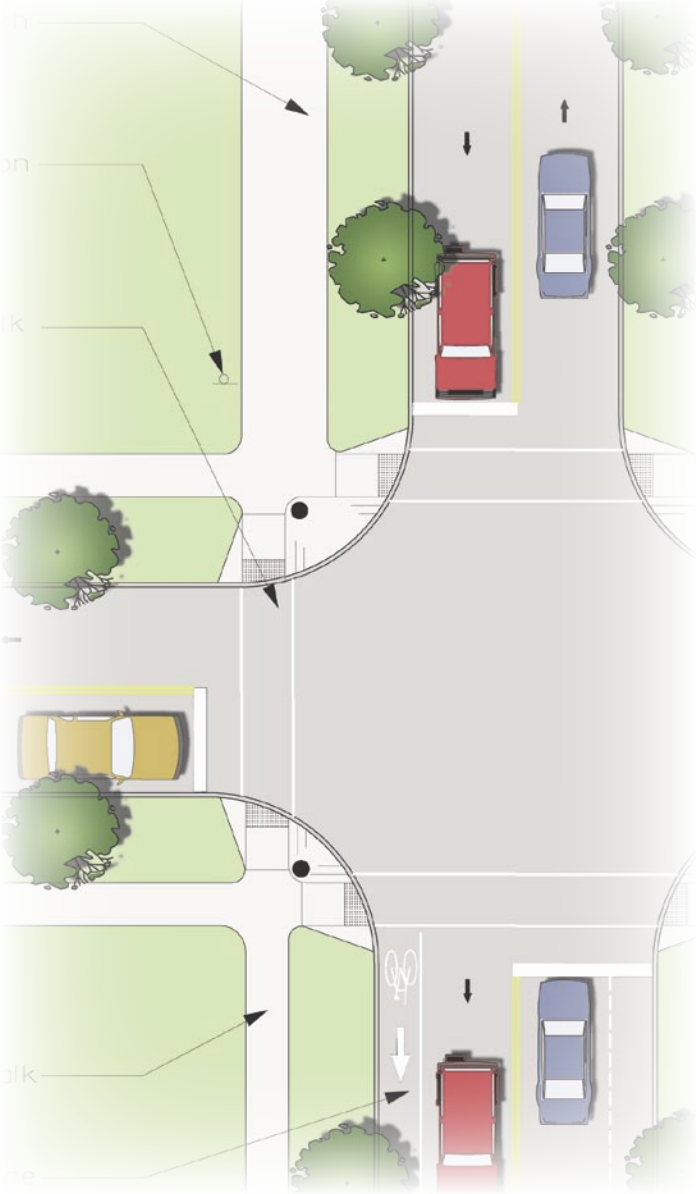
METRO Louisville

Complete Streets Manual



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Chapter 1: Purpose and Applicability

Complete Streets Policy

Louisville Metro's transportation system shall accommodate and balance a broad range of factors within all transportation and development projects, both new and retrofit, including design, planning, maintenance, and operations, for the entire right of way. The goal of this policy is to develop a multi-modal network that manages the demand for travel and improves the efficiency of the community's transportation system as envisioned in Cornerstone 2020. This policy ensures that the following objectives are achieved in future transportation projects:

1. Bicycle and pedestrian ways shall be established in new construction and reconstruction projects unless one or more of three conditions are met:
   - bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accomodate bicyclists and pedestrians elsewhere within the right of way or within the same transportation corridor.
   - the cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project. This twenty percent figure should be used in an advisory rather than an absolute sense.
   - where the street has severe topographic or natural resource constraints.
2. In rural areas, shoulders should be included in all new construction and reconstruction roadway projects unless the addition of shoulders is constrained by existing topographic and/or natural features. Shoulders have safety and operational advantages for all road users in addition to the potential future use as facilities for bicyclists and pedestrians as rural roads develop.
3. Sidewalks, shared-use paths, street crossings (including over- and undercrossings), pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated, and maintainted so that all pedestrians, including people with disabilities, can travel safely and independently.
4. The design and development of the transportation infrastructure shall be designed to be sensitive to its context and character of the built or natural environment.
5. The design and construction of new facilities that meet the criteria in item 1 above should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements. For example, a bridge that is likely to remain in place for 50 years might be built with sufficient width for safe bicycle and pedestrian use in anticipation that facilities will be available at either end of the bridge even if that is not currently the case.
6. The design and construction of new transportation infrastructure shall address the need for bicyclists and pedestrians to cross corridors as well as travel along them. Even where bicyclists and pedestrians may not commonly use a particular travel corridor that is being improved or constructed, they will likely need to be able

A Complete Street serves all transportation users

This Manual furthers Cornerstone 2020 Community Form Objectives C2.5, D2.4, E2.4, F2.4, G2.4, H2.1, H2.4, H2.5, J2.1, and J4.1, and H2.5; Mobility Objectives A3.1, D1.2, D1.3, E1.1, E1.2, H1.5, H2.2, H2.5, H2.6, H3.1, I2.1, and I3.1, and; Plan Element Policies 3.1, 3.12, 6.2, 8.4, 8.12, 9.1, and 9.2

Improved streets originally included all forms of transportation
Source: Photographic Archives, Ekstrom Library, University of Louisville

to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges shall accomodate bicyclists and pedestrians in a manner that is safe, accessible, and convenient.
7. New transportation and reconstruction projects shall adhere to design criteria identified within the Complete Streets Manual.

Purpose

Streets are an integral component of the Louisville Metro landscape. They play a vital role in both the social and economic health of this community by linking people, goods and services. The purpose of the Louisville Metro Complete Streets Manual (referred to as the Manual in the rest of the document) is to establish procedural and technical guidelines for developing a thoroughfare system that provides for safe and effective access to all users in a context-appropriate manner.

Louisville Metro first made a commitment toward a "complete streets" policy with the adoption of Cornerstone 2020, the community's comprehensive plan for growth and development. This Manual advances objectives and policies of both the Mobility and Community Form goals by addressing streetscape design in context with the existing character of the community. Furthermore, chapter 6 of this document serves as the Streetscape Design Manual referenced in Chapter 10, Part 6 of the Louisville Metro Land Development Code (LDC).

Louisville Metro's commitment to a "complete streets" policy is intended to promote the design of transportation corridors that are safe and convenient for pedestrians, bicyclists, motorists, and bus riders of all ages and abilities. The Manual will serve as a guide for Louisville Metro residents, interest groups, policy-makers, developers, designers, and agency staff to improve the function and character of our roads and roadway corridors.

Background

It was the growing popularity of the bicycle, not the automobile, that initially heightened interest in road development in this country. The Office of Road Inquiry was established in the early 1890's to promote the development of rural roads to serve wagons, coaches, and bicycles. (About.com, "How the Wheels Got Turning, a Historical Perspective on American Roads.")

With the introduction of the Model-T in 1908, the automobile quickly claimed supremacy of the road, changing the form and function of the street and its surrounding landscape or 'streetscape'. The desire to move vehicular traffic as efficiently and effectively as possible has dominated the design of streets and streetscapes for nearly a century.

For many Louisvillians, transit is their primary means of travel

A new trend in design of transportation corridors has emerged in response to a changing culture that is demanding more transportation choices. The emphasis on active lifestyles, energy conservation, and the importance of accommodating users of all ages and abilities illustrates that a streetscape will no longer be designed just for the automobile. Many communities, including Louisville Metro, are implementing variations of a "complete streets" policy.

Local Perspective

There is a demonstrated need for more modal choices and accessible roadways within this community. In 2005, 30.5% of Jefferson County's residents did not have a motor vehicle license (KY State Data Center). One can assume that these residents are using some other form of transportation to get to their destinations. According to Transit Authority of River City (TARC) statistics, 60% of Louisville Metro's transit riders are fully dependent on public transit. Demand for a system, accessible to all users that gives Louisville Metro residents more options to meet their travel needs, is evident.

Well designed streetscapes also contribute to an increased quality of life, which includes a more active lifestyle. In 2005, Metro Louisville Mayor, Jerry Abramson launched the Healthy Hometown Initiative. This initiative called for new strategies to increase access to and availability of opportunities for active living and to eliminate design and policy barriers that reduce choices for active living.

Applicability

The guidelines contained in this Manual shall apply to every development site adjacent to an existing or proposed public or private roadway. For the purpose of this Manual, a public roadway is defined as a road, thoroughfare, alley, highway, or bridge under the jurisdiction of a public agency. Private roadways would include a road, thoroughfare, alley, or bridge within an access easement that is privately owned and maintained.

All design guidelines should be implemented in accordance with the regulatory requirements contained in the Louisville Metro LDC and any neighborhood or small area plan, corridor study, or similar planning study adopted by the Planning Commission and/or the applicable legislative body.

The complete street design guidelines shall be applied to both new and retrofit transportation projects, including design, planning, maintenance, and operations, for the entire right of way. Complete street design guidelines shall include:

- adequate Right-of-Way for future bike lanes on road corridors where vehicular design speed and average daily trip (ADT) volumes warrant
- adequate Right-Of-Way or easements for multi-use trails and/or sidewalks
- easements for shared access and/or crossover access between lots for future or current connections
- easements for transit facilities, street lighting, benches, or similar facilities
- landscape areas

In addition to land area requirements, site specific

Bike racks are being designed by artists to reinvigorate downtown while supplying on-street bike parking

complete street design guidelines may include the installation and maintenance of the following streetscape features:

- Streetscape plantings
- Streetscape furnishings (e.g., benches)
- Bike racks/lockers
- Sidewalks and shared-use trails
- Transit stops/shelters
- Street lights

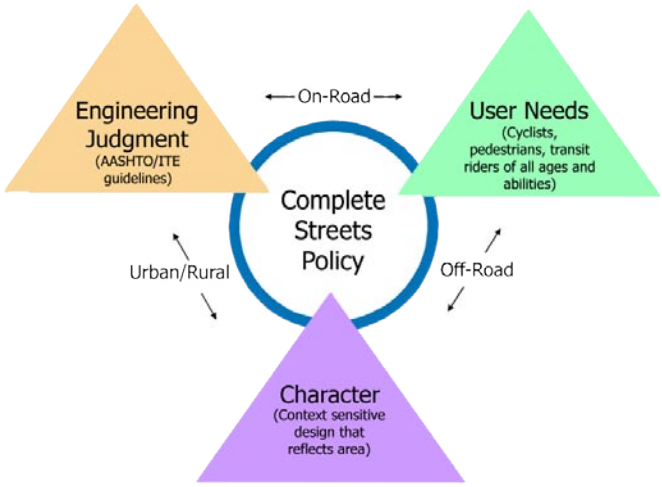
Review and Approval

New and retrofit street projects shall be reviewed for compliance with the Louisville Metro Complete Streets policy under the perview of the Department of Public Works and Assets. For retrofit projects, design flexibility shall be permitted based on existing constraints such as limited right-of-way, existing development patterns, context, topography, etc.

Chapter 2: Design Framework

Roadway and Roadside

A "complete street" is made up of two distinct areas—the roadway and the roadside. The Roadway is measured from the face of curb or pavement edge to the opposite curb or pavement edge. The Roadside includes the land area from the face of curb or pavement edge to the face of the adjacent building or structure (see figure below). The roadside typically includes a portion of the legal boundary of the road (in the form of Right-of-Way or access easement) and a portion of private property that adjoins the roadway. This Manual provides design guidelines relating to all activities occurring within a complete street.

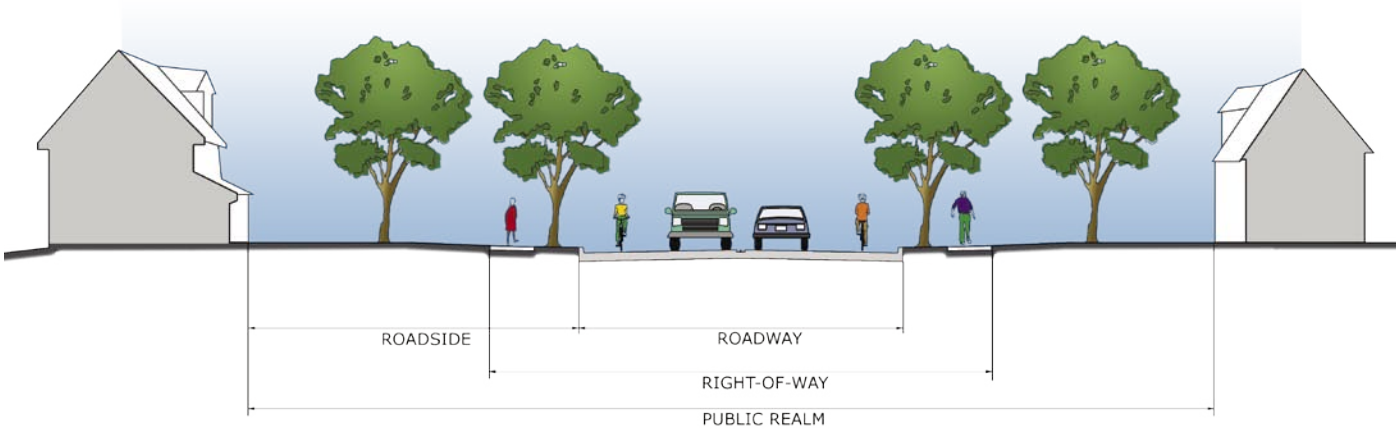


Relationship of Engineering, Character and Users

Relational Elements

Complete street design is both an art and a science. As such, good design standards balance sound engineering judgment and user needs within the context or character of the environment (see figure right). These three influences and the ways in which they relate serve as the design framework for the guidelines contained in this Manual.

Roadway design must clearly rely on the design professionals' knowledge and understanding of the elements associated with it. Travel speeds, volumes, horizontal/vertical alignments, and sight lines are a part of the complex variables that must be considered in roadway design. Engineering judgment is supported



Local Level Complete Street Illustration

by a significant body of resources including the U.S. Transportation Federal Highway Administration's (FHWA) standards and guidelines, American Association of State Highway and Transportation Officials (AASHTO) guidelines, and documents by the Institute of Transportation Engineers (ITE). The practices followed include the roadway classifications used by the Kentucky Transportation Cabinet (KYTC), Kentuckiana Regional Planning and Development Agency (KIPDA), and Louisville Metro LDC standards. This Manual should only be considered in conjunction with these existing standards and guidelines.

User needs are the second influence to be considered in the design of a "Complete Street." Many of the facilities contained within the right-of-way are uniquely associated with motorists, pedestrians, transit riders, and cyclists of varying ages and abilities. Chapter 3 describes in greater detail the characteristics of each user group and the facilities associated with each.

Character, the physical context in which the street resides, is the third influence to consider in good Complete Street design. Character influences the form and function of the roadway and its associated streetscape. In Louisville Metro, character is defined by Cornerstone 2020 and the designation of Form Districts — 11 distinct patterns of development that are applied county-wide. For the purpose of this Manual, these 11 Form Districts have been grouped into four general categories or Character Classes: Downtown, Traditional, Suburban, and Rural (see figure below).

A comprehensive design approach is necessary when developing a functional and aesthetically pleasing

A fully developed Downtown Character Class Roadside

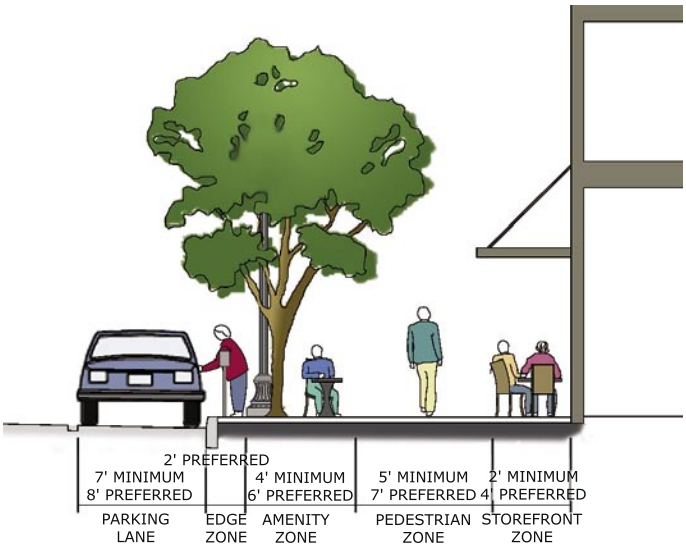
roadway and roadside. To design a complete street, there must be an understanding of the three relational elements and how they influence a transportation corridor. For instance, the inner-relationship between engineering judgment and user needs is most prevalent when considering on-road facility design guidelines. Off-road facility guidelines, however, tend to be based more on user needs and roadway character. Engineering judgment, user needs, and character overlap and intersect in varying ways with on-road facilities (such as a bike lane), off-road facilities in the right-of-way (such as a sidewalk), and the nature of the roadway (urban or rural cross-sections).

Character Classes (Form District Groupings)			
Downtown	**Traditional**	**Suburban**	**Rural**
• Downtown Form District	• Traditional Neighborhood • Traditional Marketplace Corridor • Traditional Workplace • Village Center • Town Center	• Neighborhood • Suburban Marketplace Corridor • Suburban Workplace • Regional Marketplace Center • Village Outlying • Campus	• Village Outlying

Roadside Components by Character Class

In addition to the relational elements, the roadside can be described by the activities that fall within it. These activities can be broken into four basic zones: the Edge Zone, the Amenity Zone, the Pedestrian Zone, and the Storefront Zone (see example on the right).

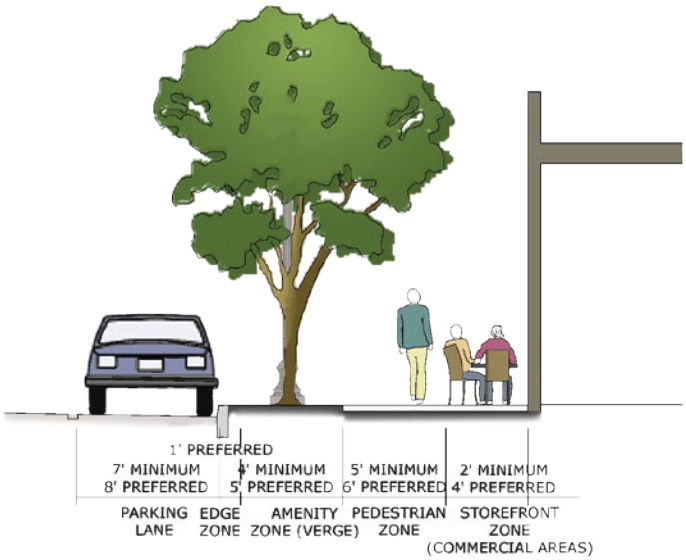
The Edge Zone is located adjacent to the road pavement and includes the curb but not the verge (the landscape area that separates the sidewalk from the street). The Amenity Zone is located between the Edge Zone and the Pedestrian Zone. It includes the verge, if applicable, and the portion of the sidewalk used for street furnishings. The Pedestrian Zone is located between the Amenity Zone and Storefront Zone and allows for the unobstructed passage of pedestrians with a preferred width of seven feet and a minimum width of five feet. The Storefront Zone, located between the Pedestrian Zone and the building façade, has a preferred width of four feet and a minimum width of two feet to accommodate window viewing, outdoor displays, and permits door swing movements. It also allows for restaurant seating or other uses with outdoor spaces.



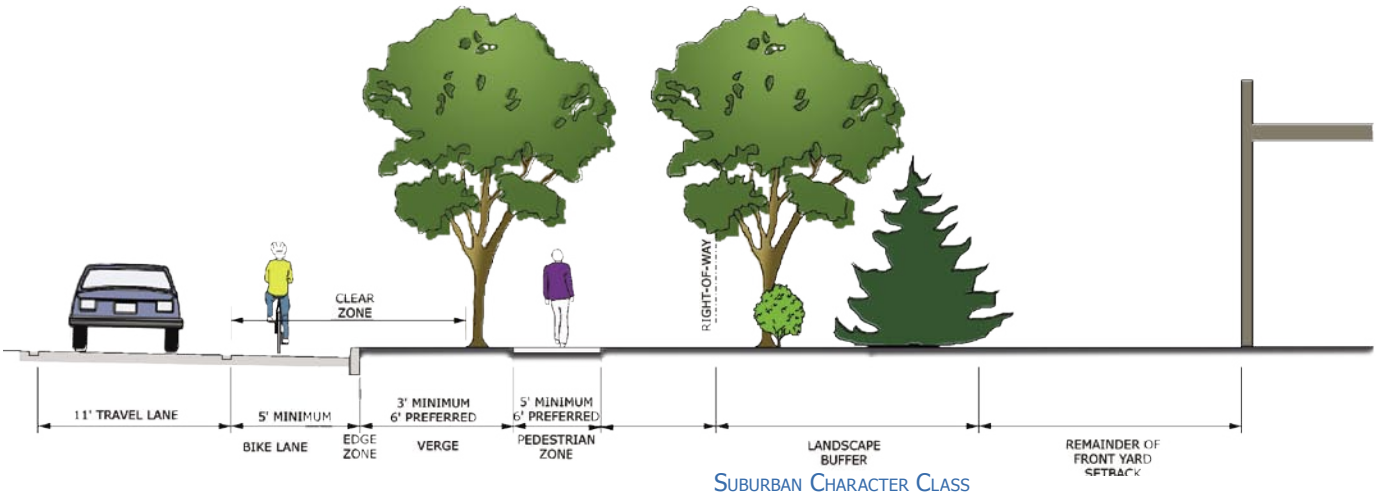
Downtown Character Class

The Downtown Character Class roadside has all four activity zones clearly defined. The Edge Zone contains parking meters where there is on-street parking and may include a concrete strip for pedestrians exiting vehicles. The Amenity Zone contains many of the streetscape elements that help define the downtown including street trees, seating areas, and light poles. This is also the appropriate area to locate trash receptacles, mail boxes, newspaper corrals, bicycle racks, and other furnishings. The Pedestrian Zone is the travel area of the sidewalk.

The nature of the Traditional Character Class roadside utilizes a smaller Edge Zone primarily for curbs. The Amenity Zone accommodates tree planting, lighting, and overhead utilities. The Amenity Zone may be paved, but typically becomes a verge as the corridor extends beyond the downtown. The Pedestrian Zone may include a slightly narrower sidewalk than in the downtown, but shall maintain a 5 foot width clear of obstructions. Non-residential areas within the Traditional roadside may continue to have a paved Storefront Zone; in residential areas this becomes a vegetated front yard.

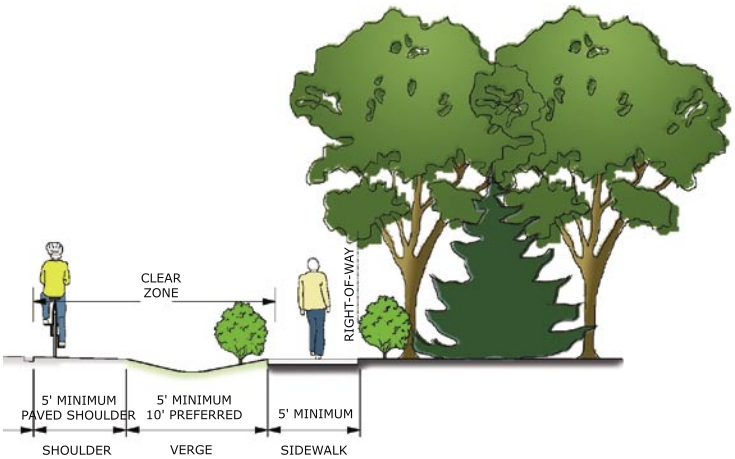


Traditional Character Class



Suburban Character Class

The Suburban Character Class roadside Edge Zone is primarily a curbed area and may include mail boxes. The Amenity Zone is a verge that may contain occasional street furnishings, including benches and TARC shelters. The Pedestrian Zone contains a five foot sidewalk. The Storefront Zone no longer applies because setbacks from the street dictate a greater separation between the street and the buildings.



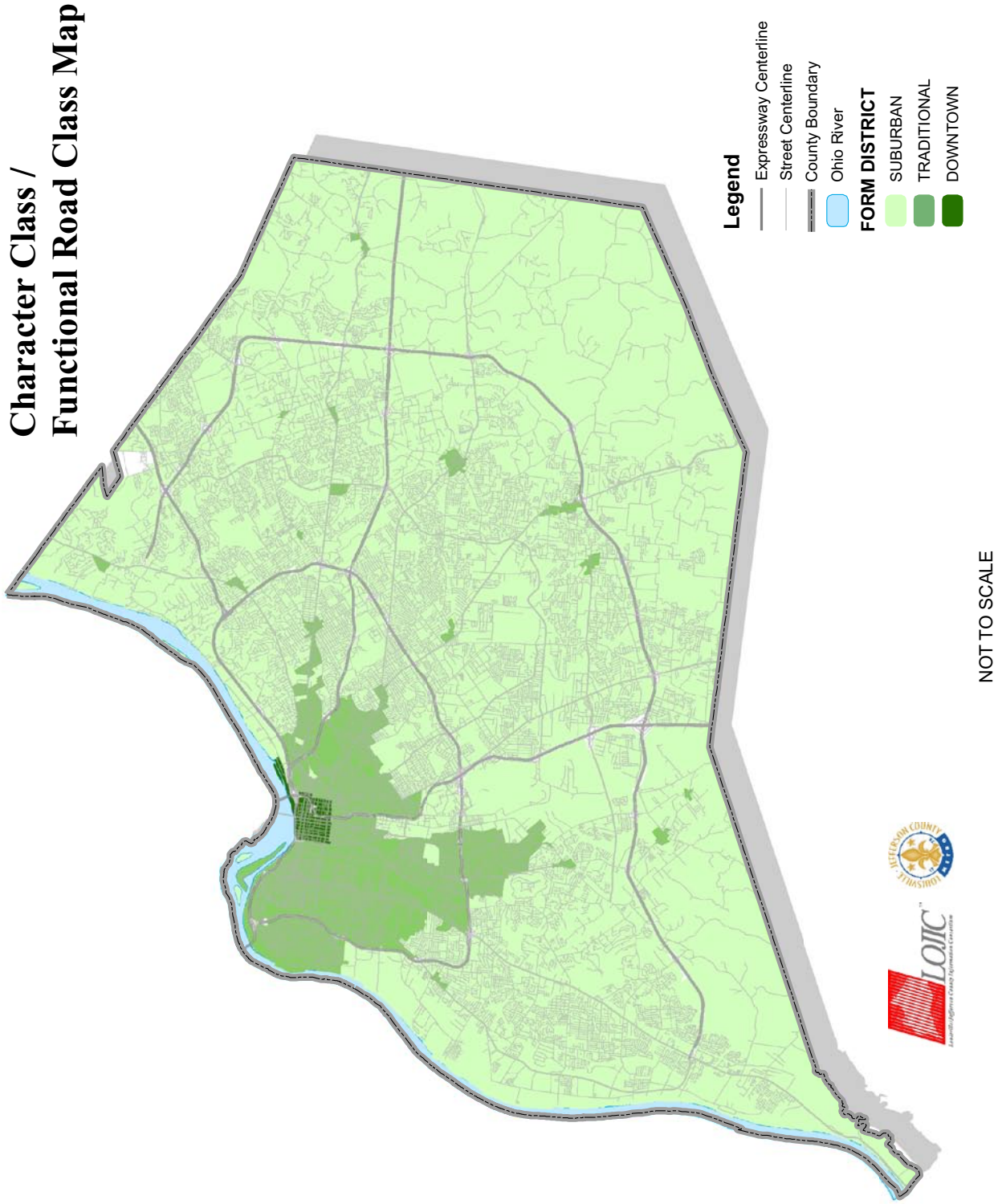
Rural Character Class

The Rural Character Class roadside has an Edge Zone that contains a shoulder rather than a curb and may include mailboxes. The Amenity Zone is a verge. On occasion, there may be a Pedestrian Zone with a sidewalk or a multi-use path, though these facilities may or may not be located in conjunction with the street.

The Character Classes and Functional Roadway Classes for Louisville Metro are illustrated by the map on page 9. The Rural Character Class can not be mapped, however, because there are no areas "officially" designated as such nor have there been any Form Districts classified as rural.

Example of Rural Character Class

Rural character areas have been partially identified in the context of various neighborhood, corridor, and small area plans such as the Wolf Pen Branch, Eastwood, Fairdale, and Tyler Rural Settlement District Neighborhood Plans; The Master Plan of Jefferson Memorial Forest; and Site Development Plan for Riverside, The Farnsley-Moreman Landing. In order to plan for appropriate facilities such as multi-use paths, there must be a comprehensive effort undertaken to identify areas within Louisville Metro that are intended to be part of a Rural Character Class.


Character Class /
Functional Road Class Map
Legend
Expressway Centerline
Street Centerline
County Boundary
Ohio River
FORM DISTRICT
SUBURBAN
TRADITIONAL
DOWNTOWN
NOT TO SCALE
LOJIC

Functional System	Services Provided
Arterial	Provides the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control.
Collector	Provides a less highly developed level of service at a lower speed for shorter distances by collecting traffic from local roads and connecting them with arterials.
Local	Consists of all roads not defined as arterials or collectors; primarily provides access to land with little or no through movement.

Thoroughfare Typology

Streets and highways are grouped using a classification system established by the Federal Highway Administration based on the function of the road. There are three highway functional classifications: arterial, collector, and local. There is a basic relationship between traffic mobility and land access that differentiates the functional roadway classes (see figure above).

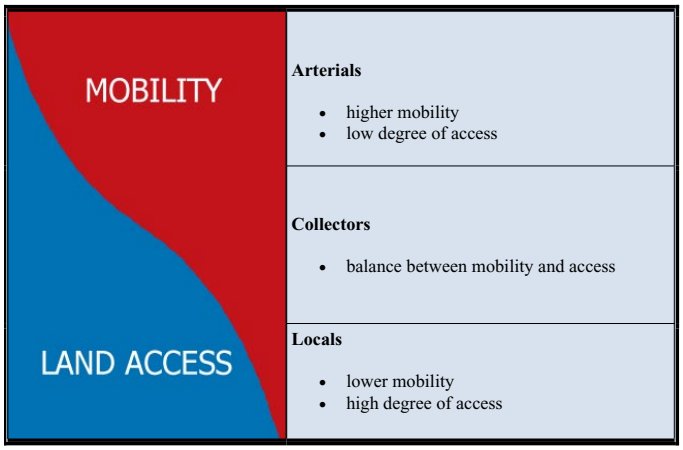
There is an established relationship between the functional classification of a roadway and the design process. The AASHTO Green Book, a nationally recognized resource for roadway design, relates functional class to a range of design criteria based on anticipated volumes and the composition of traffic associated with a given roadway class. These criteria include design speed, horizontal/vertical alignment, and basic roadway cross section information such as lane width, shoulder width, and type and width of the median area (*Flexibility in Highway Design*, FHWA).

The roadway classifications within Jefferson County are broken into additional sub-classes such as major arterials, minor arterials, primary collectors, secondary collectors, local roads, alleys and lanes and specially-classified roadways.

The guidelines contained in this manual have been developed based on a relationship between the Functional Class of the roadway and the Character Class of the roadway.

The design criteria in the following chapters will guide the appropriate facility to match user needs for a specific Functional Class while responding the Character Class for that area.

This context is also added to the roadway's cross-section which may be urban or rural. Urban sections are typically curbed with an underground stormwater drainage system. Rural sections are typically without a curb while having an above-ground roadside stormwater drainage system. These conditions all add to the character of the street and streetscape.



Source: Safety Effectiveness of Highway Design Features, Volume I, Access Control, FHWA, 1992.

Chapter 3: Users and Facilities

Introduction

In order to plan, design, and implement a thoroughfare system that helps promote choice, ensures equitable access to transportation, and reduces societal reliance on a single mode of transportation, we must first understand the user groups and the types of facilities required.

Pedestrians

Kentucky statutes define a pedestrian as "any person afoot or in a wheelchair." [KRS 189.010(8)]. Therefore, any individual at some time during a trip is defined as a pedestrian, whether traveling to their car, bus stop, bicycle, or to a final destination.

Pedestrians as a group represent a broad range of abilities according to AASHTO's *Guide for Planning, Design and Operation of Pedestrian Facilities* (July 2004). However, it distinguishes abilities of individuals based entirely on age. To appropriately plan pedestrian facilities, one must consider that an individual in any age group can have special needs or demands outside the able bodied pedestrian (see figure below).

Planning for pedestrian facilities requires an understanding of the trip itself. Pedestrian trips can be classified according to the context of the trip. The Traffic Institute at Northwestern University indexes trips into three categories: primary, secondary, and terminal trips.

Age	Characteristics
0-4	Learning to walk Restricted peripheral vision, depth perception
5-8	Increasing independence
9-13	Poor judgment Sense of invulnerability
14-18	Improved awareness of traffic environment Poor judgment
19-40	Active, fully aware of traffic environment
41-65	Slowing of reflexes
65+	Mobility restricted Vision and Hearing Loss High fatality rate

Primary trips are those that have a specific intended destination. Activity centers such as shopping districts or office parks create the highest levels of pedestrian activity because they are the destination for many primary trips.

Secondary trips are additional/unplanned trips or deviations from the primary trips. An example of a secondary pedestrian trip might be stopping at the drug store on the way to work.

A terminal trip, the final classification, represents the pedestrian portion of a trip primarily made through the use of another mode of transportation. An example of a terminal trip would be walking to the bus stop. Terminal trips would likely have the greatest impact during peak periods such as the morning or evening rush, lunch hours, or immediately before or after a sporting event.

Facilities

There are a few basic types of pedestrian facilities that act as linkages in a thoroughfare system: sidewalks, paths, shared use paths (multi-use trail), and shoulders. Sidewalks are primarily for pedestrians and are a paved portion of the public frontage. Paths are designed for pedestrians but may attract multiple user types. Paths provide a linkage through a park, greenspace, or rural area and typically match the landscape of the open space. A shared use path is physically separated from motorized vehicular traffic by an open space or barrier and can be located within the highway right-of-way or within an independent right-of-way. Shared use paths attract multiple users such as pedestrians, skaters, joggers, and bicyclists. Shoulders are a paved portion of the roadway to the right of the traveled way and are designed to serve bicyclists, pedestrians, and others.

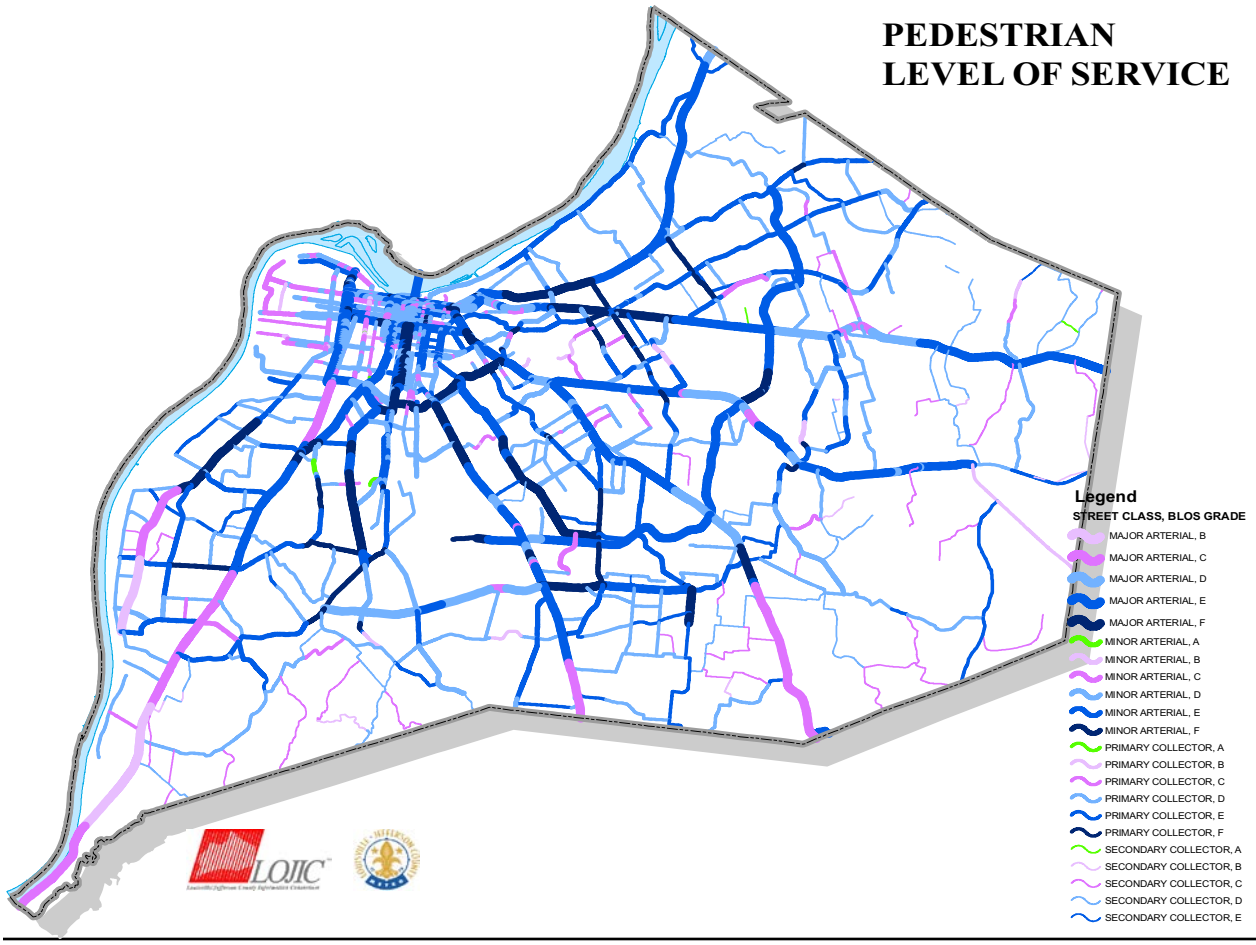
All facilities act as linkages for individuals capable of varying degrees of mobility and should utilize accessible, barrier-free routes that integrate universally accessible amenities. Facilities that are accessible to people with disabilities are generally safer and more user-friendly for all pedestrians.

Policy

A thoroughfare system that creates "Complete Streets" will require facilities that promote safe pedestrian trips for individuals of all ages and abilities. Future public improvements and private developments shall accommodate for universally accessible pedestrian linkages. Government agencies and the private sector will partner to provide pedestrian linkages between densely populated areas and public institutions, activity centers, and transit stops. Integrating universally accessible pedestrian linkages into the transportation infrastructure will be as equally important as providing for motorized transportation.

In July 2002, the Kentucky Transportation Cabinet established a bicycle and pedestrian policy that incorporates pedestrian facilities into road projects. It states, "The Kentucky Transportation Cabinet (KYTC) will consider the incorporation of pedestrian facilities on all new or reconstructed state-maintained roadways in existing and planned urban and suburban areas."

Louisville Metro 'sidewalk in-lieu of' funds shall be used to continue sidewalks from the edge of the existing infrastructure inside of that council district. The goal is to connect the existing sidewalk system together and not leave voids between sections of the pedestrian infrastructure. Priority should be given to connecting schools to neighborhoods, neighborhood commercial to residential areas, and transit facilities to all adjacent land uses. Pedestrian facilities should be adjacent to roadways, but separated from the curb whenever possible using the Amenity Zone with landscaping, a bicycle lane, or on-street parking. A clear vision area should be maintained so pedestrians can see each other and vehicles in the public realm while keeping vegetation from becoming an obstacle or encumbrance.



Bicycles

Bicyclists

Just as there are different skills, ages and types of pedestrians, so are there different types of bicyclists. *Selecting Roadway Design Treatments to Accommodate Bicycles* (FHWA-RD-92-073) outlines the following user categories to assist in the design of facilities: Advanced (A), Basic (B), and Children (C) bicyclists.

Advanced riders include commuters and high-mile enthusiasts. They are comfortable in traffic, have prolific riding skills and know the traffic/safety rules. Basic riders have low-mileage rides that are usually destination based and mostly ride for recreation. They have occasional rides and some knowledge of traffic/safety rules. Children riders are teens and younger. They have occasional short-distance rides and little relative experience with traffic/safety rules. The FHWA recommends that bicycle facilities be designed based on criteria of the Advanced bicyclist or the Basic/Children bicyclists. The average daily traffic (ADT) and the design speed of the roadway determines the best facility for the users. The FHWA guidelines tend to recommend wider outside lanes and shared facilities for Advanced cyclists and the use of shoulders and bike lanes for Basic/Children cyclists as the traffic speed increases. Though it is helpful to consider different kinds of users, not all facilities suit all kinds of bicyclists. For instance, some riders may be more comfortable on the roadway than others. Alternates for facilities may be used for different bicyclists as their skill level and comfort permit.

A commuter is an Advance Bicyclist

A Basic Bicyclist and Child Bicyclist
Source: www.kids-safety-klub.com

Facilities

Bicycle facilities vary throughout the built environment. Variations depend on the engineering judgment of on-road/off-road facilities, available room on existing roadways, and the character class of the area. The facilities include: shoulders, shared lanes, wide curb lanes, bicycle lanes, and shared use paths. Shoulders (SH) are a paved portion of the roadway to the right of

the traveled way designed to serve bicyclists, pedestrians, and others as road design allows. A shared lane (SL) is a "standard width" travel lane that both bicycles and motor vehicles share. A wide curb lane (WC) is an outside travel lane with a width of at least 14 feet to accommodate both bicyclists and motorized vehicles for shared use and is the same term as "wide outside lane." A bicycle lane (BL) is a portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicycles and other non-motorized vehicles. Bike facility on-road accommodation may occur by: reducing the number of motor vehicle lanes; reducing the lane widths; changing the on-street parking; and/or sharing the roadway in the form of shared lanes (SL), wide curb lanes (WC), and shoulders (SH).

A shared use path (SUP) is a path physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. SUPs are the same as multi-use trails and may also be used by pedestrians, skaters, wheel chair users, joggers, and other non-motorized users. Additionally, mass transit can be considered a bicycle facility because all TARC busses have bike racks to allow users to move along all major corridors that connect to one another. It serves as an option for less-experienced users to travel to destinations or facilities where they are more comfortable while traversing busier parts of the city.

The Suitability of Louisville Metro Road for Bicycling and Walking studied the metro area's arterial and collector roadways for bicycle level of service. The findings of the roadways were mapped using LOJIC and shows current suitability, while suggesting planning and possible solutions to existing roadways. The possible solutions include narrowing lanes, reducing the number of lanes, and reconsidering on-street parking if there is not a sufficient need for on-street parking.

Shoulder used as a bike facility

Bike Lane on Spring Street

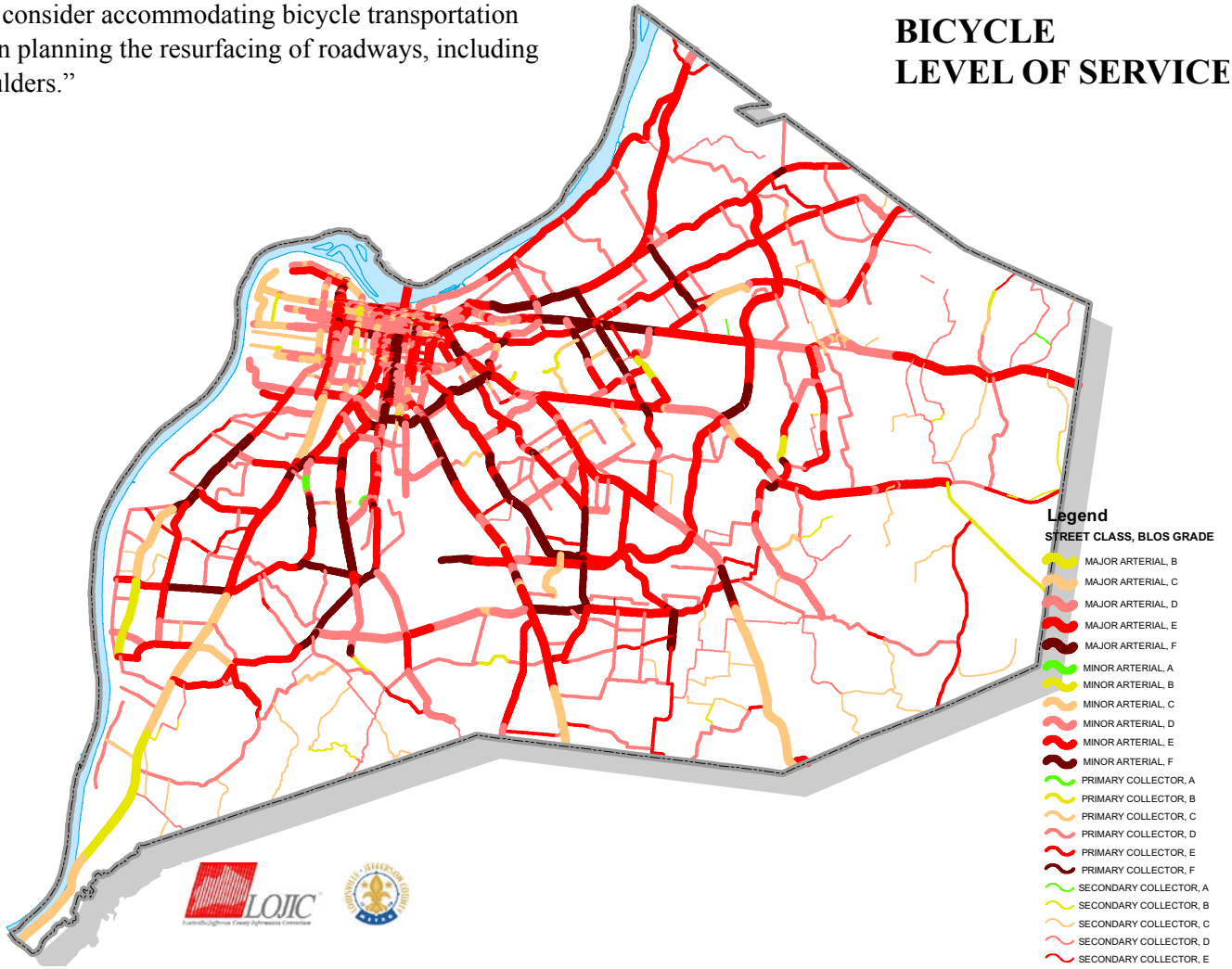
Butchertown Greenway is a Shared Use Path

Policy

Bicycle facilities shall be a part of roadway design and construction along bikeway corridors (refer to Louisville Metro Bike Map). These facilities may include: shoulders shared lanes, wide curb lanes, bicycle lanes, and shared use paths. Bicycle lanes designate a portion of the roadway with preferential use for bicyclists. Bicycles are permitted on all streets (except as prohibited by law such as riding on freeways) as a vehicle per 601 KAR 14:020.Section 9 and KRS 189.010 (19) (a).

The Kentucky Transportation Cabinet created a bicycle and pedestrian policy in July 2002 that incorporates bicycle facilities into road projects. It states, "The Kentucky Transportation Cabinet (KYTC) will consider the accommodation of bicycles on all new or reconstructed state-maintained roadways. KYTC will also consider accommodating bicycle transportation when planning the resurfacing of roadways, including shoulders."

Bike Lane (BL) on Jackson Street



Transit

Public transit provides another transportation alternative for Louisville Metro residents. The American Public Transportation Association defines public transportation as a bus, rail, or other conveyance, either publicly or privately owned, which provides to the public general or special service on a regular and continuing basis. Public Transportation is also known as "mass transportation," "mass transit," and "transit." Transit and its facilities play an important role in Louisville Metro and should be designed to accommodate all people including children, the elderly, and persons with disabilities.

TARC Bus Stop with shelter

Transit Users

Transit riders can be classified as belonging to one of two groups: those who use transit by choice and those who are captive users because they have no other viable option. Riders who elect to use transit are likely do so because of time, cost, convenience, comfort, or environmental concerns. Captive transit riders might be bound to public transportation because of age, disability, income or family circumstances (Beimborn). In Jefferson County, 60% of transit riders have no other viable transportation alternative (Site GoBility by TARC).

TARC Stop with Bike Racks allow for transitions between transportation

TARC near-side transit stop

Facilities

Transit facilities consist of boarding areas, bus pull-off areas, high occupancy vehicle lanes, transit stops, park and ride lots, and transit routes.

Transit routes are a type of transit service that operates as a fixed route along a fixed alignment or path with scheduled times for arrival and departure at terminal points and key intermediate locations. Transit Authority of River City (TARC) provides transit service across Louisville Metro (see route map on page 20).

A transit stop is a location where passengers board and land. Transit stops can serve one or more routes and include various levels of amenities depending on the level of actual or anticipated ridership.

Boarding areas are transit stops that provide a small amount of seating and a covered waiting area to protect from the elements. A shelter or awning with benches is the most common form of boarding area, but more creative designs are allowed locally with approvals by the Planning Director and Executive Director of TARC.

A bus pull-off area is a designated portion of the street where buses can stop to drop off and pick up passengers.

High occupancy vehicle lanes are designated lanes of a roadway that have been reserved for carpools, van pools, and busses.

A park and ride lot is a service that offers transit riders a place to park their car, and then transfer to a bus to complete their journey. Park-n-Tarc is the name given to local park and ride facilities.

Mass transit can also be considered a bicycle facility. All TARC buses are equipped with bike racks that allow cyclists to board. This provides an option for less experienced riders to travel to destinations or facilities by bus rather than traversing busier parts of the city on their bikes, or as an option for traversing longer distances.

Policy

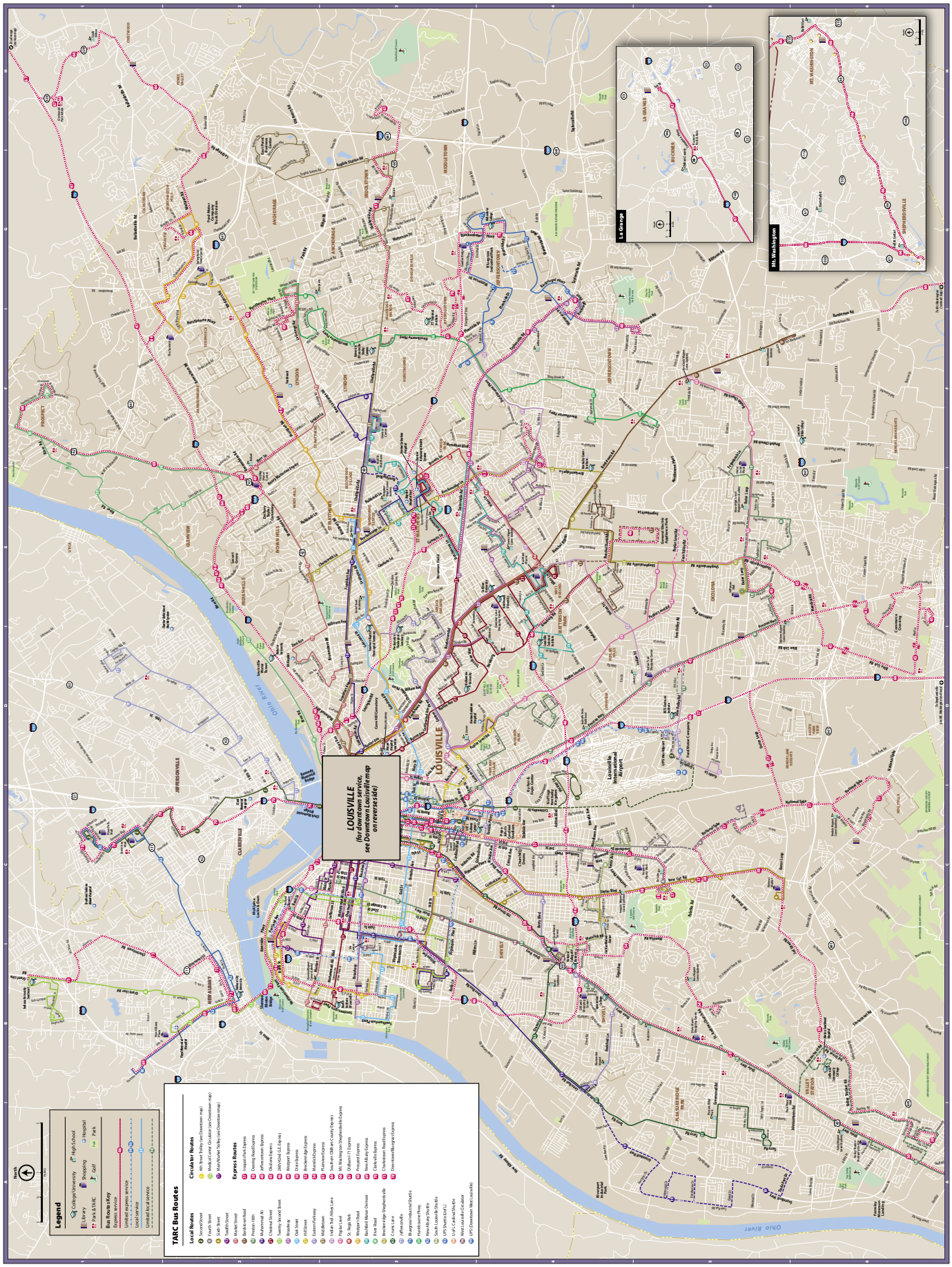
Transit facilities will be a part of all future roadway improvements and private developments. Transit facilities should accommodate people of all abilities including children, the elderly, and persons with disabilities.

Bus Stops should connect pedestrians from the street to the adjacent land uses

Bus Shelters can be designed with character

Bus Pull-off
Source: www.pedbikeimages.org
Dan Burden

Dedicated Bus Lane
Source: http://members.optushome.com.au/clanmclaren/ride _ to _ work.htm
Allister Mclaren


LOUISVILLE
(for downtown service, see Downtown Louisville map on reverse side)
La Grange
Mt. Washington
Legend
Bus Routes Key
TARC Bus Routes
Local Routes
Express Routes
Ohio River

Motorists

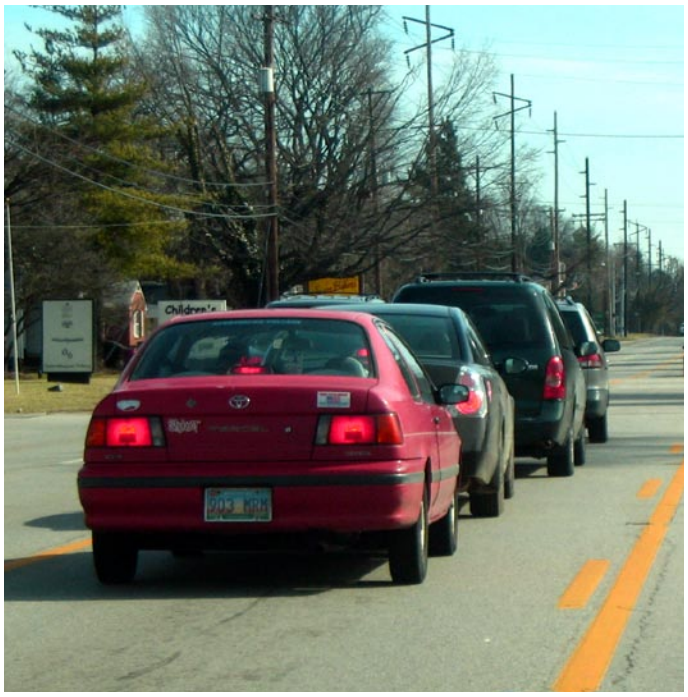
Motorists can generally be divided into three groups which would include personal vehicles, commercial drivers, and busses. Personal vehicles include a wide range of vehicle types from small compact cars to large trucks and sport utility vehicles. [Commercial drivers include semi-trucks as well as delivery vans and box trucks. Bus users include public transportation, schools, and private travel companies.] The volume of each group should be considered in the geometric design of the roadway including the lanes provided and on-road facilities such as parallel parking and bike lanes.

Facilities

Motorist facilities consist of the roadway lanes, and on-road facilities such as on-street parking. The lane widths and configuration are designed by analyzing several factors including the context of the surrounding environment, available right-of-way width, topographic constraints, volume of different users, and the mix of users on the road.

Cornerstone 2020 and the Land Development Code have designated the roadway classification for roadways in Jefferson County. Core Graphic 10, Roadway Classification and Projected Corridors, and the LDC divide roadways into six classifications. These are: major arterial, minor arterial, primary collector, secondary collector, local, and alley/lane. Each roadway classification serves a specific function.

Major and minor arterials carry the highest volume of traffic and have the highest rate of speed. They connect major activity centers and neighborhoods. Primary and secondary collectors serve as the collection and distribution system between local roadways and arterial roadways. Collector roadways provide circulation between neighborhoods and other high traffic uses such as employment centers. Collector roadways have moderate speed levels. Local roads, alleys, and lanes provide direct access for individual property owners. They typically have low traffic volumes and low speeds.



Vehicles queued in a center turn lane

Roadways can be further divided by looking at the adjoining form district including rural, suburban, traditional and downtown character districts. Each roadway classification and its surrounding context must be considered in the design of new roadways and when existing roadways are repaired or expanded.

Chapter 4: Facility Design

Introduction

The facility design criteria represented on the following pages is intended as a guideline in the planning and design of new and/or reconstructed streets and streetscape design elements. These guidelines are representative of current best management practices for Complete Streets design and bicycle, pedestrian, and motor vehicle facilities. These guidelines should be considered in conjunction with other national, state, and local guidelines including the *Americans with Disabilities Act Accessibility Guidelines* (ADAAG), the *Manual of Uniform Traffic Control Devices* (MUTCD), the American Association of State Highway Transportation Officials (AASHTO) *Design and Safety of Pedestrian Facilities* and *Design and Safety of Bicycle Facilities*.

Facility Selection and Character Class

The appropriate Complete Street facilities for any given roadway corridor in the Louisville Metro area are dependent on two factors — area character, as established by the Form District(s) and functional classification of the roadway. Specific design characteristics as well as facilities unique to each user group can be associated with any given Thoroughfare Type identified in Chapter 2, "Design Framework."

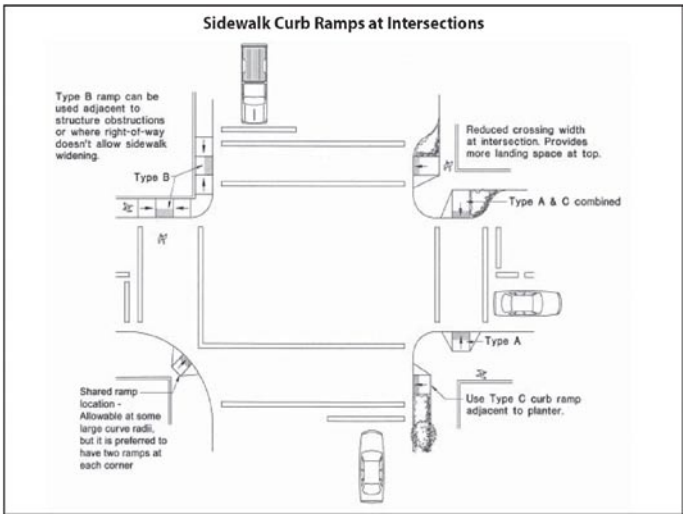
To use this Manual, first determine the appropriate facilities for the thoroughfare type being designed based on the Functional Class/Character Class Matrix found on page 24. Typical cross-sections for each Functional Class/Character Class pair have been developed to show the spatial relationship between the Complete Street facilities associated with each Thoroughfare Type and their preferred dimensions (see Appendix A).

Pedestrian Design Criteria

The *Americans with Disabilities Act Accessibility Guidelines* states:

"Title II of the Americans with Disabilities Act requires public entities that build sidewalks and trails to provide program access to existing facilities and altered facilities to be readily accessible to individuals with disabilities. Title III of the ADA requires places of public accommodation to remove barriers to access when it is readily achievable to do so and to meet the requirements for new construction and alteration in the *ADA Standards for Accessible Design* or UFAS [*Uniform Federal Accessibility Standards*] and employ good design principles to ensure that facilities are accessible to and usable by people with disabilities."

Accessible curb ramps shall be provided at all intersections having curbs or other barriers to entry from a street-level pedestrian walkway or whenever a new street, road, or highway is constructed or altered. Accessible curb ramps shall be provided at all newly constructed or altered pedestrian walkways where they intersect a street, road, or highway. Every effort should be made to use directional curb ramps and ADA detectable warnings shall be used at the end of sidewalks to crossings or road improvements. The warnings should be located at the very edge of the transition from the curb onto the roadway.



Accessible curb design options, Source: Pedestrian & Streetscape Guide, GDOT.

