

ROAD SAFETY AUDIT

Route 28 at Chickatawbut Road

Town of Milton

November 14, 2016

Prepared For:
MassDOT



Prepared By:
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11 Beacon Street, Boston, MA



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Background

Howard Stein Hudson (HSH) is assisting MassDOT District 6 with Road Safety Audits (RSA's) at high crash locations in District 6. The intersection of Route 28/Chickatawbut Road is a high crash location, with an Equivalent Property Damage Only (EPDO) score of 157 from 2012-2014, including 25 injury crashes and one fatal crash. The intersection was also listed at #31 on the list of the 2012-2014 Statewide Top 200 Crash Locations.

Project Data

The Road Safety Audit was conducted on Monday, November 14, 2016, at 10:00 a.m. at the Norman Smith Environmental Education Center. Table 1 shows the participating members of the audit.

Crash data was compiled at the intersection for the time period from 2012-2015. During this period, 60 crashes occurred at the intersection, including 34 crashes (or 57%) that resulted in personal injury and one fatal crash. Of the 60 crashes, 37 (or 62%) were angle crashes; 12 (or 20%) were rear-end crashes, five (8%) were sideswipe crashes, four (or 7%) were head-on crashes, and two (3%) were single-vehicle crashes. Most crashes occurred during the morning or evening peak periods, with 32% of crashes occurring between 6:00-10:00 a.m. and 29% of crashes occurring between 4:00-8:00 p.m. One crash involved a bicyclist. No crashes involving pedestrians were reported.

Table 1: Participating Audit Team Members

Audit Team Member	Agency/Affiliation
Mark Alba	Milton Police Department
Jack Grant	Milton Fire Department
William Clark	Town of Milton
Chris Trudel	Town of Milton
John Thompson	Town of Milton
Karl Pastore	DCR
Chenyuan Wang	CTPS
David Loutzenheiser	MAPC
Judy Jacobs	Friends of the Blue Hills
Norman Smith	Mass Audubon
Saleema Mohamed	MassDOT District 6
Hameed Pervez	MassDOT District 6
Zachary Veaner	MassDOT District 6
Courtney Dwyer	MassDOT District 6
Elsa Chan	MassDOT Traffic Safety
Kush Bhagat	MassDOT Traffic Safety
Connor Keating	MassDOT Traffic Safety
Jessica Lizza	Howard Stein Hudson
Mike Tremblay	Howard Stein Hudson

Project Location and Description

Chickatawbut Road is classified by MassDOT as an urban minor arterial and is under the jurisdiction of the Department of Conservation and Recreation (DCR). Chickatawbut Road runs east-west between Granite Street in Braintree to the east and Unquity Road to the west. Chickatawbut Road generally runs with one travel lane in each direction. Sidewalks are not provided, and though shoulders are provided, they are typically too narrow to be considered dedicated bicycle accommodations. Chickatawbut Road has a posted speed limit of 30 mph.

Chickatawbut Road runs through the Blue Hills Reservation, and thus has few cross streets or driveways aside from trail entrances, lookout points, and Reservation-related sites, such as the Norman Smith Environmental Education Center. Signage indicates that the segment of the roadway between Route 28 and Granite Street closes at night between 8:00 p.m. and 7:00 a.m.; however, RSA attendees stated that the roadway now stays open throughout the night. The same segment is closed on Sundays during the summer, and closes for several days in late autumn for controlled deer hunts.

Randolph Avenue runs north-south between Adams Street to the north and the I-93 interchange and the Blue Hill River in Randolph to the south, where it becomes North Main Street. It is also state **Route 28** between Reedsdale Road to the north and the I-93 interchange to the south. Randolph Avenue is classified by MassDOT as an urban principal arterial under the jurisdiction of MassDOT. It generally runs with two travel lanes in each direction north of Chickatawbut Road, and with one travel lane in each direction south of Chickatawbut Road. Sidewalks are provided along both sides of the roadway north of Chickatawbut Road, but are not provided on either side of the roadway south of Chickatawbut Road. Dedicated bicycle accommodations are not provided north of Chickatawbut Road. An approximately 7-foot shoulder is provided on each side of Randolph Avenue south of Chickatawbut Road, which ends at the Milton Town Line about 500 feet south of the intersection. Randolph Avenue has a posted speed limit of 40 mph approaching the study area intersection. It is posted at 50 mph south of the intersection. The Massachusetts Bay Transportation Authority (MBTA) #240 bus, which runs between the Avon Town Line and Ashmont Station, runs along Randolph Avenue, and the Brockton Area Transit (BAT) #12 bus, which runs between Ashmont Station and the Brockton MBTA Commuter Rail station, also runs along Randolph Avenue. This report will refer to Randolph Avenue in the vicinity of the study area as **Route 28**.

The intersection of **Route 28/Chickatawbut Road** is a four-legged intersection with four approaches. The Chickatawbut Road eastbound and westbound approaches each consists of a single travel lane. The Route 28 northbound and southbound approaches each consists of two travel lanes, which function as a shared left-turn/through lane and a shared through/right-turn lane. The Route 28 northbound approach receives a leading protected left-turn phase during the morning peak period, while the southbound approach receives a leading protected left-turn phase in the evening peak period. Crosswalks and pedestrian indications are provided across all legs of the intersection. Pedestrian ramps are provided at each corner of the intersection, although sidewalks are only provided along Route 28 north of the intersection.



Figure 1. *Study Area Intersection*



Audit Observations and Potential Safety Enhancements

The following sections will identify the safety issues at the intersection of Route 28/Chickatawbut Road and the possible potential safety enhancements discussed during the audit.

Safety Issue #1: Traffic Signal

Issues

Of the 60 crashes reported at the intersection from 2012-2015, 41 of the crashes, or 68%, involved left-turning vehicles from Route 28 northbound or southbound and through vehicles from the opposite direction. Thirty crashes involved northbound through vehicles and southbound left turning vehicles,



while 11 crashes involved northbound left-turn vehicles and southbound through vehicles. Of the 41 crashes, 25 resulted in personal injury. Additionally, one single-vehicle crash occurred on Route 28 southbound as a southbound through vehicle swerved to avoid a northbound left-turning vehicle. The phasing at the intersection includes a leading left-turn phase for the peak direction, and no left-turn phase for the off-peak direction. Route 28 northbound receives a leading left-turn phase during the morning peak period, while the southbound direction receives a leading left-turn phase during the evening peak period. All left turns in the off-peak direction are permissive. Motorists that are unfamiliar with the intersection may expect a protected left turn phase to appear both northbound and southbound, causing confusion, red light running, and dangerous permissive movements when the protected phase does not appear.

Route 28 northbound receives a leading dedicated left-turn phase during the morning peak period, while Route 28 southbound receives the left-turn phase during the evening peak period.

Permissive left turns at the intersection are made against two lanes of oncoming traffic. Southbound permissive left turns must wait for a gap in northbound traffic that is traveling on a downgrade after traveling through a 50 mph zone with few intersections and often is traveling faster than the posted 40 mph speed limit. The vertical curve south of the intersection also makes it difficult for southbound motorists to judge the speed of oncoming traffic. It is difficult to see oncoming traffic from Route 28 northbound while waiting to turn left from Route 28 southbound, which may cause some crashes as well as congestion as motorists wait until the signal turns red to complete their left turn.

In addition to the 30 crashes involving southbound left-turning vehicles, four rear-end crashes, all of which resulted in personal injury, occurred along the Route 28 southbound approach to the intersection, which may have been the result of left-turning vehicles stopping short as they attempt to find an acceptable gap in traffic. Similarly, seven rear-end crashes on the Route 28 northbound approach to the intersection, which may have occurred due to left-turning vehicles stopping short for oncoming traffic, made more frequent due to the downgrade of the northbound approach. RSA attendees also noted that solar glare may affect the vision of southbound motorists. These crashes, plus one northbound sideswipe

crash, also may have occurred as a motorist attempted to shift lanes to avoid a turning vehicle stopped in the left travel lane.

A “(Red) Signal Ahead” (W3-3 mod) sign is posted on a mast arm approximately 500 feet south of the intersection on Route 28 northbound. The sign is illuminated, with the “Red” text illuminated only when the Route 28 northbound signal is yellow or red. During the RSA, the lights that illuminated the sign were out, making the sign extremely difficult to read. The fatal single-vehicle crash involving a northbound vehicle, which occurred at 1:49 a.m., may have occurred because the motorist did not expect a traffic signal on Route 28 southbound, just downstream of a 50 mph zone of the roadway.

During the audit, it appeared that emergency vehicle preemption was not functioning. RSA attendees noted that “Left Turn Yield on Green” (R10-12) signage may be blocking the receiver.

Potential Enhancements:

1. Consider designating the left lanes on both Route 28 northbound and southbound as left-turn-only lanes and limiting left turns at the intersection to protected left turns only to reduce the number of crashes involving northbound or southbound left-turning vehicles and associated rear-end crashes. Consider the impact to operations at the intersection, taking into account that the left lane may already operate as a de facto left-turn lane. Consider that this enhancement may lead to more cut-through traffic on Chickatawbut Road. Also consider that both approaches should be merged into a single travel lane upstream of the intersection so that motorists do not find themselves unexpectedly trapped in left-turn lanes.
2. Consider converting one Route 28 southbound receiving lane into a Route 28 northbound left-turn pocket, while designating the left travel lane on Route 28 southbound as a left-turn lane. This enhancement would make Route 28 northbound permissive left turns easier, as these motorists would only need to determine an acceptable gap in one lane of oncoming traffic, while maintaining two northbound through lanes. Southbound left turning vehicles would also have a better view of oncoming northbound through vehicles. Consider impacts to northbound operations.
3. Consider the safety benefits of widening the Route 28 northbound and southbound approaches to the intersection to include exclusive left-turn lanes while maintaining two through lanes. The left-turn lanes should be aligned to allow for simultaneous protected left-turn signal phases from each direction. Consider the potential negative impacts of widening, which may include increased travel speeds during off-peak periods, longer pedestrian crossing distance, and impacts to the Blue Hills Reservation.
4. If left-turn lanes are implemented on the Route 28 northbound and/or southbound approaches, consider installing a flashing left arrow indication for vehicles in the left-turn lane(s) so that vehicles turning left know whether or not they must yield the right of way to oncoming traffic.
5. Consider implementing lead-lag left-turn phasing at the intersection to allow both Route 28 northbound and southbound to receive protected left turn phases.
6. Replace the missing lights in the (Red) Signal Ahead sign on Route 28 northbound, and consider replacing the sign with an upgraded sign with LED lights for added visibility and durability. Consider providing a (Red) Signal Ahead sign on Route 28 southbound.

