

**SEATTLE DEPARTMENT OF TRANSPORTATION  
DIRECTOR'S RULE 04-01**

<b>Subject:</b> Installation Criteria & Procedures for Responding to Requests for Safety Improvements regarding: Marked Pedestrian Crosswalks; General Traffic Control Signals; Pedestrian Traffic Signals; Pedestrian Traffic Signals for the Disabled or Senior Citizens; and Pedestrian Traffic Signals to Accommodate School Crossings	<b>Page 1 of 8</b>  <b>Publication:</b> 02-20-04  <b>Effective:</b> 12-31-04
<b>Type of Rule:</b> Procedural	<b>Ordinance Authority:</b> SMC 3.02.030
<b>Code and Section Reference:</b> SMC 11.16.340(N); 3.12.020	<b>Approved – SDOT</b>

This Director's Rule is established solely to provide guidelines to work toward the City's goal of installing pedestrian safety improvements when funds are available. The intent is to provide for and promote the health, safety and welfare of the general public.

It is not the intent of this Director's Rule to protect individuals or create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by this Director's Rule as a whole or any of its terms. Pedestrians and drivers have the obligation to comply with the rules of the road and have the liability for failing to do so. The City cannot provide safe crossing facilities if motor vehicle drivers and pedestrians fail to follow the rules of the road. Moreover, the City cannot anticipate and protect against all imaginable acts of negligent drivers and pedestrians, for to do so would make the City an insurer against all such acts.

**OBJECTIVES**

This Rule establishes guidelines to improve pedestrian safety and increase the awareness of the public about the criteria for establishing or permitting:

- 1) marked pedestrian crosswalks;
- 2) general traffic control signals;
- 3) pedestrian traffic signals;
- 4) pedestrian traffic signals for the disabled or senior citizens; and
- 5) pedestrian traffic signals to accommodate school crossings.

It also establishes the process by which traffic control devices may be requested and how the Department will process those requests.

## **BACKGROUND**

The City adopted Resolution 25717 in January 1979, establishing criteria for evaluating requests for traffic and pedestrian safety improvements, and for determining the relative necessity of the request. Some of the criteria set forth in Resolution 25717 were amended by the City Council when it adopted Resolution 26190 on January 14, 1980.

The University of North Carolina Highway Safety Research Center has completed the first ever nation-wide, comprehensive study of marked and unmarked crosswalks; the results of this study provide new information regarding the safety and appropriate location of marked crosswalks and are incorporated into this Rule.

More than 30 Neighborhood Plans have included statements that making improvements to the walking environment is a priority for their neighborhood. Additionally, the City of Seattle's Transportation Strategic Plan, adopted by Resolution 29815 on October 26, 1998, places a high priority on making walking safer and more attractive and calls for the Executive "to promote and highlight" certain strategies including Strategy W1.2 which call for the City to "Revise the City's policies guiding the marking of crosswalks if appropriate".

## **INSTALLATION CRITERIA**

The criteria shown below shall be used to evaluate and determine the number and location of 1) marked pedestrian crosswalks; 2) general traffic control signals; 3) pedestrian traffic signals; 4) pedestrian traffic signals for the disabled or senior citizens; and 5) pedestrian traffic signals to accommodate school crossings.

### **1. MARKED PEDESTRIAN CROSSWALKS**

#### **Background:**

Pedestrians should be able to cross roads safely, and therefore, the City should try to provide safe crossing facilities. There are many engineering measures that may be used at a pedestrian crossing, depending on site conditions. Marked crosswalks are commonly used at intersections and sometimes at mid-block locations.

It is important to remember that providing marked (painted) crosswalks is only one of many possible engineering measures. Thus, when considering how to provide safer crossings for pedestrians, the question should NOT simply be: "Should I provide a marked crosswalk or not?" Instead, the question should be: "What are the most effective measures that can be used to help pedestrians to safely cross the street?" Deciding where to mark or not mark crosswalks is only one consideration in meeting the objective to create safe pedestrian crossings.

#### **Other Treatments:**

Treatments other than installing marked pedestrian crosswalks may be considered prior to installing a marked crosswalk, if determined to be appropriate by the City Traffic Engineer. Examples of some of these pedestrian improvements include:

- Providing raised medians on multi-lane roads;
- Installing traffic signals (or pedestrian signals) where warranted or where serious pedestrian crossing problems exist;
- Reducing the effective street crossing distance for pedestrians by providing curb extensions or raised pedestrian islands or reducing four-lane undivided road sections to two through lanes with left-turn pockets with sidewalks;
- Installing traffic calming measures on neighborhood streets to slow vehicle speeds or reduce cut-through traffic. Such measures may include:
  - intersection designs (traffic mini-circles, diagonal diverters);
  - raised crossings (raised crosswalk, raised intersection, speed humps);
  - street narrowing measures (chicanes, slow points, “skinny street” designs);
- Providing adequate nighttime lighting for pedestrians;
- Redesigning intersections and driveways with refuge islands and tighter turn radii;
- Using innovative signs, signals and markings.

