



CITY OF KIRKLAND

Public Works Department

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MEMORANDUM

To: Transportation Commission

From: Daniel Rawlings, Transportation Engineer
Chuck Morrison, Transportation Engineer

Date: September 17, 2021

Subject: Traffic Signal Pedestrian Recall Guidelines

Staff Recommendation:

It is recommended that the Transportation Commission receive a briefing and provide input on the City's Traffic Signal Pedestrian Recall Guidelines.

Background:

Pedestrian recall is a traffic signal timing function that causes a pedestrian phase to automatically activate every cycle. The pedestrian phase includes the minimum 7-second walk period, and the "Flashing Don't Walk" time, which gets longer as the width of the intersection widens. For an intersection that does not operate in pedestrian recall, it is necessary for someone to activate a pedestrian pushbutton in order to trigger the pedestrian phase and cross the street.

During the spring of 2020, in response to the COVID-19 Pandemic, certain signals in the City had all of their pedestrian movements placed in 24/7 pedestrian recall. The intended effect of placing these signals in pedestrian recall was to prevent people from touching the pedestrian pushbuttons, and thus, curbing the spread of COVID-19. The intersections placed in total pedestrian recall included:

Downtown Kirkland

- Central & Lake St
- Central & 3rd St
- 3rd St & Kirkland Ave
- Lake St & Kirkland Ave

Juanita Village

- 98th Ave & Juanita Dr
- 97th Ave & Juanita Dr

These six intersections were selected because they are in areas known to have a high number of people walking.

In August, 2020, pedestrian recall at the 98th Ave & Juanita Dr and 97th Ave & Juanita Dr intersections was limited to between the hours of 7:00 AM and 9:00 PM. The four intersections in downtown Kirkland maintained 24/7 pedestrian recall operations.

In July 2021, because of what the City had learned about how the COVID-19 virus spreads, increasing vaccination rates, and case-loads at the time, the City decided to remove the pedestrian recalls at all six of the above intersections. This was consistent with why the pedestrian recall was implemented, which was to respond to concerns about COVID-19 spread.

Since the temporary implementation of pedestrian recall at these intersections was successful at making it easier for pedestrians to conveniently cross the street at signalized intersections, and it is considered an engineering best practice to support walkable communities where there is already a high volume of people walking, Public Works is developing guidelines for when pedestrian recall operation is appropriate. Evaluation of pedestrian demand will be accomplished using the performance measure log of the traffic signal controller to determine the number of traffic signal cycles¹ and how often pedestrian walk phases are activated. Consideration for pedestrian recall will primarily be based upon the percentage of cycles where pedestrian phases are active for a specific crosswalk.

Evaluation and collection of this pedestrian demand data to determine appropriate thresholds for pedestrian recall is currently ongoing. The following are draft guidelines, which will be reviewed and revised as necessary:

- If a pedestrian movement is active >75% of the time, then it should be placed in recall regardless of other effects on intersection operation.
- If a pedestrian movement is active >60% of the time, then overall intersection operation should be evaluated to determine if pedestrian recall is appropriate.
- Crosswalks which are active during the main street (higher volume) phases should be on recall whenever the intersection is coordinated with other traffic signals or if the main street consistently times high maximum values during the time period in question.
- For areas designated as having a high pedestrian priority, a lower value for the threshold may be used. This is proposed to be in the range of >40% or >50%. Evaluation of the rate of increase of pedestrian usage during the day, from the performance measure data, should indicate the appropriate time to activate recall operation.

Attachment 1 – September 22, 2021 Transportation Commission Presentation

¹ The traffic signal cycle is the time it takes to complete one sequence of serving all movements around a signalized intersection.

Traffic Signal Pedestrian Recall Guidelines

Kirkland Transportation Commission – September 22, 2021



Daniel Rawlings, Transportation Engineer
Chuck Morrison, Transportation Engineer
Public Works – Transportation Team

Presentation Overview

- Signal Timing Definitions
- Benefits and Drawbacks of Pedestrian Recall
- How Pedestrian Recall is Currently Applied in the City
- Existing Guidance on Pedestrian Recall
- City Methodology for Evaluating Intersections for Pedestrian Recall
- Draft Recommendations
- Questions?

