City of Spokane Design Standards

Nov 1, 2020

STREETS, ALLEYS, BIKEWAYS, AND SIDEWALKS

3.0 Preface

The City of Spokane's adopted infrastructure standards require the design of integrated systems. For streets, this means not only that the full network of streets will function as a system, but that the other systems the streets intersect (transit, bike, emergency response, stormwater) will be seamlessly integrated.

Each section of the standards begins with a brief definition of the topic followed by the design standard.

The following key points guide this document.

- Street design is an iterative process, that entails flexibility and trade-offs. Within the built environment, particularly, physical space might limit what or how specific elements fit together to deliver a desired contextual experience. Decisions may be pushed by regulation, physical constraints, or public opinion, but ultimately should be guided by planned strategies and/or engineering standards.
- Balance is important. To maximize one component often means less achievement of another (prioritizing vehicle speeds often degrades conditions for people on foot and bike). The proper balance will vary from place to place in the city.
- Successful design will reflect community priorities, as defined through public outreach activities at planning, scoping, and design levels. Often, achieving a design that balances scope delivery, while accomplishing community goals will require compromise.
- The ultimate focus of street design should be how the street feels for users (drivers, pedestrians, shoppers, transit riders, residents, schoolchildren, etc.) on the ground level, and the desires of the city and community for how they want the space to function.

Transportation facility design will generally be based as either: new infrastructure built to facilitate development activities, or modification of pre-existing infrastructure. Development of new infrastructure will be held to the requirements here-in to deliver the most appropriate conditions to provide travel through the various urban conditions. Often the existing built environment does not adhere to today's standards, which have been updated over the years to reflect best practices. Thus, preservation or reconstruction work will often require more balancing of priority, and will necessarily vary from the standards due to limitations of space or inadequate meshing of facilities. New Development, Preservation, and Reconstruction work are defined in section 3.1 Definitions to provide guidance for the conditions wherein variance from the standards may be acceptable.

3.1 Definitions

AASHTO See Section 1.2

ADA See Section 1.2

ADAAG See Section 1.2

Alley A public or private way designed or intended to provide access to abutting properties. Alleys are generally not intended for through vehicle movements, but are useful to providing access to businesses and residences, and in some locations bicycle and pedestrian improvements.

Arterial See *Principal Arterial, Minor Arterial,* or *Collector Arterial.*

Bicycle Facilities Facilities designated for use by commuter and recreational bicyclists. The following types of bicycle facilities are identified in the Master Bicycle Plan:

- Neighborhood Greenway
- Shared Lane
- Bike Lane
- Bike-Friendly Route
- Shared Use Path
- Soft Surface Path (unpaved)

Buffer Strips Hard surfaced or landscaped areas between travel or parking lanes and sidewalks, also called Planting Strips.

Center Crown A roadway cross-section with the highest point of the *traveled way* located at the center of the road.

City Engineer Individual overseeing all operations and functions regulated by this title, subject to the authority of the Mayor. See SMC 13.01.0202

Clear View Triangle The corner area at an intersection or driveway which must be free of obstructions to provide adequate sight distance. See SMC 17A.020.030N for dimensions.

Clear Zone The roadside area free of obstacles, starting at the edge of the traveled way.

Collector Arterial A street providing access and circulation in lower-density residential and commercial/industrial areas. *Collector arterials (consisting of FHWA classifications Urban Major Collector and Urban Minor Collector)* collect and distribute traffic from *local access streets* to *principal* and *minor arterials*. Refer to the Auto Network portion of the City's Comprehensive Plan chapter 4, section 4.4 Modal Elements for additional discussion.

Cross Slope A slope that is perpendicular to the direction of travel.

Crown (Roadway Crown) The term used to define the highest point of the *traveled way* on a roadway cross-section. The City recognizes three types of roadway sections to facilitate drainage: *center crown, quarter crown* and *curb crown*, which are defined herein.

Curb Crown A roadway cross-section with the highest point of the *traveled way* located at one curb.

Curb Ramp A ramp constructed in the sidewalk to provide an accessible route from the sidewalk to the street.

Entrance Gate Queuing Area A length of street on the public side of an entrance gate that allows vehicles to exit the connecting street prior to the gate.

Driveway A cement concrete driveway structure as shown in the Standard Plans.

Fire Lane A road or other passageway developed to allow the passage of emergency vehicles. A fire lane is not necessarily intended for general vehicular traffic usage. Refer to SMC 17F.080 Appendix D for dimensions and requirements.

Integral Curb and Gutter Concrete curb and gutter which is formed and placed as one unit.

Local Access Street A street that provides access from individual properties to *collector arterials* and *minor arterials* in residential, commercial and light industrial areas. Refer to the Auto Network portion of the City's Comprehensive Plan chapter 4, section 4.4 Modal Elements for additional discussion.

Median A painted or raised traffic island used to channel, separate and otherwise control vehicular traffic.

Minor Arterial A street providing service for trips of moderate length, connecting the principal arterial system and providing intra-community circulation. Refer to the Auto Network portion of the City's Comprehensive Plan chapter 4, section 4.4 Modal Elements for additional discussion.

Monument A physical survey monument as shown in the City's Standard Plans.

MUTCD See Section 1.2 and SMC 17A.020.130.

NACTO Refers to the National Association of City Transportation Officials.

Neighborhood Greenway A low-volume street that is designed to prioritize pedestrian and bicycle travel. Most often greenways will be implemented on local access streets, and elements of the greenway may disrupt through-travel by automobile as a means of regulating vehicle volume. Greenways are best implemented near and parallel to an arterial street which boasts access to goods and services, thus also providing ready access to users of the greenway. Another crucial element of a greenway is signage that identifies the route as a greenway and provides wayfinding.

New Development Development or redevelopment of land adjacent to (and often inclusive of a portion of) the Right of Way, or development of land with the intent of dedicating Right of Way infrastructure. Most private development falls under this category, and occasionally the City of Spokane will develop new streets through vacant or underdeveloped land.

Path Facility designed for use by bicyclists and pedestrians, usually separated from vehicle traffic by a median or landscaped area.

Place-making An element of streetscaping that involves the use of unique design features with the ability to set a street segment apart, helping to create an environment for economic vitality and innovation. Application of place-making design elements should be used in connection with planned land uses and in coordination with stakeholders.

Preservation A roadway maintenance project conducted by the City of Spokane to refresh the driving surface of the street and thus prolong the pavement service life. These projects are

generally confined to the pavement area between curbs. Example treatments may include grind and overlay, chipseal, micro-seal, slurry seal, crack seal, etc.

Principal Arterial A street serving major activity centers and providing a high degree of mobility. Refer to the Auto Network portion of the City's Comprehensive Plan chapter 4, section 4.4 Modal Elements for additional discussion.

Private Streets Roadways which are not controlled or maintained by a public authority, and which serve two or more properties.

PROWAG Refers to the Public Right-of-Way Accessibility Guidelines.

Quarter Crown A roadway cross-section with the highest point of the *traveled way* located at a distance from one curb of one-fourth the roadway width (as measured from face of curb to face of curb).

Reconstruction A roadway corridor project that typically replaces the full depth of asphalt pavement, updates curb ramps, and may include utility updates as appropriate. Sidewalk repair, replacement, capacity improvements, signal and lighting upgrades and transit stop improvements may also be included in a reconstruction project. These projects are administered by the City of Spokane, and the scope of each project is determined in accordance with city plans. As this type of work is done within the built environment, space constraints may impede the full realization of the design standards. Prioritization of standards is generally addressed within this document, but each individual project will need to be scoped with future use conditions in mind.

Shared-Use Pathway A non-motorized transportation pathway shared by pedestrians, scooters and bicyclists. May be located next to a street or in a separate right-of-way. Examples include the Children of the Sun Trail, Ben Burr Trail, Fish Lake Trail and Centennial Trail.

Street Classifications *In conformance with FHWA guidance, arterial* and *local access streets* are classified in the Auto Network portion of the City's Comprehensive Plan chapter 4, section 4.4 Modal Elements section as follows:

- Principal Arterial
- Minor Arterial
- Collector Arterial (Major Collector or Minor Collector)
- Local Access Street

Definitions of all of the above classifications are included herein. Private streets are not classified.

Street Character Character consists of refined street definition based upon a street's function within the transportation network (or classification) and its context (land use zoning).

Street Realm A part of the right-of-way designed for a particular user group or use (pedestrian, flexible zone, vehicle, median). See Figure 2.

Streetscape or Streetscaping The combinations of living and non-living items that provide opportunities for place-making. Generally everything beyond the asphalt makes up the streetscape, although the median may include streetscaping elements.

Structural Sidewalks Structural sidewalks shall be defined as all elevated slabs, grates, and panels located within a sidewalk or driveway not supported on grade. Typical examples of elevated structural sidewalks are concrete slabs, steel grates, and steel plates for utility vault lids, service elevator covers, utility covers, and building basements.

Traveled Way The area of roadway which is intended to carry vehicular traffic, not including any shoulders. See SMC 17A.02.200.

3.2 Street Character

Street design is governed by two primary factors: zoning context and classification. Zoning context refers to the environment (land use zoning) in which a street is found. For example, sidewalks must be wider on downtown streets to accommodate higher pedestrian volumes and place-making elements. Street classification speaks to its function within the network, an arterial street with planned bicycle facilities will be built with the facilities the full length of the street regardless of how the facilities might change due to zoning the street passes through. Street Character is defined by the combination of zoning and classification. A principal arterial should have a different character through a CC zone than through a Residential zone.

3.2-1 Street Zoning Application

Spokane's comprehensive plan refers to urban infrastructure contexts for the city. This refers to the land use zoning through which a street traverses and to which the street facilities provide access. Land Use Zoning is defined in Title 17C "Land Use Standards" of the Spokane Municipal Code. Zoning is applied and defined for each land parcel in the city. Streets themselves are not assigned specific zoning, but should take on the context of zoning they front.

Zoning can, for the purposes of selecting street design characteristics, be lumped into four categories: Centers and Corridors, Downtown/Commercial, Residential, and Industrial. While zoning might change multiple times along a given block, some street characteristics will necessarily remain constant. Design criteria should be selected for the most generous zoning on a given block, and should be applied block by block. In some instances a street may traverse a different zoning for only one or two blocks, and best judgement should be applied as to whether to shift the street character in such instances. Emphases should be given to place-making opportunities when considering these shifts in street character.

Some consideration should be given to the planned versus the existing land use. The Zoning code allows for a variety of uses within several of the zoning contexts. For instance, the zoning for Centers and Corridors, CC1 allows for commercial, office, or residential development. When developing the street serving a planned development, or when rehabilitating a street within the built environment, it is worth considering what land use is to be expected for the life-span of the roadway, or about 20 years.

Motor vehicle volume (Average Daily Traffic – ADT) on a given street should be a strong determinant when considering how the facilities of the street fit together to provide appropriate levels of safety and provision to all users of the street. The street classification is largely determined by existing and planned traffic volume as well as the percentage of freight traffic on the street, and combined with the street type derived from the Land Use Zoning, provides the basis for design expectations for a given street.

Spokane exhibits four street classifications:

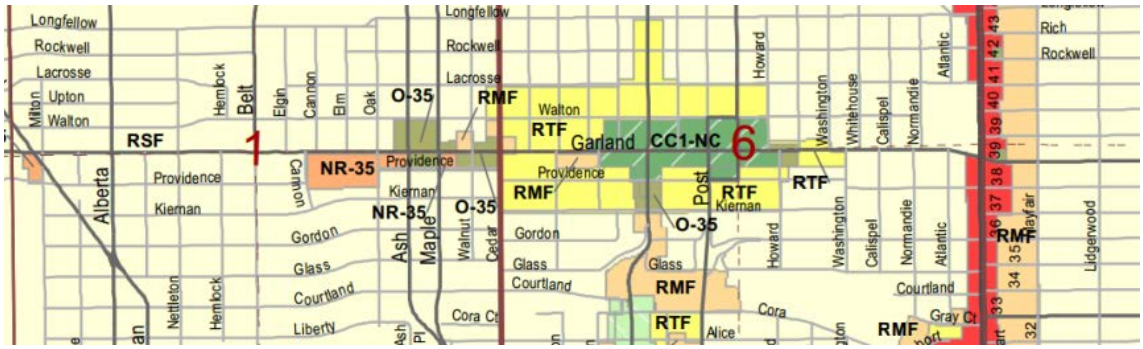
- Principal Arterial – Spokane's largest streets that provide regional connections and serve the highest volumes of traffic.
- Minor Arterials – Similar in design to Principal Arterials, Minor Arterials typically have fewer lanes and connect Collectors to Principal Arterials.

- Collector (Major and Minor) – Streets that circulate through neighborhood hubs and connect to minor and principal arterials. Collector streets are further defined as Major and Minor Collectors depending on traffic volume, but for the purposes of design, these will be treated under the same criterion.
- Local Access – Low-volume and low-speed urban streets providing access to homes and businesses.

In combination, the zoning contexts and street classifications result in sixteen overall street characterizations for Spokane. Street character, identified at the start of a project is the basis for this design standard, and sets the starting point for decision-making balance through the design process.

Street design for a given street should change with the context. For example, Garland Avenue's zoning changes several times from Alberta to Division, as depicted in Figure 1. Cross sectional design elements for the CC1-NC zone will be selected differently than for the RSF zone. Consult the zoning maps when beginning a street improvement project to understand context changes along a corridor that may warrant design adjustments from one stretch of roadway to the next.

Figure 1 – Zoning map (full map available at https://my.spokanecity.org/opendata/gis/)



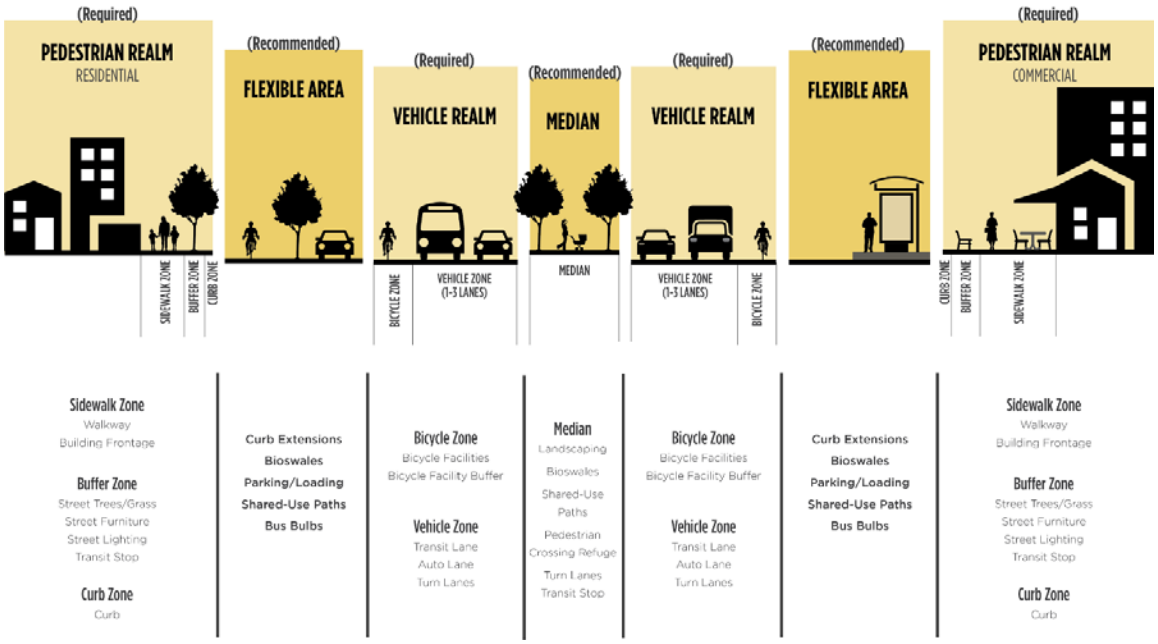
Industrial route streets serve the areas where industrial zoning is assigned. Freight routes, as planned for traversing the city, may also be considered Industrial despite other zoning such streets traverse. Due to the high percentage of larger commercial trucks, vehicle lanes are typically wider (11 to 12 feet) to provide sufficient space, which is most important approaching intersections where truck lane changes and turn movements require wider geometric layouts than passenger vehicles. These streets require special attention to factors such as pedestrian crossings, pedestrian visibility, and bicycle facility design to ensure corridors may balance industrial needs and multi-modal functions, particularly where industrial land uses are co-existent with pedestrian-generating facilities.

