TRANSPORTATION PLANNING

BALANCES POLICY, INVESTMENT, TECHNOLOGY, AND LAND USE

SUPPORTS OUR LONG-TERM GROWTH

6 CHAPTER 6: CONTEXT SENSITIVE SOLUTIONS DESIGN GUIDELINES

The design elements for an urban thoroughfare are organized into three areas, the Context, Traveled Way and Streetside. For the purpose of this guide, the adjacent land use elements that abut the street and define the street's character is the street context. The street context or development zones are generalized under four categories: Downtown, Mixed Use, Residential, and Industrial. The guidelines consist of design recommendations for both the Travelway and Streetside elements of the right-of-way. This chapter details how the right-of-way for each Functional Design Type should be developed under each context.

STREET ELEMENT DESCRIPTIONS

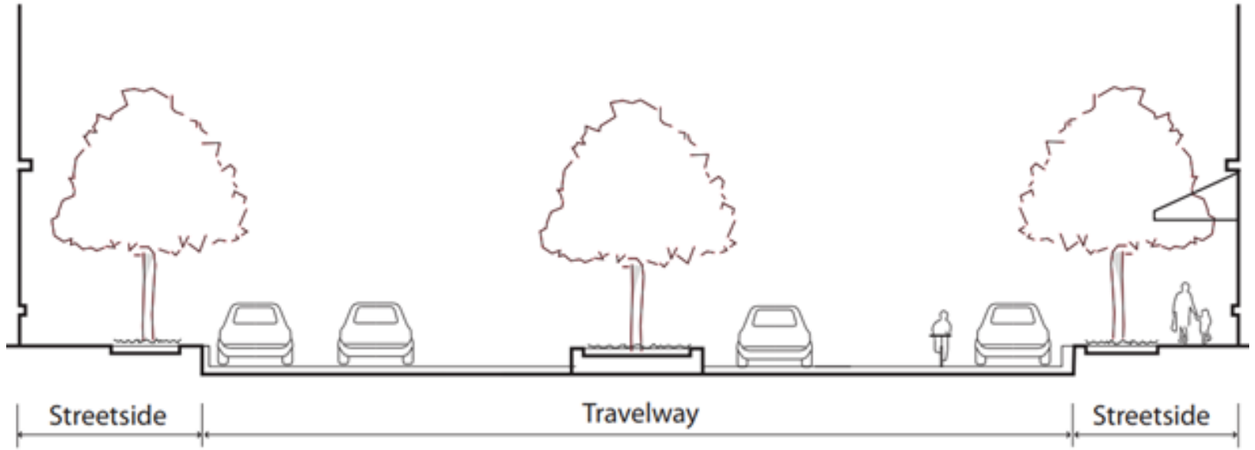
Every street segment includes many different elements that all work together to create streets that are thoughtfully designed to meet the needs of multiple users. The cross sections presented in this document show different possible arrangements for the elements that make up a street. Generally, within the public right-of-way, the elements of the street exist either within the Streetside or the Travelway. The following section offers brief summaries of all the street elements.

Streetside

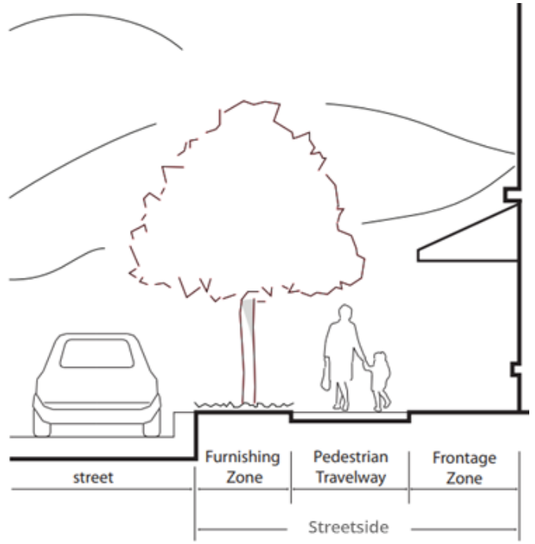
The Streetside accommodates most of the non-vehicular activity of the street including pedestrian travel, business activity, and some stormwater functions. The Streetside is the public space where much of the social activity of the city takes place. Street furniture, bicycle racks, and protected bikeways may be appropriate in the streetside.

Travelway

The Travelway is the portion of the right-of-way between the curbs that accommodates the movement of motorized and non-motorized vehicles, including trucks, transit, and bicycles, as well as on-street parking.



» Figure 6-1: Street Components



» Figure 6-2: Streetside Cross Section

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STREETSIDE ELEMENTS

Pedestrian Zone

The pedestrian zone provides for the mobility of people walking to and from their destination, whether their entire trip was as a pedestrian, or they were simply walking from their car or from the transit stop. It also serves as an important social space where people interact with one another, window shop and access businesses, have a meal at a café or wait for transit. The pedestrian zone must accommodate the unobstructed movement of people as well as the facilities and space for social functions. Accessibility and safety are primary design considerations, as is the transition from the public space of the street to private property. Included within the pedestrian zone are the furnishing zone, the pedestrian travelway, the frontage zone, and transit stops.

Frontage Zone — The frontage zone is the area next to the property line. It may front a building, parking area, front yard, or undeveloped property. The frontage zone is the ideal location to accommodate dining and display areas for adjacent businesses. These types of private activities must meet the zoning code requirements and will require proper permitting.

Pedestrian Travelway — The pedestrian travelway is designed to facilitate the unobstructed through movement of pedestrians. Ideally, even the narrowest travelway should accommodate the width of two people walking side by side. The minimum width of the Pedestrian Through Zone, also known as the walking zone or Pedestrian Access Route (PAR) is 5ft to accommodate two people passing.

Travelway width should vary based on context and the anticipated pedestrian activity of adjacent uses. In areas where pedestrian activity is predicted to be exceptionally high, near uses that generate high volumes of foot traffic, pedestrian travelway widths should be expanded. ODOT's Multimodal Design Guide suggests a 5 ft - 7 ft sidewalk width in residential areas, 6 ft - 8 ft in commercial areas, and 8 ft - 14 ft in central business districts.

A protected bikeway may also be appropriate to attract a range of people biking. In more rural and suburban settings, the pedestrian travelway may consist of a multi-use path (see bike zone for a full description of protected bikeway and multi-use path). The multi-use path may or may not be part of the public right-of-way. Though not preferred, it can be maintained on private property as part of a pedestrian easement.

Furnishing Zone — The furnishing zone accommodates several different functions. Located between the curb and the pedestrian travelway, the furnishing zone provides a buffer between pedestrians and vehicles. In rural settings, the furnishing zone may be absent in suburban and residential contexts. It may consist solely of a landscape strip with street trees, while in a more urban mixed-use setting, it may accommodate seating, wayfinding/street signs, and bicycle racks in addition to trees in tree wells. In most contexts, utility poles, fire hydrants, transit platforms, and public signage are also accommodated in this zone.

Street Trees and Landscaping — Landscaping provides a buffer between pedestrians and traffic and shields them from the elements, all while providing stormwater and air quality benefits. The best plants and trees for streets are well adapted to the climate, low maintenance, and sized properly for the available planting area.

