

City of SeaTac

Sidewalk Citizen Advisory Committee Manual



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1. Introduction

Thank you for participating in city government and volunteering your time to ensure our community continues to prosper and grow to support our residents and businesses. This manual will provide you with some basic information regarding sidewalks and other facilities for pedestrian travel to help ensure you have an understanding of sidewalk fundamentals; this will make your participation in the Committee meetings meaningful and enjoyable. Also, actually getting out and experiencing the streetscape within our community as well as others cannot be understated as a way to familiarize yourself with the issues that will be discussed in committee.

2. Overview and Purpose of the Sidewalk Advisory Committee

At the May 23, 2017 Regular Council Meeting, Council adopted Ordinance #17-1010 (Attachment A) establishing the Citizen Advisory Committees and repealing certain inconsistent Ordinances and Resolutions. The Ordinance went into effect on July 4, 2017.

Sidewalks, specifically paved sidewalks, are an important piece of walking routes within a community. They provide people with safe space to travel within the public right-of-way while staying separated from motor vehicles and on-road bicycles.

Continuous and accessible sidewalk networks improve mobility for all pedestrians and are particularly important for pedestrians with disabilities. They provide access for all types of pedestrian travel to schools, work, parks, shopping areas, transit stops and other destinations. The City of SeaTac has three light rail stations and an international airport, all of which reinforce the need for high quality pedestrian access.

The Committee serves as advisory to the City Council and is intended to develop recommendations to Council regarding the funding, construction, and site selection for sidewalk construction projects within the Community.

Specifically, the Committee is tasked with:

- 1. Researching best practices of other jurisdictions and vet those ideas within the community.**
- 2. Develop, maintain and implement a project identification, ranking and selection process.**
- 3. Seek innovative, community based ideas through sustainable, two-way communication within the community (Get out and chat with your neighbors and other residents about sidewalks!)**
- 4. Develop and provide oversight of program community outreach efforts.**

When evaluating potential projects, the Committee will be asked to use the Performance Attributes listed in the table below to help in project selection.

Performance Attribute	Description of Attribute
Safety	An assessment of the safety of the improvements. This includes safety for all users. Is a project on a Safe Routes to School route?
Mobility/ Connectivity	An assessment of mobility and connectivity both within the neighborhood and with the overall City sidewalk network. Connecting neighborhood/residential sidewalks to sidewalks on arterial roads. Assessment of access to schools, transit and neighborhood destinations (community center, places of worship, library, recreation facilities, business).
Community Support	An assessment of community support/demand for pedestrian improvements within the proposed project area.
Right of way Impacts	An assessment of the use of existing right of way and impact to adjacent parcels. An assessment of impacts to existing developed parcels.
ADA Compliance	Does project address/remove barriers as identified in ADA Self-Assessment and Transition Plan? (Example: replace ADA ramps, repairs existing upheaved sidewalks).
Road Classification	Weigh project selection more toward arterial or residential zones?
Priority Zoning	Weigh zoning classifications that promote mixed-use, multi-family, or high density development?
Volume	Foot traffic volume, Current and Projected.
Funding	Is there private/grant funding that can be leveraged for this project?

3. Definitions

In order to help familiarize committee members with the many sidewalk related terms that they will hear over the course of their service to the Committee, staff have assembled a definitions section. While this list is not all inclusive, becoming familiar with the terms herein will help to make discussion more enjoyable, flow smoothly and be less confusing.

Accessibility — Barrier free access to assist persons with disabilities.

ADA – Americans with Disabilities Act.

Advisory Committee- A group of people, commonly volunteers, who meet to advise the city on specific issues.

Air entrainment — Intentional introduction of air in the form of minute, disconnected bubbles, (generally smaller than 1 mm) during mixing of Portland cement concrete, mortar, grout or plaster to improve desirable characteristics, such as cohesion, workability, and durability.

Asset — A physical component of a facility, which has value, enables services to be provided, and has an economic life of greater than 12 months. Dynamic assets have some moving parts, while passive assets have none.

Bio retention swale – A Bio retention swale or Bio swales are roadway and site development elements designed to concentrate or remove silt and pollution from surface runoff water. The facilities generally consist of a swaled drainage course with gently sloped sides and filled with native vegetation and compost. The water's flow path, along with the wide and shallow ditch in conjunction with native vegetation, is designed to maximize the time water spends in the swale, which aids the trapping of pollutants and silt. Depending upon the geometry of land available, a bioswale may have a meandering or almost straight channel alignment.

Centerline – Middle of a roadway (from one pavement edge to the other). Not necessarily the middle of the ROW.

Curb - A vertical barrier forming part of a gutter along the edge of a street and defining the width of the roadway/traveled way.

Detectable Warning Panel/ Truncated Domes - Tactile paving (also called truncated domes, detectable warnings, Tactile Ground Surface Indicators, detectable warning surfaces) is a system of textured ground surface indicators (of a high contrasting color) found on footpaths, stairs and train station platforms to assist pedestrians who are visually impaired to locate points of access and roadway crossings

Driveway Cuts – Driveway cuts are the ramped portion of the driveway approach extending from the traveled way over the sidewalk section to private residence or business.

Driveway Wings - Driveway wings mean those portions of the driveway approach which provide a transition from the sidewalk, curb, and existing ground grades to the driveway apron grade.

Flow Control – Flow control refers to the requirement to manage surface water discharge/release as a result of flows emanating from impervious surfaces within the ROW.

Gutter - A street gutter is a depression or vertical barrier or inverted (“V”) section running parallel to a road centerline and is designed to collect water runoff flowing off and along the street and divert it into a storm collection system.

Illumination Study - An engineering study conducted to evaluate and determine the optimum lighting coverage and arrangement for a given need (i.e. vehicular traffic, non-motorized or both).

Low Impact Development - The term low impact development (LID) refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat.

Rectangular Rapid Flashing Beacon (RRFB) –RRFB(s) are user-actuated amber LEDs (Light Emitting Diode) that supplement pedestrian crossing advanced warning signs at uncontrolled intersections or mid-block crossings. They can be activated by pedestrians manually or passively by a pedestrian detection system. RRFBs use an irregular flash pattern that is similar to emergency flashers on police vehicles and may be installed on either two-lane or multi-lane roadways.

Maintenance — All actions necessary to retain an asset as near as practicable to its original condition.

Overhead Utilities – Those utilities that are most commonly distributed over a system that is suspended above ground through the use of poles. Overhead utilities typically include electrical power, telecommunications and cable.

