

TECHNICAL MEMORANDUM

DATE: August 5, 2022
TO: Kendra Dedinsky, PE, PTOE, City of Shoreline
FROM: Alex Atchison, PE, PTOE
Emily Welter, PE
SUBJECT: Multi-Way Stop Control Evaluation at 5th Avenue NE and NE 195th Street
PROJECT NUMBER: 554-3485-005

The City of Shoreline received a request to review the intersection of 5th Avenue NE and NE 195th Street for a change in stop control. This memo evaluates the change from a two-way stop control to a multi-way stop control at this intersection.

BACKGROUND INFORMATION

5th Avenue NE is a two-lane collector arterial running north-south with a posted speed limit of 30 mph. NE 195th Street is a two-lane local secondary street with a posted speed limit of 25 mph that runs for 1/3 of a mile in the study area. 5th Avenue NE and NE 195th Street intersect at a four-legged intersection with stop control along NW 195th Street. There are marked crosswalks along the north and south legs.

Traffic volume and crash data was collected to be used in the multi-way stop control evaluation. Tube counts were collected along 5th Avenue NE and NE 195th Street for 7 days in April and May of 2018 and included traffic volume and speed data. Intersection turning movement counts were collected on Thursday, June 2, 2022 during the AM, mid-day, and PM peak hours. Crash data was collected from WSDOT for the 10-year period from January 1, 2010 to December 31, 2020.

EVALUATION

A multi-way stop at the intersection of 5th Avenue NE and NE 195th Street was evaluated according to Section 2B.07 of the 2009 Edition of the *Manual on Uniform Traffic Control Devices* (MUTCD). The MUTCD states that the decision to install a multi-way stop control should be based on an engineering study. The engineering study should consider four criteria when deciding to install multi-way stop control, and if one of the four criteria is satisfied, then it is appropriate to install a multi-way stop control.

Criteria A

Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.

This location does not meet MUTCD signal warrants due to low traffic volumes. The PM peak hour warrant was evaluated, and the conditions were not met. While the City of Shoreline is considering installing a rectangular rapid flashing beacon (RRFB) at 5th Avenue NE and NE 195th Street, the City has no plans to install a traffic signal at this intersection, so **Criteria A is not satisfied**.

Criteria B

Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.

Between 2010 and 2020, nine crashes were recorded at the intersection of 5th Avenue NE and NE 195th Street: three in 2016, two in 2014, and one each in 2012, 2015, 2017, and 2019. There have not been five or more reported crashes in a 12-month period at the intersection, so **Criteria B is not satisfied**.

Criteria C

Minimum volumes:

1. *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and*
2. *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but*
3. *If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.*

Criteria C.1 and C.2

The June 2022 turning movement counts were first evaluated to determine if the combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches would meet the threshold of 200 units to satisfy Criteria C.2. During the AM peak hour, the combined volume was 49 units and during the PM peak hour, the combined volume was 54. Since neither peak hour volume meets the threshold of 200 units, it is unlikely that this threshold will be met during 8 other hours in an average day. Since Criteria C.1 and Criteria C.2 must both be met to satisfy Criteria C, **Criteria C is not satisfied**.

Criteria C.3

Speed data was collected along both 5th Avenue NE and NE 195th Street for 7 days in April and May 2018. Along 5th Avenue NE, the major street, the 85th percentile speed during the 7-day period was 37.6 mph for southbound traffic and 40.0 for northbound traffic. Since the 85th percentile speed does not exceed 40 mph, **Criteria C.3 is not satisfied**, and Criteria C.1 and C.2 must both be satisfied to the full extent.

Criteria C is not satisfied.

Criteria D

Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

For Criteria B to be satisfied to 80 percent of the minimum values, there must have been four or more reported crashes in a 12-month period at the intersection. Between 2010 and 2020, the largest number of crashes in a single year was three. **Criteria D is not satisfied**.

Other Criteria

The MUTCD cites additional criteria that may be considered as part of the multi-way stop control evaluation. These criteria include:

- A. *The need to control left-turn conflicts;*
- B. *The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;*
- C. *Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and*
- D. *An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.*

None of these other criteria are applicable to the intersection of 5th Avenue NE and NE 195th Street.

RECOMMENDATION

Based on the collected volume and crash data, none of the criteria listed in the MUTCD for installing a multi-way stop control are satisfied. The intersection of 5th Avenue NE and NE 195th Street should remain a two-way stop-controlled intersection.