Insight2050 Technical Assistance Program:

Complete Streets Policy Project

MORPC

3/25/2019

MORPC
MID-OHIO REGIONAL PLANNING COMMISSION

Worthington
Founded 1803

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Complete Streets Policy Writing Guidance

Insight2050 Technical Assistance Program:
City of Worthington Complete Streets Policy Project

MORPC

9/6/2018

The insight2050 Technical Assistance (TA) Program provides assistance from MORPC staff to local government members within the boundary of the metropolitan planning organization (MPO) for the planning of transportation and community development efforts related to the findings of insight2050 and goals of MORPC's Metropolitan Transportation Plan.

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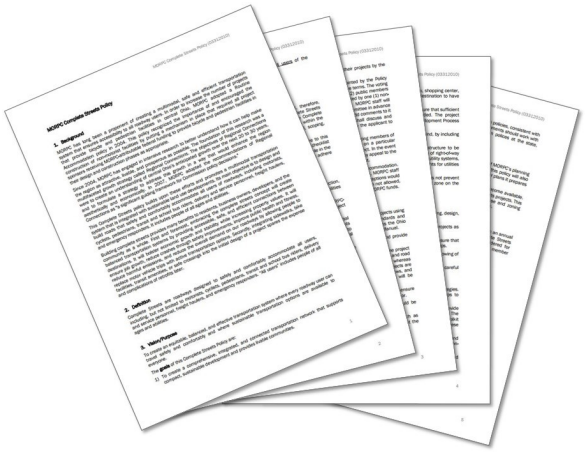
1. TYPES OF COMPLETE STREETS POLICIES



Complete Streets policies come in many formats, the most common of which are **resolutions and ordinances**. There are different requirements, processes, advantages, and disadvantages for each policy type. The following section is designed to help the City of Worthington carefully consider what type of policy will be the most effective for building community support for Complete Streets ideas and setting the foundation for Complete Streets projects in the future.

The National Complete Streets Coalition (NCSC) gives the following definition of resolutions and ordinances:

> "Resolution – Issued by a community's governing, resolutions are non-binding, official statements of support for approaching community transportation projects as a way to improve access, public health, and quality of life. Resolutions are often a very helpful first step, providing the political support for a Complete Streets approach. However, as they do not require action, they may be forgotten or neglected if an implementation plan is not created. If you do not yet have strong support from your elected leaders, a resolution is likely your best choice; be sure to include clear implementation steps." [1]

> "Ordinance - Ordinances legally require the needs of all users be addressed in transportation projects and change city code accordingly. Ordinances may also apply to private developers by changing zoning and subdivision requirements. Ordinances require strong support from the community and elected officials, and are enforceable by law, making them difficult to overlook. City departments and commissions often approve ordinance language before it moves to the legislative branch, though broad partnerships between all the actors may not be truly developed during this process. With strong support from elected officials in place, ordinances are a worthy pursuit." [1]

In 2016, the Ohio Auditor of State offered guidance for drafting resolutions and ordinances:

> "A resolution should deal with a temporary or special policy matter. A resolution is administrative because it executes a law already in effect, and resolution adoption procedures are usually less circumscribed than those for an ordinance. Policy adoption and other administrative matters are examples of actions that are proper subjects for action by resolution." [2]

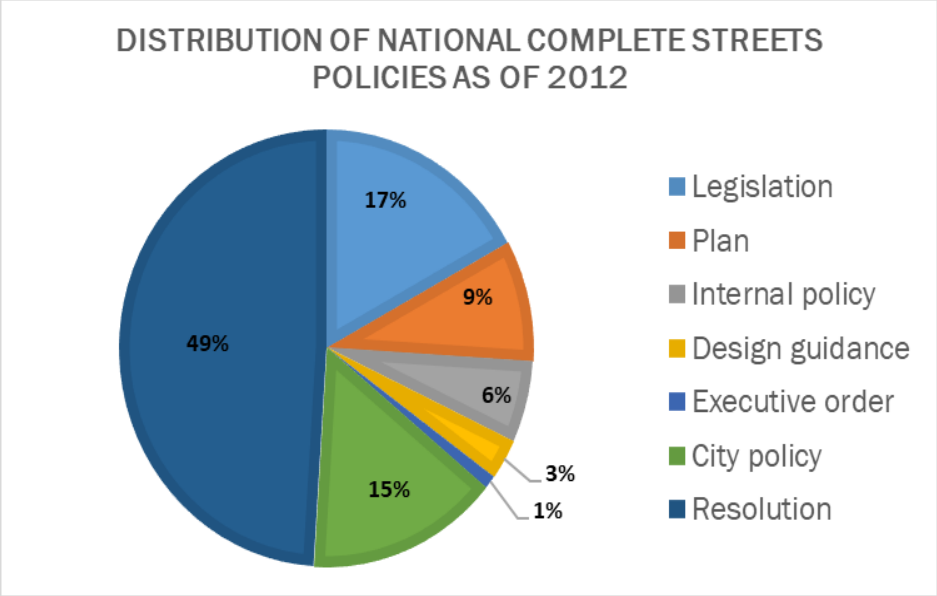
FOOTNOTES
1. NCSC, Local Policy Handbook
2. Peter N. Griggs, Drafting Resolutions and Ordinances

> "An ordinance should be used for legislation intended to have a permanent and general effect. Ordinance adoption procedures are prescribed by charter or statute and must be followed strictly. Unless an ordinance contains an emergency clause, it usually does not take effect immediately and is subject to the constitutional local referendum right." [2]

For specific details about the requirements for resolutions and ordinances, refer to the Worthington City Charter which outlines the various steps and processes for passing an ordinance or a resolution through the City Council.

All of the Central Ohio communities that have adopted a Complete Streets policy have done so through a resolution. Resolutions provide administrative direction to staff and can lay the groundwork for future policies. For example, after passing an initial resolution in support of Complete Streets ideals in the summer of 2008, the City of Columbus later took legislative action to update the city's Bike Law and followed that up with another ordinance in 2009 to secure funding for active transportation projects.

According to the NCSC about 50% of Complete Streets policies across the nation are resolutions and 17% are legislative ordinances. If the City of Worthington were to pursue a council-driven ordinance, the city could be one of the first in the area to pass a legally binding Complete Streets policy, joining just a handful of statewide communities and setting a best practice for the region.



Data source: National Complete Streets Coalition

2. ELEMENTS OF A COMPLETE STREETS POLICY

In order to develop a comprehensive Complete Streets policy, the City of Worthington should aim to include the following 10 elements identified by the NCSC:

1. **Vision and Intent:** Includes an equitable vision for how and why the community wants to complete its streets. Specifies need to create complete and connected networks and specifies at least four modes, two of which must be biking or walking.
2. **Diverse Users:** Benefits all users equitably, particularly vulnerable users and the most underinvested and underserved communities.
3. **Commitment in all projects and phases:** Applies to new, retrofit/reconstruction, maintenance, and ongoing projects.
4. **Clear, accountable expectations:** Makes any exceptions specific and sets a clear procedure that requires high-level approval and public notice prior to exceptions being granted.
5. **Jurisdiction:** Requires interagency coordination between government departments and partner agencies on Complete Streets.
6. **Design:** Directs the use of the latest and best design criteria and guidelines and sets a time frame for their implementation.
7. **Land use and context sensitivity:** Considers the surrounding community's current and expected land use and transportation needs.
8. **Performance measures:** Establishes performance standards that are specific, equitable, and available to the public.
9. **Project selection criteria:** Provides specific criteria to encourage funding prioritization for Complete Streets implementation.
10. **Implementation steps:** Includes specific next steps for implementation of the policy." (The Elements of a Complete Streets Policy, p. 1)

The three resources below discuss these 10 elements, their definitions, their justifications, and examples from around the country in increasing levels of detail:

Elements of a Complete Streets Policy Factsheet

Elements of a Complete Streets Policy Report

Local Policy Handbook

3. BEST PRACTICES

Through various policies, projects, and programs over the years, the City of Worthington has shown strong commitment to the concepts of sustainability and to improving quality of life for its residents. Developing a context-sensitive Complete Streets policy is an opportunity to expand on these efforts and reaffirm the city's commitment to incorporating sustainable practices where appropriate and navigating the evolving transportation technology landscape in a way that prioritizes residents' needs. The following subsections provide information on these best practices. **The city should consider including formal language about sustainable practices and emerging technology into the official policy.**

3.1 GREEN STORMWATER INFRASTRUCTURE

Stormwater management and transportation intersect around protecting people, equity, and the environment. **Roads need to work not only for cars, pedestrians, and cyclists—they have to work for water too.** When stormwater and sewage systems are overloaded due to heavy rainfall and flooding occurs, conditions can become unsafe for all road users.

A bioswale curb in Upper Arlington buffers pedestrians from road users. Source: MORPC

It's a matter of accessibility—when a street is flooded, pedestrians and cyclists are often the first to lose and last to regain access.[3] It's also a matter of cost-efficiency—it is expensive to treat polluted stormwater to mitigate its effects on water quality, but it is also costly not to. Polluted runoff not only damages our rivers and streams, it also degrades roads, resulting in large maintenance costs.

Green infrastructure stormwater management is a cost-effective way to remove pollutants from runoff, "green" the streets, and maximize returns on investment. Combining "gray" or traditional infrastructure with green infrastructure strategies offers solutions to expensive stormwater problems by promoting safety, accessibility, and cost-efficiency with the additional benefit of beautification.

By incorporating Green Stormwater Infrastructure (GSI) into transportation projects where appropriate, the City of Worthington can show commitment to managing all of the city's roads in a way that is environmentally responsible, economically beneficial, and equitable. GSI can be integrated into transportation projects at various scales—from planting trees to repaving roads. **Regardless of scale, the benefits of GSI include: improved water quality, better air quality, reduced flooding risks, urban heat island effect mitigation, reduced energy demands, improved resiliency, and enhanced community livability.**[4]

FOOTNOTES
3. NCSC, Greening the Streetscape: Complete Streets & Stormwater Management webinar
4. City and County of Denver Public Works, Ultra-Urban Green Infrastructure Guidelines

Permeable pavement in Canal Winchester allows rainfall to infiltrate the ground below. Source: MORPC

The suitability of GSI strategies varies from project to project and depends on the physical opportunities and constrains of the road, as well as the intended environmental benefits of the strategy.[5] Despite the context-sensitive nature of GSI projects, there are resources available that offer information and guidance for municipalities on how to integrate GSI and Complete Streets concepts in their communities. To assist its members, MORPC maintains a GSI Toolkit which provides best management practices for transportation and other development projects. The toolkit includes a sample of regional green infrastructure projects as well as a glossary of strategies. See Appendix A for relevant other reports, handbooks, and toolkits.

3.2 EMERGING TECHNOLOGY

Source: US Department of Transportation

Source: MORPC

Between the recent Smart Cities grant awarded to Columbus in 2017, the new high-capacity fiber optic cables installed along U.S. Route 33 between Dublin and East Liberty to allow for the testing of autonomous vehicles, and the groundbreaking transportation and technology research being conducted at the Ohio State University, Central Ohio is poised to become a world leader in smart mobility.

Self-driving vehicles, Wi-Fi-enabled infrastructure, data analytics, and shared autonomous vehicles can have a transformational impact on traffic, parking demand, and accessibility for the City of Worthington and its residents. Such technological advancements can support a community's Complete Streets efforts. Complete Streets policies and strategies can plan ahead for emerging technologies that will drive the future of transportation, but as these technologies change, management will likely be an iterative process.

FOOTNOTES
5. EcoDistrict Protocol

As noted by the American Planning Association, "'Smart' and 'technology' should not be used interchangeably – being smart is in part about leveraging technology. Cities should be smart about how complete streets concepts can adapt to different environments, recognizing that a one-size fits-all approach won't work." [6] The City of Worthington can think creatively about how smart transportation can support the city's Complete Streets efforts. It is critical to ensure that when planning for these emerging technologies, the safety, comfort, and accessibility of pedestrians and bicyclists of all ages and abilities continues to be a priority.

It is also important to remember that contemplating autonomous vehicles and the like as part of Complete Streets isn't just about technology – **it's about equity, sustainability, density, and affordability as well.** These technologies can be thought of as possible solutions to a wide range of challenges such as air pollution, traffic congestion, aging in place, or the obesity epidemic. For example, installation of high-capacity fiber cables along the Smart Mobility Corridor (U.S. Route 33) did not only prepare for autonomous vehicle testing, it addressed the issue of slow internet connection speeds for communities along the highway.

Leveraging the many emerging transportation technologies begins with planning ahead and working towards the vision of a multimodal transportation network that works for all people in your community. **Instead of taking a "wait and see" approach that can result in being left behind, the National Complete Streets Coalition advocates for public agencies to proactively plan for emerging technologies and take on an active leadership role.** The resources in Appendix A can help the City of Worthington as they plan for emerging transportation technology.

FOOTNOTES
6. Corey Zehngebot and Richard Peiser APA, Complete Streets Come of Age

APPENDIX A: RESOURCES

Green Infrastructure

- EPA Green Streets Municipal Handbook
- EPA A Conceptual Guide to Effective Greet Streets Design Solutions
- ODOT How Stormwater Runoff Affects Roadway Safety
- CNT The Value of Green Infrastructure: A Guide to Recognizing its Economic, Environmental, and Social Benefits
- MORPC Green Infrastructure Best Management Practices

Emerging Technology

- Corey Zehngebot and Richard Peiser (APA) – Complete Streets Come of Age
- OSMOSYS – The Future of Autonomous Vehicles video
- OSMOSYS – Executive Summary

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Implementation Toolkit

Part I: Implementation Guidelines, Performance Standards & Best Practices

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INTRODUCTION

Part 1 of the Implementation Toolkit is meant to be an internal resource for City of Worthington staff as they work towards implementing the city's Complete Streets policy. The document contains implementation guidelines, specifically engineering and enforcement strategies as they relate to pedestrians, cyclists, transit users, and motorists. The content for these sections was composed from MORPC's Complete Streets Toolkit and brought up to date with new standards developed since publication of the Toolkit.

