

**Incident Experience of Massachusetts Drivers
Before and After Participation in *Attitudinal Dynamics of
Driving Defensive Driving Course***

Analysis January 1, 2016 through December 31, 2019

Submitted to the
Commonwealth of Massachusetts
Registry of Motor Vehicles

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EXECUTIVE SUMMARY

This study compares the motor vehicle records for one year before participation in the Defensive Driving Course (DDC) *Attitudinal Dynamics of Driving* (ADD), with participants' first year and second year post-DDC ADD experience and indicates any significant differences in incidents. Use of the DDC ADD program satisfies provisions of Chapter 175, section 113B, of the Motor Vehicle and Traffic Laws of Massachusetts (MA). In 2010, this section was modified to state that drivers subject to suspension for accumulating *three surchargeable incidents* within the past 24 months must be required to complete a *driver-retraining program*, which may be completed in lieu of suspension.

The findings presented in this report are limited to those drivers who attended DDC ADD during the 2017 calendar year. The violation experience of these 41,186 drivers was analyzed from January 1, 2016 to December 31, 2019. This timeframe allows for the capturing of violations one year before and two years after any training event occurring in 2017. Four categories of motor vehicle incidents were analyzed:

- All violations reported
- Major traffic violations
- Minor traffic violations
- Surchargeable violations

Results summary:

- Of the 41,186 drivers included in this study:
 - 33,043 (80%) completed DDC ADD once
 - 6,359 (15%) completed DDC ADD twice
 - 1,357 (3%) completed DDC ADD three times
 - 326 (1%) completed DDC ADD four times
 - 69 (<1%) completed DDC ADD five times
 - 19 (<1%) completed DDC ADD six times
 - 7 (<1%) completed DDC ADD seven times
 - 5 (<1%) completed DDC ADD eight times
 - 1 (<1%) completed DDC ADD nine times
- The impact of DDC ADD was assessed by comparing the violation experience in 2016 (year prior to training year) against 2018 and 2019 (one and two years following the training year). The following results were found:
 - All participant groups had significantly fewer total violations in each of the two post training years than in the year before training.
 - Total traffic violations decreased an average of 65% during the second year following DDC ADD participation compared to the year before training.
 - Minor traffic violations decreased an average of 69% during the second year following DDC ADD participation compared to the year before training.
 - Major traffic violations decreased an average of 55% during the second year following DDC ADD participation compared to the year before training.
 - Surchargeable violations decreased an average of 77% during the second year following DDC ADD participation compared to the year before training.

- All differences listed above are statistically significant ($p < 0.05$).

These results highlight two very important aspects of the MA Driver Re-Training Program:

- First, results provide convincing evidence that the decrease in violations persists for at least two years following training. Results showed no evidence of attenuation over time. Instead, violation experience appears to continue to trend downward even after two years.
- Second, all driver groups, regardless of violation history, benefited from the MA Driver Re-Training Program.

INTRODUCTION

The provisions of Chapter 175, section 113B, of the Motor Vehicle and Traffic Laws of Massachusetts (MA) require that a driver that has had *three surchargeable incidents* within the past 24 months must be required to complete a *driver re-training program* satisfactorily to the Registrar. If the driver fails to complete the program within 90 days after notice of the requirement is sent to the driver, the Registrar will suspend the motorists' driver's license until such time as the licensee is notified of completion of the required course. Conversely, course completion within the 90 days is accepted in lieu of suspension. Prior to October 2010, the law required the driver re-training program for drivers who had accumulated five surchargeable incidents within a three year period.

A *surchargeable incident* is an "at-fault" collision/crash or conviction of a moving violation under motor-vehicle laws that can increase a driver's insurance surcharge points under the Safe Driver Insurance Plan (SDIP). A surchargeable incident is defined by the nature of the violation and not by the number of citations. It is possible, therefore, to receive several surcharge points for a single citation. The Massachusetts Point System defines surchargeable incidents as follows:

- Minor Traffic Law Violations = **2 points**
- Minor Accidents (at fault in excess of 50%):
(between \$501 and \$2001 property damage/collision/bodily injury coverage) = **3 points**
- Major Accidents (at fault in excess of 50%):
(exceeds \$2001 property damage/collision/bodily injury coverage) = **4 points**
- Major Traffic Law Violations = **5 points**

The Registrar selected the National Safety Council (NSC) DDC ADD as the program to meet the provisions of Chapter 175, section 113B. Now in its 4th Edition, DDC ADD continues on as an 8-hour instructor-led classroom program.

During the DDC ADD class, participant involvement is necessary to ensure success of the program. Students are actively involved in evaluating their driving habits and making decisions and choices about their driving behaviors. From the beginning of the program, students are exposed to the concepts of Reality Therapy, Choice Theory, and the Quality World concept as developed by Dr. William Glasser:

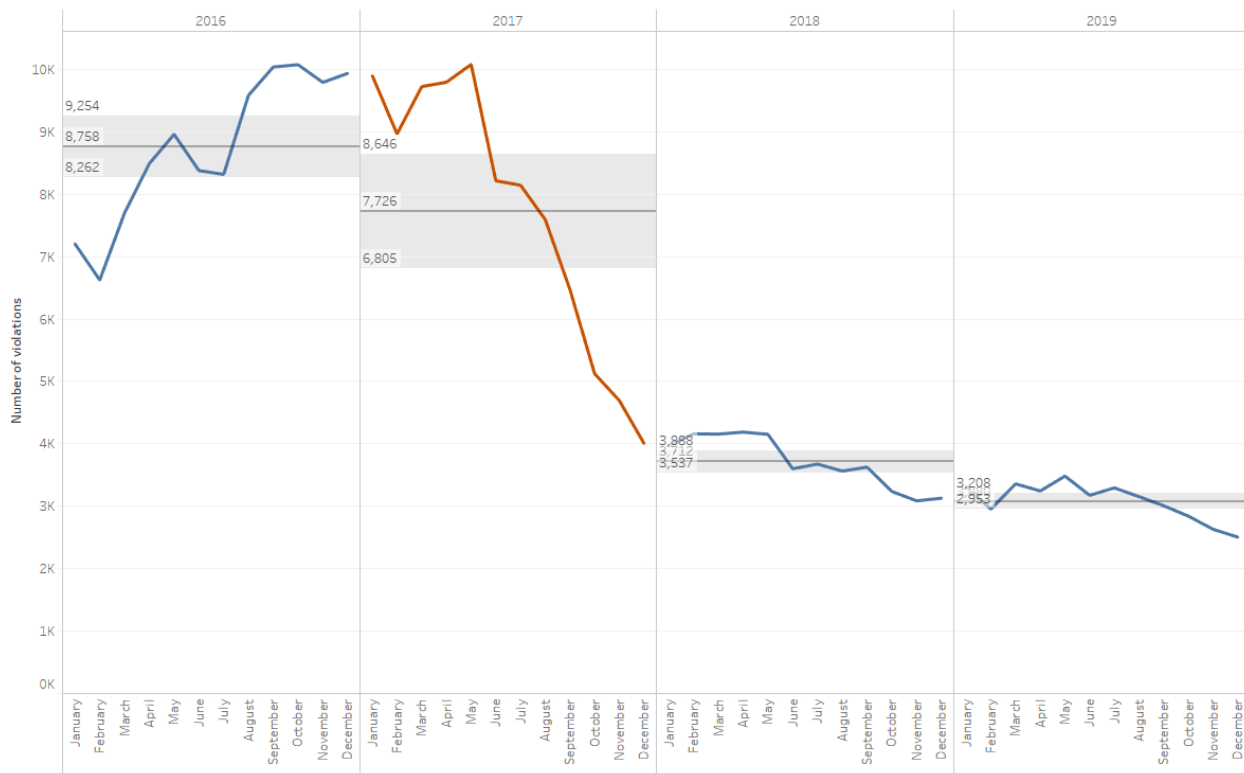
- (a) Students complete a self-assessment profile that helps them identify their behind-the-wheel behaviors and then learn how those behaviors are chosen and not simply a response to a stimulus. An important principle in the application of Reality Therapy and Control Theory is not to accept excuses, but rather to focus on behaviors.
- (b) Students then complete an activity that demonstrates that they do, in fact, know their state's traffic laws, which helps remove excuses from their reasons for being in the class.
- (c) Students can only then begin to learn that they need to change their ineffective, irresponsible driving behaviors by choosing more effective behaviors and are guided into making an individual action plan. That plan is then put into action through a variety of driving situations and scenarios.

