



Pope Street / Proctor Street Reversal Feasibility

Salem, Massachusetts

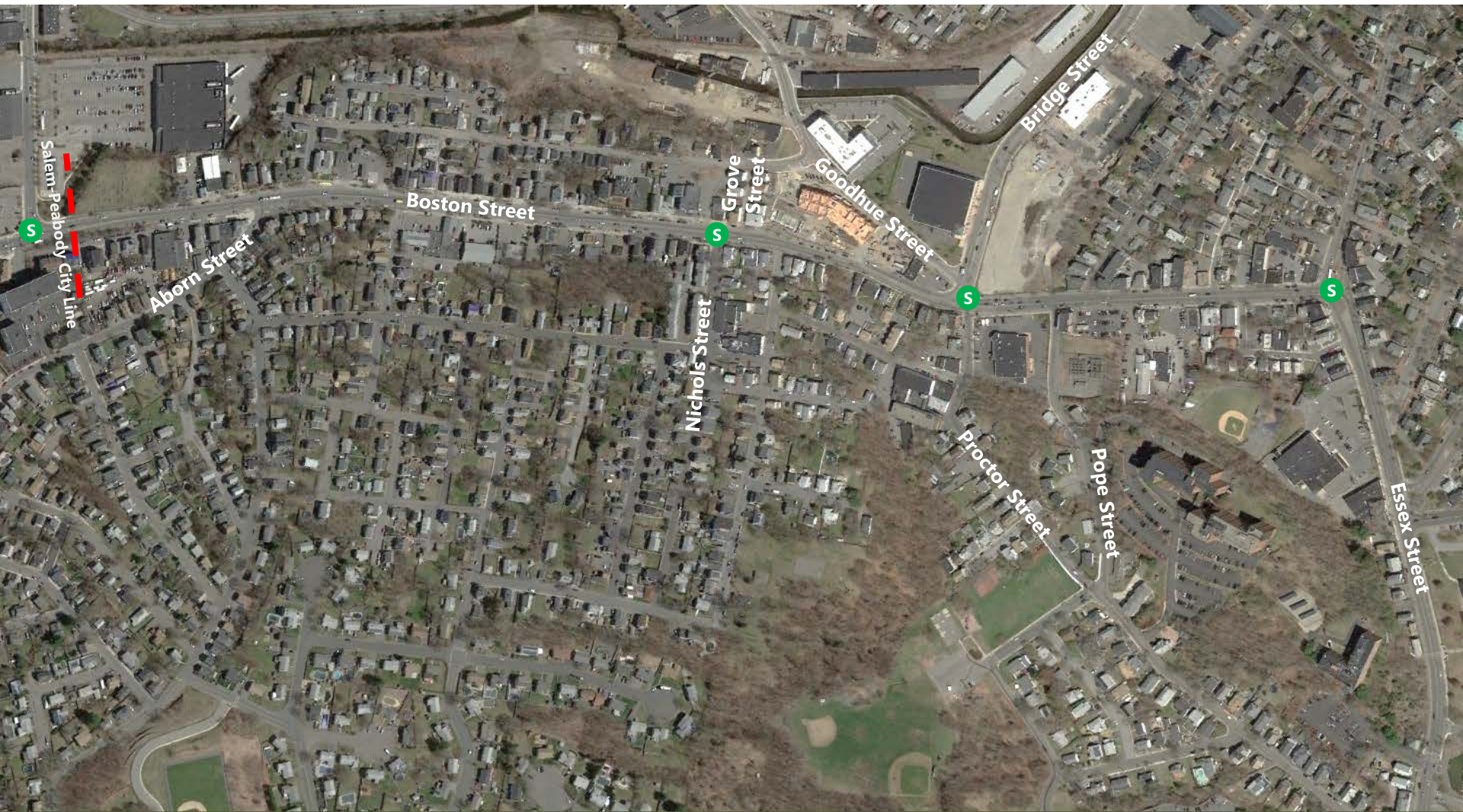
September 19, 2019

Study Overview

- Feasibility of reversing the direction of traffic on Pope Street and Proctor Street
 - Listed as potential recommendation in April 2019 Road Safety Audit
 - Born from Boston Street redesign project
- Operational analyses conducted to determine feasibility of reversing the direction of traffic

