

CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE: Discussion of Ordinance No. 950 - Amending Shoreline Municipal Code Chapter 10.20 Speed Limits
DEPARTMENT: Public Works
PRESENTED BY: Kendra Dedinsky, City Traffic Engineer
ACTION: ☐ Ordinance ☐ Resolution ☐ Motion
 ☒ Discussion ☐ Public Hearing

PROBLEM/ISSUE STATEMENT:

Fatal and serious injury collisions are on the rise in Shoreline. High vehicle speed is a key factor in these types of collisions, particularly for pedestrians and bicyclists. Recent research and associated updates to speed limit setting methods recognize that speed limits are an important tool for creating safer streets.

Staff and consultant DKS used newly published research and an associated speed limit setting tool from the National Cooperative Highway Research Program (NCHRP) to analyze speed limits for six arterial corridors in Shoreline. The study and results were presented to the Council on January 4th, 2021 and are available at the following link: [January 4, 2021 staff report on Discussion of the Arterial Speed Limit Study](#).

After additional review based on Council feedback from the January 4th discussion, staff has developed proposed amendments to SMC Chapter 10.20 Speed Limits for Council consideration, which proposes a speed limit reduction of five (5) miles per hour (mph), from 35 mph to 30 mph, for five of the six study corridors including:

- N/NE 175th Street from Aurora Avenue N to 15th Avenue NE
- Meridian Avenue N from N 145th Street to NE 205th Street
- 15th Avenue NE from NE 145th Street to NE 175th Street
- Greenwood Avenue N from N 145th Street to NW Innis Arden Way
- N/NW Richmond Beach Road from 8th Avenue NW to Fremont Avenue N

Analysis of the sixth corridor, 15th Avenue NE from NE 180th Street to NE 196th Street resulted in a recommendation to retain the existing speed limit. Council retains the authority to lower the speed limit on this segment if it chooses.

Tonight, Council will discuss proposed Ordinance No. 950 (Attachment A), which would amend SMC Chapter 10.20 to adjust the speed limit on these five corridors. Proposed Ordinance No. 950 is currently scheduled for Council action on December 6, 2021.

RESOURCE/FINANCIAL IMPACT:

The financial impact to lowering speed limits on the five recommended corridors is estimated to be approximately \$12,000 and would be funded by the Traffic Safety Capital Improvement Program. The majority of this cost is associated with physical sign changes, although a very small portion will be used for public education efforts such as yard signs to highlight the changes and provide a link to more information. Shoreline Police Department anticipates any emphasis efforts associated with these speed limit changes can be absorbed within their existing operating budget.

RECOMMENDATION

No action is required at this time; this agenda item is for discussion purposes only. Potential Council action on the amendments proposed for SMC Chapter 10.20 Speed Limits in Ordinance No. 950 is scheduled for December 6th, 2021.

Approved By: City Manager **DT** City Attorney **MK**

BACKGROUND

SMC Chapter 10.20 Speed Limits adopts by reference Washington Administrative Code (WAC) 308-330-423 Speed Restrictions, which sets a base 25 mph speed limit. This WAC incorporates various provisions of the RCW including RCW 41.61.415. This RCW permits local jurisdictions to establish or alter speed limits established by the State Department of Transportation on the basis of an engineering and traffic investigation; determining the proper maximum speed for all arterial streets. Based on this authority, SMC 10.20.010 establishes a maximum speed limit of 30 mph, 35 mph, or 40 mph for various arterial roadways citywide. This SMC was last amended in 2008 with the adoption of [Ordinance No. 491](#).

One of the most important factors in collision injury outcomes is vehicle speed. The State's Target Zero Plan highlights the recommended practice of setting speed limits appropriate for the roadway context, including consideration of pedestrians, bicyclists, adjacent land use, and collision history. As such, the 2018 Annual Traffic Report recommended a speed limit study which was supported by Council during a June 24, 2019 Council discussion. The staff report for the 2018 Annual Traffic Report is available at the following link: [June 24, 2019 staff report on Discussion of the 2018 Annual Traffic Report](#).

Throughout 2020, staff worked on a speed limit study with traffic engineering consultant DKS, a leader and expert in evolving speed limit setting practices. The study used recent research and a new tool developed under the National Cooperative Highway Research Program (NCHRP) Project 17-76 to evaluate the following six corridors:

- N/NE 175th Street from Aurora Avenue N to 15th Avenue NE
- Meridian Avenue N from N 145th Street to NE 205th Street
- 15th Avenue NE from NE 145th Street to NE 175th Street
- Greenwood Avenue N from N 145th Street to NW Innis Arden Way
- N/NW Richmond Beach Road from 8th Avenue NW to Fremont Avenue N
- 15th Avenue NE from NE 180th Street to NE 196th Street

These corridors were selected for study based on multiple factors including existing speed limit, collision history, or recent changes to roadway cross section or adjacent land use. The preliminary study recommended a 5 MPH speed limit reduction for five of the six studied corridors. The study and results were presented to the Council on January 4th, 2021 and are available at the following link: [January 4, 2021 staff report on Discussion of the Arterial Speed Limit Study](#). At this meeting, Council provided feedback on the preliminary study which included:

- Sensitivity to the disproportionate impact traffic enforcement and citations have on lower income populations and people of color.
- Questions regarding the economic cost of slower speeds.
- Interest in reevaluating the 15th Avenue NE from NE 180th Street to NE 196th Street segment given roadway alignment concerns combined with the lack of continuous sidewalk and pedestrian crossing opportunities.

- Concern that posting new speeds alone, with no other supportive measures, would not result in lower speeds.
- Support for bringing an ordinance back for discussion.