More details of these and other pedestrian facilities are provided in the City of Seattle, *Streets that Work* Manual, published in 1995. The actual installation of marked crosswalks and other treatments will be contingent upon funds being available.

**Installation Guidelines:**

Marked pedestrian crosswalks may be used to delineate preferred pedestrian travel across roadways upon the Department’s evaluation of the following:

- a) At signalized locations where vehicular traffic might block pedestrian traffic when stopping for a red light;
- b) At non-signalized locations where recommended elementary school routes cross arterial and residential streets; and
- c) At non-signalized locations where other students often cross; this includes junior high school, high school and private school students
- d) At non-signalized locations where, in the judgement of the City Traffic Engineer, the use of specially aligned crosswalks is desirable for traffic safety.

Also, typically, there should be at least 200 feet between the proposed marked crossing location and the nearest existing signal on the same arterial, except on one-way streets and in unique situations where there is high pedestrian demand. The new marked crosswalk shall not, in the Department’s judgement, unduly restrict platooned traffic, and shall be evaluated, taking into account adjacent signals and other existing marked crosswalks.

Finally, an engineering evaluation may be completed before installing a marked crosswalk in accordance with the criteria listed in Figure 1 (pg. 4). An engineering evaluation could analyze (but is not required to or limited to analyze) other factors such as pedestrian volume, gaps in traffic, approach speed, sight distances, illumination, needs of special populations, etc. In all cases, good engineering judgment must be applied.

e) Pedestrian generators: See Section 3. Pedestrian Traffic Signals

**Guidelines for installing marked crosswalks at non-signalized locations.**

	≤ 9K ADT			> 9K to ≤ 12K ADT			> 12K to ≤ 15ADT			> 15K ADT		
	≤ 30 mph	35 mph	40 mph	≤ 30 mph	35 mph	40 mph	≤ 30 mph	35 mph	40 mph	≤ 30 mph	35 mph	40 mph
2 LANES												
3 LANES												
≤ 4 LANES RAISED MEDIAN												
≥ 4 LANES NO MEDIAN												

Where speed limit exceeds 40 mph, marked crosswalks alone should never be used.

K = 1000

ADT = Average Daily Traffic

Mph = Miles per hour

	Candidate for a marked crosswalk. Marked crosswalks, if installed, must be installed carefully and selectively. Complete engineering evaluation prior to installing marked crosswalk.
	May or may not be a good candidate for a marked crosswalk. Complete engineering evaluation prior to installing marked crosswalk.
	Usually not a good candidate for a marked crosswalk (unless used in combination with other treatments). Complete engineering evaluation prior to installing marked crosswalk.

**Figure 1**

**Removal Guidelines**

Due to changing traffic conditions, there will be situations where an existing marked crosswalk no longer meets the above criteria for installation of a marked crosswalk. In these situations, SDOT will consider other treatments such as installing a pedestrian traffic signal. However, it is recognized that in some situations a signal or other improvement will not be appropriate and that it still will be necessary to remove the marked crosswalk. Prior to removal, SDOT will notify affected stakeholders of the planned removal. Additionally, SDOT will look for opportunities to redirect pedestrians to an alternative preferred crossing location. For example, it may be possible to move a bus stop so those pedestrians are directed to cross at a signalized location.

