

**Comparison of Incident Experience of Massachusetts
Drivers Before and After Participation in the DDC
Attitudinal Dynamics Course or Defensive Driving Online
Course**

Analysis January 1, 2019 through December 31, 2021

Submitted to the
Commonwealth of Massachusetts
Registry of Motor Vehicles

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Executive Summary

In response to pandemic-related public health concerns in 2020, the National Safety Council (NSC) shifted from providing the traditional in-class *DDC Attitudinal Dynamics of Driving* course (*DDC ADD*) to offering the *Defensive Driving Online* course (*DDC Online*). The goal of this study is to determine if violation rates the year following training (2021) were statistically lower than in the year prior to training (2019) for each driver group (*DDC ADD* participants and *DDC Online* participants). In addition, this study assesses if the violation rate during the year following training among *DDC ADD* participants is higher, lower, or the same as those drivers who completed *DDC Online*.

The findings presented in this report are limited to those drivers who completed either *DDC ADD* or *DDC Online* during the 2020 calendar year. The violation experience of these 39,503 drivers was analyzed from January 1, 2019 to December 31, 2021. This timeframe allows for the capturing of violations one year before and after any training event occurring in 2020. Four categories of motor-vehicle incidents were analyzed:

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

Results summary:

- Of the 39,503 drivers included in this study:
 - Training group:
 - 7,849 participated in *DDC ADD*
 - 31,654 participated in *DDC Online*
 - Gender:
 - 26,921 are male
 - 12,582 are female
 - Age:
 - 3,020 are under 21
 - 35,189 are 21 to 64
 - 1,294 are 65 or older
 - Number of training events completed in 2020:
 - 31,711 completed one training event
 - 5,468 completed two training events
 - 1,472 completed three training events
 - 852 completed four or more training events
- The impact of *DDC ADD* was compared between the two training groups (*DDC ADD* and *DDC Online*) by assessing the violation rate experience in 2019 (year prior to training) against 2021 (year following the training). The following results were found:
 - Regardless of age or gender, drivers in both training groups experienced significant reductions in surchargeable violation rates per 100 drivers:
 - In all cases, drivers in the *DDC ADD* training group experienced larger

- percent decreases than did the *DDC Online* training group.
 - In nearly all cases, drivers in the *DDC ADD* training group achieved significantly lower surchargeable violation rates the year following training than did the drivers in the *DDC Online* training group.
 - Drivers in the *DDC ADD* training group experienced larger percent decreases in violation rates per 100 drivers than did drivers in the *DDC Online* training group:
 - Total violation rates for the *DDC ADD* training group decreased 84%, while the *DDC Online* training group achieved a 71% decrease from 2019 to 2021.
 - Minor violation rates for the *DDC ADD* training group decreased 87%, while the *DDC Online* training group achieved a 74% decrease from 2019 to 2021.
 - Major violation rates for the *DDC ADD* training group decreased 72%, while the *DDC Online* training group achieved a 38% decrease from 2019 to 2021.
 - Surchargeable violation rates for the *DDC ADD* training group decreased 86%, while the *DDC Online* training group achieved a 74% decrease from 2019 to 2021.
 - During the year following training, the *DDC ADD* training group achieved lower monthly violation rates than did the *DDC Online* training group across all violation types:
 - The *DDC ADD* training group achieved a total violation rate of 2.94 per 100 drivers in 2021, compared 3.78 for the *DDC Online* training group (a difference of 22%).
 - The *DDC ADD* training group achieved a minor violation rate of 0.81 per 100 drivers in 2021, compared 1.05 for the *DDC Online* training group (a difference of 23%).
 - The *DDC ADD* training group achieved a major violation rate of 0.16 per 100 drivers in 2021, compared 0.32 for the *DDC Online* training group (a difference of 50%).
 - The *DDC ADD* training group achieved a surchargeable violation rate of 1.83 per 100 drivers in 2021, compared 2.28 for the *DDC Online* training group (a difference of 20%).

These results highlight two very important aspects of the *MA Driver Re-Training Program* during 2020:

- First, the shift from *DDC ADD* to *DDC Online* in response to public health concerns provided drivers with an effective alternative training program. Both drivers exposed to *DDC ADD* and *DDC Online* in 2020 experienced significantly lower violation rates the year following training than they did the year before training.
- Second, *DDC ADD* demonstrated stronger impact than did *DDC Online*. Drivers exposed to *DDC ADD* experienced larger percent decreases in violation rates the year following training compared to the year before training than did the *DDC Online* drivers. In addition, *DDC ADD* drivers achieved lower violation rates the year following training than did the *DDC Online* driver group.

Introduction

In response to pandemic-related public health concerns in 2020, the NSC shifted from providing the traditional in-class *DDC Attitudinal Dynamics of Driving* course (*DDC ADD*) to offering the *Defensive Driving Online* course (*DDC Online*). During the first three months of 2020, drivers were required to complete *DDC ADD*, while from April through December drivers were required to complete *DDC Online*. This study compares the violation experiences of drivers who completed only *DDC ADD* versus those who only completed *DDC Online* in 2020. Those drivers who participated in both programs in 2020 are not included in this study. The goal of this study is to determine if violation rates the year following training (2021) were statistically lower than in the year prior to training (2019) for each driver group (*DDC ADD* participants and *DDC Online* participants). In addition, this study assessed if the violation rate during the year following training among *DDC ADD* participants is higher, lower, or the same as those drivers who completed *DDC Online*.

The provisions of Chapter 175, section 113B, of the Motor Vehicle and Traffic Laws of Massachusetts (MA) require that a driver who 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 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.

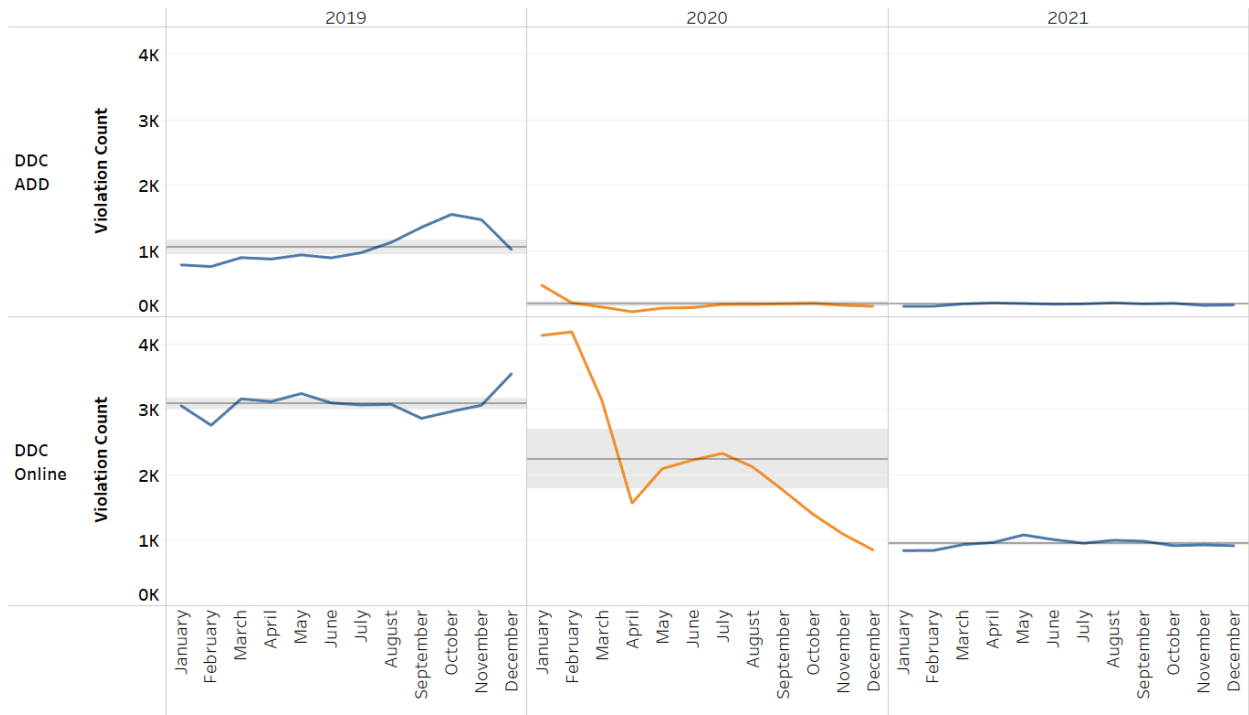
(b) Students then complete an activity that demonstrates that they do, in fact, know their state's traffic laws, which helps remove excuses from their reasons for being in the class.