DISCUSSION

The determination of an appropriate speed limit is an exercise in prioritizing safety while balancing motorists' behavior and the mobility needs of all users. Historically, speed limit setting practices have relied heavily on 85th percentile speeds; the speed at which 85% of traffic is traveling at or below. This car-centric practice was based on the idea that most drivers are prudent, however this approach diminishes the experience and safety of non-driving roadway users.

Recently published National Cooperative Highway Research Program (NCHRP) Project 17-76 investigated the factors that influence operating speed and safety and used that information to develop their speed limit setting procedure and tool. While the tool still relies heavily on vehicle operating speed data (both the 85th and 50th percentile operating speeds are considered), the tool's recommendation is also influenced by other factors such as:

- | | |
|-------------------------------------|---------------------------------------|
| • Number of lanes | • Pedestrian activity |
| • Median presence | • On-street parking activity |
| • Number of traffic signals | • Parallel parking permitted |
| • Number of access points | • Adverse alignment |
| • Bicyclist activity/bike lane type | • Average daily traffic |
| • Sidewalk presence/width | • Collision history |
| • Sidewalk buffer presence | • Serious and fatal collision history |

This additional context and overall approach aligns with State Target Zero Plan recommendations encouraging jurisdictions to consider all roadway users, adjacent land use, and injury minimization, to determine appropriate speed limits.

The following sections address Council concerns expressed during the first discussion on this topic in January 2021

Enforcement

Recognizing the disproportionate impact traffic enforcement has on lower income populations and people of color, the approach to emphasizing speed limit changes will focus on educational efforts supported by the Public Works Traffic Services group and Shoreline Police. Traffic Services will provide outreach and education via currents, email alerts, corridor signs with links to more information, and use of temporary radar speed feedback signs. In addition, speed data will be collected to monitor progress and to provide to Shoreline Police for time of day and day of week focused emphases as needed. The overarching goal is to reduce operating speeds without significantly changing existing citation rates and enforcement practices.

Economic Impact

At the January 4th discussion, Council asked about the cost versus benefit of speed limit reductions, particularly related to the economic impact of increased travel time. While there is no one agreed upon method or source for making this comparison, a 2014 study, available online at: [*A Health Impact Assessment of a Proposed Bill to Decrease Speed Limits on Local Roads in Massachusetts \(U.S.A.\)*](#), provided a thorough review of economic, environmental and health costs versus benefits of a 5 mph speed limit reduction (from 30 mph to 25 mph) statewide on local roads. While the study did show a high estimated cost per person associated with increased travel time and fuel consumption, it ultimately concluded that the “benefits outweigh the costs from both a health and economic perspective”. In addition, it recognized that lowering speeds can be a catalyst for promoting walking and biking; a more difficult benefit to quantify given lack of quality data on this subject.

A high-level analysis of the cost of increased travel time associated with speed limit reduction was conducted for the subject roadway segments as shown in Table 1. This evaluation conservatively assumed the following:

- Use of 50th percentile operating speed for a better approximation of the average speed.
- 50th percentile operating speeds decrease by 2.5 mph; a full 5 mph reduction in operating speed is not expected based on comparable studies.
- Vehicle occupancy of 1.5.
- Value of time assumed to be \$20.14/hour per the *Texas A&M Transportation Institute’s Urban Mobility Report* for the Seattle area.

Given these assumptions, the estimated average annual societal cost of increased travel time associated with speed reduction for the proposed corridors is \$2.25M.

Table 1. Estimated societal cost of increased travel time associated with speed limit changes

| | Richmond Beach Rd | Meridian Ave N | Greenwood Ave N | N 175th St (west) | NE 175th St (east) | 15th Ave NE (south) | Total |
|-----------------------------------|-------------------|----------------|-----------------|-------------------|--------------------|---------------------|--------------|
| 50th Percentile Speed (mph) | 29.3 | 31.3 | 29.4 | 32.4 | 32 | 32.3 | |
| 5 mph Reduction (mph) | 26.8 | 28.8 | 26.9 | 29.9 | 29.5 | 29.8 | |
| Segment Length (mi) | 0.5 | 3 | 0.8 | 0.75 | 0.75 | 1.5 | |
| Estimated Trip Length (mi) | 0.5 | 1.5 | 0.8 | 0.75 | 0.75 | 1 | |
| Added Delay per Trip (hours) | 0.0016 | 0.0042 | 0.0025 | 0.0019 | 0.0020 | 0.0026 | |
| Average Daily Traffic (veh/day) | 16706 | 9,456 | 8552 | 19988 | 15359 | 18306 | |
| Added Delay (hours/year) | 9707 | 14358 | 7894 | 14120 | 11135 | 17354 | |
| Annual Cost of Delay ¹ | \$ 293,677 | \$434,402 | \$ 238,830 | \$ 427,213 | \$ 336,885 | \$ 525,055 | \$ 2,256,062 |

¹ From Texas A&M Transportation Institute Urban Mobility Report Value of Time for Seattle area of \$20.17/hr, assuming 1.5 people/vehicle

With the collision history available, as well as the Washington State Department of Transportation’s estimate of collision costs by severity, it is possible to calculate the economic impact of collisions on the 5 subject corridors as shown in Table 2. The net societal cost of collisions on the 5 roadway segments is nearly \$7M annually on average.

Table 2. Estimated societal cost of collisions on the 5 subject corridors (2010-2021)

| Collision Severity | Collision History for Subject Segments (2010-2020) | Cost per Collision¹ | Total Cost |
|---------------------------|---|---------------------------------------|-------------------|
| Fatal | 6 | \$ 2,000,000 | \$ 12,000,000 |
| Serious | 26 | \$ 1,000,000 | \$ 26,000,000 |
| Minor | 103 | \$ 100,000 | \$ 10,300,000 |
| Possible | 328 | \$ 70,000 | \$ 22,960,000 |
| PDO | 561 | \$ 10,000 | \$ 5,610,000 |
| Total | | | \$ 76,870,000 |
| Annual Average | | | \$ 6,988,182 |

¹Estimated cost of collisions by severity from WSDOT Traffic Safety Office.