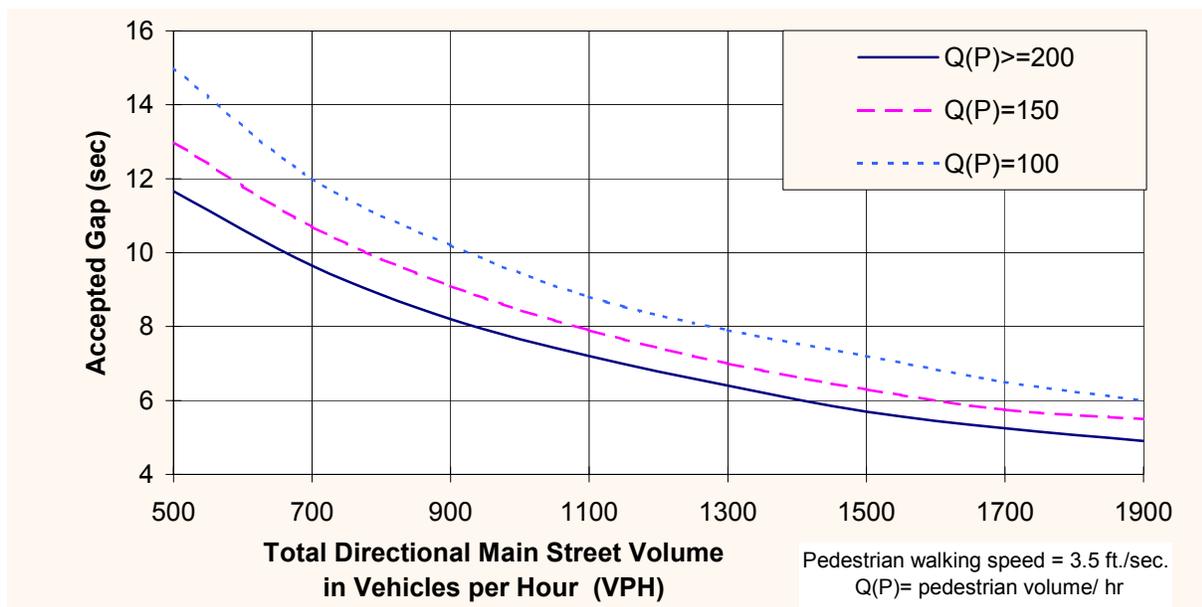
## 2. GENERAL TRAFFIC CONTROL SIGNALS

A traffic control signal may be warranted at a particular location and included on the New Signals Need Control List when it meets the criteria given in the latest edition of the “Manual on Uniform Traffic Control Devices for Streets and Highways,” published by the United States Department of Transportation. These criteria take into account vehicle and pedestrian volumes, vehicle speeds, available gaps in traffic, accidents considered correctable by a traffic signal, proximity of other traffic control devices, and other factors such as grades, curbs, and visibility. The actual installation of traffic control signals will be contingent upon funds being available and upon whether or not the need for a traffic signal can be mitigated by some alternative traffic or pedestrian safety improvement.

## 3. PEDESTRIAN TRAFFIC SIGNALS

A pedestrian traffic control signal is also what sometimes is termed a “Half Signal”. This type of signal controls the main street traffic with signal control, while any side street that may be present is controlled by stop signs, not the signal. A pedestrian traffic control signal may be warranted at a particular location and included on the New Signals Need Control List when either a) or b) below are met or exceeded:

- a) The criteria (shown in Figure 2) are met or exceeded for
  - (1) 4 hours on an average weekday, or
  - (2) 10 hours on any weekend if at least 3 hours are on the day with lighter volumes.



**Figure 2: Pedestrian Signal Warrant for an Undivided Street**

Figure 2 compares the available crossing gaps in traffic with the existing total directional, main street traffic volumes and pedestrian crossing volumes, and establishes thresholds for these

combinations. (“Total directional, main street volumes” are the totals of the main street volumes entering an intersection, whether it is from two directions on a two way street, or one direction on a one way street. The “main street” is that with the greater volume of the streets intersecting one another.) A location that has values that fall above those threshold curves for the time periods identified in either section a (1) or a (2) above will meet the criteria for this section.

**Or**

b) All the criteria are met for each of the following subsections:

(1) Traffic Volumes: Total directional main street volumes are a minimum of 500 vehicles per hour (VPH) for 8 hours of the day. If the 85<sup>th</sup> percentile speed exceeds 40 miles per hour, the total directional main street volume can be reduced to 400 VPH for 8 hours for the day (80% of original). The 85<sup>th</sup> percentile speed is that speed which 85 percent of the total vehicles are traveling at, or slower.

(2) Gaps: There shall be less than 30 usable gaps across the main street in a half-hour period. A usable gap is calculated using the formula:

$$\frac{W}{3.5 \text{ ft. sec.}} + 3 + (n - 1)2 = \text{___ Seconds}$$

Where  $W$  is the distance, in feet, from the curb, minus the *parking lane* (if the parking lane is a dependable source of protection), or the distance, in feet, from the curb to a raised pedestrian refuge island (if the refuge island is a dependable source of protection). The use of a two-way left turn lane for a refuge area may be used dependant on the individual location and the Department’s engineering judgment. The value of 3 is the perception and reaction time in seconds.  $N$  is the number of rows of pedestrians, consisting of 5 pedestrians in each row.  $N$  shall equal one for any group of 5 or less pedestrians (i.e. a group of 16 will have an  $N$  value equal to 4). Gaps should be observed during peak traffic hours, or peak pedestrian use time, if the peak traffic hours and peak pedestrian use times are not the same.