7. Ensure that emergency vehicle preemption is functional at the intersection. If necessary, relocate the “Left Turn Yield on Green” sign to elsewhere on the mast arm so that it does not inhibit the preemption receiver. Ensure that future signage on the mast arm does not inhibit the receiver.
8. Consider equipping traffic signal indications with retroreflective backplates for added visibility at night and during periods where solar glare may affect motorists’ view of signal indications.

Safety Issue #2: Congestion and Driver Frustration

According to RSA team members and observations during the RSA, there is a significant amount of red light running at the intersection, particularly on Route 28 northbound and southbound. This is likely due to the amount of congestion that is common at the intersection and the surrounding area during peak periods. RSA attendees stated that vehicles avoiding I-93 often use Route 28 as a cut-through, and that traffic volumes and queues have grown considerably over the past 10 years. Motorists may use Route 28 to bypass I-93 entirely, or use Chickatawbut Road and Route 28 to avoid the split between I-93 and Route 3 in Braintree, which is often a source of considerable congestion. Chickatawbut Road also connects to I-93 at Route 138, just east of the I-93/I-95 interchange. The use of Chickatawbut Road as a cut-through creates a demand for left turns from Route 28

southbound and from Chickatawbut Road westbound that would likely not otherwise occur onto a roadway that has few commercial or industrial destinations. Red light running crashes may also be an indication that motorists do not have enough time to stop for a yellow light as they approach the intersection, that the all-red phase is not long enough to clear vehicles through the intersection after entering, or that vehicles are speeding as they approach the intersection. Three crashes were reported involving vehicles that ran a red light, including a crash involving a bicyclist.

RSA attendees stated that traffic also uses local roadways to cut through Route 28 traffic. The neighborhood to the northwest of the intersection has reported additional traffic in recent years that appears to be avoiding Route 28 rather than stopping in the neighborhood.

Potential Enhancements:

1. Consider restricting left turns onto Chickatawbut Road, either entirely or during peak hours only, to reduce cut-through traffic and the number of crashes involving left turns onto Chickatawbut Road. Consider the operational benefits of having two fully operational through lanes at the intersection without delays caused by left-turning vehicles. Also consider the potential impact on the regional transportation network.
2. Check yellow and all-red clearance intervals at the intersection to ensure that motorists have sufficient time to clear the intersection. Note that vehicles may be traveling slower than the 40 mph posted speed limit due to congestion at the intersection, which may require longer clearance intervals.
3. Consider placing speed feedback signs on Route 28 northbound and southbound to reduce speeding along the roadway.



Congestion along Route 28 northbound and southbound has grown considerably in the past 10 years, according to RSA attendees.

Safety Issue #3: Pedestrian Accommodations

The area south and east of the intersection consists of trails that are used actively as part of the Blue Hills Reservation. This includes a trail entrance and parking lot located in the southeast corner of the intersection. While pedestrian accommodations, including crosswalks, pedestrian signals, and curb ramps are provided at the intersection, the only continuous sidewalks are located north of the intersection. Sidewalks do not connect to the parking lot in the southeast corner of the intersection, forcing trail users to walk on the roadway if they wish to cross Route 28 to access another trail entrance. RSA attendees also noted that the existing Skyline Trail crossing, located about a mile south of the intersection across Route 28, which does not have a marked crosswalk or pedestrian signal to cross the roadway, may be relocated to the intersection of Route 28/Chickatawbut Road so that trail users would have a safe place to cross.



A parking area and trail entrance is located just southeast of the intersection, which generates pedestrian traffic across Route 28.

RSA attendees stated that there is insufficient time for pedestrians to cross during the exclusive pedestrian phase, particularly larger groups of hikers which often include children attending camp at the Norman Smith Environmental Education Center. Pedestrian countdown indications are not provided at the intersection.

In some locations, the transverse crosswalk markings are worn away by vehicle traffic, which may make them difficult for motorists to see.

Potential Enhancements:

1. Consider providing a sidewalk connecting the southwest corner of the intersection to the existing parking area and trail entrance to provide a safe connection between the trail entrance and destinations on the west side of the intersection.
2. Consider allotting more time to the “Walk” and “Flashing Don’t Walk” phases of the traffic signal to allow more time for larger groups and children to cross at the intersection. The “Walk” phase should be at least seven seconds, according to the *Manual on Uniform Traffic Control Devices (MUTCD)*, but additional walk time to accommodate larger groups of pedestrians should be considered. Consider a “Flashing Don’t Walk” phase of at least 19 seconds, which accommodates pedestrians walking at 3.0 feet per second.
3. Consider striping high-visibility continental crosswalks to improve motorist awareness of the potential presence of pedestrians at the intersection.
4. Consider providing countdown pedestrian indications at the intersection so that pedestrians know how much time they have to complete their crossing.
5. Consider adding video detection sensors to dynamically increase the length of the “Walk” phase when needed for larger groups.

Safety Issue #4: Signage and Pavement Markings

There are no lane use signs or pavement markings on Route 28 approaching the intersection to inform motorists that the left travel lane is a shared left/through lane. While this is typical for approaches with no dedicated turn lanes, rear-end and sideswipe crashes along the Route 28 northbound and southbound approaches indicate that motorists may not expect vehicles to be stopped in the left lane as they wait to make a left turn. Seven rear-end crashes and one sideswipe crash occurred along the Route 28 northbound approach, and four rear-end crashes occurred along the Route 28 southbound approach to the intersection.

RSA attendees noted that signage for Chickatawbut Road may not be visible to motorists approaching on Route 28, which may cause motorist confusion.



Lane use signage and pavement markings are not provided along the Route 28 northbound and southbound approaches.

Potential Enhancements:

1. Consider placing lane use signage in advance of the intersection on Route 28 northbound and southbound and on the mast arms at the intersection to alert motorists that both travel lanes may be used for turns and for through movements. Consider supplementing with pavement markings approaching the intersection.
2. Consider placing street name signage for Randolph Avenue and Chickatawbut Road on the mast arms so that they may be more easily seen by motorists.

Summary of Road Safety Audit

Table 2 below shows the estimated time frames of short-term, mid-term, and long-term solutions, as well as the cost ranges of low-cost, medium-cost, and high-cost projects. On the following pages, Table 3 provides an estimate of the time frame and cost of each potential safety issue that may address each of the identified safety issues. Safety payoff determinations are also provided, and are based on engineering judgment.

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

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Traffic Signal	Consider designating the left lanes on both Route 28 northbound and southbound as left-turn-only lanes and limiting left turns at the intersection to protected left turns only to reduce the number of crashes involving northbound or southbound left-turning vehicles and associated rear-end crashes. Consider the impact to operations at the intersection, taking into account that the left lane may already operate as a de facto left-turn lane. Consider that this enhancement may lead to more cut-through traffic on Chickatawbut Road. Also consider that both approaches should be merged into a single travel lane upstream of the intersection so that motorists do not find themselves unexpectedly trapped in left-turn lanes.	High	Short-term	Low	MassDOT
Traffic Signal	Consider converting one Route 28 southbound receiving lane into a Route 28 northbound left-turn pocket, while designating the left travel lane on Route 28 southbound as a left-turn lane. This enhancement would make Route 28 northbound permissive left turns easier, as these motorists would only need to determine an acceptable gap in one lane of oncoming traffic, while maintaining two northbound through lanes. Southbound left turning vehicles would also have a better view of oncoming northbound through vehicles. Consider impacts to northbound operations.	Medium	Mid-term	Medium	MassDOT
Traffic Signal	Consider the safety benefits of widening the Route 28 northbound and southbound approaches to the intersection to include exclusive left-turn lanes while maintaining two through lanes. The left-turn lanes should be aligned to allow for simultaneous protected left-turn signal phases from each direction. Consider the potential negative impacts of widening, which may include increased travel speeds during off-peak periods, longer pedestrian crossing distance, and impacts to the Blue Hills Reservation.	High	Mid-term	High	MassDOT
Traffic Signal	If left-turn lanes are implemented on the Route 28 northbound and/or southbound approaches, consider installing a flashing left arrow indication for vehicles in the left-turn lane(s) so that vehicles turning left know whether or not they must yield the right of way to oncoming traffic.	Medium	Short-term	Low	MassDOT

Table 3: Potential Safety Enhancement Summary (continued)

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Traffic Signal	Consider implementing lead-lag left-turn phasing at the intersection to allow both Route 28 northbound and southbound to receive protected left turn phases.	High	Short-term	Low	MassDOT
Traffic Signal	Replace the missing lights in the (Red) Signal Ahead sign on Route 28 northbound, and consider replacing the sign with an upgraded sign with LED lights for added visibility and durability. Consider providing a (Red) Signal Ahead sign on Route 28 southbound.	Low	Short-term	Low	MassDOT
Traffic Signal	Ensure that emergency vehicle preemption is functional at the intersection. If necessary, relocate the "Left Turn Yield on Green" sign to elsewhere on the mast arm so that it does not inhibit the preemption receiver. Ensure that future signage on the mast arm does not inhibit the receiver.	Low	Short-term	Low	MassDOT
Traffic Signal	Consider equipping traffic signal indications with retroreflective backplates for added visibility at night and during periods where solar glare may affect motorists' view of signal indications.	Low	Short-term	Low	MassDOT
Congestion and Driver Frustration	Consider restricting left turns onto Chickatawbut Road, either entirely or during peak hours only, to reduce cut-through traffic and the number of crashes involving left turns onto Chickatawbut Road. Consider the operational benefits of having two fully operational through lanes at the intersection without delays caused by left-turning vehicles. Also consider the potential impact on the regional transportation network.	High	Short-term	Low	MassDOT/Town of Milton/DCR
Congestion and Driver Frustration	Check yellow and all-red clearance intervals at the intersection to ensure that motorists have sufficient time to clear the intersection. Note that vehicles may be traveling slower than the 40 mph posted speed limit due to congestion at the intersection, which may require longer clearance intervals.	Low	Short-term	Low	MassDOT
Congestion and Driver Frustration	Consider placing speed feedback signs on Route 28 northbound and southbound to reduce speeding along the roadway.	Low	Short-term	Low	MassDOT

Table 3: Potential Safety Enhancement Summary (continued)