Signal Timing Definitions

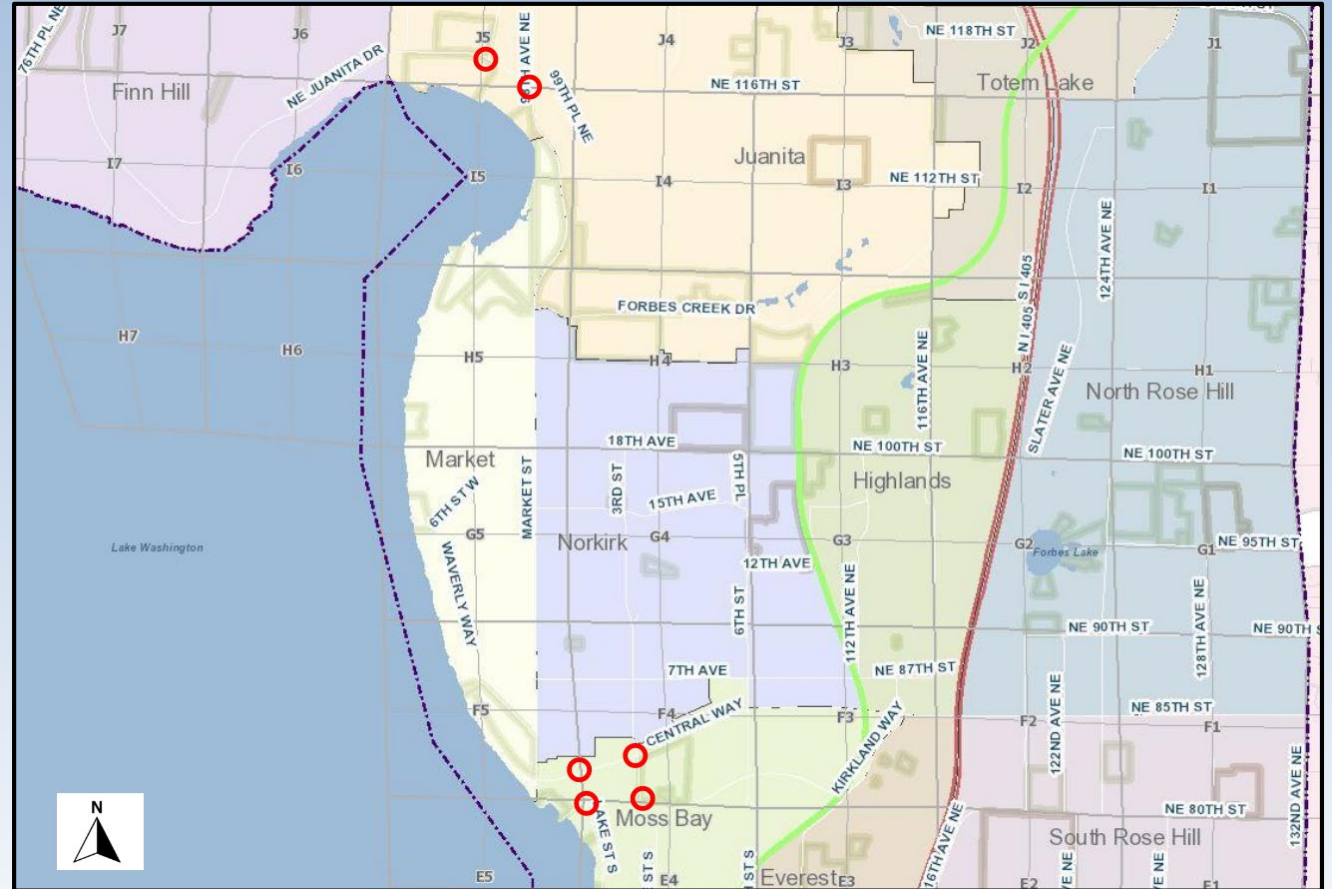
- **Coordinated Signal Operation:** Multiple intersections are synchronized and timed together to enhance certain directional movements.
- **Non-Coordinated Signal Operation (free):** Signals operate with full detection, on “first come first serve” basis. Usually for isolated intersections or intersections with low volume.
- **Pedestrian Phase:** Sum of the Walk time and Flashing Don't Walk time.
- **Cycle Length:** The amount of time to serve each movement.
- **Pedestrian Recall:** Walk phase is triggered automatically every cycle. No need for someone to press a pushbutton.
- **Actuated Pedestrian:** Pushbutton must be pressed to activate walk phase.
- **Rest in Walk:** Pedestrian phase dwells in Walk during coordinated signal phase

