

MEMORANDUM

Date: April 17, 2024 **TG:** 1.18166.21

To: Jeffrey Perrigo, PE – City of Lake Forest Park

From: Jon Pascal, PE- Transpo Group
Bahar Azin - Transpo Group

Subject: Extending Operational Hours of the NE 178th Street Traffic Safety Cameras

The City of Lake Forest Park is proposing to modify the existing school zone traffic safety cameras located along the NE 178th Street corridor to monitor vehicle speeds throughout the day. Such a change would allow the cameras to be activated 24 hours a day and 7 days a week to monitor the 25 mph corridor speed limit, while also continuing to monitor the 20 mph school zone speed limit during the morning and afternoons when Brookside Elementary School is in session. The City has requested a speed and safety analysis to provide an understanding of the existing conditions along NE 178th Street from 25th Avenue NE (western city limits) to State Route 104. This memorandum provides a summary of existing vehicle speeds, traffic volumes, crashes, and citations issued by the existing school zone traffic safety cameras and will be used as a basis for monitoring safety performance along the corridor.

State Law on Automated Traffic Safety Cameras

State law allows for additional “at-large” automated traffic safety cameras to detect speed violations based on specific population thresholds. The cameras can only be placed in locations that comply with one of the following:

- A. The location has been identified as a priority location in a local road safety plan that a city has submitted to the Washington state department of transportation and where other speed reduction measures are not feasible or have not been sufficiently effective at reducing travel speed;
- B. The location has a significantly higher rate of collisions than the city average in a period of at least three years prior to installation and other speed reduction measures are not feasible or have not been sufficiently effective at reducing travel speed; or
- C. The location is in an area within the city limits designated by local ordinance as a zone subject to specified restrictions and penalties on racing and race attendance.

The City of Lake Forest Park has designated NE 178th Street from 25th Avenue NE to State Route 104 as a “no racing zone” through adoption of Ordinance 23-1284 and codified in LFPMC 9.35.050. Such a designation allows Lake Forest Park to install “at-large” automated traffic safety cameras along the corridor to monitor vehicle speeds.

Corridor Description

The NE 178th Street corridor within the City of Lake Forest Park is shown in Figure 1. The figure highlights the location of the existing school zone speed cameras and radar speed feedback signs that are in place along the corridor.

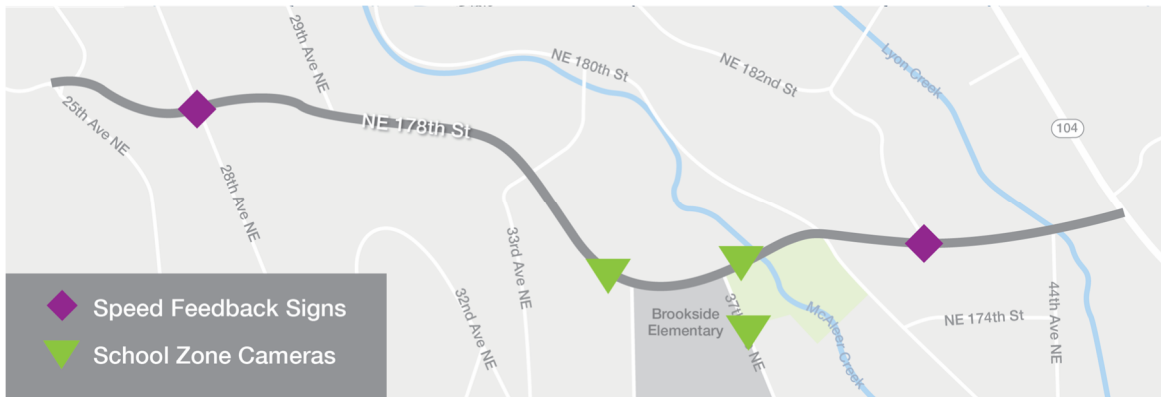


Figure 1. NE 178th Street Corridor with Existing Speed Management Tools

NE 178th Street is a two-lane east-west roadway with a posted speed limit of 25 miles per hour (mph), including a single lane in both eastbound and westbound directions. The roadway is classified as a Minor Arterial by the City of Lake Forest Park based on the adopted Comprehensive Plan.

