Code revisions – Community and Economic Development
- Design and Construction – Public Works, Engineering
- Permitting – Public Works, Building and Land Use

The responsible leads will ensure that the appropriate staff is taking the necessary measures to implement Complete Streets and report on progress regarding specific implementation issues.

3.4 Develop Conceptual Plans for Designated Streets

A key challenge in implementing the guidelines is in coordinating the many incremental actions and projects that occur within a given right-of-way. To address this issue, this report recommends the development of conceptual designs for the specific Mixed-use Center streets that will be built or retrofitted as Complete Streets. This will create a common template for all to use. Work is continually being done within the right-of-way by the Public Works Department; the water, power, and sewer utilities; and private developers as permit conditions. Unless there is a common understanding of the future Complete Street design in a given location, it is inevitable that construction will occur that is in conflict with the long-term vision for the street. This will either drive up the cost for implementing Complete Streets or will force unwelcome compromises in accepting less than full implementation.

The conceptual designs would provide a consensus vision at a low level of specificity, but one that would contain the general design for build-out of the street. This conceptual design would guide future design decisions by all stakeholders. The intent is not to provide specific design details and it should be acknowledged that changes will need to occur as specific issues are encountered. This effort can be approached in a similar fashion as the Public Works Department policy of establishing future street grades in order to help utilities locate within the right-of-way. If the conceptual planning is approached in this manner and integrated into the City's existing processes, this effort should be accomplished with moderate increased expense.

Good conceptual planning will make implementation both more timely and cost effective. There will be less likelihood for implementation decisions to fall through the cracks. Public Works staff will understand the future plans and will not only design the concepts into projects, but will also prepare grant applications with the appropriate budgets and project descriptions. Building permit requirements can be formulated to be consistent with the conceptual plans. City utilities will be better able to plan their capital projects without concern that future conflicts will occur. Finally, City planning staff will be able to develop future code changes with known future construction plans.

Developing conceptual designs will place demands on Public Works staff. However, in the long run this step will save time and work, as well as ensure consistent implementation. To limit the scope of work, the City should consider designating the Pedestrian Streets within the Mixed-use Centers as the first priority for implementation and thus the first to have conceptual designs developed.

3.5 Cost

To inform the Council's decision on Complete Streets, it is important to understand the cost implications. The cost of implementing a Complete Streets program involves either retrofitting existing streets or building new streets, as well as ongoing maintenance. The costs and funding options for each is significantly different, as discussed below.

Rebuilding a street is most likely to be funded through either a grant or a Local Improvement District. In both cases, such projects are funded and will be accounted for in the

capital projects budget. For totally rebuilt or newly constructed streets, a Complete Streets approach will typically have increases in costs over the status quo for landscaping and amenities that may be up to 10% of total construction cost. However, constructing wider sidewalks in lieu of asphalt paving is actually slightly less expensive given current asphalt prices in excess of $75 per ton. Also, given current trends in grant funding criteria, projects with pedestrian and bicycle enhancements will compete better than projects without such treatments. Therefore, implementing Complete Streets should have little impact on existing capital budgets for fully funded street replacement projects.

The major funding challenge will be in retrofitting existing streets within the Mixed-use Centers. While the level of grant funding is increasing for pedestrian and bicycle oriented projects, they are limited in number and are usually small projects that are under $150,000. The bulk of non-transit transportation funding is still reserved for capacity and safety projects within corridors that connect urban centers. The streets with the Mixed-use Centers do not tend to compete well in the traditional transportation grant process. Therefore, incremental upgrades to existing streets and sidewalks will typically have to be accomplished through a Local Improvement District or some other locally funded means; retrofits will typically have to be constructed without the benefit of significant outside grant funding.

The cost estimates in this report are derived from current data obtained from the Public Works Department. Specifically, the bid results from the Broadway LID, opened in March, 2008 and the recent downtown Pacific Avenue repairs, opened in June, 2008 have been used to help determine estimated capital costs. The maintenance costs are estimates for the increased maintenance that is anticipated and were developed with assistance from the Streets and Grounds Division.

Table 3.1 provides planning level estimates to build and maintain the major Complete Streets treatments discussed in this report. For planning purposes, the costs are calculated on a per block basis for an assumed average block, based on 13 blocks per mile.

Table 3.2 provides a planning level projection for an assumed build out scenario for the designated Pedestrian Streets within the Mixed-use Centers. The total length of all pedestrian designated streets, in the 16 Mixed-use Centers outside of downtown, is approximately 22.1 miles. That equals about 300 blocks, assuming an estimated 13 blocks per mile. The cost estimates shown in Table 2 are the product of the costs per block from Table 1 and an assumed number of blocks that would receive each of the various Complete Street treatments at build out.

