2024
Massachusetts
Safety Belt Usage
Observational Study

Prepared for

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Introduction

This report presents the results of the 2024 Safety Belt Usage Observational Study conducted within 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 Amherst. This observational study was conducted as part of an effort to evaluate safety belt usage in the Commonwealth as directed by the Office of Grants and its Office of Grants and Research (OGR) Highway Safety Division (HSD). OGR is a state agency that is part of the Executive Office of Public Safety and Security (EOPSS).

The reported safety belt usage rate in Massachusetts, a secondary law state, has been consistently lower than the national average. The results of the safety belt usage observational surveys in Massachusetts from 2012 – 2024 are presented in Table 1 below. It is important to note that safety belt usage data collection was not conducted in 2020 due to the COVID-19 pandemic.

Table 1 Massachusetts Safety Belt Usage Rates, 2012-2024

Observation Year	Observed Safety Belt Usage Rate (Weighted and Rounded)
2012	73%
2013	75%
2014	77%
2015	74%
2016	78%
2017	74%
2018	82%
2019	82%
2020	No Survey – COVID 19
2021	78%
2022	77%
2023	80%
2024	84%

Source: Highway Safety Division, 2023 Massachusetts Safety Belt Usage Observation Survey

In 2024, similar to previous years, the Safety Belt Usage Observation Study consisted of a single-stage statewide survey assessing safety belt usage in the Commonwealth of Massachusetts, in compliance with the federal requirements of Uniform Criteria for State Observational Surveys of Seat Belt Use (23 CFR Part 1340).

The sampling model used in this effort was developed and approved by the National Highway Traffic Safety Administration (NHTSA) prior to the study in 2023, replacing the previous protocol that had been employed since 2018. Similar to the previous protocol, the sampling of segments for inclusion was based upon roadway lengths proportional to the total length within the given stratum. Roadways were stratified based on roadway classification and geographic region, with the observation time period randomly selected to ensure adequate representation of daylight hours. First implemented in the 2023 sampling plan is additional segment weighting based on an estimation of the coverage of vehicles observed and the weight for missing data on persons within sampled autos.

Review of Sampling and Observation Approach

Massachusetts is composed of 14 counties, 12 of which account for over 99% of the passenger vehicle crash-related fatalities in the state, according to the Fatality Analysis Reporting System (FARS) data average for the period of 2016 to 2020. The regions where safety belt observations were conducted were initially identified using both geographic proximity to one another and the annual traffic fatality count (a measure of importance within the sampling guidelines). As a result, the sampling plan included a selection of roadways from seven regions comprised of 12 counties (all but Nantucket and Dukes) as presented in Table 2 and Figure 1. Within each region, 21 hour-long observations were made at randomly assigned time of day/day of week combinations. In total, the observation teams visited 147 locations across the Commonwealth.

Table 2 Passenger Vehicle Fatality Average Counts by Developed Region (2016 to 2020)

Region	County	County		Region	
		Average Number of Fatalities	Percent of All Statewide Traffic Fatalities	Average Number of Fatalities	Percent of All Statewide Traffic Fatalities
1	Berkshire	7.6	3.6%	41.2	19.4%
	Franklin	4.2	2%		
	Hampden	25.4	11.9%		
	Hampshire	4	1.9%		
2	Worcester	34	16%	34	16.0%
3	Middlesex	24.2	11.4%	24.2	11.4%
4	Essex	22.6	10.6%	22.6	10.6%
5	Norfolk	21	9.9%	29.6	13.9%
	Suffolk	8.6	4%		
6	Bristol	28.6	13.4%	28.6	13.4%
7	Barnstable	9	4.2%	32.2	15.1%
	Plymouth	23.2	10.9%		
Non-Sampled Counties	Dukes	0.4	0.2%	0.6	0.3%
	Nantucket	0.2	0.1%		