Street trees are a great benefit to any street. Proper planning is essential when incorporating trees into the street design. By avoiding conflicts with underground utilities, limbing trees in their first few years to achieve proper clearance, and making sure planting strips and tree wells are properly sized and have adequate room for root growth; street trees will have a greater chance of reaching full maturity.

Examples of good street tree varieties include:

Large	Medium
Sugar Maple	European Hornbeam
Kentucky Coffee Tree	American Yellowood
Gingko Biloba	Littleleaf Linden
Honeylocust (Thornless)	Lacebark Elm
Silver Linden	Pacific Sunset Maple
English Oak	Zelkova
Sweet Gum	Norway Maple
Tulip Poplar	
London Planetree	
Chestnut Oak	
Hybrid Elm	

Transit Stops — Mass transit, including buses, provide transportation services to a large portion of the population and are essential to all Miamisburg residents. People who prefer not to drive, who are physically unable to drive, or who do not have access to a car benefit from transit services, and all of Miamisburg benefits from fewer vehicles on the road and reduced emissions. This service is typically located on major corridors, and transit stop placement along those corridors must consider many factors including traffic operations, proximity to large trip generators, accessibility, and passenger amenities. Transit stops should be well integrated into the pedestrian realm and designed as safe and comfortable places for people who use transit, but they should also be incorporated into the context and function as an urban design amenity for the city.

At minimum, all transit stops should have clear signage and a hard surface landing area for boarding or exiting the transit vehicle.

Stormwater Management — Incorporating stormwater management into the design of streets is beneficial to the community on many levels. The use of green stormwater management practices such as Low Impact Development techniques, provide visual stimulation, buffering of automobile traffic, and help filter stormwater thus reducing runoff and flooding, especially in urban areas with high percentages of impervious surfaces. Green stormwater management facilities can be integrated with on-street parking areas, such as tree bulbs or pervious pavement, included with landscaping and street trees in the pedestrian zone, or designed into medians in the center of the street. The City Regulations and the latest edition of the ODNR Rainwater and Land Development Manual or ODOT Location and Design Manual - Volume 2 - Drainage Design should be consulted during the design phase of any new street or street retrofit.

Swales are typically used to mitigate stormwater in more rural and suburban environments. Swales may be part of the public right-of-way or dedicated via an easement.

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TRAVELWAY ELEMENTS

Parking Zone

On-street parking not only helps to meet the parking needs of the adjacent uses, but also offers comfort for pedestrians by providing a buffer from moving traffic in the street. While in most cases on-street parking cannot supply all the parking needs for a commercial area, it provides convenient spaces that increase pedestrian activity and allow for easy loading and unloading when additional parking is located to the rear or side of buildings. Additionally, on-street parking helps to slow street traffic thus making pedestrian crossings safer. Parking lanes should be measured to the face of the curb.

Bike Zone

Bicycle travel is an important component in any multimodal street and can be accommodated in variety of ways. Varying street types, cyclist skill level, and the availability of off-street bike routes influence the design of bike facilities. It is recommended that the city adopt a Complete Street Policy to serve as a guide for construction of bicycle facilities. Bikeway design impacts the amount of right-of-way, so guidance from NACTO, FHWA, and ODOT's Multimodal Design Guide can be utilized to determine appropriate widths.

Bicycle Lanes or Buffered Bike Lanes— Locating bicycle lanes along major and collector streets is an important part of a Complete Street approach, but not all major and collector streets require a bicycle lane to be a Complete Street. Several factors are taken into consideration to designate a bike lane on a street including:

- Streets with high traffic volume.
- Streets with operating speeds of 30 miles per hour or more.
- Connectivity to existing and/or planned bicycle systems and transit facilities.
- Connectivity to large employment centers and/or popular civic destinations.
- Experience or skill level of cyclist.

Striped bicycle lanes are recommended on certain streets in order to provide cyclists with a designated travelway that is visually separated from automobile traffic.

A standard striped bicycle lane should be five feet wide between face of curb and outside of painted stripe. A minimum of three feet of this width should be ridable surface located outside of the gutter pan or stormwater inlets. In the absence of a vertical curb, a four foot minimum bike lane is acceptable. Additionally, when formal on-street parking and bike lanes coexist, the width should be six feet.

Bike Boulevards — Bicycle boulevards are streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Signs and pavement markings create the basic elements of a bicycle boulevard. They indicate that a roadway is intended as a shared, slow street, and reinforce the intention of priority for bicyclists along a given route. Signs and pavement markings alone do not create a safe and effective bicycle boulevard, but act as reinforcements to other traffic calming and operational changes made to the roadway.

Bike boulevards are strategically identified local street corridors that are outfitted with traffic calming measures to maintain access for all road users while prioritizing local and active transportation and accommodating recreational uses. Bike Boulevards can be implemented with curb extensions, road reconfigurations, diverters, roundabouts, and many other infrastructure components that permit access while discouraging non-local automobile traffic from using the corridor as a cut through.

Multi-Use Path, Protected Bikeway, or Cycle Track — While cycling on a sidewalk is discouraged in urban areas, along Arterial Parkways and other streets in more rural or suburban settings, a multi-use path that is wide enough to accommodate both pedestrians and cyclists may be appropriate. Motorized traffic is excluded along multi-use paths because these facilities are designed for use by pedestrians, bicyclists, skaters, wheelchair users, runners, and other non-motorized users. Typically, a multi-use path, which is a combination of the bicycle and pedestrian zones, is separated from the vehicle zone by a landscaped area. A protected bikeway also combines the bicycle and pedestrian zones, but the bicyclist is protected by barriers created between the zones. A two-way, raised cycle track is similar but intended for only bicyclists while walking accommodations are handled on a sidewalk. The location of multi-use paths and protected bikeways within street rights-of-way, especially near road intersections, can challenge motorist expectations of bicyclists, so their design and interface with other travel modes should be carefully analyzed.

Vehicle Zone

Travel Lanes — Travel lanes accommodate movement of vehicular, transit, and bicycle traffic. Lane width is influenced by two distinct goals that must be balanced to create complete streets. The first is to move a particular volume of vehicles through an area safely and efficiently. The second is to create a safe and comfortable pedestrian environment by limiting crossing distances and reducing vehicle speeds. Wide streets create barriers for pedestrians and encourage higher vehicular speeds reducing the level of pedestrian activity that supports economic and community activity.

The American Association of State Highway and Transportation Officials (AASHTO) recommends narrower (10 to 11 feet) travel lanes on lower-speed urban streets, to promote flexibility in constrained right-of-way situations and to accommodate multiple modes of transportation by creating more room within the right-of-way. The benefits of narrower travel lanes include safer pedestrian conditions with shorter crossing distances and slower traffic, the ability to accommodate more modes of transportation in constrained rights-of-way, and lower construction cost. Wide outside lanes (12 feet) are appropriate on transit corridors to accommodate transit.

In non-urban settings with less pedestrian activity, wider (12 feet) vehicle lanes are appropriate. However, when wider lanes are required, consider balancing the total width of the travel way by narrowing turn lanes or medians to maintain the same overall pedestrian crossing distance.