In summary, if all of the currently designated Pedestrian Streets within the Mixed-use Centers are retrofitted, as assumed, the total anticipated capital cost is $42 million. The corresponding increase in annual maintenance would be approximately $600,000. The major increases in maintenance result from increased landscaping, low impact mitigation and pavement markings. These estimates do not include costs associated with undergrounding overhead utilities. These are high cost projects that are not assumed to be the best use of the available limited funding needed to implementing a Complete Streets policy.

Table 3.1: Estimated Capital and Maintenance Cost Per Average Block

Item	Unit	Units per Block	Unit Capital Cost	Estimated Capital Cost per Block	Unit Maint. Cost	Estimated Annual Maint. Per Block
Planted Median including trees	Lin. Ft.	250	$300.00	$75,000	$14.00	$3,500
Curb Extension @ intersection corner	Each	4	$30,000.00	$120,000	N/A	$0
Curb Extension @ mid block location	Each	2	$20,000.00	$40,000	N/A	$0
Widen Sidewalk (removal, paving & c &g)	Sq.Yd.	220	$380.00	$83,600	N/A	$0
Pedestrian Signal Enhancement	Each	1	$25,000.00	$25,000	$500.00	$500
Bicycle Loop Detector	Each	2	$1,000.00	$2,000	$50.00	$100
Bicycle Lane Marking Stripe	Lin. Ft.	600	$0.15	$90	$0.05	$30
Bicycle Symbols	Each	6	$175.00	$1,050	$58.33	$350
Sharrow Symbols	Lin. Ft.	6	$175.00	$1,050	$58.33	$350
Bike Box	Each	2	$250.00	$500	$83.33	$167
Parking Pavement Marking Stripe	Lin. Ft.	600	$0.15	$90	$0.05	$30
Street Tree in Amenity Zone	Each	20	$1,200.00	$24,000	$42.00	$840
Low Impact Development Treatment	L S	1	$20,000.00	$20,000	$1,000.00	$1,000

N/A - Maintenance costs are assumed equal to current costs since the existing streets are paved and maintained

Table 3.2: Cost Estimate for Designated Pedestrian Streets at Build-out

Item	Estimated Capital Cost per Block	Estimated Annual Maint. Per Block	Estimated Blocks of Treatment	Est. Capital Cost @ Build Out	Est. Annual Maint. Cost @ Build Out
Planted Median including trees	$75,000	$3,500	60	$4,500,000	$210,000
Curb Extension @ intersection corner	$120,000	$2,400	150	$18,000,000	$0
Curb Extension @ mid block location	$40,000	$800	150	$6,000,000	$0
Widen Sidewalk (removal, paving & c &g)	$83,600	$1,672	60	$5,016,000	$0
Pedestrian Signal Enhancement	$25,000	$500	80	$2,000,000	$40,000
Bicycle Loop Detector	$2,000	$100	80	$160,000	$8,000
Bicycle Lane Marking Stripe	$90	$30	150	$13,500	$4,500
Bicycle Symbols	$1,050	$350	150	$157,500	$52,500
Sharrow Symbols	$1,050	$350	150	$157,500	$52,500
Bike Box	$500	$167	80	$40,000	$13,333
Parking Pavement Marking Stripe	$90	$30	300	$27,000	$9,000
Street Tree in Amneity Zone	$24,000	$840	200	$4,800,000	$168,000
Low Impact Development Treatment	$20,000	$1,000	60	$1,200,000	$60,000
Total				**$42,071,500**	**$617,833**

It is not assumed that all treatments would be employed in all blocks. For example, either bicycle lanes or sharrows are assumed in all 300 blocks but not both together in the same block. Constructed medians are assumed in only 20% of the blocks and each block is only assumed to have either curb extensions (bulb outs) or a mid block crossing. The intent of these estimates is not to precisely predict the ultimate configuration but rather, to provide a reasonable estimate that represents the likely magnitude of costs that can be anticipated.

3.5.1 Overhead Utility Relocation Cost

In many of the Mixed Use Centers the existing dry utilities are located overhead. The option to convert these facilities to underground must be evaluated carefully on a case by case basis due to the relatively high cost of conversion. As discussed in section 2.2.1, the option of relocating overhead facilities to underground is highly dependent on Right-of-Way and space availability. Another key factor to the conversion cost that must be considered is the capacity and condition of the overhead system.