Thoroughfare Typology

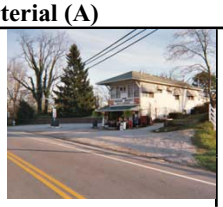
CHARACTER CLASS (FORM DISTRICTS)

Rural (R)	Suburban (S)	Traditional (T)	Downtown (D)

FUNCTIONAL CLASS (ROAD CLASSIFICATIONS)

See Glossary and Appendix A for an explanation of abbreviations

Major Arterial (A)



Rural (R)	Suburban (S)	Traditional (T)	Downtown (D)
Auto AR-1 to AR-3 **Cyclist** SH, SUP, SL, Transit **Pedestrian** SH, SUP, Transit **Transit** Stops	**Auto** AS-1 to AS-12 **Cyclist** SH,BL,SUP, Transit, SL **Pedestrian** Sidewalk, SUP, Transit **Transit** Stops	**Auto** AT-1 to AT-09 **Cyclist** BL, Transit, SL **Pedestrian** Sidewalk, Transit **Transit** Designated Pull-offs Shelters	**Auto** AD-1 to AD-9 **Cyclist** BL, Transit, SL **Pedestrian** Sidewalk, Transit **Transit** Designated Pull-offs Shelters

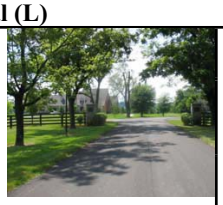
Minor Arterial (A)

Rural (R)	Suburban (S)	Traditional (T)	Downtown (D)
Auto AR-1 to AR-3 **Cyclist** SH, SUP, SL, Transit **Pedestrian** SH, SUP, Transit **Transit** Stops	**Auto** AS-1 to AS-12 **Cyclist** SH, BL, WC, SL SUP, Transit **Pedestrian** Sidewalk, SUP, Transit **Transit** Stops	**Auto** AT-1 to AT-09. **Cyclist** BL, SUP, SL, Transit **Pedestrian** Sidewalk, SUP, Transit **Transit** Designated Pull-offs Shelters	**Auto** AD-1 to AD-9 **Cyclist** BL, Transit, SL **Pedestrian** Sidewalk, Transit **Transit** Designated Pull-offs Shelters

Collector (C)

Rural (R)	Suburban (S)	Traditional (T)	Downtown (D)
Auto CR-1 to CR-4 **Cyclist** SH, SUP,SL, Transit **Pedestrian** SH, SUP, Transit **Transit** Stops	**Auto** CS-1 to CS-12 **Cyclist** SH, BL, SL, WC, SUP, Transit **Pedestrian** Sidewalk, SUP, Transit **Transit** Stops	**Auto** CT-1 to CT-12 **Cyclist** BL, WC, SL, SUP, Transit **Pedestrian** Sidewalk, SUP, Transit **Transit** Stops	**Auto** CD-1 to CD-9 **Cyclist** SL, WC, Transit **Pedestrian** Sidewalk, Transit **Transit** Stops

Local (L)



Rural (R)	Suburban (S)	Traditional (T)	Downtown (D)
Auto LR-1 to LR-2 **Cyclist** SH, SL, SUP, Transit **Pedestrian** SH, SUP, Transit **Transit** Stops	**Auto** LS-1 to LS-2 **Cyclist** SH, SL, SUP, Transit **Pedestrian** Sidewalk **Transit** Stops	**Auto** LT-1 to LT-9 **Cyclist** BL, WC,SL, SUP, Transit **Pedestrian** Sidewalk, SUP **Transit** Stops	**Auto** LD-1 to LD-9 **Cyclist** BL, WC, SL **Pedestrian** Sidewalk **Transit** Stops

Alley/Lane (AL)

Rural (R)	Suburban (S)	Traditional (T)	Downtown (D)
Auto ALS-1 **Cyclist** SL **Pedestrian** SL	**Auto** ALS-1 **Cyclist** SL **Pedestrian** SL	**Auto** ALT-1 to ALT-3 **Cyclist** SL **Pedestrian** SL	**Auto** ALD-1 to ALD-4 **Cyclist** SL, WC **Pedestrian** SL

IMAGE ABOVE FROM THE TRANSECT BY DUANY PLATER-ZYBERK, HTTP://WWW.DPZ.COM/TRANSECT.HTM

Accessible pedestrian signals (APS) shall be considered based on the criteria specified in the Manual of Uniform Traffic Control Devices (MUTCD). When an accessible pedestrian signal is used, it shall include a push button locator tone, a raised arrow oriented in the direction of travel, a speech WALK message, a vibrotactile WALK indication to warn pedestrians before entering the roadway. The push buttons should be a maximum of five feet from the ramp. The locator tone should be variable but five dB louder than the ambient street noise level.

Accessible Pedestrian Signal

Sidewalk widths and crossings

Sidewalks should be continuous and installed with a minimum clear width of five feet (7 ft. desirable) in the pedestrian zone. The width may be reduced to four feet for a length of two feet, if there is insufficient space due to street elements as long as the confining elements are separated by five feet. See the appropriate cross sections for the size specified with a particular Functional and Character Class. Crosswalks shall be used to improve the safety of a pedestrian crossing, especially on multi-lane roads with average daily traffic (ADT) above 10,000. The walking speed used for crossings and signalization shall be three and a half feet per second (following the Draft Guidelines for Accessible Public Rights of Way) with the walk interval being at least seven seconds. Shorter or longer times may be considered when a study and justification are completed. Countdown signals shall be used at high-pedestrian traffic intersections.

Pedestrian refuges may be used at multi-lane intersections or turning lane islands where crossing may take longer than one signal cycle. Pedestrian signals should be coordinated with refuge islands and may need additional push buttons. The refuge islands shall meet ADA Accessibility Guidelines including regulations on slopes, detectable warnings, and crossing from the refuge to the pavement at grade. Railroad crossings also shall have detectable warnings, cross at 90 degrees, and meet slope guidelines at the appropriate pedestrian crossing points as shown in the figure. ADAAG and AASHTO guides provide designers with many tables of information for more specific design of sidewalks including changes in level, grates and gaps, obstacles, and protruding objects. This information shall be followed at all times.

Crosswalk with ADA tactile warnings on ramps

Slopes

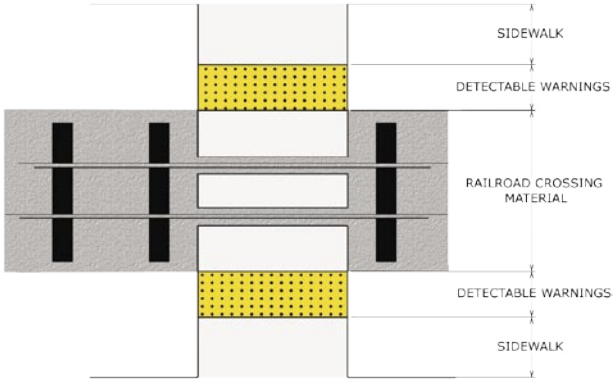
Maximum grades on sidewalks should be five percent where possible. When topography does not allow, the AASHTO Green Book recommends that the running grade of sidewalks be consistent with the running grade of adjacent roadways. ADAAG permits the running grade of the sidewalk to be consistent with the grade of the adjacent roadways but recommends that the minimum feasible slope be used. ADAAG specifies that sidewalks should lie in a continuous plane with a minimum of surface warping. Cross slopes should not exceed 1:50 or two percent.

Median refuge island, Source: http://www.pedbikeimages.org/, ITE Pedestrian Bicycle Council

A Splitter Island that acts as a Refuge Island for pedestrians

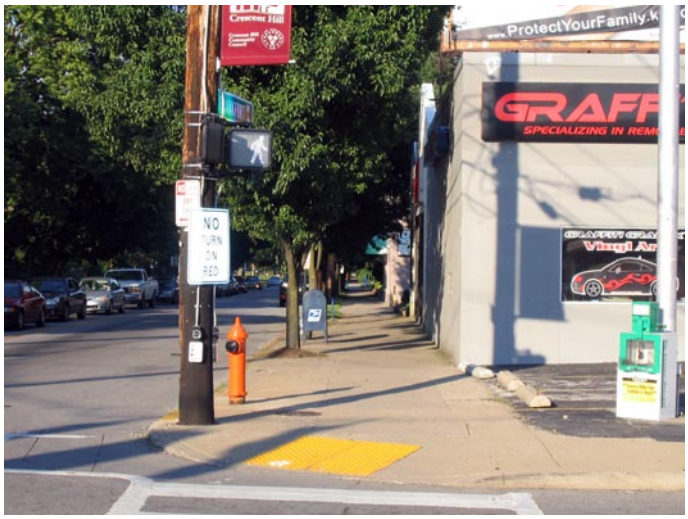
Surfaces

The type of walking surface often determines how difficult an area is to negotiate. ADAAG defines accessible surface characteristics as needing to be firm, stable, and slip-resistant. AASHTO requires sidewalks to have all-weather surfacing. The sidewalk material, such as concrete, should pass through the entrances as continuous material and contrast with the surrounding material for directing visually impaired. The pedestrian sidewalk material shall be strengthened to withstand use by vehicular traffic by increasing thickness and adding reinforcement. Sidewalks should be used along private access easements in Traditional and Suburban classes. Rural class areas may use wider shoulders instead of sidewalks if road classification, traffic volume, and amount of truck use warrants. Otherwise, a shared use path may be a suitable pedestrian facility in less dense areas of the city or used in conjunction with environmental amenities.



Accessible pedestrian railroad crossing

Even if vehicular connectivity is difficult, pedestrian connectivity should always be considered with all new developments and redeveloped land. (These might include: pass-through routes at the end of cul-du-sacs, shared use paths along riparian corridors or MSD easements.)



Accessible surfaces includes detectable warnings where the sidewalk transitions to the asphalt pavement

Shared Use Paths

Shared Use Paths are a shared facility for pedestrians and bicyclists that may or may not be associated along a roadway. The walking surface shall be accessible, firm, stable, and slip-resistant as ADAAG dictates. AASHTO requires it to have all-weather surfacing. The minimum of ten feet shall be used for all shared use paths while 12 feet is a preferred width. The size allows for two-way travel as well as for maintenance vehicles to clean accordingly. The ADAAG and AASHTO guides shall also apply to shared use paths for slopes and cross-slopes

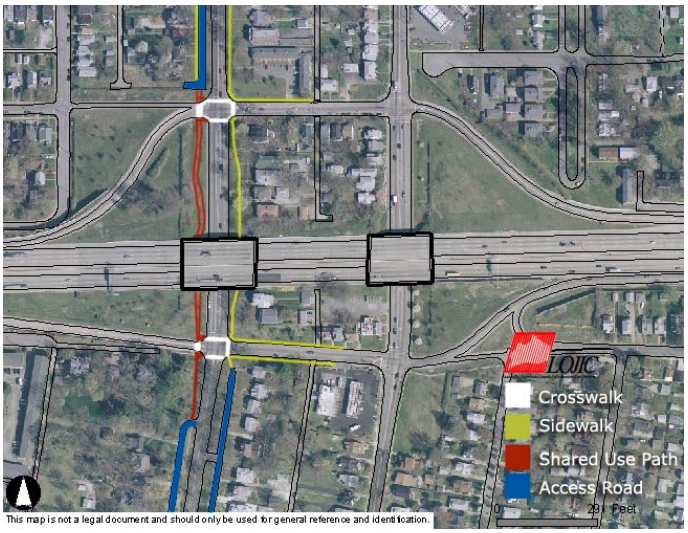
Interchange Crossings

Pedestrians and bicyclists should have facilities that allow them to transverse an interchange. Due to the confined space under interchanges, the bicycle facilities should become shared use paths prior to crossing the ramps. Ideally, the ramps would be signalized and allow for bicycle and pedestrian crossing and access along the roadway under the interchange. Then after the crossings have occurred, the bicycle facility can continue in its original form. All design decisions concerning crossings must be approved by both State and Federal officials due to their jurisdiction of the roadways.

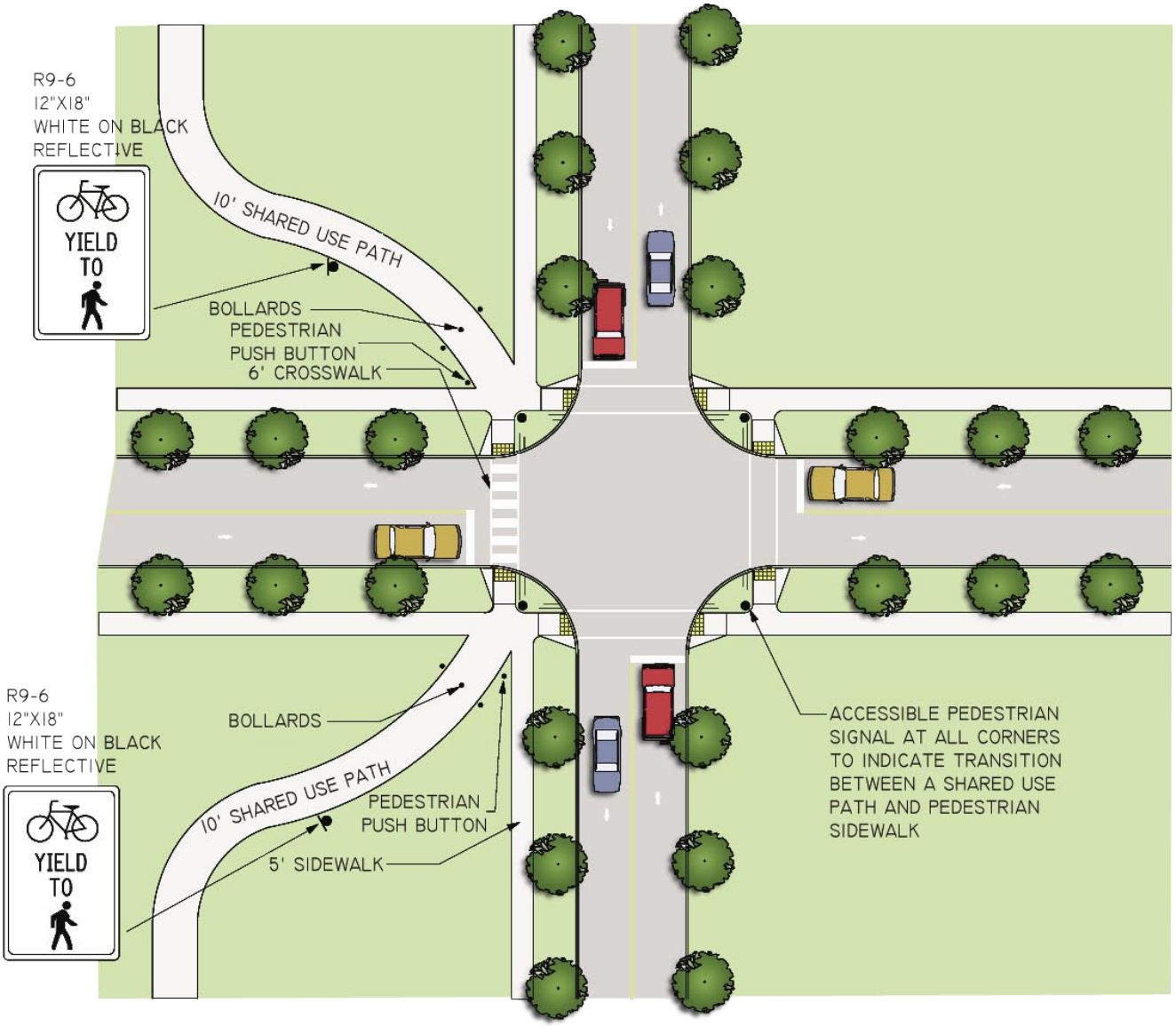
Shared Use Path at Witherspoon and Preston

Shared Use Path/Interchange Concept at Bardstown Road and I-265

Shared Use Path passing underneath I-65



Shared Use Path on Southern Parkway under I-264



Shared Use Path crossing at an Intersection

Shared Use Path at Witherspoon and Preston

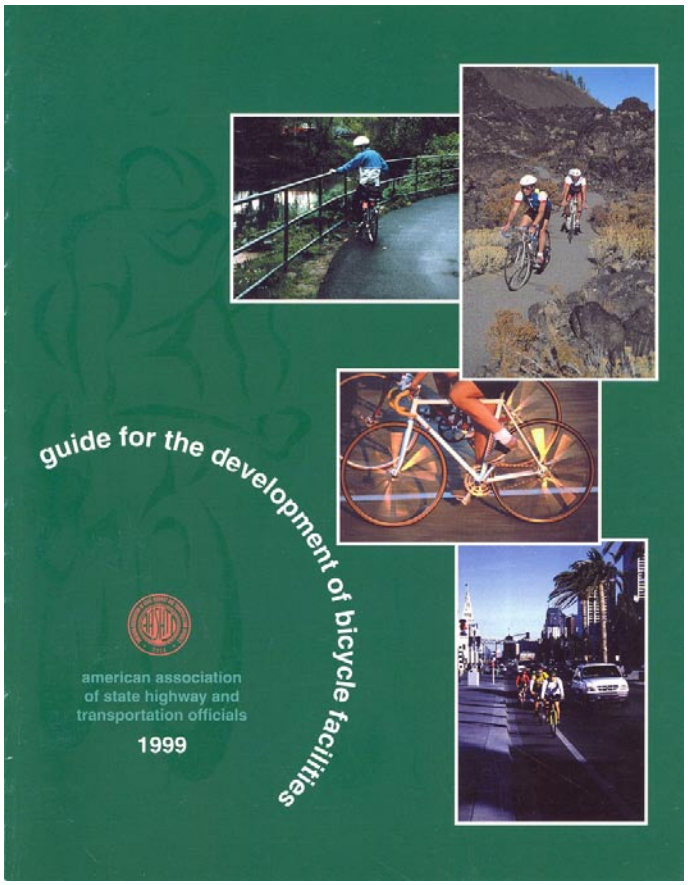
Bicycle Design Criteria

Well-designed bicycle facilities take into account several factors including the skill level of the cyclist, traffic volumes (ADT), road geometrics, Right-of-Way width, mix of vehicle types, presence of on-street parking, sight distance, and the design and spacing of access points. Bicycle facilities are designed either in conjunction with a road corridor or as an "off-road" facility in association with a greenway or shared use path.

This Manual should be used in conjunction with AASHTO's *Guide for the Development of Bicycle Facilities*, which discusses many issues on users, facility types, criteria and design guides for specific problem areas. The Kentucky Transportation Cabinet (KYTC) Road Design Guide Exhibit 1500-01, *Recommended Bicycle Facilities*, on page 33 should also be considered when designing bicycle facilities, which recommends on-road bicycle facilities based on both posted speeds and traffic volumes (ADTs) of the roadway.

Designing on-road bicycle facilities in Louisville Metro presents a number of challenges because a significant portion of the roadway network already exists. Part of the solution involves public education to increase awareness of cyclists rights on the roadways. Another part of the solution is improving existing facilities and adding additional on-road facilities. A level of service analysis was conducted by Louisville Metro, funded by the Kentuckiana Planning and Development Authority (KIPDA), that assessed current bicycle and pedestrian facilities. The study, *Suitability of Louisville Metro Roads for Bicycling and Walking*, suggested several strategies for introducing bicycle facilities into the current roadway network including: reducing the number of motor vehicle lanes; reducing the lane widths; changing the on-street parking; and/or sharing the roadway.

Several facilities allow for bicyclists and motor vehicles to share the roadway including: shared lanes (SL), wide curb lanes (WC), and shoulders (SH) (see page 31). Wide curb lanes, where bikes are adjacent to traffic, should be a minimum of 14' wide. Shared lanes, where bikes are in the lane with traffic, shall have a minimum width of 12'.

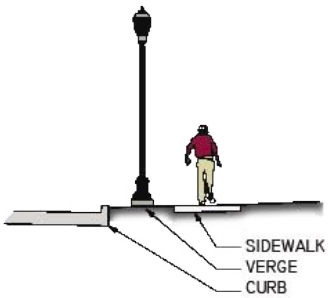


AASHTO Guide for the Development of Bicycle Facilities

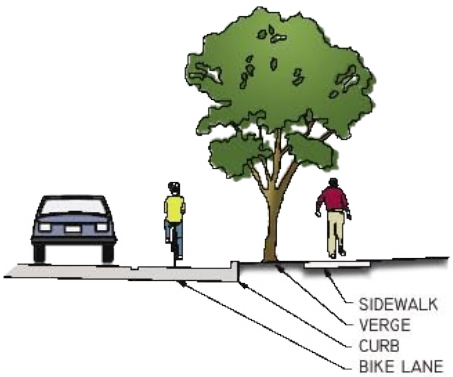
Rumble strips, as they are needed based on the roadway design, shall follow the policy described on the Federal Highway Administration (FHWA) safety website which describes a five foot nominal gap that allows bicyclists to enter and leave a shoulder while still raising the attention of motorists. A Kentucky policy on rumble strips and bicycles is needed. See http://safety.fhwa.dot.gov/roadway_dept/rumble/rumble53001.htm#attachment for more information on the federal guidelines.

Bike lanes shall be provided on both sides of a two-way street and generally placed along each outside lane with the same direction of travel as the motorized traffic (see page 34).

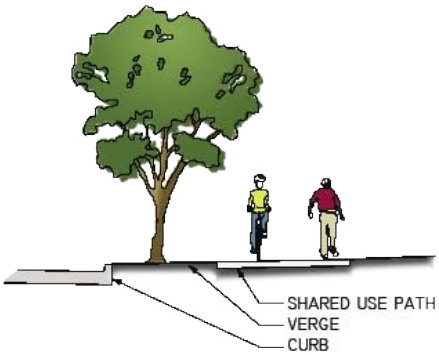
On one-way streets, bike lanes shall be placed in the right-most lane and flow in the same direction of travel as motorized traffic. Advance queues may be installed on one-way streets where there is no on-street parking or right turn lanes. Advance queues are intended to make the bicycle traffic to be more visible to motorists.



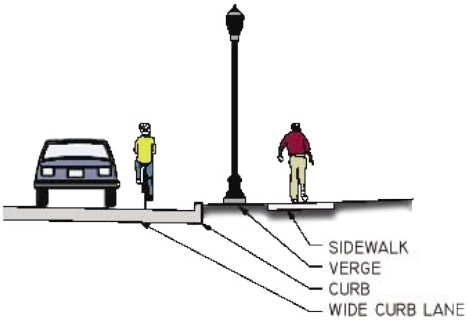
Street edge showing just sidewalk



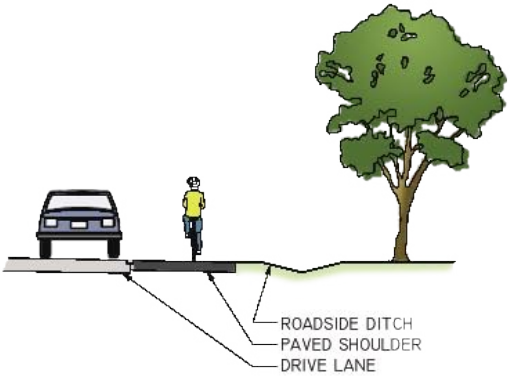
Bike Lane and adjacent sidewalk



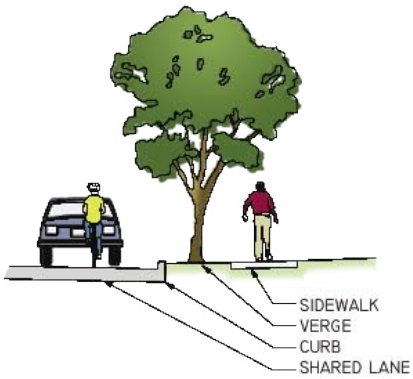
Shared Use Path with both pedestrians and bicyclists



Wide Curb Lane where motorists and bicyclists share a wider lane



Shoulder as a bicycle facility



Shared lane where motorists and bicyclists share a typical lane width

This is done by having the bike lane's stop bar striped immediately adjacent to the crosswalk while the remaining lanes would have their stop bar six feet further back. Advance queues are only practical where there is a high volume of bicycle traffic to justify their use (page35).

Bicycle lane markings and signs shall be installed in accordance with Chapter 9C of the Manual of Uniform Traffic Control Devices (MUTCD). Typical signage along bike facilities may include MUTCD signs R4-4, W11-1 & W16-1, R3-16, and R3-16a. Pages 36 and 37 illustrate the coordination of signs and markings typically found at intersections.

Pavement markings typically include arrows to indicate the direction of travel and the bike symbol to indicate the preferential use of the lane (page 36). The bike lane shall be delineated from the motor vehicle traffic using a six inch solid white line. A four inch solid white line may be used on the curb-side of the bike lane to separate it from the parking lane. Thermoplastic pavement markings with a non-slip surface are recommended for delineating the bike lane. Striping shall end at stop bars/pedestrian crosswalks and in most cases, not continue through intersections. Where there is heavy right turn movement, or a bus stop, a broken line shall be used to allow for the turning movement but also to indicate the cyclist merging into the through or turn lane prior to entering the intersection (page 37).

As new facilities are developed or redone on roads with induction loops, the loops should be tested for sensitivity

Vane-style Grate with openings perpendicular to the direction of travel

of smaller vehicles such as motorcycles and bicycles.

All bike facilities including roadways, bike lanes, and shoulders, shall have a smooth surface free of structures and obstacles. Bike lanes shall keep a minimum of 3.5 feet clear from the leading edge of grates or inlets (see inset on page 36). Gutters shall not be significantly sloped to the curb edge thus creating a hazard for bicyclists. Slotted, vane-style grates or grates with narrow openings perpendicular to the direction of travel shall be used if gutter inlets are needed on a bicycle facility.

Bicycle parking shall follow the Land Development Code Appendix 9A, Bicycle Parking Design Manual, 2002. Innovative bicycle parking is encouraged as discussed in the street furnishings section.

Bicyclist with an advance queue

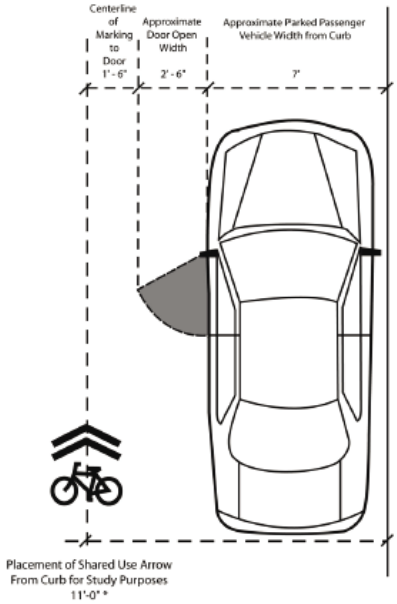
Artistic bicycle parking at Fourth and Muhammad Ali Boulevard

Shared Lanes

Traffic lanes are often too narrow to be shared side-by-side by bicyclists and passing motorists. Where parking is present, bicyclists wishing to stay out of the way of motorists often ride too close to parked cars and risk being struck by a suddenly opened car door (being "doored"). Where no parking is present, bicyclists wishing to stay out of the way of motorists often ride too close to the roadway edge, where they run the risks of being run off the road, being clipped by overtaking motorists who misjudge passing clearance, or of encountering drainage structures, poor pavement, debris, and other hazards.

Riding further to the left avoids these problems, and is legally permitted where needed for safety. However, this practice can run counter to motorist expectations. The Shared-Lane Marking indicates the legal and appropriate bicyclist line of travel, and cues motorists to pass with sufficient clearance.

Placement of shared use arrow from curb



The Shared Lane Marking is intended to:

1. Help bicyclists position themselves in lanes too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane;
2. Encourage safe passing of bicyclists by motorists;
3. Reduce the chance of a bicyclist's impacting the open door of a parked vehicle in a shared lane with on-street parallel parking;
4. Alert road users of the lateral location bicyclists may occupy; and
5. Reduce the incidence of wrong-way bicycling.

The Shared Lane Marking shown will be used to assist bicyclists with positioning in a shared lane with on-street parallel parking and to alert road users to the location a bicyclist may occupy within the traveled way.

Standard Shared Lane Marking:

If used in a shared lane with on-street parallel parking, Shared Lane Markings shall be placed so that the centers of the markings are a minimum of 3.3 m (11 ft) from the curb face, or from the edge of pavement where there is no curb.

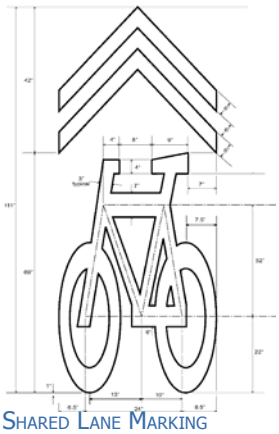
Shared Lane Markings shall not be used on shoulders or in designated bicycle lanes.

The Shared Lane Marking should not be placed on roadways with a speed limit above 55 km/h (35 mph).

When used, the Shared Lane Marking should be placed immediately after an intersection and spaced at intervals not greater than 75 m (250 ft) thereafter.

When the shared lane marking is used, the distance from the curb or from the edge of pavement or paved shoulder may be increased beyond 3.3 m (11 ft).

The Shared Lane Marking shall be made from non-slip, textured thermoplastic material whenever possible.



Shared Lane Marking

RECOMMENDED BICYCLE FACILITY TYPES
RURAL CROSS SECTION

POSTED SPEED LIMIT	AVERAGE ANNUAL DAILY TRAFFIC (AADT) VOLUME (DESIGN YEAR)		
	LESS THAN 2000	2000 - 10,000	OVER 10,000
LESS THAN 30 MPH	12' SL	12' SL (1)	6' SH
30 - 40 MPH	6'-SH	6'-SH	6'-SH
41 - 50 MPH	6'-SH	6'-SH	6'-SH
OVER 50 MPH	6'-SH	6'-SH	6'-SH

RECOMMENDED BICYCLE FACILITY TYPES
URBAN CROSS SECTION (NO PARKING)

POSTED SPEED LIMIT	AVERAGE ANNUAL DAILY TRAFFIC (AADT) VOLUME (DESIGN YEAR)		
	LESS THAN 2000	2000 - 10,000	OVER 10,000
LESS THAN 30 MPH	12' SL	14' WC	5' BL
30 - 40 MPH	5'-BL	5'-BL	5'-BL
41 - 50 MPH	5'-BL	6'-BL	6'-BL
OVER 50 MPH	6'-BL	6'-BL	6'-BL

RECOMMENDED BICYCLE FACILITY TYPES
URBAN CROSS SECTION (PARKING)

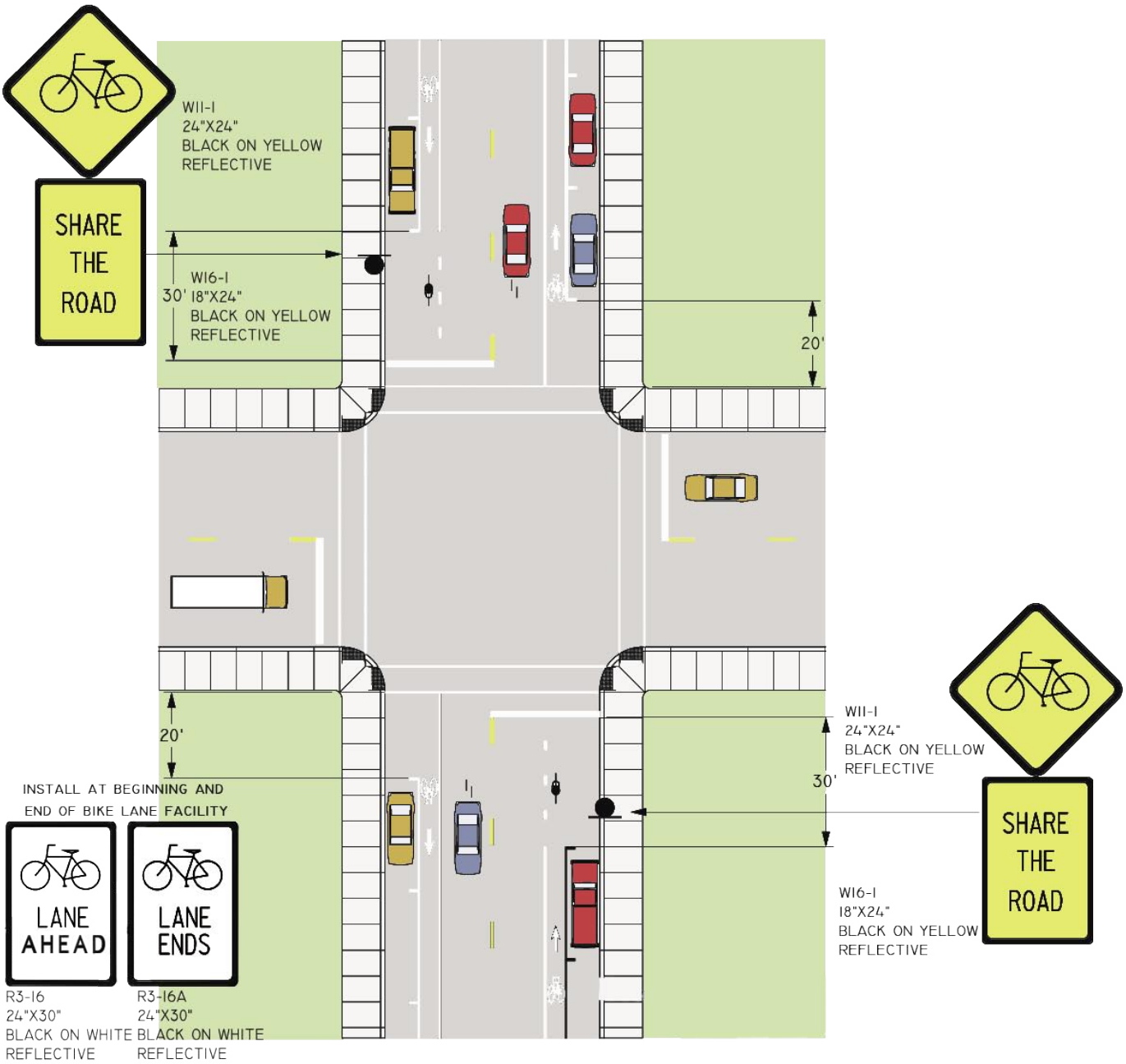
POSTED SPEED LIMIT	AVERAGE ANNUAL DAILY TRAFFIC (AADT) VOLUME (DESIGN YEAR)		
	LESS THAN 2000	2000 - 10,000	OVER 10,000
LESS THAN 30 MPH	14' WC	14' WC	5' BL
30 - 40 MPH	5'-BL	5'-BL	6'-BL
41 - 50 MPH	6'-BL	6'-BL	6'-BL
OVER 50 MPH	NA	NA	NA

LEGEND: WC = WIDE CURB LANE SH = PAVED SHOULDER
SL = SHARED LANE BL = BICYCLE LANE (2)

(1) WHEN PROJECTED TRUCK VOLUMES EXCEED 30 TRUCKS PER HOUR USE 6' - SH.
(2) THE WIDTH OF BICYCLE LANE INCLUDES THE WIDTH OF GUTTER PAN.

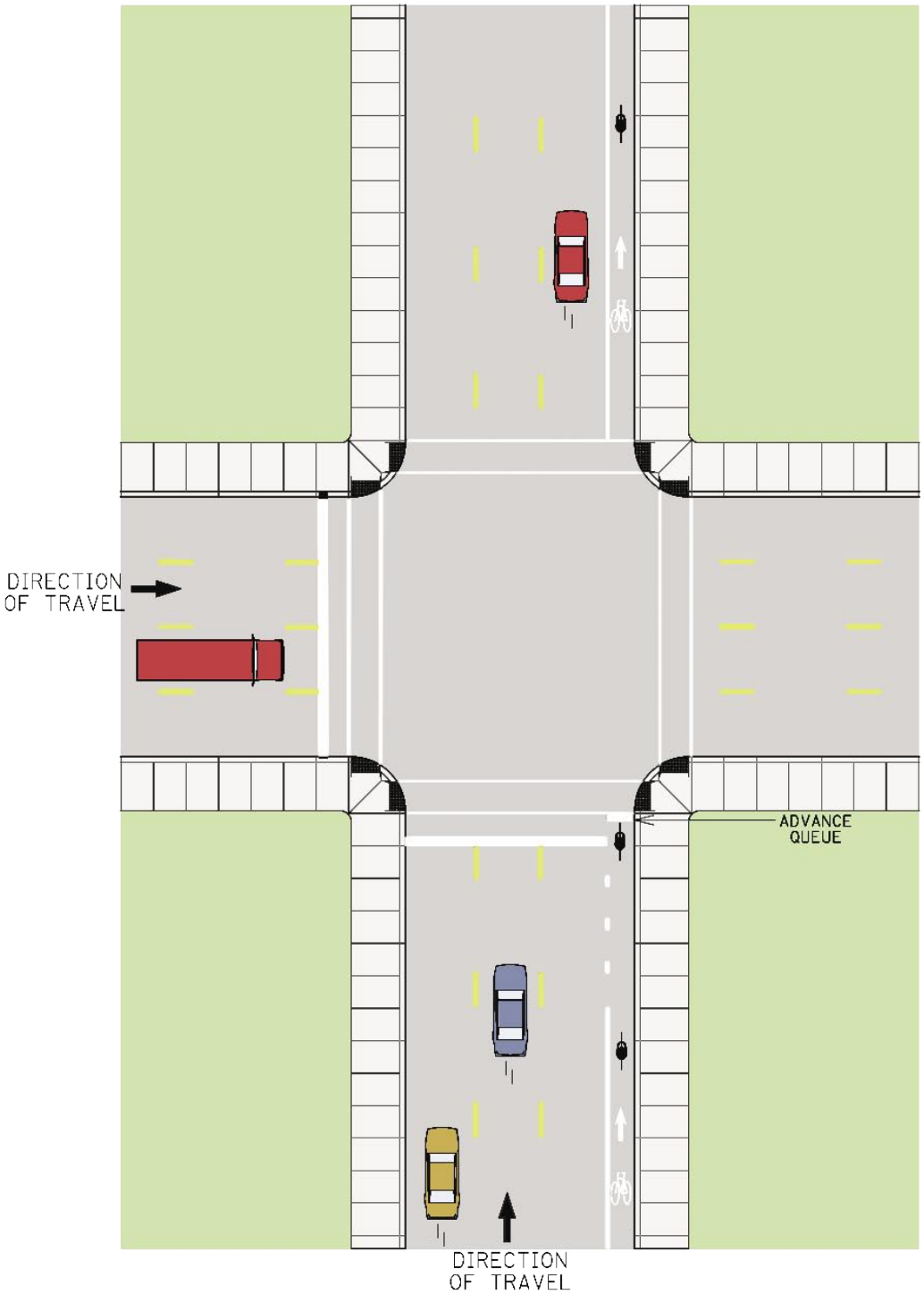
SOURCE: KYTC DESIGN MANUAL

Bike Lane with Parking
Intersection with 2-Way Arterial Street



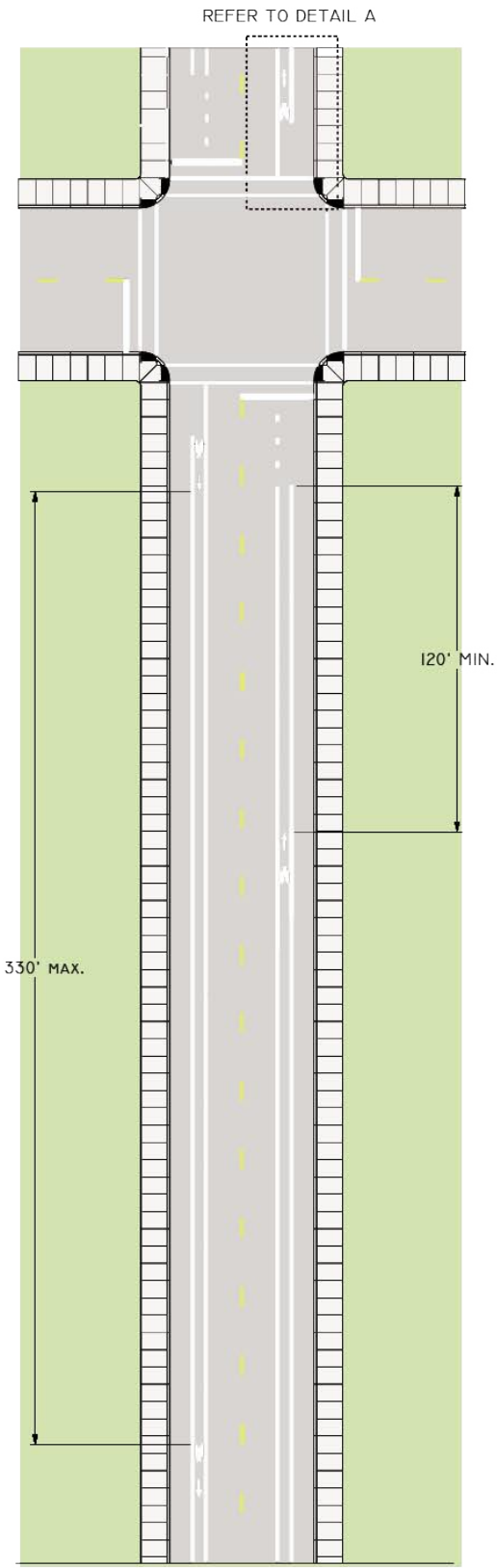
Note: Bicycle Signage details listed within appendix

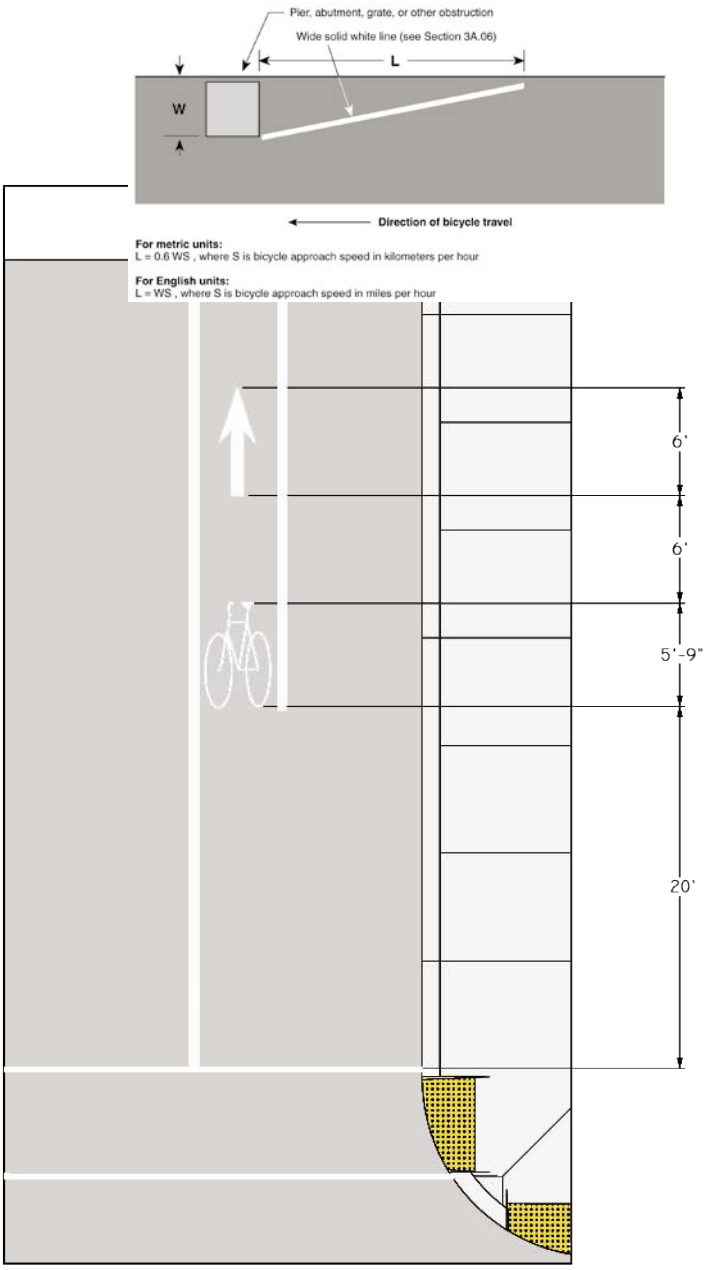
Bike Lane without parking
One way street intersecting with one way street



Note: Bicycle Signage details listed within appendix

BIKE LANE SYMBOL AND ARROW SPACING

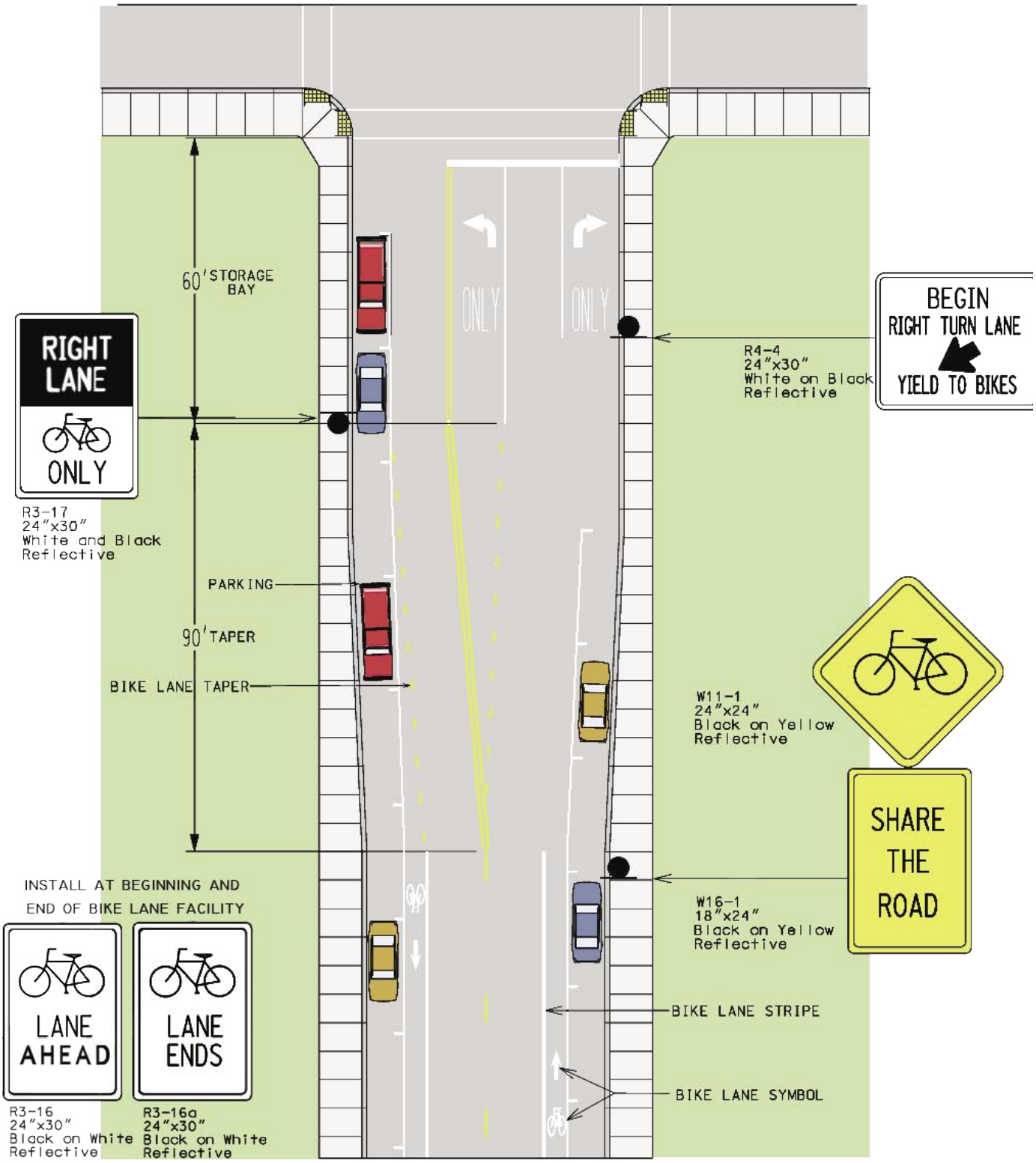




DETAIL A

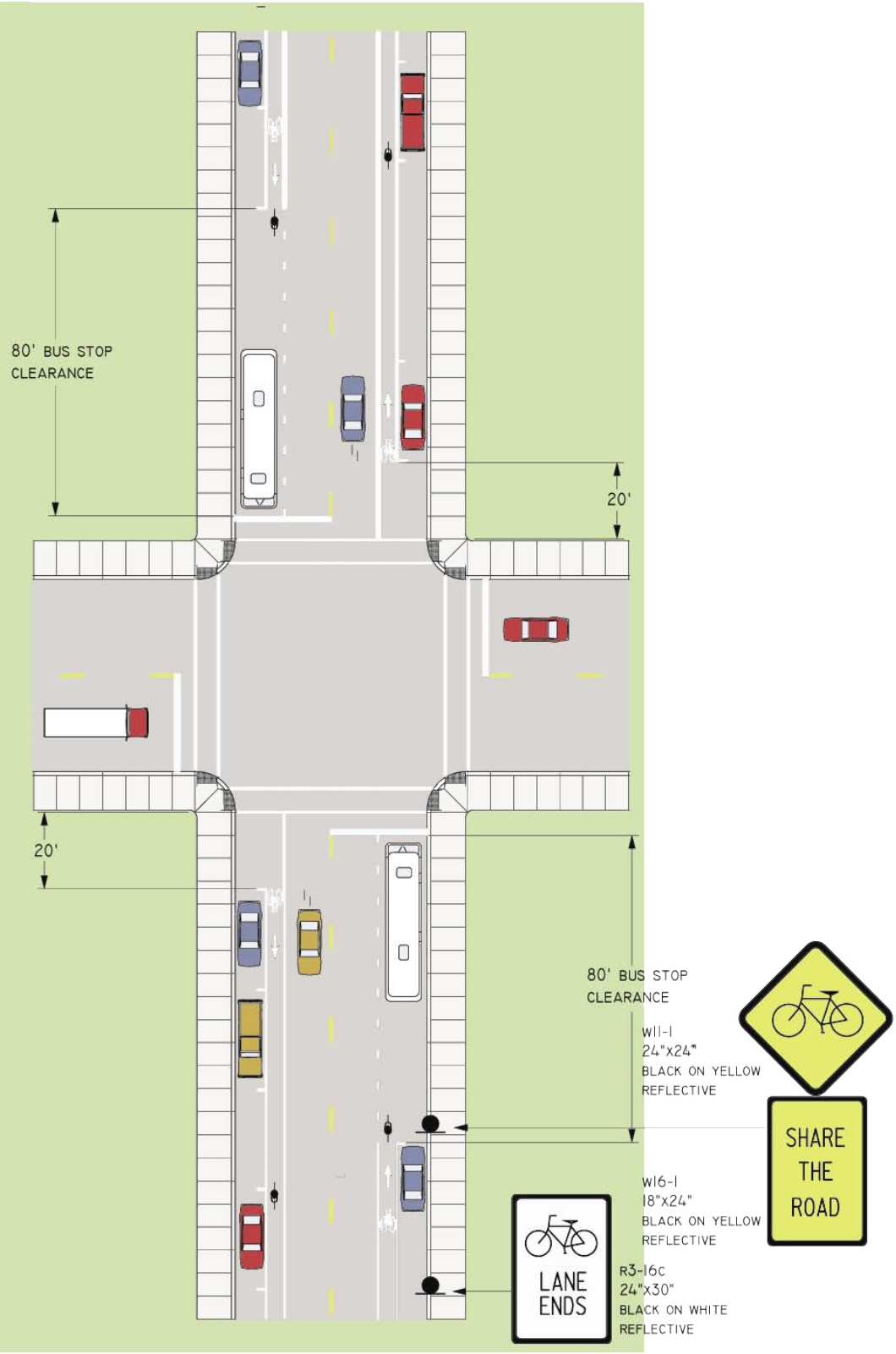
NOTE: BICYCLE SIGNAGE DETAILS LISTED WITHIN APPENDIX

Typical Bike Lane Signage



Note: Bicycle Signage details listed within appendix

BIKE LANE WITH BUS STOP
NON-CHANNELIZED INTERSECTION



NOTE: BICYCLE SIGNAGE DETAILS LISTED WITHIN APPENDIX

Transit Design Criteria

There are three primary factors to consider when selecting the location and type of transit facility for a development. These factors are the planned use of the development, the scope of the development, and the presence of transit service in the area. Other contributing factors include surrounding land uses, character of the neighborhood, environmental and/or topographic factors, service demands, and transit agency policy. Currently, TARC locates transit facilities based on the percentage of elderly residents in a neighborhood, surrounding land uses, physical constraints, and at the request of a rider.

Transit amenities are provided to ensure that patrons have a safe, accessible, and pleasant location to board a transit vehicle. Therefore, easements should be dedicated to accommodate future transit boarding areas and stops and the shelters, pads and benches associated with them.

Transit shelters or other related objects shall be located either in front of or behind the Pedestrian Zone. Transit shelters shall include seating and an accessible waiting pad connected to the existing sidewalk network. The waiting pad should be a stable, firm surface at least eight feet in length with a clear width of five feet. The grade of the pedestrian waiting pad shall be ADA compliant and should be less than two percent in slope with a preferred curb height between 6 inches and nine inches. Trash receptacles should be located within 20 feet of a transit shelter. Mass transit stops located out of the traveled way with a bus pull off should accommodate only the bus and should not be used for parking.

The minimum criteria for installing a shelter at a bus stop is based on Character Class and boarding volumes as follows:

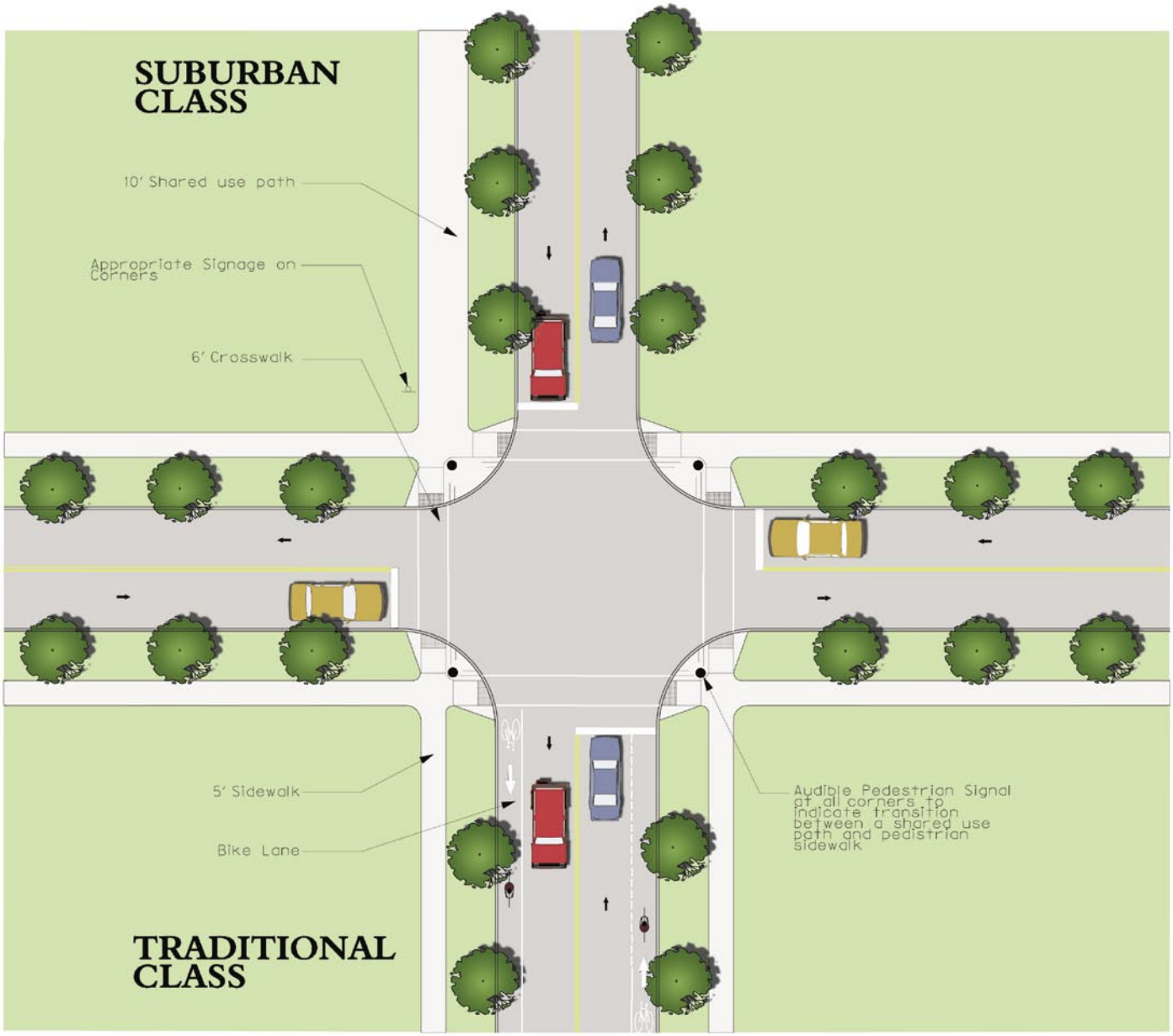
- Rural = 10 boardings a day
- Suburban = 25 boardings per day
- Downtown/Traditional = 50-100 boardings per day

All new transit stops shall conform to TARC's design guidelines.

TARC Bus Shelter at Bardstown Road and Eastern Parkway

TARC buses have bike racks

TARC Bus Stop with Brightside landscaping



Transitions

The Complete Street facility design criteria contained in this Manual is based on Character Class and Functional Roadway Class. Each typical section in Appendix A conveys relational and dimensional criteria for various facilities as they occur in a given Character Class or on a specific Functional Class of road. However, many of the roadways within Louisville Metro, particularly collector level roads and greater, will traverse more than one Character Class. Roadways may also change from one Functional Class to another as they traverse the county. Both of these conditions create transitional issues associated with a Complete Street facility design.

Character Class transitions will occur at Form District boundaries, when the adjacent Form Districts fall within differing Character Classes. There are four possible Character Class transitions: Downtown-Traditional; Traditional-Suburban; Traditional-Rural, and; Suburban-Rural. Associated with each of these Character Class transitions may be variations in the application of a particular facility. The two most critical variations from a public safety standpoint would be the transition from a shared lane bicycle facility to a dedicated bicycle lane and a sidewalk transitioning to a shared-use path. The appropriate design for these two transitions is illustrated on this page and the next.

It is recommended that a transition in facilities resulting from a change in Character Class occur at the nearest roadway intersection whenever possible. This is particularly important when dealing with an on-road facility such as a bike lane. Changes in landscape character or street furnishings however, can occur at the common property boundary between the two Character Classes rather than the nearest street in order to emphasize the character of the Form District. The design intent of an approved neighborhood plan, corridor study, or Streetscape Master Plan (see Chapter 5, Review and Approval Process) within close proximity to the site should be considered in the design of any transition area.

The possible transitions between the Downtown Character Class and a Traditional Character Class could include:
- Shared lane to dedicated bicycle lane
- Wide sidewalk without a verge to a standard sidewalk with a verge

The possible transitions between a Traditional Character Class and a Suburban Character Class and could include:
- Shared lane to dedicated bicycle lane
- Sidewalk (with or without a verge) to a shared-use path
- Sidewalk with little or no building setback to a sidewalk with a deep building setback

Transition between a Traditional Character Class and a Rural Character Class would most likely occur in a Village Form District between the center and the outlying village. Similar transitions would also occur should a Town Center Form District be established to serve a rural area. The possible transitions between these Character Classes could include:
- Sidewalk (with or without a verge) to a shared-use path
- Shared lane to a dedicated bicycle lane
- Dedicated bicycle lane to a shared lane (not signed) with a shoulder
- Shared lane on a bicycle route (signed) to a shared lane (not signed) with a shoulder
- Dedicated bike lane to a shared use path

Landscape design and the frequency and location of street furnishings would also vary between these two Character Classes as described in previous sections of this chapter.

The possible transitions between a Suburban Character Class and Rural Character Class could include:
- Sidewalk with a verge to a shared-use path
- Dedicated bicycle lane to a shared lane
- Dedicated bicycle lane to a shared lane (not signed) with a shoulder and a shared-use path
- Shared lane on a bicycle route (signed) to a shared lane (not signed) with a shoulder
- Wide curb lane to a shared use path

Bicycle Facility Transitions

Transitioning from one type of bicycle facility to another (such as from a bike lane to a shared-use path) remains an engineering problem around the nation and around the world.

Whenever a transition of this sort is necessary, planners and engineers should refer to national and international best practices and standards of design in all cases. In Portland, Oregon, transportation planners studied lane color transition from European countries and has had success implementing this concept in high conflict situations (see *Portland's Blue Bike Lanes Report*).