While it is not possible to accurately predict the true benefit to cost ratio of these proposed speed limit changes, a balanced benefit to cost ratio is certainly possible if speed reductions result in a significant decrease in collisions; particularly if injury collisions are reduced. In addition, consideration should be given to other benefits not included by this simplified comparison such as increased property values, improved livability, reduced noise, and mode shift.

Final Review of Data

A second review of data for all study corridors was completed and included corrections to some worksheets, splitting out 175th Street into two distinct segments for more context sensitive analysis, and revisiting data for the segment of 15th Avenue NE from NE 180th Street to NE 196th Street, which Council had expressed interest in reviewing again. No updates to the data changed the resulting speed limit setting tool recommendation. Staff did collect new data for the north segment of 15th Avenue NE and even considering this, and applying more conservative selections for qualitative data inputs, the tool's recommendation remains at 35 mph due to the relatively high operating speed. Both the rounded down 85th percentile, and the closest 50th percentile result in a 35-mph speed limit based on collected data. Council can still choose to amend the ordinance to include a speed reduction for 15th Avenue NE from NE 180th Street to NE 196th Street if Council so chooses. The final data worksheets, including data inputs and updates, are included with this staff report as Attachment B.

Effectiveness of Posted Speed Reductions Alone

Council also raised concerns regarding the potential for non-compliance with speed limit reductions without significant complimentary engineering or enforcement measures. The recent NCHRP research and tool, used to inform proposed speed limit reductions, describes three key points on this topic:

- 1) Drivers often choose a speed within a certain increment above the posted speed limit, anticipating that they will not be ticketed if they are not above that assumed tolerance. As such, a reduction in posted speed would be expected to produce a reduction in operating speed. Drivers that do not adhere to this principle still tend to be anchored by drivers that do.
- 2) Operating speeds are higher when posted speeds are higher and are lower when the posted speed limits are lower, confirming that the number on the sign does

influence driver speed. While the exact 5 mph reduction may not be achieved linearly, some reduction in speed still provides significant safety benefit.

- 3) NCHRP research showed that crashes on city streets were lowest where the average vehicle operating speed was within 5 mph of the posted speed. This finding informed the NCHRP speed limit setting tool algorithms. The proposed speed limit changes for the studied Shoreline roadway segments are consistent with this principle.

In addition, while engineering measures are certainly an important component of speed management, the relation to posted speed limit can result in a chicken or the egg scenario, as many design standards are determined by the speed limit. As such, lower posted speeds will allow for future capital improvements that utilize lower design speed criteria. This approach is consistent with emerging engineering and policy trajectory, which advises communities to set target speeds, using engineering methods to support them.

Speed Reduction Ordinance – Proposed Ordinance No. 950

After additional review based on Council feedback from the January 4th discussion, staff has developed proposed amendments to SMC Chapter 10.20 Speed Limits for Council consideration, which proposes a speed limit reduction of five (5) miles per hour (mph), from 35 mph to 30 mph, for the following corridors:

- N/NE 175th Street from Aurora Avenue N to 15th Avenue NE
- Meridian Avenue N from N 145th Street to NE 205th Street
- 15th Avenue NE from NE 145th Street to NE 175th Street
- Greenwood Avenue N from N 145th Street to NW Innis Arden Way
- N/NW Richmond Beach Road from 8th Avenue NW to Fremont Avenue N

Tonight, Council will discuss proposed Ordinance No. 950 (Attachment A), which would amend SMC Chapter 10.20 to adjust the speed limit on these five corridors. Proposed Ordinance No. 950 is currently scheduled for Council action on December 6, 2021.

COUNCIL GOAL(S) ADDRESSED

This item addresses the following City Council Goals:

- Goal 2: Continue to deliver highly-valued public services through management of the City's infrastructure and stewardship of the natural environment.
- Goal 4: Promote and enhance the City's safe community and neighborhood programs and initiatives.

RESOURCE/FINANCIAL IMPACT

The financial impact to lowering speed limits on the five recommended corridors is estimated to be approximately \$12,000 and would be funded by the Traffic Safety Capital Improvement Program. The majority of this cost is associated with physical sign changes, although a very small portion will be used for public education efforts such as yard signs to highlight the changes and provide a link to more information. Shoreline

Police Department anticipates any emphasis efforts associated with these speed limit changes can be absorbed within their existing operating budget.

RECOMMENDATION

No action is required at this time; this agenda item is for discussion purposes only. Potential Council action on the amendments proposed for SMC Chapter 10.20 Speed Limits in Ordinance No. 950 is scheduled for December 6th, 2021.

ATTACHMENTS

Attachment A – Proposed Ordinance No. 950

Exhibit A – Amendments

Attachment B – Speed Limit Analysis Worksheets

ORDINANCE NO. 950

**AN ORDINANCE OF THE CITY OF SHORELINE, WASHINGTON,
AMENDING CHAPTER 10.20 SPEED LIMITS OF THE SHORELINE
MUNICIPAL CODE TO LOWER SPEED LIMITS ON CERTAIN
ARTERIAL CORRIDORS.**

WHEREAS, RCW 41.61.415 authorizes the City of Shoreline to determine and declare a reasonable and safe maximum speed limit for all arterial streets; and

WHEREAS, based on the City's 2018 Annual Traffic Report, in 2020 City Staff worked on a speed limit study utilizing data from the National Cooperative Highway Research Program Project 17-76 to evaluate six arterial corridors; and

WHEREAS, these six arterial corridors were selected for study based on multiple factors including existing speed limit, collision history, recent changes to road cross section, or adjacent land use; and

WHEREAS, at its January 4, 2021, regular meeting, the City Council discussed the Arterial Speed Limit Study; and

WHEREAS, based on this discussion, City Staff proposed to reduce the speed limit by five (5) miles per hour on five (5) of the six (6) corridors studied; and

WHEREAS, the City Council discussed the proposed speed limit reduction at its November 22, 2021 regular meeting; and

WHEREAS, the City Council has determined that the amendments to SMC Chapter 10.20 are in the best interests of the City of Shoreline and the health, safety, and welfare of its residents;

**NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF SHORELINE,
WASHINGTON, DO ORDAIN AS FOLLOWS:**

Section 1. Amendment – SMC 10.20 Speed Limits. SMC Chapter 10.20 is amended as set forth in Exhibit A to this Ordinance.

