Exhibit A. Multimodal Functional Classification Memorandum & Design Best Practices

Date: March 6, 2025

To: Transportation System Plan Advisory Committee (TSPAC)

From: Project Management Team (PMT)

Project: Milwaukie Transportation System Plan

Subject: Functional Classification

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Introduction

The vehicular functional classification system originated in the early 20th century. As transportation networks expanded and became more complex, engineers and planners needed a systematic way to manage traffic. Functional classification systems attempt to impose order by categorizing roads and streets based on their intended function within a larger network. Milwaukie's current roadway functional classification divides roads into the following hierarchy: arterials, collectors, neighborhood collectors, and local streets. Each classification serves a different role in facilitating mobility and access.

As part of its needs and gaps analysis, the city and its consultants are recommending that a functional classification system be adopted for each mode of transportation considered in the Transportation System Plan, including walking, cycling, public transit, and freight. These networks would not replace but accompany the functional classification used for automobiles. This memo summarizes that need, proposes a classification for each mode, and presents modal maps with draft classification assignments.

Expanding the Functional Classification System

Why expand the functional classification system to other modes?

The city's current roadway functional classification system—arterial, collector, etc.—is fundamentally rooted in the efficient movement of vehicular traffic. While the system does consider and allow for the allocation of space for other modes of transportation, such as bicycles and pedestrians, these modes remain secondary to the focus on vehicular flow. This inherent bias towards motorized vehicles within the framework suggests that adopting a separate, distinct, functional classification for other modes is warranted. Such a classification would better reflect the unique needs of each mode and ensure that their infrastructure is considered with the same level of intentionality and priority as vehicular infrastructure. For example, cyclists and pedestrians can and do leverage different facilities, such as off-street trails, pathways, and plazas; additionally, they are generally considered to be more sensitive to out-of-direction travel, grade changes, and the surrounding land-use and transportation context.

How will the expanded classification system be used?

The expanded functional classification system will be used for the new Milwaukie Transportation System Plan (TSP) and for future updates of the TSP. In this context, it will primarily inform network analysis, guide the development of policy recommendations related to facility design, traffic management strategies, and land-use planning. Additionally, it will help with TSP project prioritization, ensuring that limited resources are directed toward the most critical facilities.

The functional classification system will also be used to implement the TSP through the city's development review process and associated land-use planning projects, such as area plans, corridor plans, and zoning amendments. Classification designations won't specify specific treatments or designs but will signal to staff what role the facility is intended to play within the modal network. Consequently, staff should be better able to avoid potential modal conflicts, consider the impact that new development might have on the network, and determine appropriate dedications and public improvement requirements.

Functional classifications versus facility types and treatments

As noted, the functional classification system does not prescribe a specific facility type (e.g., bicycle lane, multi-use pathway) or treatment (e.g., curb-extensions, Rectangular Rapid Flashing Beacons) for each road segment. While classifications indicate the role of a facility within the larger modal network, the exact facility type, or treatment needed will depend on several factors. These factors include the surrounding land-use, transportation context, and other practical constraints, such as limited right-of-way and available funding.

Example: Monroe Greenway

The Monroe Greenway Project provides a clear example of how facility needs and treatments can vary along a single route when considering factors like traffic volumes and adjacent land uses.

While the entire project (from McLoughlin Boulevard to Linwood Avenue) has been discussed as a greenway, the specific multimodal treatments will differ depending on the adjacent land uses and transportation context. For instance, the eastern segment, which runs through low-density residential development and has an average daily traffic count less than 1000, will be improved with neighborhood greenway type treatments such as curb extensions, speed cushions, street markings, and signage. In contrast, the central segment crosses major roads like Highway 224 and serves busy commercial destinations such as Milwaukie Marketplace. In this area, an on-street multi-use pathway was installed near the 7 Acres Apartment complex to provide a separated walking and biking environment. At the crossing of Highway 224, features like bicycle/pedestrian-only diverters and limitations on turning movements for automobiles are being planned to improve multimodal travel in a busy vehicle environment. While the entire route would be classified as a Major City Bikeway under the proposed system, the applied treatments would respond to the adjacent land use and travel conditions.

Speaking of...what's happening to neighborhood greenways?

In short, nothing will change— we're just giving them a new name in the TSP. All greenway-style treatments are still part of the city's toolkit to improve comfort and safety for people walking and rolling in Milwaukie.

