

ROAD SAFETY AUDIT

Three Intersections:

- Thatcher Street at Massasoit Boulevard
- Thatcher Street at Pine Street
- Pine Street at Summer Street

Brockton, MA

January 2019

Prepared For:

The City of Brockton, MA

Prepared By:

Old Colony Planning Council

70 School Street, Brockton, MA 02301

Prepared under MassDOT Contract 88826



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The Road Safety Audit

The Federal Highway Administration (FHWA) defines a Road Safety Audit (RSA) as the formal safety examination of an existing or future road or intersection by an independent, multidisciplinary team. The purpose of the RSA is to identify potential safety issues and possible opportunities for safety improvements considering all roadway users. The RSA is intended to be a proactive process based on collaborative, qualitative, and quantitative analyses.

This Road Safety Audit (RSA) for three intersections in Brockton; Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street, was conducted by the Old Colony Planning Council upon request by Rob May of the City of Brockton. This report includes average daily traffic volume counts, manual turning movement counts, level-of-service analysis, crash data compilation and analyses, and intersection warrant analyses for traffic signal and multi-way stop control implementation.

The Road Safety Audit Meeting and Team

The Road Safety Audit took place on Monday, October 22, 2018 at the Student Senate Conference Room at Massasoit Community College in Brockton. The meeting was facilitated by OCPC staff. OCPC provided collision diagrams and the latest three year crash experience based on crash reports provided by the Brockton Police Department, which were supplemented by MassDOT crash data. Traffic counts (24 hour counts), and intersection peak hour turning movement counts were also presented at the meeting.

The RSA meeting consisted of three components. The first portion of the meeting focused on a discussion of the issues and concerns. The participants then departed the OCPC office and visited the intersections for observations for the second portion of the meeting. The discussion of issues was continued during the site visits as OCPC staff took notes. The third portion of the meeting focused on potential short term and long term potential improvements for each of the intersections. The agenda and the background materials are included in the appendix to this report. Table 1 lists the names and affiliations of the audit participants. The three intersection locations are shown in Figure 1.

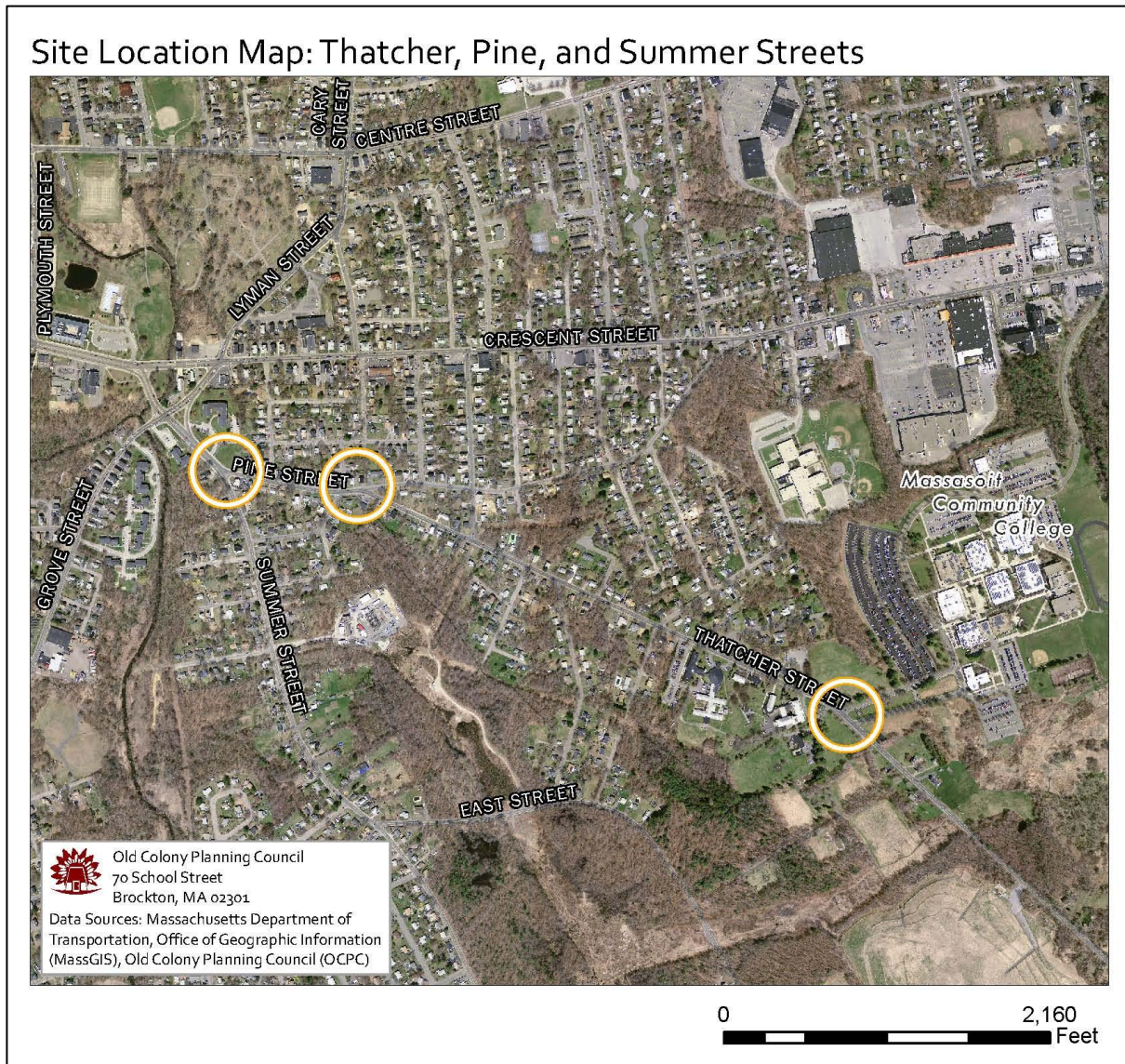


The meeting convened at the Student Senate Conference at Massasoit Community College Monday, October 22, 2018

Table 1. Participating Audit Team Members

Audit Team Member	Agency/Affiliation
Rob May	Brockton Planning Department
Chike Odunakwe	Brockton Department of Public Works
Ann Beauregard	Brockton Ward 5 Councilor
Jeanne Holmes	Brockton Resident
Brandon Wilcox	Federal Highway Administration
Jason Walters	MassDOT District 5 Projects
Bianca Marshall	MassDOT District 5
Greg Haberek	Massasoit Community College Facilities and Capital Planning
Avery Koropecy	Massasoit Tribune
William McNulty	Old Colony Planning Council
Raymond Guarino	Old Colony Planning Council
Jimmy Pereira	Old Colony Planning Council

Figure 1. Locus Map



Project Location and Description

Thatcher Street at Massasoit Boulevard

The intersection of Massasoit Boulevard and Thatcher Street consists of two separate Massasoit Boulevard drives separated by a 70 to 80 foot wide median, which consist of two distinct “T” type intersections with Thatcher Street. Since the Massasoit Boulevard drives are not a one-way pair, and two-way traffic is allowed on both drives, both of these Massasoit “T” intersections operate independently about 75 feet apart on Thatcher Street, with stop sign control on the minor street Massasoit Boulevard driveways.

Both of the Massasoit Boulevard driveways are approximately 24 feet wide and striped with a double yellow center line. There are no shoulders along these driveways and no sidewalks provided along the driveways between Thatcher Street to the campus buildings.

Thatcher Street, as well as both Massasoit Boulevard driveways, has a two lane cross-section, so both Thatcher Street/Massasoit Boulevard driveway intersections provide one lane approach on all approaches (there are no storage lanes for exclusive left turn or right turn movements at either driveway intersection). Thatcher Street is approximately 30 feet wide, and is striped with shoulders on both sides of the street. The shoulder width varies with the shoulder on the west side at 4 feet and the shoulder on the east side at 2 feet wide, which is not adequate for bicycle use. Thatcher Street has sidewalks (approximately 4 to five feet wide) on both sides of the street north of Massasoit Boulevard. Massasoit Boulevard does not provide sidewalks south of its intersection with Massasoit Boulevard.

The design of the Massasoit Community College campus had designated that the Massasoit Boulevard at Thatcher Street intersection to be the main entrance onto the campus; however, the Massasoit access at Crescent Street (Route 27) came to be used the most due to its direct access to regional arterials such as Crescent Street (Route 27), Centre Street (Route 123), and Auburn Street (Route 14). Nevertheless, peak hour turning movement counts conducted by OCPC showed that there were 456 vehicles entering and 365 vehicles exiting of the campus (both Massasoit Boulevard drives combined) during the morning peak hour, and 238 vehicles entering and 106 vehicles exiting (both Massasoit Boulevard drives combined) during the afternoon peak hour. The morning peak hour level-of-service for the Thatcher Street at Massasoit Boulevard north most driveway intersection is “B”, the morning peak hour level-of-service for the Thatcher Street at Massasoit Boulevard south most intersection driveway is also “B”. The afternoon peak hour level-of-service for the Thatcher Street at Massasoit Boulevard north most driveway intersection is “B”, the afternoon peak hour level-of-service for the Thatcher Street at Massasoit Boulevard south most intersection driveway is also “B”. The Brockton Area Transit provides fixed route bus service to the Massasoit Community College campus, with buses regularly entering and exiting Massasoit Boulevard at Thatcher Street.

Old Colony Planning Council conducted Warrant Analyses for the installation of traffic signals, and for the installation of an all-way stop sign for this intersection. The analyses were conducted in accordance with the standards in the Manual on Uniform Traffic Control Devices (MUTCD). The Thatcher Street/Massasoit Boulevard intersection met the MUTCD Warrants Warrant 1, Eight-Hour Vehicular

Volume and Warrant 2, Four-Hour Vehicular Volume for the installation of a traffic signal. It also met the warrant for an all-way stop sign.

Massasoit Boulevard, which connects between Crescent Street (Route 27) and Thatcher Street, is also part of the Claire Saltonstall Regional Bikeway, although there are no bicycle lanes or paths designated for bicycles on Massasoit Boulevard (bicycles have to share the road with vehicles). The Claire Saltonstall Regional Bikeway, also known as the Boston to Cape Cod Bikeway, is a 135-mile bikeway (marked as Bike Route 1) that begins on the Charles River Bike Path near Boston University in Boston, and travels along mostly back roads and bike paths, with occasional stretches of secondary highways, ending in Provincetown.

The Claire Saltonstall Regional Bikeway travels along Quincy Street, entering Massasoit campus at the Quincy Street/Crescent Street (Route 27)/Massasoit Boulevard intersection, going through the Massasoit campus along Massasoit Boulevard, and then continuing along Thatcher Street southwest to East Bridgewater.

Thatcher Street at Pine Street

Thatcher Street meets Pine Street in Brockton, just over a half of a mile northwest of Massasoit Boulevard, to form a “Y” type intersection. Pine Street becomes a one-way street eastbound after the intersection in the eastbound direction away from the intersection. The prevailing movements are left turns from Thatcher Street (northwesterly) to Pine Street, and right turns from Pine Street eastbound to Thatcher Street southeasterly. The intersection is stop sign controlled on the Thatcher Street northwest approach. Field observations show that because most of the movements on Pine Street eastbound are right turns, motorists pulling up to the stop sign on Pine Street do not always come to a full stop as they take a left to Pine Street. These “rolling stops” put left turning vehicles in direct conflict with Pine Street eastbound vehicles that continue straight through the intersection into the one-way section of Pine Street.

Thatcher Street is approximately 30 feet wide and is a two lane cross-section. The Thatcher Street northwest approach provides one approach lane to the intersection (shared for left and right turning vehicles).

During the morning peak hour, there are 269 vehicles turning left from Thatcher Street to Pine Street and 286 vehicles turning right from Pine Street to Thatcher Street. There are 110 vehicles during the morning peak hour that travel straight through the intersection from the Pine Street eastbound approach to the one-way section of Pine Street. During the afternoon peak hour, there are 236 vehicles turning left from Thatcher Street to Pine Street and 280 vehicles turning right from Pine Street to Thatcher Street. There are 191 vehicles during the afternoon peak hour that travel straight through the intersection from the Pine Street eastbound approach to the one-way section of Pine Street. This intersection experiences level-of-service “B” conditions during the morning and afternoon peak hours. Old Colony Planning Council conducted warrant analysis for both signal installation and an all-way stop at this intersection, based on the standards published by the Federal Highway Administration (FHWA) in the *Manual on Uniform Traffic Control Devices* (MUTCD). This intersection did not meet the minimum thresholds for the installation of an all-way stop sign or for the installation of a traffic signal.

Pine Street at Summer Street

Pine Street and Summer Street also create a “Y” type intersection located approximately 1,000 feet west of the Thatcher Street/Pine Street intersection, and about 900 feet south of Crescent Street (Route 27). Both Pine Street and Summer Street are a two lane cross section. Pine Street is stop signed controlled on the westbound approach to the intersection. Pine Street is approximately 27 feet wide with sidewalks on both sides of the road. Pine Street has one approach lane for vehicles turning left and right to Summer Street.

Summer Street is approximately 36 feet wide south of Pine Street with one northbound approach lane to the Summer Street/Pine Street intersection. Summer Street southbound is approximately 50 feet wide. The Summer Street southbound has two approach lanes, a through lane continuing on Summer Street and an exclusive left turn lane to Pine Street. There are sidewalks on both sides of Summer Street north of Pine Street. South of Pine Street, Summer Street provides a sidewalk on one side of the street. The sidewalk is on the east side of Summer Street south of Pine Street and then it transitions to the west side of the street.

During the morning peak hour, there are 249 vehicles turning left from Summer Street southbound to Pine Street and there are 231 vehicles traveling straight through southbound on Summer Street. There are 219 vehicles turning right from Pine Street eastbound to Summer Street and there are 38 left turns from Pine Street eastbound to Summer Street. There are 381 vehicles during the morning peak hour that travel straight through the intersection from the Summer Street northbound to Summer Street and there are 69 vehicles turning right from Summer Street northbound to Pine Street. This intersection experiences level-of-service “D” conditions during the morning peak hour (on the critical Pine Street minor street left and right turn lane), and level-of-service “F” (failure) during the afternoon peak hours (on the critical Pine Street minor street left and right turn lane).

Crash Details and Overview

Crash reports were compiled from the Brockton Police Department for the years 2015, 2016, and 2017, (and were cross referenced and supplemented with crash data from the MassDOT). The crashes are included in the appendix to this report. There was one crash recorded at Thatcher Street at Massasoit Boulevard within the three year crash period. This was a rear-end crash with both vehicles headed eastbound.

There were a total of seven crashes at the intersection of Thatcher Street at Pine Street within the three year study period. Three of these crashes were angle type crashes, two were single vehicle lane departure crashes where the vehicle ran off the road, one was a rear-end crash, and one was unknown. Four of the seven crashes resulted in personal injury, and three resulted in property damage only.

There were a total of nine crashes at the intersection of Summer Street at Pine Street within the three year study period. One of these crashes was an angle type crash, one was a single vehicle lane departure crash where the vehicle ran off the road, three were rear-end crashes, one was a side-swipe with vehicles

traveling in the opposite direction, and three were unknown. Two of the nine crashes resulted in personal injury, and seven resulted in property damage only. The collision diagrams and the crash data are included in the Appendix to this report.