3.2-2 Street Realms and Zones

The cross section of a street includes some elements that are standard to all streets and others that are recommended for certain street character. Within the overarching street areas (Pedestrian Realm, Flexible Area, Vehicle Realm, Median) various elements can be arranged to provide a high-quality street depending on the needs of a given area. By thinking of streets in zones, designers ensure multimodal outcomes by considering all needs in relation to land use zoning context. All Spokane streets must have sidewalks, for example, which fall under a

"required" zone, whereas additional elements such as curb extensions or medians can only be built if enough room exists after placing the required elements.

Figure 2 – Street Realms and Zones



The **Pedestrian Realm** includes the area from the property line or building front to the curb and is made up of three primary zones: the sidewalk zone, the buffer zone, and the curb zone, as defined below.

- **Sidewalk Zone.** The sidewalk zone is the area dedicated to pedestrian travel between the buffer zone and the property line. A minimum of 5 to 8 feet of concrete surfacing must be built as defined in the Land Use Zoning. ADA standards also dictate minimum dimensions to be kept clear of obstacles and protruding objects and provide a direct connection along pedestrian access routes. Vending tables, sidewalk cafes, or other activities that protrude into the through-walking space must conform to SMC Section 17C for minimum through-way requirements for the applicable Land Use Zone. In addition to the pedestrian walkway, the sidewalk zone also includes the building frontage wherein could be located vending tables, sidewalk cafes and various street furnishings.
- **Buffer Zone.** The buffer zone is located between the curb and sidewalk zone. This area can be paved or planted, depending on the street character. It may include street trees, parking meters, planters, rain gardens, bioretention swales (overlapping into flexible area), bus shelters, utility poles and boxes, lamp posts, traffic signs and signals, bike racks, news racks and stands, waste receptacles, street furniture and drinking fountains. In addition to the curb zone, the buffer zone provides a buffer for pedestrians from the adjacent roadway and can accommodate snow storage in the winter. Vegetation in this area will generally be maintained by the adjacent property owner, except in the case that such serves a stormwater management purpose. In that case, the city will often maintain vegetation.
- **Curb Zone.** The curb zone is a continuation of the sidewalk elevation plane, typically lies between the traveled way and the buffer zone, and typically consists of 6-inch-wide

elements; although wider elements like bicycle parking or riding facilities are sometimes included. The curb zone will commonly be incorporated into the flexible area for curb extensions or raised cycle tracks, for example. It provides space to open a car door, for vehicle overhangs and for pedestrians to wait for taxis or buses. For those with visual impairments, the curb indicates the border between the sidewalk and the roadway. The curb zone should be free of all objects, furniture, sign posts etc.; particularly adjacent to on-street parking.

Flexible Area (optional). This space between the vehicle realm – where vehicles and bicyclists move – and the curb zone can be programmed for car parking, bike parking, landscaping, stormwater management (general overlap with buffer zone), pavement-level protected bike lanes, shared-use paths, bus bulbs, or curb extensions. Shy space, a distance commonly required on the right side of a vehicle to allow for driver deviation near curbs is also part of this area. Not all streets have enough space for both required and optional elements.

Vehicle Realm. This area has two zones:

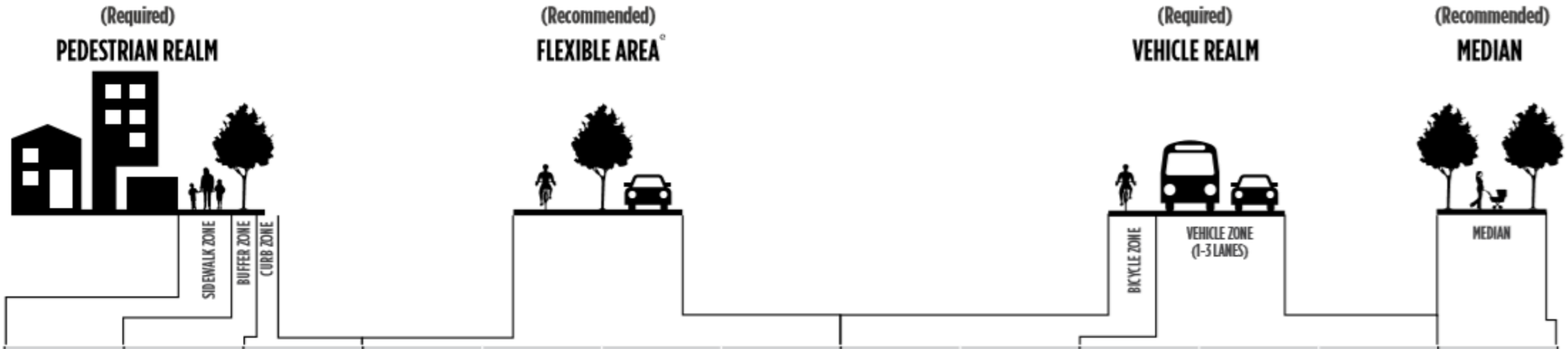
- **Bicycle Zone.** Consult the Master Bicycle Plan and Section 3.5 to determine the type of facility and design desired. Depending on the street character, this zone may include shared lane markings, a lane, a buffer between the lane and vehicles, or other components. In some cases the bicycle facilities will be placed in the Flexible Area, such as in the case of a multi-use path or parking-protected bike lanes.
- **Vehicle Zone.** Auto or transit vehicle lanes are included in this zone, including the outer travel lane, inner travel lane(s), and optional Two-Way Left Turn Lane (TWLTL).

Median. Medians calm traffic, provide refuge for pedestrians crossing the street (especially along wider streets), and present opportunities for landscaping, streetscaping, stormwater management and transit stops. Medians can be used midblock in tandem with turn lanes at intersections. Similar to the Flexible Area, not all streets need medians, and when medians are considered, access to utility access or controls, left turns, alley access, etc. should be maintained where appropriate. Based upon available right-of-way and community input, a menu of options can exist in a median. Pedestrian refuge medians should be installed in accordance with SMC 17H.010.210 and SMC 17H.010.215.

Dimensions in Table 1. Flexibility in street design may be maintained by referencing a range of possible dimensions rather than prescribing exact requirements. A design, may thus be crafted based upon the unique elements of each street. Street design, particularly within the built environment, requires a range of possible elements and dimensions in order to deliver desired outcomes. Table 1 lays out the target dimensions for street zone elements by street classification and zoning contexts.

Wider sidewalks, buffer zones, swales and medians are allowed without a deviation. Shared-use path width may be decreased to 10' or increased without a deviation. Deviations beyond these standards must be approved by the City Engineer per SMC 17H.010.020.

Table 1 **Street Dimensions**



	Sidewalk Zone[b]	Buffer Zone[c,d]	Curb Zone	Opt. Shared Use Path[f,g]	Stormwater Management[h]	Curb Extensions/ Bus Bulbs[i]	Parking	Bicycle Lane[g]	Bicycle Buffer[J]	Vehicle Zone Outer Lane[K,L]	Vehicle Zone Inner Lane[K]	Vehicle Zone Left Turn or TWLTL	Median[m]
	Downtown DTC, DTG, DTU, DTS; Form Based Code CA1, CA2, CA3, CA4								**Center & Corridor CC1, CC2, CC3, CC4**				
Urban Principal Arterial	7	5	0.5	12	Varies	7	8	6	1.5-6'	11	11	11	6-20
Urban Minor Arterial	7	5	0.5	12	Varies	7	8	6	1.5-6'	11	11	11	6-20
Urban Major/Minor Collector	7	5	0.5	12	Varies	7	8	6	1.5-6'	11	11	10	6-20
Urban Local Access	7	5	0.5	12	Varies	NA	7	6	NA	10	NA	NA	6-20
	Commercial O, OR, NR, NMU, CB, GC												
Urban Principal Arterial	7	5	0.5	12	10	7	8	6	1.5-6'	11	11	11	6-20
Urban Minor Arterial	7	5	0.5	12	10	7	8	6	1.5-6'	11	11	11	6-20
Urban Major/Minor Collector	7	5	0.5	12	10	7	8	6	1.5-6'	11	11	10	6-20
Urban Local Access	7	5	0.5	12	6.5	NA	7	6	NA	10	NA	NA	6-20
	Residential RA, RSF, RSF-C, RTF, RMF, RHD												
Urban Principal Arterial	5	6	0.5	12	10	NA	8	6	1.5-6'	11	11	10	6-20
Urban Minor Arterial	5	6	0.5	12	10	NA	8	6	1.5-6'	11	11	10	6-20
Urban Major/Minor Collector	5	6	0.5	12	10	NA	8	6	1.5-6'	11	11	10	6-20
Urban Local Access	5	6	0.5	12	6.5	NA	7	6	NA	10	NA	NA	6-20
	Industrial LI, HI, PI												
Urban Principal Arterial	5	6	0.5	12	10	NA	NA	6	3	12	12	12	6-20
Urban Minor Arterial	5	6	0.5	12	10	NA	8	6	3	12	12	12	6-20
Urban Major/Minor Collector	5	6	0.5	12	10	NA	8	6	1.5-6'	12	12	12	6-20
Urban Local Access	5	6	0.5	12	6.5	NA	7	6	NA	11	NA	NA	6-20

A. Table 1 dimensions are target values and minor adjustments are allowed to fit the street context. See discussion in section 3.2-2 for further detail.

B. See SMC 17H.010 for exceptions to residential sidewalk requirements. In locations where existing sidewalks exceed the dimension in Table 1, the sidewalk width should be maintained with redevelopment or street improvement

C. Per SMC 17C.200.050-1, a tree-planted continuous buffer requires a 5-foot minimum width for commercial zones. For residential and industrial zones, the minimum increases to 6 feet. Alternatively, a narrower buffer may be used in select zones if tree vaults are implemented.

D. Buffers in commercial areas may be planted or concrete. When stormwater disposal is a governing concern, consideration should be given to use pervious surfaces.

E. The flexible area includes a menu of options which are chosen based on what makes most sense according to city plans, environmental responsibilities, and context. In some cases, none of these will fit within the project. Only in very rare cases will more than one fit - for instance, a parking lane plus bio-retention swale.

F. In places designated for shared-use paths, the path can take the place of the sidewalk zone.

G. Consult section 3.5 of this document for guidance on facility type and selection. Possible facilities include bike lanes, buffered bike lanes and parking protected bikes lanes. Physical or grade-separation may be preferred depending on conditions. Bicycle facilities may operate in the Flexible Area or the Vehicle Realm. Bicycle boulevards and shared roadways are possibilities on local access street.

H. Consult the Spokane Regional Stormwater Manual and/or Eastern Washington Low Impact Development Guidance Manual for desired locations for stormwater facilities. The stormwater catchment area must meet the required volume generated by the planned impervious area. In Downtown, Form Based Code or Center & Corridor zoning roadside swales are less common and alternative stormwater facilities in accordance with the above identified manuals may be considered or stormwater piped to another location.

I. On transit corridors, use bus bulbs if space allows to ease boarding, reduce sidewalk congestion, and allow buses to easily re-enter traffic. This should typically be done only if there is a second lane for vehicles to continue around stopped buses.

J. "High Traffic" and "Medium Traffic" lane routes on the Master Bicycle Plan should include buffers. Separation buffer between bike lane and vehicle lane should be implemented via parallel lane edge stripes with a periodic cross-hatch. 3" is the minimum buffer unless a raised curb is used, in which case 1.5" is the minimum. Wider buffers are allowable but should be well marked with hatching or bollards.

K. When constraints are prohibitive, consider 10-foot lane width as the minimum.

L. Travel lane includes the width of the gutter pan, if integral curb and gutter is used.

M. Medians less than 6 feet wide are considered traffic channelization. A pedestrian refuge is a raised median with a minimum width of 6 feet. Wider medians may be implemented in the context of boulevards.

3.2-3 Place-Making Elements

According to the Project for Public Spaces, place-making facilitates creative patterns of use, paying particular attention to the physical, cultural, and social identities that define a place and support its ongoing evolution. Key to a successful place-making effort, is an associated community-based participation which helps identify a location's assets, inspiration, and potential to contribute to people's health, happiness, and well-being. This public participation also builds coalitions that will help care for the physical components of place-making, as well as assist in programing events held in such places.

As regards streetscaping, place-making involves the use of "unique design features that have the ability to set a street or segment of a street apart, helping to create an environment for economic vitality and innovation. Application of place-making design elements should be used in connection with planned land uses and in coordination with stakeholders." (Spokane Comprehensive Plan). This can occur through a number of planning efforts, including sub-area planning, neighborhood planning, and staff-level or board-level design review.

Capital Street projects have a unique opportunity to enhance place-making within the right-of-way. Examples of place-making treatments are provided below.

- Use of historic sidewalk patterns and stamping street names into the concrete.
- Preserving historic brick patterns in the gutter.
- Use of neighborhood specific tree grates and manhole covers.
- Re-use of historic granite curbing.
- Decorative lighting fixtures per the districts and standard types outlined in this document.
- Installation of benches, historic plaques, artwork, planter boxes, etc.
- Establishment of scenic overlooks.
- Trees and other plantings in the buffer strip or center median.
- Installation of street furnishing such as benches, bike racks, custom trash receptacles and media corrals.
- Bulb-outs at intersections or crosswalks
- Architectural features such as balconies, marquees, or arcades that may project out into the right-of-way (subject to appropriate clearances)
- Parklets and/or streateries

Other than potential landscape or hardscape improvements in a median, place-making treatments would generally be restricted to Pedestrian Realms, Alleyways, and Flexible Areas. Any place-making treatments in the Vehicle Realm (e.g. custom lighting or artwork on Skyways) must meet the other provisions of this document.

3.3 Right of Way

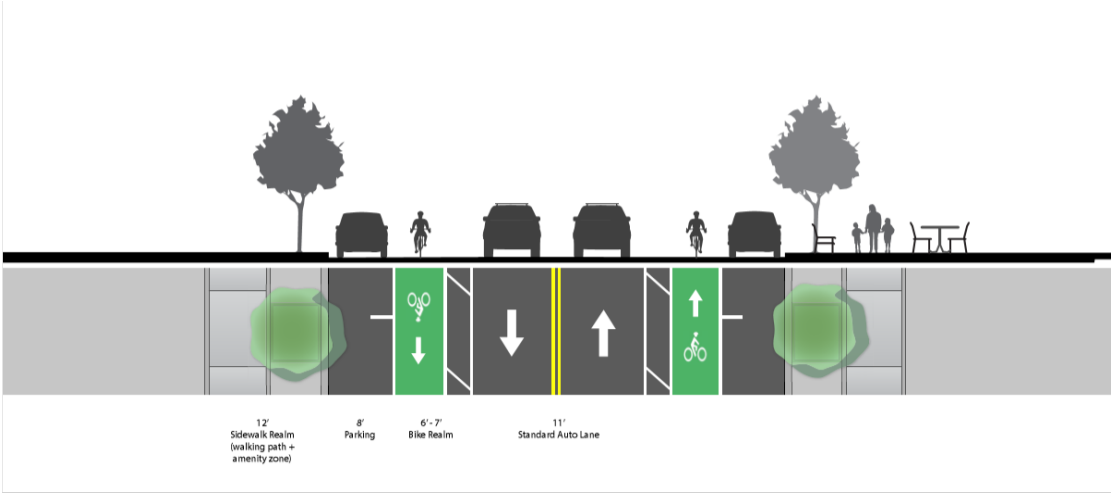
Follow the guidelines of SMC 17H.010.050 to determine minimum dimensions required for right of way for new development. Preservation and reconstruction work will often seek a balance of uses due to limited available space. Such balance should be determined based on land use context and right of way available.

Narrower right of way widths may be allowed in new development only at the discretion of the City Engineer. Variance requests will be evaluated based on topography, traffic circulation,

emergency vehicle access, zoning, utilities, existing development and on-street parking requirements.