A subset of drivers included in this analysis completed a special version of DDC ADD, Chronic Offender Program. Beginning in 2016, drivers who were assigned to ADD more than three times

were shifted to the Chronic Offender Program on their fourth or higher requirement. This program is specifically designed for repeat traffic violators and court referrals, as a diversion program for drivers with excessive violations, or for drivers with poor driving habits.

The findings presented in this report are limited to those drivers who attended DDC ADD during the 2017 calendar year. Violation experience of these 41,186 drivers was analyzed from January 1, 2016 to December 31, 2019. This timeframe allows for the capturing of violations one year before and two years after the 2017 training year. During this timeframe the 41,186 drivers received a total of 279,316 violations. A graphic depiction of the number of violations during this four-year period is provided in Figure 1. As can be clearly seen, this group of targeted drivers received dramatically fewer violations following the 2017 training year. This report documents the analysis conducted by NSC to assess changes in violation frequency before and after participation in the DDC ADD program.

Figure 1. Number of Total Violations Experienced by Target Drivers by Month, 2016-2019



METHOD

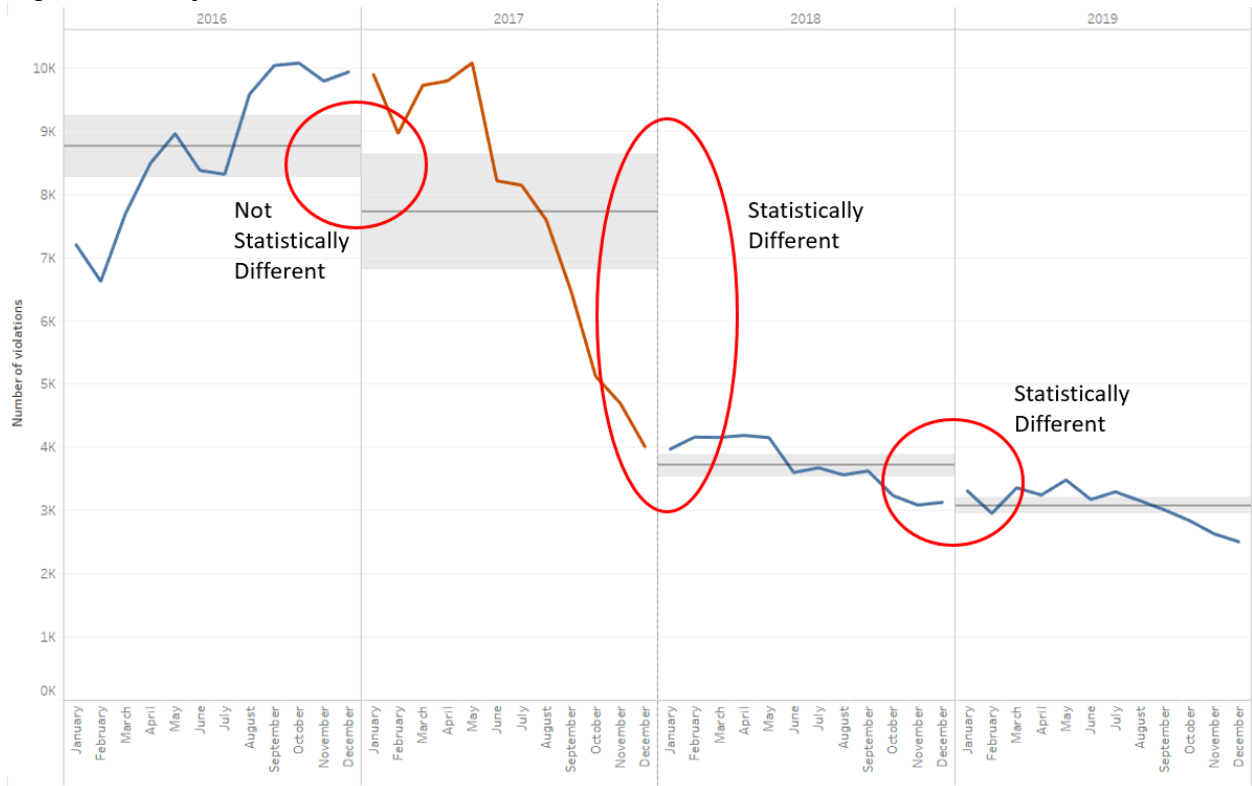
NSC sent the Massachusetts Registry of Motor Vehicles (RMV) a computerized list of 44,880 drivers who completed the DDC ADD course. This driver group attended the course during the 2017 calendar year (January 1 through December 31). The RMV provided a computerized list containing the motor-vehicle records (MVRs) of 41,186 drivers with matching Surrogate IDs, valid training class completion dates, and at least one offense during the study period.

The course participant MVR data used in this study were as follows:

- Surrogate ID
- Gender
- Birth date
- Training date
- Incident date
- HTO weight
- Major/Minor traffic violation code
- Surchargeable violation indicator
- Violation description

All analyses were conducted using Tableau 2020.3. Statistical significance is assessed by comparing confidence intervals. When two confidence intervals overlap with one another the difference between the means should not be considered statistically significant. When confidence intervals are adjusted to 83%, non-overlapping confidence intervals represent a statistically significant difference between the means at the $p < 0.05$ level (Bolker, 2015; Goldstein & Healy, 1995). A significance level of 0.05 is used for all statistical tests (i.e., a requirement of at least 95% probability that differences were not due to chance alone). As shown in Figure 2, the difference in the monthly average number of total violations in 2016 versus 2017 have overlapping confidence intervals and thus the difference between average monthly violations for these two years is not significantly different. In contrast, the differences between years 2016 versus 2018, 2017 versus 2018, and 2018 versus 2019 are significant at the $p < 0.05$ level because they all have non-overlapping confidence intervals.