Boston Street Study Area

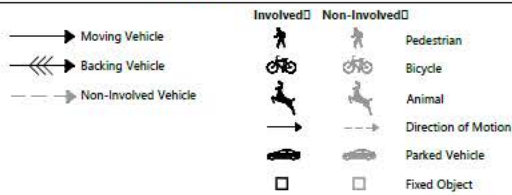
S Signalized Intersection



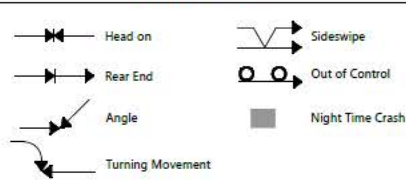
Boston Street Redesign

- Complete Streets design
 - Improve pedestrian and bicycle accommodations
 - Maintain vehicular operations
 - Reduce potential safety deficiencies
- 25% Design Filing in October / November 2019
- Road Safety Audits
 - Required at high crash locations as part of design process
 - Conducted in April 2019 by VHB

SYMBOLS



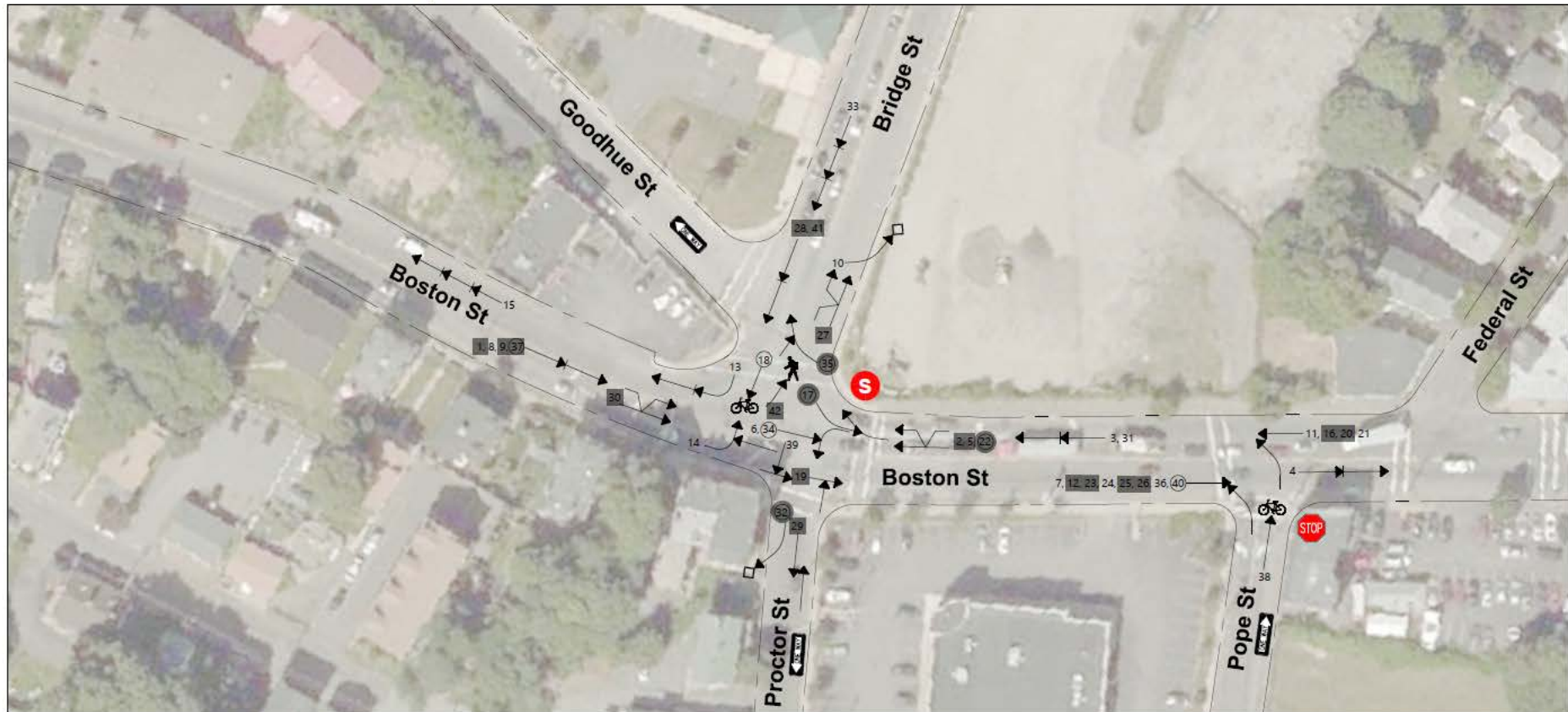
TYPES OF CRASH



SEVERITY



TRAFFIC CONTROL



Source of Crash Reports: Salem Police Department



Between 2016 and 2018:

28 Crashes at intersection of Boston St at Proctor St / Bridge St / Goodhue St

14 Crashes at intersection of Boston St at Pope St



Crash Diagram (2016-2018 Crash Data)
Boston Street at Proctor Street/Bridge Street

Salem, MA

ROAD SAFETY AUDIT

Boston Street at Proctor Street/Bridge Street and Essex Street at Boston Street to Jackson Street

Road Safety Audit—Boston Street at Bridge Street/Proctor Street and Essex Street at Boston Street to Jackson Street, City of Salem

VHB, Inc.

Final Report



Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
	Consider changing the signal phasing from permissive left turn movements to protected left turn movements to reduce angle crashes within the intersection.	High	Long-Term	High	City of Salem
	Consider signaling the intersection of Pope Street and Boston Street and coordinate the signal with the Boston Street and Proctor Street/Bridge Street intersection.	High	Long-Term	High	City of Salem
	Consider updating the signals to meet current standards including an overhead signal head per lane and ensure signal upgrades are compatible with MBTA and MassDOT specifications for transit signal priority.	Medium	Long-Term	High	City of Salem
	Consider implementing a flashing yellow signal head to the intersection.	Low	Short-Term	Medium	City of Salem
	Consider reversing the directionality of Pope Street and Proctor Street with Pope Street becoming one-way southbound and Proctor Street becoming one-way northbound to reduce angle crashes at Pope Street.	High	Long-Term	High	City of Salem
Signage	Consider removing unnecessary signage throughout the intersection to reduce sign clutter.	Low	Short-Term	Low	City of Salem
	Consider adding a stop sign on the left-hand side of the Pope Street approach to Boston Street.	Medium	Short-Term	Low	City of Salem
	Maintain existing signage and consider updating worn and faded signage to MUTCD standard signs.	Low	Short-Term	Low	City of Salem

Pope Street / Proctor Street Existing Conditions

Pope Street

- One-way northbound from Mansell Parkway to Boston Street
- Intersects Boston Street at an unsignalized intersection

Proctor Street

- One-way southbound from Boston Street to Mansell Parkway
- Two-way south of Mansell Parkway connecting to Highland Avenue
- Intersects Boston Street at a signalized intersection with Bridge Street and Goodhue Street
- Proctor Street, Pope Street, and Mansell Parkway meet at an all-way stop intersection

Existing Conditions



Reversal Feasibility Analysis

- Three different analysis conditions
 - 2026 Future Conditions with No Improvements
 - 2026 Future Condition Alternative 2C (from Boston Street redesign)
 - 2026 Future Conditions with Pope Street / Proctor Street Reversed
- Traffic counts conducted in September 2016 and June 2019
- Delays, level-of-service, and queues recorded at each study area intersection under each condition