Section 2. Corrections by City Clerk or Code Reviser. Upon approval of the City Attorney, the City Clerk and/or the Code Reviser are authorized to make necessary corrections to this Ordinance, including the corrections of scrivener or clerical errors; references to other local, state, or federal laws, codes, rules, or regulations; or ordinance numbering and section/subsection numbering and references.

Section 3. Severability. Should any section, subsection, paragraph, sentence, clause, or phrase of this Ordinance or its application to any person or situation be declared unconstitutional or invalid for any reason, such decision shall not affect the validity of the remaining portions of this Ordinance or its application to any person or situation.

Section 4. Publication and Effective Date. A summary of this Ordinance consisting of the title shall be published in the official newspaper as soon as practicable after passage. This Ordinance shall take effect at 12:01 am local time on June 1, 2022.

PASSED BY THE CITY COUNCIL ON DECEMBER 6, 2021.

Mayor Will Hall

ATTEST:

APPROVED AS TO FORM:

Jessica Simulcik Smith
City Clerk

Julie K Ainsworth-Taylor
Assistant City Attorney
on behalf of Margaret King, City Attorney

Date of Publication: _____, 2021
Effective Date: _____, 2021

EXHIBIT A

ORDINANCE NO. 950
SMC Chapter 10.20

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SMC 10.20.010 is amended to read as follows:

10.20.010 Speed limits.

WAC 308-330-423 is adopted to establish rules governing motor vehicle speed within the city; provided, that the speed limit for all streets within the city shall be 25 miles per hour, except as designated below:

A. 30 Miles Per Hour.

NW 196th Street from 23rd Avenue NW to 20th Avenue NW;

NW 195th Street from 20th Avenue NW to 15th Avenue NW;

NW Innis Arden Way from Greenwood Avenue North to 10th Avenue NW;

NW Richmond Beach Road from 15th Avenue NW to 8th Avenue NW;

North 160th Street from Greenwood Avenue North to Dayton Avenue North;

North 175th Street from Fremont Avenue North to Aurora Avenue North;

North 185th Street from Fremont Avenue North to 1st Avenue NE;

North 150th Street from 15th Avenue NE to 25th Avenue NE;

North 155th Street from Aurora Avenue North to 1st Avenue NE;

NE 155th Street from 1st Avenue NE to 15th Avenue NE;

NE 168th Street from 15th Avenue NE to 25th Avenue NE (south leg);

NE 175th Street from 15th Avenue NE to 22nd Avenue NE;

NE 185th Street from 1st Avenue NE to 10th Avenue NE;

8th Avenue NW from NW 180th Street to NW Richmond Beach Road;

8th Avenue NW from NW Richmond Beach Road to the northerly city limits (NW 205th Street);

Greenwood Avenue North from NW Innis Arden Way to North Carlyle Hall Road;

Dayton Avenue North from Carlyle Hall Road N to N Richmond Beach Road;

Fremont Avenue North from North 165th Street to the northerly city limits (North 205th Street);

Ashworth Avenue North from North 155th Street to North 200th Street;

1st Avenue NE from the southerly city limits (NE 145th Street) to NE 155th Street;

3rd Avenue NW from Richmond Beach Road NW to the northerly city limits (NW 205th Street);

EXHIBIT A

ORDINANCE NO. 950
SMC Chapter 10.20

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5th Avenue NE from the southerly city limits (NE 145th Street) to the northerly city limits (NE 205th Street);

10th Avenue NE from NE 175th Street to NE 190th Street;

15th Avenue NE from NE 196th Street to Ballinger Way NE;

19th Avenue NE from 15th Avenue NE to NE 205th Street;

24th Avenue NE from 15th Avenue NE to 25th Avenue NE;

25th Avenue NE from the southerly city limits (NE 145th Street) to NE 178th Street;

25th Avenue NE from Ballinger Way NE to NE 205th Street.;

N/NE 175th Street from Aurora Avenue N to 15th Avenue NE;

Meridian Avenue North from the southerly city limits (North 145th Street) to the northerly city limits (North 205th Street);

15th Avenue NE from the southerly city limits (NE 145th Street) to NE 175th Street;

Greenwood Avenue N from the southerly city limits (North 145th Street) to NW Innis Arden Way;

N/NW Richmond Beach Road from 8th Avenue NW to Fremont Avenue North.

B. 35 Miles Per Hour.

~~NW Richmond Beach Road from 8th Avenue NW to Fremont Avenue North;~~

~~North 175th Street from Aurora Avenue North to Interstate 5;~~

~~NE 175th Street from Interstate 5 to 15th Avenue NE;~~

North 160th Street from Dayton Avenue North to Aurora Avenue North;

North 155th Street from Westminster Way North to Aurora Avenue North;

~~Greenwood Avenue North from the southerly city limits (North 145th Street) to NW Innis Arden Way;~~

Westminster Way North from Greenwood Avenue North to Aurora Avenue North;

Dayton Avenue North from Westminster Way North to Carlyle Hall Road N;

~~Meridian Avenue North from the southerly city limits (North 145th Street) to the northerly city limits (North 205th Street);~~

1st Avenue NE from NE 195th Street to the northerly city limits (NE 205th Street);

EXHIBIT A

ORDINANCE NO. 950
SMC Chapter 10.20

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~~15th Avenue NE from the southerly city limits (NE 145th Street) to NE 175th Street;~~

15th Avenue NE from NE 180th Street to NE 196th Street.