The neighborhood greenway designation in the 2007 TSP can be thought of as the city's first attempt to establish a functional classification or network plan for cycling. From a vision perspective, the streets designated as neighborhood greenways in the 2007 TSP are still essential parts of the city's bicycle network. These routes largely remain low-speed, low-volume, and attractive for cyclists. As such, the treatments considered for these facilities will continue to come from the "neighborhood greenway" toolkit, which focuses on calming traffic, prioritizing bicycle movement, and signaling bicycle priority.

Except for Monroe Street, which is proposed to be designated as a Major City Bikeway, all other greenways will be reclassified as City Bikeways under the new system. As discussed below, both Major City Bikeways and City Bikeways are designed to offer direct, convenient bicycle access to key destinations and accommodate larger volumes of cyclists. The design guidance (see the Improvements subsection for these classifications) includes a variety of treatments aimed at maximizing cyclist comfort. While the best treatment approach will vary depending on factors like available right-of-way, funding, land use, and traffic volumes, in many cases, treatments will still involve interventions to calm traffic and maintain lower vehicular volumes along these routes.

Neighborhood greenway is a useful term that we'll probably keep using

The National Association of City Transportation Officials (NACTO) refers to low-traffic, low-speed streets that prioritize cycling as "bicycle boulevards." NACTO's Bicycle Urban Design Guide points out that communities across the country have used different terms, like "neighborhood greenway," to brand these routes. The City of Milwaukie will likely continue to use the term "neighborhood greenway" for improvement projects, as it's widely understood in the region to refer to low-traffic, low-speed streets. However, for the purposes of the TSP, these facilities will be classified under the new functional system.

Functional classifications and level of traffic stress

As the Transportation System Plan Advisory Committee (TSPAC) is aware, the updated Transportation Planning Rule (TPR) requires the city to adopt new performance standards for non-vehicular modes of transportation. The City's consultant recommended, and the committee agreed, that Pedestrian Level of Traffic Stress (PLTS) and Bicycle Level of Traffic Stress (BLTS) are useful companions to more traditional, vehicular-based measures, such as Level of Service (LOS). These measures move beyond a simple focus on infrastructure presence (i.e., is there a bike lane); instead, they ask the city to consider and track how the type and quality of infrastructure, combined with adjacent environmental factors (traffic speeds, traffic volumes, and land-use), alters the sense of safety and comfort for cyclists and pedestrians.

While the city initially considered adopting single citywide mode-specific level of traffic stress (PLTS and BLTS) targets, the introduction of a functional classification system clarifies which routes are most critical for bicycle and pedestrian travel, allowing the city to assign different stress targets based on classification. Below you'll see that new PLTS targets have been proposed for Major City Walkways (adjusting from a citywide target of PLTS 2 to PLTS 1 for these facilities). For its bicycle network, the city has retained the BLTS 1 target for all facilities.

Proposed Street Classifications

Pedestrian Classification Hierarchy and Descriptions

Major City Walkway: Major City Walkways provide safe, convenient, and attractive pedestrian accommodations along major streets and trails with the highest level of pedestrian activity supported by current and planned land uses. These include streets in Milwaukie's 2040 Town Center, streets with frequent-transit lines, and high-demand off-street trails like the Trolley Trail. Major City Walkways can also be routes providing continuous pedestrian connections across the city.

- **Level of Traffic Stress Target:** PLTS 1
- **Land Use:** Major City Walkways generally serve areas in Milwaukie's Region 2040 Town Center, where land is zoned for high density residential, commercial, and mixed-use development, but also run along major streets through predominantly low-density residential areas. Where auto-oriented land uses are allowed on Major City Walkways, site development standards should address the needs of pedestrians for access.
- **Improvements:** Major City Walkways should have regularly spaced marked crossings (with closer spacing in the Region 2040 Town Center and in other commercial and mixed-use areas, such as Milwaukie Marketplace). Major City Walkways should have wide sidewalks, and a pedestrian realm that can accommodate higher volumes of pedestrian activity.
- **Milwaukie Example:** 32nd Avenue is an example of a proposed Major City Walkway. It is a street with a frequent transit route (Route 75), has planned high-density residential uses (Hillside Manor), community service uses (Providence Hospital), and provides access to multiple commercial businesses (Milwaukie Café). It also serves as one of the few continuous north/south connections in the city, connecting Harrison Street to Johnson Creek Boulevard.

