

## **Summary of Speed Studies on Flat Hill Road**

September 26, 2024

Residents in the Flat Hill Road area requested the Select Board do review the speed limit on Flat Hill Road. At the request of the Select Board, the DPW and the Police Department combined to study vehicular speed, roadway geometry, and other site conditions to determine if any adjustments or improvements were required.

The Police conducted a speed study over the period of July 11, 2024 to July 20, 2024. The basic standard is that 85% of people will drive at a speed deemed reasonable, proper, and safe. The study showed this speed to be less than 5 mph above the speed limit. We jointly studied traffic conditions, adjacent land use, other road users and found no need for potential adjustments. Thus, no adjustments to the speed limit are suggested. The full study is available at Exhibit A.

After, a preliminary review of roadway curvature, slopes, and roadway conditions was conducted first by the DPW Director and then jointly between Mr. Bernard and the LPD Traffic Officer LaChance. As a result of that study, we find that certain advisory signs for speed limits at various locations may well be warranted. Those locations are:

<b>Location</b>	<b>Alignment Sign</b>	<b>Advisory Plaque</b>
Curve near House # 952, EB	W1-2R	25 MPH
Curve near House # 952, WB	W1-2L	25 MPH
Curve at Spring Street, EB	W1-1L	15 MPH
Curve at Spring Street, WB	W1-1R	15 MPH
Curve near House # 742, EB	W1-5	25 MPH
Curve near House # 742, WB	W1-5	25 MPH
Curve at Sunset Lane, EB	W1-1L	20 MPH
Curve at Sunset Lane, WB	W1-1R	20 MPH
Hill near House # 543, NB	W7-6	25 MPH

The signs will look like this:



Beyond that nothing further is warranted in accordance with accepted practice. The full study is available in Exhibit A.

A third study was conducted at the intersection of Flat Hill Road and Burrage Street as a resident request this intersection be an all-way stop. None of the five standard criteria for an all-way stop are met at this intersection. Therefore, I do not recommend making this intersection an all-way stop. The full study is available in Exhibit B.

# ***Town of Lunenburg***

## ***Department of Public Works***

**William Bernard,**  
**Director**



**520 Chase Road**  
**Lunenburg, MA 01462**  
**Tel.: (978) 582-4160**  
**Fax: (978) 582-4152**

September 26, 2024

Caesar Nuzzolo, Chair  
Select Board

**Re:** Flat Hill Road Petition

Dear Mr. Nuzzolo,

In response to the "Flat Hill Road Petition" received July 8, 2024, signed by approximately 100 citizens demanding the speed limit be reduced to 25 mph, I investigated the matter in conjunction with the Police Department and concluded lower the speed limit is not warranted.

However, I do recommend installing warning signs with advisory speed plaques at four horizontal curve locations and a "Hill Blocks View" sign at one vertical curve location. The estimated cost to install these signs is \$1,439.39 which fits within the DPW yearly operational budget.

I also investigated the citizen's request to make the intersection of Flat Hill Road and Burrage Street an all-way stop. The MUTCD lists 5 criteria for all-way stops. None of the criteria are met at this intersection. Therefore, I do not recommend making this intersection an all-way stop.

The attached reports detail the investigations and provide evidence for my conclusions. The Police Department concurs with my conclusions.

If you have any questions regarding this matter, please contact me at (978) 582-4160.

Sincerely,

A handwritten signature in black ink that reads "William Bernard".

William Bernard, Director  
Lunenburg DPW

# EXHIBIT A



## Investigation of the "Flat Hill Road Petition"

Received July 8, 2024

Demanding the speed limit be reduced to 25 mph

Completed by

William Bernard, DPW Director

Jacob LaChance, Police Officer Traffic Division

Dated 09/25/2024

\_\_\_\_\_  
William Bernard

DPW Director

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Chief Thomas L. Gammel

Thomas Gammel

Chief of Police

Using the MassDOT "Procedures for Speed Zoning on State Highways and Municipal Roads" as a guide I conducted my investigation with the assistance of Officer LaChance.