Smaller capacity overhead systems typically found at the end of the electrical system in residential areas typically cost $150-$300 per foot to convert to underground. Higher capacity system conversions typically cost $400-$600 per foot, and Downtown Network style systems can run as high as $1000 per foot to convert to underground.

Not included in the above typical prices are the costs to the individual property owners to convert the property side overhead wires to underground. Landscaping, retaining walls and concrete surfaces often complicate the conversion of the secondary system on private property.

These costs are based on existing conversions completed in conjunction with other improvements in the last few years. The cost of each conversion can also be affected by the capacity and number of telecommunication systems as well as the funding mechanism implemented. Local Improvement District funded projects have higher expenses than customer funded projects due to interest and the administrative overhead cost to manage the LID.

These costs are not included in the following tables, although some of the funding strategies identified below could be utilized for proactive efforts to relocate dry utilities underground. Additional analysis would need to be done to support a policy discussion involving the City Council and Public Utilities Board on this issue.

3.6 Funding Sources

Funding Complete Streets will likely require funding from multiple sources. Certain elements of Complete Streets may compete very well for some funding sources, but not be competitive, or eligible, for other funding sources. Also, some funding sources can be used for both capital improvement and maintenance needs while others are restricted for capital projects only. Following is a brief description of potential funding sources for Complete Streets.

- Gas tax – Available for both capital improvement and maintenance

Federal and state gas taxes are traditional sources of the City's transportation funding. Currently, gas tax funding in the City is about evenly split between capital and maintenance programs. Historically, gas tax has been used to fulfill the required local match requirement for the City's grant funded capital projects. This allows the City to leverage its gas tax revenue as much as 5 to 1 and the Public Works Department has been very successful in the pursuit of federal and state transportation funding. Funding programs will often be oriented toward elements of a Complete Streets project, such as pedestrian enhancements or transit linkages. Those elements should be highlighted in the funding applications.

It must be emphasized that there is an inverse relationship between the price of gasoline and the amount of gas tax revenue generated. The tax is a fixed amount per gallon and as less is used, revenues fall. In the future, trends toward more fuel efficient cars and the emergence of electric and other alternately fueled vehicles will both result in reduced City revenue. Therefore, consideration should be given to reducing the City's reliance on gas tax revenue to fund street improvement projects.

- General Fund – Available for both capital improvement and maintenance

Typically the General Fund has been used to fund operational expenses such as maintenance. The City's operational expenses for enhancement programs, such as the non-motorized plan, urban forestry, and traffic calming are funded from the General Fund. However, the General Fund could also be used as a source of funding for Complete Streets capital improvement projects if desired by the City Council.

- Real Estate Excise Tax (REET)– Available for capital improvement

Real Estate Excise Tax has been used to help fund a limited number of transportation projects in Tacoma, such as some of the Foss Waterway development projects and repairs on both the Puyallup and Lincoln Avenue bridges.

- Local Improvement District (LID) – Available for capital improvement

Local Improvement Districts have been used successfully in Tacoma for a variety of public improvements. Although most frequently used for residential street improvements, LID's have been created to finance underground utilities and more recently for large scale arterial improvements

such as the Broadway LID. Historically, the City has only provided LID matching money to help fund residential street improvements. LID's formed to finance commercial street development have been "full cost", in which the property assessments are entirely bourn by the property owners.

- Business Improvement Area (BIA) – Available for both capital improvement and maintenance

The Business Improvement Area financing mechanism has been used successfully in downtown Tacoma to provide increased security and maintenance.

- Impact Fees / Developer Requirements– Available for capital improvement

Impact fees, or similar developer based funding, could be used in conjunction with development requirements to fund Complete Streets projects. These could be area-wide projects or could be limited to frontage improvements adjacent to the proposed development. However, the City does not currently have an impact fee program.

- Vehicle License Fee – Available for both capital improvement and maintenance

Prior to the passage of Initiative 695, which eliminated the City's license fee revenue, this source of funding provided approximately $1.4 million annually and was used to fund right-of-way improvements like those proposed for Complete Streets. The legislature has recently allowed local jurisdictions to adopt a local vehicle license fee. RCW 36.73.065 authorizes the City to impose a vehicle license fee of $20 upon approval of the City Council and up to $100 upon approval of the voters. Based on an estimated 120,000 vehicles registered in Tacoma, license fees could generate between $2.4 million and $12 million annually.

- Bond issue – Available for capital improvement

The City has utilized internal bonding capacity, as well as voter approved bonds, for public improvements. Build Tacoma Together is a good example of the use of voter approved bonds for major capital improvements. A similar bond issue could be used to fund, or partially fund, Complete Streets.