There are performance standards that support pedestrian activity and active transportation as well as vehicular access. Also included are best practices for Complete Streets policy implementation. These components of transportation—arts & culture, user-based mobility strategies, and shared-use mobility— should be kept in mind by staff and decision-makers throughout the process of implementing the city's Complete Streets policy and transportation projects. This resource also contains an extensive list of external Complete Streets resources, categorized by the specific topic.

ENGINEERING STRATEGIES

Engineering is among the most important aspects of Complete Streets. The design and implementation of the transportation system affects whether an individual feels safe using non-motorized modes, and whether such choices are a convenient and comfortable alternative to automobile use. There are various plans and policies that address transportation issues at federal, statewide, regional, and local levels. While these documents are important for planning purposes, adopted standards and guidelines for engineering proper facilities take a higher precedence during project implementation as they provide the technical details necessary for good design.

Using design elements in an innovative way can create a cost-efficient complete streets project that enhances safety for all users and results in a greener infrastructure. Allowing flexibility when writing and applying standards or guidelines can ensure that the context is carefully considered. As always, good engineering judgment is necessary when designing facilities. This section describes many important engineering elements related to pedestrians, bicyclists, motorists, transit facilities, and green infrastructure. For more engineering standards for pedestrian, bicycle, and traffic calming, see Implementation Toolkit Part II: Roadway Classifications, Design Guidelines, & Land Use Considerations.

Pedestrian Facilities — CS Toolkit CH 4.5, CH 4.11

Pedestrian facilities support the most basic form of human transportation: walking. Depending on the context (such as width, allowable uses, etc.) they also allow for a wide range of other activities, including jogging, roller skating, or other emerging mobility technologies such as Segways and motorized scooters. All pedestrian facilities should accommodate people with disabilities. Settings like town squares or sidewalks with outdoor seating areas function as community gathering places in addition to accommodating pedestrians. In residential areas, pedestrian facilities often function as play areas for children. In order to develop and maintain an equitable transportation system, and to promote healthy and happy places, communities need to pay particular attention to safety and ease of use for the very old, the very young, and the disabled. New developments should always include pedestrian facilities and associated ADA elements.

The pavement area in the road, from curb-to-curb in urban areas, is often the focus of building or retrofitting a complete street — but the area between the road and the property line also can be important. Everyone is a pedestrian at some point in their journey, and street furniture can play an important role in making pedestrians safer and more comfortable. In an urban area there may be a lawn or tree buffer, a sidewalk, and even outdoor seating for a restaurant. “Street furniture” includes bike parking, benches, light poles, transit shelters, parking meters, planters, and garbage containers, among others. As with all components of Complete Streets, context-sensitivity is paramount. Bike racks, water fountains, benches, and garbage containers may not be appropriate alongside a rural or suburban street that only has a few people walking on it. The frequency of street furniture should be adjusted, with denser areas having a higher frequency of street furniture.

Bicycle Facilities — CS Toolkit CH 4.4

Bicycle facilities range from separated bike paths to marked on-street bike routes. Each type can influence the extent to which bicycling is used in a given community. The benefits of bicycling include reduced traffic congestion and pollution, and improved health of riders. Some bicyclists are comfortable only with certain conditions. Roads with shared lane markings, or sharrows, for example, may appeal only to more experienced bicyclists, while shared-use trails and barrier-separated cycle tracks may attract novice bicyclists, but not those who are more-advanced. In general, places with good bicycle facilities have more bicycle traffic than places without proper facilities. The city can seek a range of well-marked bicycling options that will make all riders feel comfortable. The Central Ohio Greenways design guidelines are a helpful resource.

Transit Facilities — CS Toolkit CH 4.6

Buses and other transit are important components of Complete Streets. Fixed-route bus service is the mainstay of Central Ohio Transit Authority, as well as systems in most other U.S. cities. It operates on a repetitive, fixed schedule basis along specific routes. Each fixed-route trip serves the same origins and destinations, with designated stops along the way. Demand-responsive transit is a federally mandated extension of fixed-route service for individuals with disabilities. The Americans with Disabilities Act (ADA) of 1990 requires comparable transportation services to be offered for individuals with disabilities who are unable to use fixed-route systems. [1]

The type of bus stop, its location, and the surrounding infrastructure should be carefully considered. There are near-side bus stops, far-side bus stops, and mid-block stops. Other bus stops may include passenger shelters; access ramps for people with disabilities and those using strollers; lighting, signage, and landscaping. Because transit always involves a multi-modal trip, sidewalks and street furniture must be part of the plan. Many riders walk to transit stops, while others ride a bike or drive a car to a Park & Ride facility.

Not only do these decisions affect whether people use transit, but they can also have an effect on the safety of transit users before and after they ride the bus. For instance, poorly sited bus stops encourage unsafe mid-block crossings or walking along roads without sidewalks. Safe and convenient access to a transit facility is a critical element in ensuring high transit ridership.

Traffic Calming — CS Toolkit CH 4.7

Well-designed traffic calming projects reduce the speed and/or volume of cars on a roadway and can lead to a variety of benefits, including: increased road safety; increased comfort and mobility for non-motorized travel; reduced automobile impacts such as congestion, expenses, and pollution; increased neighborhood interaction through more hospitable streets; increased property values; and improved public health due to more

Footnotes
1. American Public Transit Association, Glossary of Transit Terminology

opportunities for walking and other physical activity. The costs of traffic calming can vary considerably depending upon the treatment chosen and the characteristics of the site.

The Institute of Transportation Engineers organizes traffic calming into four categories: vertical deflections, horizontal shifts, roadway narrowings, and closures. Vertical deflection, such as speed humps, refers to up-and-down features to calm traffic. Horizontal shift refers to features such as chicanes or curb extensions, which require zig-zagging. Roadway narrowing seeks to slow speeds by reducing or eliminating excess roadway width. Motorists tend to drive more slowly on narrower roads that have less margin of error.

Green Infrastructure — CS Toolkit CH 4.10

Construction of complete streets offers a creative opportunity to incorporate "green infrastructure" and achieve other goals and benefits in a cost-effective way. Several technologies and strategies are available to improve the environmental performance of newly constructed and rehabilitated roadways. In general, more-sustainable pavement practices improve over their conventional counterparts in terms of stormwater runoff, materials, and construction practices. These approaches may require decision makers to be flexible and make non-traditional decisions.

Greenroads is a rating system that gives credits to projects where sustainable pavement practices are applied to new, reconstructed, or rehabilitated roads. The certification is based on a total point value similar to the LEED certification. A Greenroad is defined as "a roadway project that has been designed and constructed to a level of sustainability that is substantially higher than current common practice". [2]

The Greenroads process may result in lower construction costs, as existing asphalt can be recycled and reused on-site — thus reducing the cost of transporting materials. The on-site process may also allow projects to be completed more quickly. Locally, five Upper Arlington roads were included as part of a Greenroads pilot program: Edgevale Road, Glenmere Road, Sunset Drive, Inverness Way, and Eastcleft Drive.

Permeable pavement refers to a range of materials and techniques for paving roads, bike paths, parking lots, and pavements that allow the movement of water and air around the paving materials. Types of permeable pavement include: pervious concrete, porous asphalt, single-sized aggregate, porous turf, open-jointed blocks, resin bound, and bound recycled glass porous pavement. Permeable pavement reduces the need for retention ponds, swales, and other stormwater management devices and is thus more sustainable and cost effective. The use of permeable pervious pavement is among the Best Management Practices recommended by the Environmental Protection Agency.

In many cases, innovative approaches to stormwater management are complementary to complete streets concepts. A rain garden, for example, can be used as a corner extension to reduce the pedestrian crossing distance at an intersection and to slow vehicular traffic. Similarly, vegetated swales offer a buffer between pedestrians and vehicles — allowing

Footnotes
2. University of Washington, Greenroads

pedestrians to feel more comfortable. In general, innovative stormwater management practices seek to reduce the volume and speed of runoff through a variety of on-site treatments. As with other elements of Complete Streets, context is very important. In particular, constrained rights-of-way may present an obstacle to the implementation of innovative practices in some areas.

Other Engineering Considerations

Safe Routes to School Infrastructure — CS Toolkit CH 4.8
Pavement Types — CS Toolkit CH 4.9
Street Trees — CS Toolkit CH 4.12
Construction Access — CS Toolkit CH 4.13

ENFORCEMENT STRATEGIES

This section describes Ohio laws and common sense rules for pedestrians, bicyclists, transit users, and motorists. Following these rules ensures that transportation-related fatalities and injuries are minimized. Additionally, a safer and more orderly transportation system encourages walking and bicycling. For additional information on relevant laws, enforcement tools, and examples, see the full Chapter 6: Enforcement of MORPC's Complete Streets Toolkit.

Pedestrian-Related Enforcement— CS Toolkit CH 6.2

In general, laws related to walking and the walking environment are intended to protect pedestrians from harm that would result from crashes with motor vehicles. As a result, many pedestrian-related laws actually regulate the actions of motorists. Enforcement should emphasize that motorists must yield to pedestrians in any crosswalks, even those that are unmarked. Nonetheless, pedestrians themselves also have certain responsibilities to maintain their own safety. As in other areas of the law, common sense should also be applied.

According to the Ohio Revised Code §4511.46, the right-of-way for pedestrians in crosswalks is upheld in the following ways:

- Motorists are required to yield to pedestrians in marked mid-block crosswalks.
- Pedestrians may legally cross at any intersection — marked or unmarked.
- Drivers turning right across a crosswalk must yield, even if they have a green light, per Ohio Revised Code §4511.13. However, drivers have the right of-way if the green light is a green turning arrow.
- Drivers must yield at "Walk" signals per Ohio Revised Code §4511.14.

Pedestrians have to follow these rules:

- If the "Don't Walk" signal is flashing, pedestrians should not start crossing, but may continue across if they've already started.
- Pedestrians should not walk in prohibited areas, such as limited-access highways and railroad tracks.
- If there is no sidewalk, pedestrians may walk on the side of the road, facing traffic.
- If a sidewalk is available, pedestrians must use the sidewalk and not the roadway.
- Pedestrians are allowed to travel in both directions on sidewalks.

Pedestrians should exercise extra caution at railroad crossings. Trains always have the right -of-way over any traffic — including pedestrians, emergency vehicles, cars, law enforcement, bicyclists, and other road users.

Bicycle-Related Enforcement — CS Toolkit CH 6.3

According to the Ohio Bicycle Federation's Digest of Ohio Bicycle Traffic Laws, people who follow the rules of the road and recommended techniques can reduce their crash risk by 80

percent. Ohio law states that a bicycle is considered a "vehicle" and therefore must follow the same laws that apply to cars and trucks, which especially means not to ride against traffic and to ride predictably (Ohio Revised Code §4501.01). In addition, many Ohio localities require children and other bicyclists to wear helmets.

Bicyclists are generally prohibited from riding in crosswalks and sidewalks. However, exceptions are often made for child bicyclists. While municipalities may allow (or prohibit) bicycles to use the sidewalk, they cannot require bicyclists to use the sidewalk (Ohio Revised Code §4511.711). Riding a bicycle on the sidewalk reduces the cyclist's visibility to motor vehicles and increases their risk of getting in a crash in some situations. When bicyclists ride on the sidewalk or multi-use paths, extra caution at driveways and intersections should be exercised.

Transit-Related Enforcement — CS Toolkit CH 6.4

It is important that transit operators respect the rights of all users of the road, especially pedestrians and bicyclists, as they are particularly vulnerable if they are in a crash with a motorized vehicle. Similarly, other roadway users should understand and respect the limitations and requirements of transit vehicles. For example, they have slower acceleration, longer braking distances, and wider turning radii compared to ordinary vehicles. Education of transit drivers and the public is needed to improve the interaction of transit and other modes.

Motorist-Related Enforcement — CS Toolkit CH 6.5

Enforcement efforts to promote complete streets should include substantial efforts directed toward motorists. In almost all areas, motorists comprise the majority of road users, and the vast majority of trips in Central Ohio are currently taken by motor vehicle. Motorists are less vulnerable to injury and death in crashes than non-motorized users, such as pedestrians and bicyclists. Therefore, safe driving behavior on the part of motorists is essential in order to reduce the number of vehicle-related injuries and deaths.

Pedestrians have the legal right-of-way at marked mid-block crosswalks, and motorists must yield to pedestrians in unmarked crosswalks at intersections, "Walk" signals, and at right turn intersections unless there is a green turning arrow. Enforcement is a useful strategy to ensure that people follow these regulations and that both motorists and pedestrians are safe.

Bicycles are particularly prone to crashes at intersections, just as motor vehicles are more likely to crash into other motor vehicles at intersections. Bicyclists are allowed to use the full lane on most roadways. An Ohio law requiring at least 3 feet of space when passing bicyclists on the road went into effect in early 2017. It is important to ensure that motorists respect bicyclists and interact safely on the road with them. Law enforcement officers should also be familiar with bicyclists' rights and educate other roadway users.

