

# 2009 Massachusetts Safety Belt Usage Observation Study

*Prepared for*

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## Introduction

This report presents the results of the 2009 safety belt observation study conducted in the Commonwealth of Massachusetts. The observations and report were completed by the University of Massachusetts Traffic Safety Research Program (UMassSafe) located at the University of Massachusetts in Amherst. This observational study was conducted as a component of an effort to evaluate safety belt usage in the Commonwealth as directed by the Executive Office of Public Safety and Security's - Highway Safety Division (EOPSS-HSD).

The reported safety belt usage in Massachusetts, a secondary safety belt law state, has consistently had an observed usage rate lower than the national average. Nevertheless, the survey results of safety belt observation usage in Massachusetts from 1998 - 2008 are presented in Table 1 below.

**Table 1 Massachusetts Safety Belt Usage Rates, 1998-2008**

<b>Observation Year</b>	<b>Observed Safety Belt Usage Rate (Weighted and Rounded)</b>
1998	51%
1999	52%
2000	50%
2001	56%
2002	51%
2003	62%
2004	63%
2005	65%
2006	67%
2007	69%
2008	67%

Source: Highway Safety Division, 2008 Massachusetts Safety Belt Usage Observation Survey

In 2009 the safety belt study was completed in two stages: 1) a sub-sample consisting of approximately 20 percent of the data collection points of the full-survey completed in advance of the HSD-sponsored *Spring Click It or Ticket* (CIOT) Mobilization and 2) a full blown statewide survey to assess safety belt usage in the Commonwealth of Massachusetts in compliance with *SAFETEA-LU* requirements. This report represents the direct observation results from both of these observation efforts.

The sampling model was developed and approved by the National Highway Traffic Safety Administration (NHTSA) and builds upon a similar methodology employed in 2008. The sampling plan utilized the Massachusetts Statewide Travel Demand Model to stratify roadways in Massachusetts with the probability of a segment being selected being dependent on the proportion of road segment traffic volumes to the total volumes of all segments in the

corresponding stratum. Roadways were stratified by direction on the basis of: functional classification, geography, and time period and day of the week.

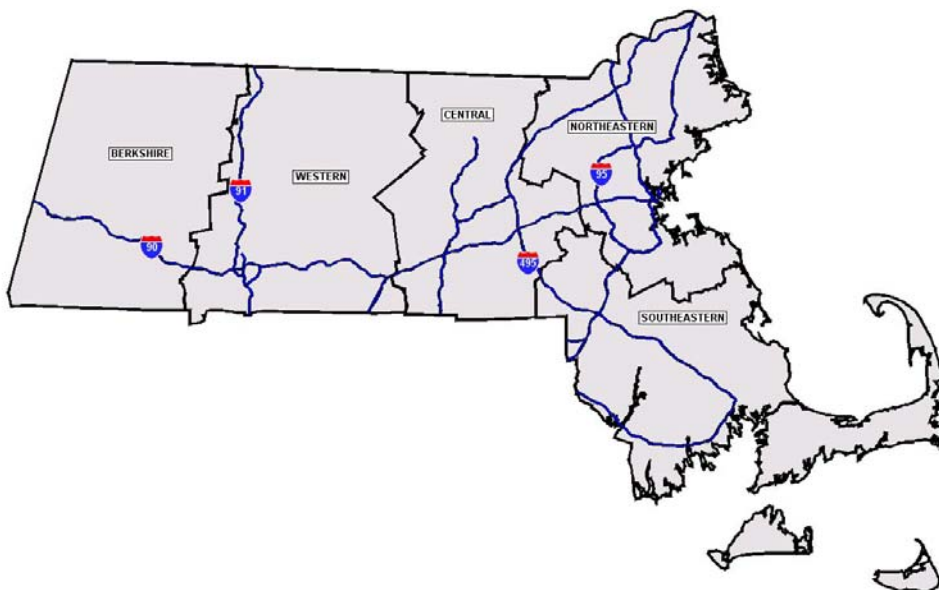
## ***Observation Approach***

As a component of the observation study, teams of observers made 160 site visits for the full-blown statewide observation study and 30 site visits for the subsample observations. The teams observed and recorded the following attributes for occupants of passing vehicles:

- Vehicle information:
  - Vehicle type (passenger car, pickup truck, SUV, van, small commercial passenger vehicles)
  - State of vehicle license plate (MA, NH, Other)
- Shoulder belt usage:
  - Driver seat belt usage
  - Front seat outboard passenger seat belt usage
- Vehicle occupant information
  - Driver gender
  - Driver age category (teenager, adult, elderly adult)
  - Driver apparent race (white, black, Hispanic, other)
  - Passenger gender
  - Passenger age category (child, teenager, adult, elderly adult)
  - Passenger apparent race (white, black, Hispanic, other)

Observations were completed across the commonwealth with the regions as pictured in Figure 1. Within each region equal visits were made based upon time of day/day of week and roadway functional classification. The specific time periods included the following:

- Weekday A.M. Peak Period (6 a.m. to 10 a.m.)
- Weekday Midday Peak Period (10 a.m. to 3 p.m.)
- Weekday P.M. Peak Period (3 p.m. to 7 p.m.)
- Weekend Period (6 a.m. to 7 p.m.)