City Walkway: City Walkways provide safe, convenient, and attractive pedestrian access along major streets with moderate levels of pedestrian activity supported by current and planned land uses. These include streets with non-frequent transit lines, and streets that provide direct connections between Major City Walkways, and key destinations.

- **Level of Traffic Stress Target:** PLTS 2
- **Land Use:** City Walkways provide access along major streets, connecting residential neighborhoods with low and moderate density development to Major City Walkways, Neighborhood Hubs, schools, and other local key destinations.
- **Improvements:** City Walkways should have regularly spaced marked crossings (with closer spacing in commercial and mixed-use areas), sidewalks, and a pedestrian realm that can accommodate moderate levels of pedestrian activity.
- **Milwaukie Example:** International Way is an example of a proposed City Walkway. It provides access to various businesses, connects two proposed Major City Walkways (37th Avenue and Lake Road) and is a street with an infrequent transit line (Route 152). International Way runs through exclusively commercial and industrial land uses and sees moderate pedestrian activity (likely due to the auto-oriented nature of development).

Neighborhood Walkway: Neighborhood Walkways provide safe and convenient connections from residential neighborhoods to Major City Walkways, City Walkways, and nearby key destinations such as schools, parks, and Neighborhood Hubs. Neighborhood Walkways are primarily routes that have low levels of motor vehicle traffic or do not allow motor vehicle traffic.

- **Level of Traffic Stress Target:** PLTS 2
- **Land Use:** Neighborhood Walkways are usually located in residential or natural areas on low-volume streets or connections that do not allow motor vehicles.
- **Improvements:** Neighborhood Walkways should be designed to provide a safe and comfortable walking environment but may take many forms depending on the context. Design types may include sidewalks, shoulders, shared streets, woonerfs, pedestrian-only paths, multi-use paths, soft-surface trails, and ramps/stairs.
- **Milwaukie Example:** Roswell Street is an example of a proposed Neighborhood Walkway. It is primarily serving neighborhood residents, acts as a critical connector to a school (Ardenwald Elementary).

Local Service Walkway: Local
Service Walkways provide the local circulation needs for pedestrians and provide safe and convenient access to local destinations.

- **Level of Traffic Stress Target:** PLTS 2
- **Land Use:** Local Service Walkways support all land uses by providing direct access to properties.
- **Improvements:** Local Service Walkways should be designed to provide a safe and comfortable walking environment but may take many forms depending on the context. Design types may include sidewalks, shoulders, shared streets, woonerfs, pedestrian-only paths, multi-use paths, soft-surface trails, and ramps/stairs.
- **Milwaukie Example:** Local service walkways are any street/route not designated as a Major City Walkway, City Walkway, or Neighborhood Walkway.

