Special Study
Response of Various Crash Types to COVID Quarantine
Weeks Ending March 10 through August 25, 2020 Data (25 Weeks)
The first 25 Weeks of government recommendations

David B. Brown, PhD, P.E.
brown@cs.ua.edu
August 28, 2020

Table of Contents

1 Introduction

In this report we will refer to *Week 1* as representing the crash frequency as *the closest number that we could derive that approximates the crash levels of the various crash types in 2020 prior to the COVID quarantine actions (initiated March 10, 2020).* The charts answer the questions as to how the various types of crashes were reduced (or increased) with the decline in traffic after Week 1. This is given in each of the charts by week. The numbers on the X axis in the Section 3 graphs indicate the number of weeks that elapsed after Week 1. Week 1 is the name we are giving to the baseline average that represents crash frequency (of various types) under normal (pre-COVID) conditions.

Many documents have been written regarding traffic volume ramifications of the COVID-19 virus. If this report contradicts any of those reported findings, this should not infer that either this or these other sources are incorrect. They are most likely based on different state or federal data sources, which could vary considerably from state to state. The data sources for the results in this report are Alabama crashes as reported by eCrash, and COVID cases in Alabama from Alabama Department of Public Health (ADPH) as well as sources given at the end of this section. While the results obtained have their most direct application within the state of Alabama, there is much commonalty between them and what has been observed in other states. The strongest evidence occurs when the results presented here validate those obtained elsewhere.

How can metrics of extremely different crash types (e.g., all crashes and bicycle crashes) be compared on the same chart? The answer is that the raw *numbers of crashes* for each are not being compared. What is being compared is the *proportions* by which the number of crashes increased or decreased in the time periods following the initiation of COVID quarantine guidance. These proportions (e.g., 0.9, 0.8, 1.2, etc.) are given on the Y axis. Too turn them into percentage increase/decrease, multiply by 100.

All of the crash charts (except the first) contain two thin lines representing *fatal* and *all crashes.* This provides a common frame of reference for comparing how the various crash types changed. In addition to all crashes and fatal crashes that appear in all of the charts, the following crash types were also displayed over time (each independently, two lines per chart);
- Speeding Crashes and ID/DUI Crashes
- Pedestrian Crashes and Bicycle Crashes
- Motorcycle Crashes and Large Truck Crashes
- Aggressive Driving and Interstate Travel
- Young Driver Crashes and Federal/State Travel
- Rural Crashes and Urban Crashes.

Their crash frequencies for the original and updated Week 1 are compared in the Week 15 report.

Section 2 is a new section that has been added to show the growth of COVID cases and deaths in Alabama. Section 3 presents the crash charts that are now updated bi-weekly. The results have

been smoothed by averaging every two weeks rather than showing every week as a distinct point. Even though this is less detail, the overall shape of these curves conveys the trends better than to the weekly charts, many of which were extremely choppy and difficult to read.

Four additional sections appear after the standardized charts:
- Section 4. CARE IMPACT comparisons for several of the crash types plotted;
- Section 5. Daily comparison of fatalities in 2020 vs. 2019 starting April 1, 2020.
- Section 6. Same as Section 5, but for the earlier months of 2019 and 2020; and
- Section 7. Correlation analysis showing how total crashes predict AADT.

The chart in Section 7 demonstrates the very high correlation between traffic volume and crash frequency. Crash frequency is an excellent proxy measure for traffic volume, and thus the charts can be used to gauge the degree to which the drivers of the various demographics and vehicle types conformed to the COVID quarantine or otherwise changed their behavior.

Credits for data sources:

(1) We appreciate the efforts of the Alabama Law Enforcement Agency (ALEA) and local law enforcement agencies in collecting these data, and ALEA's role in maintaining the crash records.
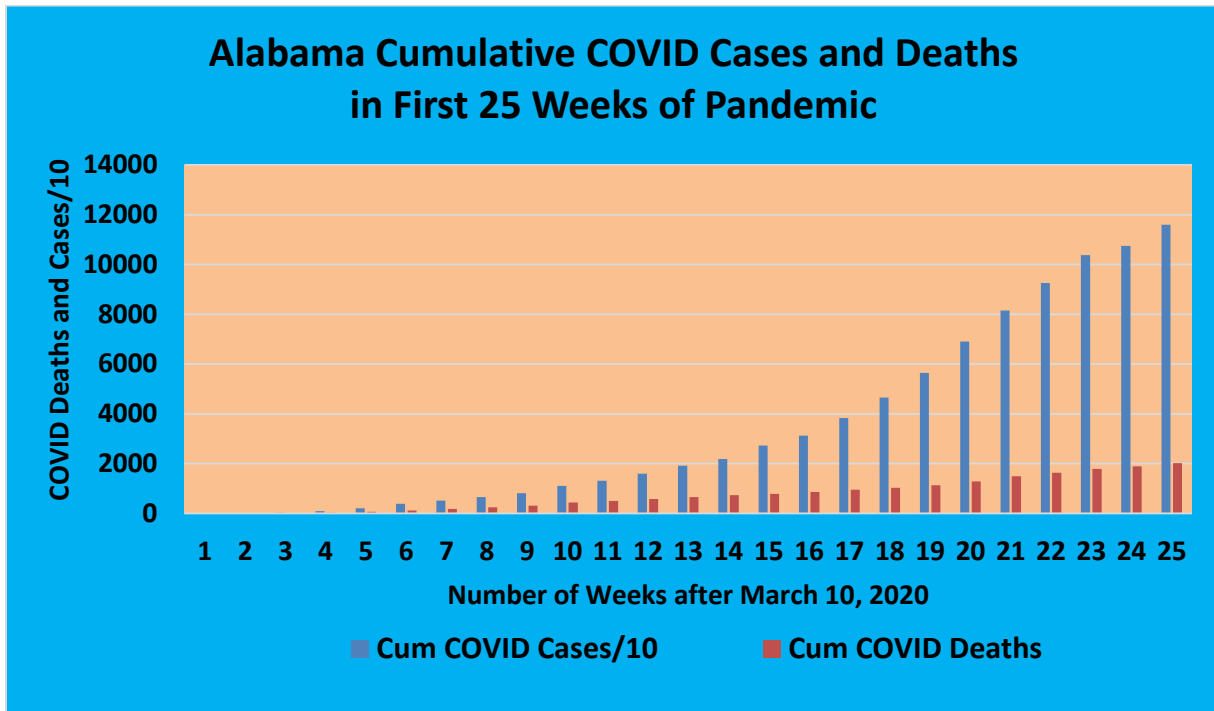*(2) We also appreciate CAPS for the daily annual (2020 vs 2019) comparison of fatalities.*
(3) We are updating the new Sate COVID case numbers with data from Bing:
https://www.bing.com/search?q=number+covid+fatalities+in+United+states&FORM=BAWPGLM&u=&redir=2&frb=1
(4) *Some of the early COVID fatality numbers were obtained from: John Hopkins CSSE, CDC Testing Report;* https://covidusa.net/?autorefresh=1&state=Alabama.