Pollution Generating Surface - "Pollution-generating surfaces" refers to those surfaces which are considered a source of pollutants in stormwater runoff resulting from exposure to vehicular traffic/activity.

Rain garden - A rain garden is a planted depression or a hole that allows rainwater runoff water quality treatment and absorption from impervious areas, like roofs, driveways, roadways, walkways, parking lots, and compacted lawn areas.

Rehabilitation — Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally, involves repairing the asset to deliver its original level of service without resorting to significant upgrading or renewal, using available techniques and standards.

Replacement — Complete replacement of an asset that has reached the end of its service life to provide an alternative that satisfies the targeted level of service.

ROW – Right-of-Way is a type of easement granted or reserved over the land for transportation purposes, this can be for a highway, public footpath, rail transport, canal, as well as electrical transmission lines, oil and gas pipelines. A right-of-way can be used to build a bike trail.

Shared Use Path - A shared-use path or mixed-use path is a form of multi-modal infrastructure with an active width of 10 feet or greater that supports multiple non-motorized modes of transportation.

Sharrow - A road marking of a bicycle with two chevrons above it, marked on a roadway as a symbol to indicate that motor vehicles and bicycles are to share the lane of travel.

Utility vault - A utility vault is an underground structure providing access to subterranean public utility equipment, such as valves for water or natural gas pipes, or switchgear for electrical or telecommunications equipment

Sidewalk Panel – Concrete sidewalks are typically poured in sections which allows for non-destructive expansion/ contraction to occur as temperatures fluctuate. Repairs to sidewalk panels will typically involve the removal and replacement of an entire panel. Panel sizes vary, but in residential settings are typically 10 feet by existing sidewalk width.

Traffic Calming - An engineering design approach aimed at improving pedestrian and motorist safety by reducing vehicle speed and vehicle volumes through the use of outreach and education, police enforcement and the implementation of physical road improvements. Examples of physical traffic calming improve include but are not limited to: curb bulb outs (chokers) chicanes, speed tables, and roadway channelization. **Curb Ramps** - A curb cut, or curb ramp, is a solid (usually concrete) ramp graded down from the top surface of a sidewalk to the surface of an adjoining street.

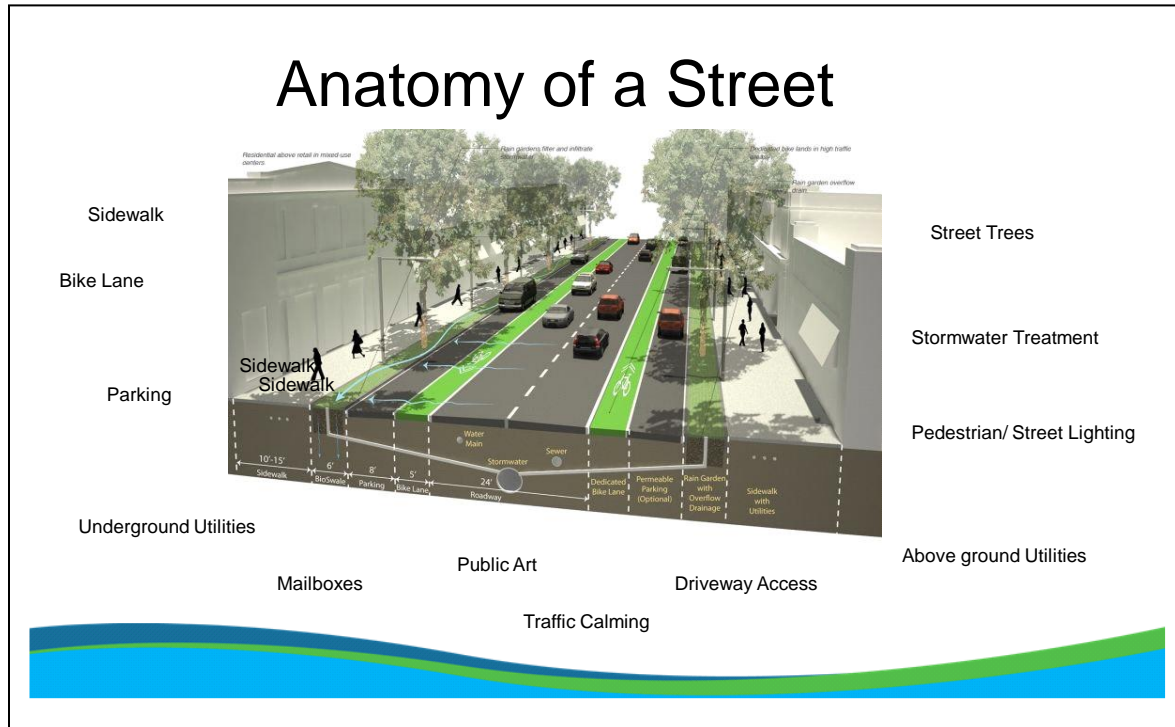
Tree Drip Line — Drip line is the edge defined by the extent of the leaves/growth of the tree.

Underground Utilities - Those utilities that are most commonly distributed over a system that is buried in the ground. Virtually any utility can be placed underground, examples include water, sewer, storm water, natural gas, electrical, communications and cable.

Water Quality - Water quality describes the condition of the water, including chemical, physical, and biological characteristics, usually with respect to its suitability for a particular purpose such as drinking or swimming. Poor water quality can also pose a health risk for the native ecosystems.

4. Sidewalk Elements

There are many different elements associated with City Streets that when brought together appropriately create a complete street anatomy (Provided as Attachment D is SeaTac's complete streets Ordinance) that provides functionality and safety for all modes of transportation. The image below identifies many of these elements and shows how they integrate together to form a complete street.



The sidewalk materials and elements described below are intended to provide an overview of the what goes into constructing sidewalk projects and the variety of options that are available to fit the needs of our community.

Sidewalk Materials and Surface Types

Concrete is the most common sidewalk material. While urban, suburban and heavily used sidewalks are almost universally made of concrete, walkways may be constructed of asphalt, brick pavers, or other materials if they are properly maintained and accessible. In more rural areas, a “side path” made of a material other than concrete may be suitable and be a better fit with a rural environment. Each of these elements differ on price, durability and aesthetics. The following sections will discuss each of these elements.