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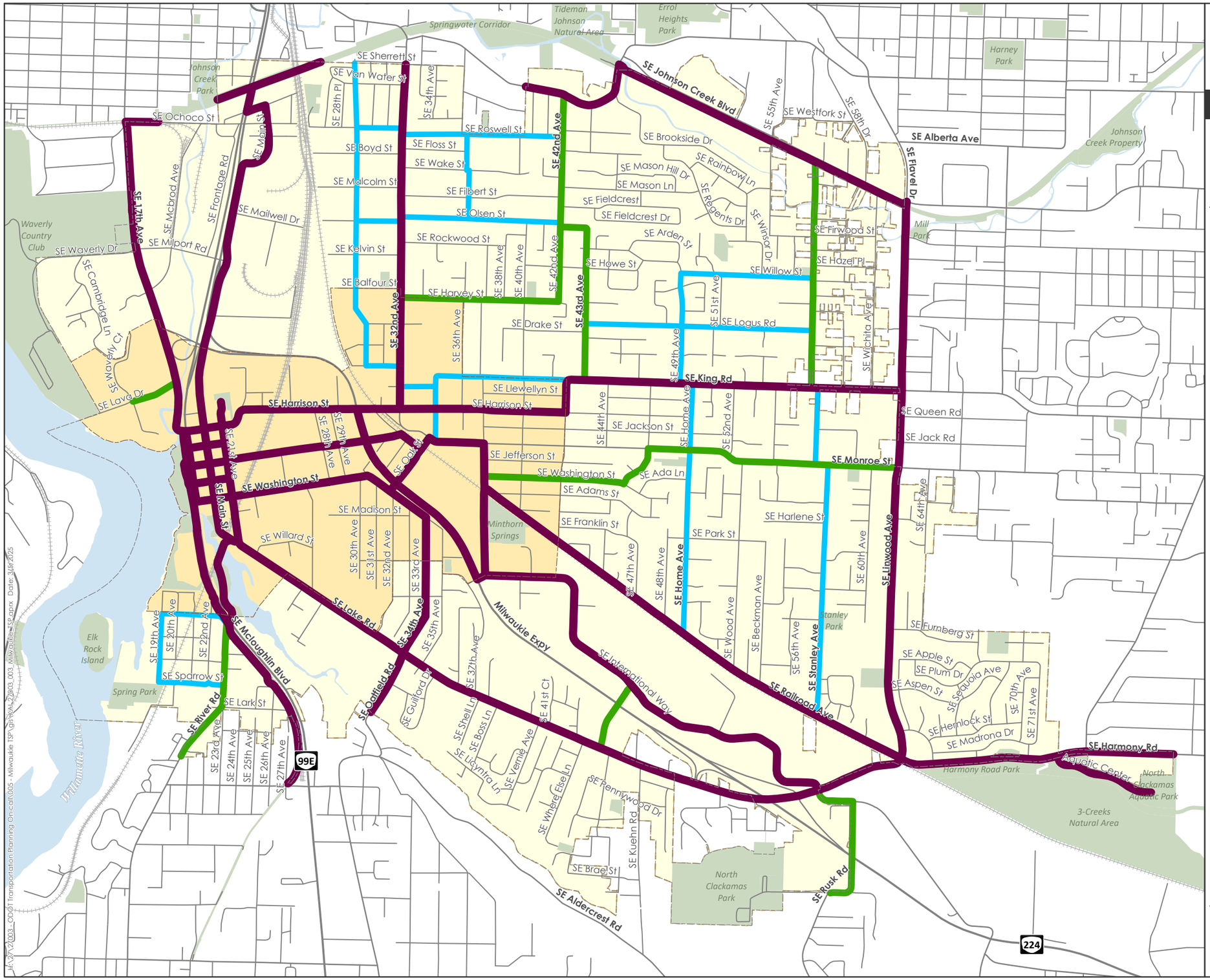
FIGURE 1

Proposed Pedestrian Classifications



Legend

- Major City Walkway
- City Walkway
- Neighborhood Walkway
- Local Service Walkway
- Milwaukie City Limits
- Milwaukie Town Center
- Parks

Generated On: 3/5/2025

Data Sources: City of Milwaukie, ODOT

0 — 0.25 — 0.5 — 0.75 Miles

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Bicycle Classification Hierarchy and Descriptions

Major City Bikeway: Major City Bikeways are the foundation of Milwaukie's bicycle network, accommodate higher volumes of bicycle traffic, and generally provide continuous routes through the city for cyclists traveling longer distances. Major City Bikeways connect cyclists to City Bikeways, Neighborhood Bikeways, and generally connect to regional bicycle facilities.

- **Level of Traffic Stress Target:** BLTS 1
- **Land Use:** Major City Bikeways support a variety of land-use types. Where appropriate, development standards should preserve the functionality of the facility to maintain safe and comfortable conditions for high volumes of cyclists.
- **Improvements:** Major City Bikeways should be designed to accommodate larger numbers of cyclists, maximize their comfort, and minimize delays. Motor vehicle lanes and possibly on-street parking may be removed on Major City Bikeways to provide added width for separated in-roadway facilities where compatible with adjacent land uses. Where improvements to the bicycling environment are needed but the ability to reallocate road space is limited, consider alternative approaches that include property acquisition, or dedication, parallel routes and/or less desirable facilities.
- **Milwaukie Example:** Linwood's Avenue multiuse pathways are an example of a proposed Major City Bikeway. It serves as a continuous comfortable connection through the city and connects Portland, Milwaukie, and Clackamas. Moreover, the two separated pathways, each over 10 ft wide, are designed to accommodate many cyclists and to maximize their comfort (the pathways are raised, separated from automobile traffic by a curb and landscape strip).

City Bikeway: City Bikeways establish direct and convenient bicycle access between key destinations within Milwaukie and between Major City Bikeways. City Bikeways accommodate higher volumes of cyclists and connect cyclists across longer distances than neighborhood bikeways.