### Determine The Existing Speed Limit

Lunenburg Code § 332-7.21. Speed zones states:

In accordance with MGL c. 90, § 18, no operator shall operate a motor vehicle on the streets or ways or portions thereof designated in Schedule VI of these Traffic Rules and Orders at speeds in excess of those designated in said schedule, provided such speeds have been authorized by the Board of Selectmen, and which have the written approval of the Massachusetts Department of Transportation and Registrar of Motor Vehicles. Operation of a motor vehicle at a rate of speed in excess of those limits set forth in said schedule shall be *prima facie* evidence that such speed is greater than is reasonable and proper. The provisions of this regulation shall not, however, abrogate in any sense Chapter 90, Section 14 of the General Laws.

Schedule VI, § 332-18.1. Speed zones, does not list Flat Hill Road.

Therefore, the speed limit is defined by State Law, specifically, Chapter 90 Section 17:

Part I - ADMINISTRATION OF THE GOVERNMENT, Title – XIV PUBLIC WAYS AND WORKS, Chapter 90 MOTOR VEHICLES AND AIRCRAFT, Section 17 - SPEED LIMITS

Section 17. No person operating a motor vehicle on any way shall run it at a rate of speed greater than is reasonable and proper, having regard to traffic and the use of the way and the safety of the public. Unless a way is otherwise posted in accordance with the provisions of section eighteen, it shall be *prima facie* evidence of a rate of speed greater than is reasonable and proper as aforesaid (1) if a motor vehicle is operated on a divided highway outside a thickly settled or business district at a rate of speed exceeding fifty miles per hour for a distance of a quarter of a mile, or (2) on any other way outside a thickly settled or business district at a rate of speed exceeding forty miles per hour for a distance of a quarter of a mile, or (3) inside a thickly settled or business district at a rate of speed exceeding thirty miles per hour for a distance of one-eighth of a mile, or (4) within a school zone which may be established by a city or town as provided in section two of chapter eighty-five at a rate of speed exceeding twenty miles per hour. Operation of a motor vehicle at a speed in excess of fifteen miles per hour within one-tenth of a mile of a vehicle used in hawking or peddling merchandise and which displays flashing amber lights shall likewise be *prima facie* evidence of a rate of speed greater than is reasonable and proper. If a speed limit has been duly established upon any way, in accordance with the provisions of said section, operation of a motor vehicle at a rate of speed in excess of such limit shall be *prima facie* evidence that such speed is greater than is reasonable and proper; but, notwithstanding such establishment of a speed limit, every person operating a motor vehicle shall decrease the speed of the same when a special hazard exists with respect to pedestrians or other traffic, or by reason of weather or highway conditions. Any person in violation of this section, while operating a motor vehicle through the parameters of a marked construction zone or construction area, at a speed which exceeds the posted limit, or at a speed

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that is greater than is reasonable and proper, shall be subject to a fine of 2 times the amount currently in effect for the violation issued. Except on a limited access highway, no person shall operate a school bus at a rate of speed exceeding forty miles per hour, while actually engaged in carrying school children.

In the case of Flat Hill Road, part 3 [(3) inside a thickly settled or business district at a rate of speed exceeding thirty miles per hour for a distance of one-eighth of a mile] applies. **Thus, the speed limit on Flat Hill Road is 30 miles per hour.**

#### Radar Speed Studies

The following speed studies have been conducted by the Lunenburg Police:

1. 11-05-2021 to 11-08-2021, westbound at Stonefence Road
2. 11-09-2023 to 11-15-2023, southbound at Burrage Street
3. 11-13-2023 to 11-19-2023, northbound at Burrage Street
4. 07-11-2024 to 07-17-2024, westbound with speed displayed
5. 07-17-2024 to 07-20-2024, westbound with without speed displayed

Study #	Average Speed	85 <sup>th</sup> Percentile Speed
1	23.86	31.00
2	28.08	33.58
3	28.68	33.55
4	24.08	33.82
5	26.69	35.95
Average	26.28	33.58

85<sup>th</sup> percentile speed is a measured value of prevailing speeds at which 85% of all vehicles are traveling at or below in free-flowing traffic.

Note: Flat Hill Road from Reservoir Road to Sunset Lane is oriented east-west. Flat Hill Road from Sunset Lane to Elmwood Road is oriented north-south.

