



To: Members of the Advisory Committee for the City of Milwaukie's Transportation System Plan 2023-2025 Update

From: Laura Weigel, Planning Manager

Date: May 10, 2024, for Thursday, May 16, 2024, TSPAC Meeting #4

Subject: Meeting Materials

Dear Committee Members,

I hope you all are enjoying this burst of summer after slogging through the last few weeks!

The focus of our meeting and will be the draft:

- Analysis Methodology and Performance Measures Memorandum
- Livable Streets memo

I'll warn you that the Performance Measures memo is really technical and wonky, so it might be challenging to digest. We'll do our best to walk you through it during our meeting. The Livable Streets memo is rooted in the City's [adopted TSP](#), so I encourage you to take a look at the chapters referenced in the memo.

Following up from our last meeting in February - Staff revised the draft goals and policies based on feedback from the Advisory and Technical Committees and shared that draft at the community workshop that was held on March 21. The goals and policies were also vetted through a community survey. The goals and policies were then revised again based on community feedback and will be reviewed by the Planning Commission on Tuesday, May 14. You can see the revisions as well as a summary of the event and survey in the Planning Commission packet [here](#).

We thank you once again for dedicating your time and energy to this process and are excited to be developing a transportation system that benefits all Milwaukie residents. Should you have any questions or require further information, please do not hesitate to reach out.

Sincerely,

Laura Weigel, AICP
Planning Manager

Attachments:

Exhibit A. *Draft* Analysis Methodology and Performance Measures Memorandum

Exhibit B. *Draft* Livable Streets Memo

DRAFT ANALYSIS METHODOLOGY AND PERFORMANCE MEASURES MEMORANDUM

| | |
|-----------------|--|
| Date: | May 9, 2024 |
| To: | TSP Advisory and Technical Committees |
| From: | Kittelson & Associates, Inc. |
| Project: | Milwaukie Transportation System Plan |
| Subject: | Analysis Methodology and Performance Measures Memorandum |

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INTRODUCTION

Oregon Administrative Rule (OAR) 660-012, also known as the Transportation Planning Rule (TPR) provides requirements for Oregon jurisdictions creating and updating transportation system plans. The TPR was updated by the Oregon Department of Land Conservation and Development (DLCD) in 2022 and 2023 to implement the Climate-Friendly and Equitable Communities (CFEC) program. The CFEC program expanded upon the previous transportation system planning requirements, placing new emphasis on equity-based engagement efforts, and requiring a new performance-based transportation planning approach to help Oregon achieve its climate pollution goals.

As a component in the development of a new Milwaukie Transportation System Plan (TSP), this memorandum contains the following:

- Summation of the new performance-based planning requirements contained within the new CFEC rules. In particular, the new rules require the selection of performance standards for selecting and prioritizing the various modal-based transportation planning projects.
- Preliminary recommendations for specific performance standards that should be considered as part of the new TSP.
- Documentation of the intended methodology and assumptions that will be used to complete the various technical components of the TSP. This information is summarized primarily for review purposes by partnering agencies prior to beginning the technical analysis in the upcoming Transportation System Conditions and Needs/Gaps Analysis. Given the mainly informative and technical nature of this information, the methodology and assumptions are included in *Appendix A*.

PERFORMANCE-BASED APPROACH TO TSP DEVELOPMENT

Recent changes to the (TPR) ([OAR 660-012](#)) require a performance-based approach to TSP development in metropolitan areas. The performance-based approach is rooted in the need to ensure local and regional transportation planning efforts are helping Oregon achieve its goals for reducing climate pollution. For Milwaukie's new TSP, this includes:

1. Supporting the performance measures and targets from an approved regional scenario plan developed to address [OAR 660-044](#) greenhouse gas reduction target requirements. Cities, counties and Metro must report progress towards achieving the targets. ([-0900](#), [0905](#) and [-0910](#))
2. Identifying and applying local performance measures and/or evaluation criteria based on the jurisdiction's goals and objectives to identify needs, evaluate alternatives, and develop the modal plans. These should include performance measures the jurisdiction is considering to adopt as performance standards.
3. Adopting two or more performance standards to apply to subsequent comprehensive plan amendments (including TSP updates) and land use decisions (including site development). These shall be supportive of achieving the performance targets from the approved regional scenario plan.
4. Prioritizing projects utilizing a framework that incorporates prioritization factors established in the TPR and considering local evaluation criteria. ([-0155](#), [-0520](#), [-0620](#), [-0720](#), [-0820](#))

Table 1 defines terms related to the performance-based approach for implementing the TPR. Following the table definition summary is a more detailed explanation of the terms and how they apply to the Milwaukie TSP update effort. Appendix B includes the OARs most frequently referenced in this memorandum.

Table 1. Definitions for the Performance-Based Approach to TSP Development

| Term | Definition | Application to the Milwaukie TSP |
|----------------------|--|--|
| Performance Measures | Indicators used to evaluate the performance of the transportation system under existing and future conditions. They can be used to establish baselines, forecast performance of the planned system, and to track progress over time. | Milwaukie will be required to report progress on performance measures identified in Metro's <i>2023 Regional Transportation Plan under the Climate Smart Strategy performance measures</i> . The required performance measures can be supplemented with local performance measures and/or evaluation criteria based on TSP goals and objectives to inform development of the TSP. |
| Performance Targets | Future year targets set for performance measures to compare against reported annual progress. | Performance targets must be set by Milwaukie at levels that are reasonably likely to achieve the regional greenhouse gas (GHG) reduction targets. In Milwaukie's case, the Metro 2023 <i>Regional Transportation Plan</i> has already identified targets for each of the selected performance measures. These are identified later in this memorandum (see Table 2). |

| Term | Definition | Application to the Milwaukie TSP |
|------------------------|---|---|
| Performance Standards | An adopted performance standard based on performance measures used to develop the TSP and containing specified thresholds that are used to determine transportation deficiencies and to review comprehensive plan and land use regulation amendments. | Milwaukie must adopt at least two transportation performance standards. At least one transportation performance standard must support increasing transportation options and avoiding principal reliance on the automobile. Performance standards can be selected by the City, but shall be supportive of achieving the Metro performance measures and targets in the <i>Metro 2023 Regional Transportation Plan</i> . |
| Thresholds | Performance level set for a Performance Standard to determine adequacy and if the standard is met. | Thresholds can be set for different facility types, location, or other factors. |
| Evaluation Criteria | Used to compare alternatives, select and prioritize projects | Milwaukie will set these based on TSP goals and objectives. |
| Prioritization Factors | Factors specified in the TPR that shall be used for prioritizing projects by mode, in specific areas, and systemwide. | Milwaukie must prioritize specific types of projects to improve access, equity, and safety, among other factors. These can be supplemented with local prioritization factors. |

Performance Measures

Consistent with [-0900](#), [0905](#) and [-0910](#), the City of Milwaukie will be required to coordinate its planning process with Metro's Climate Smart Strategy performance measures documented in the [Metro 2023 Regional Transportation Plan](#). The following Table 2 documents the current implementation and performance monitoring results from the *Metro 2023 Regional Transportation Plan*.

These measures should be considered or evaluated, if needed, during the existing and future conditions analysis to establish baselines for the performance measures, establish targets for the -0905 performance measures if a target has not been set already, and identify needs. They should influence modal plan development and be used to evaluate future performance of the system.

Table 2. Metro 2023 RTP Climate Smart Strategy Implementation and Performance Monitoring

| | Climate Smart Strategy Baseline (2010) | Climate Smart Strategy Monitoring Target (2035) | 2023 RTP Base Year (2020) | RTP 23 +STS Target Scenario Constrained (2045) |
|---|--|--|------------------------------|---|
| <i>1. Implement the 2040 Growth Concept and local adopted land use and transportation plans</i> | | | | |
| a. Share of households living in a walkable mixed used development in the UGB | 26% | 37% | 29% | 37% |
| b. New residential units built through infill and redevelopment in the UGB ¹ | 58% | 65% | TBD | 75% |
| c. New residential units built on vacant land in the UGB ¹ | 42% | 35% | TBD | 25% |
| d. Acres of urban reserves ¹ | Not applicable | 12,000 | Not applicable | TBD |
| e. Daily vehicle miles per capita | 19 | 17 | 15 | 10 |
| <i>2. Make transit convenient, frequent, accessible and affordable</i> | | | | |
| a. Daily transit service revenue hours (excluding C-TRAN service hours) | 4,900 | 9,400 | 7,390 | 10,192 |
| b. Share of households within 1/4-mile all day frequent transit service | 30% | 37% | 44% | 41% |
| c. Share of low-income households within 1/4-mile all day frequent transit service | 39% | 49% | 74% | 82% |
| d. Share of employment within 1/4-mile all day frequent transit service | 41% | 52% | 64% | 67% |
| <i>3. Make biking and walking safe and convenient</i> | | | | |
| a(1). Daily trips made walking | 505,000 | 768,000 | 1,416,311 | 2,129,413 |
| a(2). Daily trips made biking | 179,000 | 280,000 | 91,000 | 121,552 |
| b(1). Per capita biking miles per week | 2.1 | 3.4 | 1.1 | 1.3 |
| b(2). Per capita pedestrian miles per week | 1.3 | 1.8 | 2.8 | 3.3 |
| c(1 and 2). See 4a(2) and 4a(3) below | See 4a(2) and 4a(3) below | | | |
| d(1). New miles of bikeways ² | 623 existing miles | 421 | 626 existing miles | 76 |
| d(2). New miles of sidewalks ² | 5072 existing miles | Data not available | TBD | 59 |

| | Climate Smart Strategy Baseline (2010) | Climate Smart Strategy Monitoring Target (2035) | 2023 RTP Base Year (2020) | RTP 23 +STS Target Scenario Constrained (2045) |
|---|--|--|------------------------------|---|
| d(3). New miles of regional trails ² | 229 existing miles | 140 | 247 existing miles | 80 |
| 4. Make streets and highways safe, reliable | | | | |
| a(1). Fatal and severe injury crashes - motor vehicles ³ | 398 | 199 | 433 | No forecast data |
| a(2). Fatal and severe injuries – pedestrians ³ | 63 | 32 | 78 | No forecast data |
| a(3). Fatal and severe injuries - bicyclists ³ | 35 | 17 | 26 | No forecast data |
| b. Change in travel time and reliability in regional mobility corridors | Data not available | Not evaluated | Data not available | No forecast data |
| c. Share of freeway lanes blocking crashes cleared within 90 minutes | Data not available | 100% | Data not available | No forecast data |
| 5. Use technology to actively manage the transportation system | | | | |
| a. Share of arterial delay reduced by traffic management strategies | 10% | 35% | Data not available | No forecast data |
| b. Share of regional transportation system covered with system management/TSMO | Data not available | Data not available | Data not available | No forecast data |
| 6. Provide information and incentives to expand the use of travel options | | | | |
| a. Share of households participating in individual marketing | 9% | 45% | 0.3% | 0.6% |
| b. Share of workforce participating in commuter programs | 20% | 30% | 17% | 14% |
| 7. Manage parking to make efficient use of vehicle parking and land dedicated to parking | | | | |
| a(1). Share of work trips occurring in areas with actively managed parking | 13% | 30% | TBD | TBD |
| a(2). Share of non-work trips occurring in areas with actively managed parking | 8% | 30% | TBD | TBD |
| 8. Support transition to cleaner low carbon fuels, efficient fuels and pay-as-you-go insurance | | | | |
| a(1). Share of registered passenger cars that are electric or plug-in-hybrid electric | 1% | 8% | 3% | 48% |

| | Climate Smart Strategy Baseline (2010) | Climate Smart Strategy Monitoring Target (2035) | 2023 RTP Base Year (2020) | RTP 23 +STS Target Scenario Constrained (2045) |
|--|--|--|--|---|
| a(2). Share of registered light trucks that are electric or plug-in-hybrid electric | 1% | 2% | 2% | 9% |
| b. Share of households using pay-as-you-go insurance | 1% | 40% | 6% | 91% |
| 9. Secure adequate funding for transportation investments | | | | |
| a. Address local, regional, and state transportation funding gap | Not evaluated | | Regional funding discussions are ongoing | |
| 10. Demonstrate leadership on climate change | | | | |
| a. Region-wide annual tons per capita greenhouse gas emissions (MTCO2e) from household light-duty vehicles within the Target Rule area | Not evaluated | | 2.3 | 0.36 |
| b. Region-wide annual tons per capita greenhouse gas emissions (MTCO2e) from all vehicles within the Target Rule area | Not evaluated | | TBD | |

Table Notes:

1. Data is derived from the 2018 Urban Growth Report adopted by the Metro Council in Dec. 2018.
2. Climate Smart Strategy target reflects number of miles of new bikeways, sidewalks and trails for projects in the 2014 RTP. 2023 RTP values reflect number of miles of new bikeways, sidewalks and trails for projects on planned regional networks in the 2023 RTP.
3. Climate Smart Strategy target reflects the 50 percent reduction target adopted in 2014 RTP. The 2023 RTP includes a target of zero fatal and severe injury crashes by 2035. The region does not currently have a safety predictive model to forecast this information, but will track progress toward the target through periodic RTP updates as required by federal transportation performance management requirements. Data shown for 2023 RTP Base Year (2020) reflects the annual average number of fatal and severe injury crashes reported by the Oregon Department of Transportation for the years 2016-2020.

Source: Metro 2023 Regional Transportation Plan Draft Climate Smart Strategy Implementation and Performance Monitoring

Performance Standards

Performance standards are selected from performance measures used to develop the TSP and contain specified thresholds. Performance standards are adopted metrics used to review comprehensive plan and land use regulation amendments and analyze transportation impacts as part of development review.

[OAR 660-012-0215\(3\)](#) requires Milwaukie to adopt at least two transportation performance standards. Historically, performance standards have been heavily focused on the accommodation of vehicular travel such as level of service (a vehicular delay-based standard) or volume to capacity (a roadway/intersection-based capacity standard). Under the new rules, at least one of the new transportation performance standards must support increasing transportation options and avoiding principal reliance on the automobile. The performance standards must also support achieving the targets for the performance measures from the Climate Smart Strategy section of the Metro 2023 Regional Transportation Plan developed to address OAR 660-044 greenhouse gas reduction requirements. Additionally, the performance standards must evaluate at least two of the following objectives for the transportation system, for any or all modes of transportation:

1. Reducing climate pollution: creating feasible transportation options that reduce carbon emissions
2. Equity: consideration for existing or proposed transportation-related disparities and barriers experienced by historically underserved populations
3. Safety: providing a transportation system that reduces injuries and fatalities and that people feel comfortable using
4. Network connectivity: modal networks that provide route options to users and minimize out-of-direction travel
5. Accessibility: the ease of reaching (and interacting with) destinations or activities distributed in space
6. Efficiency: the maximization of transportation services at the lowest possible cost
7. Reliability: dependably provides users with a consistent range of predictable travel times
8. Mobility: the ability to move freely and easily

The performance standards could be based on a measure from the Metro Climate Smart Strategy or measures identified based on the city's TSP goals and objectives. While multiple performance measures will be considered during the development of the TSP, two or more need to be adopted as standards.

Table 3 shows the performance measures that have been included in a toolkit in ODOT's Analysis Procedures Manual to identify and select performance standards to meet the TSP requirements in [OAR 660-12-0215](#). Jurisdictions may adopt performance standards based on different measures; however, these have been identified as good candidates for the City of Milwaukie based on their ability to document incremental changes impacted by projects, plan amendments, site developments and mitigations, their overall flexibility, ease of application and potential data availability. Table 3 also identifies the [OAR 660-012-0215\(3\)](#) objectives that the potential performance standards could have a primary impact upon (the two adopted standards must collectively address two or more of these) and which potential performance

standards would support increasing transportation options and avoiding principal reliance on the automobile (at least one performance standard must meet this criteria). Additional information on each of these potential performance standards is included in ODOT's Analysis Procedures Manual.