Audit Observations and Potential Safety Enhancements

During the RSA meeting prior to the field visits, an introduction of the RSA process and a summary of the crash information was presented to the audit participants. Following this presentation, the members of the audit team were asked to discuss the existing issues that may affect safety at the three intersections. The audit team then visited the all three intersections as a group, at which time observations, safety concerns, and deficiencies were identified and documented by OCPC staff.

Provided below is a list of the safety concerns and the potential enhancements that were identified during the RSA.

Thatcher Street at Massasoit Boulevard

Safety Issue: The Thatcher Street approach southeast to Massasoit Boulevard (northern most driveway) is curved creating a skewed “T” intersection. In addition, the northern most Massasoit Boulevard driveway has long queues and delays when classes let out in the afternoon. Thatcher Street curves as it approaches Massasoit Boulevard creating an intersection with Massasoit Boulevard that is not at a 90 degree angle. A convent is located across from Massasoit Boulevard, with a driveway onto Thatcher Street located approximately 100 feet north of Massasoit Boulevard. A portion of the convent property may be redeveloped under the State Law Chapter 40R Smart Growth Zoning Overlay District on Thatcher Street and this may provide an opportunity to create a four-way intersection with Thatcher Street and the development driveway and Massasoit Boulevard (the northern most intersection).



The Massasoit Boulevard northern most intersection with Thatcher Street.

Enhancements: Realign the intersection of Thatcher Street and Massasoit Boulevard (north most driveway) to create a 90 degree angle. Create a four-way intersection with the proposed residential drive (should the project is approved and constructed).

Enhancement: Convert the Thatcher Street/Massasoit intersection an all-way stop with overhead flashing beacons. OCPC warrant analysis based on MUTCD standards shows that the all-way stop warrants are satisfied.

Enhancement: Signalize the Thatcher Street/Massasoit intersection. OCPC signal warrant analysis, based on MUTCD standards, shows that traffic signal warrants one and two of the five warrants are satisfied.

Safety Issue: The turning radius on Massasoit Boulevard is inadequate for buses and heavy vehicles turning in and out of Massasoit Boulevard to and from Thatcher Street. The turning radius becomes even more constricted in the winter due to snow. The two driveway design for entrance and exits to and from the Massasoit campus can be confusing to drivers.

Enhancement: The potential exists to widen one of the Massasoit Boulevard driveways, create two approach lanes, an exclusive left turn storage lane and an exclusive right turn storage lane, and eliminate the other driveway. The Brockton Fire Department representative expressed that this design would not be acceptable for optimal access for first responders.

Safety Issue: Speeding on Thatcher Street, and vehicles do not come to a complete stop at the stop signs on the Massasoit Boulevard approaches. There are also heavy volumes of trucks on Thatcher Street.

Enhancement: Enhanced enforcement of speed limits on Thatcher Street and enhanced enforcement of traffic control at the Thatcher Street/Massasoit Boulevard intersections.

Safety Issue: There are no sufficient pedestrian amenities. This includes a lack of sidewalks and safe pedestrian crossings. Also, in the winter time, plowed snow banks force walkers to walk on the street.

Add crosswalks to the Thatcher Street/Massasoit Boulevard intersection, and extend sidewalks along the north east side of Thatcher Street from the existing sidewalk to Pine Street. Plow sidewalks in the winter time. Add sidewalks to Massasoit Boulevard from Thatcher Street into the campus.

Safety Issue: There is a lack of way finding signs on the surrounding road network (Summer Street, Pine Street, and Thatcher Street) to direct vehicles to this entrance. There is only one street light available at the intersection.

Enhancements: Post way finding signs on Thatcher Street and the surrounding road network to direct vehicles to the Thatcher Street/Massasoit Boulevard access. Improve lighting at the Thatcher Street/Massasoit Boulevard access drive and intersection.

Safety Issue: Thatcher Street lacks bicycle lanes, as does Massasoit Boulevard (Massasoit Boulevard is part of the Claire Saltonstall Regional Bicycle Route).

Enhancement: Add bicycle lanes on Thatcher Street where the shoulder is wide enough, and “Sharrows” reminding motorists to share the road with bikes where there are no shoulders. Add bicycle lanes to Massasoit Boulevard or bicycle tracks where feasible.

Thatcher Street at Pine Street

Safety Issue: The intersection is poorly aligned.

The intersection’s skewed alignment impacts sight lines on the Thatcher Street (stop signed) approach. The skewed alignment also creates driver confusion regarding where the road continues for vehicles traveling eastbound on Pine Street.

There are heavy left turn traffic volumes on the Thatcher Street approach which conflict with through volumes on Pine Street to the one-way section eastbound. There are also heavy right turn volumes from Pine Street eastbound to Thatcher Street. Left turns from Thatcher Street take for granted that approaching vehicles on Pine will go right onto Thatcher because of the high volumes on this movement and the misalignment of the road; however, some of the vehicles on Pine Street continue straight through on Pine Street eastbound, therefore coming into direct conflict with the left turns from Thatcher to Pine Street.



Vehicle taking a left turn from Thatcher Street to Pine Street crossing the double yellow line encroaching on the Pine Street eastbound approach lane.

The stop line and stop sign on the Thatcher Street approach are located too far back on the approach. The visibility of the stop sign could be enhanced. There are high volumes of buses and heavy vehicles, including school buses, BAT buses, and trucks to salvage yards on Thatcher Street. Poor alignment also creates a lack of turning radius for buses and heavy vehicles. Vehicles taking a left turn from Thatcher Street to Pine Street westbound sometimes encroach over the double yellow center line into the Pine Street eastbound approach lane. The lack of shoulders along with the poor alignment leave no place for snow during winter, which further constrains turning radii for buses and heavy vehicles.

Enhancements: Reconstruct and realign the intersection closer to 90 degrees to create a “T” type intersection (this could require right of way takings). This could include adding a channeled “free right turn” with an island for right turning vehicles from Pine Street eastbound to Thatcher Street. Add an overhead flashing beacon for better intersection visibility (flashing red facing Thatcher Street and flashing yellow facing Pine Street).

Enhancement: Move the stop bar and stop sign on Thatcher Street closer to Pine Street. Update the sign for retro-reflectivity and pavement markings (with “STOP” at the stop bar). In addition, bring the Thatcher Street double yellow Center Line in 90 degree alignment with Pine Street.

Safety Issue: There are two curb cuts from an adjacent property that access the southwest corner of the intersection.

Enhancement: Close one of the curb cuts. Preferably close the curb cut at the Pine Street eastbound approach to the intersection.

Safety Issue: Traffic control, way finding, and street signs are faded or missing.

Enhancements: Repositioned the street signs for better visibility. Provide way finding signs for St. Joseph’s Medical Center and Massasoit to improve visibility. Stop signs and one-way signs for Pine Street need to be upgraded and repositioned for better visibility. Replace and restripe faded pavement markings, fog lines and stop lines.

Safety Issue: Pedestrian crossings and amenities are lacking at the intersection.

Enhancements: Install a raised crosswalk with a Rapid Rectangular Flashing Beacon.

Safety Issue: The intersection lacks bicycle lanes.

Enhancement: Install bicycle lanes where the road has sufficient width, and add “Sharrows” to those sections where bicycle lanes are not feasible to remind motorists to share the road with bicycles.

Pine Street at Summer Street

Safety Issue: The intersection is poorly aligned, and the sight lines on the Pine Street (stop signed, minor street) approach are limited.

Enhancements: Reconstruct and realign the intersection to create a 90 degree intersection and evaluate the installation of a roundabout or a traffic signal. Old Colony Planning Council conducted signal warrant analyses for the intersection based on the standards published in the FHWA’s MUTCD. The results of the warrant analyses show that the intersection traffic operations satisfy the minimum threshold for the installation of a traffic signal under Warrants 1, 2, and 3.



Enhancement: A concrete wall on the southeast corner of the intersection blocks sight lines; a request should be made to the owner to remove the wall or lower it to improve sight lines.

Safety Issue: Vehicles on Summer Street tend to speed due to the free right turn at the Summer Street/Lyman Street intersection, along with wide lanes, (Summer Street southbound) and the descending grade on the Summer Street northbound approach.

Enhancement: Install overhead flashing beacons to improve intersection visibility (an interim treatment before installing signals or a roundabout).

Safety Issue: The intersection lacks crosswalks across Summer Street as well as pedestrian and bicycle amenities.

Enhancements: Narrow the Summer Street southbound approach to reduce pedestrian walking time and exposure. Add crosswalks across Summer Street with ADA compliant ramps.

Enhancement: Add bicycle lanes where the right of way permits, or “Sharrows” to remind motorists to share the road with bicycles.

Safety Issue: The drainage is insufficient due to the location of the catch basins and they tend to get clogged with debris.

Enhancement: Clean catch basins and consider a regular maintenance schedule.

Enhancement: Relocate catch basins south across Pine Street to the bottom of the descending grade on the Summer Street northbound approach.

Summary of Road Safety Audit

Based on the review of data, on-site field observations and group discussion, the RSA team identified possible enhancements that could improve safety at the intersection. Further study and design work will need to be conducted to determine the feasibility of making some of the improvements. Table 2 summarizes the estimated time frame and costs breakdown and Table 3 summarizes the safety issues, possible enhancements, estimated safety payoff, time frame, cost, and responsibility. Safety payoff estimates are based on engineering judgment and are categorized as low, medium, and high. The time frame is categorized as short-term (<1 year), midterm (1 to 3 years), or long-term (typically >3 years). Long-term improvements are typically considered to be substantial improvements with an expected time frame for implementation greater than 3 years. The costs are categorized as low (<\$10,000), medium (\$10,001 to \$50,000), or high (>\$50,000).

Table 2: Estimated Time Frame and Costs Breakdown

Time Frame		Costs	
Short-Term	<1 Year	Low	<\$10,000
Mid-Term	1-3 Years	Medium	\$10,001-\$50,000
Long-Term	>3 Years	High	>\$50,000

Table 3: Potential Safety Enhancement Summary Thatcher Street at Massasoit Boulevard

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Thatcher Street southeast to Massasoit Boulevard is curved creating a skewed “T” intersection. Massasoit Boulevard driveway has long queues and delays when classes let out.	Realign Thatcher Street and Massasoit Boulevard to create a 90 degree angle and also create a four-way intersection with the proposed residential drive (if the project is approved).	Medium	>3 Years	High	City of Brockton
	Signalize the Thatcher Street/Massasoit intersection.	Medium	>3 Years	High	
	Convert the Thatcher Street/Massasoit intersection to an all-way stop with overhead flashing beacons.	Medium	< 1 Year	Medium	
The turning radius on Massasoit Boulevard is inadequate for buses and heavy vehicles and becomes even more constricted in the winter due to snow. Also, the dual driveway design for into the Massasoit campus causes driver confusion.	Widen one of the Massasoit Boulevard driveways, creating an exclusive left turn storage lane and an exclusive right turn storage lane, and close up the other driveway, (not recommended by the Brockton Fire Department for optimal access for first responders).	Low	>3 Years	High	City of Brockton
Excessive speeding on Thatcher Street and vehicles do not come to a complete stop at the stop signs on the Massasoit Boulevard approaches.	Enhanced enforcement of speeds and enhanced enforcement of traffic control.	Medium	<1 Year	Low	City of Brockton
There is a lack of sidewalks and safe pedestrian crossings, and in the winter time, plowed snow banks force walkers to walk on the street.	Add crosswalks to the intersection, extend sidewalks along the north east side of Thatcher Street from the existing sidewalk to Pine Street. Plow sidewalks in the winter time. Add sidewalks to Massasoit Boulevard from Thatcher Street into the campus.	High	1-3 Years	High	City of Brockton and Massasoit Community College
There is a lack of way finding signs and lighting is inadequate.	Post way finding signs on surrounding road network directing vehicles Massasoit Campus and improve lighting.	Low	<1 Year	Low	City of Brockton
Thatcher Street and Massasoit Boulevard lack bicycle lanes.	Add bike lanes on Thatcher Street where the shoulder is wide enough, and “Sharrows” where there are no shoulders. Add bicycle lanes to Massasoit Boulevard or bicycle tracks (separate paths) where feasible.	Medium	1-3 Years	High	City of Brockton and Massasoit Community College

Table 4: Potential Safety Enhancement Summary Thatcher Street at Pine Street

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
The intersection is poorly aligned.	Reconstruct and realign the intersection to 90 degrees creating a conventional “T” type intersection (adding a channeled “free right turn” with island if feasible from Pine Street eastbound to Thatcher Street.	High	> 3 Years	High	City of Brockton
	Add overhead flashing beacons (flashing red facing Thatcher Street and flashing yellow facing Pine Street.	Medium	1-3 Years	Medium	
	Move the Thatcher Street stop bar and stop sign closer to Pine Street, update signs for retro-reflectivity, update pavement markings (with “STOP” at the stop bar), and bring the Thatcher Street double yellow Center Line in 90 degree alignment with Pine Street.	Medium	< 1 Year	Low	
Two curb cuts from an adjacent property access directly to the southwest corner of the intersection.	Close one of the curb cuts, preferably the curb cut at the Pine Street eastbound approach to the intersection.	High	>3 Years	High	City of Brockton
Safety Issue: Traffic control, way finding, and street signs are faded or missing.	Street signs need to be repositioned for better visibility. Way finding signs for St Joseph’s Medical Center and Massasoit need better positioning for visibility. Traffic control, stop signs, and one-way signs for Pine Street need upgrading (retro-reflectivity) and repositioning for visibility. Repaint pavement markings, fog lines, and stop lines.	Low	< 1 Year	Low	City of Brockton
Pedestrian crossings and amenities are lacking.	Install a raised crosswalk with a Rapid Rectangular Flashing Beacon	Medium	1-3 Years	Medium	City of Brockton
The intersection lacks bicycle lanes.	Install bicycle lanes where the road has sufficient width and “Sharrows” to those sections where bicycle lanes are not feasible.	Medium	< 1 Year	Low	City of Brockton

Table 5: Potential Safety Enhancement Summary Summer Street at Pine Street

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
The intersection is poorly aligned, and the sight lines on the Pine Street (stop signed, minor street) approach are limited.	Reconstruct and realign the intersection to 90 degrees, evaluate the installation of a roundabout or a traffic signal.	Medium	>3 Years	High	City of Brockton
	Request the owner of adjacent property remove a concrete wall or lower it to improve sight lines.	Medium	< 1 Year	Low	
Vehicles on Summer Street southbound speed due to the free right turn at the Summer Street/Lyman Street intersection, along with wide lanes. The descending grade on Summer Street northbound also leads to speeding.	Install overhead flashing beacons to improve intersection visibility (an interim treatment before installing signals or a roundabout).	Medium	>3 Years	Medium	City of Brockton
The intersection lacks crosswalks across Summer Street as well as pedestrian and bicycle amenities.	Narrow the Summer Street southbound approach to reduce pedestrian walking time and exposure. Add crosswalks across Summer Street with ADA compliant ramps.	Medium	1-3 Years	Medium	City of Brockton
	Add bicycle lanes where the right of way permits, or “Sharrows” to remind motorists to share the road with bicycles.	Medium	< 1 Year	Low	
The drainage is insufficient due to the location of the catch basins. They tend to get clogged with debris.	Clean catch basins and relocate catch basins south across Pine Street to the bottom of the descending grade on the Summer Street northbound approach.	Low	>3 Years	High	City of Brockton