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Pedestrian Accommodations	Consider providing a sidewalk connecting the southwest corner of the intersection to the existing parking area and trail entrance to provide a safe connection between the trail entrance and destinations on the west side of the intersection.	Medium	Mid-term	Medium	DCR
Pedestrian Accommodations	Consider allotting more time to the “Walk” and “Flashing Don’t Walk” phases of the traffic signal to allow more time for larger groups and children to cross at the intersection. The “Walk” phase should be at least seven seconds, according to the Manual on Uniform Traffic Control Devices (MUTCD), but additional walk time to accommodate larger groups of pedestrians should be considered. Consider a “Flashing Don’t Walk” phase of at least 19 seconds, which accommodates pedestrians walking at 3.0 feet per second.	Medium	Short-term	Low	MassDOT
Pedestrian Accommodations	Consider striping high-visibility continental crosswalks to improve motorist awareness of the potential presence of pedestrians at the intersection.	Low	Short-term	Low	MassDOT
Pedestrian Accommodations	Consider providing countdown pedestrian indications at the intersection so that pedestrians know how much time they have to complete their crossing.	Medium	Short-term	Medium	MassDOT
Pedestrian Accommodations	Consider adding video detection sensors to dynamically increase the length of the “Walk” phase when needed for larger groups.	Medium	Mid-term	Medium	MassDOT
Signage and Pavement Markings	Consider placing lane use signage in advance of the intersection on Route 28 northbound and southbound and on the mast arms at the intersection to alert motorists that both travel lanes may be used for turns and for through movements. Consider supplementing with pavement markings approaching the intersection.	Low	Short-term	Low	MassDOT
Signage and Pavement Markings	Consider placing street name signage for Randolph Avenue and Chickatawbut Road on the mast arms so that they may be more easily seen by motorists.	Low	Short-term	Low	MassDOT

Appendix A. RSA Meeting Agenda

Agenda

Road Safety Audit

Milton, MA

Randolph Avenue (Route 28) / Chickatawbut Road

Meeting Location: Norman Smith Environmental Educational Center

Chickatawbut Road East of Route 28, Milton, MA

November 14, 2016

10:00 AM – 12:00 PM

Type of meeting:

High Crash Location – Road Safety Audit

Attendees:

Invited Participants to Comprise a Multidisciplinary Team

Please bring:

Thoughts and Enthusiasm!!

10:00 AM

Welcome and Introductions

10:15 AM

Discussion of Safety Issues

- Crash history, Speed Regulations – provided in advance
- Existing Geometries and Conditions

10:45 AM

Site Visit

- Drive to the intersections of Randolph Avenue (Route 28) and Chickatawbut Road
- As a group, identify areas for improvement

11:30 AM

Discussion of Potential Improvements

- Discuss observations and finalize safety issue areas
- Discuss potential improvements and finalize recommendations

12:00 PM

Adjourn for the Day – but the RSA has not ended

Instructions for Participants:

- Before attending the RSA on November 14, participants are encouraged to drive/walk 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. Participants are encouraged to come with thoughts and ideas, but are reminded that the synergy that develops and respect for others' opinions are key elements to the success of the overall RSA process.
- 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.

Appendix B. RSA Audit Team Contact List

Participating Audit Team Members

Date: Monday, November 14, 2016 Location: Norman Smith Environmental Education Center, Milton, MA

Audit Team Members	Agency/Affiliation	Email Address	Phone Number
Mark Alba	Milton Police Department	malba@mpdmilton.org	617-898-4814
Jack Grant	Milton Fire Department	jgrant@townofmilton.org	617-898-4904
William Clark	Town of Milton	wclark@townofmilton.org	617-898-4847
Chris Trudel	Town of Milton	ctrudel@townofmilton.org	617-898-4870
John Thompson	Town of Milton	jthompson@townofmilton.org	617-898-4869
Karl Pastore	DCR	karl.pastore@state.ma.us	508-866-2580
Chenyuan Wang	CTPS	cwang@ctps.org	857-702-3698
David Loutzenheiser	MAPC	dloutzenheiser@mapc.org	617-933-9743
Judy Jacobs	Friends of the Blue Hills	judy@friendsofthebluehills.org	508-238-6933
Norman Smith	Mass Audubon	nsmith@massaudubon.org	617-333-0690
Saleema Mohamed	MassDOT District 6	saleema.mohamed@dot.state.ma.us	508-988-5390
Hameed Pervez	MassDOT District 6	hameed.pervez@state.ma.us	857-468-6307
Zachary Veaner	MassDOT District 6	Zachary.veaner@dot.state.ma.us	857-368-6163
Courtney Dwyer	MassDOT District 6	Courtney.dwyer@dot.state.ma.us	857-368-6165
Elsa Chan	MassDOT Traffic Safety	elsa.chan@state.ma.us	857-368-9648
Kush Bhagat	MassDOT Traffic Safety	kush.bhagat@dot.state.ma.us	857-368-9652
Connor Keating	MassDOT Traffic Safety	connor.keating@dot.state.ma.us	
Jessica Lizza	Howard Stein Hudson	jlizza@hshassoc.com	617-348-3330
Mike Tremblay	Howard Stein Hudson	mtremblay@hshassoc.com	617-348-3347