- Grants– Available for capital improvement

There are a variety of grant funds which could be used for elements of Complete Streets projects. The City has been successful in the past in securing grant funding for transportation projects from WSDOT, TIB, FMSIB, PSRC, EDA and Congressional earmarks. Typically the various grant programs target particular transportation elements, which requires partial funding from a number of these sources to assemble full funding for a Complete Streets project.

- Latecomer fees– Available for capital improvement

Latecomer fees are a mechanism which allows the City to recover pro-rata costs of a duly authorized public improvement from future developers which receive benefit from the public improvement. The City created a latecomers fee agreement for the construction of S. Steele Street south of S. 35th Street.

- Street Utility– Available for both capital improvement and maintenance

RCW 82.80.040 authorizes the City to create a street utility to own, construct, operate and maintain street improvements such as street lighting, traffic control devices, sidewalks, curbs, gutters, parking facilities, and drainage facilities. RCW 82.80.050 authorizes the City to levy charges for up to 50% of the costs of the street utility. The City should consult with legal counsel to review case history related to street utilities and to ensure compliance with all the requirements of the RCW.

3.7 Phasing Implementation

It is important to recognize that the implementation of a Complete Streets approach will be phased in over time. To be successfully implemented it is important that the City Council formally adopt a Complete Streets policy. This policy, when combined with conceptual planning, will set a clear, unambiguous direction for staff to follow. It will allow priorities to be set so that incremental progress toward meeting those priorities will continue. Then, regardless of funding levels, City staff will still be able to continue working toward implementation of the common vision.

The rate at which implementation will occur is directly related to the amount of funding that is available. Obviously, if $42 million were made available and the scenario described above is adopted, then implementation would occur without delay. If no funding, beyond existing sources, is provided then implementation will be incremental and require years to fully occur.

While $42 million is a daunting figure when viewed alone, it is not an insurmountable amount if an integrated plan of development is adopted. To put the required level of capital outlay in perspective, consider that the City's sanitary sewer utility has been investing approximately $4 million annually for the Inflow and Infiltration (I & I) elimination program. Also, not all of these street improvements will be funded solely by the City. Some of these streets will receive grant funding or be improved as part of private development proposals. City design staff can identify those that will compete best and the Capital Improvement Plan should be written to anticipate grant funding where it is reasonable to do so. The successful work of the City's Infrastructure Team should be expanded to explicitly include consideration of Complete Streets. This team's work of coordinating public works and utilities projects, such as the Broadway LID, will be invaluable in leveraging existing construction funding to implement Complete Streets.

As stated earlier, the speed at which Complete Streets gets implemented will be dependent upon available funding. Funding policy and priorities are clearly the responsibility of City Council policy. However for discussion purposes, this report looks at three potential implementation scenarios. The intent of these scenarios is to frame a discussion that realistically examines the type of choices that would need to be made, not to predict an outcome or to make specific policy recommendations. Clearly, the policy decisions that are made by the City Council will be determined by economic and political considerations beyond the scope of this report.

These scenarios are based on the assumption that implementation will begin with streets in the Mixed-use Centers as the first priority. All of the scenarios recognize that private or outside funding will be required. However, faster implementation will require both new priorities and funding sources, while slower implementation will rely more on existing funding sources and be less dependent on new funding. Speeding up implementation will most likely require incentives for private development through mechanisms, such as city LID participation. All of the scenarios assume that increased maintenance costs are split evenly between City expense and outside sources, such as expanded use of the BIA mechanism. The scenarios below identify existing and potential new funding sources that could be employed to implement a Complete Streets program within 5, 10 or 20 years. All dollar amounts are assumed to be equivalent to 2008.

- 5 Year Scenario

The 5 year scenario for build-out of designated Pedestrian Streets will require an average annual expenditure of $8.4 million in capital investment. It is also the scenario that is most reliant upon developing new funding sources. Therefore, it is most dependent upon public support, since the bulk of the new funding would require a public vote. With the new funding sources in place, this scenario would be able to split the new expenditure requirements evenly between the City and outside sources. It assumes that the maximum, $100 Vehicle License Fee is adopted and that 20% of that revenue is directed to implementing Complete Streets. It also assumes that, in order to provide an incentive to private developers, the City provides a 50% LID match for Complete Street retrofit projects. The remainder of new funding is providing through a combination of existing sources, bonds, grants, new street utility revenue, REET, and miscellaneous private development requirements. Table 3.3 shows the 5-year implementation scenario.