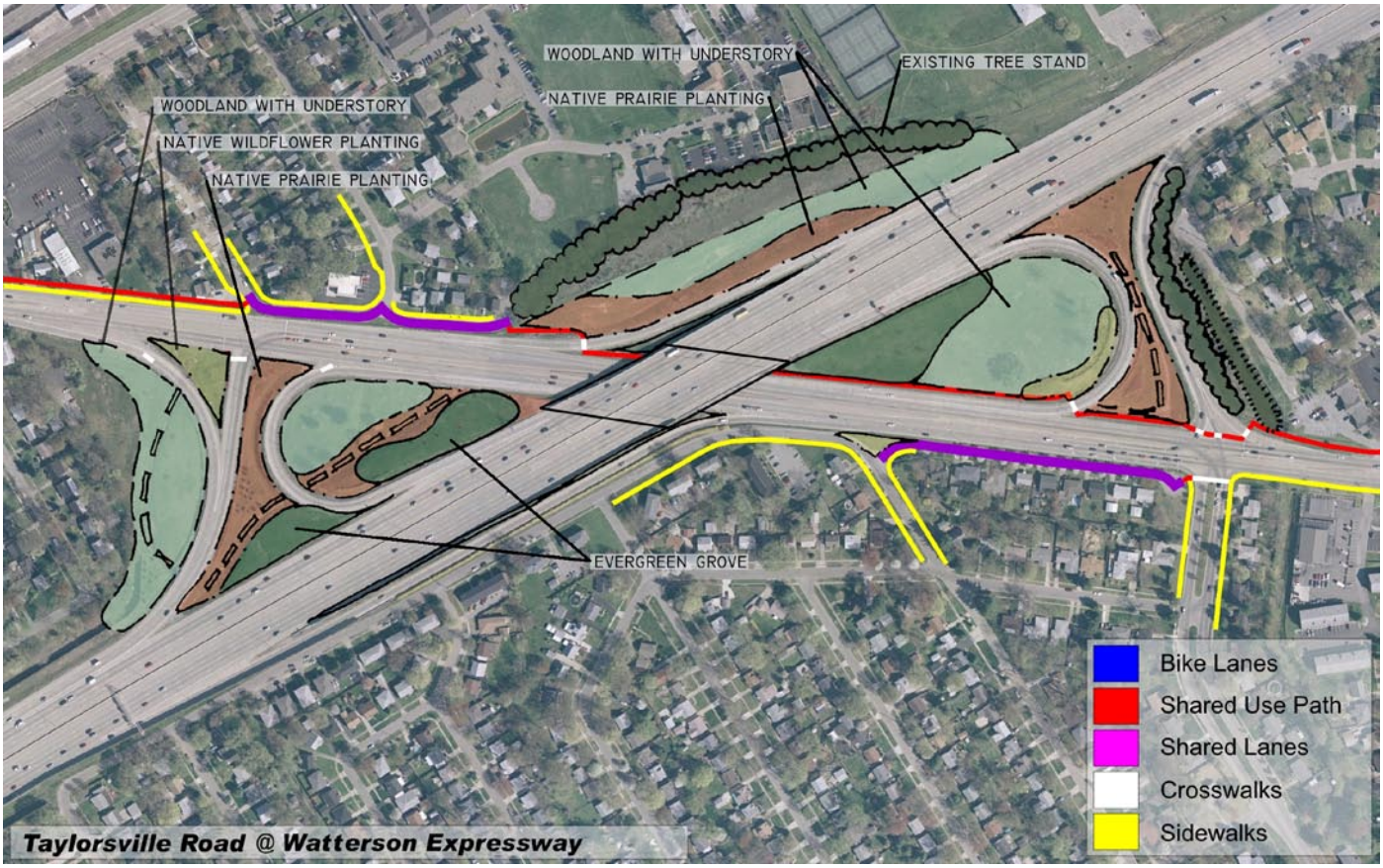
Bike Facility Transition from Bike Lane to Shared Use Path (Source: Portland, OR Office of Transportation)

Gateways/Interchanges

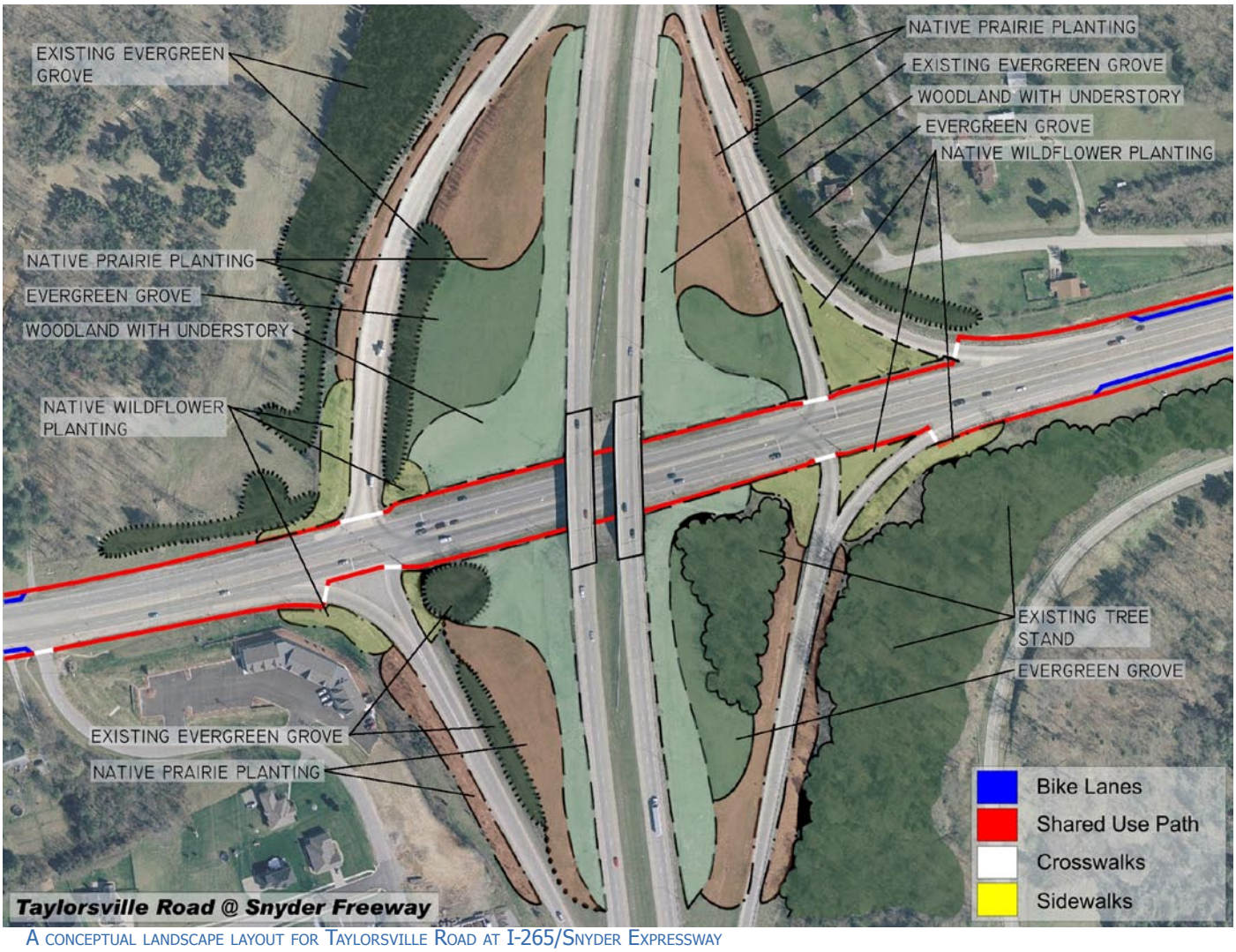
Over a hundred years ago, Louisville's city leaders recognized that great communities are built through careful planning and design. They realized the functional needs of a growing population could be balanced with aesthetics preserving the natural beauty inherent in the native landscape. This is most evident in the parkway system designed by landscape architect, Frederick Law Olmsted. As transportation systems have expanded throughout the city, efforts have been made to incorporate scenic qualities. In the late 1960s, there was enough public interest in fostering the scenic quality of highways that Federal legislation provided funding incentives for roadside enhancements.

On a local level, incentives like Operation Brightside (created in 1986), planning documents such as the 1991 *Highway Beautification Master Plan*, the 1994 *Master Plan for Renewing Louisville's Olmsted Parks and Parkways*, and the policies of the late 1990s continue to recognize the importance of planning and designing aesthetically pleasing and easy to maintain transportation corridors. The Mayor's Strategic Plan for 2004-2007 outlines a vision for a "community all people are proud to call home" where Louisville is a clean and green city that promotes environmental standards in air and water quality, creating sustainable projects, and practicing "responsible stewardship of public assets."

In 1991, the *Highway Beautification Master Plan* was completed due to the leadership of Brightside and collaboration with state and local agencies to result in a plan that balances beauty and function of the transportation corridors. The master plan proposes to "recognize the highway landscape as an extensive system of open space that ties the city together." It establishes that the transportation corridors can be an environmental and visual resource in addition to safely moving large volumes of traffic at high speeds.



A conceptual landscape layout for Taylorsville Road at I-264/Watterson Expressway



A conceptual landscape layout for Taylorsville Road at I-265/Snyder Expressway

A glance at a Kentucky state highway map will immediately show Louisville Metro as a major hub of the state highway system. Three interstates enter Jefferson County to pass through the downtown core and outlying areas of Louisville Metro at the northern, eastern, and southern county lines. This provides the opportunity to implement improvements at the perimeters on the I-64, I-65, I-71, and soon the I-265 corridors for gateway designations. Already, The Ohio River Bridges – Kennedy Interchange project is taking a first step to develop a transportation project that includes mobility for many modes of transportation and landscape guidelines for Spaghetti Junction, segments of I-64/I-71, I-65, and I-64 in the downtown core that create western gateways for Louisville Metro. This project furthers the vision of the *Highway Beautification Master Plan* and could be a model for creating gateways at the northern (I-71), eastern (I-64), and southern (I-65), perimeters of Louisville Metro.

The driver's experience of the highway landscape is primarily a visual one that is viewed at a high rate of speed. However, as drivers are queued off and onto the highways at controlled points, such as interchanges, the vehicle speeds decrease which allows the occupants a prolonged viewing experience of the roadside landscape. Most existing interchanges are large, one-dimensional green planes. They have little landscape interest and are canvases waiting to be painted in shades of green and seasonal colors.

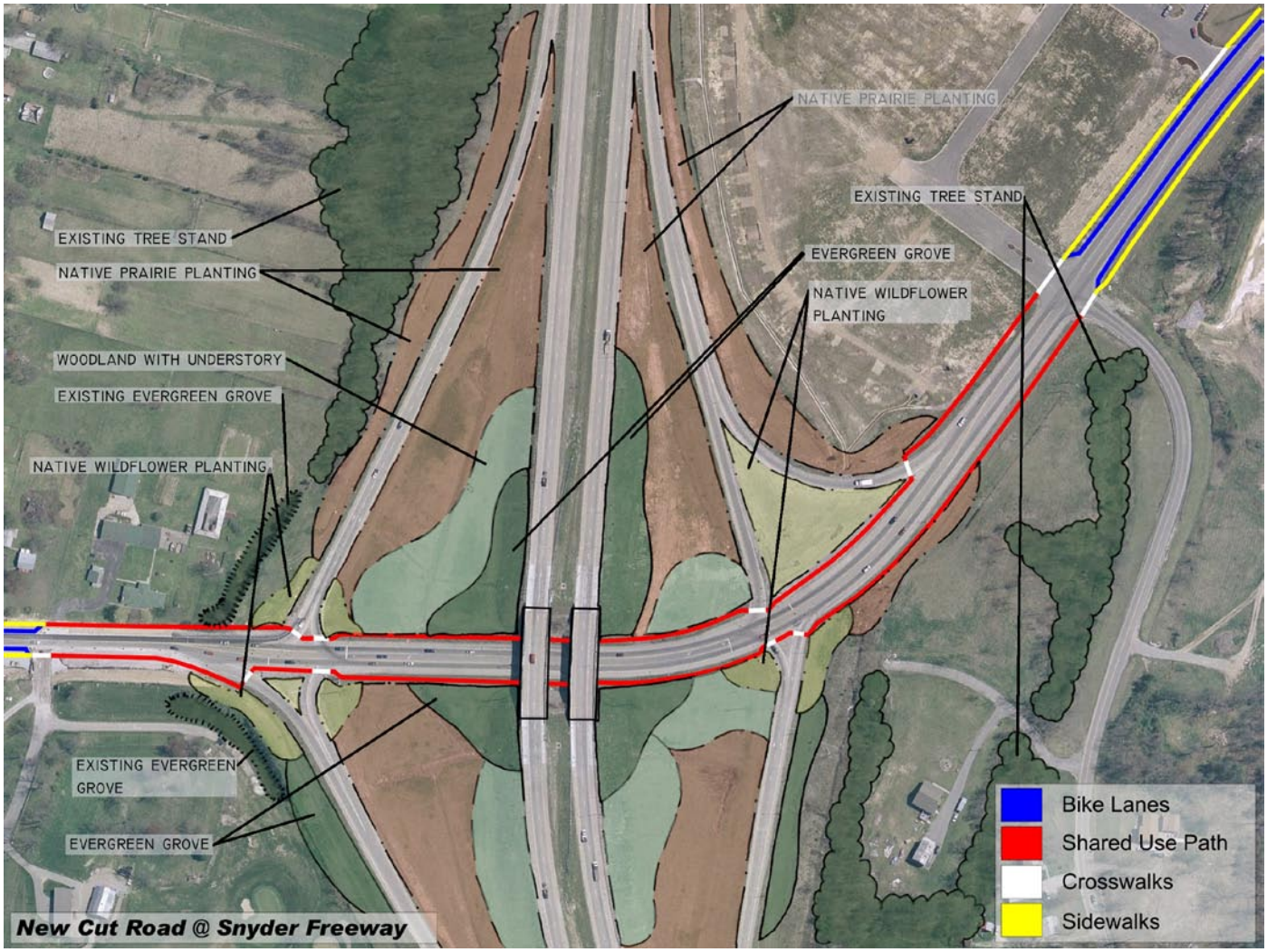
The beautification of all interchanges will require a site-

specific design and should follow the Design Criteria listed in the Highway Beautification Master Plan. In addition, the existing visual quality of an area should be considered when designing the roadside landscape of an interchange. *The Highway Beautification Master Plan* states, "In many ways the roadside landscape extends beyond the right-of-way fence." This is evident in the priority corridors of Taylorsville Road and New Cut Road, which illustrate the differences in the character of interchanges.

Taylorsville Road at I-264 has a physical context of an older residential, urban setting. As Taylorsville progresses east and intersects with I-265, the character of the area is new residential with some retail areas.

New Cut Road has a roadside landscape that extends long beyond the right-of-way fence at the I-265 interchange. As New Cut Road leaves the more urban areas of Louisville Metro, the corridor land uses include a mix of established subdivisions, a historic park, a growing industrial presence, and a sensitive wet woods, which all have a backdrop to the forested knobs of the nation's largest urban forest, the Jefferson Memorial Forest. Each interchange has unique physical context that should be evaluated in the design of the roadside landscape.

Each of the conceptual plans for the highway interchanges demonstrates how the use of native species and massing of plants can create a context sensitive, low maintenance and beautiful landscape around the roadways. The woodland areas should be planted



A conceptual landscape layout for New Cut at I-265/Snyder Expressway

with native hardy canopy trees such as maple, oak and ash. These areas should contain a large portion of colorful understory trees such as redbud and dogwood. The wildflower areas provide splashes of color at the intersections where vehicle speeds are slower. The prairie plantings will also add color while providing a lower maintenance landscape from the typical trimmed lawn areas around most interchange areas. Invasive plants such as crown vetch and burning bush should be removed from the interchange landscape areas. The use of native species will bring natural beauty to the interchanges while protecting some of the natural plant heritage of the area.

The plans and initiatives established by Louisville Metro describe the combined vision and strategies to enhance the transportation corridors and begin to illustrate the partnerships that will be needed for successful implementation. The state highway's long range plans provide the opportunity for developing individual project scopes that include a comprehensive approach to designing transportation corridors that are safe roadways and an environmental and visual resource. The Highway Beautification Master Plan envisions a broad corridor concept plan that utilizes "masses and layers of green, with seasonal accents of color and meadow like openings… [that] become self-sustaining over time." Including landscaping components within a highway construction project to support the master plan's corridor concept is feasible and is exhibited in The Ohio River Bridges project.

In order to plan, design, implement, and maintain the beautification efforts, several project cooperators must be involved; namely: KYTC District 5, Louisville Metro Public Works, Brightside, neighborhood organizations, small cities, and Metro Parks. Partnerships for funding, installation, and maintenance must be fostered and cooperators' efforts in the transportation corridors must dovetail from conception in order to ensure success and longevity of any project. Projects in the highway corridors will be designed on a case by case basis due to the variety of opportunities and constraints of each site. As the project planning progresses, the role of each cooperator can be fully defined. However, the beginnings of some roles can already be outlined. For instance, KYTC District 5 will oversee permitting and promote greener stewardship of the highway right-of-ways at the state level. Brightside can continue their BrightSite efforts to fulfill the corridor concept plan that proposes seasonal accents of color and meadow like openings to compliment the greening of the highway "open space" landscape.

Chapter 5: Review and Approval

Purpose

Streetscape design should be considered as part of the normal review and approval process established within the Louisville Metro Land Development Code. Review of site specific streetscape design requirements should occur as part of the existing development process where plans are reviewed as follows:

- Inspections, Permits, and Licenses (IP&L) - Category 2 development plans
- Development Review Committee (DRC) - Category 3 development plans
- Planning Commission - rezoning cases

Certain streetscape furnishing intended to be placed in a public Right-of-Way should be reviewed and permitted by the agency with jurisdictional authority. Such furnishings would include:

- Tree Grates
- Planters/Pots
- Newspaper Racks
- Kiosks

Streetscape Master Plan

A Streetscape Master Plan (Master Plan) serves as a guide for future development along a designated roadway corridor. The Master Plan would provide continuity for the roadway corridor or block face by establishing a plan for:

- Appropriate bicycle and pedestrian facilities
- Access management and connectivity
- Street trees
- Unified streetscape lighting and furnishings, where required

Typically, the Master Plan provisions are implemented over time by multiple property owners as parcels on the block develop or re-develop. The information contained

Streetscape Master Plan for Shelbyville Road in Middletown

in a Master Plan should provide a sufficient level of detail to allow implementation of the streetscape to occur either incrementally or at one time, through multiple or single sources, yet maintain a consistent character. A Master Plan should include:

- Existing Context Statement
- Design Intent
- Baseline Inventory (redevelopment/infill projects)
- Conceptual Design Recommendations
- Suggested maintenance plan

A Master Plan may also address additional design issues dependent on the individual project including:

- Suggested phasing
- Roadside drainage improvements to increase safety and visual quality
- Preliminary cost opinions (publicly funded projects)

The conceptual design recommendations should address:

- Typical cross section
- Style and placement of public amenities such as benches, bike racks, trash receptacles, and lighting

- Placement and general design of landscape beds, parking screening, street trees and other landscaping
- Pavement and pavement edge treatments to improve safety and pedestrian/vehicular accessibility
- Sidewalk improvements including the location of new sidewalks, extension and/or repair of existing sidewalks, and recommendations for sidewalk materials, widths, and other design considerations
- Ways to make pedestrian linkages more pedestrian friendly and aesthetically pleasing
- General treatment and style of signage to improve effectiveness and create a more coherent appearance for the area

Review and Approval Process

The review and approval process for Master Plans would depend on the nature and magnitude of the project. In considering the appropriate level of review and approval, Master Plan projects should be divided into two categories—New Road projects and Infill/Existing Roadway Reconstruction projects.

New Road Projects

New Road Projects would consist of any development proposing a new public or private roadway associated with a previously undeveloped/unimproved tract or tracts of land. The review of any applicable streetscape design criteria associated with a New Road Project would occur as part of the established plan review process.

Redevelopment/Infill Projects

Redevelopment and/or infill projects will alter the existing streetscape, directly impacting land uses found adjacent to the corridor today as well as current users of the roadway itself. As such, the Streetscape Master Plan review and approval process for redevelopment or infill projects should be subject to an expanded public process. Such projects should follow a process similar to the neighborhood planning process contained in the Louisville Metro Code of Ordinances.

All Streetscape Master Plans should consider the regional context of the area to ensure appropriate transitions between corridors or segments of corridors, particularly when the area of one Streetscape Master Plan connects to or crosses another planned area.

Any area that is included in the approved Streetscape Master Plan shall have a landscape plan approved prior to requesting a building permit. The landscape plan shall conform to the standards of the streetscape master plan. The streetscape master plan will also require that the property owners shall be responsible for maintenance of streetscape elements as required by an approved streetscape master plan.

Where ever possible Streetscape Master Plans should consider approved neighboring streetscape master plans or planning documents to provide continuity along the corridor.

Glossary

ADA: Americans with Disabilities Act

ADT (Average Daily Traffic): The average number of vehicles per day that pass over a given point.

Access: A way or means of approach to provide vehicular or pedestrian physical entrance to a property.

Access Management Standards: Local public safety or public works regulations that control vehicular movement between streets and abutting private land uses, including curb cut size, location and spacing standards, raised medians and raised traffic islands; regulations prohibiting left and/or right turns into or out of driveways and/or streets; curb parking restrictions; grade separations; and circumstances requiring the construction of frontage roads.

Accessibility: The ADA requires transit agencies (i.e.TARC) to provide accessible buses or equivalent services to persons with mobility, sensory or cognitive impairments.

Advance queues: Pavement markings at a stop condition that allow bicycle traffic to be more visible to motorists.

Alley: A way, other than a street, that is open to common use; and affords a secondary means of vehicular access to adjoining or adjacent property.

Amenity Zone: The portion of the sidewalk or green space between the curb line Edge Zone and the Pedestrian Zone in which the street furnishings are located. The verge is included in this zone.

Arterial Street: A major thoroughfare, used primarily for through traffic rather than for access to adjacent land, that is characterized by high vehicular capacity and continuity of movement.

Bicycle: A device, upon which any person may ride, propelled exclusively by human power through a belt, chain or gears, and having one or more wheels. (Ordinance 74.07)

Bicycle Lane (BL): A portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicycles and/or other non-motorized vehicles.

Bicyclists: Those that ride bicycles as an Advanced cyclist or commuter, Basic bicyclist or Recreational rider, or Child rider.

Block: The aggregate of private lots, passages, rear lanes and alleys, circumscribed by thoroughfares.

Block Face: The aggregate of all the building facades on one side of a block. The Block Face provides the context for establishing architectural harmony.

Boarding Area with seats and shelter*:* Bus boarding area that features a place for seating and a covered waiting area to protect from the elements. Shelters or awnings and benches are the most common elements, but a more creative design concept may be allowed based on approval by the Planning Director and Executive Director of transit agency.

Buffer (or Buffering): Man-made or natural materials or open space having the effect of ameliorating the adverse effects of a land use upon adjoining or nearby land uses and enhancing the compatibility of the use with such adjoining or nearby land uses.

Bus Pull-off*:* A designated portion of the street that buses can stop to drop off and pick up passengers.

Character: The attributes, qualities, and features that distinguish an area, and give it a sense of purpose, function, definition, and uniqueness.

Captive Riders: Persons who are bound to public transportation because of age, disability, income or other circumstances and have no other choice of transportation available to them.

Choice Rider: Riders who own their own car but choose to use public transit.

Clear Zone Width: The total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area. The desired width is dependent upon the traffic volumes and speeds and on the roadside geometry (AASHTO *Roadside Design Guide*).

Clear Vision Area: Area above 2 feet and below 8 feet in grade.

Collector: Provides a less highly developed level of service at a lower speed for shorter distances by collecting traffic from local roads and connecting them with arterials.

Complete Streets: A system of streets designed and operated to enable safe access for all users (pedestrians, bicyclists, motorists and bus riders) of all ages and abilities along and across the street.

Connection (Vehicular): A driveway, street, turnout, or other means of providing for property access to or from controlled access facilities. For the purpose of access, two one-way connections to a property may constitute a single connection.

Corridor: A lineal geographic system incorporating transportation and/or greenway trajectories.

Crossover Access: A way or means of approach to provide vehicular or pedestrian physical entrance to a property across another property or properties

Curb: The stone or concrete boundary at the edge of the pavement of a street, which also usually includes gutters.

Density: The number of residential dwelling units per acre of land, determined by dividing the number of dwelling units by the area of the development site.

Design Speed: The velocity at which a thoroughfare tends to be driven without the constraints of signage or enforcement. There are four ranges of speed: Very Low: (below 20 MPH); Low: (20-25 MPH); Moderate: (25-35 MPH); High: (above 35 MPH). Lane width is determined by desired design speed.

Design Width: The width specification the sidewalk was intended to meet; it extends from the curb or planting strip to any buildings or landscaping that forms the opposite borders of the sidewalk.

Driveway: A private roadway providing access to a street or highway.

Easements: The right of a person, government agency, or public utility company to use public or private land owned by another for a specific purpose

Edge Zone: The area located adjacent to the road pavement including the curb but not the verge.

Fence: Any construction of wood, metal, wire mesh, masonry, or other material, erected for the purpose of assuring privacy or protection, but excluding shrubbery and plantings.

Form District: An area with distinct boundaries, delineated on the Zoning District Map to which a set of regulations governing the pattern and form of development and redevelopment applies.

Functional Class: The process by which streets and highways are grouped into classes, or systems, according to the character of traffic service that they are intended to provide.

Gateway/Interchanges: Interstate interchanges serving as entrances to the city of Metro Louisville

Grade: The average elevation of the finished ground surface; when determining height of structures, it is the average elevation at the outside of a fence or wall, or at the outside walls of a building.

Green: An open space, available for unstructured recreation. The green is surrounded by roadways or the fronts of buildings and, consist of grassy areas and trees.

Greenway: A linear open space at least 50 feet wide or other width as established by a legislatively adopted greenways plan, along either a natural corridor such as a riverfront, stream valley or ridge line, or along a railroad right-of-way converted to recreational use, a canal, scenic road or other route managed for public use including wildlife habitat. Greenways typically link parks, nature preserves, cultural features or historic sites with each other or with populated areas for bicycles and pedestrians.

Grid Street Pattern: A street system that creates similar size blocks and four-way intersections. Grid street pattern is common in older neighborhoods and traditional development forms. A standard grid pattern is characterized by straight streets, 90 degree intersections and rectangular blocks. In a modified grid, a connected system of curvilinear streets may replace the more formal grid pattern, to insure compatibility with adjacent development and to address physical features of the site.

High Occupancy Vehicle Lanes*:* Where one or more lanes in a roadway are reserved for carpools, van pools, and buses.

Highways: Every way or place of whatever nature when any part of it is open to the use of the public, as a matter of right, license or privilege, for purpose of vehicular traffic.

Historic District: An area designated by a local government or Historic Commission or Board which includes or encompasses such historic sites, landmarks, buildings, signs appurtenances, structures, or objects as may be determined to be appropriate for historic preservation.

Infrastructure: Facilities and services needed to sustain industry, residential, commercial and all other land use activities.

Landscaping: Treatment of land comprising a building site or easement which consists of, but is not limited to, the use of grass, ground covers, shrubs, vines, hedges, trees, berms and architectural landscape features and material, for the visual and functional purposes of the site.

Local: Consists of all roads not defined as arterials or collectors; primarily provides access to land with little or no through movement.

Major Thoroughfare Plan: Includes a plan depicting all collectors, arterials, and limited access roads but does not include local roads.

Master Plan: A master plan as required by a Planned Development District detailing the specific requirements and layout for the development of a particular area.

Median: The physical or painted separation provided on divided highways between two adjacent roadways.

Mobility: The ability to move or be moved from place to place.

Motor vehicle: Any vehicle that is propelled by other than muscular power and that is used for transportation of persons or property over the public highways of the state, except road rollers, mopeds, vehicles that travel exclusively on rails, and vehicles propelled by electric power obtained from overhead wires.

Motorist: Someone who drives or travels in an automobile.

Open Space: Any publicly dedicated or privately owned area of land or water that is permanently preserved and maintained. Such an area may be predominately in a natural condition or improved or modified for uses such as recreation, education, aesthetics, cultural or natural resource management or public health and safety.

Park: A relatively large open space available for recreation and usually located at the edge of a development, neighborhood or village. It may be surrounded by roadways, the fronts of buildings, or the side or rear of publicly or privately owned lots. It is usually partially fronted by buildings and has a landscape which may consist of natural areas, paved paths and trails, some open lawn, trees, recreational facilities and open shelters, and requires substantial maintenance.

"Park and Ride" – A service that offers customers a place to park their car, and then transfer to a transit service to complete their journey.

Passage (PS): A pedestrian connector passing between buildings, providing shortcuts through long blocks and connecting rear parking areas to frontages. Passages may be roofed over.

Path (PT): A pedestrian way traversing a park or rural area, with landscape matching the contiguous open space. Paths should connect directly with the urban sidewalk network.

Pavement Width: The width of the pavement of a street, as measured from edge to edge but excluding the curbs, if any.

Pedestrian: Any person afoot or in a wheelchair.

Pedestrian Access: An improved surface which connects the public right-of-way with private property or a building entrance.

Pedestrian and Bicycle Corridor: A linear open space at least 30 feet wide, containing a pathway for pedestrians and/or bicycles and providing linkages within, between and among developments, neighborhoods and the community as a whole.

Pedestrian Way: A right-of-way dedicated to or set aside for public use, which cuts across a block to facilitate pedestrian access to adjacent streets and properties.

Pedestrian Zone: A portion of the sidewalk that is maintained free of any obstructions to allow for the passage of pedestrians.

Primary Street: The street with the highest functional class abutting a property. Where there is more than one street with the same functional class abutting a property, the Planning Director or designee shall determine the primary street for the site. There shall be only one primary street adjacent to a property.

Primary Trip: Trips that have a specific intended destination.

Private Frontage: The privately-held layer between the frontage line and the principal building façade. The structures and landscaping within the Private Frontage may be held to specific standards. The variables of Private Frontage are the depth of the setback and the combination of architectural elements such as fences, stoops, porches and galleries.

Private Roadway: A road, thorough-fare, alley, or bridge within an access easement that is privately owned and maintained.

Public Frontage: The area between the curb of the vehicular lanes and the front property line. Elements of the Public Frontage include the type of curb; walk, planter, street tree and streetlight.

Public Realm: In the context of the Traditional Neighborhood Form, the area of the lot occupied by the public right-of-way and the area in front of the principal structure or to the required principal structure setback/build-to line.

Public Roadway: As a road, thorough-fare, alley, highway, or bridge under the jurisdiction of a public agency.

Public Transportation: Transportation by bus, rail, or other conveyance, either publicly or privately owned, which provides to the public general or special service on a regular and continuing basis. Also known as "mass transportation," "mass transit" and "transit."

Refuge Island: A raised longitudinal space separating the two main directions of traffic.

Right-of-Way: The streets, parkways, sidewalks, pathways and other land over which the public has a right of passage or land over which a rail line passes.

Road (RD): A local, rural and suburban thoroughfare of low vehicular speed and capacity. Its public frontage consists of swales drained by percolation and a walking path or bicycle trail along one or both sides.

Roadside: The areas between the outside edges of the shoulders and the Right-of-Way boundaries. Unpaved median areas between inside shoulders of divided highways and infield areas of interchanges are included.

Roadway: The strip of land through which a road is constructed and which is physically altered.

Rumble strips: Raised or grooved patterns constructed on, or in travel lane and shoulder pavements.

Rural Section: A cross-section of roadway that does not use curb and gutter, provides an above-ground stormwater system, and typically does not contain sidewalks.

Sidewalk: The paved layer of the public frontage dedicated exclusively to pedestrian activity.

Sight Distance: The length of roadway ahead over which an object of a specific height is continuously visible to the driver.

Screening: The use of solid fencing or dense vegetative plantings to visually block a particular use from an abutting or adjacent use. See also "Buffer."

Secondary Trips: Incidental trips; trips that might deviate from the original purpose of a primary trip and that would probably not be taken if the individual was not already making a trip.

Shared Access: A way or means of approach to provide vehicular or pedestrian physical entrance to properties with a shared property line.

Shared Lane (SL): A "standard width" travel lane that both bicycles and motor vehicles share.

Shared Use Path (SUP): A path physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheel chair users, joggers, and other non-motorized users. It is the same term as "multi-use trail."

Shoulder (SH): A paved portion of the roadway to the right of the traveled way that may serve bicyclists, pedestrians, and others.

Sight Distance Triangle: An area at the intersection of roadways free of obstruction in the vertical plane.

Storefront Zone: The portion of the sidewalk located between the Pedestrian Zone and the building façade.

Street: Any public way or legally created private way for vehicular traffic used as a means of access to lots abutting thereon, and including the following:

(a) Major Arterial -A street primarily for through traffic, usually on a continuous route.

(b) Minor Arterial -A secondary way or highway for use primarily as a connector for major arterials, minor arterials, or between a minor arterial and a collector.

(c) Collector -A street intended to move traffic from local streets and other collectors to the arterial street system. A collector street serves a neighborhood or large subdivision and should be designed so that no single family residential properties face onto it. Collector level streets are those streets either designated as such by the Comprehensive Plan for Louisville and Jefferson County, or by the Director of Works.

(d) Local -A street used primarily for access to abutting property.

(e) Cul-de-sac -A street ending in a turn-around and designed not to be extended.

(f) Stub street -A street usually ending at a property line which is designed to be extended in the future.

(g) Through street -A local street or segment of a series of local streets which provides at least two separate points of access to a collector, arterial or another through street. Certain street segments not meeting this requirement may be designated a through street if approved by the County Engineer. All arterial and collector streets are designated as through streets. (See also "Grid Street Pattern" in the *Land Development Code*)

Streetscape: The visual character that establishes a major part of the public realm. The streetscape is composed of thoroughfares (travel lanes for vehicles and bicycles, parking lanes for cars, and sidewalks or paths for pedestrians) as well as the visible private frontages (building facades and elevations, porches, yards, fences, awnings, etc.), and the amenities of the public frontages (street trees and plantings, benches, streetlights, etc.).

Street Tree: A tree and/or group of trees planted (typically in a linear fashion) usually within verges, medians, or along streets – to enhance visual quality of a street, to provide spatial enclosure, to provide canopy coverage (shade) over pavement, as well as other technical benefits. Coniferous trees shall not be used as street trees. Refer to LDC appendix 10 A for preferred street trees.

Street Wall: Vertical plane at the right-of-way line created by the façade of a structure or series of structures along a given block face.

Suburban Form Districts: Those form districts that follow a more suburban pattern of development, the following are Suburban Form Districts: Neighborhood Form District, Suburban Marketplace Corridor Form District, Suburban Workplace Form District, Regional Center Form District, Village Form District "Outlying" and Campus Form District.

Terminal Trips: The pedestrian portion of a trip that was primarily made through the use of another mode of transportation.

Traditional Form Districts: The following form districts shall be considered traditional form districts: Town Center Form District, Traditional Neighborhood Form District, Traditional Marketplace Corridor Form District, Traditional Workplace Form District and Village Form District "Center".

Transit: Facility consisting of the roads and equipment necessary for the movement of passengers or goods.

Transit Route: A type of transit service that operates as a fixed route along a fixed alignment or path with scheduled times for arrival and departure at terminal.

Transit Stop*:* A location where passengers board and alight. Bus stops can serve one or more routes and include various levels of amenities depending on the level of actual or anticipated ridership.

Transitions: A change from one place or state to another such as between Character Districts or between different modes of travel (i.e. bike lane to shared use path).

Traveled Way: The portion of the roadway provided for the movement of vehicles, exclusive of shoulders.

Tree: Any self-supporting woody plant of a species which normally grows, or is capable of growing, to an overall height of a minimum of fifteen feet in the north central region of Kentucky. This term includes canopy trees and understory trees, but does not include shrubs, ground cover or containerized trees and nursery stock trees for resale in licensed nurseries.

Tree Canopy: Layer of elevated vegetation from the ground. Tree canopy is measured from the outer edge of the canopy or dripline.

Tree, Type A: A large tree that will reach a mature height of over fifty (50) feet. (See LDC Preferred Plant List)

Tree, Type B: A medium tree that will reach a mature height of approximately twenty-five (25) to fifty (50) feet. (See LDC Preferred Plant List)

Tree, Type C: A small tree that will reach a mature height of approximately ten (10) to twenty-five (25) feet. (See LDC Preferred Plant List)

Tree, Understory: Any self-supporting woody plant of a species which normally achieves an overall height at maturity of 15-35 feet and a minimum crown spread of 15 feet, and which can grow beneath larger canopy trees.

Type: A category determined by function, disposition, and configuration, including size or extent. There are community types, street types, civic space types, etc.

Thoroughfare: A vehicular way incorporating moving lanes and parking lanes within a right-of-way.

Vehicle: Vehicles that have their own motive power and that are used for the transportation of people or goods on streets. *Motor vehicle* includes motorcycles, passenger vehicles, trucks, and recreational vehicles with motive power.

Vehicle Design Speed: A selected speed used to determine the various geometric design features of the roadway.

Vehicle, Passenger: A motor vehicle designed to carry ten (10) persons or less including the driver. Passenger vehicle also includes motor vehicles designed to carry ten (10) persons or less that are constructed either on a truck chassis or with special features for occasional off-road use. Passenger vehicle includes vehicles commonly called cars, minivans, passenger vans, sports utility vehicles (SUVs) and jeeps. Passenger vehicle is intended to cover the vehicles defined as passenger cars and multipurpose passenger vehicles by the National Highway Traffic Safety Administration.

Verge: A strip or border with grass or landscaping that separates the sidewalk from the street. (Referred to as the planted strip or utility strip by transportation engineers.)

Wide Curb Lane (WC): An outside travel lane with a width of at least 14 feet to accommodate both bicyclists and motorized vehicles for shared use.

Yard: An open space, other than a court, on the same lot with a building, unoccupied and unobstructed from the ground upward.

Yard, Front: A yard extending across the front of a lot, between the side lot lines, and being the minimum horizontal distance between the street right-of-way line and the principal building or any projections thereof other than the projections of uncovered steps, uncovered balconies or uncovered porches. On corner lots the front yard shall be considered as parallel to the street on which the lot has its least dimension.

Zoning District: Any area within Jefferson County delineated on the Zoning District Map to which a set of regulations governing permitted land use, density and intensity of development applies.

Zoning District Map: The map setting forth the boundaries of the zoning and form districts of all of Jefferson County, Kentucky.

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Appendix A - Sections and Signage

Introduction

The sections that follow are based on joining the functional class and the character class into a Complete Street. The Thoroughfare Typology chart, shown on page 24, shows how the roadway and user facilities interact with the character class of each part of Louisville Metro. The sections follow the aforementioned Edge Zone, Amenity Zone, Pedestrian Zone, and Storefront Zone concepts with actual user facilities and dimensions. The intent is to allow flexibility in the Complete Street design using sound engineering judgment and context-sensitive design.

The rural character class sections are drawn at their full width. Environmental constraints such as waterways, steep longitudinal and cross slopes, and sensitive landscapes may constrain the potential for a roadway to meet the width guidelines shown. Sound engineering judgment may be used to vary or justify smaller sections. If alternatives are needed, pedestrian and bicycle facilities should be provided in alternate but connecting locations using 'in-lieu of' fees or other funding sources.

The facilities are shown in bird's eye or plan view as well as in a cut away or section view to reveal the different parts of the right-of-way. The sections show the relationship of different facilities by demonstrating their location, interaction with the other users facilities, and their widths. The drawings have text underneath to describe a portion of the streetscape and its relative size. The widths are given with minimum and preferred distances. The preferred distances are considered typical and are allowed to proceed without variances and/or justification upon review. The minimum distances are shown as the lowest value allowed. Smaller dimensions may be used if variances and/or justification is approved upon more stringent review. Indents in the section's pavement indicate where the lane markings occur.

Facilities Legend

Arterial (Major and Minor)

Arterial Rural Character District

AR-1 2-Way, 4-Lane, Shared Use Path/Sidewalk
AR-2 2-Way, 4-Lane, Designated Turn Lane, Shared Use Path/Sidewalk
AR-3 2-Way, 4-Lane, Median, Shared Use Path/Sidewalk

Arterial Suburban Character District

AS-1 2-Way, 4-Lane, Shared Use Path, Shared-Lane
AS-2 2-Way, 4-Lane, Bike Lane, Sidewalk
AS-3 2-Way, 4-Lane, Wide Curb Lane*, Sidewalk
AS-4 2-Way, 4-Lane, Shoulder, Sidewalk, Shared Use Path
AS-5 2-Way, 4-Lane, Shared Turn Lane, Shared Use Path
AS-6 2-Way, 4-Lane, Shared Turn Lane, Bike Lane, Sidewalk
AS-7 2-Way, 4-Lane, Shared Turn Lane, Wide Curb Lane*
AS-8 2-Way, 4-Lane, Shared Turn Lane, Shoulder, Sidewalk/Shared Use Path
AS-9 2-Way, 4-Lane, Median, Shared Use Path, Shared-Lane

* Wide Curb Lane on Minor Arterial Only

Appendix - Sections

Arterial Traditional Character District

AT-1 1-Way, 4-6 Lane, Parallel Parking, Bike Lane, Sidewalk
AT-2 1-Way 4-6 Lane, Parallel Parking, Shared Use Path*, Shared-Lane
AT-3 2-Way, 4-6 Lane, Shared Use Path*, Shared-Lane
AT-4 2-Way, 4-6 Lane, Bike Lane, Sidewalk
AT-5 2-Way, 4-6 Lane, Parallel Parking, Shared Use Path*, Shared-Lane
AT-6 2-Way, 4-6 Lane, Parallel Parking, Bike Lane, Sidewalk
AT-7 2-Way, 4-6 Lane, Shared Turn Lane, Shared Use Path, Shared-Lane
AT-8 2-Way, 4-6 Lane, Shared Turn Lane, Bike Lane, Sidewalk
AT-9 2-Way, 4-6 Lane, Shared Turn Lane, Parallel Parking, Bike Lane, Sidewalk

* Shared Use Path on Minor Arterial Only

Arterial Downtown Character District

AD-1 1-Way, 4-6 Lane, Parallel Parking, Bike Lane, Sidewalk
AD-2 1-Way, 4-6 Lane, Parallel Parking, Shared-Lane
AD-3 2-Way, 4-6 Lane, Shared-Lane
AD-4 2-Way, 4-6 Lane, Bike Lane, Sidewalk
AD-5 2-Way, 4-6 Lane, Parallel Parking, Shared-Lane
AD-6 2-Way, 4-6 Lane, Parallel Parking, Bike Lane, Sidewalk
AD-7 2-Way, 4-6 Lane, Shared Turn Lane, Shared-Lane
AD-8 2-Way, 4-6 Lane, Shared Turn Lane, Bike Lane, Sidewalk
AD-9 2-Way, 4-6 Lane, Shared Turn Lane, Parallel Parking, Bike Lane, Sidewalk

* Shared Use Path on Minor Arterial Only

Collector

Collector Rural Character District

CR-1 2-Way, 2-Lane, Shared Use Path/Sidewalk
CR-2 2-Way, 2-Lane, Designated Turn Lane, Shared Use Path/Sidewalk
CR-3 2-Way, 2-Lane, Median, Shared Use Path/Sidewalk
CR-4 2-Way, 2-Lane, No Shoulder, Shared Use Path/Sidewalk, Shared-Lane

Collector Suburban Character District

CS-1 2-Way, 2-Lane, Shoulder, Shared Use Path/Sidewalk
CS-2 2-Way, 2-Lane, Median, Shoulder, Shared Use Path/Sidewalk
CS-3 2-Way, 2-Lane, Shared Use Path/Sidewalk, Shared-Lane
CS-4 2-Way, 2-Lane, Bike Lane, Sidewalk
CS-5 2-Way, 2-Lane, Wide Curb Lane, Sidewalk
CS-6 2-Way, 2-Lane, Shared Turn Lane, Shared Use Path, Shared-Lane
CS-7 2-Way, 2-Lane, Shared Turn Lane, Bike Lane, Sidewalk
CS-8 2-Way, 2-Lane, Shared Turn Lane, Wide Curb Lane, Sidewalk
CS-9 2-Way, 2-Lane, Shared Turn Lane, Shoulder, Shared Use Path/Sidewalk
CS-10 2-Way, 2-Lane, Median, Shared Use Path/Sidewalk
CS-11 2-Way, 2-Lane, Median, Bike Lane, Sidewalk
CS-12 2-Way, 2-Lane, Median, Wide Curb Lane, Sidewalk

Collector Traditional Character District

CT-1 1-Way, 2-Lane, Parallel Parking, Bike Lane, Sidewalk
CT-2 1-Way, 2-Lane, Parallel Parking, Shared Use Path, Shared-Lane
CT-3 1-Way, 2-Lane, Parallel Parking, Wide Curb Lane, Sidewalk
CT-4 2-Way, 2-Lane, Bike Lane, Sidewalk
CT-5 2-Way, 2-Lane, Shared Use Path, Shared-Lane
CT-6 2-Way, 2-Lane, Wide Curb Lane, Sidewalk
CT-7 2-Way, 2-Lane, Parallel Parking, Bike Lane, Sidewalk
CT-8 2-Way, 2-Lane, Parallel Parking, Shared Use Path, Shared-Lane
CT-9 2-Way, 2-Lane, Parallel Parking, Wide Curb Lane, Sidewalk
CT-10 2-Way, 2-Lane, Shared Turn Lane, Bike Lane, Sidewalk
CT-11 2-Way, 2-Lane, Shared Turn Lane, Shared Use Path, Shared-Lane
CT-12 2-Way, 2-Lane, Shared Turn Lane, Wide Curb Lane, Sidewalk

Collector Downtown Character District

CD-1 1-Way, 2-Lane, Parallel Parking, Shared Lane, Sidewalk
CD-2 1-Way, 2-Lane, Parallel Parking, Shared-Lane
CD-3 1-Way, 2-Lane, Parallel Parking, Wide Curb Lane, Sidewalk
CD-4 2-Way, 2-Lane, Shared Lane, Sidewalk
CD-5 Reserved
CD-6 2-Way, 2-Lane, Wide Curb Lane, Sidewalk
CD-7 Reserved
CD-8 2-Way, 2-Lane, Parallel Parking, Shared Use Path/Shared Lane
CD-9 2-Way, 2-Lane, Parallel Parking, Wide Curb Lane, Sidewalk

Local

Local Rural Character District

LR-1 2-Way, 2-Lane, Shared Lane, Shared Use Path/Sidewalk
LR-2 2-Way, 2-Lane, No Shoulder, Shared Lane, Shared Use Path/Sidewalk

Local Suburban Character District

LS-1 2-Way, 2-Lane, Shared Use Path/Shared Lane
LS-2 2-Way, 2-Lane, Shoulder, Shared Use Path/Sidewalk

Local Traditional Character District

LT-1 1-Way, 2-Lane, Parallel Parking, Bike Lane, Sidewalk
LT-2 1-Way, 2-Lane, Parallel Parking, Shared Use Path, Shared-Lane
LT-3 1-Way, 2-Lane, Parallel Parking, Wide Curb Lane, Sidewalk
LT-4 2-Way, 2-Lane, Bike Lane, Sidewalk
LT-5 2-Way, 2-Lane, Shared Use Path, Shared-Lane
LT-6 2-Way, 2-Lane, Wide Curb Lane, Sidewalk
LT-7 2-Way, 2-Lane, Parallel Parking, Bike Lane, Sidewalk
LT-8 2-Way, 2-Lane, Parallel Parking, Shared Use Path, Shared-Lane
LT-9 2-Way, 2-Lane, Parallel Parking, Wide Curb Lane, Sidewalk

Appendix - Sections

Local Downtown Character District

LD-1 1-Way, 2-Lane, Parallel Parking, Bike Lane, Sidewalk
LD-2 1-Way, 2-Lane, Parallel Parking, Shared-Lane
LD-3 1-Way, 2-Lane, Parallel Parking, Wide Curb Lane, Sidewalk
LD-4 2-Way, 2-Lane, Bike Lane, Sidewalk
LD-5 2-Way, 2-Lane, Shared-Lane
LD-6 2-Way, 2-Lane, Wide Curb Lane, Sidewalk
LD-7 2-Way, 2-Lane, Parallel Parking, Bike Lane, Sidewalk
LD-8 2-Way, 2-Lane, Parallel Parking, Shared-Lane
LD-9 2-Way, 2-Lane, Parallel Parking, Wide Curb Lane, Sidewalk

Alley/Lane

Alley/Lane Rural/Suburban Character District

ALS-1 2-Way, 2-Lane, No Shoulder

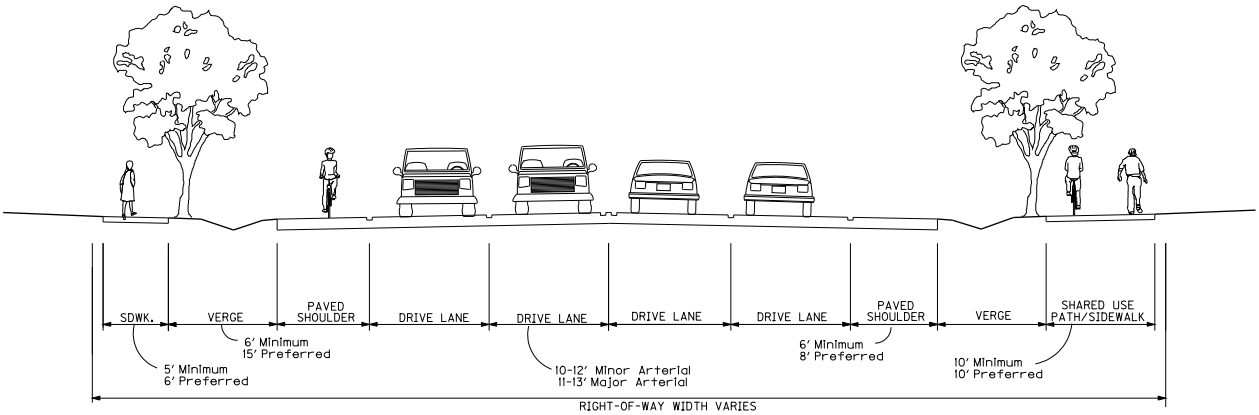
Alley/Lane Traditional Character District

ALT-1 1-Way, 1-Lane
ALT-2 2-Way, 1-Lane
ALT-3 2-Way, 2-Lane

Alley/Lane Downtown Character District

ALD-1 1-Way, 1-Lane
ALD-2 2-Way, 1-Lane
ALD-3 2-Way, 2-Lane
ALD-4 2-Way, 2-Lane, Wide Curb Lane

Signage



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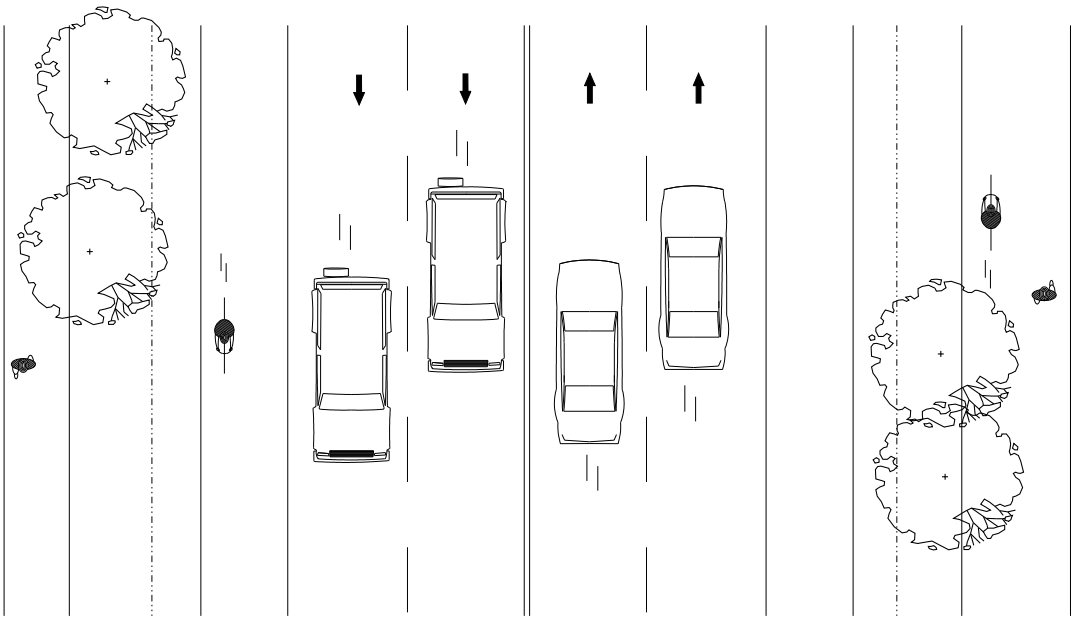
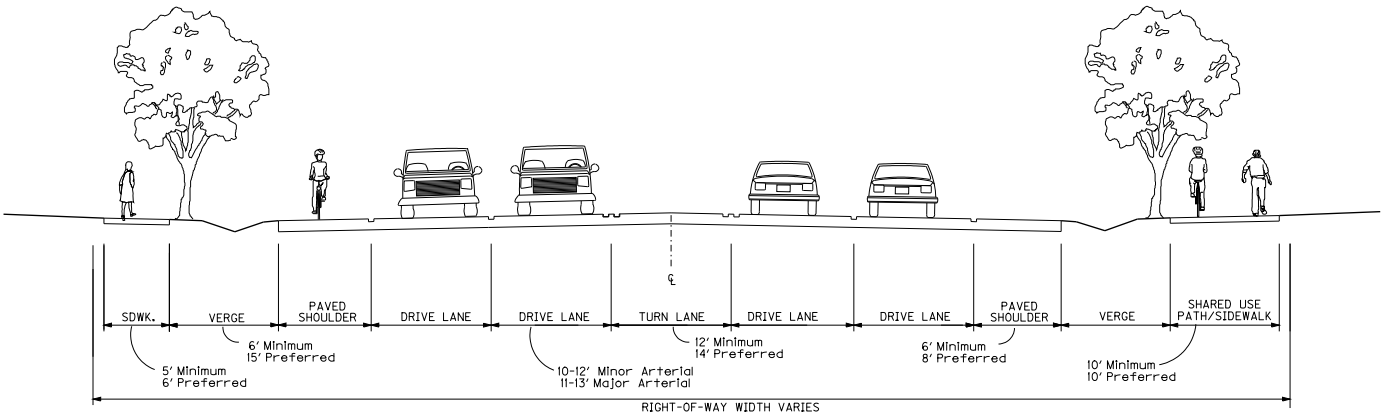