Table 3. Candidate Performance Measures for Adopting as Performance Standards

| Performance Measures | OAR 660-012-0215(3) Objectives with Primary Impact | Supports increasing transportation options and avoiding principal reliance on the automobile? |
|---|---|--|
| Accessibility to key destinations | Accessibility, Equity | Yes |
| Accessibility to employment | Accessibility, Equity | Yes |
| Accessibility to transit | Accessibility, Equity | Yes |
| Bicycle level of traffic stress (BLTS) | Accessibility | Yes |
| Pedestrian level of traffic stress (PLTS) | Accessibility | Yes |
| System completeness | Network Connectivity, Accessibility | Yes |
| Bicycle crash risk | Safety | Yes |
| Pedestrian crash risk | Safety | Yes |
| Walking and biking facility condition | Accessibility | Yes |
| Pedestrian crossing spacing | Network Connectivity, Accessibility | Yes |
| AADT/capacity | Efficiency, Mobility | No |
| Hours of congestion/Duration of congestion | Efficiency, Reliability, Mobility | No |
| Level of service | Efficiency, Reliability, Mobility | No |
| Queuing | Mobility | No |
| Existing and predicted total crashes | Safety | No |
| Travel speed | Efficiency, Mobility | No |
| Vehicle hours traveled (VHT) | Reducing Climate Pollution | No |
| Household-based vehicle miles traveled (VMT) per capita | Reducing Climate Pollution | No |
| Volume-to-capacity ratio (V/C) at Intersections | Efficiency, Mobility | No |
| V/C for roadway links | Efficiency, Mobility | No |

When selecting measures to adopt as performance standards, the City of Milwaukie needs to consider the following criteria:

- Does the standard help support progress for at least one of the [OAR 660-012-0215\(3\)](#) objectives? If so, which ones?
- Does the standard support increasing transportation options and avoiding principal reliance on the automobile? (One of the two measures must meet this criterion.)
- Can the City support the staff time or consultant time and expense to report on the standard or review the impact of the standard for transportation projects and land use and development applications?
- Does the City have the data available? If not, can they collect the necessary data and will they have the resources needed to do so?
- Does the standard support progress towards the TSP goals and objectives and support achieving the targets for the performance measures from the Metro Regional Transportation Plan? If so, which ones? Greater consideration could be given to standards that address multiple goals and performance measures.
- What will the thresholds be for the standard and will they create outcomes desired by the community?
- What standards do partner and neighboring agencies use and is there a benefit in coordinating standards? How will the two or more selected standards work together? Per [OAR 660-012-0215\(3\)](#), updated Transportation System Plans “must clearly establish how to apply the multiple performance standards to a proposal that meets some, but not all, of the transportation performance standards.”

Recommended City of Milwaukie Performance Standards

The City of Milwaukie currently has a level of service (LOS) D standard¹ during the peak operating conditions for all intersections that fall within the City's jurisdiction. Keeping LOS as a performance standard or switching to a volume to capacity-based standard² will help the City to continue to support the goals of efficiency, reliability, and mobility by monitoring the degradation of intersection delay/capacity and identify the need for future development projects to maintain that standard.

The non-vehicular-based performance measures documented in Table 4 are recommended for consideration as part of development of the new TSP process. These performance standards would equip the city with tools to review and address comprehensive plan amendments, land use regulation amendments, and development applications while supporting the broader goals of network connectivity, accessibility, and equity.

¹ LOS D refers to a stable flow of traffic where vehicular volumes are near capacity at an intersection and the density of traffic restricts maneuverability and slows speeds. A LOS D standard indicates that intersections must be designed to operate at this level or better during peak traffic conditions.

² Volume to capacity standards compare how many vehicles use an intersection compared to how many vehicles could use the intersection over a time period.

Table 4. Potential Performance Standards Supporting Increasing Transportation Options

| Potential Performance Standard | OAR 660-012-0215(3) Objectives with Primary Impact | Key Considerations |
|---|--|---|
| System Completeness | Network Connectivity, Accessibility | <p>System completeness is often reviewed at the system-wide level but can be viewed at the facility level. This metric is easily understood by the public and can support a broad range of goals.</p> <p>The TSP will include modal maps and identify gaps in the system as well as information about total miles of pedestrian and bicycle facility and the number of transit routes and stops in the City.</p> |
| Bicycle Level of Traffic Stress (BLTS) | Accessibility | <p>BLTS is well suited for high-level plans and has a direct connection to roadway characteristics. Most of the data points needed to calculate BLTS are readily available in the City's dataset for most roads. Data collection overlaps with PLTS and could be completed in tandem.</p> <p>BLTS 2 is often used as a target because it appeals to the majority of the potential bike-riding population. BLTS 1 is desired within ¼ mile of schools,</p> <p>The TSP will evaluate the percentage of collector and arterial streets that are rated BLTS 1 or 2.</p> |
| Pedestrian Level of Traffic Stress (PLTS) | Accessibility | <p>PLTS is well suited for high-level plans and has a direct connection to roadway characteristics. Most of the data points needed to calculate PLTS are readily available in the City's dataset for most roads. Data collection overlaps with BLTS and could be completed in tandem.</p> <p>PLTS 2 is often used as a target because it appeals to the majority of users. PLTS 1 is the preferred target within ¼ miles of schools and in land uses including downtown cores, medical facilities, areas near assisted living/retirement centers, and within ¼ mile of transit stops.</p> <p>The TSP will evaluate the percentage of collector and arterial streets that are rated PLTS 1 or 2.</p> |
| Accessibility to Transit | Accessibility, Equity | <p>Accessibility to transit helps to compare transit system alternatives. Developing a complete and usable and that includes scheduling and routing data can be cumbersome, so partnership with TriMet would be needed to establish base data for evaluation.</p> <p>Common distances used as analysis factors for walking and biking to/from transit stops are ¼ mile and 1 mile, respectively.</p> <p>The TSP will evaluate the percentage of the City that is within ½ and ¼ mile of transit.</p> |

Additional details on the strength and limitations of these, and other, potential performance standards are included in *Appendix C: Draft Performance Measure and Performance Standard Application Guidance*.

Prioritization Framework

In Milwaukie, the TPR includes requirements for how to prioritize projects within each modal plan, in specific areas, and for the system as a whole. An approach is to prioritize the projects in each modal plan first, assess whether the required priorities in specific areas are met, and then develop the financially-constrained project list for all modes and verify that it prioritizes the required systemwide outcomes.

Step 1: Mode Specific Prioritization Factors

Pedestrian and Bicycle System Prioritization Factors (-0520 and -0620)

When prioritizing pedestrian and/or bicycle system projects systemwide, higher prioritization shall be given to projects that:

- Are located in climate-friendly areas.
- Are located in areas with concentrations of underserved populations.
- Are located in areas with pedestrian and/or bicycle safety risk factors such as roadways with high speeds and high traffic volumes.
- Are located in areas with reported crashes involving serious injuries and deaths to pedestrians and/or people riding bicycles.
- Provide access to key pedestrian and/or bicycle destinations identified as provided in OAR 660-012-0360.
- Connect to, fill gaps in, and expand the existing pedestrian and/or bicycle system networks.
- Implement, where applicable, the adopted regional scenario plan developed to address OAR 660-044 greenhouse gas reduction targets.

Transit System Prioritization Factors (-0720)

When prioritizing transit system projects, higher prioritization shall be given to projects that:

- Are located in climate-friendly areas
- Are located in areas with concentrations of underserved populations
- Provide access to key public transportation destinations identified as provided in OAR 660-012-0360
- Connect to, fill gaps in, and expand the existing public transportation network
- Implement, where applicable, the adopted regional scenario plan developed to address OAR 660-044 greenhouse gas reduction targets.

Street and Highway System Prioritization Factors (-0820)

When prioritizing street and highway system projects, higher prioritization shall be given to projects that:

- Reallocate right-of-way from facilities dedicated to moving motor vehicles to those for use by the pedestrian, bicycle, and public transportation systems, particularly in climate-friendly areas, areas with concentrations of underserved populations, and areas with reported crashes involving serious injuries and deaths.
- Fill gaps in the existing street network.
- Implement, where applicable, the adopted regional scenario plan developed to address OAR 660-044 greenhouse gas reduction targets or help meet the performance targets per -0910.

Step 2: Area Specific Prioritization Factors

Jurisdictions should review the priority projects in the areas described below to verify that the required priorities for these areas and priority users are addressed.

- Within CFA's
 - Agencies shall prioritize pedestrian, bicycle, and public transportation facilities and services and ensure planned facilities are safe, low stress, and comfortable for people of all ages and abilities.
- In areas with concentrations of underserved populations
 - Agencies shall prioritize projects addressing historic and current marginalization and work to rectify previous harms and prevent future harms from occurring.
- In industrial areas, along routes accessing key freight terminals, and other areas where accommodations for freight are needed
 - Agencies must consider the needs of freight users. Pedestrian, bicycle, and public transportation system connections must be provided in industrial areas at a level that provides safe access for workers.
- In areas near schools or areas with expected concentrations of children, older people, or people with disabilities
 - Agencies must prioritize safe, protected, and continuous pedestrian and bicycle networks connecting to key destinations, including transit stops.

Step 3: TPR Required Prioritization Factors (-0155(3))

Jurisdictions should develop their combined prioritized project list for their financially-constrained plan and verify that it prioritizes the these systemwide outcomes

- Meeting greenhouse gas reduction targets
- Improving equitable outcomes for underserved populations
- Improving safety, particularly reducing or eliminating fatal and serious injuries
- Improving access for people with disabilities
- Improving access to key destinations
- Completing the multimodal transportation network (filling gaps, making connections)
- Supporting the economies of the community, regional, and state
- Other local factors

CONNECTION BETWEEN PRIORITIZATION FACTORS AND THE TSP GOALS

Table 5 connects the prioritization framework above to the goals identified in Milwaukie's current Vision, Goals, and Policies memorandum. These performance measures will be used to evaluate existing and future conditions, identify needs and solutions, and will influence project prioritization.

Table 5. Prioritization Factors and TSP Goals

| Goal | Goal Statement | Prioritization Factor |
|---|--|---|
| Safety | Improve the safety and comfort of the multimodal transportation network. | <ul style="list-style-type: none">• Improve safety, particularly reducing or eliminating fatalities and serious injuries• Pedestrian and/or bicycle system projects are prioritized if they are located in areas with pedestrian and/or bicycle safety risk factors such as roadways with high speeds and high traffic volumes and/or are located in areas with reported crashes involving serious injuries and deaths to pedestrians and/or people riding bicycles |
| Active, Healthy, Transportation Choices | Establish and/or complete a network of multimodal facilities that make walking, biking, and rolling an attractive, comfortable, healthy, and convenient choice for people of all ages and abilities. | <ul style="list-style-type: none">• Complete the multimodal transportation network, including filling gaps and making connections• Projects in an industrial area create or improve pedestrian, bicycle, and public transportation system connections at a level that provides safe access for workers• Pedestrian and/or bicycle projects that connect to, fill gaps in, and expand the existing pedestrian and/or bicycle system networks• Projects in Climate Friendly Areas that improve existing or provide new pedestrian, bicycle, and public transportation facilities and services, or create safe, low stress, and comfortable travel via walking, rolling, cycling, and public transportation for people of all ages and abilities with minimal interference from motor vehicle traffic |
| Mobility, Accessibility, and Connectivity | Provide an efficient and well-connected multimodal transportation system that works to connect the community to key destinations. | <ul style="list-style-type: none">• Improve access for people with disabilities• Improve access to destinations, particularly key destinations as identified in OAR 660-012-0360• Projects in areas near schools or other locations with expected concentrations of children or areas with expected concentrations of older people or people with disabilities that provide safe, protected, and continuous pedestrian and bicycle networks connecting to key destinations, including transit stops• Pedestrian and/or bicycle system projects that provide access to key pedestrian and/or bicycle destinations identified as provided in OAR 660-012-0360 |
| Coordination with Local, Regional, and State Partners | Foster and maintain relationships with public and private partners in the common interest of enhancing the city's transportation network. | <i>Prioritization factors do not directly relate to this goal, however local, regional, and state partners will be engaged in the TSP development process.</i> |
| Resiliency | Develop a multimodal transportation system that provides travel options during normal conditions, natural disasters, or emergencies. | |
| Parking | Reduce land used for parking to achieve local, state and regional parking goals while also managing parking impacts. | |
| Fiscal Stewardship and System Management | Make the most of transportation resources by leveraging available funding opportunities, preserve existing infrastructure, and reduce system maintenance costs. | <ul style="list-style-type: none">• Align with the functional classification of planned or existing transportation facilities or segments |
| Economic Vitality | Develop a transportation system that supports and facilitates economic activity through the efficient movement of people, goods, and services. | <ul style="list-style-type: none">• Support the economies of the community, region, and state• Projects in Industrial Areas, along routes accessing key freight terminals, and other areas where accommodations for freight are needed that consider the needs of freight users |
| Equity | New investments in Milwaukie's transportation system are distributed fairly to reduce or eliminate transportation-related barriers and disparities, especially those experienced by marginalized or underserved populations. | <ul style="list-style-type: none">• Improve equitable outcomes for underserved populations, as identified in OAR 660-012-0125• Projects in areas with high concentrations of underserved populations that address historic and current marginalization and/or work to rectify previous harms and prevent future harms from occurring. These areas may have suffered from disinvestment or harmful investments, including transportation system investments. Such harms include but are not limited to displacement, increased exposure to pollutants, |

| Goal | Goal Statement | Prioritization Factor |
|------------------|--|--|
| | | <ul style="list-style-type: none">destruction and division of neighborhoods, heat islands, and unsafe conditions for pedestrians, cyclists, transit users, and others.• Pedestrian and/or bicycle system projects that are located in areas with concentrations of underserved populations |
| Climate Friendly | Develop a transportation system that works to minimize pollution and reduce impacts to the environment and climate change. | <ul style="list-style-type: none">• Support meeting greenhouse gas reduction targets, including:• Reduce household-based vehicle miles traveled per capita to meet greenhouse gas reduction targets provided in OAR 660-044-0020 or OAR 660-044-0025[1];• Support compact, pedestrian-friendly patterns of development in urban areas, particularly in climate-friendly areas;• Reduce single-occupant vehicle travel as a share of overall travel; and• Support meeting performance targets set for required performances measures for reporting (see Performance Measures for Reporting).• Pedestrian and/or bicycle system projects that are located in climate-friendly areas |
| Transit Forward | Make public transit service more viable. | <ul style="list-style-type: none">• Transit elements incorporated in Equity and Mobility, Accessibility, and Connectivity measures. |

NEXT STEPS

This memorandum will be reviewed by the Transportation System Plan Technical and Advisory Committees, Transportation Planning Analysis Unit, and Region 1 Traffic Section. After obtaining approval of the analysis methodology the project team will begin the transportation system conditions needs analysis.

APPENDIX A – MILWAUKIE TSP METHODOLOGY AND ASSUMPTIONS

Study Area

The study area for the Milwaukie TSP update is defined as the City of Milwaukie boundaries. The study area does not include areas that are in the Urban Growth Management Areas (Figure 1).

Data

Information contained within the City GIS, Metro Regional Land Information System, or other publicly available databases and imagery will be utilized for the existing transportation system conditions analysis. No new data will be collected for this element of the TSP update.

Analysis Methodology

This section documents the analysis methodology associated with the existing and future conditions analyses.

Land Use and Population Analysis

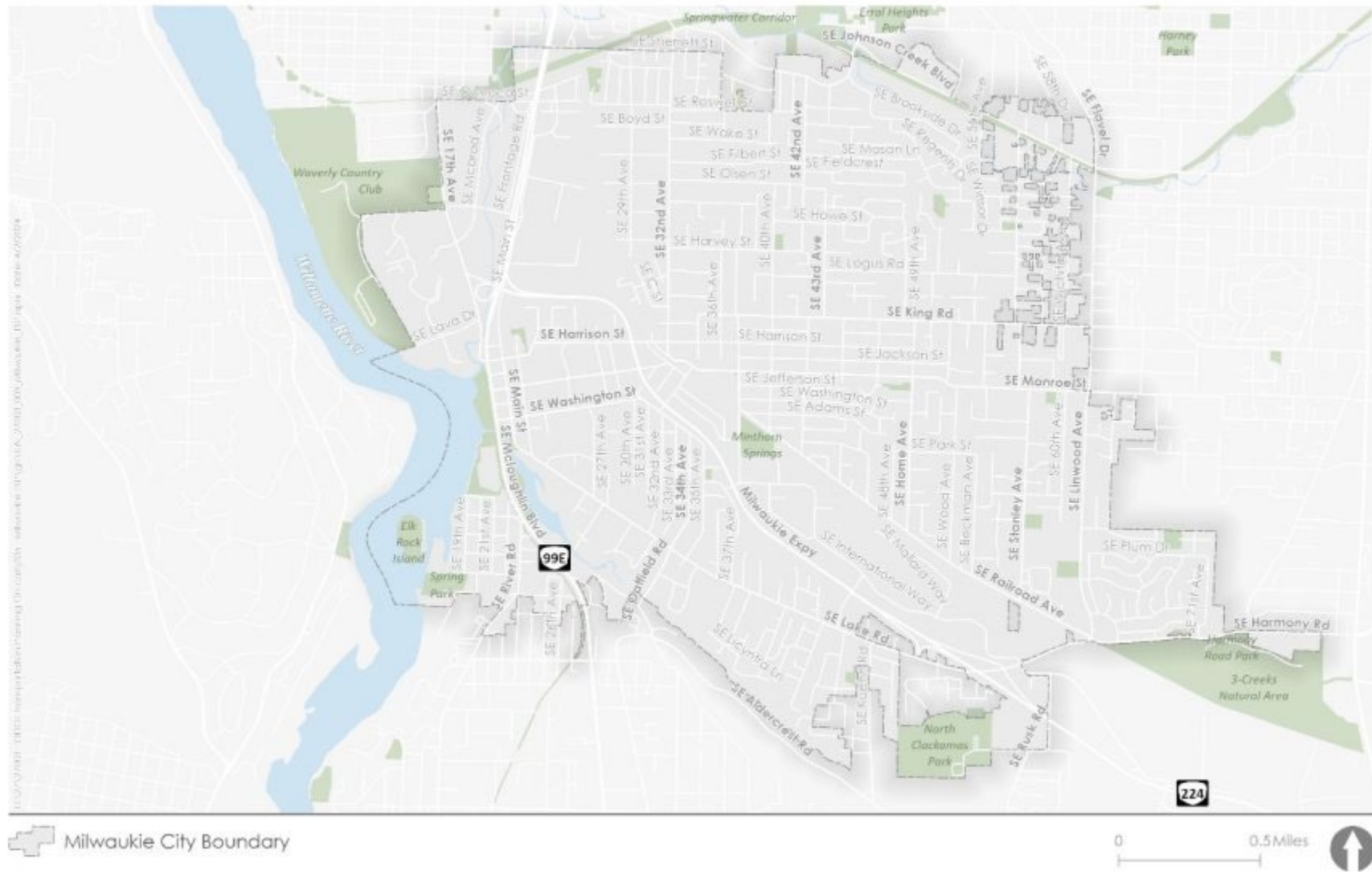
Current population locations and characteristics will be summarized according to most recent American Community Survey data and City GIS data. This will include:

9. Summaries of the locations of underserved and transportation-disadvantaged populations in Task 2.
10. Existing land uses including total land area by Comprehensive Plan Designation and Zoning and the locations and amounts of buildable lands by Comprehensive Plan Designation and Zoning.
11. Maps of identified activity centers and key destinations as identified and provided in GIS by City staff.
12. General characterization of the type of trips and seasonal variations in trips generated by activity centers.