C. 40 Miles Per Hour.

Aurora Avenue North from the southerly city limits (North 145th Street) to the northerly city limits (North 205th Street).

D. 45 Miles Per Hour. [Reserved].

| NCHRP 17-76 Speed Limit Setting Tool | | | |
|---|--|---|---|
| Input Cells | | Description | Output Cells |
| Site Description Data | | | Color-Coding Legend |
| Suburban | | Roadway context | Aqua = basic input cell |
| Minor arterial | | Roadway type | Denim = basic input cell with drop-down menu |
| Yes | | Are crash data available? | Orange = optional input cell (not needed for calculations) |
| K. Dedinsky | | Analyst | Green = optional input cell (use if data for agency & region are available, leave blank otherwise) |
| 10/1/2021 | | Date | Rose = intermediate calculations |
| N Richmond Beach Rd | | Roadway name | Purple = final analysis results |
| Fremont Ave N to 8th Ave NW | | Description | |
| 35 | | Current speed limit (mph) | |
| | | Notes | Note: The "Test macros" button provides a message to verify proper macro operation. |
| Analysis Results | | | Advisory, Calculated, or Warning Messages |
| Speed limit setting group | | Developed | |
| Suggested speed limit (mph) | | 30 | This value is determined by speed data & site characteristics. |
| Speed Data | | | Advisory, Calculated, or Warning Messages |
| 55 | | Maximum speed limit (mph) | |
| 34.4 | | 85th-percentile speed (mph) | |
| 29.3 | | 50th-percentile speed (mph) | |
| Site Characteristics | | | Advisory, Calculated, or Warning Messages |
| 0.77 | | Segment length (mi) | |
| 4 | | Number of lanes (two-way total) | |
| Undivided | | Median type | |
| 4 | | Number of traffic signals | |
| 18 | | Number of access points (total of both directions) | |
| Not high / Any type | | Bicyclist activity / bike lane type | |
| Adequate | | Sidewalk presence / width | |
| Not present | | Sidewalk buffer | |
| Some | | Pedestrian activity | |
| Not high | | On-street parking activity | |
| No | | Parallel parking permitted? | |
| No | | Angle parking present? | |
| Yes | | Adverse alignment present? | |
| | | | Rounded-Down 85th Closest 50th (5.19 signals / mi) 23.38 access points / mi |
| | | | Consider location-specific advisory speed warnings. |
| Crash Data | | | Advisory, Calculated, or Warning Messages |
| 11 | | Number of years of crash data | |
| 16,706 | | Average AADT for crash data period (veh/d) | |
| No | | Is the segment a one-way street? | |
| 204 | | All (KABCO) crashes for crash data period | |
| 7 | | Fatal & injury (KABC) crashes for crash data period | |
| | | Average KABCO crash rate (crashes / 100 MVMT) | |
| | | Average KABC crash rate (crashes / 100 MVMT) | |
| 1.3 x average KABCO crash rate (crashes / 100 MVMT) | | 587.9 | |
| 1.3 x average KABC crash rate (crashes / 100 MVMT) | | 171.6 | |
| Critical KABCO crash rate (crashes / 100 MVMT) | | 501.9 | |
| Critical KABC crash rate (crashes / 100 MVMT) | | 159.2 | |
| | | | Observed KABCO crash rate = 394.99 crashes / 100 MVMT Observed KABC crash rate = 13.55 crashes / 100 MVMT HSIS average KABCO crash rate = 452.26 crashes / 100 MVMT HSIS average KABC crash rate = 131.98 crashes / 100 MVMT |

| NCHRP 17-76 Speed Limit Setting Tool | | | |
|---|---|-------------|--|
| Input Cells | | Description | Output Cells |
| Site Description Data | | | Color-Coding Legend |
| Urban | Roadway context | | Aqua = basic input cell |
| Principal arterial | Roadway type | | Denim = basic input cell with drop-down menu |
| Yes | Are crash data available? | | Orange = optional input cell (not needed for calculations) |
| K. Dedinsky | Analyst | | Green = optional input cell (use if data for agency & region are available, leave blank otherwise) |
| 8/30/2021 | Date | | Rose = intermediate calculations |
| NE 175th St | Roadway name | | Purple = final analysis results |
| I-5 to 15th Ave NE | Description | | |
| 35 | Current speed limit (mph) | | |
| | Notes | | Note: The "Test macros" button provides a message to verify proper macro operation. |
| Analysis Results | | | Advisory, Calculated, or Warning Messages |
| Speed limit setting group | | Developed | |
| Suggested speed limit (mph) | | 30 | This value is determined by speed data, site characteristics, & crash data. |
| Speed Data | | | Advisory, Calculated, or Warning Messages |
| 55 | Maximum speed limit (mph) | | |
| 37 | 85th-percentile speed (mph) | | |
| 32 | 50th-percentile speed (mph) | | |
| Site Characteristics | | | Advisory, Calculated, or Warning Messages |
| 0.75 | Segment length (mi) | | |
| 4 | Number of lanes (two-way total) | | |
| Undivided | Median type | | |
| 3 | Number of traffic signals | | |
| 50 | Number of access points (total of both directions) | | |
| Not high / Any type | Bicyclist activity / bike lane type | | |
| Narrow | Sidewalk presence / width | | |
| Not present | Sidewalk buffer | | |
| Some | Pedestrian activity | | |
| Not high | On-street parking activity | | |
| No | Parallel parking permitted? | | |
| No | Angle parking present? | | |
| No | Adverse alignment present? | | |
| Crash Data | | | Advisory, Calculated, or Warning Messages |
| 10 | Number of years of crash data | | |
| 15,359 | Average AADT for crash data period (veh/d) | | |
| No | Is the segment a one-way street? | | |
| 190 | All (KABCO) crashes for crash data period | | |
| 72 | Fatal & injury (KABC) crashes for crash data period | | |
| | Average KABCO crash rate (crashes / 100 MVMT) | | |
| | Average KABC crash rate (crashes / 100 MVMT) | | |
| 1.3 x average KABCO crash rate (crashes / 100 MVMT) | 587.9 | | |
| 1.3 x average KABC crash rate (crashes / 100 MVMT) | 171.6 | | |
| Critical KABCO crash rate (crashes / 100 MVMT) | 507.4 | | |
| Critical KABC crash rate (crashes / 100 MVMT) | 162.3 | | |
| | | | Observed KABCO crash rate = 451.89 crashes / 100 MVMT Observed KABC crash rate = 171.24 crashes / 100 MVMT HSIS average KABCO crash rate = 452.26 crashes / 100 MVMT HSIS average KABC crash rate = 131.98 crashes / 100 MVMT Closest 50th |