#### How to Establish a Speed Limit

Section 5.h. *Establishing Speed Limits and Length of Speed Zones* from the MassDOT “*Procedures for Speed Zoning on State Highways and Municipal Roads*” states the following:

The observed 85th percentile speed is typically one of the bases for establishing speed zones. This method assumes that most motorists are prudent and capable of selecting safe speeds and is in conformance with the MUTCD. Thus, speeds established in this manner meet the legal requirement that they be “reasonable and proper.” However, it is also recognized that drivers receive their cues from roadway geometry, adjacent land use, and surrounding road users and context but may not adjust their speed if the cues are not present (if drivers do not see the pedestrian activity taking place). Therefore, when establishing speed zones, roadway geometry, adjacent land use, road users and context must be factored in and the observed 85th percentile speed is not just used in isolation. In sections with transit stops, adjacent land uses and other context where non-motorist activity is anticipated (even if not observed during the speed zoning process), the area may be zoned lower than the 85th percentile, but in no cases more than 7 miles per hour lower.

Based on the speed studies and Section 5.h. of MassDOT's procedures for setting speed limits, the present speed limit of 30 MPH is warranted. The average speed is less than 30 mph but greater than 25 mph. The 85<sup>th</sup> percentile speed is greater than 30 mph; however, 7 mph less than the 85<sup>th</sup> percentile speed of 33.58 is 26.58 or greater than 25 mph. **Therefore, sound engineering judgement dictates that the speed limit remains 30 mph.**

#### Crash Data

Section 5.h. *Establishing Speed Limits and Length of Speed Zones* from the MassDOT "Procedures for Speed Zoning on State Highways and Municipal Roads" states the following:

In sections that have been identified as having an unusual rate of crashes that can be attributed to speeding the area may be zoned lower than the 85th percentile speed, but in no case more than 7 miles per hour lower. This should be considered more as an exception than the rule and should be done only where enforcement agencies will ensure consistent enforcement which will increase the effectiveness of the zone to an acceptable level of conformance.

The Police Department provided the following data:

- From 2007 to 2024 there were 5 accidents, none in the last 10 years. These accidents were near the Sunset Lane Intersection. 4 occurred in December and 1 in February.
  - I suspect all 5 accidents were weather (snow/ice) related and not related to speed.
- There were no accidents at the intersections with May Street, Spring Street, and Stonefence Road.
- The area of Burrage had 2 accidents, one in January and one in June; specifically, from 2021-2024: 1 and from 2014-2021: 1.
- The area of Reservoir Road had two accidents, one in January and one in October.

**With so few accidents, there is no justification to lower the speed limit.**

#### Horizontal Curves

Section 5.h. *Establishing Speed Limits and Length of Speed Zones* from the MassDOT "Procedures for Speed Zoning on State Highways and Municipal Roads" states the following:

In general, speed zones should not be changed due to the presence of a horizontal curve. Advisory speeds on horizontal curves should be based upon the speed zone on the upstream tangent roadway section and are further described in Section 10.a of this document.

Section 10.a *Advisory Speed Signs and Plaques* states:

The speed exhibited on all advisory speed signs and plaques is the maximum comfortable and safe speed, rather than an actual speed limit, so the signs are designed with a black legend on a yellow background. Advisory speeds are not enforceable limits.

Use of a ball-bank indicator is the simplest and most widely used device to measure safe, comfortable speeds on horizontal curves. A ball-bank indicator is a curved level that measures the combined effect of the body roll angle, the centrifugal force, and the superelevation angle as a vehicle negotiates a horizontal curve at various speeds.

Advisory speed signs and plaques may be installed by municipalities on any locally-owned street or highway without permission from MassDOT as long as the selected speed is based on an engineering study and their use conforms to the MUTCD.

A preliminary study using a ball-bank indicator was conducted by the DPW Director. A more detailed study was conducted by the DPW Director and Jacob LaChance, the Traffic Division Police Officer, on September 17, 2024. The study was conducted following the procedure outlined in Section 2C.08 of the MUTCD and Section 10.a of the MassDOT “*Procedures for Speed Zoning on State Highways and Municipal Roads*”. The *Manual on Uniform Traffic Control Devices for Streets and Highways*—the MUTCD—defines the standards used by road managers nationwide to install and maintain traffic control devices on all streets, highways, pedestrian and bicycle facilities, and site roadways open to public travel. The MUTCD is published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F.