Metro Model Versions/Assumptions

Metro, ODOT, and DKS Associates are currently working on a case study project for Milwaukie that is evaluating how to use the Metro regional travel demand model to comply with CFEC rules for jurisdictions within the region. The case study is anticipated to provide information supporting climate analyses, including greenhouse gas emissions and vehicle miles traveled. The Milwaukie TSP will document the findings of this study pending the timeframe and outcomes of that effort.

Figure 1: Study Area



Enhanced Review Process

Oregon Administrative Rule (OAR) 660-012-0830 requires enhanced review of select roadway projects when preparing a new or updated TSP. The enhanced review process applies to the City of Milwaukie as it is located within Metro. A new step in the preparation of TSPs, the enhanced review process applies specifically to existing planned TSP projects or new proposed TSP projects that fall under one of the following categories:

- New or extended arterial street, highway, or freeway projects that would carry vehicle traffic;
- New or expanded interchanges;
- An increase in the number of general purpose travel lanes for an existing arterial or collector street, highway, or freeway; and
- New or extended freeway auxiliary lanes.

If there are currently planned or anticipated new TSP projects that would meet the enhanced review criteria, the new process would require local agencies to develop new alternative projects to determine if these alternatives could substantially address the identified need without implementation of the roadway projects.

As part of this task, the Project Team, in coordination with ODOT and the Department of Land Conservation and Development (DLCDD), has reviewed the list of projects from the existing 2018 *Milwaukie TSP* and the *Metro 2023 Regional Transportation Plan (RTP)*. Based on this review, there are no currently planned projects that are likely to trigger enhanced review.

Livable Streets

The livable streets analysis and recommendations will identify standard cross-sections and right-of-way needs based on the land use context for the local street functional classifications.

Livable streets will reflect Metro's *Designing Livable Streets and Trails Guide* and ODOT's *Highway Design Manual*. Recommendations will include recommended changes to the City's Code as needed to support the local street and greenway standards.

Parking

OAR 660-012-0415 identifies that cities with populations over 25,000 within the Portland Metropolitan Area shall set parking maximums in Metro Region 2040 centers. According to the United States Census Bureau, the City of Milwaukie has a population of 21,375 (2022), therefore the requirement to identify parking maximums does not currently apply.

The TSP will include recommendations for locations of parking and charging stations for vehicles and bicycles.

Multimodal Analysis

The existing conditions inventory, needs determination, and solutions assessment will be consistent with the elements required under [OAR 600-012-0150](#). Table 6 documents the “shall” statements required for cities and counties within metropolitan areas, which will be evaluated where there is available data and ability to evaluate based on the project scope and budget. Where there is no available data (e.g. data about the condition of bicycle facilities) or the evaluation goes beyond the project scope and budget, the TSP update will identify the need for additional data collection in the future. Items **bolded** in the table below are anticipated to be evaluated as part of this TSP update based on scope, budget, and available data.

Table 6. Transportation System Needs and Gaps Analysis According to OAR 660-020-0150³

| Mode | Facility Inventory | Needs Determination | Deficiencies Determination | Developing Solutions |
|---------|---|---|---|--|
| Bicycle | <ul style="list-style-type: none">• Identification of bicycle lanes, bicycle routes, accessways, paths, and other types of bicycle facilities, including pedestrian facilities that may be used by bicycles along bicycle boulevards and along all arterials and collectors within the planning area• Identification of bicycle facilities of all types within Climate-Friendly Areas, within Metro Region 2040 centers, within one-quarter mile of all primary and secondary schools, and on bicycle boulevards• Identification of the width, type, and condition of bicycle facilities• Identification of the consistency of bicycle facilities with applicable state, regional, and local standards• Identification of crash risk factors of inventoried bicycle facilities, including speed, volume, separation, and roadway width• Location of all reported injuries and deaths of people on bicycles from the most recent 5 years of available data• Identification of key bicycle destinations | <ul style="list-style-type: none">• Identification of the local, regional, and state standards for a complete bicycle system for people of all ages and abilities⁴• Evaluation of gaps and deficiencies in the bicycle network relative to standards, including missing bike lanes, narrow bike lanes, unmarked crossings, poor surface conditions, poor street lighting, roadway hazards, etc.• Evaluation of gaps in bicycle access to/from key destinations, including transit stops, schools, shopping areas, medical facilities, civic and recreational uses, and trails• Analysis of bicycle crash data and risk-based safety issues (see ODOT's Bicycle Safety Implementation Plan for additional information)• Evaluation of high bicycle fatality and serious injury crash locations | <ul style="list-style-type: none">• Evaluation of gaps in bicycle access to/from key destinations, including transit stops, schools, shopping areas, medical facilities, civic and recreational uses, and trails, based on future no-build condition and future land use conditions• Analysis of bicycle risk-based safety issues (see ODOT's Bicycle Safety Implementation Plan for additional information), based on future no-build condition and future land use conditions | <ul style="list-style-type: none">• Completeness of the bicycle network• Gaps and deficiencies in the bicycle facilities along all arterials and collectors• Gaps and deficiencies in the bicycle facilities along all streets (including local streets) within climate-friendly areas, within Metro Region 2040 centers, within one-quarter mile of all primary and secondary schools, and along designated bicycle boulevards• Gaps in the bicycle facilities that would link key community destinations (e.g., major employment centers, schools, parks, transit stops, intermodal facilities, and recreation areas)• Known safety issues in the bicycle network (specifically, crash history, noting fatal and severe injury crashes, or roadway characteristics such as number of lanes, speed, and volume of motor vehicles)• Enhanced facilities (above the minimum bicycle system requirements) where necessary or desirable• Bicycle facility design standards for arterials, collectors, and shared-use paths• Bicycle projects identified in other relevant state, regional, and local plans• Bicycle facilities with:<ul style="list-style-type: none">– Separated bike lanes (including cycle tracks)– Buffered bike lanes– On-street bike lanes– Shoulder bikeways– Shared roadway pavement marking and signs– Shared use paths• Enhanced bicycle crossings with:<ul style="list-style-type: none">– Bike boxes– Two-stage turn queue boxes– Intersection crossing markings– Median diverters |

³ This table was developed based on ODOT's draft Transportation System Plan Guidelines resource (<https://www.oregon.gov/odot/Planning/TSP-Guidelines/Pages/Prepare.aspx>) – the table is subject to change based on updates to the Transportation System Plan Guidelines.

⁴ The pedestrian and bicycle analyses will follow the Pedestrian Level of Traffic Stress (PLTS) and Bicycle Level of Traffic Stress (BLTS) analysis methodologies outlined in the APM. Both PLTS and BLTS methods group facilities into four different stress levels for segments, intersection approaches, and intersection crossings. Facilities with an LTS 1 rating have little to no traffic stress, require less attention, and are suitable for all users. Facilities with an LTS 2 rating have little traffic stress, but require more attention and therefore, may or may not be suitable for small children. Facilities with an LTS 3 rating have moderate traffic stress and are suitable for adults. Facilities with an LTS 4 rating have high traffic stress and are only suitable for able-bodied adults with limited options.

| Mode | Facility Inventory | Needs Determination | Deficiencies Determination | Developing Solutions |
|------------|--|--|---|---|
| | | | | – Protected intersections |
| Pedestrian | <ul style="list-style-type: none"> • Identification of sidewalks, crosswalks, shared-use paths, trails, and other types of pedestrian facilities along all arterials and collectors within the planning area • Identification of pedestrian facilities of all types within Climate-Friendly Areas, within Metro Region 2040 centers, and within one-quarter mile of all primary and secondary schools • Identification of the width, type, and condition of pedestrian facilities • Identification of crossing distances, type of crossing, closed crossings, curb ramps, and distance between crossings • Identification of the consistency of pedestrian facilities with applicable state, regional, and local design standards • Identification of crash risk factors of inventoried pedestrian facilities, including speed, volume, separation, and roadway width • Location of all reported injuries and deaths of people walking or using a mobility device from the most recent 5 years of available data • Identification of key pedestrian destinations | <ul style="list-style-type: none"> • Identification of the local, regional, and state standards for a complete pedestrian system¹ • Evaluation of gaps and deficiencies in the pedestrian network relative to standards, including missing sidewalks, narrow sidewalks, curb-tight sidewalks, poor sidewalk condition, poor street lighting, unmarked crossings, wide spacing between marked crossings, etc. • Evaluation of gaps in pedestrian access to/from key destinations, including transit stops, schools, shopping areas, medical facilities, civic and recreational uses, and trails • Pedestrian crash analysis and risk-based safety analysis • Analysis of pedestrian crash data and risk-based safety issues (see ODOT's Bicycle and Pedestrian Safety Implementation Plan for additional information) • Evaluation of pedestrian fatality and serious-injury crash locations • Evaluation of marked crossings, including location, spacing, treatments, etc. | <ul style="list-style-type: none"> • Evaluation of gaps in pedestrian access to/from key destinations, including transit stops, schools, shopping areas, medical facilities, civic and recreational uses, and trails, based on future no-build condition and future land use conditions • Analysis of pedestrian risk-based safety issues (see ODOT's Bicycle and Pedestrian Safety Implementation Plan for additional information), based on future no-build condition and future land use conditions • Evaluation of marked crossings, including location, spacing, treatments, etc., based on future no-build condition and future land use conditions | <ul style="list-style-type: none"> • Completeness of the pedestrian network • Gaps and deficiencies in the pedestrian network along all arterials and collector • Gaps and deficiencies in the pedestrian network along all streets (including local streets) within climate-friendly areas, within Metro Region 2040 centers, and within one-quarter mile of all primary and secondary schools • Gaps in the pedestrian facilities that would link key community destinations (e.g., major employment centers, schools, parks, transit stops, intermodal facilities, and recreation areas) • Known safety issues in the pedestrian network (specifically, crash history, noting fatal and severe injury crashes, or roadway characteristics such as number of lanes, speed, and volume of motor vehicles) • Enhanced facilities (above the minimum pedestrian system requirements) where necessary or desirable • Pedestrian facility design standards for arterials, collectors, and local streets • Pedestrian projects identified in other relevant state, regional, and local plans • Pedestrian facilities with: <ul style="list-style-type: none"> – Sidewalks – Landscape strips (protective buffers) – Pedestrian pathways/accessways – Pedestrian plazas – Shared-use paths and trails – Pedestrian scale lighting – Pedestrian amenities • Enhanced pedestrian crossings with: <ul style="list-style-type: none"> – High visibility pavement markings and signs – Raised median islands with pedestrian refuge – Flashing beacons (RRFBs, PHBs, etc.) – Curb extensions |
| Transit | <ul style="list-style-type: none"> • Identification of local and intercity transit service providers • Identification of fixed-route and dial-a-ride service areas and the location of fixed routes, major stations, and transit stops • Identification of service characteristics, such as days and hours of operation and service frequency | <ul style="list-style-type: none"> • Identification of the local, regional, and state standards for a complete public transportation system⁶ • Evaluation of gaps in the local transit network that serve key destinations, including schools, shopping areas, medical facilities, civic and recreational uses, and trails | <ul style="list-style-type: none"> • Evaluation of gaps in the local transit network that serve key destinations, including schools, shopping areas, medical facilities, civic and recreational uses, and trails, based on future no-build condition and future land use conditions • The item to evaluate “transit corridors, including priority and other transit corridors in areas with greater than 10,000 in population, | <p>The project team will coordinate with TriMet in preparation of transit solutions.</p> <ul style="list-style-type: none"> • Completeness of the public transportation network • Gaps and deficiencies in the public transportation network, including transit supportive facilities (e.g., stations, hubs, stops, shelters, signs, and ancillary features) • Gaps in the public transportation network that would link key community destinations (e.g., major |

⁶ The transit analysis will follow the qualitative multimodal assessment (QMA) methodology outlined in the APM. Transit QMA provides a qualitative “good”, “fair”, “poor” rating for transit service based on hours of service, service frequency, and service coverage.

| Mode | Facility Inventory | Needs Determination | Deficiencies Determination | Developing Solutions |
|---------|---|--|---|---|
| | <ul style="list-style-type: none"> • Identification of intercity bus and passenger rail terminals and park-and-ride stations • Identification of the location of transportation-disadvantaged and disabled populations, including areas with disproportionate concentrations of these populations • Identification of special service characteristics, such as bus rapid transit • Identification of transitways, transit lanes, transit priority signals, queue jumps, on-route charging, and other transit supportive facilities not otherwise inventoried • Identification of existing and planned transit trunk routes, exclusive transit ways, terminals and major transfer stations, major transit stops, and park-and-ride stations • The item to evaluate “the feasibility of developing a public transit system for areas within an urban area containing a population greater than 25,000 persons not currently served by transit” is not applicable⁵ • Identification of ADA accessibility to individual transit stops and services • Identification of key public transportation destinations | <ul style="list-style-type: none"> • The item to evaluate “transit corridors, including priority and other transit corridors in areas with greater than 10,000 in population “ is not applicable⁷. • Evaluation of transit supportive facilities on priority and other transit corridors, including stations, hubs, stops, shelters, signs, and ancillary features • Qualitative multimodal assessment of the public transit system (see ODOT's Analysis and Procedures Manual for technical guidance) • Assessment of transit stops for accessibility by disabled and safety for all riders, including the accessibility of amenities such as bus shelters | <p>based on future no-build condition and future land use conditions” is not applicable⁸.</p> <ul style="list-style-type: none"> • Evaluation of transit supportive facilities on priority and other transit corridors, including stations, hubs, stops, shelters, signs, and ancillary features, based on future no-build condition and future land use conditions • Qualitative multimodal assessment of the public transit system (see ODOT's Analysis and Procedures Manual for technical guidance), based on future no-build condition and future land use conditions | <p>employment centers, schools, parks, transit stops, intermodal facilities, and recreation areas)</p> <ul style="list-style-type: none"> • Gaps in the pedestrian and/or bicycle networks that limit access to/from existing or planned transit stops • Public transportation projects identified in other relevant transit agency plans |
| Roadway | <ul style="list-style-type: none"> • Document characteristics within the project limits of known roadway projects that will be moved into the updated TSP and that will be subject to an enhanced review process based on OAR 660-012-0830 (see Enhanced Review of Select Roadway Projects for more information) • Location of all publicly owned, operated, or supported streets • Identification of roadway ownership by jurisdiction • Identification of roadway classifications by jurisdiction, including federal, state, regional, and local classifications, as applicable • Identification of primary uses, and whether they serve local, regional, pass-through, or freight traffic • Identification of primary users of a facility, including whether users are primarily on | <ul style="list-style-type: none"> • Identification of the local, regional, and state standards for a complete street and highway system • Review state, regional, and local transportation/land use plans to identify roadway projects that will be moved into the updated TSP and that will be subject to an enhanced review process based on OAR 660-012-0830 (see Enhanced Review of Select Roadway Projects for more information) • Evaluation of local street design standards according to applicable state and regional standards and guidelines • Comparison of roadway characteristics (travel lane widths, shoulder/bike lane widths, etc.) to applicable state, regional, and local standards • Evaluation of the local street network and the identification of areas where new local streets will be needed. Cities and counties | <ul style="list-style-type: none"> • Evaluation of the local street network and the identification of areas where new local streets will be needed, based on future no-build condition and future land use conditions. Cities and counties must plan local streets in climate-friendly areas and Metro Region 2040 centers to prioritize pedestrian and bicycle systems and be limited to local access for motor vehicles. • Evaluation of the collector street network and the identification of new collector streets connected with local streets and arterials, based on future no-build condition and future land use conditions. Cities and counties must plan collectors in climate-friendly areas and Metro Region 2040 centers to prioritize pedestrian, bicycle, and public transportation systems. • Evaluation of the arterial street network, identification of new arterial streets connected with local streets and arterials, | <ul style="list-style-type: none"> • Completeness of the roadway network and local street connectivity relative to local performance measures, standards, and targets • Gaps and deficiencies in the roadway network along arterials, collectors, and local streets • Address gaps and deficiencies in the roadway network that would link key community destinations (e.g., major employment centers, schools, parks, transit stops, intermodal facilities, and recreation areas) • Roadway design standards for arterials, collectors, and local streets that reflect the minimum size necessary for the identified function, planned land use context, and expected users of the facility (roadway design standards may be included as a reference if located in a separate manual) • Roadway projects identified in other relevant state, regional, and local plans (projects identified in other plans are also subject to the requirements of OAR 660-012-0830) |

⁵ This will not be evaluated in the TSP Update because it is not applicable based on the population size of Milwaukie.