2 COVID Case Fatality Rate Change Over the 25 Weeks.

Alabama Cumulative COVID Cases and Deaths in First 25 Weeks of Pandemic

The chart above shows how the cumulative number of COVID cases and the cumulative number of COVID deaths have increased in Alabama over the first 25 weeks of the pandemic. Note that, while the Y-axis gives the number of deaths, *it is only 1/10th of the case count*. This was done so that the cases and deaths could be shown on the same chart. Note how the number of cases has been increasing exponentially, especially in the most recent weeks. The actual cumulative numbers for Week 25 (ended August 25, 2020) were 115,992 cases and 2,017 fatalities.

The chart below shows how the probability of survival has changed over the 25 weeks. The death rate got up to nearly 4 per hundred cases (4%) in weeks 9-11, but it is now down to under two in 100 cases (actual value leveled off in the past three weeks to between 1.7% and 1.8%). This shows how increased testing, improved testing techniques, and other medical advances have been beneficial in reducing the proportion of cases that result in death.

Deaths Per 100 COVID Cases

Deaths per 100 COVID Cases (y-axis)

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Value	0	0	0.5	2.5	3.2	3.0	3.5	3.7	3.9	4.0	3.9	3.6	3.4	3.3	2.9	2.8	2.5	2.2	2.0	1.9	1.8	1.8	1.7	1.8	1.7

Number of Weeks after March 10, 2020
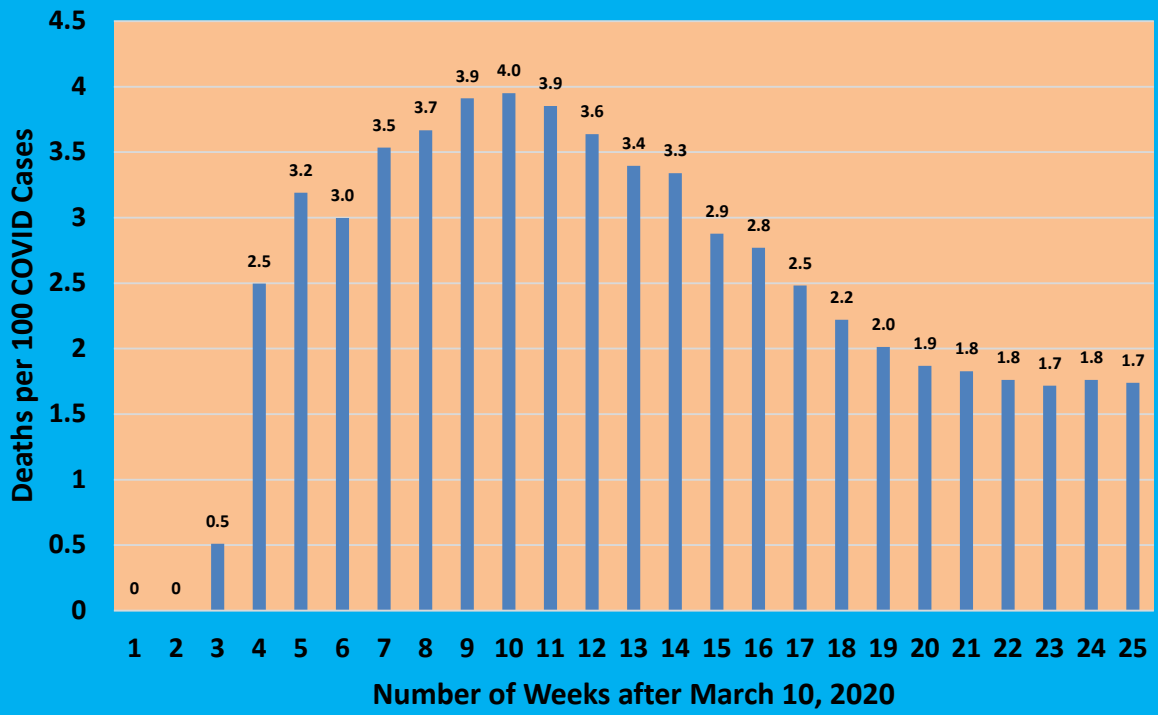
3 First 25 Weeks Crash Response Temporal Displays

To set the stage for the comparisons to follow in this section, consider the *All Crashes* (yellow) and the *Fatal Crashes* (orange) lines in the chart displayed below. Lighter colors were chosen for these two lines so they would blend into the background of the charts that follow to prevent their being a distraction from the two lines on each of these charts that illustrate the chart's major findings. Consistent with what has been observed in most states, All Crashes came down to about 50% of their pre-COVID levels in the first few weeks. However, after Week 5, fatal crashes not only did not remain at the lower level, and after Week 12, it exceeded the pre-COVID levels. "All Crashes" regressed toward their pre-COVID level after Week 7, and it has now leveled-out at about 80% of the pre-COVID level (about 2000 crashes per week).
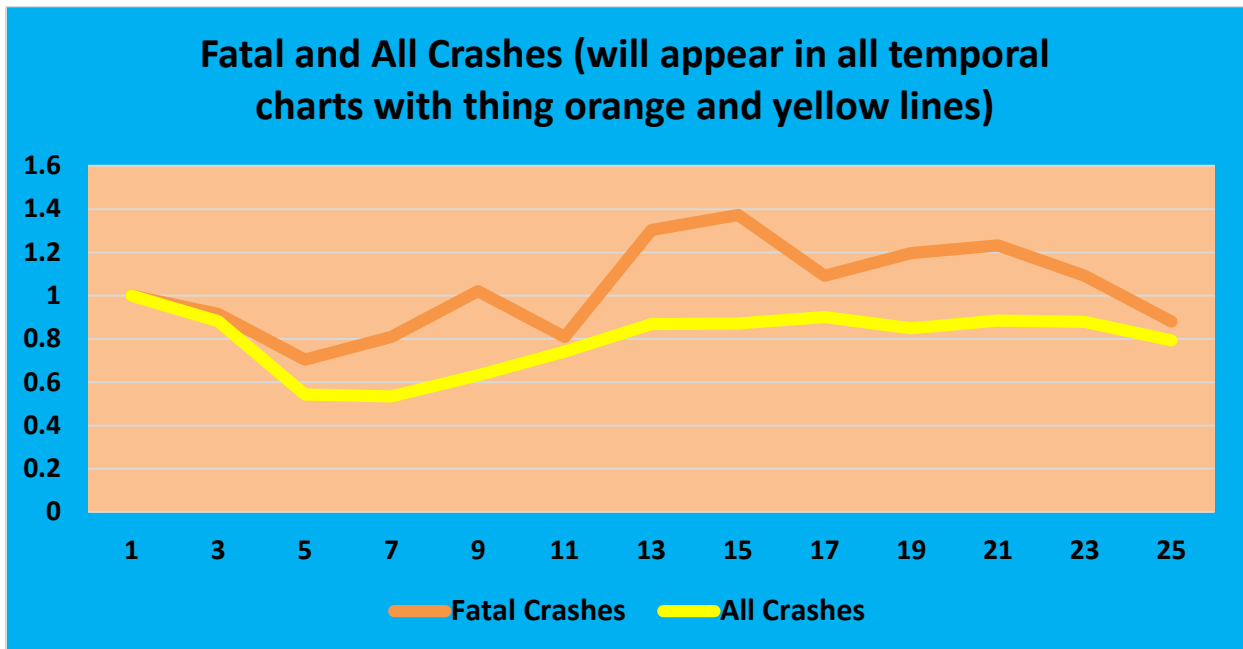
Fatal crashes rose in Weeks 12-15 to about 30% higher than the pre-COVID level, and they did not drop until Week 17. It is now at about 11 fatal crashes per week. See Sections 5 and 6 below for comparisons of fatalities in 2020 and 2019.