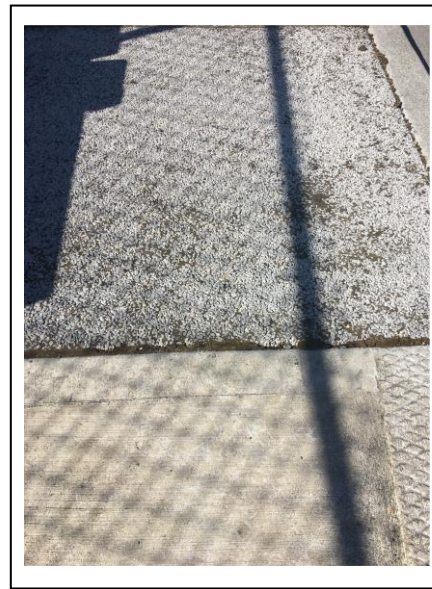
Impervious Concrete

- Impervious concrete sidewalks are the most common type used within urban settings. These types of sidewalks are well understood in terms of both their construction and maintenance.
- **Durability**- Highly durable and long lasting.
- **Aesthetics**- Sets the standard for look and feel of sidewalks in the United States. This is the most common type of material used. Typically, a brushed finish is used to provide slip resistance.



Pervious Concrete

- Recognized as a Best Management Practice by the U.S. Environmental Protection Agency, pervious concrete is a special type of concrete with a high porosity used for concrete flatwork applications that allows water from precipitation and other sources to pass directly through, thereby reducing runoff from a site and allowing groundwater recharge. Pervious concrete can also reduce the impact of development on trees. A pervious concrete section allows the transfer of both water and air to roots systems allowing trees to flourish even in highly developed areas.
- **Durability-** The small amount of fine aggregate to the mixture increases the durability of pervious concrete however, there are concerns over the resistance to the freeze-thaw cycle,
- **Aesthetics-** Pervious concrete has many small ridges and can easily become covered with moss and dirt, thus requiring a greater amount of cleaning than other types of concrete. Maintenance costs are higher.



The photos above show pervious concrete, often referred to as “popcorn” concrete, adjacent to impervious brush finished concrete. The porous nature of the pervious concrete allows water to pass through the material rather than runoff; use of this type of concrete helps projects reduce stormwater runoff and meet regulatory requirements.

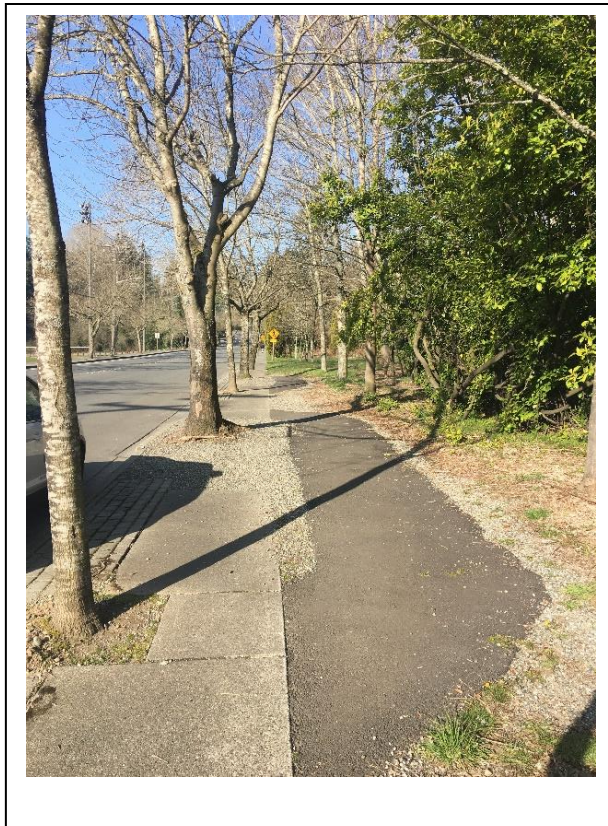
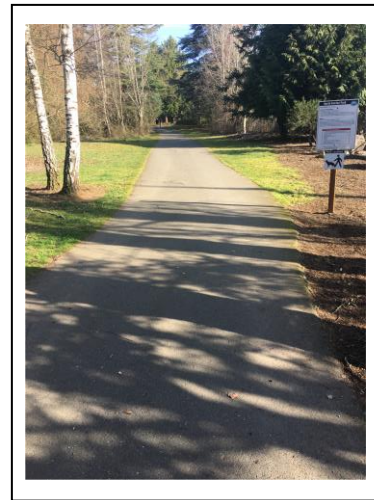
Stamped Concrete

- Stamped concrete is concrete that is patterned and/or textured to resemble brick, slate, flagstone, tile, wood and other various patterns and textures.
- **Durability-** Stamped concrete has superior durability and weather resistance compared to other materials it is made to look like.
- **Aesthetics-** Stamped concrete rates very high for aesthetics because of its ability to resemble the high end look of stone, brick or wood and provide needed traction.



Asphalt Concrete

- Asphalt concrete is a composite material commonly used to surface roads and parking lots. It consists of mineral aggregate bound together with a binder (asphalt).
- **Durability-** The durability of asphalt concrete varies greatly depending on the type chosen.
- **Aesthetics-** Asphalt concrete is generally black in color.



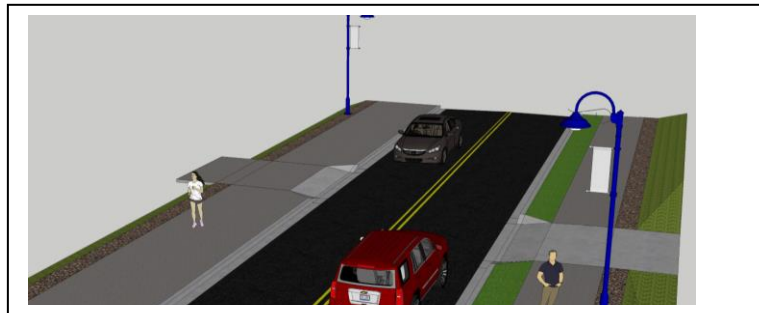
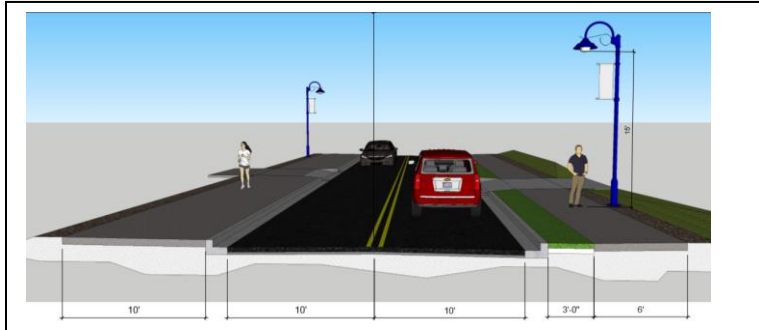
Pavers

- Pavers are individual pieces of stone, brick or concrete that are set in place to provide a walkable surface.
- **Durability-** Romans built roads with them that are still there. Individual bricks are placed on a bed of sand and this allows them to be flexible and shift as the ground moves. Durability is high although settlement can be problematic.
- **Aesthetics-** Brick pavers can be very aesthetic and often provide ecological benefits by adding ground water recharge. Water is able to pass between the joints and enter the underlying soil.