| NCHRP 17-76 Speed Limit Setting Tool | | | |
|---|---|-------------|--|
| Input Cells | | Description | Output Cells |
| Site Description Data | | | Color-Coding Legend |
| Urban | Roadway context | | Aqua = basic input cell |
| Principal arterial | Roadway type | | Denim = basic input cell with drop-down menu |
| Yes | Are crash data available? | | Orange = optional input cell (not needed for calculations) |
| K. Dedinsky | Analyst | | Green = optional input cell (use if data for agency & region are available, leave blank otherwise) |
| 8/30/2021 | Date | | Rose = intermediate calculations |
| N 175th St | Roadway name | | Purple = final analysis results |
| Aurora to I-5 | Description | | |
| 35 | Current speed limit (mph) | | |
| | Notes | | Note: The "Test macros" button provides a message to verify proper macro operation. |
| Analysis Results | | | Advisory, Calculated, or Warning Messages |
| Speed limit setting group | | Developed | |
| Suggested speed limit (mph) | | 30 | This value is determined by speed data, site characteristics, & crash data. |
| Speed Data | | | Advisory, Calculated, or Warning Messages |
| 60 | Maximum speed limit (mph) | | The assumed upper value for this speed limit setting group is 55 mph. |
| 38.3 | 85th-percentile speed (mph) | | |
| 32.4 | 50th-percentile speed (mph) | | |
| Site Characteristics | | | Advisory, Calculated, or Warning Messages |
| 0.75 | Segment length (mi) | | |
| 4 | Number of lanes (two-way total) | | |
| Undivided | Median type | | |
| 3 | Number of traffic signals | | Rounded-Down 85th |
| 34 | Number of access points (total of both directions) | | Rounded-Down 85th (4 signals / mi) |
| Not high / Any type | Bicyclist activity / bike lane type | | Rounded-Down 85th (45.33 access points / mi) |
| Narrow | Sidewalk presence / width | | |
| Not present | Sidewalk buffer | | |
| Some | Pedestrian activity | | Closest 50th |
| Not high | On-street parking activity | | |
| No | Parallel parking permitted? | | |
| No | Angle parking present? | | |
| No | Adverse alignment present? | | |
| Crash Data | | | Advisory, Calculated, or Warning Messages |
| 10 | Number of years of crash data | | |
| 19,988 | Average AADT for crash data period (veh/d) | | |
| No | Is the segment a one-way street? | | |
| 275 | All (KABCO) crashes for crash data period | | Observed KABCO crash rate = 502.58 crashes / 100 MVMT |
| 94 | Fatal & injury (KABC) crashes for crash data period | | Observed KABC crash rate = 171.79 crashes / 100 MVMT |
| | Average KABCO crash rate (crashes / 100 MVMT) | | HSIS average KABCO crash rate = 452.26 crashes / 100 MVMT |
| | Average KABC crash rate (crashes / 100 MVMT) | | HSIS average KABC crash rate = 131.98 crashes / 100 MVMT |
| 1.3 x average KABCO crash rate (crashes / 100 MVMT) | 587.9 | | |
| 1.3 x average KABC crash rate (crashes / 100 MVMT) | 171.6 | | |
| Critical KABCO crash rate (crashes / 100 MVMT) | 500.5 | | Closest 50th |
| Critical KABC crash rate (crashes / 100 MVMT) | 158.4 | | Closest 50th |