**The results of the study are as follows:**

Location	Alignment Sign	Advisory Plaque
Curve near House # 1031, WB & EB	None	none
Curve near House # 952, EB	W1-2R	25 MPH
Curve near House # 952, WB	W1-2L	25 MPH
Curve at Spring Street, EB	W1-1L	15 MPH
Curve at Spring Street, WB	W1-1R	15 MPH
Curve near House # 742, EB	W1-5	25 MPH
Curve near House # 742, WB	W1-5	25 MPH
Curve at Sunset Lane, EB	W1-1L	20 MPH
Curve at Sunset Lane, WB	W1-1R	20 MPH

#### Vertical Curves

Section 2C.18 of the MUTCD states:

A HILL BLOCKS VIEW (W7-6) sign may be used in advance of a crest vertical curve to advise road users to reduce speed as they approach and traverse the hill as only limited stopping sight distance is available.

When a HILL BLOCKS VIEW sign is used, it should be supplemented by an Advisory Speed (W13-1P) plaque indicating the recommended speed for traveling over the hillcrest based on available stopping sight distance.

**Based on sound engineering judgement, a HILL BLOCKS VIEW (W7-6) with an Advisory Speed (W13-1P) of 25 MPH is recommended for Flat Hill Road northbound near House # 543.**

#### Other Considerations

MassDOT “*Procedures for Speed Zoning on State Highways and Municipal Roads*” states the following:

- Regulatory speed limits are those that are established and approved by MassDOT per MGL c. 90 § 18. Upon approval by MassDOT, regulatory speed limits may then be posted and are enforceable by law.
  - See Lunenburg Section 332-18.1. Speed Zones
- Statutory speed limits are based on the specific categories of roadways as established by the State Legislature (MGL c. 90 §§ 17 and 17C). These speed limits are not posted, with exception to area-wide signs posted at jurisdictional boundaries or warning signs posted on specific streets.
  - Most of the streets in Lunenburg fall under this category.

- Oftentimes, communities and MassDOT are asked to reduce the speed limit on a roadway because concerned community members want to reduce the vehicle speeds. However, modifying a speed limit without making other changes will likely have little effect on reducing speeds. To effectively reduce vehicle speeds, setting speed limits should be included only as a part of a broader strategy that includes geometric changes to the road and other educational and enforcement components.
  - A broader strategy that includes geometric changes cannot be completed at this time. A consultant engineer would need to be hired to study and develop plans. A construction contract would then need to be awarded to build the plans. This could cost up to and possibly over \$1,000,000.
- Studies have shown that arbitrarily raising or lowering posted speed limits alone will result in a difference of less than 2 mph in mean and 85<sup>th</sup> percentile speeds.
  - The 85<sup>th</sup> percentile speed will still be over 30 mph ( $33.58 - 2 = 31.58$ ) if the Select Board chooses to arbitrarily lower the speed limit on Flat Hill Road to 25 mph; thus, doing nothing to satisfy the demands of the petitioners.
- Section 10.f. Speed Feedback Signs states:  
Speed Feedback Signs (SFS) systems are not a panacea for long-term reductions in speed profiles under all conditions. Under most scenarios, general speeds will drop immediately after installation due to a “novelty” effect of the device; the extent speeds increase back to the pre-installation rate over time is oftentimes related to the setting in which it was installed. Research has shown that SFS systems are not effective everywhere, and when used they may only be effective over short distances.
  - **Therefore, I do not recommend installing SFS signs.**

#### Future Study

Part 7. Follow-up Studies of the MassDOT “Procedures for Speed Zoning on State Highways and Municipal Roads” states the following:

Once new speed limit signs have been in place for at least six months it may be beneficial to conduct a follow-up spot speed observations to determine the zone's effectiveness and to evaluate any changes in speed patterns. The comparison of the speed observations made before and after the zoning should be recorded. Consideration should be given to revising numerical limits which vary by 7 mph or more from the newly recorded 85th percentile speeds. If changed, a new Special Speed Regulation will be required.

After new speed zones have been in effect for at least one year, it may be beneficial to review police crash reports for the 12+ months, if available. While it should be acknowledged that one year of data is not sufficient for a true crash analysis, this snapshot should be able to provide insight into whether speed-related crashes have changed in frequency and if the new speed zones have affected overall safety.