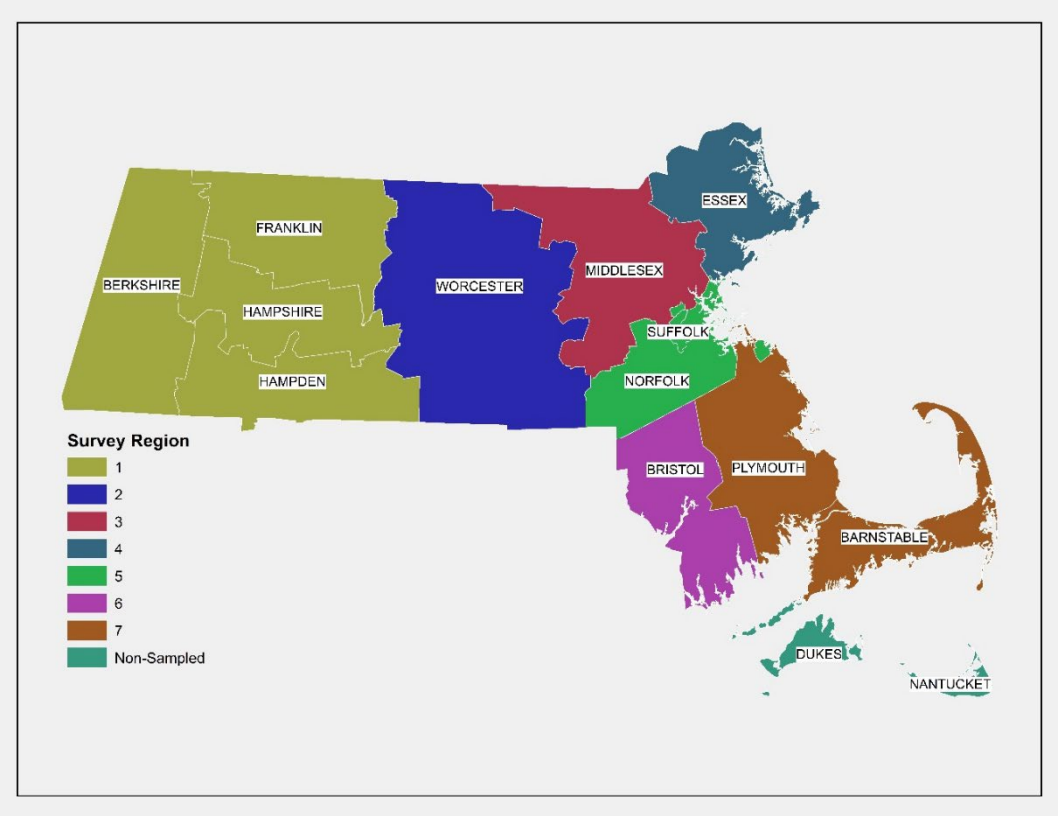

Figure 1 Massachusetts Counties and Study Regions

Using 2021 TIGER data developed by the U.S. Census Bureau, a listing of road segments was selected which have been classified by the U.S. Census Bureau using the MAF/TIGER Feature Class Code (MTFCC). There are principally three roadway classifications: 1) Primary Roads, 2) Secondary Roads, and 3) Local Roads (See Table 3 for detailed definitions). In addition, the listings include segment length as determined by TIGER. This descriptive information allowed for stratification of road segments, while a systematic probability proportional to size (PPS) sample was employed to select the road segments to be used as observation sites.

Table 3 Massachusetts MTFCC Codes Included by Default in the Road Segment File

Code	Name	Definition
S1100	Primary Road	Primary roads are generally divided, limited-access highways within the interstate highway system or under state management, and are distinguished by the presence of interchanges. These highways are accessible by ramps and may include some toll highways.
S1200	Secondary Road	Secondary roads are main arteries, usually in the U.S. Highway, State Highway or County Highway System. These roads have one or more lanes of traffic in each direction, may or may not be divided, and usually have at-grade intersections with many other roads and driveways. They often have both a local name and a route number.
S1400	Local Neighborhood Road, Rural Road, City Street	These are generally paved non-arterial streets, roads, or byways that usually have a single lane of traffic in each direction. Roads in this feature class may be privately or publicly maintained. Scenic Park roads are included in this feature class, as are (depending on the region of the country) some unpaved roads.

Although not a variable used for sampling, the day of week/time of day observations were aggregated for analysis consistent with previous years for comparison purposes. The aggregation was as follows and corresponds to the observation periods:

- Weekday A.M. Peak Period (7 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 (Saturday/Sunday 7 a.m. to 7 p.m.)

