



MEMORANDUM

To: Michelle Marx, City of Portland

From: Corinna Kimball-Brown, Nelson\Nygaard Consulting Associates

Date: April 12, 2018

Subject: PedPDX Network Needs Analysis Initial Findings- DRAFT

CROSSING THE ROADWAY

Gaps

The Network Needs Analysis defines a crossing gap as a segment of a Pedestrian Priority Network street, designated as a City Walkway or Major City Walkway, where the distance between marked pedestrian crossings exceeds the City of Portland's Interim Spacing Guidelines.

Guidelines

The City of Portland's interim spacing guidelines for marked pedestrian crossings are as follows (for more information, see the Network Completeness and Adequacy Criteria Memo):

- On City Walkways and Major City Walkways *within* pedestrian districts, marked crossings should be no more than 530 ft apart
- On City Walkways and Major City Walkways *outside of* pedestrian districts, marked crossings should be no more than 800 ft apart
- The analysis does not include Neighborhood Walkways

Methods

1. Pedestrian Priority Network streets with a designation of City Walkway or Major City Walkway were split into segments at the locations of marked crossings. Marked crossings include those with basic parallel striping, high-visibility striping, and those indicated with distinct paving materials (for example, on the downtown transit mall).
2. The length of the each street segment was rounded, so that a segment that was within five feet of the desired distance between marked crossings would not be identified as a gap.
3. The crossing spacing guidelines were applied to each street segment based on its rounded length and whether it was located inside or outside of a pedestrian district. When a street segment was partially in a pedestrian district and partially outside of one, the crossing spacing guidelines for pedestrian districts (530 feet maximum) were applied.
4. For a street segment identified as a gap, the length of the segment was divided by the desired crossing spacing to arrive at a rough estimate of how many additional crossings are needed citywide.

Initial Findings

The initial gaps analysis found:

- A total of 448 miles of City Walkway and Major City Walkway with crossing gaps, 79% of the 567 total miles of streets with those designations.
- The longest gap is 49,011 feet, or 9.28 miles, on NW Skyline Boulevard.
- The mean length of gaps between crossings is 1,835 feet, or roughly 1/3 mile.
- Approximately 3,520 new marked crossings would need to be installed citywide in order for all City Walkways and Major City Walkways to meet the spacing guidelines.

Pedestrian Districts

Within pedestrian districts, the initial analysis identified the following:

- 175 miles of City Walkway/Major City Walkway where gaps are present, representing 69% of the total miles within pedestrian districts
- Mean gap distance of 1,310 feet, or 2.5 times the spacing guidelines
- Maximum gap distance of 10,420 feet, or 2 miles, on SW Barbur Boulevard
- Need for approximately 1,720 new marked crossings

City Walkways and Major City Walkways outside of Pedestrian Districts

On City Walkways and Major City Walkways outside of Pedestrian Districts, the initial analysis identified the following:

- 274 miles of City Walkway/Major City Walkway where gaps are present, representing 88% of the total miles outside of pedestrian districts
- Mean gap distance of 2,474 feet, more than 3 times the spacing guidelines
- Need for approximately 1,800 new marked crossings