Sidewalk Width

Narrow sidewalks do not work well. In the past, many sidewalks within SeaTac were constructed with a five-foot width, however our minimum now is six-feet. Walking can be a social activity; therefore, facilities should accommodate comfortable social walking. A six-foot width allows for two people to walk comfortably side by side and provides sufficient space for pedestrians passing in the opposite direction. Wider sidewalks should be considered where there is no sidewalk buffer along an arterial street and along roads adjacent to school grounds where large numbers of walkers are expected. Various sidewalk widths are shown in the photos below.



ADA / Universal Design

Sidewalks that meet ADA requirements are easy to maneuver by people in wheelchairs as well as other pedestrians with disabilities. The purpose of universal design is to provide an environment that is equally accessible and comfortable for users of all abilities and ages, including children. To help ensure access for all, the Americans with Disabilities Act (ADA) of 1990 prohibits discrimination on the basis of disability. Sidewalks and other pedestrian facilities in the public right-of-way are subject to the requirements of the ADA. In 2004 the U.S. Access Board released the Americans with Disabilities Act (ADA) and the Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities. These guidelines contain scoping and technical requirements for accessibility to sites, facilities and buildings by all users. The City has adopted an ADA transition plan which identifies ADA deficiencies in our ROW and our approach/schedule to address them.

Curb Ramps

At intersection crossing locations, each corner should have two curb ramps, one for each crossing. Curb ramps should be perpendicular wherever possible, where each corner has two ramps installed perpendicular to the face of the curb (vs. a single ramp facing diagonally into the intersection). A big advantage of having two ramps at the corner and small curb radii is that the curb ramps can lead directly along the line of travel guiding pedestrians into the crosswalk rather than into the middle of the intersection. Two ramps which end at the crosswalk also provide directional guidance to pedestrians with vision impairments. The photos below show different types of curb ramps.



Warning Strips

The two-foot deep truncated dome tactile strip at the bottom of the curb ramp has a contrasting color to the rest of the sidewalk. Truncated domes are the standard design requirement for detectable warnings on curb ramps and at transitions from sidewalks to street crossings. These small, flattened domes provide a surface that is distinguishable underfoot and by cane. ADA guidelines require the use of a truncated dome warning strip at the bottom of every newly constructed curb ramp. These domes provide a tactile warning to pedestrians with a visual impairment who would otherwise be given warning by the presence of a curb. The truncated dome tactile strip should be two feet deep for the entire width of the ramp and should have a contrasting color with the adjacent sidewalk. There are different materials and construction methods that can be used to provide the truncated dome tactile warning strip at the base of the curb ramp. Below are shown two different approaches to warning strips, the picture to the left shows truncated domes which are used today and the photo to the right shows stamped concrete from more than 30-years ago, which does not meet current ADA requirements.

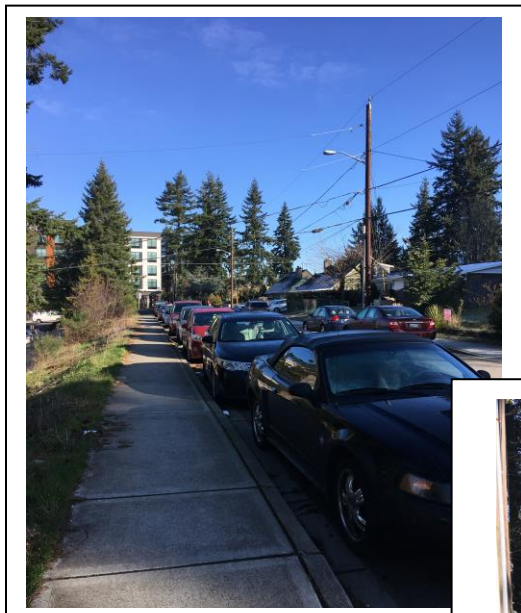


Sidewalk Buffers

The space between the sidewalk and closest lane of moving vehicles is the sidewalk buffer. In general, there are four types of sidewalk buffers including;

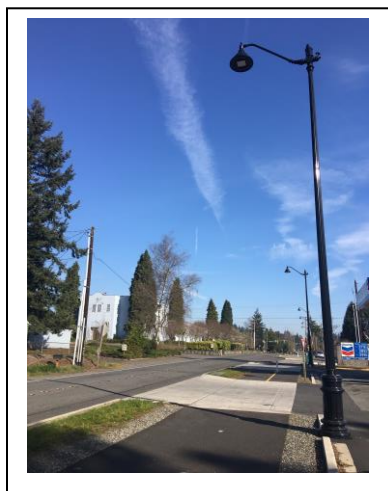
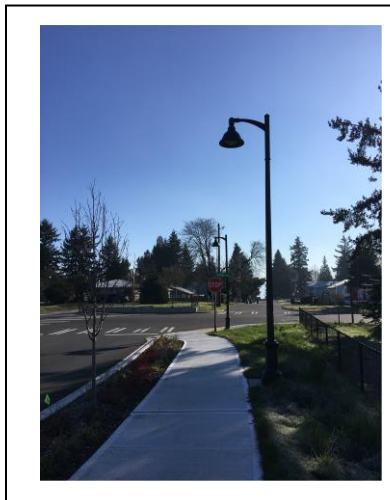
- Planting strip of grass and trees: This is the preferred buffer as it provides a more pleasant, shaded environment to walk.
- Bicycle lane: If a planting strip is not possible, a bicycle lane can provide an acceptable buffer between pedestrians and motor vehicles.
- Parked cars: Parked cars can provide a buffer between pedestrians and motor vehicles, but can also create a visual screen for pedestrians as they cross at midblock.
- Street furniture including benches, newspaper boxes, street lighting and public art.