Once they had arrived at their assigned location, the two-person teams observed and recorded the following attributes for occupants of passing vehicles:

- Vehicle information:
  - Vehicle type (passenger, SUV, pick-up, mini-van, small commercial vehicle)
  - State of vehicle registration (MA, NH, other)
- Shoulder belt usage:
  - Driver-seat belt usage
  - Front-seat outboard-passenger seat belt usage
- Vehicle occupant information:
  - Driver apparent sex (male, female, unknown)
  - Driver apparent age (teen, adult, elder adult, unknown)
  - Driver apparent race (White, Black, Hispanic, other, unknown)
  - Passenger apparent sex (male, female, unknown)
  - Passenger apparent age (child, teen, adult, elder adult, unknown)
  - Passenger apparent race (White, Black, Hispanic, other, unknown)

It should be noted that although it was not needed, the approved sampling plan allowed for the inclusion of additional sites if the calculated variance did not achieve plus/minus 2.5% as required by the NHTSA protocol.

Results and Discussion

Between the 4th and 25th of June 2024, a total of 28,772 drivers and front outboard passengers in a total of 24,822 vehicles were observed at 147 observation locations statewide. The statistically weighted percentage of front seat occupants visibly using safety belts during the observational study was 84.36%. The 95th percent confidence interval ranges between 82.51% and 86.29%, with a relative error well below the required 2.5% threshold. In an unweighted format, the percentage of belt usage was 83.10%, representing an increase from the 2023 unweighted value of 79.29%; similarly, the weighted rate increased from 80.44% in 2023 to 84.36% in 2024. This improvement trend remains consistent with the prior year's study results, in which the change from 2022 to 2023 reflected a relative 4.5% improvement, while the 2023 to 2024 change reflected a relative 4.9% improvement.

Table 4 presents a breakdown of observed variables in a weighted format while providing a comparison to both 2023 and 2022. The change in percent (i.e. not percent change) of usage by variable from 2023 to 2024 is also presented in Table 4.

Given the sizable increase of nearly four percentage points (80.44% to 84.36%) in the weighted safety belt usage rate, additional consideration across variables is warranted. Some of the interesting findings include, but are not limited to, the following:

- Consistent with previous years, occupants identified as *female* were found to use seat belts 15% more often than occupants identified as *male*, with usage rates of 90.69% and 79.10%, respectively.

- *Teens* had an 85.50% usage rate, increasing by 2.05 percentage points. While *Adults* continued to have a lower usage rate compared to other age groups, they did experience the most significant improvement by 4.54 percentage points to an 83.43% usage rate. *Elder adults* (>65) had a slight decrease in usage, from 87.43% in 2023 to 86.09% in 2024.

- Based on apparent race, after substantial improvements experienced in 2022 and 2023 of belted rates for *Black* and *Hispanic* groups, in 2024 *Black* occupants showed a slight decrease to 79.56% and *Hispanic* occupants to 70.92%.

- Consistent with the previous year, nearly 7% of the vehicles observed were identified as out-of-state. Interestingly, *New Hampshire* had experienced a relative 5% reduction in belt usage in both of the prior years, however in 2024, the group demonstrated a relative 7% improvement to 74.27%, However, *New Hampshire* seat belt usage still remains a relative 12% lower than *Massachusetts* (84.73%), while those *out-of-state (other)* were observed similarly at 85.84%.

- In terms of vehicle type, *SUVs* continued to have the highest seat belt usage rate at 89.68%, with *passenger cars* and *vans* closely behind at 85.92% and 87.39%, respectively; while *small commercial vehicles* continued to have the lowest rate at 57.14%. Also consistent with the prior year, *pick-up trucks* experienced the most significant improvements, a relative 12% increase to 70.95%.

- Of all categorical time of day findings, seat belt usage during *weekends* showed the most significant decrease from 83.65% in 2023 to 81.05% in 2024. Comparatively, the *A.M. peak* period on weekdays showed a significant increase from 78.06% in 2023 to 85.49% in 2024, a relative 10% improvement.