PERFORMANCE STANDARDS

As the FHWA writes in its Guidebook for Developing Pedestrian and Bicycle Performance Measures, "performance management techniques promote informed decision-making by relating community goals to the measurable effects of transportation investments. Key steps in performance management are to decide what to measure in order to capture the current state of the system, to set targets to improve those measures, and to use the measures to evaluate and compare the effects of proposed projects and policies." Since each transportation project is different, the performance measures on the following pages do not specify precise numbers to target. However, they demonstrate the types of performance measures that the City of Worthington can use to monitor the progress towards the multimodal, safety, environmental, equity, and economic goals of the city as they relate to transportation.

Local community groups, community leaders, and relevant government agencies can bring creative ideas to the table as the City of Worthington continues to develop and refine its performance standards. Additionally, the city should work with the appropriate agencies to ensure that any data associated with the chosen performance measures is shared appropriately and available to use for benchmarking throughout the process of implementing the city's Complete Streets Policy.

Performance Measures

Multimodal Mobility	Access	Safety
Linear feet of new sidewalk or MUP created	Auto trips along project	Number of fatal crashes
Square footage of pedestrian-only public spaces created (e.g. plaza)	Bicycle trips along project	Number of crashes involving serious injury
Number of enhanced crosswalks	Freight trips along project	Number of impaired driving arrests
Miles of on-street bicycle routes created	Walk trips along project	Number of crashes involving pedestrians or cyclists
Number of bicycle facilities installed (e.g. bike racks, air pumps)	On-street parking spots established	Percent of vehicles exceeding speed limit
Number of transit trips generated		Emergency vehicle response time
Frequency of transit vehicles		Number of ADA/AASHTO compliant fixtures
Average speed of transit vehicles		
Mode shift from single-occupancy vehicle to walking, bicycling, or transit		
Average distance between signalized and/or protected crosswalks		

Sources: NCSC Evaluating Complete Streets Projects, FHWA Guidebook for Developing Pedestrian & Bicycle Performance Measures

Performance Measures

Place	Environmental	Equity	Economic
Number of placemaking projects that embrace local and historical arts and culture	Number of new street trees	Mode shift by age group, gender, income, disability status, race, and/or ethnicity	Number of temporary/ permanent jobs created
Number of temporary/ permanent public art installations	Number of Green Stormwater Infrastructure (GSI) projects	Number of crashes involving pedestrians or cyclists by age, gender, income, disability status, race, and/or ethnicity	Changes in property value
Percent of shaded public spaces and travel areas	Stormwater quality impacts of GSI	Number of ADA compliant ramps	Changes in vacancy rates
Presence of bicycle and pedestrian wayfinding signs and/or maps	Percentage of recycled materials used in construction	Number of ADA compliant Accessible Pedestrian Signals for visually impaired pedestrians	Amount of private investment generated
Number of temporary activities or installations	Number of energy efficient lighting fixtures	Linear feed of “first and lase mile” transportation connections added	Retail/restaurant sales at businesses adjacent to project
Number of resident-led placemaking initiatives		Diversity of labor force used for construction projects	Customer experience surveys
		Non-single-occupancy vehicle access to amenities by age, gender, income, disability status, race, and/or ethnicity	

Sources: NCSC Evaluating Complete Streets Projects, FHWA Guidebook for Developing Pedestrian & Bicycle Performance Measures

BEST PRACTICES: ARTS & CULTURE

Examples of transportation projects where arts & culture have been incorporated through creative placemaking. Source: Transportation for America

Worthington is a historic city with strong values and a long heritage. Transportation for America defines creative placemaking as "an approach that deeply engages the arts, culture, and creativity in planning and designing transportation projects to better reflect and celebrate local culture, heritage and values." [3] By nature, public roads are a community space. They not only present the opportunity to provide mobility options for people, but also to engage the community through social interaction and economic activity. Bringing arts and culture to appropriate streets through creative placemaking is just another way to make a street more complete.

As the Land Policy Institute acknowledges, "quality places rarely occur accidently." They have to be planned. Coordinating transportation and land use planning is a valuable focused growth strategy to promote cohesive, efficient, and quality development. Mobility and place are inextricably linked, which gives us the opportunity to think creatively about how the streets function and how people interact with them. A complete street is one that can accommodate the different functions a community may need in a manner that is still safe and equitable. For example, City of Worthington's downtown street network provides vehicle access to jobs during the week, but in the evening and on weekends it functions as the location of pedestrian-oriented farmers' markets and street festivals. Another example: A bus stop can be just a bus stop, or it can serve as a canvas to display local community art or history.

Bringing arts and culture to the roads through creative placemaking can help build the community's support for transportation and development projects. It can also be a useful economic development tool that fosters economic vitality. The City of Worthington should seek out opportunities for collaboration among transportation, development, parks and recreation, and public service officials and local arts and culture groups to brainstorm how the city can ensure safe, accessible, and attractive roads and public spaces that feature local art and reflect neighborhood values. The city already is coordinating the development of its Complete Streets policy with its consultant-led bicycle and pedestrian plan.

Footnotes
3. Transportation for America, What is Creative Placemaking?

BEST PRACTICES: USER-BASED MOBILITY

People have varying mobility patterns and transportation needs. It is important to remember that we cannot design roads as if they affect all people in the same way. The City of Worthington has already shown an interagency commitment to thinking about the transportation needs of traditionally underserved residents. The idea behind user-based mobility strategies is that by acknowledging how different groups of people use the transportation system in different ways, we can begin to retrofit and design a network that maximizes efficiency for everyone.

Source: Access Advocates

Source: National Center for Safe Routes to School

User-based mobility strategies aim to help road designers consider the mobility of all users equally. For a road to be safe and efficient for all people – men, women, disabled, elderly, parents, children, low-income, and so on – the mobility patterns of everyone must be considered throughout the entire design process from conception to construction. This is particularly important for traditionally underserved groups, who may not have proper representation in the decision-making, design, or review processes. As planners, engineers, and decision-makers, we must familiarize ourselves with the people and resources that will help us create a network that is safe, equitable, and offers accessible transportation options for residents of all travel habits and mobility needs.

For example, people with caregiving responsibilities often travel with dependents, which can often entail equipment like strollers or wheelchairs. And compared to men, women are more likely to "trip-chain" – combining domestic, personal, and work responsibilities into one trip with a series of tasks and locations. Couple this knowledge with an understanding of local demographics, and we can now make more informed decisions about sidewalk width, utilities placement, pedestrian signal timing, municipal service prioritization, transit stop placement, and more.

Ultimately, user-based mobility strategies are not for one particular group, or meant to prioritize one group over another – they're for everybody. Considering the mobility of all people throughout the design process can maximize efficiency and increase quality of service for everyone, often with minimal costs. [4] For public agencies and municipalities that serve all types of people, the resources below offer insight and guidance on how to incorporate mobility for users of all ages, abilities, and travel habits into the decision-making process.

Footnotes
4. Jon Burkhardt and Jim McLary (APTA), The Business Case for Mobility Management

BEST PRACTICES: SHARED-USE MOBILITY

Source: Shared-Use Mobility Center

Photographer: Doug Buchanan Source: Biz Journals

Shared-use mobility can be defined as "transportation services that are shared among users." [5] This can include a wide range of familiar and new modes of transportation from public transit to ride hailing. These types of services – carpooling, vanpooling, bike-sharing, car-sharing, and even scooter-sharing – are a continually growing part of the "shared economy" which has increased mobility for many people in urban, suburban, and rural communities across the country. As the City of Worthington works towards a transportation network that embraces Complete Streets ideals, these newer forms of mobility will need to be part of the conversation.

Like most things, there are positive, negative, and yet to be determined impacts associated with shared-use mobility. While the city may not be able to predict how shared-use mobility will evolve as transportation technology advances, there are steps that can be taken to help the city leverage the technology and maximize benefits for the shared-use mobility users and workers who call City of Worthington home.

When it comes to ride hailing services in particular (i.e. Uber and Lyft), there is the possibility that in some cities, widespread adoption can lead to decreases in transit ridership and increases in vehicle miles traveled (VMT), traffic congestion, and emissions. [6] It is not easy to predict which cities will face these issues because it can be difficult to get the detailed data needed to fully understand the effects of ridesharing in smaller cities and suburban areas. At the same time, increased use of ride-hailing can provide first-mile/last-mile service to transit stops, potentially reducing personal-vehicle use.

That said, cities like Worthington can simultaneously embrace shared-use mobility companies that want to enter the market *and* highlight the existing transit services that the city has to offer through COTA. And while ride hailing services can enhance mobility and access to amenities for many people, they can also be prohibitive due to cost or inaccessibility. City of Worthington residents – particularly those who are disabled, elderly,

Footnotes
5. Shared-Use Mobility Center, What is Shared-Use Mobility?
6. Laura Bliss (Citylab), The Ride-Hailing Effect: More Cars, More Trips, More Miles

and/or low-income – have access to a range of fixed and on-demand transportation services, which are detailed in the Delaware and Franklin County Coordinated Public Transit Human Services Plan. The city should continue efforts to widely promote these services, especially those that are free or subsidized for disabled, elderly, and/or low-income residents.

Since 2016, ride hailing in the state of Ohio has been regulated by the Public Utilities Commission of Ohio (PUCO) as required in House Bill 237. PUCO has set statewide stipulations regarding drivers' insurance, background checks, age, and criminal history. The bill also details protections for customers against discrimination, data collection obligations for rideshare companies, and permit requirements for legal operation within the state. [7]

The National Complete Streets Coalition encourages local governments to avoid a "wait and see" approach when it comes to emerging technologies. Although the City of Worthington may not be able to predict exactly what or how transportation technology will evolve in the coming years, the city can still take an active leadership role in public-private partnerships. When it comes to local regulations for shared-use mobility modes, cities must navigate carefully. "For their part, many urban experts and economists agree that any regulation beyond basic safety is too much regulation." [8] Aggressive regulations can lead to missed opportunities or costly battles with national companies, while too few regulations can lead to unsafe conditions for local riders and drivers. Additionally, responsible regulation of these industries requires data collection, analysis, and management that may be unsustainable at the local level.

City of Worthington can work to avoid these issues by pursuing partnerships with companies that align with the community's goals and embrace transparency. The city can vigilantly enforce the existing state laws that protect local riders and drivers, and frequently assess local policies that are relevant to shared-use mobility modes. The city should listen to the public's concerns around these types of transportation services, and work with the appropriate agencies and community stakeholders to identify gaps in safety regulations that the city can address (e.g. seatbelt or helmet policies).

Footnotes
7. Andrew L. Smith (Cincinnati Bar Association), Ridesharing Regulations Arrive in the Buckeye State
8. James Krohe Jr. (APA), Not Your Daddy's Taxi

COMPLETE STREETS RESOURCES

Planning for pedestrians

- Institute for Transportation and Development Policy – Pedestrians First: Tools for a Walkable City
- Institute for Transportation Engineers & CNU – Designing Walkable Urban Thoroughfares: A Context Sensitive Approach
- Jeff Speck (TED talk) – 4 Ways to Make a City More Walkable
- MORPC – Active Transportation Plan Cost Estimator Tool
- PEDSAFE – Street Furniture/Walking Improvements

Planning for bicyclists

- NACTO – Designing for All Ages & Abilities: Contextual Guidance for High-Comfort Bicycle Facilities
- BIKESAFE – Selecting Improvements for Bicyclists
- Portland Office of Transportation – Four Types of Cyclists

Planning for transit

- COTA – Bus Stop Design Guide
- Federal Transit Administration – Planning for Transit-Supportive Development: A Practitioner's Guide
- MORPC – Delaware and Franklin Counties Coordinated Plan

Mobility for users of all ages & abilities

- National Center for Mobility Management – Expanding Access to Our Communities: A Guide to Successful Mobility Management Practices in Small Urban and Rural Areas
- FHWA – Accessible Shared Streets: Notable Practices and Considerations for Accommodating Pedestrians with Vision Disabilities
- FHWA – How to Develop an ADA Self-Evaluation & Transition Plan
- Transportation for America – Aging in Place: Stuck without Options
- American Public Transportation Association – The Business Case for Mobility Management
- Age-Friendly Columbus – A Day in the Life of Karen video
- Swedish Association of Local Authorities and Regions – Sustainable Gender Equality Video
- ODOT– Safe Routes to School Infrastructure Toolkit
- ODOT– Safe Routes to School Non-Infrastructure Toolkit

Facility maintenance

- FWHA – A Guide for Maintaining Pedestrian Facilities for Enhanced Safety
- Pedestrian and Bicycle Information Center – Pedestrian Facility Maintenance webinar
- NACTO – Performance Measures

Evaluation & performance standards

- FHWA – Guidebook for Developing Pedestrian & Bicycle Performance Measures
- National Complete Streets Coalition – Evaluating Complete Streets Projects
- Frederick C. Dock and Ellen Greenberg (ITE Journal) – Multimodal and Complete Streets Performance Measures in Pasadena, California

- Victoria Transport Policy Institute – Evaluating Complete Streets: The Value of Designing Roads for Diverse Modes, Users and Activities

Networks & connectivity

- National Complete Streets Coalition – Networks of Complete Streets
- CNU – Sustainable Street Network Principles
- FHWA – Small Town and Rural Multimodal Networks

Green stormwater infrastructure

- National Complete Streets Coalition – Greening the Streetscape: Complete Streets & Stormwater Management Webinar
- MORPC – Green Infrastructure Best Management Practices
- MORPC – Regional Sustainability Agenda

Arts & culture

- National Complete Streets Coalition – Promoting Equitable Change through Creative Placemaking and Complete Streets webinar
- Transportation for America – Eight Approaches to Creative Placemaking
- Transportation for America – Arts, Culture and Transportation: A Creative Placemaking Field Scan

Technology

- National Complete Streets Coalition – Impact of Emerging Technologies on Complete Streets Webinar
- American Public Transportation Association – Shared Mobility and the Transformation of Public Transit
- NACTO – Bike Share in the U.S. 2017

Parking

- NJ Economic Development Authority – Parking Matters: Designing, Operating, and Financing Structured Parking in Smart Growth Communities
- Pedestrian and Bicycle Information Center – What are Park Once and Walk Policies or Programs?
- EPA – Parking Cash Out: Implementing Commuter Benefits as One of the Nation's Best Workplaces for Commuters

Miscellaneous resources

- National Complete Streets Coalition – Safe Streets, Stronger Economies: Complete Streets project outcomes from across the country
- National Complete Streets Coalition – Complete Streets: Guide to Answering the Cost Question
- Mick Cornett (TED talk) – How an Obese Town Lost a Million Pounds
- ODOT — Retrofitting for Complete Streets

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Implementation Toolkit

Part II: Roadway Classifications, Land Use Considerations, & Design Guidelines

Insight2050 Technical Assistance Program:

City of Worthington Complete Streets Policy Project

MORPC

2/13/2019

The insight2050 Technical Assistance (TA) Program provides assistance from MORPC staff to local government members within the boundary of the metropolitan planning organization (MPO) for the planning of transportation and community development efforts related to the findings of insight2050 and goals of MORPC's Metropolitan Transportation Plan.