If a sidewalk buffer does not exist, an effort should be made to provide a wider sidewalk. A wider sidewalk allows a pedestrian to avoid the splash zone (area adjacent to a motor vehicle travel lane into which water spray created by a motor vehicle traveling through water on the roadway enters) and provides a snow storage area and a more comfortable separation between moving vehicles and pedestrians. Below are shown examples of buffering between vehicular traffic and pedestrians using the sidewalk.



Street Lighting

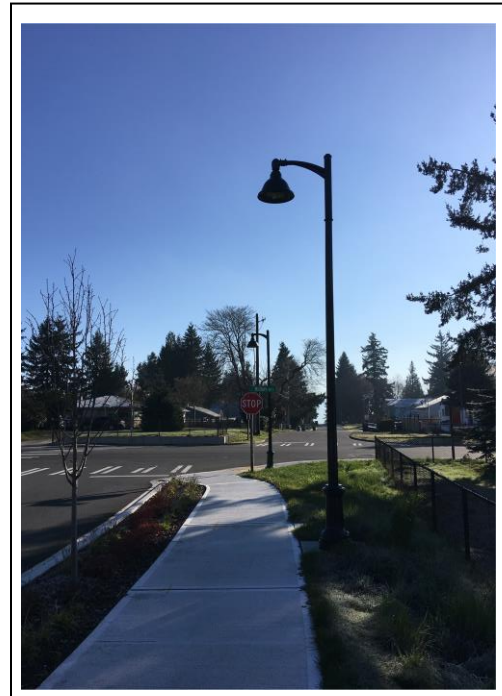
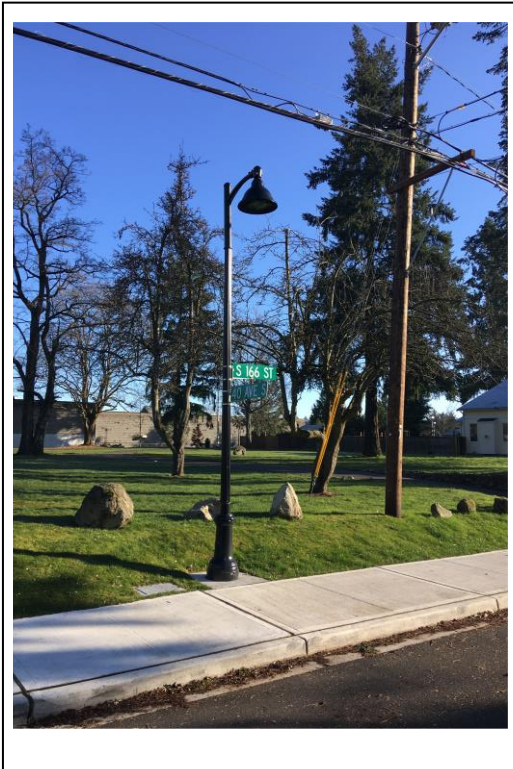
Street lighting improves pedestrian visibility and personal security. On streets with lots of trees, street lighting scaled to pedestrians (low lights) illuminates the sidewalk even after the trees grow big and tall. Street lighting improves safety by allowing pedestrians and motorists to see each other. It also adds to personal safety and aesthetics. Two-sided lighting should be considered along wide streets, and it is especially important to provide lighting at the crossings. Lighting can also be helpful along streets adjacent to the school grounds to minimize school vandalism and improve security. While most school walking activity occurs during daylight hours, the morning school trip in the middle of winter often occurs during hours of darkness, and many school activities occur during nighttime hours. The streetlights shown below demonstrate the type and some of the variety found within the City of SeaTac. The City is working on identifying and adopting a street lighting standard.



Under Grounding aerial utilities

Under grounding aerial utilities is the replacement of overhead cables providing electrical power or telecommunications with underground cables. This action can aid in fire prevention and make power lines less susceptible to outages during high wind thunderstorms or heavy snow or ice storms.

Undergrounding also increases the aesthetic quality of the landscape without power lines, however it can increase the initial costs of electric power transmission and distribution but may decrease operational costs over the lifetime of the cables. Shown below on the left is an example of overhead utilities left in place and on the right, undergrounded.

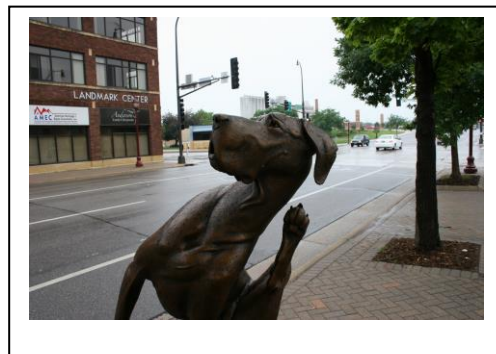


Public Art and Place Making elements

Public art in sidewalks can increase the aesthetics and improve the feel of a neighborhood. There are many examples of how public art in/on sidewalks can be demonstrated. Some of these examples include:

- Putting crushed glass aggregate in the sidewalk to give it a sparkling look.
- Installing footprints to describe dance steps.
- Including quotes or plaques in the sidewalk.
- Putting a statue on the sidewalk.
- Installing creative benches

The City is exploring the idea of creating a 1% for the arts program that would require 1-percent of the capital construction cost for public works projects to be set aside for public art in the right-of-way. If this approach is approved, then public art elements would be included in the design of all future sidewalk projects. Below are some examples of public art in the right-of-way.



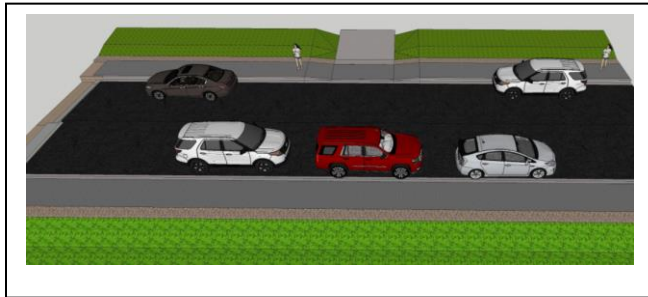
Mailboxes

Mailboxes are an important part of the look of a neighborhood. Mailboxes are privately owned and typically reside in the right-of-way. The Post Office has specific requirements for the installation of mailboxes to ensure that the mail can be delivered safely, efficiently and effectively. How the frontage improvements are designed directly impacts how mailboxes are installed and oriented. The City of SeaTac has a locking mailbox program which provides high quality locking mailboxes at a low cost to our residents and installs them as an incentive. Preventing mail theft helps to reduce the workload placed on our Police staff and minimizes impacts to our residents. Below are some examples of mailbox placement within the right-of-way. The preferred approach is to have the boxes clear of the sidewalk to provide as much clear space as possible.