- **Level of Traffic Stress Target: B**LTS 1
- **Land Use**: City Bikeways support a variety of land-use types. Where appropriate, development standards should preserve the functionality of the facility to maintain safe and comfortable conditions for high volumes of cyclists
- **Improvements**: City Bikeways should also be designed to accommodate large numbers of cyclists, to maximize their comfort and to minimize delays. Motor vehicle lanes and possibly on-street parking may be removed from City Bikeways to provide needed width for separated-in-roadway facilities where compatible with adjacent land uses and only after taking into consideration the essential movement of all modes. Where improvements to the bicycling environment are needed but the ability to reallocate road space is limited, consider alternative approaches that include property acquisition, or dedication, parallel routes and/or less desirable facilities. City Bikeways developed as shared roadways use all appropriate tools to achieve BLTS 1.
- **Milwaukie Example**: 29th Avenue is an example of a proposed City Bikeway. It serves as a direct and comfortable connection between a Major City Bikeways (Springwater Corridor Trail) and a significant residential development (Hillside Manor).

Neighborhood Bikeway: Neighborhood Bikeways provide connections from residential neighborhoods to Major City Bikeways, City Bikeways, and nearby destinations such as schools, parks, transit stops, and commercial areas.

- **Level of Traffic Stress Target: B**LTS 1
- **Land Use**: Neighborhood Bikeways are usually supported by low and moderate density residential development.
- **Improvements**: Neighborhood Bikeways should be designed to provide a safe and comfortable cycling environment but may take many forms depending on the context. Design types may include minimal treatments, signage and markings, or may be a shared road environment that utilizes significant traffic calming and operation management strategies. Separated facilities are generally not provided on Neighborhood Bikeways.
- **Milwaukie Example**: Logus Road is an example of a proposed Neighborhood Bikeway. It connects two City Bikeways (43rd Avenue and Stanley Avenue) and connects nearby properties to a school (Lewelling Elementary).

Local Service Bikeway: Local Service Bikeways serve local circulation needs for bicyclists and provide access to adjacent properties. Streets that are not classified as Major City Bikeways, Neighborhood Bikeways, or City Bikeways are classified as a Local Service Bikeway.

- **Level of Traffic Stress Target: B**LTS 1.
- **Land Use:** Local Service Bikeways support all land uses by providing direct access to properties.
- **Improvements:** Consider the following design treatments for Local Service Bikeways: shared roadways, traffic calming, bicycle lanes, and extra-wide curb lanes. Crossings of Local Service Bikeways with other rights-of-way should minimize conflicts. On-street parking on Local Service Bikeways should not be removed to provide bicycle lanes.
- **Milwaukie Example:** As noted, local service bikeways are any street/route not designated as a Major City Bikeways, City Bikeways, or Neighborhood Bikeways.

