TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, MA 01843
978.794.1792

TECHNICAL MEMORANDUM

TO: Mr. Joshua Crabb, Highway Superintendent
Fairhaven Highway Department
5 Arsene Street
Fairhaven, Massachusetts 02719

DATE: September 19, 2025

FROM: Samuel W. Gregorio, PE, PTOE, RSP_1, Senior Project Manager
Gerson M. Ribeiro EIT, Project Engineer

PROJ NO.: T1680

RE: School Street & Ash Street – Fairhaven, Massachusetts
One-Way Flow Assessment

INTRODUCTION

TEC, Inc. (TEC) has been retained by the Town of Fairhaven (the "Town") to provide an evaluation of a potential corridor flow conversion from two-way flow (bidirectional traffic) to one-way flow along both School Street and Ash Street in the vicinity of the Elizabeth I. Hastings Middle School in Fairhaven, Massachusetts. The current two-way flow condition of the subject roadways between Adams Street and the school grounds results in unorganized school operations mixing with the residential traffic for the various dwellings along each subject roadway. The location has been identified as a location of concern in the community.

TEC has evaluated traffic and safety characteristics of the study corridors under base year and future year conditions consistent with the *Transportation Impact Assessment (TIA) Guidelines* issued by the Massachusetts Department of Transportation (MassDOT)[1] and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports. Note that this study does not provide specific capacity and queue analysis of the subject intersections. The findings and recommendations for the change in flow conditions, if noted, are based on the detailed traffic analyses included in this report.

EXISTING CONDITIONS

A field inventory of the existing conditions along Ash Street and School Street was conducted by TEC staff in April 2025 to obtain information related to intersection and roadway geometrics, operating characteristics, and safety characteristics. A description of the existing roadway and intersection geometry is provided below. A graphical depiction of the study area is provided in Figure 1.

[1] *Transportation Impact Assessment (TIA) Guidelines*; Massachusetts Department of Transportation; March 13, 2014.

North

1" = 200'

Figure 1

Study Location Map

TEC
The Engineering Corp
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, MA 01843
978-794-1792
www.TheEngineeringCorp.com

Key Corridors

School Street

School Street is a 750-foot two-lane, east-west, local roadway under the jurisdiction of the Town of Fairhaven. The roadway generally aligns with the bus turnaround at the northerly end of the Hastings Middle School property. School Street is approximately 30 feet wide and provides a single travel lane in each direction with directional flow separated by a marked centerline. Sidewalks are provided along both sides of the corridor. No formal bicycle accommodation is provided along School Street. On-street parking is permitted along both sides of the corridor. A flow restriction which limits the corridor to westbound flow only (exiting the school) is in place along School Street from Monday through Friday between 7:00 AM to 9:00 AM and between 2:00 PM to 4:00 PM. This restriction is only signed along School Street at its intersection with Adams Street.

There is no MassDOT Special Speed Regulation along School Street. The corridor is therefore subject to a 30 mile per hour (mph) statutory speed limit under Massachusetts General Law (MGL) Chapter 90, Section 17 (Ch90 §17) for thickly settled / business districts in absence of a Special Speed Regulation. Note that prior to this assessment, a 20-mph posted speed limit was present along School Street; however, no documented Special Speed Regulation supported this speed zone. The speed limit signs have since been removed from the corridor by the Town.

Ash Street

Ash Street is a 900-foot two-lane, east-west, local roadway under the jurisdiction of the Town of Fairhaven. The roadway generally aligns with the southerly end of the Hastings Middle School property. Ash Street is approximately 25 feet wide and provides a single travel lane in each direction with directional flow unmarked. Pedestrian and bicycle accommodation is provided along the corridor. On-street parking is permitted along the southerly side of the corridor; however, it is not uncommon for vehicles to park along both sides of the roadway with encroachment over the roadway edge.