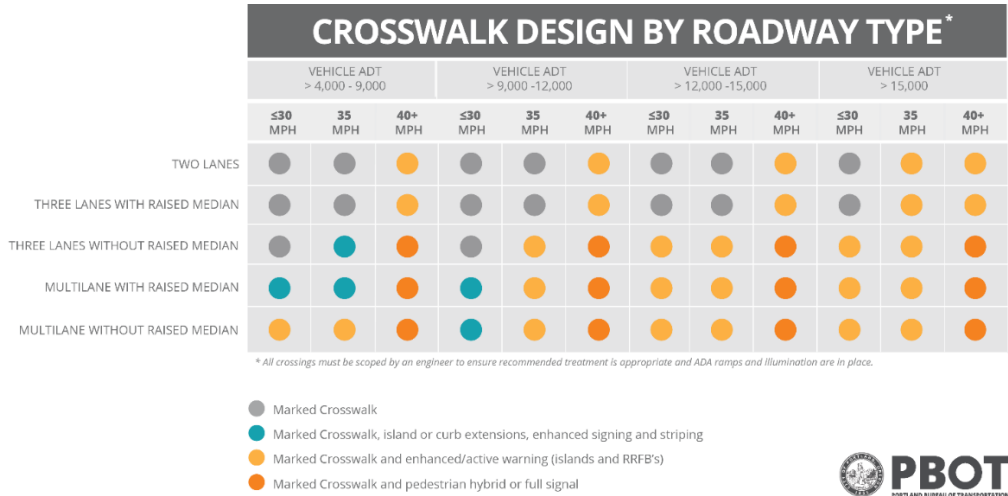
Deficiencies

The Network Needs Analysis assessed the sufficiency of all marked crossings on Pedestrian Priority Network streets with a designation of City Walkway or Major City Walkway. Crossings were identified as potentially deficient if the design of the crosswalk did not meet the desired design guidelines, as outlined below.

Criteria

The City of Portland has established the desired design of a crosswalk based on the speed limit, number of lanes, and average daily traffic (ADT) of the roadway that it crosses, as illustrated in Figure 1. The needs analysis was performed for marked crossings on City Walkways and Major City Walkways, and identified those crossings that are potentially deficient based on the City of Portland's general guidelines and available data. Ultimately, City engineers will assess each potentially deficient crossing location to determine the appropriate design.

Figure 1 Crosswalk Design by Roadway Type



For the purpose of this analysis, if the roadway is in the . . .

- Grey category and there is a marked crosswalk, then the crossing is not deficient
- Blue category and the crossing includes a curb extension or pedestrian refuge island, then the crossing is not deficient
- Orange category and the crossing has a Rectangular Rapid Flash Beacon (RRFB), then the crossing is not deficient
- Red/dark orange category and the crossing is located at a hybrid or full signal, then the crossing is not deficient

Methods

- Existing marked crossings were assigned values for the following characteristics of the crossing:
 - Presence of curb extension
 - Presence of pedestrian refuge island
 - Presence of signal (RRFB, hybrid, or full signal)
- Existing marked crossings were assigned values for the following characteristics of the roadway on which they are located:
 - Speed limit
 - Average daily traffic (ADT)
 - Number of lanes
 - Presence of raised median
- The marked crossings were assigned to a crossing design category and a roadway design category based on the chart shown in Figure 1. For example, a crossing with an existing pedestrian refuge island but no signal would be assigned to the “blue” crossing category. If that crossing were on a roadway with two lanes, speed limit of 40 mph, and ADT of between 9,000 and 12,000, it would be assigned to the “orange” roadway design category.

4. Deficient crossing were identified as those where the roadway category calls for a level of design that exceeds the existing crossing design.

Initial Findings

There are 218 deficient marked crossings on City Walkways and Major City Walkways, about 5% of the 4,458 total crossings. The number is relatively low partly because 66% of existing marked crossings are at a signalized intersection, which is deemed sufficient for all roadway types by the City of Portland. Figure 2 shows the number of crossing deficiencies organized by the existing design versus the desired crossing design for the roadway.

Figure 2 Number of Crossing Deficiencies: Desired Crossing Design versus Existing Crossing Design

Existing Crossing Design	Desired Crossing Design for Roadway		
	Blue: pedestrian refuge or curb extension	Orange: RRFB	Red: hybrid or full signal
Blue: marked crosswalk with pedestrian refuge island or curb extension	NA	97	1
Grey: marked crosswalk	3	108	9

The vast majority of deficient crosswalks are found on roads for which the desired crosswalk design is “orange”, that is, a marked crossing with an RRFB. These are roads which have a higher speed limit and/or more lanes, and/or higher ADT, but are not in the highest category for all of the factors combined. About 30% of the crosswalks analyzed fall on a road with a desired crossing design of “orange”, but they make up 94% of the deficient crosswalks. Most of the deficient crossings that should be in the “orange” design category are actually “grey”, meaning they have a marked crosswalk with no other design elements.

ALONG THE ROADWAY

Gaps

The Network Needs Analysis defines a gap along the roadway as a segment of a Pedestrian Priority Network street that does not meet the City of Portland’s guidelines.

Guidelines

The guidelines for pedestrian walkways are based on the 1998 Pedestrian Design Guide, the Comprehensive Plan, and the Alternative Pedestrian Walkway Guidelines, currently under development (for more information see the Network Completeness and Adequacy Criteria Memo). These guidelines set the standard that all streets should have sidewalks on both sides, except in locations where Alternative Street Design criteria are met. Alternative Street Design criteria allow for a sidewalk on only one side in locations that are environmentally constrained and/or where the posted speed is 25 mph or less. Unimproved right-of-way (ROW), that does not include a paved walkway is also considered to be a gap in the network.