Appendix C. Detailed Crash Data

COLLISION DIAGRAM

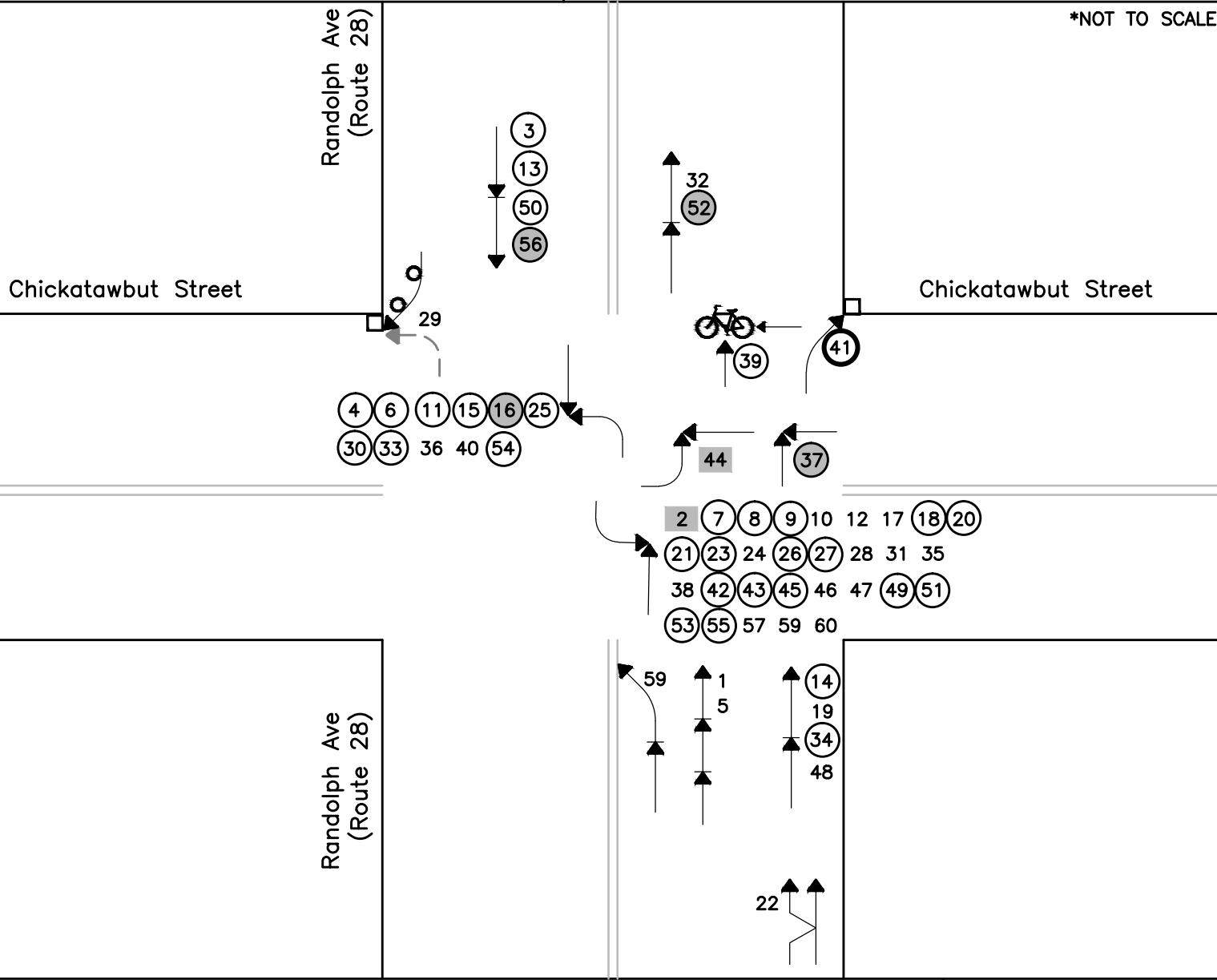
TIME PERIOD ANALYZED: 2012–2015

SOURCE OF CRASH REPORTS: STATE/LOCAL POLICE

DATE PREPARED: 8/12/2016

PREPARED BY: Jinkun Yuan

*NOT TO SCALE



SYMBOLS

TYPES OF CRASH

SEVERITY

- Moving Vehicle
- Backing Vehicle
- Non-Involved Vehicle

- Head on

#

- Involved Non-Involved

- Rear End

Injury

- Pedestrian

- Angle

Fatal

- Bicycle

- Turning Movement

#

- Animal

- Sideswipe

Property Damage Only

- Direction of Motion

- Out of Control

Only

- Parked Vehicle

- Night Time Crash

Only

- Fixed Object

- Night Time Crash

N

Crash Data Summary Table

Randolph Avenue (Route 28) at Chikatawbut Street, Milton, MA

2012-2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages			Comments
									Type	Type	Type	
			m/d/y						D1	D2	D3	
1	1/14/12	Saturday	11:34 AM	Rear-end	Daylight	Clear	Dry	Unknown	43	18	UNK	Unknown vehicle rear-ended MV 2 which caused it to crash into MV 1
2	4/20/12	Friday	9:28 PM	Angle	Dark - lighted roadway	Clear	Dry	Failed to yield right of way	26	38		
3	4/23/12	Monday	7:57 AM	Rear-end	Daylight	Rain	Wet	Inattention	42	26		MV 1 slid due to wet surface
4	6/5/12	Tuesday	8:43 AM	Angle	Daylight	Rain	Wet	Failed to yield right of way	25	53		
5	6/8/12	Friday	4:06 PM	Rear-end	Daylight	Cloudy	Dry	Unknown	UNK	UNK	UNK	
6	7/5/12	Thursday	5:41 PM	Sideswipe, opposite direction	Daylight	Clear	Dry	No Improper Driving	48	37		MV 2 did not see MV 1 while turning left
7	7/9/12	Monday	2:25 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	26	58		
8	7/15/12	Sunday	4:15 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	28	41		
9	7/22/12	Sunday	1:25 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	20	64		
10	8/30/12	Thursday	7:54 AM	Angle	Daylight	Clear	Dry	Unknown	25	23		MV 2 did not see MV 1 while turning left
11	9/6/12	Thursday	12:52 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	68	51		
12	10/12/12	Friday	9:38 AM	Angle	Daylight	Cloudy	Dry	Visibility Obstructed	20	36		Large box truck was in the intersection which blocked the visibility
13	10/15/12	Monday	2:33 PM	Rear-end	Daylight	Clear	Dry	No Improper Driving	37			
14	11/14/12	Wednesday	4:59 PM	Rear-end	Dark - lighted roadway	Clear	Dry	Inattention	54	72	39	MV 2 rear ended MV 1 and continue to drive and rear ended MV 3
15	12/9/12	Sunday	4:09 PM	Sideswipe, opposite direction	Daylight	Clear	Dry	No Improper Driving	73	38		
16	12/15/12	Saturday	10:09 PM	Angle	Dark - lighted roadway	Clear	Dry	Failed to yield right of way	35	48		
17	12/25/12	Tuesday	12:20 PM	Angle	Daylight	Snow	Wet	No Improper Driving	67	44		
18	1/29/13	Tuesday	11:26 AM	Angle	Daylight	Cloudy	Wet	Failed to yield right of way	50	50		
19	1/31/13	Thursday	8:46 AM	Rear-end	Daylight	Unknown	Wet	Followed too closely	66	28		
20	2/13/13	Wednesday	11:53 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	37	49		
21	5/15/13	Wednesday	7:30 AM	Angle	Daylight	Clear	Dry	Unknown	54	39		Operator of MV 1 states he has the "green left turn arrow", and MV 2 states he was trying to beat the light
22	5/21/13	Tuesday	8:37 AM	Sideswipe, same direction	Daylight	Clear	Dry	Failure to keep in proper lane or running off road	54	30		Misjudged the distance while changing lanes
23	6/6/13	Thursday	1:04 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	19	48		
24	7/7/13	Sunday	1:22 PM	Angle	Daylight	Clear	Dry	Unknown	33	60		MV 2 did not see MV 1 because there were 2 vehicles ahead of MV 1 and they all turned left and right
25	7/12/13	Friday	2:42 PM	Angle	Daylight	Cloudy	Dry	Failed to yield right of way	24	39		
26	8/2/13	Friday	11:41 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	23	28		
27	8/9/13	Friday	6:36 PM	Head on	Daylight	Clear	Dry	Unknown	20	24		MV 2 was turning left and did not see MV 1
28	8/16/13	Friday	11:17 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	43	23		
29	9/4/13	Wednesday	7:04 AM	Single Vehicle Crash	Daylight	Clear	Dry	Other improper action	34			Unknown vehicle cut off in front.
30	11/19/13	Tuesday	6:45 AM	Head on	Daylight	Clear	Dry	Unknown	61	22		
31	1/26/14	Sunday	4:58 PM	Head on	Dusk	Clear	Dry	Unknown	59	56		
32	3/27/14	Thursday	9:12 AM	Rear-end	Daylight	Clear	Dry	Unknown	31	34		
33	4/1/14	Tuesday	7:10 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	45	23		
34	4/3/14	Thursday	8:50 AM	Rear-end	Daylight	Clear	Dry	Followed too closely	UNK	44		
35	4/11/14	Friday	7:06 PM	Sideswipe, opposite direction	Dusk	Cloudy	Dry	Unknown	49	UNK		
36	4/22/14	Tuesday	3:41 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	36	19		
37	4/25/14	Friday	7:38 PM	Angle	Dusk	Clear	Dry	Unknown	29	52		Improper approach to emergency vehicle and ran red light
38	5/21/14	Wednesday	10:22 AM	Angle	Daylight	Clear	Dry	No Improper Driving	30	20		
39	5/24/14	Saturday	8:54 AM	Angle	Daylight	Cloudy	Dry	Disregarded traffic signs, signals, road markings	73	46		MV 1 ran red light (NB)
40	5/24/14	Saturday	4:55 PM	Angle	Daylight	Clear	Dry	Unknown	75	33		Both operator stated they have the right of way
41	5/31/14	Saturday	1:49 AM	Single Vehicle Crash	Dark - lighted roadway	Clear	Wet	Unknown	62			Fatal crash due to vehicle went off the road and hit the traffic control pole
42	6/13/14	Friday	6:21 AM	Angle	Daylight	Cloudy	Dry	Failed to yield right of way	33	65		
43	8/14/14	Thursday	7:01 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	48	34		MV 1 was traveling on the left lane of Route 28 N, and MV 3 was on the right lane of route 28 North, When MV slowed down, MV 2 which was behind MV 1 tried to move to the right lane to avoid rear end, but it ended up rear end MV 1 and sideswiped MV
44	11/14/14	Friday	6:17 PM	Angle	Dark - lighted roadway	Clear	Dry	No Improper Driving	80	17		Vehicle turning left did not see vehicle coming straight ahead
45	11/17/14	Monday	2:53 PM	Angle	Daylight	Rain	Wet	No Improper Driving	35	39		
46	12/14/14	Sunday	9:49 AM	Angle	Daylight	Cloudy	Dry	Failed to yield right of way	21	75		
47	12/17/14	Wednesday	9:46 AM	Angle	Daylight	Rain	Wet	No Improper Driving	56	64		
48	3/7/15	Saturday	1:16 PM	Sideswipe, same direction	Daylight	Clear	Dry	Unknown	28	42		
49	3/11/15	Wednesday	10:21 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	31	44		
50	4/21/15	Tuesday	4:55 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	48	34		
51	4/27/15	Monday	7:58 AM	Angle	Daylight	Cloudy	Dry	Unknown	53	36		

Crash Data Summary Table

Randolph Avenue (Route 28) at Chikatawbut Street, Milton, MA

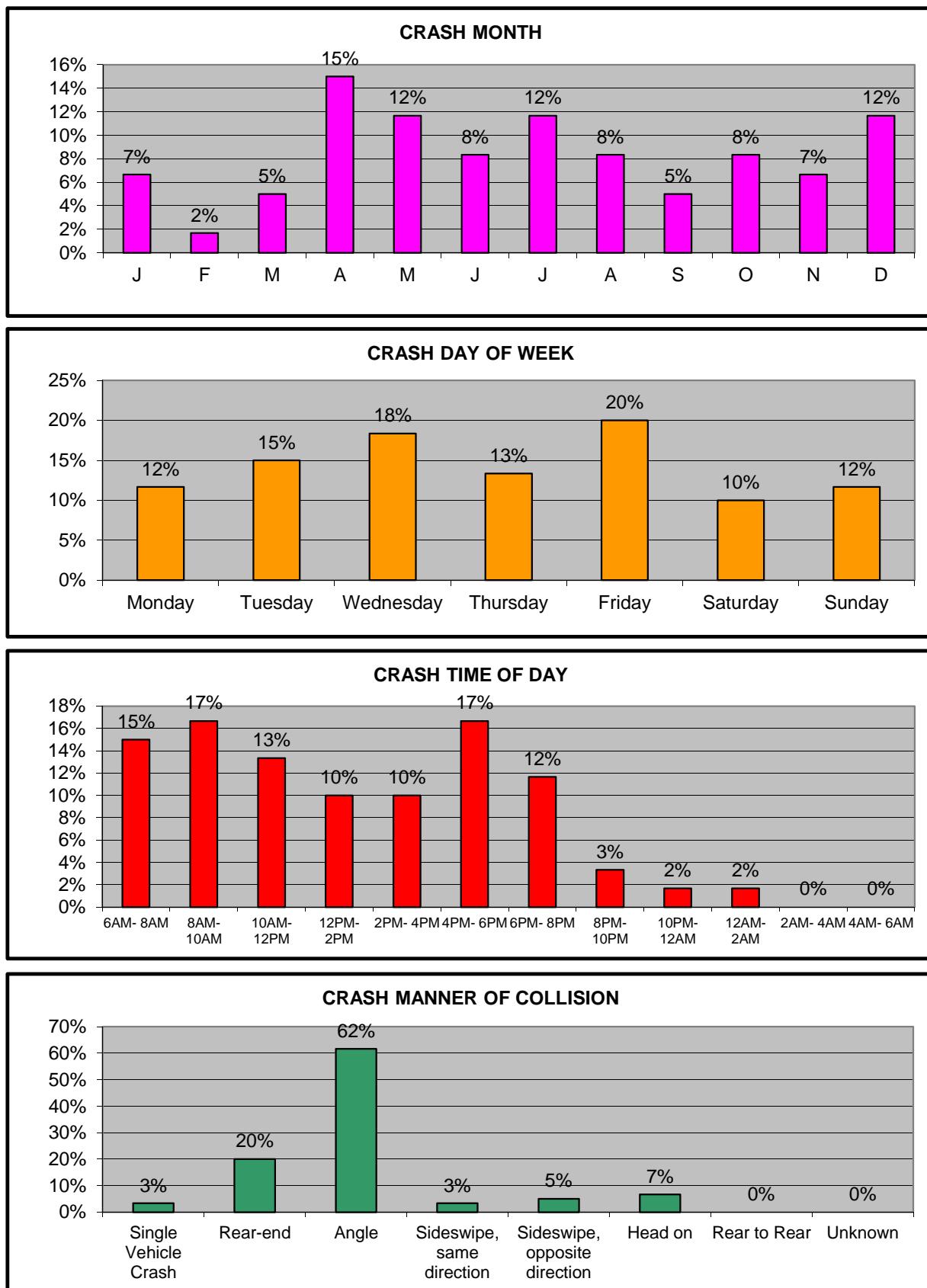
2012-2015

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Ages			Comments
									Type	Type	Type	
			m/d/y									
52	5/4/15	Monday	9:37 PM	Rear-end	Dark - lighted roadway	Clear	Dry	Unknown		27	22	
53	6/8/15	Monday	8:17 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way		30	44	
54	7/5/15	Sunday	4:31 PM	Angle	Daylight	Clear	Dry	Unknown		67	45	Both vehicles did not see each other
55	9/22/15	Tuesday	2:19 PM	Head on	Daylight	Cloudy	Dry	Failed to yield right of way		33	18	
56	10/7/15	Wednesday	6:23 PM	Rear-end	Dusk	Clear	Dry	Unknown		34	UNK	Hit and run
57	10/21/15	Wednesday	10:48 AM	Angle	Daylight	Rain	Wet	Failed to yield right of way		24	61	
58	10/28/15	Wednesday	7:02 PM	Rear-end	Dark - lighted roadway	Rain	Wet	Inattention		31	37	MV 1 making left turn
59	12/11/15	Friday	7:18 AM	Angle	Daylight	Cloudy	Wet	Failed to yield right of way		68	47	
60	12/16/15	Wednesday	4:45 PM	Angle	Dark - lighted roadway	Clear	Dry	No Improper Driving		27	29	

*Courtesy Crash - A term used to describe a crash that occurs subsequent to a non-involved mainline driver who gives the right of way, contrary to the rules of the road, to another driver.