⁷ This will not be evaluated in the TSP Update because it is not applicable based on the population density along transit corridors in Milwaukie.

⁸ This will not be evaluated in the TSP Update because it is not applicable based on the population density along transit corridors in Milwaukie.

| Mode | Facility Inventory | Needs Determination | Deficiencies Determination | Developing Solutions |
|---------|---|--|--|---|
| | foot, bicycle, transit, freight, or personal vehicle <ul style="list-style-type: none"> • Identification of land use context for each segment of a facility, including types of planned land uses surrounding the facility • Identification of the location of key destinations • Identification of roadway characteristics: <ul style="list-style-type: none"> – For local streets include location – For collector streets include location, condition, and number of general-purpose travel lanes and turn lanes – For arterial streets include location, condition, and number of general-purpose travel lanes, turn lanes, and lane width – For expressways and other limited-access highways include location, condition, and number of general-purpose travel lanes, turn lanes, and lane width, as well as the locations and types of interchanges • An overview of pricing strategies in use, including specific facility pricing, area or cordon pricing, and parking pricing • Identification of pavement type and conditions through a windshield survey • Location of all reported serious injuries and deaths of people related to vehicular crashes from the most recent 5 years of available data | <p>must plan local streets in climate-friendly areas and Metro Region 2040 centers to prioritize pedestrian and bicycle systems and be limited to local access for motor vehicles.</p> <ul style="list-style-type: none"> • Evaluation of the collector street network and the identification of new collector streets connected with local streets and arterials. Cities and counties must plan collectors in climate-friendly areas and Metro Region 2040 centers to prioritize pedestrian, bicycle, and public transportation systems. • Evaluation of the arterial street network, identification of new arterial streets connected with local streets and arterials, and designation of arterial streets as local access priority, through movement priority, or arterial segments in a climate-friendly area. | and designation of arterial streets as local access priority, through movement priority, or arterial segments in a climate-friendly area, based on future no-build condition and future land use conditions. | |
| Freight | <ul style="list-style-type: none"> • Identification of Oregon Highway Plan Freight Routes and Reduction Review Routes • Identification of National Highway System (NHS) freight intermodal connectors and facilities (e.g., truck-rail intermodal yards, truck-rail reload facilities, marine terminals, pipeline terminals, air-cargo facilities, park-and-ride lots, highway-to-rail transfer facilities), including service levels and other characteristics • Identification of the National Highway Freight Network Critical Urban and/or Rural Freight Corridors • Identification of local and regional truck freight routes | <ul style="list-style-type: none"> • No freight needs identified as shall statements | <ul style="list-style-type: none"> • No freight deficiencies as shall statements | <ul style="list-style-type: none"> • Known multi-modal safety issues along designated freight routes • Existing or projected future operational issues and geometric bottlenecks that impact the movement of truck freight along designated freight routes • Truck freight projects identified in other relevant state, regional, and local plans |

Crash Analysis

The five most recent years of complete crash data available will be obtained from ODOT's crash database. Currently, complete crash data is available for the period from January 1, 2017 through December 31, 2021. The crash data will be analyzed according to the shall statements of OAR 660-020-0150, as documented in Table 6.

Potential countermeasures (and resulting crash percentage reductions) will be taken from the All Roads Transportation Safety (ARTS) Crash Reduction Factors (CRF) listing, the CRF Appendix, or the Crash Modification Factor (CMF) Clearinghouse; CMFs from the Clearinghouse will be three stars or better.

Planning Level Cost Estimates

Planning level cost estimates will be developed for proposed solutions to inform the identification of a fiscally constrained project list.

According to the Financial Forecast Memo, the City is projected to have approximately \$22 million available for capital projects over the next 20 years (excluding potential bonds). This amount of funding will be used to identify the fiscally constrained project list.

APPENDIX B: OREGON ADMINISTRATIVE RULES

This appendix includes the Oregon Administrative Rules (OARs) reviewed to develop the analysis methodology and performance measures. They were copied from the OAR database in February 2022.

OAR 660-012-0155

Prioritization Framework

(1) Cities, counties, Metro, and state agencies shall use the framework in this rule for decision making regarding prioritization of transportation facilities and services. Cities, counties, Metro, and state agencies shall consider the following:

- (a) Prioritization factors as provided in section (3);
- (b) Classification of facilities or segments as provided in section (4);
- (c) The planned land use context as provided in section (5); and
- (d) Expected primary users as provided in section (6).

(2) Cities, counties, Metro, and state agencies may use local values determined through engagement as provided in OAR 660-012-0120 to weight various prioritized factors when making prioritization decisions as provided in this division.

(3) Cities, counties, Metro, and state agencies shall prioritize transportation facilities and services based on the following factors:

(a) Meeting greenhouse gas reduction targets, including:

(A) Reducing per-capita vehicle miles traveled to meet greenhouse gas reduction targets provided in OAR 660-044-0020 or OAR 660-044-0025;

(B) Supporting compact, pedestrian-friendly patterns of development in urban areas, particularly in climate-friendly areas;

(C) Reducing single-occupant vehicle travel as a share of overall travel; and

(D) Meeting performance targets set as provided in OAR 660-012-0910.

(b) Improving equitable outcomes for underserved populations identified in OAR 660-012-0125;

(c) Improving safety, particularly reducing or eliminating fatalities and serious injuries;

(d) Improving access for people with disabilities;

(e) Improving access to destinations, particularly key destinations identified as provided in OAR 660-012-0360;

(f) Completing the multimodal transportation network, including filling gaps and making connections;

(g) Supporting the economies of the community, region, and state; and

(h) Other factors determined in the community.

(4) Cities, counties, Metro, and state agencies shall consider the functional classification of planned or existing transportation facilities or segments when making decisions about appropriate transportation facilities and services. Cities, counties, Metro, and state agencies may establish mode-specific functional classifications for each mode on any facility or segment that they own and operate.

(5) Cities, counties, Metro, and state agencies shall consider the planned land use context around an existing or planned transportation facility or segment when making decisions about appropriate transportation facilities and services.

(a) Within climate-friendly areas, cities, counties, Metro, and state agencies shall prioritize pedestrian, bicycle, and public transportation facilities and services. Cities, counties, Metro, and state agencies shall ensure facilities are planned for these modes to experience safe, low stress, and comfortable travel for people of all ages and abilities within climate-friendly areas with minimal interference from motor vehicle traffic.

(b) In areas with concentrations of underserved populations, cities, counties, Metro, and state agencies shall prioritize transportation projects addressing historic and current marginalization. Proposed transportation projects in these areas must work to rectify previous harms and prevent future harms from occurring. These areas may have suffered from disinvestment or harmful investments, including transportation system investments. Such harms include but are not limited to displacement, increased exposure to pollutants, destruction and division of neighborhoods, heat islands, and unsafe conditions for pedestrians, cyclists, transit users, and others.

(6) Cities, counties, Metro, and state agencies shall consider the expected primary users of an existing or planned transportation facility or segment when making decisions about appropriate transportation facilities and services. In particular:

(a) In areas near schools or other locations with expected concentrations of children, or areas with expected concentrations of older people or people with disabilities, cities, counties, Metro, and state agencies must prioritize safe, protected, and continuous pedestrian and bicycle networks connecting to key destinations, including transit stops.

(b) In industrial areas, along routes accessing key freight terminals, and other areas where accommodations for freight are needed, cities, counties, Metro, and state agencies must consider the needs of freight users. Pedestrian, bicycle, and public transportation system connections must be provided in industrial areas at a level that provides safe access for workers.

Statutory/Other Authority: ORS 197.040

Statutes/Other Implemented: ORS 197.012, ORS 197.180, ORS 197.712 & ORS 468A.205

History:

[LCDD 9-2023, amend filed 11/07/2023, effective 11/07/2023](#)

[LCDD 3-2022, adopt filed 08/17/2022, effective 08/17/2022](#)

[LCDD 2-2022, temporary adopt filed 06/01/2022, effective 06/01/2022 through 11/27/2022](#)

OAR 660-012-0160

Reducing Vehicle Miles Traveled

(1) The following jurisdictions are exempt from the requirements of this rule:

(a) Cities under 5,000 population;

(b) Counties under 5,000 population within urban growth boundaries but outside of incorporated cities; and

(c) Counties under 10,000 population within urban growth boundaries but outside of incorporated cities.

(2) When a city or county, makes a major update to a transportation system plan as provided in OAR 660-012-0105, or Metro makes an update to a regional transportation plan as provided in OAR 660-012-0140, they shall use the following requirements to project vehicle miles traveled per capita for the planning period.

(a) The city, county, or Metro must prepare a projection that estimates changes between vehicle miles traveled per capita from the base year and vehicle miles traveled per capita that would result from all projects on the financially-constrained project list prepared as provided in OAR 660-012-0180; and

(b) Projections of vehicle miles traveled per capita must incorporate the best available science on latent and induced travel of additional roadway capacity.

(3) The projections prepared as provided in section (2) must be based on:

(a) Land use and transportation policies in an acknowledged comprehensive plan and in the proposed transportation system plan;

(b) Local actions consistent with the adopted performance targets under OAR 660-012-0910, or OAR 660-044-0110; and

(c) Forecast land use patterns as provided in OAR 660-012-0340.

(4) Cities and counties may only adopt a transportation system plan if the projected vehicle miles traveled per capita at the horizon year using the financially-constrained project list is lower than estimated vehicle miles traveled per capita in the base year scenario.

(5) A city or county is not required to meet the requirements in sections (2) through (4) of this rule if the city or county has selected a financially-constrained project list that does not contain any project that would require review as provided in OAR 660-012-0830(1).

(6) Metro shall adopt a regional transportation plan in which the projected vehicle miles traveled per capita at the horizon year using the financially-constrained project list is lower than the estimated vehicle miles traveled per capita at the base year by an amount that is consistent with the metropolitan greenhouse gas reduction targets in OAR 660-044-0020. Metro may rely on assumptions on future state and federal actions, including the following state-led actions that affect auto operating costs:

(a) State-led pricing policies, and energy prices; and

(b) Vehicle and fuel technology, including vehicle mix, vehicle fuel efficiency, fuel mix, and fuel carbon intensity.

Statutory/Other Authority: ORS 197.040

Statutes/Other Implemented: ORS 184.899, ORS 197.012, ORS 197.712 & ORS 486A.205

History:

[LCDD 3-2022, adopt filed 08/17/2022, effective 08/17/2022](#)

[LCDD 2-2022, temporary adopt filed 06/01/2022, effective 06/01/2022 through 11/27/2022](#)

OAR-660-012-0215

Transportation Performance Standards

(1) This rule applies to transportation performance standards that cities and counties use to review comprehensive plan and land use regulation amendments as provided in OAR 660-012-0060. If a city or county requires applicants to analyze transportation impacts as part of development review in acknowledged local land use regulations, then that review must include evaluation of the performance standards established under this rule. This rule applies to transportation performance standards that Metro uses to review functional plan amendments as provided in OAR 660-012-0060.

(2) Cities and counties shall adopt transportation performance standards. The transportation performance standards must support meeting the targets for performance measures set as provided in OAR 660-012-0910. The transportation performance standards must include these elements:

(a) Characteristics of the transportation system that will be measured, estimated, or projected, and the methods to calculate their performance;

(b) Thresholds to determine whether the measured, estimated, or projected performance meets the performance standard. Thresholds may vary by facility type, location, or other factors. Thresholds shall be set at the end of the planning period, time of development, or another time; and

(c) Findings for how the performance standard supports meeting the targets for performance measures set as provided in OAR 660-012-0910.

(3) Cities, counties, Metro, and state agencies shall adopt two or more transportation performance standards. Metro may adopt regional performance standards in a functional plan for use across regional and local plans. At least one of the transportation performance standards must support increasing transportation options and avoiding principal reliance on the automobile. The transportation system plan must clearly establish how to apply the multiple performance standards to a proposal that meets some, but not all, of the transportation performance standards. The transportation performance standards must evaluate at least two of the following objectives for the transportation system, for any or all modes of transportation:

(a) Reducing climate pollution;

(b) Equity;

(c) Safety;

(d) Network connectivity;

(e) Accessibility;

(f) Efficiency;

(g) Reliability; and

(h) Mobility.

Statutory/Other Authority: ORS 197.040

Statutes/Other Implemented: ORS 197.012, ORS 197.180 & ORS 197.712

History:

[LCDD 9-2023, amend filed 11/07/2023, effective 11/07/2023](#)

[LCDD 3-2022, adopt filed 08/17/2022, effective 08/17/2022](#)

[LCDD 2-2022, temporary adopt filed 06/01/2022, effective 06/01/2022 through 11/27/2022](#)

OAR 660-012-0905

Land Use and Transportation Performance Measures

(1) Cities, counties, and Metro that have a land use and transportation scenario approved by the commission as provided in OAR 660-044-0050 or OAR 660-044-0120 shall report on the performance measures from the approved regional scenario plan.

(2) Cities and counties that do not have a land use and transportation scenario approved by the commission as provided in OAR 660-044-0120 shall report on the specific actions, including capital improvements and the adoption of policies or programs that they have or will undertake to reduce pollution and increase equitable outcomes for underserved populations. At a minimum, this report must include the following performance measures:

(a) Compact Mixed-Use Development

(A) Number of publicly supported affordable housing units in climate-friendly areas.

(B) Number of existing and permitted dwelling units in climate-friendly areas and percentage of existing and permitted dwelling units in climate-friendly areas relative to total number of existing and permitted dwelling units in the jurisdiction.

(C) Share of retail and service jobs in climate-friendly areas relative to retail and service jobs in the jurisdiction.

(b) Active Transportation

(A) Percent of collector and arterial streets in climate-friendly areas and underserved population neighborhoods with bicycle and pedestrian facilities with Level of Traffic Stress 1 or 2.

(B) Percent of collector and arterial streets in climate-friendly areas and underserved population neighborhoods with safe and convenient marked pedestrian crossings.

(C) Percent of transit stops with safe pedestrian crossings within 100 feet.

(c) Transportation Options

(A) Number of employees covered by an Employee Commute Options Program.

(B) Number of households engaged with Transportation Options activities.

(C) Percent of all Transportation Options activities that were focused on underserved population communities.

(d) Transit

(A) Share of households within one-half mile of a priority transit corridor.

(B) Share of low-income households within one-half mile of a priority transit corridor.

(C) Share of key destinations within one-half mile of a priority transit corridor.

(e) Parking Costs and Management: Average daily public parking fees in climate-friendly areas.

(f) Transportation System

(A) Vehicle miles traveled per capita.

(B) Percent of jurisdiction transportation budget spent in climate-friendly areas and underserved population neighborhoods.

(C) Share of investments that support modes of transportation with low pollution.

Statutory/Other Authority: ORS 197.040

Statutes/Other Implemented: ORS 197.012, ORS 197.712 & ORS 468A.205

History:

[LCDD 9-2023, amend filed 11/07/2023, effective 11/07/2023](#)

[LCDD 3-2022, adopt filed 08/17/2022, effective 08/17/2022](#)

[LCDD 2-2022, temporary adopt filed 06/01/2022, effective 06/01/2022 through 11/27/2022](#)

APPENDIX C: DRAFT PERFORMANCE MEASURE AND PERFORMANCE STANDARD APPLICATION GUIDANCE

DRAFT LIVABLE STREETS ANALYSIS AND RECOMMENDATIONS

| | |
|-----------------|---|
| Date: | May 10, 2024 |
| To: | TSP Advisory and Technical Committees |
| From: | Kittelson & Associates, Inc. |
| Project: | Milwaukie Transportation System Plan |
| Subject: | Livable Streets Analysis and Recommendations Memorandum |

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PURPOSE OF THIS MEMORANDUM

As one of several steps in the development of Milwaukie's new Transportation System Plan (TSP), this memorandum focuses on Milwaukie's existing street design policies and standards. These policies and standards guide the planning, design, and construction of the public roadways in the City. The purpose of this memorandum is to review the documents that support and contain the street design policies and standards and assess their content against regional guidance, best practices, and adherence to modern design principles. Of particular focus are the principles contained within Livable Streets design concepts.