- 10 Year scenario

The 10 year scenario will require an average annual expenditure of $4.2 million in capital investment. This scenario is less reliant upon developing new funding sources than the 5 year scenario. It would reduce the City share of the new expenditure requirements to approximately 29% as compared to 50% for the 5 year scenario. It assumes that the $20 Vehicle License Fee is adopted and that 20% of that revenue is directed to implementing Complete Streets. Like the 5 year scenario it assumes a City LID match, but it is reduced to 25% for Complete Street retrofit projects. The remainder of new funding is providing through existing sources, grants, and private development requirements. Table 3.4 shows the 10-year implementation scenario.

- 20 Year Scenario

The 20 year scenario will require an average annual expenditure of $2.1 million in capital investment. This scenario is the least reliant upon developing new funding sources. It would rely almost entirely upon the City's existing transportation revenue sources to fund the Complete Streets projects and would require funding to focus on Complete Streets. This may result in eliminating or deferring non-Complete Streets projects. It assumes that no Vehicle License Fee is adopted and that no City LID match is provided

Table 3.3: 5 - Year Implementation Scenario

5 Year Implementation for Mixed Use Centers				
	Avg. Annual Capital		5th Year Maint. Cost	
Estimated Annual Cost	$8.4 million		$0.6 million	
	City Expense	Expense by Others	City Expense	Expense by Others
Potential Revenue Sources	$4.2 mil.	$4.2 mil.	$0.3 mil.	$0.3 mil.
Gas Tax	X		X	
General Fund			X	
Real Estate Excise Tax	X			
Local Improvement District	X	X		
Business Improvement Area				X
*Impact Fees		X		
*Vehicle License Fees	X			
Complete Street Bond Issue		X		
State and / or Federal Grants		X		
*Latecomer Fees		X		
*Street Utility	X		X	
Private Development Requirements		X		

*New potential revenue source requiring City Council action

Table 3.4: 10 - Year Implementation Scenario

10 Year Implementation for Mixed Use Centers				
	Avg. Annual Capital Cost		10th Year Maint. Cost	
Estimated Annual Cost	$4.2 million		$0.6 million	
Potential Revenue Sources	City Expense	Expense by Others	City Expense	Expense by Others
	$1.2 mil.	$3.0 mil.	$0.3 mil.	$0.3 mil.
Gas Tax	X		X	
General Fund			X	
Real Estate Excise Tax	X			
Local Improvement District	X	X		
Business Improvement Area				X
*Impact Fees		X		
*Vehicle License Fees	X			
Complete Street Bond Issue				
State and / or Federal Grants		X		
*Latecomer Fees				
*Street Utility				
Private Development Requirements		X		

*New potential revenue source requiring City Council action

Table 3.5: 20 - Year Implementation Scenario

20 Year Implementation for Mixed Use Centers				
	Avg. Annual Capital		20th Year Maint. Cost	
Estimated Annual Cost	$2.1 million		$0.6 million	
	City Expense	Expense by Others	City Expense	Expense by Others
Potential Revenue Sources	$0.1 mil.	$2.0 mil.	$0.3 mil.	$0.3 mil.
Gas Tax	X		X	
General Fund			X	
Real Estate Excise Tax				
Local Improvement District		X		
Business Improvement Area				X
*Impact Fees				
*Vehicle License Fees				
Complete Street Bond Issue				
State and / or Federal Grants		X		
*Latecomer Fees				
*Street Utility				
Private Development Requirements		X		

*New potential revenue source requiring City Council action

for Complete Street retrofit projects. Implementation would depend on grants, full cost LID's, and private development requirements. Table 3.5 shows the 20-year implementation scenario.

3.8 Summary of Policy Questions for Consideration

Implementation of a Complete Streets policy is an ambitious undertaking that will involve major policy decisions impacting numerous City departments and community stakeholders. To be successful it will require the enthusiastic support of all affected parties. Listed below are some of the policy questions that the City Council will be considering.

1. City Council policy resolution declaring that it is the policy of Tacoma that street construction should incorporate Complete Streets principles.

- How to implement the new Complete Streets policy for all streets?

- Should the first priorities be the designated pedestrian streets within Mixed-use Centers?

2. Develop conceptual plans.

- What are the funding and staffing requirements needed to produce concepts and how should they be provided?

- What is the desired schedule for completing the conceptual planning process?

3. If the Mixed-use Centers are the first priority, how long should the implementation within the centers take?

4. What new funding sources, if any, should be pursued?

5. How should stakeholder input be incorporated into the design process?

- In development of standard designs.

- In selection of specific treatments to be used at specific locations.

Consensus on these and similar policy questions will be instrumental in the successful implementation of Complete Streets in Tacoma.