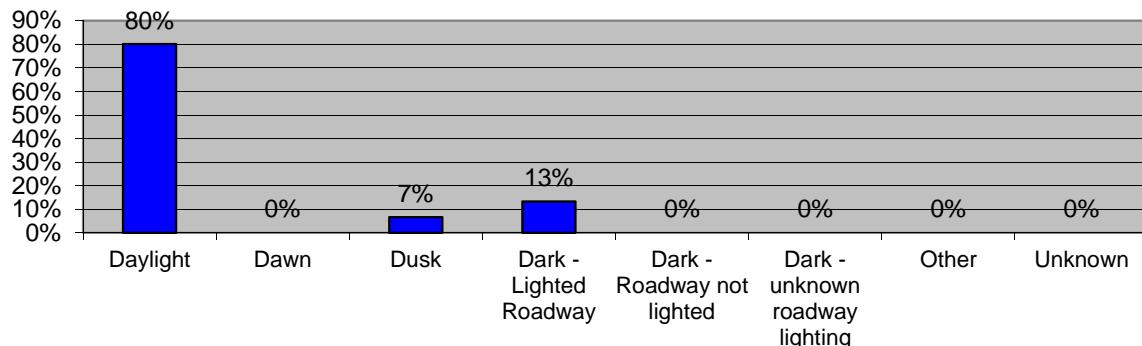
Summary based on Crash Reports obtained from the Milton Police and State Police.

Crash Data Summary Tables and Charts
 Randolph Avenue (Route 28) at Chikatawbut Street, Milton, MA

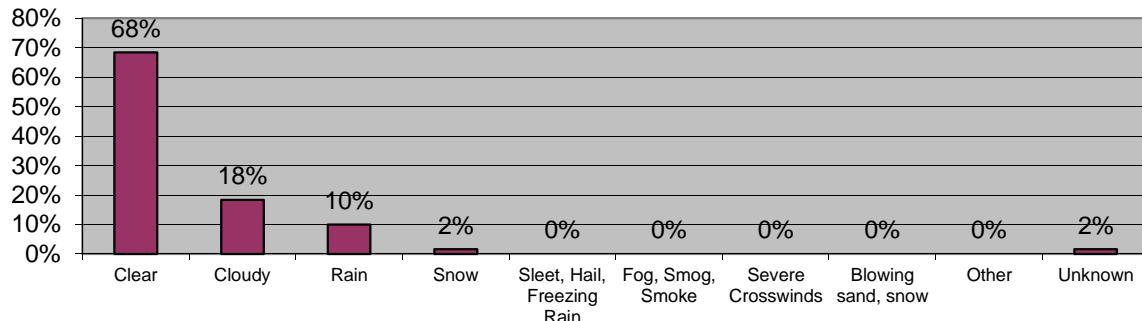


Crash Data Summary Tables and Charts
 Randolph Avenue (Route 28) at Chikatawbut Street, Milton, MA

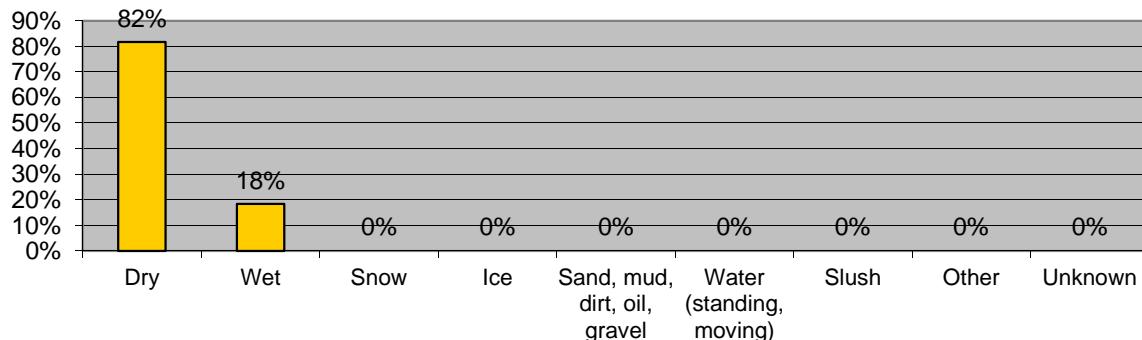
CRASH LIGHT CONDITION



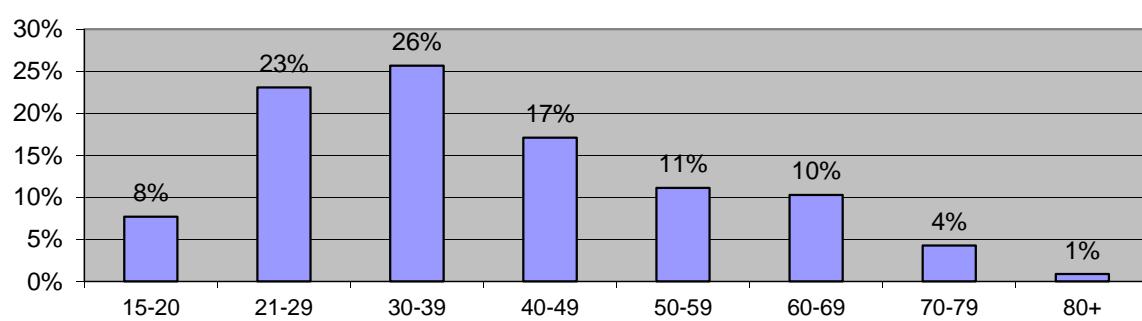
CRASH WEATHER CONDITION



CRASH ROAD SURFACE



CRASH DRIVER AGES



Appendix D. Additional Information

Accurate Counts
978-664-2565

Page 1

Location : Randolph Avenue NB

Location : @ #711

City/State: Milton, MA

Site Code: 16390NB1
1639VOLNB1

Start Time	Tue A.M.	25-Feb-14 P.M.	Wed A.M.	26-Feb-14 P.M.	Thu A.M.	27-Feb-14 P.M.	Daily Average A.M.	Daily Average P.M.
12:00	46	93	41	97	*	*	44	95
12:15	26	103	30	89	*	*	28	96
12:30	28	129	16	100	*	*	22	114
12:45	22	108	17	100	*	*	20	104
01:00	10	122	12	105	*	*	11	114
01:15	17	112	17	110	*	*	17	111
01:30	17	123	13	113	*	*	15	118
01:45	11	135	6	110	*	*	8	122
02:00	7	131	10	118	*	*	8	124
02:15	13	118	11	126	*	*	12	122
02:30	10	148	10	136	*	*	10	142
02:45	8	209	5	174	*	*	6	192
03:00	10	200	5	180	*	*	8	190
03:15	1	274	5	231	*	*	3	252
03:30	3	224	7	229	*	*	5	226
03:45	7	232	3	224	*	*	5	228
04:00	7	275	7	248	*	*	7	262
04:15	7	304	5	250	*	*	6	277
04:30	9	293	6	292	*	*	8	292
04:45	16	305	10	304	*	*	13	304
05:00	12	291	8	301	*	*	10	296
05:15	21	314	20	348	*	*	20	331
05:30	31	284	26	333	*	*	28	308
05:45	36	310	37	303	*	*	36	306
06:00	39	303	32	270	*	*	36	286
06:15	43	310	39	237	*	*	41	274
06:30	58	289	48	253	*	*	53	271
06:45	73	259	88	266	*	*	80	262
07:00	88	191	78	252	*	*	83	222
07:15	126	214	114	171	*	*	120	192
07:30	145	158	119	165	*	*	132	162
07:45	121	134	138	121	*	*	130	128
08:00	166	127	165	93	*	*	166	110
08:15	154	106	154	128	*	*	154	117
08:30	133	96	137	101	*	*	135	98
08:45	141	101	134	94	*	*	138	98
09:00	99	85	102	99	*	*	100	92
09:15	99	98	90	99	*	*	94	98
09:30	110	67	92	80	*	*	101	74
09:45	94	77	100	79	*	*	97	78
10:00	91	57	77	46	*	*	84	52
10:15	106	61	95	73	*	*	100	67
10:30	108	48	83	59	*	*	96	54
10:45	91	40	68	53	*	*	80	46
11:00	112	43	94	47	*	*	103	45
11:15	109	50	87	59	*	*	98	54
11:30	103	48	92	47	*	*	98	48
11:45	140	58	97	49	*	*	118	54
Total Combined Total	2924	7857	2650	7562	0	0	2787	7708
Peak Vol. P.H.F.	08:00 594 0.895	05:45 1212 0.977	07:45 594 0.900	04:45 1286 0.924	-	-	-	08:00 593 0.893
ADT	ADT 10,496		AADT 10,496					05:00 1241 0.937

Accurate Counts
978-664-2565

Page 1

Location : Randolph Avenue NB
Location : @ #711
City/State: Milton, MA

Site Code: 16390NB1
1639VOLNB1

Start Time	Mon 24-Feb-14	Tue 25-Feb-14	Wed 26-Feb-14	Thu 27-Feb-14	Fri 28-Feb-14	Average Day	Sat 01-Mar-14	Sun 02-Mar-14	Week Average
12:00 AM	*	122	104	*	*	113	*	*	113
01:00	*	55	48	*	*	52	*	*	52
02:00	*	38	36	*	*	37	*	*	37
03:00	*	21	20	*	*	20	*	*	20
04:00	*	39	28	*	*	34	*	*	34
05:00	*	100	91	*	*	96	*	*	96
06:00	*	213	207	*	*	210	*	*	210
07:00	*	480	449	*	*	464	*	*	464
08:00	*	594	590	*	*	592	*	*	592
09:00	*	402	384	*	*	393	*	*	393
10:00	*	396	323	*	*	360	*	*	360
11:00	*	464	370	*	*	417	*	*	417
12:00 PM	*	433	386	*	*	410	*	*	410
01:00	*	492	438	*	*	465	*	*	465
02:00	*	606	554	*	*	580	*	*	580
03:00	*	930	864	*	*	897	*	*	897
04:00	*	1177	1094	*	*	1136	*	*	1136
05:00	*	1199	1285	*	*	1242	*	*	1242
06:00	*	1161	1026	*	*	1094	*	*	1094
07:00	*	897	709	*	*	703	*	*	703
08:00	*	430	416	*	*	423	*	*	423
09:00	*	327	357	*	*	342	*	*	342
10:00	*	206	231	*	*	218	*	*	218
11:00	*	199	202	*	*	200	*	*	200
Day Total	0	10781	10212	0	0	10498	0	0	10498
% Avg. Wkday	0.0%	102.7%	97.3%	0.0%	0.0%				
% Avg. Week	0.0%	102.7%	97.3%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak Vol.	-	08:00	08:00	-	-	08:00	-	-	08:00
PM Peak Vol.	-	17:00	17:00	-	-	17:00	-	-	17:00
Grand Total	0	10781	10212	0	0	10498	0	0	10498