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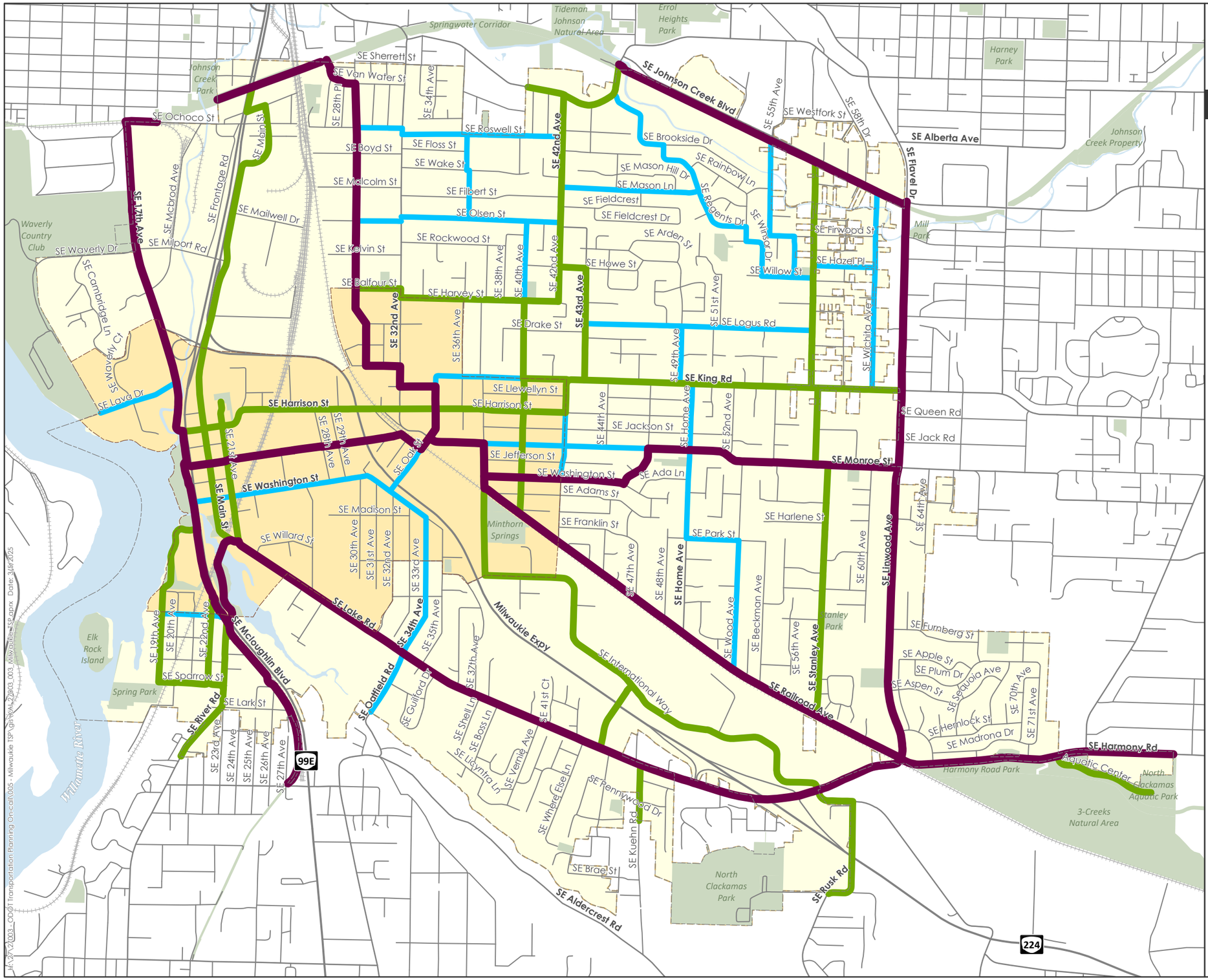
FIGURE 2

Proposed Bike Classifications



Legend

- Major City Bikeway
- City Bikeway
- Neighborhood Bikeway
- Local Service Bikeway
- Milwaukie City Limits
- Milwaukie Town Center
- Parks

Generated On: 3/5/2025

Data Sources: City of Milwaukie, ODOT

0 — 0.25 — 0.5 — 0.75 Miles

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Transit Classification Hierarchy and Descriptions

Regional Transitway: Regional Transitways facilitate regional transit trips with fast and reliable service over long distances, operating in right-of-way that is either reserved exclusively for transit use or enhanced for high-capacity transit accommodations.

- **Land Use:** Land near Regional Transitways is typically zoned for major regional attractions, high-density residential and mixed-use development. Auto-oriented development is discouraged at or near Regional Transitway stops.
- **Improvements:** Use transit-preferential treatments to facilitate fast and reliable transit operations. Provide signal preemption or transit signal priority at major intersections, prioritize transit stations or transit lanes over on-street parking, and provide enough lane width to accommodate standard transit vehicles.
- **Milwaukie Example:** The MAX Light Rail Orange Line is currently the only example of a transit facility that would be classified as a Regional Transitway in Milwaukie. However, Metro's High Capacity Transit Strategy identifies two routes through the city that would possibly warrant reclassifying those facilities as Regional Transitways.

Major Transit Priority Street: Major Transit Priority Streets facilitate the frequent and reliable movement of transit vehicles that connect the Milwaukie Town Center to adjacent communities and other key destinations. Major Transit Priority Streets have frequent service or are expected to receive that level of service in the future to support envisioned growth.

- **Land Use:** Transit-oriented land uses are encouraged along Major Transit Priority Streets, particularly in the Milwaukie Town Center. Auto-oriented development is typically discouraged from locating on a Major Transit Priority Street.
- **Improvements:** Use transit-preferential treatments such as signal preemption or transit signal priority at major intersections, prioritize transit stops or transit lanes over on-street parking, and provide enough lane width to accommodate standard transit vehicles.
- **Milwaukie Example:** King Road and Harrison Streets are examples of a Major Transit Priority Street. Both accommodate Frequent Bus Routes (service offered every 15 minutes) that connect the Milwaukie Town Center to regional destinations.

Transit Access Street: Transit Access Streets facilitate the movement of transit vehicles connecting Downtown Milwaukie with neighborhoods, industrial and employment areas with other destinations and other transit service.