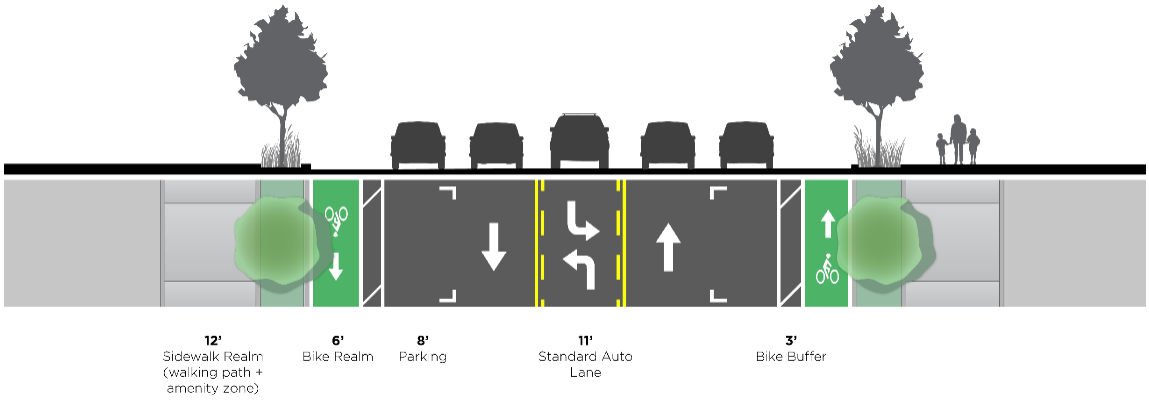
Application of Table 1 to a new and existing right-of-way is illustrated below. In some cases, the designer will be laying out a new street (Figure 3).

Figure 3 – Sample layout of an Urban Collector



In retrofit situations, Minor Arterials built to the city's earlier standards can have space reallocated based upon current pedestrian, bicycle, stormwater, transit, and/or other plans (Figure 4).

Figure 4 –Reallocation of space on example Urban Collector/Minor Arterials



In alignment with city goals (from the Transportation Chapter of the Comprehensive plan) TR A: Promote a Sense of Place and TR B: Provide Transportation Choices to achieve a balanced, multimodal transportation approach (emphasis on walking, biking, transit) street space must be reallocated if possible to users aside from drivers. FHWA has published guidelines for when a road can be downsized to three lanes (two through lanes and a center turn lane). Roads with 10,000 ADT or less are considered great candidates for a road diet. Roads with 10,000-15,000 ADT are good candidates in many instances, but agencies should conduct intersection analyses and consider signal retiming with implementation. Roads with 15,000 -20,000 ADT may be good candidates but agencies should first conduct a corridor analysis. Excess vehicle lanes can be allocated to parking, landscaping, stormwater facilities, bicycle facilities, or widened sidewalks.

When undertaking a repaving or reconstruction project on multi-lane streets with ADT of 20,000 or less, designers must undertake a traffic analysis and consider reconfiguring traffic.

3.4 Pedestrian Realm Facilities

3.4-1 Sidewalks

Sidewalks are the basic element of walkability, and can be augmented with planted buffer strips, center medians, and street furniture. The sidewalk zone includes both the area in front of a building where cafes or vendors might operate as well as the area for walking through. Ensure that for land uses where cafes and other active frontage uses are expected, appropriate unobstructed sidewalk width for walking is maintained per SMC 10.28.

Sidewalks shall be located as required by SMC 17H.010.180. Width and profile grade design criteria for sidewalks are outlined in Table 1 and Table 8. Sidewalks shall be designed in accordance with the Standard Plans and City of Spokane GSPs, and may use pervious concrete where feasible (SMC 17C.110.410, 17C.120.230, 17C.130.230).

Shared-use pathways may be substituted for sidewalks. This will typically occur in locations designated as shared-use paths on the Bicycle Plan, but other locations may be identified through the development permitting process or through a capital project design process.

Where existing, elevated structural sidewalks (vaulted over building basement spaces) are intended to be kept, they shall be designed in accordance with the applicable portions of the latest edition of the Uniform Building Code. The minimum concentrated load, L, to be used in the design shall be 10,000 pounds applied over a contact area of 100 square inches. The minimum single axle load shall be 20,000 pounds. The design tire load shall be 600 pounds per inch of tire width. The construction of new buildings with open space under the sidewalk shall not be allowed, nor shall private utilities for said buildings be placed under the sidewalk.

When development occurs on sites with existing sidewalks; broken, heaved, or delaminated sidewalk adjacent to the project shall be repaired or replaced as part of the project. Locations of sidewalk repair or replacement shall be included on plans submitted to Developer Services for review.

Reconstruction projects, where funding sources allow, should also consider sidewalk condition and completeness. Existing sidewalk width may fall short of the current standard. Consideration for widening will be a decision during the scoping phase while funding is gathered. Preservation projects is not required to adjust sidewalk width or condition of sidewalk parallel to the roadway, but grind and overlays are required to attend to ADA compliance updates at street crossings, in accordance with federal regulations.

Pedestrian detours must be planned and implemented whenever work reduces the through-walking path below acceptable ADA standards. Temporary sidewalk, when necessary, may displace vehicle parking or travel lanes, as appropriate, in order to provide a walking path detour for high-use sidewalks.

3.4-2 Buffer Zone

Buffer strips (separated sidewalk) can add greenery to a street, provide snow storage space, and provide horizontal separation for pedestrians from vehicle traffic. Buffer Strips can be hard surfaced or planted depending on the land-use zoning. The requirements for buffer strips are

included in SMC 17H.010.190, which requires buffer strips on both sides of all streets; SMC 17C.200.050, which guides dimensional requirements for incorporating street trees; and Table 1 which compiles the dimensional requirements from each land use zoning as defined in SMC 17C.

Reconstruction work should include pedestrian buffer strips where space allows. However, space limitations may determine availability of this option. Roadway narrowing may be considered when conditions allow, to create the necessary space for pedestrian buffers. Refer to the Pedestrian Master Plan, and prioritize buffers particularly for projects within pedestrian priority areas. Even creating this condition on one side is preferable to neither side. When creating a buffer on one side, take into account the continuity of pedestrian travel and likely destinations like schools, markets or community facilities. Street maintenance activities (non-capital) are not required to consider linear elements beyond the curblines unless attending to ADA or utility items.

3.4-3 Curbs and Gutters

Integral cement concrete curb and gutter shall be constructed per the City standard plan on roadways with profile grades below 1.0 percent. Special drainage issues may allow the use of alternative curb profiles depending upon road profile and setting, upon approval of the City Engineer. When repairing or replacing existing sections of curb, the type of curb constructed may match the adjacent curb.

The curb radius at alley entrances is addressed in the City's Standard Plans.

Consider curb extensions (bulb-outs or bumpouts) at intersection corners whenever on-street parking is present along the block. Curb extensions shorten the crosswalk width, assure parking setbacks from intersections and crosswalks, and delineate (or "book-end") parking lanes. The extension from the curbline should generally be 1 foot less than the parking lane width, but in some instances additional "shy distance" from the adjacent travel lane may be considered. Bumpout design must consider whether a bike lane is planned in the future. Curb extensions may also be used midblock to provide traffic calming or to protect a midblock crosswalk. Bumpouts should generally be implemented as part of a series, as singular instances of bumpouts on a corridor could result in a hazard. Use appropriate design and accommodated vehicles and refer to effective turning radii when designing curb extensions. Curb bumpouts should be delineated with flexible candles on the curb line near the travel paths to aid in winter visibility for drivers and snow plowing.

Figure 5 – Curb extension works to narrow a road adjacent to a school

Source: Googlemaps

3.4-4 Curb Ramps

Curb ramps can improve access for many, especially wheelchair users, people wheeling strollers, people with mobility challenges and older adults. How curb ramps are installed affect accessibility, particularly for people experiencing vision loss. Visual impairment can be very limiting for individuals, and physical clues built into street infrastructure are quite helpful. Curb ramps shall be designed in accordance with the recommendations of PROWAG, NACTO, the WSDOT Standard Specifications, and the City of Spokane Standard Plans and General Special Provisions. Curb ramps shall be located in accordance with the City of Spokane Standard Plans, SMC 17H.010.200, and SMC 17H.010.210E. Reconstruction and grind and overlay type preservation projects shall include ADA compliance updates as required by federal regulations.

In all new construction and reconstruction projects placement of two ADA compliant curb ramps per corner is required. The ramp layout should maintain the pedestrian line of travel when feasible. Ramps should be aligned such that the running slope (and edge curb if used) is parallel to the crosswalk markings and direction of pedestrian travel. Grade breaks at the top and bottom of the ramp should be perpendicular to the direction of travel. The low-point for stormwater collection should not be in front of the ramp.

Figure 6 – Ramp running slope aligned with direction of pedestrian travel and ramp on opposite corner

Figure 7 – Ramp running slope misaligned with crosswalk does not provide information to sight impaired individuals

For retrofit or preservation work the priority is to use two curb ramps per corner. However, the use of single curb ramps per corner may be appropriate when relocation of utilities would be required to accommodate dual ramps, topographic constraints, right-of-way constraints or intersections with small curb radii. When using a single curb ramp per corner, it is helpful to avoid deviating from the pedestrian line of travel. Alignment cues such as use of perpendicular angles should be utilized. Curb ramps are generally built with flared sides, but at times will be built with pedestrian curbs flanking the ramp. Pedestrian curbs used in this manner should be parallel to the crosswalk.

Figure 8 – Dual ramps with curbs instead of flares

3.4-5 Street and Pedestrian Lighting

General

This section provides general information on street lighting with the City of Spokane. Additional detail, such as the need, type and location, and request process for new lighting is determined by the "Street Lighting Guidelines", a document available from the Street Department.

Street lighting will generally be provided by the serving utility company. In these locations the maintenance and capital costs are included in the utility company rate. However, on bridges, traffic signals, downtown, certain business districts, and other locations the City may provide lighting equipment and maintenance in addition to the energy costs.

Arterial Street Lighting

Arterial lighting is typically 200 watt LED equivalent with one luminaire per intersection. Continuous roadway lighting on arterials is considered on a case by case basis. Lighting levels may be increased on arterials if the City Engineer determines higher levels are appropriate. Generally, low-volume neighborhood collector arterials will have lighting similar to residential streets while high-volume minor and principal arterials may have continuous high-level lighting service.

Arterial lighting will typically be installed on wood poles. The City Engineer may elect to install metal poles on certain streets. Adjacent property owners have the option of upgrading to metal poles through direct negotiation with the serving utility company.

If the arterial lighting service provided by the City does not fit the desired needs of the adjacent property owner, developer, or neighborhood association, they may install a private lighting system. The City will not participate in the costs of any such system. The presence of such a private system will not preclude the City from providing street lighting in conformance with the "Street Lighting Guidelines" if requested. All private lighting systems will require appropriate permits and encroachment agreements.

Preservation projects will not be required to update street lighting. Reconstruction projects should consider updating lighting as defined here-in.

Decorative Street Lighting

Decorative street lighting is limited to specific areas of the city and are considered an appropriate kind of place-making element. These areas are defined below. For new installations the maintenance cost may be funded by a business district or similar organization. This section is not applicable to lighting installed and maintained by the Parks Department.

The city has adopted three specific luminaire styles that must be used for all new city-maintained installations or updates. The styles are referred to as Modern Acorn, Transitional Series and Traditional Series. Project designers should refer to Standard Plan J-200 for the specific type to use in the CBD and North Bank/Spokane Arena Districts, and refer to the Street Department for guidance on specific types not listed on that plan.

> **Central Business District**. A large area generally defined as the area south of the Spokane River, west of Division, north of I-90 and east of Maple Street. Some areas in the CBD provide decorative pedestrian lighting and street lighting, others are pedestrian only. Much of this area still has the Expo '74 lights that are being removed and replaced

with street improvement projects. The infrastructure supporting this lighting (conduits, wiring, electrical cabinets) also need to be updated when the newer decorative fixture are installed.

University District (south). Parts of the south University District including the Sherman Plaza, the south bridge landing, on Riverside from Sherman to Sheridan, on Sheridan from Riverside to Sprague. Overlaps with the East Sprague Business District lighting.

East Sprague Business District. The area along Sprague Avenue east of Division to Altamont Street.

North Bank/Spokane Arena. There is some decorative lighting in the vicinity of the Spokane Arena and north edge of Riverfront Park.

Monroe-Lincoln South. This business district has pedestrian lighting on the arterial street from approximately 10th Avenue to 15th Avenue.

North Monroe. Monroe Street from the river north to Alice Avenue. There is a gap between Mallon and Indiana.

The following districts have special fixtures that are maintained by other entities.

University District (north). The area east of Division, south of the river, and north of the railroad. This lighting is maintained by WSU.

Kendall Yards. The Kendall Yards development has decorative pedestrian lighting throughout the development. This lighting is maintained by Kendall Yards.

Gonzaga District. Parts of the Gonzaga campus including the frontage along Hamilton Street. This lighting is maintained by Gonzaga.

Many of the decorative lighting areas have legacy fixtures that are maintained by the City but no longer used for new installations.

West Broadway. Broadway Avenue from approximately Elm Street to Walnut Street within the West Central neighborhood.

Browne's Addition. The intersection of Pacific Avenue and Canon Street in the Browne's Addition neighborhood.

Perry District. Along Perry Street from 8th Avenue to 12th Avenue.

Sunset Boulevard. Along Sunset Boulevard from 5th Avenue to Hemlock Street, generally associated with the Inland Empire Way underpass.

Hillyard District. The Hillyard Business District has decorative lighting along Market Street.

Cliff Drive. On the Cliff Drive bridge over Grove Road.

Local Access Street Lighting

Local Access Street lighting consists of a 100 watt LED equivalent lighting fixture on a wood pole at each intersection. Midblock lights may be installed on long blocks of 600 feet or more. However, lights will not be placed less than 200 feet apart.

- The Streets Department maintains a first-come, first-serve priority listing for new lights to be installed as funding comes available.
- Street lights will not be provided at dead ends or at the end of cul-de-sacs. However a midblock street light may be approved for cul-de-sac streets at least 600 feet long.
- The person or group requesting lighting may upgrade the basic wood pole to a metal pole through private negotiations with the electrical service company.
- If the basic street lighting service provided by the city does not fit the desired needs of the adjacent property owner, developer, or neighborhood association, they may install a private lighting system after obtaining the appropriate permits and encroachment agreements. The city will not normally participate in the cost of any such system.

3.4-6 Roadside Planting

Any roadside planting shall conform to the City's clearances/clear zone standards as discussed in Section 3.12 and SMC 17A.020.030N, and SMC 17C.200.050. A permit in accordance with SMC12.02.960 is required for the planting, removal, or pruning of any street tree. Guidelines for proper tree installation can be obtained from the Urban Forestry program of the Parks and Recreation Division. Locations of all existing and proposed street trees shall be shown on plans submitted for review.

The standards within this chapter provide a target set of dimensions for basic tree growth space. Following these standards will support the growth of street trees in an urban environment, and but will not likely support a thriving canopy that can be experienced in more park-like settings. Within the confines here-in defined, tree growth and health will, in time, be stunted, requiring replacement at a younger age. In order to develop a more mature canopy, additional space (beyond these standards) for root growth would be necessary. In further consideration of larger growth expectations, the planter width should appropriately provide for larger trees. The following recommendations set the stage for the standard street tree, thus if larger growth is desired, additional considerations should be discussed during the tree permitting process.

Existing Street Trees

When development occurs on sites with existing street trees, the following items must be addressed as part of the project:

- All dead or diseased trees must be removed and replaced.
- Trees that are missing shall be replaced.
- Broken or missing irrigation systems shall be repaired or replaced as needed when incorporating new plantings.
- Broken or missing tree grates shall be repaired or replaced.
- All concrete tree grates shall be replaced with metal grates meeting ADA requirements.
- When structural sidewalk is removed and backfilled, concrete planter vaults shall be removed and replaced with an appropriate containment facility providing at least 100 cubic feet of soil.
- Gaps between the tree grate and the soil surface exceeding 6 inches shall be filled in with pea gravel.

- Tree grates that are not flush with the surrounding sidewalk shall be raised or lowered as necessary to prevent a tripping hazard.
- If existing trees have roots that have heaved pavement or sidewalk, work with Urban Forestry to determine an appropriate course of action.

New Street Trees

Tree selection shall be coordinated through Urban Forestry. Approval shall be obtained from the City Engineer and the Urban Forester prior to planting tree(s) in the City right of way. A Street Tree Permit (SMC 12.02.960) is also required before planting tree(s) in the City right of way.