As noted, Ash Street is operating under an assumed two-way flow condition; however, there are several indicators that the corridor is generally utilized as a one-way road. This includes a single “One-Way” (R6-1) sign present on the easterly end of the corridor for eastbound flow and no stop line / stop sign provided at the westerly end of the corridor along Ash Street westbound. The corridor does have two (2) traffic signs facing the westbound direction of travel and traffic counts indicate that traffic volume is utilizing both directions of travel. Travel applications such as Waze and Google Earth also appear to indicate two-way flow allowance.

There is no MassDOT Special Speed Regulation along Ash Street. The corridor is therefore subject to a 30-mph statutory speed limit under MGL Ch90 §17 for thickly settled / business districts in absence of a Special Speed Regulation. Note that prior to this assessment, a 20-mph posted speed limit was present along Ash Street; however, no documented Special Speed Regulation supported this speed zone. The speed limit signs have since been removed from the corridor by the Town.

TRAFFIC VOLUMES

Traffic volume data for this report was obtained from Turning Movement Counts (TMCs) and supplemented with Automatic Traffic Recorder (ATR) counts conducted at the study area intersections. The details of the data collection effort for this project are described below.

Turning Movement Counts

To establish existing traffic volumes at the study area intersection, manual TMCs were conducted during a typical weekday morning (7:00 AM to 9:00 AM) and weekday afternoon (1:00 PM to 5:00 PM) peak hours on Wednesday, May 28, 2025. Local schools were in regular session during the time of the traffic counts. A detailed summary of the TMCs, partitioned into 15-minute intervals, is provided within Attachment A.

Automatic Traffic Recorder Counts

An ATR was conducted for a continuous 48-hour mid-week period on School Street and Ash Street east of Adams Street from Wednesday, May 28, 2025 through Thursday, May 29, 2025 concurrently with the TMCs. The ATRs were obtained to gather additional daily traffic volume data, vehicle speeds, and vehicle classification. A summary of the weekday ATR traffic data is presented in Table 1. A detailed summary of the ATR data, partitioned into 15-minute intervals, is provided within Attachment B.

Table 1 – Existing Weekday Traffic Volume Summary

Location	Weekday Traffic Volume[a]	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		Traffic Volume[b]	K Factor[c]	Directional Distribution[d]	Traffic Volume	K Factor	Directional Distribution
School Street, north of Center Street	725	241	33.2%	99.6% WB	54	7.4%	68.5% WB
Ash Street, east of Adams Street	730	279	38.2%	99.3% EB	49	6.7%	87.8% EB

[a] Daily traffic expressed in vehicles per day.
[b] Hourly traffic expressed in vehicles per hour.
[c] Percent of daily traffic volumes which occur during the peak hour.
[d] Percent of peak hour volume in the predominant direction of travel.

The School Street corridor carries approximately 725 vehicles per day (vpd) on an average weekday. Directional distribution along the roadway is nearly 100 percent weighed in the westbound direction during the weekday morning peak hour which is expected to be based on a mix of residents leaving for work and vehicles departing the school. The directional distribution is still heavily weighted, albeit a lessened percentage, in the westbound direction during the afternoon peak hours. Throughout the typical day, School Street is regularly utilized as a two-way flow corridor. The traffic pattern for school arrival and dismissal runs from Ash Street to the Hastings Middle School to School Street which supports the aforementioned westbound flow during the overlapping weekday morning / school arrival period.