Figure 2. Comparison of Confidence Intervals for Total Violations



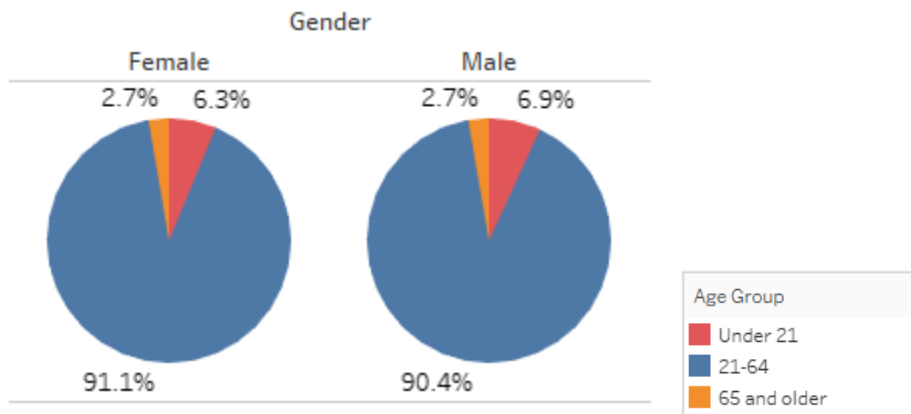
RESULTS

Demographics

The mean age of the 41,186 DDC ADD participants was 34.3 years. The mean age for male participants was 34.1 years, while the mean age for females was 34.6 years. Females made up 33.6% of the drivers studied.

Overall, the age distribution of drivers included in this study is nearly identical for both males and females (see Figure 3).

Figure 3. Age Distribution of Drivers by Gender



As the number of training classes increases (up to six classes), there is a slightly larger proportion of male drivers under 21 years old compared to female drivers. The largest disparity occurs among drivers who attended five training classes; young (under 21) male drivers in this group represent 13% of the male drivers, compared to no young female drivers (Figure 4 and Table 1).

Figure 4. Percentage of DDC ADD Course Participants by Gender, Age, and Number of Training Events

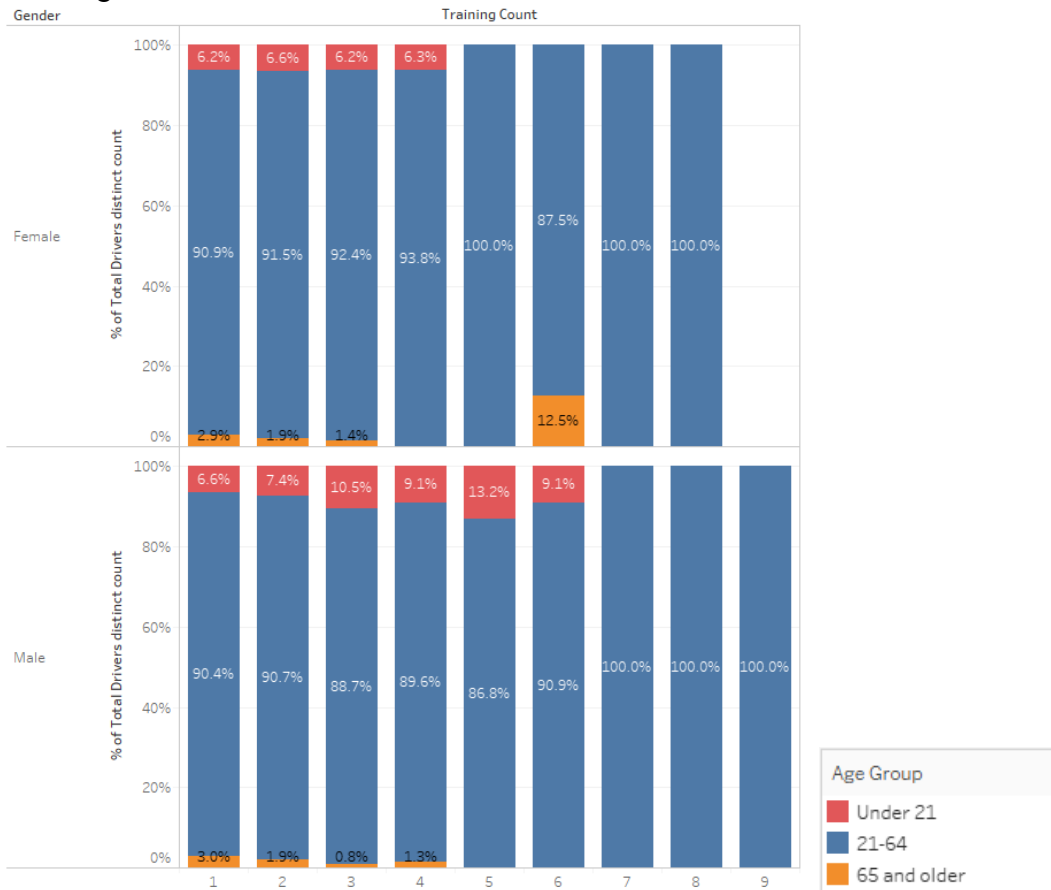


Table 1. Number and Percentage of DDC ADD Course Participants by Gender, Age, and Number of Training Events

Age Group	Gender					
	Male		Female		TOTAL	
	Number	%	Number	%	Number	%
All Participants						
Under 21	1,879	6.9	867	6.3	2,746	6.7
21-64	24,718	90.4	12,605	91.0	37,323	90.6
65 and older	745	2.7	372	2.7	1,117	2.7
TOTAL	27,342	100.0	13,844	100.0	41,186	100.0
Participants Completing One Training Event						
Under 21	1,437	6.6	697	6.6	2,134	6.5
21-64	19,751	90.9	10,180	91.5	29,931	90.6
65 and older	653	2.9	325	3.0	978	3.0
TOTAL	21,841	100.0	11,202	100.0	33,043	100.0
Participants Completing Two Training Events						
Under 21	316	7.4	137	6.6	453	7.1
21-64	3,878	90.7	1,906	91.5	5,784	91.0
65 and older	82	1.9	40	1.9	122	1.9
TOTAL	4,276	100.0	2,083	100.0	6,359	100.0
Participants Completing Three Training Events						
Under 21	97	10.5	27	6.2	124	9.1
21-64	817	88.7	403	92.4	1,220	89.9
65 and older	7	0.8	6	1.4	13	1.0
TOTAL	921	100.0	436	100.0	1,357	100.0

Table 1 (Continued). Number and Percentage of DDC ADD Course Participants by Gender, Age, and Number of Training Events