**Although I do not recommend changing the speed limit, I recommend speed studies be conducted in April of 2025 and October of 2025.**

Estimated Cost of Recommended Signs

I obtained a sales quote from MassCor (Massachusetts Correctional Industries) for the signs in the amount of \$774.55. A total of 8 signposts are required. The DPW has these in stock and purchased them for \$27.55 each and \$14.95 each for the post anchors for a total value of \$340.00. The estimated cost of hardware (nuts and bolts) is \$105.

Total Estimated Material Costs are \$1,219.55

The estimated labor costs are: say 2 men for 4 hours each at \$27.48 = \$219.84

Total Estimated Cost: \$1,439.39

# EXHIBIT B

## Investigation Of The Request

### To Make The Intersection Of Flat Hill Road At Burrage Street A 4-Way Stop

Received July 16, 2024 from Lynne Man (463 Burrage Street)

Completed by

William Bernard, DPW Director

Jacob LaChance, Police Officer Traffic Division

Dated 09/25/2024

William Bernard

William Bernard

DPW Director

Chief Thomas L. Gammel

Thomas Gammel

Chief of Police

Using the Manual on Uniform Traffic Control Devices for Streets and Highways as a guide, I conducted my investigation with the assistance of Officer LaChance.

The *Manual on Uniform Traffic Control Devices for Streets and Highways*—the MUTCD—defines the standards used by road managers nationwide to install and maintain traffic control devices on all streets, highways, pedestrian and bicycle facilities, and site roadways open to public travel. The MUTCD is published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F.

The following excerpt from the MUTCD defines the 5 factors (A-E) to be studied:

#### *Manual on Uniform Traffic Control Devices for Streets and Highways*

11th Edition, December 2023

US Department of Transportation

Federal Highway Administration

#### Section 2B.12 All-Way Stop Control

Support:

01 The provisions in the following sections describe warrants for the recommended engineering study to determine all-way stop control. Warrants are not a substitute for engineering judgment. The fact that a warrant for a particular traffic control device is met is not conclusive justification to install or not install all-way stop control. Because each intersection will have unique characteristics that affect its operational performance or safety, it is the engineering study for a given intersection that is ultimately the basis for a decision to install or not install all-way stop control.

02 All-way stop controls at intersections with substantially differing approach volumes can reduce the effectiveness of these devices for all roadway users.

Guidance:

03 The decision to establish all-way stop control at an unsignalized intersection should be based on an engineering study. The engineering study for all-way stop control should include an analysis of factors related to the existing operation and safety at the intersection, the potential to improve these conditions, and the applicable factors contained in the following all-way stop control warrants:

All-Way Stop Control Warrant A: Crash Experience (see Section 2B.13)

All-Way Stop Control Warrant B: Sight Distance (see Section 2B.14)

All-Way Stop Control Warrant C: Transition to Signal Control or Transition to Yield Control at a Circular Intersection (see Section 2B.15)

All-Way Stop Control Warrant D: 8-Hour Volume (Vehicles, Pedestrians, Bicycles) (see Section 2B.16)

All-Way Stop Control Warrant E: Other Factors (see Section 2B.17)

Option:

04 The decision to install all-way stop control on site roadways open to public travel may be based on engineering judgment.

Standard:

05 The satisfaction of an all-way stop control warrant or warrants shall not in itself require the installation of all-way stop control at an unsignalized intersection.

I then looked at each of the 5 factors.

#### **Section 2B.13 All-Way Stop Control Warrant A: Crash Experience**

Option:

01 All-way stop control may be installed at an intersection where an engineering study indicates that:

For a four-leg intersection, there are five or more reported crashes in a 12-month period or six or more reported crashes in a 36-month period that were of a type susceptible to correction by the installation of way stop control.

For a three-leg intersection, there are four or more reported crashes in a 12-month period or five or more reported crashes in a 36-month period that were of a type susceptible to correction by the installation of way stop control.

Per the Police, the area of Burrage had 2 accidents, one in January and one in June; specifically, from 2021-2024: 1 and from 2014-2021: 1.

Therefore, an all-way stop is not warranted.

#### **Section 2B.14 All-Way Stop Control Warrant B: Sight Distance**

Option:

01 All-way stop control may be installed at an intersection where an engineering study indicates that sight distance on the minor-road approaches controlled by a STOP sign is not adequate for a vehicle to turn onto or cross the major (uncontrolled) road.