Following advisory committee and public review/feedback, the assessment findings and recommendations will be incorporated into the preparation of the new Milwaukie TSP.

WHAT IS A LIVABLE STREET?

Historically, many transportation systems were built before the adoption of modern roadway design standards or planned and built based on a rigid set of standards that did not consider the land use context, instances of constrained rights of way, and the needs of the neighborhoods that they served. The result was an underbuilt travel corridor, a corridor that prioritized motor vehicles, and/or a corridor that lacked multimodal accommodations.

In more recent years, jurisdictions have started to move away from these rigid design standards in favor of planning and design parameters that are flexible and compatible with the unique characteristics of the adjacent land uses. Commonly referred to as Livable Streets, this design concept focuses on the planning and design of roadways that are¹:

- Safe and comfortable places to travel for people of all ages and abilities
- Designed to encourage slower travel speeds
- Welcoming, spaces for people of all backgrounds
- Places to interact and linger
- Designed to foster a sense of community, ownership, and responsibility
- Designed to protect the environment
- Able to adapt to new mobility technologies
- Resilient to changing climates and the impacts of weather events

Livable Streets Assessment

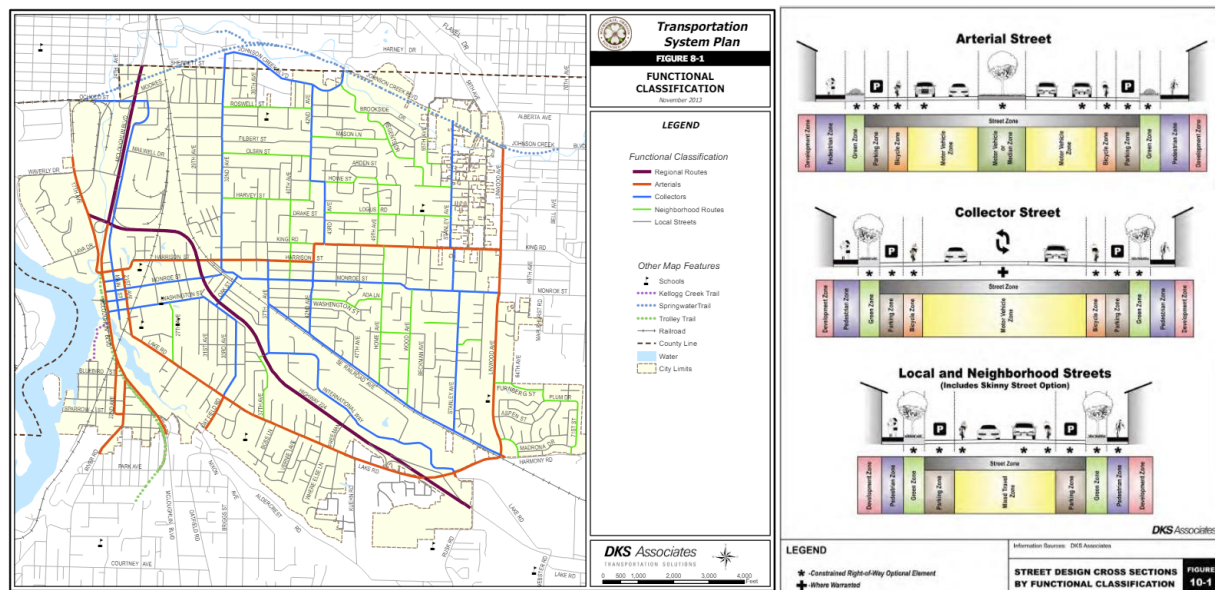
To ensure Milwaukie's streets are more "livable" in the context of creating "safe and comfortable places to travel for people of all ages and abilities", the assessment initially focuses on those documents relevant to the planning, design, and implementation of the transportation system including Milwaukie's adopted TSP, its Public Works Standards, and its Municipal Code. A summary of the assessment findings and recommended changes for local consideration are presented in the following sections of this memorandum.

¹ Source: Metro 2019. *Designing Livable Streets and Trails Guide*.

MILWAUKIE TRANSPORTATION SYSTEM PLAN

The adopted Milwaukie TSP, among many things, guides street design decisions through the establishment of a functional classification plan for City roadways. The functional classification plan establishes “a hierarchy of streets ranging from those that are primarily for travel mobility (arterials) to those that are primarily for access to property (local streets). The functional classification system is developed with the recognition that individual streets do not act independently of each other but form a network of streets that work together to serve travel needs”. The TSP also sets street design policy by defining the typical elements of the different street types, provides guidance on typical widths for these elements, and outlines alternative design treatments that can be considered in various circumstances and constrained environments. Snapshots of the roadway functional classification map and street design cross section details are provided for visual context in Exhibit 1 below. A more detailed explanation and summary of these elements are included in Appendix A of this memorandum.

Exhibit 1 – Milwaukie TSP Functional Classification Map and Street Design Details



TSP Assessment Findings and Recommendations

In general, the adopted TSP's policy guidance is consistent with the overall principles of the Livable Streets design concepts. Specifically, it already identifies a flexible set of high-level roadway design guidelines, and in most cases, establishes the general parameters for when flexible design treatments should be considered. These design guidelines and parameters have been found to be consistent with modern best practices, they advance Livable Streets design concepts through a recognition and emphasize on flexibility and context sensitive design, and as such, no major overhaul is recommended.

While no major changes are recommended, it is anticipated that as part of the new Milwaukie TSP, the street design policies and design principles in the current adopted TSP will undergo a general update and refresh per additional input from City planning/engineering staff, advisory

committees, and public feedback. As part of this general update/refresh, it recommended that the following elements be added and reorganized.

Neighborhood Greenways

Discussion on the concept of neighborhood greenways is included in the adopted TSP in the Bicycle Element (Chapter 6). Neighborhood greenways are a design concept that primarily benefits bicyclists and other wheeled devices, but their design treatments also provide a more comfortable street environment for other users such as pedestrians.

Neither the adopted TSP nor the *Public Works Standards* (see following section) outline specific performance guidelines for when to consider or apply a neighborhood greenway overlay according to motor vehicle speeds and traffic volumes. To help guide future decision making, it is recommended that the following neighborhood greenway performance guidelines be incorporated into both the new Milwaukie TSP and *Public Works Standards*. These vehicle speed and volume performance guidelines are consistent with application guidelines used in neighboring cities including the City of Portland:

- Vehicle speeds should be no more than 20 mph on all neighborhood greenways.
- The ideal neighborhood greenway has a target volume of 1,000 motor vehicles a day or less.
- Neighborhood greenways can function effectively with added design features with an average of 1,500 motor vehicles per day.

Woonerfs

The adopted TSP does not discuss the street design concept known as a woonerf.

A woonerf is a type of road design that blends the vehicular and pedestrian spaces into one shared space. Typically, there is no formal division between the pedestrian zones and the mixed travel way zones, creating a pedestrian-focused space that is open for vehicles but with the expectation that vehicular travel will be minimal and at much slower speeds. Woonerfs have the following benefits:

- Creates a community-oriented space that is not dominated by vehicular travel.
- Encourages multimodal travel.
- Incorporates outdoor furnishings, landscaping, on-street parking, and lighting. These elements act as traffic calming devices to ensure slow travel speeds.

Woonerf treatments should follow the following general design parameters:

- Have a clear and distinct entrance with appropriate signing
- Incorporate different surface treatments
- Eliminate the continuous curb, creating a uniform surface that has no vertical separation between zones
- Incorporate traffic calming measures such as street furniture, landscaping, on-street parking
- Use a design speed for all wheeled vehicles of 10 mph.

- Seating, recreation, and other pedestrian-only areas within the woonerf are delineated and protected by a pavement change, planters, decorative bollards, and/or similar features.
- Do not incorporate speed bumps, humps, or tables; traffic signals; medians; pedestrian crossings; bike lanes
- Automobile parking spaces, if any, are dispersed within the woonerf
- Parking spaces are delineated by physical features such as landscaping, different paving materials

The descriptive inclusion of this design concept along with the visual representation shown in Exhibit 3 is recommended for the new TSP as it will provide policy-based direction for City staff to consider and implement this unique and transformative roadway design concept when appropriate.

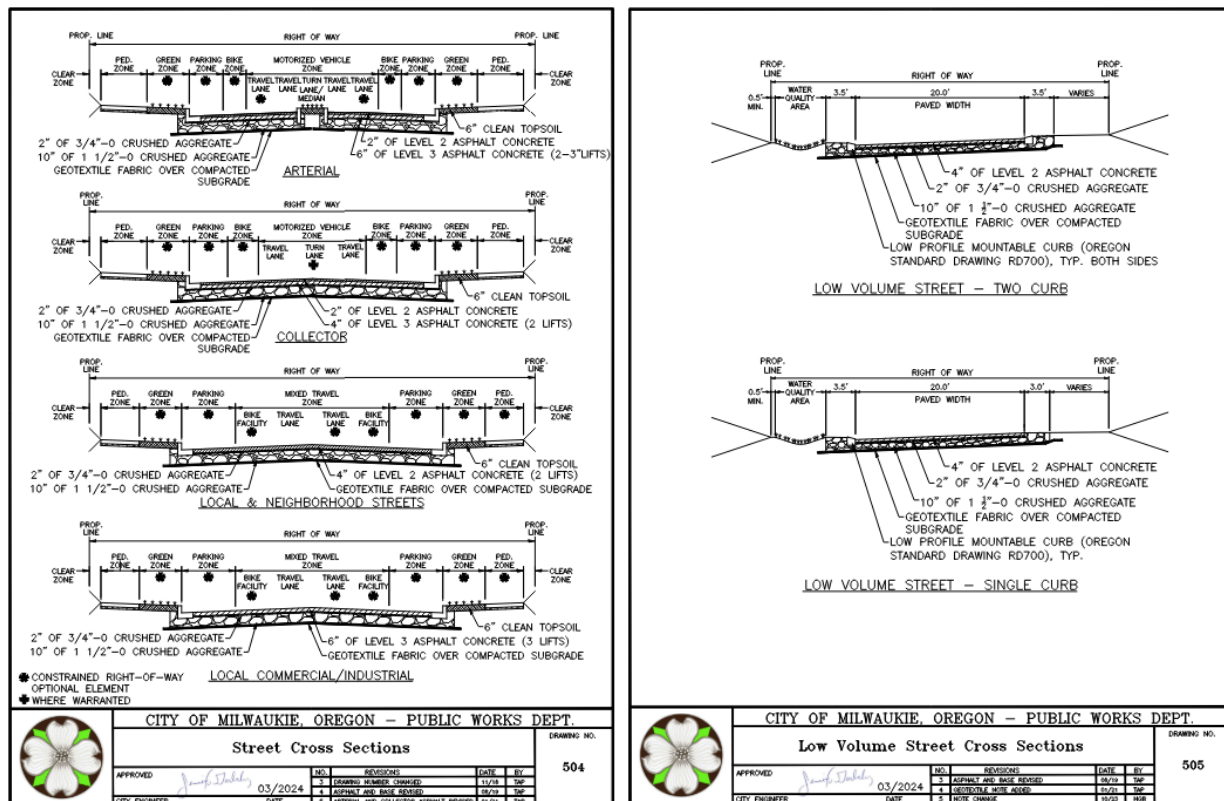
Exhibit 2 – Woonerf Design Concept



MILWAUKIE PUBLIC WORKS STANDARDS

Milwaukie's Public Works Standards, last revised March 2024, include detailed design-based street standards. *Section 5 Street Standards* outline the specific design requirements for street design and are used and referred to by City staff, developers, and roadway design professionals in the process of building and retrofitting streets in the City. Snapshots of the roadway cross section design details are included in Exhibit 3 for visual context. A more detailed explanation of the street design standards and other affiliated design details contained within Section 5 are provided in *Appendix B of this memorandum*.

Exhibit 3 – Public Works Street Cross Sections Design Details



Public Works Standards Assessment Findings and Recommendations

In general, the street standards are rooted in a structured but flexible set of guidelines that ensure all street designs will:

- Provide for safe and efficient travel of the public.
- Be designed to carry the appropriate traffic volumes for each street classification.
- Be designed to meet or exceed minimum guidelines set forth in the American Association of State Highway and Transportation Officials' (AASHTO) latest edition of *A Policy on Geometric Design of Highways and Streets*.
- Facilitate local circulation and discourage nonlocal, through traffic.

- Be designed to the full width cross section (the widest dimension of all individual street elements) as specified by functional classification.
- Be modified only when a full width cross section is not appropriate or feasible. These considerations include:
 1. Options and/or needs for environmentally beneficial and/or green street designs.
 2. Multimodal street improvements identified in the TSP.
 3. Street design alternative preferences identified in Chapter 10 of the adopted TSP, specifically regarding sidewalk and landscape strip improvements.
 4. Existing development pattern and proximity of existing structures to the right-of-way.
 5. Existing right-of-way dimensions and topography.
- Facilitate in-fill development by allowing for the reduction of standards on certain low volumes streets.

These guidelines are generally consistent with the Livable Street design concept and do not require modifications.

At a more detailed level, the design elements of these standards were reviewed and compared to best practices and local/regional guidance documents such as ODOT's *Highway Design Manual*, and Metro's *Designing Livable Streets and Trails Guide*. As shown in Table 1, Milwaukie's current design standards for local and collector streets² fall within the range of ideal dimensions for the various street elements. In one case, recommendations for future modifications are identified in order to provide additional clarity and flexibility.

² Additional facility types and context for application are provided in the background documents and public works standards, however the table focuses on key elements appropriate for local, neighborhood, and collector streets.

Table 1 Public Works Street Design Guidance Findings and Recommendations for Local and Neighborhood Routes

| Element | Ideal Dimensions from Regional Guidance and Best Practices | Milwaukie Public Works Standards | Findings | Recommendations |
|--------------------------|--|---|---|---|
| Clear Zone | 0.5 – 4 ft. on both sides of the roadway | Minimum of 6 inches | Milwaukie's public works standards offer flexibility within this ideal range. | No changes are recommended. |
| Pedestrian Zone | 5 – 10 ft. with an additional 0.5 – 2 ft. of curb/gutter | <ul style="list-style-type: none"> • 6 ft. sidewalk when curb tight (no adjacent green zone) • 5 ft. when separated by a green zone | <p>Milwaukie's public works standards for sidewalks fall within this ideal range.</p> <p>The sidewalk standard in the Section 5.0030 design standards table identifies sidewalks will be 6 ft. in width for local and neighborhood collectors. However, the supplemental language identifies a minimum of 5 ft.</p> | The supplemental language should be clarified to indicate local and neighborhood route sidewalks should be 6 ft. in width and can be reduced to 5 ft. when separated from travel lanes by a green zone. |
| Green Zone | 0 – 6 ft. landscape strip | 3 - 5 ft. | Milwaukie's public works standards offer flexibility within this range. | No changes are recommended. |
| Parking Zone | 7 - 8 ft. on street parking | 6 – 8 ft. | Milwaukie's public works standards generally fall within this ideal range. Flexibility provisions that allow 6 ft. parking lanes in residential zones where needed to accommodate constrained environments. | No changes are recommended. |
| Mixed Travel Zone | 5 – 9 ft. bike lane 10 – 12 ft. travel lanes | <ul style="list-style-type: none"> • Travel lane - 8 ft. or 10 ft for local streets • Travel lane - 10 ft. for neighborhood streets • Bike Lane: 5 ft. | Milwaukie's public works standards fall within this range and offer flexibility within this ideal range for the accommodation of narrower bike and travel lane widths. | No changes are recommended. |

Local/Neighborhood Street and Collector Design Illustrations

While the *Section 5 Street Design Standards* table and the accompanying Street Cross Sections identify a range of design guidelines for local, neighborhood, and collector streets, it is recognized that these particular street types often require the greatest level of flexibility and creativity given the unique travel needs and right of way constraints in the City. Based on recent and on-going street improvement projects, a visualization of several ideal local, neighborhood, and collector street cross sections have been prepared for potential inclusion in the new Milwaukie TSP. These visual cross sections are not meant to replace the street design cross sections/policy guidance in the TSP, nor are they meant to replace the more detailed street design standards in the Section 5 of the Public Works Standards. They are however presented to visually illustrate a range of design treatments that could be considered by City staff when planning for and designing different local street, neighborhood street, and collector street improvement projects. These design treatments have been prepared to be in alignment with the City's general design principles, but they are also rooted in the Livable Streets design concepts which focus on the provision of flexible, safe, comfortable, and inclusive spaces for travelers of all abilities.