- **Land Use:** Pedestrian-oriented development and accommodations are encouraged in commercial, institutional, mixed-use, and industrial areas along Transit Access Street.
- **Improvements:** Provide transit signal priority as needed at major intersections and prioritize transit stops over on-street parking. Provide sufficient lane width to accommodate standard transit vehicles where appropriate, taking into account other street classifications.
- **Milwaukie Example:** Lake Road and International Way are examples of Transit Access Streets. These routes have infrequent transit service that provides a connection between Downtown Milwaukie, employment, and residential areas.

Local Service Transit Street: Local Service Transit Streets primarily facilitate movement of smaller transit vehicles, including paratransit and community/jobs connector shuttles. Local Service Transit Streets seldom have regular transit service except for short street segments and do not typically include transit specific street design elements such as bus stops.

- **Land Use:** Transit operations on Local Service Transit Streets should give preference to access for individual properties and to the specific needs of property owners and residents along the street.
- **Improvements:** There typically are no special design treatments for transit vehicles.
- **Milwaukie Example:** Local Service Transit Streets is any street not classified as a Regional Transitways, Major Transit Priority Streets, or Transit Access Streets.

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FIGURE 3

Proposed Transit Classifications

Legend

- Regional Transitway
- Major Transit Priority Street
- Transit Access Street
- Local Service Transit Street
- Milwaukie City Limits
- Milwaukie Town Center
- Parks

Generated On: 3/6/2025

Data Sources: City of Milwaukie, ODOT

0 0.25 0.5 0.75 Miles

Freight Classification Hierarchy and Descriptions

Regional Truckway: Regional Truckways accommodate the continuous and regional flow of truck freight through the city.

- **Land Use:** Serve regional freight needs along major highway corridors.
- **Improvements:** Regional Truckways are limited access facilities designed to accommodate the movement of all types and sizes of trucks.
- **Milwaukie Example:** Highway 224 is an example of a proposed Regional Truckway. It is a major vehicular oriented highway corridor with limited access that provides a continuous high-capacity freight route through Milwaukie.

Priority Truck Street: Priority Truck Streets serve as the primary travel routes for local truck freight, connecting freight-generating land uses to Regional Truckways.

- **Land Use:** Support industrial and employment uses that generate high truck activity on corridors served by Priority Truck Streets.
- **Improvements:** Priority Truck Streets are designed to accommodate most truck classes. Buffer adjacent residential uses from noise impacts, where warranted.
- **Milwaukie Example:** SE 17th Avenue is an example of a Priority Truck Street. It is a key roadway that connects freight-generating land uses to Regional Truckways.

Truck Access Street: Truck Access Streets serve as the primary local access corridors for industrial and other freight-generating land uses.

- **Land Use:** Support industrial and commercial land uses that generate moderate to high volumes of truck trips.
- **Improvements:** Priority Truck Streets are designed to accommodate most truck classes in balance with other modal needs.
- **Milwaukie Example:** SE International Way is an example of a Truck Access Street. It is a key roadway that directly serves a variety of industrial and commercial uses.

Local Service Truck Street: Local Service Truck Streets serve local truck circulation and access.

- **Land Use:** Local Service Truck Streets provide for goods and service delivery to individual commercial, employment, and residential land uses outside of industrial area.
- **Improvements:** Local Service Truck Streets should give preference to accessing individual properties and the specific needs of property owners and residents along the street.

Milwaukie Example: Local Service Truck Streets are any street/route not designated as a Regional Truckway, Priority Truck Street, or Truck Access Street