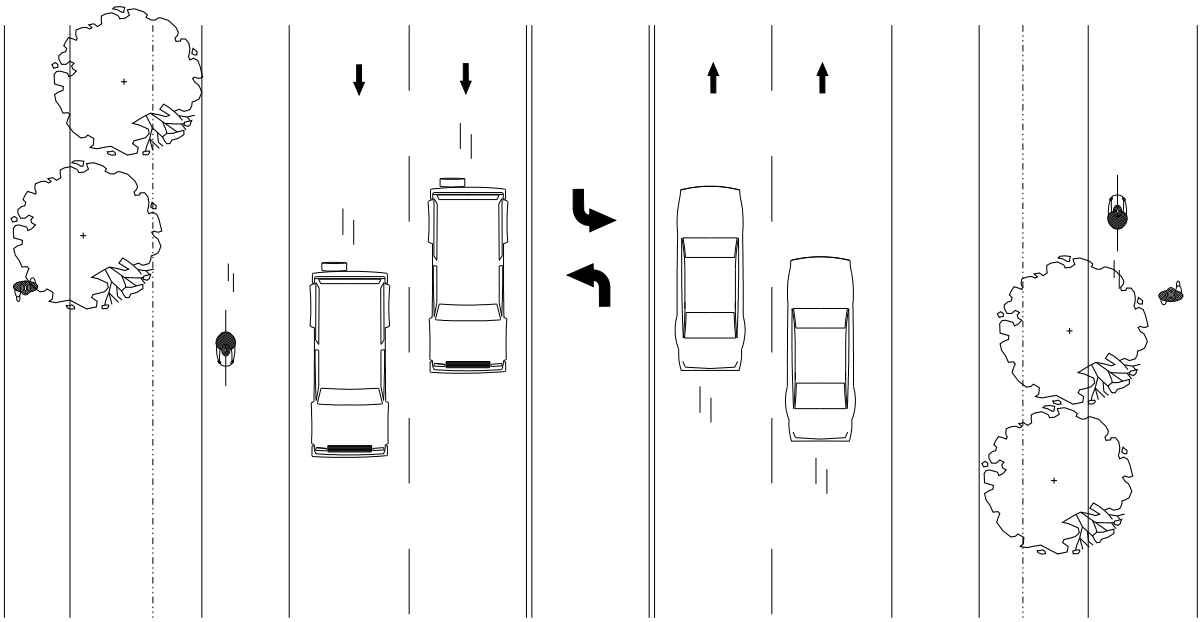
PLAN VIEW

AR–1

2–WAY, 4–LANE, SHARED USE PATH/SIDEWALK



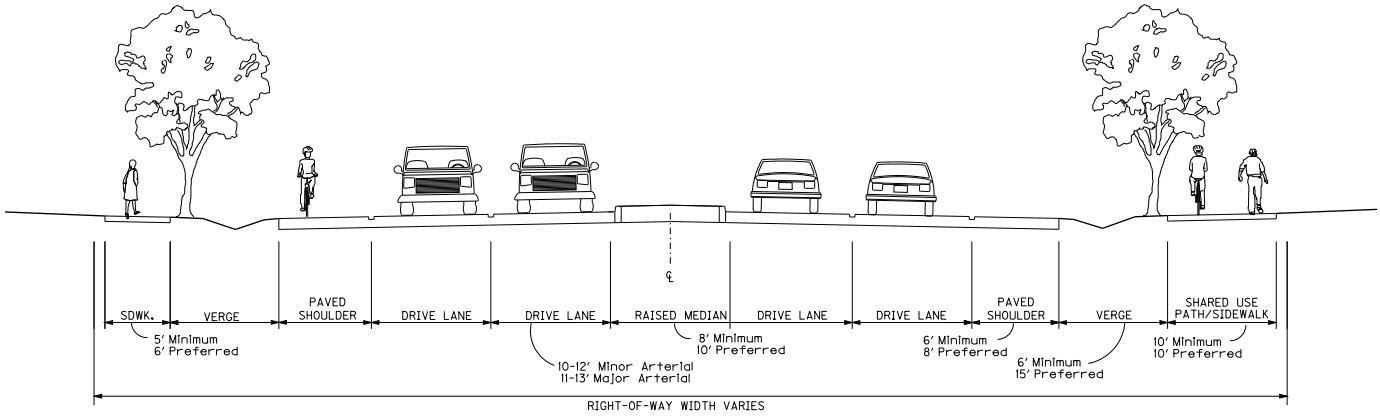
SECTION VIEW



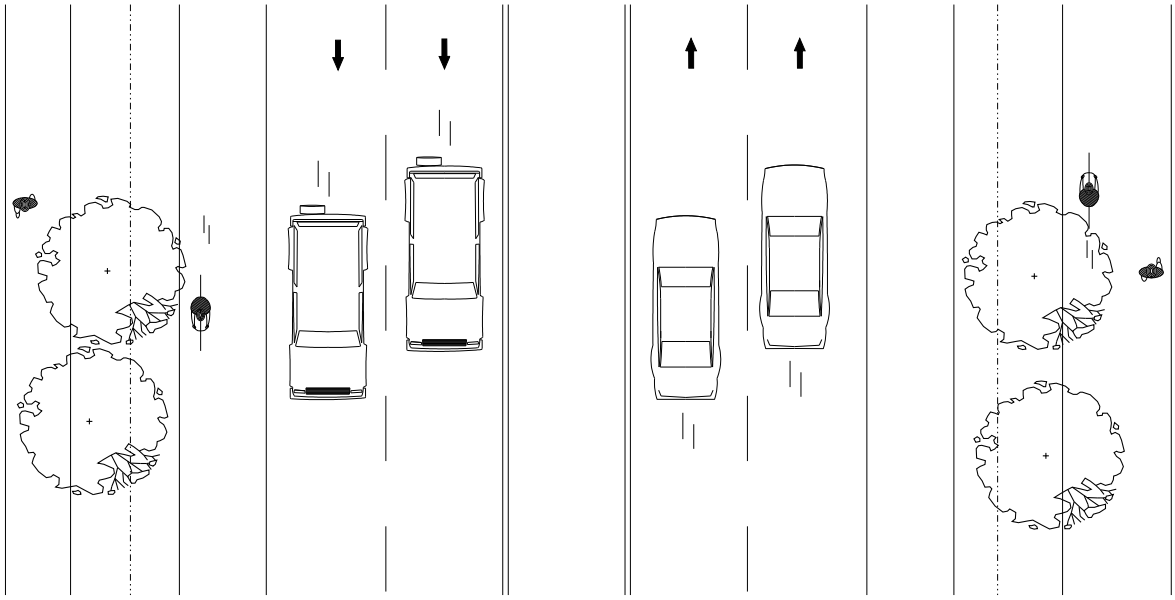
PLAN VIEW

AR–2

2–WAY, 4–LANE, DESIGNATED TURN LANE, SHARED USE PATH/SIDEWALK



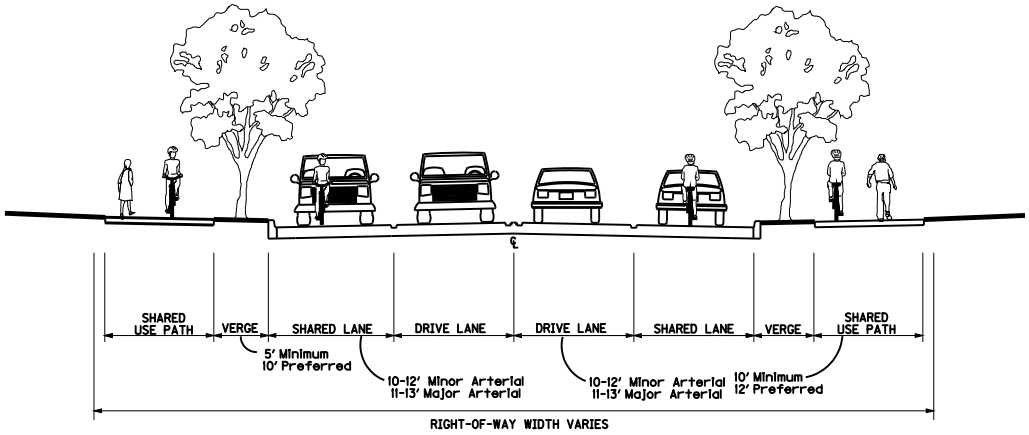
SECTION VIEW



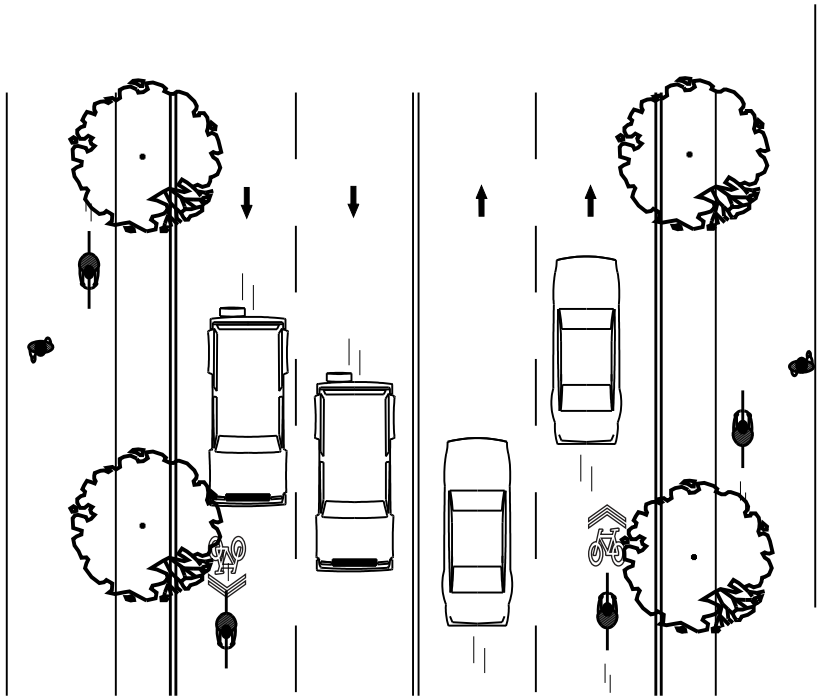
PLAN VIEW

AR–3

2–WAY, 4–LANE, MEDIAN, SHARED USE PATH/SIDEWALK



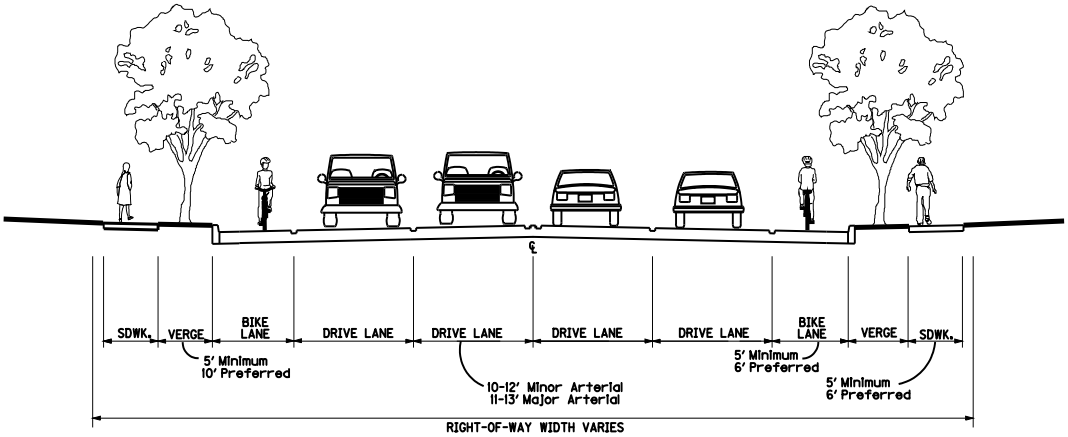
SECTION VIEW



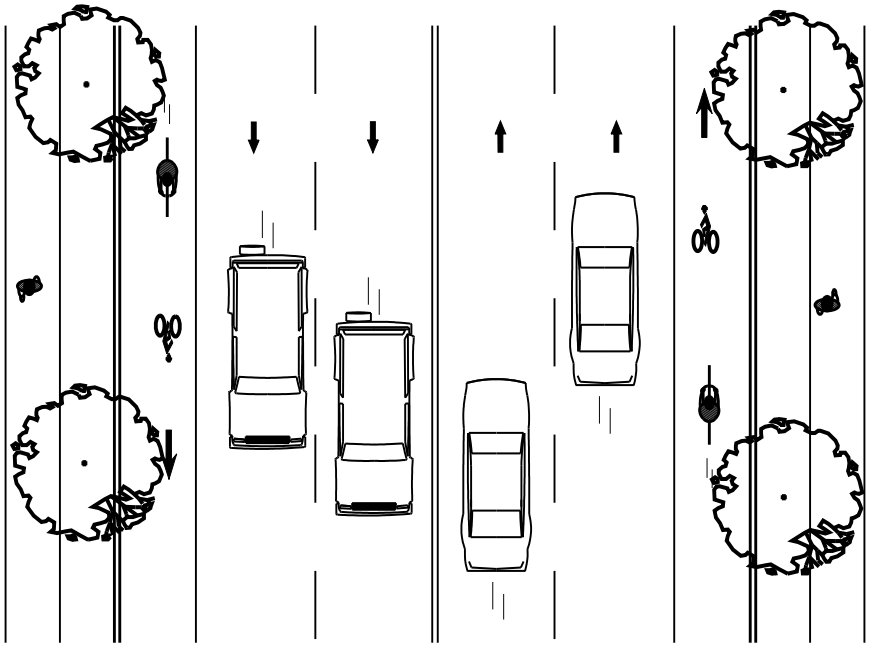
PLAN VIEW

AS–1

2–WAY, 4–LANE, SHARED USE PATH, SHARED LANE



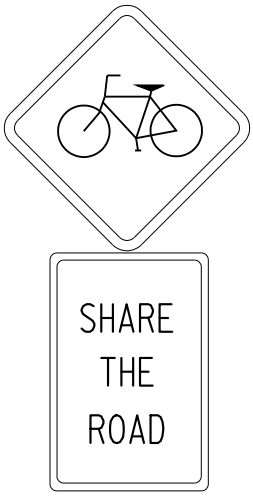
SECTION VIEW

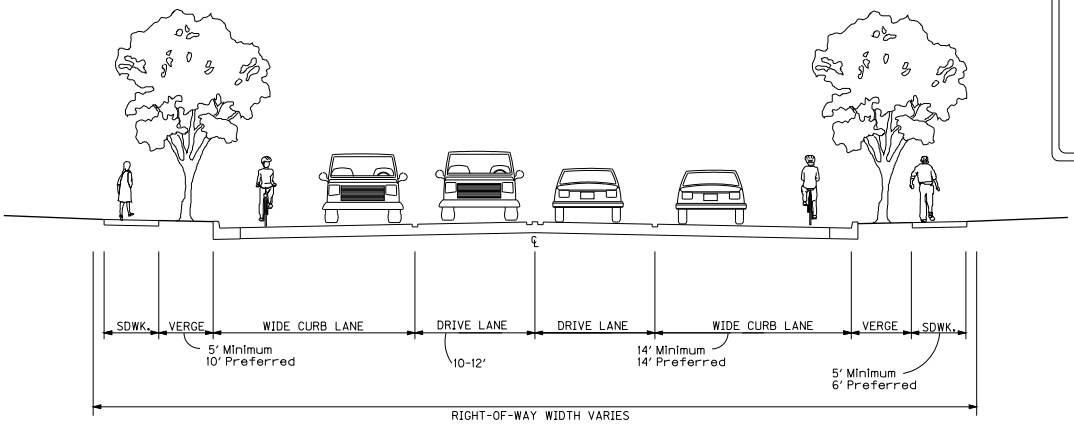


PLAN VIEW

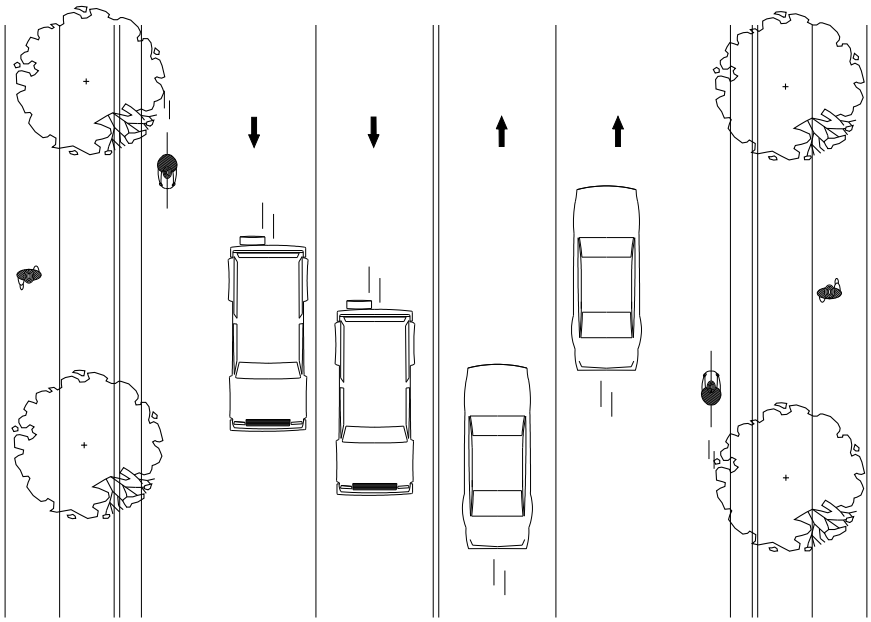
AS–2

2–WAY, 4–LANE, BIKE LANE, SIDEWALK





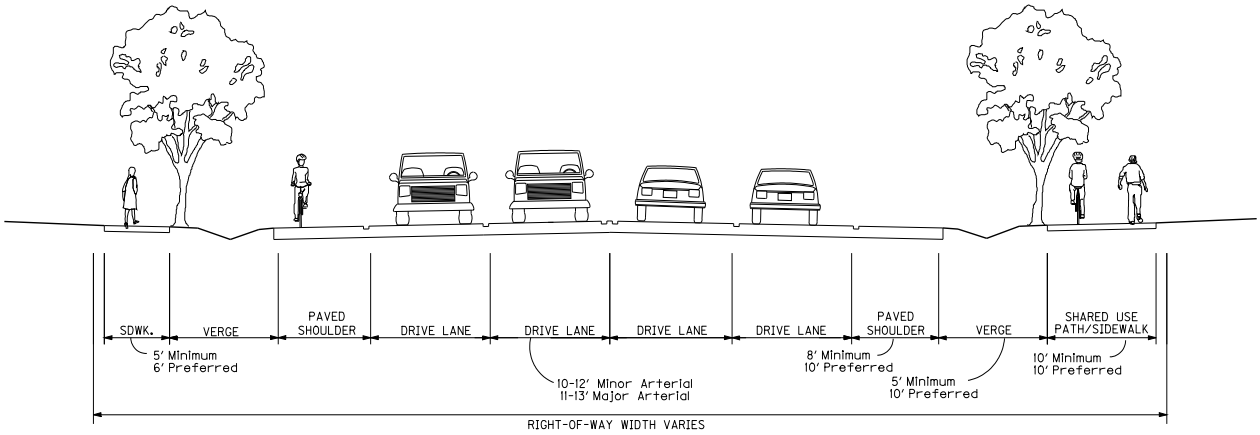
SECTION VIEW



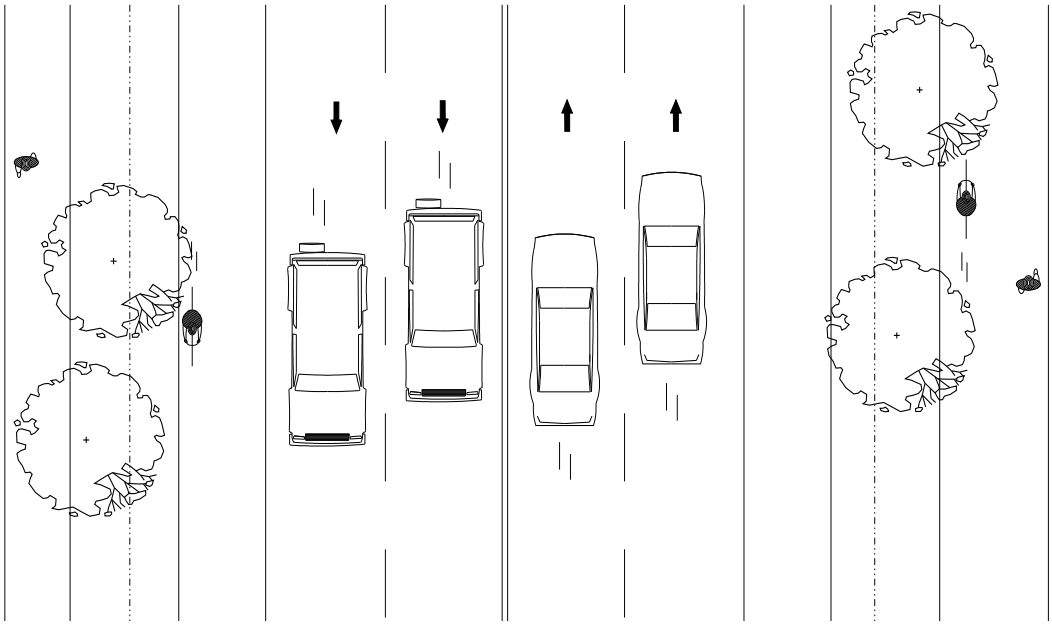
PLAN VIEW

AS–3

2–WAY, 4–LANE, WIDE CURB LANE, SIDEWALK



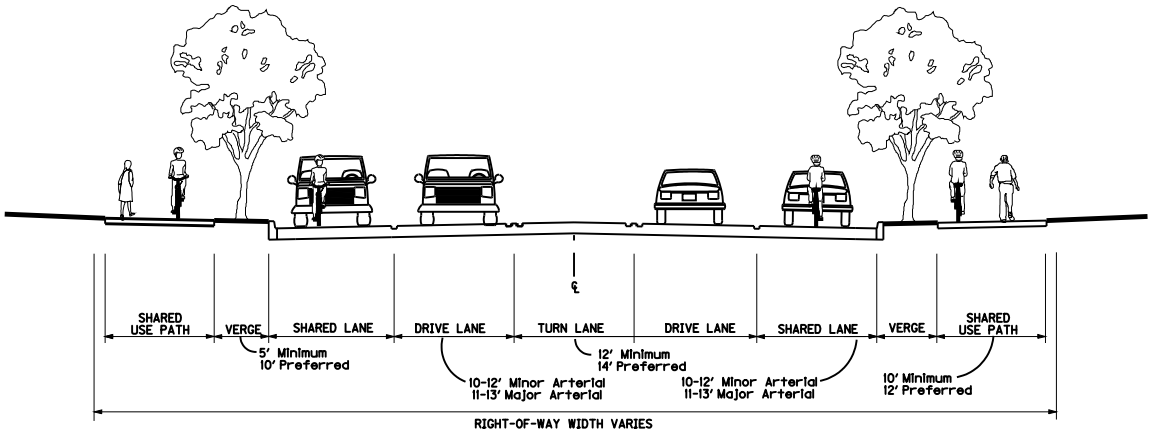
SECTION VIEW



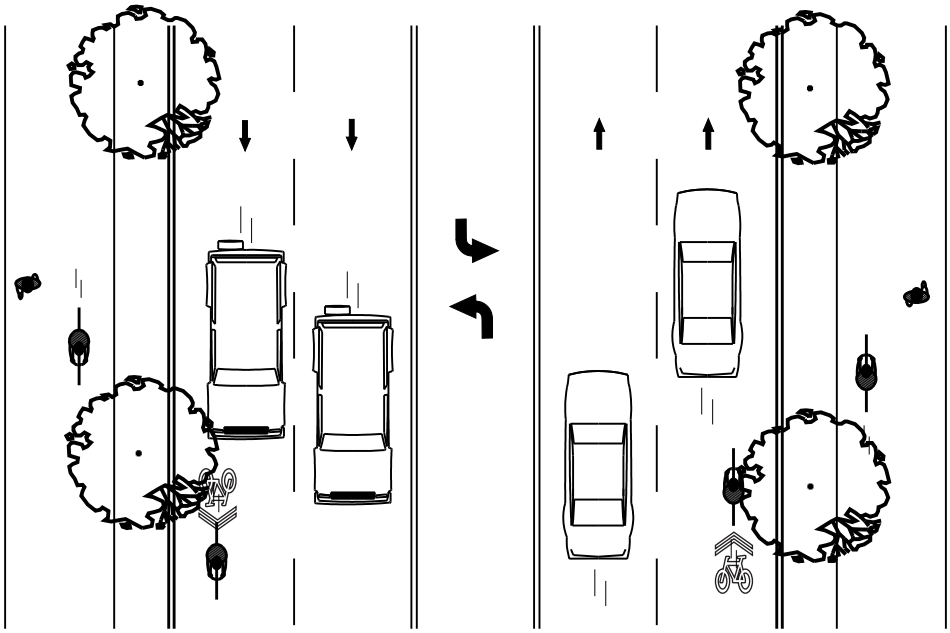
PLAN VIEW

AS–4

2–WAY, 4–LANE, SHOULDER, SIDEWALK, SHARED USE PATH



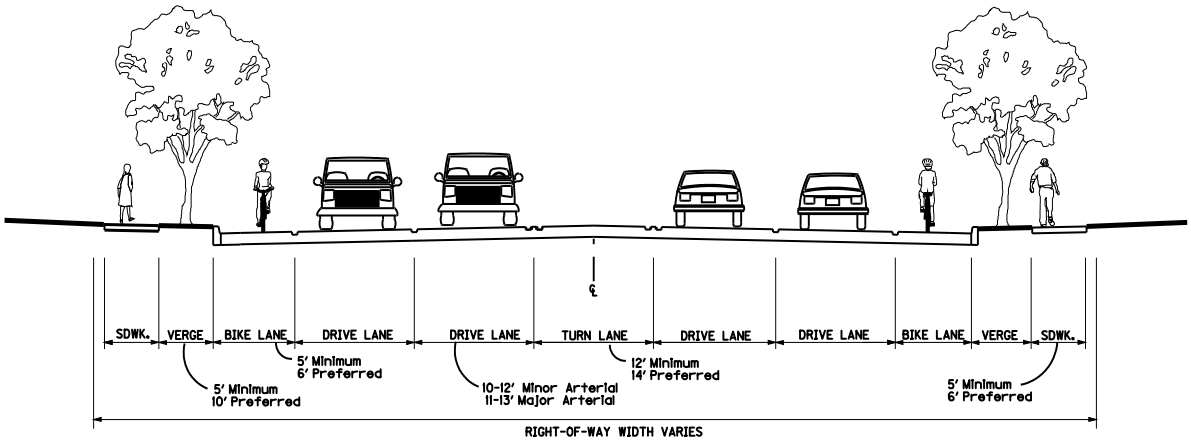
SECTION VIEW



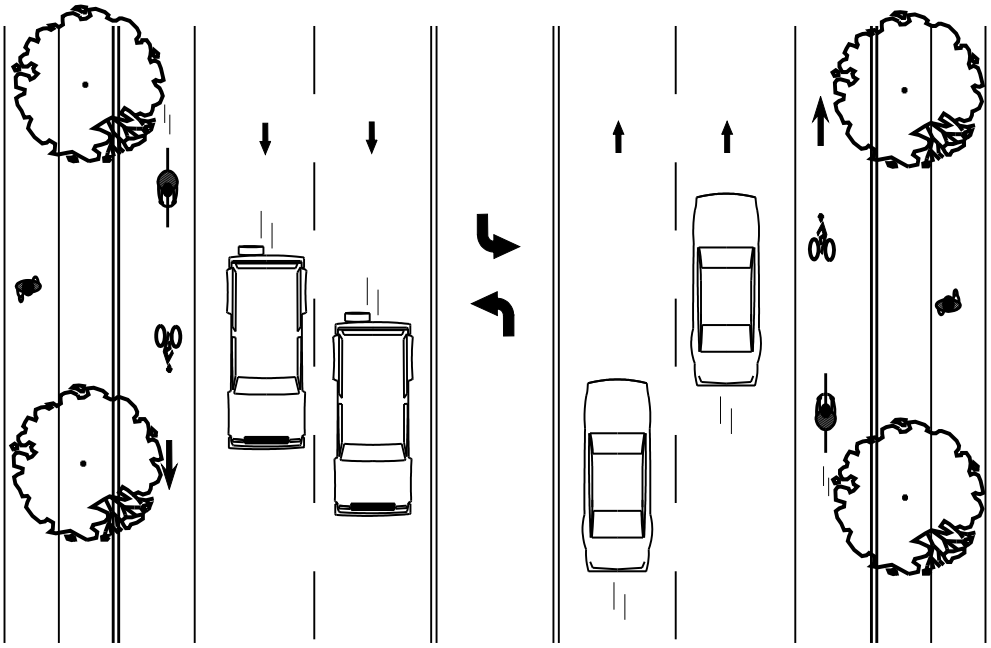
PLAN VIEW

AS–5

2–WAY, 4–LANE, SHARED TURN LANE, SHARED USE PATH, SHARED LANE



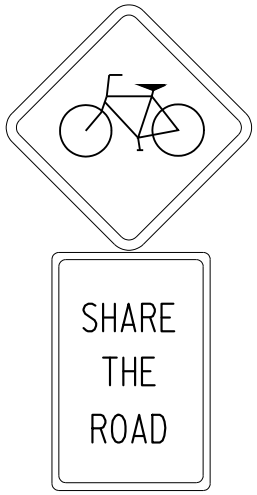
SECTION VIEW

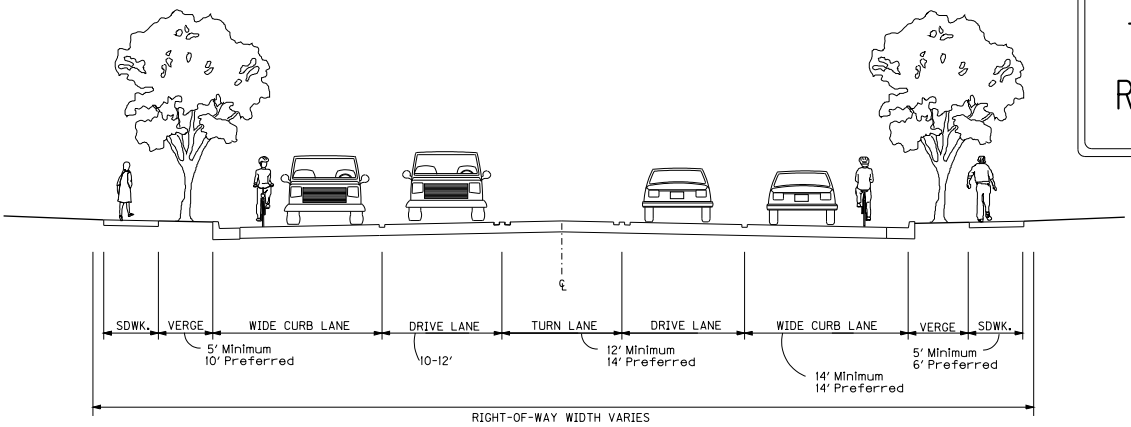


PLAN VIEW

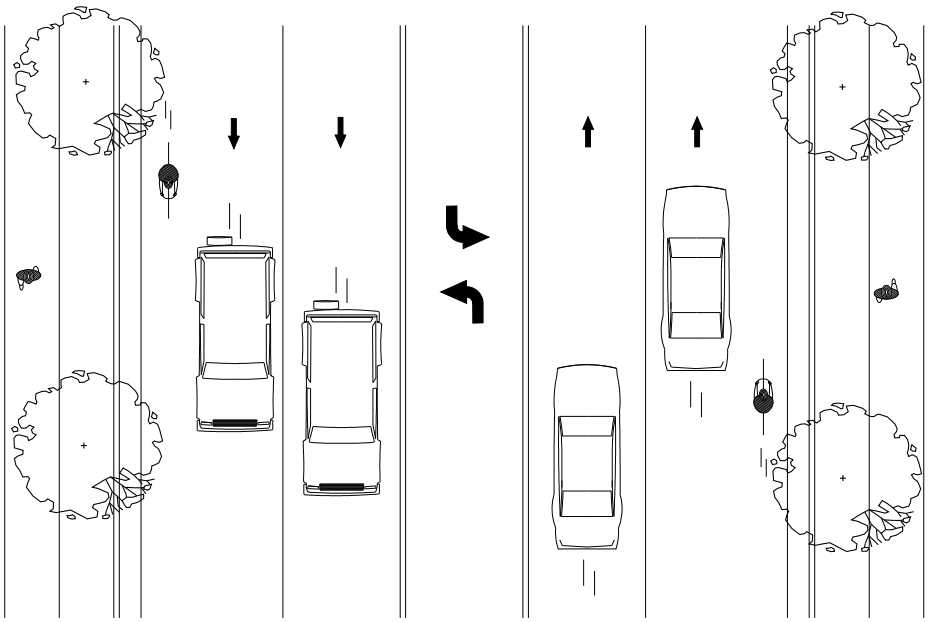
AS–6

2–WAY, 4–LANE, SHARED TURN LANE, BIKE LANE, SIDEWALK



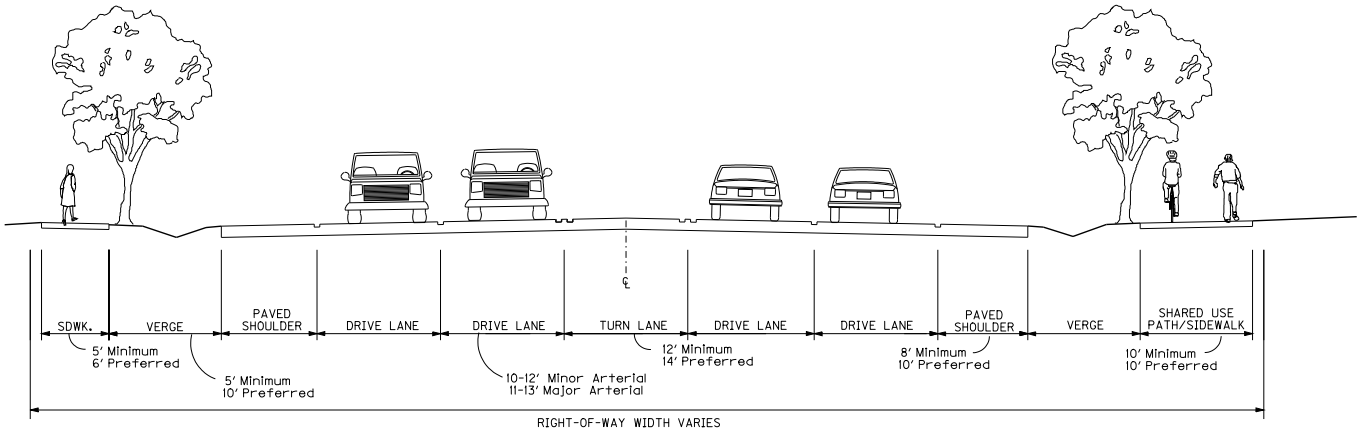


SECTION VIEW

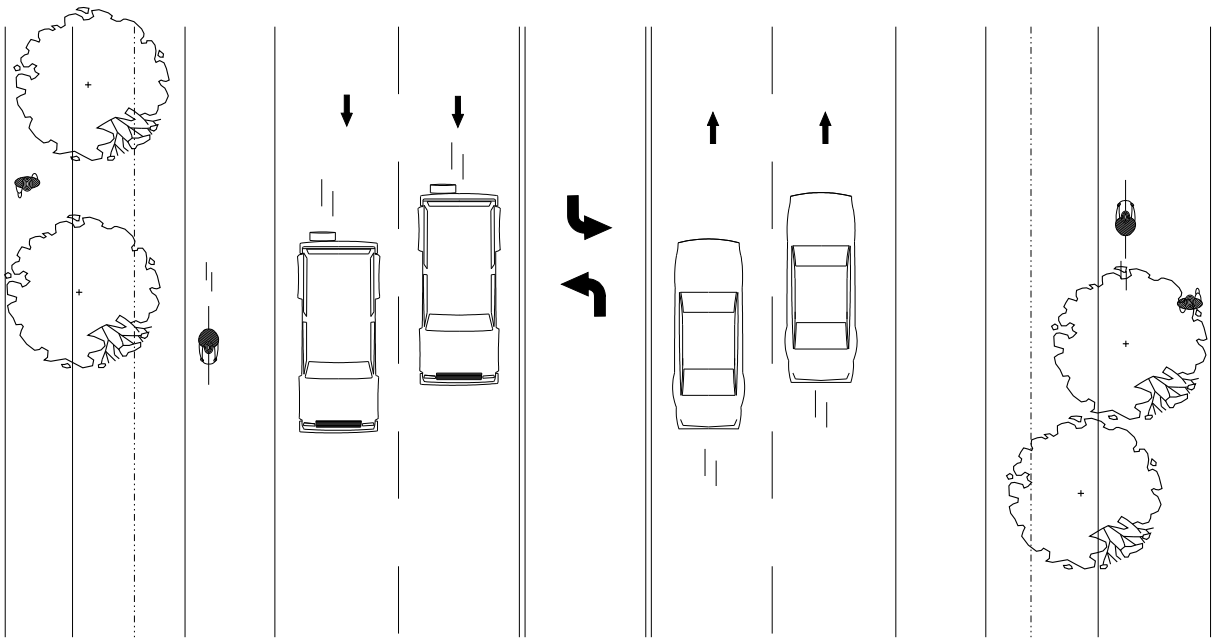


PLAN VIEW

AS–7
2–WAY, 4–LANE, SHARED TURN LANE, WIDE CURB LANE



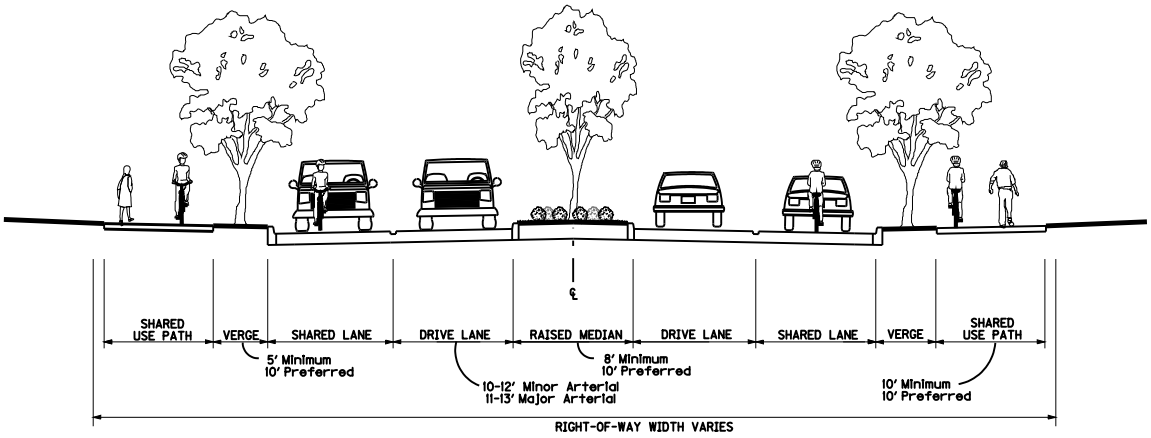
SECTION VIEW



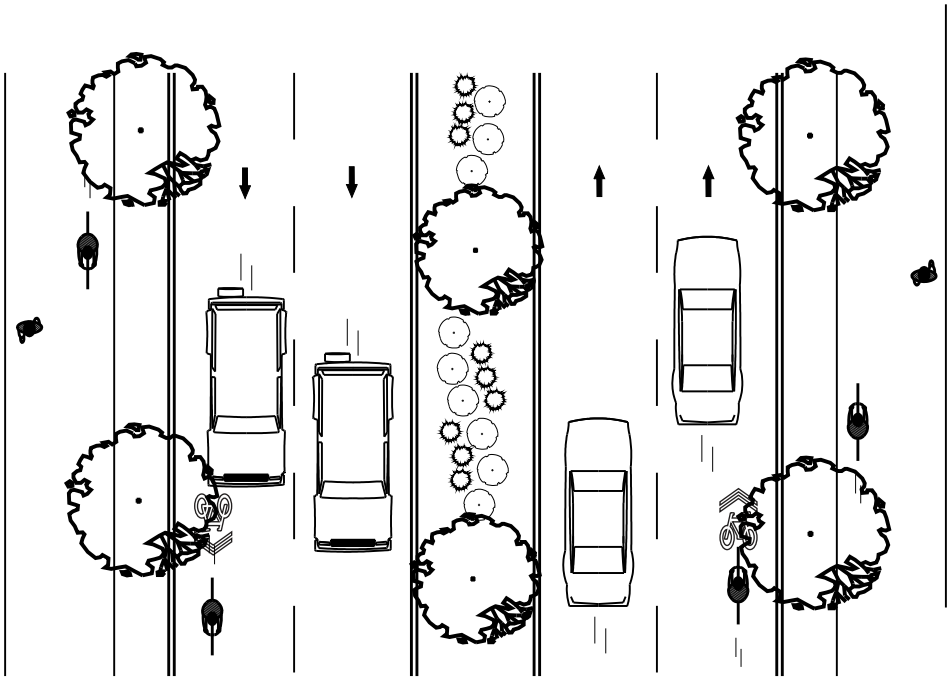
PLAN VIEW

AS–8

2–WAY, 4–LANE, SHARED TURN LANE, SHOULDER, SIDEWALK/SHARED USE PATH



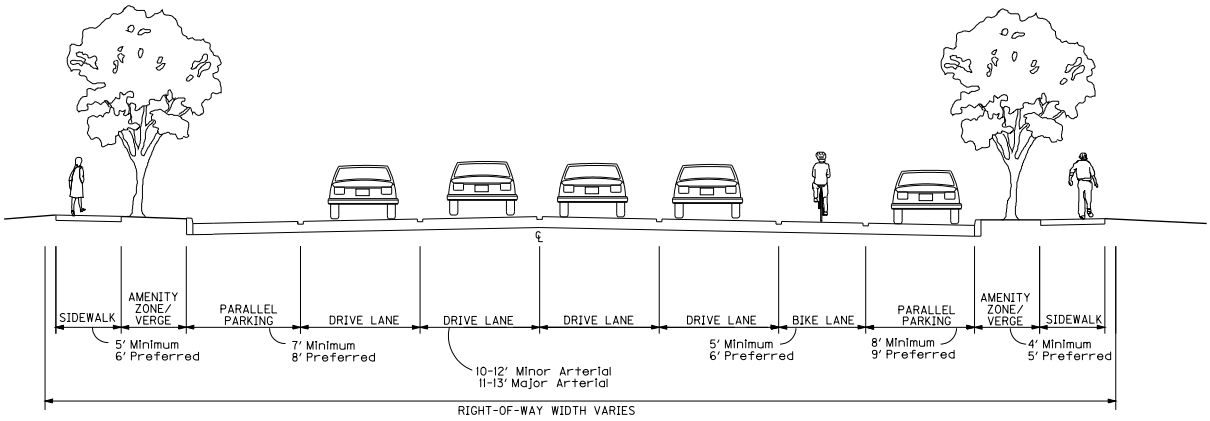
SECTION VIEW



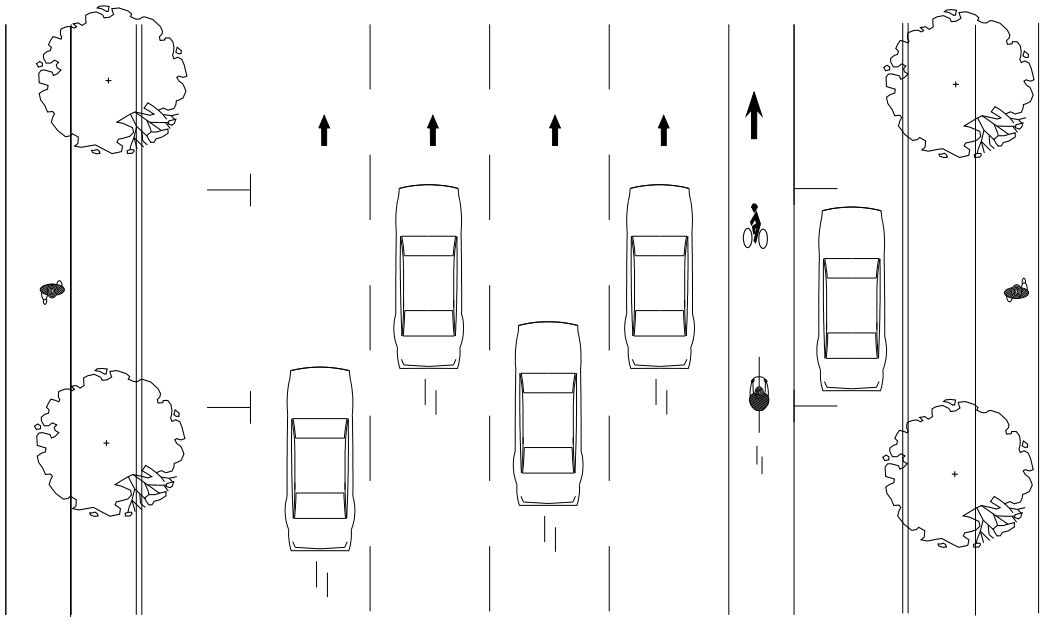
PLAN VIEW

AS–9

2–WAY, 4–LANE, MEDIAN, SHARED USE PATH SHARED LANE



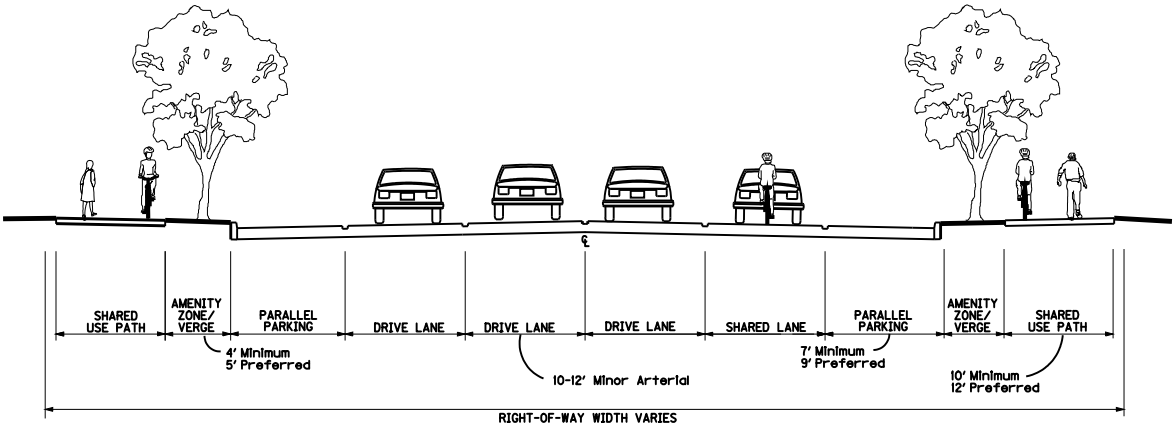
SECTION VIEW



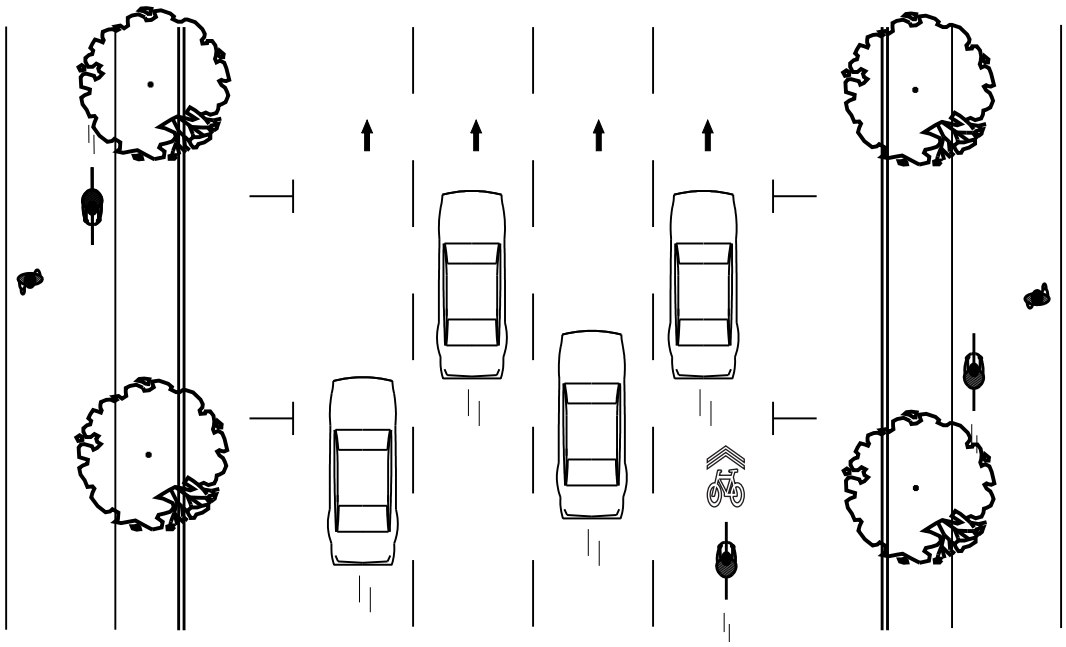
PLAN VIEW

AT–1

1–WAY, 4–6 LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK

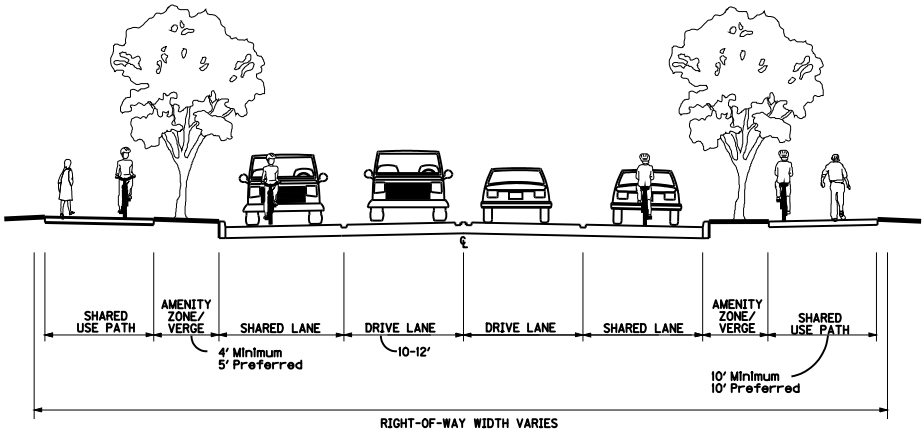


SECTION VIEW

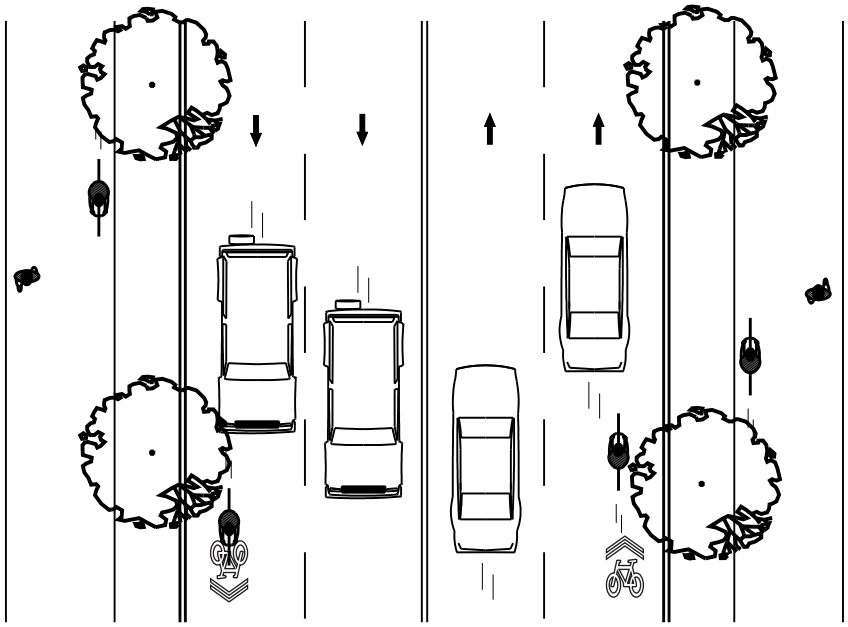


PLAN VIEW

AT–2
1–WAY, 4–6 LANE, PARALLEL PARKING, SHARED USE PATH, SHARED LANE



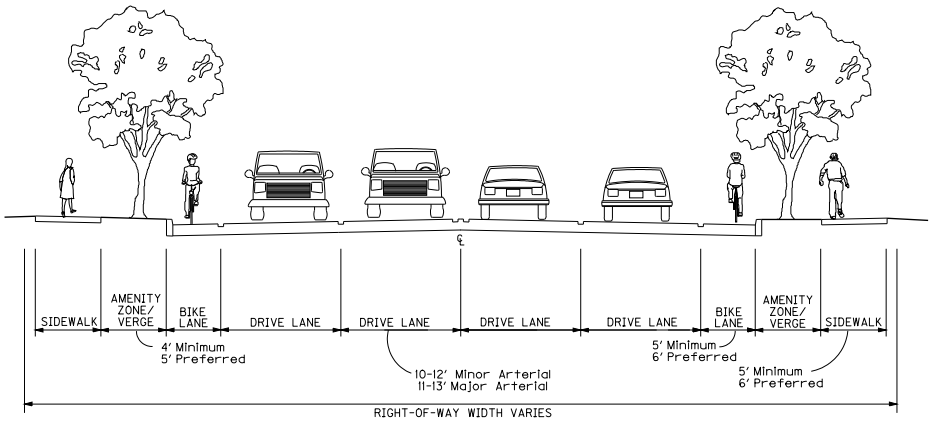
SECTION VIEW



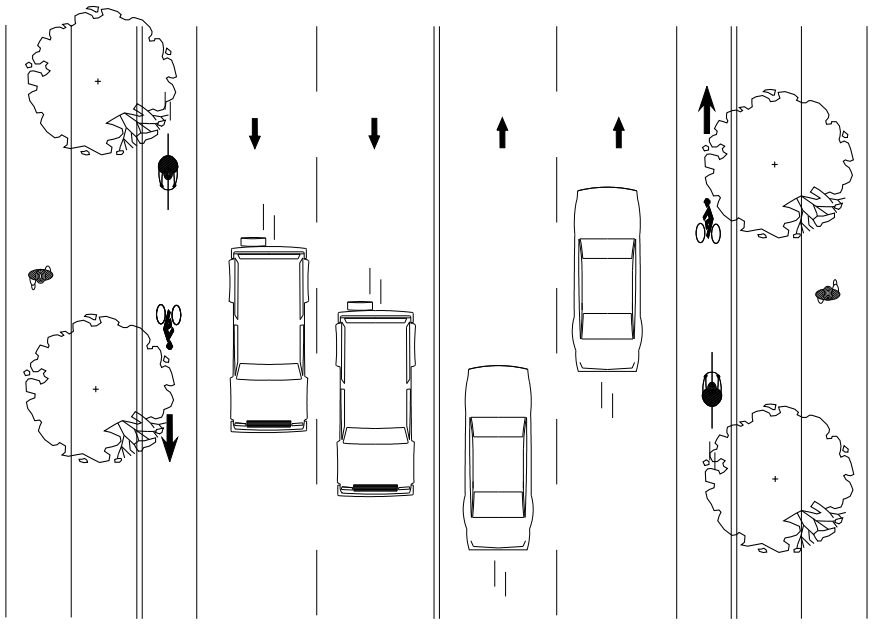
PLAN VIEW

AT–3

2–WAY, 4–6 LANE, SHARED USE PATH, SHARED LANE



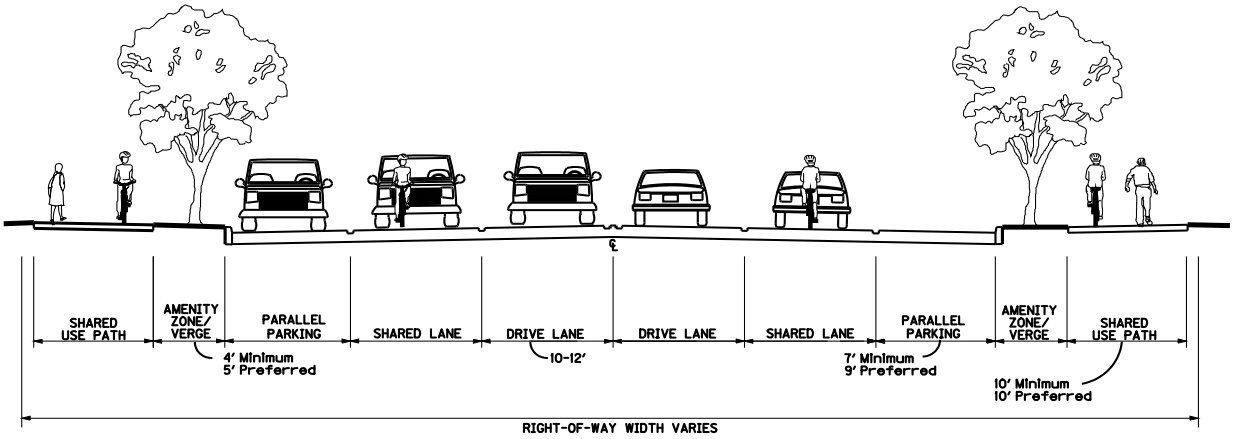