Medians and Pedestrian Refuges — Medians are continuous islands separating the opposing directions of traffic. Medians are used for beautification, access management, safety, utilities, and stormwater management. By separating and controlling traffic, medians help reduce vehicle-and-vehicle as well as vehicle and bicycle/pedestrian conflicts. Landscaped medians, especially those with canopy trees, can be a unique focal point to a neighborhood, and when properly designed, they provide efficient stormwater management and reduce the urban heat island effect. Medians can also function as pedestrian refuges. These refuges break up a large crossing by providing a safe place for pedestrians and cyclists to stop while crossing the street. They are especially important on wide thoroughfares.

Landscaped medians should take priority over continuous left turn lanes or paved medians wherever possible. Plant and hardscape materials should be low maintenance including miniature grasses that do not require mowing and/or drought tolerant tree and shrub species such as:

Traffic Control Devices — Miamisburg maintains over 116 miles of public roadways and rights-of-way and 33 signalized intersections. Along with the Ohio Department of Transportation (ODOT), Miamisburg installs and maintains traffic control devices including signals, pavement markings, and signs within the Vehicle Zone. The Ohio Manual on Uniform Traffic Control Devices (OMUTCD) defines the standards used by local road managers installing and maintaining traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. Coordination with Miamisburg, and in some instances ODOT, while applying the Miamisburg Transportation Plan is essential for the safe and efficient movement of people and supporting community activities.

Development Zone

The development zone is the private property that abuts the public right-of-way. While this document does not address any standards specific to the development zone, the character of the development zone affects the design and use of the public street space. The development zone or street context has been generalized under four categories:

1. Downtown: special mixed-use areas that are intended to encourage, support and enhance the downtown area as a high-density, mixed-use urban center by including sites for offices, residential, commercial, recreational, and public and semi-public uses.
2. Mixed Use: typically provide for a variety of commercial, service, retail and multi-family uses.
3. Residential: includes agricultural and residential uses of varying denisities.
4. Industrial: generally includes manufacturing, factories, power plants, warehouses, and other uses that are important to the City's economy.

The street context is to follow the generalized land use map for the city as developed from the current zoning classifications. The zoning districts established under the City's zoning code as included in the

Agricultural & Residential	Mixed Use	Industrial	Downtown
R-1 Residential District	OS-1 Office-Service District	I-1 Light Industrial District	CBD-1 Central Business District
R-2 Residential District	HS-1 Highway Service District	I-2 General Industrial District	CSD-1 Central Service District
R-3 Residential District	GB-1 General Business District	MB-1 Mound Business District	
R-4 Residential District	RO-1 Research-Office Light Industrial District	PI Planned Industrial District	
OR-1 Office-Residential District	PO Planned Office District	AO Austin Center Overlay District	
NB-1 Neighborhood Business District	PC Planned Commercial District		
A Agriculture District			
AR Agricultural Residential District			
PR Planned Residential Development District			
PMH Planned Manufactured and Mobile Home Residential District			
Low-Density Residential (Immediate Areas outside the Corp. Limits)			

» Table 6-1: Street Context Classifications

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Development Zone	Pedestrian Zone	Green Zone	Bicycle Zone	Parking Zone	Vehicle Zone	Bicycle Zone	Green Zone	Pedestrian Zone	Development Zone

	Development Zone		**Green Zone**		**Bicycle Zone**
	The basic intent for the Development Zone is that buildings orient toward and have good functional and visual connections to the street. Within the Development Zone, the building setbacks, site design and land uses will vary based on the context.		Landscaping and trees in the Green Zone serve multiple purposes: • Buffering for pedestrians from weather and automobile traffic • Green Infrastructure to mitigate stormwater and summer heat/glare • Underlying support for property values/desirability of real estate		Arterial-Boulevards typically have lower traffic speeds and volumes so bicyclists are less likely to feel comfortable in mixed traffic. The Bicycle Zone is essential to encourage cycling.
	Pedestrian Zone (Frontage, Through, Furnishing Zones)		**Parking Zone**		**Vehicle Zone**
	Pedestrian travel should be a prominent option on Arterial-Boulevards. This zone should include unobstructed sidewalks at appropriate widths for adjacent and surrounding land uses.		The need for the Parking Zone varies on Arterial-Boulevards. The benefits of the Parking Zone include traffic calming, buffering between vehicles and pedestrians, and easy "in and out" access to adjacent land uses.		The Vehicle Zone serves motor vehicles, with a variety of lane configurations, to accommodate higher volumes than Avenues. Narrow lanes should be considered to slow traffic and provide for the expansion of other zones within the right-of-way.

» Figure 6-3: Arterial-Boulevard: Typical Zones

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In areas of parks, open space, or Special Development Districts (SDD), the most prevalent adjoining land use category shall be used to define the street context of the area.

TRAFFIC CALMING MEASURES

Traffic calming refers to measures which aim to reduce or manage the negative effects of motor vehicle use, such as speeding and reckless driving, and enhance safety for all users of the street. Traffic calming and the Context Sensitive Solutions approach are synonymous as they pertain to the design of most roadways.

In the ITE/FHWA Traffic Calming EPrimer, these measures are broken down into 4 different categories 1. Horizontal Deflection, 2. Vertical Deflection, 3. Street Width Reduction, and 4. Routing Restriction. Horizontal traffic calming elements reduce vehicular speeds by narrowing lanes or adding horizontal curves on the street. Vertical traffic calming treatments compel motorists to slow their speed to traverse the treatment and are found to be the most effective speed reduction treatments. The ITE Traffic Calming EPrimer module tool defines and provides an overview and application guidance for each traffic calming measure.

Although traffic calming was initially implemented mostly on local roads, many cities in the U.S. are now calming collector streets and arterials as well. The road diet, or removing and/or narrowing travel lanes, is one of the most common traffic calming practices for arterial and collector roads. The following list describes some of the other more common types of traffic calming devices and measures.

Curb Extensions (horizontal deflection)

When placed mid-block, curb extensions can be used to create a chicane, a series of bulbouts on alternating sides of the street, which is used to calm traffic by narrowing the street and requiring motorists to reduce their speed in order to maneuver through the device. Curb extensions can also be used at intersections or mid-block to provide visual distinction and reduce pedestrian crossing distances at established crosswalk locations. Bulbouts help to provide a clear visual signal to drivers that a crossing is approaching and makes waiting pedestrians more visible. Chokers or Neckdowns tend to be longer than bulb-outs and often line up with and help to define parallel street parking areas. These extensions narrow the appearance of the street and can be attractive, especially when landscaped. Incorporating swales or bioretention areas into curb extensions can help to capture or reduce stormwater runoff.

Traffic Circles (Not Roundabout) (horizontal deflection)

Traffic circles are raised islands placed in intersections which cause motorists to slow down as they check for opposing traffic when approaching the intersection and maneuver around the device. Traffic circles have been shown to significantly reduce collisions at intersections. They are appropriate on non-arterial streets where traffic volume is not a concern, but traffic speed is.