Appendix A. RSA Meeting Agenda

Agenda	<h2>Road Safety Audit</h2> <h3>Brockton, MA</h3> <h4><u>Three Intersections</u></h4> <ul style="list-style-type: none"> • Pine Street at Summer Street • Pine Street at Thatcher Street • Thatcher Street at Massasoit Community College Driveway <p style="text-align: right;"> Meeting Location: Massasoit Community College Student Senate Conference Room 1 Massasoit Boulevard Brockton, MA 02302 Monday October 22, 2018 10:00 AM – 12:00 PM </p>
	<p>Type of meeting: Road Safety Audit</p> <p>Attendees: Invited Participants to Comprise a Multidisciplinary Team</p> <p>Please bring: Thoughts and Enthusiasm</p>
10:00 AM	<p>Welcome and Introductions</p>
10:05 AM	<p>Review of Site Specific Material - Review and Discuss Project</p> <ul style="list-style-type: none"> • Review of Traffic Data • Existing Conditions and Known Challenges
10:45 AM	<p>Visit the Intersections and Discussion</p> <ul style="list-style-type: none"> • Identify deficiencies at the study area location • OCPC staff will document all observations and comments
11:30 AM	<p>Wrap up Site Visit and Post Visit Discussion Meeting</p> <ul style="list-style-type: none"> • Discuss issues and document and finalize potential improvements
12:00 PM	<p>Adjourn for the Day</p>
<p><u>Instructions for Participants:</u></p> <ul style="list-style-type: none"> • Before attending the RSA participants are encouraged to drive through the intersection and complete/consider elements on the RSA Prompt List with a focus on safety. • All participants will be actively involved in the process throughout. • After the RSA meeting, participants will be asked to comment and respond to the document materials to assure it is reflective of the RSA completed by the multidisciplinary team. • CONTACT: Please direct questions regarding this RSA to Raymond Guarino, OCPC, (508) 583-1833, Ext 212, rguarino@ocpcrpa.org. <p style="text-align: center;">Old Colony Planning Council, 70 School Street. Brockton, MA 02301</p>	



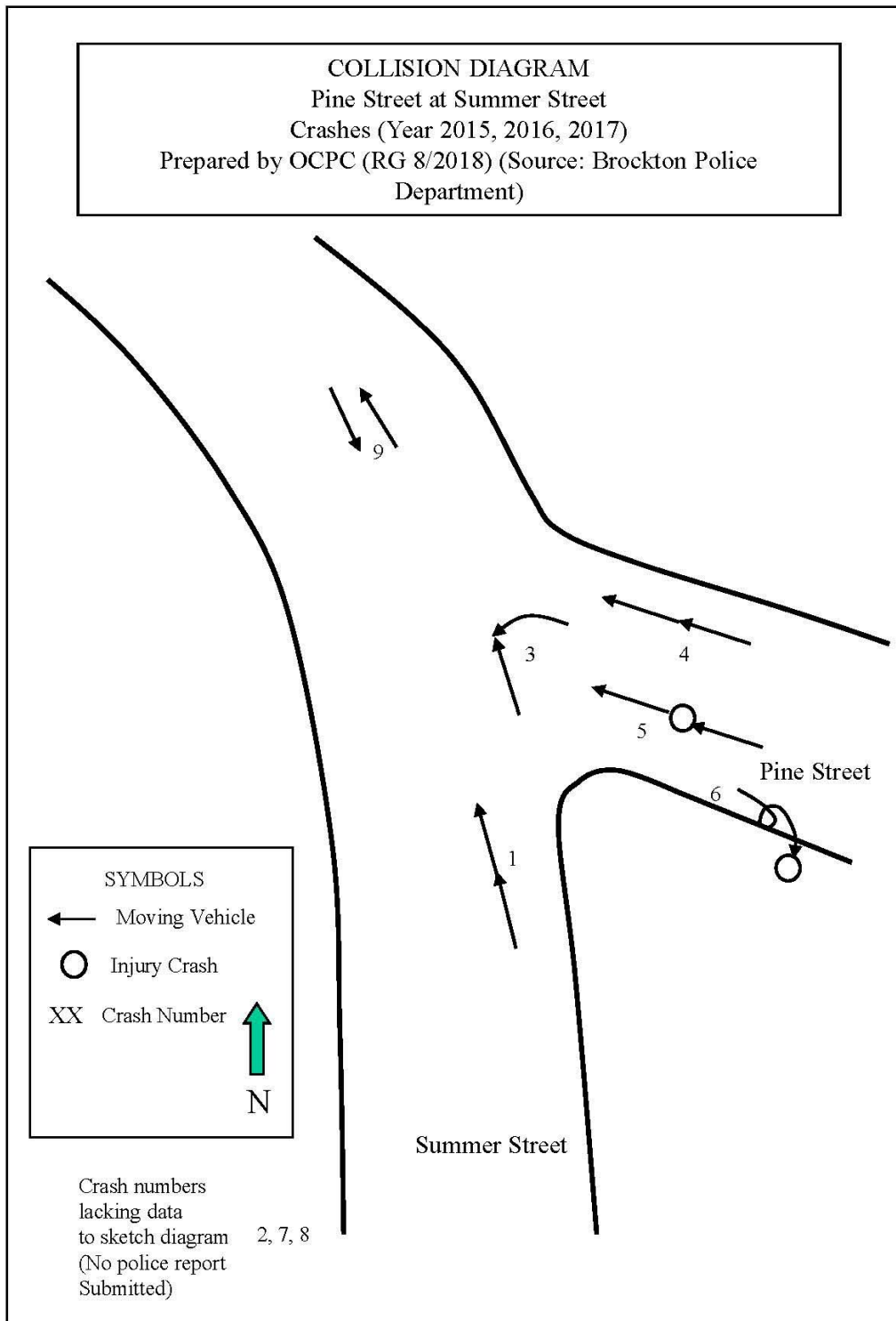
Appendix B. RSA Audit Team

Participating Audit Team Members

Date: October 22, 2018 Location: Massasoit Community College, Brockton MA

Audit Team Members	Agency/Affiliation	Email Address	Phone Number
Name	Agency	Email	xxx-xxx-xxxx
Rob May	Brockton Planning Department	rmay@cobma.us	
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Ann Beauregard	Brockton Ward 5 City Councilor	abeauregard@cobma.us	
Jeanne Holmes	Brockton Resident	friendoftag@gmail.com	
Brandon Wilcox	FHWA	brandon.wilcox@dot.gov	
Jason Walters	MassDOT District 5	jason.walters@state.ma.us	
Bianca Marshall	MassDOT District 5 traffic	bianca.marshall@dot.state.ma.us	
Greg Haberek	Massasoit Community College	ghaberek@massasoit.mass.edu	(508) 588-9100
Avery Koropey	Massasoit Tribune	akoropey@massasoit.edu	
William McNulty	Old Colony Planning Council	wmcnulty@ocpcrpa.org	508-583-1833
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Jimmy Pereira	Old Colony Planning Council	jpereira@ocpcrpa.org	508-583-1833

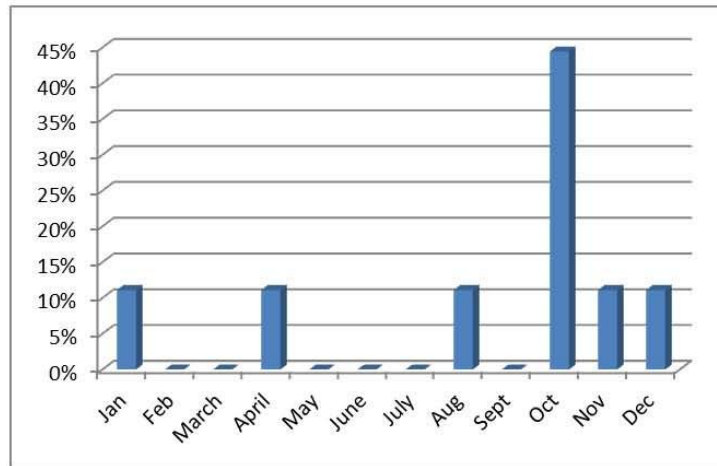
Appendix C. Detailed Crash Data



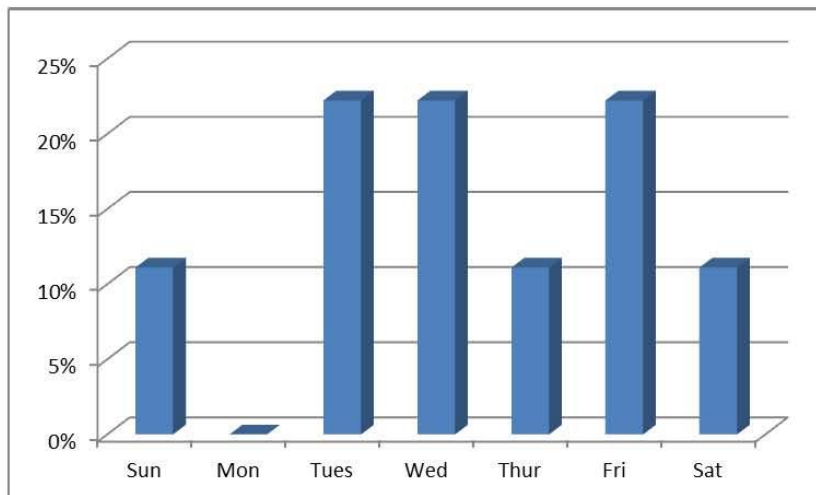
**Crash Data Summary Table 2015, 2016, 2017
 Pine Street at Summer Street - Brockton**

Crash Num	P.D. Code	Crash Date	Crash Day	Time of Day	Manner of Coll	Light Cond	Weather	Road Surf	Age 1	Age 2	Age 3	Comments	Inj
1	17-1958-AC	10/28/2017	Sat	1:03 PM	Rear-end	Daylight	Clear	Dry	19	69		Veh 2 stopped NB to allow bicycle to cross and was hit by veh1.	PDO
2	N/A	1/9/2015	Fri	2:51 PM	N/A	Daylight	N/A	N/A	N/A	N/A			PDO
3	N/A	4/10/2015	Fri	10:26 AM	Angle	Daylight	N/A	N/A	N/A	N/A		Veh 1 turning left from Pine to Summer thought Veh 2 had right turn signal but hit Veh 2 travelling north on Summer	PDO
4	N/A	10/18/2017	Wed	9:05 AM	Rear-end	Daylight	N/A	N/A	N/A	N/A		Both veh on Pine at stop sign Veh 1 rear-ended veh 2	PDO
5	15-1523-AC	8/19/2015	Wed	12:10 PM	Rear-end	Daylight	Clear	Dry	51	37		Both veh on Pine at stop sign Veh 1 rear-ended veh 2	Inj
6	17-2024-AC	11/7/2017	Tues	1:11 AM	Ran off Road	Dark Lighted roadway	Rain	Wet	42			Veh turning right from Summer to Pine ran off the road	Inj
7	N/A	10/20/2015	Tues	3:57 PM	N/A	Daylight	N/A	N/A	N/A	N/A			PDO
8	15-2442-AC	12/31/2015	Thur	8:22 PM	N/A	Dark Lighted roadway	N/A	N/A	N/A	N/A			PDO
9	17-1769-AC	10/1/2017	Sun	5:05 PM	Sideswipe opposite	Daylight	Clear	Dry	45	23			PDO