The following subsections will present the changes in the various crash types. The All and Fatal crash lines have been displayed as thin lines so that they do not distract from the main objectives of the charts.

3.1 Speeding Crashes and Impaired Driving (DUI) Crashes
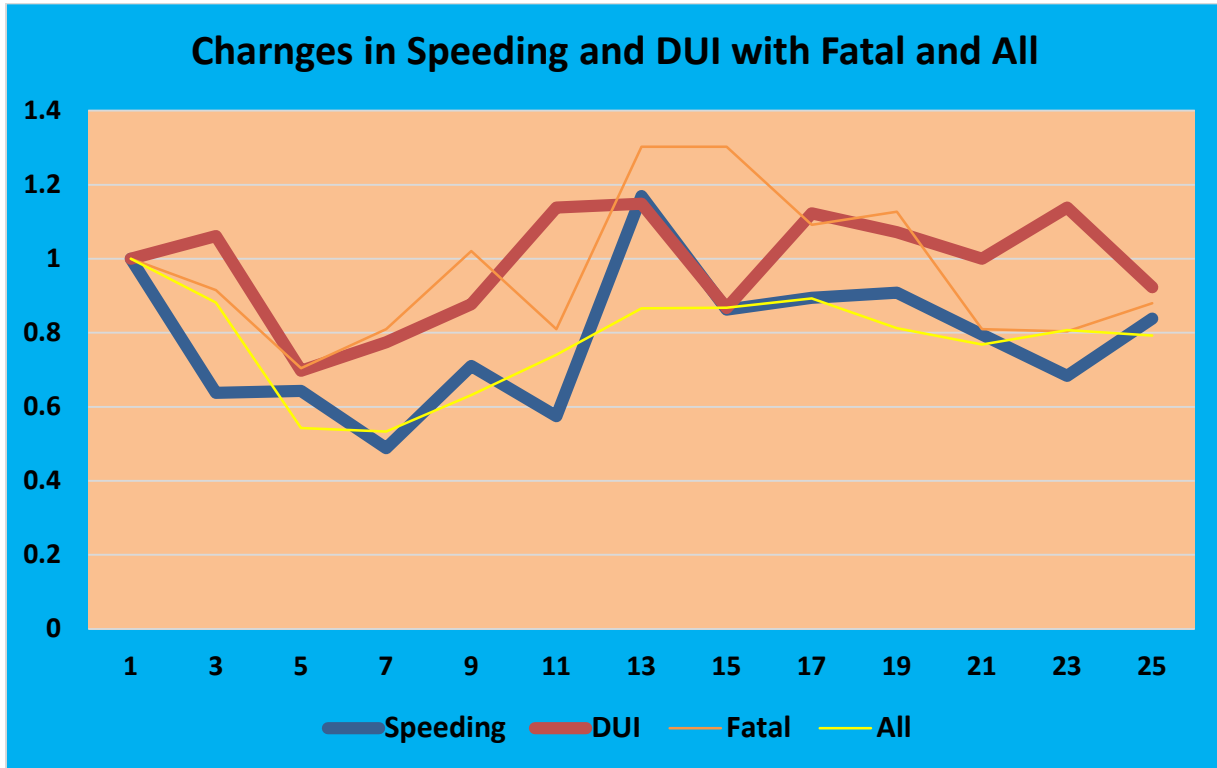
The dark blue speeding curve almost coincided with the red DUI in Weeks 13-15, and right after that it coincided with the All Crashes line. It is interesting to see the correlation between the Speeding and Fatal crash lines, as generally they rise and fall together. Very few fatal crashes do not involve excessive speed.

ID/DUI crashes increased in the first week, and while they decreased for a few weeks after that, it was higher than its pre-COVID proportion from Weeks 11-3 and also 17-23, before its recent decrease. For more details on Speeding and ID/DUI crashes, please see Section 4.1.

According to Alabama crash reports, traffic deaths as of July 14, 2020 were 6.7% lower than this day in 2019. However, the fatality rate per mile increased significantly, as it has in all states according to the National Safety Council. The total crash frequency through the end of May 2020 was 51,243, as compared to 65,898 for the end of May in 2019. This is a 22.2% reduction in total crashes, which provide an excellent proxy for traffic volume (see Section 7 of this report). However, fatal crashes through the end of May 2019 were 333 as opposed to the end of May 2020, which was 297. This 10.8% reduction is less than half of the overall crash reduction of 22.2%. These rates are generally persisting. See Section 4.5 for more on crash severity.

3.2 Pedestrians and Bicycles
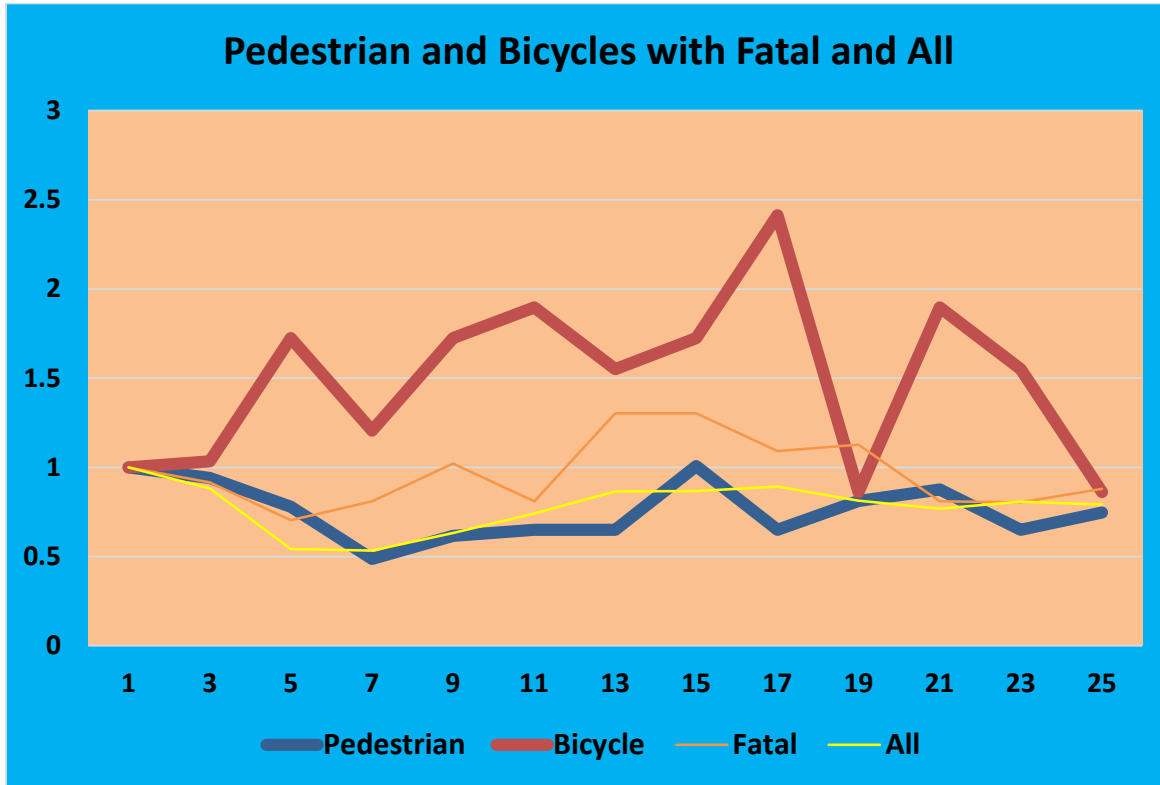
Pedestrian collisions (dark blue) had a slight rise in Week 15 but then came down to below the All Crash levels, and have been quite comparable since then. Currently pedestrian crashes are doing about the same as All Crashes in their reductions.