Landscaping & Street Trees (street width reduction)

Landscaping and street trees have been shown to reduce traffic speeds by creating a more enclosed and pedestrian friendly environment. Vertical elements, such as street trees, change drivers' perception of the street, giving the street a narrower feel. This can help alert drivers to the presence of pedestrians and cause them to reduce speed. Street trees and landscaping are often used in conjunction with other traffic calming techniques.

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Street Closures

Street closures involve the installation of some form of barrier to block through access by vehicles while maintaining access for pedestrians and bicyclists. They have been shown to be effective in reducing traffic volumes. Some roadways may require emergency vehicle access, which can sometimes be accommodated through roadway design and removable traffic control devices. Street closures can be either full closures that block vehicular access in both directions or half closures which limit vehicular traffic to either entry or exit, but not both. Similar to diverters, street closures can have a significant impact on adjacent or nearby streets. Particular care is given when considering the use of this device.

PARKING MANAGEMENT STRATEGIES

Parking management embraces a variety of strategies that seek to either reduce parking spaces needed or to use parking spaces more efficiently. Parking should be considered an important land use—one that affects development patterns as well as travel behavior. Even the perception of available parking can influence mode choice and economic competitiveness of an area.

On-street Residential Neighborhood Parking

Some areas with high demand for parking and/or high parking fees may push demand for parking into nearby residential neighborhoods. This demand can be managed with parking permits for residents. Overly restrictive regulations in residential areas can, however, lead to increased public and private parking development costs, which can prevent transit-oriented and traditional neighborhood development. The city should evaluate neighborhoods on a block-by-block basis while considering the development goals of Miamisburg.

Several options could be considered if parking becomes an issue in a neighborhood that goes above just amending the city parking regulations.

1. Widen streets as part of comprehensive roadway improvement projects.
2. Reduce driveways.
3. Reduce the width of driveway curb cuts.
4. Convert four-way stop intersections to two-way stop intersections.
5. Explore the possibility of creating small off-street parking lots for residents.
6. Explore creating or restoring alleys for rear access and parking.
7. Eliminate superfluous fire hydrants (if any).
8. Implement parking permits and time limits.

On-street Commercial Area Parking

On-street parking is a significant issue in downtown Miamisburg and parking management strategies need to be implemented immediately. On-street parking, as close to a business as possible, is the most convenient type of parking for potential customers, and keeping those spots available for short-term use should be a high priority. Managing parking in commercial areas typically involves ,setting peak hour, daytime, or 24-hour parking restrictions; and establishing parking time limits.

Many communities have established Parking Management Authorities (PMAs) to oversee parking management and to determine metered and parking lot prices. These PMAs can then return the increased revenue generated from on-street parking pricing to Miamisburg in the form of streetscape improvements: lighting, planters, security, etc. An improved street environment can attract pedestrians and bicyclists who add to commercial ,foot-traffic without congesting the roadways.

Peripheral Parking Lots

Parking lots placed outside of the Central Business District (CBD) or downtown area are called peripheral parking. When within 1/4 mile of the activity center, however, most users will walk to their final destination. The primary goal of peripheral lots is to divert traffic from the CBD or major destinations where traffic bottlenecks might occur. Unlike other parking management strategies, the use of peripheral parking might change where people drive, but it is generally not an attempt to influence the mode choice or travel behavior of the driver.

Peripheral parking can convert transit commuters to drivers or reduce usage of park-and-ride facilities further out from the destination. When given the choice, few developers will trade peripheral parking for less on-site parking and so the peripheral parking may not greatly reduce the amount of CBD parking. Peripheral lots can also foster carpooling if spaces in the CBD are reserved for carpools while others are shifted to the peripheral lots. Creating a pleasant street environment to the destinations is key to a successful peripheral parking lot. The adjoining transportation networks should incorporate landscaping and lighting to enhance aesthetics as well as include amenities such as benches, trash bins, and bike racks for convenience of the users.

Structured Parking

The choice between surface and structured parking is generally driven by land costs. Where land costs are higher – usually in denser, more urban environments – it becomes more economical to build up than to build out. The annual cost to own and operate a parking space in structured parking can be up to nine times higher than a parking space on a surface lot. Therefore, structured parking is recommended for areas with higher land values and high demand for parking. The construction costs of structured parking per space diminish with scale, but consideration must be given to the ability to recover costs through parking fees.

Bicycle Parking

The city should consider bicycle parking and bicycle facilities as a means to reduce the number of spaces necessary. Many lots will use irregular or small spaces for bicycle and motorcycle parking.

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ACCESS MANAGEMENT STANDARDS

The balancing act for most communities lies in allowing the proper amount of access for any particular road classification. Allowing too much direct access to land from arterial roadways can generate several problems, including delays, congestion, and reduced travel speed for commuters and travelers. Excessive direct access also leads to poor operational performance on major arterial roadways. Additionally, air quality can suffer, and excessive energy consumption associated with increased stop and go traffic will increase. However, the most significant concern for drivers is the increased crash rates, injury rates, and costs associated with inadequate access management.

In order to promote effective and efficient use of highway facilities and to sustain the reasonable economic development of land, it is necessary to establish, implement, and enforce sound access management policies. All properties, whether they are existing and

FHWA Functional Roadway Classifications	Context-Sensitive Roadway Classifications						
		Freeway/ Expressway	Boulevard/ Parkway	Avenue	Main Street	Neighborhood Connector	Street
	Expressway	■					
	Principal Arterial		■		■		
	Minor Arterial		■	■	■		
	Collector			■	■	■	
	Local				■	■	■

are being redeveloped or are being developed for the first time, will be required to conform to all requirements of access control as designated in this chapter.

GENERAL REQUIREMENTS

1. No driveway should be closer than 50 feet to any intersection, as measured from the right- of-way line of the intersecting street to the point of curb return for the driveway.
2. The maximum driveway width at the right-of-way line should be as follows:
   a. Industrial — Thirty-six (36) feet
   b. Commercial — Twenty-four (24) feet
   c. Multifamily Residential — Twenty-four (24) feet
   d. Single-Family Residential — Eighteen (18) feet
3. One or more existing curb cuts on a property do not guarantee the same number or location of curb cuts when the property is redeveloped for the same or a different use.
4. When a property is redeveloped, the access to that property may be required across a common access easement if that possibility exists.
5. When the criteria for safe left turns cannot be met, the need can be eliminated by prohibiting left turns by exiting vehicles.
   a. Restriction of turning movements to right turns in and out of a driveway, may eliminate the need for the sight distances.

ARTERIAL-PARKWAYS AND ARTERIAL-BOULEVARDS

The primary purpose of this classification of roadway is to provide access to the abutting property.