(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.

DDC Online is a highly-engaging course that has modernized content, a state-of-the-art look and feel, and is highly interactive. The course was developed to be simple and streamlined so each user is able to understand all life-saving concepts. The course presents real-life driving situations, hazard recognition scenarios, and defensive driving techniques to motivate drivers to change risky driving habits and behaviors to avoid collisions and traffic violations. The course features adaptive curriculum tailored to the participant's profile, including age, gender, driving behaviors and attitudes, vehicle, and geographic location based on a series of responses to questions asked throughout the course. It is offered in English and Spanish.

The findings presented in this report are limited to those drivers who attended only *DDC ADD* or only *DDC Online* during the 2020 calendar year. Violation experience of these 39,503 drivers was analyzed from January 1, 2019 to December 31, 2021. This timeframe allows for the capturing of violations one year before and after the 2020 training year. During this timeframe, the 39,503 drivers received 122,099 violations. A graphic depiction of the number of violations during this three-year period by training group is provided in Figure 1. As can be clearly seen, both groups of drivers received dramatically fewer violations the year following the training year than in 2019. This report documents the analysis conducted by NSC to assess changes in violation rates before and after participation in both the *DDC ADD* and *DDC Online* programs. In addition, this study assesses if the violation rate during the year following training among *DDC ADD* participants is higher, lower, or the same as those drivers who completed *DDC Online*.

Figure 1. Comparison of monthly violations by training group, 2019-2021



Method

NSC sent the Massachusetts Registry of Motor Vehicles (RMV) a computerized list of 40,810 drivers who completed either the *DDC ADD* or *DDC Online* course. These driver groups attended the course during the 2020 calendar year (January 1 through December 31). The RMV provided a computerized list containing the motor-vehicle records (MVRs) of 39,503 drivers with matching Surrogate IDs. Approximately 1,300 records were not able to be included in the study because IDs could not be matched to motor-vehicle records or because no violations were identified during the study period.

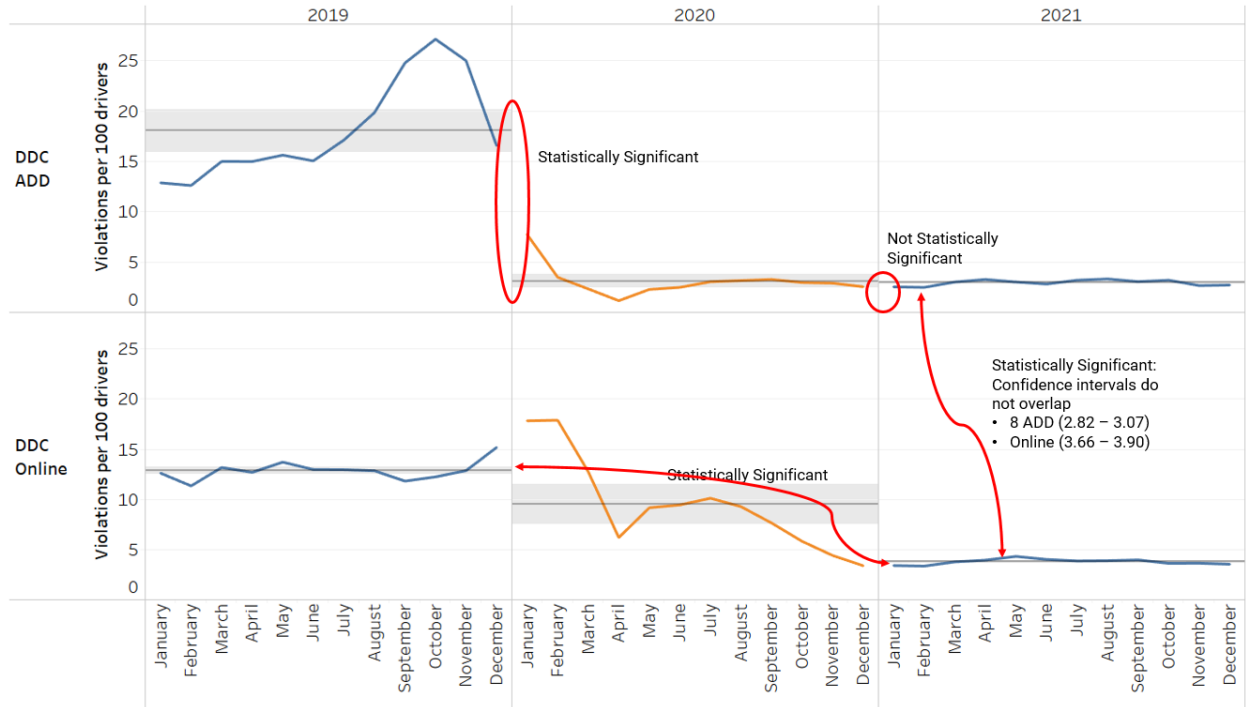
The course participant MVR data used in this study were as follows:

- 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 2022.4. 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). The following conclusions can be made using Figure 2:

- For the *DDC ADD* training group, the confidence intervals between 2020 and 2021 overlap, indicating the average monthly violation rate between these two years is not significantly different.
- For both training groups, the confidence intervals between 2019 and 2020 do not overlap, indicating significantly lower violation rates in 2020 than in 2019.
- For both training groups, the confidence intervals between 2019 and 2021 do not overlap, indicating significantly lower violation rates in 2021 than in 2019.
- For 2021, the confidence intervals of the two training groups do not overlap, indicating that the *DDC ADD* training group experienced significantly lower violation rates the year following training than did the *DDC Online* training group.

Figure 2. Comparison of Confidence Intervals for Total Violation Rates



Results

Demographics

The mean age of the 7,849 *DDC ADD* participants was 31.4 years, while the mean age of the 31,654 *DDC Online* participants was 30.5. Among *DDC ADD* training participants, 62.5% are male and 37.5% female. Among *DDC Online* training participants, 69.6% are male and 30.4% are female. The age distribution in both training groups is very similar with about 8% under 21, 89% 21-64, and 3% 65 and older (see Table 1).

Table 1. Number and Percentage of DDC ADD and DDC Online Participants by Gender and Age

Age Group	Gender					
	Male		Female		TOTAL	
	Number	%	Number	%	Number	%
All Participants						
Under 21	2,154	5.5%	866	2.2%	3,020	7.6%
21-64	23,917	60.5%	11,272	28.5%	35,189	89.1%
65 and older	850	2.2%	444	1.1%	1,294	3.3%
TOTAL	26,921	68.1%	12,582	31.9%	39,503	100.0%
Participants Completing <i>DDC ADD</i>						
Under 21	404	5.1%	202	2.6%	606	7.7%
21-64	4,318	55.0%	2,605	33.2%	6,923	88.2%
65 and older	181	2.3%	139	1.8%	320	4.1%
TOTAL	4,903	62.5%	2,946	37.5%	7,849	100.0%
Participants Completing <i>DDC Online</i>						
Under 21	1,750	5.5%	664	2.1%	2,414	7.6%
21-64	19,599	61.9%	8,667	27.4%	28,266	89.3%
65 and older	669	2.1%	305	1.0%	974	3.1%
TOTAL	22,018	69.6%	9,636	30.4%	31,654	100.0%

Regardless of training group, most drivers only completed one training event in 2020. Among *DDC ADD* participants, 89.6% completed one training event in 2020 compared to 78.0% of the *DDC Online* participants. Reflecting that *DDC ADD* was available for three months while *DDC Online* was available for nine months in 2020, a larger percentage of *DDC Online* students participated in two or more classes (Table 2). Ninety-nine percent of drivers in the *DDC ADD* group and 97% in the *DDC Online* group completed three or fewer training events during 2020.