In an effort to assist in the selection of an appropriate tree, the City has published a document entitled "Spokane Urban Forestry Approved Street Tree List" which is included in Appendix F. Not all of the trees appearing on this list are acceptable for every situation. Requests to plant trees not included on the list will be considered on a case-by-case basis. Urban Forestry can provide the most current list.

When locating street trees, the following specific criteria shall apply. In the case that these criteria would prohibit planting of street trees, the Urban Forester and City Engineer may consider alternatives:

a) Street tree installations shall meet all City of Spokane visibility requirements as defined by clear view triangle (SMC 17A.020.030) for intersections and driveway approaches and be placed to provide minimum stopping sight distance for stop signs and visibility for warning and other regulatory signs.

b) Street trees shall be located so as to not interfere with street signs, visibility of regulatory and warning signs, lighting poles, STA stops or pads and to accommodate ADA pedestrian requirements. Also tree locations should consider the tree canopy reach, the impact that may have on fire aerial operations and visibility of warning and regulatory signs.

c) Minimum separation distances from the centerline of a tree to other structures or improvements in the planting strip shall be as follows:

1) 10 feet to edge of single-family residential driveway, 15 feet to edge of commercial or multi-family driveway (10 feet may be allowed in some cases);

2) 20 feet to street light luminaire (15 feet may be allowed where lighting pattern is not affected);

3) 10 feet to hydrants and utility poles. Lower limbs must be pruned for full visibility of the hydrant. No new utility pole location shall be established closer than 10 feet to an existing tree;

4) As required to provide an adequate clear sight triangle as defined below and shown in the Appendix;

5) 15 feet to underground duct or pipe;

6) 5 feet from curb cut for drainage;

7) 20 feet from drywell, unless the species permits a closer placement due to crown diameter;

8) and shall conform with the Arboricultural Manual: Specifications and Standards of Practice.

d) Trees that are suitable for wet areas shall be selected for planting within bioretention or biofiltration areas. Trees that are planted within bioretention or biofiltration areas shall not interfere with, obstruct, or retard the flow of water in the stormwater facility.

e) Spacing of street trees will be determined by the permitting department. Clustering of trees may be allowed under specific circumstances. Contact Urban Forestry Department for more information.

f) If trees are to be planted in an area with no planting strip, the following criteria shall apply:

1) A permanent, hard walking surface at least four feet wide shall be provided between the tree well or planting area and any structure or obstruction.

2) Sidewalk cuts in concrete for tree planting shall be at least 48-inch x 96-inch as shown on the Standard Plans to allow air and water to the root area. Regardless of the sidewalk cut size, the soil volume below the sidewalk should facilitate a minimum of 100 cubic feet for each tree.

3) In cases where the existing walk cannot meet the four foot width requirement after tree planting, additional sidewalk width must be added within street right of way or an easement or the tree position must be modified.

g) Irrigation systems shall be required for all areas where street trees are planted. In most cases, irrigation is to be provided by adjacent land owners.

h) Any proposed deviation from these conditions shall require submittal of a written request/ explanation to the Department of Engineering Services or Development Services Center and shall be subject to review and approval by the City Engineer and/or the Director of Parks and Recreation.

3.4-7 Transit Stops

Transit riders must walk along and often cross the street to access and exit their bus stop. Transit-supportive design provides safe and convenient walking routes considering every passenger's trip from start to finish. Transit stops play an important role as part of the streetscape; with the integration of quality bus shelters, wayfinding maps, real-time information systems, and other key features, bus stops have the potential to enhance the public realm.

Stop Placement

Stop placement must be determined through discussion with STA. Locate bus stops in safe and secure locations where they meet both passenger and operational needs. Each intersection and potential bus stop exhibits unique characteristics that should be considered. Near and far side stops at signals both have pros and cons. Locating stops on the far side reduces conflicts between right-turning vehicles and buses, but can also result in traffic queues through the intersection. Far side stops also allow buses to clear the intersection and efficiently continue operations. Near side stops place the riders closer to the crosswalk.

In-lane vs. pullout stops have similar pros and cons. In-lane bus stops speed up the operation for transit riders since the bus doesn't need to maneuver out of the lane and then wait for traffic to come back in. They also require less curb space than pullouts which can work better in areas

where on-street parking is a priority. In-lane stops work best when the stop time can be minimized through the use of off-board fare payment and curb height that matches the bus floor level. Pullout stops prioritize through traffic movement including through-moving transit, and may be desirable when the bus dwell time is consistently expected to be long (such as at a high school with large groups getting off at one time) or on higher speed roadways such as US 2 in the West Plains.

Coordinate all stop placements with STA such that operations are directly considered.

Pedestrian crossing facilities near bus stops

Locate safe, convenient, and ADA-accessible crossing facilities at or near all bus stops matched to street type. Bus stops on the far-side of intersections require pedestrians to cross behind the vehicle. On the far-side, provide a 90-foot no parking zone with the bus stop located at the far end of the zone.

Where it is impractical to locate bus stops on the far side, near side bus stops should be located at least 30 feet from the intersection crosswalk to ensure pedestrian visibility and space to load/unload bicycles. Provide a 100-foot no parking zone with the bus stop located at least 30 feet from the crosswalk. No parking zones will need to be longer for bus pullout conditions. Refer to route bus size and Transit Authority plans for routes along the roadway when selecting the proper facility type and size.

Bike facilities near bus stops

Bus stops adjacent to bike lanes create conflict zones. There are several design options that can be used to provide safer interaction between these two transportation modes. Figure 9 shows bike lanes separated from bus stop activity using an island bus stop design. This design channelizes the bike lane between the island and the curb.

Figure 9 – Island bus stop separates bike lane from bus traffic

Figure 10 shows a shared bike lane and bus stop where the bike lane rises up to the bus platform level and shares the space used for the bus boarding zone. While the example photo shows a temporary installation would typically use a concrete bumpout.

Figure 10 – Shared bike lane and bus stop using temporary platform

Bus Stop Amenities

Bus stop amenities encompass the infrastructure present where passengers wait for transit vehicles. They include physical infrastructure such as seating, shelters, and lighting, and informational infrastructure like transit maps or real time information boards. Bus stops with higher levels of activity typically have more intensive infrastructure. Shelters will be located outside of the required boarding and alighting area. Coordinate with STA to ensure shelter location, seating, schedule information, and properly located bus stop signs do not interfere with pedestrian zones and accessibility.

- **Paved and Accessible Boarding and Alighting Areas.** Provide a paved and unobstructed boarding and alighting area that is a minimum 8' x 8', providing space for ramp deployment while ensuring ADA accessibility. A sidewalk can serve part of this purpose, but may require additional space to meet STA design standards[1]. Higher-use transit stops may warrant additional paved frontage for queueing passengers.
- **Supply Secure Bicycle Parking Where Demand Warrants.** Secure bike parking at bus stops encourage people to ride bikes to transit, expanding the reach of transit for many users. Provide leased bike lockers, on-demand eLockers, and basic bike racks where appropriate. Locate basic bicycle parking such as staple racks at all HPT stops and bicycle lockers at all park-and-ride locations. Other optional parking facilities include bike corrals or covered parking areas.

Preservation work is performed between curb lines, and need not address transit facility updates. Reconstruction work should coordinate closely with the needs of current and future transit facilities and incorporate these as appropriate.

[1] https://www.spokanetransit.com/projects-plans/bus-stop-design-standards

3.5 Flexible Area

This space between the Pedestrian Realm and the Vehicle Realm can be programmed for car parking, bike parking, landscaping, stormwater management, pavement-level protected bike lanes, shared-use paths, bus bulbs or curb extensions.

3.5-1 On-Street Parking

Parking lanes allow drivers and bicyclists to park their vehicles in the public right-of-way, providing convenient access to businesses and homes, and offering loading zones for freight vehicles. Carefully managed, on-street parking can offer traffic calming, economic development, and access benefits. On-street parking lane widths shall be in accordance with SMC 17H.010.120, the City's Comprehensive Plan and/or as directed by the City Engineer. Requests for a reduced street cross-section will be evaluated on a case-by-case basis and a waiver of the on-street parking requirement granted at the discretion of the City Engineer.

Parking and utility access locations should not share the same space. When conducting preservation work that refreshes the paved surface, there is opportunity to re-balance the uses of space. The scoping of such projects should consider the need for parking or access points, which offset one another. Consolidation of access driveways can provide additional parking space. This must be done in coordination with adjacent property owners, and in accordance with access management standards.

Some older streets in Spokane function as “yield streets”. These are bi-directional streets with a through-way narrower than two cars in width, meaning drivers must yield to each other to pass. Yield street operation work best on residential streets when parking utilization is 40-60%, creating a “checkered” parking scheme, which allows drivers to pull over in empty parking spaces or driveways. Yield street operation works best on residential local access streets with two-way traffic that measure 24-26 feet wide with parking on both sides, or 16-20 feet wide with parking on one side.

Figure 11 – Example of a Yield Street: Baldwin Ave between N Hamilton St and N Perry St (25-feet wide)

Parking Lane Width

Parking on arterial streets must be accommodated by 8-foot-wide parking lanes. See Table 1 for parking dimensions. Parking width on residential streets may be narrower, but the street must meet minimum width requirements defined in SMC 17H.010.060.

Bicycle Lanes Adjacent to Parking

When bicycle lanes are included in the Master Bicycle Plan, consult Table 1 for the desired bicycle lane width to be used in tandem with parking lanes. Ideally, provide a buffer between the bike lane and travel lane, allowing cyclists to ride outside the parked car "door zone". Where parking has a high usage and turnover, consider using parking-protected bike lanes with a door zone buffer to reduce conflicts between bikes and cars.

Angle Parking

Angle parking may increase parking supply if sufficient uninterrupted curb length is available, and is useful in mixed-use areas and retail and commercial districts. Angle parking tends to create a traffic calming effect by inducing caution for motorists driving adjacent to the parking zone. Refer to the city's standard plan G-60 for dimensions.

Utilize back-in angle parking, which requires the driver to back into the space; particularly when placed adjacent to bicycle lanes. This allows drivers to load vehicles from the sidewalk, improves driver-bicyclist visibility as the driver departs the space, and increases safety for the driver as the person can pull out into traffic rather than blindly backing up into traffic.

Other Parking Lane Uses

New uses of the parking lanes such as bike corrals and parklets increase the use of the public space for active living, placemaking and recreation.

Bike Corrals

Bike corrals expand the amount of bicycle parking on a street without taking valuable space away from the sidewalk. Bike Corrals typically replace one parking space at the request of a local business or property owner and accommodates 12-24 bikes. Corrals can be installed at corners to "daylight" an intersection since bicycle parking has minimal effect on the visibility of pedestrians to moving vehicle traffic. Bike corrals have been shown to have a positive impact on nearby business.[2] Corral location must consider:

- Safety for users
  - Set corral back from travel lanes in a parking lane
  - Use corrals on streets with low speed limits and low parking turnover
- Rack placement
  - Perpendicular to curb/roadway for wider parking lanes
  - Angled racks better for narrower lanes
- Land uses
  - Commercial and retail uses have more demand for corrals

[2] Meisel, Drew. Bike Corrals: Local Business Impacts, Benefits, and Attitudes." Portland State University. http://bikeportland.org/wp-content/uploads/2010/05/PDX_Bike_Corral_Study.pdf

- Design
  - Demarcate corral with bollards, rubber curbs, and striping. Planters and reflective bollards may also be used.

Before installing a bike corral, require a maintenance agreement between the city and a local business owner or community organization who will maintain the corral and clear it from snow, dirt, or debris.

Parklets

Parklets repurpose street right-of-way, often motor vehicle parking spaces, into publicly accessible spaces for all to use. Parklets provide additional public space for people to sit, enjoy meals, meet others, and use for art and plantings. Parklets help communities reimagine the role of the public street. Parklets should be installed on low speed streets.

Before installing a parklet, require a maintenance agreement between the city and a local business owner or community organization who will maintain the space and clear it from snow, dirt or debris.

Requirements for parklet design, planning, and maintenance can be found in the SMC 10.55 Parklets and Streateries.

3.5-2 Stormwater Management

Low-Impact Development Stormwater Treatments

Stormwater facilities are addressed in SMC 17D.060. Conventional stormwater management infrastructure is engineered to convey the largest volume of water from a site as quickly as possible, collecting surface runoff in subsurface structures.[3] Sustainable stormwater management, by contrast, views rainwater as an amenity, using it to improve urban ecology, microclimates, air quality, and the aesthetic quality of the public realm.

Low impact development design utilizes landscaping, engineering, and urban design tools to mimic natural watershed capabilities.

Figure 12 – Lincoln Street stormwater management

[3] "Chapter 3, Fundamentals of Stormwater Management," *New Hampshire Stormwater Manual* (Concord: New Hampshire Department of Environmental Services, 2006).

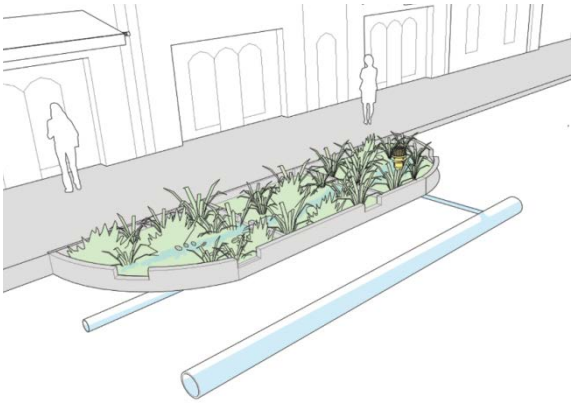
Stormwater facilities that fit the urban landscape, particularly in retrofit situations, are described below. Consult the Spokane Regional Stormwater Manual and Eastern Washington Low Impact Development Guidance Manual for detailed standards and placement guidance. Some tools for Low Impact Development are listed below.

Bioretention Facilities

Bioretention facilities are shallow landscaped depressions that receive stormwater from small contributing areas. They can be integrated into the site as a landscaped amenity because they are small-scale and dispersed. Bioretention facilities can be placed flexibly within medians, curb extensions, or public space. Maintenance of bioretention facilities involves vegetation management, soil replacement, and sediment and debris removal. In some cases it may be preferable to pipe stormwater to a nearby site where a single large bioretention facility can be constructed. This option must be enacted in accordance with the stormwater development guidelines. City reconstruction projects may have more flexibility to operate in this manner due to the extents and connectedness of the right of way.

When bioretention facilities are added to collectors or arterials, the designer should consult with STA to determine if current of future bus stops may be needed within the project limits. Adding a bus stop later on will reduce the area available for stormwater treatment.

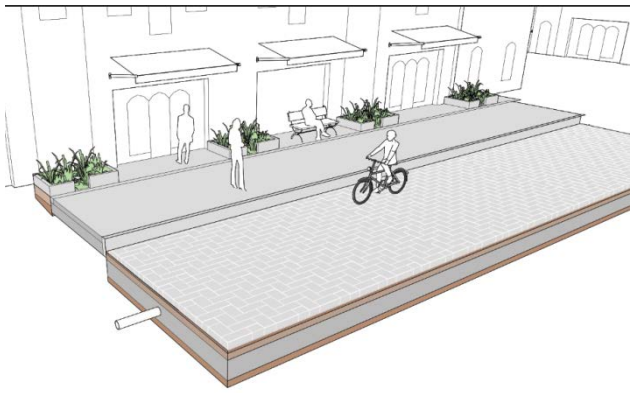
Figure 13 – Bioretention facility



Permeable pavement

Permeable pavements are being tested in the city for sidewalks, transit stops, pathways, parking lanes and travel lane surfacing. Permeable pavements generally do not work well on travel lanes of roads with high volumes and extreme loads, or where hazardous materials, dirt, or anything that could clog the pavement are loaded and unloaded. Permeable pavements may work well in parking lots, sidewalks, residential streets, medians, driveways, and fire lanes. Maintenance of permeable pavement involves street sweeping, leaf pick up, and may include pressure washing and vacuuming.