Standard on street Parking

Standard parking provides space for cars to be parked in an orderly manner between the travel lane and the curb/gutter; this type of parking can help improve the safety of both pedestrians and bicyclists by allowing for more barriers between moving vehicles and pedestrians. Standard parking space widths are between 8.5 and 9 feet and are parallel or angled with the roadway. Shown below are examples of standard on street parking.



Pocket Parking

Pocket parking is a design approach that allows for a narrower roadway with occasional opportunities for parking. This approach to parking allows for more variety with respect to pedestrian amenities up to and including wider landscaping areas, wider sidewalks, and space making. Also, pocket parking helps to break up the density of cars parked thereby providing improved aesthetics. Additionally, packet parking ensures that mailboxes can be located such that they will not get blocked by parked vehicles. Shown below is an example of pocket parking.



Bulb outs

Curb extensions (also called bulb-outs) extend the sidewalk into the parking lane to narrow the roadway and provide additional pedestrian space at key locations; they can be used at corners and at mid-block. Curb extensions enhance pedestrian safety by increasing pedestrian visibility, shortening crossing distances, slowing turning vehicles, and visually narrowing the roadway.

Generally, these benefits are greater the further the bulb-out extends into the roadway and the tighter the turn radius created by the bulb-out, but should be balanced against roadway characteristics and the needs of large vehicles to navigate turns.

Curb extensions can often be lengthened to create public spaces, landscaped areas, or transit waiting areas. They can also be employed as neck-downs or chokers, traffic calming techniques that reduce vehicle travel lanes.

Curb extensions can have the following benefits:

- Increased pedestrian visibility at intersections through improved sight lines
- Decreased pedestrian exposure to vehicles by shortening the crossing distance
- Reduced vehicle turn speeds by physically and visually narrowing the roadway
- Increased pedestrian waiting space
- Additional space for street furnishings, plantings and other amenities
- Reduced illegal parking at corners crosswalks and bus stops
- Facilitated ability to provide two curb ramps per corner

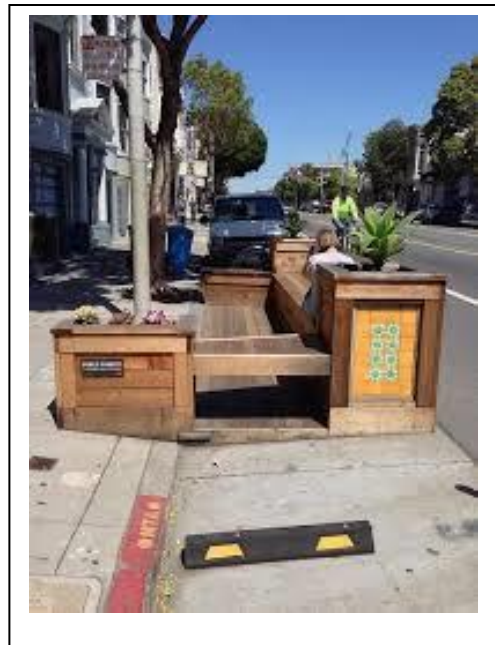
Although curb extensions have many benefits, they may not be appropriate in all circumstances. Use of curb extensions should consider the following:

- They may be more expensive to construct than other measures
- They can reduce flexibility of the roadway in construction routing
- They can reduce future flexibility in making changes to the location of bus zones, roadway lane layout, or crosswalks



Parklets

Parklets are public seating platforms that convert curbside parking spaces into vibrant community spaces. Also known as street seats or curbside seating, parklets are often the product of a partnership between the city and local businesses, residents, or neighborhood associations.



5. Traffic Calming

“In almost all U.S. cities, the bulk of the right-of-way is given to the roadway for vehicles, the least to the sidewalk for pedestrians... just suppose that Americans were to extend their walking radius by only a few hundred feet. The result could be an emancipation... –William H. Whyte (CITY: Rediscovering the Center)



Developed in Europe, traffic calming (a direct translation of the German “verkehrsberuhigung”) is a system of design and management strategies that aim to balance traffic on streets with other uses. It is founded on the idea that streets should help create and preserve a sense of place, that their purpose is for people to walk, stroll, look, gaze, meet, play, shop and even work alongside cars – but not dominated by them.

The tools of traffic calming take a different approach from treating the street only as a conduit for vehicles passing through at the greatest possible speed. They include techniques designed to lessen the impact of motor vehicle traffic by slowing it down, or literally “calming” it. This helps build human-scale places and an environment friendly to people on foot.

Besides its power to improve the livability of a place, the beauty of traffic calming is that it can be applied inexpensively and flexibly. The strategies outlined below in [The Traffic Calming Toolbox](#) can be employed by painting lines, colors and patterns; using planters, bollards and other removable barriers; eliminating or adding parking; or installing sidewalk extensions or similar structures with temporary materials. All provide an opportunity to test devices, combinations and locations, fine-tuning the approach according to results. Traffic calming, along with other small-scale improvements, can enhance a place immediately, while being tested and refined to meet long-term needs. When funds are available, the right combination of devices can be transformed into permanent improvements and extended over a broader area. Regardless of what traffic-calming action is undertaken, the benefit to a community is greater when the technical improvements are strengthened by visual enhancements like trees, flowers and other amenities.

THE TRAFFIC CALMING TOOLBOX

1. DIAGONAL PARKING



Cars park diagonally, jutting out from the curb, rather than parallel to it. The benefits:

- Simple and inexpensive
- Changes both the perception and the function of a street
- Shortens the “peering distance” for people crossing the street
- Drivers pulling out must be alert to approaching traffic
- Oncoming drivers must be alert to the cars pulling out
- All of this added driver awareness creates more awareness of pedestrians
- Can add up to 40% more parking space than parallel parking

2. CHANGING ONE-WAY STREETS TO TWO-WAY



Single or double traffic lanes, either face-to-face or with a median, sometimes flanked by parking. The benefits:

- Less driving, less confusion, and better traffic access
- Eliminates the need to drive blocks and blocks out of the way
- No need to make extra turns to get to nearby destinations
- Drivers can get directly to their destination
- Increases commercial traffic and business
- Decreases the speed of traffic

3. WIDENING SIDEWALKS/NARROWING STREETS AND TRAFFIC LANES



These techniques provide a flexible way to take back space from the street for non-motor-vehicle uses. Traditional traffic engineering calls for 12- to 13-foot lanes, citing “traffic safety” standards – but newer evidence shows that lanes as narrow as nine feet can still be safe for driving.

