City of Bellevue

Transportation Commission Study Session

DATE: January 2, 2025

TO: Chair Stash and Members of the Transportation Commission

FROM: Kevin McDonald, AICP, Principal Transportation Planner
kmcdonald@bellevuewa.gov, 425-452-4558

Chris Breiland, PE, Fehr & Peers
cbreiland@fehr&peers.com

SUBJECT: **Mobility Implementation Plan Update: Pedestrian Level of Traffic Stress**

DIRECTION REQUESTED

	Action
X	Discussion/Direction
X	Information

At the January 9 study session, Transportation Department staff and the consultant team from Fehr & Peers will review the framework components of a Pedestrian Level of Traffic Stress (PLTS) for the update to the Mobility Implementation Plan (MIP). While no formal action is requested at this study session, staff will seek concurrence with recommended primary PLTS metrics.

BACKGROUND AND INFORMATION

In the Mobility Implementation Plan (adopted 2022, Resolution No. 10085), the Bicycle Level of Traffic Stress (BLTS) Performance Metrics and Performance Targets are established for the arterial bicycle network. BLTS is used to describe the intended performance of the network, to identify and prioritize Performance Target gaps, and to inform the design of the bicycle network facilities to address the gaps.

This update of the MIP will include a new section on Pedestrian Level of Traffic Stress (PLTS) that will establish Performance Metrics and Performance Targets for the arterial pedestrian network. Currently, in the MIP, the only pedestrian network metric for arterials is the presence of a sidewalk and the target is to have a sidewalk on both sides. PLTS will be a new tool for:

- Planning: To determine the simple, clear and understandable primary metrics to use and the target performance of the pedestrian network, and
- Implementation: To identify and prioritize performance target gaps and to determine context-appropriate project concepts to address the gaps.

In developing the BLTS recommendation for the MIP, the Transportation Commission recognized that there are many factors that contribute to the experience of comfort and safety of a person bicycling, and that the key factors of posted speed limit, daily traffic volume, and the bicycle facility type would provide primary metrics and the targets that could be easily understood by the public, while allowing some flexibility to address Performance Target gaps through implementation that may vary depending on the context.

Staff recommends pursuing a similar approach to developing PLTS primary metrics and performance targets. In this memo, staff will focus on the primary metrics, with performance targets to be developed in consideration of the recommended metrics.

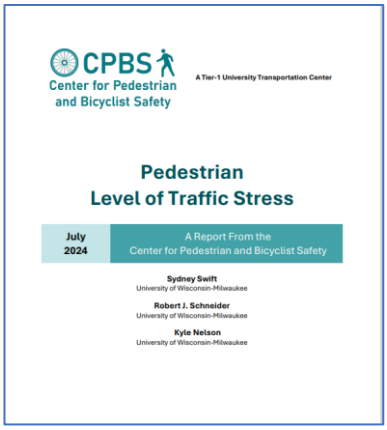
Pedestrian Level of Traffic Stress

Purpose

Pedestrian Level of Traffic Stress is a qualitative way to describe the comfort level and safety of people walking adjacent to motor vehicle traffic along or across a street given various sets of conditions. The PLTS describes four categories of pedestrian comfort and safety along an arterial segment:

- PLTS 1: Little to no stress or concerns for safety in a comfortable pedestrian environment.
- PLTS 2: Low stress. Generally, a comfortable pedestrian environment.
- PLTS 3: Moderate stress. May be somewhat uncomfortable.
- PLTS 4: High stress. Uncomfortable.

Best Practice



The definitive body of research on the subject of Pedestrian Level of Traffic Stress was prepared in July 2024 by the Center for Pedestrian and Bicyclist Safety which is "…a consortium of universities committed to eliminating pedestrian and bicyclist fatalities and injuries through cutting-edge research, workforce development, technology transfer, and education". Members of the consortium are The University of New Mexico; San Diego State University; The University of California Berkeley; The University of Tennessee Knoxville; and The University of Wisconsin Milwaukee. The primary authors are affiliated with the University of Wisconsin, Milwaukee which has been leading this research for several years. The report was funded by a grant from the U.S. Department of Transportation, University

Transportation Centers Program. The report contains components/metrics considered to be important factors in pedestrian comfort and safety along segments of arterials and at crossings.

Along arterial segments, the Center's research finds the following metrics are most substantially related to pedestrian comfort. All of the metrics also have a documented relationship with traffic safety outcomes

- Posted speed limit or actual measured traffic speed
- Traffic volume (daily)
- Width of the sidewalk
- Width of the paved shoulder (if no sidewalk is present)
- Width of buffer between motor vehicle travel lane and pedestrian space

Generally, in the expression of PLTS and the selection of metrics, simplicity is favored over complexity. The report notes that environmental factors (land use, crossing opportunities, slope, uneven surface, etc) will also impact pedestrian comfort.