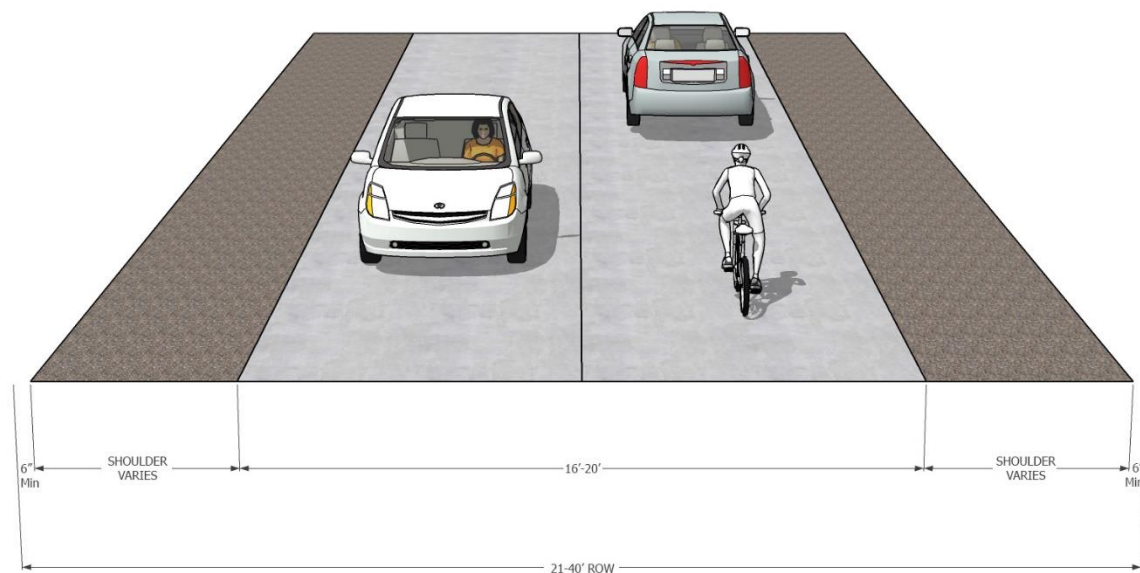
Local and Neighborhood Street Cross-Sections

The cross sections below (Figure 1 through Figure 5) build on the standard cross sections included in the Public Works Standards to provide illustrative examples of local and neighborhood street cross sections that the City can consider for planning and implementation purposes.

Unenhanced Local Street

Figure 1 illustrates an unimproved local street cross section that would apply to existing streets in the City. This cross section recognizes a minimum design allowance for specific situations where a full local street upgrade is not feasible or necessary and overall traffic volumes and speeds are very low.

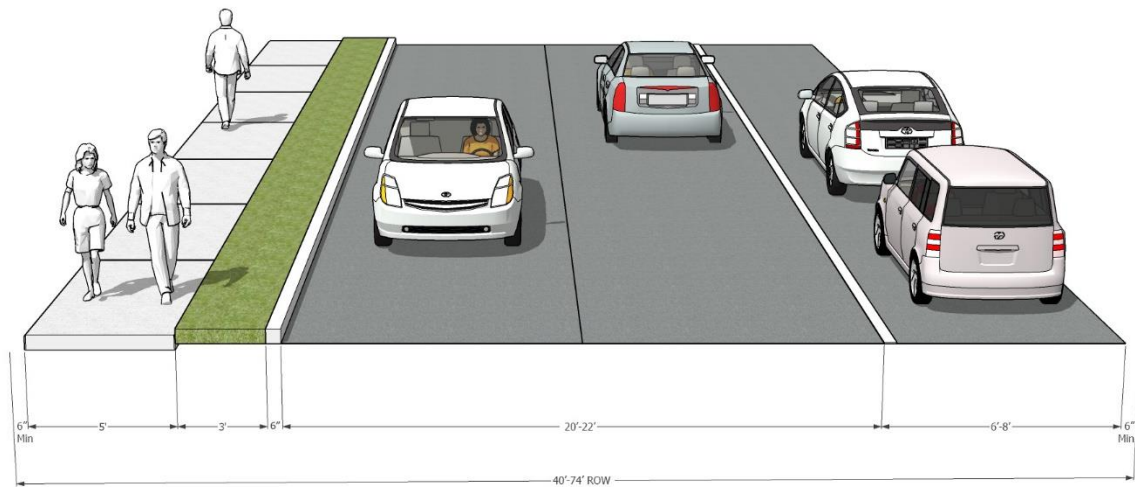
Figure 1 Local Street - Unimproved



Local/Neighborhood Street with Sidewalks on One Side

Figure 2 illustrates a local/neighborhood street cross section with a sidewalk on one side of the roadway and the accommodation of on-street parking on the other side. Bicyclists would share the roadway with vehicles. This cross section is appropriate for low traffic volumes and speeds. It could be a design application for a neighborhood greenway.

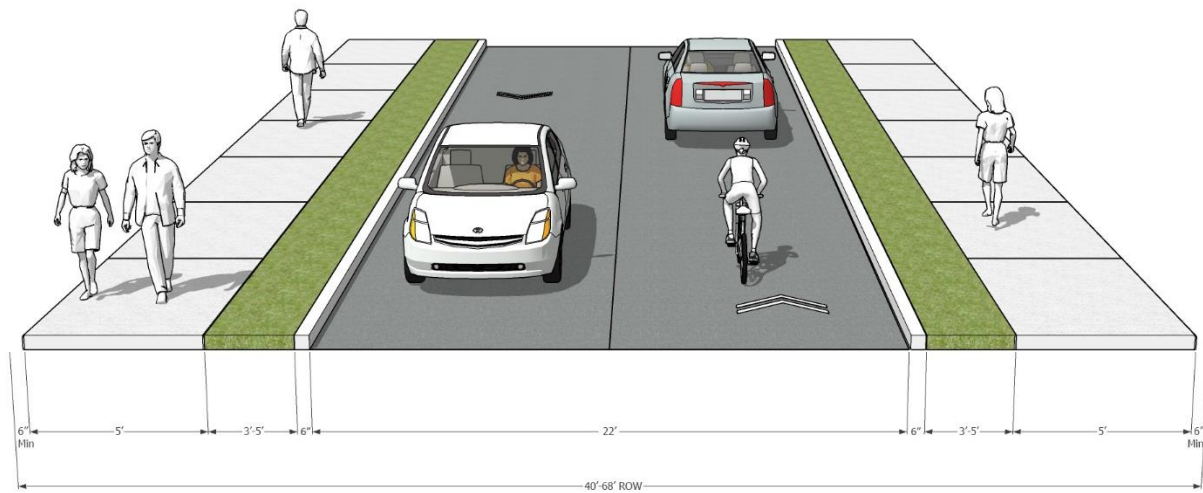
Figure 2. Local/Neighborhood Streets with Sidewalks on One Side



Local/Neighborhood Street with Sidewalks on Both Sides

Figure 3 illustrates a local/neighborhood street cross section, enhanced to provide separate sidewalk facilities for people walking. Bicyclists would share the roadway with vehicles. This cross section does not include on-street parking and would therefore only be appropriate on certain neighborhood streets that are not anticipated to have on-street parking needs. This cross section is appropriate for low traffic volumes and speeds. It could be a design application for a neighborhood greenway.

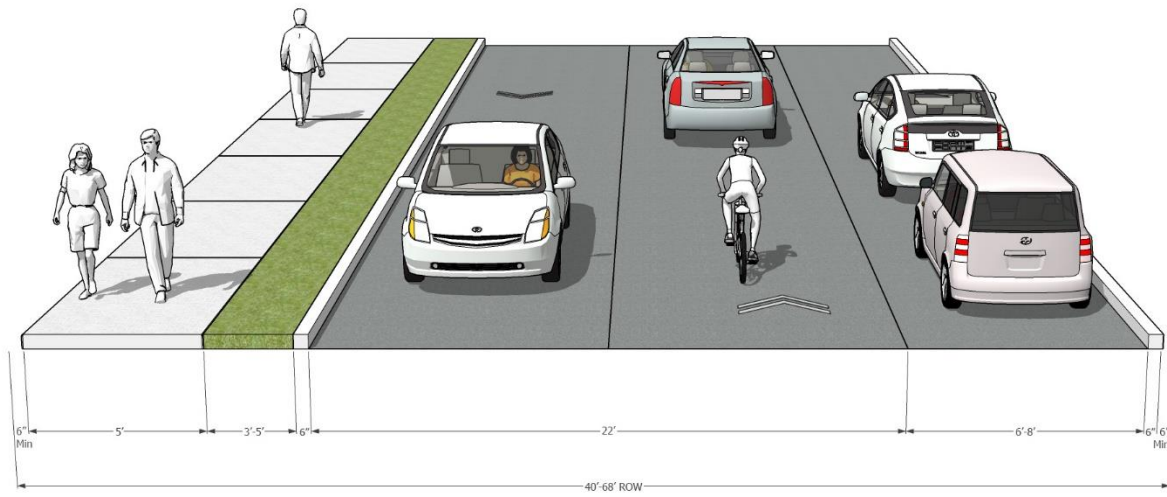
Figure 3. Local/Neighborhood Streets with Sidewalks on Both Sides



Local/Neighborhood Streets with Sidewalks and On-Street Parking

Figure 4 illustrates a local/neighborhood street cross section, enhanced to provide on-street parking and separate facilities for people walking. Bicyclists would share the roadway with vehicles. This cross section is appropriate for local and neighborhood streets with low traffic volumes and speeds. It could be a design application for a neighborhood greenway.

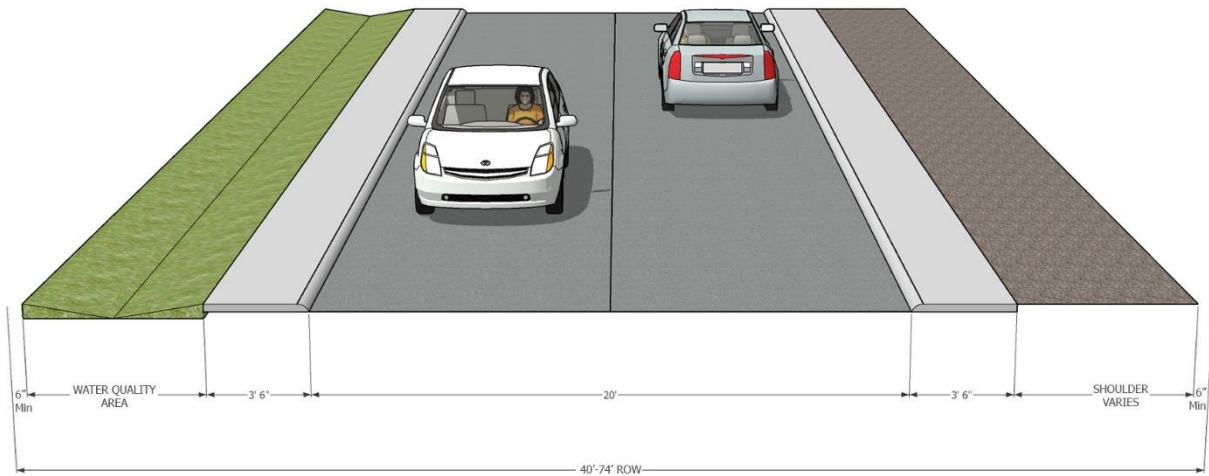
Figure 4. Local/Neighborhood Street with Sidewalks and On-Street Parking



Low Volume/Shared Street

Figure 5 illustrates a low volume street cross section. The Low Volume Street (LVS) standard is not intended to be used in lieu of one of the City's local street standard, but is intended to facilitate infill development in situations where development to the assigned standard would likely preclude such development. Appropriate for situations where traffic volumes and speeds should be considerably lower than the standards that allow 20 MPH streets.

Figure 5. Low Volume Street



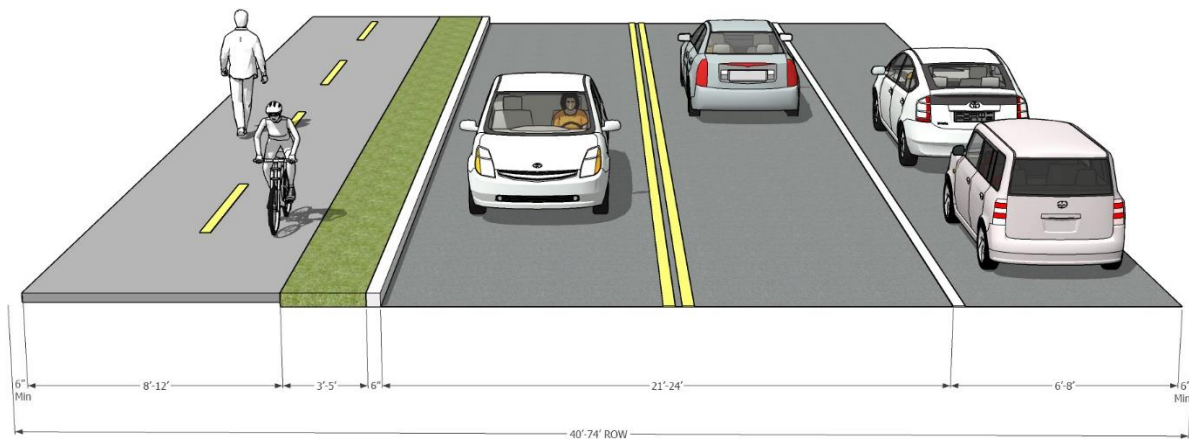
Collector Street Cross-Sections

The cross sections below (Figure 6 through Figure 9) build on the standard cross sections included in the Public Works Standards to provide illustrative examples of potential collector street cross sections.

Collector Street with Multiuse Use Path

Error! Reference source not found. Figure 6 illustrates a collector street, enhanced to provide separate facilities for people walking and biking on one side of the roadway while maintaining one lane of on-street parking. This cross section is appropriate for collector streets with moderate traffic volumes and speeds. It could be a design application in a constrained right of way setting when there is a need for enhanced bicycle accommodations.

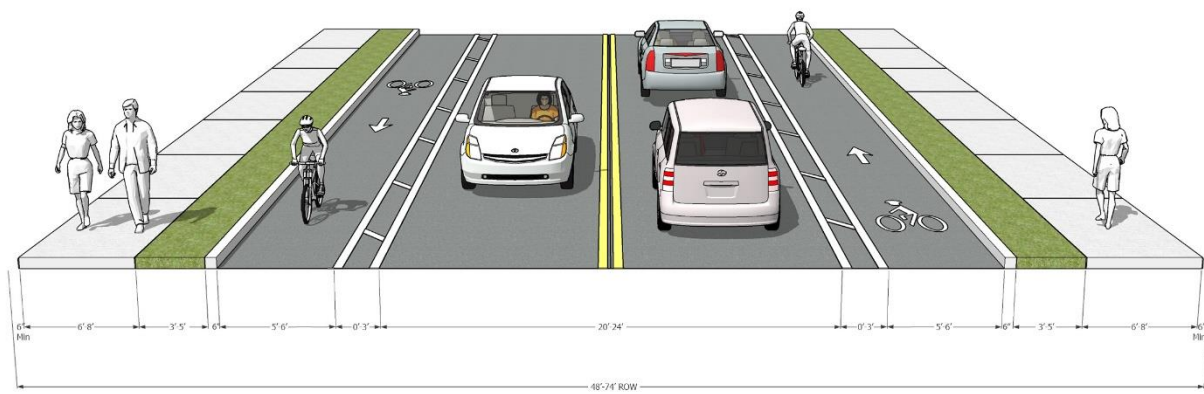
Figure 6. Collector Street with a Shared Use Path



Collector Street with Pedestrian and Bicycle Facilities

Figure 7 illustrates a collector street cross section, enhanced to provide more traditional sidewalk and bicycle facilities for multimodal travel. Right of way permitting, the bicycle lanes could be designed as buffered bicycle lanes. It does not include on-street parking. This cross section is appropriate for collector streets (and arterials in some settings) with moderate traffic volumes and speeds.