Through the TA Program, MORPC staff will assist member communities with specific planning services related to transportation, air quality, traffic, and other projects that support consideration of transportation in land use planning and/or demonstrate the benefits of various modes of transportation.

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Table of Contents

How to Use this Resource

Part 2 of the Implementation Toolkit is meant to be an internal resource for City of Worthington staff as they work towards implementing the city's Complete Streets policy. It contains a brief discussion of federal roadway classifications and offers a context-sensitive roadway typology that is specific to the City of Worthington. Section 2 discusses land use considerations as they relate to creating Complete Streets and a healthy community that can meet present and future transportation and development demands. Section 3 connects the previous two sections by providing street design guidelines that integrate transportation and land use. The guidelines are in matrix format and can be used by city staff as a "menu of options" for creating streets that support safe active transportation options while accommodating all necessary vehicle traffic.

This Implementation Toolkit follows local, state, and regional best practices and was developed through an iterative process with community stakeholders. Content for the street design matrices was composed from MORPC's Complete Streets Toolkit, Institute of Transportation Engineers (ITE) and Congress for New Urbansim's (CNU) Designing Walkable Urban Thoroughfares report, and best practices from the National Association of City Transportation Officials (NACTO).



Picture sources: MORPC

Section 1: Roadway Classifications

As the City of Worthington strives for a focused growth approach to development and a transportation network that follows the ideals of Complete Streets, it is important to highlight the inherent connection between movement and place. Standard roadway classifications reflect a hierarchy of vehicle capacity. They do not fully capture the relationship between movement and place because they do not account for contextual changes in land use, multimodal capacity, and/or other community initiatives. This document aims to be a holistic resource by integrating roadway classifications, land use considerations, and street design guidelines.

When classifying roads we can take into account the capacity for streets to move pedestrians, cyclists, transit riders, emergency vehicles, and various other non-vehicle roadway users that rely on a safe and connected transportation network. The City of Worthington and MORPC worked together to develop a context-sensitive roadway classification system that considers multimodal mobility, development intensity, flexible design, and surrounding land uses. The system was developed following guidance and best practices from ITE, CNU, and the Ohio Department of Transportation (ODOT).

While the Context-Sensitive Roadway Classifications defined on page 7 are a useful tool for implementing Complete Streets in the City of Worthington, the Federal Highway Administration (FHWA) Functional Roadway Classifications defined on page 6 are also important. The Functional Roadway Classification system assigns typologies based on a roadway's role in providing access and mobility in the region. A roadway's FHWA Federal Classification is closely connected to eligibility for federal funds. The table below shows the relationship between the Functional Roadway Classification system and the Context-Sensitive Roadways Classification system. Read the table horizontally to understand the Context-Sensitive typologies associated with a roadway's existing functional classification.

The Context-Sensitive Roadway Classifications provide more detail than the FHWA Functional Roadway Classifications and can help the City of Worthington develop and retrofit a transportation network that is safe, efficient, and equitable for all of the city's residents and visitors.

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

1.1 FHWA Federal Roadway Classifications

Expressway	Expressways offer a high level of vehicle mobility, typically on roadways with a physical barrier between directional travel lanes. Expressways do not allow access to adjoining land uses. [1]
Principal Arterial	Principal Arterial roads also provide a high level of vehicle mobility in both rural and urban areas. Unlike expressways, Principal Arterials provide access to adjacent land uses. [1]
Minor Arterial	Minor arterial roads provide connectivity between the Principal Arterial system and provide vehicle mobility for moderate length trips. Minor arterials in rural contexts tend to have higher travel speeds and minimum interference. [1]
Collector	Collector roads provide connections between the arterial network and local roads. Subtle differences between Major and Minor collector roads generally involve speed limit, traffic volumes, travel lanes, and curb cuts. [1]
Local	Local roads provide direct access to abutting land uses, typically local residences and businesses. The majority of roadways in the United States are classified as local. [1]

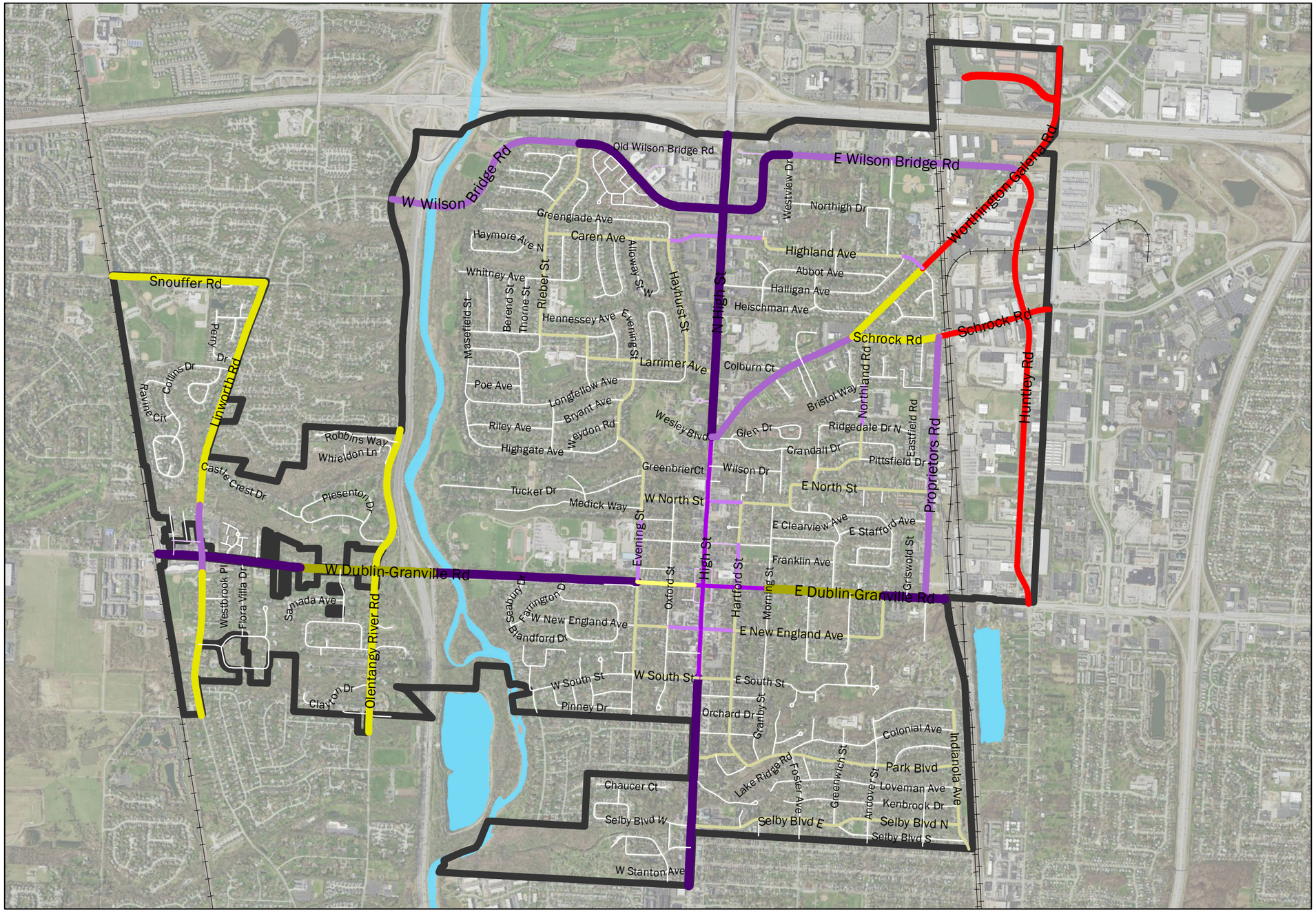
1. ODOT, Highway Functional Classification System: Concepts, Procedures, and Instructions

1.2 Context-Sensitive Roadway Classifications

Freeway / Expressway	Freeways and expressways are high-speed roadways (50 mph or more) that accommodate large amounts of vehicle traffic and prohibit pedestrian access. They are either partially or completely controlled access and typically have 4 or more lanes. Freeways and expressways can include tollways, high-speed parkways, and limited-access thoroughfares with occasional at-grade intersections. [2]
Parkway	Parkways constitute high-capacity, multi-lane, high- or medium- speed thoroughfares that offer connections to other high-capacity regional roads. Parkways generally have landscaping on each side and a landscaped median. Due to high speeds and high volumes of vehicles, active transportation facilities are typically separated from travel lanes on these roadways. Parkways should appropriately accommodate transit. They are functionally classified as Principal or Minor Arterials. [2]
Boulevard	Boulevards are walkable, low-speed (35 mph or below) divided thoroughfares, functionally classified as either Principal Arterials or Minor Arterials depending on the context. They typically have 3 to 4 travel lanes. These roads are designed to accommodate "both through and local traffic, pedestrians, and bicyclists…[and] high ridership transit corridors." Boulevards provide connectivity between the arterial roadway system and provide vehicle mobility for long to moderate length trips. They are the primary routes for goods movement and emergency response routes. [1,2]
Avenue	Avenues are low-to-medium speed (25 to 35 mph) walkable roadways that generally have 2 to 4 travel lanes. They provide vehicle mobility for moderate to short trips, while offering primary pedestrian and bicycle routes. They are classified as either Minor Arterial or Collector roads. Avenues provide connections between the arterial network and local roads, and provide access to abutting local development is a main function. [1,2]
Main Street	Main Streets are a specific type of Avenue that offers access along the Town Center. They are categorized by low speeds and prioritized design for pedestrian and bicycle facilities. Pedestrian-oriented streetscapes, street furniture, on-street parking, and access to commercial and/or mixed-use districts are typical of Main Streets. Main Streets can include all functional classifications except Expressway depending on context. [3]
Neighborhood Connector	Neighborhood Connectors are another type of Avenue roadway. They primarily function to connect neighborhood roads to higher-capacity Avenues and Boulevards. Neighborhood Connectors are characterized by less through traffic than typical Avenues or Main Streets. [3]
Street	Streets are categorized as low-speed (25 mph), walkable roadways which primarily function to provide access to adjacent land for local vehicle, pedestrian, or bicycle traffic. Streets are designed to connect residential areas with other neighborhoods and may also offer connections to the arterial network. Streets are functionally classified as Local roads and typically have 2 travel lanes. In urban contexts, streets include alleyways and private roads. [1,2]

2. CNU & ITE, Designing Walkable Urban Thoroughfares: A Context Sensitive Approach
3. Boston Transportation Department, Street Types

City of Worthington Context- Sensitive Roadway Classifications



Worthington Streets

Context, Classification

- Commercial/Industrial - Avenue
- Mixed Use - Boulevard/Parkway
- Mixed Use - Avenue
- Mixed Use - Main Street
- Mixed Use - Neighborhood Connector
- Mixed Use - Street
- Residential - Boulevard/Parkway
- Residential - Avenue
- Residential - Main Street
- Residential - Neighborhood Connector
- Residential - Street

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The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
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Section 2: Land Use Considerations

Based on the 2014 insight2050 report, we expect the City of Worthington to see rapid population growth and demographic shifts over the next 30 years. That growth will be accompanied by shifting demands in housing and transportation—people will want more walkable communities with affordable transportation options, compact housing choices, and mixed-use environments where they can live, work, and play. Transportation and land use are inherently linked; mode choice is influenced not only by transportation infrastructure, but land use characteristics as well. Both transportation and land use have implications for density, public health, the environment, and economic development. A comprehensive, focused growth approach is one that integrates land use and transportation planning. From a Complete Streets perspective, supporting safe and equitable transportation options within any land use requires a balance between "Pedestrian Priority" and "Vehicle Priority".