- Narrowing lanes and to widen sidewalks eases crossing for pedestrians and gives them more space to walk.
- Lanes can also be removed from serving traffic and designated for busses, trolleys, or other types of transit.
- Traffic lanes can be transformed into bicycle lanes.
- All street lanes can be narrowed together to create more room for non-auto uses.

- Vertical elements like trees or bollards further reduce the “optical width” of a narrowed street, thereby discouraging speeding.

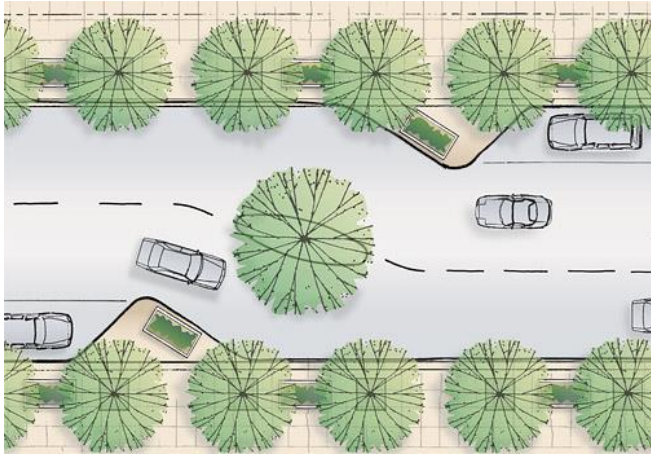
4. BULBS – CHOKERS – NECKDOWNS



Interchangeable terms for sidewalk extensions in selected areas – such as at intersections or at mid-block – as opposed to a full sidewalk widening. The benefits:

- Provide a haven for pedestrians waiting to cross the street
- Shorten the crossing distance
- Define parking bays
- Deflect through traffic at a corner
- Function as entry points
- Provide space for amenities and enhancements (e.g. kiosks, trees, lighting)

5. CHICANES



Sidewalk extensions that jog from one side of a street to the other to replicate such a circuitous route. The benefits:

- Narrow, curving roads encourage motorists to drive more slowly and carefully
- An undulating path interrupts any clear view ahead and compels drivers to slow down
- Chicanes can be formed using sculpture, plantings and parking to enhance the appearance and function of a street
- Diagonal parking and parallel parking can be alternated to create a chicane effect.
- Chicanes are best used on narrow roads, to prevent cars from swinging out to maintain their speed around the bends.

6. ROUNDABOUTS



Large, raised, circular islands at the middle of major intersections, around which all oncoming vehicles must travel until reaching their destination street, where they then turn off. The benefits:

- Create a “calmed,” steady flow of traffic
- Reduction in conflict points, which can lead to fewer accidents
- Traffic signals are not customarily required (although traffic control signs are prominent)
- Streets narrow as they approach the roundabout, and crosswalks are installed on these approaches – thereby slowing oncoming vehicles and giving pedestrians a safe, obvious opportunity to cross
- Enhanced with fountains, sculpture or attractive landscaping, the island can serve as a striking gateway
- A sloping ramp around the perimeter of the raised island allows buses, trucks and other large vehicles to maneuver the continuous curve while still maintaining a lowered speed.

7. TRAFFIC CIRCLES



Essentially “mini-roundabouts” designed for small intersections, often used to slow traffic from a wide street into a smaller local street. Traffic circles:

- Help to slow down traffic in neighborhoods and remind drivers that they must proceed carefully
- Help to sustain lowered vehicle speeds when they’re used in a series
- Provide an opportunity for community activity in residential areas, where citizens can create plantings or add other enhancements

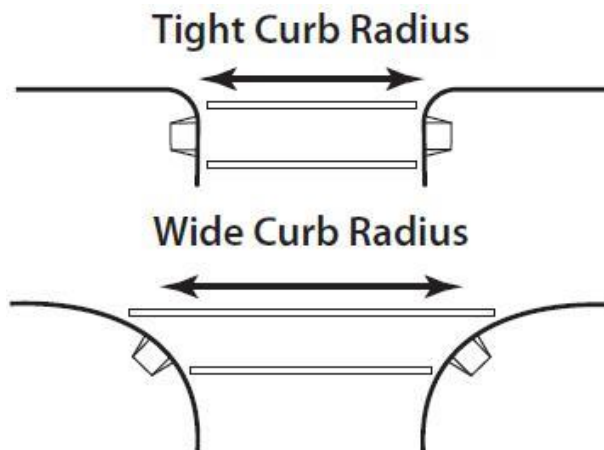
8. RAISED MEDIANS



Elevated islands parallel to traffic lanes down the middle of the street, as on a boulevard. The benefits:

- Curtail vehicle space
- Provide a safe in-between refuge for pedestrians as they make their way across the street, split up a lengthy curb-to-curb distance (especially helpful for people who cannot move quickly)
- Provide ideal locations for trees, flowers, sculpture and other amenities

9. TIGHT CORNER CURBS



The longer the radius of a curve, the faster a vehicle can move around that curve – as many pedestrian witness when, in crossing at an intersection, they are confronted by a car whizzing around the corner seemingly out of nowhere. Reducing a corner radius to somewhere between one and twenty feet can:

- Inhibit the speed of turning vehicles

- Give pedestrians a better chance to see and be seen by approaching traffic
- Add sidewalk space, thereby shortening the distance to the other side of the street

10. DIVERTERS



These physical barriers redirect traffic heading for a certain street onto a different course, reducing vehicle overload on vulnerable (usually residential) streets overrun by through traffic looking for shortcuts.

- **Diagonal Diverters** traverse an entire intersection, actually creating two unconnected streets that each turn sharply away from one another.
- **Semi-Diverters** restrict traffic in one direction to prevent entrance to a street, while permitting traffic to pass through in the other direction.
- Although they effectively reduce traffic volume, diverters must be part of a comprehensive improvement scheme or else they can end up simply displacing congestion.