Benefits and Drawbacks of Pedestrian Recall

- Benefits:
 - Reduce pedestrian delay
 - Improve compliance and thus pedestrian safety
 - Pedestrians who are first to arrive may not press pushbutton
- Drawbacks:
 - Reduce intersection capacity
 - Can increase vehicle delay
 - Can increase pedestrian delay if crossing times are long [4]

Current Application of Pedestrian Recall

- Applied to coordinated signal phases with Rest in Walk feature
- 2020 COVID-19 Response – Ped Recall applied to all phases of selected signals
 - Central & Lake St
 - Central & 3rd St
 - 3rd St & Kirkland Ave
 - Lake St & Kirkland Ave
 - 98th Ave & Juanita Dr
 - 97th Ave & Juanita Dr



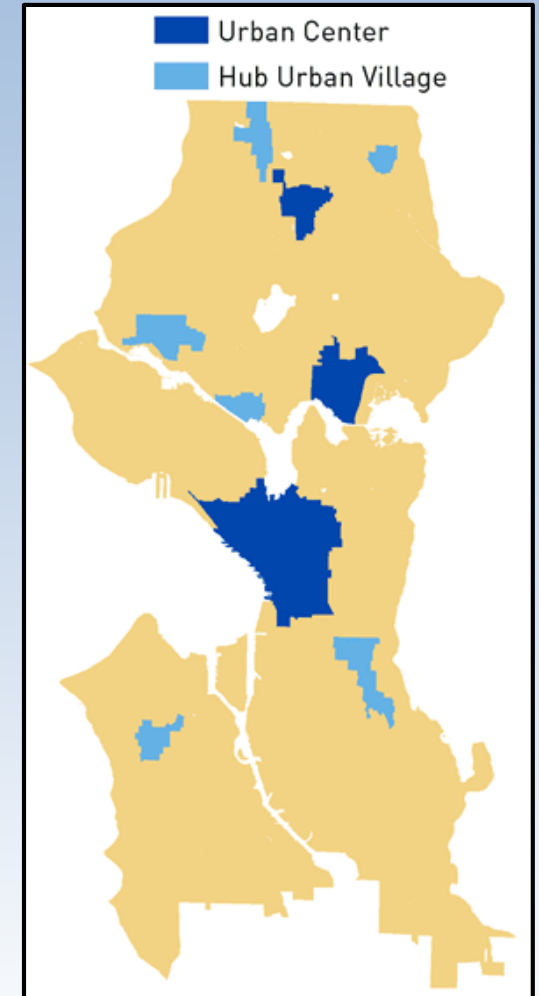
Existing Guidelines on Pedestrian Recall

- Signal Timing Manual (NCHRP Report 812)
 - Ped recall may be used at locations and/or times with high pedestrian activity [1]
- NACTO
 - Recommends pretimed signal with pedestrian recall in downtown areas, central business districts, and urban areas
 - Actuated signal operation should only be in rural or suburban settings [2]