Table 2. Number and Percentage of Training Events by Training Method Type

Number of Training Events	Number of Drivers by Training Method Type					
	<i>DDC ADD</i>		<i>DDC Online</i>		TOTAL	
	Number	%	Number	%	Number	%
1	7,029	89.6%	24,682	78.0%	31,711	80.3%
2	685	8.7%	4,783	15.1%	5,468	13.8%
3	110	1.4%	1,362	4.3%	1,472	3.7%
4	17	0.2%	491	1.6%	508	1.3%
5	7	0.1%	204	0.6%	211	0.5%
6	1	0.0%	71	0.2%	72	0.2%
7	0	0.0%	26	0.1%	26	0.1%
8	0	0.0%	18	0.1%	18	0.0%
9	0	0.0%	8	0.0%	8	0.0%
10	0	0.0%	4	0.0%	4	0.0%
11	0	0.0%	2	0.0%	2	0.0%
12	0	0.0%	1	0.0%	1	0.0%
14	0	0.0%	1	0.0%	1	0.0%
16	0	0.0%	1	0.0%	1	0.0%
TOTAL	7,849	100.0%	31,654	100.0%	39,503	100.0%

Comparison of *DDC ADD* and *DDC Online* Training Groups

Overall Impact of Training

The first set of analyses explores the impact of *DDC ADD* and *DDC Online*, combining all driver demographic groups. Because participation in training is triggered by the accumulation of surchargeable events, the analysis first focuses on the impact of training on surchargeable events. As shown in Figure 3, both training groups experienced lower monthly average violation rates per 100 drivers in the year following training (2021) compared to the year before training (2019). As discussed previously, statistical significance is identified when the confidence intervals between years or groups do not overlap.

Figure 3 also shows that the *DDC ADD* training group's violation rate peaked during September through November 2019 while the *DDC Online* training group experienced a violation peak in January and February 2020. The timing of these peaks are consistent with the timing of when

the courses were completed by each group. The September to November 2019 peak is consistent with subsequent DDC ADD participation taking place from January through March 2020. Likewise, the January and February 2020 peak is consistent with DDC Online participation taking place from April through December 2020. Because violations peaked earlier for the DDC ADD participants than they did for the DDC Online participants, before after comparisons could be impacted. Because of this comparison issue, a second analysis was also conducted that compares the violation rates of the two groups of drivers during 2021. By 2021, both groups experienced very consistent violation rates month to month indicating that the two groups had established new violation base line levels. Comparing violation rates in 2021 helps to determine if either training group was able to establish a lower violation rate baseline than the other group following training.

The second analysis compares the confidence intervals between the two training groups the year following training (2021). As discussed above, this analysis is conducted to determine if either training group achieved a significantly lower monthly violation rate than the other group. As shown in Figure 3 and Table 3, the *DDC ADD* drivers achieved a significantly lower monthly surchargeable violation rate during the year following training than did the *DDC Online* training group.

Figure 3. Comparison of Average Monthly Surchargeable Violations per 100 Drivers One Year Before and After by Training Group

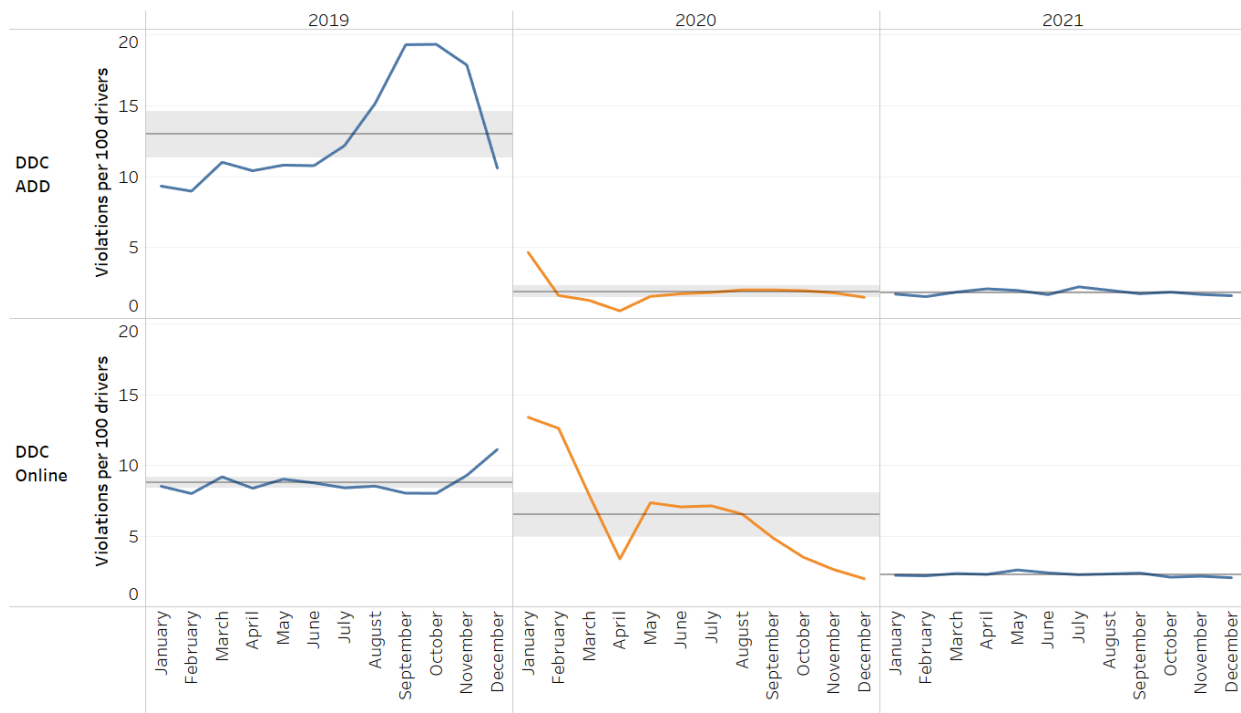


Table 3 expands on the analysis illustrated in Figure 3 by assessing the impact on average monthly violations rates for total violations, minor violations, major violations, as well as surchargeable violations. Using Table 3, the following conclusions can be made:

- Both training groups achieved significantly lower violation rates for all violation types in the year after training compared to the year before training.

- Before versus after percent decreases were larger for the *DDC ADD* training group than the *DDC Online* training group across all violation types.
 - For example, total violation rates for the *DDC ADD* training group decreased 84%, while the *DDC Online* training group achieved a 71% decrease from 2019 to 2021.
 - Minor violation rates for the *DDC ADD* training group decreased 87%, while the *DDC Online* training group achieved a 74% decrease from 2019 to 2021.
 - Major violation rates for the *DDC ADD* training group decreased 72%, while the *DDC Online* training group achieved a 38% decrease from 2019 to 2021.
 - Surchargeable violation rates for the *DDC ADD* training group decreased 86%, while the *DDC Online* training group achieved a 74% decrease from 2019 to 2021.
- During the year following training, the *DDC ADD* training group achieved lower monthly violation rates than did the *DDC Online* training group across all violation types:
 - The *DDC ADD* training group achieved a total violation rate of 2.94 per 100 drivers in 2021, compared to 3.78 for the *DDC Online* training group. In other words, during the year following training, the *DDC ADD* training group achieved a surchargeable violation rate 22% lower than the *DDC Online* training group.
 - The *DDC ADD* training group achieved a minor violation rate of 0.81 per 100 drivers in 2021, compared to 1.05 for the *DDC Online* training group (a difference of 23%).
 - The *DDC ADD* training group achieved a major violation rate of 0.16 per 100 drivers in 2021, compared to 0.32 for the *DDC Online* training group (a difference of 50%).
 - The *DDC ADD* training group achieved a surchargeable violation rate of 1.83 per 100 drivers in 2021, compared to 2.28 for the *DDC Online* training group (a difference of 20%).