Tacoma Mixed-use Centers Complete Streets Design Guidelines

Appendices

Summary of Supporting Policies, Goals, and Actions related to Complete Streets

Tacoma's Climate Action Plan – Green Ribbon Climate Action Task Force

The Tacoma Climate Action Plan outlines strategies for reducing greenhouse gas emissions. The strategies discussed include existing, developing and new strategies. Those that may support or affect streetscape improvements include:

Replacing street lights with more efficient technologies

1. Implementing a comprehensive City-wide bicycle and pedestrian system
2. Implementing smart growth principles supporting bike and pedestrian friendly neighborhoods
3. Increasing tree planting requirements and incentives
4. Supporting TOD and increased use of public transit, biking and walking
5. Incorporate "complete streets" principles in the City Public Works design standards
6. Establishing and maintaining trees on streets and City rights-of-way

Transportation Subcommittee – Draft Recommendations and Strategies

- Adopt a complete streets policy
- Develop a comprehensive city-wide bicycle and pedestrian system.
- Construct the streetcar system

City of Tacoma Comprehensive Plan

The Comprehensive Plan contains intent language and policies that support the development of complete streets practices.

Generalized Land Use Element

Section II – Mixed Use Centers

Supporting Intent Language

The vision for mixed use centers emphasizes:

- Creating safe, comfortable, interesting walking and biking environment through the efficient use of land,
- Providing frequent and convenient transit with good roads, and
- Creating quality urban neighborhoods.

Among the key principles for development of mixed-use centers are:

- Transportation Choices

- Create comfortable and safe walking districts
- Provide functional bicycle access and facilities
- Increase transit ridership
- Reduce dependence on cars

■ Quality of Life and Active Living
- Create pedestrian-oriented streets
- Increase vegetation and greenery in an urban setting
- Create comfortable and accessible public spaces

Compact Development

LU-MUCD-5 Public Transit Support
Give maximum consideration for transit user convenience in centers including pullout lanes, fully developed transit stops, and, where appropriate, park and ride and multimodal facilities.

LU-MUCD-7 Circulation
Provide convenient and attractive pedestrian and bicycle linkages among all developments and uses within the center and surrounding neighborhoods.

LU-MUCD-11 Transit-Oriented Development
Partner with Pierce Transit in providing development incentives and programs to improve transit-orientation and walking conditions in all centers.

Parking

LU-MUP-1 Parking
Minimize the amount of land dedicated to parking and encourage alternative transportation, use of compact stalls, joint and cooperative parking between uses, transportation demand management, multilevel parking structures, and other methods.

Design

LU-MUD-6 Pedestrian and Bicycle Design
Provide for designated pedestrian/bicycle pathways, landscaping, weather protection, public art, bicycle racks, street furniture, pedestrian scale street lighting, and other amenities to encourage walking, biking and transit use.

LU-MUD-9 Green Infrastructure and Streetscape Improvements

Improve livability, particularly in and adjacent to mixed-use centers, through targeted streetscape improvements that include integrated landscaping, pedestrian facilities and stormwater management with enhanced aesthetics.

LU-MUD-15 Pedestrian Streets in Core Area
Identify arterials within the core area of mixed-use centers as key pedestrian streets and priorities for City streetscape improvements.

Urban Center

LU-MUUC-9 Tacoma Mall Subarea Planning

One of the objectives of a subarea plan is to:

- Define average block size, future "complete streets," the public street network, and on-site streets ("Complete Streets" include safe facilities for pedestrians, bicycles and transit in addition to vehicles.)

Capital Facilities Element

CF-EDNR-7 Facilities in Mixed-use Centers
Prioritize capital facility improvements within mixed-use centers to enhance and revitalize these areas, support compact development and encourage transit use.

Transportation Element

Land Use and Transportation

T-LUT-3 Centers and Corridors
Give high priority to improvements of transportation facilities and services within designated centers and along identified corridors connecting the centers.

T-LUT-5 Accessibility
Situate new transportation facilities in a manner that will assure reasonable access for all modes to places of employment and attraction in the City.

Multimodal System

T-MS-2 Roadway Capacity
Assess roadway capacity on the basis of a facility's total people-carrying capacity in addition to its vehicle-carrying capacity.

T-MS-10 Complete Streets
Apply the Complete Streets guiding principle(1), where appropriate, in the planning and design for new construction, reconstruction and major transportation improvement projects (2), to appropriately accommodate all users, moving by car, truck, transit, bicycle, wheelchair, or foot to move along and across streets. The Complete Streets guiding principle shall also be used to evaluate potential transportation projects, and to amend and revise design manuals, regulations, standards and programs as appropriate to create over time an integrated and connected network of Complete Streets that meets user needs while recognizing the function and context of each street.