11. ROAD HUMPS, SPEED TABLES, AND CUSHIONS



These devices reduce speed by introducing modest up-and-down changes in the level of the street, thereby requiring drivers to decelerate.

- **Road humps** (or “speed humps”) are rounded mounds, approximately three inches high and 10 to 12 feet long. They effectively slow down traffic to 15-20 mph without making drivers uncomfortable. For optimum speed reduction, road humps need to be placed at frequent, designated intervals based on the street’s dimensions, to minimize the tendency to accelerate between them. (Humps are not to be confused with the speed *bumps*, which are usually at least 5-6” high and less than three feet long.)
- **Speed tables** are road humps that are flat on top and sometimes slightly longer. They are the same width as the street and rise to meet the grade of the sidewalk, providing safe and comfortable crossings for walkers and wheelchairs (and greater access for snow clearance than road humps). One benefit of speed tables is that people cross at the point where drivers decrease speed.



- **Cushions** cover only part of the width of the street to allow passage for emergency vehicles, buses or other large vehicles, and bicycles; they are usually placed at varying intervals to respond to the need to channel the wheels of larger vehicles, while still providing hurdles wide enough to slow standard-sized vehicles.
- It is important to highlight road humps, speed tables and cushions with clear markings to alert approaching drivers. This can be accomplished by: painting words and symbols directly on the street; changing the texture of the street surface; or using signage (the word “Bump” instead of “Hump” is a standard approach thought to effectively put drivers on the alert).

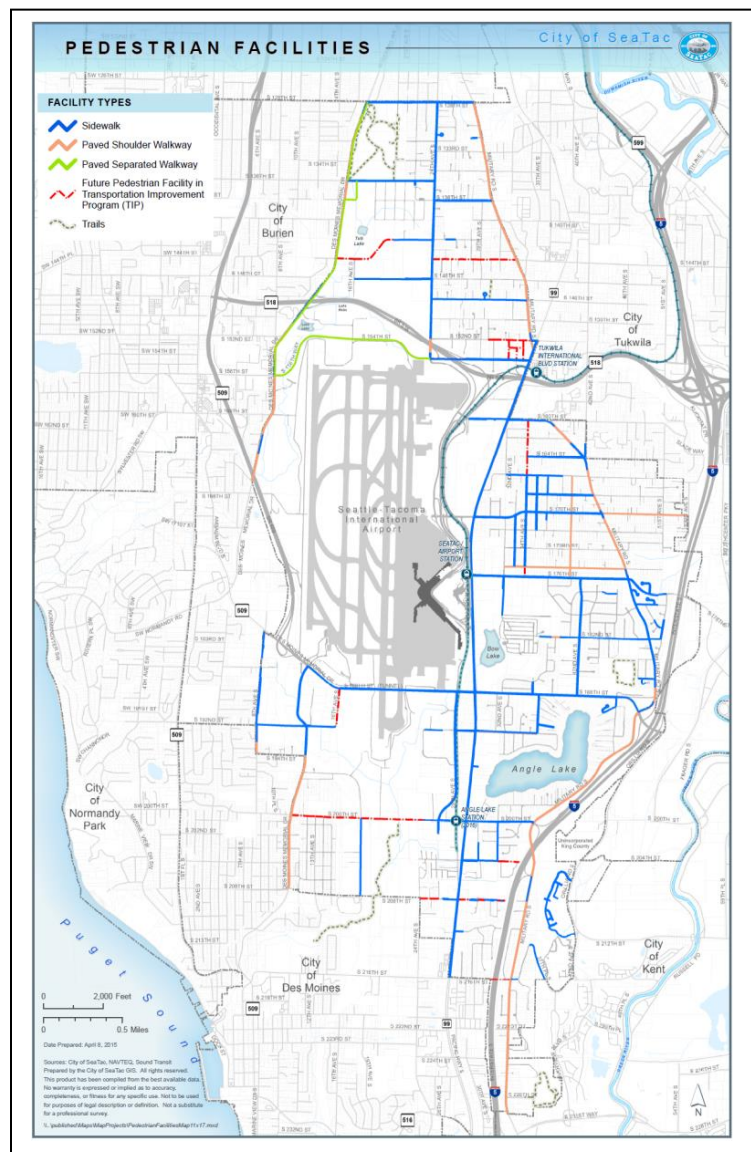
12. RUMBLE STRIPS AND OTHER SURFACE TREATMENTS



- **The rumble strip** provides visual and aural cues to alert drivers to areas that require special care (shopping centers, freeways undergoing construction work, schools, entrances to residential neighborhoods). Materials like granite and concrete are roughened by being broken into raised lines or patterns, and placed in strips across roadways, usually in a series. Drivers can lessen the vibration and the abrasive sound they create by slowing down.
- **Changes in pavement color and texture** (such as bricks or Belgian blocks), used in interesting and visually attractive ways, can also have the effect of rumble strips. These paving treatments also: delineate and create awareness of a pedestrian crosswalk or haven; make a street appear narrower than it is to deter speeding; define a street from a sidewalk or a parking lane.

6. Past Projects

There are approximately 75 centerline miles of streets within the City of SeaTac and over 42 miles of sidewalks that have been constructed since incorporation. Our approach to constructing sidewalk projects has moved more toward providing a complete street (See Attachment D) more than one size fits all. Not every side street needs to have full-on sidewalks, curbs and gutters to be a complete street. We can also install walking paths, or have sidewalks installed on just one side of the street. We are now incorporating undergrounding of overhead utilities, pedestrian lighting and landscaping into our projects on a regular basis. This approach is sensitive to the context of the project area and builds value and pride in our community and leads to more physical activities (walking, running cycling etc.) in our right-of-way. The map below provides an overview of pedestrian and multimodal facilities within the City.



The following sidewalk projects have been completed since 2009. Committee members are encouraged to walk these projects in order to see how they are incorporated into the neighborhoods, how future projects might improve upon them and how they are being used by our residents today.

- **42nd Avenue South**, South 188th Street to South 176th Street
- **South 138th Street**, Military Road South to 24th Avenue South
- **South 164th Street**, 34th Avenue South to Military Road South
- **South 168th Street**, Military Road South to 34th Avenue South
- **South 179th Street**, Military Road South to 42nd Avenue South
- **37th/40th Avenue South**, South 172nd Street to South 166th Street
- **32nd Avenue South**, South 192nd Street to South 188th Street
- **South 166th Street**, 34th Ave South to Military Road South