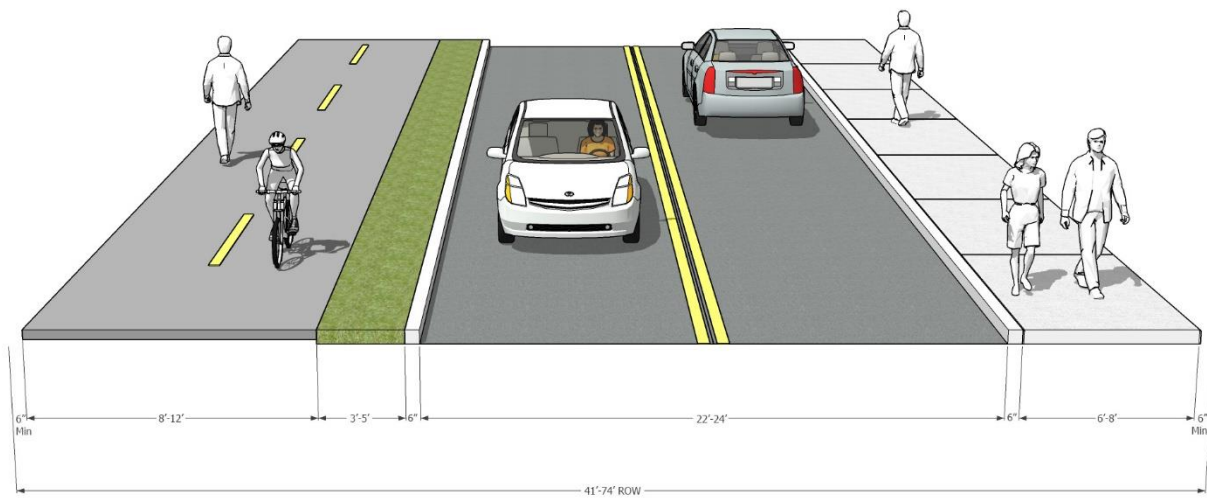
Figure 7. Collector Street with Separate Pedestrian and Bicycle Facilities



Collector Street with Multiuse Path on One Side

Figure 8 illustrates a collector street cross section, enhanced to provide a separate multiuse path for walking and biking on one side of the roadway and a simple sidewalk on the other. This cross section is appropriate for collector streets with moderate traffic volumes and speeds when there is a need for enhanced bicycle accommodations.

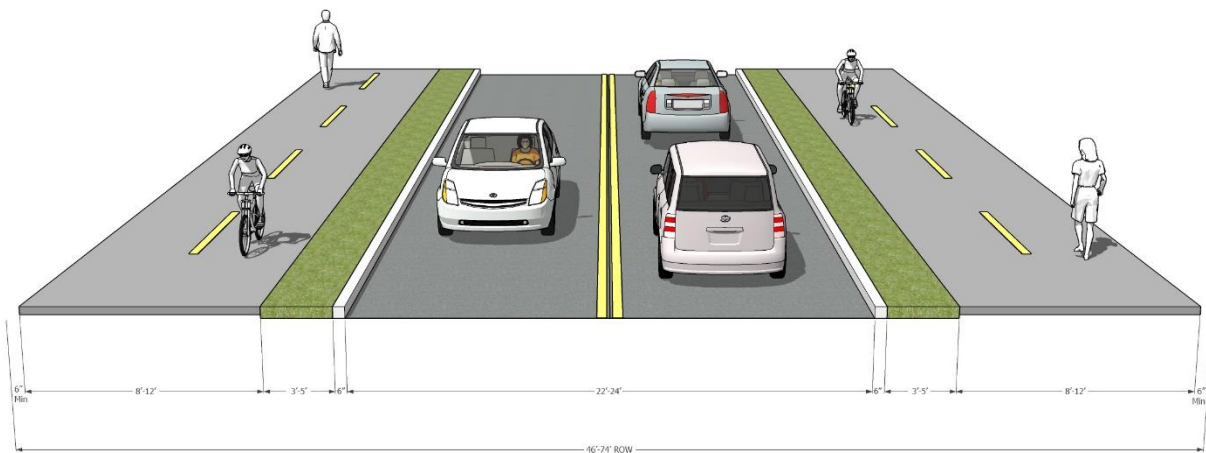
Figure 8. Collector Street with Multiuse Path on One Side



Collector Street with Multiuse Path on Both Sides

Figure 9. illustrates a collector street cross section, enhanced to provide separate facilities for people walking and biking on both sides of the roadway. This cross section is appropriate for collector streets (and arterials in some settings) with moderate to high traffic volumes/speeds and where there is a need for enhanced bicycle accommodations.

Figure 9. Collector Street with Multiuse Paths on Both Sides



Code Modifications

This is a placeholder for draft code content after confirming cross sections/standards with the committees.

NEXT STEPS

This memorandum will be reviewed by the Transportation System Technical and Advisory Committees. Following acceptance of the local street design standard recommendations, the project team will begin the transportation system conditions and needs/gaps analysis.

APPENDIX A:

MILWAUKIE TRANSPORTATION SYSTEM PLAN

The adopted Milwaukie Transportation System Plan is a policy document that includes guidance on street design decisions through the establishment of a functional classification plan for City roadways; defining street elements, providing guidance on typical widths for these elements, and outlining various traffic calming and neighborhood traffic management techniques. These elements can all be found in adopted TSP: Chapter 8 Street Network, Chapter 10 Street Design, Chapter 5 Pedestrian Element, Chapter 6 Bicycle Element, and Chapter 11 Neighborhood Traffic Management.

TSP Street Design Policy/Guidance

Chapter 10 Street Design describes the importance of street design, why it matters, and the street design options available in Milwaukie. Figure 10 illustrates Milwaukie's street design cross sections. These cross sections provide a policy framework rather than specific design details. As shown, all streets are defined to include different design elements consisting of the following:

- Development Zone -The development zone is not in, but adjoins, the public right-of-way. Access to the development zone is almost always through the public right-of-way in the form of a driveway or sidewalk.
- Pedestrian Zone - The pedestrian zone is the public space between the development zone and the green zone. This area should support pedestrian activities by providing a comfortable space for walking, socializing, and accessing private property and buildings.
- Green Zone - The green zone is the public space that separates the pedestrian zone from the street zone. It functions as a buffer between pedestrians and motor vehicle, bicycle, and other street zone users. Depending on the context, it can accommodate street trees, plantings, utilities, and space to manage stormwater runoff.
- Street Zone - The street zone is the primary travel way for motor vehicles and bicycles. Depending on the classification of street, it may contain parking lanes, turning lanes, travel lanes, and bike lanes or mixed vehicle lanes that include bicycles.

While the TSP street design cross sections do not specify widths or ranges of widths for these zones (those are formally defined in the *Milwaukie Public Works Standards*), they do identify typical widths as summarized in Table 2.

Figure 10. Milwaukie TSP Street Design Cross Sections

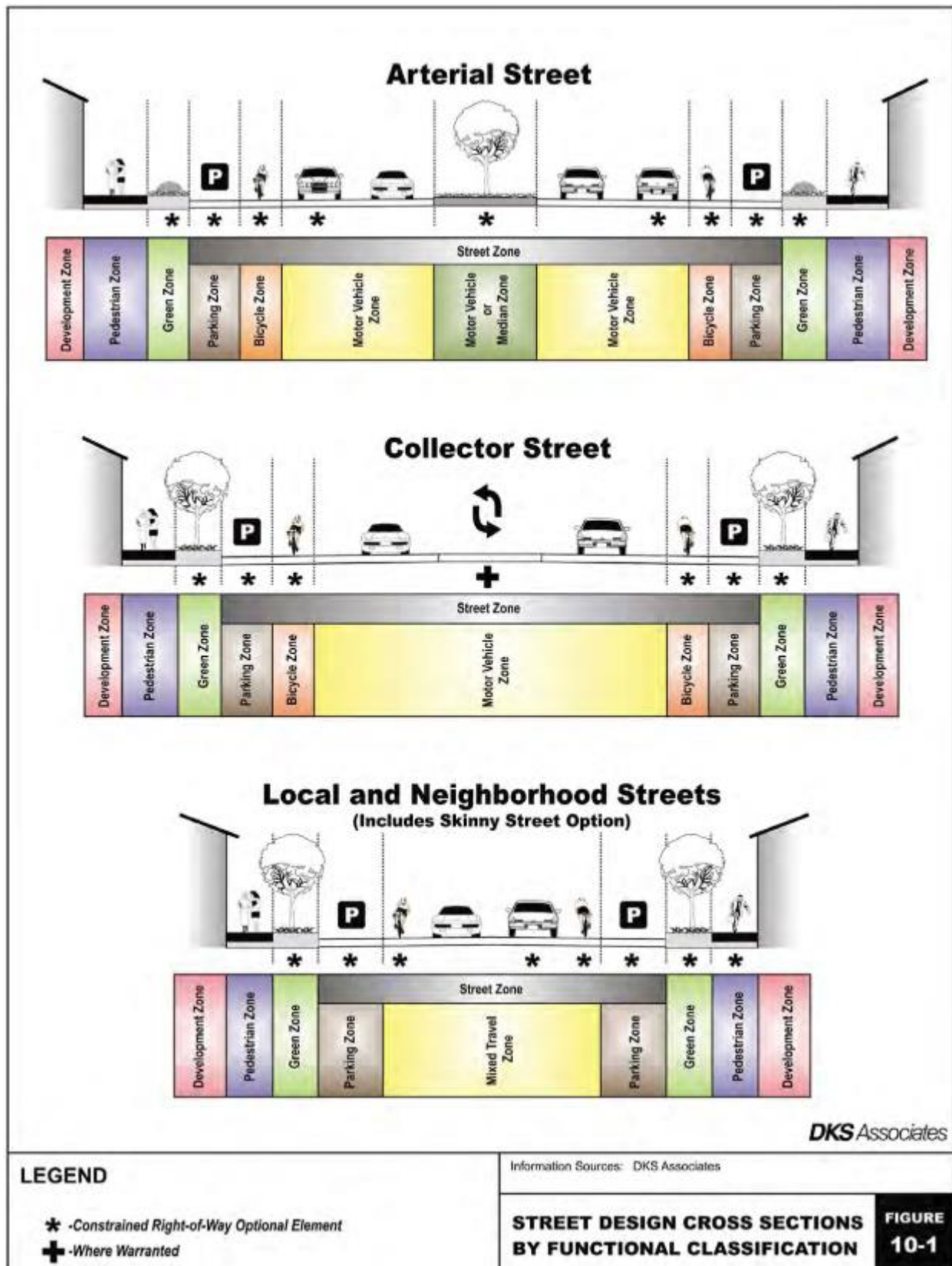


Table 2. Local Street Design Guidance from the Milwaukie TSP

| Element | Typical Width | Policy Notes |
|--|--|--|
| Development Zone | Varies | The development zone is outside the public right of way. In commercial or industrial zones, a building face may clearly define the edge of the right-of-way. In residential zones, the outer edge of the right-of-way is often not clearly or accurately marked. |
| Pedestrian Zone | 5 ft. when adjacent to a green zone; 6 ft. when adjacent to a street zone | Pedestrian zones should be wider in dense commercial zones and on streets with high traffic volumes and speeds and may be narrower on local streets with low traffic volumes. |
| Green Zone | At least 5 ft. | Green zones offers a place to locate street trees, bike racks, street furniture, transit amenities, utilities, and plantings designed to manage stormwater runoff. |
| Parking Zone | 6 - 8 ft. | For skinny streets, streets can accommodate one-way travel at a time with parking on one or both sides of the roadway. |
| Street Zone (including the mixed travel zone) | Bicycle lane - 5-6 ft. Travel lane - 9-12 ft. Shared travel lane - 14-16 ft. | The street zone also contains pedestrian traffic at street intersections and midblock pedestrian crossings. The street zone may also contain green street treatments or traffic management devices to slow traffic or deter cut-through traffic. |

One critical element recognized by the TSP is the importance of flexibility. Since the majority of Milwaukie's local street grid has already been developed (much of which without modern bicycle, pedestrian, or stormwater facilities), it can be difficult to upgrade streets due to insufficient right of way, cost, and topographic circumstances. The TSP therefore includes the following policy framework that allows for flexible parameters and decision-making³.

- *Maintain flexibility in street design standards to allow for local design preferences and to avoid costly and time-consuming variance process requirements.*
- *Balance citywide needs, local design preferences, and best practices when utilizing street design standards.*
- *Provide for public involvement in the utilization of street design standards and during the design phase of street-related Capital Improvement Projects.*
- *Consider maintenance costs and issues when utilizing design standards.*
- *Utilize design standards, including alternative designs, which accommodate emergency response routes and needs.*
- *Require a minimum of one-sided pedestrian facilities on all streets.*
- *Require green zones and green street treatments where appropriate and practical.*
- *Maintain design consistency along a street's length where appropriate.*

³ Source: 2018 Milwaukie Transportation System Plan, Chapter 10: Street Design

Street Design Alternatives

The TSP outlines several alternative design guidelines involving the accommodation of green streets, skinny streets, bicyclists, and green ways.

Green Streets

Green streets are special design features that accommodate stormwater management features in the roadway right-of-way where it can be treated through natural biological processes.

Green street treatments are appropriate for all levels of roadway classifications.

Finding: While limited in scope and detail, the recognition of the importance of green streets as a beneficial environmental feature is consistent with Livable Streets design concepts and should be carried forward as part of the TSP update.

Skinny Streets

The TSP recognizes the importance of allowing for narrower or skinny streets when there are areas with limited right of way or physical constraints that prevent full width accommodations. In these situations, the TSP identifies the following circumstances when skinny street accommodations are appropriate:

- Low vehicular volumes and speeds
- Limited to local or neighborhood streets
- One-way couplet situations

Finding: The recognition of the importance of skinny streets as a flexible design treatment and the circumstances in which they should be considered is consistent with Livable Streets design concepts and should be carried forward as part of the TSP update.

Bicycle Accommodations

The TSP identifies the need to accommodate the many different types of bicyclists, skill levels and trip types by providing adequate facilities for all. Different bicycle facility types recognized by the TSP include the following:

- Multi-use paths – off street routes, typically recreation focused, appropriate for all user groups
- Cycle tracks – exclusive bike facilities that are separated from vehicle traffic
- Bike lanes – striped area within the roadway right of way for exclusive bicycle use
- Shared travelways – roadways where vehicles and bicyclists share the same travel space
- Neighborhood greenways - lower-order, lower-volume streets with various treatments to promote safe and convenient bicycle travel

Finding: The TSP provides general guidance on the application and typical widths of these bicycle accommodations and should be carried forward as part of the TSP update.

Neighborhood Greenways

Within the Bicycle Element of the TSP, neighborhood greenways have been defined and designated for select roadways in Milwaukie. Neighborhood greenways are described as having the following characteristics:

- Lower-order, lower-volume streets with various treatments to promote safe and convenient bicycle travel and enhance pedestrian travel as well.
- Usually accommodate bicyclists and motorists in the same travel lanes, often with no specific vehicle or bicycle lane delineation.
- Assign higher priority to through bicyclists, with secondary priority assigned to motorists.
- Include treatments to slow vehicle traffic to enhance the bicycling environment.
- Traffic controls along a neighborhood greenway assign priority to bicyclists while encouraging through-vehicle traffic to use alternate parallel routes.
- Work best in well-connected street grids, where riders can follow reasonably direct and logical routes and where higher-order, parallel streets exist to serve through-vehicle traffic.

The TSP does not define thresholds or specific design standards for neighborhood greenways, but it does identify potential treatments falling into the following five application levels:

- Level 1: Signage (e.g., wayfinding and warning signs along and approaching the neighborhood greenway).
- Level 2: Pavement markings (e.g., directional pavement markings, shared lane markings).
- Level 3: Intersection treatments (e.g., signalization, curb extensions, refuge islands).
- Level 4: Traffic calming (e.g., speed humps, mini traffic circles).
- Level 5: Traffic diversion (e.g., choker entrances, traffic diverters).

Finding: Discussion on the concept of neighborhood greenways is currently incorporated in Chapter 6 Bicycle Element. While primarily a design concept that benefits bicyclists, the supporting policy statements and design parameters would be more visible and impactful as a component of the Street Design Alternatives section in Chapter 10 Street Design.

In addition to potential reorganization of the neighborhood greenway guidelines, it is noted that neither the TSP nor the *Public Works Standards* outline specific performance guidelines for when to consider or apply a neighborhood greenway overlay according to motor vehicle speeds and traffic volumes. To help guide future decision making, it is recommended that the following neighborhood greenway performance guidelines be incorporated into the Milwaukie TSP update. These vehicle speed and volume performance guidelines are consistent with application guidelines used in neighboring cities including the City of Portland:

- *Vehicle speeds should be no more than 20 mph on all neighborhood greenways.*
- *The ideal neighborhood greenway has a target volume of 1,000 motor vehicles a day or less.*
- *Neighborhood greenways can function effectively with added design features with an average of 1,500 motor vehicles per day.*

APPENDIX B:

MILWAUKIE PUBLIC WORKS STANDARDS

Milwaukie's *Public Works Standards*, last revised March 2024, includes detailed design-based street standards for how to build and retrofit streets in the City. For reference, Figures 11-13 illustrate the street cross section graphics and street design details contained in the Public Works Standards.