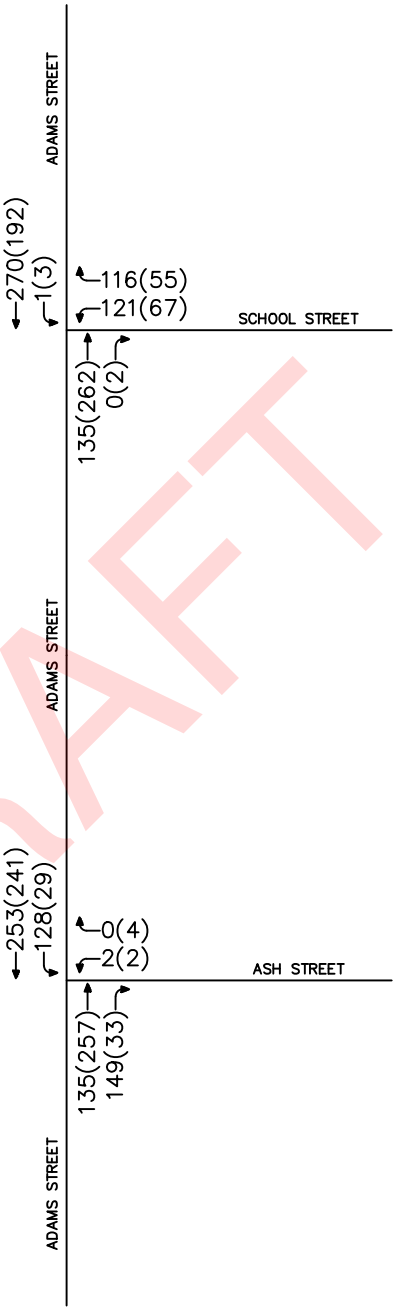
The Ash Street corridor carries approximately 730 vpd on an average weekday. Directional distribution along the roadway is nearly 100 weighed in the eastbound direction during the weekday morning peak hour which indicates that residents generally utilize the corridor as a one-way flow corridor even when leaving for work in the morning likely based on the overwhelming number of vehicles on the corridor in that hour that are school related. The directional distribution is still heavily weighted, albeit a lessened percentage, in the eastbound direction during the afternoon peak hours. The overall westbound flow along Ash Street throughout the day is minimal; however, does exists. The traffic pattern for school arrival and dismissal runs from Ash Street to the Hastings Middle School to School Street which supports the aforementioned eastbound flow during the overlapping weekday morning / school arrival period.

Seasonal Adjustment

In accordance with MassDOT standards, traffic volumes are typically adjusted to average-month conditions. To account for seasonal adjustment, TEC utilized MassDOT's weekday seasonal and axle correction factors published in 2024 (the most recent year of the data). These factors provide a month-to-month overview of traffic volumes statewide by roadway functional classification and land (urban vs. rural) type. For local roadways, traffic volumes for the month of May were 9.0% higher (factor of 0.91) than the average-month conditions. Therefore, all traffic volumes within the study area were unadjusted to reflect a conservative condition. The compiled seasonal adjustment date is provided in Attachment C. The resulting 2025 Base Year Conditions weekday morning and weekday afternoon peak hour traffic volume network is illustrated in Figure 2.

Not to Scale

School Street & Ash Street - Fairhaven, Massachusetts
One-Way Flow Assessment



XXX(XXX) = WEEKDAY MORNING PEAK HOUR(WEEKDAY EVENING PEAK HOUR)

Figure 2

2025 Base Year Conditions
Weekday Morning and Weekday Evening
Peak Hour Traffic Volumes

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, MA 01843
978-794-1792
www.TheEngineeringCorp.com

SAFETY ANALYSIS

A comprehensive traffic safety analysis was conducted for the School Street and Ash Street corridors. The traffic safety analysis included the compilation and examination of the crash data and a general safety review of sight distances along the corridor and at the study area intersections.

Crash Data

Crash reports for the study area were compiled and analyzed for the most recent consecutive six-year period (2019-2024) on file identified from MassDOT's Interactive Mapping Portal for Analysis and Crash Tracking (IMPACT) system. A compilation of the detailed crash data is provided in Attachment D.