Figure 14 – Permeable pavement



3.5-3 Shared-Use Pathways

Shared-Use Pathways can be used adjacent to roadways under certain conditions. They work best in locations where limited vehicle volumes can cross the pathway. Common placements would be a pathway between the road and a ridge, river, railroad, freeway, or other manmade or natural feature that restricts vehicular cross traffic. Examples of this in Spokane include the Centennial Trail along Pettet Drive and Upriver Drive, the Ben Burr connection on 3rd Avenue, the South Gorge Trail in Peaceful Valley, and the pathway along Government Way. Low-volume street or driveway interactions may be accommodated with design features such as signage, pavement markings and adequate sight distance.

Figure 15 – Shared-Use Pathway along Pettet Drive

Shared-Use Pathways shall be employed where designated in the City's Comprehensive Plan and in the Master Bicycle Plan, and shall be designed in accordance with SMC 17H.010.260. When constructed within the road right-of-way, these will typically be constructed behind the curb and accommodate both bicycles and pedestrians. Additional width to provide at least 2' separation from the curb is desirable.

In locations with a high volume of pedestrians (downtown, college campus) or significant through bicycle traffic, it may be desirable to physically separate the pedestrians and cyclists using striping and pavement markings.

Figure 16 – Shared-Use Pathway with Separate Bicycle and Pedestrian Lanes

3.6 Vehicle Realm Access Management and Connectivity

3.6-1 Access Management and Driveway Design

Driveway locations shall be designed to provide for safe operations and minimal disruption of traffic flow. In general, the higher the street classification, the fewer the number of access points that are allowed. In areas of high-density housing, shared driveways are encouraged. Multiple unshared driveways with minimal separation between them are discouraged. Minimize driveway width and place them to reduce conflict points.

Access management enables better property access by allowing people to get off the main road and circulate through local streets. On higher speed streets, frequent access points become a safety hazard for all users. Reduce the number of driveways per property to reduce conflict points across all modes, as appropriate and when opportunity arises (see Figure 15).

Access management (i.e. consolidation or reduction of the number of driveway access points along a corridor) may be conducted during street reconstruction projects. However, driveway installations and renovations are generally completed as part of new development and must adhere to the following:

- **Encourage Alley Development to Reduce Driveways on Streets with higher Bike/Ped Activity**. Alleys provide alternative access to adjoining properties. Require utilization of these alleys instead of driveways to reduce the number of access points on main streets. Develop new alleys where possible to provide this alternative access.
- **Design Driveways to Favor Pedestrians and Bicyclists**. Driveways should not be designed as small intersections, but as minor curb cuts. Whenever possible, sidewalks across driveways should maintain their grade rather than sloping down to the street. The

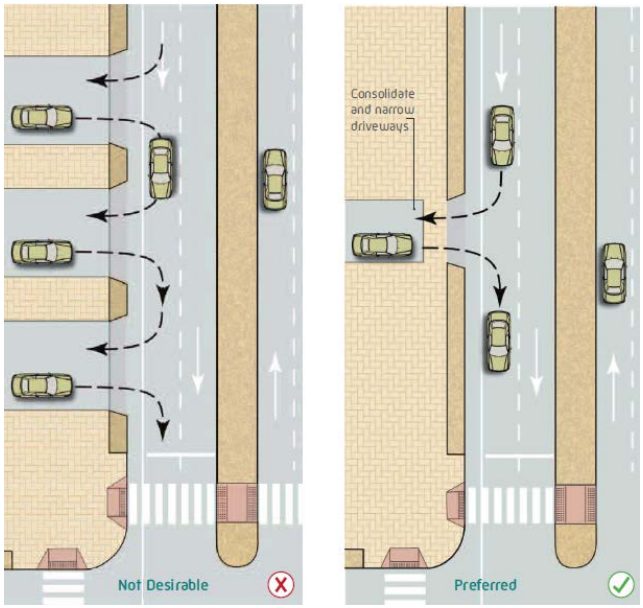
material used to delineate the sidewalk should continue through the driveway. See Figure 13, Figure 14, Standard Plans F-103, F-104, and F104B for examples.

- **During Street Projects, Assess Closure of Driveways**. When street projects are undertaken, evaluate the potential for consolidating driveways along the street to reduce the number of access points. Where streets do not meet the established driveway spacing standard, require new development and consider opportunities during reconstruction projects to address this.
- **High Volume Commercial Driveways**. These driveways should be considered in areas where high volume deliveries are required, where the receiving business may be likely to have a designated loading dock. Commercial driveways may also be considered in a dense commercial center, where multiple businesses could share commercial delivery space without restricting parking availability for customers. It is critical that this type of driveway design does not over-ride the facilities for the most vulnerable users, such as pedestrians. If visibility is a challenge for commercial vehicles entering or exiting, warning systems may be installed to warn drivers and pedestrians alike of an approaching vehicle.
- **Infill Access**. On case-by-case basis, single family residential zones can be developed using a variance to develop interior lots that share a driveway with primary lots. This is meant to facilitate development of lots that could not otherwise be developed in accordance with the standards. This applies only to parcels that are between 0.2 and 1.5 acres in size (8,700 to 63,430 ft^2), with an approved Design Variance. Utility, emergency fire access, stormwater considerations, and other considerations must also be met.

Figure 17 - Brick sidewalk pattern is continued over the driveway to establish pedestrian dominance.

Figure 18 - Continuous Sidewalk Design Establishes Pedestrian Space over Driveway

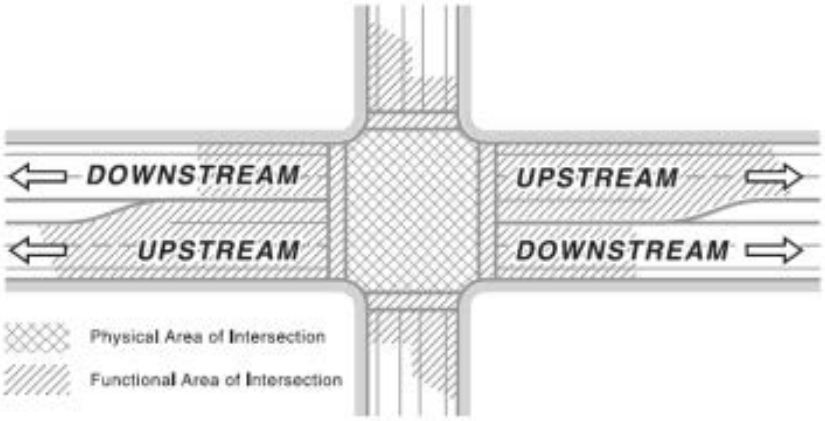
Figure 19 – Consolidated driveways increase safety for drivers and pedestrians



Access Management Standards

- Principal and Minor Arterial driveway spacing: minimum 125 feet
- Collector driveway spacing: minimum 90 feet
- Local Residential driveway spacing: one per parcel for new development
- Driveways shall be located outside the Functional Intersection Area at signals (area beyond physical intersection that includes decision and maneuvering distance), or in the alternative, may be restricted to right-in, right-out.

Figure 20 – Functional Intersection Area



- One driveway per commercial parcel with one additional access point per fronting street allowed if the property frontage is over ¼ mile in length and the site generates more than 100 PM peak hour departing trips.
- Commercial driveway approaches should be at least 75 feet from the point of curvature of a public road curb return on arterial streets and at least 30 feet for local access streets.

- For commercial driveways handling high volumes, a deceleration lane may be provided approaching the driveway, as justified by a traffic study or operational analysis. The driveway design must still maintain a tight turning radius to foster low speeds.
- Residential driveway approaches should not be closer than 15 feet from the point of curvature of a public road curb return on arterial streets and 10 feet for local access streets.
- Limit the Width of Driveways. Driveway width should be no more than 40% of the frontage (SMC 17H.010.220).
- Restrict Driveways near Bus Stops and Intersections. Do not place driveways within 100 feet of major intersections and 50 feet of other junctions, including bus stops, crosswalks, and small intersections.
- Shared driveways is a strategy to consolidate the number of access points along a block to reduce the number of potential conflict points between motorists and pedestrians. Driveways can be consolidated in instances where a single parcel has multiple access points, or where neighboring parcels may share parking resources. Driveway consolidation typically occurs during redevelopment as parcels and land use along a corridor change. Guidance for shared driveways for Single Family Residential Zoning development projects is found in the Infill Access and Utilities Standard.
- See additional access standards for Downtown Zones in SMC 17C.124.280 and Residential Zones in SMC 17C.110.535.

Standards for State Highways

Specific access standards apply for state highways within the City limits, which are classified as managed access facilities. Managed access is based on the premise that access rights of a property owner are subordinate to the public's right and interest in a safe and efficient highway system.

In accordance with Chapter 47.50 RCW, the City adopts by reference, the provisions of Chapter 468-52 WAC, together with all future amendments, in order to regulate and control vehicular access and connection points of ingress to and egress from, the State Highway System within the incorporated areas of the City of Spokane.

3.6-2 Street Connectivity

Connectivity refers to the density and directness of connections in path or road networks. Well-connected street networks have short links, frequent intersections, and minimal dead-ends or cul-de-sacs. High connectivity creates a more accessible and resilient transportation network, providing direct routes between destinations, multiple route options, and ultimately more capacity.

In designing streets, subdivisions, and retrofitting streets:

- The layout of new streets should consider future extensions of public roads and utilities into adjacent undeveloped parcels.
- Create blocks no longer than 660 feet in length. In urban settings (dense housing, centers and corridors, downtown, or commercial), strive to create short blocks that foster circulation.
- If topography, surrounding development patterns or other constraints make it impossible to meet the 660' block length, the City Engineer may approve a longer length if the total

perimeter of the block is less than 2000 feet. In these situations, pedestrian connections should still be provided at 660 feet or less.

- While rare; when opportunities arise (in the built environment) retrofit areas of the city with existing blocks longer than 660 feet in length with, at minimum, walking and bicycling connections. See Figure 21 for an example.
- When retrofitting areas of the city to create greater connectivity; utilities, emergency access, and maintenance access should be reviewed.

Figure 21 – Baymount Court connects through to Eagle Ridge Blvd for pedestrians and bicyclists.

3.6-3 Alleys

Alleys shall be constructed in accordance with SMC 17H.010.130 and the Standard Plans. All alleys shall have a minimum paved width of 12 feet with a 4-foot buffer strip on each side. The buffer strips may be paved, grassed, or graveled. The buffer strip may be used for utilities, but must be kept free of all vertical obstructions. Fences may not be placed in the buffer strip.

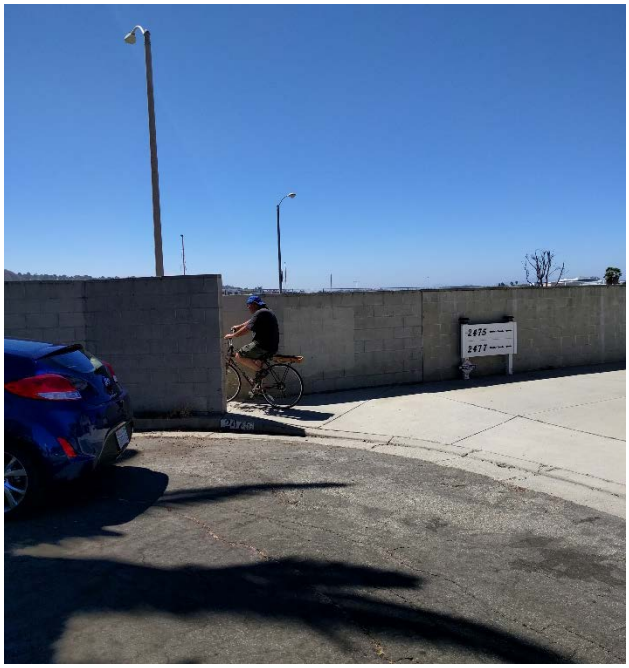
Preservation and reconstruction work will generally re-pave alley entrances to assure level matching of paving to the alley surfacing. When applicable, entrance design should coordinate with alley activation surfacing designs. Alley paving projects must comply with ADA standards where intersecting with sidewalks.

3.6-4 Turnarounds

Cul-de-sacs limit connectivity, lengthen emergency response time, and create a physical barrier between residents and trip generators. SMC 17H.010.080 restricts the construction of new cul-de-sacs unless specific conditions are met. Standard Plans W-114 and W-115 show design details of turnarounds.

In new developments, require a "stub-out" future roadway connection at the end of a street that will connect to future development. Connect existing turnarounds to any pedestrian and bicycle trails in the vicinity to close a gap in the walking and bicycling network.

Figure 22 - Example of bicycle and pedestrian connection from a dead-end street, providing additional connectivity.



If cul-de-sacs are provided, use the following types:

- **Standard Cul-de-sac**: The standard cul-de-sac is preferred for construction on local access dead end streets. The radius point of the bulb is on the street centerline. Install a stub-out at the end of the turnaround.
- **Offset Cul-de-sac**: An offset cul-de-sac has a radius point offset from the centerline, with one curb being tangent to the bulb curb. Like the standard cul-de-sac, it is intended for use on local access dead end streets.
- **Temporary Cul-de-sac**: A temporary cul-de-sac is similar to the standard cul-de-sac but allows for planned street continuation. Curbing is not installed in the temporary cul-de-sac, and the roadway dimensions resume at the terminus in preparation of further street construction (the terminus is suitably blocked to eliminate immediate access). When the street is extended, new curbs are constructed along the roadway tangent, extending from the end points of the original curbs and the excess asphalt is removed.
- **Hammerhead**: The hammerhead termination may be used on local access dead ends, but is primarily intended for use in dead end residential alleys. Construction of a hammerhead termination on local access streets is allowed only on approval of the City Engineer.

The following specific design criteria shall apply to the design of cul-de-sacs:

1. Cul-de-sac islands may be an option for any permanent cul-de-sac. The island area shall be finished in a manner approved by the City Engineer.

2. Minimum curb radius for the bulb shall be 50 feet plus the radius of a center island, if used.
3. Minimum right of way radius for the bulb section shall be 56 feet plus the radius of a center island, if used. If the sidewalk is to be located on an easement, the minimum right of way radius is 51 feet.
4. Unless otherwise approved by the City Engineer, cul-de-sacs shall be designed to "drain out" to the adjacent street to avoid flooding if the storm drainage system fails.
5. Cul-de-sac profiles shall be established to provide minimum 2% grades at all places along the gutter lines.
6. Provide a 14-foot wide connection (10-foot path plus 2-foot buffers) for pedestrians and bicyclists along fences separating two yards

3.6-5 Entrance Gates and Queuing Area

Proposed entrance gates may be allowed and designed in accordance with SMC 17H.010.100 and shall not interfere with emergency vehicle access. An adequate fire lane must be provided. If a center island is used, a minimum 14-foot wide lane between the face of curb and center island shall be provided. The center island shall not extend past the end of the gate when it is fully opened. In a case where there is no center island, the minimum road width is 20 feet. No parking on either side of the street will be allowed within 48 feet of the gate on both sides of the gate. The no parking zone shall be clearly signed on both sides of the gate. When fully opened, the gate shall not block access to structures or fire hydrants.

Gated streets require a queuing area to allow vehicles to exit the connecting street prior to the gate. The queuing area must be at least 48 feet long (measured from the intersecting curb line) to accommodate fire vehicles. Queuing areas longer than 150 feet will require a public turnaround designed to City Standards.

3.7 Vehicle Realm Geometrics

3.7-1 Bike Facilities

Bicycle facilities shall be employed where designated in the City's Comprehensive Plan and in the Master Bicycle Plan, and shall be designed in accordance with SMC 17H.010.260. Implementation of planned bicycle routes should be prioritized whenever reconstruction or preservation work is conducted, and new development should consider implementation of bicycle facilities to appropriately tie into the planned or existing network.

Side slopes adjacent to bikeways shall meet the requirements of Table 3. Minimum widths for bicycle facilities are shown in Table 1. Bicycle facility dimensions include the gutter pan.