(1) The Complete Streets guiding principle is to design, operate and maintain streets to enable safe and convenient access and travel for all users – pedestrians, bicyclists, transit riders, and people of all ages and abilities, as well as freight and motor vehicle drivers – and to foster a sense of place in the public realm.

(2) Major transportation improvement projects include but are not limited to street and sidewalk construction; street and sidewalk lighting; street trees and landscaping; street amenities; drainage, pedestrian and bicycle safety improvements; access improvements for freight; access improvements, including compliance with the Americans with Disabilities Act; and public transit facilities accommodation including, but not limited to, pedestrian access improvements to transit stops and stations.

Non-motorized Transportation

T-NT-1: Identification of Projects
Assign high priority to pedestrian d bicycle projects that serve the following objectives: address safety issues; provide access to designated centers; encourage safe and active routes to schools; provide linkages to the transit, ferry and school bus systems; complete planned pedestrian or bicycle facilities or trails; provide system connectivity.

Environmental Stewardship

T-ES-4 Stormwater Management
Employ Best Management Practices (BMPs) for stormwater management, Low Impact Development (LID) measures, and effective street cleaning to alleviate a major source of groundwater pollution due to roadway uses.

T-ES-5 Urban Design

Give maximum consideration to aesthetics and beautification while insuring compatibility with safety standards in the design and location of both local and state owned transportation facilities to ensure a positive contribution to the appearance and form of the city.

DRAFT Open Space Habitat and Recreation Element

OS-GI-1 Green Streets and Corridors

Designate specific streets, trails and other public rights-of-way which are the most appropriate for implementation of green infrastructure practices, based on their location, width, prominence, potential to enhance habitat connectivity and/or contiguity with open space areas. Prioritize those streets for implementation of such measures.

OS-GI-2 Tree Planting and Maintenance

Engage in and encourage planting and maintaining of native and climate-adapted trees and plants city-wide, including street trees, within utility rights-of-way, on private property, in parks, cemeteries and on school sites, and within highway rights-of-way. Prioritize designated Green Streets and Corridors for such actions.

OS-GI-3 Sustainable Development Practices City-wide

Encourage and support sustainable development practices throughout the City, such as low impact development stormwater management, green building and complete streets. Prioritize designated Green Streets and Corridors for such actions.

OS-GI-4 Streetscape Improvements

Recognize that streets and sidewalks provide a vast amount of open space, and develop complete streets standards and low impact development (LID) street sections for creating a balance between pedestrians, bicycles and automobiles, making sidewalks pleasant and functional open spaces, and accommodating LID stormwater management.

OS-HA-4 Sustainable Development Practices Within Corridors

Seek to minimize development of new public infrastructure and improvements within the designated Habitat Corridors. When development is deemed necessary, design and construct, to the extent feasible, to minimize the impacts to habitat functions through use of LID stormwater techniques, alternative routes and siting, green building techniques and other approaches.

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Appendix B: Summary of Existing Conditions of Designated Pedestrian Streets within Mixed-use Centers