Table 3. Comparison of Average Monthly Violation Rate per 100 Drivers One Year Before and After by Training Group

Training Group	One Year Before		One Year After		Before - After % Dif.*	One Year After ADD vs. Online % Dif.
	Average	Confidence Interval	Average	Confidence Interval		
Total Traffic Violations						
<i>DDC ADD</i>	18.06	15.95 - 20.17	2.94	2.82 - 3.07	-84%	-22%
<i>DDC Online</i>	12.88	12.47 - 13.28	3.78	3.66 - 3.90	-71%	
Minor Traffic Violations						
<i>DDC ADD</i>	6.17	5.38 - 6.96	0.81	0.75 - 0.86	-87%	-23%
<i>DDC Online</i>	4.01	3.90 - 4.12	1.05	0.99 - 1.11	-74%	
Major Traffic Violations						
<i>DDC ADD</i>	0.58	0.52 - 0.64	0.16	0.14 - 0.19	-72%	-50%
<i>DDC Online</i>	0.52	0.46 - 0.55	0.32	0.27 - 0.37	-38%	
Surchargeable Violations						
<i>DDC ADD</i>	12.99	11.35 - 14.63	1.83	1.75 - 1.92	-86%	-20%
<i>DDC Online</i>	8.78	8.42 - 9.15	2.28	2.22 - 2.34	-74%	

* **Bold** indicates statistical significance ($p < 0.05$).

Impact of Training by Gender

Next, the analyses explores the impact of training by gender. As shown in Figures 4 and 5, regardless of training group, both male and female drivers achieved significantly lower monthly average surchargeable violation rates per 100 drivers in the year following training (2021) compared to the year before training (2019).

Table 4 expands on the analysis shown in Figures 4 and 5. The following conclusions can be made using Table 4:

- Both males and females benefited from training regardless of the training group.
- Both male and female drivers achieved larger before versus after percent decreases in surchargeable violation rates in the *DDC ADD* training group than the *DDC Online* training group.
 - Male drivers in the *DDC ADD* training group achieved an 84% decrease compared to a 72% decrease achieved by males in the *DDC Online* training group.
 - Female drivers in the *DDC ADD* training group achieved an 88% decrease compared to a 79% decrease achieved by females in the *DDC Online* training group.
- During the year following training, both male and female drivers in the *DDC ADD* training group achieved a lower monthly surchargeable violation rate than did the *DDC Online* training group.
 - In the year following training, male drivers in the *DDC ADD* training group achieved a surchargeable violation rate of 2.01 versus a rate of 2.45 achieved by males in the *DDC Online* training group (a difference of 18%).
 - In the year following training, female drivers in the *DDC ADD* training group achieved a surchargeable violation rate of 1.54 versus a rate of 1.89 achieved by females in the *DDC Online* training group (a difference of 19%).

Figure 4. Male Drivers: Comparison of Average Surchargeable Violations per 100 Drivers One Year Before and After by Training Group

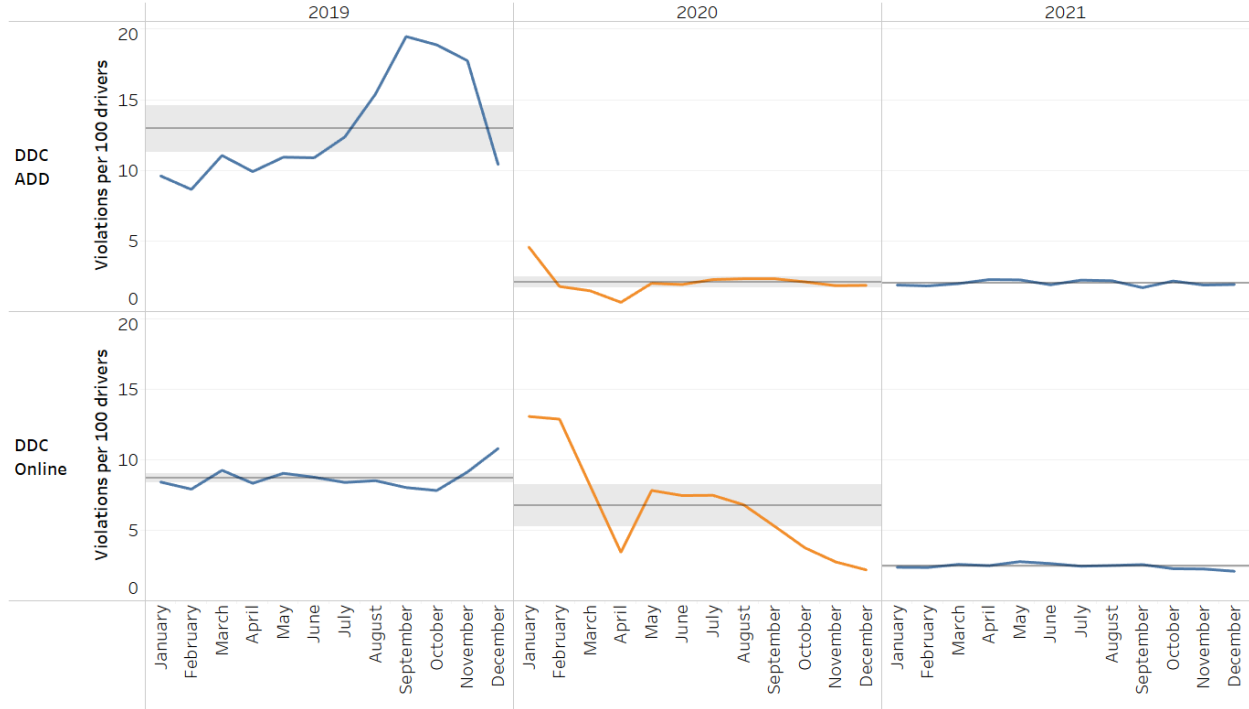


Figure 5. Female Drivers: Comparison of Average Surchargeable Violations per 100 Drivers One Year Before and After by Training Group

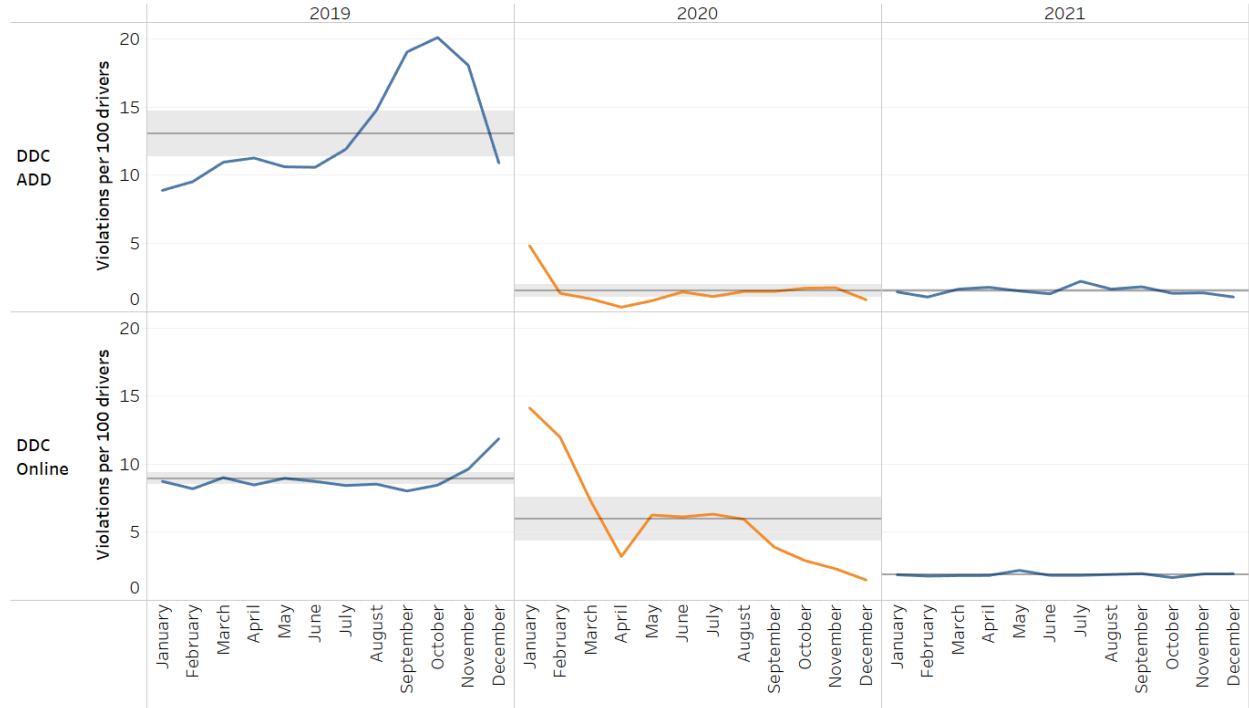


Table 4. Comparison of Average Monthly Surchargeable Violation Rates per 100 Drivers One Year Before and After by Training Group and Gender