Age Group	Gender					
	Male		Female		TOTAL	
	Number	%	Number	%	Number	%
Participants Completing Four Training Events						
Under 21	21	9.1	6	6.3	27	8.3
21-64	206	89.6	90	93.8	296	90.8
65 and older	3	1.3	0	0.0	3	0.9
TOTAL	230	100.0	96	100.0	326	100.0
Participants Completing Five Training Events						
Under 21	7	13.2	0	0.0	7	10.1
21-64	46	86.8	16	100.0	62	89.9
65 and older	0	0	0	0	0	0.0
TOTAL	53	100.0	16	100.0	69	100.0
Participants Completing Six Training Events						
Under 21	1	9.1	0	0.0	1	5.3
21-64	10	90.9	7	87.5	17	89.5
65 and older	0	0.0	1	12.5	1	5.3
TOTAL	11	100.0	8	100.0	19	100.0
Participants Completing Seven Training Events						
Under 21	0	0.0	0	0.0	0	0.0
21-64	5	100.0	2	100.0	7	100.0
65 and older	0	0.0	0	0.0	0	0.0
TOTAL	5	100.0	2	100.0	7	100.0
Participants Completing Eight Training Events						
Under 21	0	0.0	0	0.0	0	0.0
21-64	4	100.0	1	100.0	5	100.0
65 and older	0	0.0	0	0.0	0	0.0
TOTAL	4	100.0	1	100.0	5	100.0
Participants Completing Nine Training Events						
Under 21	0	0.0	0	0.0	0	0.0
21-64	1	100.0	0	0.0	1	100.0
65 and older	0	0.0	0	0.0	0	0.0
TOTAL	1	100.0	0	0.0	1	100.0

Ninety-nine percent of drivers included in this study completed four or fewer training events during 2017. The vast majority completed only one training event in 2017. Of the 41,186 drivers included in this study, 33,043 (80%) completed one training event, 6,359 (15%) completed two

training events, 1,357 (3%) completed three training events, 326 (1%) completed four training events, and 101 (<0.5%) completed five or more training events.

Primary Before and After Comparisons

The first set of analyses explores the impact of DDC ADD, combined for all driver groups. Because participation in DDC ADD is triggered by the accumulation of surchargeable events, the analysis first focuses on the impact of DDC ADD on surchargeable events. As shown in Figure 5, drivers experienced statistically fewer surchargeable violations and lower monthly average violation rates per 100 drivers in both the first and second years following training (2018 and 2019) compared to the year before training (2016). As discussed previously, statistical significance is identified when the confidence intervals between years or groups do not overlap.

Figure 5. Impact of DDC ADD Training – Number of Surchargeable Violations by Month and Average Monthly Surchargeable Violations per 100 Drivers One Year Before Compared to Two Years After

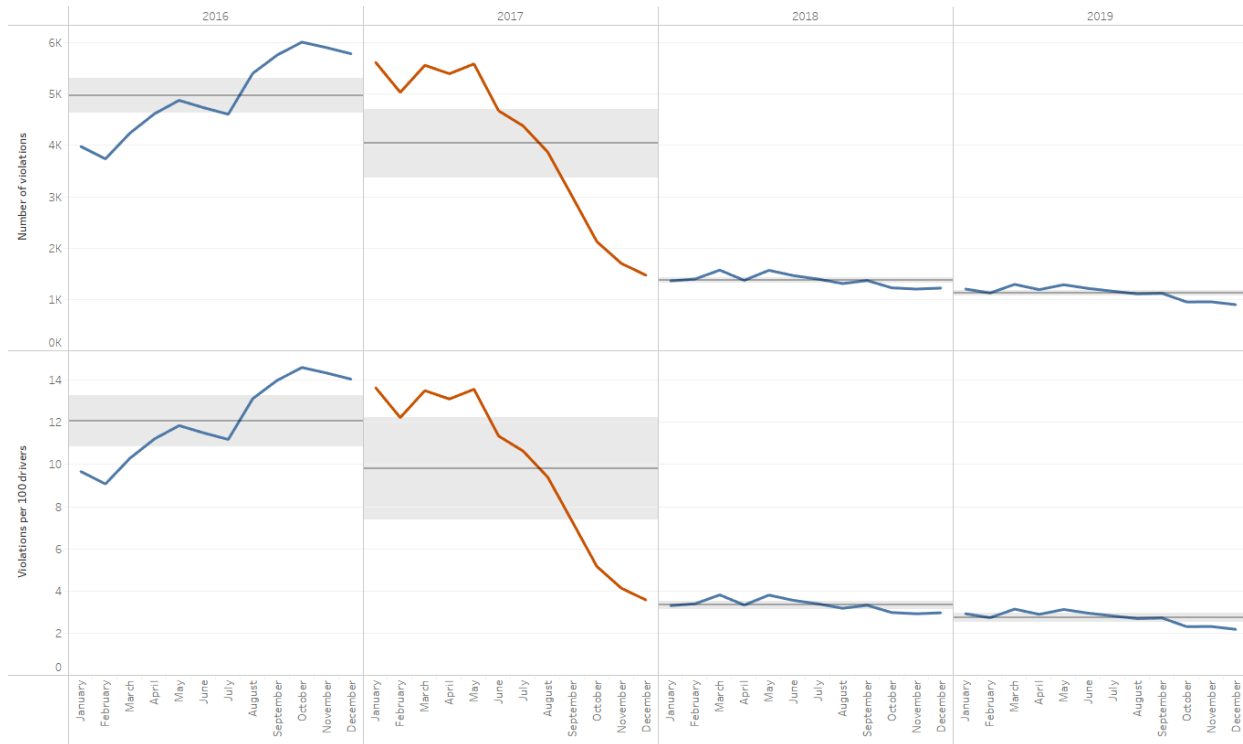


Table 2 expands on the analysis illustrated in Figure 5 by assessing the impact on average monthly violations and rates for total violations, minor violations, major violations, as well as surchargeable violations. The analyses found that drivers had significantly fewer violations and lower violation rates for all violation types in the second year after DDC ADD training compared to the year before the DDC ADD training, illustrating that the improved driving behavior persists for at least two years.