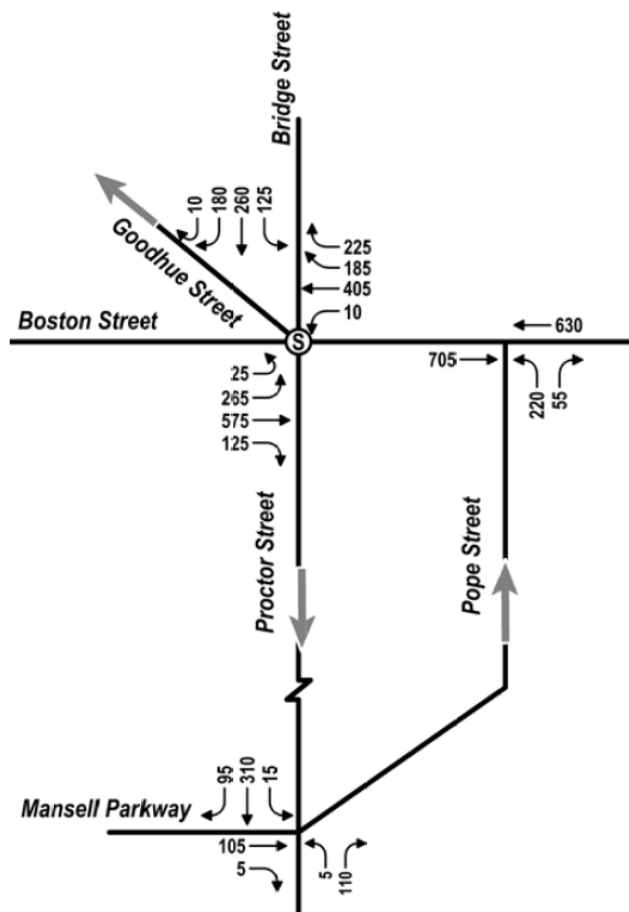
2026 Future Conditions with No Improvements



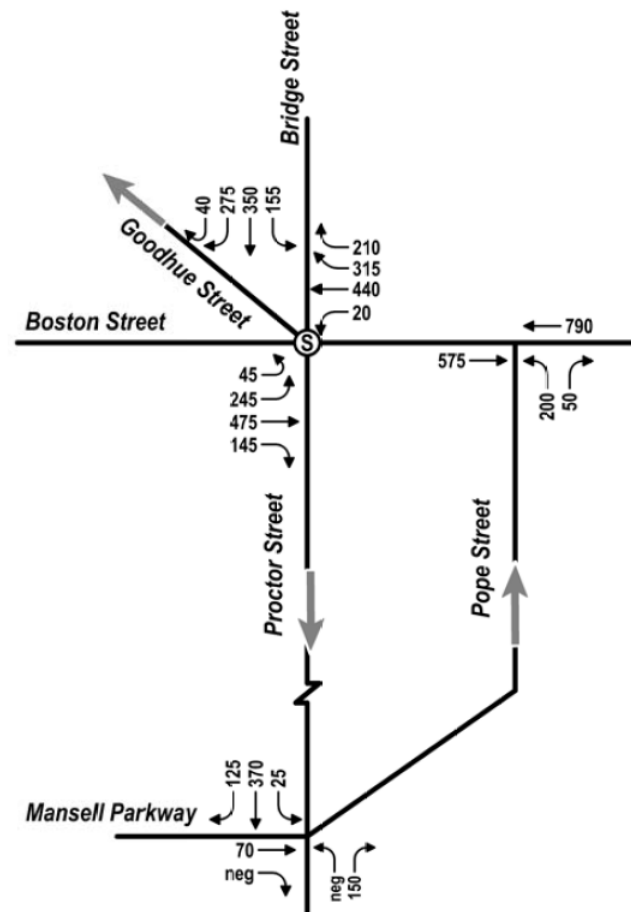
2026 Future Conditions with No Improvements

- Future traffic conditions in 2026 with no roadway improvements

Weekday Morning Peak Hour



Weekday Evening Peak Hour



2026 Future Conditions with No Improvements

Level of Service

Overall (Signalized)

AM: 32 seconds (C)

PM: 56 seconds (E)

Pope St Approach

AM: > 120 seconds (F)

PM: > 120 seconds (F)

Overall (All-Way Stop)

AM: 11 seconds (B)

PM: 13 seconds (B)