**Figure 1: Observation Regions**

Roadways were classified as local, collector, arterial, or freeway locations. Please note that the observation locations visited during this subsample were visited again during the full-blown observational study.

The combination of Region, Time/Day, and Roadway Classification result in the creation of 80 unique strata from which two observation locations were randomly sampled for each strata. Please note that the approved sampling plan called for the addition of sites as needed if the calculated variance did not achieve plus/minus 5 percent as required with NHTSA protocol.

## ***Results***

Between June 1 and June 30, 2009 a total of 49,407 drivers and front outboard passengers in a total of 40,294 vehicles were observed at the 160 observation locations. The statistically weighted percentage of front seat occupants properly using seat belts during the observation study was **73.61 percent**. Based upon the variation in the sampling plan the 95% confidence interval ranges between 73.05 and 74.17 percent with a relative error well below the required 5 percent threshold. This number represents the highest ever observed percentage in Massachusetts and is reflective of an increase of 6.77 percentage points from the 2008 value of 66.84 percent. In an unweighted format the percentage of belt usage was 73.99 percent. Table 2 presents a breakdown of observed variables, in a weighted format and as compared to 2008 values. Also presented in Table 2, percent change 2008 to 2009.

**Table 2 Summary of Study Data by Observation Variable - Weighted**

Observation Variable	2009 Data		2008 Data	Change in Percentage 2008 to 2009
	Total Observed Occupants	Weighted Percent Belted	Weighted Percent Belted	
All Vehicle Occupants	49,407	73.61	66.84	6.77
<b>Gender</b>				
Male	23,064	68.44	60.82	7.62
Female	26,212	79.43	73.95	5.48
Status Unknown	131	84.30	82.62	1.68
<b>Apparent Age</b>				
Child (passenger <12)	651	87.87	82.92	4.95
Teen	2,205	66.91	58.97	7.94
Adult	41,886	72.81	65.77	7.04
Elder Adult (>65)	4,612	82.12	76.41	5.71
Status Unknown	53	75.08	90.10	-15.02
<b>Apparent Race</b>				
Black	2,076	71.98	63.11	8.87
Hispanic	2,477	63.82	48.38	15.44
White	43,094	73.92	67.90	6.02
Other	1,458	82.63	69.83	12.8
Status Unknown	302	77.41	61.78	15.63
<b>State of Vehicle Registration</b>				
Massachusetts	44,913	72.63	66.05	6.58
New Hampshire	540	71.85	68.51	3.34
Out of State (Other)	3,929	84.93	78.46	6.47
Unknown	25	91.53	80.00	11.53
<b>Vehicle Type</b>				
Passenger Car	26,819	75.77	69.43	6.34
Pick-up Truck	4,761	60.87	48.89	11.98
SUV	11,469	77.04	71.51	5.53
Van	3,787	80.07	70.26	9.81
Commercial Vehicle	2,571	49.96	42.70	7.26
<b>Time of Day/Day of Week</b>				
A.M. Peak - Weekday	10,998	72.46	67.01	5.45
Midday Peak - Weekday	12,508	70.85	66.50	4.35
P.M. Peak - Weekday	13,255	75.33	67.37	7.96
Weekend	12,646	75.55	66.41	9.14
<b>Observation Region</b>				
Berkshire	9,054	77.61	70.88	6.73
Western	9,456	73.27	69.16	4.11
Central	10,429	72.48	65.11	7.37
Northeast	9,998	72.92	68.42	4.5
Southeast	10,470	72.26	60.96	11.3
<b>Occupant Role</b>				
Driver Alone	30,578	72.05	65.60	6.45
Driver with Passenger	9,716	77.30	68.06	9.24
Passenger	9,113	74.94	70.11	4.83
<b>Functional Classification</b>				
Collector	14,369	68.59	59.70	8.89
Arterial	19,691	73.11	66.39	6.72
Freeway	10,567	80.05	73.51	6.54
Local	1,615	72.54	72.19	0.35

As part of the subsample observations 30 site visits were made and reported on prior to the CIOT Mobilization. Between April 20 and May 8, the observed belt usage at these subsample locations was 69.23 percent. As part of the full-blown statewide observation these 30 observation locations resulted in an observed belt usage of 73.80 percent representing an increase of 4.57 percentage points. Table 3 summarizes the before and after numbers at each of the subsample locations. Please note that one location was observed twice in each of the observation periods. As shown in Table 3 the belt usage after the CIOT Mobilization increased, decreased, and remained unchanged (<1%) at 16, 10, and 3 observation locations, respectively.