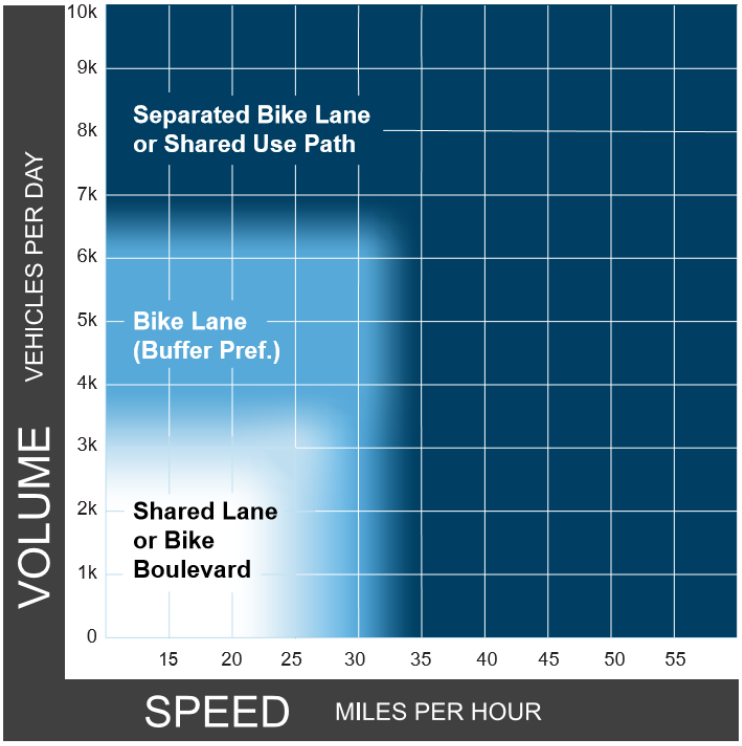
Consult the Bicycle Master Plan for design details on each bike facility type, and consider factors such as ADT, speed limit, and number of lanes when designing the bicycle facilities in accordance with the contextual guidance from FHWA shown in Figure 22 below.

Stress analysis research shows intersections are the toughest part to navigate, especially for people interested but concerned about cycling for transportation. Consult the MUTCD, NACTO Urban Bikeway Design Guide, AASHTO Guide for the Development of Bicycle Facilities, and FHWA Bikeway Selection Guide for corridor and intersection treatments.

Buffered bike lanes combine a single-direction bike lane with a buffer to provide a comfortable facility for users. The overall dimension should not be less than 6 feet without a buffer, or less than 7 feet including a buffer. This wider dimension accounts for curb-side obstructions or parked vehicle door dangers. Design should use a parallel line buffer design rather than cross-hatching to minimize the maintenance expense, although short lengths of cross-hatching may be used near conflict zones (intersections or driveways) to better communicate the purpose of the parallel lines as bike lane markings. Vertical elements may be introduced into the bike lane buffer. Planters may be used in downtown and other lower speed areas if they follow the guidelines in the Horizontal Clear Zone section. Reflective plastic bollards may be appropriate elsewhere.

Two-way bike lanes (on the same side of the road) are not addressed in Figure 1. If used they should be a minimum width of 8', although 10' is preferred, with a 2' minimum buffer.

Figure 23 – FHWA Bikeway Guide



Notes

1 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.

2 Advisory bike lanes may be an option where traffic volume is <3K ADT.

Neighborhood Greenways (aka Bike Boulevard) are residential bikeways that prioritize bicycle and pedestrian travel over vehicle through-put. Several tools may be employed to create a greenway. Generally a greenway will be sited on a residential street paralleling a nearby arterial street. Thus connections to destinations along the arterial are readily accessed, though the stress experienced by the walker or biker are much lower. Prioritizing pedestrian and bicycle traffic is achieved by providing appropriate facilities for these modes of travel and by calming or reducing vehicle traffic flows. Greenways are commonly attributed with slow speed, minimum stop signs, and protected crossings of arterial streets.

Some greenway tools include signing and intersection treatments. Signage should be used to highlight the designated greenway, and should also provide distance-based wayfinding to community destinations for bicycle and walking traffic. Intersection treatments are particularly important to the success of a greenway. Intersections with arterial streets need to provide safe and functional crossing methods for bicycle and pedestrian traffic. Intersection treatments might also be used to dissuade vehicle traffic from the greenway. This can be done through limiting turn movements onto the corridor from more busy streets or even by diverting traffic off of the corridor at lower volume intersections. It is important that these treatments are used only on designated greenway corridors, as the impact to neighborhood traffic patterns can be significant.

Figure 24 – Neighborhood Greenway Sign

Shared-Use Pathways are typically off-street facilities designed for all non-motorized users. A minimum width of 12 feet is commonly used, although wider sections may be desirable to accommodate high volumes or utility access. Guidelines for shared-use pathways next to roadways are discussed in Section 3.5-4.

Green paint should be used only in high conflict areas. Examples of high conflict areas include marking a bike lane through an intersection where there are heavy conflicting right turn movements, marking a contra-flow bike lane through an intersection, or marking the entrance to a right-turn only lane where vehicles must cross the bike lane. Green paint can also be used to connect corridors that are otherwise unclear, when introducing bicycle facilities newly to a corridor, to aid in wayfinding or in places where vehicles are found to encroach on the bicycle facility.

Bicycle detours must be planned and implemented whenever work interrupts a bicycle lane. Temporary shared-use lanes may be used, if traffic volumes are acceptable. When traffic volumes are high, bicycle detours should guide cyclists on routes and temporary facilities with relatively similar safety conditions as the route being detoured from.

3.7-2 Profile Grades

The maximum profile grade for all streets, alleys, and pathways is 8%. A variance may be granted by the City Engineer considering topography, safety, maintainability, function, and emergency vehicle access. The minimum profile grade for all streets, alleys, and pathways is 0.8%. Cul-de-sac profiles shall be established per section 3.7-3. The profile grade at all residential intersections, along minor roadways at arterials, and for all roadways at controlled intersections shall be no greater than 3% at any point within 100 feet of the near end of the curb radius on minor roadways.

Preservation work need not correct profile grade issues, except as possible to eliminate minor inconsistencies. Reconstruction projects should address needed profile improvements.

3.7-3 Horizontal Curves

Horizontal curves are to be determined in accordance with normal civil engineering procedures, considering design speeds, sight distances, roadway crown, building proximity, and vertical grades. For arterial streets with speeds of 30 mph or higher, A 100-foot horizontal curve radius

shall be considered the minimum unless otherwise authorized by the City Engineer. The maximum superelevation on horizontal curves shall be 2%. The minimum horizontal curve radii shall be determined per AASHTO Design for Low Speed Urban Streets, based on design speed, which shall be the posted speed limit, and considering the roadway crown. Pavement widening on horizontal curves to accommodate large vehicles shall be considered per AASHTO Chapter III - Elements of Design, Table III-23.

Preservation work need not correct horizontal curvature issues, except as possible to eliminate minor inconsistencies when the roadway is not bounded by curbing. Reconstruction projects should address needed horizontal curvature improvements within a reasonable effort and cost.

3.7-4 Vertical Curves

Refer to Table 2 for sag and crest vertical curve design criteria. Vertical curves must provide adequate stopping sight distance as defined in the 2011 AASHTO "A Policy on Geometric Design of Highways and Streets".

Preservation work need not correct vertical curvature issues. Reconstruction projects should address needed vertical curvature improvements, as possible while matching adjacent buildings and driveway grades.

3.7-5 Roadway Side Slopes

Roadway side slopes shall meet the requirements of Table 3; special sloping may be required to meet minimum sight distances.

Preservation work need not correct side slope issues. Reconstruction projects should address needed improvements, particularly where safety has proven to be compromised due to obstructions to sight distance.

3.7-6 Design Speed

Street design sets the context for driver response. Historic design practices have used 85th percentile observed speeds or have established design speed higher than the posted speed. In particular, design speed is used during design of horizontal curves. Because design speed is one of the factors in determining street context, it should be established as the posted or target speed. This practice will avoid "speed creep", which can occur when streets are built to operate at higher speeds than posted and the next design period resets with a speed study revealing the 85th percentile has increased. Streets designed for the target operating speed have proven to have greater user compliance, and are thus safer for all users.

Table 4 – Target speeds by street type

	RESIDENTIAL, INDUSTRIAL, CB AND GC				CC, DOWNTOWN, FORM BASED CODE			
Street Type	Principal Arterial	Minor Arterial	Collector	Local	Principal Arterial	Minor Arterial	Collector	Local
Design Speed = Posted Speed = Target Speed (mph)	30-35	30-35	30	25	20-30	20-30	20-30	20-25

3.7-7 Vertical Clearances

The clearance above any street surface shall be as provided in SMC 17H.010.240 and SMC 12.02.0462.

Preservation projects must coordinate with Urban Forestry to ensure the tree canopy is in compliance. Reconstruction projects must similarly ensure the tree canopy is in compliance, and should consider opportunities to improve upon other hazards or obstructions.

3.7-8 Horizontal Clear Zones

This section is intended to replace the former City of Spokane clear zone policy ADMIN 0370-08-04. Clear zones are unobstructed, traversable areas that extend beyond the curb-to-curb dimensions of the traveled street. Clear zones allow for loss of control and other erratic driving behavior. Commonly found fixed objects in the right-of-way include: trees with a diameter of 4 inches or more (measured at 6" above ground surface), wooden poles or posts greater than 16 square inches in cross-section (without breakaway features), bridge piers, retaining walls, landscaping walls, some types of fences, signal poles, signal/lighting/ITS cabinets, culvert ends, utility poles and luminaire poles.

Generally, clear zones can be reduced in urban areas since wide unobstructed sidewalk and/or shoulders lining the roadway encourage higher-speed driver behavior. The presence of street trees and other roadside features tend to decrease overall speeds, increasing safety for all users and more comfort for people walking and biking. The City of Spokane Comprehensive Plan promotes a sense of place, encourages the installation of street trees in the planting/pedestrian buffer strips, and encourages other urban amenities along and adjacent to roadways such as planters, bollards, benches, light fixtures, kiosks, clocks and transit shelters.

The City of Spokane is granted jurisdiction over clear zones along City streets and managed access State highways within the City per RCW 47.24.020(2). Along managed access State highways this authority applies only beyond the curb, or if no curbs, beyond the portion of the roadway used for highway purposes. Between the curbs (median areas) the Washington State Department of Transportation (WSDOT) has jurisdiction over clear zone. WSDOT has full authority over clear zones inside and outside curbs along State limited access facilities within the City.

Table 5 – Minimum Clear Zone (distance from edge of traveled way)

	Posted Speed 20-35mph		Posted Speed 40 or above	
	Existing Fixed Objects[2,3]	New Fixed Object [2]	Existing Fixed Objects[2,3]	New Fixed Object [2]
State Highways	WSDOT[1]	WSDOT[1]	WSDOT[1]	WSDOT[1]
New street construction	n/a	4	n/a	10
Street reconstruction including width or profile adjustments	1.5	4	6	10[1]
Street reconstruction not including width or profile adjustments	1.5	4	6	10[1]
New installations not related to street construction	n/a	4	n/a	10[1]

[1] If 10 feet clear distance cannot be provided within the available right-of-way, the design engineer may evaluate and justify placement as near the outer edge of the right-of-way as practical.

[2] On a curbed street all fixed objects shall be at least 1.5 behind curb regardless of the location of the travelled way. This is to ensure clearance for parked vehicle doors, snow removal, sign overhang, etc.

[3] Fixed objects / trees with less than 1.5 feet clearance should be considered for removal or relocation. If clearance is between 1.0 and 1.5 feet existing fixed objects including trees may remain unless damage indicates a history of vehicle collision, the object or tree conflicts with the condition or operation of a street, alley or sidewalk, or removal/relocation is required due to other public safety, convenience or aesthetic considerations.

When indicated by Table 5, rigid objects within the clear zone should be removed or not installed, relocated to a position outside the minimum clear zone, remodeled to make traversable, breakaway, or shielded.

- A larger clear zone on the outside of horizontal curves is desirable. On streets with on-street parking, bike lanes, or on streets without curb the clear zone is measured from the edge of traveled way.
- Signals, cabinets, illumination poles, parking meters and ITS equipment are exempt from the policy, although desired placement is at least 1.5 feet from the face of curb.
- Traffic control signs, fire hydrants and residential mailboxes may be placed in the clear zone if on a breakaway fixture or a frangible design.
- Planter boxes, benches, bike racks, transit shelters, bollards, utility standpipe vents clocks, trash cans, fencing for sidewalk cafes, kiosks, security barriers, mail drop boxes, tree guard and other street furniture typically used in the downtown and centers and corridors are exempt from the policy, although desired placement is at least 1.5 feet from the face of curb.
- Any planter boxes placed in the street as traffic calming or delineation devices should be of a frangible design or pinned in place. Height including sight blocking vegetation shall not exceed 36 inches.
- Within medians the clear zone should be 1.5 feet along straight sections, and 3 feet near intersections where the median is near the alignment of turning movements.
- The width of on-street parking and bike lanes can be included in the measurement of clear zone distance.
- In areas where sidewalk does not exist, the future location of sidewalk shall be evaluated. Existing buildings or other property improvements may make it prohibitive to provide separated sidewalk with planting or pedestrian buffer strips in the future. If it is determined that future sidewalk will necessitate installation adjacent to curb, the distance behind curb shall be increased to allow installation of the proper width sidewalk without obstructions.
- Attainment of these clear zone values does not relieve the Design Engineer of the responsibility to evaluate sight distances in accordance with applicable design standards.
- A three foot clearance to roadside objects should be provided near turning radii at intersections and driveways to prevent a truck overhang from striking an object.

3.7-9 Roadway Drainage

Stormwater collected within the roadway must be effectively routed to drainage facilities, such that flow accumulations and pooling are minimized, or otherwise efficiently dissipated. Minimum roadway profile grades are shown in Table 6. Standard Plan W-101 provides a chart for selecting a roadway crown section based on roadway width and curb height differential. Refer to the City's Standard Plans for cross-section and staking data. For vertical curves, the designer's attention is called to the limiting K-value factors shown in the Table 2 footnotes.

Generally, no more than three lanes should be sloped in any one direction. On wide streets, a quarter-crown or center-crown cross-section is recommended, or the designer may consider stormwater collection at the median.

Refer to Section 3.4-5 herein for stormwater disposal methods and design requirements. New development and re-development treatment requirements are addressed in the stormwater design guidelines.

3.7-10 Through Traffic Lanes

Refer to Table 1 for traffic lane design width guidelines.

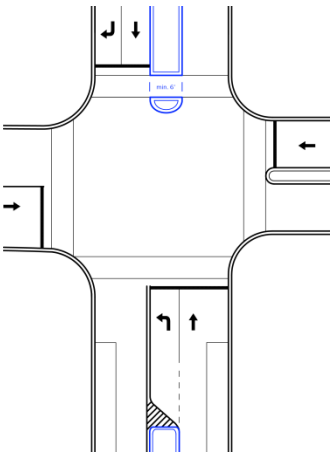
Reconstruction and preservation work shall incorporate markings for all users of the street as determined within this standard for planned pedestrian, bicycle, and vehicular facilities.

3.7-11 Exclusive Turn Lanes

Left and right dedicated turn lanes widen the intersection, often require adding another signal phase, and may lengthen the overall delay for users. Dedicated turn lanes should be used only when specifically determined by an engineering analysis to solve congestion issues. The engineering analysis should consider the impact not only on the target intersection, but also the surrounding street network. Refer to appropriate MUTCD guidelines for design and application of dedicated turn lanes.

In connected networks, left turns can be restricted at periodic intersections to avoid having long exposed pedestrian crossings at every intersection.

Figure 25 – Pedestrian refuge at left turn lane pocket



Preservation work need not incorporate roadway reconfiguration projects, unless planned as a follow-up to reconstruction work that conducts such changes, and thus would otherwise leave pavement patching.

3.7-12 Tapers

The standard taper length for narrowing or offsetting of a lane shall be based on the design speed, per the U.S. Department of Transportation Manual on Uniform Traffic Control Devices (MUTCD).

3.7-13 Survey Monuments

At a minimum, monumentation shall be provided in the following locations:

a) At center of each cul-de-sac

b) At point of curvature on all horizontal curves

c) At point of tangency on all horizontal curves

d) On the roadway centerline at the end of every plat.

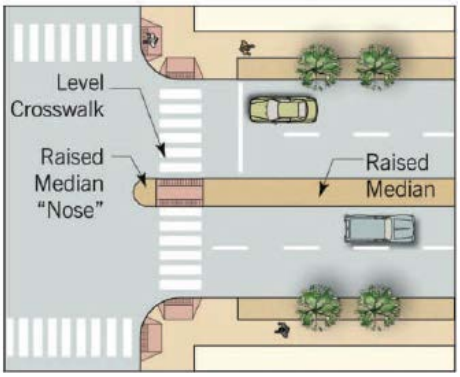
Monument pins with cases shall be installed at these locations in accordance with the City's Standard Plans.

