Seattle Department of Transportation

SDOT Policy Memorandum

To: Dusty Rasmussen, Interim Transportation Operations Division Director

Thru: Venu Nemani, City Traffic Engineer

From: Project Development Division

Date: January 4, 2022

Subject: SDOT Enhanced Pedestrian Crossing Location Guidelines

Purpose

The purpose of these guidelines is to allow for pedestrian crossing investments at locations that are best suited to enhance pedestrian mobility. This document is intended to establish parameters in which an arterial or non-arterial school zone crossing improvement could be proactively warranted, but does not speak to the appropriate design treatment, which is addressed in supplementary SDOT guidance. This document uses the term “enhanced” pedestrian crossing to mean a crossing that is marked and that may include supplementary treatments depending on roadway characteristics.

Goals

The overarching objective of the guidelines established in this document is to improve pedestrian safety, mobility, and access with respect to arterial roadways and non-arterials within school zones. The guidelines work to achieve this goal by:

- Facilitating a predictable and intuitive pedestrian network that offers opportunities to cross roadways where there is likely to be the greatest need.
- Reducing the distance pedestrians need to travel to access an enhanced crossing and encouraging the use of more protected crossing locations.
- Enabling enhanced pedestrian crossings to be planned and constructed concurrently with transit facilities and development anticipated to generate pedestrian demand.

Evaluation and Guideline Revisions

These guidelines are intended to serve as a living document that can be updated over time as informed by data, observations, and operational needs.

Background

SDOT’s mission is to deliver a transportation system that provides safe and affordable access to opportunities and places. This mission is in service to the vision of Seattle as a thriving, equitable community powered by dependable transportation. To advance the mission and vision, SDOT has developed updated policies for installing enhanced pedestrian crossings for arterials.

Policy and Research Framework

Pedestrian crossings are governed by Washington State law, national engineering standards and local guidance. Marked pedestrian crossings alert drivers when to expect pedestrian crossings, but in many cases, should be combined with other enhanced treatments to achieve a safety benefit. A 2001 FHWA study found that marked crosswalks alone on two-lane roads and low-volume roads (<12,000 ADT) produced no difference in pedestrian crash rates. Marked crosswalks installed without other treatments or with only raised medians on multi-lane and higher-volume roads was also correlated with higher rates of pedestrian crashes.[1]

There is, however, a broad toolkit of treatments that can be used to enhance the safety of pedestrian crossings (e.g., rapid flashing beacons, curb bulbs, in-street warning signs), which are not addressed in these guidelines. Marked crosswalks have also been studied and shown to significantly improve driver stop compliance, pedestrian wait time, and pedestrian comfort.[2]

Legal Framework

Per RCW 46.61.235, a legal crosswalk exists at every intersection unless it is otherwise signed, regardless of whether the crosswalk is marked or unmarked. SMC 11.14.135 provides further code guidance for the City of Seattle, specifying that legal crosswalks at intersections are defined by projections of the curb and back of sidewalk lines across the street or by a line 10 feet behind the face of the curb or roadway edge when there is no sidewalk; or, a marked crosswalk including marked crosswalks not at an intersection. Marked crosswalks should always be installed based on engineering judgment and are best suited in certain locations desirable for directing pedestrians to the preferred location for crossing the street and alerting road users of a pedestrian crossing point.

City Policy Framework

Seattle 2035

The City's Comprehensive Plan, *Seattle 2035*, calls for coordinating transportation decisions and investments with the City's overall growth strategy with a particular focus on improving walkability in Seattle's Urban Centers and Urban Villages.

> *Goals*
>
> *TG-1 Ensure that transportation decisions, strategies, and investments support the City's overall growth strategy and are coordinated with this Plan's land use goals.*

[1] Zegeer, C., Stewart, J., Huang, H. and Lagerwey, P. (2001). *Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines*. [online] Nacto.org.

[2] Havard, C. and Willis, A. (2011). *Effects of Installing a Marked Crosswalk on Road Crossing Behaviour and Perceptions of the Environment.* [online]. Academia.edu.