1. The following spacing restrictions should be adhered to:
   a. To be capable of being signalized, access points that require signalization shall not be located any closer than one-quarter mile to the nearest signalized intersection or signalized driveway, in addition to satisfying the warrants contained in the State Manual of Uniform Traffic Control Devices for Streets and Highways. The exact location of the signal should be determined by a traffic engineering study. Furthermore, provisions should be made for all turning movements in order to maintain the design capacity of the roadway.
   b. Unsignalized access points should be spaced a minimum distance of six hundred (600) feet. In addition, some turning restrictions and/or reserved turn lanes may be required.
   c. In no case should a driveway be located closer than 100 feet to an intersection involving a major arterial.
2. At those access points where turning vehicles from the Arterial-Parkway or Arterial-Boulevard will affect the roadway capacity to the extent that turn lanes are needed, the turn lanes should be provided by the developer. This policy should be enforced regardless of whether the roadway is a two-lane or a multi-lane facility.
3. Main access points on opposite sides of the Arterial-Parkway or Arterial-Boulevard shall be located opposite each other; otherwise, turning movement restrictions may be imposed.
4. Access points should be limited to one per tract or lot. If, however, the spacing requirements for a direct access point cannot be satisfied, then an indirect access point should be located on a frontage road, on an intersecting street, or a shared common driveway that meets the spacing requirements. In addition, for these two lower-class roadways to function properly, access onto them should be controlled as follows:
   a. Access points onto streets intersecting the Arterial-Parkway or Arterial-Boulevard should be spaced a minimum distance of one hundred (100) feet, measured from point of curb return to point of curb return, from the Arterial-Parkway or Arterial-Boulevard as well as from adjacent access points. This restriction would also include frontage roads intersecting Streets.
   b. Where existing, access points onto frontage roads paralleling the Arterial-Parkway should be spaced a minimum distance of one hundred (100) feet, measured from point of curb return to point of curb return, from adjacent access points.
5. Where the frontage of a tract is greater than six hundred (600) feet, an additional access point may be permitted. The form of access, however, may be direct or indirect. One or both of the access points may have direct access onto the Arterial-Parkway or Arterial-Boulevard, depending on the location of adjacent direct access points. In the case where the adjacent access locations allow only one point of direct access, the second access point will be direct.
6. The location of access points should comply with safe sight distance practices as indicated in ODOT's Location and Design Manual, Volume 1- Roadway Design or upon review by the City Engineer.
7. Access points should be located a sufficient distance from property lines to allow the curb radius or flare to fall entirely in front of the subject property, except where a common driveway serving two properties is constructed.
8. In the process of providing access to abutting property, the developer and the approving governmental agency, together, must strive to provide the highest level of safety possible and to maintain the roadway design capacity.

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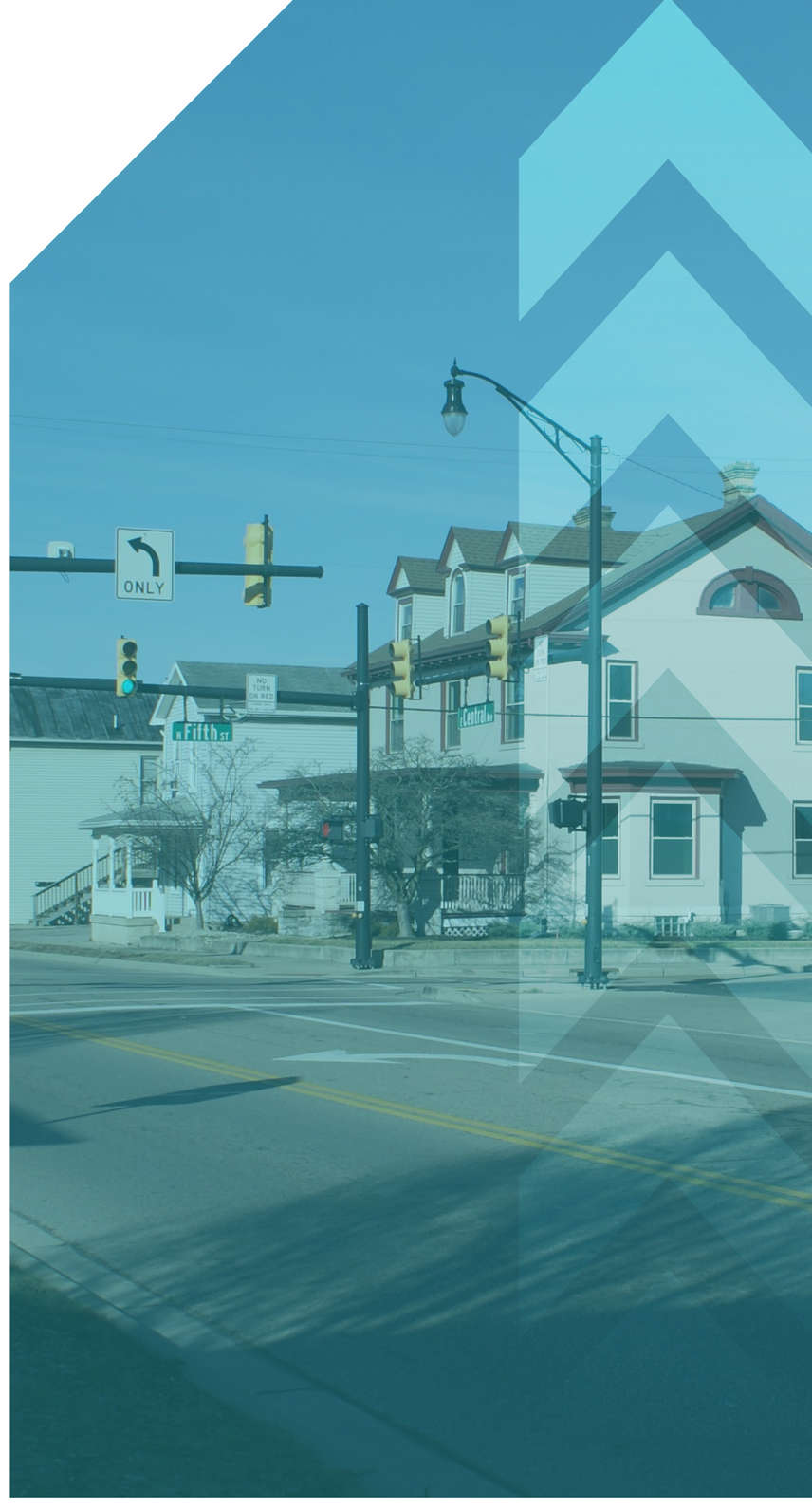
AVENUES, MAIN STREETS, AND NEIGHBORHOOD CONNECTORS
The primary purpose of this classification of roadway is to provide access to the abutting property.