In a collaborative report meant to guide cities working towards a more active transportation-friendly network, ITE and CNU defined the range of Pedestrian Priority as:

Pedestrian Places—mixed-use areas with a significant pedestrian presence, not dominated by, and sometimes prohibiting, vehicles

Pedestrian Supportive—mixed-use areas with moderate to significant pedestrian presence

Pedestrian Tolerant—areas that minimally accommodate pedestrians but do not support a high level of pedestrian activity and are usually vehicle dominant

Pedestrian Intolerant—areas with little support for walking or that prohibit pedestrians are vehicle dominant

Opposite to the Pedestrian Priority range is Vehicle Priority, defined as:

Vehicle Place—roadways that prioritize vehicle movement with little to no consideration for multimodal mobility

Vehicle Supportive—roadways that still primarily prioritize vehicle movement, but with appropriate infrastructure to support multimodal transportation options

Vehicle Tolerant—areas that accommodate vehicle traffic, but have a well-connected multimodal network that encourages active transportation through street design and compatible land use

Vehicle Intolerant—areas that are primarily for pedestrians and may prohibit vehicle traffic altogether for special events or permanently

2.1 Pedestrian Places

Pedestrian Places prioritize pedestrians and cyclists and should support a wide range of land uses. In these spaces, **mixed-use, commercial retail, and commercial office** land uses should be prioritized. **Compact residential and civic** land uses are also encouraged. Street design and land use for Pedestrian Places should provide opportunity for social and economic activity through flexible and design-oriented zoning codes, placemaking, and street furniture.

Pedestrian Places can range from vehicle supportive to vehicle intolerant. It is important that regardless of the level of vehicle capacity, pedestrian places provide infrastructure for safe and affordable multimodal transportation options that are accessible and inviting for all people.

Examples of Pedestrian Places from across the region—Worthington, Easton, Downtown Columbus, Dublin, New Albany, and Gateway District in Columbus. Sources: MORPC

2.2 Pedestrian Supportive Places

The infrastructure needed for a road to be Pedestrian Supportive will be different based on the road classification and adjacent land use. Regardless of vehicle capacity, Pedestrian Supportive roads require a well-connected active transportation network that gives users safe access to destinations and recreational amenities. Higher vehicle-capacity roads can support **mixed-use, commercial retail, and commercial office** land uses. Lower vehicle -capacity roads can support mixed-use, **neighborhood commercial, compact residential, civic, and institutional** land uses.

Flexible zoning practices, "Park Once and Walk" parking policies, placemaking, and design guidelines are useful tools for creating roads that support active transportation options while still accommodating vehicle traffic.

Examples of Pedestrian Supportive roads from around the region and the country—London, New Albany, Bridge Street District in Dublin, Columbus, Westerville, Easton, and Kentlands, MD.
Sources: MORPC, DPZ

2.3 Pedestrian Tolerant Places

Pedestrian Tolerant roads prioritize vehicle movement over multimodal transportation. They are often characterized by wide travel lanes, wide intersections, frequent curb cuts, dispersed land uses, large setbacks, and large amounts of surface parking. Low population density and development intensity are indications that Pedestrian Tolerant infrastructure may be sufficient to meet residents' multimodal needs. When striving for a focused growth approach to new development, Pedestrian Tolerant roads are suitable along **industrial, low density residential, and agricultural land uses**.

Pedestrian Tolerant roads may not encourage mode shift from single-occupancy vehicles to walking or cycling, but they do provide essential connections to jobs and other key services, particularly for low-income people. Pedestrian Tolerant roads must still be safe and accessible to all users. Where appropriate, principal arterials and minor collectors should prioritize additional intersection infrastructure and signage in order to increase pedestrian and cyclist safety, visibility, and comfort.

Examples of Pedestrian Tolerant roads from around the region— Columbus, Westerville, Easton, and Plain City. Sources: MORPC

2.4 Pedestrian Intolerant Places

Pedestrian Intolerant roads are not just those without any multimodal infrastructure – inadequate facilities can also render a street functionally Pedestrian Intolerant. Sidewalks that are not wide enough, lacking ADA ramps, or that are obstructed can create mobility challenges. Bike lanes on high speed, high vehicle capacity roads may intimidate all cyclists but the most experienced and confident (less than 1% of riders). Pedestrian Intolerant roads can encourage unsafe behavior that leads to collisions and injuries.

When coupled with dispersed commercial retail or commercial office uses, roads without sufficient multimodal infrastructure can encourage single-occupancy vehicle trips due to concerns about safety, inconvenience, and access to desired destinations. For those whose mobility options may be limited, Pedestrian Intolerant roads deny them the opportunity to safely get to the amenities they need and/or want. Aside from expressways or other roads where pedestrians are legally prohibited, it is almost never appropriate to completely exclude pedestrian infrastructure as doing so can disproportionately impact low-income families, the elderly, new Americans, people with disabilities, women, and/or people of color.

Examples of Pedestrian Intolerant roads from around the region and country—Polaris, Columbus, Gahanna, and Louisville, KY. Sources: MORPC

Section 3: Street Design Guidelines & Cross-Sections

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

MORPC and the City of Worthington have developed the matrices and cross-sections to be context-sensitive for the City’s needs and community vision. The content in the matrices has been refined to reflect how the City of Worthington designs, develops, maintains, and redevelops its roadways. There are a total of three matrices, one for each type of land use within the city: Mixed-Use, Residential, and Industrial. The matrices contain Complete Streets design elements that have been compiled from MORPC’s Complete Streets Toolkit, ITE and CNU’s Designing Walkable Urban Thoroughfare report, and the NACTO website. For more information about a particular Complete Streets element within a matrix, see the glossary on page 24.

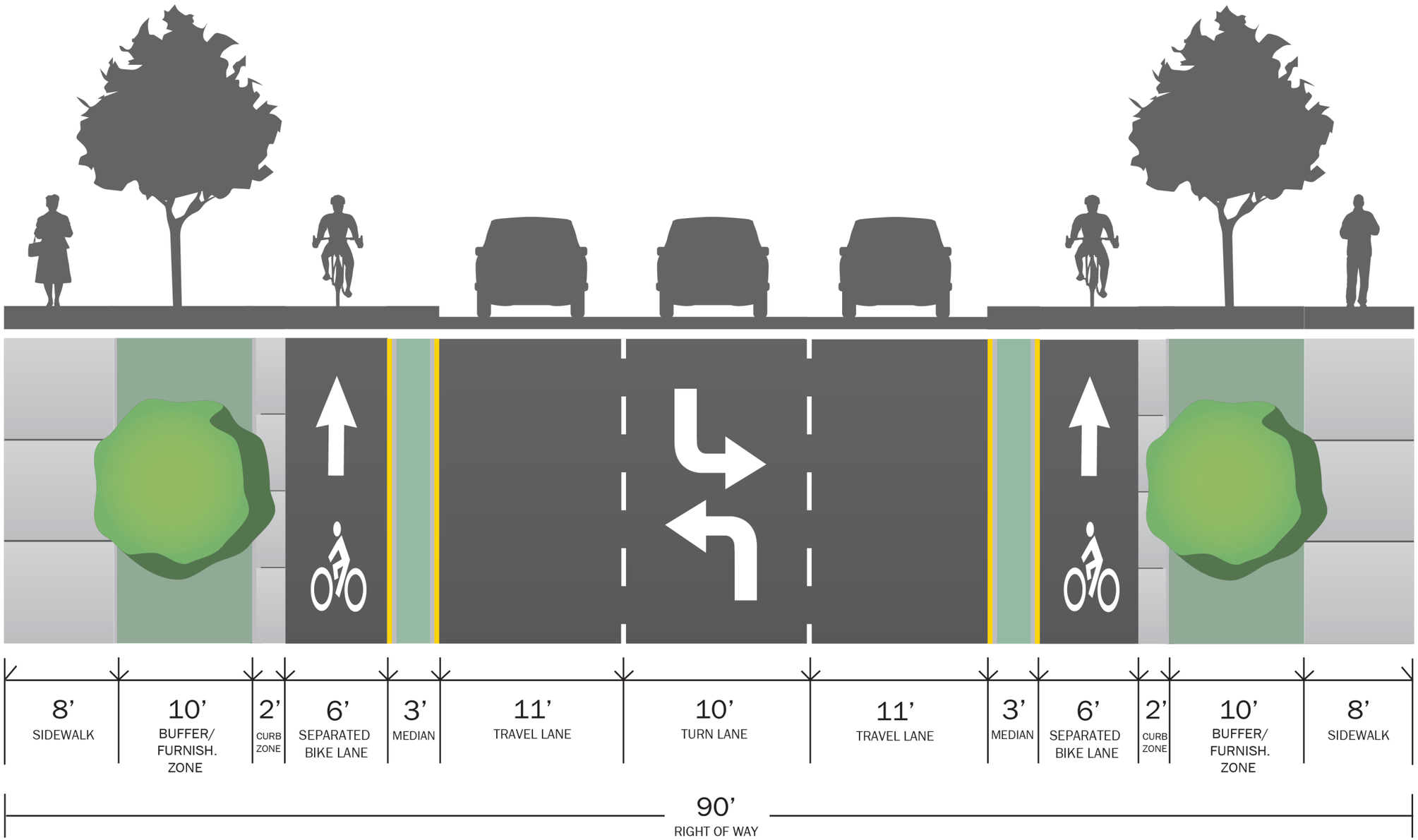
Mixed Use Street Design Guidelines

	Parkway	Boulevard	Avenue	Main Street	Neighborhood Connector	Street
Vehicle Zone Design						
Number of Lanes	4 - 6	4- 6	2 - 4	2 - 3	2 - 3	2
Width of Lanes	11'	10' - 11'	10 - 11'	10'	10'	9 - 10'
Design Speed (mph)	30–35	30–35	25–35	20–25	25	15–25
Traffic calming	Raised / landscaped / striped medians Bus bulbs Striped chokers	Raised / landscaped / striped medians Roundabouts Striped chokers Bus bulbs Textured pavement (low impact)	Raised / landscaped / striped medians Roundabouts Striped chokers Textured pavement (low impact)	Striped chokers Textured pavement (low impact) Traffic circles	Striped chokers Traffic circles	Speed bumps Mini-traffic circle Striped chokers
Transit Considerations	Express	Express and Local	Local	Local	Local	Local and none
Freight Movement	Regional truck route	Regional truck route	Local truck route	Local deliveries only	Local deliveries only	Local deliveries only
Pedestrian Zone Design						
Curb Zone	0.5' - 1'	1.5' - 2.5'	1.5' - 2.5'	1.5' - 2.5'	1.5' - 2.5'	1.5' - 2.5'
Buffer / Furnishings Zone	8' - 12' Grass / trees / landscaping / GSI Street lights / signage Bike racks Bus shelters / bus stops	8' - 12' Grass / trees / landscaping / GSI Street lights / signage Bike racks Bus shelters / bus stops	4' - 8' Grass / trees / landscaping / GSI Street lights / signage Bike racks Bus stops	4' - 6' Grass / trees / landscaping / GSI Street lights / signage Bike racks Bus shelters / bus stops	4' - 6' Grass / trees / landscaping / GSI Street lights / signage Bus stops	4' - 6' Grass / trees / landscaping / GSI Street lights / signage
Pedestrian Through Zone	6' - 12'	6' - 12'	6' - 12'	6' - 12'	6' - 8'	6' - 8'
Frontage Zone	0' - 2' Planters / landscaping Outdoor seating Moveable signage	0' - 6' Planters / landscaping Outdoor seating Moveable signage	4' - 12' Planters / landscaping Outdoor seating Café seating Moveable signage	4' - 12' Planters / landscaping Outdoor seating Café seating Moveable signage	2' - 6' Planters / landscaping Outdoor seating Moveable signage	2' - 6' Planters / landscaping Outdoor seating Moveable signage
Pedestrian Crossing	Marked crosswalks Signalized crosswalks Pedestrian refuge areas	Marked crosswalks Signalized crosswalks Pedestrian refuge areas	Marked crosswalks Signalized crosswalks Mid-block signalized crosswalks Pedestrian refuge areas Striped curb extensions	Marked crosswalks Signalized crosswalks Mid-block signalized crosswalks Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions
Bicycle Zone Design						
Bicycle Zone	Barrier-separated bike lane 5' - 12' SUP ≥ 8'	Barrier-separated bike lane 5' - 12' Buffered bike lane 5' - 8' SUP ≥ 8'	Buffered bike lane 5' - 8' Bike lane 5' - 6' SUP ≥ 8'	Buffered bike lane 5' - 8' Bike lane 5' - 6' Sharrows Super sharrows SUP ≥ 8'	Buffered bike lane 5' - 8' Bike lane 5' - 6' Bike boulevard Sharrows Super Sharrows SUP ≥ 8'	Bike lane 5' - 6' Bike boulevard Sharrows
Bicycle Intersection Design	Bicycle refuge areas	Bicycle refuge areas	Intersection crossing markings	Intersection crossing markings	Intersection crossing markings	Intersection crossing markings
Parking Design	On-street parking Structured parking Screening Shared surface lots	On-street parking Structred parking Screening Rear / alley-access surface lots Shared surface lots	On-street parking Screening Rear / alley-access surface lots Shared surface lots Minimal curb cuts	On-street parking Screening Rear / alley-access surface lots Shared surface lots Minimal curb cuts	On-street parking Screening Rear / alley-access surface lots Shared surface lots	On-street parking Screening Shared surface lots