- Across the Commonwealth, *Region 5* (Suffolk/Norfolk Counties) was attributed with the highest safety belt usage rate of 87.32%; a notable relative improvement from the prior year at 81.35%. While all groups experienced improvements, *Region 6 (Bristol County)* and *Region 4 (Essex County)* remained with the lowest usage rates of 78.27% and 80.62%, respectively.

- Examining the effects of passenger presence, *drivers with passengers* exhibited a slightly higher rate of seat belt usage at 85.45%, compared to *drivers alone* at 83.78%. This marginal difference, a relative 2%, is not as noteworthy compared to prior years, in which the effect of a passenger would increase the driver's likelihood to be belted by a relative 7.5% (2023).

- With respect to roadway classification of the observation sites, *secondary* (arterial) roadways saw the highest seat belt usage rate in 2024 at 85.32%, this group also accounted for the most significant increase from 80.18% in 2023.

Table 4 Summary of Weighted Study Data by Observation Variable with Known Belt Status

Observation Variable	2024 Data		2023 Data	2022 Data	Change in Percentage Points (2024 vs. 2023)
	Total Observed Occupants	Weighted % Belted	Weighted % Belted	Weighted % Belted	
All Vehicle Occupants	28772	84.36%	80.44%	77.00%	3.92
Apparent Sex					
Male	15410	79.10%	75.22%	71.49%	3.88
Female	13188	90.69%	86.48%	83.60%	4.21
Status Unknown	174	80.50%	73.18%	82.62%	7.32
Apparent Age					
Child (passenger <12)	351	95.00%	92.15%	89.27%	2.85
Teen	1230	85.50%	83.45%	81.15%	2.05
Adult	19121	83.43%	78.89%	76.05%	4.54
Elder Adult (>65)	7980	86.09%	87.43%	82.13%	-1.34
Status Unknown	90	76.02%	70.66%	71.25%	5.36
Apparent Race					
Black	2037	79.56%	81.57%	75.88%	-2.01
Hispanic	1751	70.92%	71.87%	65.11%	-0.95
White	22725	85.10%	80.46%	77.41%	4.64
Other	1850	91.91%	87.28%	78.67%	4.63
Status Unknown	409	79.24%	79.10%	79.01%	0.14
State of Vehicle Registration					
Massachusetts	26696	84.73%	80.93%	76.83%	3.80
New Hampshire	552	74.27%	69.93%	74.13%	4.34
Out of State (Other)	1434	85.84%	81.48%	81.85%	4.36
Unknown	90	83.75%	82.26%	71.70%	1.49
Vehicle Type					
Passenger Car	8734	85.92%	82.21%	79.11%	3.71
Pick-Up Truck	3411	70.95%	63.58%	60.42%	7.37
SUV	13908	89.68%	86.25%	82.57%	3.43
Van	940	87.39%	82.47%	80.40%	4.92
Small Commercial Vehicle	1677	57.14%	52.35%	53.65%	4.79
Unknown (other)	102	82.97%	70.96%	79.00%	12.01
Time of Day/Day of Week					
A.M. Peak – Weekday	9105	85.49%	78.06%	75.71%	7.43
Mid-day – Weekday	9556	82.54%	79.68%	76.91%	2.86
P.M. Peak – Weekday	7034	86.12%	82.49%	78.54%	3.63
Weekend	3077	81.05%	83.65%	78.70%	-2.60
Observation Region					
Region 1	2771	84.64%	83.21%	74.77%	1.43
Region 2	2567	83.99%	81.51%	72.46%	2.48
Region 3	4663	85.50%	82.99%	81.49%	2.51
Region 4	4426	80.62%	75.44%	77.79%	5.18
Region 5	4869	87.32%	81.35%	80.76%	5.97
Region 6	6151	78.27%	72.89%	74.41%	5.38
Region 7	3325	85.58%	79.97%	74.78%	5.61
Occupant Role					
Driver Alone	20566	83.78%	78.91%	75.70%	4.87
Driver with Passenger	4224	85.45%	84.80%	80.87%	0.65
Passenger	3982	86.42%	84.56%	81.13%	1.86
Roadway Classification					
Primary (Interstate)	1643	84.80%	81.57%	80.81%	3.23
Secondary (Arterial)	7277	85.32%	80.18%	78.90%	5.14
Local (All others)	19852	83.21%	79.58%	75.59%	3.63