1. The following spacing restrictions should be adhered to:
    a. To be signalized, access points that require signalization should not be located any closer than one-quarter mile to the nearest signalized intersection or signalized driveway, in addition to satisfying the warrants contained in the State Manual of Uniform Traffic Control Devices for Streets and Highways. The exact location of the signal should be determined by a traffic engineering study.
    b. Unsignalized access points should be spaced as follows:
        i. On two-lane roadways, one access point per existing tract or parcel. If, however, the frontage is greater than six hundred (600) feet, an additional access point may be permitted. Furthermore, the minimum spacing between adjacent access points on Avenues, Main Streets, and Neighborhood Connector facilities should be one hundred (100) feet, measured from point of curb return to point of curb return.
        ii. On multi-lane roadways, the spacing should be dependent on whether a barrier median exists. If a barrier median exists, access points may be spaced as close as three hundred (300) feet. Certain turning movements, however, will be prohibited. If a barrier median does not exist, then the minimum spacing of access points should be six hundred (600) feet. In addition, some turning movements may be prohibited.
        iii. In no case should a driveway be located closer than 50 feet to an intersection involving Avenues, Main Streets, and Neighborhood Connectors.
2. At those access points where turning vehicles from the Avenues, Main Streets, and Neighborhood Connectors affect the roadway, the turn lanes should be provided by the developer. This should be enforced regardless of whether the roadway is a two-lane or a multi-lane facility.
3. Major access points on the Avenues, Main Streets, and Neighborhood Connectors should be located opposite each other; otherwise, turning movement restrictions may be imposed.
4. One access point per existing tract or parcel will be allowed. If, however, the spacing requirements for a direct access point cannot be satisfied, then an indirect access point should be located on an intersecting street or share a common driveway that meets the spacing requirements. In addition, for these two lower-class roadways to function properly, access onto them should be controlled as follows:
    a. Access points onto Streets intersecting Avenues, Main Streets, or Neighborhood Connectors should be spaced a minimum distance of one hundred (100) feet, measured from point of curb return to point of curb return, from the Avenue, Main Street, or Neighborhood Connector as well as from adjacent points. This restriction would also include frontage roads intersecting Street.
    b. Access points onto frontage roads paralleling the Avenues, Main Streets, and Neighborhood Connectors should be spaced a minimum distance of one hundred (100) feet, measured from point of curb return to point of curb return, from adjacent access points.
5. Where the frontage of a tract on a multi-lane roadway is greater than six hundred (600) feet, an additional access point may be permitted. The form of access, direct or indirect, will be dependent upon the location of adjacent access points.
6. The location of access points shall comply with safe sight distance, as indicated in ODOT's Location and Design Manual, Volume 1- Roadway Design.
7. Access points should be located a sufficient distance from property lines to allow the curb radius or flare to fall entirely in front of the subject property, except where a common driveway serving two properties is constructed.
8. In the process of providing access to abutting property, the developer and the approving governmental agency, together, must strive to provide the highest level of safety possible and to maintain the roadway design capacity.



CHAPTER 6: CONTEXT SENSITIVE SOLUTIONS DESIGN GUIDELINES

STREETS

The primary purpose of this classification of roadway is to provide access to the abutting property. Consequently, there are fewer standards governing the location of access points on them.

1. The spacing of access points on this classification of roadway should be fifty (50) feet, measured from point of curb return to point of curb return, except in residential subdivisions where there are no spacing requirements.
2. The number of access points shall be limited to one per tract except where the frontage is greater than 100 feet and it can be demonstrated by the developer that an additional curb cut will benefit traffic movement.
3. The location of the access point shall comply with safe sight distance as indicated in ODOT's Location and Design Manual, Volume 1- Roadway Design
4. Access points should be located a sufficient distance from property lines to allow the curb radius or flare to fall entirely in front of the subject property, except where a common driveway serving two properties is constructed.
5. In the process of providing access to abutting property, the developer and the approving governmental agency, together, must strive to provide the highest level of safety possible.

STREET DESIGN GUIDELINES & CROSS-SECTIONS

The street design guideline matrices on the following pages aim to be holistic by integrating context-sensitive roadway classifications and land use characteristics. They are not meant to be prescriptive, but rather to offer a menu of options for developing or redeveloping a roadway into a Complete Street. The cross-sections are also not meant to be prescriptive, but to visualize the different ways Complete Streets design can be implemented on a roadway with a particular land use or street context, roadway classification, and right-of-way width.

These design guidelines are to be used by the private and public sectors when proposing street improvements and/or new streets. The guidelines are expressed in a series of tables and diagrams for street segments and general guidelines for intersections. The figures and tables show Typical Zones and the purposes served by each of the design elements within the right-of-way. The tables are followed by a variety of possible cross-sections for classification. The Roadway Intersection Characteristics tables (Appendix A-39 and A-40) are a list of guidelines/best practices for how to create appropriate intersections for the various roadway classifications.

The City of Miamisburg developed the matrices and cross-sections to be context-sensitive for the City's needs and community vision. The content in the matrices has been refined to reflect how the City of Miamisburg designs, develops, maintains, and redevelops its roadways. The matrices contain Complete Streets design elements that have been compiled from ODOT, ITE and CNU's Designing Walkable Urban Thoroughfare report, and the NACTO website. Throughout the tables and the diagrams, street sections are divided into zones as described above with corresponding colors.

The design guidelines are not standards; they are recommendations intended to complement the existing standards and guidelines adopted by the city. Design of streets and intersections is performed by registered engineers, and the experience and judgment of those individuals is essential. Guidelines in this handbook are appropriate in many cases but are not a substitute for engineering experience and judgment.

Guidelines in this handbook are intended to assist in the design of new and reconstructed streets. Although they are not necessarily intended to be applied to maintenance projects that preserve and extend the service life of existing highways and structures, they can be used to complement projects when minor retrofits are needed.