Crash Month

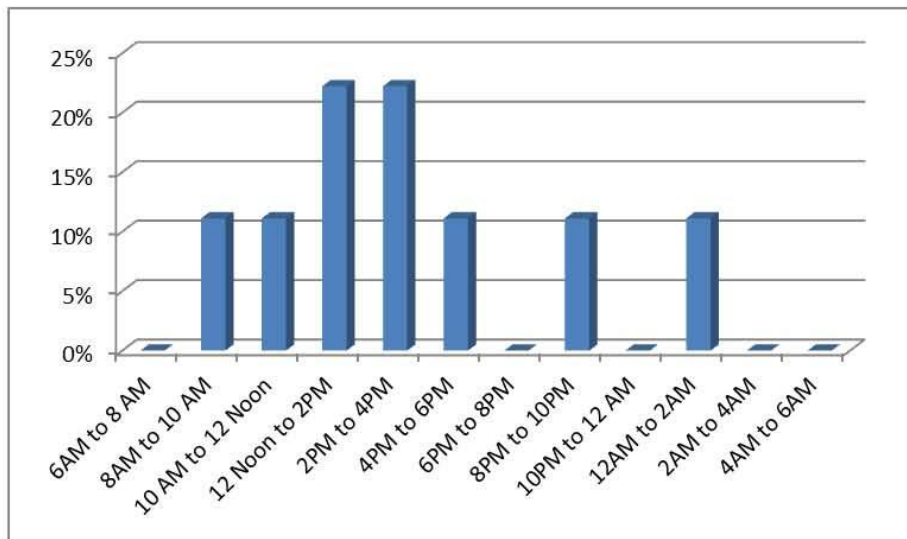


Day of the Week

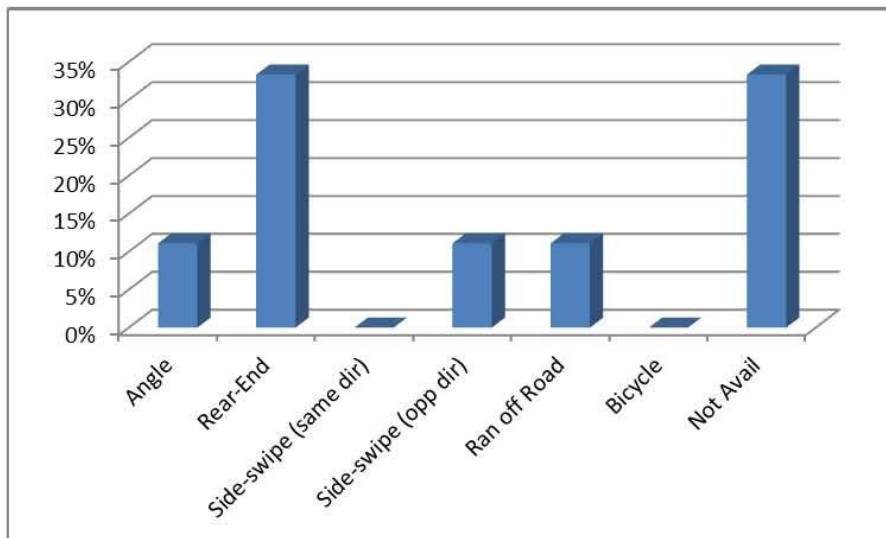


Pine Street at Summer Street -
Brockton

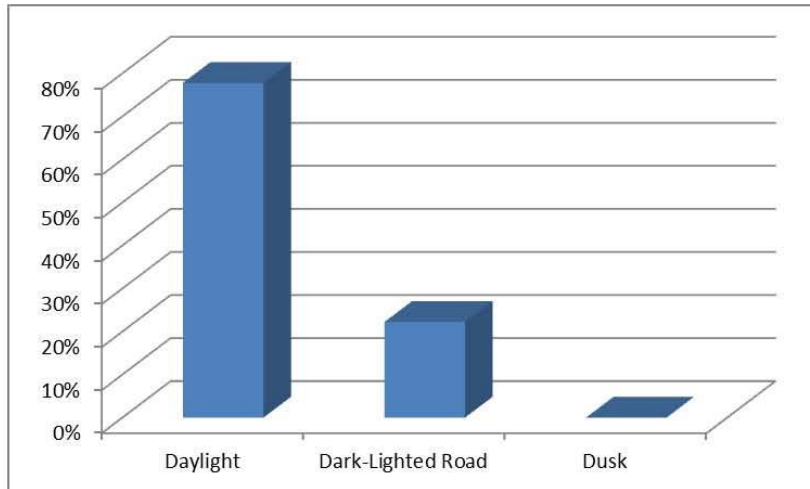
Time of Day



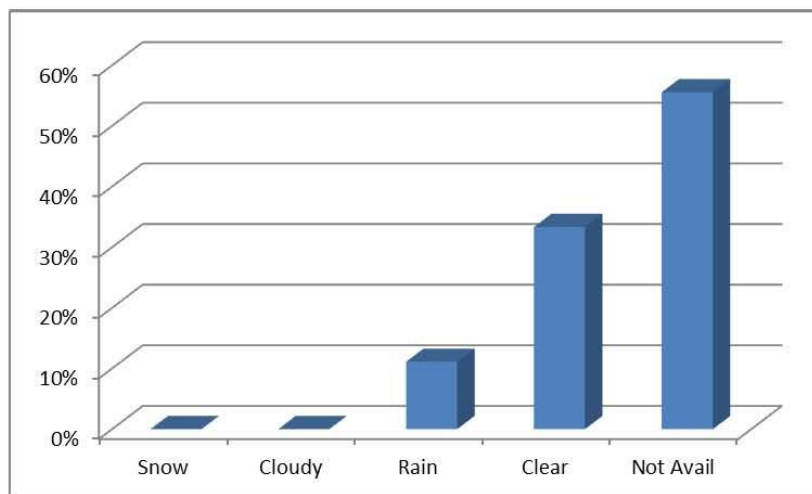
Manner of Collision



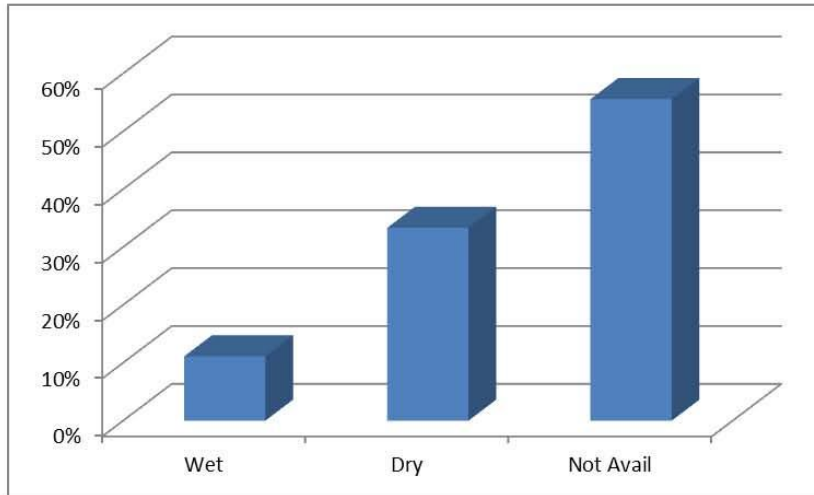
Light Conditions



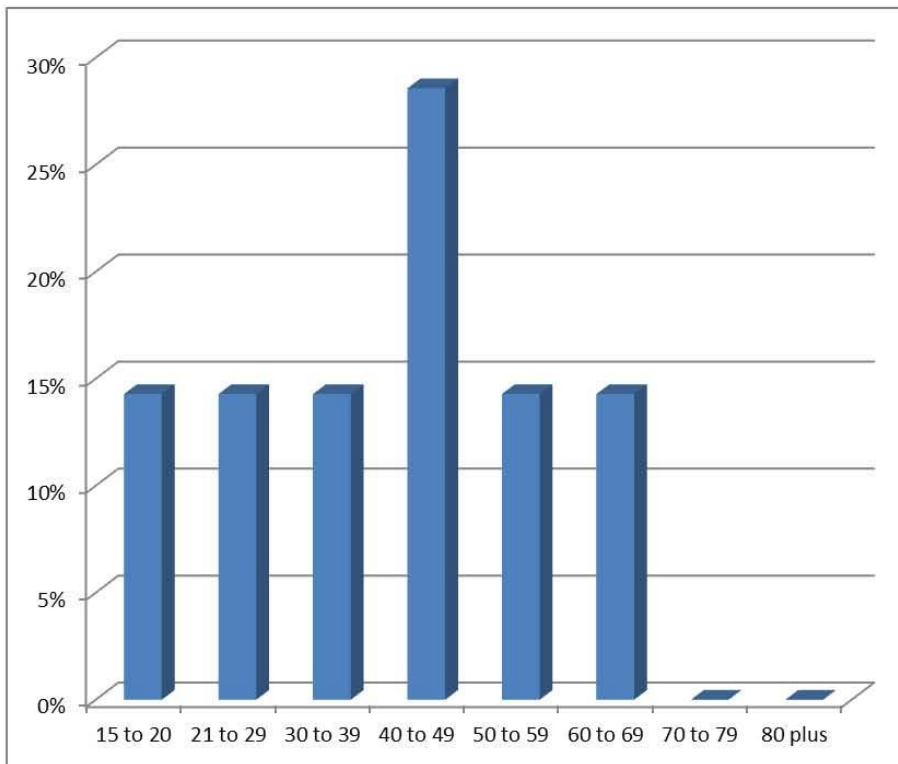
Weather Conditions

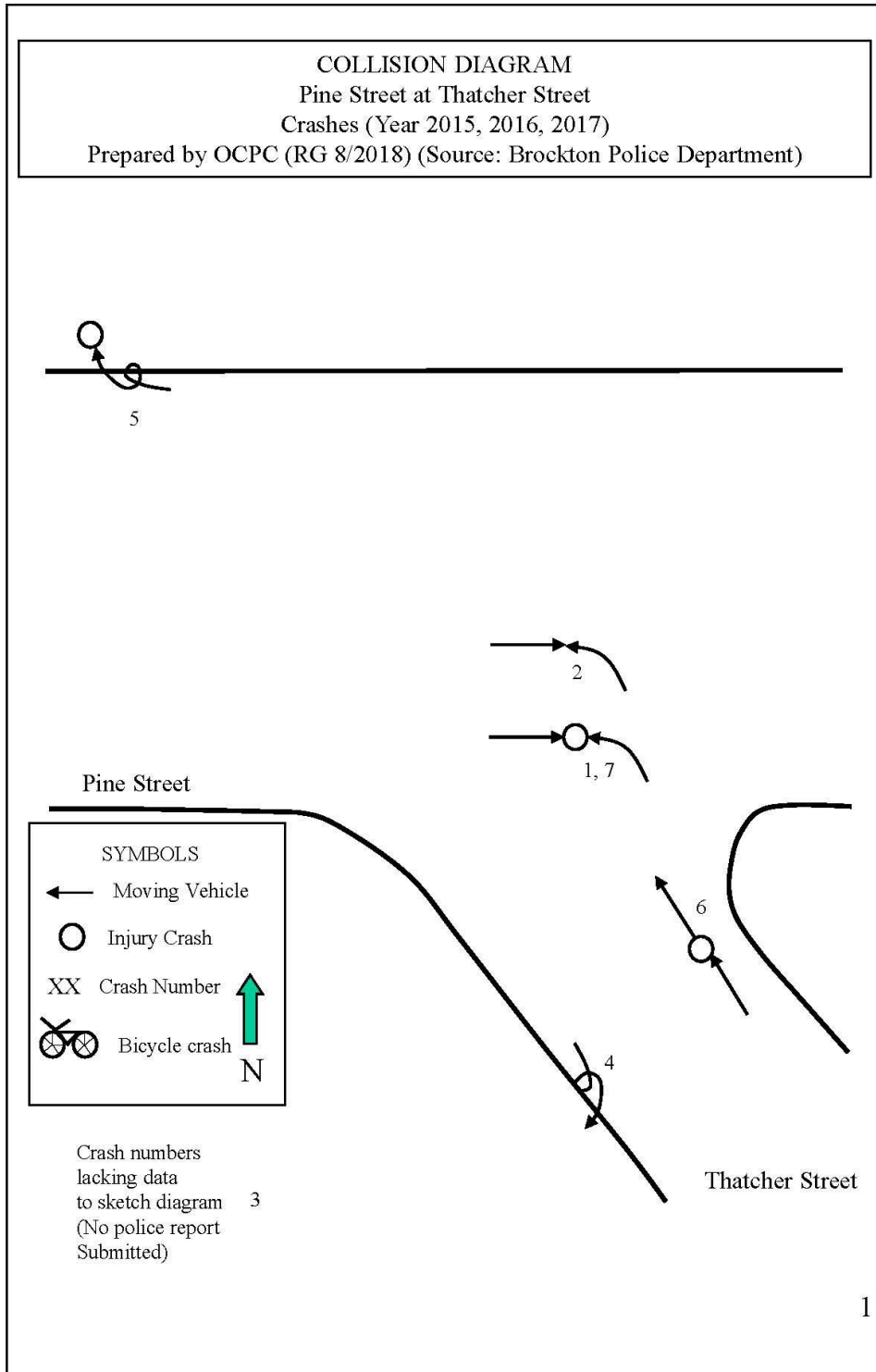


Road Surface Conditions



Age

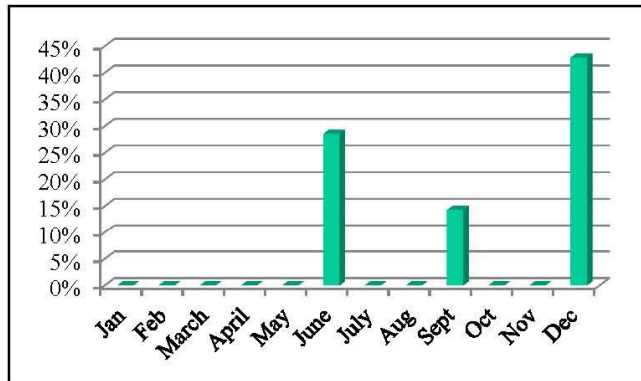




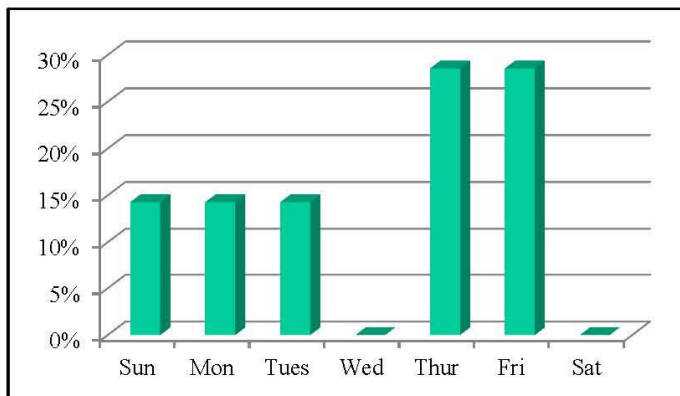
**Crash Data Summary Table 2015, 2016, 2017
 Pine Street at Thatcher Street - Brockton**

Crash Num	P.D. Code	Crash Date	Crash Day	Time of Day	Manner of Coll	Light Cond	Weather	Road Surf	Driver Contribute Code	Age 1	Age 2	Comments
1	16-1022-AC	6/5/2016	Sun	10:04 AM	Angle	Daylight	Rain	Wet	Veh 1 cited for not yielding ROW	18	29	
2	17-2259-AC	12/5/2017	Tues	8:33 PM	Angle	Dark - Lighted Rd	Rain	Wet	Veh 1 Inattention	35	34	Veh 1 issued warning for failure to grant ROW
3	N/A	9/15/2016	Thur	8:44 PM	N/A	Dark - Lighted Rd	N/A	N/A	N/A	N/A	N/A	
4	16-2240-AC	12/2/2016	Fri	12:53 AM	Ran off Rd	Dark - Lighted Rd	Clear	Dry	Animal crossing the road	20		Driver ran off the road hit tree to avoid an animal
5	17-2199-AC	11/27/2017	Mon	9:57 AM	Ran off Rd	Daylight	Cloudy	Dry	Ran off road and hit a tree	44		Driver distracted due to choking.
6	17-2438-AC	12/28/2017	Thur	2:23 PM	Rear-end	Daylight	Clear	Dry		43		Hit and run
7	16-1091-AC	6/17/2016	Fri	10:07 AM	Angle	Daylight	Clear	Dry		49	33	