Bicycles (red line), on the other hand, had a dramatic increase in crashes relative to the other crash proportions, which might indicate that a large number of new bicyclists are engaging in this activity without the normal crash avoidance habits of more experienced bicyclists. While this came down somewhat in Weeks 7 and 19, it has shown consistently higher levels in all of the other weeks except the most recent.

For more details on Pedestrian and Bicycle crashes, please see Section 4.3.

3.3 Motorcycles Involved Crashes and Large Truck Caused
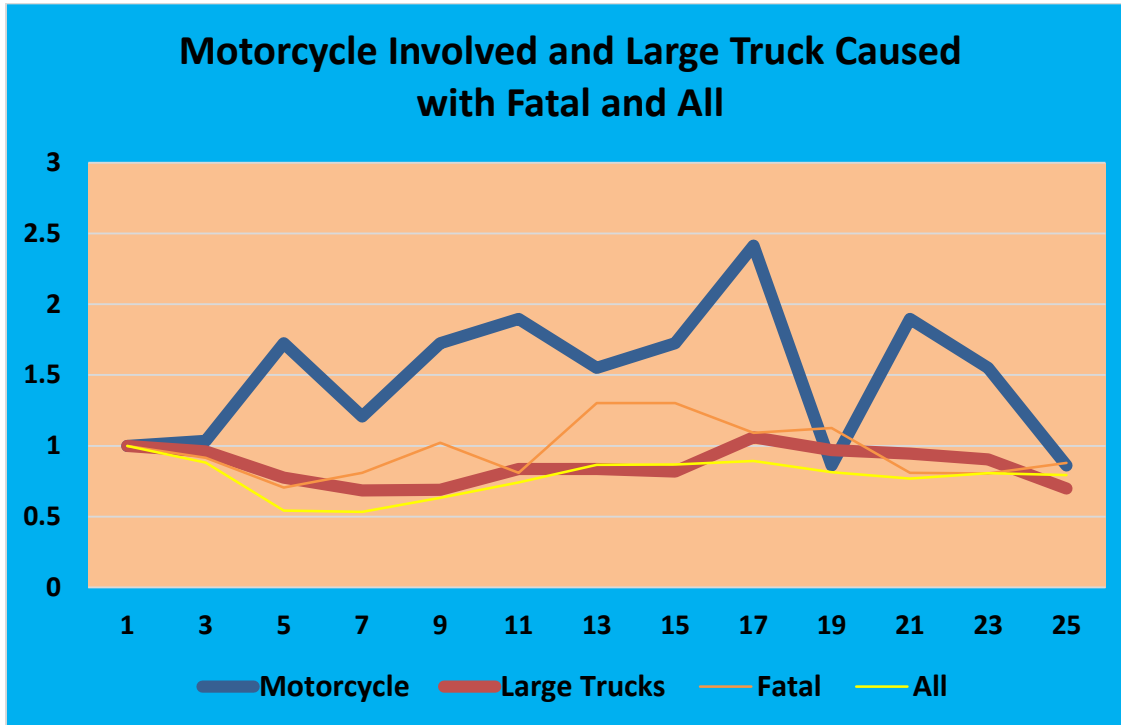
It was speculated that since the number of trucks on the road had not decreased nearly as much as passenger vehicles, that truck crashes might have relatively higher comparative proportion. This has not been the case, as can be seen by the red line on the chart. A significant proportion of two-vehicle truck crashes have historically been caused by passenger cars (especially at the higher severity levels), so fewer cars on the road would help to reduce large truck crashes. For a study of causative vehicle types in disparate two-vehicle crashes for a large variety of vehicle types and all severity classifications, please see:

http://www.safehomealabama.gov/wp-content/uploads/2018/12/At-Fault-Analyses-Discussion-v04.pdf

Clearly motorcycles (blue) have a much different pattern, and we suspect that the cause would be much the same as that discussed for bicycles above. That is, a larger number of inexperienced motorcyclists are on the road. The proportion of motorcycle crashes are well above their pre-COVID levels, and this has contributed to a relatively higher fatal crash rate. As of July 15, 2020, there were 15 fatalities involving motorcycles during the COVID period (close to one per week).

For more information on causal unit types, please see Section 4.4.