These specifications apply to all preservation and reconstruction work.

3.8 Median Realm

Build medians in accordance with Table 1 on new streets. In retrofit situations, vehicle lanes could be narrowed to add pedestrian refuge islands or medians at unsignalized marked crosswalks on principal or minor arterials in dense zoning[4]. Pedestrian refuge islands should be considered for wider street crossings. A minimum of 6 feet is required for a pedestrian refuge median (8 feet is optimal). However, in retrofit situations a narrow pass-through may be more desirable than no island at all. A narrow median pass-through can provide a place for crosswalk warning signage and also work to reduce vehicular speeds by visually narrowing the roadway. When crosswalks go through a median, protect the crosswalk users with a raised median nose. The end of the median must be marked with a vertical marker for snow plow delineation.

Figure 26 - Protecting crossings with a median tip provides safety from turning traffic



Some transit routes may find it beneficial to place bus stops in the median. This is type of setup requires left-side boarding doors on the bus and crosswalks to reach the median. The City Line route, opening in 2021, has designed several median stops.

Speeds can be reduced at neighborhood entry points by installing a short median. This treatment provides a cue to drivers that they are leaving an arterial street and entering a local street. See Figure 28.

Medians, where constructed, shall not exceed 600 feet in length without a break that allows emergency vehicles to cross through the median and continue in the same direction (S-Turn movement). See SMC 17H.010.140 requirements on emergency vehicles access and staging areas on local streets. The break in the median does not need to allow for U-turn movements. Consider the space required for turning movements when installing in tandem with bulbouts.

[4] Per crosswalk ordinance https://static.spokanecity.org/documents/projects/crosswalkordinance/adopted-crosswalk-ord-c35141.pdf

Figure 27 – Neighborhood entry median.

Medians may be combined with on-street parking, bulb-outs or chicanes provided that fire staging areas are provided periodically. These designs must be closely coordinated with the fire department to ensure adequate access to hydrants and structures. Staging areas must not be used for snow storage and must be clearly marked to restrict parking. Hydrants should be located at the staging areas which improves fire access and helps to enforce the parking restriction. Hydrants could also be located in the median, allowing better access and limiting the possibility of blockage by parked cars. Prior to approving hydrants in the median, the method for snowplowing this area and keeping the hydrant clear must be discussed with Streets. Median landscaping should consider the height of adjacent buildings and the need for aerial equipment. Neighborhoods developed with this pattern should also provide a grid network to allow for alternative routes during emergency events.

Figure 28 – Summit Parkway with medians, bulb-outs and fire staging areas.

Preservation work need not adjust nor replace medians. Reconstruction projects should consider the space used by the median, and the utility of that space to be maintained as median or other uses. Pavement and median condition should be considered as possible replacement items during scoping of capital work.

3.9 Neighborhood Traffic Calming

Traffic calming increases safety through vertical and horizontal traffic slowing measures, and by reducing traffic in residential neighborhood areas. Install traffic calming strategically to protect vulnerable users, reduce speeds in areas exhibiting safety concerns, and as part of the city's Neighborhood Traffic Calming Program. Tools include:

- Horizontal measures – Chicanes, intersection and midblock curb extensions, traffic circles
- Vertical measures – Raised crosswalks, tabletop intersections, installation of sidewalks.
- Traffic reduction – Diverters, medians with walking and bicycling cut-throughs

A formal neighborhood traffic calming program is presently administered by the City through Neighborhood Services. Included in the program is a "Traffic Calming Toolbox", outlining the basic options for solving concerns within any given neighborhood. This toolbox, although not exhaustive, is a reference for optional traffic calming elements within capital or development projects. The NACTO Urban Street Design Guide is also a good reference for traffic calming design. When considering traffic reduction measures, consideration should be given to where traffic will reroute to.

Implementation of traffic calming is required only for approved applications. New developments may include traffic calming measures as appropriate, per SMC 17H.010.160. Preservation and reconstruction projects will install traffic calming elements as programmed.

3.10 Pavement Design

3.10-1 Asphalt Binder Selection

All Hot Mix Asphalt binder and aggregates used in the traveled way shall conform with WSDOT specifications, and meet the requirements for durability and performance.

These specifications apply to all rehabilitation maintenance and capital work.

3.10-2 Pavement Section Thickness

The minimum asphalt thickness shall be in accordance with Standard Plan W-101A. As noted in W-101A, the City Engineer may require a pavement design for local access (residential or commercial) streets. This will be evaluated on a case-by-case basis. All arterials require a pavement design, which shall be approved by the City Engineer. A rational pavement design for either arterials or residential streets must contain the following:

1. Traffic Loading – an estimate of the number and types of loadings that roadway will carry for the design life. This estimate of loading must be established by a procedure accepted by the City Engineer and be expressed in 18-Kip Equivalent Single Axle Loads (ESAL's).

2. Subgrade Support—a representative value for the stiffness of the native material on which the road will be built. This value will be established by a procedure accepted by the City Engineer and be expressed as resilient modulus (MR). When determining MR, soil sampling is to include:

a) Obtaining a sufficient number of soil samples which adequately represents the subgrade MR, and where significant changes in MR occur;

b) Constructing a soil log to a minimum of five foot depth below proposed subgrade and classify the soil per USC; and

c) Recording the location of where the samples were obtained, normally by station and offset. This record shall be provided to Engineering Services.

3. Analysis- a procedure for establishing the surfacing depth requirements for a given traffic loading and subgrade resilient modulus. The City Engineer must approve this procedure. The following procedure is pre-approved: Guide for Design of Pavement Structures (26), 1994 the American Association of State Highway and Transportation Officials (AASHTO).

The pavement design life is 20 years for new construction and 15 years for pavement overlays. The structural pavement calculations, soil sample locations, lab results, design criteria and recommendations are to be included in a report prepared by the sponsor's engineer. All design factors used are to be listed in the report, including traffic loads projected to occur over the life of the pavement. The report is to be stamped by an engineer, licensed in the State of Washington.

These specifications apply to all preservation and reconstruction work.

3.10-3 Pavement Patching

The City of Spokane adopted the Spokane Regional Pavement Cut Policy in 2005. The adoption resolution is included in Appendix F. This pavement cut policy is updated on a regular basis through coordination with Avista and other local agencies in the Spokane area. All pavement cuts for utility work and patches shall be designed and constructed in accordance with the latest version of this policy.

These specifications apply to all preservation and reconstruction work.

3.11 Intersections

Intersections represent the most complex pieces of the network. They are the place at which multiple modes meet and need to pass safely through. Keeping intersections compact increases eye contact between users, and making them legible or intuitive means each user knows where he or she belongs. Follow these principles of intersection design:

- Make intersections as compact as possible
- Identify utility maintenance access in design considerations
- Analyze intersections as part of a network, not in isolation
- Design intersections as shared spaces
- Integrate space and time; for example adjust signalization timing to improve flow on a corridor

The maximum centerline distance between intersections shall be 660 feet. The minimum recommended centerline distance is 150 feet, or 300 feet for signalized intersections. In general, intersections should be at right angles. The minimum acute intersecting angle for streets shall be 70-degrees. For stop sign-controlled streets the 70-degree (tangent) portion shall extend along the controlled street a minimum of 30 feet from the end of the curb radius. For all cases, the effects of sight distance shall be considered.

Preservation projects may implement adjustments to striping patterns, but will not be expected to adjust curb placement except as necessary for ADA compliance measures. Intersection design

principles should be reconsidered for reconstruction projects. This is particularly important if there are high incidents of collision, but may also be important if the use patterns have evolved since the original construction; i.e. a new industrial area has developed.

3.11-1 Design Vehicle

Streets should be designed to serve the most vulnerable user. Designing streets for the largest possible vehicle results in streets with oversized intersections and large turning radii. The result is higher operating speeds for the most frequent vehicles on the street – passenger cars. Use both design vehicles and accommodated vehicles for intersection design. Each intersection is unique, and designing for the largest most frequent vehicle (comprising 10% or more of Average Daily Traffic) allows for better –controlled turning speeds on streets and at intersections. Follow these guidelines for selecting design and accommodated vehicles:

- **Establish a *design vehicle***. The selected design vehicle should be the largest vehicle that accounts for at least 10% of a street's average daily traffic. Selection of the design vehicle should consider the make-up and expectation for traffic flowing through a given intersection. The design vehicle will dictate the minimum turn radius.
- **Establish an *accommodated vehicle* for infrequent users.** The accommodated vehicle is the largest expected vehicle. Use curb and turning radii that allows the accommodated vehicle to use the full street for turns, including parking lanes, bikeways, and adjacent lanes. Consider medians and curb lines as barriers. Restrict parking near intersections and employ recessed stop lines if needed.

  Figure 29 – Infrequent accommodated vehicle can encroach into opposing lane

The use of design and accommodated vehicles during design allows more flexibility to adjust designs in favor of pedestrian or bicycle traffic (the most vulnerable users). The following points illustrate options to consider space requirements with this greater latitude.

- Consider the use of tools such as **staggered (offset) stop lines** (where opposing queue storage is adequate) to accommodate vehicles before electing to widen intersection curb alignments.

Figure 30 – Recessed stop bar used where bus must turn right frequently

- The largest frequent user (candidate design vehicle) of most local streets is a 30-foot delivery truck (SU-30). SU-30 vehicles have similar width and wheelbase to a school bus.
- If designing a segment of a designated emergency response route, use appropriate fire apparatus as the accommodated vehicle. In some instances, truck selection might be determined by the fire trucks expected to use the route based on proximity to nearest fire stations.

Table 7 summarizes likely design and accommodated vehicles by context and street type.

Table 7 - Minimum Design Vehicle Standards

	RESIDENTIAL, INDUSTRIAL[1], CB AND GC		CC, DOWNTOWN, FORM BASED CODE	
Street Type	Arterials[2]	Local	Arterials[2]	Local
Design Vehicle (10% or more of ADT)	WB-40	SU-30	SU-30 & STA 40' bus	SU-30
Control Vehicle (Infrequent Largest User)	WB-62	WB-62	Ladder truck	Ladder truck

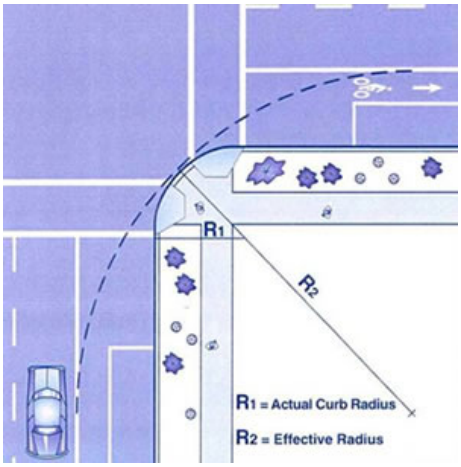
[1] Urban streets zoned for industrial uses may require larger design and control vehicles.

[2] Intersections of arterials with a local street should use the local street design vehicle unless nearby land uses dictate the need to accommodate a larger vehicle.

3.11-2 Curb Radius

Curb radii influence driver behavior—positively and negatively—affecting turning speeds and the safety of all users. Minimize curb radius based upon the design and accommodated vehicle. Calculate both the actual radius – the radius of the curb itself- and the effective radius, or the wheel track of vehicles. For example, at intersections with on street parking and no curb extensions, the effective radius is much higher than the actual radius. In all cases, consider the widths of the approach and receiving lanes, as crowding may cause poor driver response.

Figure 31 – Actual vs. Effective Radius



Source: saferoutesinfo.org

Retrofit existing curbs with curb extensions to reduce actual and effective turning radius. Consider curb extensions whenever on-street parking is present. However, consideration for stormwater flow-lines must be incorporated into design and retrofits.

Curb radius determines turning speed. Use corner radius to keep turning speeds low while allowing the design vehicle to turn.

Table 8 – Intersection Curb radius and speed

	RESIDENTIAL, INDUSTRIAL, CB AND GC	CC, DOWNTOWN, FORM BASED CODE
Actual Radius	20 feet minimum	10 feet minimum
Effective Radius	25 feet minimum	20 feet minimum
Turning Speed[1]	10-15 mph	10 mph

[1] For right turn movements. Left turns will typically be 5 mph faster.

3.11-3 Bus Bulbs at Intersections

For bus bulbs at intersections, a bulb for a single bus measures 30' long, allowing both doors to open on the bulb, and measures 6-8' wide. On heavy ridership routes where more than one articulated bus platforms several times per day, the bulb measures up to 140' in length. The return angle will be 45 degrees. If the route requires buses to turn right after stopping at a bulb, ensure actual and effective radius meets appropriate bus turning templates.

3.11-4 Clear Sight Triangle

For design purposes the clear horizontal sight distance triangle at intersections shall be as described in AASHTO "A Policy on Geometric Design of Highways and Streets", Chapter 9, section on Sight Distance.

For vegetation enforcement purposes, use the clear view triangle shown in SMC 17A.020.030.

3.11-5 Roundabouts

Roundabouts will be reviewed in every case and shall be designed in accordance with WSDOT's design standards. Roundabouts are intended for arterials and collectors. Roundabouts can ease congestion and improve safety at skewed or five-leg intersections.

Typically, roundabouts are larger scale facilities, as they are intended for use along arterials and collectors as previously noted. They facilitate traffic flow without the need for signalization. Roundabouts generally reduce the number of conflict points for vehicles in the intersection and reduce the severity of collisions between vehicles. Design is critical to facilitate safe travel for bicyclists or pedestrians to limit conflicts at the legs of the intersection, as well as to provide needed information for pedestrian alignment and crossing. While vehicle safety is generally improved, improper design can degrade safety for bicycle and pedestrian travel.

Compact urban roundabouts may also be used at city intersections. They have a smaller footprint with and use a completely mountable center island. In many cases existing curb or sidewalk can be left in place.

Preservation work will generally be applied to roundabout pavement surfaces, but implementation of these facilities would qualify as reconstruction.

3.12 Signing and Pavement Markings

3.12-1 Traffic Control Signs

All existing and proposed official traffic control signs required by MUTCD as part of street design shall be shown on the plans, and shall be subject to review and approval by the City Engineer. The plans shall include all existing and proposed signs, show the full width of the street, include any signs on the opposite side of the street, and show existing conditions beyond the proposed development. Prior to construction, shop drawings for all new street signs shall be submitted to Street Maintenance - Signs and Markers for approval.

Preservation and reconstruction work should update signage as appropriate.

Warning and regulatory signs provide motorists with critical information and need to be visible in order to be effective. Provide minimum sight distances according to Table 3-1 in the 2011 AASHTO "A Policy on Geometric Design of Highways and Streets".

3.12-2 Pavement Markings

Design plans for pavement markings shall be approved by the City Engineer prior to construction. Plans shall include all existing and proposed striping, show the full width of the street, and show existing conditions beyond the proposed development. Any existing markings that are to be removed shall be clearly designated.

Preservation and reconstruction work shall incorporate markings for all users of the street as determined within this standard for planned pedestrian, bicycle, and vehicular facilities.

Plastic is the preferred material for pavement markings on Principal and Minor Arterials. Stop lines, crosswalk lines, wide lines (gore stripe), dotted wide lines, dotted bicycle lines, dotted extension lines, arrows, words and symbols shall be preformed thermoplastic. Other lines may be paint with thermoplastic dots according to the City of Spokane Standard Plans.