Pedestrian Level of Traffic Stress Implementation in Jurisdictions

As staff noted at the Commission study session on December 12, Bellevue would not be the first jurisdiction to implement PLTS performance metrics. Below are several examples from jurisdictions that document pedestrian network performance metrics. Note that most jurisdictions use the same set of fundamental metrics.

- Washington Department of Transportation (WSDOT)
    - Posted Speed limit
    - Daily Traffic Volume
    - Number of travel lanes
    - Sidewalk presence
    - Pavement condition
- Oregon Department of Transportation (ODOT)
    - Posted speed limit
    - Roadway cross section (number of lanes)
    - Sidewalk width and buffer
    - Pavement condition
    - General land use
- Boulder, CO
    - Posted speed limit
    - Number of travel lanes
    - Presence of sidewalk
    - Presence of buffer

    - Commercial driveway curb cuts
- Montgomery County, MD
    - Posted speed limit
    - Roadway classification (considers number of lanes and traffic volume)
    - Sidewalk presence and width
    - Surface condition
    - Land Use (urban, non-urban)

Primary Metrics for Bellevue Arterial Corridor Pedestrian Level of Traffic Stress

As noted above, best practices research and community applications indicate that there are a few important metrics widely used to describe the comfort and safety of the pedestrian environment. Staff recommend that a PLTS for Bellevue should incorporate the following primary metrics to describe the pedestrian LTS along Bellevue arterials and to establish performance targets.

- Actual Traffic Speed (Bellevue has available data to use as a fundamental metric instead of posted speed limit. Actual speed may have more impact on traffic stress than posted speed.)
- Average Daily Traffic Volume (same metric as for Bicycle LTS)
- Width of sidewalk (the MIP already includes the presence of a sidewalk)
- Presence of buffer (separation of people walking from moving vehicles)

Supplemental Components

The primary metrics capture the most important variables that the research shows are related to pedestrian safety and comfort. These metrics can be evaluated across the entire city. However, as staff have reviewed best practices and considered how PLTS can be incorporated into programming, several “supplemental components” were identified. Supplemental components may be considered when describing and evaluating the pedestrian environment. These components can also help prioritize performance target gaps and inform the design of project concepts to address gaps. At the project implementation stage, supplemental components would be helpful in refining/informing designs and development mitigations. Examples include:

- Effective (unobstructed) sidewalk width.
- Sidewalk condition

- Presence of street trees or other fixed components in the landscape buffer that add a more substantial physical barrier from moving traffic. This is a documented safety countermeasure.
- Presence of curbside parking lane or dedicated bicycle facility that provide a physical separation from moving vehicles. These are documented safety countermeasures.
- Planned land use intensity as defined in the Performance Management Area.
- Pedestrian destinations, i.e.) school, library.
- Presence, spacing, and volume of commercial/multifamily driveways. Driveways are a safety concern for people walking.
- Spacing of designated arterial crossings (designated by some type of crossing treatment and signalization at intersections and mid-block crossing locations)
- Accessibility standards (i.e., ADA, PROWAG)
    - ADA – Americans with Disabilities Act. Congress intended that the Act "provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities"
    - PROWAG – Public Right of Way Access Guide. This document, by the U. S. Access Board, addresses access to sidewalks and streets, crosswalks, curb ramps, pedestrian signals, on-street parking, and other components of public right-of-way.

The recommended primary metrics have been demonstrated through research and applications to be the significant factors in determining pedestrian comfort and safety – level of traffic stress. In Bellevue, information on these metrics is readily available for purposes of mapping and documenting performance. Supplemental components may be considered when assigning priorities and when crafting project concepts to address performance target gaps. This approach is similar to that used for the bicycle network to establish performance targets, identify performance target gaps, determine priorities, and inform project concepts that address performance target gaps.

NEXT STEPS

Staff plan to return to a future study session (January 23, 2025) to present an approach similar to the familiar table format for the bicycle network LTS to document PLTS using the recommended primary metrics for the arterial network. Staff also intend to introduce arterial intersection and mid-block crossing metrics that will help define a complete and connected arterial corridor for people walking.

In February or March, staff will map existing PLTS conditions and overlay PLTS performance targets (PLTS 1, PLTS 2 and PLTS 3) onto the Bellevue arterial network. PLTS 4 may be an existing condition, but it would not be a recommended target.

Staff will soon initiate an Engaging Bellevue project page to verify that the 2009 Pedestrian and Bicycle Plan networks for local streets meet current needs and to solicit input on where the planned network should be modified.

ATTACHMENTS

None