3.4 Aggressive Driving Crashes and Interstate Crashes

Aggressive Driving Crashes and Crashes on Intrsttes, with Fatal and All
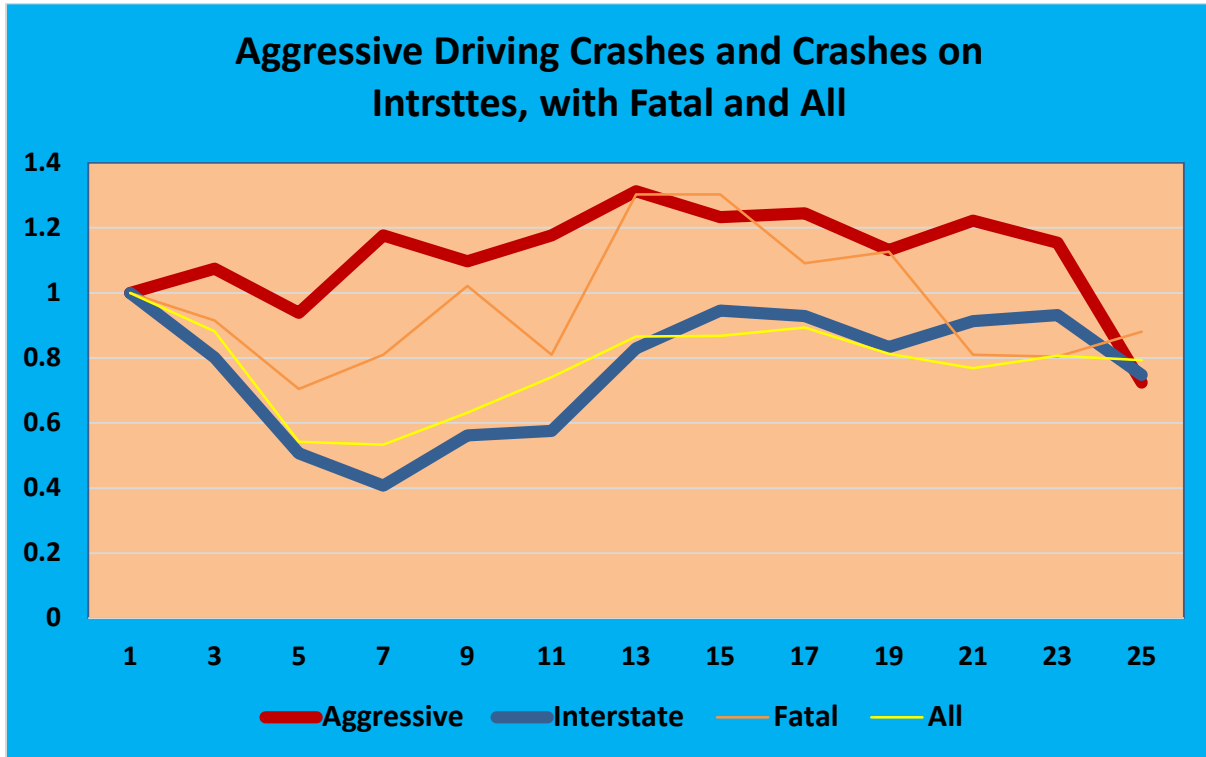
With few exceptions, Interstate travel crashes dropped off as much or more than either fatal crashes or total crashes, which probably indicates that fewer longer trips are being taken in the COVID period.

On the other hand, aggressive driving rose after Week 5, and it has stayed well above the expected All Crash level as well as its pre-COVID level until the most recent week.

This is a time of considerable frustration on the roadways for many people. We appeal to everyone to be patient and have consideration for other drivers on the road. Driving aggressively is not going to get you there any quicker, and it might not get you there at all.

3.5 Misjudge Stopping Distance and Young (16-20) Driver Caused Crashes
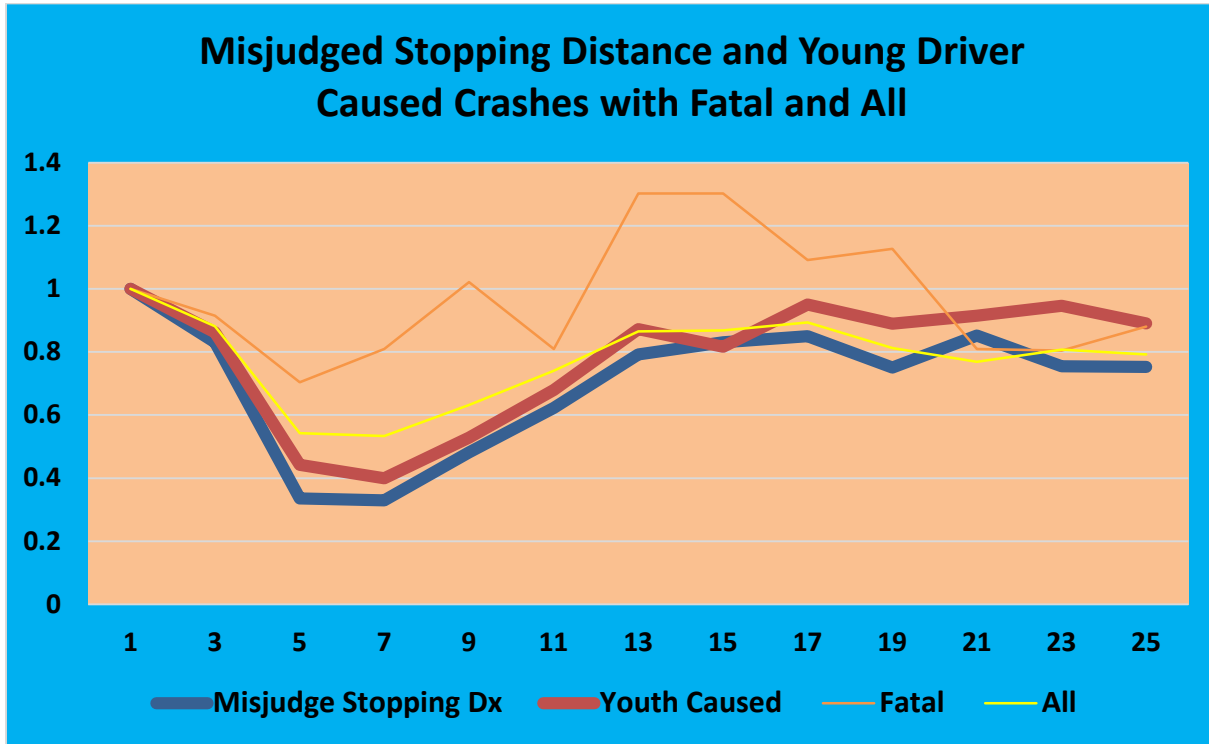
Misjudging stopping distance and youth driver (aged 16-20) caused crashes were quite close, both following the general All Crash trend in their reductions, as far as the shapes of the curves are concerned. Both of these generally had a greater proportionate reduction than the overall crashes in the first 16 weekw. It is good to see that, generally, younger drivers are not causing more than their expected number of crashes in these critical times.