Crash Month

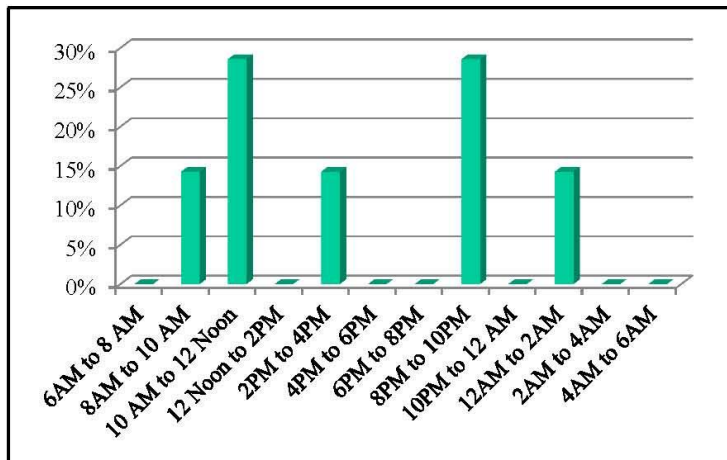


Day of the Week

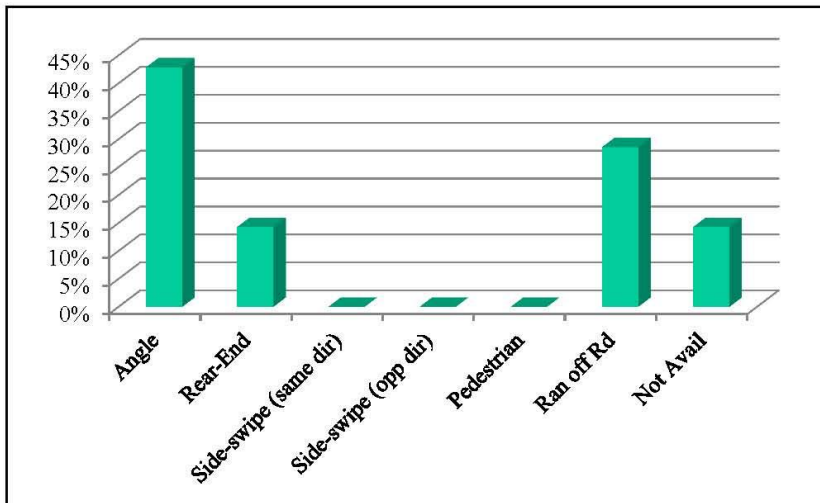


Pine Street at Thatcher Street - Brockton

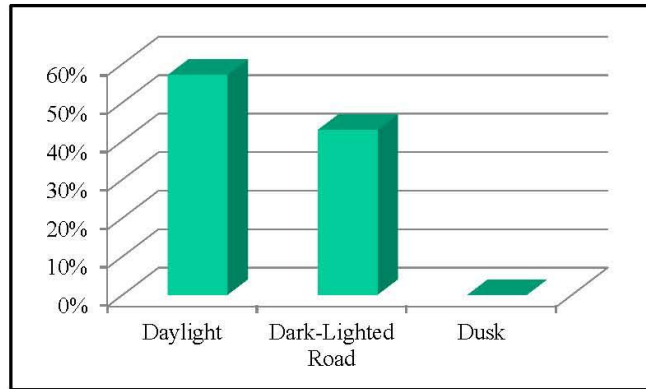
Time of Day



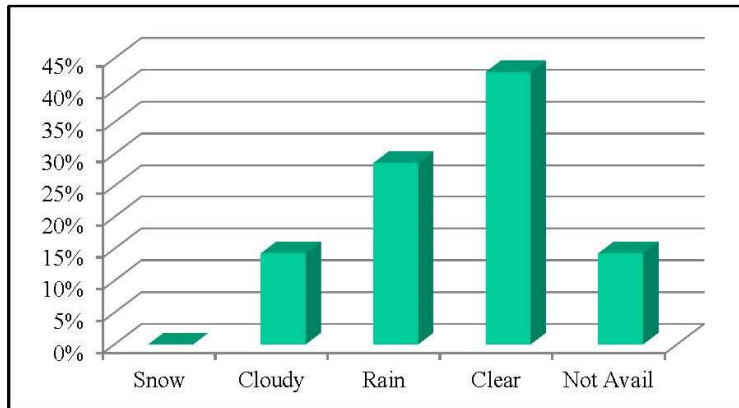
Manner of Collision



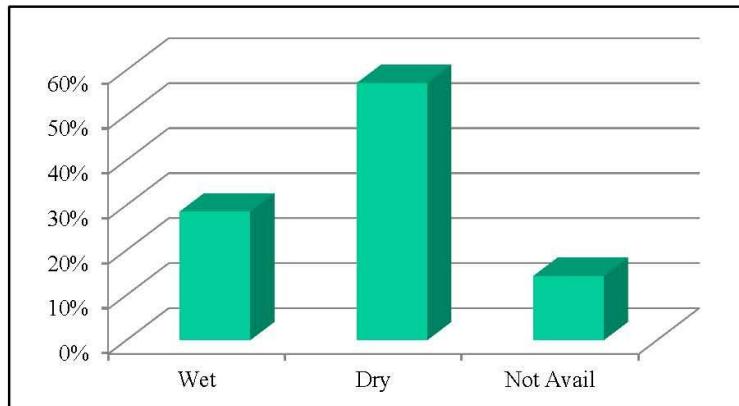
Light Conditions



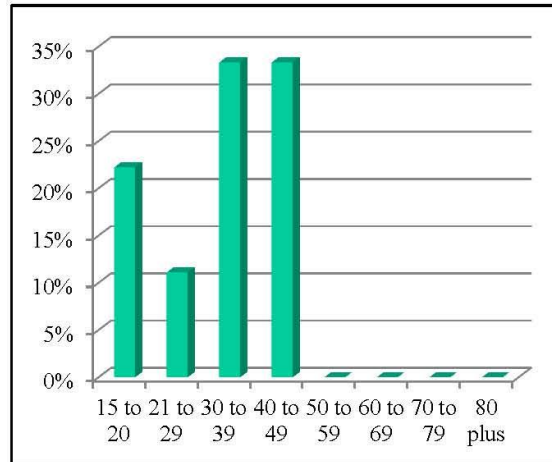
Weather Conditions



Road Surface Conditions



Age



Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street
 Old Colony Planning Council *Final Report*

Crash_Numb	Crash_Date	Crash Time	Severity	Num of Vehicles	Type	Vehicle_Ac	Vehicle_T	Most_Harmf	Vehicle_Co	Road_Surfa	Ambient_Li	Weather_Co	At_Roadway
#####	26-Jan-2016	7:37 AM	Property damage only (none injured)	2	Rear-end	V1: Travelling straight ahead / V2:Turning left	V1:Eastbound / V2:Eastbound	with motor vehicle in traffic / V2: Collision with motor	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear	THATCHER ST / MASSASOIT BLVD

Appendix D. Additional Information

- Automatic Traffic Recorder (ATR) Vehicle Counts
- Intersection Turning Movement Counts
- Intersection Warrant Analysis

Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street

Old Colony Planning Council *Final Report*

Community: Brockton
 Com#_UR/FC: 44_UO
 Recorder #: 25236
 Layout: L6 Basic (2')

Old Colony Planning Council
 70 School Street
 Brockton, MA 02301
 (508) 583-1833
www.ocpcrpa.org

Page 1
 Station ID:
 Site Code: 44
 Date Start: 10-Apr-18
 Date End: 11-Apr-18
 Massasoit Blvd, North Driveway

Start Time	09-Apr-18		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	1	3	2	5	*	*	*	*	*	*	*	*	2	4
01:00	*	*	1	0	0	2	*	*	*	*	*	*	*	*	0	1
02:00	*	*	0	0	0	1	*	*	*	*	*	*	*	*	0	0
03:00	*	*	0	2	0	0	*	*	*	*	*	*	*	*	0	1
04:00	*	*	1	2	1	1	*	*	*	*	*	*	*	*	1	2
05:00	*	*	8	3	6	2	*	*	*	*	*	*	*	*	7	2
06:00	*	*	35	25	38	20	*	*	*	*	*	*	*	*	36	22
07:00	*	*	171	53	166	48	*	*	*	*	*	*	*	*	168	50
08:00	*	*	171	61	247	95	*	*	*	*	*	*	*	*	209	78
09:00	*	*	255	116	214	121	*	*	*	*	*	*	*	*	234	118
10:00	*	*	143	136	112	155	*	*	*	*	*	*	*	*	128	146
11:00	*	*	95	128	73	224	*	*	*	*	*	*	*	*	84	176
12:00 PM	*	*	86	230	88	150	*	*	*	*	*	*	*	*	87	190
01:00	*	*	53	223	62	152	*	*	*	*	*	*	*	*	58	188
02:00	*	*	37	147	51	176	*	*	*	*	*	*	*	*	44	162
03:00	*	*	47	160	59	153	*	*	*	*	*	*	*	*	53	156
04:00	*	*	47	115	59	130	*	*	*	*	*	*	*	*	53	122
05:00	*	*	143	107	123	98	*	*	*	*	*	*	*	*	133	102
06:00	*	*	75	65	58	60	*	*	*	*	*	*	*	*	66	62
07:00	*	*	18	73	16	76	*	*	*	*	*	*	*	*	17	74
08:00	*	*	10	168	14	120	*	*	*	*	*	*	*	*	12	144
09:00	*	*	4	66	5	83	*	*	*	*	*	*	*	*	4	74
10:00	*	*	7	23	2	16	*	*	*	*	*	*	*	*	4	20
11:00	*	*	1	14	1	9	*	*	*	*	*	*	*	*	1	12
Lane	0	0	1409	1920	1397	1897	0	0	0	0	0	0	0	0	1401	1906
Day	0	0	3329	3294	3294	3294	0	0	0	0	0	0	0	0	3307	3307
AM Peak	-	-	09:00	10:00	08:00	11:00	-	-	-	-	-	-	-	-	09:00	11:00
Vol.	-	-	255	136	247	224	-	-	-	-	-	-	-	-	234	176
PM Peak	-	-	17:00	12:00	17:00	14:00	-	-	-	-	-	-	-	-	17:00	12:00
Vol.	-	-	143	230	123	176	-	-	-	-	-	-	-	-	133	190
Comb. Total	0	0	3329	3294	3294	3294	0	0	0	0	0	0	0	0	3307	3307

Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street

Old Colony Planning Council *Final Report*

Old Colony Planning Council
 70 School Street
 Brockton, MA 02301
 (508) 583-1833
 www.ocpcrpa.org

Page 1

Community: Brockton
 Com#_UR/FC: 44_U0
 Recorder #: 32539
 Layout: L6 Basic (2')

Station ID:
 Site Code: 44
 Date Start: 10-Apr-18
 Date End: 11-Apr-18
 Massasoit Blvd, South Driveway

Start Time	09-Apr-18		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
01:00	*	*	0	0	1	0	*	*	*	*	*	*	*	*	0	0
02:00	*	*	0	1	2	0	*	*	*	*	*	*	*	*	1	0
03:00	*	*	0	0	1	1	*	*	*	*	*	*	*	*	0	0
04:00	*	*	4	0	3	0	*	*	*	*	*	*	*	*	4	0
05:00	*	*	7	0	10	0	*	*	*	*	*	*	*	*	8	0
06:00	*	*	35	1	35	1	*	*	*	*	*	*	*	*	35	1
07:00	*	*	111	5	103	5	*	*	*	*	*	*	*	*	107	5
08:00	*	*	118	9	134	8	*	*	*	*	*	*	*	*	126	8
09:00	*	*	93	17	96	15	*	*	*	*	*	*	*	*	94	16
10:00	*	*	48	27	56	27	*	*	*	*	*	*	*	*	52	27
11:00	*	*	35	17	45	71	*	*	*	*	*	*	*	*	40	44
12:00 PM	*	*	48	57	59	44	*	*	*	*	*	*	*	*	54	50
01:00	*	*	69	47	49	47	*	*	*	*	*	*	*	*	59	47
02:00	*	*	29	42	43	53	*	*	*	*	*	*	*	*	36	48
03:00	*	*	41	39	40	55	*	*	*	*	*	*	*	*	40	47
04:00	*	*	44	44	44	55	*	*	*	*	*	*	*	*	44	50
05:00	*	*	62	41	55	45	*	*	*	*	*	*	*	*	58	43
06:00	*	*	25	22	40	18	*	*	*	*	*	*	*	*	32	20
07:00	*	*	14	13	19	12	*	*	*	*	*	*	*	*	16	12
08:00	*	*	12	20	14	11	*	*	*	*	*	*	*	*	13	16
09:00	*	*	5	5	8	9	*	*	*	*	*	*	*	*	6	7
10:00	*	*	6	1	5	0	*	*	*	*	*	*	*	*	6	0
11:00	*	*	1	2	0	2	*	*	*	*	*	*	*	*	0	2
Lane Day	0	0	807	410	862	479	0	0	0	0	0	0	0	831	443	
AM Peak	-	-	08:00	10:00	08:00	11:00	-	-	-	-	-	-	-	08:00	11:00	
Vol.	-	-	118	27	134	71	-	-	-	-	-	-	-	126	44	
PM Peak	-	-	13:00	12:00	12:00	15:00	-	-	-	-	-	-	-	13:00	12:00	
Vol.	-	-	69	57	59	55	-	-	-	-	-	-	-	59	50	
Comb. Total	0		1217		1341		0		0		0		0		1274	

Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street

Old Colony Planning Council *Final Report*

Old Colony Planning Council
 70 School Street
 Brockton, MA 02301
 (508) 583-1833
 www.ocpcrpa.org

Page 1

Community: Brockton
 Com#_UR/FC: 44_U6
 Recorder #: 19651
 Layout: L6 Basic (2')

Station ID:
 Site Code: 44
 Date Start: 10-Apr-18
 Date End: 11-Apr-18
 Pine St, east of Summer St

Start Time	09-Apr-18		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	29	12	28	27	*	*	*	*	*	*	*	*	28	20
01:00	*	*	17	5	18	3	*	*	*	*	*	*	*	*	18	4
02:00	*	*	7	5	4	5	*	*	*	*	*	*	*	*	6	5
03:00	*	*	9	8	11	7	*	*	*	*	*	*	*	*	10	8
04:00	*	*	22	23	19	22	*	*	*	*	*	*	*	*	20	22
05:00	*	*	41	61	31	52	*	*	*	*	*	*	*	*	36	56
06:00	*	*	152	120	129	135	*	*	*	*	*	*	*	*	140	128
07:00	*	*	279	234	297	245	*	*	*	*	*	*	*	*	288	240
08:00	*	*	337	208	345	245	*	*	*	*	*	*	*	*	341	226
09:00	*	*	330	192	307	200	*	*	*	*	*	*	*	*	318	196
10:00	*	*	261	171	284	224	*	*	*	*	*	*	*	*	272	198
11:00	*	*	231	220	241	269	*	*	*	*	*	*	*	*	236	244
12:00 PM	*	*	284	287	262	238	*	*	*	*	*	*	*	*	273	262
01:00	*	*	243	255	236	228	*	*	*	*	*	*	*	*	240	242
02:00	*	*	282	236	296	266	*	*	*	*	*	*	*	*	289	251
03:00	*	*	319	265	341	289	*	*	*	*	*	*	*	*	330	277
04:00	*	*	346	182	403	231	*	*	*	*	*	*	*	*	374	206
05:00	*	*	375	194	376	219	*	*	*	*	*	*	*	*	376	206
06:00	*	*	237	127	257	114	*	*	*	*	*	*	*	*	247	120
07:00	*	*	167	98	193	125	*	*	*	*	*	*	*	*	180	112
08:00	*	*	126	131	135	125	*	*	*	*	*	*	*	*	130	128
09:00	*	*	106	91	110	93	*	*	*	*	*	*	*	*	108	92
10:00	*	*	66	39	59	29	*	*	*	*	*	*	*	*	62	34
11:00	*	*	44	31	39	34	*	*	*	*	*	*	*	*	42	32
Lane	0	0	4310	3195	4421	3425	0	0	0	0	0	0	0	0	4364	3309
Day	0	0	7505		7846		0	0	0	0	0	0	0	0	7673	
AM Peak	-	-	08:00	07:00	08:00	11:00	-	-	-	-	-	-	-	-	08:00	11:00
Vol.	-	-	337	234	345	269	-	-	-	-	-	-	-	-	341	244
PM Peak	-	-	17:00	12:00	16:00	15:00	-	-	-	-	-	-	-	-	17:00	15:00
Vol.	-	-	375	287	403	289	-	-	-	-	-	-	-	-	376	277
Comb. Total	0	0	7505		7846		0	0	0	0	0	0	0	0	7673	

Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street
 Old Colony Planning Council *Final Report*

Community: Brockton
 Com#_UR/FC: 44_U0
 Recorder #: 13209
 Layout: L6 Basic (2')

Old Colony Planning Council
 70 School Street
 Brockton, MA 02301
 (508) 583-1833
 www.ocpcrpa.org