2026 Future Conditions with No Improvements

95th Percentile Queue Lengths



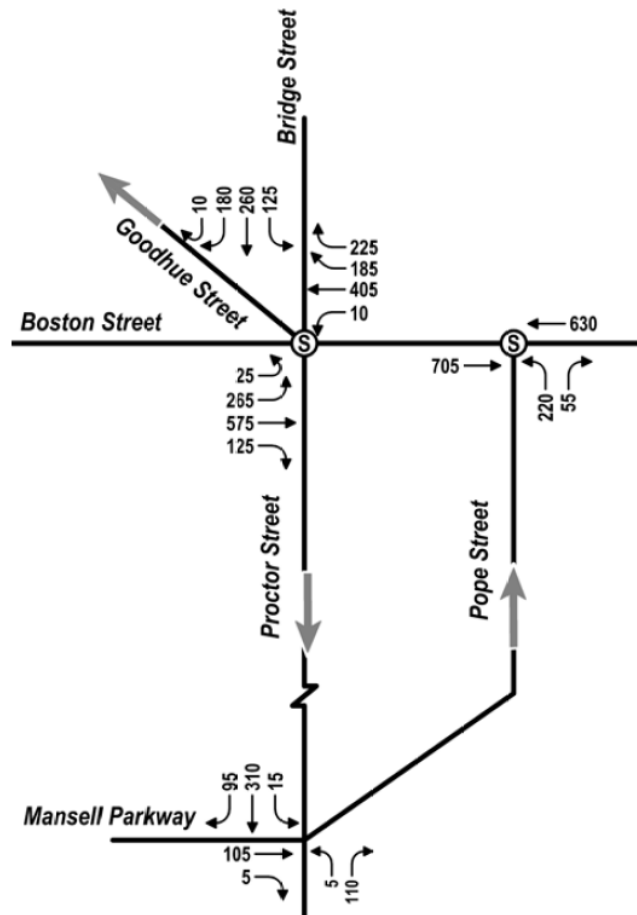
2026 Future Conditions – Alternative 2C



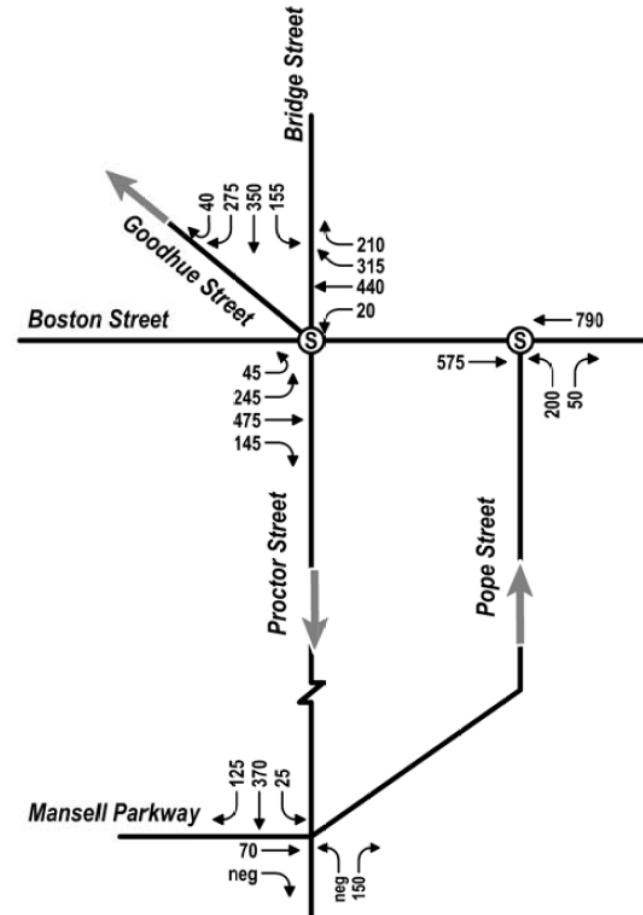
2026 Future Conditions – Alternative 2C

- Future traffic conditions in 2026 with Boston Street improvements

Weekday Morning Peak Hour



Weekday Evening Peak Hour



2026 Future Conditions – Alternative 2C

Level of Service

Overall (Signalized)

AM: 31 seconds (C)

PM: 53 seconds (D)

Overall (Signalized)

AM: 23 seconds (C)

PM: 36 seconds (D)