Training Event	One Year Before		One Year After		Before - After % Dif.*	One Year After ADD vs. Online % Dif.
	Average	Confidence Interval	Average	Confidence Interval		
All Drivers						
<i>DDC ADD</i>	12.99	11.35 - 14.63	1.83	1.75 - 1.92	-86%	-20%
<i>DDC Online</i>	8.78	8.42 - 9.15	2.28	2.22 - 2.34	-74%	
Male drivers						
<i>DDC ADD</i>	12.94	11.30 - 14.58	2.01	1.93 - 2.09	-84%	-18%
<i>DDC Online</i>	8.72	8.37 - 9.06	2.45	2.37 - 2.53	-72%	
Female drivers						
<i>DDC ADD</i>	13.05	11.40 - 14.71	1.54	1.40 - 1.68	-88%	-19%
<i>DDC Online</i>	8.93	8.50 - 9.36	1.89	1.83 - 1.94	-79%	

* **Bold** indicates statistical significance ($p < 0.05$).

Impact of Training by Driver Age Group

Drivers were segmented into three age groups (Under 21, 21-64, and 65 and older). As shown in Figures 6-8, regardless of training group, all three age groups experienced statistically lower monthly average surchargeable violation rates per 100 drivers the year following training (2021) compared to the year before training (2019).

Table 5 expands on the analysis shown in Figures 6-8. The following conclusions can be made using Table 5:

- All three age groups benefited from training, regardless of the training group.
- All three age groups achieved larger before versus after percent decreases in average monthly surchargeable violation rates in the *DDC ADD* training group than the *DDC Online* training group.
 - Drivers under 21 years old in the *DDC ADD* training group achieved an 82% decrease compared to a 68% decrease achieved by under 21 year old drivers in the *DDC Online* training group.
 - 21 to 64 year old drivers in the *DDC ADD* training group achieved an 86% decrease compared to a 74% decrease achieved by 21 to 64 year old drivers in the *DDC Online* training group.
 - 65 and older drivers in the *DDC ADD* training group achieved a 92% decrease compared to an 85% decrease achieved by 65 and older drivers in the *DDC Online* training group.
- During the year following training, under 21 year old drivers and drivers from 21 to 64 in the *DDC ADD* training group achieved lower average monthly surchargeable violation rates than did the *DDC Online* training group.
 - In the year following training, under 21 year old drivers in the *DDC ADD* training group achieved a surchargeable violation rate of 3.19 versus a rate of 3.90 achieved by under 21 year old drivers in the *DDC Online* training group (a difference of 18%).
 - In the year following training, 21 to 64 year old drivers in the *DDC ADD* training

group achieved a surchargeable violation rate of 1.75 versus a rate of 2.18 achieved by 21 to 64 year old drivers in the *DDC Online* training group (a difference of 19%).

- In the year following training, rate difference between training groups among 65 and older drivers was not statistically different.

Figure 6. Under 21 Drivers: Comparison of Average Surchargeable Violations per 100 Drivers One Year Before and After Training Group

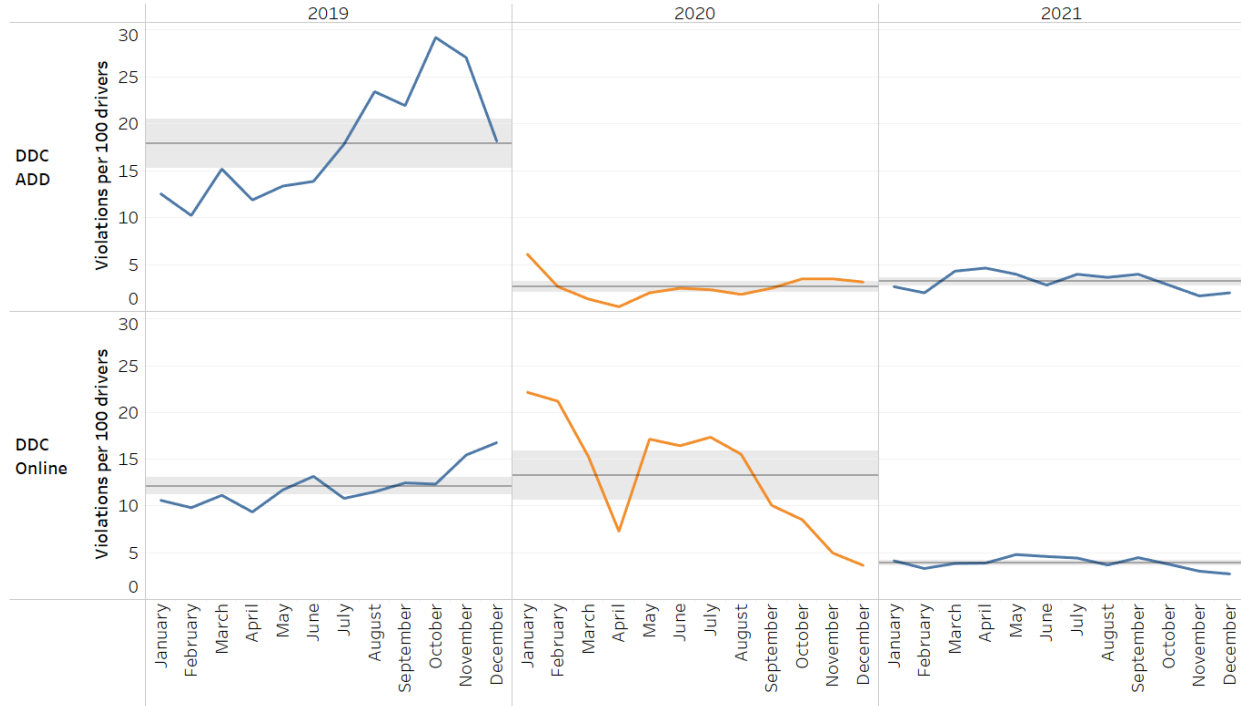


Figure 7. 21 to 64 Drivers: Comparison of Average Surchargeable Violations per 100 Drivers One Year Before and After by Training Group