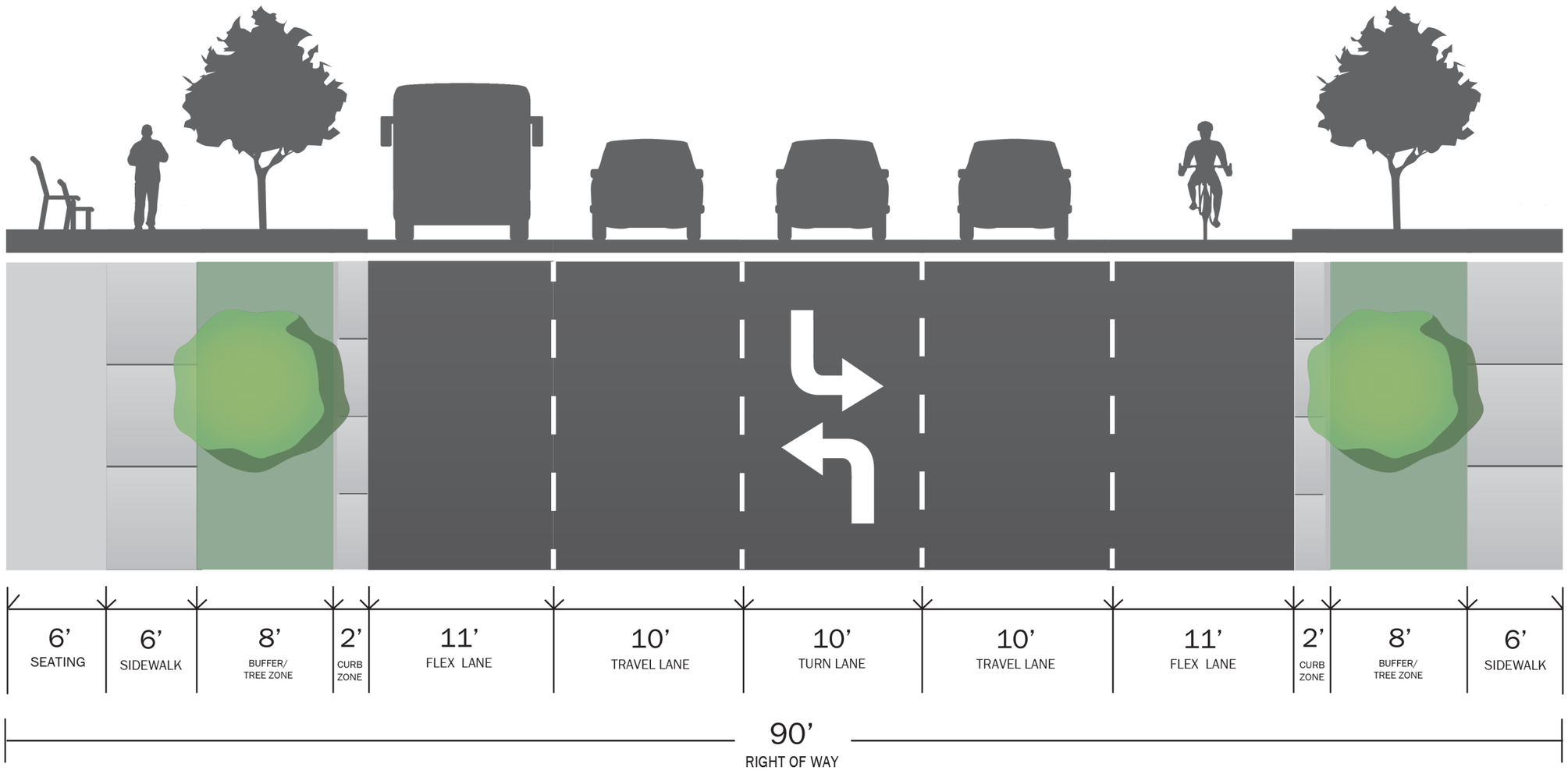
Mixed Use Flex Lane Design Guidelines

	Parkway	Boulevard	Avenue	Main Street	Flex Lane priorities by time of day
Flex Lane Design					
Early Morning (12 a.m. - 6 a.m.)	Commercial vehicle loading / drop-off	Commercial vehicle loading / drop-off	Commercial vehicle loading / drop-off	Commercial vehicle loading / drop-off	Priorities: Access for commerce
Morning (6 a.m. - 11 a.m.)	General purpose travel lane Bus only lane Low-speed motorized/non-motorized lane	General purpose travel lane Bus only lane Low-speed motorized/non-motorized lane	General purpose travel lane Low-speed motorized/non-motorized lane Food trucks / parklet / public art Short-term parking	General purpose travel lane Low-speed motorized/non-motorized lane Food trucks / parklet / public art Short-term parking	Priorities: Mobility Activation / greening
Mid-Day (11 a.m. - 4 p.m.)	Bus only lane Food trucks Short-term parking Low-speed motorized/non-motorized lane	Bus only lane Food trucks Short-term parking Low-speed motorized/non-motorized lane	Low-speed motorized/non-motorized lane Food trucks / parklet / public art Short-term parking	Low-speed motorized/non-motorized lane Food trucks / parklet / public art Short-term parking	Priorities: Activation / greening Access for people Mobility
Evening (4 p.m. - 9 p.m.)	General purpose travel lane Bus only lane Short-term parking	General purpose travel lane Bus only lane Low-speed motorized/non-motorized lane Short-term parking	General purpose travel lane Low-speed motorized/non-motorized lane Short-term parking	General purpose travel lane Low-speed motorized/non-motorized lane Short-term parking	Priorities: Mobility Access for people
Late Night (9 p.m. - 12 a.m.)	Commercial vehicle loading / drop-off Short-term parking General purpose travel lane	Commercial vehicle loading / drop-off Short-term parking General purpose travel lane	Commercial vehicle loading / drop-off Short-term parking General purpose travel lane	Commercial vehicle loading / drop-off Short-term parking General purpose travel lane	Priorities: Access for commerce Access for people Mobility

Mixed-Use Boulevard Example 1



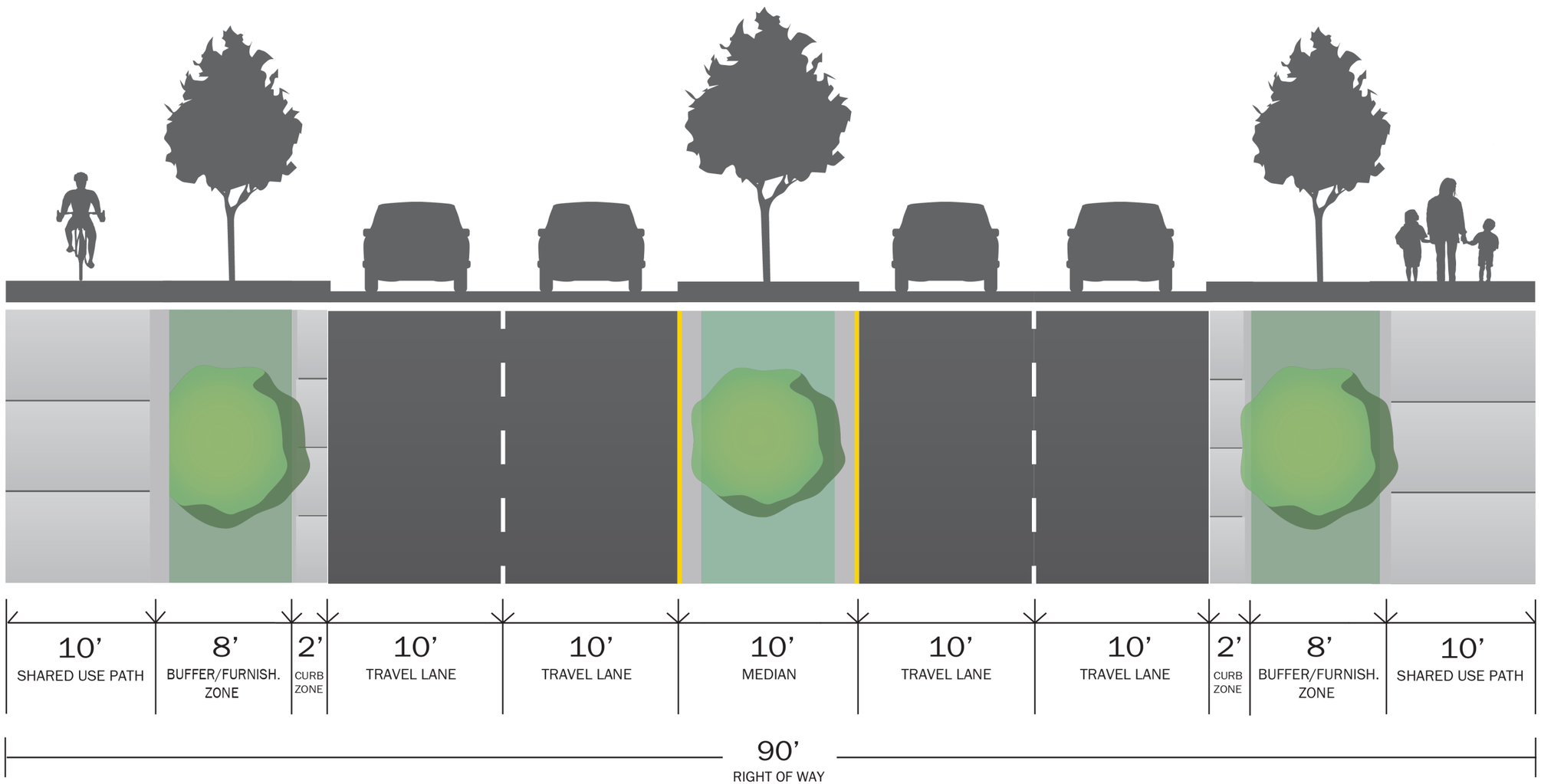
Mixed-Use Boulevard Example 2



Flex lanes manage sought-after curbside space by accommodating multiple functions throughout the day. For a roadway like the one shown above, this could include:

- On-street parking lane
- Bus-only lane
- Through bicycle traffic lane
- Through vehicle traffic lane