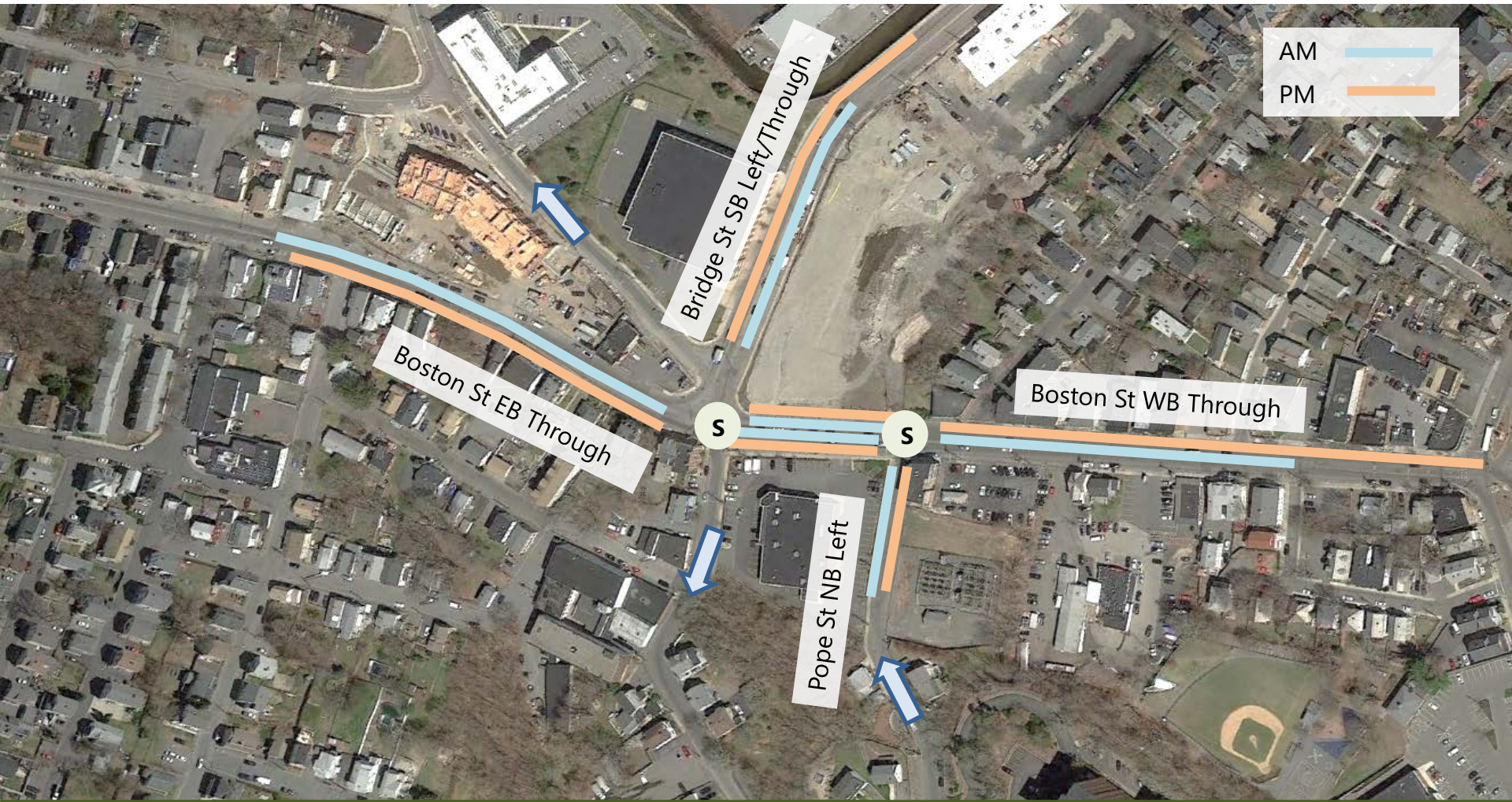
Overall (All-Way Stop)

AM: 11 seconds (B)