Figure 11. Street Cross Sections from Public Works Standards

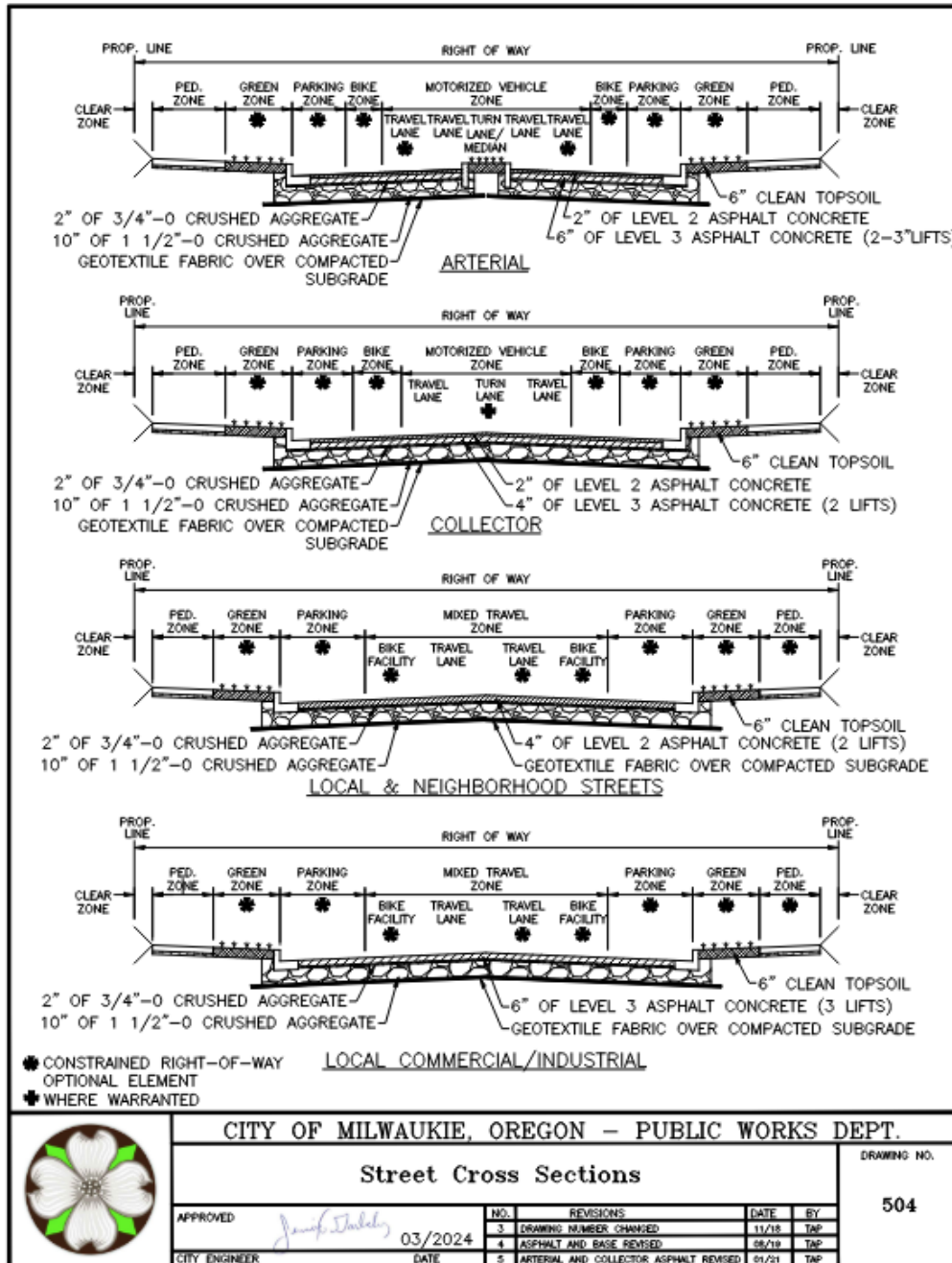


Figure 12. Low Volume Street Cross Sections from the Public Works Standards

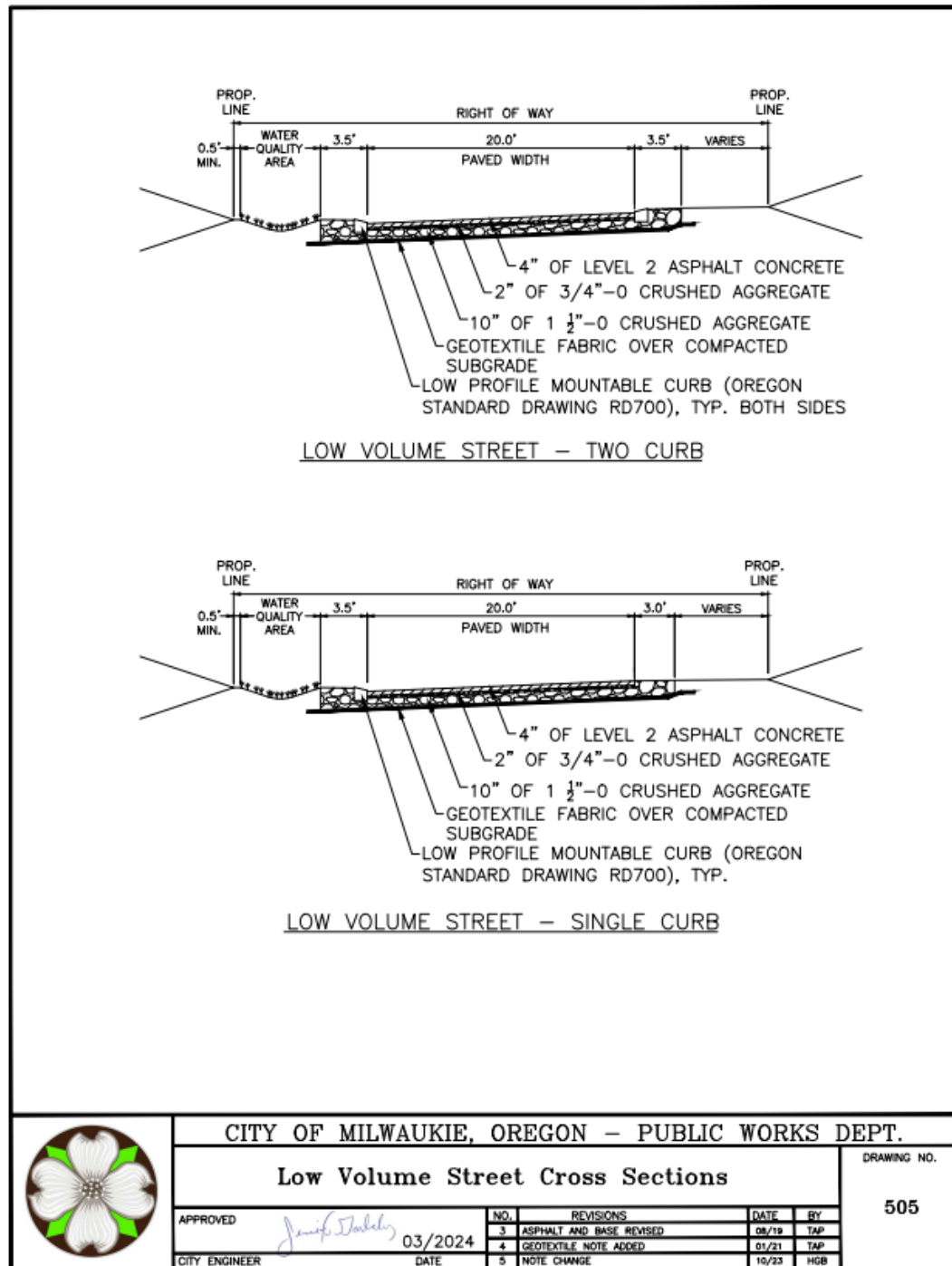


Figure 13. Street Design Elements and Dimensional Standards for Street Cross Sections by Functional Classification

| Street Design Elements and Standards | | | | | | | |
|--------------------------------------|-----------------------------------|----------------------------|-----------|-------------------|------------------|---------------------------|---------------------------|
| Street Classification | Full-Width Right-of-Way Dimension | Individual Street Elements | | | | | |
| | | Travel Lane (Center Lane) | Bike Lane | On-Street Parking | Landscape Strips | Sidewalk Curb Tight | Sidewalk Setback |
| Arterial | 54'-89' | 11'-12' (12'-13') | 5'-6' | 6'-8' | 3'-5' | 8'-10' | 6' |
| Collector | 40'-74' | 10'-11' | 5'-6' | 6'-8' | 3'-5' | 8' | 6' |
| Neighborhood | 20'-68' | 10' | 5' | 6'-8' | 3'-5' | 6' | 5' |
| Local | 20'-68' | 8' or 10' | 5' | 6'-8' | 3'-5' | 6' | 5' |
| Truck Route | 34'-89' | 11'-12' (12'-13') | 5'-6' | 6'-8' | 3'-5' | 8'-10' | Per Street Classification |
| Transit Route | 30'-89' | 10'-12' (12'-13') | 5'-6' | 6'-8' | 3'-5' | Per Street Classification | Per Street Classification |

The Public Works Standards offer additional standards that supplement and support the dimensional standards shown in Figures 9 and 10 when needed for flexibility. These additional standards are summarized in Table 3.

Table 3. Local and Neighborhood Streets Design Elements According to Public Works Standards

| Element | Standard Width | Notes |
|------------------------|---|--|
| Clear Zone | Minimum of 6 inches | A clear zone is part of the public right of way and offers an unobstructed area beyond the edge of the multimodal travel area. A minimum of 6 inches will be required between a property line and the street element that abuts it; e.g., sidewalk or landscape strip. |
| Pedestrian Zone | <ul style="list-style-type: none"> 6 ft. sidewalk when curb tight (no adjacent green zone) 5 ft. when separated by a green zone | <p>Sidewalk widths may be reduced to a minimum of 4 ft. for short distances for the purpose of avoiding obstacles within the public right-of-way including, but not limited to, trees and power poles.</p> <p>An 8' wide multiuse side path can be substituted for the bike lane and setback sidewalk. A 10' wide multiuse side path can be substituted for the bike lane and curb tight sidewalk.</p> |
| Green Zone | 3 - 5 ft. | <p>Landscape strip widths will be measured from the back of curb to the front of sidewalk.</p> <p>Where water quality treatment is provided within the public right-of-way, the landscape strip width may be increased to accommodate the required treatment area.</p> |
| Parking Zone | 6 – 8 ft. | <p>On-street parking in industrial zones will have a minimum width of 8 ft.</p> <p>On-street parking in commercial zones will have a minimum width of 7 ft.</p> <p>On-street parking in residential zones will have a minimum width of 6 ft.</p> |

| Element | Standard Width | Notes |
|--------------------------|---|--|
| Mixed Travel Zone | <ul style="list-style-type: none"> • Travel lane - 8 ft. or 10 ft for local streets • Travel lane - 10 ft. for neighborhood streets • Bike Lane: 5 ft. | <p>A minimum of 10-foot travel lane width will be provided on local streets with no on-street parking.</p> <p>Additional width is required for travel lanes located next to a curb line (1-2 feet).</p> <p>Where shared lanes or bicycle boulevards are planned, up to an additional 6 ft of travel lane width will be provided.</p> <p>Bike lane widths may be reduced to a minimum of 4 ft where unusual circumstances exist and where such a reduction would not result in a safety hazard.</p> |

In addition to this flexibility, the following language is provided that gives the City Engineer autonomy in determining when to deviate from these standards when needed to support special circumstances.

The City Engineer will determine the full-width cross section for a specific street segment based on functional classification using the dimensions and standards stated above. The full-width cross section is the sum total of the widest dimension of all individual street elements. If the City Engineer determines that a full-width cross section is not appropriate or feasible, the City Engineer may first reduce individual street elements to the minimum dimensions and standards stated above. If necessary to further reduce the street cross section width, the City Engineer may eliminate individual street elements on one or both sides of the street in accordance with Figure 10-1 of the TSP. When making a street design determination that varies from the full-width cross section, the City Engineer will consider the following:

- 1. Options and/or needs for environmentally beneficial and/or green street designs.*
- 2. Multimodal street improvements identified in the TSP.*
- 3. Street design alternative preferences identified in Chapter 10 of the TSP, specifically regarding sidewalk and landscape strip improvements.*
- 4. Existing development pattern and proximity of existing structures to the right-of-way.*
- 5. Existing right-of-way dimensions and topography.*

Design Assessment Findings

Ideal dimensions of roadway design elements are shown in Table 4 for local and collector streets⁴ based on best practices and general guidance in ODOT's *Highway Design Manual*, and the *Designing Livable Streets and Trails Guide*. As shown in the table, Milwaukie's current design standards fall within the range of ideal dimensions and no changes are needed/recommended.

Table 4. TSP Street Design Guidance Findings

| Element | Ideal Dimensions from Regional Guidance and Best Practices | Findings |
|--------------------------|--|--|
| Clear Zone | 0.5 – 4 ft. on both sides of the roadway | Milwaukie's public works standards offer flexibility within this ideal range. |
| Pedestrian Zone | 5 – 10 ft. with an additional 0.5 – 2 ft. of curb/gutter | Milwaukie's public works standards for sidewalks fall within this ideal range and offers flexibility when needed. However, the supplemental language emphasizes a minimum dimension versus a desired dimension. |
| Green Zone | 0 – 6 ft. landscape strip | Milwaukie's public works standards offer flexibility within this range. |
| Parking Zone | 7 - 8 ft. on street parking | Milwaukie's public works standards offer flexibility within this range, but do provide provisions that allow 6' parking lanes in residential zones where needed to accommodate constrained environments. |
| Mixed Travel Zone | 5 – 9 ft. bike lane 10 – 12 ft. travel lanes | Milwaukie's public works standards fall within this range and provide flexibility for the accommodation of narrower travel lane widths. However, the supplemental language emphasizes the minimum dimension for bicycle facilities versus a desired dimension. |

⁴ Additional facility types and context for application are provided in the background documents and public works standards, however the table focuses on key elements appropriate for local, neighborhood, and collector streets.

APPENDIX C:

MILWAUKIE MUNICIPAL CODE

The City's street design standards are referenced by the Milwaukie Municipal Code which is the City's main regulatory document. Code sections that regulate street design standards can be found in the following title sections:

Title 12 Streets, Sidewalks, and Public Spaces

Title 12 includes a code provision under section 12.02.010 that indicates all streets constructed in the City shall be constructed in conformance with the applicable public works standards.

Title 17 Land Division

Within this chapter, section 17.28.020 sets design standards for public facility improvements as part of land divisions and boundary changes. This section notes that all land divisions and boundary changes increasing the number of lots will be subject to Chapter 19.700 Public Facility Improvements and the Public Works Standards for improvements to streets, sidewalks, bicycle facilities, transit facilities, and public utilities.

Title 19 Zoning Ordinance

Section 19.700 ensures that development, including redevelopment, provides public facilities that are safe, convenient, and adequate in rough proportion to their public facility impacts. Section 19.701.1 provides standards for transportation facilities and states that design standards for transportation facilities must:

- Protect the functional classification, capacity, and LOS of transportation facilities;
- Ensure transportation facility improvements are provided in rough proportion to development impacts;
- Provide an equitable and consistent method of requiring transportation facility improvements; and
- Ensure that transportation facility improvements accommodate multimodal modes of travel including pedestrian, bicycle, transit, and auto.

Section 19.703.3 clarifies the approval criteria for transportation facility improvements. Either development will provide transportation improvements or mitigation at the time of development that is in rough proportion to its potential impacts (see Section 19.705 for rough proportionality definition), or pay a fee in lieu of construction as allowed by Chapter 13.32.

Section 19.708 contains the City's requirements and standards for improvements to public streets, including pedestrian, bicycle, and transit facilities. As noted in the section, *"The City acknowledges the value in providing street design standards that are both objective and flexible. Objective standards allow for consistency of design and provide some measure of certainty for developers and property owners. Flexibility, on the other hand, gives the City the ability to design streets that are safe and that respond to existing street and development conditions in a way that preserves neighborhood character."*

Section 19.708.2 “contains the street design elements and dimensional standards for street cross sections by functional classification. Dimensions are shown as ranges to allow for flexibility in developing the most appropriate cross section for a given street or portion of street based on existing conditions and the surrounding development pattern. The additional street design standards in Subsection 19.708.2.A augment the dimensional standards contained in Table 19.708.2. The Engineering Director will rely on Table 19.708.2 and Subsection 19.708.2.A to determine the full-width cross section for a specific street segment based on functional classification. The full-width cross section is the sum total of the widest dimension of all individual street elements. If the Engineering Director determines that a full-width cross section is appropriate and feasible, a full-width cross section will be required. If the Engineering Director determines that a full-width cross section is not appropriate or feasible, the Engineering Director will modify the full-width cross section requirement using the guidelines provided in Subsection 19.708.2.B.”

When making a street design determination that varies from the full-width cross section, the Engineering Director shall consider the following:

1. Options and/or needs for environmentally beneficial and/or green street designs.
2. Multimodal street improvements identified in the TSP.
3. Street design alternative preferences identified in Chapter 10 of the TSP, specifically regarding sidewalk and landscape strip improvements.
4. Existing development pattern and proximity of existing structures to the right-of-way.
5. Existing right-of-way dimensions and topography.