Crash Rates

In addition to examining the number of crashes in the study area, an intersection crash rate was calculated to compare the occurrence of crashes to the volume of traffic passing through the study area intersection. The crash rate per million entering vehicles (MEV) for intersections was calculated using the weekday evening peak hour volumes from the TMCs and K-factor (relation of peak-hour traffic to daily traffic) in Table 1. The crash rate at the intersections was compared to the statewide and district-wide averages published by MassDOT in June 2018 for intersections and June 2023 for roadway segments to determine the significance of the crash occurrence. The statewide and District 5 average for unsignalized intersections is 0.57 crashes per MEV. Crash rate calculations can be found in Attachment D.

Intersection Crash Data Summary

Adams Street / School Street

The intersection of Adams Street / School Street experienced only one (1) crash over the six-year study period. Whereas the crash rate is typically only calculated for complete years of data, the intersection did not experience a crash during the dedicated timeframe and therefore the crash rate is 0.00 crashes per MEV. The single crash was a rear-end crash along Adams Street northbound which resulted in a non-fatal injury. The crash data does not indicate any crash trends.

Adams Street / Ash Street

The intersection of Adams Street / Ash Street experienced only one (1) crash over the six-year study period. Whereas the crash rate is typically only calculated for complete years of

data, the intersection did not experience a crash during the dedicated timeframe and therefore the crash rate is 0.00 crashes per MEV. The single crash was a single vehicle crash along Adams Street northbound. The crash data does not indicate any crash trends.

Corridor Crash Data Summary

School Street

The Main Street corridor also experienced one (1) crash over the six-year study period at non-intersection locations along its 800-feet length. The crash was reported to be a rear-end crash along School Street eastbound in rainy weather conditions with a wet road surface. The second vehicle was a parked vehicle.

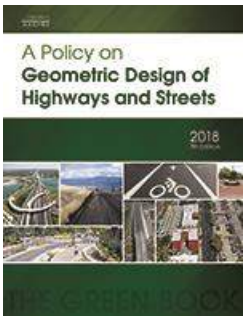
Ash Street

The Ash Street corridor also experienced two (2) crashes over the six-year study period. A sideswipe crash occurred along Ash Street eastbound where a vehicle attempted to overtake another vehicle during the weekday morning peak hour and a single vehicle crashed along Ash Street eastbound. Overall, the number of crashes does not indicate any specific crash trends.

Sight Distance Evaluation

TEC visited the site and measured the available sight lines at both the Adams Street / School Street and Adams Street / Ash Street intersections in April 2025. The available sight lines were compared to minimum requirements established by the American Association of State Highway and Transportation Officials (AASHTO)[2].

Sight distance represents the length of roadway that is visible to a driver traveling within the roadway. Two types of sight distance are typically evaluated for driveways and intersections: stopping sight distance (SSD) and intersection sight distance (ISD). SSD is the minimum distance required for a driver traveling along a roadway to perceive an object in the roadway and stop safely in advance of the object when traveling on a wet pavement surface. SSD is measured from an eye height of 3.5 feet to an object height of 2 feet above the ground, which is equivalent to a driver viewing the taillight of a vehicle ahead. SSD is measured along the centerline of the travel lane approaching a driveway or intersection.



Current AASHTO 'Green Book' (2018)

[2] *A Policy on Geometric Design of Highways and Streets (the "Green Book")*; American Association of State Highway and Transportation Officials; Washington DC; 2018

ISD represents the length of the roadway visible to a driver waiting to exit a driveway or minor street. Minimum ISD requirements are based on the distance required for a driver to exit a minor street onto a major street without requiring an approaching vehicle to reduce its speed from the design speed to less than 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet and is measured from a distance 15 feet beyond the edge of the travel-way of the major roadway to represent a driver waiting to exit a driveway or minor roadway.