Page 1
 Station ID:
 Site Code: 44
 Date Start: 10-Apr-18
 Date End: 11-Apr-18
 Pine St, east of Thatcher St

Start Time	10-Apr-18 Tue	EB							
12:00 AM		13							
01:00		14							
02:00		2							
03:00		2							
04:00		12							
05:00		27							
06:00		88							
07:00		112							
08:00		124							
09:00		102							
10:00		86							
11:00		85							
12:00 PM		120							
01:00		127							
02:00		151							
03:00		172							
04:00		169							
05:00		171							
06:00		128							
07:00		106							
08:00		97							
09:00		73							
10:00		42							
11:00		23							
Total		2046							
AM Peak	-	08:00	-	-	-	-	-	-	-
Vol.	-	124	-	-	-	-	-	-	-
PM Peak	-	15:00	-	-	-	-	-	-	-
Vol.	-	172	-	-	-	-	-	-	-

Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street

Old Colony Planning Council *Final Report*

Old Colony Planning Council
70 School Street
Brockton, MA 02301
(508) 583-1833
www.ocpcrpa.org

Page 1

Community: Brockton
Com#_UR/FC: 44_U6
Recorder #: 22926
Layout: L6 Basic (2')

Station ID:
Site Code: 44
Date Start: 10-Apr-18
Date End: 11-Apr-18
Summer St, north of Pine St

Start Time	09-Apr-18		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	45	81	59	86	*	*	*	*	*	*	*	*	52	74
01:00	*	*	24	36	24	41	*	*	*	*	*	*	*	*	24	38
02:00	*	*	13	19	18	16	*	*	*	*	*	*	*	*	16	18
03:00	*	*	34	18	26	22	*	*	*	*	*	*	*	*	30	20
04:00	*	*	70	34	79	38	*	*	*	*	*	*	*	*	74	36
05:00	*	*	242	93	227	89	*	*	*	*	*	*	*	*	234	91
06:00	*	*	455	212	465	193	*	*	*	*	*	*	*	*	460	202
07:00	*	*	592	390	615	400	*	*	*	*	*	*	*	*	604	395
08:00	*	*	551	424	573	462	*	*	*	*	*	*	*	*	562	443
09:00	*	*	417	414	434	402	*	*	*	*	*	*	*	*	426	408
10:00	*	*	377	371	411	397	*	*	*	*	*	*	*	*	394	384
11:00	*	*	402	365	465	397	*	*	*	*	*	*	*	*	434	381
12:00 PM	*	*	452	382	433	419	*	*	*	*	*	*	*	*	442	400
01:00	*	*	453	388	425	397	*	*	*	*	*	*	*	*	439	392
02:00	*	*	518	442	517	464	*	*	*	*	*	*	*	*	518	453
03:00	*	*	488	502	491	548	*	*	*	*	*	*	*	*	490	525
04:00	*	*	465	604	473	603	*	*	*	*	*	*	*	*	469	604
05:00	*	*	429	585	482	542	*	*	*	*	*	*	*	*	456	564
06:00	*	*	329	506	329	485	*	*	*	*	*	*	*	*	329	496
07:00	*	*	273	374	322	429	*	*	*	*	*	*	*	*	298	402
08:00	*	*	275	355	277	327	*	*	*	*	*	*	*	*	276	341
09:00	*	*	185	246	228	299	*	*	*	*	*	*	*	*	206	272
10:00	*	*	135	168	140	195	*	*	*	*	*	*	*	*	138	182
11:00	*	*	94	150	112	159	*	*	*	*	*	*	*	*	103	154
Lane	0	0	7318	7159	7625	7390	0	0	0	0	0	0	0	0	7474	7275
Day	-	-	14477	-	15015	-	-	-	-	-	-	-	-	-	14749	-
AM Peak	-	-	07:00	08:00	07:00	08:00	-	-	-	-	-	-	-	-	07:00	08:00
Vol.	-	-	592	424	615	462	-	-	-	-	-	-	-	-	604	443
PM Peak	-	-	14:00	16:00	14:00	16:00	-	-	-	-	-	-	-	-	14:00	16:00
Vol.	-	-	518	604	517	603	-	-	-	-	-	-	-	-	518	604
Comb. Total	0	0	14477	15015	0	0	0	0	0	0	0	0	0	0	14749	0

Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street

Old Colony Planning Council *Final Report*

Old Colony Planning Council
 70 School Street
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Page 1

Community: Brockton
 Com#_UR/FC: 44_U6
 Recorder #: 19644
 Layout: L6 Basic (2')

Station ID:
 Site Code: 44
 Date Start: 10-Apr-18
 Date End: 11-Apr-18
 Summer St, south of Pine St

Start Time	09-Apr-18		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	39	49	45	47	*	*	*	*	*	*	*	*	42	48
01:00	*	*	21	19	23	26	*	*	*	*	*	*	*	*	22	22
02:00	*	*	12	13	15	13	*	*	*	*	*	*	*	*	14	13
03:00	*	*	26	11	18	10	*	*	*	*	*	*	*	*	22	10
04:00	*	*	56	29	61	29	*	*	*	*	*	*	*	*	58	29
05:00	*	*	195	62	176	69	*	*	*	*	*	*	*	*	186	66
06:00	*	*	392	129	385	131	*	*	*	*	*	*	*	*	388	130
07:00	*	*	471	236	486	239	*	*	*	*	*	*	*	*	478	238
08:00	*	*	447	226	416	259	*	*	*	*	*	*	*	*	432	242
09:00	*	*	298	186	313	202	*	*	*	*	*	*	*	*	306	194
10:00	*	*	252	169	279	214	*	*	*	*	*	*	*	*	266	192
11:00	*	*	228	219	240	197	*	*	*	*	*	*	*	*	234	208
12:00 PM	*	*	248	204	258	231	*	*	*	*	*	*	*	*	253	218
01:00	*	*	264	230	258	250	*	*	*	*	*	*	*	*	261	240
02:00	*	*	374	276	368	294	*	*	*	*	*	*	*	*	371	285
03:00	*	*	371	366	338	392	*	*	*	*	*	*	*	*	354	379
04:00	*	*	403	405	415	380	*	*	*	*	*	*	*	*	409	392
05:00	*	*	382	369	388	358	*	*	*	*	*	*	*	*	385	364
06:00	*	*	283	343	287	319	*	*	*	*	*	*	*	*	285	331
07:00	*	*	245	264	261	315	*	*	*	*	*	*	*	*	253	290
08:00	*	*	192	264	204	241	*	*	*	*	*	*	*	*	198	252
09:00	*	*	135	185	167	216	*	*	*	*	*	*	*	*	151	200
10:00	*	*	128	136	122	149	*	*	*	*	*	*	*	*	125	142
11:00	*	*	70	110	78	124	*	*	*	*	*	*	*	*	74	117
Lane	0	0	5532	4500	5601	4705	0	0	0	0	0	0	0	0	5567	4602
Day	0	0	10032	10306	10306	10306	0	0	0	0	0	0	0	0	10169	10169
AM Peak	-	-	07:00	07:00	07:00	08:00	-	-	-	-	-	-	-	-	07:00	08:00
Vol.	-	-	471	236	486	259	-	-	-	-	-	-	-	-	478	242
PM Peak	-	-	16:00	16:00	16:00	15:00	-	-	-	-	-	-	-	-	16:00	16:00
Vol.	-	-	403	405	415	392	-	-	-	-	-	-	-	-	409	392
Comb. Total	0	0	10032	10306	10306	10306	0	0	0	0	0	0	0	0	10169	10169

Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street

Old Colony Planning Council *Final Report*

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Page 1

Community: Brockton
 Com#: UR/FC: 44_U6
 Recorder #: 32540
 Layout: L6 Basic (2')

Station ID:
 Site Code: 44
 Date Start: 10-Apr-18
 Date End: 11-Apr-18
 Thatcher St, north of Massasoit Blvd

Start Time	09-Apr-18		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	8	13	10	9	*	*	*	*	*	*	*	*	9	11
01:00	*	*	2	3	4	5	*	*	*	*	*	*	*	*	3	4
02:00	*	*	2	5	3	6	*	*	*	*	*	*	*	*	2	6
03:00	*	*	5	8	4	3	*	*	*	*	*	*	*	*	4	6
04:00	*	*	10	9	13	8	*	*	*	*	*	*	*	*	12	8
05:00	*	*	40	24	33	18	*	*	*	*	*	*	*	*	36	21
06:00	*	*	104	92	98	85	*	*	*	*	*	*	*	*	101	88
07:00	*	*	217	234	221	231	*	*	*	*	*	*	*	*	219	232
08:00	*	*	209	260	241	313	*	*	*	*	*	*	*	*	225	286
09:00	*	*	187	345	181	297	*	*	*	*	*	*	*	*	184	321
10:00	*	*	197	229	226	255	*	*	*	*	*	*	*	*	212	242
11:00	*	*	239	223	337	209	*	*	*	*	*	*	*	*	288	216
12:00 PM	*	*	324	220	265	224	*	*	*	*	*	*	*	*	294	222
01:00	*	*	299	184	238	196	*	*	*	*	*	*	*	*	268	190
02:00	*	*	235	164	287	201	*	*	*	*	*	*	*	*	261	182
03:00	*	*	227	222	269	243	*	*	*	*	*	*	*	*	248	232
04:00	*	*	173	237	214	288	*	*	*	*	*	*	*	*	194	262
05:00	*	*	202	276	202	283	*	*	*	*	*	*	*	*	202	280
06:00	*	*	122	153	101	154	*	*	*	*	*	*	*	*	112	154
07:00	*	*	86	73	96	75	*	*	*	*	*	*	*	*	91	74
08:00	*	*	138	50	121	59	*	*	*	*	*	*	*	*	130	54
09:00	*	*	71	42	86	36	*	*	*	*	*	*	*	*	78	39
10:00	*	*	31	28	20	31	*	*	*	*	*	*	*	*	26	30
11:00	*	*	29	20	20	11	*	*	*	*	*	*	*	*	24	16
Lane Day	0	0	3157	3114	3290	3240	0	0	0	0	0	0	0	0	3223	3176
AM Peak Vol	-	-	11:00	09:00	11:00	08:00	-	-	-	-	-	-	-	-	11:00	09:00
PM Peak Vol	-	-	12:00	17:00	14:00	16:00	-	-	-	-	-	-	-	-	12:00	17:00
Comb. Total	0	0	6271	6271	6530	6530	0	0	0	0	0	0	0	0	6399	6399

Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street
 Old Colony Planning Council *Final Report*

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Page 1

Community: Brockton
 Com#_UR/FC: 44_U6
 Recorder #: 32537
 Layout: L6 Basic (2')

Station ID:
 Site Code: 44
 Date Start: 10-Apr-18
 Date End: 11-Apr-18
 Thatcher St, south of Massasoit Blvd

Start Time	09-Apr-18		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	6	13	11	11	*	*	*	*	*	*	*	*	8	12
01:00	*	*	2	3	4	7	*	*	*	*	*	*	*	*	3	5
02:00	*	*	2	5	3	4	*	*	*	*	*	*	*	*	2	4
03:00	*	*	4	9	3	2	*	*	*	*	*	*	*	*	4	6
04:00	*	*	12	7	16	7	*	*	*	*	*	*	*	*	14	7
05:00	*	*	47	18	43	15	*	*	*	*	*	*	*	*	45	16
06:00	*	*	137	78	134	67	*	*	*	*	*	*	*	*	136	72
07:00	*	*	318	106	319	105	*	*	*	*	*	*	*	*	318	106
08:00	*	*	284	110	338	111	*	*	*	*	*	*	*	*	311	110
09:00	*	*	215	135	215	156	*	*	*	*	*	*	*	*	215	146
10:00	*	*	169	187	156	199	*	*	*	*	*	*	*	*	162	193
11:00	*	*	175	170	174	229	*	*	*	*	*	*	*	*	174	200
12:00 PM	*	*	177	217	188	198	*	*	*	*	*	*	*	*	182	208
01:00	*	*	188	217	172	201	*	*	*	*	*	*	*	*	180	209
02:00	*	*	160	218	172	246	*	*	*	*	*	*	*	*	166	232
03:00	*	*	165	260	189	278	*	*	*	*	*	*	*	*	177	269
04:00	*	*	138	286	170	319	*	*	*	*	*	*	*	*	154	302
05:00	*	*	216	238	199	252	*	*	*	*	*	*	*	*	208	245
06:00	*	*	114	127	106	134	*	*	*	*	*	*	*	*	110	130
07:00	*	*	45	89	58	85	*	*	*	*	*	*	*	*	52	87
08:00	*	*	45	115	54	85	*	*	*	*	*	*	*	*	50	100
09:00	*	*	21	64	38	79	*	*	*	*	*	*	*	*	30	72
10:00	*	*	25	31	12	33	*	*	*	*	*	*	*	*	18	32
11:00	*	*	21	29	18	18	*	*	*	*	*	*	*	*	20	24
Lane Day	0	0	2686	2732	2792	2841	0	0	0	0	0	0	0	0	2739	2787
AM Peak Vol.	-	-	07:00	10:00	08:00	11:00	-	-	-	-	-	-	-	-	07:00	11:00
PM Peak Vol.	-	-	17:00	16:00	17:00	16:00	-	-	-	-	-	-	-	-	17:00	16:00
Comb. Total	0	0	5418	5633	5633	5633	0	0	0	0	0	0	0	5526	5526	

Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street
 Old Colony Planning Council *Final Report*

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Page 1

Community: Brockton
 Com#_UR/FC: 44_U6
 Recorder #: 25310
 Layout: L6 Basic (2')

Station ID:
 Site Code: 44
 Date Start: 10-Apr-18
 Date End: 11-Apr-18
 Thatcher St, south of Pine St

Start Time	09-Apr-18		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	11	19	24	15	*	*	*	*	*	*	*	*	18	17
01:00	*	*	4	7	6	11	*	*	*	*	*	*	*	*	5	9
02:00	*	*	5	5	5	2	*	*	*	*	*	*	*	*	5	4
03:00	*	*	6	7	4	4	*	*	*	*	*	*	*	*	5	6
04:00	*	*	18	9	20	8	*	*	*	*	*	*	*	*	19	8
05:00	*	*	44	21	38	18	*	*	*	*	*	*	*	*	41	20
06:00	*	*	113	85	120	67	*	*	*	*	*	*	*	*	116	76
07:00	*	*	220	187	240	200	*	*	*	*	*	*	*	*	230	194
08:00	*	*	206	242	241	277	*	*	*	*	*	*	*	*	224	260
09:00	*	*	183	269	178	254	*	*	*	*	*	*	*	*	180	262
10:00	*	*	170	204	215	211	*	*	*	*	*	*	*	*	192	208
11:00	*	*	216	168	264	198	*	*	*	*	*	*	*	*	240	183
12:00 PM	*	*	293	187	244	188	*	*	*	*	*	*	*	*	268	188
01:00	*	*	265	153	236	163	*	*	*	*	*	*	*	*	250	158
02:00	*	*	240	168	259	198	*	*	*	*	*	*	*	*	250	183
03:00	*	*	272	187	299	216	*	*	*	*	*	*	*	*	286	202
04:00	*	*	174	202	228	258	*	*	*	*	*	*	*	*	201	230
05:00	*	*	190	237	212	250	*	*	*	*	*	*	*	*	201	244
06:00	*	*	111	139	107	141	*	*	*	*	*	*	*	*	109	140
07:00	*	*	93	72	108	86	*	*	*	*	*	*	*	*	100	79
08:00	*	*	136	46	128	61	*	*	*	*	*	*	*	*	132	54
09:00	*	*	77	43	84	51	*	*	*	*	*	*	*	*	80	47
10:00	*	*	34	32	28	31	*	*	*	*	*	*	*	*	31	32
11:00	*	*	33	28	35	18	*	*	*	*	*	*	*	*	34	23
Lane Day	0	0	3114	2717	3323	2926	0	0	0	0	0	0	0	0	3217	2827
AM Peak Vol.	-	-	220	269	264	277	-	-	-	-	-	-	-	-	240	262
PM Peak Vol.	-	-	12:00	17:00	15:00	16:00	-	-	-	-	-	-	-	-	15:00	17:00
Comb. Total	0	0	5831	6249	6249	6044	0	0	0	0	0	0	0	6044	6044	

Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street

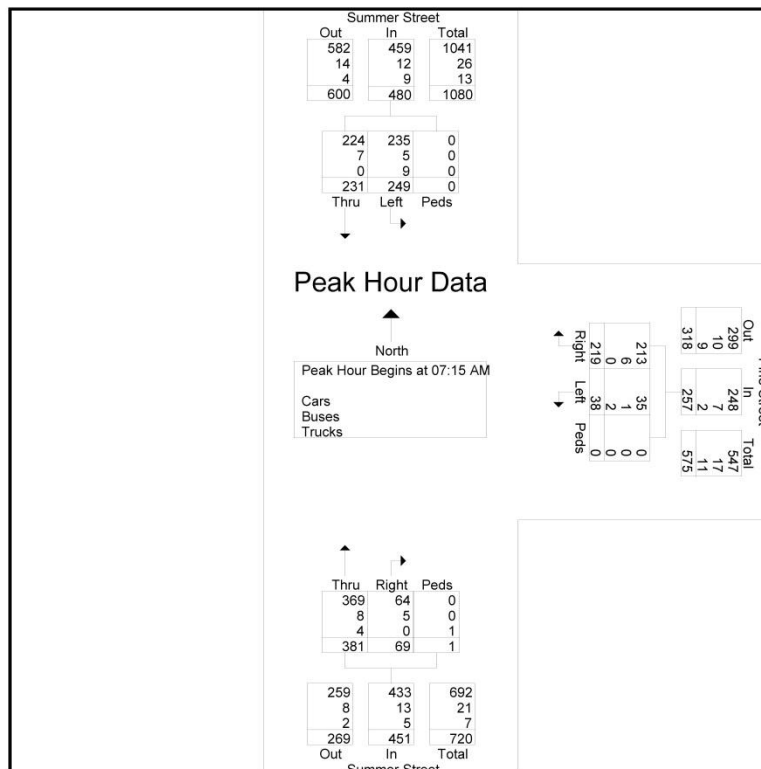
Old Colony Planning Council *Final Report*



Community: Brockton
 Weather: Clear
 Board # & Staff: TDC-8 (2) / KM
 Traffic Control: Stop Sign

File Name : Summer Street & Pine Street_AM
 Site Code : 44
 Start Date : 4/12/2018
 Page No : 4

Start Time	Summer Street Southbound				Pine Street Westbound				Summer Street Northbound				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	51	52	0	103	47	4	0	51	20	106	0	126	280
07:30 AM	58	54	0	112	66	12	0	78	20	99	0	119	309
07:45 AM	63	71	0	134	60	11	0	71	12	74	1	87	292
08:00 AM	59	72	0	131	46	11	0	57	17	102	0	119	307
Total Volume	231	249	0	480	219	38	0	257	69	381	1	451	1188
% App. Total	48.1	51.9	0		85.2	14.8	0		15.3	84.5	0.2		
PHF	.917	.865	.000	.896	.830	.792	.000	.824	.863	.899	.250	.895	.961
Cars	224	235	0	459	213	35	0	248	64	369	0	433	1140
% Cars	97.0	94.4	0	95.6	97.3	92.1	0	96.5	92.8	96.9	0	96.0	96.0
Buses	7	5	0	12	6	1	0	7	5	8	0	13	32
% Buses	3.0	2.0	0	2.5	2.7	2.6	0	2.7	7.2	2.1	0	2.9	2.7
Trucks	0	9	0	9	0	2	0	2	0	4	1	5	16
% Trucks	0	3.6	0	1.9	0	5.3	0	0.8	0	1.0	100	1.1	1.3



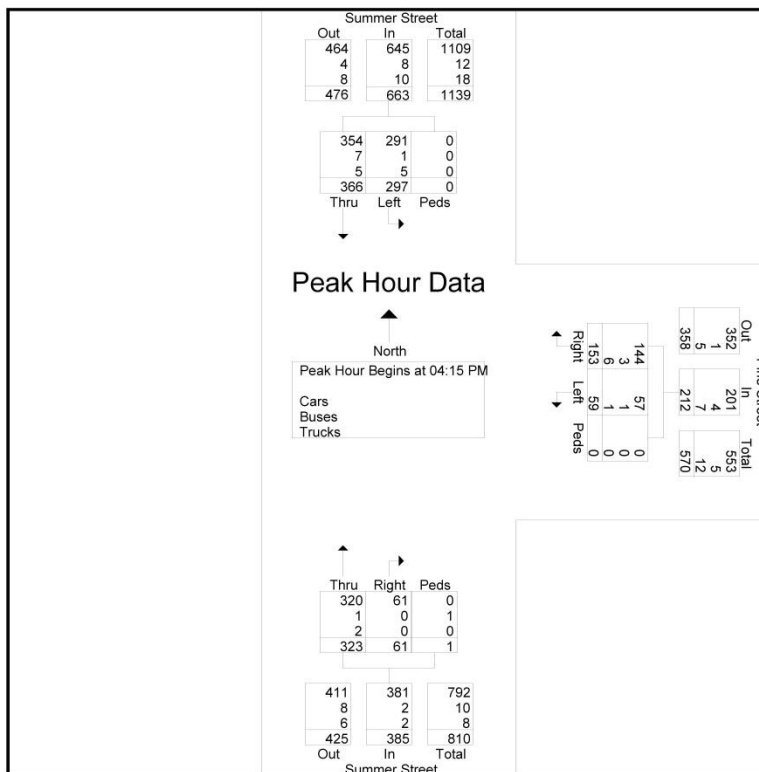
Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street
 Old Colony Planning Council *Final Report*



Community: Brockton
 Weather: Light Rain
 Board # & Staff: TDC-8 (2) / KM
 Traffic Control: Stop Sign

File Name : Summer Street & Pine Street_PM
 Site Code : 44
 Start Date : 4/10/2018
 Page No : 4

Start Time	Summer Street Southbound				Pine Street Westbound				Summer Street Northbound				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	88	68	0	156	32	14	0	46	15	78	1	94	296
04:30 PM	77	77	0	154	36	11	0	47	13	94	0	107	308
04:45 PM	106	76	0	182	35	20	0	55	15	71	0	86	323
05:00 PM	95	76	0	171	50	14	0	64	18	80	0	98	333
Total Volume	366	297	0	663	153	59	0	212	61	323	1	385	1260
% App. Total	55.2	44.8	0		72.2	27.8	0		15.8	83.9	0.3		
PHF	.863	.964	.000	.911	.765	.738	.000	.828	.847	.859	.250	.900	.946
Cars	354	291	0	645	144	57	0	201	61	320	0	381	1227
% Cars	96.7	98.0	0	97.3	94.1	96.6	0	94.8	100	99.1	0	99.0	97.4
Buses	7	1	0	8	3	1	0	4	0	1	1	2	14
% Buses	1.9	0.3	0	1.2	2.0	1.7	0	1.9	0	0.3	100	0.5	1.1
Trucks	5	5	0	10	6	1	0	7	0	2	0	2	19
% Trucks	1.4	1.7	0	1.5	3.9	1.7	0	3.3	0	0.6	0	0.5	1.5



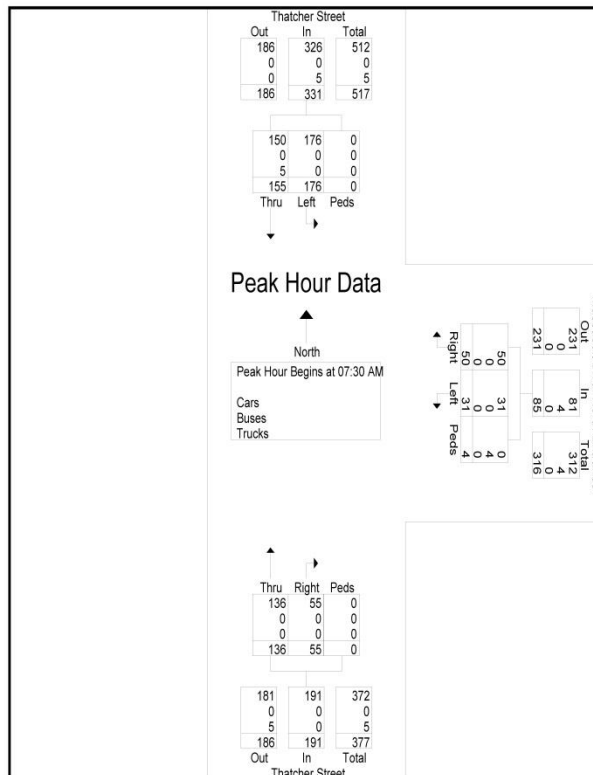
Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street
 Old Colony Planning Council *Final Report*



Community: Brockton
 Weather: Clear
 Board # & Staff: DB-400 (6) / PC
 Traffic Control: Stop Sign

File Name : Thatcher Street & Massasoit Boulevard_North Entrance_AM
 Site Code : 44
 Start Date : 4/12/2018
 Page No : 4

Start Time	Thatcher Street Southbound				Massasoit Blvd. North Entrance Westbound				Thatcher Street Northbound				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	33	34	0	67	13	6	0	19	16	42	0	58	144
07:45 AM	56	57	0	113	18	9	3	30	22	30	0	52	195
08:00 AM	35	61	0	96	9	4	1	14	10	28	0	38	148
08:15 AM	31	24	0	55	10	12	0	22	7	36	0	43	120
Total Volume	155	176	0	331	50	31	4	85	55	136	0	191	607
% App. Total	46.8	53.2	0		58.8	36.5	4.7		28.8	71.2	0		
PHF	.692	.721	.000	.732	.694	.646	.333	.708	.625	.810	.000	.823	.778
Cars	150	176	0	326	50	31	0	81	55	136	0	191	598
% Cars	96.8	100	0	98.5	100	100	0	95.3	100	100	0	100	98.5
Buses	0	0	0	0	0	0	4	4	0	0	0	0	4
% Buses	0	0	0	0	0	0	100	4.7	0	0	0	0	0.7
Trucks	5	0	0	5	0	0	0	0	0	0	0	0	5
% Trucks	3.2	0	0	1.5	0	0	0	0	0	0	0	0	0.8



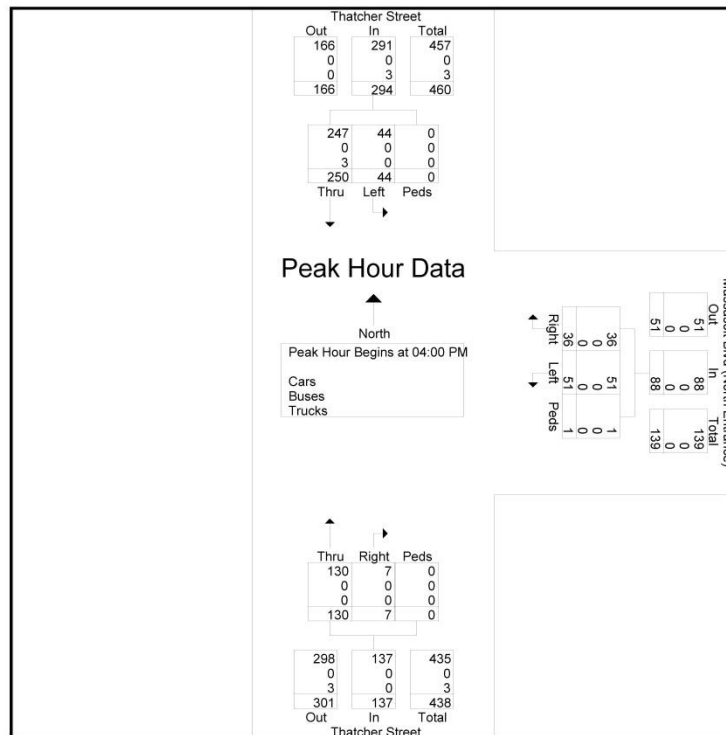
Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street
 Old Colony Planning Council *Final Report*



Community: Brockton
 Weather: Clear
 Board # & Staff: DB-400 (6) / PC
 Traffic Control: Stop Sign

File Name : Thatcher Street & Massasoit Boulevard_North Entrance_PM
 Site Code : 44
 Start Date : 4/12/2018
 Page No : 4

Start Time	Thatcher Street Southbound				Massasoit Blvd (North Entrance) Westbound				Thatcher Street Northbound				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	77	7	0	84	10	14	1	25	0	37	0	37	146
04:15 PM	61	11	0	72	9	8	0	17	3	28	0	31	120
04:30 PM	59	6	0	65	7	15	0	22	1	35	0	36	123
04:45 PM	53	20	0	73	10	14	0	24	3	30	0	33	130
Total Volume	250	44	0	294	36	51	1	88	7	130	0	137	519
% App. Total	85	15	0		40.9	58	1.1		5.1	94.9	0		
PHF	.812	.550	.000	.875	.900	.850	.250	.880	.583	.878	.000	.926	.889
Cars	247	44	0	291	36	51	1	88	7	130	0	137	516
% Cars	98.8	100	0	99.0	100	100	100	100	100	100	0	100	99.4
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Trucks	3	0	0	3	0	0	0	0	0	0	0	0	3
% Trucks	1.2	0	0	1.0	0	0	0	0	0	0	0	0	0.6



Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street
 Old Colony Planning Council *Final Report*