3.6 Rural and Urban

Rural and Urban Crashes with Fatal and All
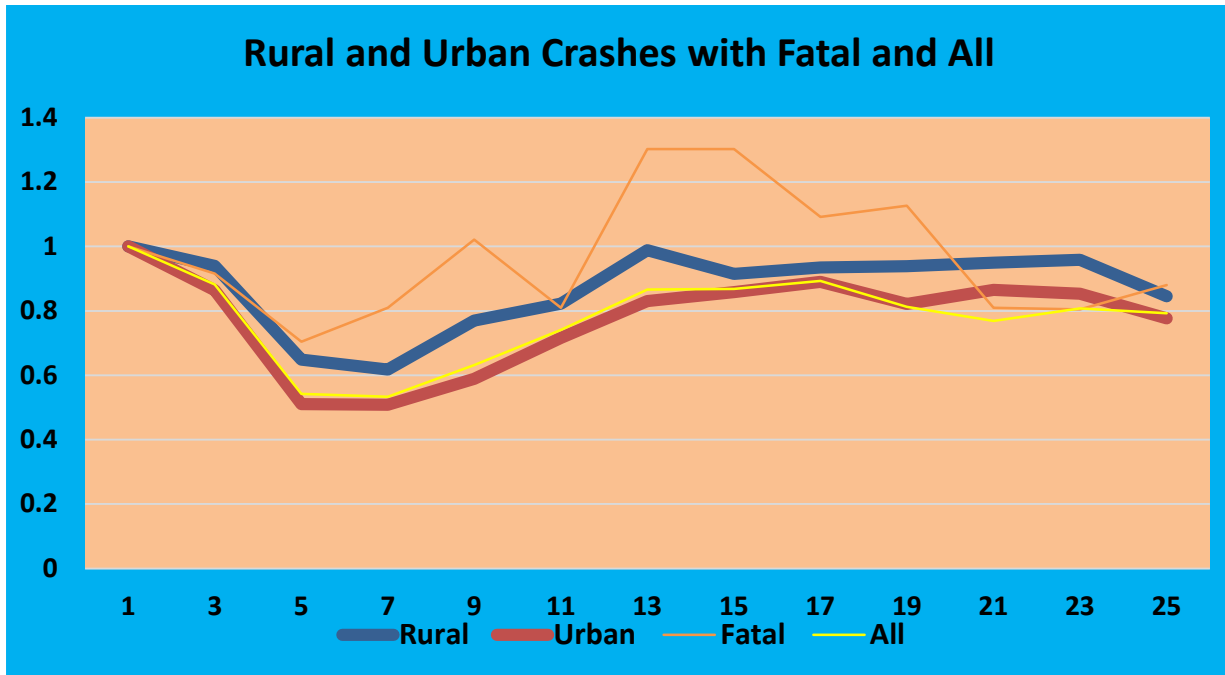
Since the total of Urban and Rural crashes equals All Crashes, it is expected that one of these will be above, and the other below, the yellow (All Crash) line. Since Week 1, the Rural crashes have been above this line, and the Urban crashes have generally been below it. This indicates that rural driving did not fall off as much as city driving, a fact that could be due to the need for rural dwellers in securing the necessities of life.

4 CARE IMPACT Comparisons Relative to the Temporal Graphs

Unless otherwise stated, the IMPACT displays in this section are comparisons of identical crash attributes for the COVID time frame in 2020 (March 11-July 14, 2020) against all crashes in 2018, 2019 and 2020 up to the COVID time frame (before March 11, 2020). The last three days of the COVID time frame (July 12-14, 2020) had only partial reporting in the crash database. Total crashes per day in these three days averaged only about 35.4% of the average crash counts for the first 11 days of July. This has no practical effect on the IMPACT comparisons.

The Pre-COVID time period is also referenced as "Normal" in some of the comments below.

For instructions on reading and use of IMPACT, please click here:

https://www.technolytix.net/uploads/2/2/7/6/22761914/description_of_care_impact_output.pdf

Please contact us if you have any questions or see any way we can help.

4.1 C015 Primary Contributing Circumstances (PCC) – See 2.1 and 2.4

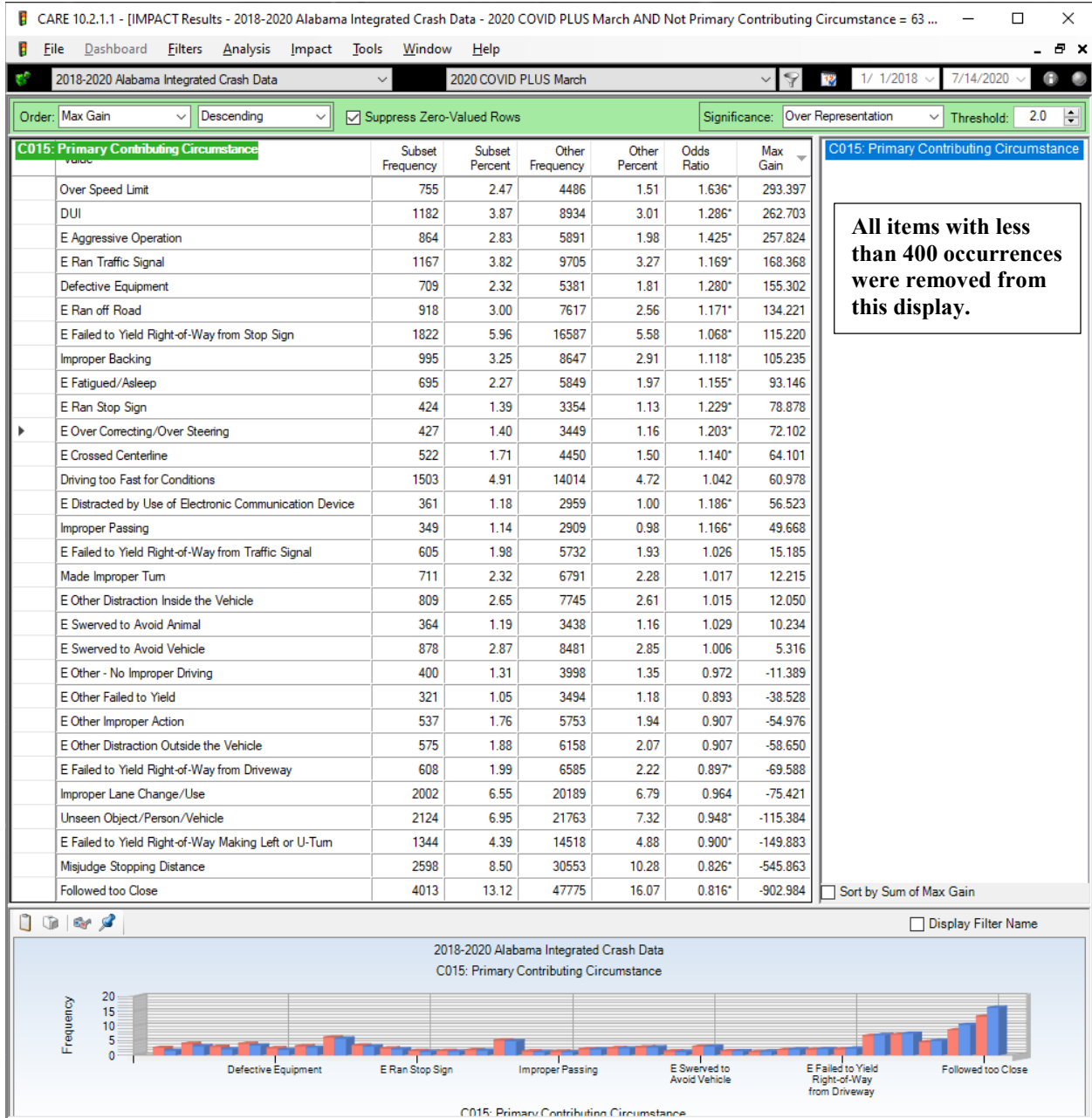| C015: Primary Contributing Circumstance Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
Over Speed Limit	755	2.47	4486	1.51	1.636*	293.397
DUI	1182	3.87	8934	3.01	1.286*	262.703
E Aggressive Operation	864	2.83	5891	1.98	1.425*	257.824
E Ran Traffic Signal	1167	3.82	9705	3.27	1.169*	168.368
Defective Equipment	709	2.32	5381	1.81	1.280*	155.302
E Ran off Road	918	3.00	7617	2.56	1.171*	134.221
E Failed to Yield Right-of-Way from Stop Sign	1822	5.96	16587	5.58	1.068*	115.220
Improper Backing	995	3.25	8647	2.91	1.118*	105.235
E Fatigued/Asleep	695	2.27	5849	1.97	1.155*	93.146
E Ran Stop Sign	424	1.39	3354	1.13	1.229*	78.878
E Over Correcting/Over Steering	427	1.40	3449	1.16	1.203*	72.102
E Crossed Centerline	522	1.71	4450	1.50	1.140*	64.101
Driving too Fast for Conditions	1503	4.91	14014	4.72	1.042	60.978
E Distracted by Use of Electronic Communication Device	361	1.18	2959	1.00	1.186*	56.523
Improper Passing	349	1.14	2909	0.98	1.166*	49.668
E Failed to Yield Right-of-Way from Traffic Signal	605	1.98	5732	1.93	1.026	15.185
Made Improper Turn	711	2.32	6791	2.28	1.017	12.215
E Other Distraction Inside the Vehicle	809	2.65	7745	2.61	1.015	12.050
E Swerved to Avoid Animal	364	1.19	3438	1.16	1.029	10.234
E Swerved to Avoid Vehicle	878	2.87	8481	2.85	1.006	5.316
E Other - No Improper Driving	400	1.31	3998	1.35	0.972	-11.389
E Other Failed to Yield	321	1.05	3494	1.18	0.893	-38.528
E Other Improper Action	537	1.76	5753	1.94	0.907	-54.976
E Other Distraction Outside the Vehicle	575	1.88	6158	2.07	0.907	-58.650
E Failed to Yield Right-of-Way from Driveway	608	1.99	6585	2.22	0.897*	-69.588
Improper Lane Change/Use	2002	6.55	20189	6.79	0.964	-75.421
Unseen Object/Person/Vehicle	2124	6.95	21763	7.32	0.948*	-115.384
E Failed to Yield Right-of-Way Making Left or U-Turn	1344	4.39	14518	4.88	0.900*	-149.883
Misjudge Stopping Distance	2598	8.50	30553	10.28	0.826*	-545.863
Followed too Close	4013	13.12	47775	16.07	0.816*	-902.984