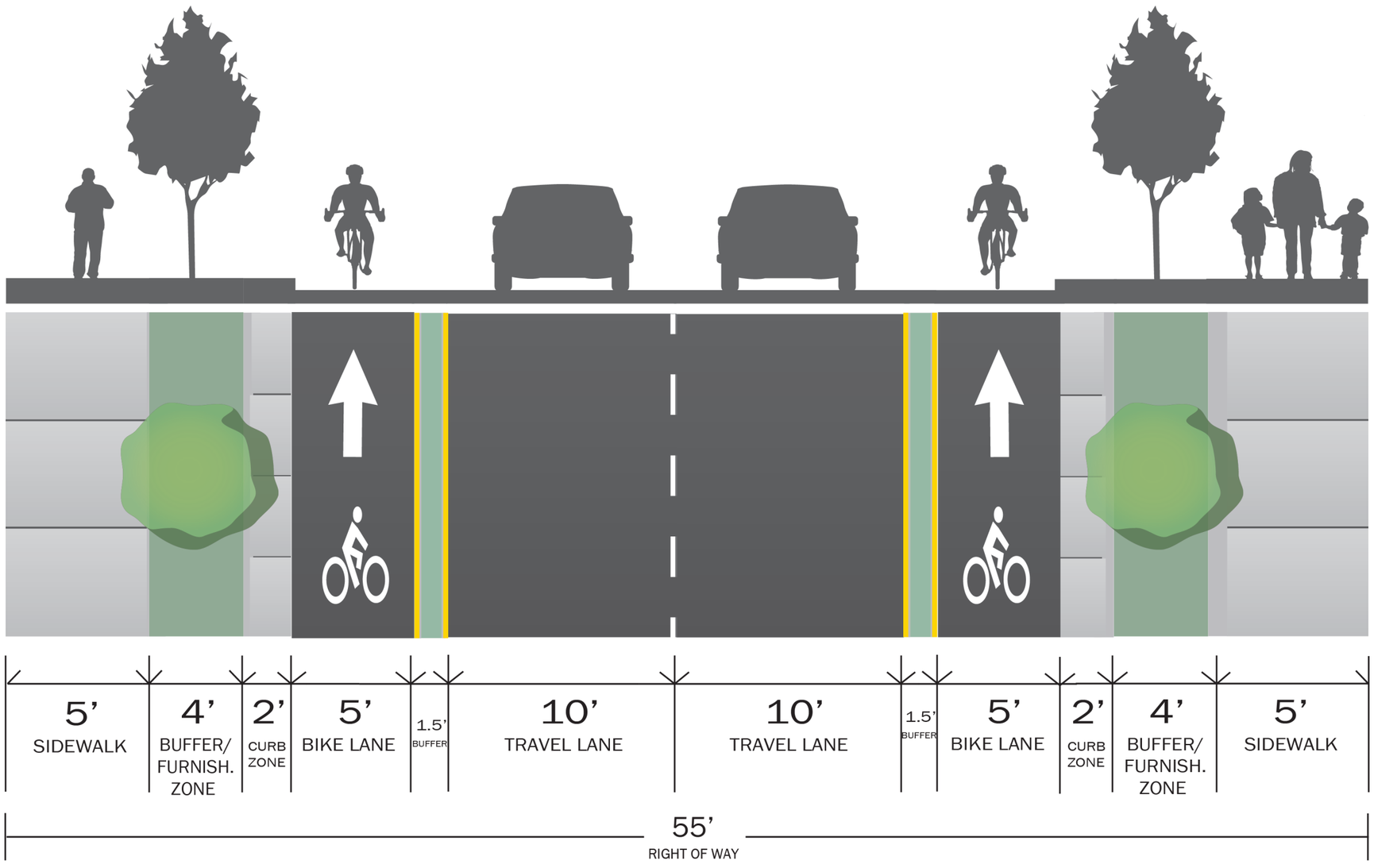
Mixed-Use Boulevard Example 3



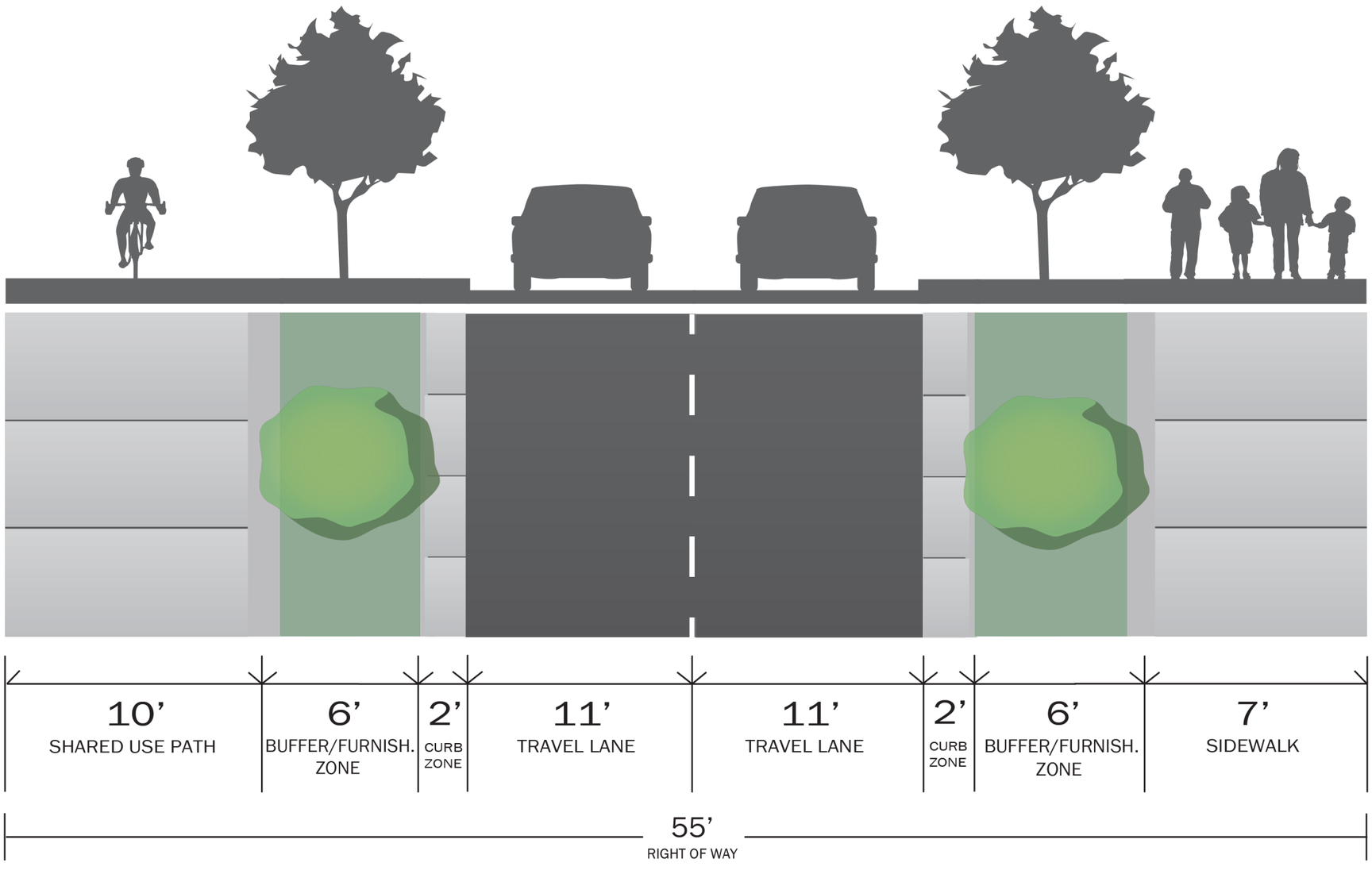
Residential Street Design Guidelines

	Parkway	Boulevard	Avenue	Main Street	Neighborhood Connector	Street
Vehicle Zone Design						
Number of Lanes	4 - 6	4- 6	2 - 4	2 - 3	2 - 3	1 - 2
Width of Lanes	11'	10' - 11'	10 - 11'	10'	10'	9 - 10'
Design Speed (mph)	30–35	30–35	25–35	20–25	25	15–25
Traffic calming	Raised / landscaped / striped medians Striped chokers	Raised / landscaped / striped medians Roundabouts Striped chokers	Raised / landscaped / striped medians Roundabouts Striped chokers	Striped chokers Traffic circles	Striped chokers Traffic circles Speed bumps	Speed bumps Mini-traffic circle
Transit Considerations	Local and none	Local and none	Local and none	Local and none	Local and none	None
Freight Movement	Local deliveries only	Local deliveries only	Local deliveries only	Local deliveries only	Local deliveries only	Local deliveries only
Pedestrian Zone Design						
Curb Zone	0.5' - 1'	1.5' - 2.5'	1.5' - 2.5'	1.5' - 2.5'	1.5' - 2.5'	1.5' - 2.5'
Buffer / Furnishings Zone	4' - 12' Grass / trees / landscaping / GSI Street lights / signage Bus shelters / bus stops	4' - 12' Grass / trees / landscaping / GSI Street lights / signage Bus stops	4' - 6' Grass / trees / landscaping / GSI Street lights / signage Bus stops	2' - 6' Grass / trees / landscaping / GSI Street lights / signage Bus stops	2' - 4' Grass / trees / landscaping / GSI Street lights / signage Bus stops	2' - 4' Grass / trees / landscaping / GSI Street lights / signage
Pedestrian Through Zone	5' - 8'	5' - 8'	5' - 8'	5' - 8'	5' - 6'	5' - 6'
Frontage Zone						
Pedestrian Crossing	Marked crosswalks Signalized crosswalks Pedestrian refuge areas	Marked crosswalks Signalized crosswalks Pedestrian refuge areas	Marked crosswalks Signalized crosswalks Pedestrian refuge areas Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions	Marked crosswalks Signalized crosswalks Striped curb extensions
Bicycle Zone Design						
Bicycle Zone	Barrier-separated bike lane 5' - 12' SUP ≥ 8'	Barrier-separated bike lane 5' - 12' SUP ≥ 8'	Buffered bike lane 5' - 8' Bike lane 5' - 6' Sharrows Super sharrows Bike boulevard SUP ≥ 8'	Buffered bike lane 5' - 8' Bike lane 5' - 6' Sharrows Super sharrows SUP ≥ 8'	Bike lane 5' - 6' Bike boulevard Sharrows Super sharrows SUP ≥ 8'	Bike lane 5' - 6' Bike boulevard Sharrows
Bicycle Intersection Design	Bicycle refuge areas Intersection crossing markings	Intersection crossing markings	Intersection crossing markings	Intersection crossing markings	Intersection crossing markings	Intersection crossing markings
Parking Design	On-street parking Screening (multifamily housing)	On-street parking Screening (multifamily housing)	On-street parking Screening (multifamily housing)	On-street parking Screening (multifamily housing)	On-street parking	On-street parking