ADT ADT 10,496 AADT 10,496

Accurate Counts
978-664-2565

Page 1

Location : Randolph Avenue NB

Location : @ #71

City/State: Milton, MA

Site Code: 16390NB1
1639CLSNB1

Northbound

Start Time	MtrCyc	Cars & Trailers	2 Axle Long	2 Axle Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/25/14	0	112	9	0	1	0	0	0	0	0	0	0	0	122
01:00	0	48	5	1	1	0	0	0	0	0	0	0	0	55
02:00	0	31	6	0	0	0	0	0	1	0	0	0	0	38
03:00	0	17	2	0	2	0	0	0	0	0	0	0	0	21
04:00	0	35	4	0	0	0	0	0	0	0	0	0	0	39
05:00	0	83	13	1	3	0	0	0	0	0	0	0	0	100
06:00	0	179	26	6	1	0	0	1	0	0	0	0	0	213
07:00	0	419	47	6	0	0	0	1	1	0	0	0	0	480
08:00	1	485	73	20	9	2	0	3	0	1	0	0	0	594
09:00	0	324	50	9	15	2	0	2	1	0	0	0	0	402
10:00	3	304	60	6	17	1	1	3	1	0	0	0	0	396
11:00	2	365	77	5	14	0	0	1	0	0	0	0	0	464
12 PM	1	363	52	2	12	1	0	2	0	0	0	0	0	433
13:00	1	384	81	5	16	2	0	3	0	0	0	0	0	492
14:00	4	503	70	12	13	1	0	3	0	0	0	0	0	606
15:00	7	752	134	16	10	5	0	4	1	1	0	0	0	930
16:00	6	1021	112	12	18	1	0	7	0	0	0	0	0	1177
17:00	6	1069	86	15	14	0	0	6	0	1	1	0	1	1199
18:00	1	1035	93	16	9	0	0	5	1	1	0	0	0	1161
19:00	1	613	66	5	8	1	0	3	0	0	0	0	0	697
20:00	0	380	41	5	1	1	0	2	0	0	0	0	0	430
21:00	0	288	32	3	2	0	0	2	0	0	0	0	0	327
22:00	0	180	22	3	1	0	0	0	0	0	0	0	0	206
23:00	0	181	16	1	0	1	0	0	0	0	0	0	0	199
Day Total		9171	1177	149	173	18	1	48	5	4	1	0	1	10781
Percent	0.3%	85.1%	10.9%	1.4%	1.6%	0.2%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
AM Peak Vol.	10:00	08:00	11:00	08:00	10:00	08:00	10:00	08:00	02:00	08:00				08:00
PM Peak Vol.	15:00	17:00	15:00	15:00	16:00	15:00	16:00	16:00	15:00	15:00	17:00		17:00	594
	7	1069	134	16	18	5		7	1	1	1		1	1199

Location : Randolph Avenue NB
 Location : @ #711
 City/State: Milton, MA

Site Code: 16390NB1
 1639CLSNB1

Northbound

Start Time	MtrCyc	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total	
02/26/14 01:00	0	96	6	0	2	0	0	0	0	0	0	0	0	104	
02/26/14 02:00	0	34	2	0	0	0	0	0	0	0	0	0	0	36	
02/26/14 03:00	0	16	3	0	1	0	0	0	0	0	0	0	0	20	
02/26/14 04:00	0	23	4	0	1	0	0	0	0	0	0	0	0	28	
02/26/14 05:00	0	73	15	1	0	2	0	0	0	0	0	0	0	91	
02/26/14 06:00	0	176	22	8	0	0	0	1	0	0	0	0	0	207	
02/26/14 07:00	1	390	43	9	5	0	0	1	0	0	0	0	0	449	
02/26/14 08:00	0	471	75	24	11	1	0	3	3	1	1	0	0	590	
02/26/14 09:00	0	316	41	8	14	0	0	4	1	0	0	0	0	384	
02/26/14 10:00	0	262	52	3	3	0	0	2	0	0	0	1	0	323	
02/26/14 11:00	3	307	50	4	6	0	0	0	0	0	0	0	0	370	
02/26/14 12 PM	1	316	56	6	6	1	0	0	0	0	0	0	0	386	
02/26/14 13:00	5	347	69	3	14	0	0	0	0	0	0	0	0	438	
02/26/14 14:00	1	457	64	11	16	2	0	3	0	0	0	0	0	554	
02/26/14 15:00	5	701	116	14	16	1	0	9	0	0	1	0	1	864	
02/26/14 16:00	10	927	112	16	21	0	0	5	1	2	0	0	0	1094	
02/26/14 17:00	7	1147	93	12	13	2	0	8	3	0	0	0	0	1285	
02/26/14 18:00	1	929	70	12	4	2	0	7	0	1	0	0	0	1026	
02/26/14 19:00	3	624	58	6	14	1	0	3	0	0	0	0	0	709	
02/26/14 20:00	0	362	45	5	3	1	0	0	0	0	0	0	0	416	
02/26/14 21:00	1	324	25	3	3	0	0	0	1	0	0	0	0	357	
02/26/14 22:00	0	207	22	2	0	0	0	0	0	0	0	0	0	231	
02/26/14 23:00	0	186	14	2	0	0	0	0	0	0	0	0	0	202	
Day Total		38	8732	1063	150	153	13	0	47	5	7	2	1	1	10212
Percent	0.4%	85.5%	10.4%	1.5%	1.5%	0.1%	0.0%	0.5%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.	11:00	08:00	08:00	08:00	09:00	05:00		09:00	08:00	08:00	08:00	10:00		08:00	
PM Peak Vol.	16:00	17:00	15:00	16:00	16:00	14:00		15:00	16:00	17:00	15:00		15:00	17:00	
Grand Total	71	17903	2240	299	326	31	1	95	10	11	3	1	2	20993	
Percent	0.3%	85.3%	10.7%	1.4%	1.6%	0.1%	0.0%	0.5%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	

Accurate Counts
978-664-2565

Location : Randolph Avenue NB

Location : @ #71

City/State: Milton, MA

Site Code: 16390NB1
1639SPDNB1

Northbound

Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	85th Percent	95th Percent
02/25/14	0	0	1	1	18	43	36	19	4	0	0	0	0	0	122	46	49
01:00	0	0	1	0	4	7	14	19	7	2	1	0	0	0	55	46	51
02:00	0	0	0	0	10	16	10	1	0	0	1	0	0	0	38	43	46
03:00	0	0	0	0	3	8	5	3	2	0	0	0	0	0	21	48	52
04:00	0	0	1	0	2	9	14	7	5	0	1	0	0	0	39	50	54
05:00	0	0	1	1	14	22	34	18	6	4	0	0	0	0	100	48	54
06:00	0	0	1	13	53	69	57	16	3	1	0	0	0	0	213	49	52
07:00	0	0	3	18	54	119	178	93	13	1	1	0	0	0	480	46	50
08:00	0	3	1	18	82	201	179	89	20	0	0	0	0	0	594	46	49
09:00	0	0	3	7	64	154	130	37	6	0	0	0	0	0	402	44	48
10:00	1	0	0	8	42	154	115	57	10	7	1	0	0	1	396	46	50
11:00	0	1	2	4	47	146	177	48	23	10	4	2	0	0	464	46	53
12 PM	0	1	1	12	48	132	145	64	23	5	2	0	0	0	433	47	51
13:00	0	0	4	8	44	148	166	81	27	6	3	4	1	0	492	47	52
14:00	0	2	3	9	39	163	241	96	35	10	6	1	0	0	606	48	53
15:00	0	0	4	35	89	289	362	105	34	8	3	1	0	0	930	46	50
16:00	0	0	12	47	127	401	412	153	23	1	1	0	0	0	1177	45	49
17:00	0	14	30	165	487	387	98	17	1	0	0	0	0	0	1199	44	47
18:00	0	1	5	84	231	527	255	73	5	0	0	0	0	0	1161	43	46
19:00	0	1	2	15	112	293	214	54	6	0	0	0	0	0	897	44	47
20:00	0	0	0	7	67	192	117	39	8	0	0	0	0	0	430	44	48
21:00	0	0	1	4	44	132	111	31	2	0	0	0	0	0	327	44	48
22:00	0	0	0	3	32	86	62	13	5	2	1	0	0	0	206	44	49
23:00	0	0	0	1	16	62	71	37	9	3	0	0	0	0	199	47	51
Total	1	12	57	297	1370	3853	3509	1280	301	62	28	8	2	1	10781		
Percent	0.0%	0.1%	0.5%	2.8%	12.7%	35.7%	32.5%	11.9%	2.8%	0.6%	0.3%	0.1%	0.0%	0.0%			
AM Peak Vol.	10:00	08:00	07:00	07:00	08:00	08:00	08:00	07:00	11:00	11:00	11:00	11:00	11:00	10:00	08:00		
AM Peak Vol.	1	3	3	18	82	201	179	93	23	10	4	2	1	1	594		
PM Peak Vol.		14:00	17:00	18:00	18:00	18:00	16:00	18:00	14:00	14:00	14:00	14:00	13:00	13:00	17:00		
PM Peak Vol.		2	14	64	231	527	412	153	35	10	6	4	1	1	1199		