Policies

T 1.1 Provide safe and reliable transportation facilities and services to promote and accommodate the growth this Plan anticipates in urban centers, urban villages, and manufacturing/industrial centers.
T 1.2 Improve transportation connections to urban centers and villages from all Seattle neighborhoods, particularly by providing a variety of affordable travel options (pedestrian, transit, and bicycle facilities) and by being attentive to the needs of vulnerable and marginalized communities.
T 1.3 Design transportation infrastructure in urban centers and villages to support compact, accessible, and walkable neighborhoods for all ages and abilities.
T 1.4 Design transportation facilities to be compatible with planned land uses and consider the planned scale and character of the surrounding neighborhood.
T 1.5 Invest in transportation projects and programs that further progress toward meeting Seattle's mode-share goals…and reduce dependence on personal automobiles, particularly in urban centers.

Pedestrian Master Plan

SDOT's Pedestrian Master Plan (PMP) guides the City's efforts to become the most walkable and accessible city in the nation and establishes five goals to achieve this vision. These goals align with the objective of these guidelines to provide more comfortable and accessible pedestrian crossings.

Vibrancy – Develop a connected pedestrian environment that sustains healthy communities and supports a vibrant economy.

Health – Get more people moving to improve health and increase mobility.

Climate - More people walking for more trips can also reduce the consumption of fossil fuels, leading to a healthier environment for all Seattleites.

Safety – Reduce the number and severity of crashes involving pedestrians.

Equity – Make Seattle a more walkable and accessible city for all through equity in public engagement, service delivery, accessibility, and capital investments.

The PMP identifies a series of strategies and actions that establish a framework for achieving the plan's five goals. Included in these strategies is a call to increase opportunities for controlled pedestrian crossings on arterials, directing SDOT to "review and establish maximum controlled crossing spacing standards/guidelines for multi-lane arterials." These guidelines seek to advance this action through providing opportunities for additional enhanced crossings at priority pedestrian generator locations.

Vision Zero Action Plan

Seattle has adopted a goal to eliminate traffic deaths and serious injuries on city streets by 2030. To achieve this goal, SDOT has identified a list of near-term actions in the 2015 Vision Zero Action Plan that work to reduce serious and fatal crashes. These actions fall into three categories:

1. Street design, policies, and regulation
2. Education and public engagement
3. Enforcement

One of the key near-term policy actions is to "update SDOT's crosswalk policies to put greater emphasis on the presence of transit stops, elderly people, and students." These crosswalk placement guidelines address this action through the consideration of schools, transit stops, and facilities serving older adults to warrant new marked pedestrian crossings.

Transportation Operations Division Policy Framework

SDOT's Transportation Operations Division (TOD) has adopted several related policies and standard practices that work in concert with this guidance. While these guidelines establish only the criteria to determine the most suitable locations for new enhanced pedestrian crossings from a user perspective, other adopted TOD policies and standard practices provide additional guidance on the appropriate pedestrian crossing treatments, timing for pedestrians at signalized intersections, and the requirements for curb ramps and accessible pedestrian signals. **While these guidelines establish criteria to determine the locations to best enhance pedestrian mobility, existing policies and engineering judgment will continue to determine the most appropriate treatment and implementation will be determined by available funding.**

TOD's previous practice to warrant an enhanced pedestrian crossing required recording counts of 20+ adults or 10+ children per hour for neighborhood greenway and school zone crossings, and for all other locations required 40+ pedestrians per hour for several hours in a day. Since this guidance was developed, Seattle has experienced rapid population growth and associated changes to development and pedestrian activity. These guidelines have focused investments at crossings already hospitable to pedestrians but have prevented investments at locations with desire lines that are currently prohibitive to safe or frequent crossing due to roadway conditions such as vehicle volumes and/or speeds. Similarly, as written it did not allow for proactive installation–meaning installing an enhanced pedestrian crossing in anticipation of increased pedestrian usage, such as a new school or planned frequent transit stop.

External Guidance

MUTCD

The MUTCD does not contain a specific warrant for installation of marked crosswalks alone. It calls for engineering judgment to consider "the number of lanes, the presence of a median, the

distance from adjacent signalized intersections, the pedestrian volumes and delays, the average daily traffic (ADT), the posted or statutory speed limit or 85th-percentile speed, the geometry of the location, the possible consolidation of multiple crossing points, the availability of street lighting, and other appropriate factors."

However, it does provide warrants for new traffic signals and pedestrian hybrid beacons (comparable to Seattle's pedestrian half-signals) which take into account the speed and volume of vehicles and the number of pedestrians crossing the street. It does not provide guidance for proactive installation in locations where the speed and volume of traffic inhibits crossing, or where the distance between enhanced crosswalks is so long that pedestrians are not crossing consistently at one place.