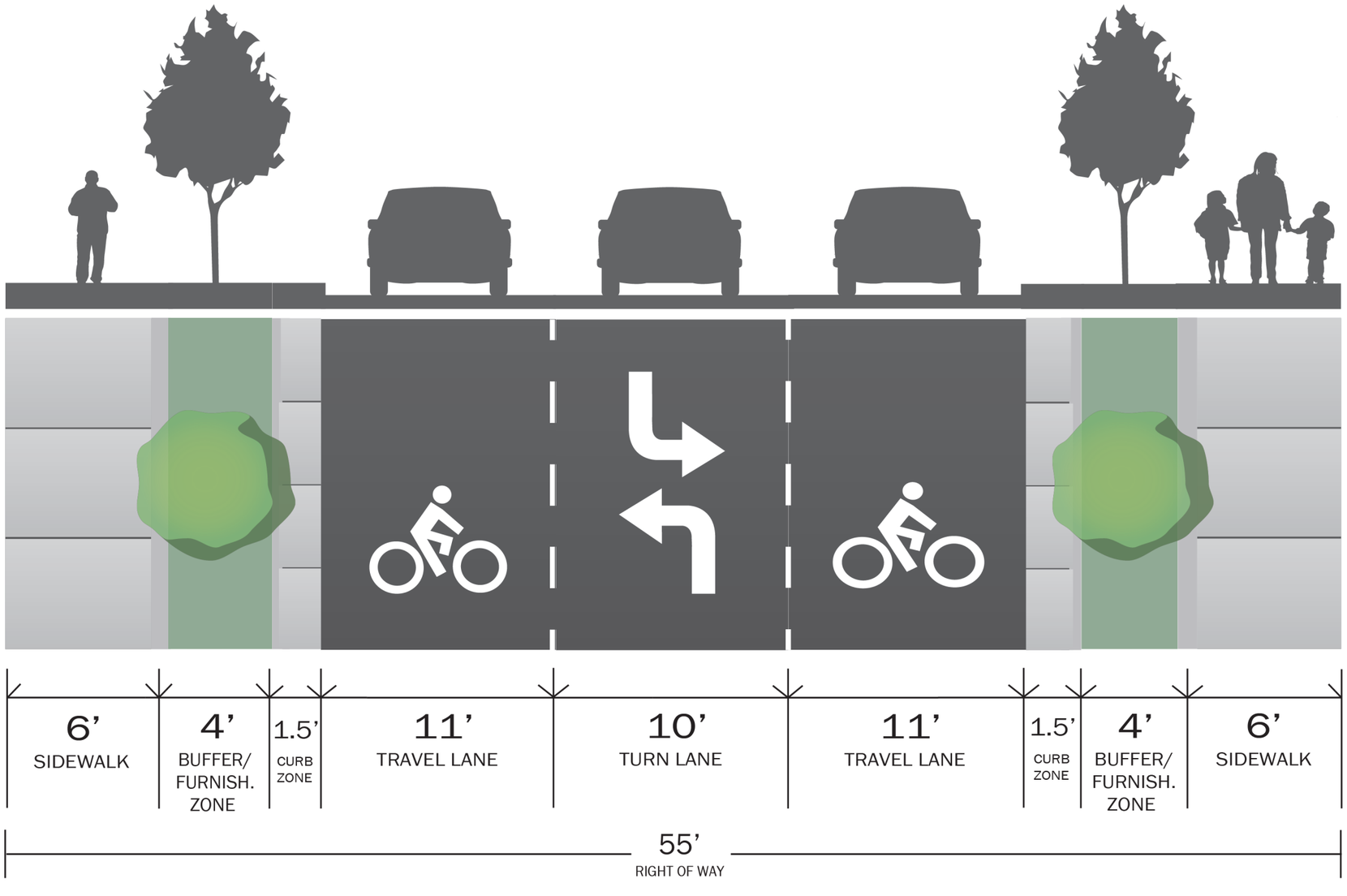
Residential Avenue Example 1



Residential Avenue Example 2



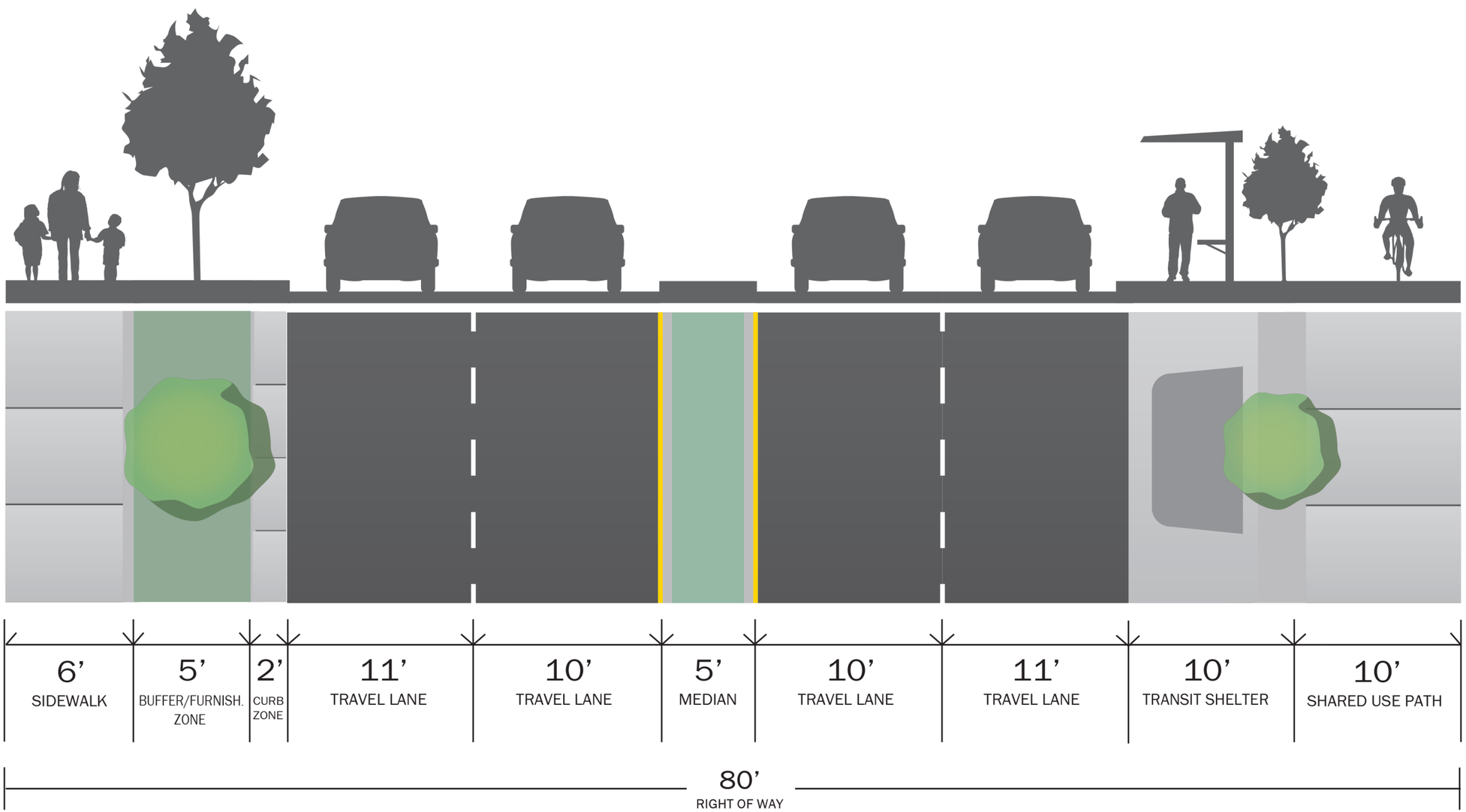
Residential Avenue Example 3



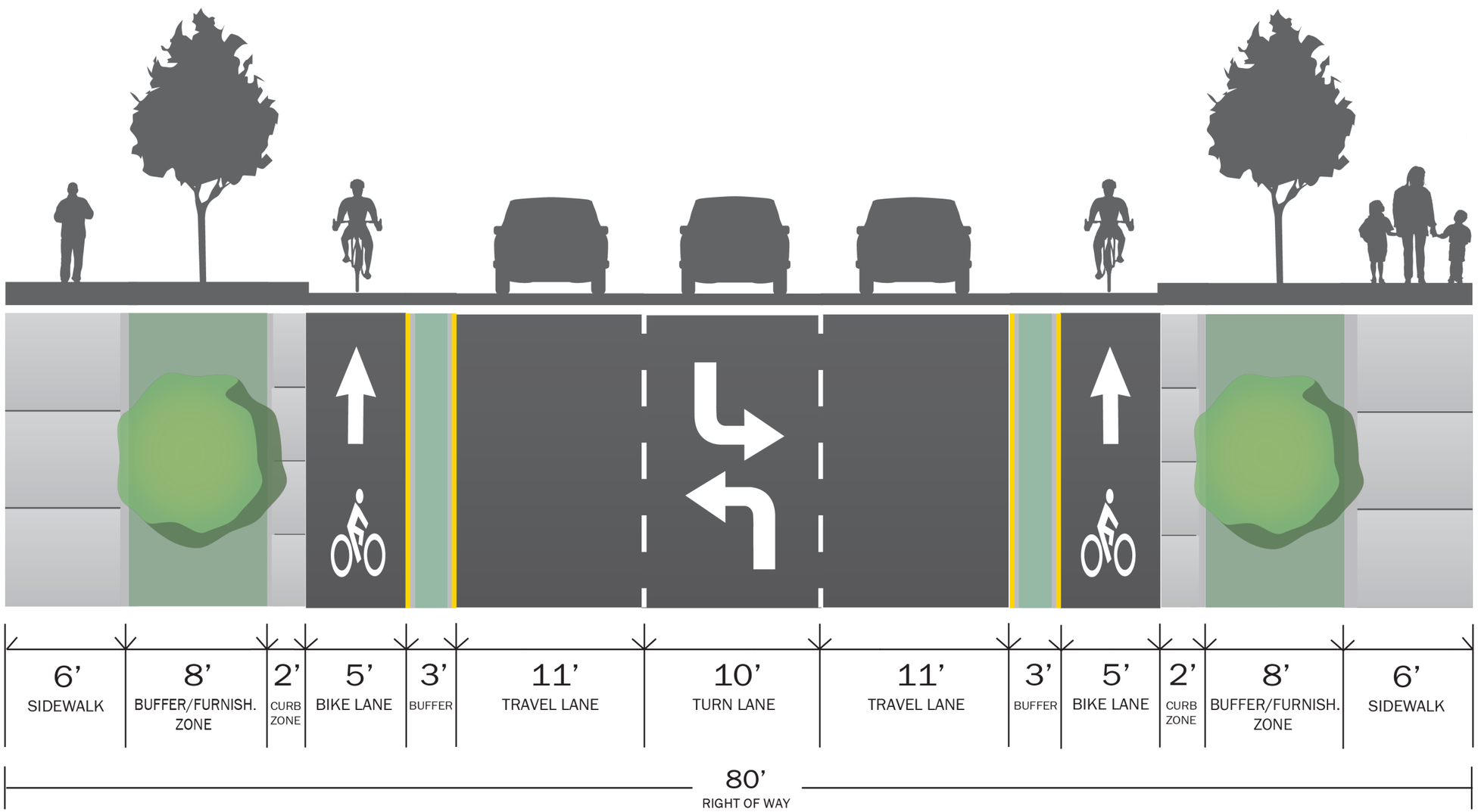
Industrial Street Design Guidelines

	Parkway	Boulevard	Avenue	Main Street	Neighborhood Connector	Street
Vehicle Zone Design						
Number of Lanes	4 - 6	5 - 6	2 - 4			
Width of Lanes	11'	10' - 11'	10 - 11'			
Design Speed (mph)	30–35	30–35	25–35			
Traffic calming	Raised / landscaped / striped median Striped chokers	Raised / landscaped / striped medians Striped chokers	Raised / landscaped / striped medians Striped chokers			
Transit Considerations	Express and Local	Express and Local	Express and Local			
Freight Movement	Regional truck route	Regional truck route	Regional & local truck route			
Pedestrian Zone Design						
Curb Zone	0.5' - 1'	1.5' - 2.5'	1.5' - 2.5'			
Buffer / Furnishings Zone	4' - 8' Grass / trees / landscaping / GSI Street lights / signage Bus shelters / bus stops	4' - 8' Grass / trees / landscaping / GSI Street lights / signage Bus shelters / bus stops	4' - 8' Grass / trees / landscaping / GSI Street lights / signage Bus shelters / bus stops			
Pedestrian Through Zone	5' - 8'	5' - 8'	5' - 8'			
Frontage Zone						
Pedestrian Crossing	Marked crosswalks Signalized crosswalks Pedestrian refuge areas Mid-block signalized crosswalks	Marked crosswalks Signalized crosswalks Pedestrian refuge areas Mid-block signalized crosswalks	Marked crosswalks Signalized crosswalks Pedestrian refuge areas Mid-block signalized crosswalks			
Bicycle Zone Design						
Bicycle Zone	Barrier-separated bike lane 5' - 12' Buffered bike lane 5' - 8' SUP ≥ 8'	Barrier-separated bike lane 5' - 12' Buffered bike lane 5' - 8' SUP ≥ 8'	Barrier-separated bike lane 5' - 12' Buffered bike lane 5' - 8' SUP ≥ 8'			
Bicycle Intersection Design	Bicycle refuge areas	Bicycle refuge areas	Bicycle refuge areas			
Parking Design	Screening Shared surface lots	Screening Shared surface lots	Screening Shared surface lots			

Industrial Avenue Example 1



Industrial Avenue Example 2



Complete Streets Elements Glossary

- Barrier-separated bike lane
- Bicycle refuge area
- Bike boulevard
- Bike lane
- Buffered bike lane
- Bus bulb
- Bus shelter
- Bus stop
- Choker / curb extension
- Curb cuts
- Curb zone
- Flex lane
- Frontage zone
- Furnishings zone
- Green Stormwater Infrastructure (GSI)
- Intersection crossing markings (bike)
- Lane Width
- Metered on-street parking
- Mid-block signalized crosswalk
- Mini-traffic circle
- On-street parking
- Outdoor seating
- Parking lot design
- Pedestrian refuge area
- Pedestrian through zone
- Planters
- Raised median
- Roundabout
- Screening
- Shared parking
- Shared use path (SUP)
- Sharrows
- Signage
- Signalized crosswalks
- Super sharrows (picture)
- Speed bump
- Street furniture
- Structured parking
- Textured pavement
- Trees

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Complete Streets Policy

Formal Draft

Insight2050 Technical Assistance Program:
City of Worthington Complete Streets Policy Project

MORPC

2/13/2019

Background:

Complete Streets are roadways that are designed to consider all transportation user types. Incorporating Complete Streets principles into project design, construction and maintenance such as resurfacing and reconstruction can improve transportation system safety, accessibility, efficiency, and capacity.

In terms of safety, a study of reconfigured streets in New York City showed a 35 percent decrease in injuries to all street users after protected bike lanes, pedestrian islands, and other Complete Streets components were added. Those same components can increase accessibility by clearly welcoming bicyclists, pedestrians, and other users– including children. The safe use of this public space by a greater variety of users makes the street more efficient, with more people able to comfortably use different parts of the right-of-way.

It may seem counterintuitive in a car-focused culture, but a complete street with fewer automobile lanes can increase capacity. That's because a typical car (6 feet by 15 feet) can take up 90 square feet on the roadway – not including the full lane width or safe distance between vehicles. Thus, increasing capacity for automobiles most likely would require a costly widening of the right-of-way – which would both reduce adjacent non-roadway space and significantly affect the existing built environment and open space. Carving out space on limited right of way for higher volume passenger vehicles (i.e. buses) and smaller/slow speed modes (pedestrians, cyclists, scooters, etc.) may move fewer cars but more people.

As a result, Complete Streets can provide many benefits to residents, business owners, developers, and communities as a whole. Complete Streets can increase property values, economic growth, and economic stability. Roadways designed for Complete Streets can reduce crashes, improve public health, reduce harmful emissions, and reduce the overall demand on a community's roadways by providing safe, convenient, reliable, and affordable transportation options.

Goals:

The purpose of this policy is to promote development and redevelopment of public right-of-way within the City of Worthington to accommodate all users including pedestrians, cyclists, transit, and motorized vehicles. The goals include:

- Create a safe and equitable transportation network for all City of Worthington residents regardless of age, gender, ability, or status. The City recognizes that a safe and equitable transportation network is one that accommodates pedestrians, cyclists, transit users, school bus riders, automobile drivers, commercial vehicles, emergency responders, and other users through appropriate infrastructure and equitable access to work, school, worship, and play.
- Create a transportation network that contributes to neighborhoods' sustainability and all residents' quality of life. The City recognizes that Complete Streets roadways can improve roadway safety, enhance the livability of the built environment, reduce municipal and household costs, maximize roadway capacity, and support economic development – especially when well-integrated with adjacent land uses and applied in a context sensitive way.

Objectives:

In accordance with nationally adopted Complete Streets principles, and the City's goals to connect and expand the many miles of multi-use trails, dedicated bike paths, and shared

roadways, the City will:

- Identify opportunities and funding sources to improve non-motorized facility connections from residential neighborhoods to local parks, schools, civic spaces, commercial centers, regional trails, and other residential neighborhoods.
- Solicit funding for street improvements that will enhance the safety of the City's multimodal network.
- Integrate sustainable design treatments, including incorporation of Green Stormwater Infrastructure and Low Impact Development, wherever financially and logistically feasible in order to improve water and air quality, reduce flooding risks, and enhance community livability.
- Partner with private, public, and nonprofit entities to leverage new and emerging transportation technologies in a way that maximizes safety, equity, sustainability, and affordability for the City and its residents.
- Collaborate with state, regional, and neighboring jurisdictions to promote the City's multimodal network connectivity to the surrounding region.
- Enhance coordination among relevant City Departments and agencies in order to maximize fiscal resources.
- Ensure that safe sidewalks, crosswalks, waiting areas, and other features provide the first-/last-mile "connective tissue" between transit stops and the homes of transit users.

Policy Requirements:

Feasibility consideration for Complete Streets elements and facilities will be made at each phase of every infrastructure or transportation project including planning, design, construction, and reconstruction. Consideration for Complete Streets principles – including equity, sustainability, and accessibility – will be incorporated into the maintenance phase of every infrastructure or transportation project. The City will assess projects' impacts on pedestrians, bicyclists, and transit users of all ages and abilities, as well as motorists, emergency services, commercial vehicles. Exceptions from feasibility consideration will be made for infrastructure and transportation projects only in the following cases:

- Specific users are legally prohibited on the roadway (such as expressways or pedestrian malls)
- The costs of providing Complete Streets facilities will be excessive when compared to the determined existing and future need or expected use of the facilities
- Based on projections involving population, employment, and/or traffic volumes, there is an absence of current and future need

If the City makes exceptions from feasibility consideration, it will provide a detailed explanation of the reason(s) for the exceptions.

The City will establish and monitor performance metrics that assess the transportation network's impact on accessibility, safety, multimodal mobility, sense of place, equity, economic development, and the natural environment.

The City will consult national and regional best practices in design when developing or redeveloping roadways. Design standards will be based on roadways' safety performance, land use characteristics, functional classification, context-sensitive classification, and requirements

set forth by City Codified Ordinance and the Manual of Uniform Traffic Safety Devices.

The City will work to incorporate Complete Streets principles into all future plans, manuals, policies, and programs that are relevant to transportation, infrastructure, or development to the maximum extent practicable.

The City will follow the context-sensitive street design and implementation guidance detailed in the 2019 Bicycle and Pedestrian Master Plan and 2018-2019 insight2050 Technical Assistance Program Toolkit.

insight 2050
technical assistance program

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Insight2050 Technical Assistance Program
City of Worthington Complete Streets Policy Project