Accurate Counts
978-664-2565

Site Code: 16390NBL
1639SPDNBL

Location : Randolph Avenue NB

Location : @ #711

City/State: Milton, MA

Northbound

Start Time	15	16	21	26	31	36	41	46	51	56	61	66	71	76	999	Total	85th Percent	95th Percent
02/26/14 01:00:	0	0	0	2	11	31	39	18	2	1	0	0	0	0	0	104	46	49
02/26/14 02:00:	0	0	0	0	7	20	8	10	3	0	0	0	0	0	0	48	47	51
02/26/14 03:00:	0	0	0	1	4	17	7	4	3	0	0	0	0	0	0	36	46	52
02/26/14 04:00:	0	0	0	0	1	3	8	2	3	0	0	0	0	0	0	20	49	53
02/26/14 05:00:	0	0	0	0	1	8	7	6	4	0	0	1	1	0	0	28	51	65
02/26/14 06:00:	0	0	0	2	18	44	76	41	22	3	1	0	0	0	0	91	51	57
02/26/14 07:00:	0	0	1	7	28	100	183	100	20	8	1	0	0	0	0	448	48	51
02/26/14 08:00:	0	0	4	29	119	195	153	71	17	1	1	0	0	0	0	590	45	49
02/26/14 09:00:	1	0	2	5	56	142	122	44	10	2	0	0	0	0	0	364	45	49
02/26/14 10:00:	0	0	1	3	46	132	100	29	9	1	0	1	1	0	0	323	45	49
02/26/14 11:00:	0	0	3	6	33	120	121	45	30	5	5	1	0	1	1	370	48	53
02/26/14 12 PM:	0	0	1	4	40	75	132	83	36	10	4	1	0	0	0	366	49	54
02/26/14 13:00:	1	0	1	2	30	89	135	108	42	24	3	2	1	0	0	438	51	56
02/26/14 14:00:	0	0	1	7	27	148	216	107	26	14	4	2	2	0	0	554	48	53
02/26/14 15:00:	0	0	2	9	84	272	332	125	27	6	4	3	0	0	0	864	46	50
02/26/14 16:00:	0	0	6	28	114	348	413	151	28	5	1	0	0	0	0	1094	46	49
02/26/14 17:00:	0	0	11	58	186	498	409	98	15	0	0	0	0	0	0	1295	44	47
02/26/14 18:00:	0	0	3	16	150	480	295	73	9	0	0	0	0	0	0	1026	43	47
02/26/14 19:00:	0	0	1	19	119	293	207	57	12	1	0	0	0	0	0	709	44	48
02/26/14 20:00:	0	0	0	4	44	156	144	51	15	2	0	0	0	0	0	416	45	50
02/26/14 21:00:	0	0	0	10	44	130	127	33	12	1	0	0	0	0	0	357	45	49
02/26/14 22:00:	0	0	2	1	32	96	69	25	5	0	1	0	0	0	0	231	45	49
02/26/14 23:00:	0	0	1	3	17	70	78	24	8	1	0	0	0	0	0	202	46	50
Total	2	3	40	220	1230	3482	3407	1324	370	89	26	13	5	1	10212			
Percent	0.0%	0.0%	0.4%	2.2%	12.0%	34.1%	33.4%	13.0%	3.6%	0.9%	0.3%	0.1%	0.0%	0.0%				
AM Peak Vol.	09:00	05:00	08:00	08:00	08:00	08:00	07:00	07:00	11:00	07:00	11:00	05:00	04:00	11:00	08:00			
PM Peak Vol.	13:00	17:00	17:00	17:00	17:00	17:00	16:00	16:00	13:00	13:00	12:00	15:00	14:00		17:00			
Grand Total	3	15	97	517	2600	7335	6916	2604	671	151	54	21	7	2	20993			
Percent	0.0%	0.1%	0.5%	2.5%	12.4%	34.9%	32.9%	12.4%	3.2%	0.7%	0.3%	0.1%	0.0%	0.0%				

15th Percentile : 34 MPH
50th Percentile : 39 MPH
85th Percentile : 46 MPH
95th Percentile : 50 MPH

Statistics
10 MPH Pace Speed : 36-45 MPH
Number in Pace : 13161
Percent in Pace : 62.7%
Number of Vehicles > 40 MPH : 10426
Percent of Vehicles > 40 MPH : 49.7%
Mean Speed(Average) : 41 MPH

Location : Randolph Avenue

Location : @ #711

City/State: Milton, MA

Site Code: 16390SB1
1639VILSB1

Start Time	Tue A.M.	25-Feb-14	Wed A.M.	26-Feb-14	Thu A.M.	27-Feb-14	Daily Average A.M.	Daily Average P.M.
	P.M.		P.M.		P.M.			
12:00	14	127		25	116	*	20	122
12:15	11	144		14	127	*	12	136
12:30	14	137		12	115	*	13	126
12:45	9	151		6	148	*	8	150
01:00	6	131		2	133	*	4	132
01:15	7	140		8	120	*	8	130
01:30	6	131		10	120	*	8	126
01:45	8	146		3	129	*	6	138
02:00	6	170		11	175	*	8	172
02:15	7	213		5	186	*	6	200
02:30	3	191		3	177	*	3	184
02:45	1	178		0	181	*	0	180
03:00	5	202		5	202	*	5	202
03:15	7	191		3	175	*	5	183
03:30	7	202		6	189	*	6	196
03:45	7	219		9	212	*	8	216
04:00	4	182		7	208	*	6	195
04:15	10	204		13	214	*	12	209
04:30	25	179		19	181	*	22	180
04:45	44	196		40	195	*	42	196
05:00	48	237		35	177	*	42	207
05:15	73	308		77	200	*	75	254
05:30	123	265		139	280	*	131	272
05:45	214	240		212	246	*	213	243
06:00	340	232		296	256	*	318	244
06:15	375	197		390	215	*	382	206
06:30	410	153		403	203	*	406	178
06:45	394	121		400	173	*	397	147
07:00	413	126		401	121	*	407	124
07:15	455	109		426	120	*	440	114
07:30	387	98		411	94	*	399	96
07:45	401	76		464	96	*	432	86
08:00	319	76		342	77	*	330	76
08:15	361	71		332	90	*	346	80
08:30	300	58		309	102	*	304	80
08:45	342	68		309	79	*	326	74
09:00	264	64		270	79	*	267	72
09:15	253	54		227	70	*	240	62
09:30	218	74		168	73	*	193	74
09:45	199	60		155	76	*	177	68
10:00	153	48		145	60	*	149	54
10:15	137	49		150	57	*	144	53
10:30	161	50		122	65	*	142	58
10:45	134	57		137	72	*	136	64
11:00	115	29		119	54	*	117	42
11:15	114	43		136	43	*	125	43
11:30	145	28		103	29	*	124	28
11:45	131	20		125	20	*	128	20
Total Combined Total		7180	6445	7004	6530	0	7092	6492
Peak Vol. P.H.F.	06:30 1672 0.919	05:00 - 1050 0.852	07:00 1702 0.917	05:30 - 997 0.890	- - -	- - -	07:00 1678 0.953	05:15 1013 0.931
ADT	ADT 13,580		AADT 13,580					

Accurate Counts
978-664-2565

Page 1

Location : Randolph Avenue
Location : @ #711
City/State: Milton, MA

Site Code: 16390SB1
1639VILSB1

Start Time	Mon 24-Feb-14	Tue 25-Feb-14	Wed 26-Feb-14	Thu 27-Feb-14	Fri 28-Feb-14	Average Day	Sat 01-Mar-14	Sun 02-Mar-14	Week Average
12:00 AM	*	48	57	*	*	52	*	*	52
01:00	*	27	23	*	*	25	*	*	25
02:00	*	17	19	*	*	18	*	*	18
03:00	*	26	23	*	*	24	*	*	24
04:00	*	83	79	*	*	81	*	*	81
05:00	*	458	463	*	*	460	*	*	460
06:00	*	1519	1489	*	*	1504	*	*	1504
07:00	*	1656	1702	*	*	1679	*	*	1679
08:00	*	1322	1292	*	*	1307	*	*	1307
09:00	*	934	820	*	*	877	*	*	877
10:00	*	585	554	*	*	570	*	*	570
11:00	*	505	483	*	*	494	*	*	494
12:00 PM	*	559	506	*	*	532	*	*	532
01:00	*	548	502	*	*	525	*	*	525
02:00	*	752	719	*	*	736	*	*	736
03:00	*	814	778	*	*	796	*	*	796
04:00	*	761	798	*	*	780	*	*	780
05:00	*	1050	903	*	*	976	*	*	976
06:00	*	703	847	*	*	775	*	*	775
07:00	*	409	431	*	*	420	*	*	420
08:00	*	273	348	*	*	310	*	*	310
09:00	*	252	298	*	*	275	*	*	275
10:00	*	204	254	*	*	229	*	*	229
11:00	*	120	146	*	*	133	*	*	133
Day Total	0	13625	13534	0	0	13578	0	0	13578
% Avg. WkDay	0.0%	100.3%	99.7%	0.0%	0.0%				
% Avg. Week	0.0%	100.3%	99.7%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak Vol.	-	07:00	07:00	-	-	07:00	-	-	07:00
PM Peak Vol.	-	1656	1702	-	-	1679	-	-	1679
Grand Total	0	13625	13534	0	0	13578	0	0	13578
ADT	ADT 13,580		AADT 13,580						

Accurate Counts
978-664-2565

Page 1

Location : Randolph Avenue

Location : @#711

City/State: Milton, MA

Site Code: 16390SB1

1639CLSSB1

Southbound

Start Time	MtrCyc	Cars & Trailers	2 Axle Long	2 Axle Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/25/14 00:00	0	39	5	2	1	1	0	0	0	0	0	0	0	48
01:00	0	25	2	0	0	0	0	0	0	0	0	0	0	27
02:00	0	14	3	0	0	0	0	0	0	0	0	0	0	17
03:00	0	23	2	0	1	0	0	0	0	0	0	0	0	26
04:00	0	69	8	1	4	1	0	0	0	0	0	0	0	83
05:00	2	354	66	11	12	4	0	0	6	1	1	1	1	458
06:00	5	1258	172	16	22	9	5	19	4	5	3	1	0	1519
07:00	14	1462	125	13	15	5	5	11	2	4	3	1	0	1655
08:00	8	1158	110	8	18	4	0	6	2	2	3	0	2	1321
09:00	2	790	91	9	22	5	0	9	1	3	2	0	0	934
10:00	0	489	72	6	9	2	0	6	0	1	0	0	0	585
11:00	2	411	67	5	12	2	2	3	1	0	0	0	0	505
12 PM	0	465	65	5	12	2	1	8	0	0	0	1	0	559
13:00	0	470	52	6	14	2	1	2	0	0	0	0	1	548
14:00	4	599	103	19	14	3	1	7	0	2	0	0	0	752
15:00	2	693	89	14	6	4	0	5	0	1	0	0	0	814
16:00	0	665	73	8	7	1	0	5	1	1	0	0	0	761
17:00	2	939	87	7	7	0	1	4	2	4	0	0	0	1050
18:00	1	632	55	7	3	0	0	5	0	0	0	0	0	703
19:00	0	371	32	2	2	0	0	2	0	0	0	0	0	409
20:00	0	244	27	2	0	0	0	0	0	0	0	0	0	273
21:00	0	228	17	4	3	0	0	0	0	0	0	0	0	252
22:00	0	184	15	2	3	0	0	0	0	0	0	0	0	204
23:00	0	112	6	2	0	0	0	0	0	0	0	0	0	120
Day Total	42	11694	1344	149	187	45	11	98	12	22	12	3	4	13623
Percent	0.3%	85.8%	9.9%	1.1%	1.4%	0.3%	0.1%	0.7%	0.1%	0.2%	0.1%	0.0%	0.0%	
AM Peak Vol.	07:00	07:00	06:00	06:00	06:00	06:00	06:00	06:00	06:00	06:00	06:00	06:00	08:00	07:00
PM Peak Vol.	14:00	17:00	14:00	14:00	13:00	15:00	12:00	12:00	16:00	14:00	12:00	13:00	17:00	
	4	939	103	19	14	4	1	8	1	2	1	1	1	1050