NACTO

The NACTO Urban Street Design Guide encourages accounting for both existing as well as projected crossing demand in the locating of new crossing facilities. Frequent crossings reinforce walkability and have the potential to fuel greater demand. Pedestrian crossings should be located as per current or projected pedestrian desire lines and their placement should be balanced with that of the motorized traffic network, so as to not severely compromise either.

NACTO emphasizes there is no absolute rule for crosswalk spacing. Rather it depends on block length, street width, building entrances, traffic signals, etc. In general, if it takes a person more than 3 minutes to walk to a crosswalk, wait to cross the street, and then resume his or her journey, he or she may decide to cross along a more direct, but unsafe or unprotected, route. While this behavior depends heavily on the speed and volume of motorists, it is imperative to understand crossing behaviors from a pedestrian's perspective.

WSDOT

WSDOT's Enhancement Criteria for Uncontrolled Pedestrian Crossing Locations establishes a two-step engineering study to determine whether a crosswalk should be marked at an existing uncontrolled location and if additional treatments are needed for the enhanced crossing. The first step of the engineering study considers pedestrian and bicycle volumes, crash history, and travel patterns as well as qualitative data on the specific location (e.g., proximity to pedestrian generators, land use context, demographics of vulnerable populations). This is used to determine the need for the crossing. The second step of the study factors in existing intersection features and quantitative information about the location, including average daily traffic volumes, number of lanes, and illumination, to determine the treatments that would be needed to enhance the crossing. The first step of this study in WSDOT's criteria is similar to the guidance established in this document, which focuses on evaluating a multitude of qualitative and quantitative factors to determine where an enhanced crossing is most appropriate.

Guidelines for Enhanced Pedestrian Crossings

The following guidelines are intended to identify potential new enhanced crossing locations in the citywide pedestrian network based on both anticipated and observed pedestrian crossing

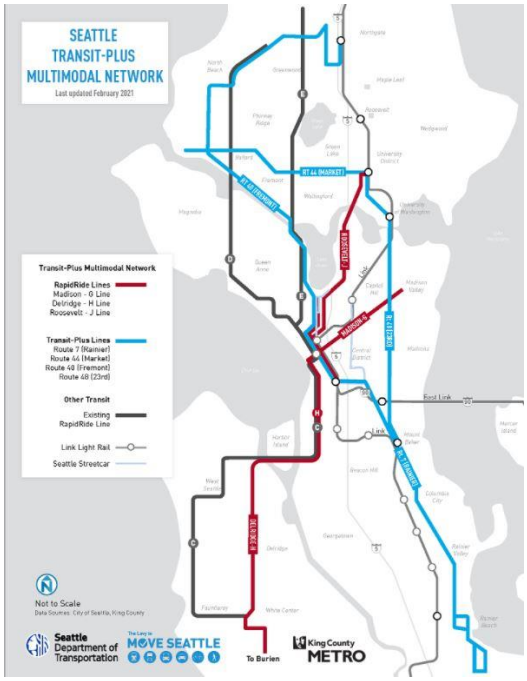
infrastructure needs along arterial roadways. While this guidance is expected to allow for more frequent crossings for pedestrians, all pedestrian crossing locations, including newly defined legal crossings, must be based on best engineering judgement and must be approved by the SDOT Traffic Operations Division. Enhanced pedestrian crossings and new legal crossings must consider vehicle speeds and volumes, safety, sight distance, intersection geometry, land use, and the movement of vehicles from driveways and parking lanes. Specific enhanced crosswalk treatments should be informed based on supplementary SDOT policy.

Pedestrian Generator Guidelines

Tier 1 Pedestrian Generators

Based on best engineering judgement, enhanced pedestrian crossings *should be consistently provided* at the following existing and planned pedestrian generator locations, with respect to arterials (non-arterials in school zones):

- Trail crossings.
- Neighborhood greenway crossings.
- Public and private school zones. Within school zones, marked pedestrian crossings are recommended at both arterial and non-arterial intersection legs along a school's parcel based on key campus access points and where significant crossing demand is expected or observed.
- Transit stops along Seattle's Transit-Plus Multimodal Corridor (TPMC) network, including RapidRide, Transit-Plus Lines, Link Light Rail, and Seattle Streetcar lines. SDOT may also consider stop relocation or consolidation (in coordination with transit agencies) prior to marking a new pedestrian crossing.