**Table 3 Summary of Subsample Data by Observation Location (Unweighted)**

Observation Location		Pre CIOT Mobilization % Belted	Post CIOT Mobilization % Belted	Change in Percentage Pre vs. Post CIOT Mobilization
City/Town <sup>a</sup>	Observation Location (known status)	(known status)	(known status)	
Attleboro	Pleasant St.	62.13%	75.67%	13.54%
Berlin	Ramp from 495 SB to Rt 62	83.72%	83.98%	0.26%
Boston	Berkeley St	74.88%	71.98%	-2.90%
Brockton	Main St	49.85%	59.37%	9.52%
Chicopee	Center St.	58.54%	74.35%	15.82%
Clinton	Chestnut St	70.30%	70.35%	0.05%
Holyoke	Beech St.	72.66%	72.10%	-0.57%
Lanesborough	Bull Hill Rd.	57.00%	72.86%	15.85%
Lee	Lee exit off turnpike	85.56%	85.17%	-0.39%
Ludlow	Center St.	65.32%	65.67%	0.35%
Lynn	Lynn Shore Dr	75.76%	78.03%	2.27%
Mansfield	Ramp from 495 to Rt 140	71.24%	66.67%	-4.58%
Monson	Main St.	74.84%	75.92%	1.08%
New Bedford	Coggeshall Rd	44.61%	61.68%	17.07%
Northborough	Main St.	84.43%	77.54%	-6.89%
Norton	Ramp from 495 NB to Rt 123	70.28%	71.72%	1.44%
Norwood	Central St.	52.21%	67.50%	15.29%
Palmer	Palmer ramp Rt 32 to Rt 90	79.80%	82.75%	2.95%
Pittsfield	West St.	67.67%	75.65%	7.98%
Pittsfield	First St.	64.52%	69.02%	4.49%
Pittsfield	Dalton	70.99%	64.97%	-6.02%
Plymouth	Sandwich St	60.41%	69.29%	8.88%
Southboro	Ramp from 495 NB to Rt 9	65.27%	81.29%	16.02%
Springfield	West Columbus Exit 91	75.35%	76.47%	1.12%
Sterling	Ramp from I-90 to Rt 140	72.80%	70.83%	-1.97%
Walpole	West St.	73.73%	71.67%	-2.06%
Waltham	Ramp from I95 NB to Rt 20	88.46%	80.82%	-7.64%
Worcester	Clark St	70.55%	68.06%	-2.49%
Worcester	Millbury St	68.66%	74.71%	6.05%
<b>TOTALS</b>		<b>69.23%</b>	<b>73.80%</b>	<b>4.57%</b>

## ***Discussion***

The results presented are encouraging given the increased rate of observed safety belt usage. This observed rate translate to a 20 percent conversation rate from 2008, and an overall increase of nearly 7 percentage points. One significant observation regarding the reported increase is the changes across each observation variable. Specifically, there was an increase from 2008 to 2009 in every observation category, which is perhaps indicative of a sustainable increase that can be maintained or even built upon in future years. Some of the interesting findings include, but are not necessarily limited to the following:

- Males again had a significantly lower belt usage than females; however, the increase in male belt usage from 2008 was greater than the observed increase in female belt usage.
- The belt usage for teens is significantly higher than in 2008 and is nearly consistent with the observed rate in 2007 (69%). Not considering children in the front seat, elder adults had the highest observed safety belt usage rate, followed by adults, then teens.
- The belt usage of occupants in out of state vehicles was again higher than that in those of Massachusetts vehicles. Vehicles registered in New Hampshire had a rate that was slightly lower than the rate for Massachusetts vehicles (72% and 73%, respectively).
- Based upon the apparent race of occupants, belt usage increased for all apparent races. The greatest increase was observed among vehicle occupants reported as Hispanic.
- Observed belt usage for occupants in small commercial vehicles and pick-up trucks were significantly lower than occupants of all other vehicle types; however there was an increase of 12 percentage points among pick-up truck occupants and an increase of 7 percentage points in occupants of small commercial vehicles.
- Regionally, the observed belt usage was highest in the Berkshire region and all other regions had nearly identical usage rates.
- Belt usage increased from 2008 in all time periods, with the highest observed belt usage in the PM period (3:00 to 7:00 PM).
- The observed belt usage was highest for drivers with passengers, followed by passengers. Drivers traveling alone once again had the lowest observed usage.
- Consistent with previous observation data the observed freeway usage rate was highest along freeways (80%). The observed usage rate among all other roadway types was comparable (between 69 and 73 percent).
- The percent belted at the subsample observation was higher by 4.57 percentage points in the after period as compared to the pre-Mobilization observations. Across the observation locations belt usage increased at 16 of 29 observation locations based upon unweighted usage rates.