SECTION VIEW



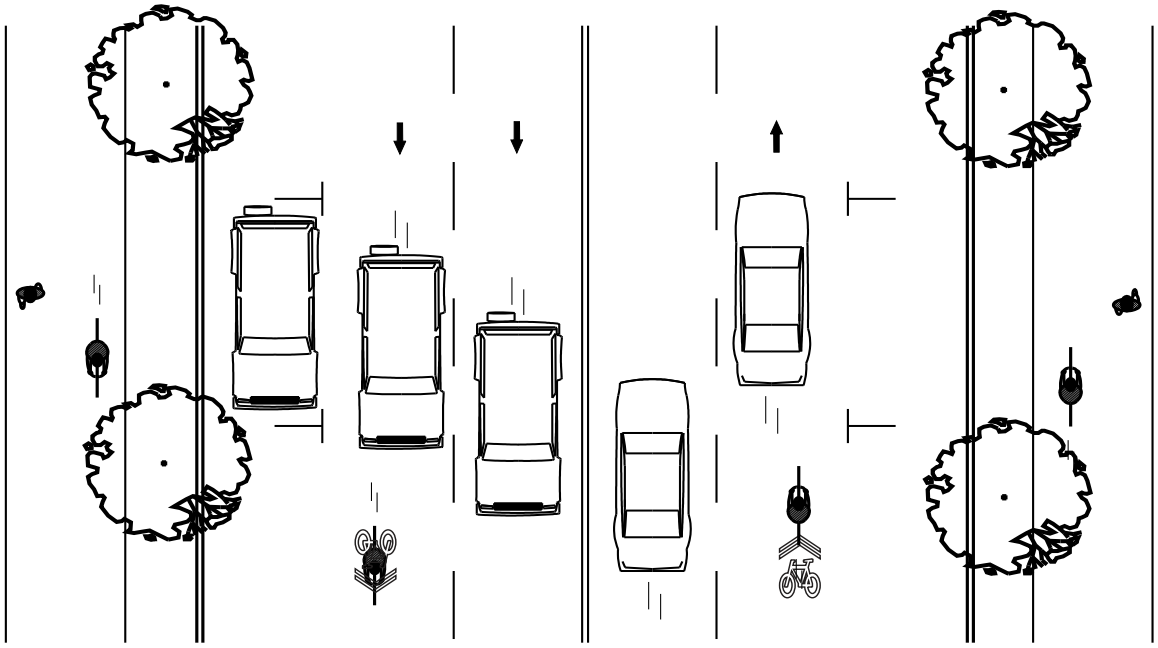
PLAN VIEW

AT–4

2–WAY, 4–6 LANE, BIKE LANE, SIDEWALK



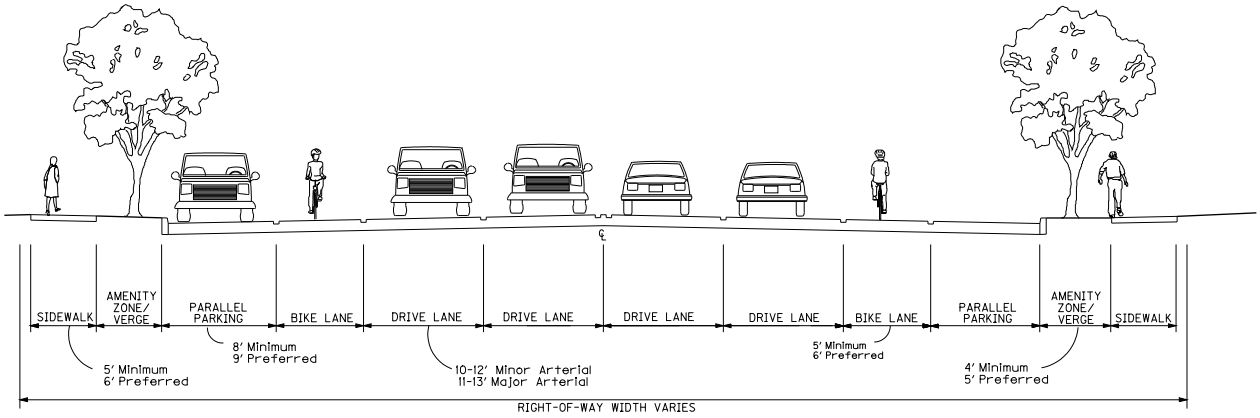
SECTION VIEW



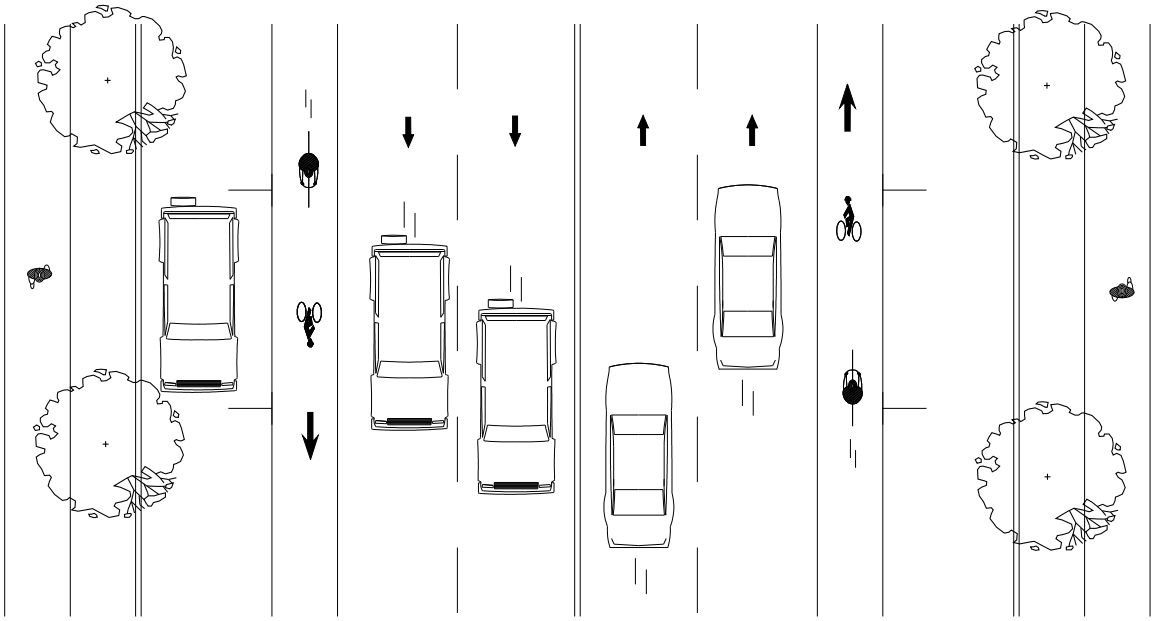
PLAN VIEW

AT–5

2–WAY, 4–6 LANE, PARALLEL PARKING, SHARED USE PATH, SHARED LANE



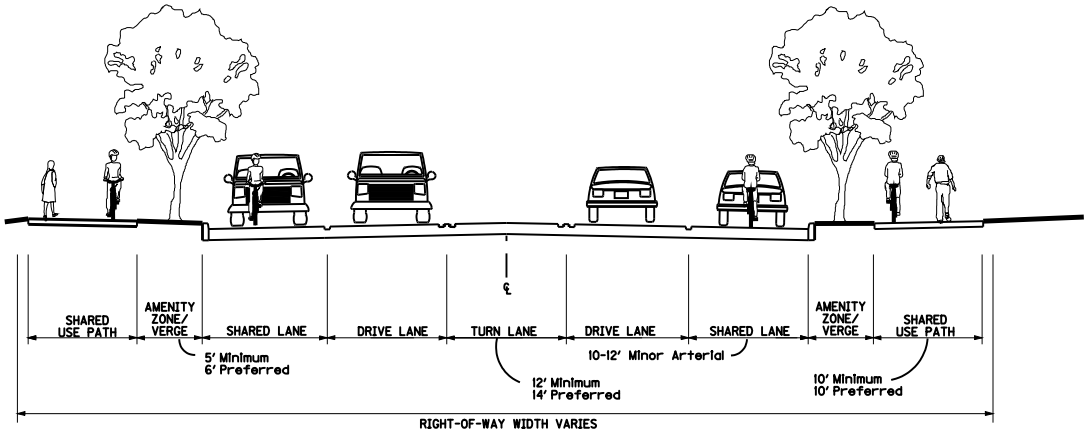
SECTION VIEW



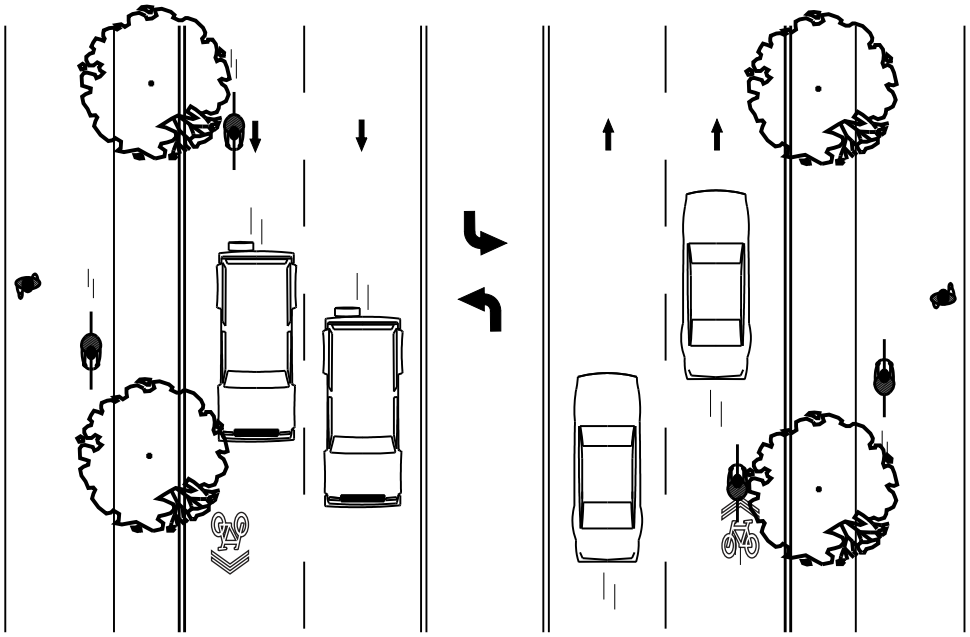
PLAN VIEW

AT–6

2–WAY, 4–6 LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK



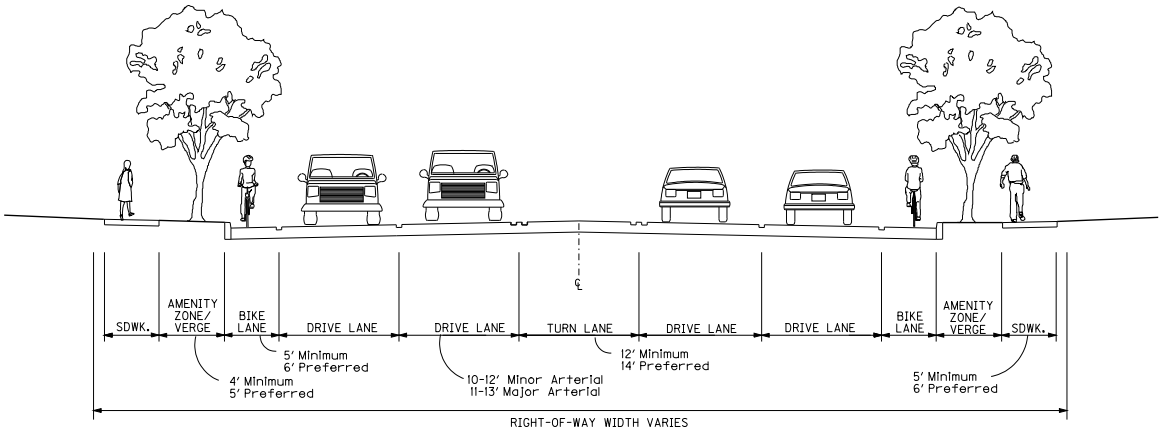
SECTION VIEW



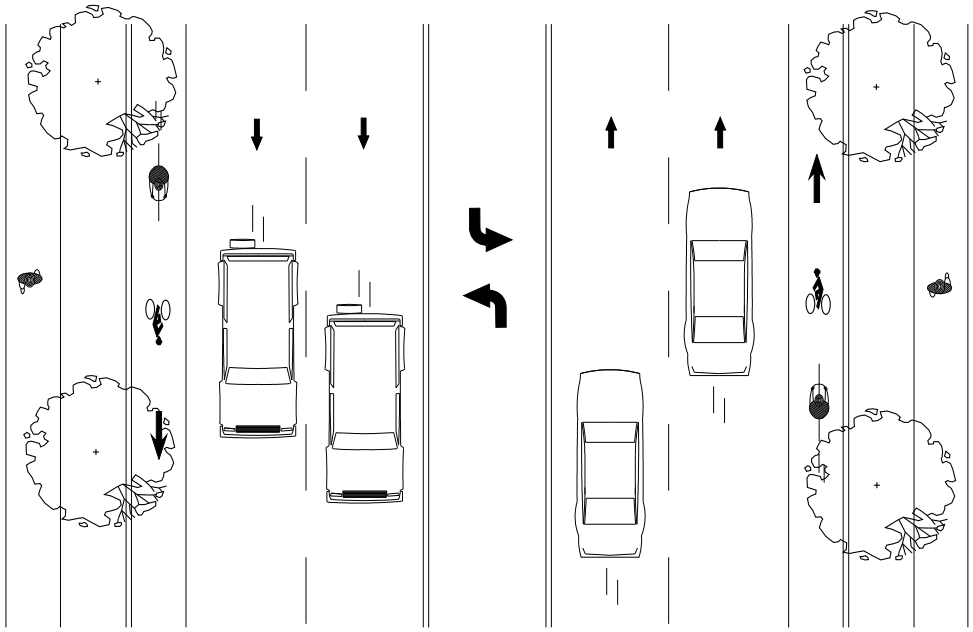
PLAN VIEW

AT–7

2–WAY, 4–6 LANE, SHARED TURN LANE, SHARED USE PATH, SHARED LANE



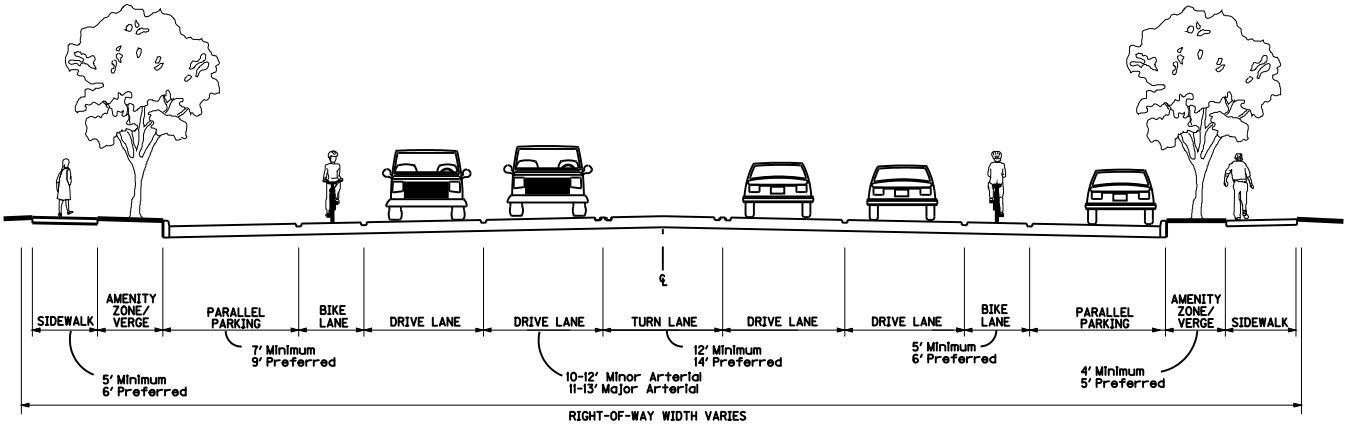
SECTION VIEW



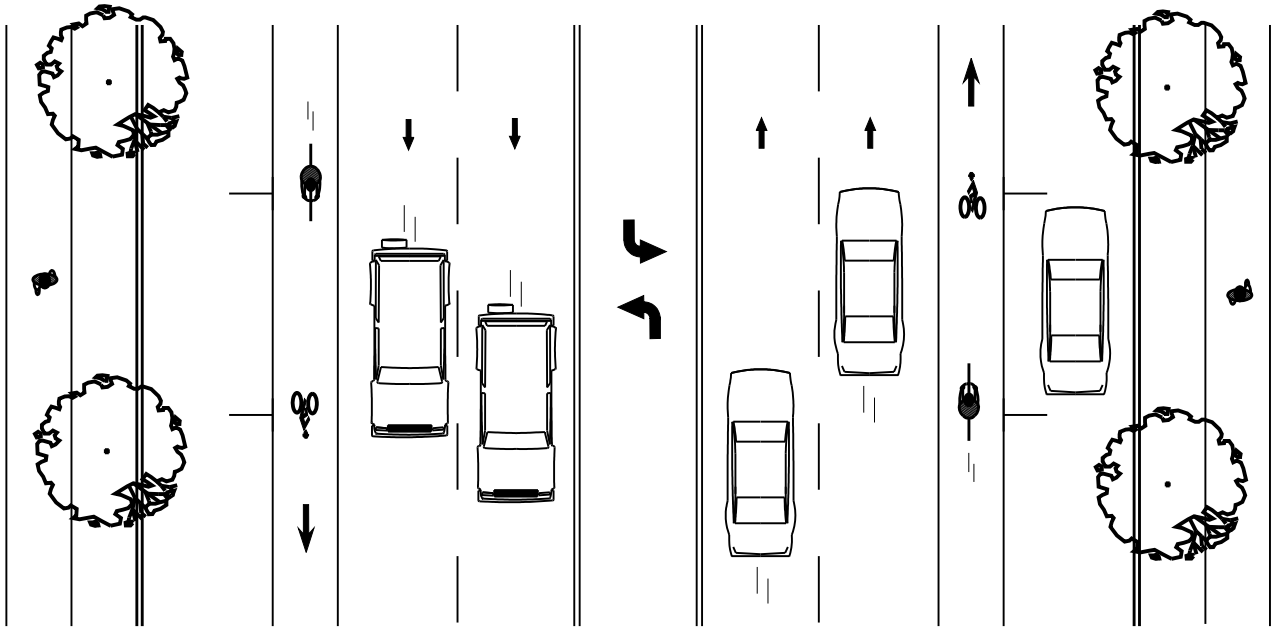
PLAN VIEW

AT–8

2–WAY, 4–6 LANE, SHARED TURN LANE, BIKE LANE, SIDEWALK



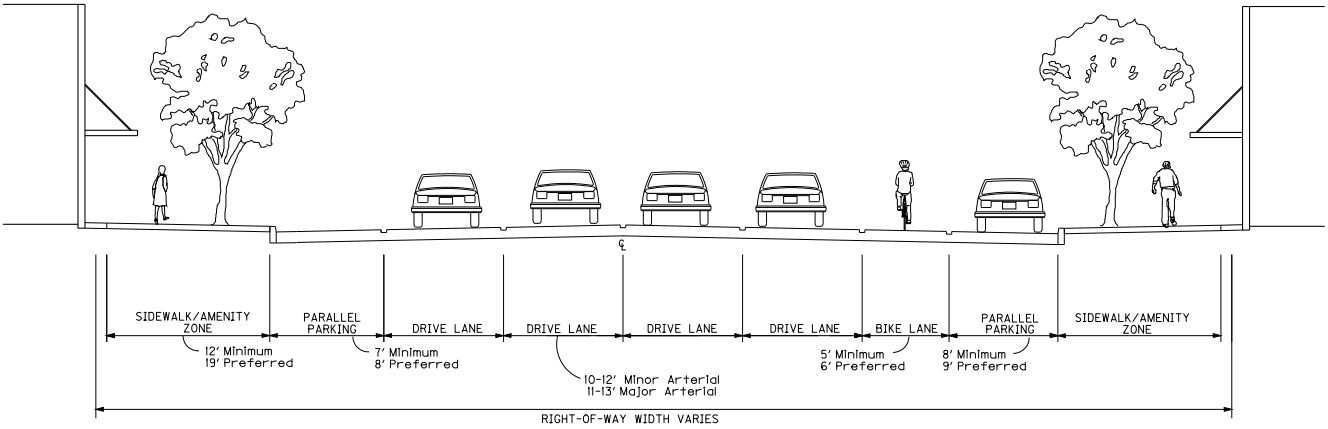
SECTION VIEW



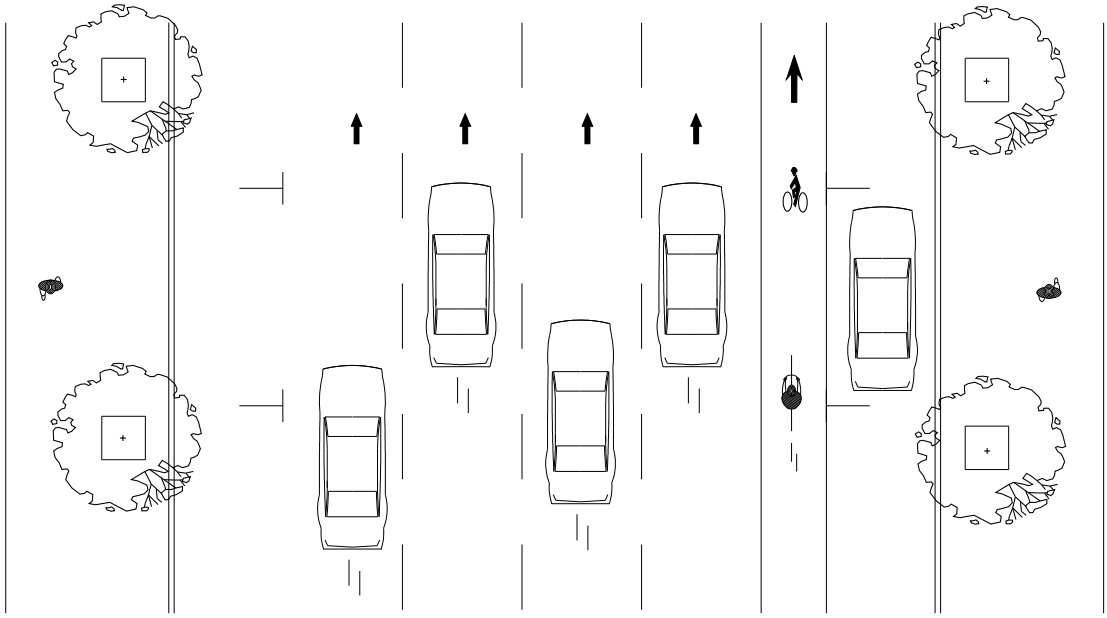
PLAN VIEW

AT–9

2–WAY, 4–6 LANE, SHARED TURN LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK



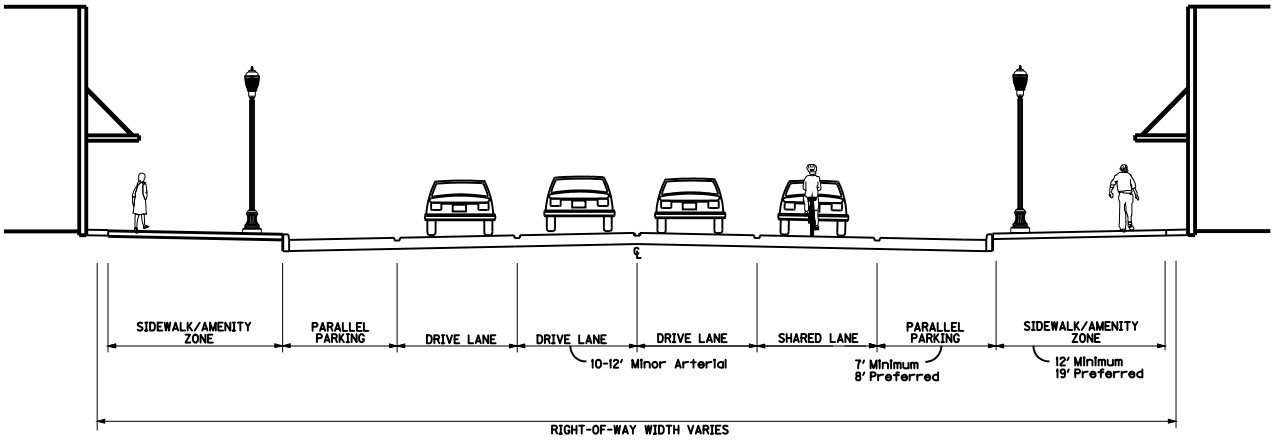
SECTION VIEW



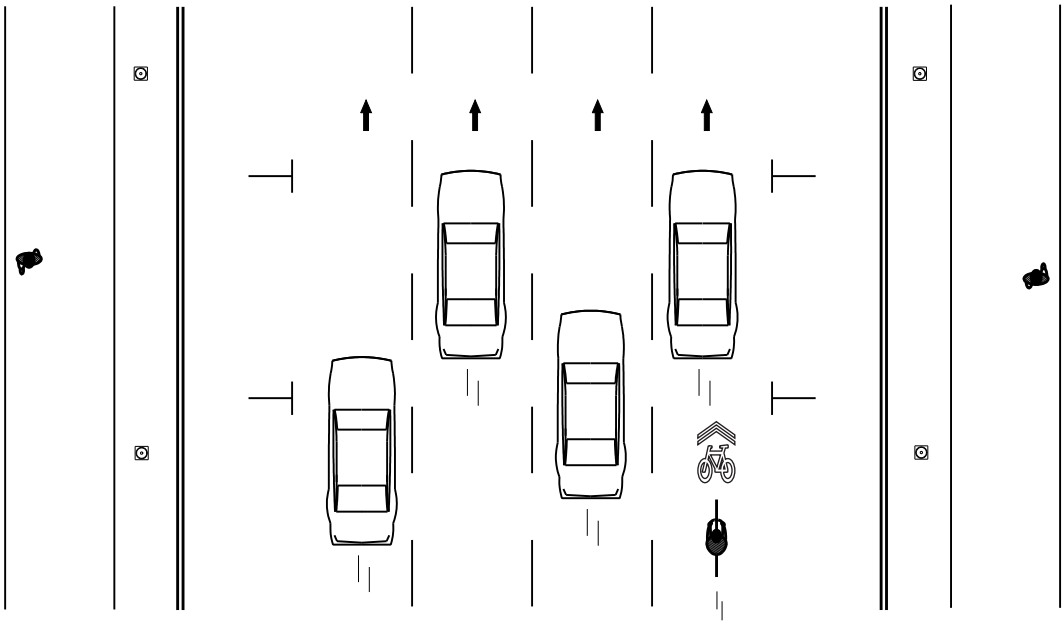
PLAN VIEW

AD–1

1–WAY, 4–6 LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK



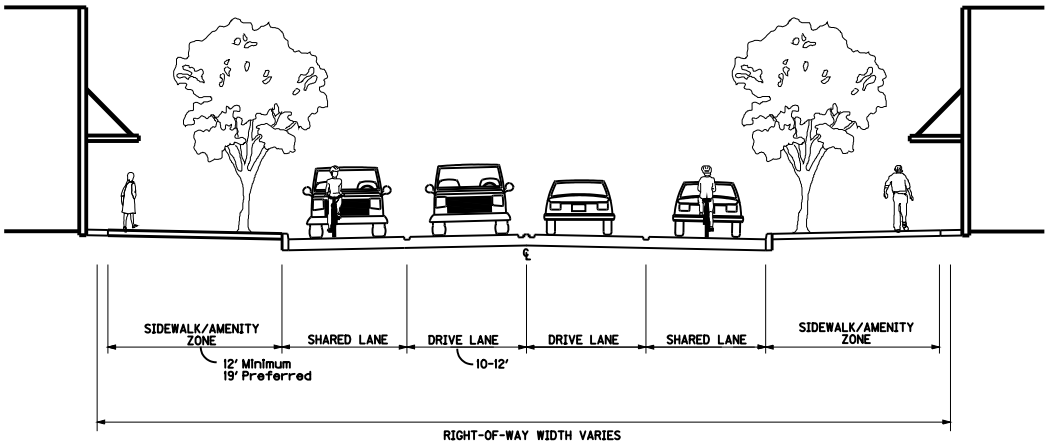
SECTION VIEW



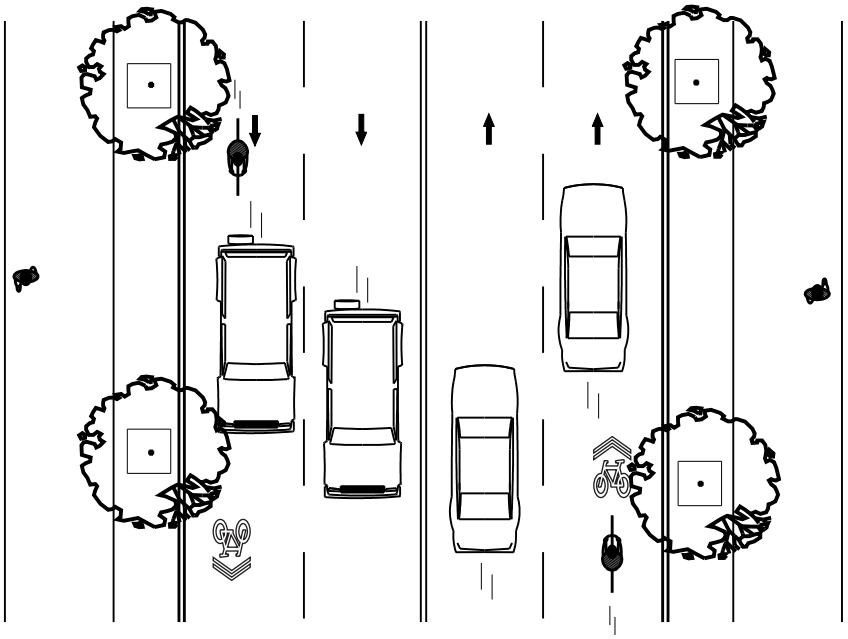
PLAN VIEW

AD–2

1–WAY, 4–6 LANE, SHARED LANE, PARALLEL PARKING, SIDEWALK



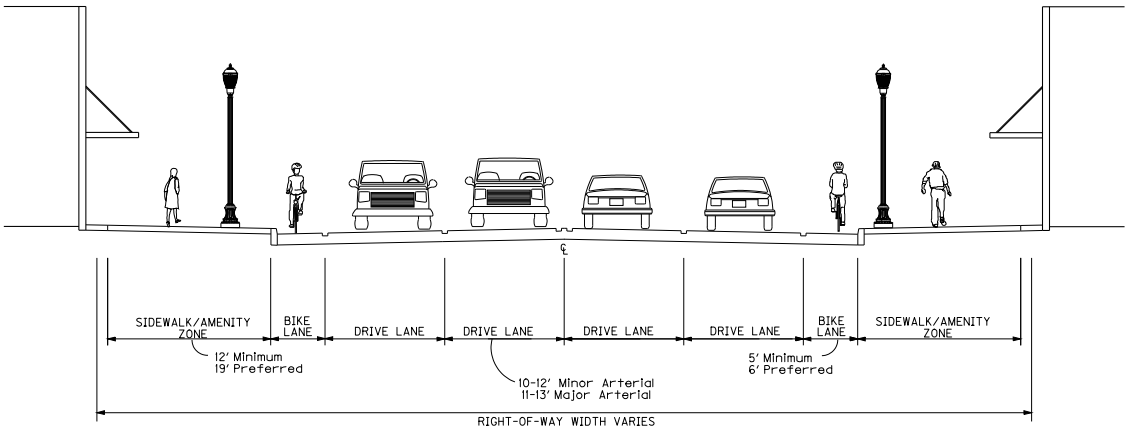
SECTION VIEW



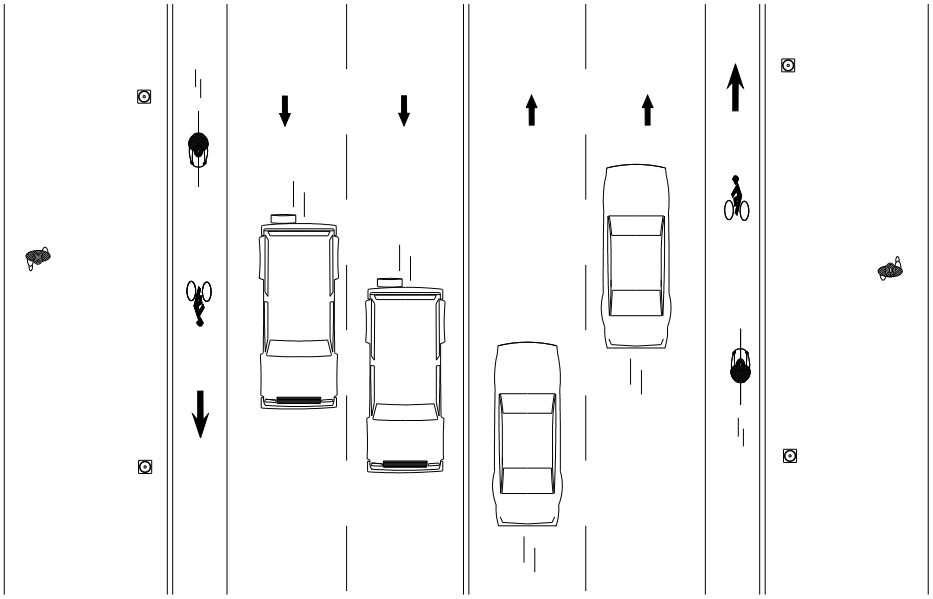
PLAN VIEW

AD–3

2–WAY, 4–6 LANE, SHARED LANE, SIDEWALK



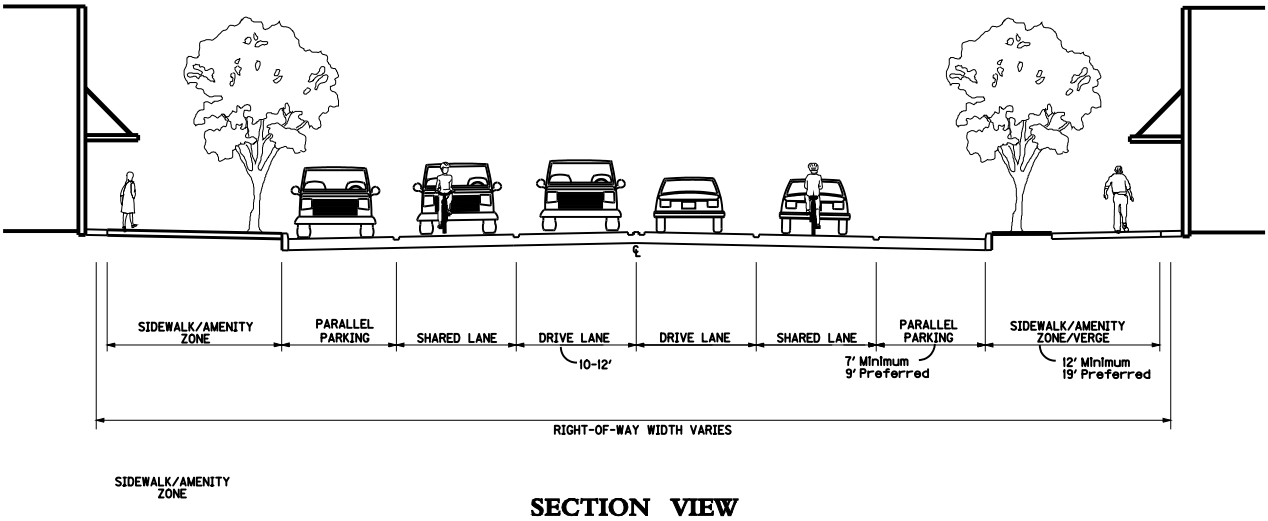
SECTION VIEW



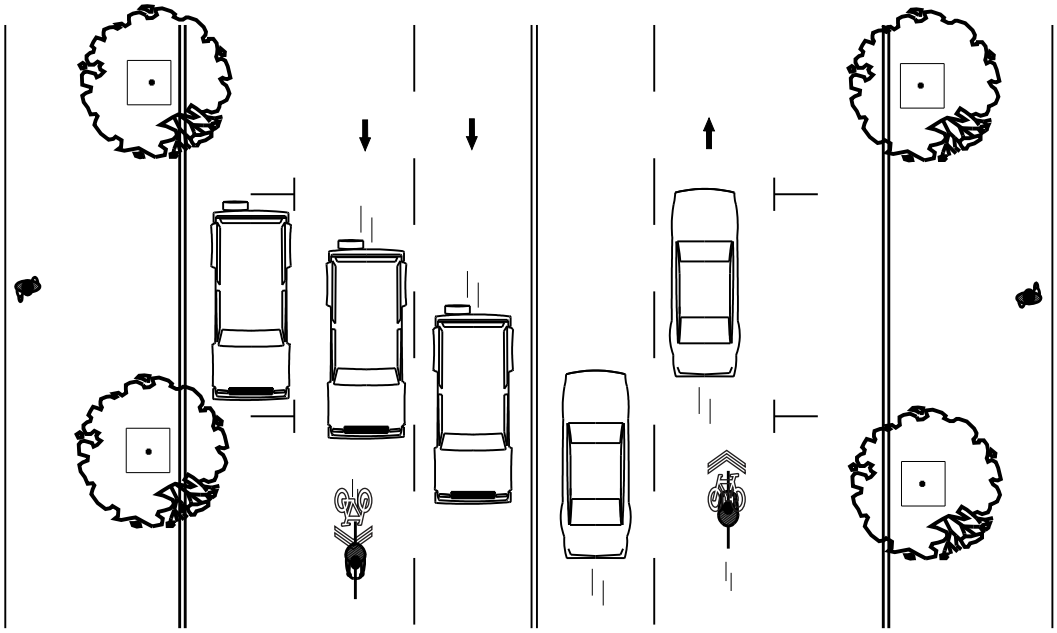
PLAN VIEW

AD–4

2–WAY, 4–6 LANE, BIKE LANE, SIDEWALK



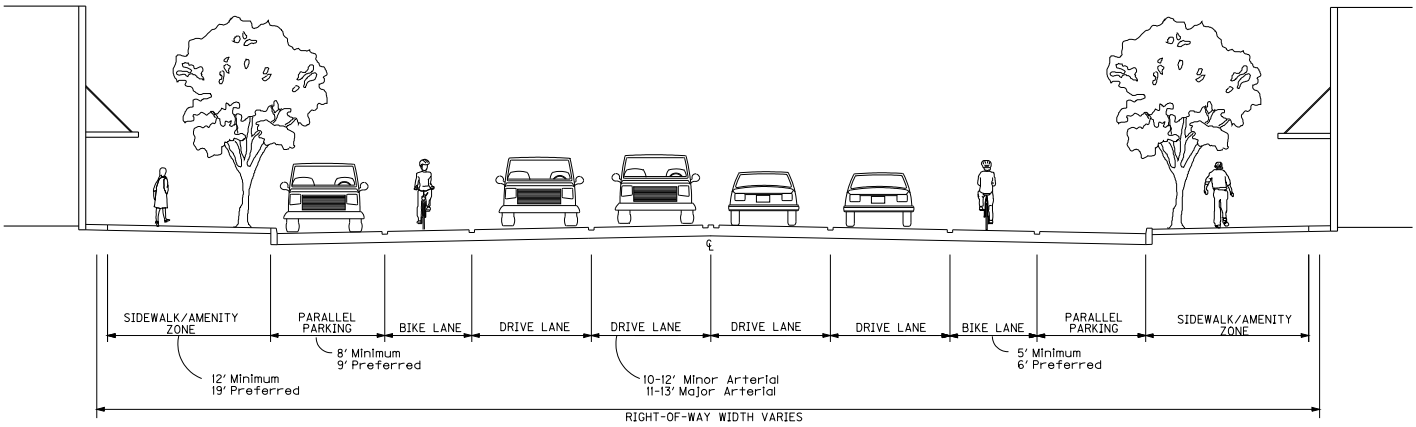
SECTION VIEW



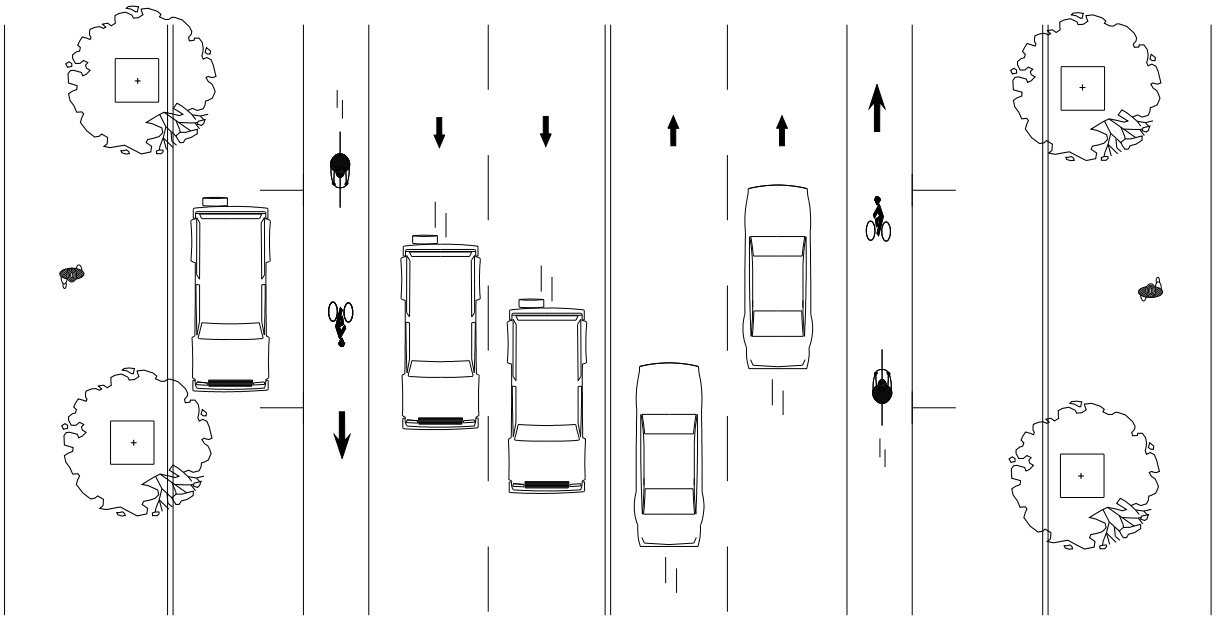
PLAN VIEW

AD–5

2–WAY, 4–6 LANE, PARALLEL PARKING, SHARED LANE, SIDEWALK



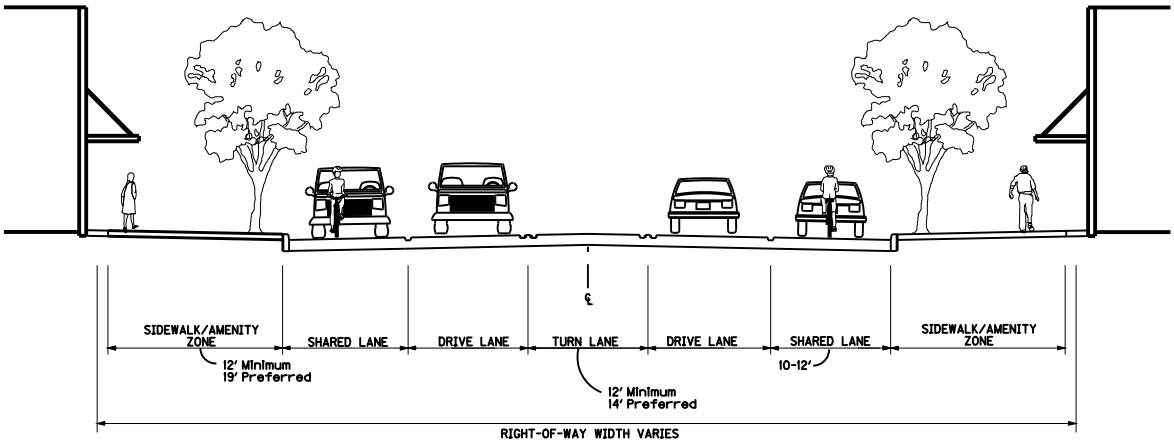
SECTION VIEW



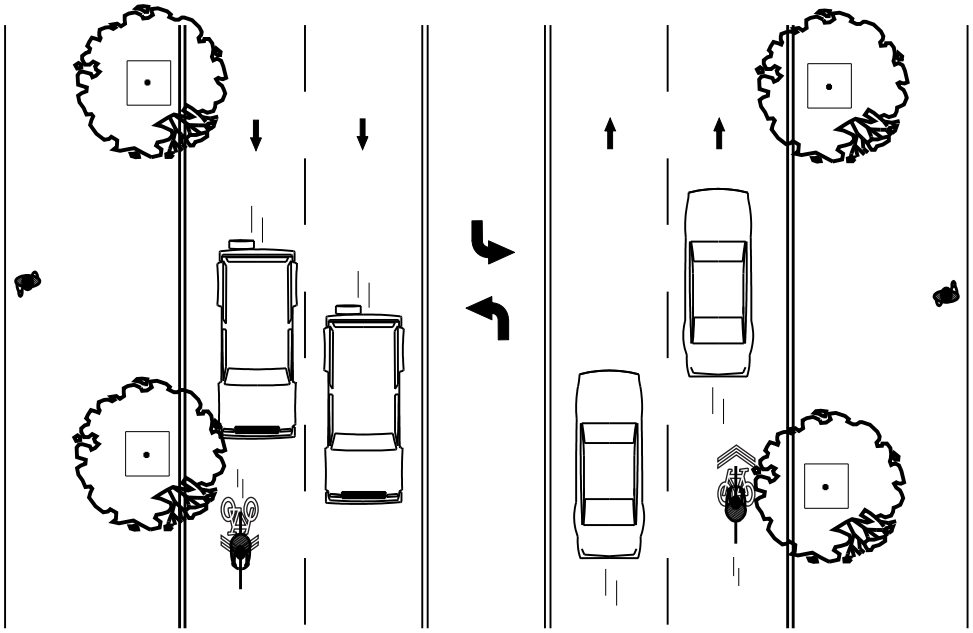
PLAN VIEW

AD–6

2–WAY, 4–6 LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK



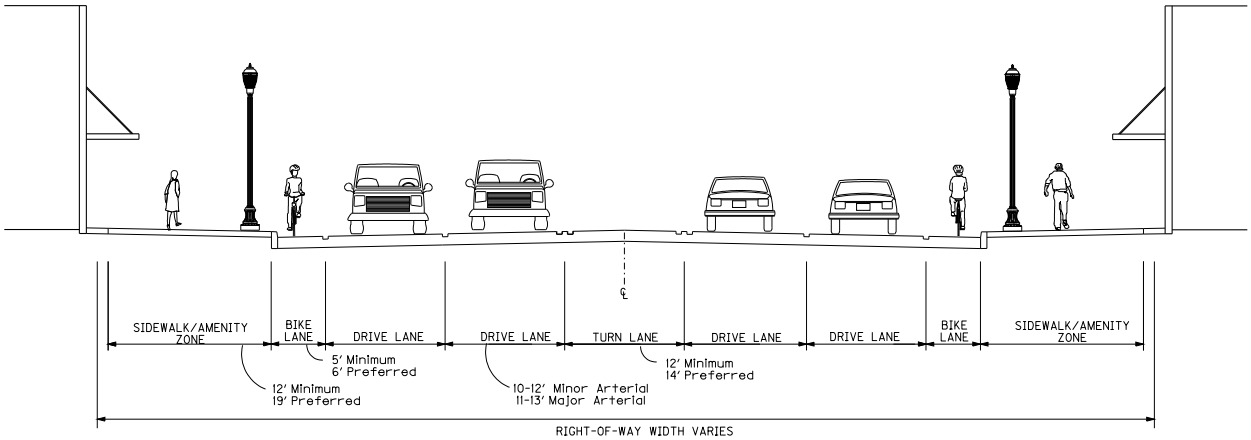
SECTION VIEW



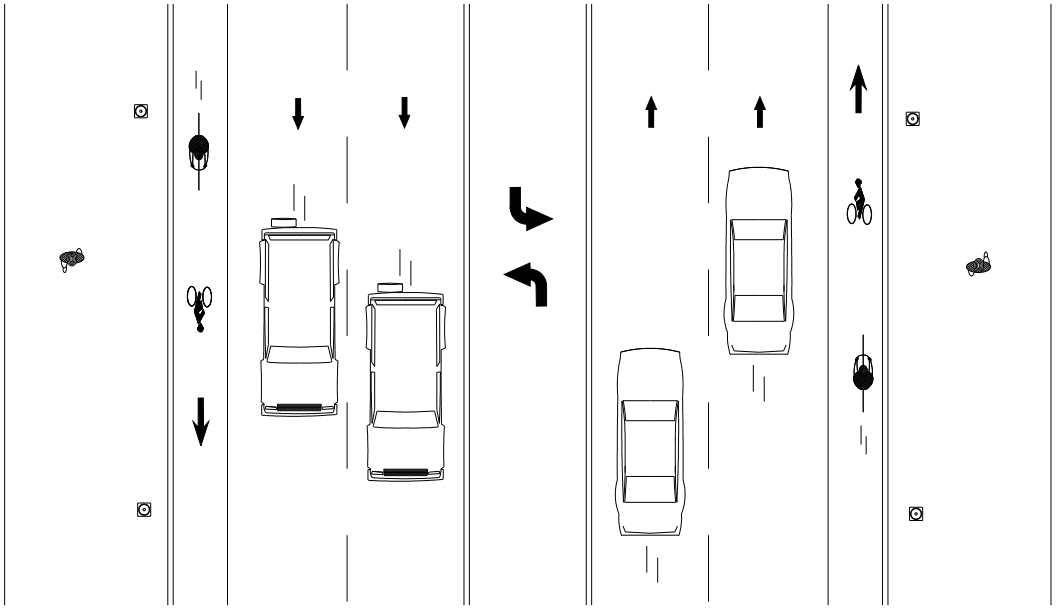
PLAN VIEW

AD–7

2–WAY, 4–6 LANE, SHARED TURN LANE, SHARED LANE, SIDEWALK



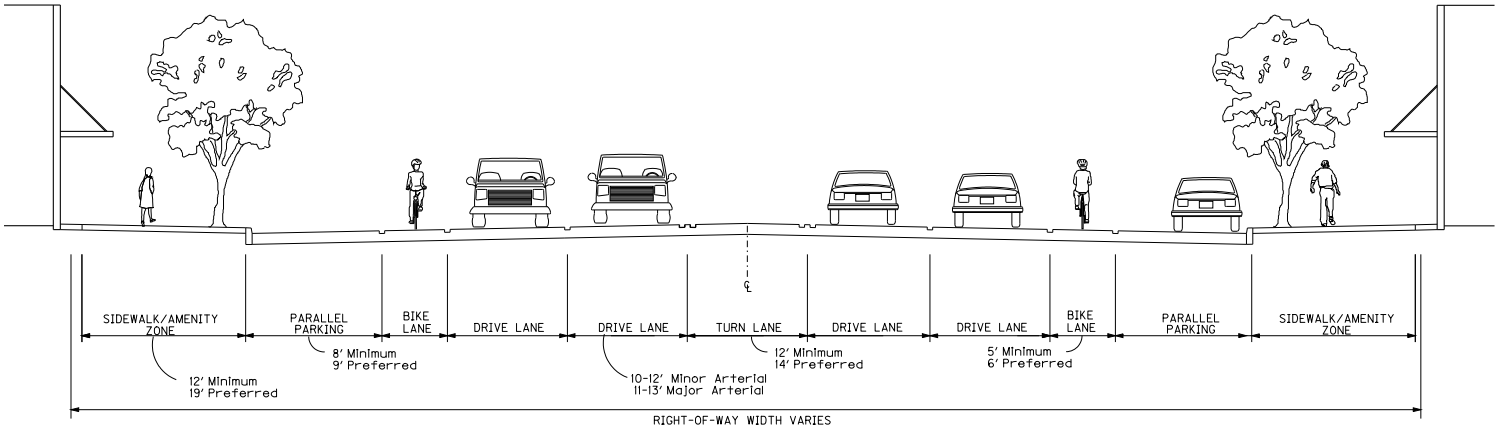
SECTION VIEW



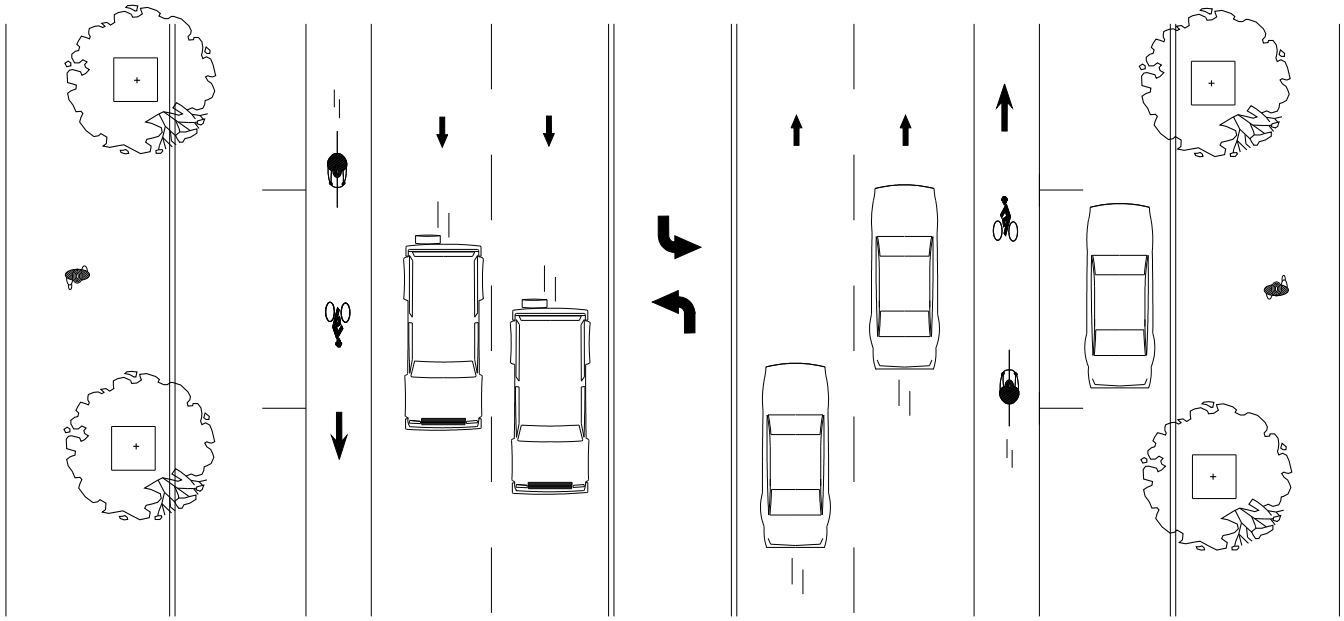
PLAN VIEW

AD–8

2–WAY, 4–6 LANE, SHARED TURN LANE, BIKE LANE, SIDEWALK



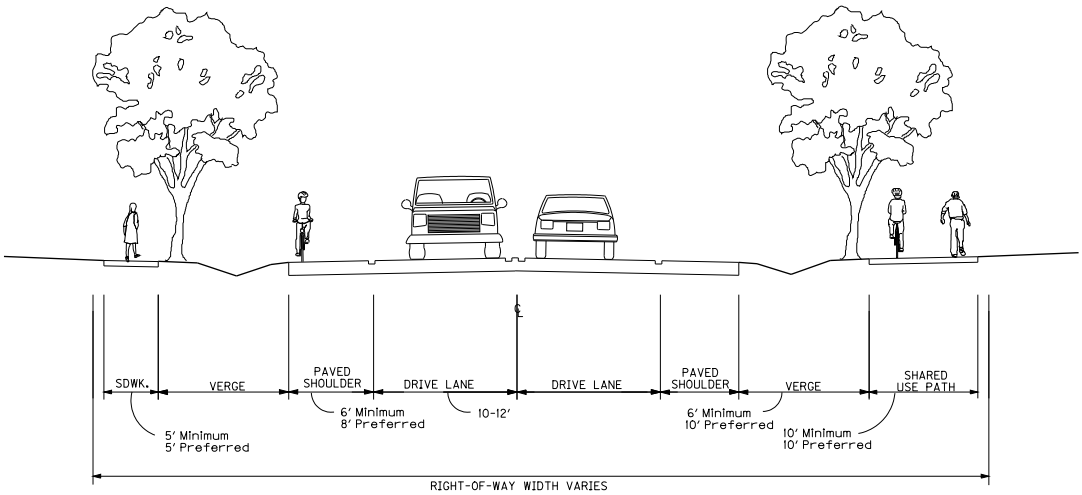
SECTION VIEW



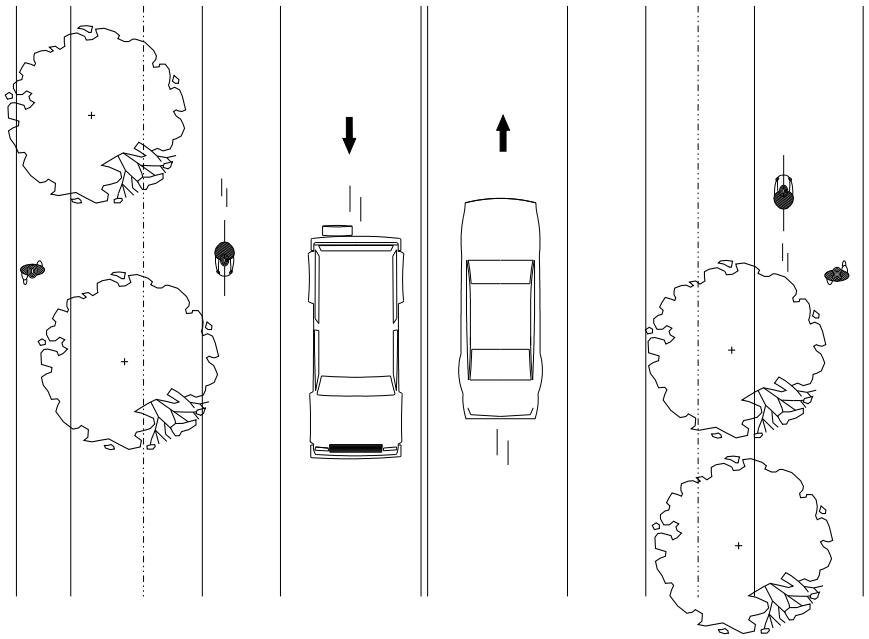
PLAN VIEW

AD–9

2–WAY, 4–6 LANE, SHARED TURN LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK



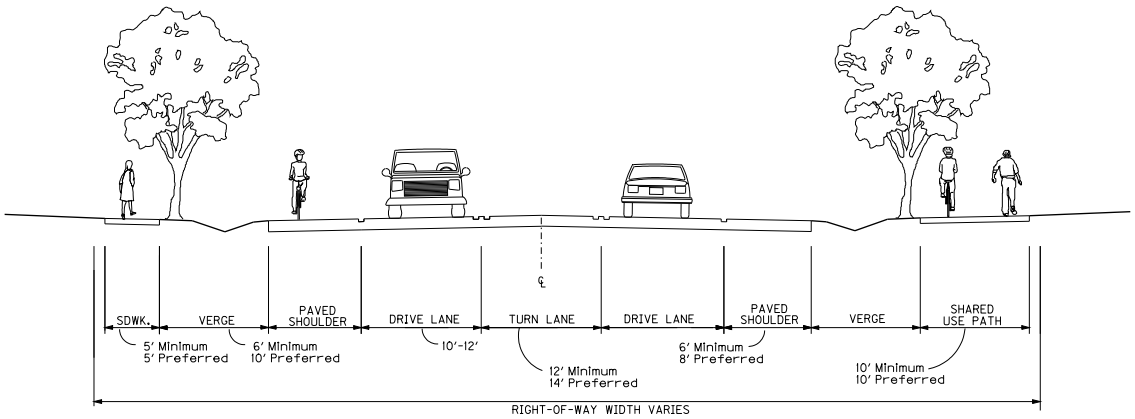
SECTION VIEW



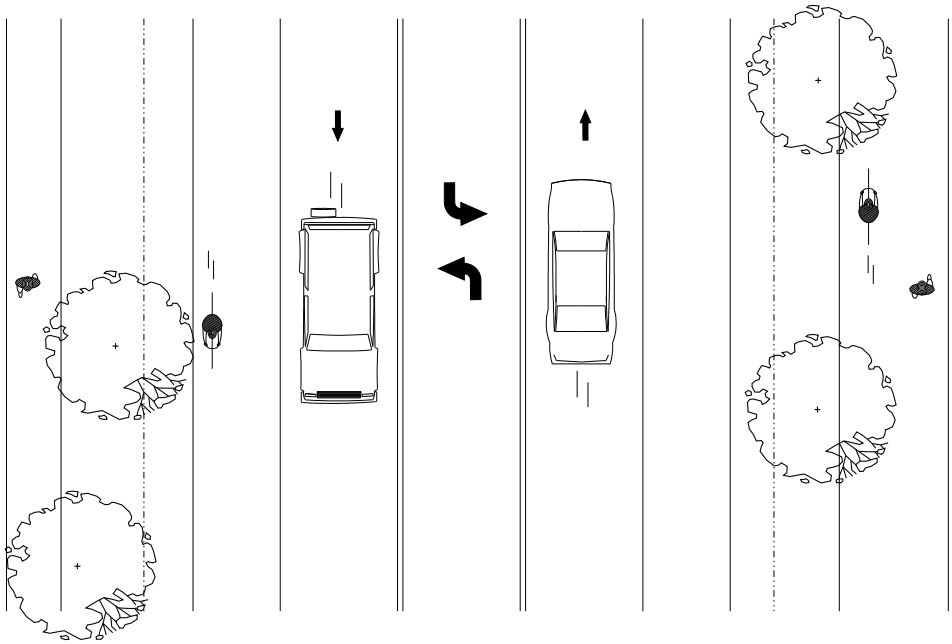
PLAN VIEW

CR–1

2–WAY, 2–LANE, SHARED USE PATH/SIDEWALK



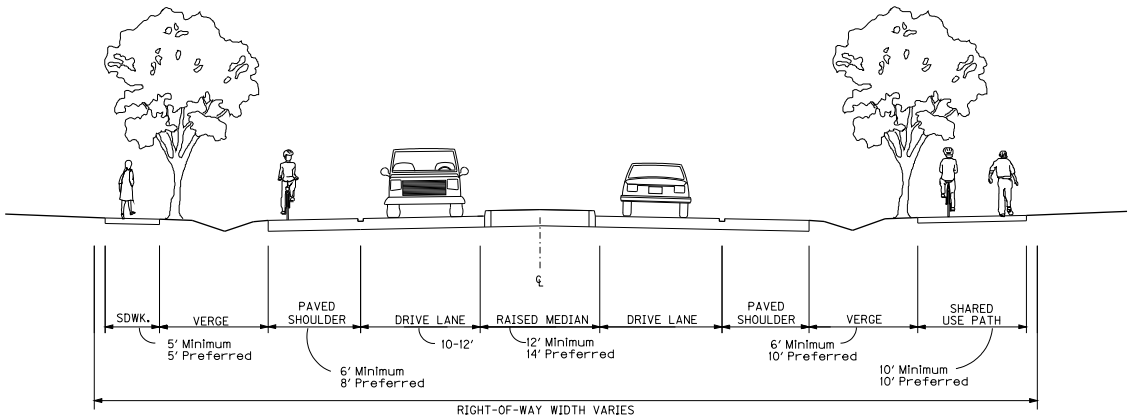
SECTION VIEW



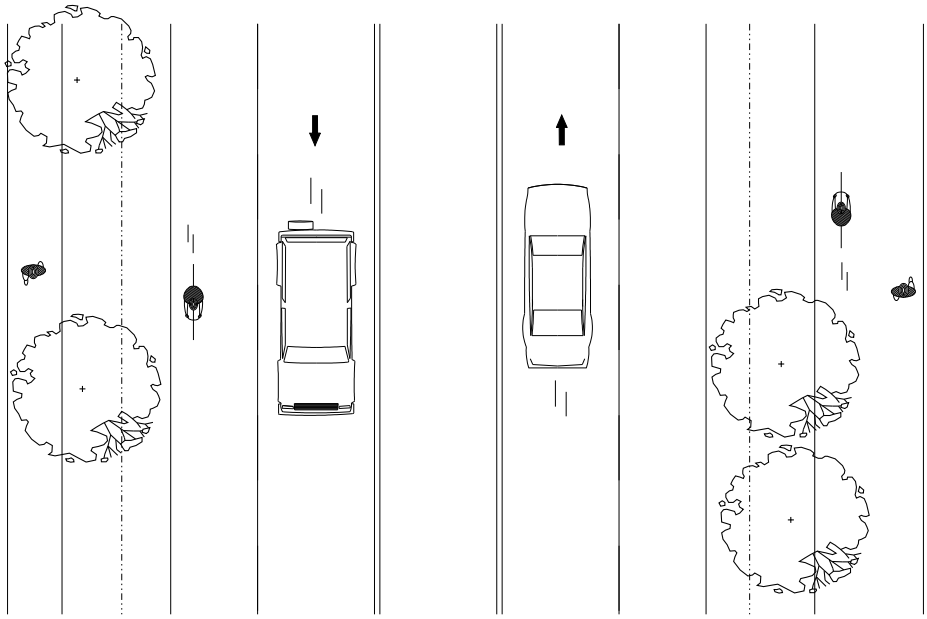
PLAN VIEW

CR–2

2–WAY, 2–LANE, DESIGNATED TURN LANE, SHARED USE PATH/SIDEWALK



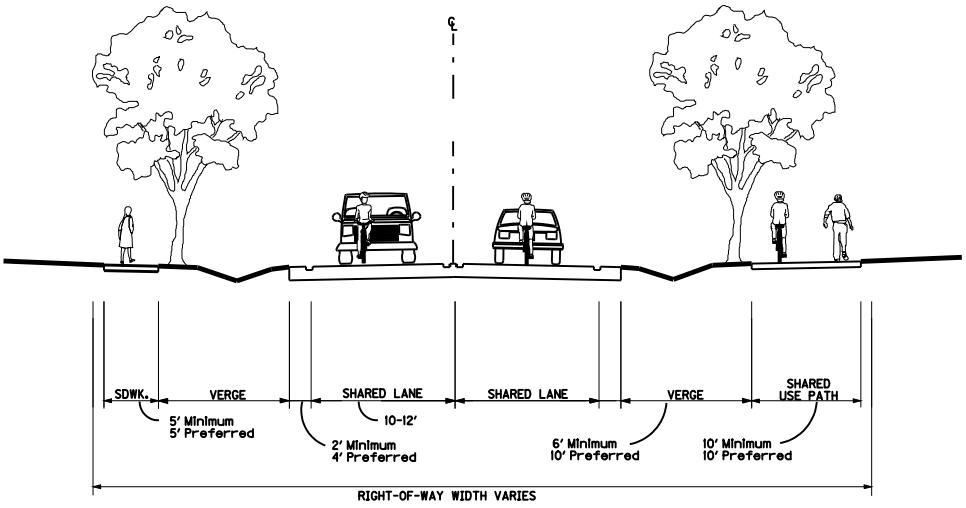
SECTION VIEW



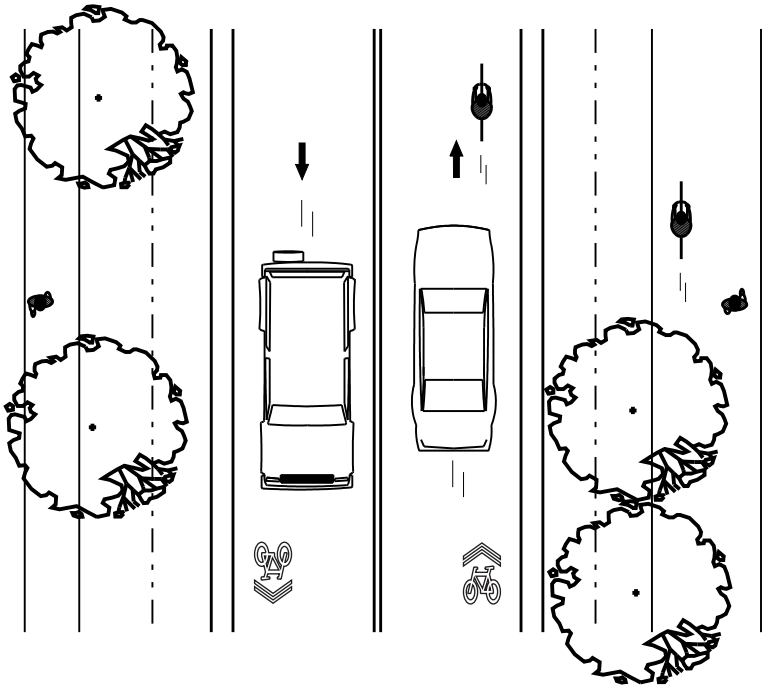
PLAN VIEW

CR–3

2–WAY, 2–LANE, MEDIAN, SHARED USE PATH/SIDEWALK



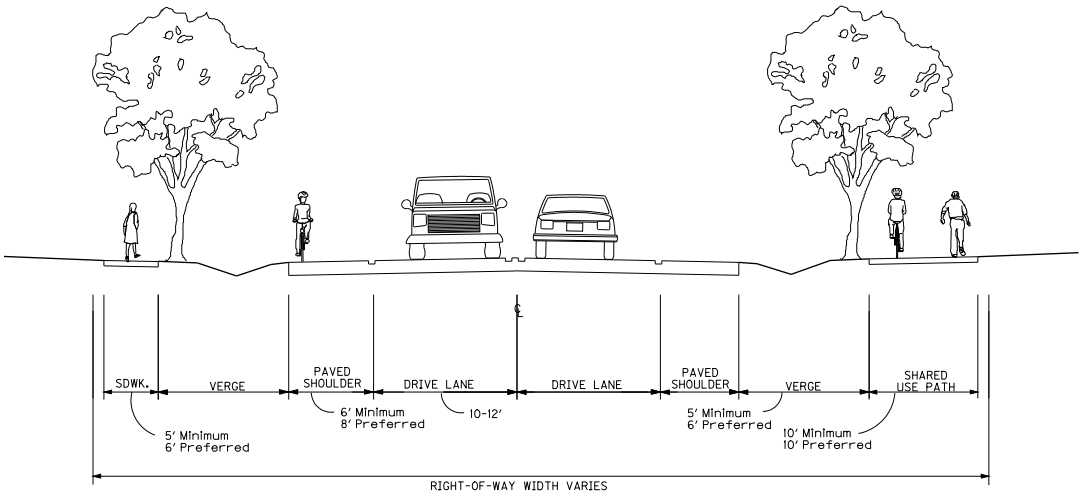
SECTION VIEW



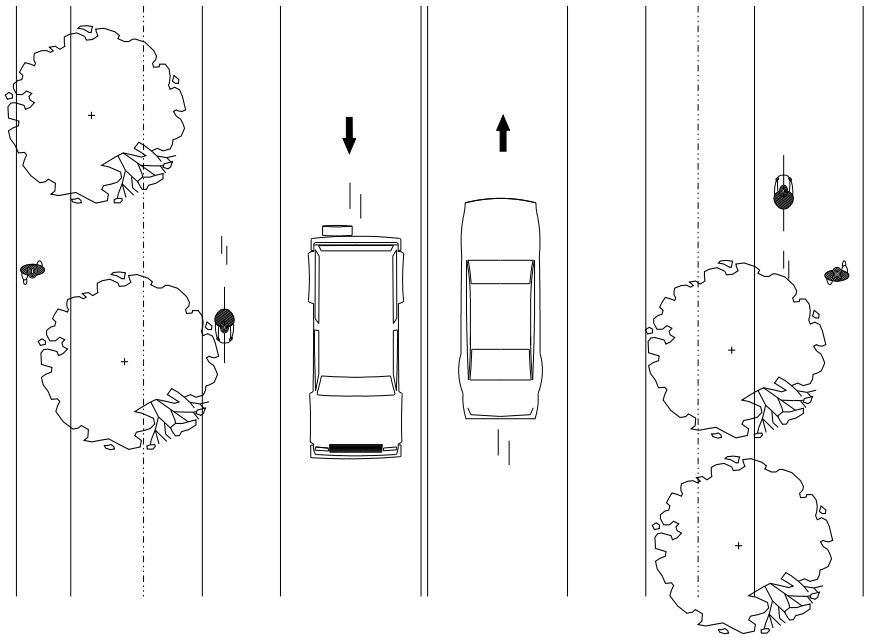
PLAN VIEW

CR–4

2–WAY, 2–LANE, NO SHOULDER, SHARED USE PATH/SIDEWALK SHARED LANE



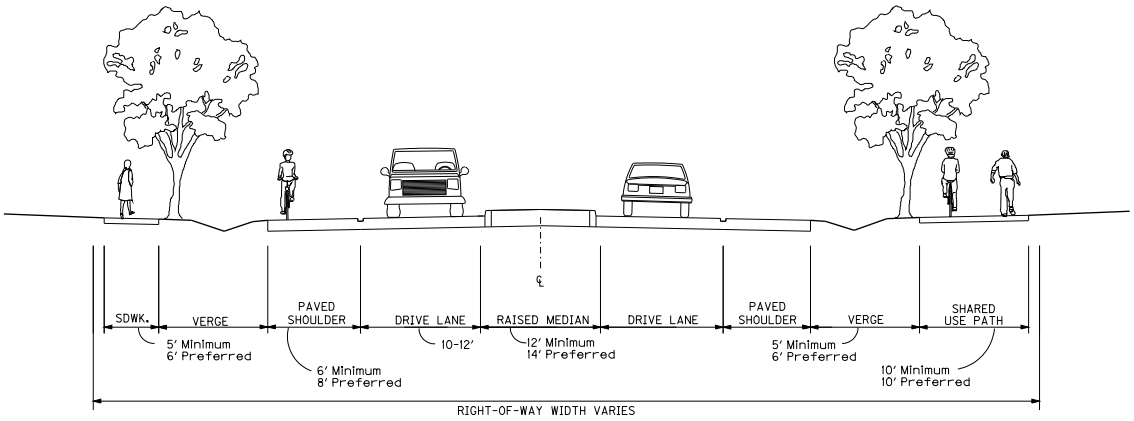
SECTION VIEW



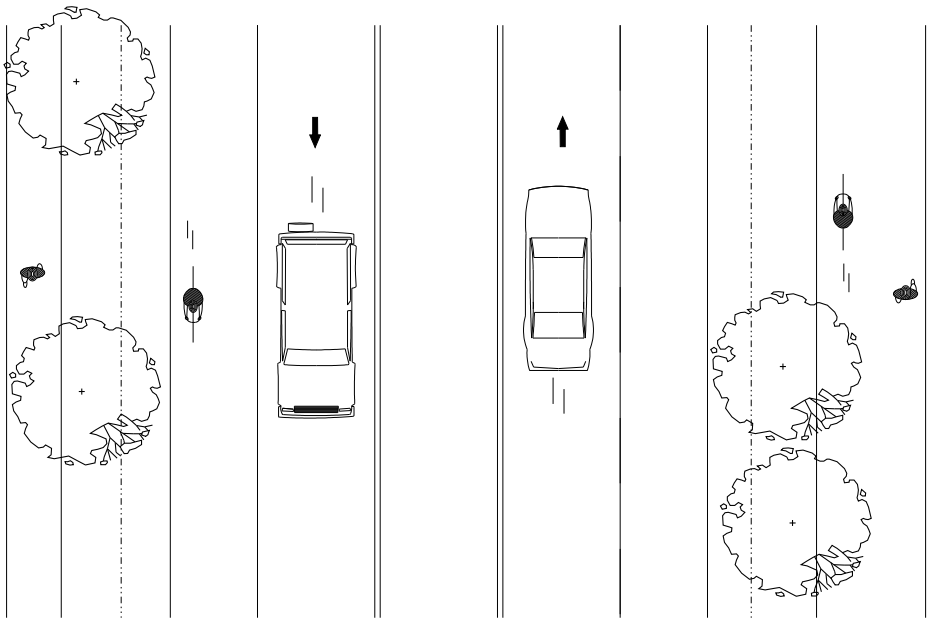
PLAN VIEW

CS–1

2–WAY, 2–LANE, SHOULDER, SHARED USE PATH/SIDEWALK



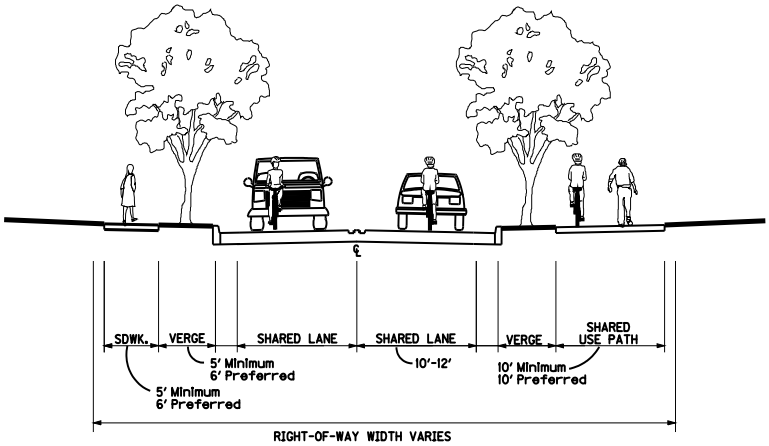
SECTION VIEW



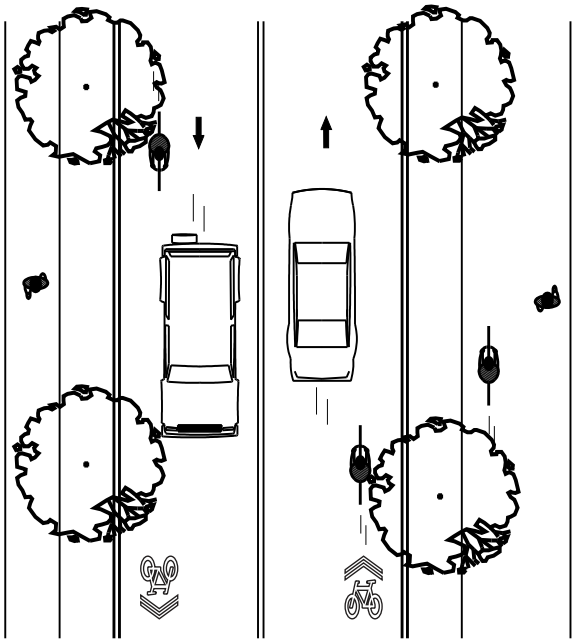
PLAN VIEW

CS–2

2–WAY, 2–LANE, MEDIAN, SHOULDER, SHARED USE PATH/SIDEWALK



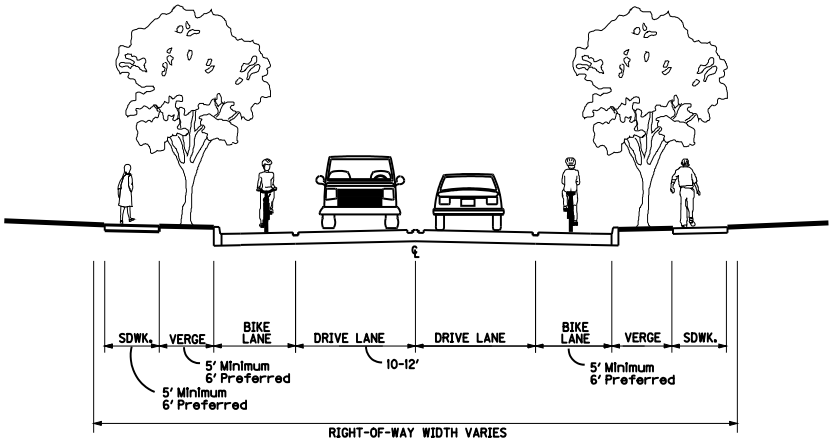
SECTION VIEW



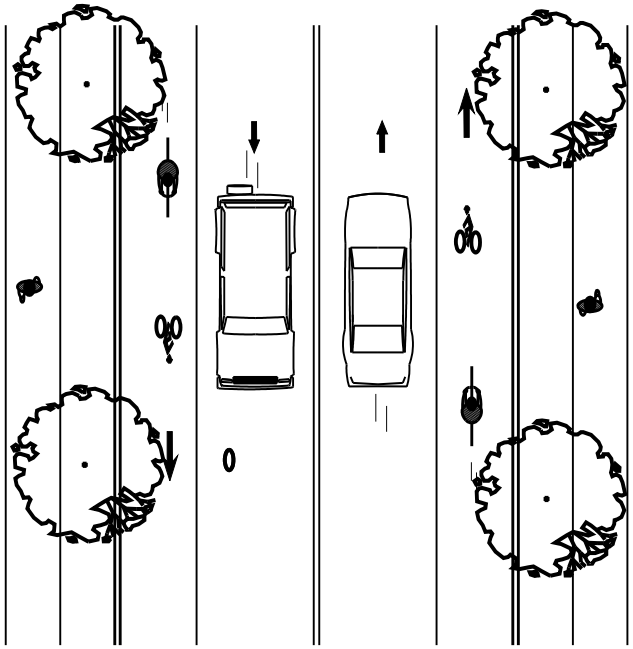
PLAN VIEW

CS–3

2–WAY, 2–LANE, SHARED USE PATH/SIDEWALK SHARED LANE



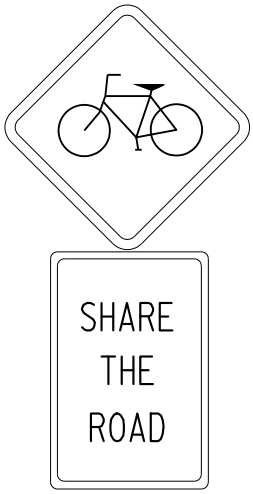
SECTION VIEW

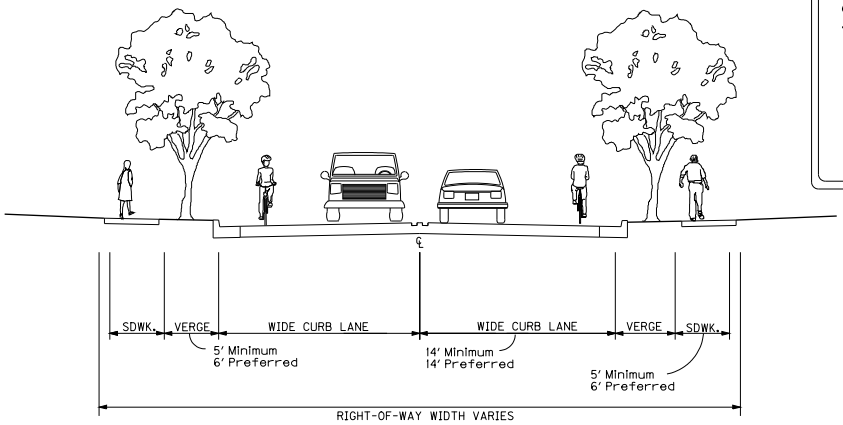


PLAN VIEW

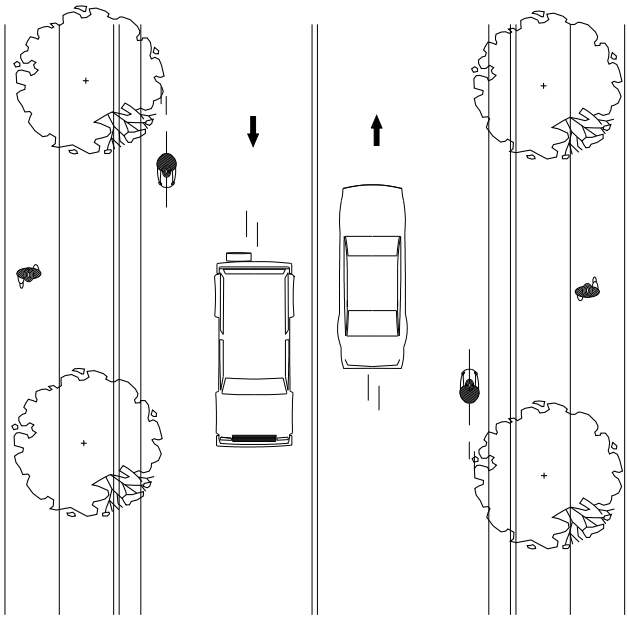
CS–4

2–WAY, 2–LANE, BIKE LANE, SIDEWALK





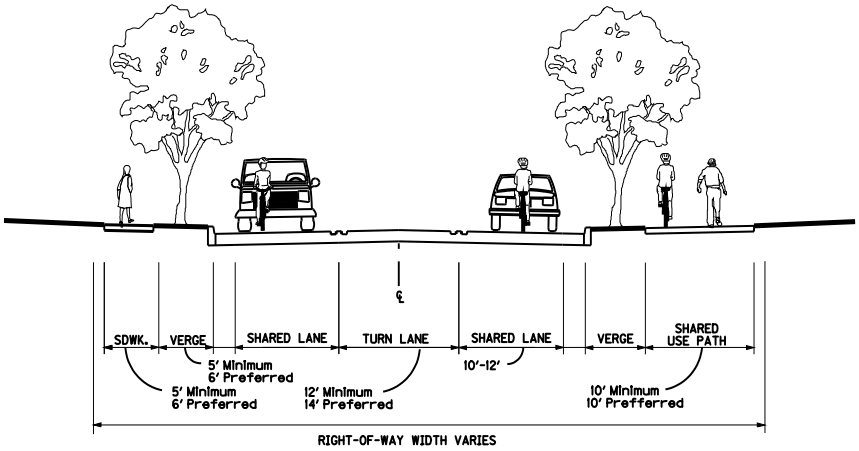
SECTION VIEW



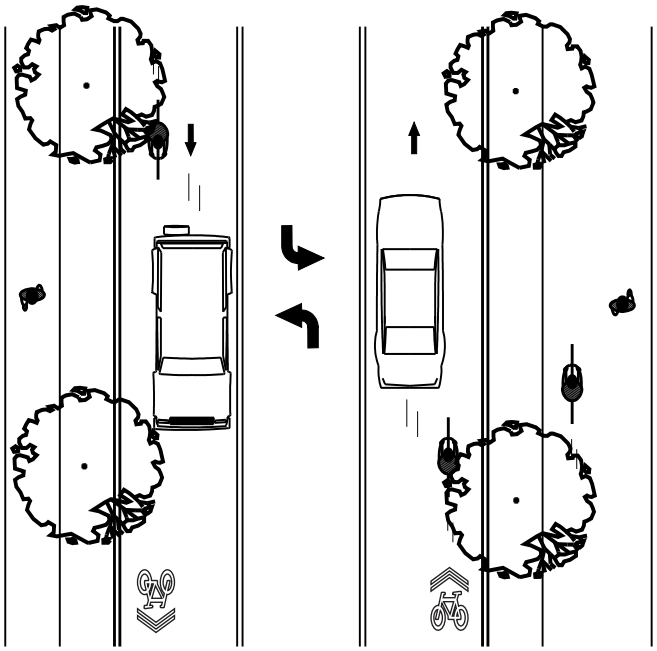
PLAN VIEW

CS–5

2–WAY, 2–LANE, WIDE CURB LANE, SIDEWALK



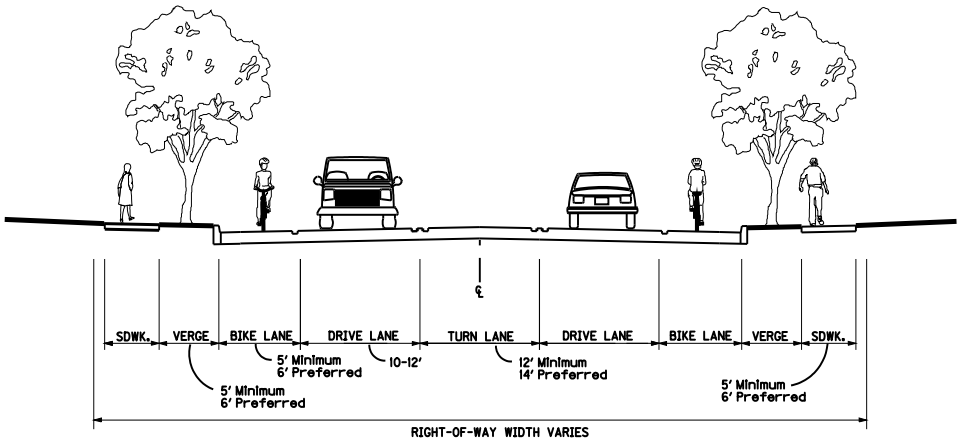
SECTION VIEW



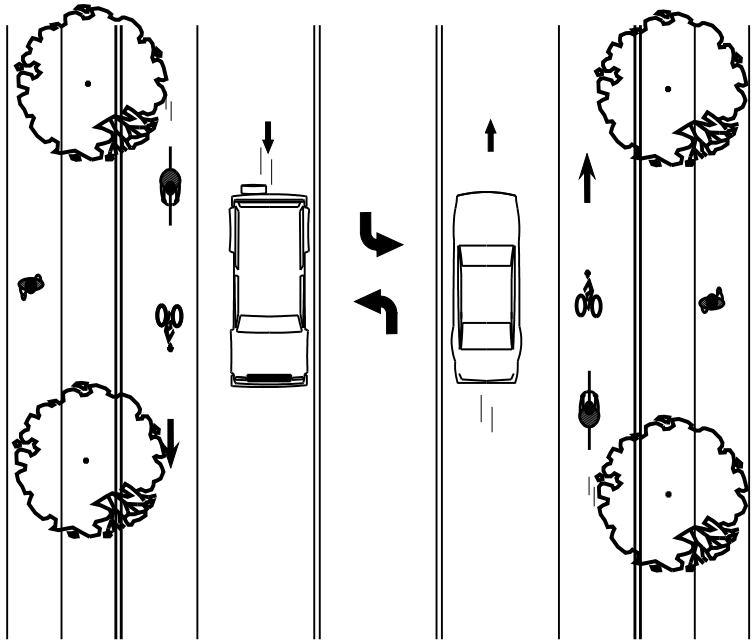
PLAN VIEW

CS–6

2–WAY, 2–LANE, SHARED TURN LANE, SHARED USE PATH SHARED LANE



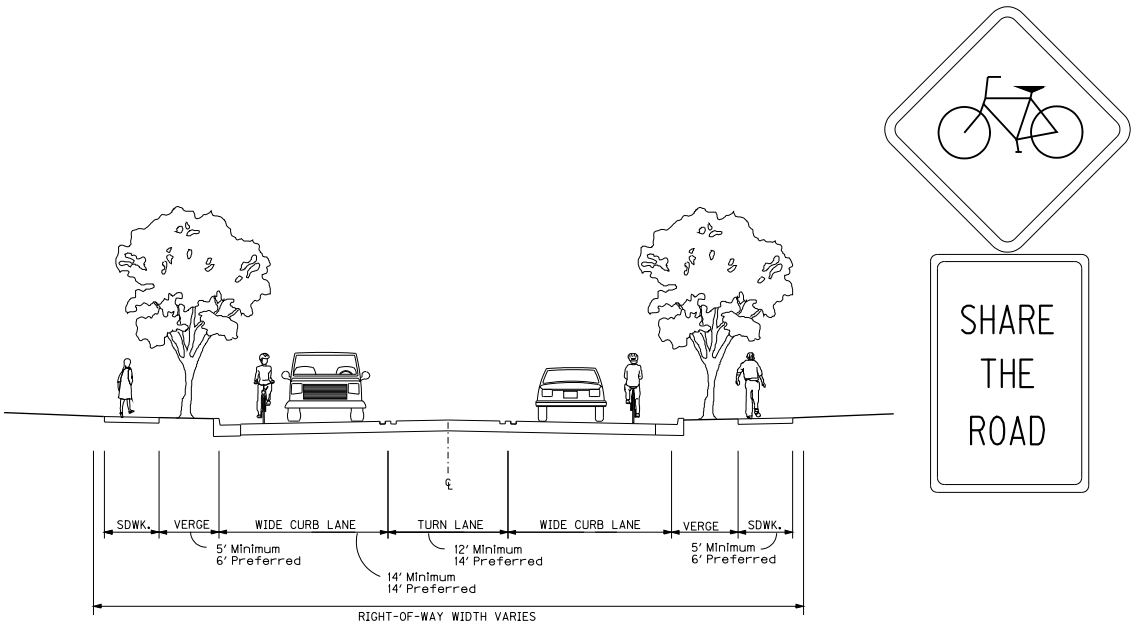
SECTION VIEW



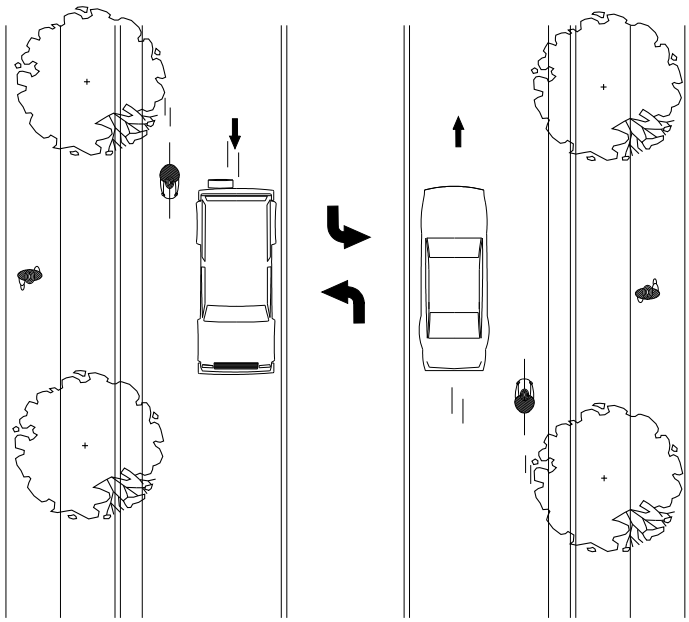
PLAN VIEW

CS–7

2–WAY, 2–LANE, SHARED TURN LANE, BIKE LANE, SIDEWALK



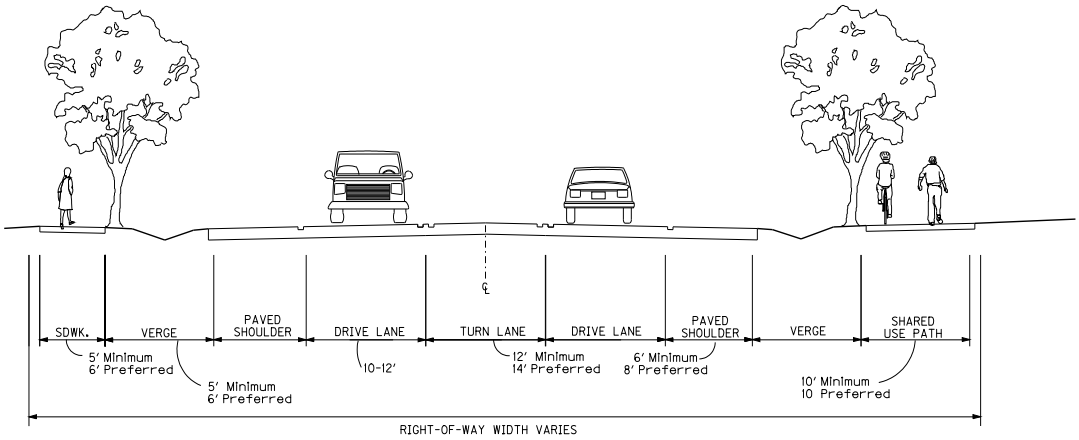
SECTION VIEW



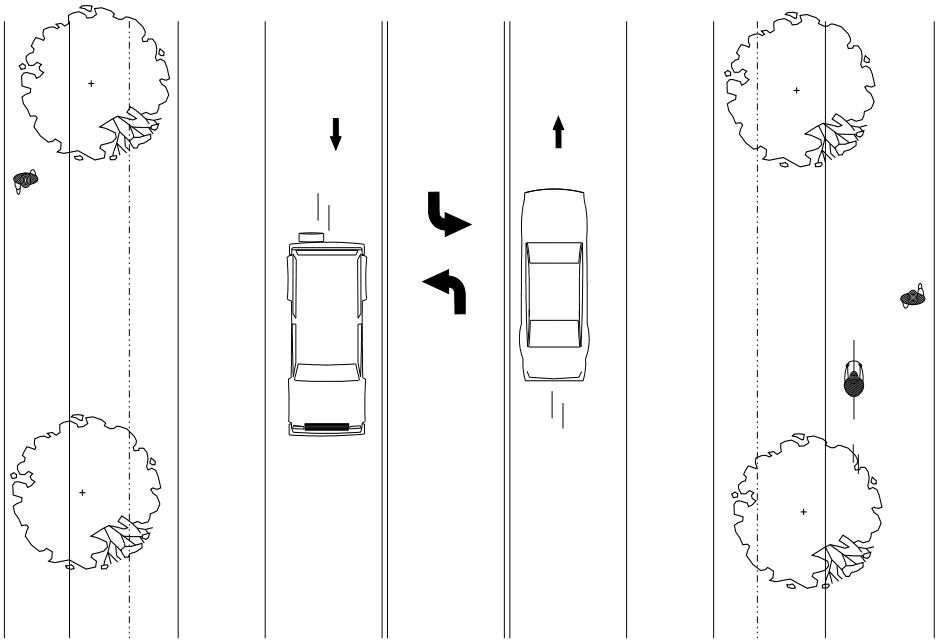
PLAN VIEW

CS–8

2–WAY, 2–LANE, SHARED TURN LANE, WIDE CURB LANE, SIDEWALK

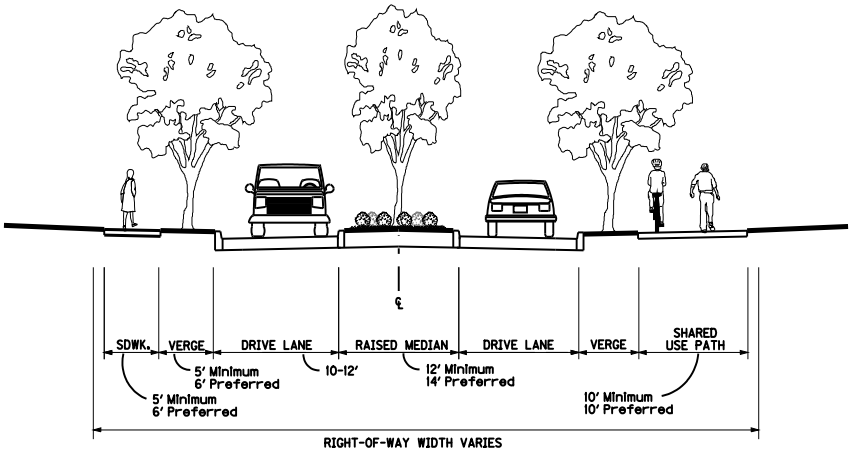


SECTION VIEW

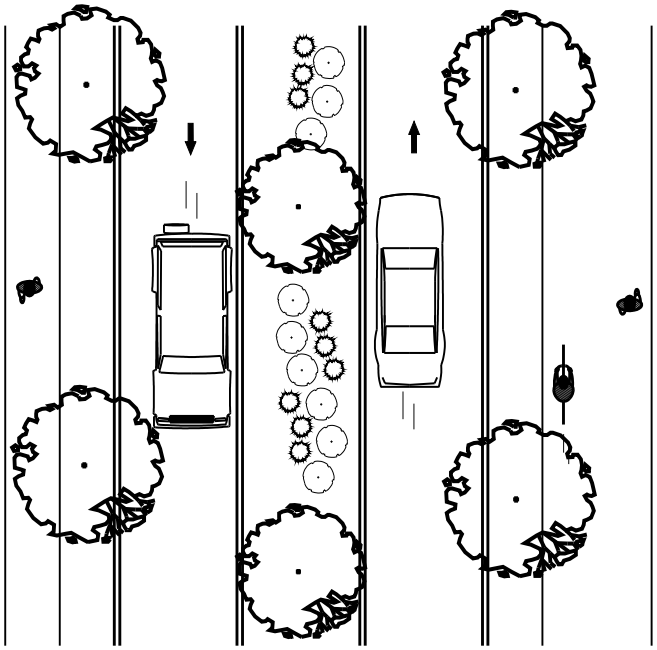


PLAN VIEW

CS–9
2–WAY, 2–LANE, SHARED TURN LANE, SHOULDER, SHARED USE PATH/SIDEWALK



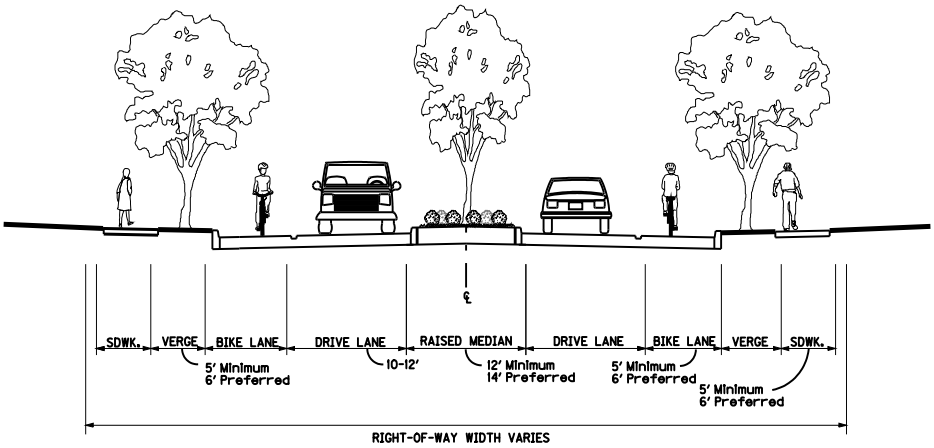
SECTION VIEW



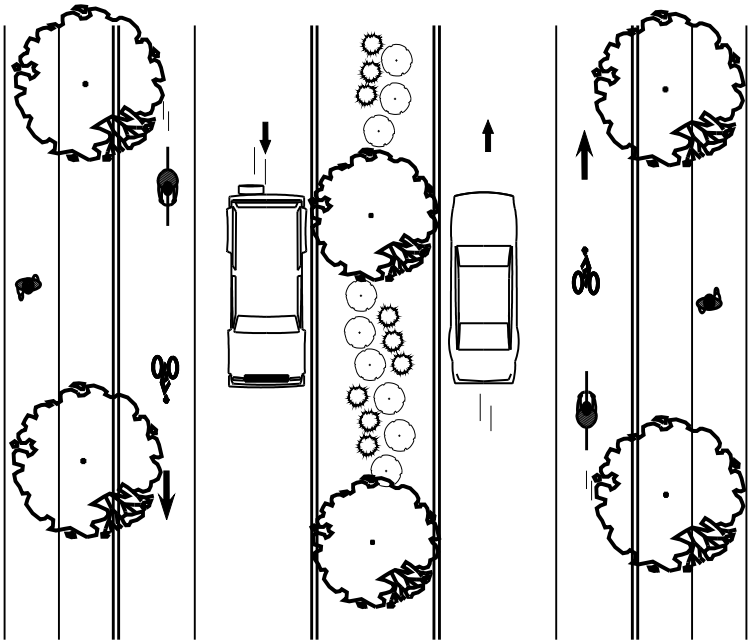
PLAN VIEW

CS–10

2–WAY, 2–LANE, MEDIAN, SIDEWALK/SHARED USE PATH



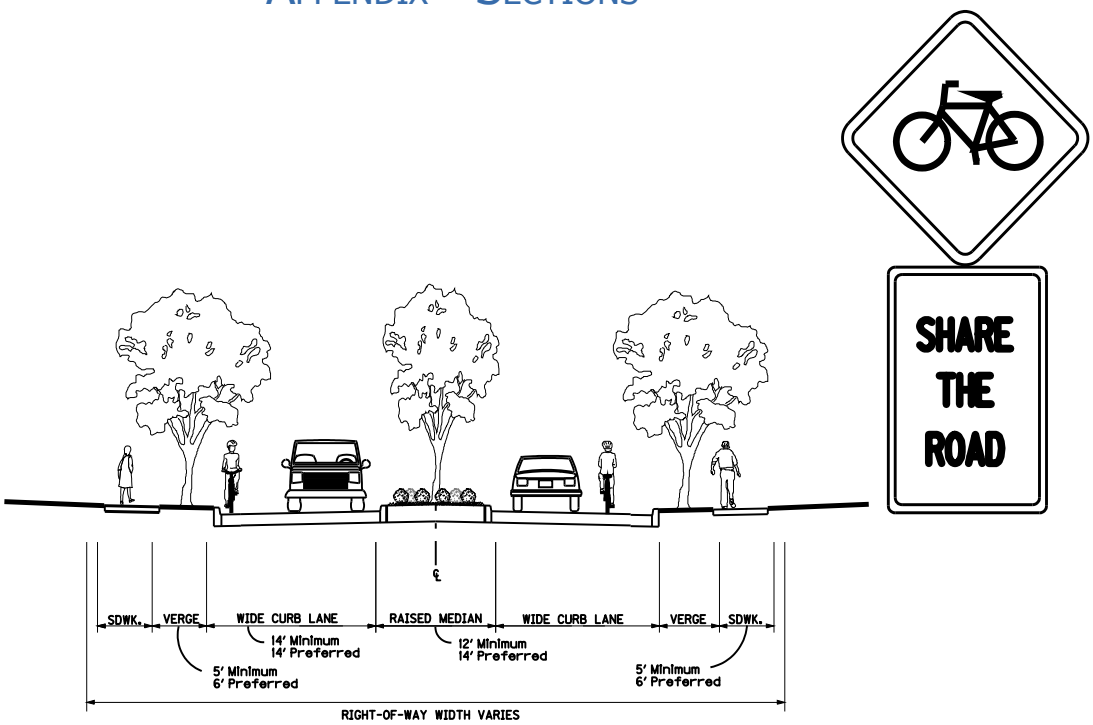
SECTION VIEW



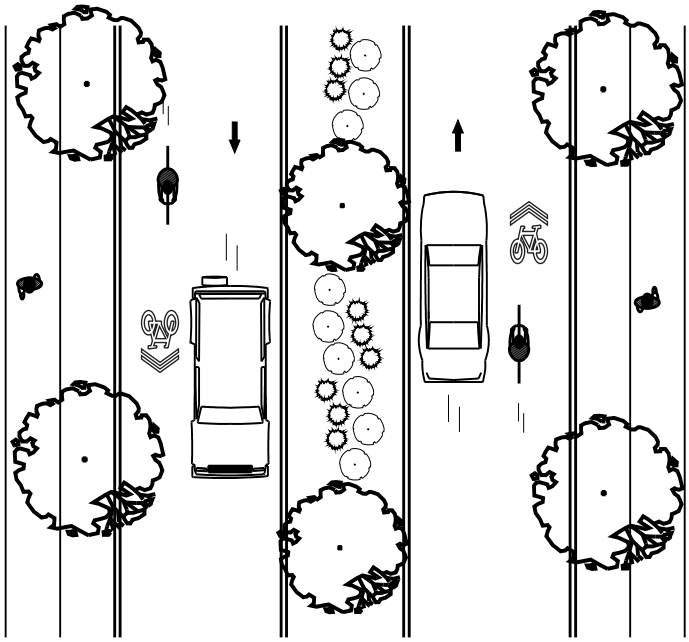
PLAN VIEW

CS–11

2–WAY, 2–LANE, MEDIAN, BIKE LANE, SIDEWALK



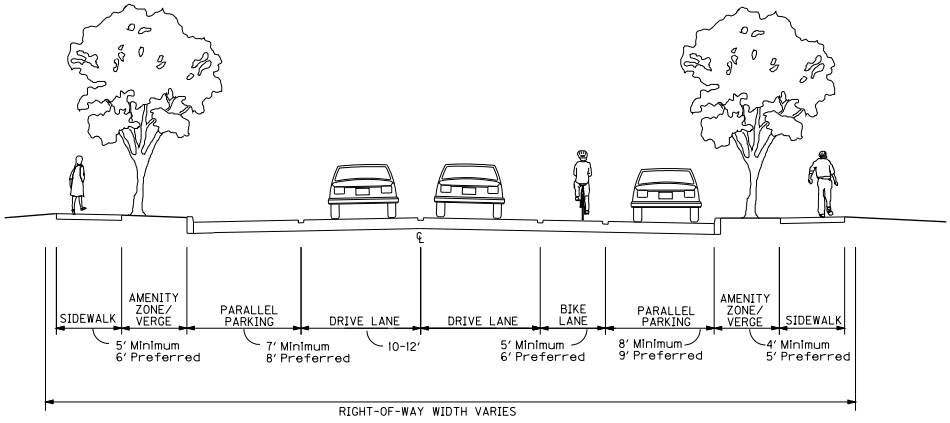
SECTION VIEW



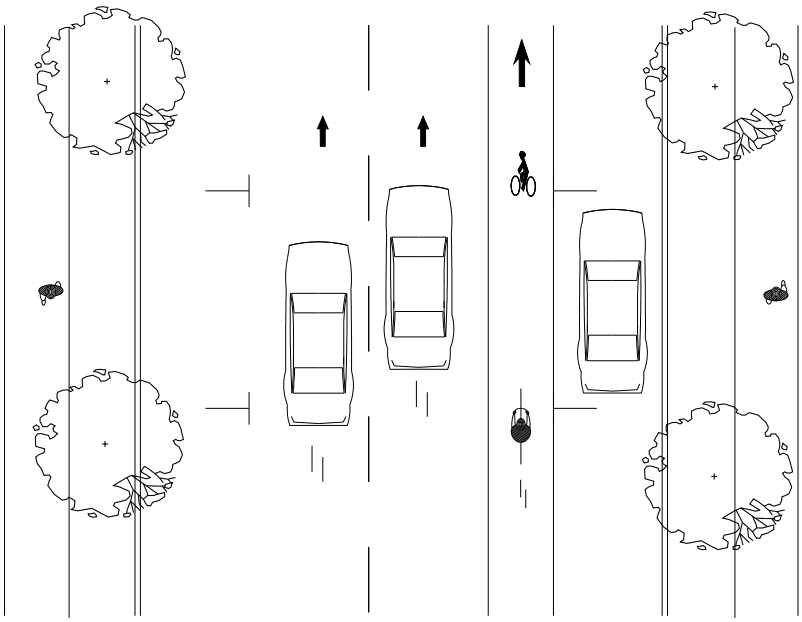
PLAN VIEW

CS–12

2–WAY, 2–LANE, MEDIAN, WIDE CURB LANE, SIDEWALK

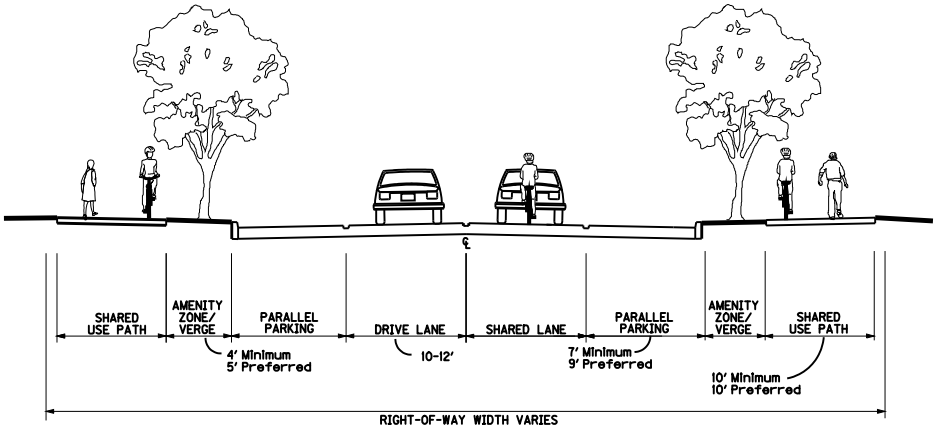


SECTION VIEW

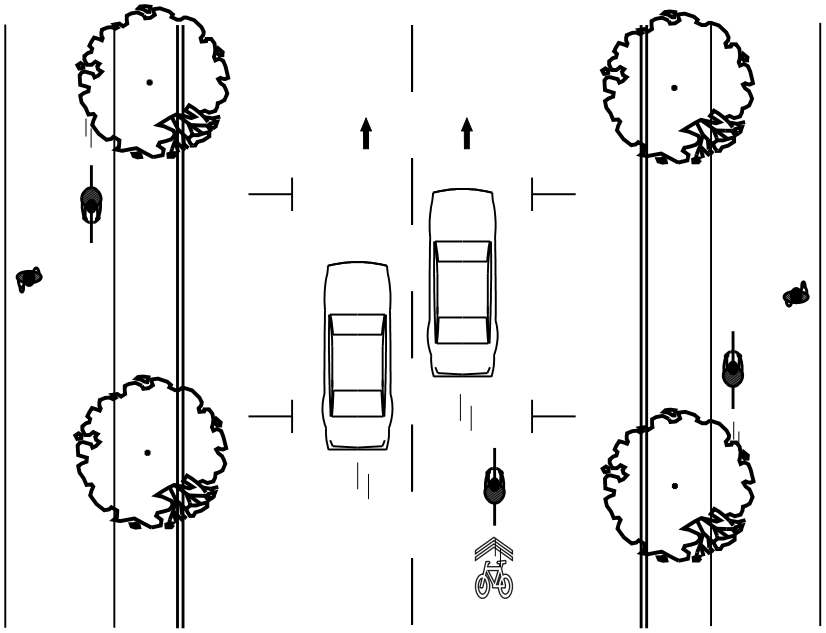


PLAN VIEW

CT–1
1–WAY, 2–LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK



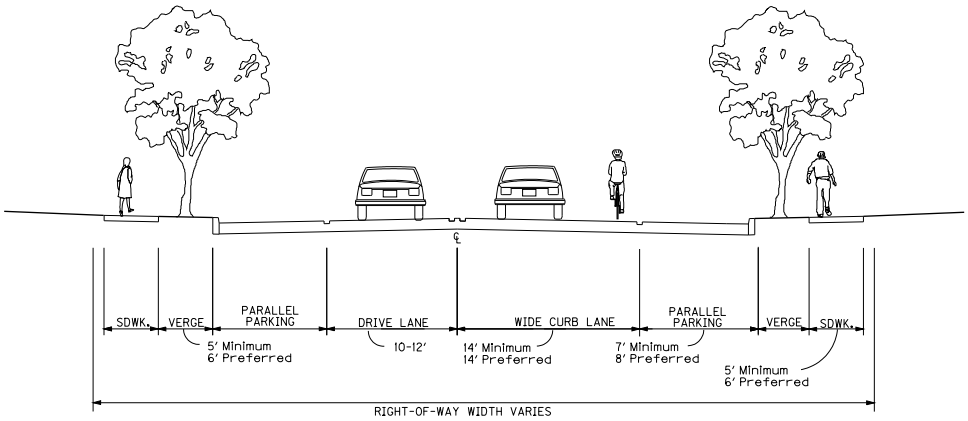
SECTION VIEW



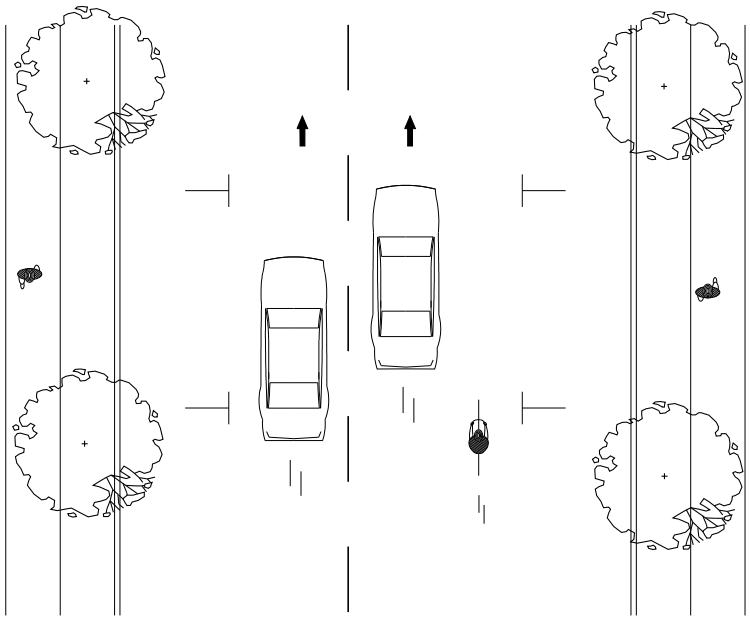
PLAN VIEW

CT–2

1–WAY, 2–LANE, PARALLEL PARKING, SHARED USE PATH, SHARED LANE



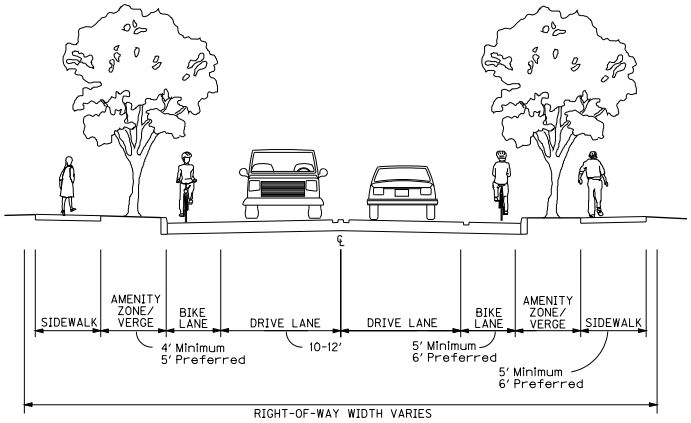
SECTION VIEW



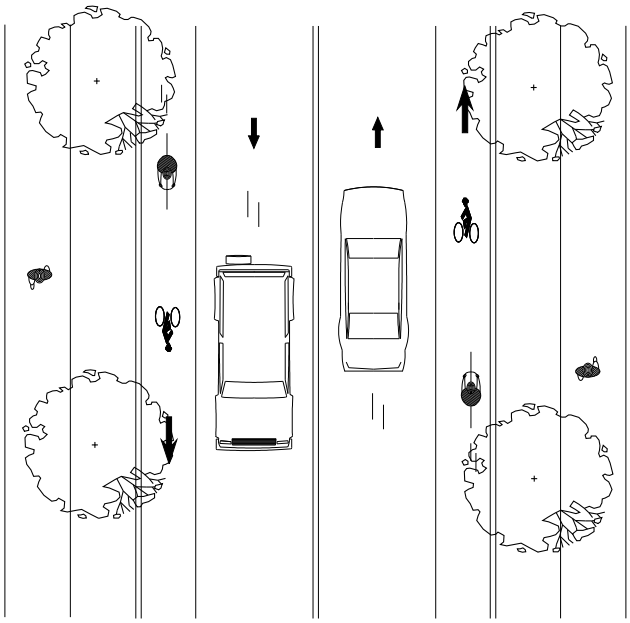
PLAN VIEW

CT–3

1–WAY, 2–LANE, PARALLEL PARKING, WIDE CURB LANE, SIDEWALK



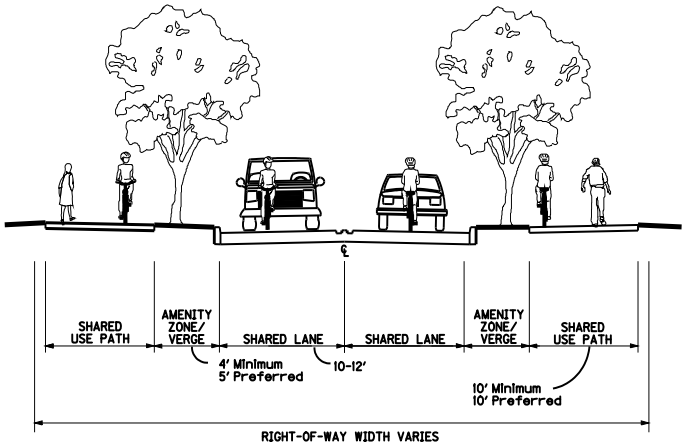
SECTION VIEW



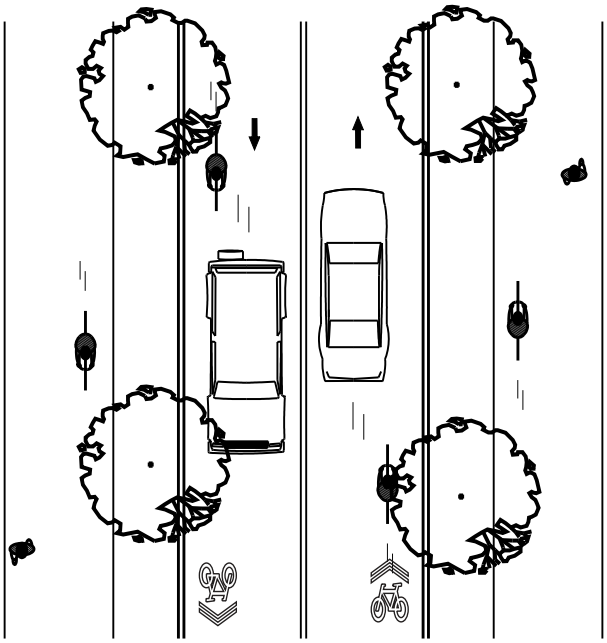
PLAN VIEW

CT–4

2–WAY, 2–LANE, BIKE LANE, SIDEWALK



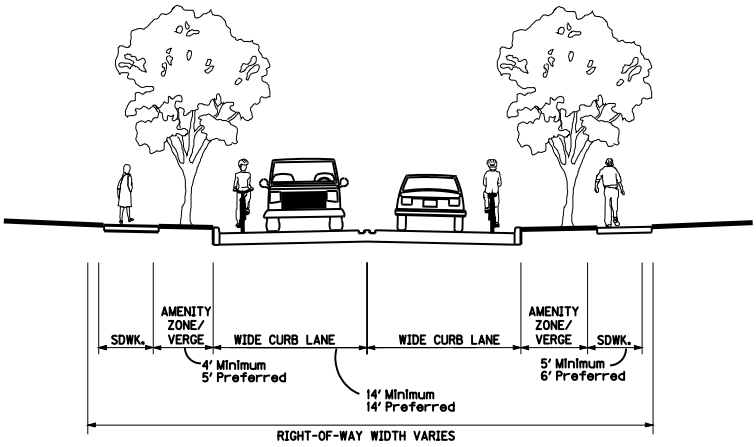
SECTION VIEW



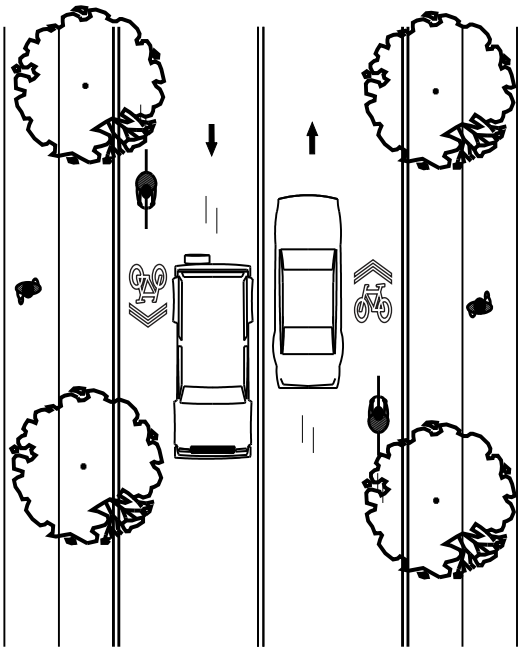
PLAN VIEW

CT–5

2–WAY, 2–LANE, SHARED USE PATH, SHARED LANE



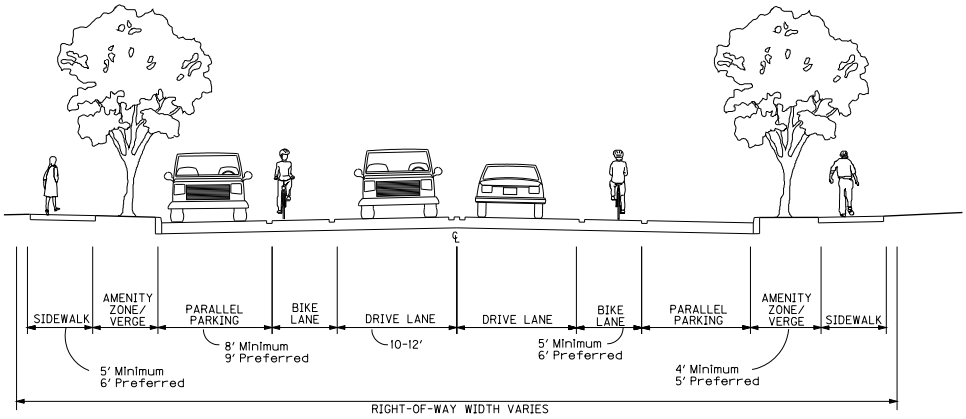
SECTION VIEW



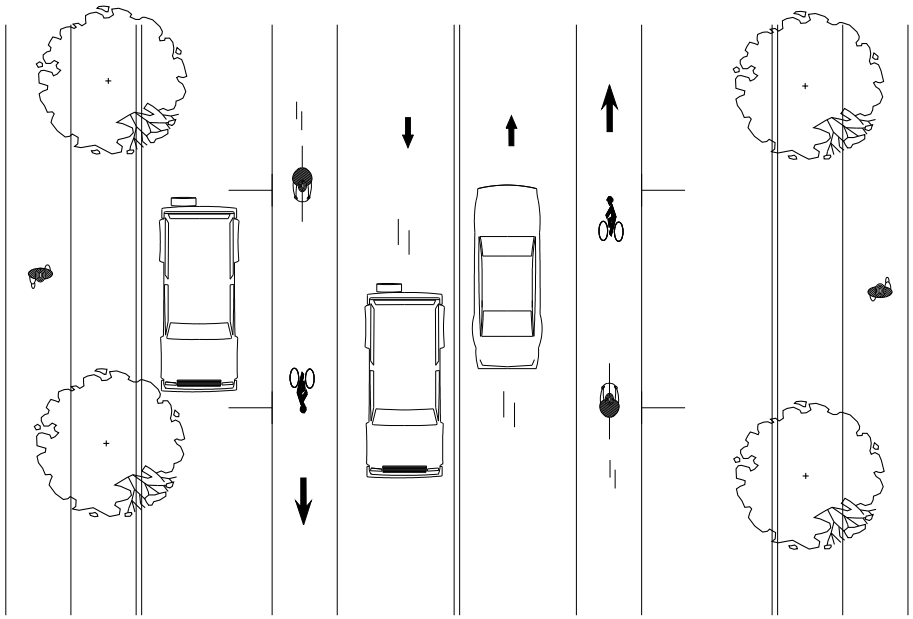
PLAN VIEW

CT–6

2–WAY, 2–LANE, WIDE CURB LANE, SIDEWALK