Based on best engineering judgement, enhanced pedestrian crossings *should be considered for proactive installation* at the following existing and planned pedestrian generator locations. These locations require additional documentation to provide justification on the need for an upgraded crossing based on anticipated crossing demand and the demographics that would be served by the enhanced crossing, including vulnerable populations and people with disabilities:

- Transit stops outside of the TPMC network. Marked crossing justification should evaluate boarding and alighting data, ridership projections, and/or transit rider ADA requests. SDOT may also consider stop relocation or consolidation (in coordination with transit agencies) prior to marking a new pedestrian crossing.
- Main park entrances.
- Facilities serving high volumes of vulnerable populations, senior centers, senior living facilities, senior meal sites, health care facilities, and childcare centers.
- Community facilities, including libraries, food banks, community centers, and places of worship.
- Entrances to major institutions, including hospitals, universities, and colleges.
- High-density pedestrian-oriented retail and commercial office developments.

Justification documentation to demonstrate the need for an enhanced pedestrian crossing at these generators should include:

- Roadway characteristic data of the higher volume street:
    - Average daily traffic volumes
    - 85th percentile speeds
    - Number of lanes/description of channelization
- 5-year crash data at the intersection, including pedestrian crashes
- Description of planned and existing land uses near the intersection
- Recent peak-hour or 12-hour pedestrian count at the intersection
- Description of demographics or older adult/disabled user groups that the enhanced crossing would serve, if applicable
- Documentation explaining the reasoning for prioritizing an enhanced crossing at the proposed intersection (e.g., programmatic prioritization processes, participatory budgeting, etc.)

Additional Pedestrian Facility Considerations

When determining the location of new enhanced pedestrian crossings, special consideration should be given to providing a frequent and predictable network of pedestrian crossings within Urban Villages and Urban Centers, where pedestrian demand is expected to be the greatest. The location of enhanced crossings should also consider connections to other pedestrian facilities, such as existing and planned sidewalks, curb ramps, curb bulbs, and pedestrian median islands.

If an arterial intersection does not meet the pedestrian generator criteria described above but does warrant an enhanced pedestrian crossing based on a pedestrian volume study, then an enhanced pedestrian crossing may be provided. To satisfy this warrant, pedestrian crossing volumes must include at least 20 pedestrians per hour along neighborhood greenways and within school zones (with children and aging adults counting double) or 40 pedestrians per hour (with children and aging adults counting double) in all other locations.

Implementation of these Guidelines

These guidelines will inform future pedestrian investments; programs that fund pedestrian improvements, such as Vision Zero, Pedestrian Master Plan Implementation, Safe Routes to School, ADA, and Neighborhood Greenways will apply these guidelines as a framework to further refine program priorities. These guidelines are not intended to replace direction from modal master plans, strategic plans, or established prioritization processes, which center equity, safety, and accessibility factors, rather than frequent requests. Additionally, investments in pedestrian infrastructure, like all improvements, are based on available funding.

Maintenance is necessary for ensuring a safe, equitable, accessible, and comfortable pedestrian environment. As these guidelines are implemented, maintenance of marked crosswalks and associated treatments, including signals and signs, should be continuously assessed to ensure that installed crossing treatments can operate safely throughout their lifespan.

The crossing recommendations in these guidelines should be evaluated and implemented with all new capital projects as funding allows.

Impact of these Guidelines

These guidelines on enhanced pedestrian crossing locations have the potential to increase the number of enhanced pedestrian crossings and/or the associated design treatments required over time. Based on the guidance above, these will be most prevalent in Seattle’s Urban Center and Urban Villages, which aligns with the City’s vision for enhanced pedestrian access and mobility.

Implementation of these guidelines along with additional capital funding have the potential to increase citywide maintenance needs for pedestrian facilities over time but will simultaneously advance the City’s progress towards providing a safe, equitable, accessible, and comfortable pedestrian environment. Maintenance needs will be continuously evaluated as new enhanced pedestrian crossings are installed.

Deviations

Any deviations from the recommended pedestrian generator criteria or other guidance provided above shall be documented and approved by SDOT Traffic Operations.

Approvals

Venu Nemani, City Traffic Engineer	01/09/2022 Date
Dusty Rasmussen Dusty Rasmussen (Jan 10, 2022 09:04 PST) Dusty Rasmussen, Interim Transportation Operations Division Director	01/10/2022 Date