Existing Guidelines on Pedestrian Recall

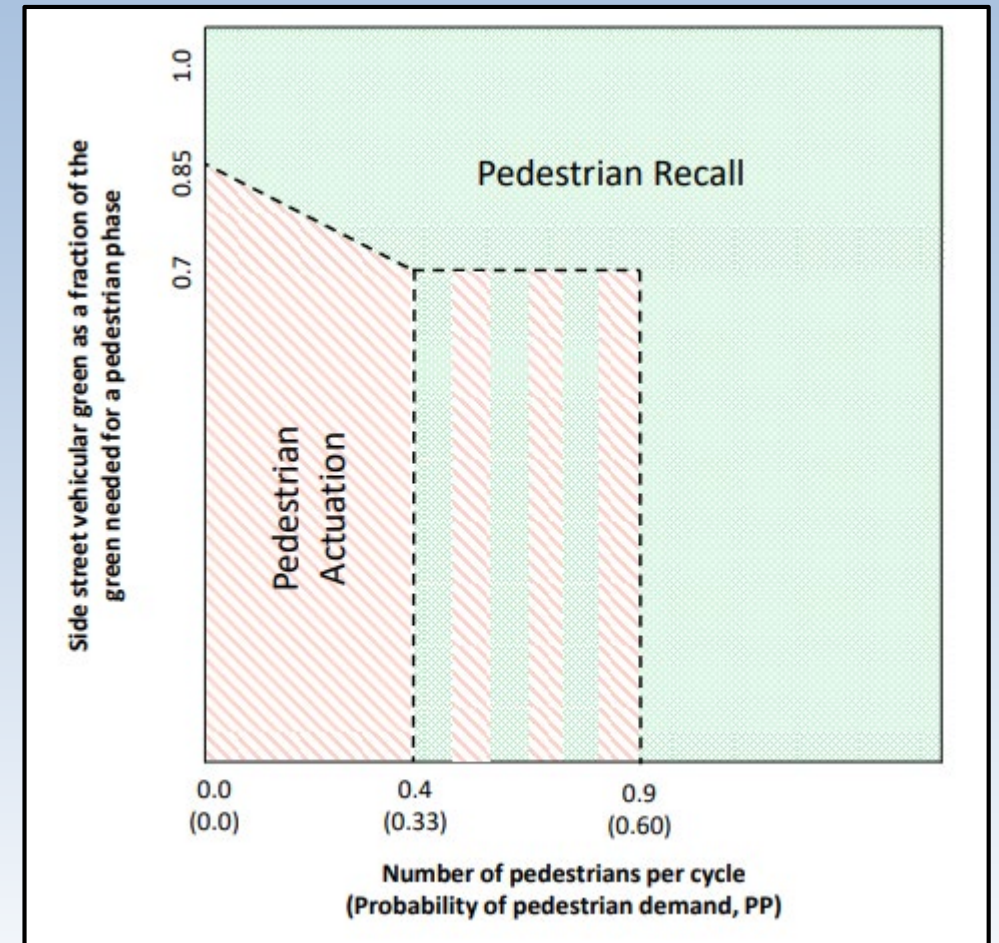
- City of Seattle

- Total recall (ped recall on all crosswalks) at intersections within Urban Centers and Urban Villages
- Provide ped recall on all main street movements
- Additional thresholds to consider
 - If pushbuttons are activated 50% of cycles a majority of the day
 - If pushbuttons are activated 75% of cycle during peak hours
 - Vehicle green time is within 5 seconds of minimum pedestrian time [3]