Support:

02 At such a location, 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.

In November of 2023 Officer LaChance investigated the sight distances at this location. His conclusion was that if 2 trees were removed, the sight distances would be adequate. The DPW subsequently removed the 2 trees.

In September of 2024 Officer LaChance and the DPW Director revisited the intersection. Our conclusions are sight distances were adequate; however, they could be improved with the removal of brush on the southwest corner of the intersection and the removal of a tree on the northwest corner. The DPW will schedule this work.

Therefore, an all-way stop is not warranted.

#### **Section 2B.15 All-Way Stop Control Warrant C: Transition to Signal Control or Transition to Yield Control at a Circular Intersection**

Option:

01 All-way stop control may be installed at locations where all-way stop control is an interim measure that can be installed to control traffic while arrangements are being made for the installation of a traffic control signal (see Chapter 4C) at the intersection or for the installation of yield control at a circular intersection.

There are no plans to install Signal Control at the intersection.

Therefore, an all-way stop is not warranted.

## Section 2B.16 All-Way Stop Control Warrant D: 8-Hour Volume (Vehicles, Pedestrians, Bicycles)

Option:

01 All-way stop control may be installed at an intersection where an engineering study indicates:

The combined motor vehicle, bicycle, and pedestrian volume entering the intersection from the major-street approaches is at least 300 units per hour for each of any 8 hours of a typical day; and

The combined motor vehicle, bicycle, and pedestrian volume entering the intersection from the minor-street approaches is at least 200 units per hour for each of any of the same 8 hours.

02 If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants may be reduced to 70 percent of the values given in Items A and B in Paragraph 1 of this Section.

In November of 2023 Officer LaChance conducted a speed study at this location which included vehicle counts on Flat Hill Road. The busiest times of the day were 2 PM to 5 PM with the maximum hourly count of 236 vehicles cumulative over the entire study period (11/13/2023 to 11/19/2023) or an average of 39 vehicles in one hour.

The DPW Director counted motor vehicles, bicycles, and pedestrians from 2 PM to 5 PM on September 24, 2024.

		Flat Hill Road Northbound	Flat Hill Road Southbound	Flat Hill Road Totals	Burrage Street Eastbound	Burrage Street Westbound	Burrage Street Totals	
2 PM to 3 PM	Vehicles	29	25	54	12	11	23	
	Trucks	1	0	1	0	0	0	
	Pedestrians	0	0	0	1	3	4	
	Bicycles	0	0	0	1	0	1	
		Total	30	25	55	14	14	28
3 PM to 4 PM	Vehicles	30	22	52	19	5	24	
	Trucks	0	0	0	0	0	0	
	Pedestrians	1	2	3	1	0	1	
	Bicycles	0	1	1	0	0	0	
		Total	31	25	56	20	5	25
4 PM to 5 PM	Vehicles	45	26	71	18	8	26	
	Trucks	0	0	0	0	0	0	
	Pedestrians	0	1	1	3	1	4	
	Bicycles	2		2	0	0	0	
		Total	47	27	74	21	9	30
Totals	Vehicles	104	73	177	49	24	73	
	Trucks	1	0	1	0	0	0	
	Pedestrians	1	3	4	5	4	9	
	Bicycles	2	1	3	1	0	1	
		Total	108	77	185	55	28	83

The observed traffic counts in both studies were significantly less than the 300 unit per hour threshold for the major-street (Flat Hill Road) and the 200 unit per hour threshold for the minor-street (Burrage Street).

Therefore, an all-way stop is not warranted.

## Section 2B.17 All-Way Stop Control Warrant E: Other Factors

Option:

01 All-way stop control may be installed at an intersection where an engineering study indicates that all-way stop control is needed due to other factors not addressed in the other all-way stop control warrants. Such other factors may include, but are not limited to, the following:

The need to control left-turn conflicts, an intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where all-way stop control would improve traffic operational characteristics of the intersection, or where pedestrian and/or bicyclist movements support the installation of all-way stop control.

Based on sound engineering judgement, there is no need for left-turn control (as supported by the crash data), there is no need to improve traffic operational characteristics of the intersection (as supported by the low traffic counts); and no need for all-way stop control for pedestrian and/or bicyclist movements (as supported by the crash data and count data).