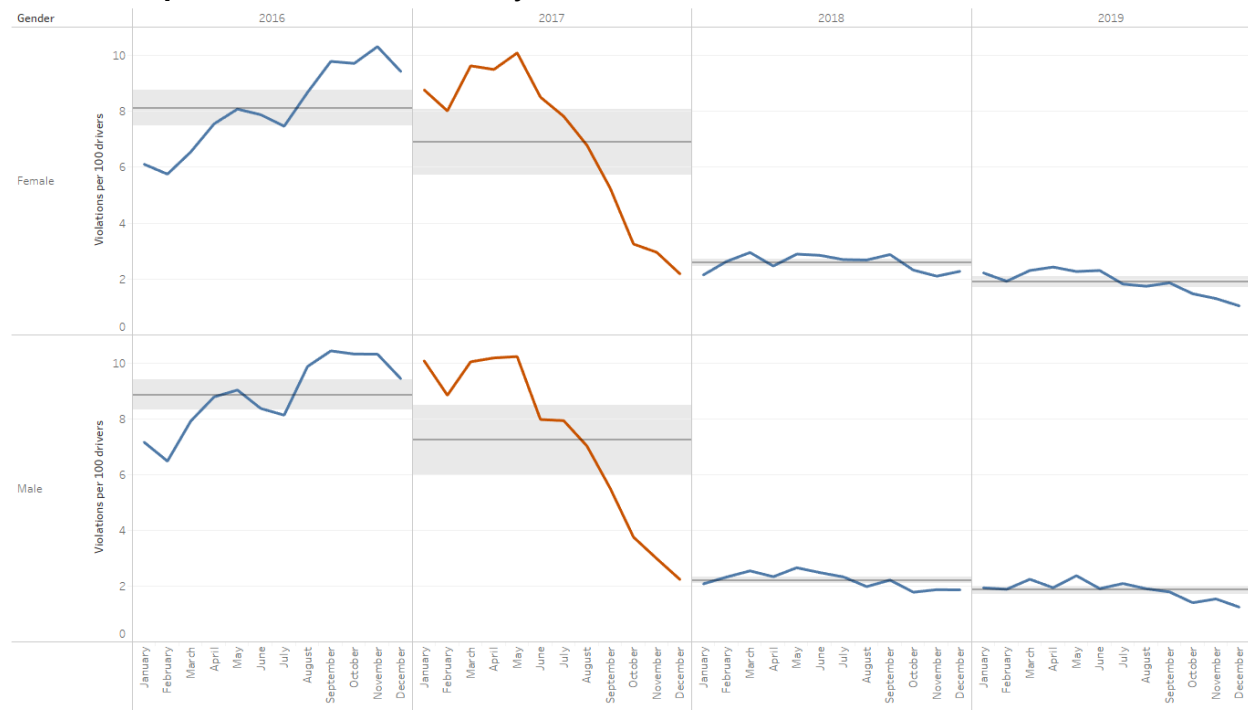
Table 2. Impact of DDC ADD Training – Average Monthly Number of Violations and Violation Rates per 100 Drivers One Year Before Compared to Two Years After

	Average Monthly Number of Violations			Average Monthly Violation Rate per 100 Drivers		
	One Year Before	Two Years After	% Chg.	One Year Before	Two Years After	% Chg.
Total Traffic Violations	8,758	3,080	-65*	21.26	7.48	-65*
Minor Traffic Violations	3,353	1,042	-69*	8.14	2.53	-69*
Major Traffic Violations	871	388	-55*	2.12	0.94	-55*
Surchargeable Violations	4,972	1,125	-77*	12.07	2.73	-77*

* Statistically significant ($p < 0.05$).

Next, the analyses explores the impact of DDC ADD by gender. As shown in Figure 6, both males and females experienced statistically lower monthly average surchargeable violation rates per 100 drivers in both the first and second years following training (2018 and 2019) compared to the year before training (2016). Differences between males and females were not statistically different across the four years of the analysis. Additional details are also provided in Table 3.

Figure 6. Impact of DDC ADD Training (Regardless of the Number of Training Events Completed) – Average Number of Monthly Surchargeable Violations per 100 Drivers One Year Before Compared to Two Years after by Gender



Drivers were segmented into three age groups (Under 21, 21-64, and 65 and older). As shown in Figure 7, all three age groups experienced statistically lower monthly average surchargeable violation rates per 100 drivers in both the first and second years following training (2018 and 2019) compared to the year before training (2016). Comparing surchargeable violation rates before training shows no statistical difference between under 21 drivers and 21-64 drivers.

However, 65 and older drivers did have a statistically lower average monthly surchargeable violation rate before training than did the under 21 drivers at the $p < 0.05$ level. During the second year following training (2019), both the 21-64 driver group and the 65 and older driver group experience statistically lower monthly average surchargeable violation rates than did the under 21 driver group at the $p < 0.05$ level. Additional details are also provided in Table 3.

Figure 7. Impact of DDC ADD Training (Regardless of the Number of Training Events Completed) – Average Number of Monthly Surchargeable Violations per 100 Drivers One Year Before Compared to Two Years after by Age Group

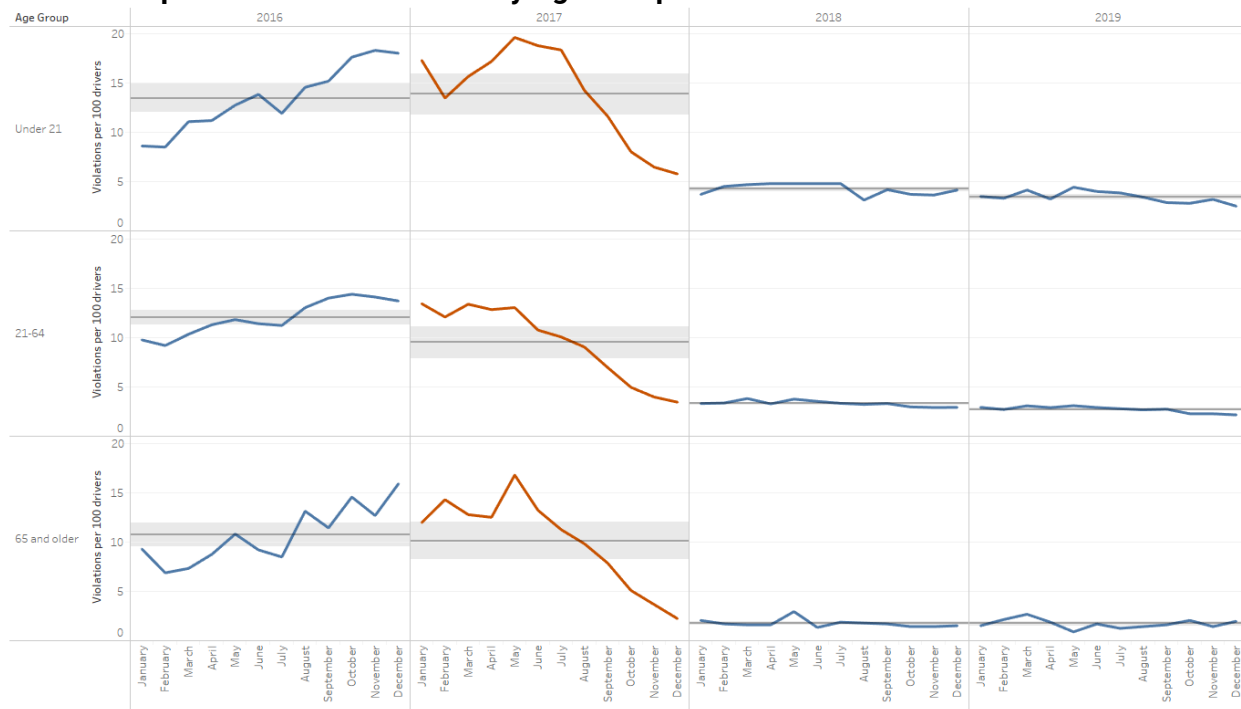


Table 3 expands on the analysis illustrated in Figures 6 and 7 by assessing the impact on average monthly rates for total violations, minor violations, major violations, as well as surchargeable violations. Table 3 shows the average monthly violations per 100 drivers for each driver subgroup in the year prior to DDC ADD training and the second year following DDC ADD training, as well as the percent changes in the means. The analyses found that nearly all participant groups, regardless of age group or sex, had significantly fewer violations in the second year after DDC ADD training than in the year before the DDC ADD training.