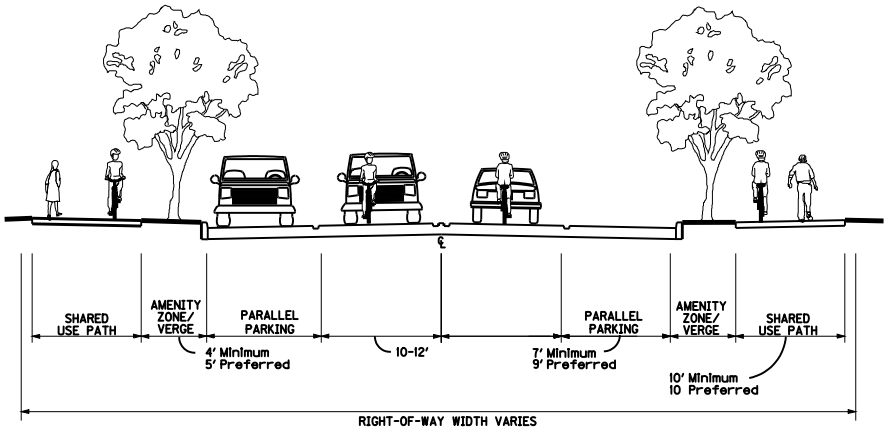


SECTION VIEW

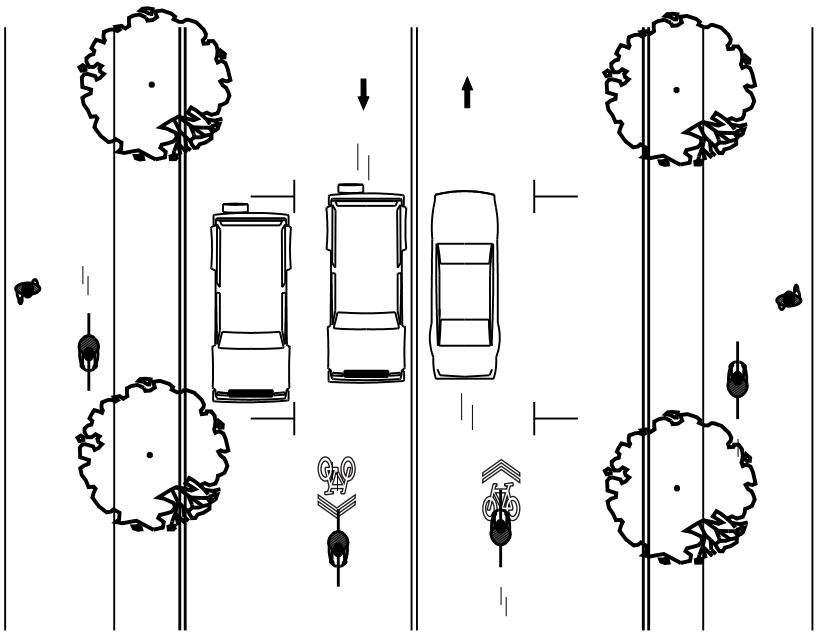


PLAN VIEW

CT–7
2–WAY, 2–LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK



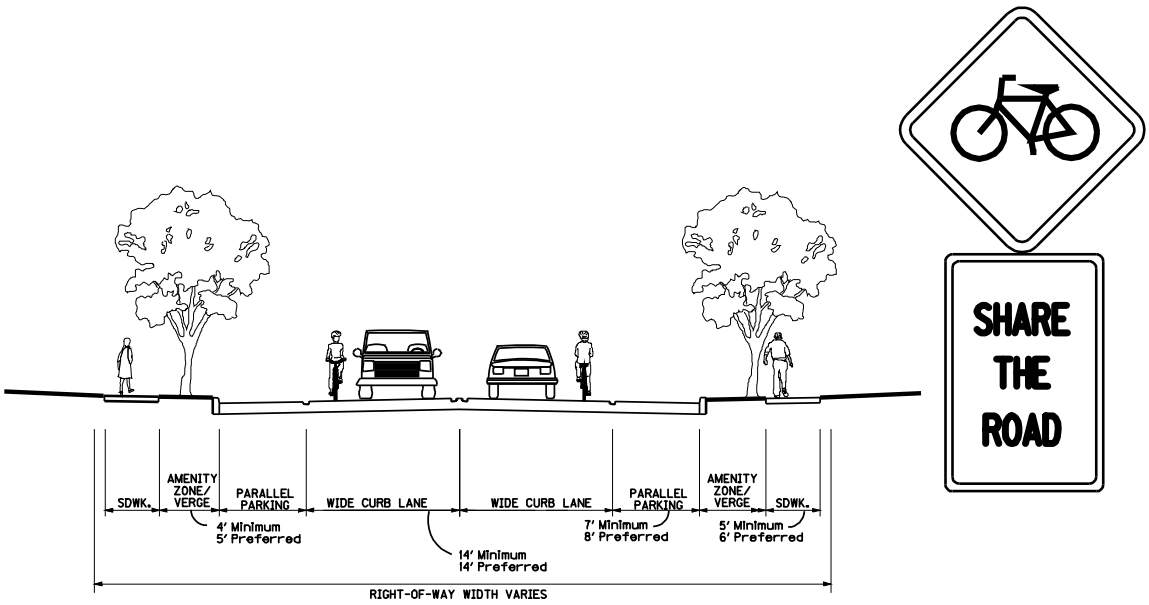
SECTION VIEW



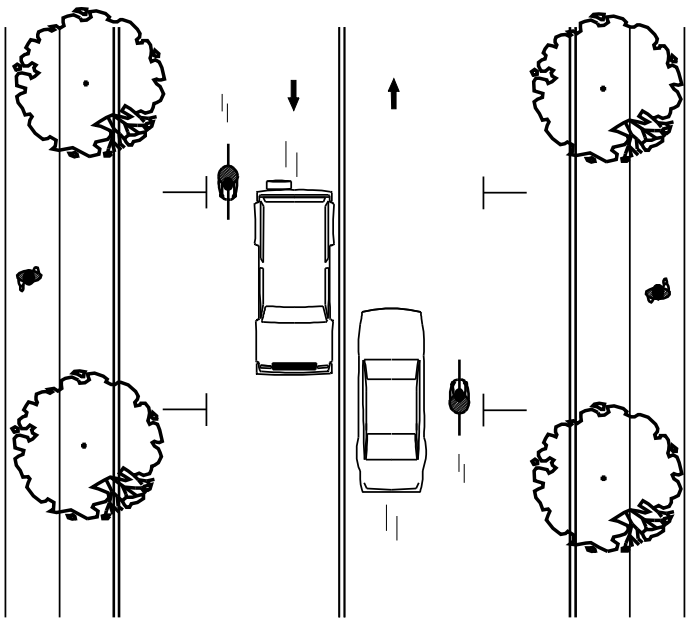
PLAN VIEW

CT–8

2–WAY, 2–LANE, PARALLEL PARKING, SHARED USE PATH, SHARED LANE



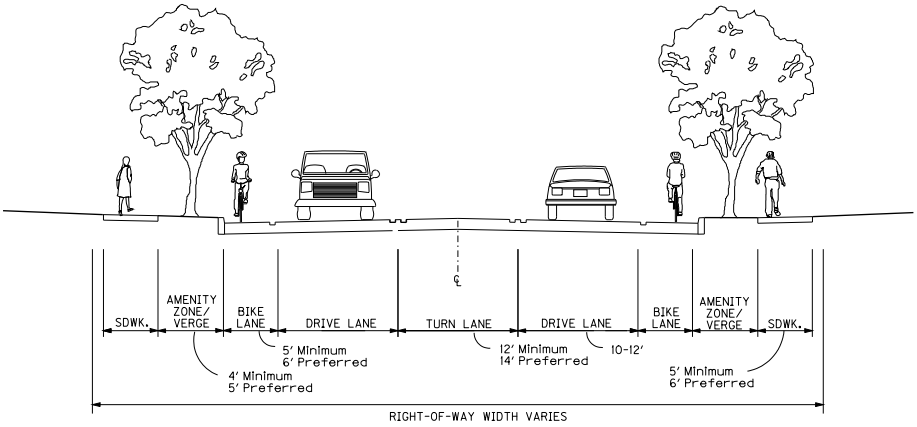
SECTION VIEW



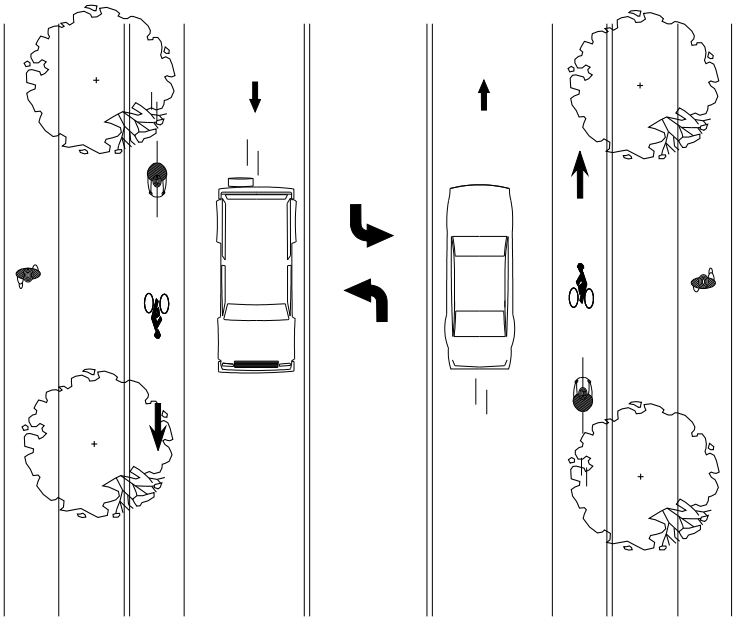
PLAN VIEW

CT–9

2–WAY, 2–LANE, PARALLEL PARKING, WIDE CURB LANE, SIDEWALK



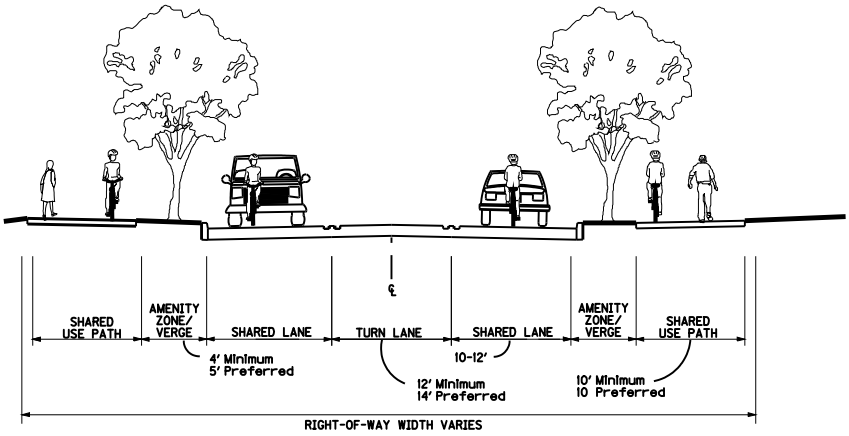
SECTION VIEW



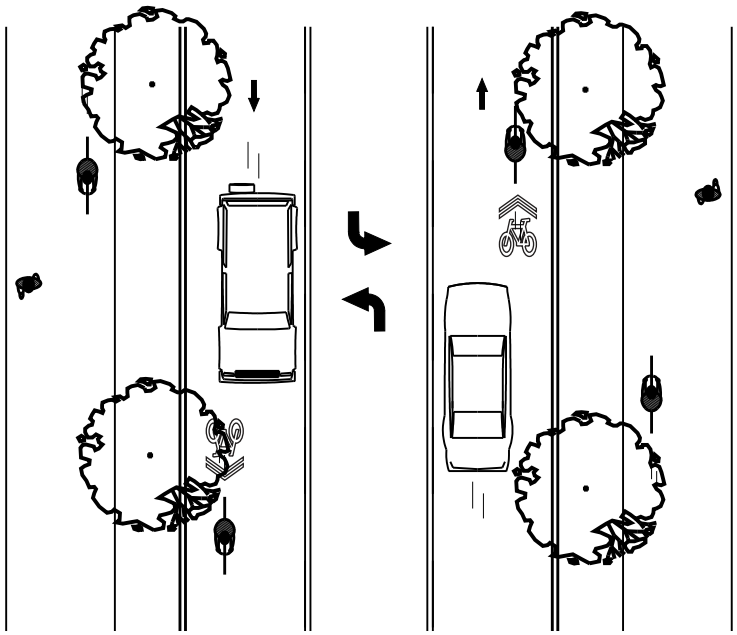
PLAN VIEW

CT–10

2–WAY, 2–LANE, SHARED TURN LANE, BIKE LANE, SIDEWALK



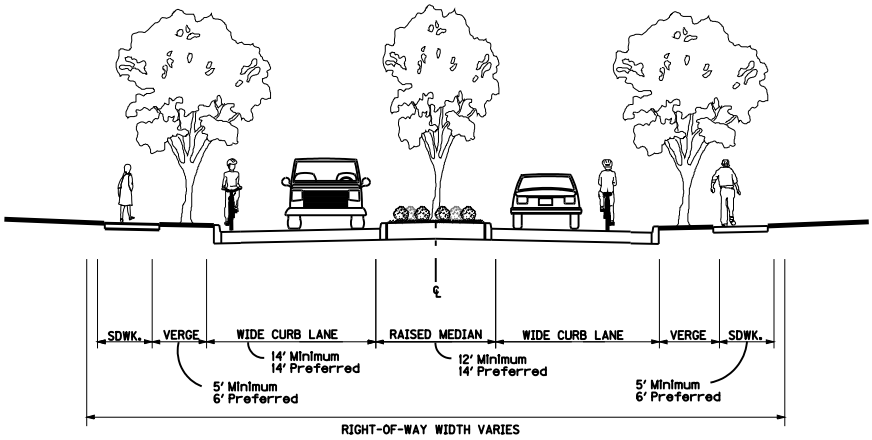
SECTION VIEW



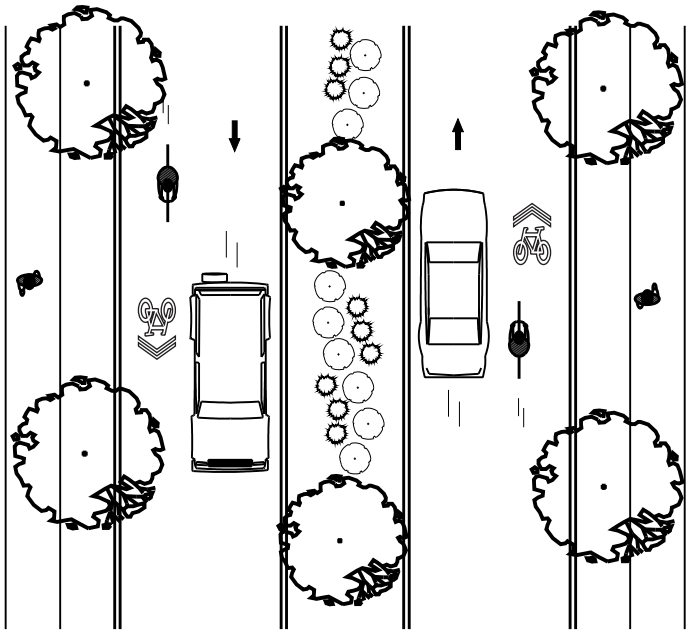
PLAN VIEW

CT–11

2–WAY, 2–LANE, SHARED TURN LANE, SHARED USE PATH, SHARED LANE



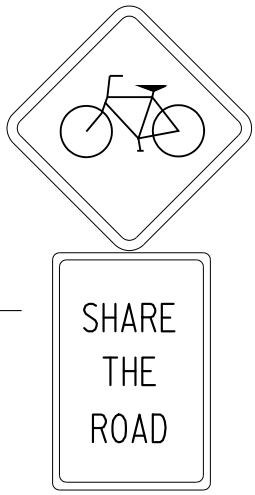
SECTION VIEW

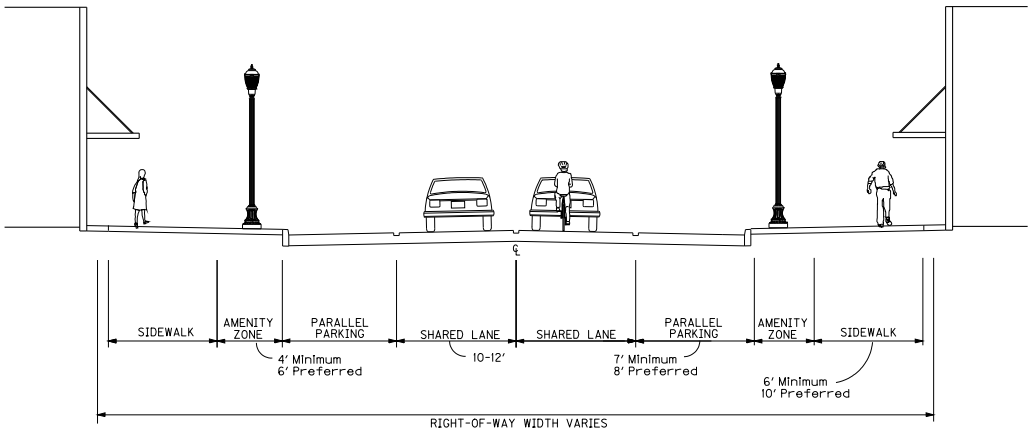


PLAN VIEW

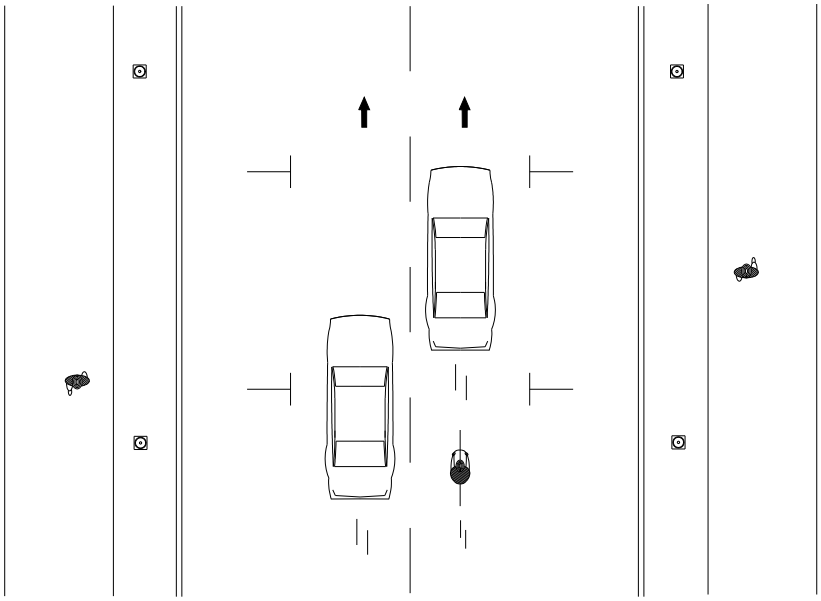
CS–12

2–WAY, 2–LANE, MEDIAN, WIDE CURB LANE, SIDEWALK





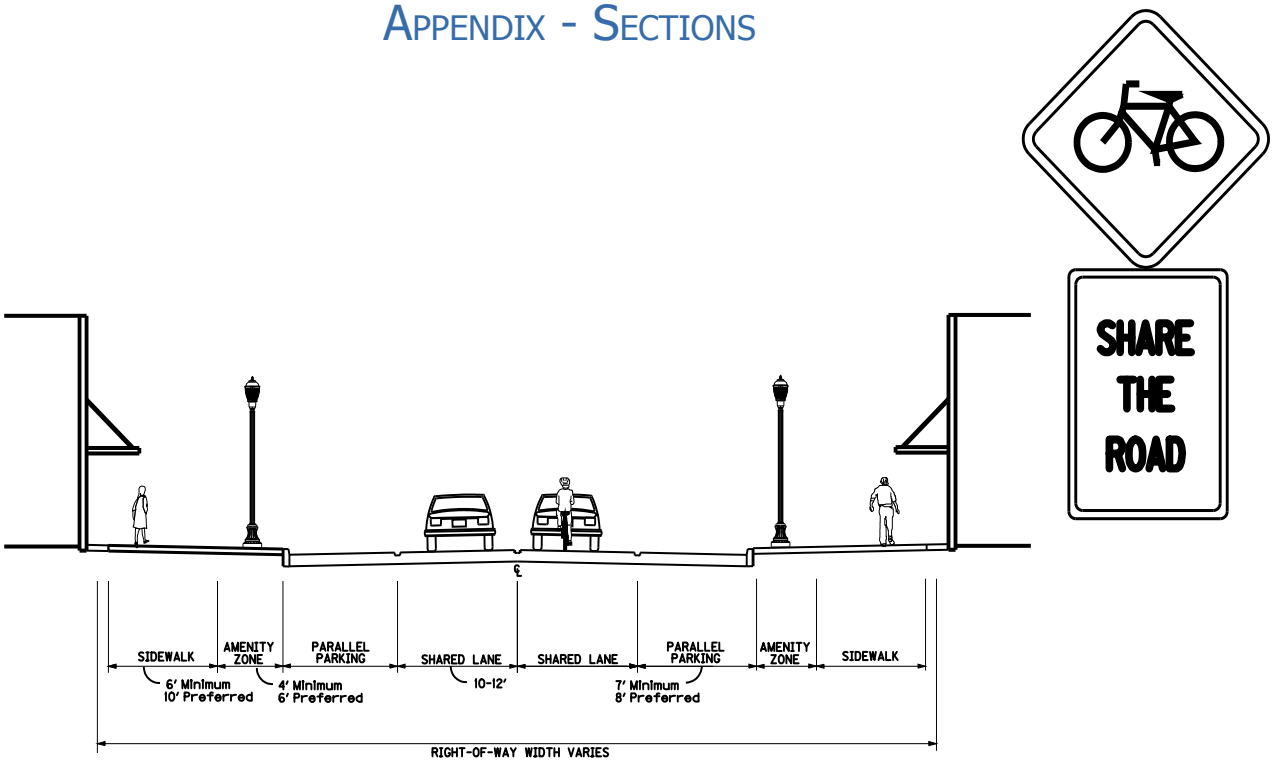
SECTION VIEW



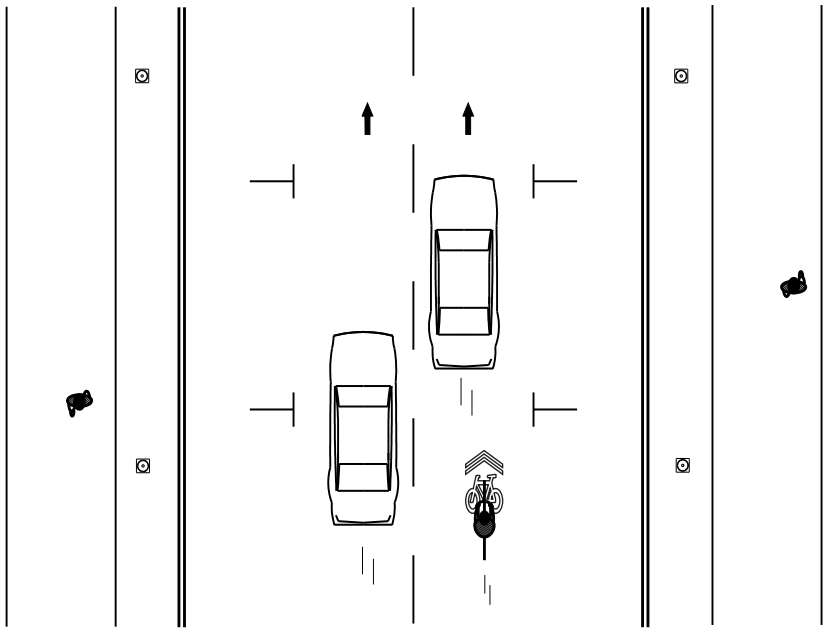
PLAN VIEW

CD–1

1–WAY, 2–LANE, PARALLEL PARKING, SHARED LANE, SIDEWALK



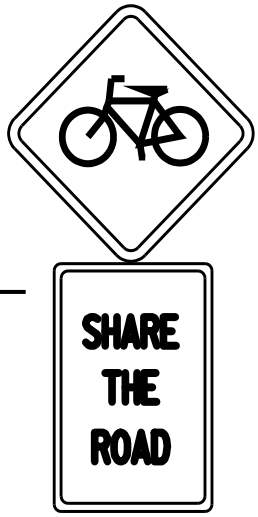
SECTION VIEW

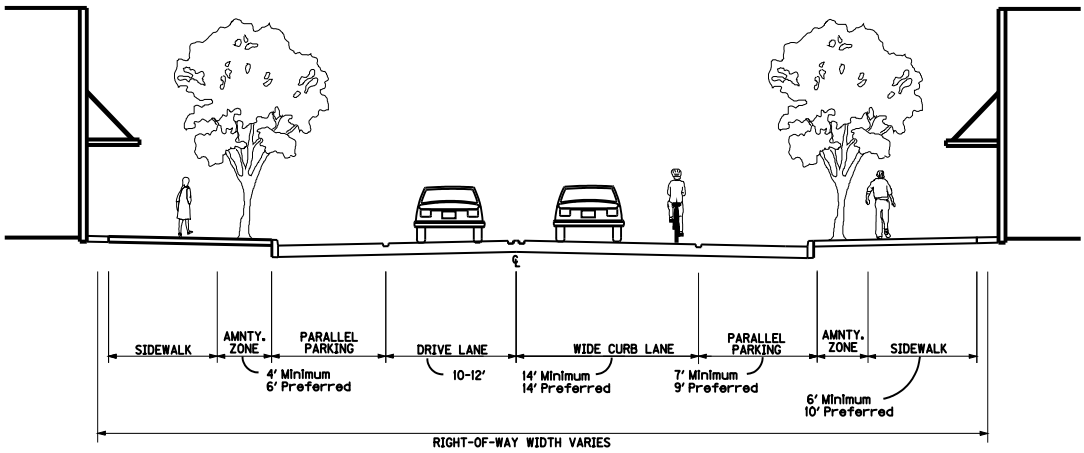


PLAN VIEW

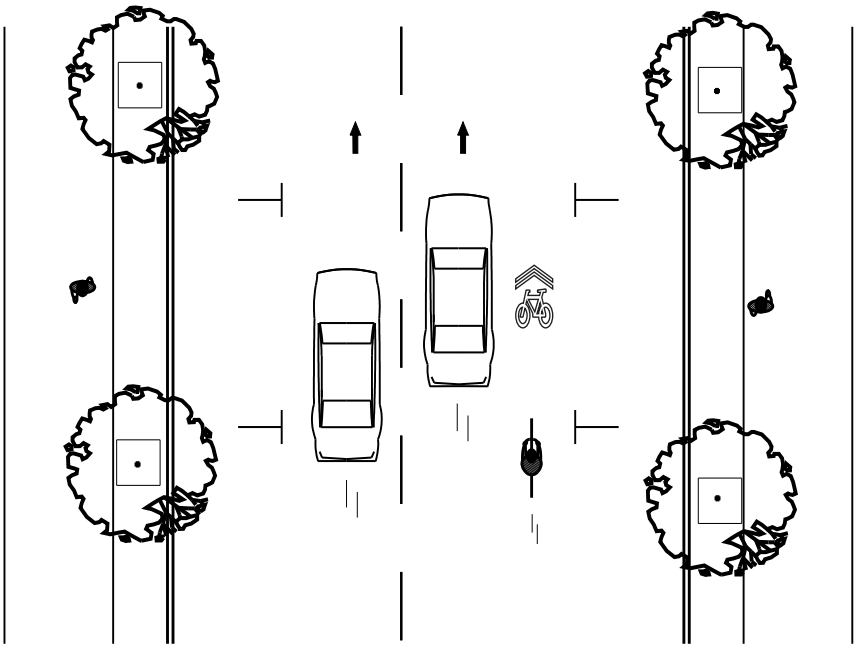
CD–2

1–WAY, 2–LANE, PARALLEL PARKING, SHARED LANE, SIDEWALK





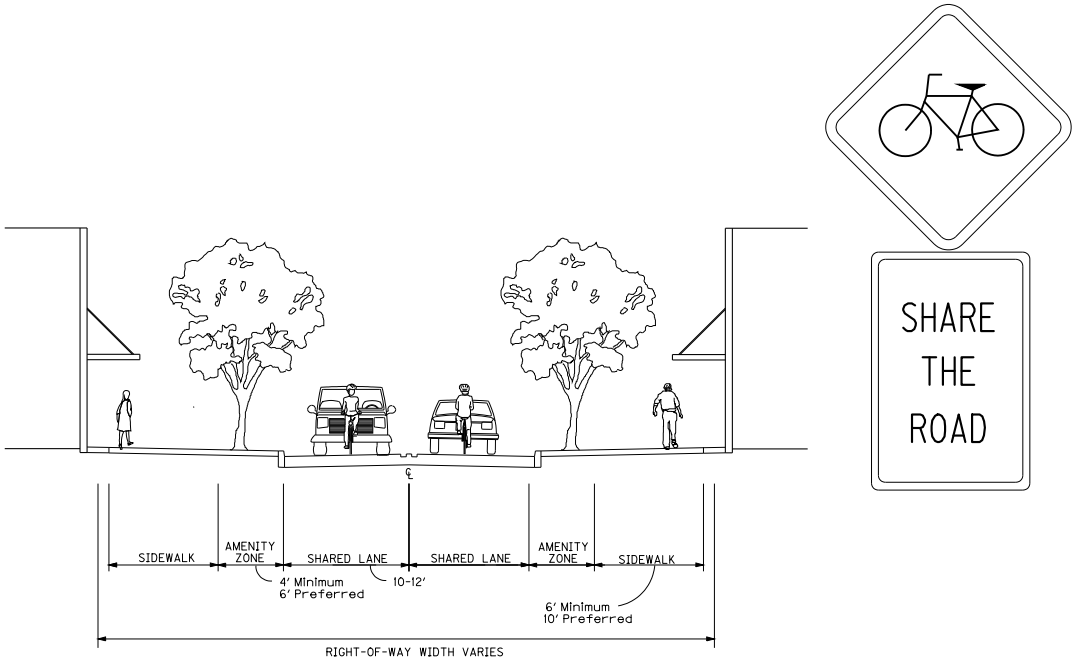
SECTION VIEW



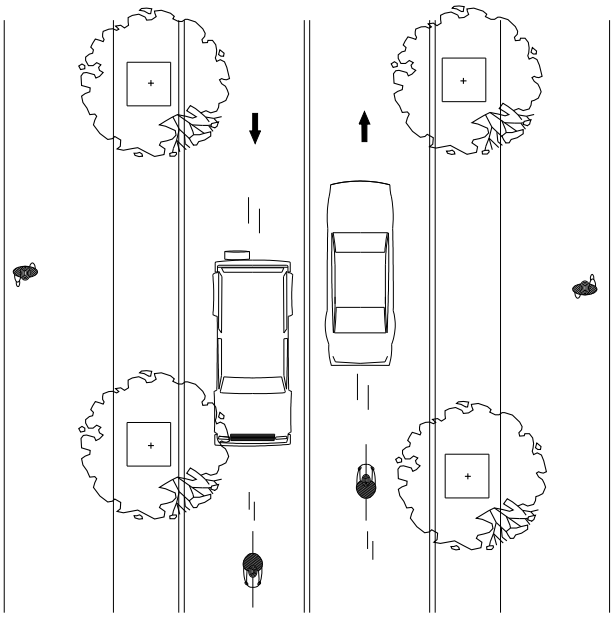
PLAN VIEW

CD–3

1–WAY, 2–LANE, PARALLEL PARKING, WIDE CURB LANE, SIDEWALK



SECTION VIEW

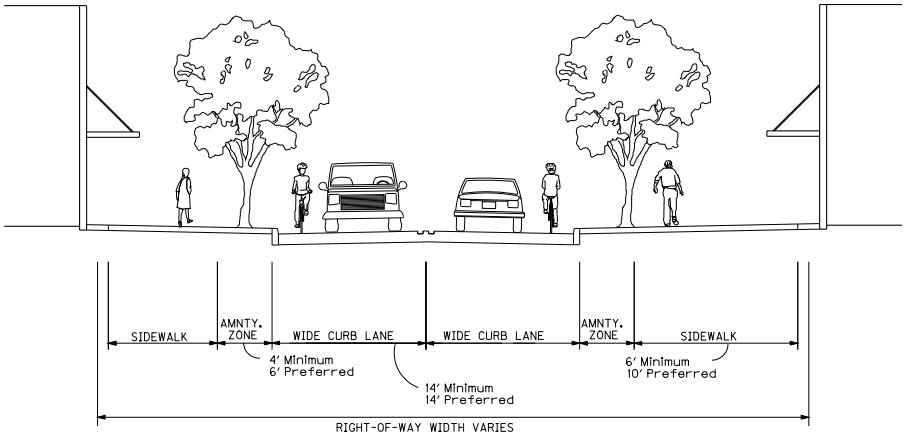


PLAN VIEW

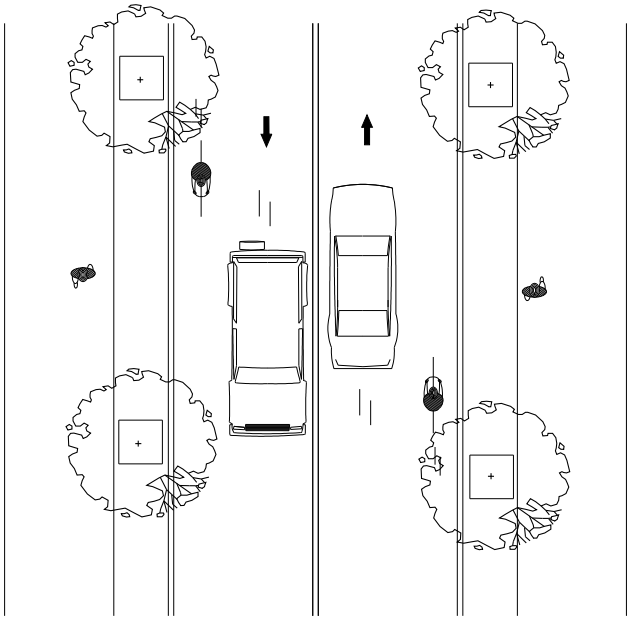
CD–4

2–WAY, 2–LANE, SHARED LANE, SIDEWALK

CD-5: Reserved for additional Downtown Collector Section



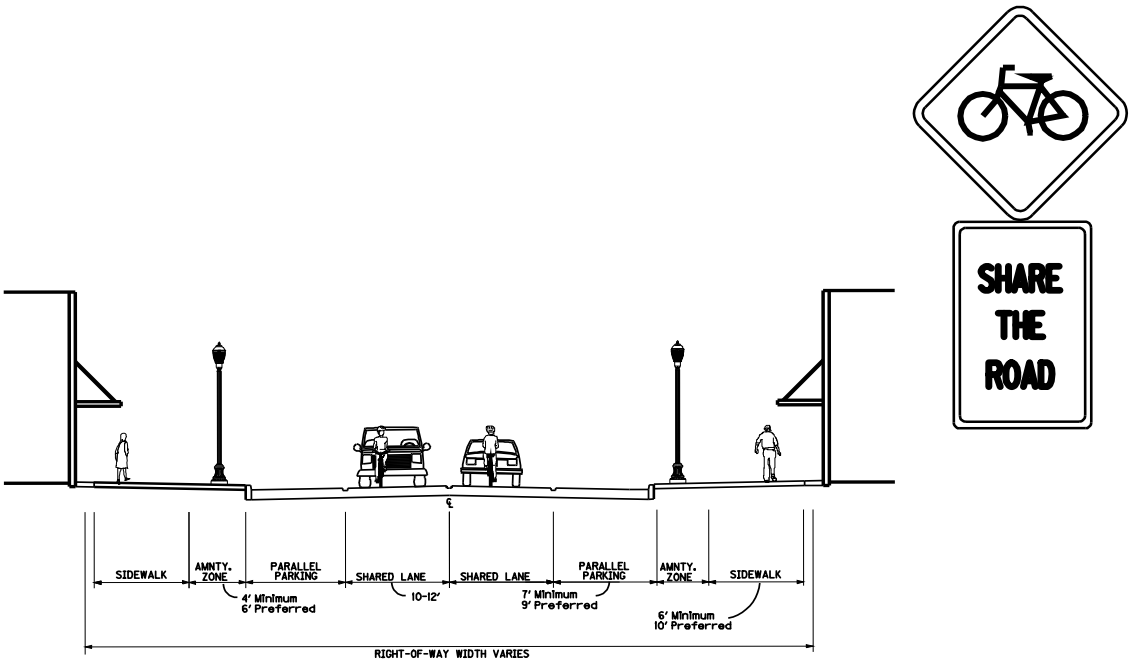
SECTION VIEW



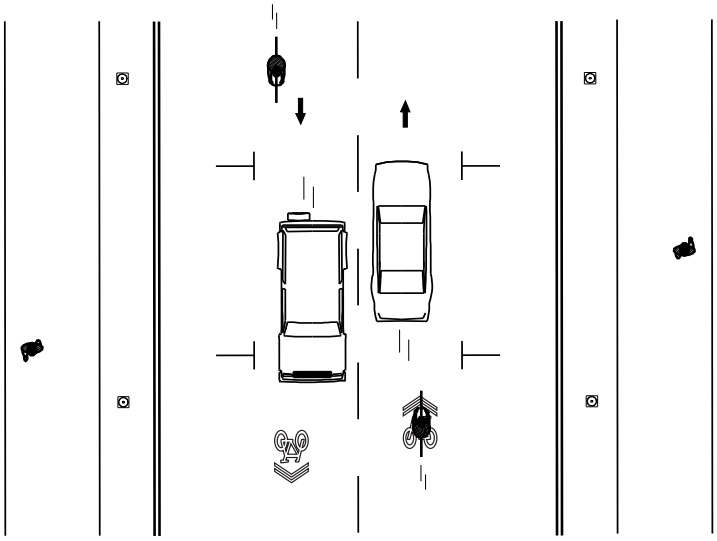
PLAN VIEW

CD–6
2–WAY, 2–LANE, WIDE CURB LANE, SIDEWALK

CD-7: Reserved for additional Downtown Collector Section

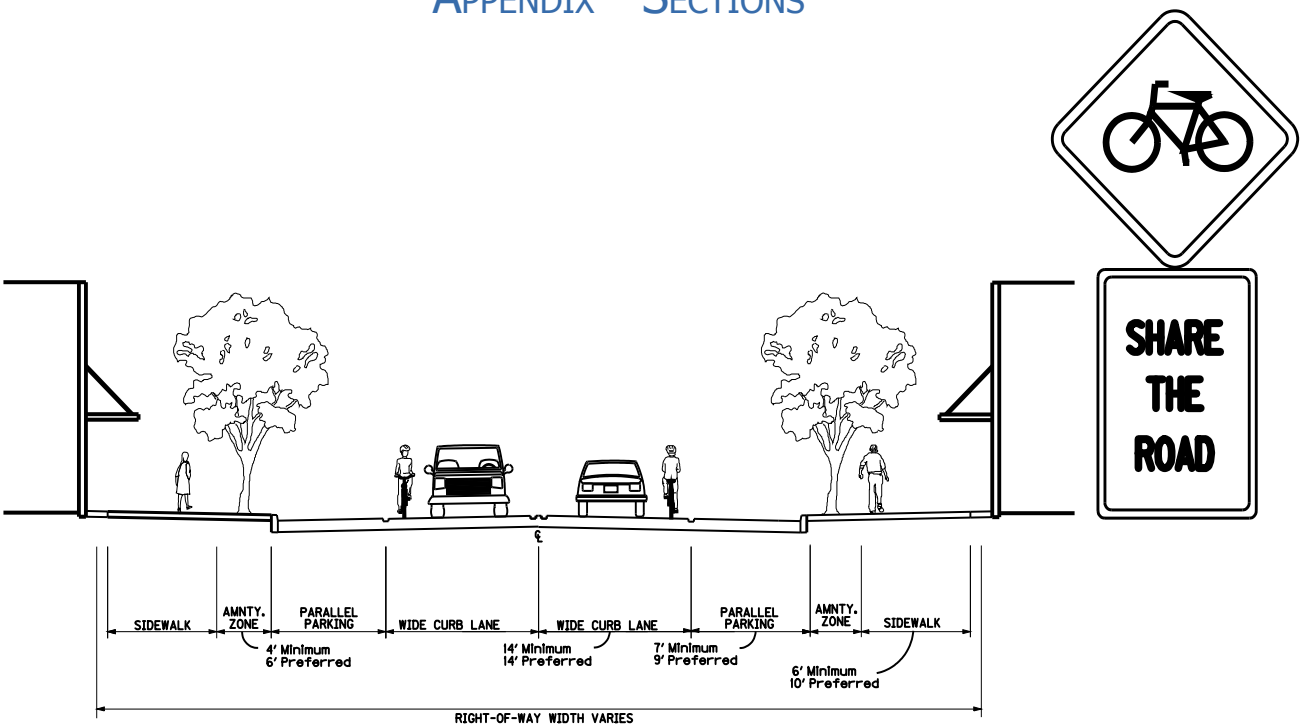


SECTION VIEW

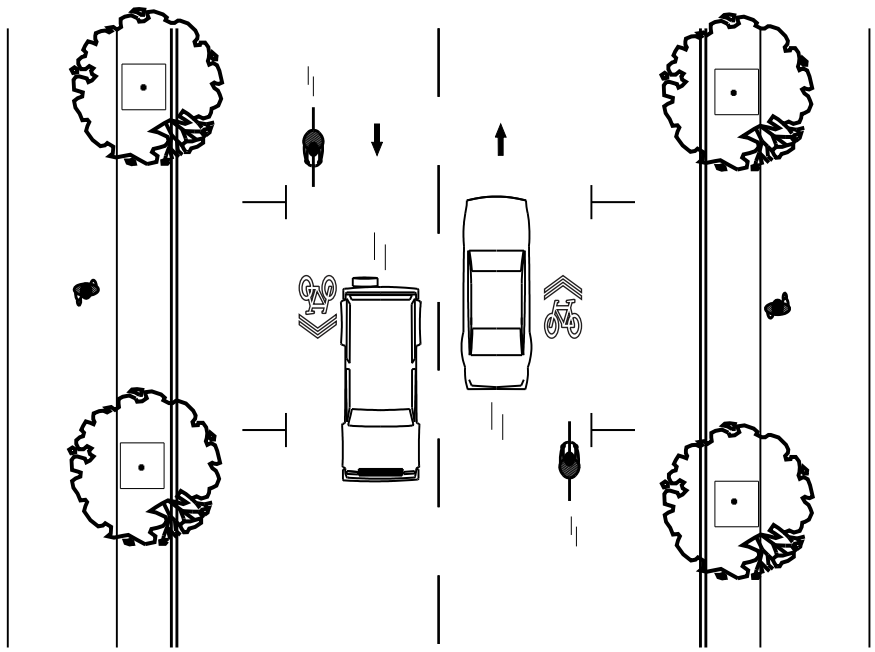


PLAN VIEW

CD–8
2–WAY, 2–LANE, PARALLEL PARKING, SIDEWALK, SHARED LANE



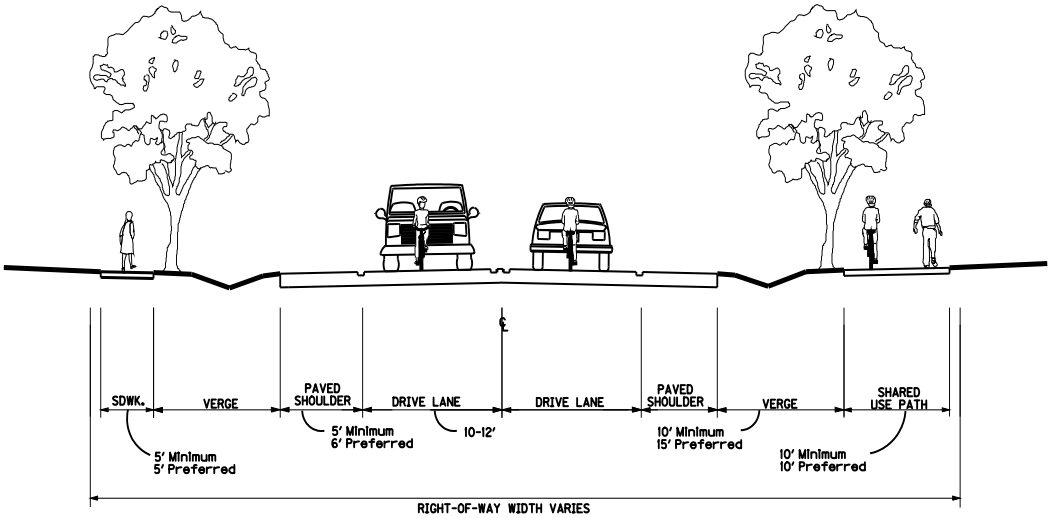
SECTION VIEW

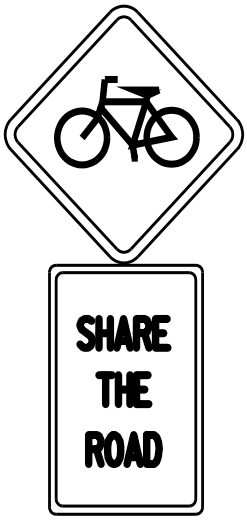


PLAN VIEW

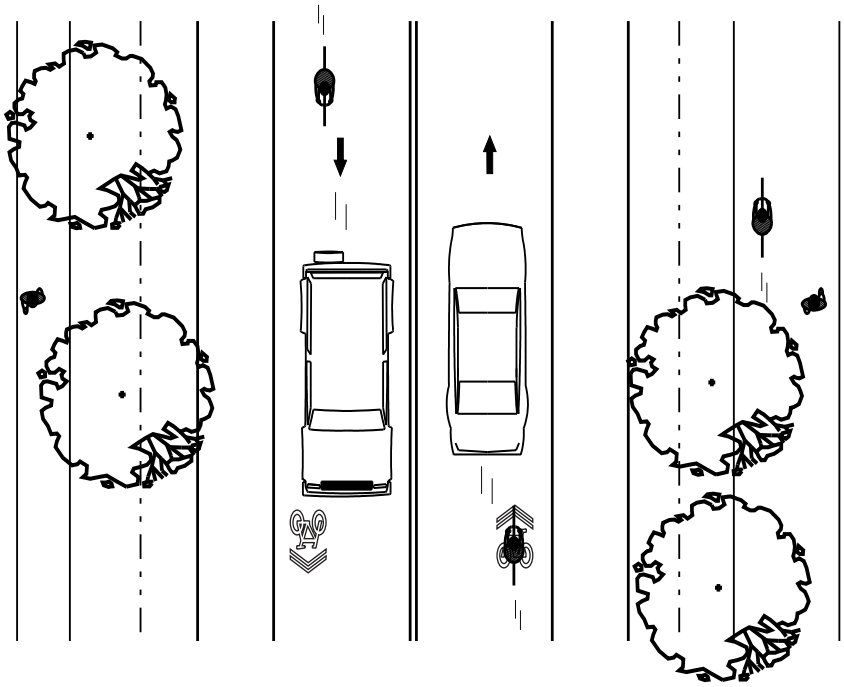
CD–9

2–WAY, 2–LANE, PARALLEL PARKING, WIDE CURB LANE, SIDEWALK





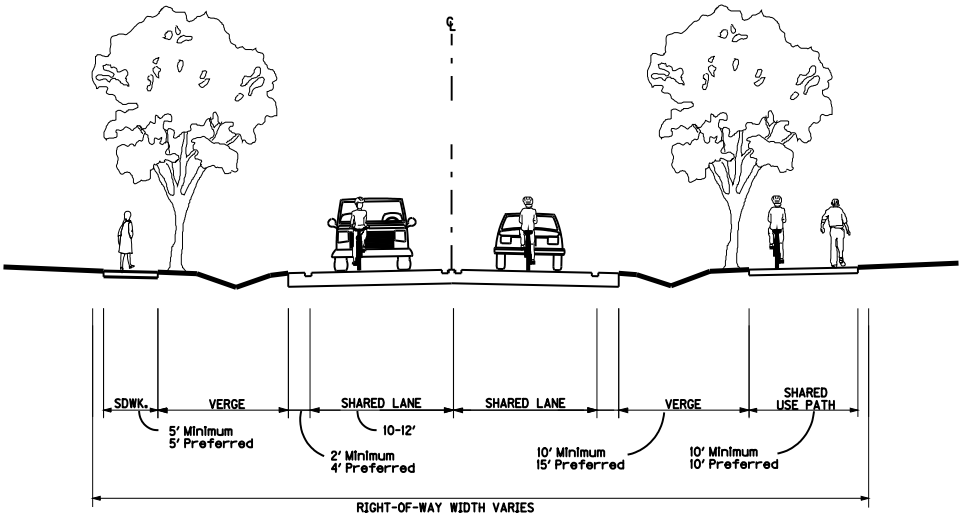
SECTION VIEW



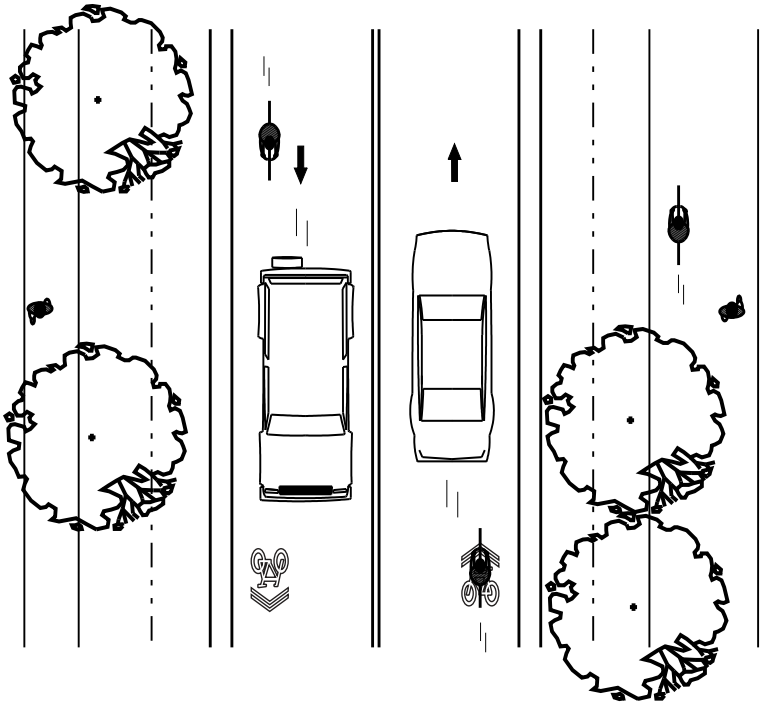
PLAN VIEW

LR–1

2–WAY, 2–LANE, SHARED LANE, SHARED USE PATH/SIDEWALK



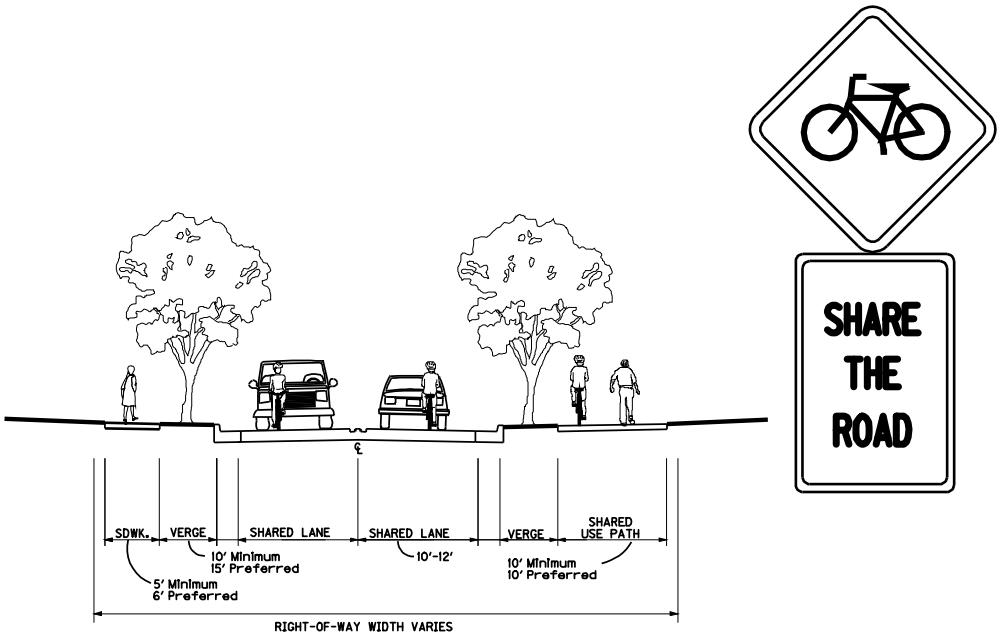
SECTION VIEW



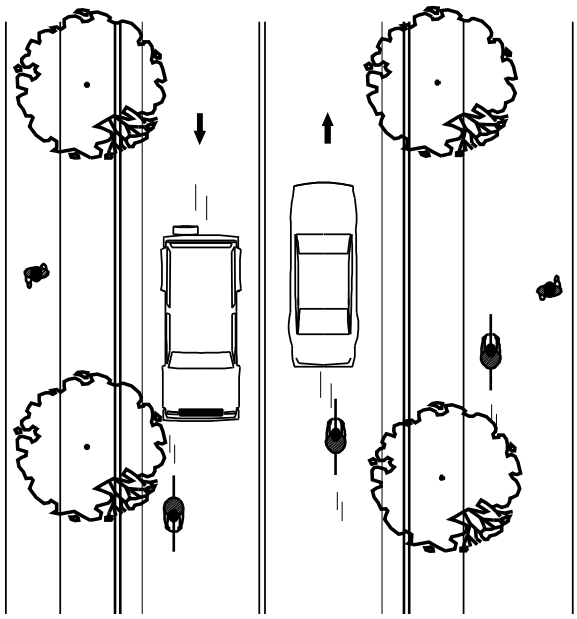
PLAN VIEW

LR–2

2–WAY, 2–LANE, NO SHOULDER, SHARED LANE, SHARED USE PATH/SIDEWALK



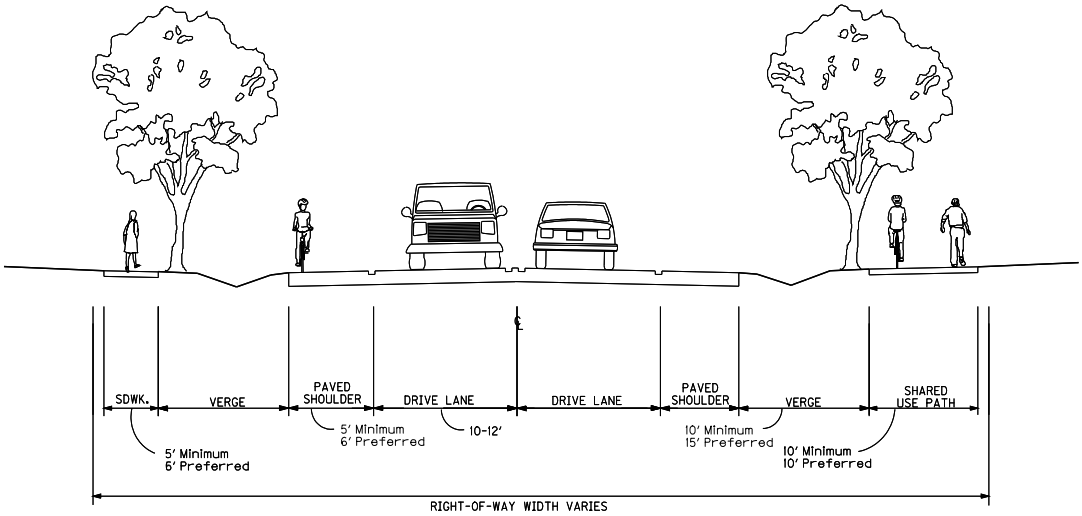
SECTION VIEW



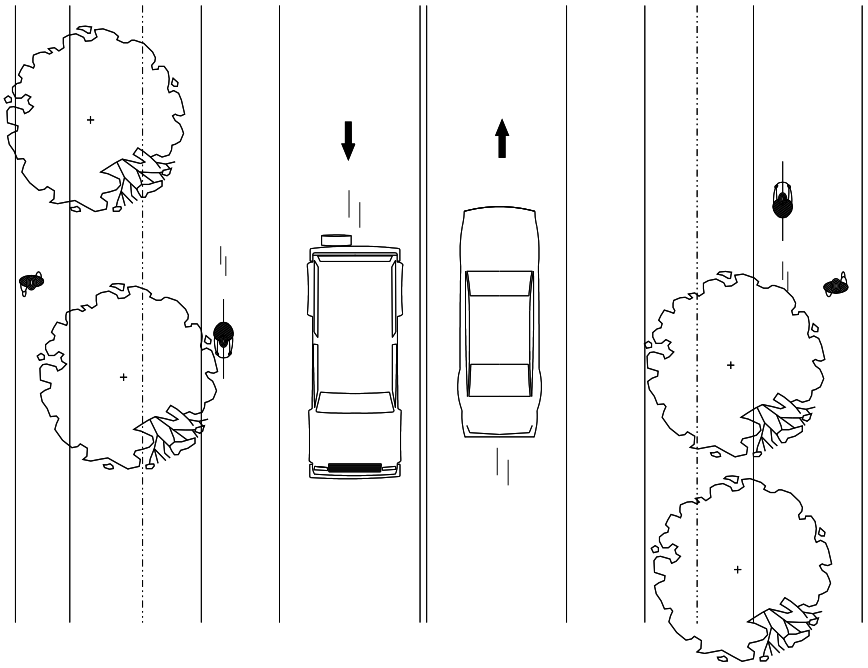
PLAN VIEW

LS–1

2–WAY, 2–LANE, SHARED USE PATH, SHARED LANE



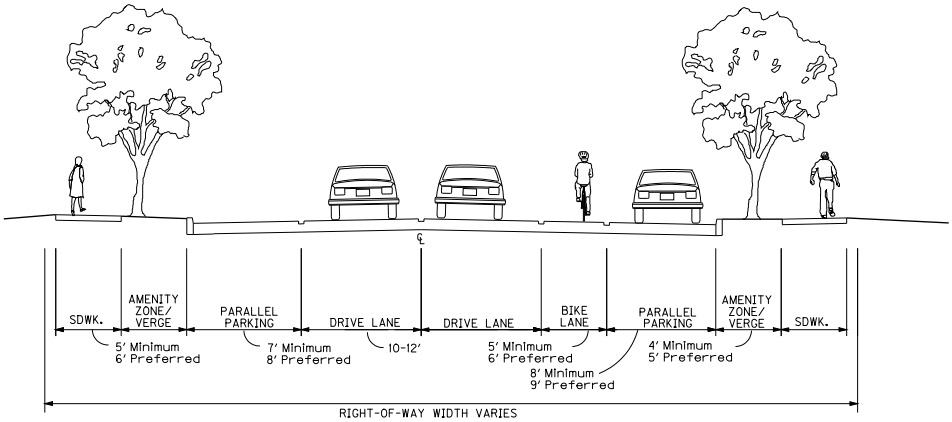
SECTION VIEW



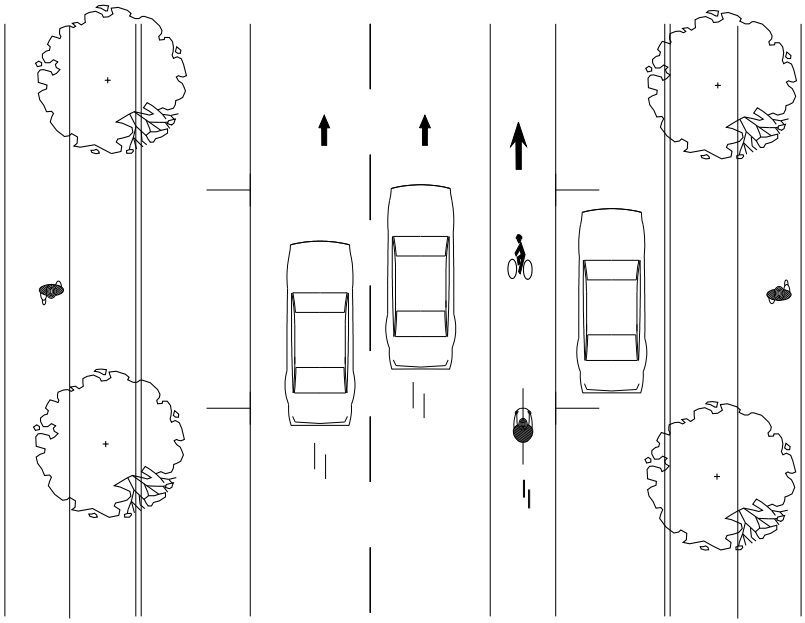
PLAN VIEW

LS–2

2–WAY, 2–LANE, SHOULDER, SHARED USE PATH/SIDEWALK



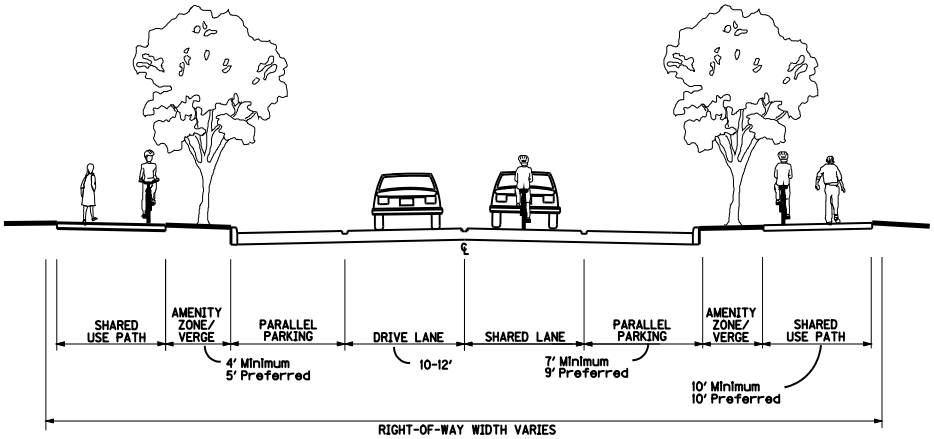
SECTION VIEW



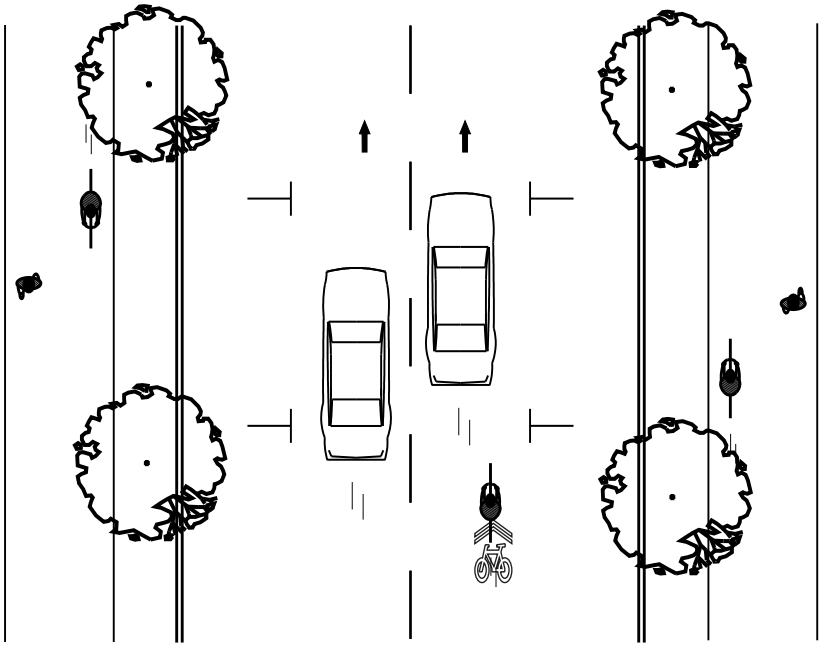
PLAN VIEW

LT–1

1–WAY, 2–LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK



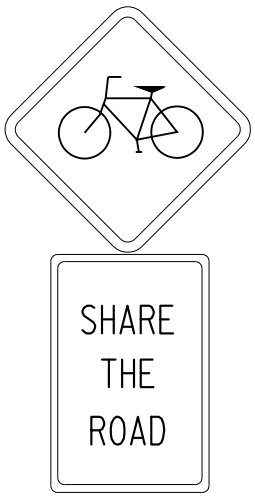
SECTION VIEW

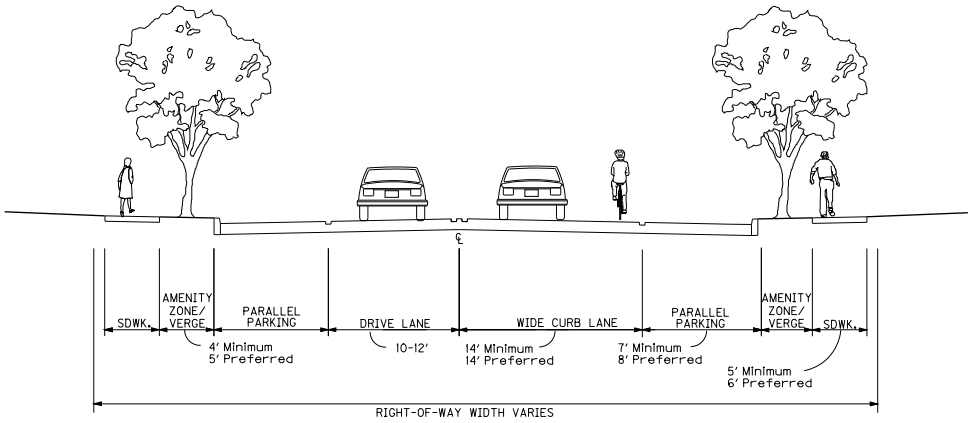


PLAN VIEW

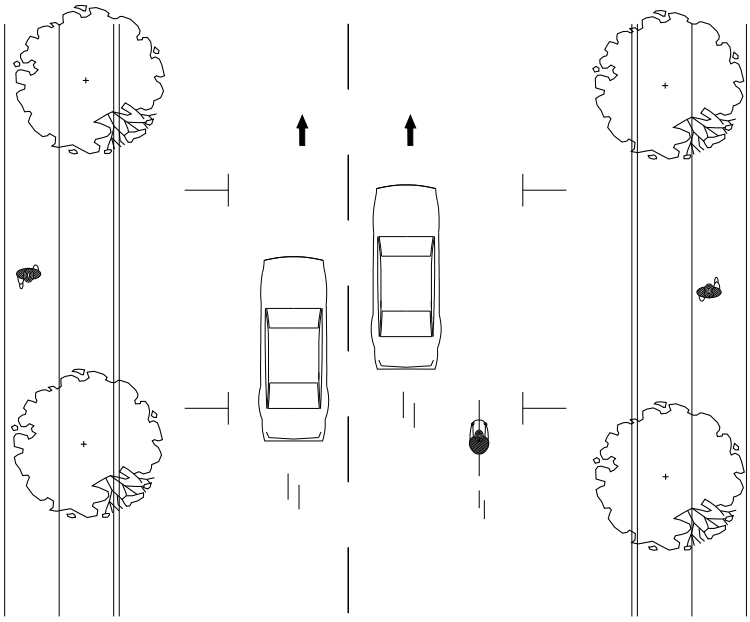
LT–2

1–WAY, 2–LANE, PARALLEL PARKING, SHARED USE PATH, SHARED LANE





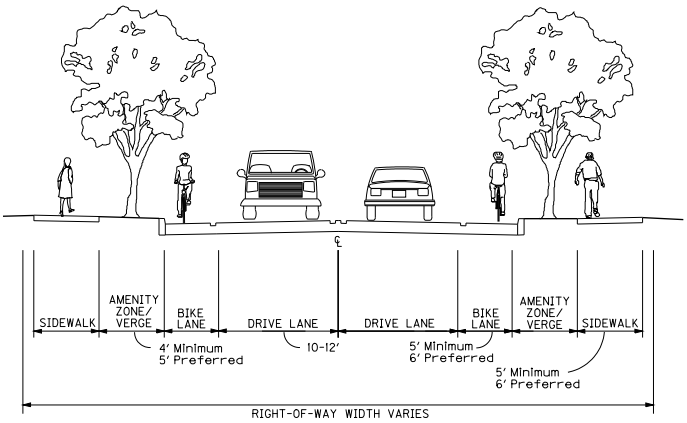
SECTION VIEW



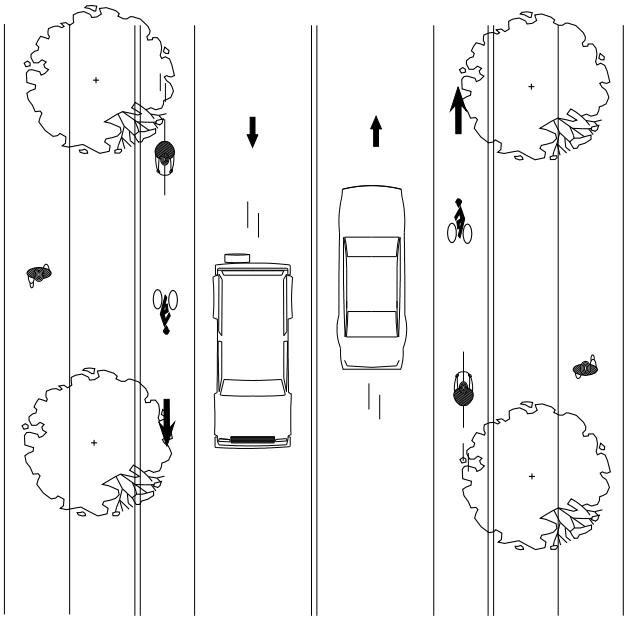
PLAN VIEW

LT–3

1–WAY, 2–LANE, PARALLEL PARKING, WIDE CURB LANE, SIDEWALK