Location : Randolph Avenue
Location : @ #711
City/State: Milton, MA

Site Code: 16390SB1
1639CLSSB1

Southbound

Start Time	MtrCyc	Cars & Trailers	2 Axle Long	2 Axle Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
02/26/14	0	52	2	1	1	1	0	0	0	0	0	0	0	57
01:00	0	21	2	0	0	0	0	0	0	0	0	0	0	23
02:00	0	16	2	0	1	0	0	0	0	0	0	0	0	19
03:00	0	21	2	0	0	0	0	0	0	0	0	0	0	23
04:00	0	67	8	1	0	3	0	0	0	0	0	0	0	79
05:00	2	370	60	10	11	3	0	2	2	1	0	1	1	463
06:00	11	1236	170	15	26	8	1	13	4	2	1	0	2	1489
07:00	8	1506	118	22	10	7	0	23	3	1	1	3	3	1702
08:00	3	1127	111	11	15	7	0	11	2	3	0	0	1	1291
09:00	1	700	76	11	13	5	0	9	1	2	2	0	0	820
10:00	1	473	53	3	13	3	0	6	1	1	0	0	0	554
11:00	1	388	76	7	6	2	0	1	2	0	0	0	0	483
12 PM	1	424	54	12	13	0	0	2	0	0	0	0	0	506
13:00	0	424	58	6	12	2	0	0	0	0	0	0	0	502
14:00	1	598	81	20	12	2	0	3	0	0	1	0	1	719
15:00	6	657	85	11	11	2	0	6	0	0	0	0	0	778
16:00	4	691	82	9	6	2	0	1	0	2	0	1	0	798
17:00	3	776	97	8	13	1	0	2	1	2	0	0	0	903
18:00	1	788	42	6	7	0	0	2	1	0	0	0	0	847
19:00	1	4021	25	3	0	0	0	0	0	0	0	0	0	431
20:00	0	330	17	1	0	0	0	0	0	0	0	0	0	348
21:00	2	288	5	1	2	0	0	0	0	0	0	0	0	298
22:00	2	246	3	2	1	0	0	0	0	0	0	0	0	254
23:00	0	142	3	1	0	0	0	0	0	0	0	0	0	146
Day Total	48	11743	1232	161	173	48	1	81	17	14	6	1	8	13533
Percent	0.4%	86.8%	9.1%	1.2%	1.3%	0.4%	0.0%	0.6%	0.1%	0.1%	0.0%	0.0%	0.1%	
AM Peak Vol.	06:00	07:00	06:00	07:00	06:00	06:00	06:00	07:00	06:00	08:00	09:00	07:00	07:00	
PM Peak Vol.	15:00	18:00	17:00	14:00	12:00	13:00		15:00	17:00	16:00	14:00	16:00	14:00	17:00
Grand Total	90	23437	2576	310	360	93	12	179	29	36	18	4	12	27156
Percent	0.3%	86.3%	9.5%	1.1%	1.3%	0.3%	0.0%	0.7%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%

Accurate Counts
978-664-2565

Location : Randolph Avenue

Site Code: 16390SB1
1639SPDSB1

Location : @ #711

City/State: Milton, MA

Southbound

Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	999	Total	85th Percent	95th Percent
02/25/14 01:00	0	0	0	3	8	15	11	6	4	1	0	0	0	0	0	48	48	53
02:00	0	0	0	0	1	8	5	2	1	0	0	0	0	0	0	27	47	53
03:00	0	0	0	1	6	8	5	0	0	0	0	0	0	0	0	17	46	50
04:00	0	0	0	0	6	15	33	14	10	5	0	0	0	0	0	83	51	56
05:00	1	0	4	25	98	166	110	39	8	5	1	0	0	0	0	458	49	54
06:00	0	1	8	14	115	505	572	248	44	8	4	0	0	0	0	1519	46	50
07:00	22	29	86	217	449	482	271	89	10	1	0	0	0	0	0	1656	42	46
08:00	16	35	56	123	323	390	286	73	19	1	0	0	0	0	0	1322	43	46
09:00	0	0	2	8	36	151	329	265	108	30	4	1	0	0	0	934	45	49
10:00	0	0	4	7	50	164	222	106	24	5	3	0	0	0	0	585	47	51
11:00	0	0	1	7	43	134	192	97	28	3	0	0	0	0	0	505	47	51
12 PM	0	0	3	11	72	185	183	80	21	4	0	0	0	0	0	559	46	50
13:00	0	0	1	2	43	165	214	95	24	4	0	0	0	0	0	548	47	50
14:00	1	0	2	13	59	227	296	118	31	4	1	0	0	0	0	752	46	50
15:00	3	0	12	27	125	286	229	105	21	6	0	0	0	0	0	814	45	49
16:00	0	0	0	26	102	222	265	117	25	3	1	0	0	0	0	761	46	50
17:00	2	11	40	168	357	328	112	27	3	1	0	0	0	0	0	1050	45	49
18:00	0	0	1	40	117	297	185	54	9	0	0	0	0	0	0	703	43	47
19:00	0	1	4	5	53	122	157	55	9	3	0	0	0	0	0	409	45	49
20:00	0	1	3	31	78	117	28	12	1	1	0	0	0	0	0	273	45	50
21:00	0	1	4	4	30	93	89	28	6	1	0	0	0	0	0	252	45	49
22:00	0	0	3	20	78	68	25	8	1	0	1	0	0	0	0	204	46	50
23:00	0	0	2	14	32	42	21	5	4	0	0	0	0	0	0	120	47	52
Total	44	72	199	589	2014	4294	4214	1701	408	71	17	2	0	0	0	13625		
Percent	0.3%	0.5%	1.5%	4.3%	14.8%	31.5%	30.9%	12.5%	3.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.	07:00	08:00	07:00	07:00	07:00	06:00	06:00	06:00	06:00	05:00	05:00	05:00	05:00	05:00		07:00		
PM Peak Vol.	22	35	86	217	449	505	572	248	44	8	5	1				1656		
PM Peak Vol.	15:00	17:00	15:00	17:00	17:00	17:00	17:00	14:00	14:00	15:00	14:00	22:00				17:00		
	3	2	12	40	168	357	328	118	31	6	1	1				1050		

Accurate Counts
978-664-2565

Site Code: 16390SB1
1639SPDSB1

Location : Randolph Avenue

Location : @ #711

City/State: Milton, MA

Southbound

Start Time	15	16	21	26	31	36	41	46	51	56	61	66	71	76	999	Total	85th Percent	95th Percent
02/26/14 01:00	0	0	0	1	7	15	20	10	2	1	0	1	0	0	0	57	47	52
02:00	0	0	0	0	2	9	11	1	0	0	0	0	0	0	0	23	44	46
03:00	0	0	0	0	3	10	5	1	0	0	0	0	0	0	0	19	43	46
04:00	0	0	0	0	3	16	25	24	6	4	0	1	0	0	0	79	50	56
05:00	0	1	0	5	26	77	164	131	45	10	3	0	0	0	0	463	49	54
06:00	1	0	4	27	98	468	564	252	62	9	3	1	0	0	0	1489	47	50
07:00	4	17	34	171	489	549	303	106	23	6	0	0	0	0	0	1702	42	47
08:00	0	3	35	84	336	414	294	102	19	3	1	1	0	0	0	1292	43	48
09:00	1	0	0	6	95	246	258	189	39	5	0	0	1	0	0	820	47	51
10:00	0	0	1	3	41	130	198	115	53	12	1	0	0	0	0	554	49	53
11:00	0	0	0	4	34	109	211	91	25	9	0	0	0	0	0	483	47	51
12 PM	0	0	1	3	25	143	192	108	29	4	1	0	0	0	0	506	48	51
13:00	1	0	0	2	32	114	198	119	34	0	1	0	0	0	0	502	48	51
14:00	0	1	1	3	38	203	276	146	39	10	2	0	0	0	0	719	48	51
15:00	0	0	2	12	94	229	263	137	34	6	0	1	0	0	0	778	47	50
16:00	0	0	0	8	101	224	315	106	38	5	1	0	0	0	0	798	46	50
17:00	1	0	4	52	149	294	290	79	22	8	2	0	0	0	0	903	45	49
18:00	1	0	2	31	233	408	149	19	3	1	0	0	0	0	0	847	41	44
19:00	0	1	7	47	287	78	104	1	0	0	0	0	0	0	0	431	41	44
20:00	0	0	3	17	148	161	17	2	0	0	0	0	0	0	0	348	44	46
21:00	0	0	2	23	153	107	9	33	0	0	0	0	0	0	0	298	43	45
22:00	0	0	1	5	94	137	11	4	0	1	0	0	0	0	0	254	44	46
23:00	0	0	1	5	21	108	9	1	0	0	0	0	0	0	0	146	45	47
Total	9	24	86	427	1905	4370	4335	1774	485	94	16	8	1	0	0	13534		
Percent	0.1%	0.2%	0.6%	3.2%	14.1%	32.3%	32.0%	13.1%	3.6%	0.7%	0.1%	0.1%	0.0%	0.0%	0.0%			
AM Peak Vol.	07:00	07:00	08:00	07:00	07:00	06:00	06:00	06:00	10:00	05:00	00:00	09:00				07:00		
PM Peak Vol.	13:00	13:00	17:00	17:00	18:00	18:00	16:00	14:00	14:00	14:00	14:00	17:00				17:00		
Grand Total	53	96	285	1016	3919	8664	8549	3475	893	165	33	10	1	0	0	27159		
Percent	0.2%	0.4%	1.0%	3.7%	14.4%	31.9%	31.5%	12.8%	3.3%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%			
15th Percentile :						33 MPH												
50th Percentile :						39 MPH												
85th Percentile :						45 MPH												
95th Percentile :						50 MPH												

Statistics
10 MPH Pace Speed : 36-45 MPH
Number in Pace : 15982
Percent in Pace : 58.8%
Number of Vehicles > 40 MPH : 13126
Percent of Vehicles > 40 MPH : 48.3%
Mean Speed(Average) : 40 MPH

Appendix E. Road Safety Audit References

Road Safety Audit References

Massachusetts Traffic Safety Toolbox, Massachusetts Highway Department,
www.mhd.state.ma.us/safetytoolbox.

Road Safety Audits, A Synthesis of Highway Practice. NCHRP Synthesis 336. Transportation Research Board, National Cooperative Highway Research Program, 2004.

Road Safety Audits. Institute of Transportation Engineers and U.S. Department of Transportation, Federal Highway Administration, www.roadwaysafetyaudits.org.

FHWA Road Safety Audit Guidelines. U.S. Department of Transportation, Federal Highway Administration, 2006.

Road Safety Audit, 2nd edition. Austroads, 2000.

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