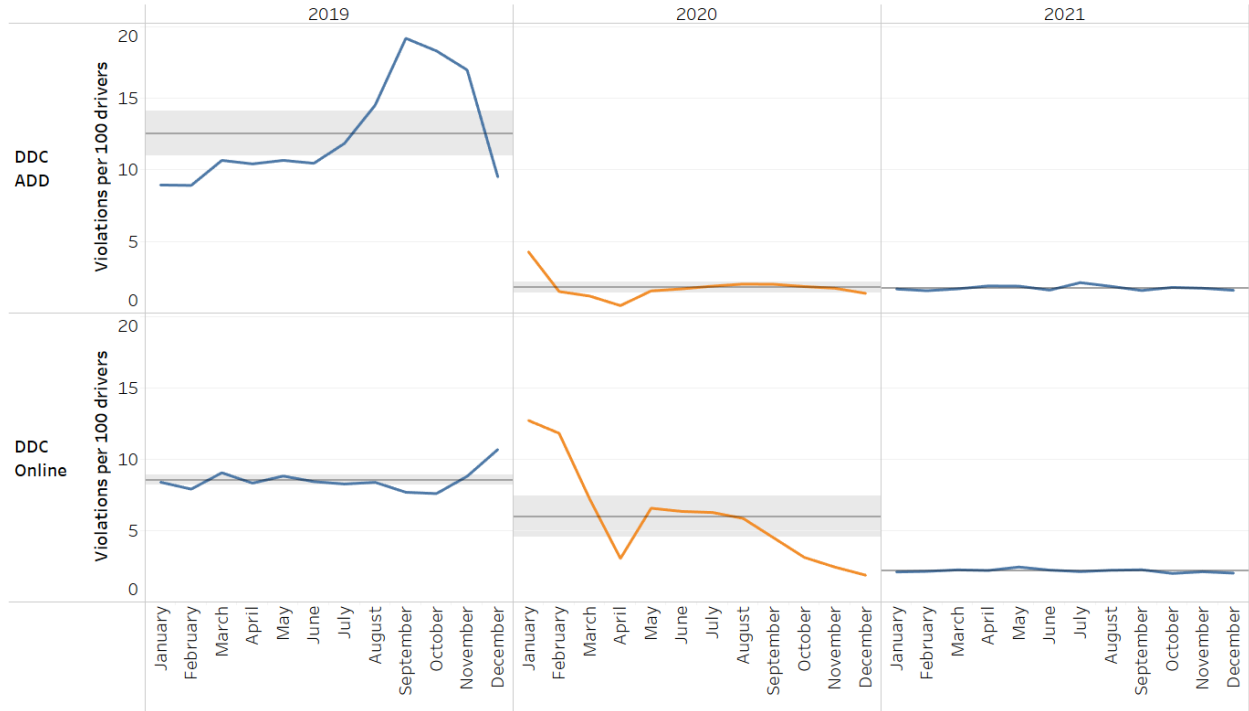


Figure 8. 65 and Older Drivers: Comparison of Average Surchargeable Violations per 100 Drivers One Year Before and After by Training Group

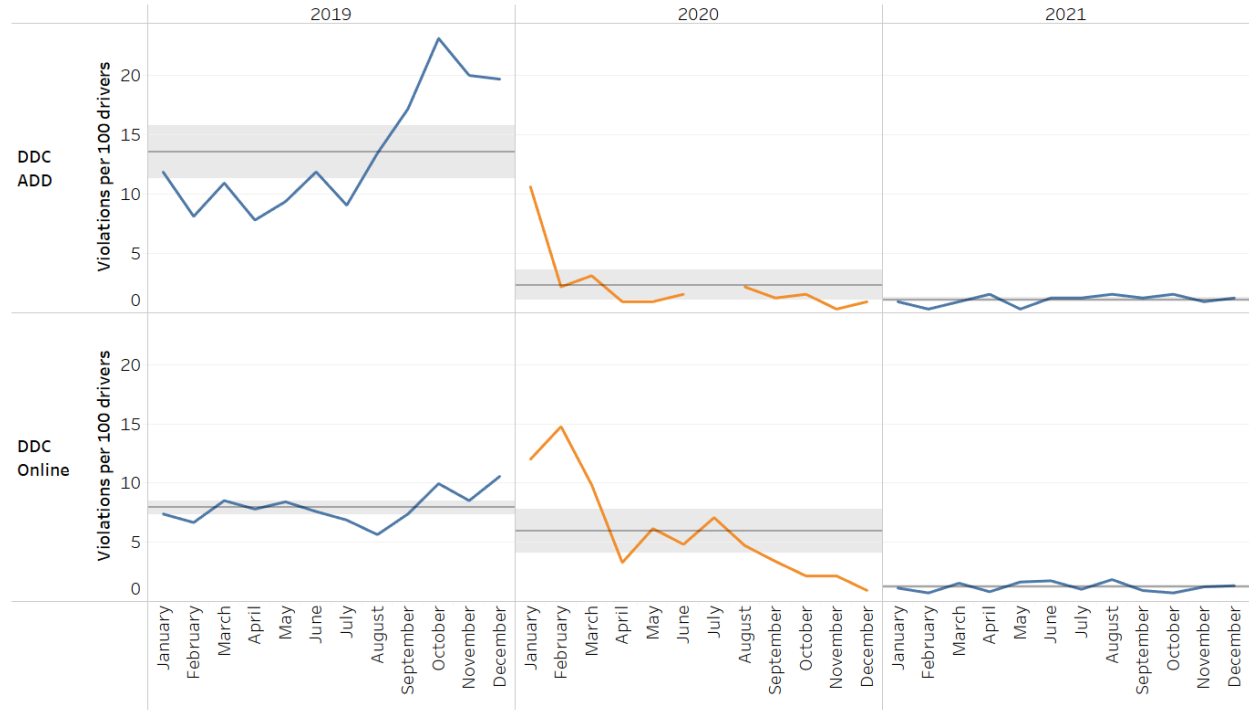


Table 5. Comparison of Average Surchargeable Violations per 100 Drivers One Year Before and After by Training Method and Age of Driver

Training Event	One Year Before		One Year After		Before - After % Dif.*	One Year After ADD vs. Online % Dif.
	Average	Confidence Interval	Average	Confidence Interval		
All Drivers						
<i>DDC ADD</i>	12.99	11.35- 14.63	1.83	1.75- 1.92	-86%	-20%
<i>DDC Online</i>	8.78	8.42- 9.15	2.28	2.22- 2.34	-74%	
Under 21						
<i>DDC ADD</i>	17.89	15.25- 20.53	3.19	2.76- 3.62	-82%	-18%
<i>DDC Online</i>	12.1	11.17- 13.03	3.9	3.63- 4.17	-68%	
21 to 64						
<i>DDC ADD</i>	12.53	10.95- 14.11	1.75	1.68- 1.82	-86%	-20%
<i>DDC Online</i>	8.53	8.18- 8.87	2.18	2.13- 2.23	-74%	
65 and older						
<i>DDC ADD</i>	13.54	11.34- 15.74	1.13	0.94- 1.31	-92%	-8%
<i>DDC Online</i>	7.95	7.34- 8.53	1.23	1.06- 1.40	-85%	

* **Bold** indicates statistical significance ($p < 0.05$).

Impact of Training by Number of Training Events Completed

An analysis was conducted to compare the impact of the two training groups by the number of training events completed in 2020. Because 98% of drivers in this study completed three or fewer training events in 2020, this analysis focuses on comparing the impact of participating in one to three training events. As shown in Figures 9 - 11 and Table 6, regardless of training group or number of training events completed, drivers experienced statistically lower monthly average surchargeable violation rates per 100 drivers the year following training (2021) compared to the year before training (2019).

Table 6 expands on the analysis shown in Figures 9 - 11. The following conclusions can be made using Table 6:

- Drivers benefited from training regardless of the training group or number of training events completed in 2020.
- Regardless of the number of training events completed, drivers achieved larger before versus after percent decreases in surchargeable violation rates in the *DDC ADD* training group than the *DDC Online* training group.
 - Drivers who completed one *DDC ADD* training event achieved an 86% decrease compared to a 73% decrease achieved by those drivers who completed one *DDC Online* training event.
 - Drivers who completed two *DDC ADD* training events achieved an 87% decrease compared to a 75% decrease achieved by those drivers who completed two *DDC Online* training events.

- Drivers who completed three *DDC ADD* training events achieved an 84% decrease compared to a 76% decrease achieved by those drivers who completed three *DDC Online* training events.
- During the year following training, drivers who completed one or two training events in the *DDC ADD* training group achieved lower monthly surchargeable violation rates than did the *DDC Online* training group.
 - In the year following training, drivers who completed one *DDC ADD* training event achieved a surchargeable violation rate of 1.78 versus a rate of 2.12 achieved by drivers who completed one *DDC Online* training event (a difference of 16%).
 - In the year following training, drivers who completed two *DDC ADD* training events achieved a surchargeable violation rate of 2.24 versus a rate of 2.74 achieved by drivers who completed two *DDC Online* training events (a difference of 18%).
 - In the year following training, rate difference between training groups among drivers who completed three training events was not statistically different.