CHAPTER 5: THOROUGHFARE PLAN WITH CONTEXT SENSITIVE CLASSIFICATIONS

Mixed Use Street Design Guidelines

	Parkway	Boulevard	Avenue	Main Street	Neighborhood Connector	Street
AADT	Principal Arterial: 7,000 -27,000 Minor Arterial: 3,000- 14,000	Principal Arterial: 7,000 -27,000 Minor Arterial: 3,000- 14,000	Minor Arterial: 3,000- 14,000 Collector: 1,100 – 6,300	Principal Arterial: 7,000 -27,000 Minor Arterial: 3,000- 14,000 Collector: 1,100 – 6,300	Collector: 1,100 – 6,300 Local: 100 – 700	Local: 100 – 700
Right-of-Way Widths	Principal Arterial- 120' Minor Arterial- 100' Minimum- 80'	Principal Arterial- 120' Minor Arterial- 100' Minimum- 80'	Minor Arterial- 100' Collector- 80' Minimum- 60'	Principal Arterial- 120' Minor Arterial- 100' Collector- 80' Local/Minimum- 60'	Collector- 60' Predominant/Functional- 50' Minimum- 50'	Ideal- 60' Predominant/Functional- 50' Minimum- 40' Alleyway- 20'
Access Control	Principal Arterial- Partial/Full Control Other- By Permit	Principal Arterial- Partial/Full Control Other- By Permit	By Permit	Principal Arterial- Partial/Full Control Other- By Permit	By Permit	By Permit
Vehicle Zone Design						
Number of Lanes	4 – 6 Frontage roads may be required to limit disruption to traffic flows from driveways	4- 6 Frontage roads may be required to limit disruption to traffic flows from driveways	2 - 4	2 - 3	2 - 3	2
Lane / Pavement Width	11 – 12' Principal Arterial	11 – 12' Principal Arterial 10' - 11'	10 - 11'	11 – 12' Principal Arterial 10' Other Functional Class (36' min. F-F with on-street parking)	10' Other Functional Class (28' min. F-F with on-street parking)	10' (28' min. F-F with on-street parking)
Divided / Undivided	Principal Arterials: Either Other: Undivided	Principal Arterials: Either Other: Undivided	Undivided	Principal Arterials: Either Other: Undivided	Undivided	Undivided
Design Speed (mph)	30+	30+	25+	20—25	25	15—25
Traffic calming	Raised / landscaped / striped medians Bus bulbs.	Raised / landscaped / striped medians Roundabouts, Bus bulbs Textured pavement (low impact)	Raised / landscaped / striped medians Roundabouts Textured pavement (low impact)	Textured pavement (low impact) Traffic circles	Traffic circles	Mini-traffic circle
Pedestrian Zone Design						
Buffer / Furnishings Zone	8' - 12' Grass / trees / landscaping / Street lights / Signage, Bike racks Bus shelters / Bus stops	8' - 12' Grass / trees / landscaping / Street lights / Signage, Bike racks Bus shelters / Bus stops	4' - 8' Grass / trees / landscaping / Street lights / Signage Bike racks / Bus stops	2' - 6' Grass / trees / landscaping / Street lights / Signage / Bike racks Bus shelters / Bus stops	2' - 6' Grass / trees / landscaping / Street lights / Signage / Bus stops	2' - 6' Grass / trees / landscaping / Street lights / Signage
Pedestrian Through Zone	5' - 12'	5' - 12'	5' - 12'	5' - 12'	5' - 8'	5' - 8'
Frontage Zone	0' - 2' Planters / landscaping Outdoor seating Portable signage	0' - 6' Planters / landscaping Outdoor seating Portable signage	0' - 12' Planters / landscaping / Outdoor seating Portable café seating Portable signage	0' - 8' Planters / landscaping Outdoor seating Portable café seating Portable signage	0' - 4' Planters / landscaping Outdoor seating Portable signage	0' - 4' Planters / landscaping Outdoor seating Portable signage
Pedestrian Crossing Typical Treatments	Marked crosswalks Signalized crosswalks Pedestrian refuge areas	Marked crosswalks Signalized crosswalks Pedestrian refuge areas	Marked crosswalks Signalized crosswalks Mid-block signalized crosswalks Pedestrian refuge areas Striped curb extensions	Marked crosswalks Signalized crosswalks Mid-block signalized crosswalks striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions
Bicycle Zone Design						
Bicycle Zone	Barrier-separated bike lane 5' - 12' Shared Use Path (SUP) ≥ 8'	Barrier-separated bike lane 5' - 12' Buffered bike lane 5' - 8' Shared Use Path (SUP) ≥ 8'	Buffered bike lane 5' - 8' Bike lane 5' - 6' Shared Use Path (SUP) ≥ 8'	Buffered bike lane 5' - 8' Bike lane 5' - 6', Sharrows Shared Use Path (SUP) ≥ 8'	Buffered bike lane 5' - 8' Bike lane 5' - 6', Bike boulevard Sharrows, Shared Use Path (SUP) ≥ 8'	Bike lane 5' - 6' Bike boulevard Sharrows
Parking / Parking Access	On-street parking allowed Shared access Minimal curb cuts	On-street parking allowed Rear / alley-access surface lots Shared access, Minimal curb cuts	On-street parking allowed Rear / alley-access surface lots	On-street parking allowed Rear / alley-access surface lots Shared access, Minimal curb cuts	On-street parking allowed Rear / alley-access surface lots	On-street parking allowed

» Notes:

1. The Pavement Section for each roadway classification shall be determined by the proposed use and soil conditions. Pavements must be structurally designed to accommodate the current and predicted traffic needs and be based on a 20-year projection of the anticipated traffic loading.
2. Special accommodations on truck and/or transit routes should be considered.
3. Roadways on the National Highway System (NHS) may be required to have 12' lanes.

CHAPTER 5: THOROUGHFARE PLAN WITH CONTEXT SENSITIVE CLASSIFICATIONS

Agricultural & Residential Street Design Guidelines

	Parkway	Boulevard	Avenue	Main Street	Neighborhood Connector	Street
AADT	Principal Arterial: 7,000 -27,000 Minor Arterial: 3,000- 14,000	Principal Arterial: 7,000 -27,000 Minor Arterial: 3,000- 14,000	Minor Arterial: 3,000- 14,000 Collector: 1,100 – 6,300	Principal Arterial: 7,000 -27,000 Minor Arterial: 3,000- 14,000 Collector: 1,100 – 6,300	Collector: 1,100 – 6,300 Local: 100 – 700	Local: 100 – 700
Right-of-Way Widths	Principal Arterial- 120' Minor Arterial- 100' Minimum- 80'	Principal Arterial- 120' Minor Arterial- 100' Minimum- 80'	Minor Arterial- 100' Collector- 80' Minimum- 60'	Principal Arterial- 80' Minor Arterial- 80' Collector- 70' Local/Minimum- 60'	Collector- 60' Predominant/Functional- 50' Minimum- 50'	Ideal- 60' Predominant/Functional- 50' Minimum- 40' (Alleyways)
Access Control	Principal Arterial- Partial/Full Control Other- By Permit	Principal Arterial- Partial/Full Control Other- By Permit	By Permit	Principal Arterial- Partial/Full Control Other- By Permit	By Permit	By Permit
Vehicle Zone Design						
Number of Lanes	3 – 5	3- 5	2 - 4	2 - 3	2 - 3	1 - 2
Lane / Pavement Width	11 – 12' Principal Arterial	11 – 12' Principal Arterial 10' - 11'	10 - 11'	11 – 12' Principal Arterial 10' Other Functional Class (36' min. F-F with on-street parking)	10' Other Functional Class (28' min. F-F with on-street parking)	10' (28' min. F-F with on-street parking)
Divided/Undivided	Principal Arterials: Either Other: Undivided	Principal Arterials: Either Other: Undivided	Undivided	Principal Arterials: Either Other: Undivided	Undivided	Undivided
Design Speed (mph)	30+	30+	25+	20—25	25	15—25
Traffic calming	Raised / landscaped / striped medians	Raised / landscaped / striped medians Roundabouts	Raised / landscaped / striped medians Roundabouts	Traffic circles	Traffic circles	Mini-traffic circle
Pedestrian Zone Design						
Buffer / Furnishings Zone	4' - 12' Grass / trees / landscaping / Street lights / signage Bus shelters / bus stops	4' - 12' Grass / trees / landscaping / Street lights / signage Bus stops	4' - 6' Grass / trees / landscaping / Street lights / signage Bus stops	2' - 6' Grass / trees / landscaping / Street lights / signage Bus stops	2' - 4' Grass / trees / landscaping / Street lights / signage Bus stops	2' - 4' Grass / trees / landscaping / Street lights / signage
Pedestrian Through Zone	5' - 8'	5' - 8'	5' - 8'	5' - 8'	5' - 6'	5' - 6'
Frontage Zone						
Pedestrian Crossing Typical Treatments	Marked crosswalks Signalized crosswalks Pedestrian refuge areas	Marked crosswalks Signalized crosswalks Pedestrian refuge areas	Marked crosswalks Signalized crosswalks Pedestrian refuge areas Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions
Bicycle Zone Design						
Bicycle Zone	Barrier-separated bike lane 5' - 12' Shared Use Path (SUP) ≥ 8'	Barrier-separated bike lane 5' - 12' Shared Use Path (SUP) ≥ 8'	Buffered bike lane 5' - 8' Bike lane 5' - 6' Sharrows Bike boulevard Shared Use Path (SUP) ≥ 8'	Buffered bike lane 5' - 8' Bike lane 5' - 6' Sharrows Shared Use Path (SUP) ≥ 8'	Bike lane 5' - 6' Bike boulevard Sharrows Shared Use Path (SUP) ≥ 8'	Bike lane 5' - 6' Bike boulevard Sharrows
Parking / Parking Access	On-street parking allowed	On-street parking allowed	On-street parking allowed	On-street parking allowed	On-street parking allowed	On-street parking allowed