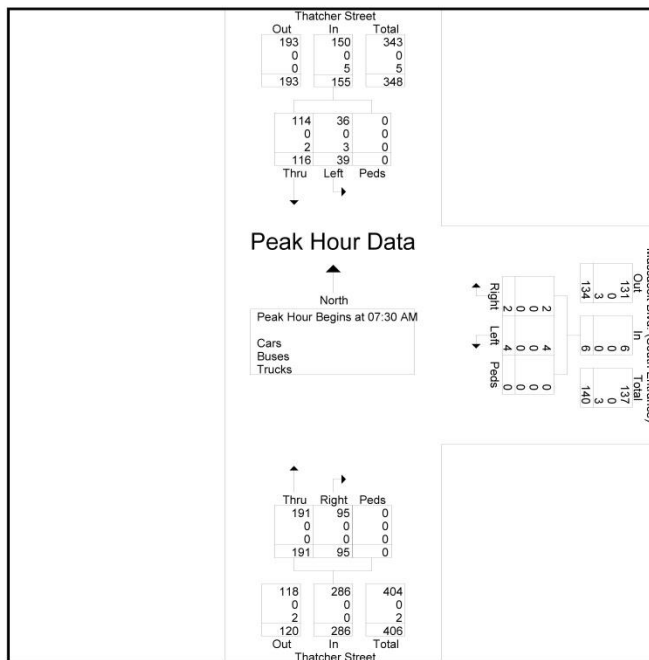
Old Colony Planning Council

70 School Street
 Brockton, MA 02301
 (508) 583-1833
 www.ocpcrpa.org

Community: Brockton
 Weather: Clear
 Board # & Staff: DB-400 (5) / JP
 Traffic Control: Stop Sign

File Name : Thatcher Street & Massasoit Boulevard_South Entrance_AM
 Site Code : 44
 Start Date : 4/12/2018
 Page No : 4

Start Time	Thatcher Street Southbound				Massasoit Blvd. (South Entrance) Westbound				Thatcher Street Northbound				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	29	4	0	33	1	1	0	2	28	58	0	86	121
07:45 AM	38	18	0	56	1	1	0	2	22	52	0	74	132
08:00 AM	29	6	0	35	0	0	0	0	13	38	0	51	86
08:15 AM	20	11	0	31	0	2	0	2	32	43	0	75	108
Total Volume	116	39	0	155	2	4	0	6	95	191	0	286	447
% App. Total	74.8	25.2	0		33.3	66.7	0		33.2	66.8	0		
PHF	.763	.542	.000	.692	.500	.500	.000	.750	.742	.823	.000	.831	.847
Cars	114	36	0	150	2	4	0	6	95	191	0	286	442
% Cars	98.3	92.3	0	96.8	100	100	0	100	100	100	0	100	98.9
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Trucks	2	3	0	5	0	0	0	0	0	0	0	0	5
% Trucks	1.7	7.7	0	3.2	0	0	0	0	0	0	0	0	1.1



Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street

Old Colony Planning Council *Final Report*



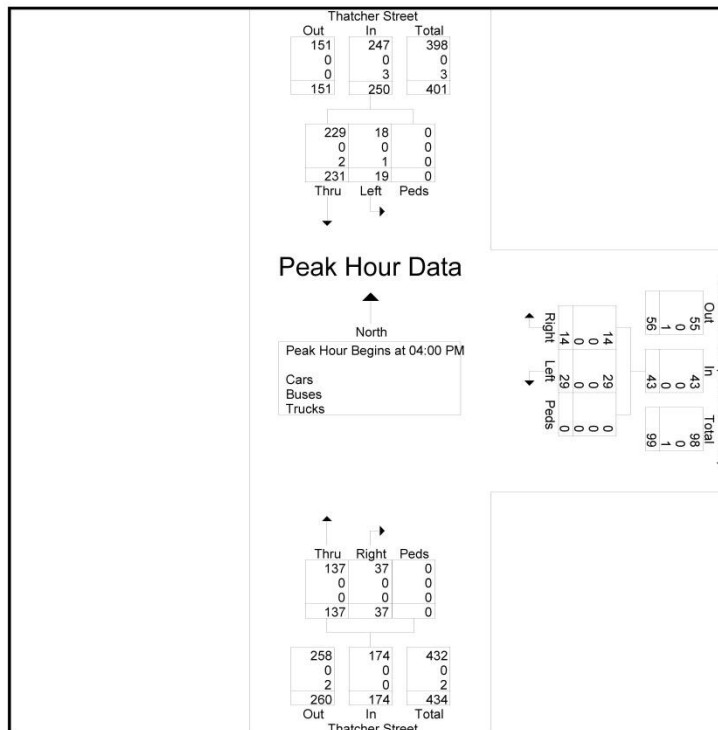
Old Colony Planning Council

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 Brockton, MA 02301
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Community: Brockton
 Weather: Clear
 Board # & Staff: DB-400 (5) / JP
 Traffic Control: Stop Sign

File Name : Thatcher Street & Massasoit Boulevard_South Entrance_PM
 Site Code : 44
 Start Date : 4/12/2018
 Page No : 4

Start Time	Thatcher Street Southbound				Massasoit Blvd (South Entrance) Westbound				Thatcher Street Northbound				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	70	7	0	77	5	10	0	15	7	37	0	44	136
04:15 PM	54	7	0	61	5	1	0	6	10	31	0	41	108
04:30 PM	57	2	0	59	2	10	0	12	8	36	0	44	115
04:45 PM	50	3	0	53	2	8	0	10	12	33	0	45	108
Total Volume	231	19	0	250	14	29	0	43	37	137	0	174	467
% App. Total	92.4	7.6	0		32.6	67.4	0		21.3	78.7	0		
PHF	.825	.679	.000	.812	.700	.725	.000	.717	.771	.926	.000	.967	.858
Cars	229	18	0	247	14	29	0	43	37	137	0	174	464
% Cars	99.1	94.7	0	98.8	100	100	0	100	100	100	0	100	99.4
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Trucks	2	1	0	3	0	0	0	0	0	0	0	0	3
% Trucks	0.9	5.3	0	1.2	0	0	0	0	0	0	0	0	0.6



Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street

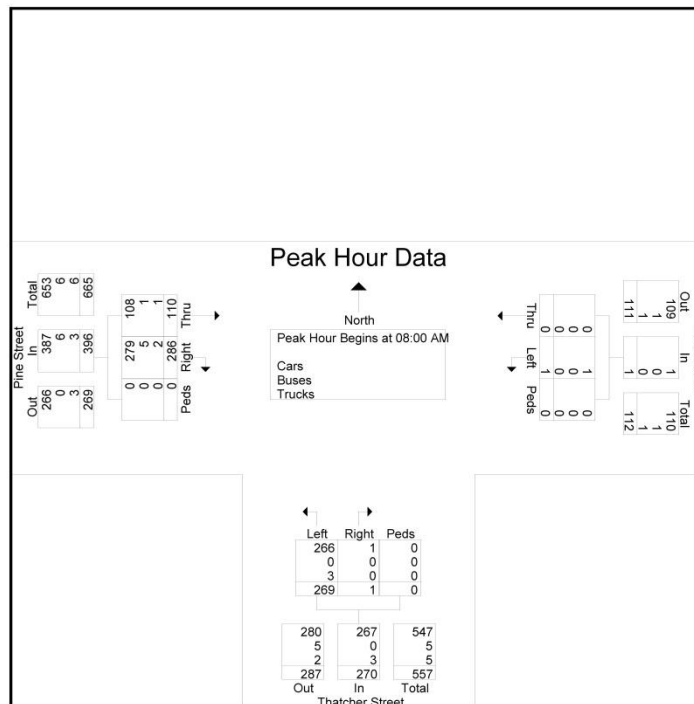
Old Colony Planning Council *Final Report*



Community: Brockton
 Weather: Clear
 Board # & Staff: DB_400 (3) / BH
 Traffic Control: Stop Sign

File Name : Thatcher Street & Pine Street_AM
 Site Code : 44
 Start Date : 4/11/2018
 Page No : 4

Start Time	Pine Street Westbound				Thatcher Street Northbound				Pine Street Eastbound				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	0	1	0	1	0	69	0	69	66	31	0	97	167
08:15 AM	0	0	0	0	0	57	0	57	43	15	0	58	115
08:30 AM	0	0	0	0	0	58	0	58	71	28	0	99	157
08:45 AM	0	0	0	0	1	85	0	86	106	36	0	142	228
Total Volume	0	1	0	1	1	269	0	270	286	110	0	396	667
% App. Total	0	100	0		0.4	99.6	0		72.2	27.8	0		
PHF	.000	.250	.000	.250	.250	.791	.000	.785	.675	.764	.000	.697	.731
Cars	0	1	0	1	1	266	0	267	279	108	0	387	655
% Cars	0	100	0	100	100	98.9	0	98.9	97.6	98.2	0	97.7	98.2
Buses	0	0	0	0	0	0	0	0	5	1	0	6	6
% Buses	0	0	0	0	0	0	0	0	1.7	0.9	0	1.5	0.9
Trucks	0	0	0	0	0	3	0	3	2	1	0	3	6
% Trucks	0	0	0	0	0	1.1	0	1.1	0.7	0.9	0	0.8	0.9



Road Safety Audit— Three Intersections: Thatcher Street at Massasoit Boulevard, Thatcher Street at Pine Street, and Pine Street at Summer Street
 Old Colony Planning Council *Final Report*

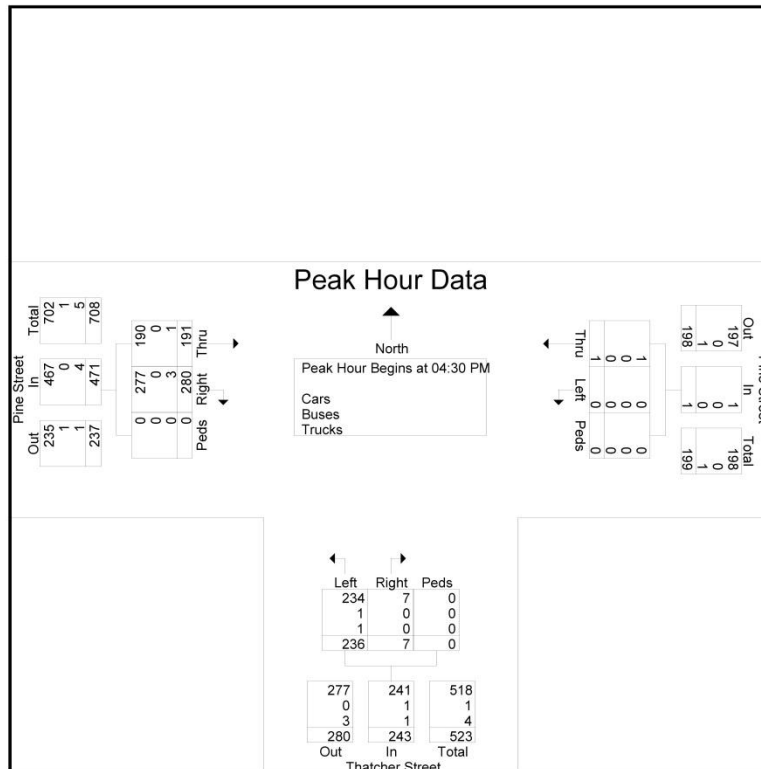


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Community: Brockton
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 Board # & Staff: DB-400 (3) / BH
 Traffic Control: Stop Sign

File Name : Thatcher Street & Pine Street_PM
 Site Code : 44
 Start Date : 4/11/2018
 Page No : 4

Start Time	Pine Street Westbound				Thatcher Street Northbound				Pine Street Eastbound				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	0	0	0	0	1	54	0	55	68	56	0	124	179
04:45 PM	0	0	0	0	2	65	0	67	68	48	0	116	183
05:00 PM	0	0	0	0	1	63	0	64	63	40	0	103	167
05:15 PM	1	0	0	1	3	54	0	57	81	47	0	128	186
Total Volume	1	0	0	1	7	236	0	243	280	191	0	471	715
% App. Total	100	0	0		2.9	97.1	0		59.4	40.6	0		
PHF	.250	.000	.000	.250	.583	.908	.000	.907	.864	.853	.000	.920	.961
Cars	1	0	0	1	7	234	0	241	277	190	0	467	709
% Cars	100	0	0	100	100	99.2	0	99.2	98.9	99.5	0	99.2	99.2
Buses	0	0	0	0	0	1	0	1	0	0	0	0	1
% Buses	0	0	0	0	0	0.4	0	0.4	0	0	0	0	0.1
Trucks	0	0	0	0	0	1	0	1	3	1	0	4	5
% Trucks	0	0	0	0	0	0.4	0	0.4	1.1	0.5	0	0.8	0.7



Warrants Summary Report

1: Pine at Thatcher

Intersection Information

	Major Street	Minor Street
Street Name	Pine Street	Thatcher Street
Direction	EB	WB/NB
Number of Lane	1	1
Approach Speed	30	35

Warrant	Met?	Notes
Warrant 1, Eight-Hour Vehicular Volume		
	No	
Condition A or B Met	No	0 Hours met (8 required)
Condition A and B Met	No	0 Hours met (8 required)
Warrant 2, Four-Hour Vehicular Volume		
	No	0 Hours met (4 required)
Warrant 3, Peak Hour		
	No	
Condition A Met?	No	0 Hours met (1 required)
Condition B Met?	No	0 Hours met (1 required)
Warrant 4, Pedestrian Volume		
	No	
Condition A Met?	No	0 Hours met (4 required)
Condition B Met?	No	0 Hours met (1 required)
Warrant 5, School Crossing		
	No	

Warrants Summary Report		
1: Summer at Pine		
Intersection Information		
	Major Street	Minor Street
Street Name	Summer Street	Pine Street
Direction	NB/SB	WB
Number of Lane:	1	1
Approach Speed	35	35
Warrant	Met?	Notes
Warrant 1, Eight-Hour Vehicular Volume		
	Yes	
Condition A or B Met	Yes	11 Hours met (8 required)
Condition A and B Met	Yes	13 Hours met (8 required)
Warrant 2, Four-Hour Vehicular Volume		
	Yes	11 Hours met (4 required)
Warrant 3, Peak Hour		
	Yes	
Condition A Met?	No	0 Hours met (1 required)
Condition B Met?	Yes	2 Hours met (1 required)
Warrant 4, Pedestrian Volume		
	No	
Condition A Met?	No	0 Hours met (4 required)
Condition B Met?	No	0 Hours met (1 required)
Warrant 5, School Crossing		
	No	

Warrants Summary Report

1: Thatcher @ Massasoit

Intersection Information:

	Major Street	Minor Street
Street Name	Thatcher Street	Massasoit
Direction	NB/SB	WB
Number of Lane:	1	1
Approach Speed	35	30

Warrant	Met?	Notes
Warrant 1, Eight-Hour Vehicular Volume		
	Yes	
Condition A or B Met?	Yes	8 Hours met (8 required)
Condition A and B Met?	No	4 Hours met (8 required)
Warrant 2, Four-Hour Vehicular Volume		
	Yes	9 Hours met (4 required)
Warrant 3, Peak Hour		
	No	
Condition A Met?	No	0 Hours met (1 required)
Condition B Met?	No	0 Hours met (1 required)
Warrant 4, Pedestrian Volume		
	No	
Condition A Met?	No	0 Hours met (4 required)
Condition B Met?	No	0 Hours met (1 required)
Warrant 5, School Crossing		
	No	

Appendix E. Road Safety Audit References

Road Safety Audit References

FHWA Office of Safety - Proven Safety Countermeasures, U.S. Department of Transportation, Federal Highway Administration <https://safety.fhwa.dot.gov/provencountermeasures/>.

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Road Safety Audits. ITE Technical Council Committee 4S-7. Institute of Transportation Engineers, February 1995.