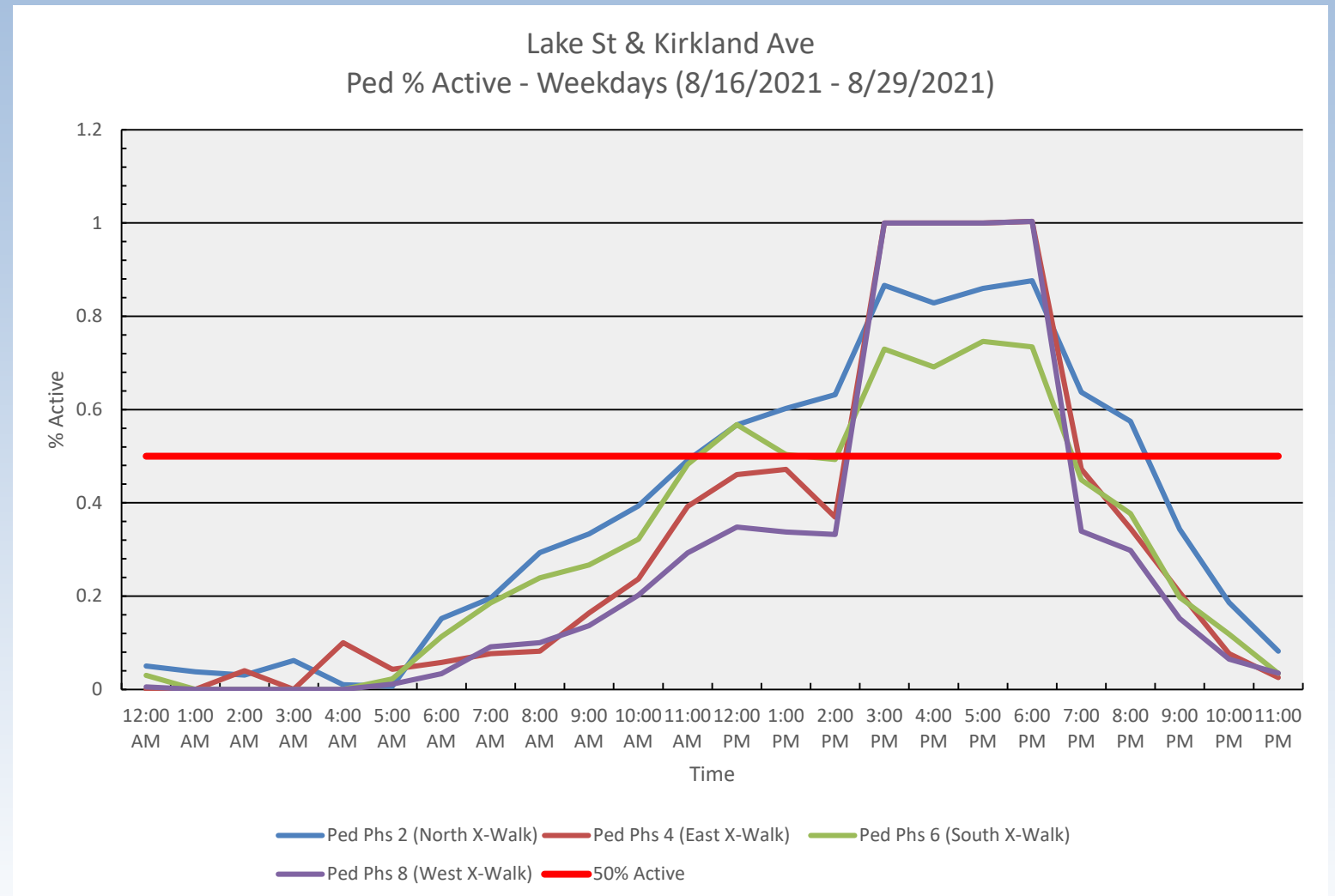
Existing Guidelines on Pedestrian Recall

- Cesme, Furth, Casburn, and Lee Study on Ped Recall
 - Recommendations for pedestrian recall at coordinated signals
 - Narrow application, but can still apply to certain City signals