Methods

For the initial analysis, gaps in the along-the-roadway network were identified for arterials and collectors on the Pedestrian Priority Network, due to data availability. The next phase of analysis will identify gaps in the network on local streets on the Pedestrian Priority Network.

1. The City of Portland provided data on sidewalk presence and absence for curblines on arterial and collector streets. This data represents both the portions of each curb where a sidewalk is located, and those portions of the curb where there is no sidewalk.
2. The curbline sidewalk presence and absence data was summarized for each side of each street segment of the Pedestrian Priority Network. In general, each street segment is equal to one block, but there is considerable variation, particularly in areas where streets do not follow a grid pattern.
3. Those street segments that may meet Alternative Street Design criteria were identified. This includes:
 - a. Streets with a speed limit of 25 mph or less
 - b. Streets that are considered to be environmentally constrained, which include streets that: are located within 15 feet of a steep slope (>50%); have a grade of 8% or greater, or; are adjacent to primary water quality protection areas, landslide hazard areas, 100-year flood areas, or wildlife habitat areas.
4. All segments of City Walkways and Major City Walkways, including those segments that may meet Alternative Street Design criteria, were assigned to one of the following categories:
 - a. Not a gap: sidewalk present on both sides of the street
 - b. Not a gap: sidewalk gap on one side of the street and street segment meets Alternative Design criteria
 - c. Gap: sidewalk gap on both sides of the street (this includes street segments with intermittent sidewalks on both sides)
 - d. Gap: sidewalk gap on one side of the street, not meeting Alternative Design criteria
 - e. No data: data was not available for every City Walkway at this stage in the analysis

Initial Findings

In the initial analysis of collectors and arterials on the Pedestrian Priority Network for which data was available, 42% of the 487 total street miles were identified as having sidewalk gaps on one or both sides of the street. It should be noted that the totals given below do not represent miles of missing sidewalk, but rather the total length of the street segments that have a gap in the sidewalk on one or both sides.

- 50% of Pedestrian Priority Network collectors and arterials have a sidewalk present on both sides
- 8% of Pedestrian Priority Network collectors and arterials have a sidewalk gap on one side and meet Alternative Street Design criteria
- 10%, about 50 miles, of Pedestrian Priority Network collectors and arterials have a sidewalk gap on one side and do not meet Alternative Street Design criteria
- 32%, about 157 miles, of Pedestrian Priority Network collectors and arterials, have a sidewalk gap on both sides

Deficiencies

The Network Needs Analysis defines a deficiency along the roadway as a segment of a Pedestrian Priority Network street that is within a Pedestrian District, or that has a designation of Major City Walkway, where the existing sidewalk does not meet the City of Portland's minimum width guidelines.

Guidelines

Sidewalk width standards, as established by the 1998 Pedestrian Design Guide, are defined based on pedestrian classifications. In the future, the standards will be based on design classifications. For the purposes of this analysis, a minimum 6-foot clear zone was used as the standard for Major City Walkways citywide, and for all Pedestrian Priority Network streets within Pedestrian Districts. Ultimately, a wider sidewalk clear zone will be required for many streets, but a 6-foot width represents a conservative approach to identifying deficiencies, as none of the streets analyzed are expected to have a lower standard.

Methods

1. Sidewalk width data was summarized for each side of each street segment. When a street segment was flanked by sidewalks of varying widths, the minimum width was used.
2. Street segments were assigned to the following categories
 - a. Sufficient width
 - b. Deficient width both sides of the street
 - c. Deficient width on one side of the street
 - d. No sidewalk present/no data available

Initial Findings

22% of the streets with existing sidewalks, about 68 miles out of 309 miles total, have a deficient clear zone width on one or both sides of the street.

In Pedestrian Districts

- 19% of streets, 53 miles out of 280, have a deficient sidewalk along them
 - 43% of these have a deficient sidewalk on one side only
- 21% of neighborhood walkways within pedestrian districts have a deficient sidewalk, out of 80 miles total
- 18% of Community Walkways and Major Community Walkways within pedestrian districts have a deficient sidewalk, out of 200 miles total

On Major City Walkways outside of Pedestrian Districts

- 21% (15 miles out of 72) have a deficient sidewalk
 - Just over 50% of these are deficient on both sides