| NCHRP 17-76 Speed Limit Setting Tool | | | |
|--------------------------------------|---|-------------|--|
| Input Cells | | Description | Output Cells |
| Site Description Data | | | Color-Coding Legend |
| Suburban | Roadway context | | Aqua = basic input cell |
| Collector | Roadway type | | Denim = basic input cell with drop-down menu |
| Yes | Are crash data available? | | Orange = optional input cell (not needed for calculations) |
| DKS | Analyst | | Green = optional input cell (use if data for agency & region are available, leave blank otherwise) |
| 8/31/2020 | Date | | Rose = intermediate calculations |
| Greenwood Ave N | Roadway name | | Purple = final analysis results |
| from N 145th St to N 160th St | Description | | |
| 35 | Current speed limit (mph) | | |
| | Notes | | Note: The "Test macros" button provides a message to verify proper macro operation. |
| Analysis Results | | | Advisory, Calculated, or Warning Messages |
| Speed limit setting group | | Developed | |
| Suggested speed limit (mph) | | 30 | This value is determined by speed data & site characteristics. |
| Speed Data | | | Advisory, Calculated, or Warning Messages |
| 50 | Maximum speed limit (mph) | | |
| 41 | 85th-percentile speed (mph) | | |
| 29.4 | 50th-percentile speed (mph) | | |
| Site Characteristics | | | Advisory, Calculated, or Warning Messages |
| 0.8 | Segment length (mi) | | |
| 2 | Number of lanes (two-way total) | | |
| Undivided | Median type | | |
| 0 | Number of traffic signals | | 0 signals / mi |
| 24 | Number of access points (total of both directions) | | 30 access points / mi |
| Not high / Any type | Bicyclist activity / bike lane type | | |
| None | Sidewalk presence / width | | |
| Some | Pedestrian activity | | Closest 50th |
| Not high | On-street parking activity | | |
| Yes | Parallel parking permitted? | | Rounded-Down 85th |
| No | Angle parking present? | | |
| No | Adverse alignment present? | | |
| Crash Data | | | Advisory, Calculated, or Warning Messages |
| 10 | Number of years of crash data | | |
| 8,552 | Average AADT for crash data period (veh/d) | | |
| No | Is the segment a one-way street? | | |
| 36 | All (KABCO) crashes for crash data period | | Observed KABCO crash rate = 144.16 crashes / 100 MVMT |
| 1 | Fatal & injury (KABC) crashes for crash data period | | Observed KABC crash rate = 4 crashes / 100 MVMT |
| | Average KABCO crash rate (crashes / 100 MVMT) | | HSIS average KABCO crash rate = 229.55 crashes / 100 MVMT |
| | Average KABC crash rate (crashes / 100 MVMT) | | HSIS average KABC crash rate = 70.26 crashes / 100 MVMT |
| | 1.3 x average KABCO crash rate (crashes / 100 MVMT) | 298.4 | |
| | 1.3 x average KABC crash rate (crashes / 100 MVMT) | 91.3 | |
| | Critical KABCO crash rate (crashes / 100 MVMT) | 281.4 | |
| | Critical KABC crash rate (crashes / 100 MVMT) | 99.9 | |

| NCHRP 17-76 Speed Limit Setting Tool | | | |
|---|---|-------------|--|
| Input Cells | | Description | Output Cells |
| Site Description Data | | | Color-Coding Legend |
| Urban | Roadway context | | Aqua = basic input cell |
| Minor arterial | Roadway type | | Denim = basic input cell with drop-down menu |
| Yes | Are crash data available? | | Orange = optional input cell (not needed for calculations) |
| DKS | Analyst | | Green = optional input cell (use if data for agency & region are available, leave blank otherwise) |
| 8/31/2020 | Date | | Rose = intermediate calculations |
| Meridian Ave N | Roadway name | | Purple = final analysis results |
| NE 145th St to 205th St | Description | | |
| 35 | Current speed limit (mph) | | |
| | Notes | | Note: The "Test macros" button provides a message to verify proper macro operation. |
| Analysis Results | | | Advisory, Calculated, or Warning Messages |
| Speed limit setting group | | Developed | |
| Suggested speed limit (mph) | | 30 | This value is determined by speed data, site characteristics, & crash data. |
| Speed Data | | | Advisory, Calculated, or Warning Messages |
| 55 | Maximum speed limit (mph) | | |
| 35.7 | 85th-percentile speed (mph) | | |
| 31.3 | 50th-percentile speed (mph) | | |
| Site Characteristics | | | Advisory, Calculated, or Warning Messages |
| 3 | Segment length (mi) | | |
| 2 | Number of lanes (two-way total) | | |
| Undivided | Median type | | |
| 6 | Number of traffic signals | | 2 signals / mi |
| 77 | Number of access points (total of both directions) | | 25.67 access points / mi |
| Not high / Any type | Bicyclist activity / bike lane type | | |
| Adequate | Sidewalk presence / width | | |
| Present | Sidewalk buffer | | |
| Some | Pedestrian activity | | |
| Not high | On-street parking activity | | |
| Yes | Parallel parking permitted? | | Rounded-Down 85th |
| No | Angle parking present? | | |
| No | Adverse alignment present? | | |
| Crash Data | | | Advisory, Calculated, or Warning Messages |
| 10 | Number of years of crash data | | |
| 9,456 | Average AADT for crash data period (veh/d) | | |
| No | Is the segment a one-way street? | | |
| 361 | All (KABCO) crashes for crash data period | | Observed KABCO crash rate = 348.65 crashes / 100 MVMT |
| 10 | Fatal & injury (KABC) crashes for crash data period | | Observed KABC crash rate = 9.66 crashes / 100 MVMT |
| | Average KABCO crash rate (crashes / 100 MVMT) | | HSIS average KABCO crash rate = 229.55 crashes / 100 MVMT |
| | Average KABC crash rate (crashes / 100 MVMT) | | HSIS average KABC crash rate = 70.26 crashes / 100 MVMT |
| 1.3 x average KABCO crash rate (crashes / 100 MVMT) | | 298.4 | |
| 1.3 x average KABC crash rate (crashes / 100 MVMT) | | 91.3 | |
| Critical KABCO crash rate (crashes / 100 MVMT) | | 254.5 | |
| Critical KABC crash rate (crashes / 100 MVMT) | | 84.3 | Closest 50th |