There is a school zone located between 35th Avenue NE and 37th Avenue NE, with speed cameras operating from 7:30 am to 9:30 am and 2:30 pm to 4:30 pm, with a reduced speed limit of 20 mph. Additionally, two speed feedback signs are positioned at the intersections of NE 178th Street and 28th Avenue NE, and NE 178th Street and 40th Avenue NE.

Vehicle Speeds

Speeds for all vehicles were collected along the study corridor at two locations by using the speed feedback signs at the intersection of NE 178th Street and 40th Avenue NE, and the intersection of NE 178th Street and 28th Avenue NE over two months from April to May 2023. The posted speed limit on the corridor during the data collection period was 25 mph.

Key speed indicators include the median speed, 85th percentile speed, 10 mph pace, percent in pace, and percent of vehicles 5 mph over the speed limit. The key indicators are used to help identify if a speeding problem exists and to what extent. The definition and purpose of the speed indicators are described below. Table 1 summarizes the key speed indicators for the study corridor.

Median Speed – The speed in which 50 percent of all traffic is traveling at or below. The statistical median is not typically used in determining the appropriate posted speed limit, but is used as a point of reference in understanding the prevailing conditions. Ideally, the median speeds should be under the posted speed limit.

85th Percentile Speed – The speed in which 85 percent of the traffic is traveling at or below. Typically, the 85th percentile speed should be within 5 to 10 mph of the posted speed.

10 mph Pace – The 10 mph pace is a measure of the range in speeds and is defined as the consecutive 10 mph range containing the highest number of vehicles. Typically, the upper limit of the 10 mph pace should be near the posted speed limit.

Percent in Pace – The percent in pace represents the percentage of all vehicles traveling within the 10 mph pace. It is desirable to have a high percentage of the total number of vehicles in the 10 mph pace.

Percent of Vehicles 5 mph over the Speed Limit – A measure representing the number of vehicles traveling over the posted speed limit by at least 5 mph. This represents the percentage of vehicles that could be the target of automated traffic safety cameras since citations are usually given to vehicles exceeding the speed limit by more than 5 mph.

Table 1. NE 178th Street Speed Data Summary (2023)

Indicator	Westbound ¹	Eastbound ²
Posted Speed Limit (mph)	25 mph	25 mph
Average Daily Traffic	2,250 vehicles	3,655 vehicles
Median Speed	23 mph	24 mph
85th Percentile Speed	28 mph	29 mph
10 mph Pace	19-29 mph	20-30 mph
% in Pace	63%	62%
% of Vehicles 5 mph over Speed Limit ³	7%	9%

1. Data collected in the westbound direction at 40th Avenue NE.

2. Data collected in the eastbound direction at 28th Avenue NE

3. Represents the vehicles exceeding the posted speed limit by at least 5 mph.

As shown in Table 1 the number of vehicles driving at 31 mph or more is about 7 percent of the total daily westbound traffic and 9 percent of the total daily eastbound traffic.

For a more comprehensive understanding of speed distribution within the corridor, Figure 2 and Figure 3 present a summary of speed distribution data gathered from the speed feedback signs. The graphs show the average daily number of vehicles operating in speed ranges of 5 mph.