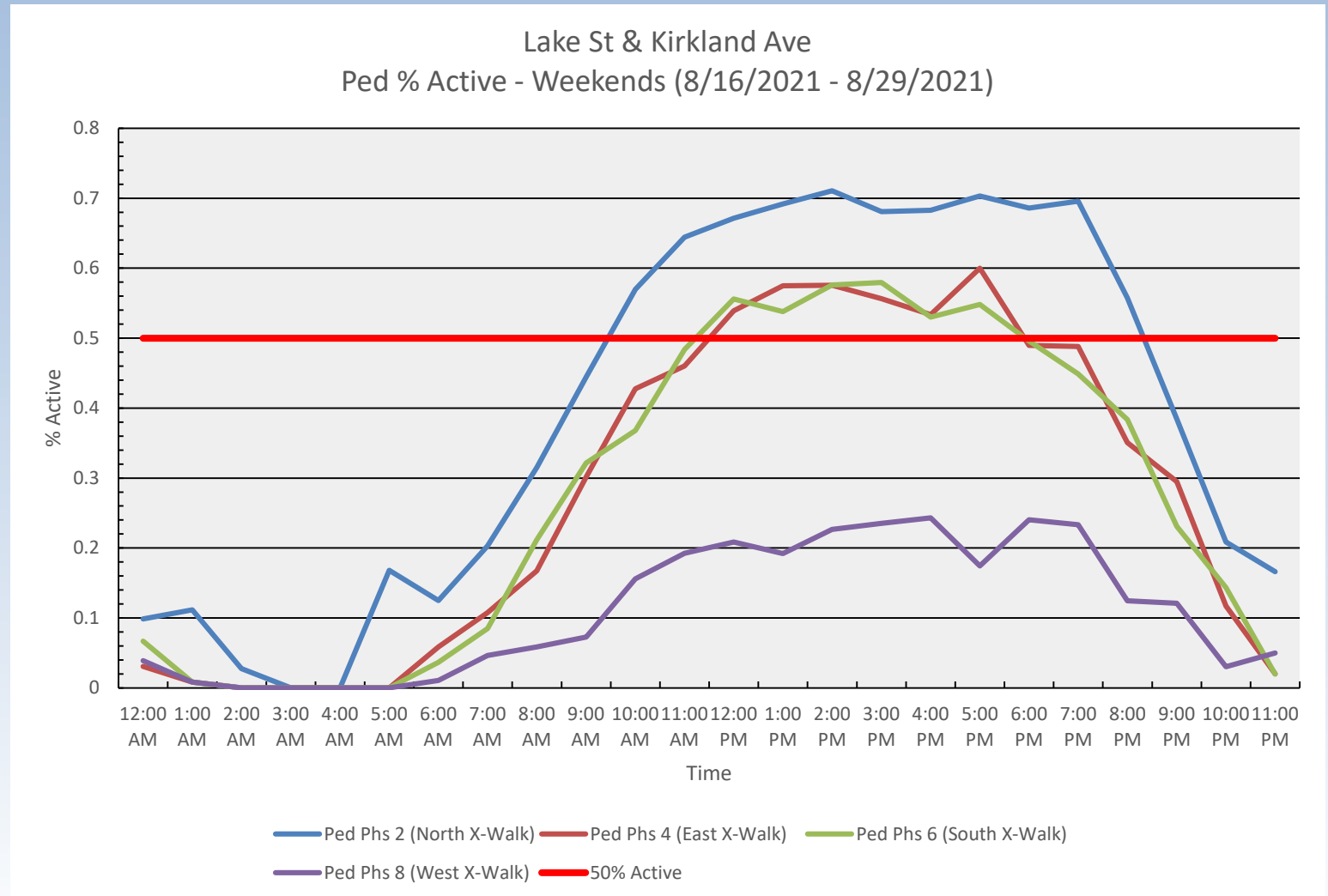
City Methodology for Evaluating Pedestrian Recall

- Location based process
 - Record number of walk phases per crosswalk and cycles throughout the day
 - Chart % of cycles where walk phases are activated



City Methodology for Evaluating Pedestrian Recall

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Draft Recommendations

Circumstance	Recommendation
Pedestrian movement active >75%	Pedestrian recall recommended
Pedestrian movement active >60%	Pedestrian recall considered, determine effects on overall signal operation
In high pedestrian area, pedestrian movement active >40%-50%	Pedestrian recall considered, evaluate rate of pedestrian usage during the day
Pedestrian movement associated with main street in coordination	Pedestrian recall recommended

Note: Values will be reviewed and revised as necessary in the future.

Questions??

References

- [1] T. Urbanik et al., Signal Timing Manual - Second Edition, The National Academies Press, 2015.
- [2] National Association of City Transportation Officials, Urban Street Design Guide, 2013.
- [3] Bergeson, Ethan. "We've completed pedestrian-first crosswalk safety goal six months early and are advancing a new policy to create more automatic walk signals and give people more time to cross the street." *SDOT Blog* (blog), July 23, 2020, <https://sdotblog.seattle.gov/2020/07/23/weve-completed-pedestrian-first-crosswalk-safety-goal-six-months-early-and-are-advancing-a-new-policy-to-create-more-automatic-walk-signals-and-give-people-more-time-to-cross-the-street/>
- [4] P. G. Furth, B. Cesme, R. Casburn and K. Lee, "Development of Pedestrian Recall versus Actuation Guidelines for Pedestrian Crossings at Signalized Intersections," *Transportation Research Record: Journal of the Transportation Research Board*, 2021.