As shown in the "All Age Groups" column in Table 3, males and females had statistically significant reductions across the four violation categories defined in this study. Percentage reductions in incidents during the second year after DDC ADD training tended to be highest regarding surchargeable events compared to the other violation categories. Percent decreases in the average monthly surchargeable rate ranges from 72% among under 21 year old females to 85% among 65 and older males.

Table 3. Impact of DDC ADD Training (Regardless of the Number of Training Events Completed) – Average Number of Monthly Violations per 100 Drivers One Year Before Compared to Two Years after by Age and Sex

Sex	Age Group											
	Under 21 Years Old			21-64 Years Old			65 and Older			All Age Groups		
	One Year Before	Two Years After	% Chg.	One Year Before	Two Years After	% Chg.	One Year Before	Two Years After	% Chg.	One Year Before	Two Years After	% Chg.
Total Traffic Violation												
Male	23.95	10.05	-58%*	21.71	7.50	-65%*	14.34	3.03	-79%*	21.66	7.55	-65%*
Female	18.20	8.13	-55%*	20.86	7.39	-65%*	12.79	3.45	-73%*	20.48	7.33	-64%*
Total	22.14	9.44	-57%*	21.42	7.46	-65%*	13.82	3.17	-77%*	21.26	7.48	-65%*
Minor Traffic Violation												
Male	11.15	3.83	-66%*	8.44	2.58	-69%*	4.79	0.76	-84%*	8.53	2.62	-69%*
Female	7.55	2.71	-64%*	7.47	2.38	-68%*	3.72	0.93	-75%*	7.37	2.36	-68%*
Total	10.01	3.48	-65%*	8.12	2.51	-69%*	4.43	0.79	-82%*	8.14	2.53	-68%*
Major Traffic Violations												
Male	1.59	1.07	-33%*	2.28	0.94	-59%*	1.12	0.32	-71%*	2.20	0.93	-58%*
Female	0.89	1.09	+22%	2.07	0.97	-53%*	0.56	0.68	+21%	1.95	0.96	-51%*
Total	1.37	1.08	-21%*	2.21	0.95	-57%*	0.92	0.31	-66%*	2.12	0.94	-56%*
Surchargeable Violations												
Male	13.99	3.42	-76%*	11.90	2.63	-78%*	10.85	1.66	-85%*	12.19	2.88	-76%*
Female	12.44	3.50	-72%*	12.22	2.87	-76%*	10.51	1.84	-82%*	12.02	2.65	-78%*
Total	13.50	3.44	-75%*	12.01	2.71	-77%*	10.74	1.72	-84%*	12.07	2.73	-77%*

* Statistically significant ($p < 0.05$).

Secondary Before and /After Comparisons

Impact of Number of Training Events

A secondary set of analysis were also conducted to assess the impact of two training-related factors. First, the impact of DDC ADD participation was assessed by number of training events completed in 2017. Because 99% of drivers in this study completed four or fewer training events in 2017, this analysis focuses on assessing the impact of participating in one to four training events. As shown in Figure 8 and Table 4, the average monthly surchargeable violation rate was significantly lower one and two years after DDC ADD training than during the year prior to training for all groups of drivers (participation from one to four training events).

Figure 8. Impact of DDC ADD Training (Regardless of the Number of Training Events Completed) – Average Number of Monthly Surchargeable Violations per 100 Drivers One Year Before Compared to Two Years after by Number of Training Events (1 through 4)

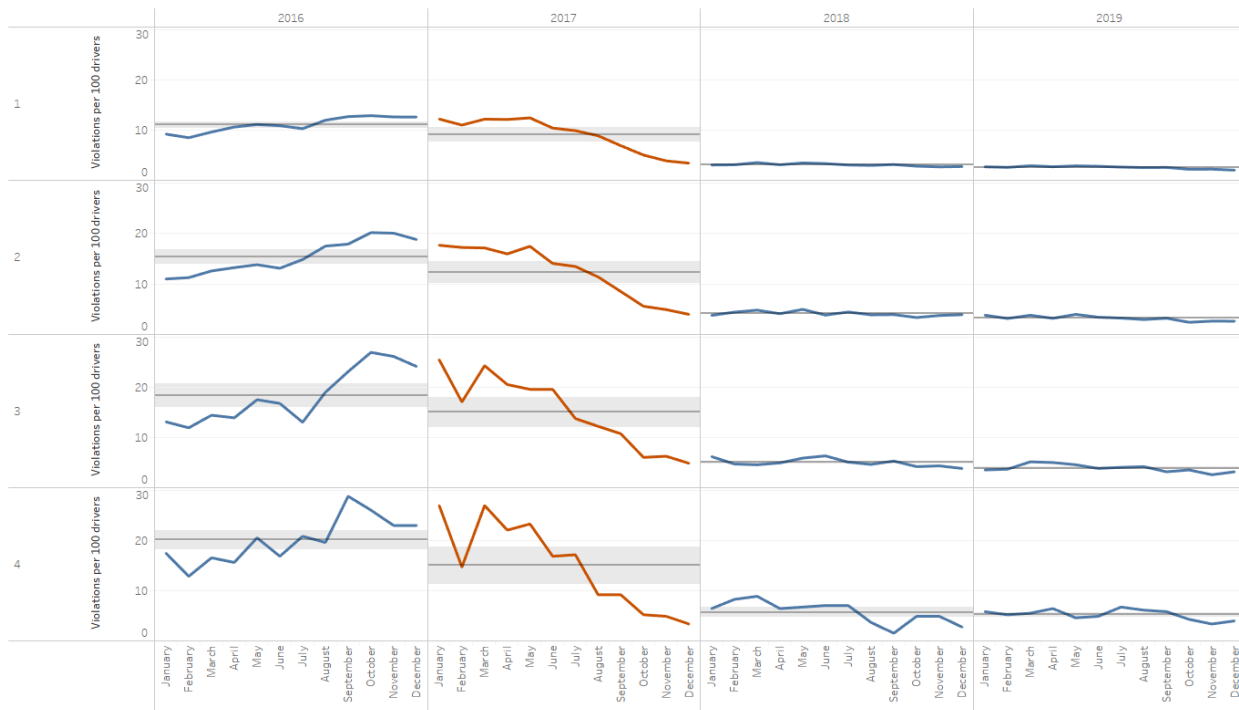


Table 4 expands on the Figure 8 analysis by exploring the impact of multiple training events on total violations, minor violations, major violations, as well as surchargeable violations. Participants completing one to four training events experienced lower average monthly violation rates in the first and second years after DDC ADD training than in the year before DDC ADD training across nearly all violation categories. The only exception, the decrease in major violations was not significant until the second year following training; during the first year following training the decrease was not statistically significant.