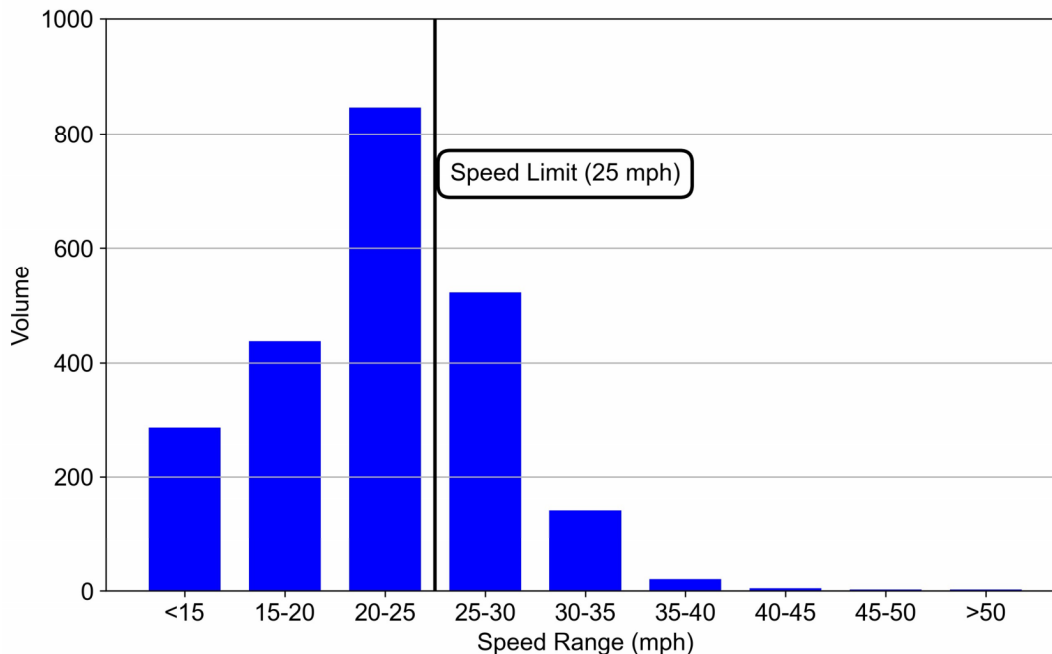


Figure 2 Vehicle Speed Distribution for NE 178th Street at 40th Avenue NE (Westbound)

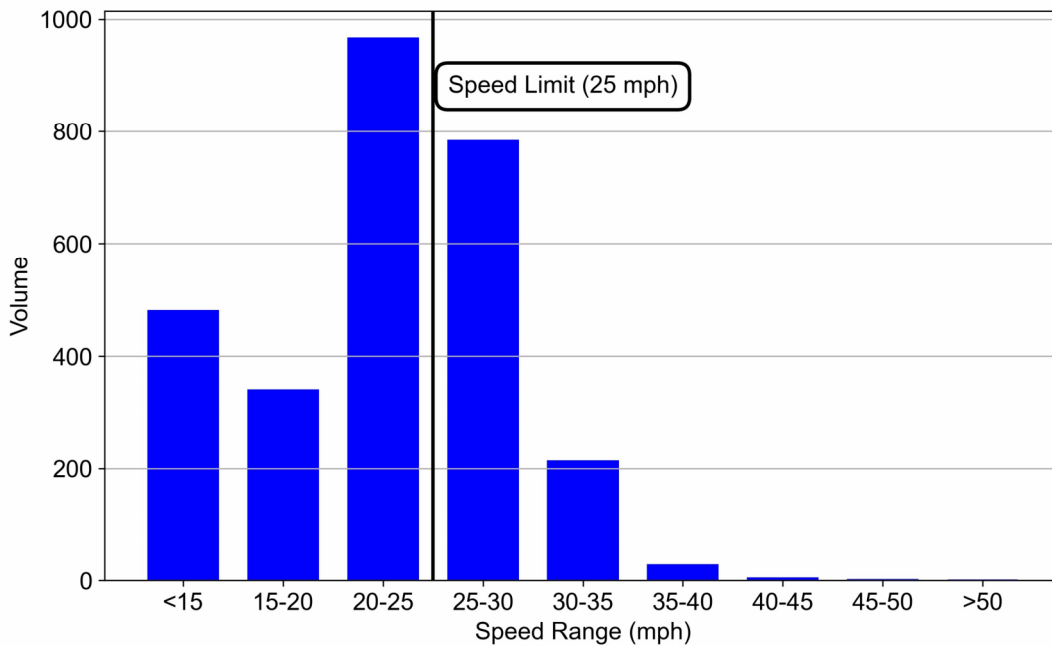


Figure 3 Vehicle Speed Distribution for NE 178th Street at 28th Avenue NE (Eastbound)

The figures highlight that a majority number of vehicles operate at or under 25 mph. However, they also highlight many vehicles continue to exceed the speed limit, specifically in the eastbound direction. The second highest volume of vehicles falls within the speed range of 25 to 30 mph.

Collision Records

Crash records over the most recent complete five-year period were reviewed for the corridor. The crash records are summarized in Table 2. Historical crash data was provided by WSDOT for the period of January 1, 2019 to December 31, 2023.

Table 2. Annual Collision Summary – 2019 to 2023

Roadway Segment	2019	2020	2021	2022	2023	Total	Annual Average
NE 178th Street	8	1	2	2	1	21	3.5

Source: WSDOT, 2023.

Note: Under 23 U.S. Code § 409 and 23 U.S. Code § 148, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

As shown in Table 2, the corridor experienced an annual average of more than 3 collisions over the last 5-year period, with 21 collisions total along the corridor. The majority of collisions resulted in property damage only, with no fatalities and two injuries over the last 5-year period.