» Notes:

1. The Pavement Section for each roadway classification shall be determined by the proposed use and soil conditions. Pavements must be structurally designed to accommodate the current and predicted traffic needs and be based on a 20-year projection of the anticipated traffic loading.
2. Special accommodations on truck and/or transit routes should be considered.
3. Roadways on the National Highway System (NHS) may be required to have 12' lanes.

CHAPTER 5: THOROUGHFARE PLAN WITH CONTEXT SENSITIVE CLASSIFICATIONS

Industrial Street Design Guidelines

	Parkway	Boulevard	Avenue	Main Street	Neighborhood Connector	Street
AADT	Principal Arterial: 7,000 -27,000 Minor Arterial: 3,000- 14,000	Principal Arterial: 7,000 -27,000 Minor Arterial: 3,000- 14,000	Minor Arterial: 3,000- 14,000 Collector: 1,100 – 6,300			
Right-of-Way Widths	Principal Arterial- 120' Minor Arterial- 100' Minimum- 80'	Principal Arterial- 120' Minor Arterial- 100' Minimum- 80'	Minor Arterial- 100' Collector- 80' Minimum- 60'			
Access Control	Principal Arterial- Partial/Full Control Other- By Permit	Principal Arterial- Partial/Full Control Other- By Permit	By Permit			
Vehicle Zone Design						
Number of Lanes	3 – 5	3 – 5	2 - 4			
Lane / Pavement Width	11' - 12'	10' - 11'	10 - 11'			
Divided/Undivided	Principal Arterials: Either Other: Undivided	Principal Arterials: Either Other: Undivided	Undivided			
Design Speed (mph)	30+	30+	25+			
Traffic calming	Raised / landscaped / striped median	Raised / landscaped / striped medians				
Pedestrian Zone Design						
Buffer / Furnishings Zone	4' - 8' Grass / trees / landscaping / Street lights / Signage Bus shelters / Bus stops	4' - 8' Grass / trees / landscaping / Street lights / Signage Bus shelters / Bus stops	4' - 8' Grass / trees / landscaping / Street lights / Signage Bus shelters / Bus stops			
Pedestrian Through Zone	5' - 8'	5' - 8'	5' - 8'			
Frontage Zone						
Pedestrian Crossing	Marked crosswalks Signalized crosswalks Pedestrian refuge areas Mid-block signalized crosswalks	Marked crosswalks Signalized crosswalks Pedestrian refuge areas Mid-block signalized crosswalks	Marked crosswalks Signalized crosswalks Pedestrian refuge areas Mid-block signalized crosswalks			
Bicycle Zone Design						
Bicycle Zone	Barrier-separated bike lane 5' - 12' Buffered bike lane 5' - 8' SUP ≥ 8'	Barrier-separated bike lane 5' - 12' Buffered bike lane 5' - 8' SUP ≥ 8'	Barrier-separated bike lane 5' - 12' Buffered bike lane 5' - 8' SUP ≥ 8'			
Parking / Parking Access	No on-street parking Minimal curb cuts	No on-street parking Minimal curb cuts	No on-street parking			

» Notes:

1. The Pavement Section for each roadway classification shall be determined by the proposed use and soil conditions. Pavements must be structurally designed to accommodate the current and predicted traffic needs and be based on a 20-year projection of the anticipated traffic loading.
2. Special accommodations on truck and/or transit routes should be considered.
3. Roadways on the National Highway System (NHS) may be required to have 12' lanes.

Downtown Street Design Guidelines

	Parkway	Boulevard	Avenue	Main Street	Neighborhood Connector	Street
AADT				Minor Arterial: 3,000- 14,000 Collector: 1,100 – 6,300	Collector: 1,100 – 6,300 Local: 100 – 700	Local: 100 – 700
Right-of-Way Widths				Minor Arterial- 80' Collector- 70' Local/Minimum- 60'	Collector- 60' Predominant/Functional- 50' Minimum- 50'	Ideal- 60' Predominant/Functional- 50' Minimum- 40' (Alleyways)
Access Control				Principal Arterial- Partial/Full Control Other- By Permit	By Permit	By Permit
Vehicle Zone Design						
Number of Lanes				2 - 3	2 - 3	2
Lane / Pavement Width				11 – 12' Principal Arterial 10' Other Functional Class (36' min. F-F with on-street parking)	10' Other Functional Class (28' min. F-F with on-street parking)	10' (28' min. F-F with on-street parking)
Divided/Undivided				Principal Arterials: Either Other: Undivided	Undivided	Undivided
Design Speed (mph)				20—25	25	15—25
Traffic calming				Textured pavement (low impact) Traffic circles	Traffic circles	Speed bumps Mini-traffic circle
Pedestrian Zone Design						
Buffer / Furnishings Zone				4' - 6' Grass / trees / landscaping / Street lights / Signage / Bike racks Bus shelters / Bus stops	4' - 6' Grass / trees / landscaping / Street lights / Signage / Bus stops	4' - 6' Grass / trees / landscaping / Street lights / Signage
Pedestrian Through Zone				6' - 12'	6' - 8'	6' - 8'
Frontage Zone				4' - 12' Planters / landscaping Portable Outdoor seating Portable Café seating Portable signage	2' - 6' Planters / landscaping Portable Outdoor seating Portable signage	2' - 6' Planters / landscaping Portable Outdoor seating Portable signage
Pedestrian Crossing				Marked crosswalks Signalized crosswalks Mid-block signalized crosswalks Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions
Bicycle Zone Design						
Bicycle Zone				Buffered bike lane 5' - 8' Bike lane 5' - 6' Sharrows	Buffered bike lane 5' - 8' Bike lane 5' - 6' Bike boulevard Sharrows	Bike lane 5' - 6' Bike boulevard Sharrows
Parking / Parking Access				On-street parking allowed Rear / alley-access surface lots Shared access Minimal curb cuts	On-street parking allowed Rear / alley-access surface lots	On-street parking allowed

» Notes:

1. The Pavement Section for each roadway classification shall be determined by the proposed use and soil conditions. Pavements must be structurally designed to accommodate the current and predicted traffic needs and be based on a 20-year projection of the anticipated traffic loading.
2. Special accommodations on truck and/or transit routes should be considered.
3. Roadways on the National Highway System (NHS) may be required to have 12' lanes.