SSD is typically considered the critical sight distance, as it represents the minimum distance required for safe stopping, while ISD represents an acceptable speed reduction for approaching vehicles. The ISD, however, must be at least equal to the minimum required SSD in order to prevent a driver from entering the roadway when an approaching vehicle is too close to safely stop. The guidance provided by AASHTO states:

> *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."*

In the absence of 85th percentile speed data along Adams Street, the operating speed was calculated based on the 30-mph statutory speed. In addition, the roadway grades entering the intersection from each approach were approximated based on the online MassMapper database[3]. Tables 2 and 3 provide a summary of the available SSD and ISD at the intersections of Adams Street / School Street and Adams Street / Ash Street, respectively.

Table 2 – Existing Stopping Sight Distance Measurements

Approach / Direction	Operating Speed [(a)]	AASHTO Recommended Minimum	Measured Stopping Sight Distance
Adams Street / School Street:			
Adams Street Northbound	30 MPH	200 FT	>500 FT
Adams Street Southbound	30 MPH	200 FT	>500 FT
Adams Street / Ash Street:			
Adams Street Northbound	30 MPH	200 FT	>500 FT
Adams Street Southbound	30 MPH	200 FT	>500 FT

[a] Operating speeds calculated as statutory speed.

[3] https://maps.massgis.digital.mass.gov/MassMapper/MassMapper.html

Table 3 – Existing Intersection Sight Distance Measurements

Approach / Direction	Operating Speed [a]	AASHTO Desired Minimum	AASHTO Recommended Minimum	Measured Intersection Sight Distance
School Street at Adams Street:				
School Street looking North [looking right]	30 MPH	410 FT	200 FT	>500 FT [b]
School Street looking South [looking left]	30 MPH	410 FT	200 FT	200 FT
Ash Street at Adams Street				
Ash Street looking North [looking right]	30 MPH	410 FT	200 FT	280 FT
Ash Street looking South [looking left]	30 MPH	410 FT	200 FT	170 FT

[a] Operating speeds calculated as statutory speed.
[b] Assumes visibility behind public shade tree.

As shown in Table 2, the SSD along Adams Street at the study area intersection exceeds AASHTO minimum recommendations for safe operations. For both School Street and Ash Street, the ISD reported in Table 3 is more challenging. From School Street looking north, the ISD generally exceeds minimum recommendations; however, a public shade tree does interrupt the visibility. From School Street looking south, the ISD is restricted by the private fence at 113 Adams Street. From Ash Street looking north, the ISD is limited by a chain link fence which can be seen though depending on the vehicle position. If measured from the corner point of the fence, the ISD would only slightly exceed minimum recommendations for safe operations. From Ash Street looking south, the ISD is significantly limited by the building structure at 105 Adams Street (Galarza's Barbar Shop). This approximated sight line through field measurement (170-feet) would accommodate a vehicle travelling along Adams Street at 27 mph.

TRAFFIC IMPACT ANALYSIS

Recommendations provided in this study denote retaining two-way flow along both School Street and Ash Street. As a result, capacity and vehicle queue analyses were conducted under 2025 Base Year Conditions only. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study. Synchro 12™ software was used to perform the analysis.

Levels of Service

A primary result of capacity analyses is the assignment of level-of-service to traffic facilities under various traffic-flow conditions.[4] The concept of level-of-service is defined as a qualitative measure describing operational conditions within a traffic stream and their

[4] The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 7th Edition*; Transportation Research Board; Washington, DC; 2022

perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level of service (LOS) A representing the best operating conditions and LOS F representing the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

Queue Length Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the *Synchro 12™* intersection capacity analysis software, which is also based upon the methodology and procedures presented in the Highway Capacity Manual (*HCM), 7th Edition*. Synchro reports the 95th percentile queues for unsignalized intersections and both the 50th (average) and 95th percentile vehicle queues for signalized intersections, which are based on the number of vehicles that experience a delay of six seconds or more at an intersection and is a function of the traffic signal timing; vehicle arrival patterns during the analysis period; and the saturation flow rate. The 50th percentile or average vehicle queue is the average number of vehicles that are projected to be delayed by six seconds or more at the intersection under study during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only five percent of the time, or approximately three minutes out of 60 minutes during the peak one hour of the day. During the remaining 57 minutes, the vehicle queue length will be less than the 95th percentile queue length.