MUC	Pedestrian Street	ROW (ft)	Cartway (ft)	Sidewalk (ft)	Street Class	Cntr Type	Bus	St Car	Notes	St Configuration c = center turn lane m = planted median p = parking t= intersection turn lane
6th & Pine	**6th Avenue (west of Pine)**	66	50	8	Principle Arterial	NC	Y			– – c – –
6th & Pine	**6th Avenue (east of Pine)**	75	50	13	Principle Arterial	NC	Y			– – c – –
34th & Pacific	**Pacific Avenue**	100	57	22	Principle Arterial	NC	Y			– – c – –
56th & STW	**South Tacoma Way (btwn 52nd and 56th)**	100	50	24	Principle Arterial	NC	Y		This is the section with the center strip and lots of pedestrian amenities	– – c – – m
56th & STW	**South Tacoma Way (elsewhere)**	100	70	16	Principle Arterial	NC	Y			– – c – – m
56th & STW	South 56th Street	80	56	12	Principle Arterial	NC	Y			– – – – –
72nd & Pacific	South 72nd Street	70	56	5, 8, 11	Principle Arterial	CC	Y		cartway widens at intersections, sidewalk varies	– – c – –
72nd & Pacific	**Pacific Avenue (north of 72nd)**	100	56	22	Principle Arterial	CC	Y			– – c – –
72nd & Pacific	**Pacific Avenue (south of 72nd)**	80	56	8 and 16	Principle Arterial	CC	Y		8 ft on west side, 15 ft on east side	– – c – –
72nd & Portland	**South 72nd Street**	72	55	8	Principle Arterial	CC	Y		Intermittent areas of 15' sidewalk	– – c – –
72nd & Portland	Portland Avenue	80	55	8 to 16	Principle Arterial	CC	Y		ROW and widewalks vary greatly. Cartway is mostly consistent	– – c – –
James Center	**Mildred Street**	80 and 100	55	12 and 30	Minor Arterial	CC	Y		As Mildred approaches 12th Street, the ROW begins at 80' jumps to 100', then slowly narrows to 80'	– – c – –
James Center	South 19th Street	?	?	?	Principle Arterial	CC	Y		Parcel and sidewalk line south of 19th is cut off in data	– – c – –
38TH & G	**South 38th Street**	80	56	12	Principle Arterial	NC	Y			p – – p
38TH & G	South G (from 36th to 38th)	80	48	15	Minor Arterial	NC	Y		40 feet south of 38th st	p – – – – p
38TH & G	Yakima Avenue (from 36th to 39th)	80	54	12 to 27		NC	Y		Widest near Lincoln Park. Narrowest between 38th and 39th	p – – p
Lower Portland	**Portland Avenue**	60 and 78	55	11	Principle Arterial	CC	Y		60 feet between 34th and Wright (ROW line extends into street, beyond sidewalk)	– – c – – m
Lower Portland	East 32nd Street	80	38	21	Principle Arterial	CC	N			p – c – p
Lower Portland	East 29th Street	80	36	20 to 26	Principle Arterial	CC	N			p – – p
McKinley	**McKinley Avenue (btwn Division and Wright)**	80	45	16 and 18	Minor Arterial	NC	Y		Varies - generally, 16 on the west side, 18 on the east side	p – – p

MUC	Pedestrian Street	ROW (ft)	Cartway (ft)	Sidewalk (ft)	Street Class	Cntr Type	Bus	St Car	Notes	St Configuration c = center turn lane m = planted median p = parking t= intersection turn lane
McKinley	**McKinley Avenue (btwen Division and 39th)**	87	44	20	Minor Arterial	NC	Y		Cartway widens (56') and sidewalk narrows (12') on the west side north of 39th	p – – p
MLK	**Martin Luther King Jr. Way**	80	50	15	Collector	NC	Y	Initial	Street Car between 6th Ave & 23rd Ave	p – c – p
MLK	South 11th Street	80	56	12	Minor Arterial	NC	Y	?	Hill climb shown on Street car Study.	p – c – p
MLK	South 12th Street	80	40	20	Minor Arterial	NC	Y		cartway widens (48') between L and MLK.	p – – p t
MLK	6th Avenue	80	50	15	Principle Arterial	NC	Y	Initial		p – – p
Narrows	**6th Avenue**	100	56	22	Principle Arterial	NC	Y			p – – – p
Proctor	North 26th Street	80	48	16	Collector	NC	Y		narrows to 11' west of Proctor	p – c – p
Proctor	**North Proctor Street**	80	56	11	Collector	NC	Y		sidewalk varies by one or two feet	p – – p
Stadium	Division Avenue (from 2nd to Tacoma)	100	50	25	Minor Arterial	NC	N	Initial	Division has some bus stops where it is a ped st. Streetcar	p – – –
Stadium	**Tacoma Avenue**	100	55	22	Collector	NC	Y			p – c – p
Stadium	North 1st Street	80	50	50	Principle Arterial	NC	Y			p – – – – p
Stadium	North I Street	80	45	18	Principle Arterial	NC	Y			p – – p
Tacoma Central	**Union Avenue**	78 to 90	56	11	Principle Arterial	CC	Y		ROW varies. Sidewalk widens in most areas, but mostly 11'	– – c – –
Tacoma Mall	South 47th/48th Transition Street	80	58	12	Minor Arterial	UC	Y			– – c – –
Tacoma Mall	**Steele Street**	100	75	varies	Collector	UC	N		Sidewalk varies greatly between 8 and 15 feet	– – – c – – p m
Westgate	**Pearl Street**	100	64	20	Principle Arterial	CC	?		Cartway narrows to 58' in the north; sidewalk narrower (16') on west side. Busses only N of N 26th ST	– – c – – m
Westgate	North 26th Street (west of Pearl)	80	43	12	Collector	CC	Y		widens approaching Pearl from west	– c –
Westgate	North 26th Street (east of Pearl)	100	55	18 and 24	Collector	CC	Y		sidewalk is wider on north side of street	p – c – p