Of the total collisions, six involved improper vehicle movements (improper passing, improper backing, or not granting right-of-way to another vehicle), three involved driver inattention or distraction, and one involved a driver under the influence of alcohol. No collisions involved pedestrians or bicyclists.

School Zone Speed Camera Citations

In addition to the radar speed feedback sign, data for both directions of travel were collected from the school zone speed cameras. The cameras currently operate from 7:30 to 9:30 am and 2:30 to 4:30 pm when school is in session and enforce the 20 mph school zone speed limit. While the cameras record driver speeds continuously, citations are issued during enforcement hours only. The cameras also operate during school early release time periods, which is why some citations are noted during the midday period. The citation data were collected for the most recent year, 2023. The summary of citations issued by each hour of the day is shown in Table 3.

Table 3. School Speed Camera Citations Records by Time of the Day

Time Period	% of Total Citations	Average Number of School Zone Citations per Hour per Day ¹	Average Number of School Zone Citations per Hour per Year
7-7:59 AM	8%	4	607
8-8:59 AM	18%	8	1,460
9-9:59 AM	14%	6	1,092
10-10:59 AM	-	-	-
11-11:59 AM	2%	1	132
12-12:59 PM	1%	-	72
1-1:59 PM	4%	2	301
2-2:59 PM	15%	6	1,147
3-3:59 PM	24%	11	1,925
4-4:59 PM	15%	6	1,167
TOTAL	100%	44	7,903

NOTE: 2023 data for both directions

1. Represents the ratio of the average daily citations recorded by time of the day.

Based on the citation records from school zone speed cameras in Table 3, there are on average approximately 44 citations recorded daily, which results in approximately 7,903 citations recorded per year. A higher number of citations is generally observed during the afternoon hours.

Estimated Number of Citations with All-Day Speed Enforcement

Expanding the operating hours of the traffic safety cameras would extend the duration that speeding violations would be captured. To estimate the total number of citations that may be issued with the extended operating hours of the cameras, it was assumed that the proportion of vehicles exceeding the posted speed limit by over 5 mph will remain consistent at approximately 7 percent of total westbound daily traffic and 9 percent for eastbound daily traffic (see Table 1). In addition, vehicle speeds and traffic volumes fluctuate on a daily basis, so a +/- 15 percent range in total citations was assumed. As a result, the number of vehicles receiving citations could fluctuate between 350 to 470 vehicles per day if the camera operating hours are expanded to monitor vehicle speeds 24 hours a day, 7 days per week. Based on the experience of other agencies, it is also expected that vehicle speeds and the number of citations would decrease over time as more drivers become familiar with the cameras.

Key Findings

The key findings of the speed and safety analysis along NE 178th Street are the following:

- **No-Racing Zone:** NE 178th Street has been designated as a "no racing zone," subject to specified restrictions and penalties on racing and race attendance, under Ordinance 23-1284 and LFPMC 9.35.050. Such a designation allows the City to install

“at-large” automated traffic safety cameras along the corridor to monitor vehicle speeds.

- **Vehicle Speeds:** Existing speed data shows a persistent trend of vehicles traveling over the speed limit despite existing speed management tools. While a significant portion of vehicles drive below the posted speed limit, a considerable number of vehicles exceed the speed limit. Records show that approximately 7 percent of vehicles travel over 5 mph above the speed limit in the westbound direction and 9 percent in the eastbound direction.
- **Collision Records:** Over the past five years, the corridor has experienced an average of more than five collisions annually, totaling 21 collisions. While most collisions resulted in property damage only, improper vehicle movements, driver distraction, and exceeding safe speeds were the key contributing factors.
- **School Zone Speed Camera Citations:** With operating hours from 7:30 am to 9:30 am and 2:30 pm to 4:30 pm, and a reduced speed limit to 20 mph, an average of 44 daily citations and 7,903 yearly citations are issued to vehicles traveling at 26 mph or greater.
- **Extending Speed Camera Operating Hours:** Expanding the operating hours of the traffic safety cameras would extend the duration that speeding violations would be captured. It is estimated that approximately 350 to 470 citations would be issued per day if the camera operating hours were expanded to monitor vehicle speeds 24 hours a day, 7 days per week.
- **Monitoring:** The data summarized in this study may be used to monitor changes in vehicle speeds, collisions, and number of citations and track the safety performance of the corridor over time.