Parameters for Traffic Impact Analysis

Unsignalized Intersections

The levels of service of two-way stop-controlled unsignalized intersections are determined by application of a procedure described in the *HCM 7th Edition*. Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and stop signs. Control delay includes the effects of initial deceleration delay approaching a stop sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the *HCM 7th Edition*. Table 4 summarizes the relationship between level of service and average control delay for unsignalized intersections.

Table 4 – Level of Service Criteria for Unsignalized Intersections [a]

Level of Service (v/c ≤ 1.0)	Level of Service (v/c > 1.0)	Average Control Delay (sec/veh)	Description
A	F	≤10.0	LOS A represents a condition with little or no control delay to minor street traffic.
B	F	10.1 to 15.0	LOS B represents a condition with short control delays to minor street traffic.
C	F	15.1 to 25.0	LOS C represents a condition with average control delays to minor street traffic.
D	F	25.1 to 35.0	LOS D represents a condition with long control delays to minor street traffic.
E	F	35.1 to 50.0	LOS E represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
F	F	>50.0	LOS F represents a condition where minor street demand volume exceeds capacity of an approach lane, with excessive control delays resulting.

[a] Source: *Highway Capacity Manual 7th Edition*; Transportation Research Board; Washington D.C.; 2022

Intersection Capacity and Queue Analysis Results

Formalizing Ash Street to two-way flow is not expected to significantly change the traffic volume conditions along School Street and Ash Street. This is generally apparent as there are measurable traffic volumes travelling along Ash Street westbound movement generally consistent with the number of residential dwellings along the corridor. Under the 2025 Base Year Condition, all movements at both the intersections of Adams Street / School Street and Adams Street / Ash Street operate at an acceptable level of service (LOS C or better) with volume-to-capacity (v/c) ratios well below 1.00 indicating that each approach to each intersection can accommodate the demand with additional reserve capacity available to accommodate additional volume that may reassign based on a change in flow condition.

The results of the intersection capacity analysis are summarized in Table 5. The capacity analysis worksheets are provided in Attachment E.

Table 5 – Intersection Capacity and Queue Analysis Summary

	2025 Existing Year Condition			
Intersection / Lane Group	**V/C[a]**	**Delay[b]**	**LOS[c]**	**Queue[d]**
Adams Street / School Street				
Weekday AM Peak Period				
School Street WB	0.73	24.0	C	155
Adams Street / SBL	0.01	7.5	A	<25
Weekday PM Peak Period				
School Street WB	0.39	15.5	C	45
Adams Street / SBL	0.01	8.3	A	<25
Adams Street / Ash Street				
Weekday AM Peak Period				
Ash Street WB	0.04	24.4	C	<25
Adams Street / SBL	0.17	8.7	A	<25
Weekday PM Peak Period				
Ash Street WB	0.02	11.9	B	<25
Adams Street / SBL	0.04	8.1	A	<25

[a] Volume-to-capacity ratio,
[b] Delay expressed in seconds per vehicle (average)
[c] Level of service
[d] 95th Percentile Queue

RECOMMENDATIONS

TEC recommends that the Town of Fairhaven retain two-way flow conditions along both School Street and Ash Street between Adams Street and the Hastings Middle School grounds. The basis of this retention is:

- To remove the existing and future potential of non-school-related public travel within the Hastings Middle School grounds; specifically, residents of both School Street and Ash Street.
- That the deficiency in sight distance at both School Street and Ash Street looking south are existing conditions with two-way flow and could be partially mitigated by other means.
- To allow for other measures to be implemented on the Hastings Middle School grounds that could formalize on-site flow patterns for staff, parents, and buses.