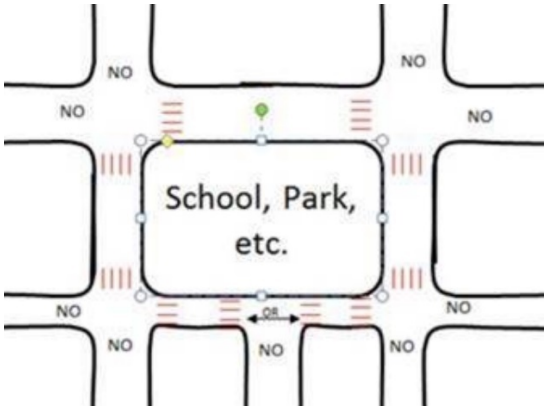
3.12-3 Crosswalks

Facilitate safe pedestrian crossings along centers and corridors, and near pedestrian generators. The crosswalk standards are outlined in SMC 17H.010.210 and SMC 17H.010.215. In general these sections of code require the following:

- **Placement**. Provide marked crosswalks along centers and corridors and near schools, parks, hospitals, churches, trail crossings, and other significant pedestrian generating facilities.
- **Design**. In the Downtown, Commercial, Centers and Corridors, and Form Based Code zones, a minimum 6-foot pedestrian refuge at unsignalized crosswalk locations is encouraged where the total crossing is 3 or more automotive lanes.
- **Striping.** Refer to City of Spokane Standard Plans.
- **Stop bar.** Refer to City of Spokane Standard Plans.
- **RRFBs/PHBs**. Install pedestrian-activated tools such as Rectangular Rapid-Flash Pedestrian Beacons and Pedestrian Hybrid Beacons in locations that serve pedestrian generators as ascribed by engineering analysis and approved by the City Engineer. The MUTCD and FHWA-SA-18-018 shall be used as a reference for determining the appropriate crosswalk treatment.

The following exhibit is intended to provide clarification on crosswalk placement based on SMC 17H.010.210.

Figure 32 – Crosswalk placement near schools and parks



3.13 Traffic Signals and Intelligent Transportation Systems

3.13-1 Traffic Signal Design

Street traffic signals shall be designed with direct coordination and review by the City Street Department. Preservation and reconstruction work should consider traffic signal updates and replacements as appropriate.

- In downtown, use signal progression to promote smooth progression of vehicular traffic at or below the posted speed in an effort to reduce congestion. Work to reduce signal delay on heavily used bike routes.

- Use of Pedestrian Recall is addressed in SMC 16A.84.040.
- In urban areas with heavy pedestrian traffic, consider the use of Leading Pedestrian Intervals (LPI). LPIs add a few seconds of time for pedestrians to establish themselves in the crosswalk before the vehicle signal turns green, enforcing that turning traffic yield to pedestrians. If LPI is used without Accessible Pedestrian Signals the walk interval may need to be increased to aid sight impaired pedestrians who listen for the parallel traffic movement to know when to walk. LPI is addressed in SMC 16A.84.
- Signalized intersections should be re-timed approximately every five years to reduce both air pollution and delay.
- At rehabilitated or new signals, retrofit with Accessible Pedestrian Signals. Prioritize APS installations near concentrations of vulnerable populations, such as near senior centers or hospitals. Intersection APS retrofits are addressed in SMC 16A.84.060.
- Signal interconnection of traffic signals to the Central City Signal Server via fiber optic or copper Ethernet for progressing traffic through an area. New signal and pedestrian hybrid beacon installations should include interconnect infrastructure.

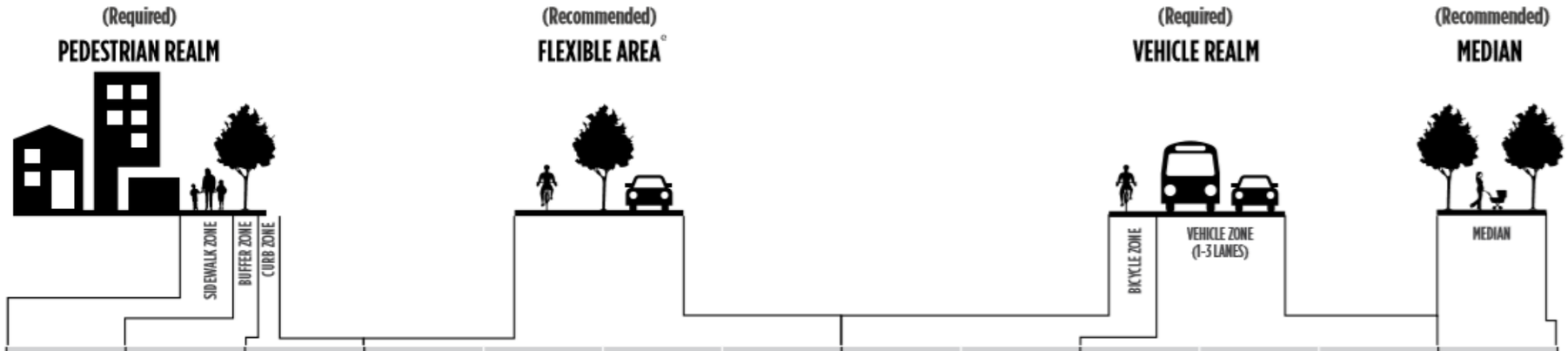
3.13-2 Intelligent Transportation Systems

The City of Spokane uses several types of Intelligent Transportation Systems (ITS) throughout the City to help monitor and manage traffic flow.

- PTZ cameras provide live video feeds to the regional traffic management center and are used by city staff to monitor traffic conditions, adjust signal timing, and perform studies. Additional fixed cameras provide telemetry at several intersections throughout the City.
- Permanent count stations are located throughout the City. These provide count information throughout the year.
- Over 95% of the City's traffic signals communicate with a central server via Ethernet over copper or fiber. Remote access is also available to all City owned PTZ, fixed cameras and dynamic message signs.
- Dynamic Message Signs have been installed in key arterial locations within the city to display messages related to traffic control and safety.
- Flashing school beacons have been installed at most of the schools in the city limits to provide real-time information to drivers on the times the 20 mph speed limit is in effect.
- Speed feedback signs have been installed through the traffic calming program. Some models can provide count and speed data.
- Bike and pedestrian count stations are installed on select regional trails within the city and provide time of day, weekday vs. weekend and season count data for use in planning.
- Remote Weather Information System (RWIS) units provide information on air temperature, humidity, dew point and road surface temperature. One is currently installed on the south hill.
- Bluetooth/WiFi readers are used to monitor corridor travel times on Maple/Ash, Division, Freya/Greene/Market, and US 2 in cooperation with the Spokane Regional Traffic Management Center.

3.14 Reference Tables

Table 1 **Street Dimensions**



	Sidewalk Zone[b]	Buffer Zone[c,d]	Curb Zone	Opt. Shared Use Path[f,g]	Stormwater Management[h]	Curb Extensions/ Bus Bulbs[i]	Parking	Bicycle Lane[g]	Bicycle Buffer[j]	Vehicle Zone Outer Lane[k,l]	Vehicle Zone Inner Lane[k]	Vehicle Zone Left Turn or TWLTL	Median[m]
	Downtown DTC, DTG, DTU, DTS; Form Based Code CA1, CA2, CA3, CA4								**Center & Corridor CC1, CC2, CC3, CC4**				
Urban Principal Arterial	7	5	0.5	12	Varies	7	8	6	1.5-6'	11	11	11	6-20
Urban Minor Arterial	7	5	0.5	12	Varies	7	8	6	1.5-6'	11	11	11	6-20
Urban Major/Minor Collector	7	5	0.5	12	Varies	7	8	6	1.5-6'	11	11	10	6-20
Urban Local Access	7	5	0.5	12	Varies	NA	7	6	NA	10	NA	NA	6-20
	Commercial O, OR, NR, NMU, CB, GC												
Urban Principal Arterial	7	5	0.5	12	10	7	8	6	1.5-6'	11	11	11	6-20
Urban Minor Arterial	7	5	0.5	12	10	7	8	6	1.5-6'	11	11	11	6-20
Urban Major/Minor Collector	7	5	0.5	12	10	7	8	6	1.5-6'	11	11	10	6-20
Urban Local Access	7	5	0.5	12	6.5	NA	7	6	NA	10	NA	NA	6-20
	Residential RA, RSF, RSF-C, RTF, RMF, RHD												
Urban Principal Arterial	5	6	0.5	12	10	NA	8	6	1.5-6'	11	11	10	6-20
Urban Minor Arterial	5	6	0.5	12	10	NA	8	6	1.5-6'	11	11	10	6-20
Urban Major/Minor Collector	5	6	0.5	12	10	NA	8	6	1.5-6'	11	11	10	6-20
Urban Local Access	5	6	0.5	12	6.5	NA	7	6	NA	10	NA	NA	6-20
	Industrial LI, HI, PI												
Urban Principal Arterial	5	6	0.5	12	10	NA	NA	6	3	12	12	12	6-20
Urban Minor Arterial	5	6	0.5	12	10	NA	8	6	3	12	12	12	6-20
Urban Major/Minor Collector	5	6	0.5	12	10	NA	8	6	1.5-6'	12	12	12	6-20
Urban Local Access	5	6	0.5	12	6.5	NA	7	6	NA	11	NA	NA	6-20

A. Table 1 dimensions are target values and minor adjustments are allowed to fit the street context. See discussion in section 3.2-2 for further detail.

B. See SMC 17H.010 for exceptions to residential sidewalk requirements. In locations where existing sidewalks exceed the dimension in Table 1, the sidewalk width should be maintained with redevelopment or street improvement

C. Per SMC 17C.200.050-1, a tree-planted continuous buffer requires a 5-foot minimum width for commercial zones. For residential and industrial zones, the minimum increases to 6 feet. Alternatively, a narrower buffer may be used in select zones if tree vaults are implemented.

D. Buffers in commercial areas may be planted or concrete. When stormwater disposal is a governing concern, consideration should be given to use pervious surfaces.

E. The flexible area includes a menu of options which are chosen based on what makes most sense according to city plans, environmental responsibilities, and context. In some cases, none of these will fit within the project. Only in very rare cases will more than one fit - for instance, a parking lane plus bio-retention swale.

F. In places designated for shared-use paths, the path can take the place of the sidewalk zone.

G. Consult section 3.5 of this document for guidance on facility type and selection. Possible facilities include bike lanes, buffered bike lanes and parking protected bikes lanes. Physical or grade-separation may be preferred depending on conditions. Bicycle facilities may operate in the Flexible Area or the Vehicle Realm. Bicycle boulevards and shared roadways are possibilities on local access street.

H. Consult the Spokane Regional Stormwater Manual and/or Eastern Washington Low Impact Development Guidance Manual for desired locations for stormwater facilities. The stormwater catchment area must meet the required volume generated by the planned impervious area. In Downtown, Form Based Code or Center & Corridor zoning roadside swales are less common and alternative stormwater facilities in accordance with the above identified manuals may be considered or stormwater piped to another location.

I. On transit corridors, use bus bulbs if space allows to ease boarding, reduce sidewalk congestion, and allow buses to easily re-enter traffic. This should typically be done only if there is a second lane for vehicles to continue around stopped buses.

J. "High Traffic" and "Medium Traffic" lane routes on the Master Bicycle Plan should include buffers. Separation buffer between bike lane and vehicle lane should be implemented via parallel lane edge stripes with a periodic cross-hatch. 3' is the minimum buffer unless a raised curb is used, in which case 1.5' is the minimum. Wider buffers are allowable but should be well marked with hatching or bollards.

K. When constraints are prohibitive, consider 10-foot lane width as the minimum.

L. Travel lane includes the width of the gutter pan, if integral curb and gutter is used.

M. Medians less than 6 feet wide are considered traffic channelization. A pedestrian refuge is a raised median with a minimum width of 6 feet. Wider medians may be implemented in the context of boulevards.

Table 2 – Vertical Curve Design Parameters

	ARTERIALS (all types)	LOCAL	ALLEY	BICYCLE / PEDESTRIAN PATHWAY
Minimum Design Speed[1]	30 mph	25 mph	20 mph	20 mph
Vertical Curves[2] are required if the Algebraic Grade Difference, A, is:	A>1%	A>2%	A>2%	A>2%
Minimum Length is 3 times the Design Speed				

[1] Design speed is posted speed. In practice speeds may be less or more than shown depending on other design factors not accounted for herein. The design engineer shall justify the use of values other than those listed above.

[2] Curves must meet stopping sight distance per AASHTO 2011. "K" of 167 is used to find the maximum curve length for drainage.

Table 3 – Side slopes

	ARTERIALS	LOCALS	ALLEYS	BICYCLE / PEDESTRIAN PATHWAY
Grade break at back of walk up down	 4:1 4:1	 1.5:1 2:1		
Grade break at back of walk up down	 1.5:1 2:1	 1.5:1 2:1		
Grade break at edge of pavement up down			 1.5:1 2:1	 1.5:1 2:1
Grade break at edge of traveled way, including any shoulders up down			 1.5:1 2:1	 1.5:1 2:1
Notes: Use WSDOT standards when curbs do not exist. Grades shown are horizontal:vertical				

Table 4 – Target Speeds by Street Type

	RESIDENTIAL, INDUSTRIAL, CB AND GC				CC, DOWNTOWN, FORM BASED CODE			
Street Type	Principal Arterial	Minor Arterial	Collector	Local	Principal Arterial	Minor Arterial	Collector	Local
Design Speed = Posted Speed = Target Speed (mph)	30-35	30-35	30	25	20-30	20-30	20-30	20-25

Table 5 – Minimum Clear Zone (distance from edge of traveled way)

	Posted Speed 20-35mph		Posted Speed 40 or above	
	Existing Fixed Objects(2,3)	New Fixed Object (2)	Existing Fixed Objects(2,3)	New Fixed Object (2)
State Highways	WSDOT[1]	WSDOT[1]	WSDOT[1]	WSDOT[1]
New street construction	n/a	4	n/a	10
Street reconstruction including width or profile adjustments	1.5	4	6	10[1]
Street reconstruction not including width or profile adjustments	1.5	4	6	10[1]
New installations not related to street construction	n/a	4	n/a	10[1]

[1] If 10 feet clear distance cannot be provided within the available right-of-way, the design engineer may evaluate and justify placement as near the outer edge of the right-of-way as practical.

[2] On a curbed street all fixed objects shall be at least 1.5 behind curb regardless of the location of the travelled way. This is to ensure clearance for parked vehicle doors, snow removal, sign overhang, etc.

[3] Fixed objects / trees with less than 1.5 feet clearance should be considered for removal or relocation. If clearance is between 1.0 and 1.5 feet existing fixed objects including trees may remain unless damage indicates a history of vehicle collision, the object or tree conflicts with the condition or operation of a street, alley or sidewalk, or removal/relocation is required due to other public safety, convenience or aesthetic considerations.

Table 6 – Street Profile Grades

	ARTERIALS	LOCALS	ALLEYS	BICYCLE / PEDESTRIAN PATHWAY
Minimum Profile Grade	0.8%	0.8%[1]	0.8%	0.8%
Maximum Profile Grade	8.0%	8.0%	8.0%	8.0%
Grade at Intersections[2]	n/a	n/a	n/a	n/a

[1] Cul-de-sac profiles shall be established to provide minimum one percent grades at all places along the gutter lines.

[2] Unless otherwise approved by the Engineer, the profile grade at all residential intersections, along the minor roadway at arterials, and for all roadways at controlled intersection shall be no greater than three percent at any point within 100 feet of the near end of the radius.

Table 7 – Minimum Design Vehicle Standards

	RESIDENTIAL, INDUSTRIAL[1], CB AND GC		CC, DOWNTOWN, FORM BASED CODE	
Street Type	Arterials[2]	Local	Arterials[2]	Local
Design Vehicle (10% or more of ADT)	WB-40	SU-30	SU-30 & STA 40' bus	SU-30
Control Vehicle (Infrequent Largest User)	WB-62	WB-62	Ladder truck	Ladder truck

[1] Urban streets zoned for industrial uses may require larger design and control vehicles.

[2] Intersections of arterials with a local street should use the local street design vehicle unless nearby land uses dictate the need to accommodate a larger vehicle.

Table 8 – Curb radius standard

	RESIDENTIAL, INDUSTRIAL, CB AND GC	CC, DOWNTOWN, FORM BASED CODE
Actual Radius	20 feet minimum	10 feet minimum
Effective Radius	25 feet minimum	20 feet minimum
Turning Speed[1]	10-15 mph	10 mph

[1] For right turn movements. Left turns will typically be 5 mph faster.

Table 9 – Profile grade of sidewalks and buffer strips

	All Zoning	
Street Type	Arterials	Local
Sidewalk Cross Slope	1.5% to 2%	1.5% to 2%
Sidewalk Profile Grade	Same grade as street profile	
Contiguous with curb Isolated from curb	5% max	5% max