Table 4. Impact of DDC ADD Training Events – Monthly Average Number of Before/After Violations per 100 Drivers and Percentage Change by Total Number of Training Events Completed

	One Year Before	One Year After (% Change)	Two Years After (% Change)
All Participants			
Total Traffic Violations	21.26	9.01 (-58)*	7.48 (-65) *
Minor Traffic Violations	8.14	3.09 (-62) *	2.53 (-69) *
Major Traffic Violations	2.12	1.16 (-45) *	0.94 (-56) *
Surchargeable Violations	12.07	3.33 (-72) *	2.73 (-77) *
Participants Completing a Total of One Training Event			
Total Traffic Violations	19.27	8.13 (-58) *	6.78 (-65) *
Minor Traffic Violations	7.40	2.77 (-63) *	2.30 (-69) *
Major Traffic Violations	1.86	0.99 (-47) *	0.82 (-56) *
Surchargeable Violations	11.09	3.08 (-72) *	2.56 (-77) *
Participants Completing a Total of Two Training Events			
Total Traffic Violations	27.39	11.63 (-57) *	9.63 (-65) *
Minor Traffic Violations	10.47	4.07 (-61) *	3.15 (-70) *
Major Traffic Violations	2.86	1.59 (-44) *	1.37 (-52) *
Surchargeable Violations	15.36	4.10 (-73) *	3.20 (-79) *
Participants Completing a Total of Three Training Events			
Total Traffic Violations	35.26	15.24 (-57) *	11.97 (-66) *
Minor Traffic Violations	13.32	5.24 (-61) *	4.40 (-67) *
Major Traffic Violations	3.91	2.56 (-35) *	1.46 (-63) *
Surchargeable Violations	18.36	5.00 (-73) *	3.87 (-79) *
Participants Completing a Total of Four Training Events			
Total Traffic Violations	40.54	18.46 (-54) *	15.18 (-62) *
Minor Traffic Violations	14.54	6.37 (-56) *	5.24 (-64) *
Major Traffic Violations	4.71	3.34 (-29)	2.39 (-49)*
Surchargeable Violations	20.12	5.73 (-71) *	5.24 (-74) *

* Statistically significant ($p < 0.05$).

Impact of Chronic Offender Program (COP)

The second training-related factor assessed is the impact of the Chronic Offender Program (COP). As discussed in the introduction, a subset of drivers, which represents 23% of the ADD assigned drivers, included in this analysis completed COP, a special version of DDC ADD. Drivers who were previously assigned DDC ADD three times are assigned to COP on the fourth and subsequent requirement. This program is specifically designed for repeat traffic violators and court referrals, as a program for drivers with excessive violations, or for drivers with poor driving habits. This analysis assesses the impact on the average monthly surchargeable rate among drivers who participated in at least one COP compared to drivers who have not participated in COP.

As shown in Figure 9 and Table 5, the average monthly surchargeable violation rate was significantly lower one and two years after DDC ADD training than during the year prior to training for both drivers who participated in COP at least once and for drivers who have not been

assigned COP. Comparing surchargeable violation rates before training shows that COP assigned drivers experienced significantly higher average monthly surchargeable violation rates than non-COP assigned drivers. The COP participating drivers continued to experience higher violation rates during the two years following training than the non-COP assigned drivers. However, both driving groups experienced similar levels of improvement following training, with at least a 77% decrease in average monthly surchargeable violation rates during the second year post training compared to the year prior to training.

Figure 9. Impact of DDC ADD COP Training – Average Number of Monthly Surchargeable Violations per 100 Drivers One Year Before Compared to Two Years after by Participation in COP

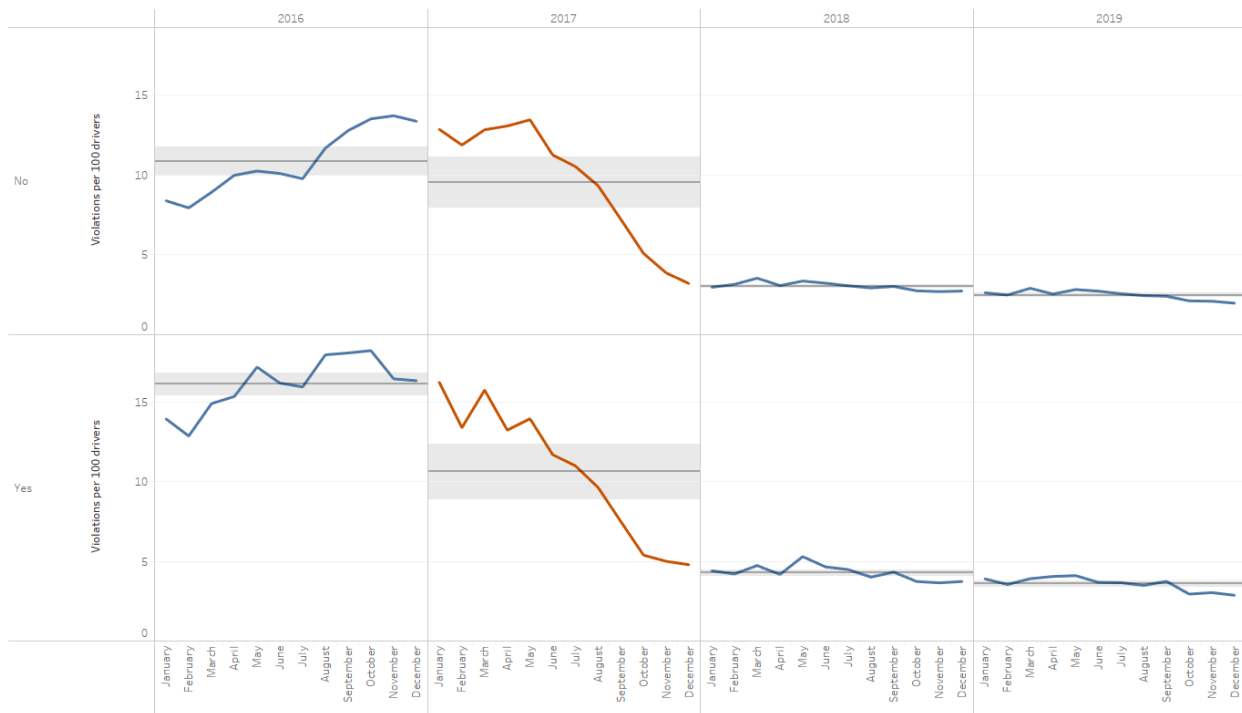


Table 5 expands on the Figure 9 analysis by exploring the impact of COP on total violations, minor violations, major violations, as well as surchargeable violations. Both COP trained drivers and non-COP drivers experienced lower average monthly violation rates in the first and second years after completing DDC ADD training than in the year before DDC ADD training across all violation categories.