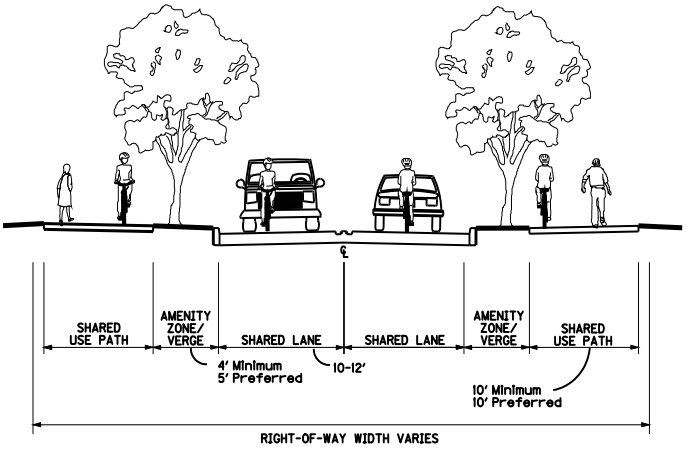
SECTION VIEW



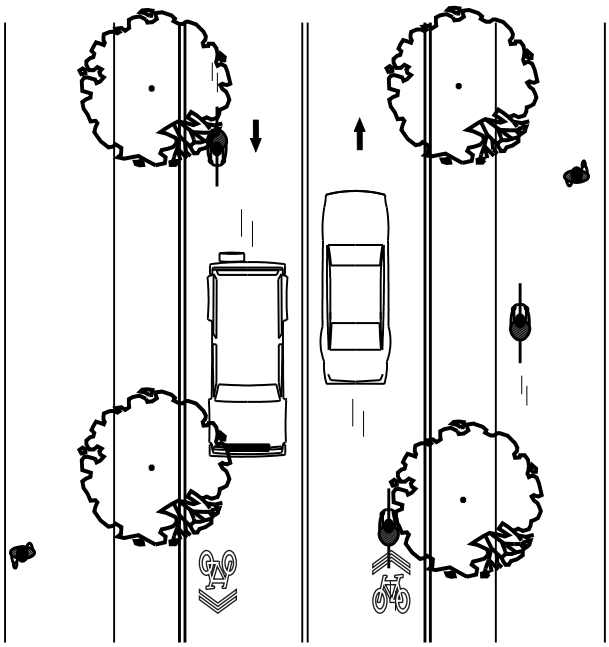
PLAN VIEW

LT–4

2–WAY, 2–LANE, BIKE LANE, SIDEWALK



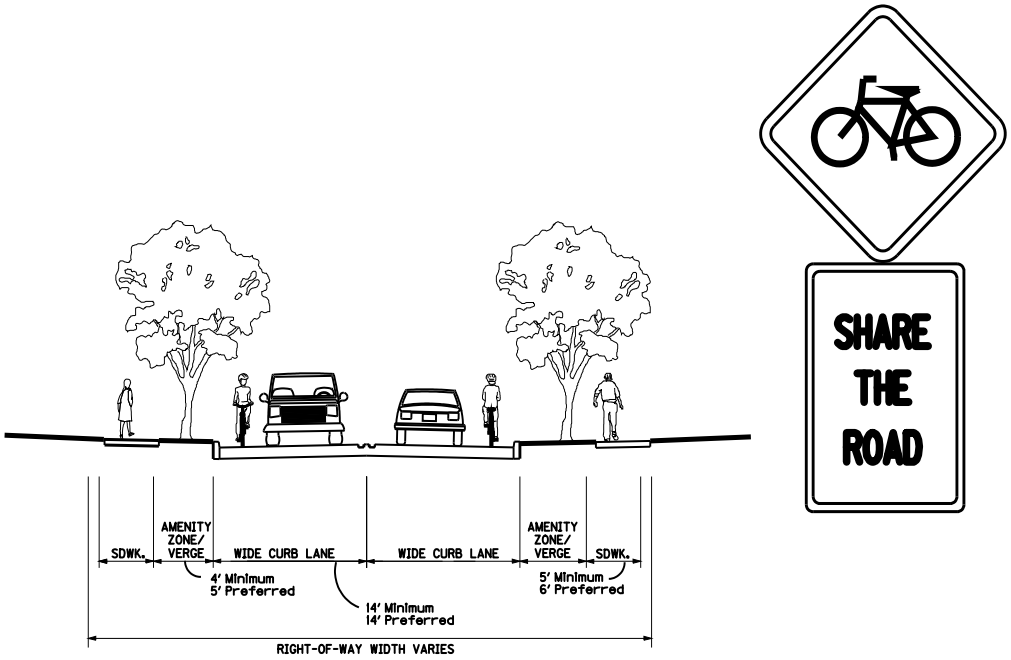
SECTION VIEW



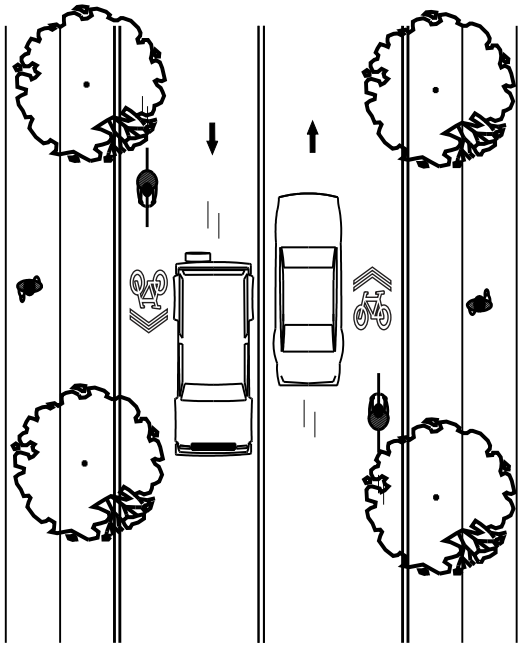
PLAN VIEW

LT–5

2–WAY, 2–LANE, SHARED USE PATH, SHARED LANE



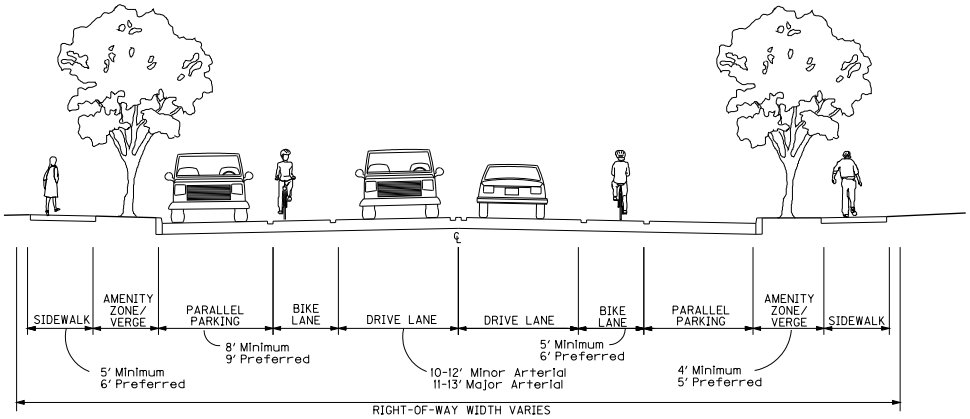
SECTION VIEW



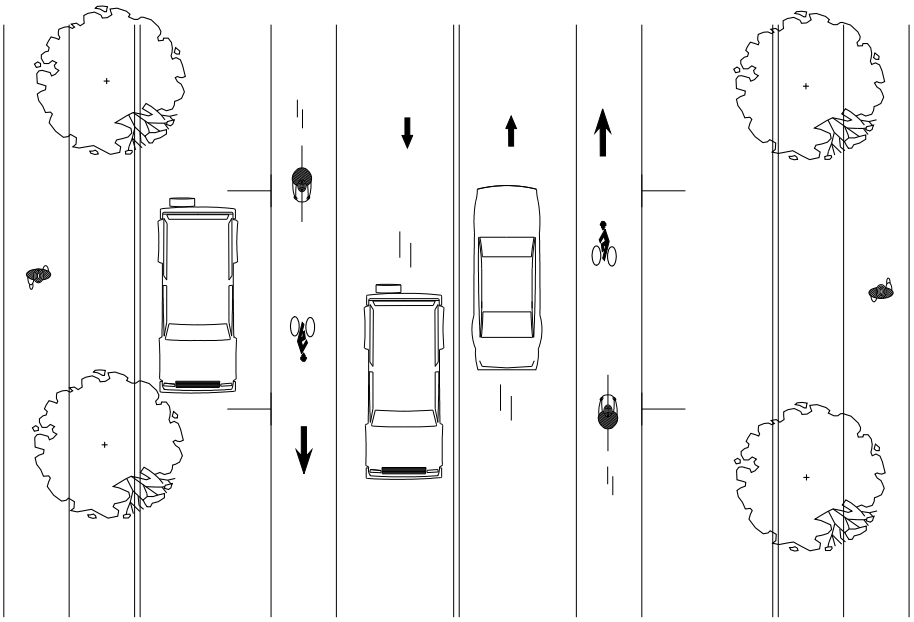
PLAN VIEW

LT–6

2–WAY, 2–LANE, WIDE CURB LANE, SIDEWALK



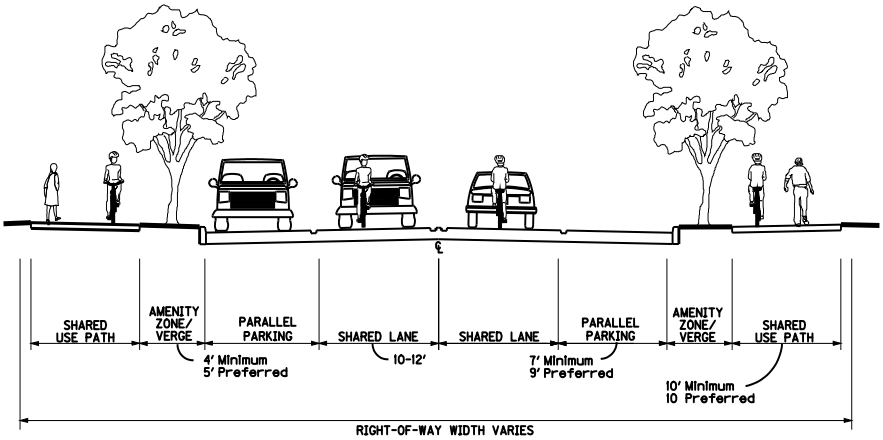
SECTION VIEW



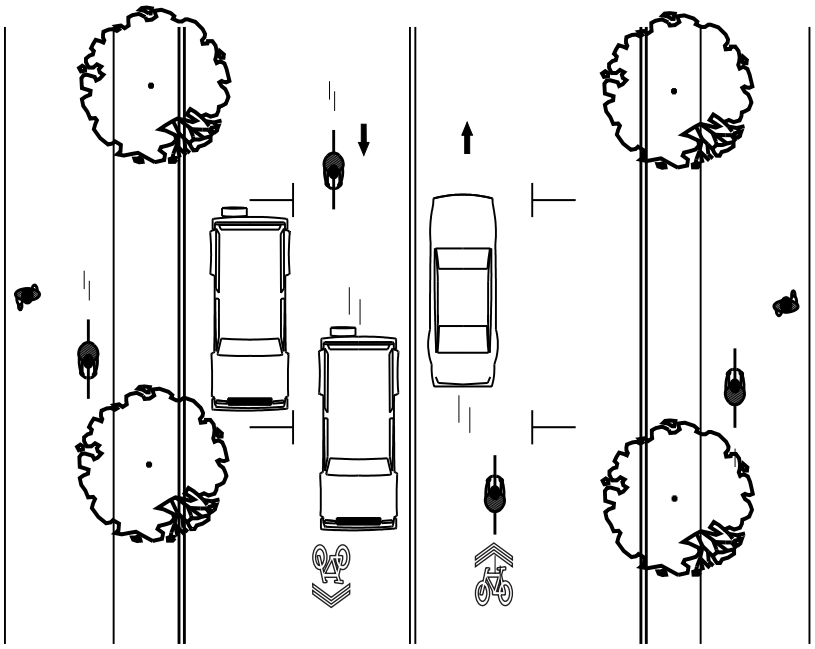
PLAN VIEW

LT–7

2–WAY, 2–LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK



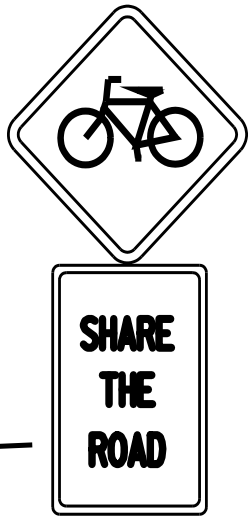
SECTION VIEW

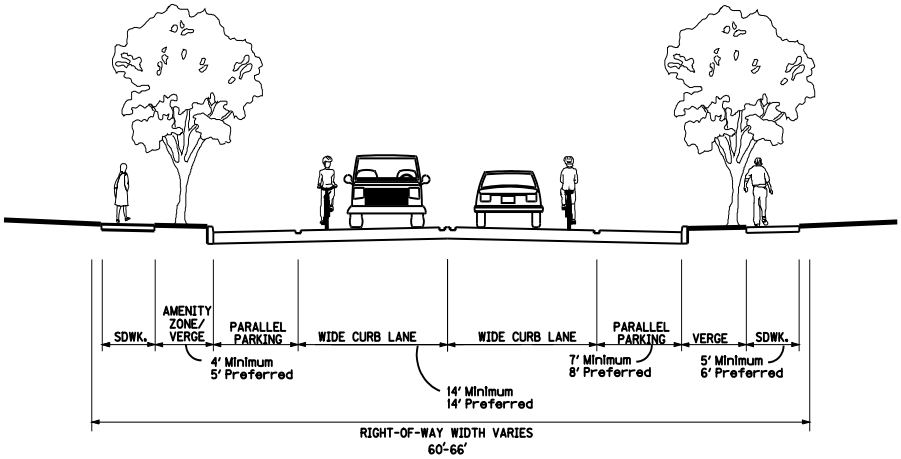


PLAN VIEW

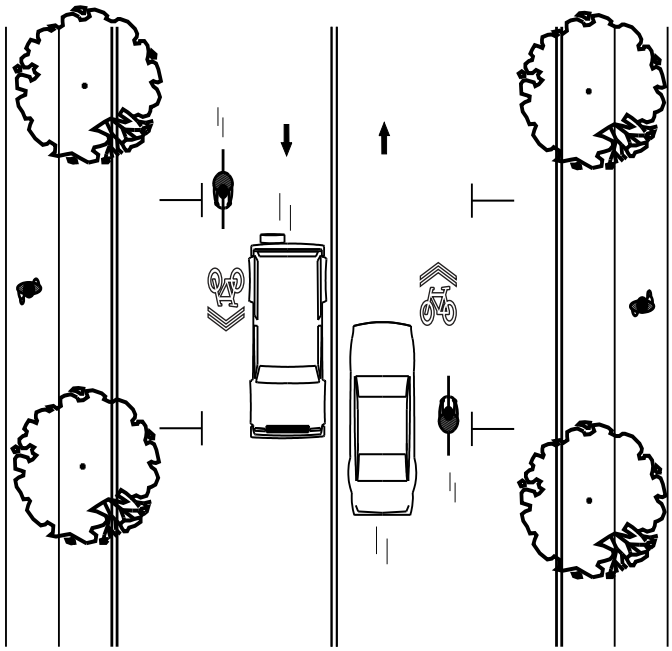
LT–8

2–WAY, 2–LANE, PARALLEL PARKING, SHARED USE PATH, SHARED LANE





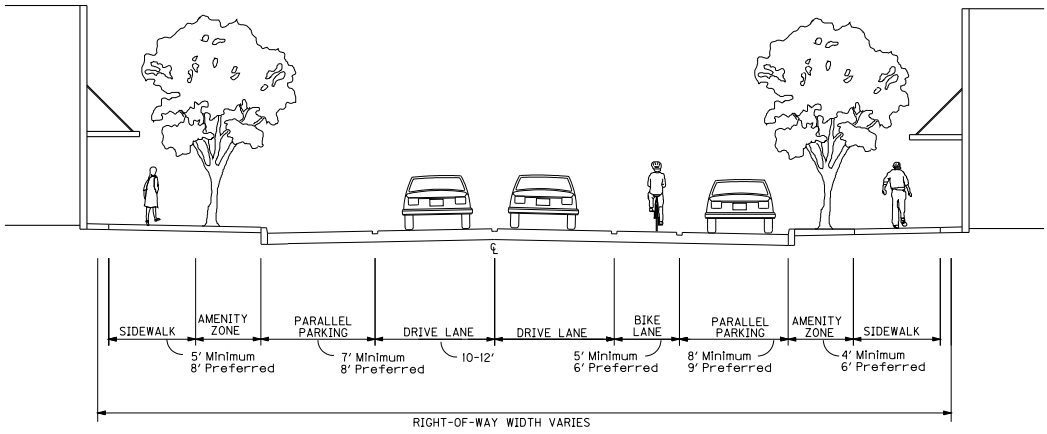
SECTION VIEW



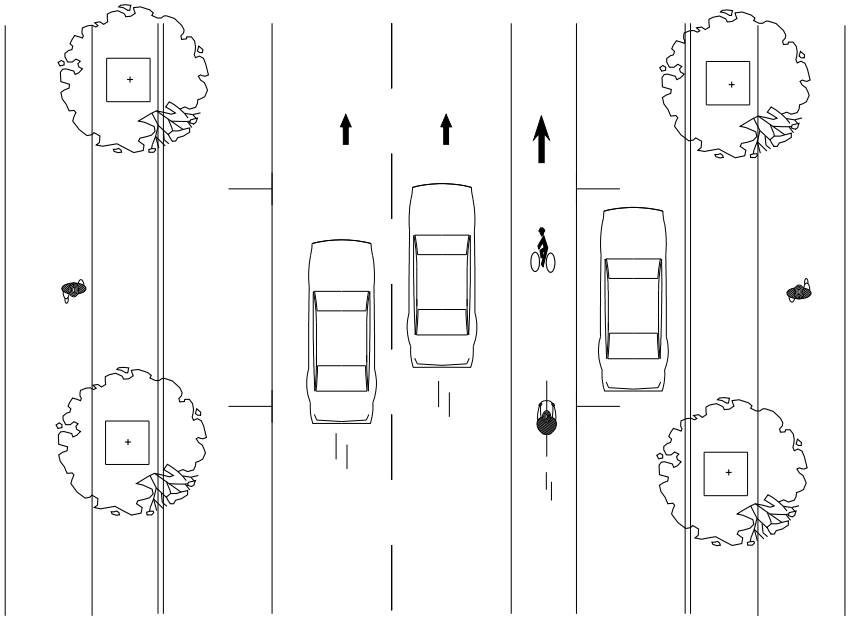
PLAN VIEW

LT–9

2–WAY, 2–LANE, PARALLEL PARKING, WIDE CURB LANE, SIDEWALK



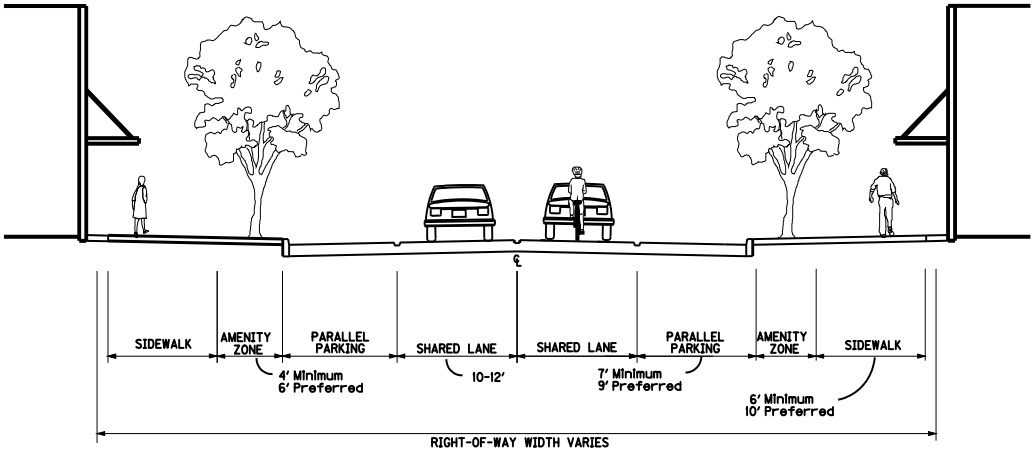
SECTION VIEW



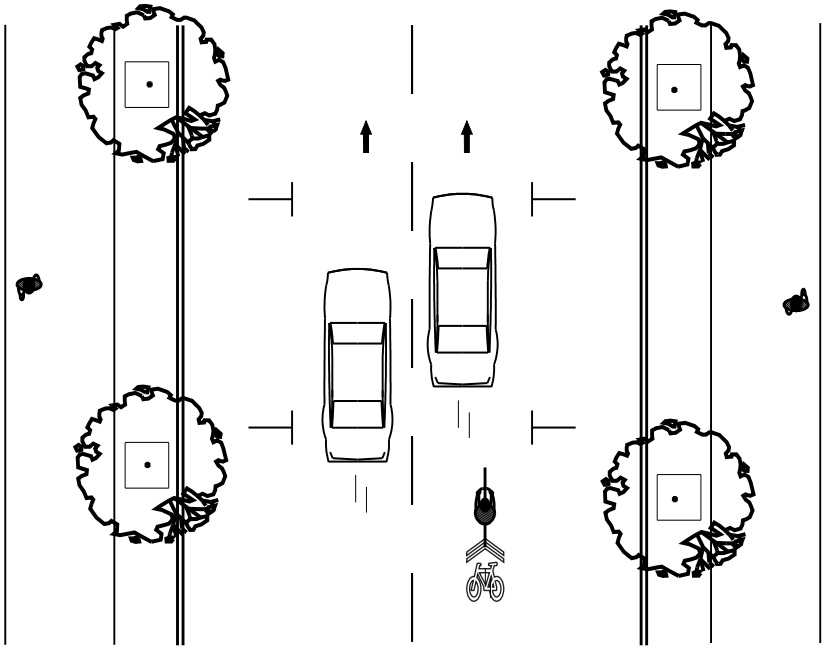
PLAN VIEW

LD–1

1–WAY, 2–LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK

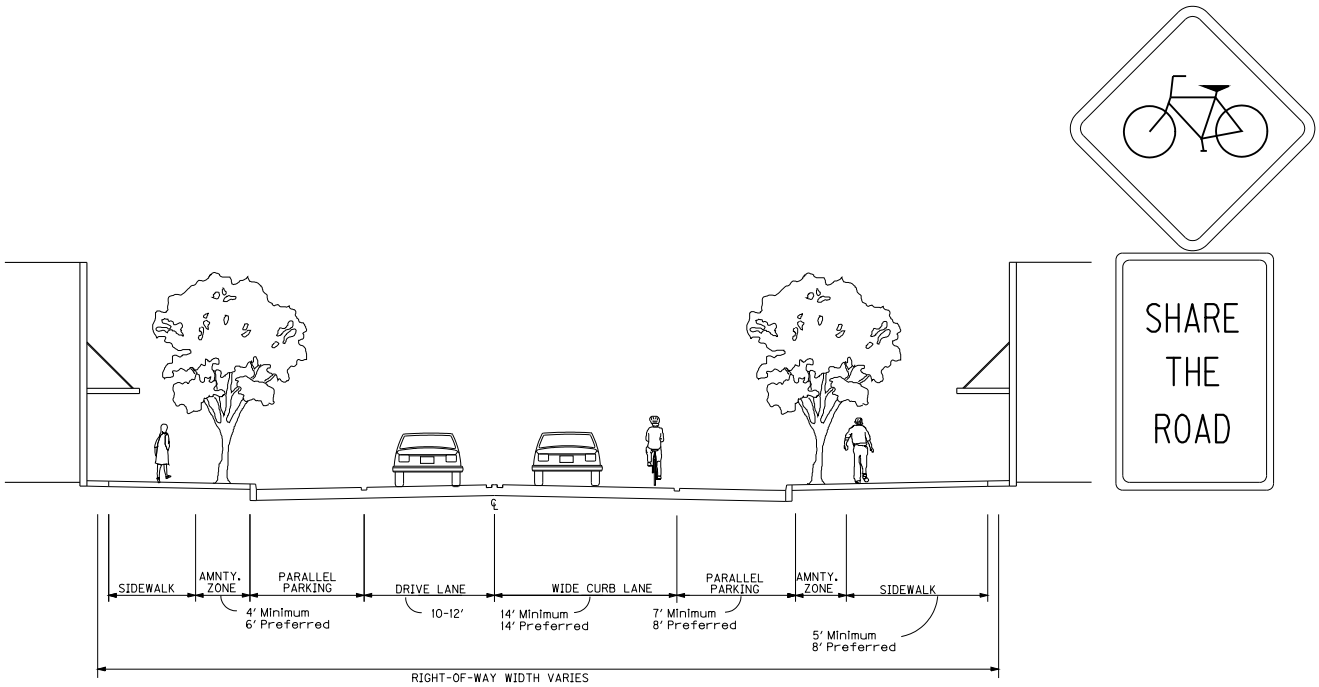


SECTION VIEW

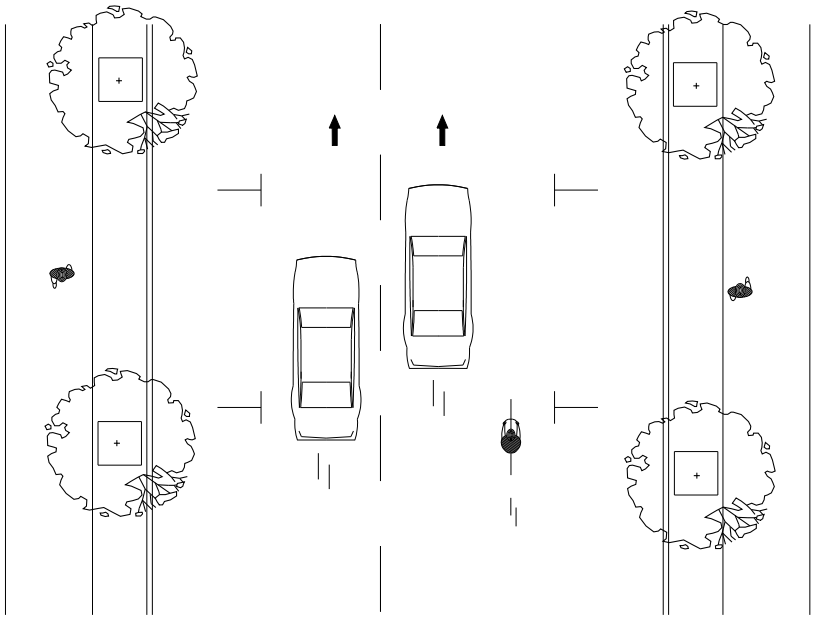


PLAN VIEW

LD–2
1–WAY, 2–LANE, PARALLEL PARKING, SHARED LANE, SIDEWALK



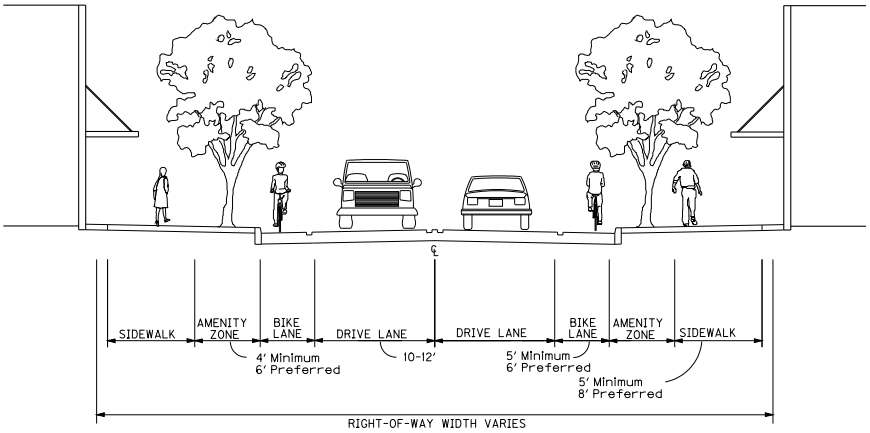
SECTION VIEW



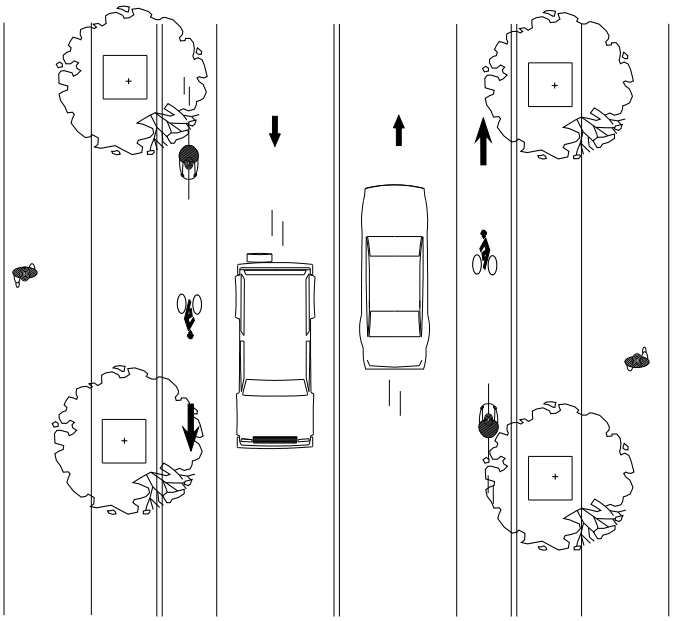
PLAN VIEW

LD–3

1–WAY, 2–LANE, PARALLEL PARKING, WIDE CURB LANE, SIDEWALK



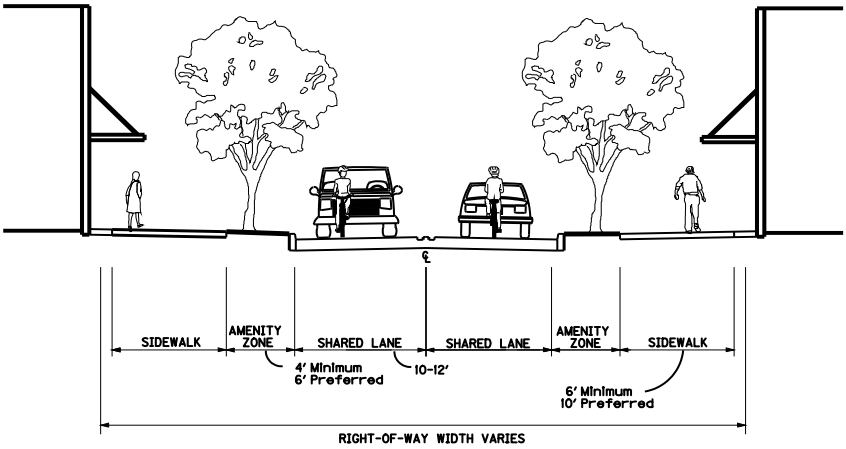
SECTION VIEW



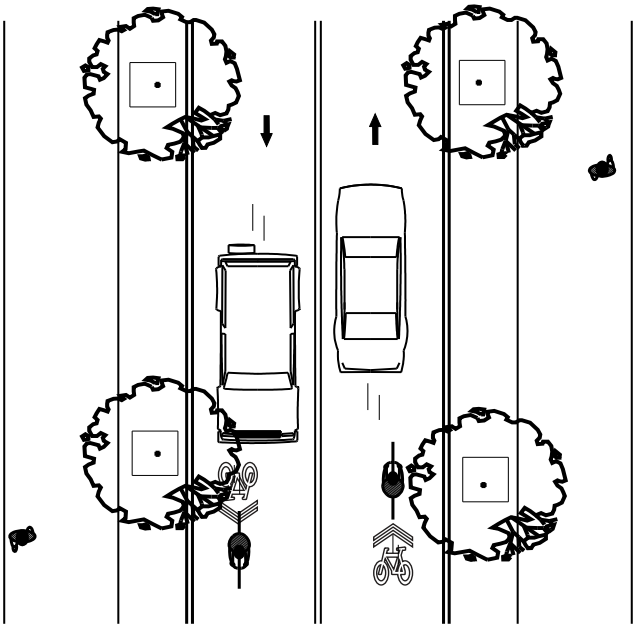
PLAN VIEW

LD–4

2–WAY, 2–LANE, BIKE LANE, SIDEWALK



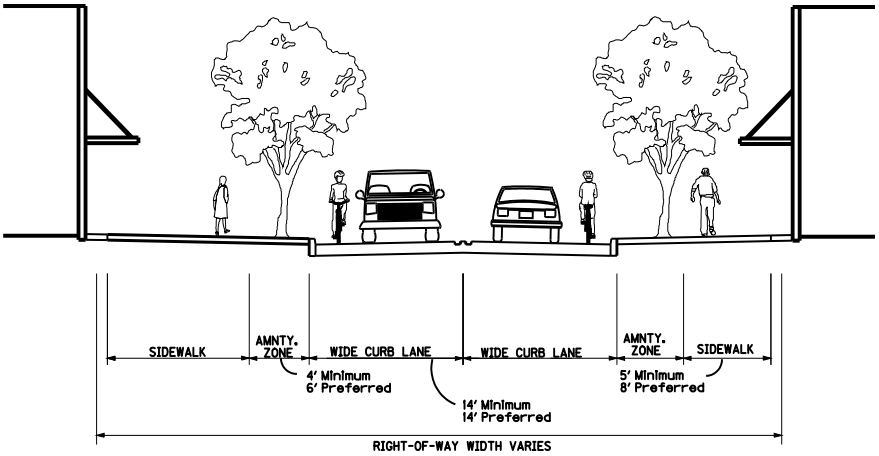
SECTION VIEW



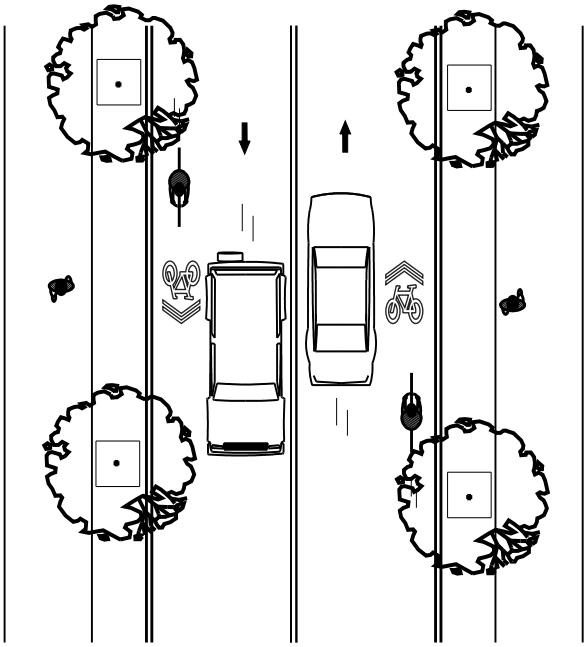
PLAN VIEW

LD–5

2–WAY, 2–LANE, SHARED LANE, SIDEWALK



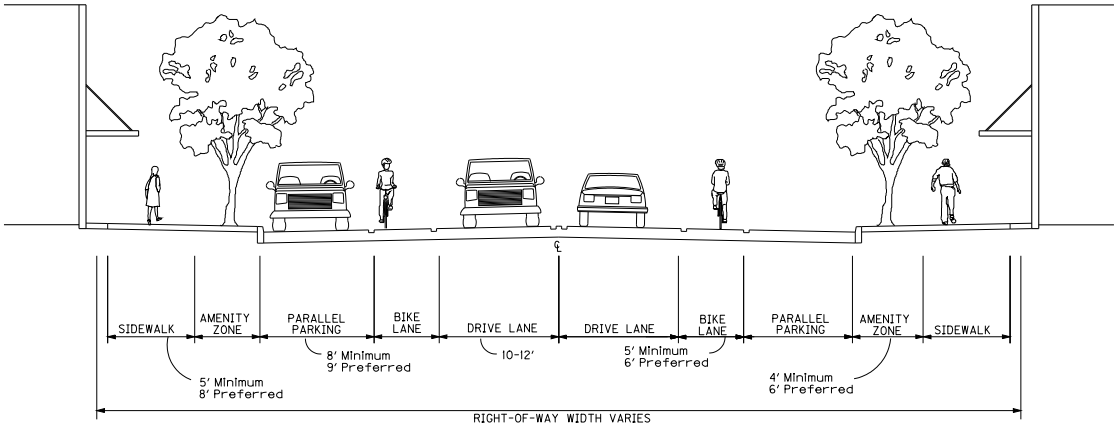
SECTION VIEW



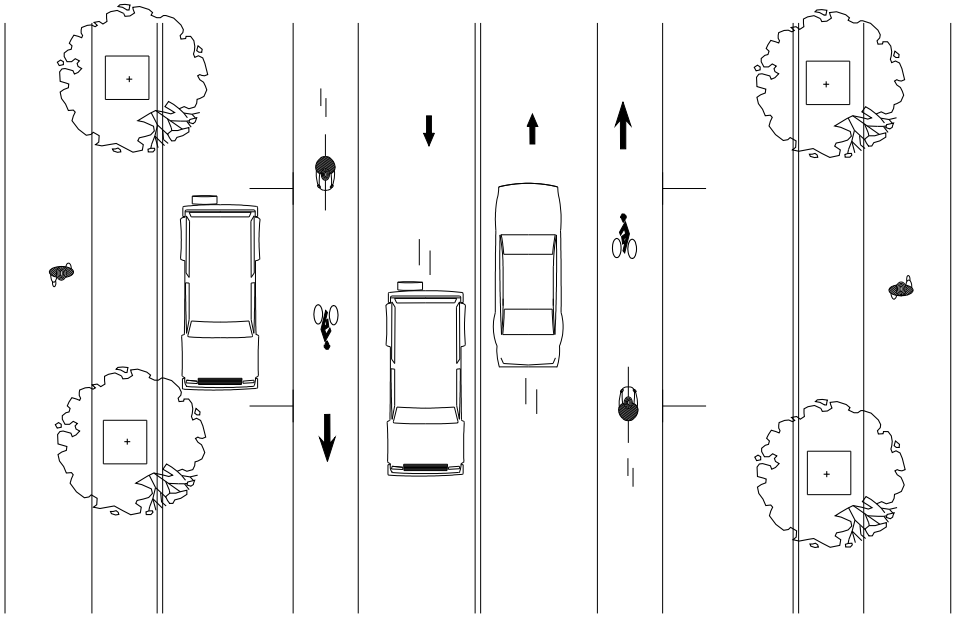
PLAN VIEW

LD–6

2–WAY, 2–LANE, WIDE CURB LANE, SIDEWALK



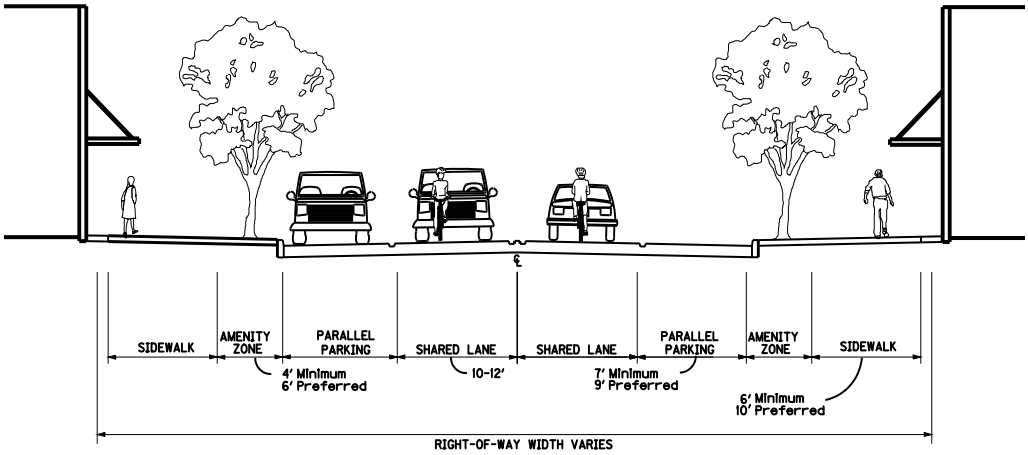
SECTION VIEW



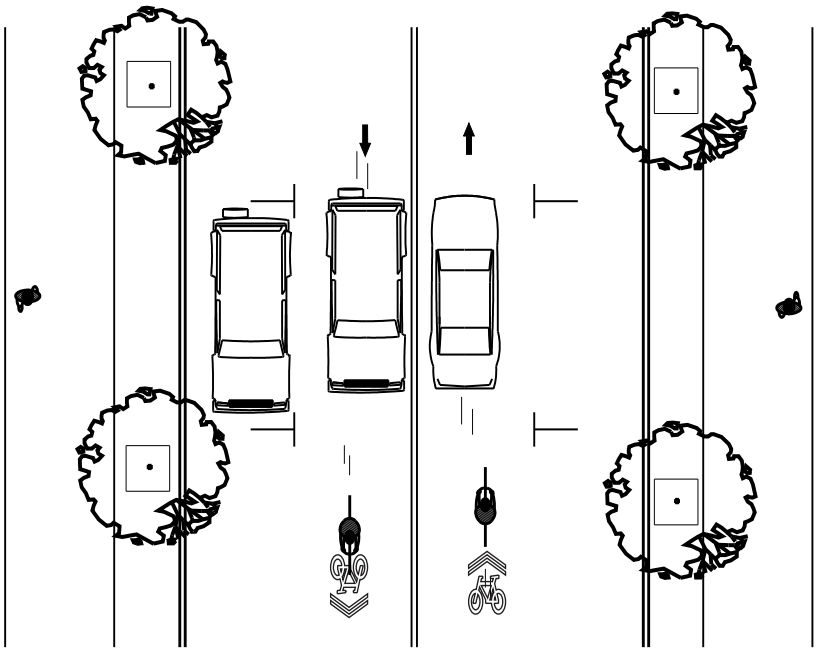
PLAN VIEW

LD–7

2–WAY, 2–LANE, PARALLEL PARKING, BIKE LANE, SIDEWALK



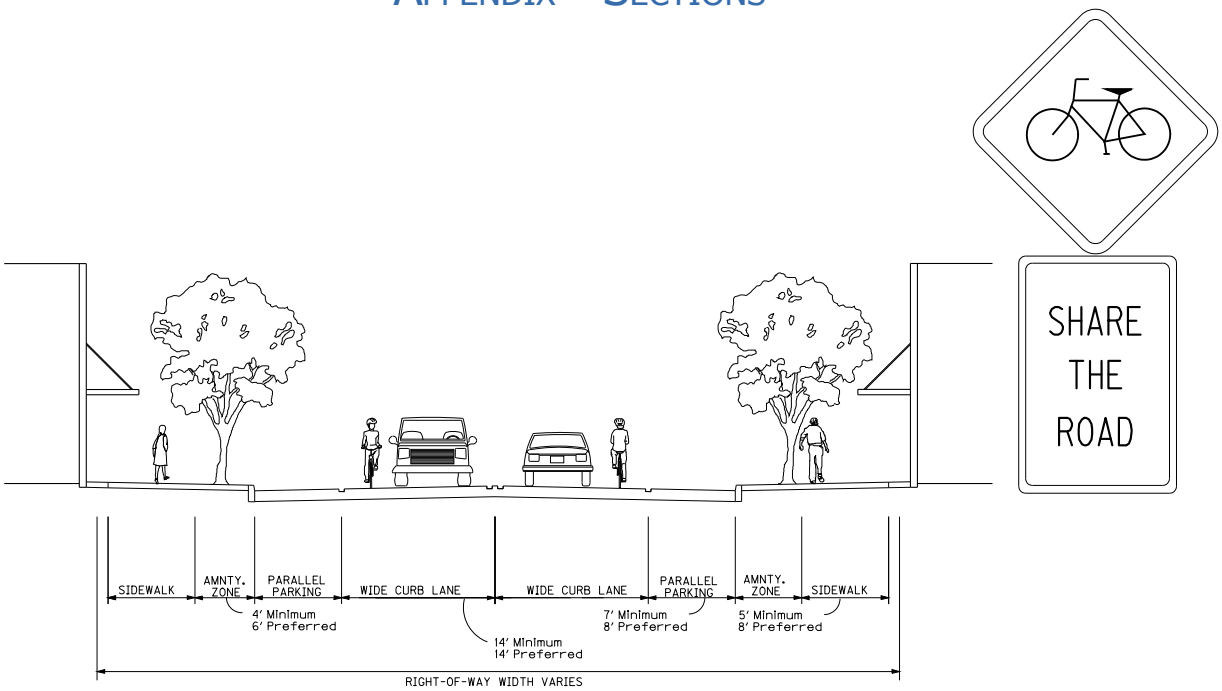
SECTION VIEW



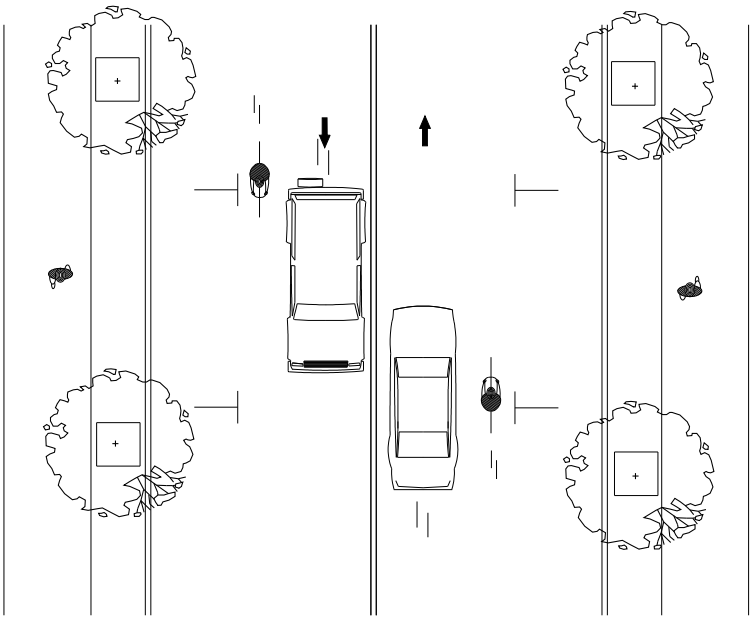
PLAN VIEW

LD–8

2–WAY, 2–LANE, PARALLEL PARKING, SHARED LANE, SIDEWALK



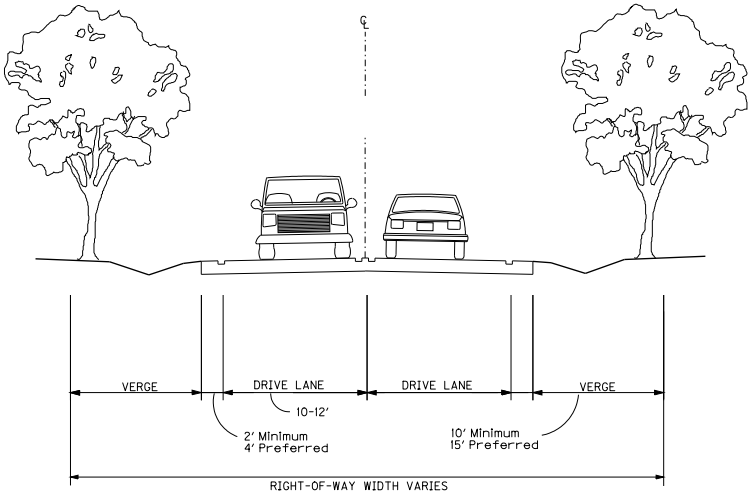
SECTION VIEW



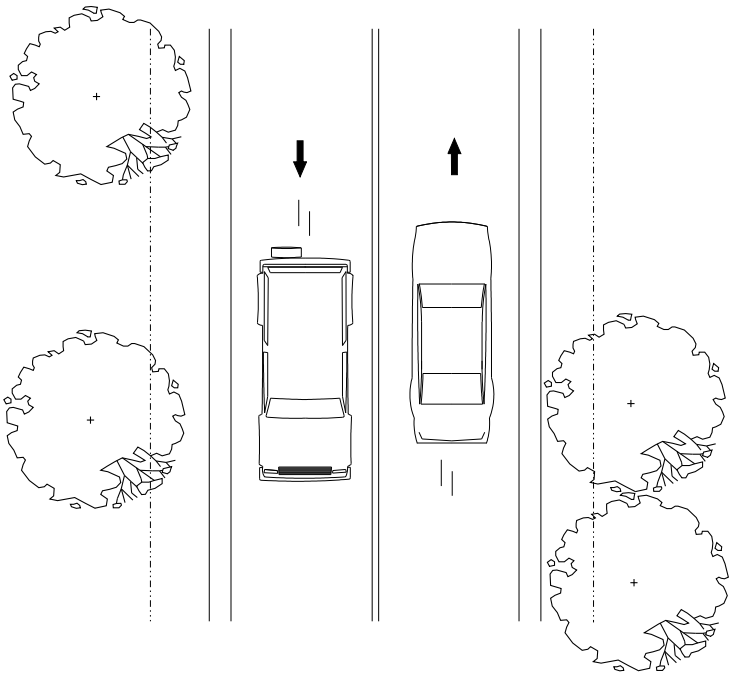
PLAN VIEW

LD–9

2–WAY, 2–LANE, PARALLEL PARKING, WIDE CURB LANE, SIDEWALK



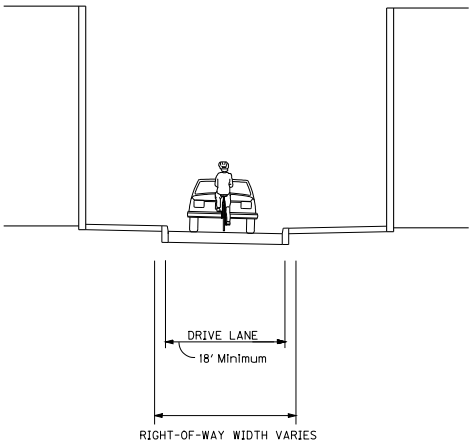
SECTION VIEW



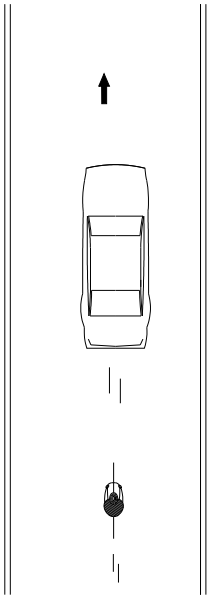
PLAN VIEW

ALS–1

2–WAY, 2–LANE, NO SHOULDER



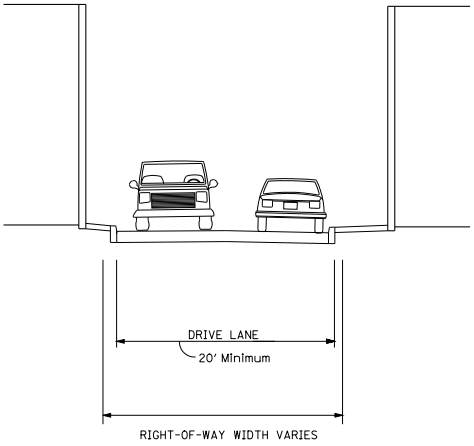
SECTION VIEW



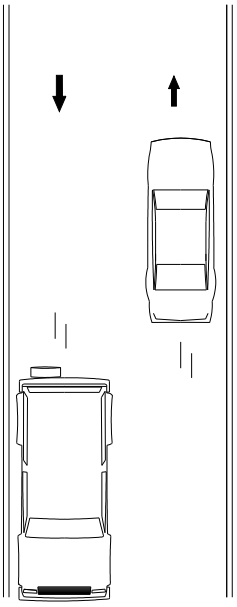
PLAN VIEW

ALT–1

1–WAY, 1–LANE



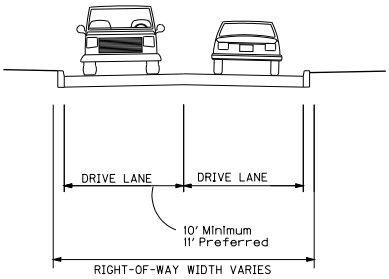
SECTION VIEW



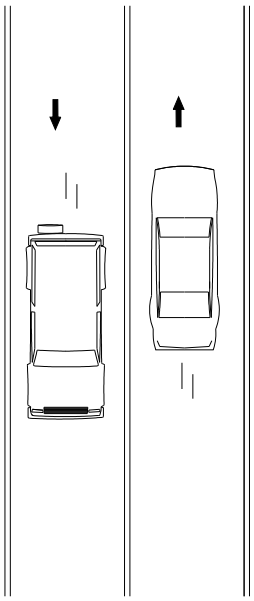
PLAN VIEW

ALT–2

2–WAY, 1–LANE



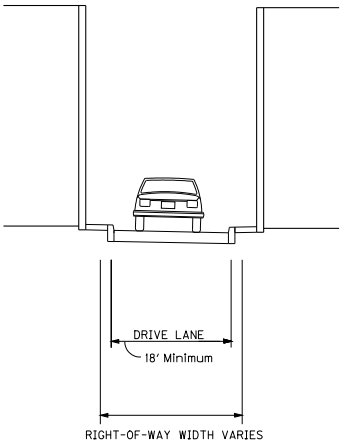
SECTION VIEW



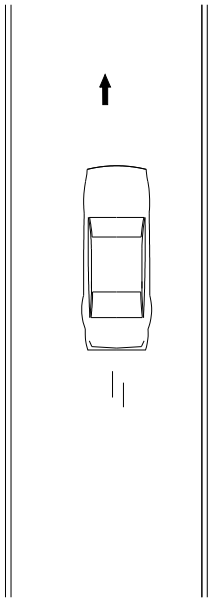
PLAN VIEW

ALT–3

2–WAY, 2–LANE



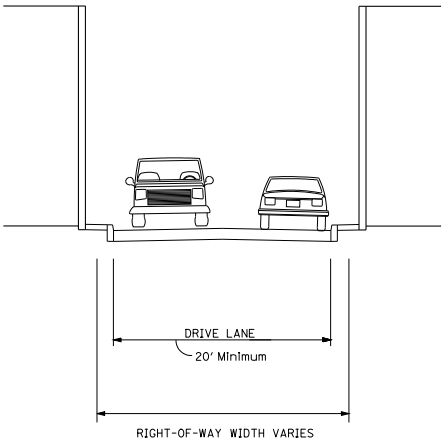
SECTION VIEW



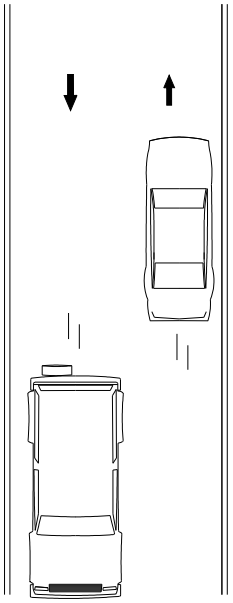
PLAN VIEW

ALD–1

1–WAY, 1–LANE



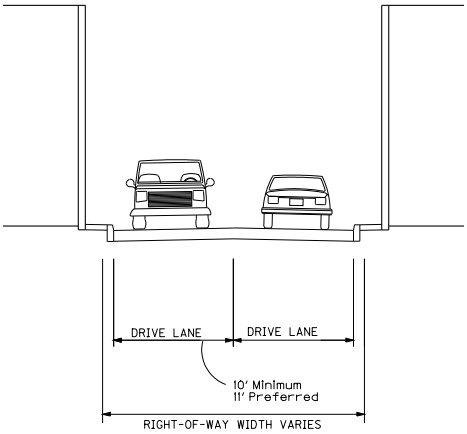
SECTION VIEW



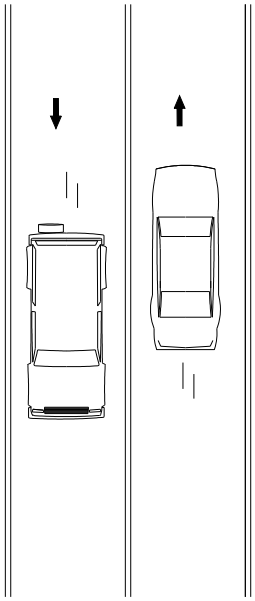
PLAN VIEW

ALD–2

2–WAY, 1–LANE



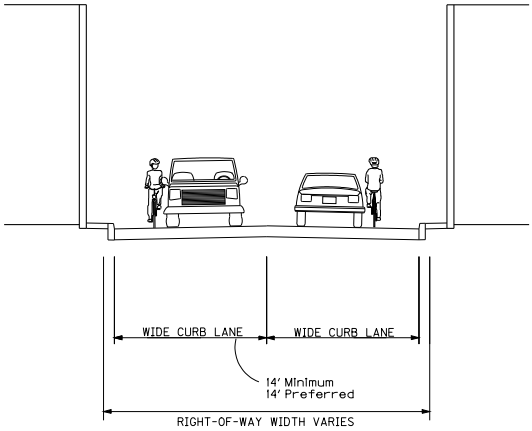
SECTION VIEW



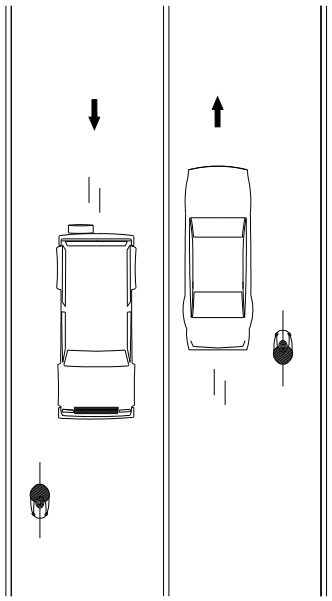
PLAN VIEW

ALD–3

2–WAY, 2–LANE



SECTION VIEW

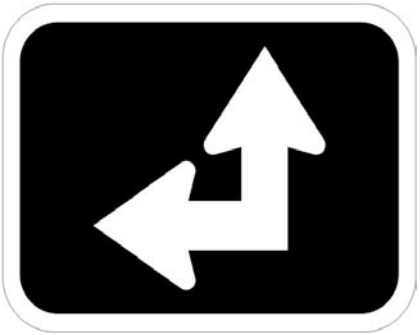


PLAN VIEW

ALD–4

2–WAY, 2–LANE, WIDE CURB LANE

Signage



BIKE LANE

AHEAD

ENDS

SHARED LANE
YIELD TO
BIKES

SHARED LANE
YIELD TO
BIKES

NO PARKING
BIKE
LANE