> **All items with less than 400 occurrences were removed from this display.**

Ordered by Max Gain. The most significant over-representations are seen in Speed, DUI and Aggressive Operation, which are consistent with the graphs in Sections 3.1 and 3.4. An asterisk (*) on the Odds Ratio value indicates that there is a statistically significant difference in this item between the COVID and the Normal periods. There were 12 items that showed significant over-representations, the top three were Speed, DUI and Aggressive Operation. See the graph in the next section for a comparison of all of the significantly over-represented PCCs.

**4.2 Comparison of All Significantly Over-Represented PCCs.**
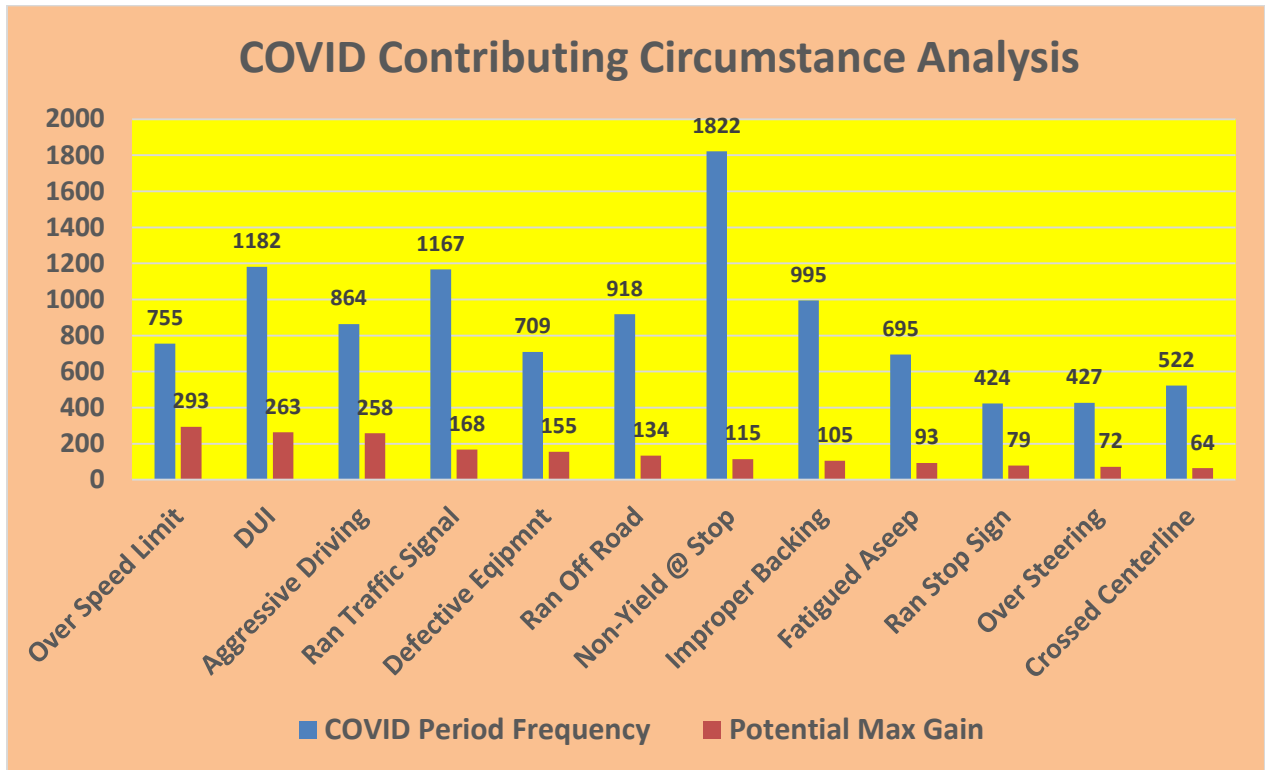
This chart has been updated with data to the middle of July, with reporting drop-off on July 12-14 due to reports not getting into the system at the time of data availability. The over-represented PCCs are ordered left to right from those that have the highest potential for crash reduction (Max Gain) to those with the least. In this application, Max Gain is defined as the expected number of crashes that would be reduced if drivers in the COVID time period behaved as those in the Normal time period (i.e., pre-COVID 2018, 2019 and 2020 through March 10, 2020). The higher the red bar (Max Gain) the greater the potential for reducing the blue bar (total crashes due to this PCC).