Therefore, an all-way stop is not warranted.

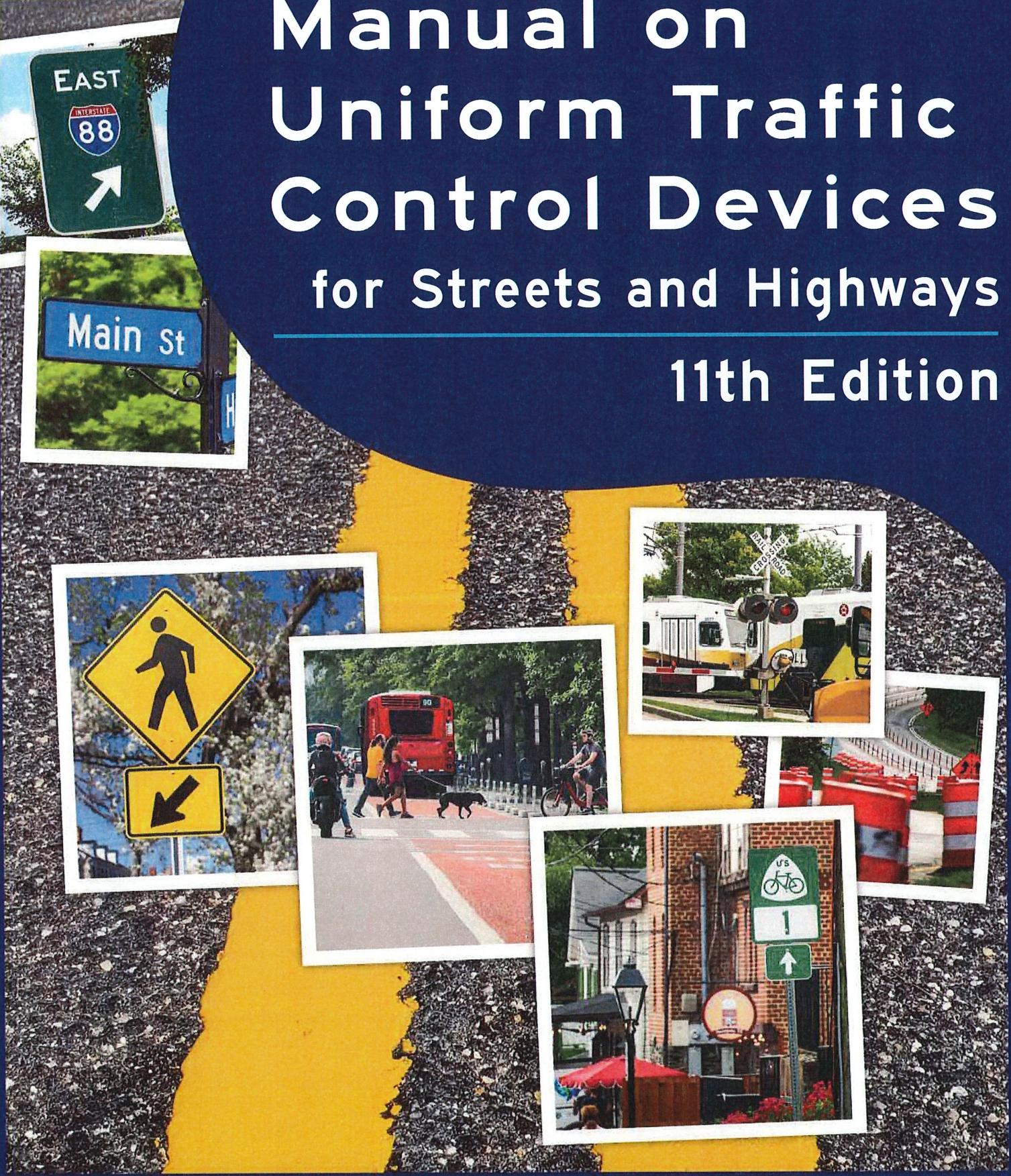


# Procedures for Speed Zoning on State Highways and Municipal Roads

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*Standards and Practices to Promote Safe and Efficient Travel in Massachusetts*

*Revised September, 2021*



# Manual on Uniform Traffic Control Devices for Streets and Highways

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11th Edition



U.S. Department of Transportation

Federal Highway Administration

December 2023