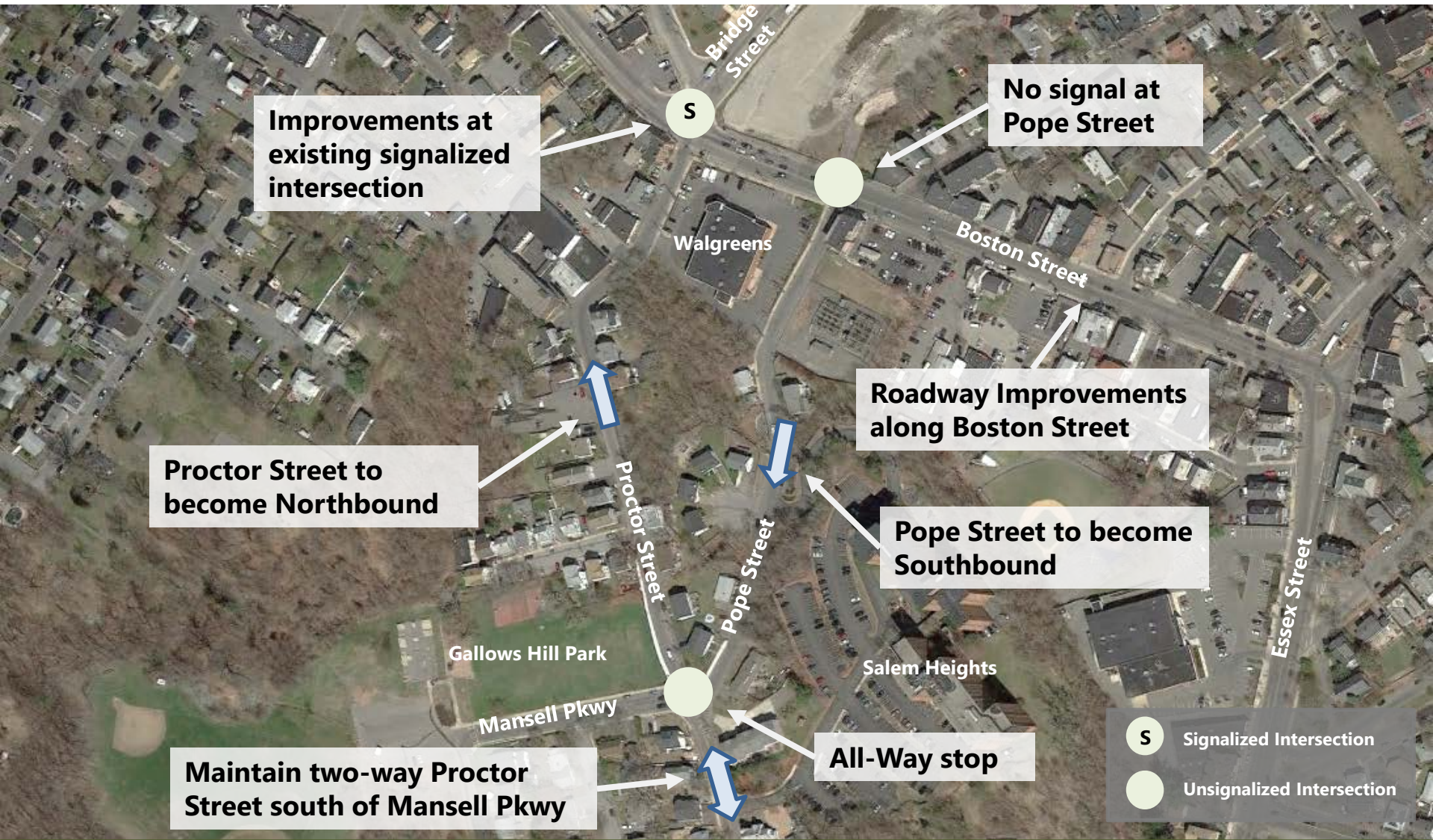
PM: 13 seconds (B)

2026 Future Conditions – Alternative 2C

95th Percentile Queue Lengths



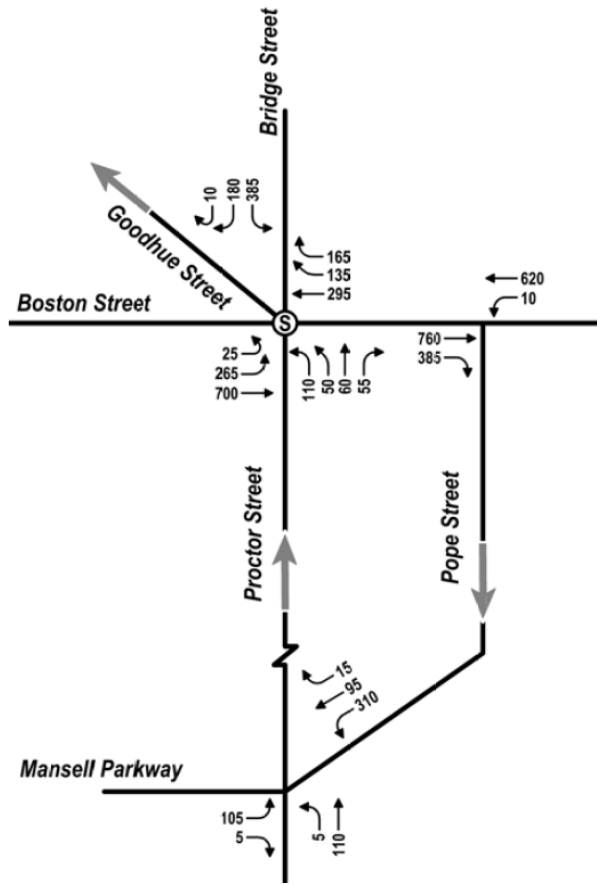
2026 Future Conditions with Direction Reversal