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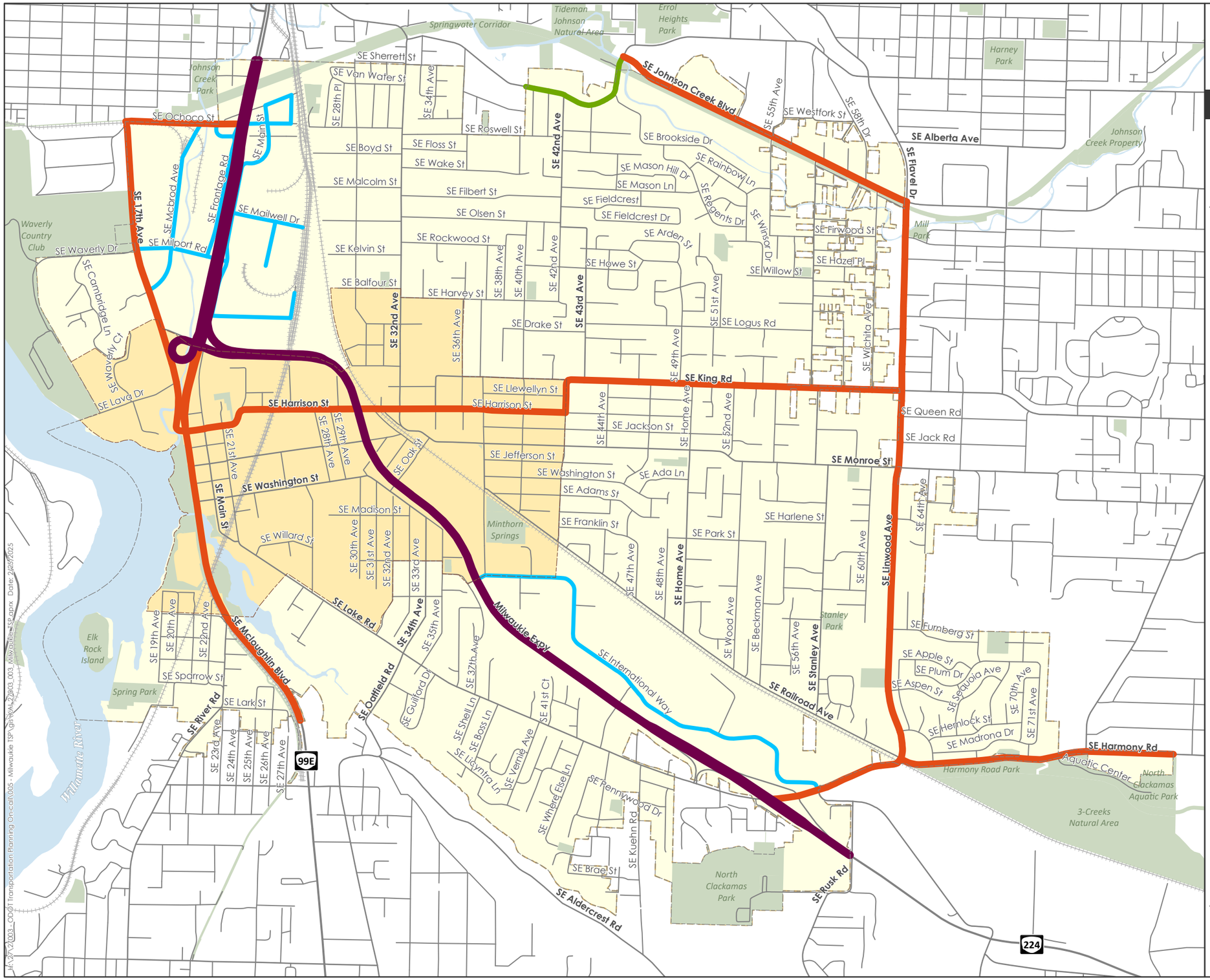
FIGURE 4

Proposed Freight Classifications



Legend

- Regional Truckway
- Priority Truck Street
- Weight Restricted Truck Priority Street
- Truck Access Street
- Local Service Truck Street
- Milwaukie City Limits
- Milwaukie Town Center
- Parks

Generated On: 2/25/2025

Data Sources: City of Milwaukie, ODOT

0 0.25 0.5 0.75 Miles

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Bicycle and Pedestrian Facility Design Guidance

The active transportation sections of Milwaukie's current TSP include a list of potential facility types and roadway treatments designed to make streets safer and more comfortable for people walking and rolling. This is a standard feature in TSPs and active transportation plans. Over the past two decades, however, cities across the U.S. and internationally have gained valuable insights into best practices for managing active transportation systems, including facility designs, roadway markings, operations, and signage. As a result, the range of possible interventions has grown significantly, making it impractical to list all of them in the document.

Instead, we propose that the TSP refer to a selection of authoritative sources that represent the professional consensus on best practices. These include:

- NACTO's *Urban Bikeway Design Guide*
- NACTO's *Urban Street Design Guide*
- NACTO's *Transit Street Design Guide*
- Metro's *Designing Livable Streets and Trails Guide*
- Oregon Department of Transportation's *Blueprint for Urban Design*

This approach will help streamline the document while ensuring alignment with the latest standards and practices as they evolve over the lifespan of the TSP.