Figure 9. Drivers Completing One Training Event: Comparison of Average Surchargeable Violations per 100 Drivers One Year Before and After by Training Method

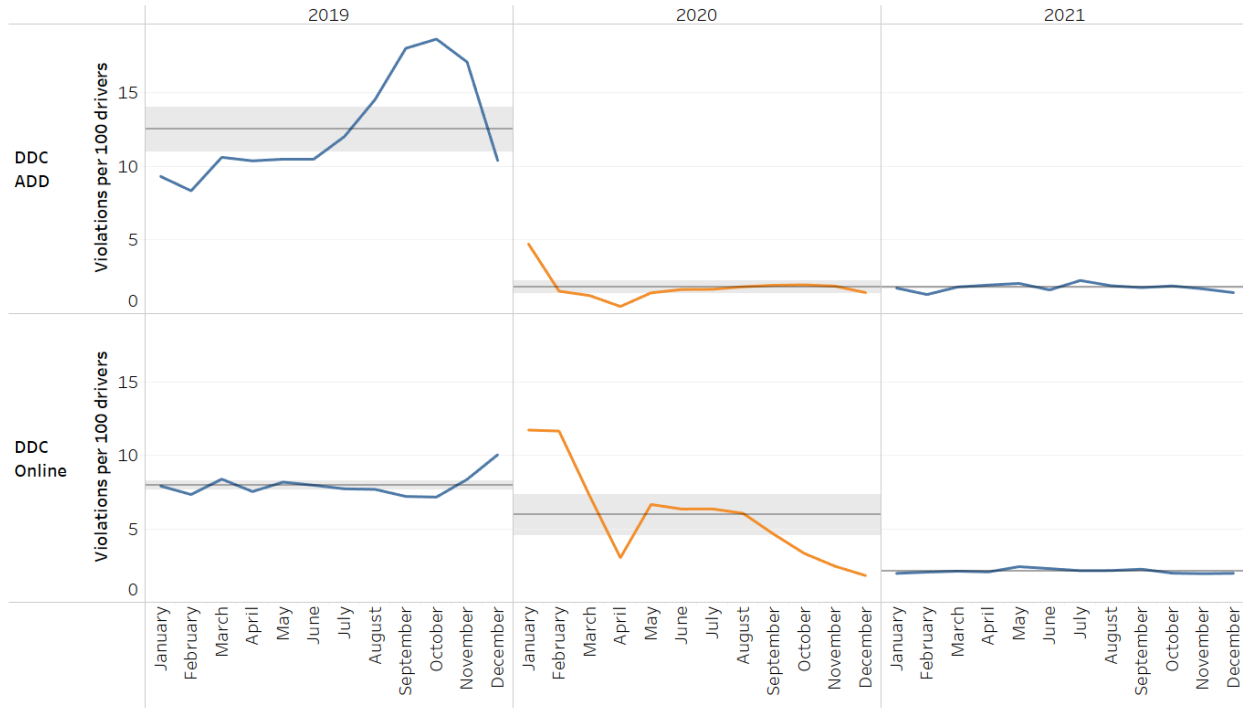


Figure 10. Drivers Completing Two Training Events: Comparison of Average Surchargeable Violations per 100 Drivers One Year Before and After by Training Method

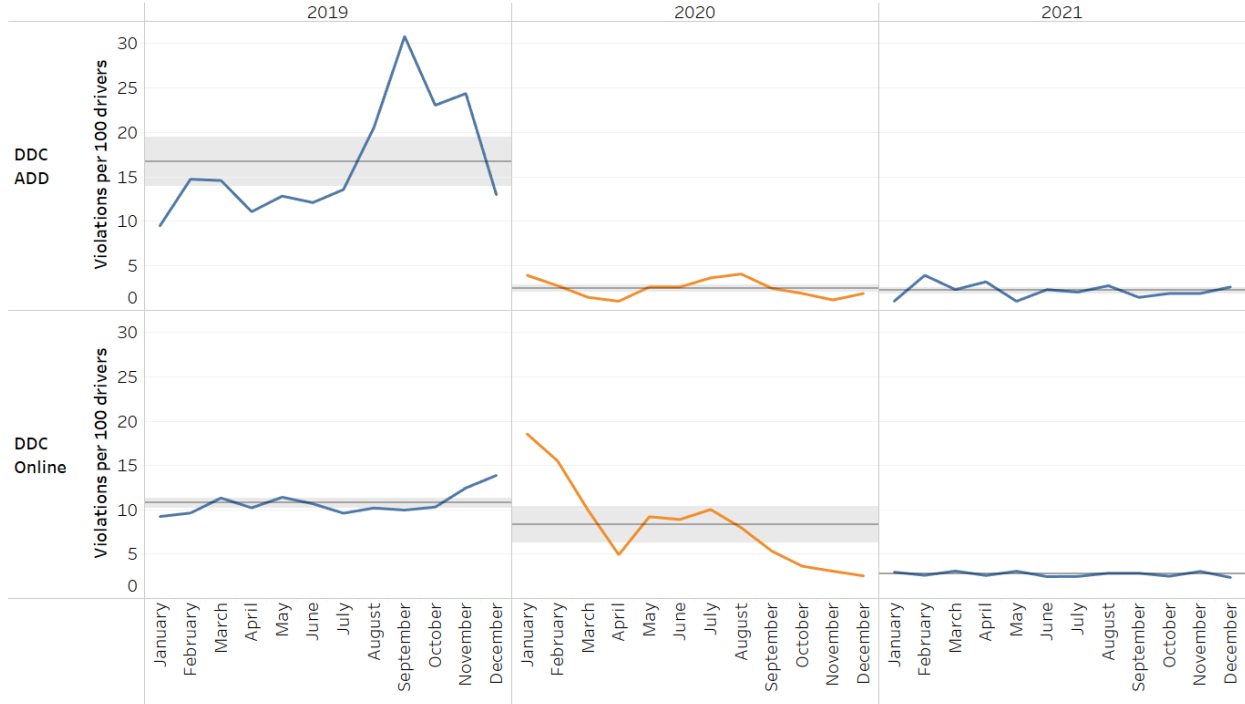


Figure 11. Drivers Completing Three Training Events: Comparison of Average Surchargeable Violations per 100 Drivers One Year Before and After by Training Method

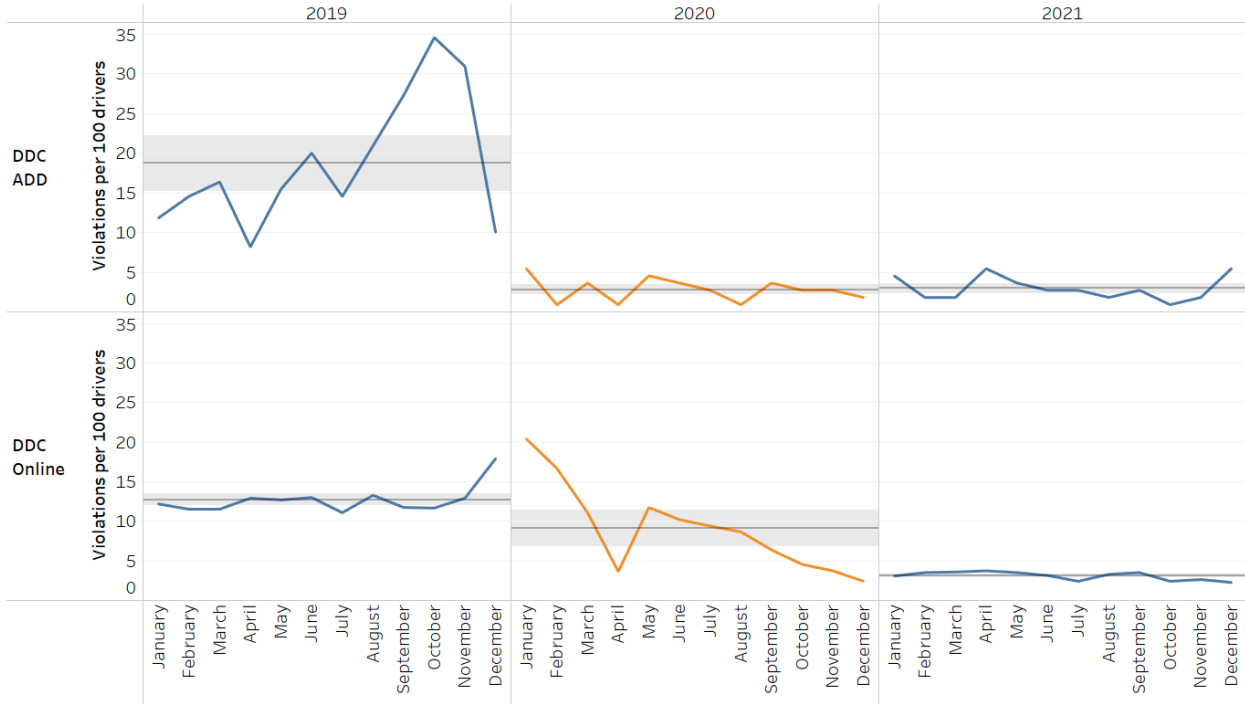


Table 6. Comparison of Average Surchargeable Violations per 100 Drivers One Year Before and After by Training Method and Number of Training Events Completed