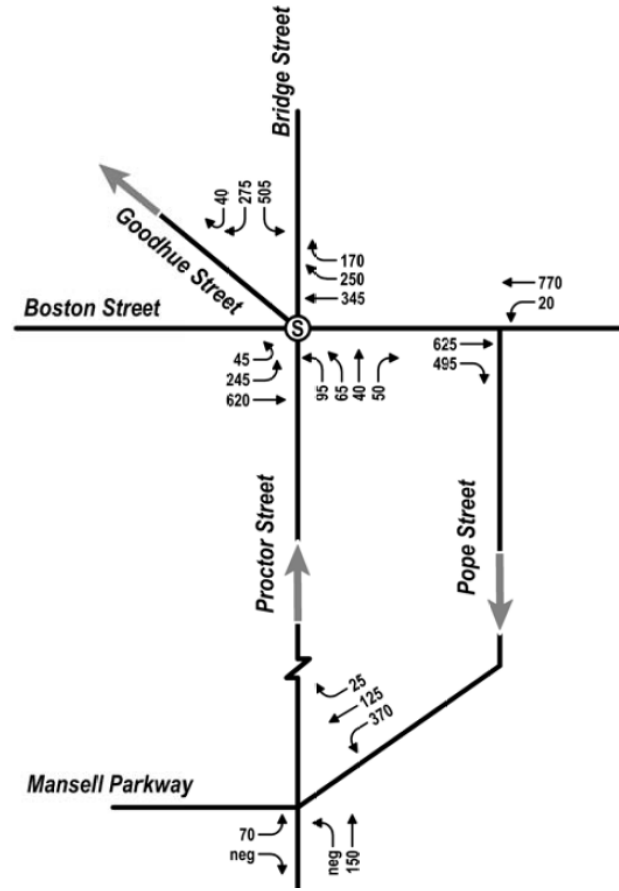
2026 Future Conditions with Direction Reversal

- Future traffic conditions in 2026 with Boston Street improvements and reversal of Pope and Proctor Streets

Weekday Morning Peak Hour



Weekday Evening Peak Hour



2026 Future Conditions with Direction Reversal

Level of Service

Overall (Signalized)

AM: 48 seconds (D)

PM: 58 seconds (E)

Overall (All-Way Stop)

AM: 12 seconds (B)

PM: 16 seconds (C)

2026 Future Conditions with Direction Reversal

95th Percentile Queue Lengths



Analysis Summary

Boston Street at Proctor Street / Bridge Street / Goodhue Street

- Overall LOS C-D (AM) and LOS D-E (PM) for all conditions
- Increase in queues due to roadway improvements (ped/bike)
- Reduction in WB queues with Pope/Proctor reversal

Boston Street at Pope Street

- LOS F on Pope Street approach under existing conditions
- Signal increases queues on Boston Street, improves queues on Pope Street
- Pope/Proctor reversal eliminates conflict point

Proctor Street at Pope Street / Mansell Parkway

- Little operational change between conditions

Additional Considerations

- Impacts to property abutters
 - Change in traffic flow
 - Impacts to Salem Heights and Walgreens parking lots
- Roadway Improvements
 - Update signage
 - Update pavement markings
 - No additional right-of-way required
- New traffic signal equipment
- Potential for driver confusion

Trish Domigan | PDomigan@vhb.com | 617.924.1770

Amy Silbovitz | ASilbovitz@vhb.com | 617.607.2159

www.vhb.com