| NCHRP 17-76 Speed Limit Setting Tool | | | |
|--------------------------------------|---|-------------|---|
| Input Cells | | Description | Output Cells |
| Site Description Data | | | Color-Coding Legend |
| Urban | Roadway context | | Aqua = basic input cell |
| Principal arterial | Roadway type | | Denim = basic input cell with drop-down menu |
| Yes | Are crash data available? | | Orange = optional input cell (not needed for calculations) |
| DKS | Analyst | | Green = optional input cell (use if data for agency & region are available, leave blank otherwise) |
| 8/31/2020 | Date | | Rose = intermediate calculations |
| 15th Ave N | Roadway name | | Purple = final analysis results |
| NE 145th St to 175th St | Description | | |
| 35 | Current speed limit (mph) | | |
| | Notes | | Note: The "Test macros" button provides a message to verify proper macro operation. |
| Analysis Results | | | Advisory, Calculated, or Warning Messages |
| Speed limit setting group | | Developed | |
| Suggested speed limit (mph) | | 30 | This value is determined by speed data, site characteristics, & crash data. |
| Speed Data | | | Advisory, Calculated, or Warning Messages |
| 55 | Maximum speed limit (mph) | | |
| 43.3 | 85th-percentile speed (mph) | | |
| 32.3 | 50th-percentile speed (mph) | | |
| Site Characteristics | | | Advisory, Calculated, or Warning Messages |
| 1.5 | Segment length (mi) | | |
| 3 | Number of lanes (two-way total) | | |
| TWLT | Median type | | |
| 6 | Number of traffic signals | | |
| 57 | Number of access points (total of both directions) | | |
| Not high / Any type | Bicyclist activity / bike lane type | | |
| Adequate | Sidewalk presence / width | | |
| Present | Sidewalk buffer | | |
| Some | Pedestrian activity | | |
| Not high | On-street parking activity | | |
| No | Parallel parking permitted? | | |
| No | Angle parking present? | | |
| No | Adverse alignment present? | | |
| Crash Data | | | Advisory, Calculated, or Warning Messages |
| 10 | Number of years of crash data | | |
| 18,306 | Average AADT for crash data period (veh/d) | | |
| No | Is the segment a one-way street? | | |
| 288 | All (KABCO) crashes for crash data period | | |
| 5 | Fatal & injury (KABC) crashes for crash data period | | |
| | Average KABCO crash rate (crashes / 100 MVMT) | | |
| | Average KABC crash rate (crashes / 100 MVMT) | | |
| | 1.3 x average KABCO crash rate (crashes / 100 MVMT) | 263.2 | |
| | 1.3 x average KABC crash rate (crashes / 100 MVMT) | 86.0 | |
| | Critical KABCO crash rate (crashes / 100 MVMT) | 226.3 | |
| | Critical KABC crash rate (crashes / 100 MVMT) | 80.0 | |
| | | | Observed KABCO crash rate = 287.35 crashes / 100 MVMT Observed KABC crash rate = 4.99 crashes / 100 MVMT HSIS average KABCO crash rate = 202.46 crashes / 100 MVMT HSIS average KABC crash rate = 66.16 crashes / 100 MVMT Closest 50th |

| NCHRP 17-76 Speed Limit Setting Tool | | | |
|--------------------------------------|---|-------------|---|
| Input Cells | | Description | Output Cells |
| Site Description Data | | | Color-Coding Legend |
| Urban | Roadway context | | Aqua = basic input cell |
| Principal arterial | Roadway type | | Denim = basic input cell with drop-down menu |
| Yes | Are crash data available? | | Orange = optional input cell (not needed for calculations) |
| K. Dedinsky | Analyst | | Green = optional input cell (use if data for agency & region are available, leave blank otherwise) |
| 9/30/2021 | Date | | Rose = intermediate calculations |
| 15th Ave N | Roadway name | | Purple = final analysis results |
| NE 180th to NE 196th | Description | | |
| 35 | Current speed limit (mph) | | |
| | Notes | | Note: The "Test macros" button provides a message to verify proper macro operation. |
| Analysis Results | | | Advisory, Calculated, or Warning Messages |
| Speed limit setting group | | Developed | |
| Suggested speed limit (mph) | | 35 | This value is determined by speed data & site characteristics. |
| Speed Data | | | Advisory, Calculated, or Warning Messages |
| 55 | Maximum speed limit (mph) | | |
| 43.9 | 85th-percentile speed (mph) | | |
| 34.7 | 50th-percentile speed (mph) | | |
| Site Characteristics | | | Advisory, Calculated, or Warning Messages |
| 0.8 | Segment length (mi) | | |
| 4 | Number of lanes (two-way total) | | |
| Undivided | Median type | | |
| 3 | Number of traffic signals | | |
| 45 | Number of access points (total of both directions) | | |
| Not high / Any type | Bicyclist activity / bike lane type | | |
| None | Sidewalk presence / width | | |
| Some | Pedestrian activity | | |
| Not high | On-street parking activity | | |
| No | Parallel parking permitted? | | |
| No | Angle parking present? | | |
| Yes | Adverse alignment present? | | |
| Crash Data | | | Advisory, Calculated, or Warning Messages |
| 10 | Number of years of crash data | | |
| 12,640 | Average AADT for crash data period (veh/d) | | |
| No | Is the segment a one-way street? | | |
| 72 | All (KABCO) crashes for crash data period | | |
| 28 | Fatal & injury (KABC) crashes for crash data period | | |
| | Average KABCO crash rate (crashes / 100 MVMT) | | |
| | Average KABC crash rate (crashes / 100 MVMT) | | |
| | 1.3 x average KABCO crash rate (crashes / 100 MVMT) | 587.9 | |
| | 1.3 x average KABC crash rate (crashes / 100 MVMT) | 171.6 | |
| | Critical KABCO crash rate (crashes / 100 MVMT) | 511.2 | |
| | Critical KABC crash rate (crashes / 100 MVMT) | 164.4 | |
| | | | Observed KABCO crash rate = 195.08 crashes / 100 MVMT Observed KABC crash rate = 75.86 crashes / 100 MVMT HSIS average KABCO crash rate = 452.26 crashes / 100 MVMT HSIS average KABC crash rate = 131.98 crashes / 100 MVMT |