Training Event	One Year Before		One Year After		Before - After % Dif.*	One Year After ADD vs. Online % Dif.
	Average	Confidence Interval	Average	Confidence Interval		
All Participants						
<i>DDC ADD</i>	12.99	11.35 - 14.63	1.83	1.75 - 1.92	-86%	-20%
<i>DDC Online</i>	8.78	8.42 - 9.15	2.28	2.22 - 2.34	-74%	
Participants Completing a Total of One Training Event						
<i>DDC ADD</i>	12.52	11.00 - 14.05	1.78	1.67 - 1.89	-86%	-16%
<i>DDC Online</i>	7.96	7.63 - 8.29	2.12	2.05 - 2.18	-73%	
Participants Completing a Total of Two Training Events						
<i>DDC ADD</i>	16.69	13.94 - 19.45	2.24	1.87 - 2.61	-87%	-18%
<i>DDC Online</i>	10.75	10.18 - 11.32	2.74	2.63 - 2.86	-75%	
Participants Completing a Total of Three Training Events						
<i>DDC ADD</i>	18.71	15.18 - 22.25	3.01	2.36 - 3.66	-84%	-3%
<i>DDC Online</i>	12.71	11.95 - 13.47	3.11	2.89 - 3.33	-76%	

* **Bold** indicates statistical significance ($p < 0.05$).

Impact of Training on Crash Rates

The final analysis compares crash-related traffic violations before and after exposure to *DDC ADD* versus *DDC Online* courses. A violation was categorized as crash-related if it had one of three violation descriptions:

- Property Damage Liability
- Collision
- Bodily Injury Liability

As shown in Figure 12 and Table 7, regardless of training group, drivers experienced statistically lower monthly average crash-related surchargeable violation rates per 100 drivers the year following training (2021) compared to the year before training (2019).

Table 7 expands on the analysis shown in Figure 12. The following conclusions can be made using Table 7:

- Drivers experienced lower crash-related surchargeable violation rates the year following training regardless of the training group.
- Drivers achieved larger before versus after percent decreases in crash-related surchargeable violation rates in the *DDC ADD* training group than the *DDC Online* training group.
 - Drivers in the *DDC ADD* training group achieved an 82% decrease compared to a 71% decrease achieved by those drivers in the *DDC Online* training group.
- During the year following training, the difference between the crash-related surchargeable violation rates was not statistically different for the two training groups.

Figure 12. Comparison of Average Number of Monthly Crash-Related Surchargeable Violations per 100 Drivers One Year Before and After by Training Method

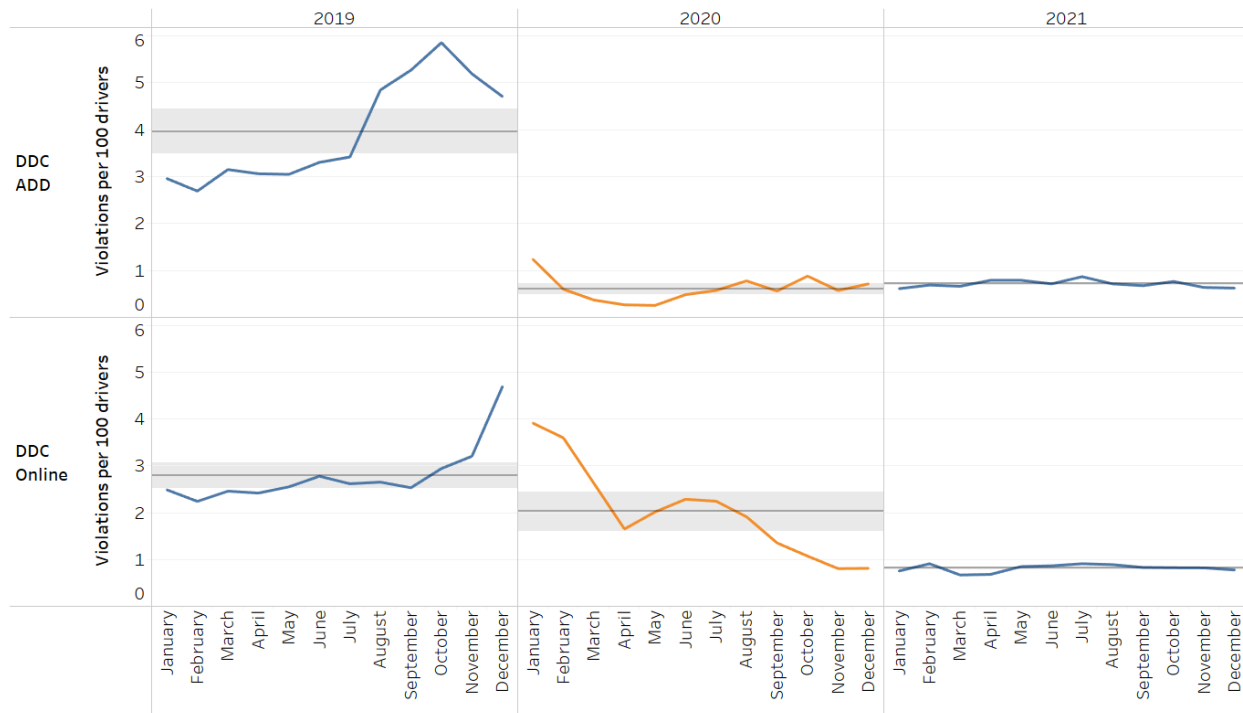


Table 7. Comparison of Average Number of Monthly Crash-Related Surchargeable Violations per 100 Drivers One Year Before and After by Training Method

Training Event	One Year Before		One Year After		Before - After % Dif.*	One Year After ADD vs. Online % Dif.
	Average	Confidence Interval	Average	Confidence Interval		
Surchargeable Crashes						
<i>DDC ADD</i>	3.96	3.48 - 4.43	0.72	0.68 - 0.75	-82%	-12%
<i>DDC Online</i>	2.8	2.53 - 3.08	0.82	0.78 - 0.85	-71%	

* **Bold** indicates statistical significance ($p < 0.05$).

Summary

In summary, based on the information made available by the Commonwealth of Massachusetts RMV, participants in both the *DDC ADD* and *DDC Online* programs showed statistically significant reductions in total, minor, major, surchargeable, and crash-related violation rates the year following training than they did the year before training. These reductions were significant across all driver demographic subgroups.

These results highlight two very important aspects of the *MA Driver Re-Training Program* in 2020:

- First, the shift from *DDC ADD* to *DDC Online* in response to public health concerns provided drivers with an effective alternative training program. Both drivers exposed to *DDC ADD* and *DDC Online* in 2020 achieved significantly lower violation rates the year following training than they did the year before training.
- Second, *DDC ADD* demonstrated stronger impact than did *DDC Online*. Drivers exposed to *DDC ADD* experienced larger percent decreases in violation rates the year following training compared to the year before training than did the *DDC Online* drivers. In addition, *DDC ADD* drivers achieved lower violation rates the year following training than did the *DDC Online* driver group.

The improvement demonstrated following training was consistent, regardless of the number of training events completed in 2020. Drivers who completed one *DDC ADD* training event in 2020 had an average monthly surchargeable violation rate of 12.52 per 100 drivers the year before training and demonstrated an 86% decrease in violations the year following training. Drivers who completed three *DDC ADD* training events had an average monthly surchargeable violation rate of 18.71 per 100 drivers the year before training and demonstrated an 84% decrease in violations the year following training.

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