As part of this recommendation, TEC has outlined a list of improvements and actions that could be implemented by the Town to formalize two-way flow along each roadway and

provide additional clarification as to the two-way flow status of Ash Street. The following outlines the improvements and actions as identified by TEC:

- Install stop-line and stop sign (R1-1) to the Ash Street westbound approach to Adams Street.
- Remove the School Street westbound flow restriction and related traffic signs adjacent to Adams Street.
- Remove the existing "One-Way" (R6-1) sign at the easterly end of Ash Street. Remove the existing "One-Way" (R6-1) sign at the westerly end of School Street.
- Consider the installation of an advisory speed of 25 mph along Adams Street northbound in advance of Ash Street to accommodate the limited 170-foot sight line from Ash Streete to this approach.
- Install "Do Not Enter" (R5-1) and "One-Way" (R6-1) to each side of School Street at the Hastings Middle School property line. Additional text or sign plaques may be added that denote bus traffic is allowed through the prohibition pending any modifications to school pick-up and drop-off procedures.
- Install an advanced stop control (W3-1) warning sign on the School Street and Ash Street westbound approaches in advance of Adams Street.
- Remove all remaining speed limit signs along Adams Street, School Street, and Ash Street as the speed along these roadways is statutory and not regulatory by a MassDOT Special Speed Regulation.
- Consider the replacement of all stop signs and advanced school crossing signs with LED enhanced signage to extend the visibility and importance of the downstream traffic condition.
- Reconstruct the pedestrian curb ramp on the southeast corner of Adams Street / Ash Street to orient the ramp towards Adams Street and construct a new crosswalk location across Adams Street. Crossing improvement will include Americans with Disabilities Act (ADA) / Architectural Access Board (AAB) / Public Right-of-Way Accessibility Guidelines (PROWAG) compliant pedestrian curb ramps at each end of the crossing, high-visibility crosswalk markings, school crossing warning signs (S1-1) with 'arrow' plaques (W16-7p), and advanced school crossing warning signs (S1-1) with "AHEAD" plaques (W16-9p) along both the Adams Street approaches.

- Convert the existing pedestrian crossing warning signs (W11-2) at and in advance of the Adams Street crosswalk at School Street to school crossing warning signs (S1-1). Reconstruct the pedestrian curb ramp at the intersection to ADA / AAB / PROWAG compliance with high-visibility crosswalk markings.
- Utilize the crossing locations across Adams Street to establish a regulatory 20-mph school zone with school zone flasher assemblies installed in advance of School Street along Adams Street southbound and in advance of Ash Street along Adams Street northbound. The school zone flasher assemblies shall comply with Chapter 7 of the *Massachusetts Amendments to the 2009 Manual on Uniform Traffic Control Devices (the "MA-MUTCD Amendments")* as published in November 2022.
    - Install dynamic speed radar feedback signs in conjunction with the school zone flashers along Adams Street in both directions.
    - Note the minimum recommendation for stopping sight distance at 20 mph is 115-feet.
- In conjunction with formalizing two-way flow along Ash Street, sign an on-street parking restriction along one side of Ash Street. Replace all on-street parking traffic signs along the corridor. TEC recognizes that retaining on-street parking will result in limited roadway width for two-way flow (17 to 18 feet); however, the bidirectional friction on this roadway is and expected to be limited.

School Zone Flasher Assembly with Dynamic Speed Radar Feedback

Enhanced Recommendations

The opportunity exists to formalize two-way flow along Ash Street with more impactful infrastructure and regulatory improvements. These may include:

- The Town should consider full on-street parking restrictions along the corridor to allow for the full width of Ash Street to be utilized for two-way flow without limited roadway width.
- Consider the box-widening of Ash Street up to 2 to 3 feet to ensure minimum 10-foot travel lanes should a single on-street parking lane along the corridor be desired. Widening to achieve this width is most practical along the northerly edge of pavement and may only result in a need to remove one public shade tree, relocate two utility poles, and

have limited impact on subsurface utilities (catch basin locations are set back from roadway edge).