Table 5. Impact of DDC ADD COP Training Events – Monthly Average Number of Before/After Violations per 100 Drivers and Percentage Change by Participation in COP

	One Year Before	One Year After (% Change)	Two Years After (% Change)
All Participants			
Total Traffic Violations	21.26	9.01 (-58)*	7.48 (-65) *
Minor Traffic Violations	8.14	3.09 (-62) *	2.53 (-69) *
Major Traffic Violations	2.12	1.16 (-45) *	0.94 (-56) *
Surchargeable Violations	12.07	3.33 (-72) *	2.73 (-77) *
Drivers participating in at least one COP			
Total Traffic Violations	30.13	12.24 (-59) *	10.26 (-66) *
Minor Traffic Violations	11.68	4.31 (-63) *	3.55 (-70) *
Major Traffic Violations	3.20	1.62 (-49) *	1.29 (-60) *
Surchargeable Violations	16.13	4.29 (-73) *	3.58 (-78) *
Drivers without COP participation			
Total Traffic Violations	18.62	8.05 (-57) *	6.65 (-64) *
Minor Traffic Violations	7.09	2.72 (-62) *	2.23 (-69) *
Major Traffic Violations	1.79	1.03 (-42) *	0.84 (-53) *
Surchargeable Violations	10.86	3.04 (-72) *	2.48 (-77) *

* Statistically significant ($p < 0.05$).

Impact of DDC ADD on Crash Rates

The final analysis explores crash-related traffic violations before and after exposure to the DDC ADD course. A violation was categorized as crash-related if it had one of three violation descriptions:

- Property Damage Liability
- Collision
- Bodily Injury Liability

Comparing the crash-related surchargeable violation rates shows that the rate of crash-related violations significantly decreased during the 2017 training year, as well as one and two years following the training year.

Figure 10. Impact of DDC ADD Training – Average Number of Monthly Crash-Related Surchargeable Violations per 100 Drivers One Year Before Compared to Two Years after

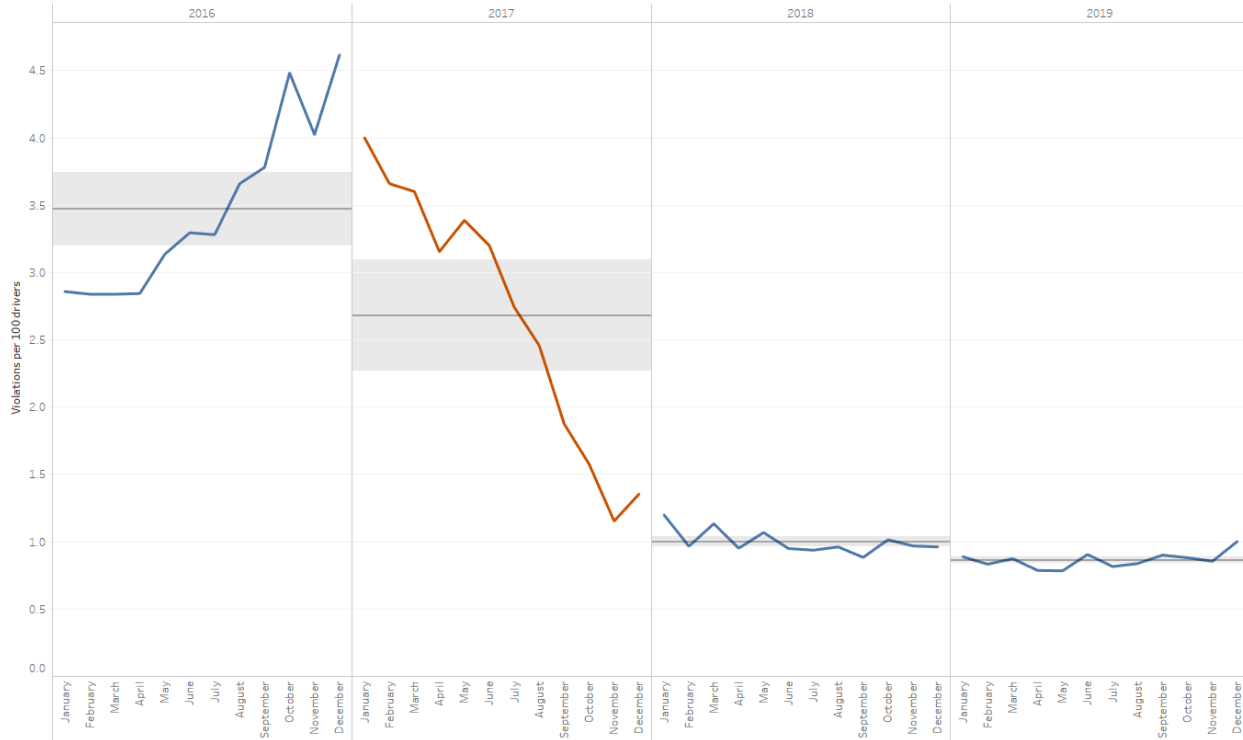


Table 6 expands on the Figure 10 analysis by exploring the impact of DDC ADD training on total violations as well as surchargeable violations. The majority of crash-related violation were surchargeable resulting in very similar total and surchargeable violation crash rates. Both categories of violations decreased by 75% two years following training compared to the year prior to training.

Table 6. Impact of DDC ADD Training Events – Monthly Average Number of Before/After Crash-Related Violations per 100 Drivers and Percentage Change

	One Year Before	One Year After (% Change)	Two Years After (% Change)
Total Traffic Violations	3.55	1.00 (-72)*	0.87 (-75) *
Surchargeable Violations	3.47	1.00 (-72)*	0.86 (-75) *

* Statistically significant ($p < 0.05$).

Summary

In summary, based on the information made available by the Commonwealth of Massachusetts RMV, participants in this study showed statistically significant reductions in total, minor, major, and surchargeable incidents in the first and second years after exposure to the DDC ADD course compared with the year before. These reductions were significant across nearly all driver subgroups or violation types.

These results highlight two very important aspects of the MA Driver Re-Training Program:

- First, these results provide convincing evidence that the decrease in violations persists for at least two years following the training event. Results showed no evidence of attenuation over time. Instead, in most cases the violation experience appears to continue to trend downward even after two years.
- Second, all driver groups, regardless of violation history, benefited from the MA Driver Re-Training Program.

The improvement demonstrated following training was consistent, regardless of violation history. Drivers who completed one training event had an average monthly surchargeable violation rate of 11.09 per 100 drivers the year before training and demonstrated a 77% decrease in violations the second year following training. Drivers who completed four training events had an average monthly surchargeable violation rate of 20.12 per 100 drivers the year before training and demonstrated a 74% decrease in violations the second year following training.

REFERENCES

Bolder, B. (2015). *Overlapping confidence intervals*. Accessed on 12/4/2020 at: https://rstudio-pubs-static.s3.amazonaws.com/132971_a902bb2b962b407e9e9436559c6f5d36.html .

Goldstein, H. & Healy, M. (1995). The Graphical Presentation of a Collection of Means. *Journal of the Royal Statistical Society, 158 Part 1*, pp. 175-177.