(3) Distance between signals: There shall be at least 300 feet between the proposed signal location and the nearest existing signal on the same arterial, except on one-way streets and within Urban Villages or Urban Centers. The new signal shall not, in the Department’s judgment, unduly restrict platooned traffic, and shall be coordinated with adjacent signals.

(4) Pedestrian Generators: One or more of the following types of facilities, or facilities that, in the judgment of the Department, generate levels of pedestrian traffic similar to the following types of facilities, must be near the proposed crossing.

- Medical Facilities – includes hospitals and medical clinics.
- Housing for Pedestrian or Transit-dependant populations – includes retirement homes, senior housing, high-density housing, and hospice centers.
- Service Centers for Pedestrian or Transit-dependant populations – includes senior service centers, disabled service centers, and child and adult protective service centers.

- Pedestrian Transportation Facilities – includes staircases or trails connecting grade-separated transportation facilities, neighborhood plan-designated key pedestrian linkages, transit transfer points, and bridges where at least one side of the bridge is restricted to pedestrians.
- Activity Centers Serving Pedestrians – includes parks, libraries, and community centers.

An entrance to the facility that is used by a majority of the pedestrian traffic must be at least 300 feet from an existing signal that crosses the same arterial, with the exception of those locations within Urban Villages or Urban Centers.

#### **4. PEDESTRIAN TRAFFIC SIGNALS FOR THE DISABLED or SENIOR CITIZENS**

A pedestrian traffic control signal identified to meet the needs of the disabled or senior citizens may be warranted at a particular location and included on the New Signals Control List when one of the following conditions exist:

- a) For four-lane streets (two moving vehicular lanes in each direction) with a speed limit of 30 miles per hour or less, there must be a minimum of 100 disabled or senior citizen pedestrians attempting to cross during an eight hour period and, during the hour pedestrian volume is highest, there must be fewer than 60 adequate gaps in the vehicular traffic. A gap is defined as the time between vehicles moving on the street that is equal to the walking time required for a pedestrian to cross the street, plus some reaction time. See Section 4 (b) (2) for details.
- b) For two-lane streets (one moving vehicular lane in each direction) with a speed limit of 30 miles per hour or less, there must be a minimum of 200 disabled or senior citizen pedestrians attempting to cross during an eight hour period and, during the hour the pedestrian volume is the highest, there must be fewer than 60 adequate gaps in the vehicular traffic.
- c) For any street with a speed limit greater than 30 miles per hour, the required disabled or senior citizen pedestrian volume shall be reduced to 80 percent of the requirement shown in paragraphs (a) and (b), above. The gap requirement shall remain the same.
- d) The surveyed disabled or senior citizen pedestrian volumes may be increased if available information indicates that an immediate increase in actual volume can be anticipated.

The actual installation of disabled or senior citizen traffic signals will be contingent upon funds being available and upon whether or not the need for a traffic signal can be mitigated by some alternative traffic/pedestrian safety improvement.

#### **5. PEDESTRIAN TRAFFIC SIGNALS TO ACCOMMODATE SCHOOL CROSSINGS**

A school crossing traffic signal will be warranted at a particular location when it meets the school crossing traffic signal criteria defined in the latest edition of the “Manual on Uniform Traffic Control Devices for Streets and Highways.” The principal criterion is the number of adequate gaps in the vehicular traffic on the street to be crossed by the students. The actual installation of school crossing traffic signals will be contingent upon funds being available and upon whether or not the need for a traffic signal can be mitigated by some alternative traffic/pedestrian safety improvement.

## **PROCEDURES**

The Department shall evaluate and respond to requests for motor vehicle traffic or pedestrian traffic safety improvements using the following procedures.

For requests for marked pedestrian crosswalks, general traffic control signals, pedestrian traffic signals, pedestrian traffic signals for the disabled or senior citizens, and pedestrian traffic signals to accommodate school crossings:

- (1) Upon receipt of a request, the City Traffic Engineer, or the Engineer's designated representative, shall conduct an evaluation for locations in question, using the guidelines set forth in the **Installation Criteria** section above.
- (2) If the location meets the above guidelines, the location will be added to the current needs list to compete for funding as it becomes available.
- (3) If the evaluation shows that the location does not meet the guidelines set forth above for the particular type request, the request shall be placed in the Location File for future reference and the requestor will be contacted as to the decision. The City Traffic Engineer's decision to deny a request at any location may be appealed by any person to the Director of SDOT within fourteen (14) days of the date the decision was delivered to the requestor. The Director of the Seattle Department of Transportation will then respond to the appeal in a timely manner. The response shall be in writing if requested.