The top three (Over Speed Limit, DUI and Aggressive Operation) have well over 200 potential crash reductions each, and they largely account for the reason that fatalities have not gone down as much as overall crashes have. The next tier of three (Ran Traffic Signal, Defective Equipment, and Ran off Road) also have nearly identical Max Gains at 168, 155 and 134. Failure to Yield at a Stop Sign also shows a fairly large gain with 115, but its gain is smaller than those to the left of it even though it has the highest frequency of all of the PCCs shown. Improper Backing comes next with a 105 potential gain. The rest have fewer than 100 each, but their importance should not be disregarded, since collectively they still represent significantly more occurrences in the COVID time period than in the Normal pre-COVID period.

4.3 C057 and 58 Pedestrians and Bicycles Involved – Compare with 3.2

C057 Number of Pedestrians
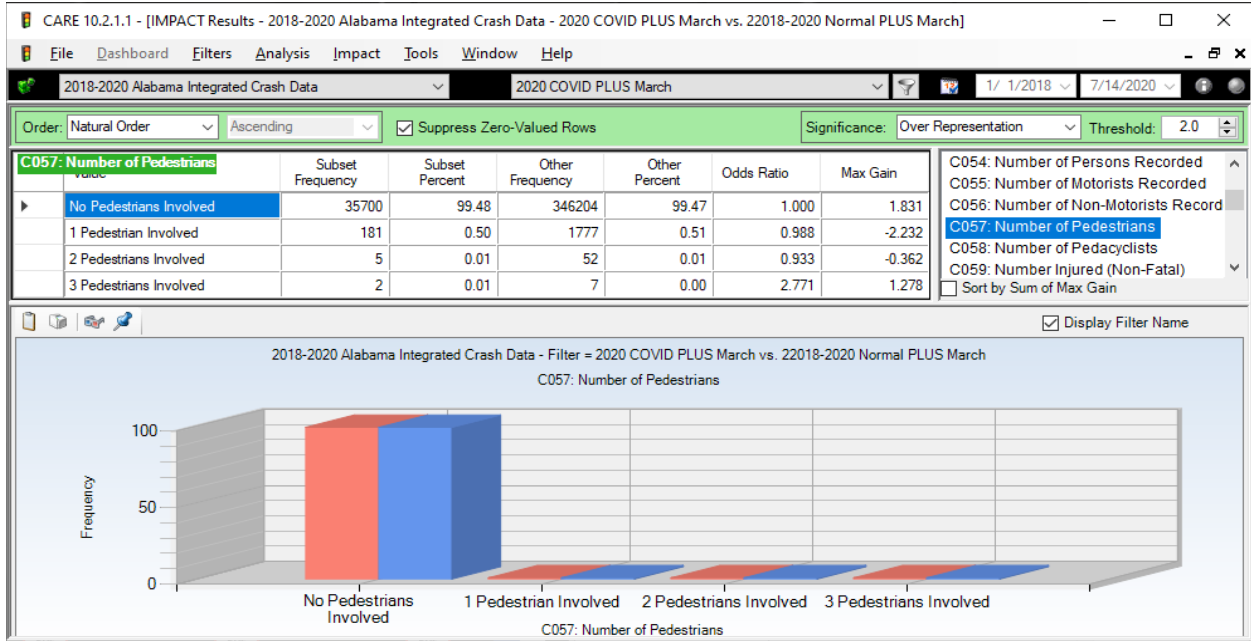
C058 Number of Pedalcyclists
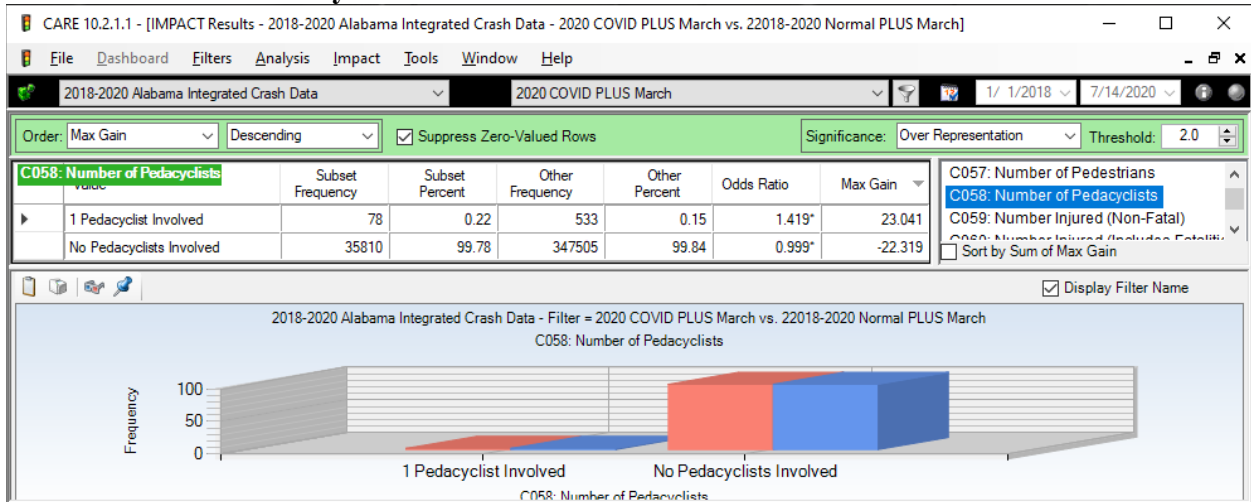
Bicycles had a much greater proportionate increase than did pedestrians as was shown in Section 3.2. Pedestrian count changes were not above what could be expected from random variation. On the other hand, the bicycle proportion increased by a factor that was 41.9% higher for the COVID period than for the Normal period, which is shown as a statistically significant increase by an asterisk on its Odds Ratio of 1.419.

4.4 C101 Causal Unit (CU) Type – Compare with 3.3

C101: Causal Unit (CU) Type Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
Pick-Up (Four-Tire Light Truck)	6702	18.83	58598	16.98	1.109*	658.441
Motorcycle	358	1.01	2280	0.66	1.522*	122.850
E Single-Unit Truck (2-Axle/6-Tire)	421	1.18	3302	0.96	1.236*	80.445
E 4-Wheel Off Road ATV	56	0.16	243	0.07	2.234*	30.938
E Cargo Van (10000 lbs or Less)	296	0.83	2615	0.76	1.098	26.300
E Single-Unit Truck (3 Axles or Less)	164	0.46	1372	0.40	1.159	22.498
CU is Unknown	1382	3.88	13391	3.88	1.001	0.907
E Passenger Van	107	0.30	1071	0.31	0.969	-3.459
Station Wagon	81	0.23	819	0.24	0.959	-3.468
E Truck (6 or 7) with Trailer	91	0.26	974	0.28	0.906	-9.454
Pedestrian	61	0.17	711	0.21	0.832	-12.330
E Unknown Type of Motorized Vehicle	393	1.10	3949	1.14	0.965	-14.284
E Tractor/Semi-Trailer	694	1.95	7080	2.05	0.950	-36.202
E Mini-van	677	1.90	7290	2.11	0.900*	-74.861
E Sport Utility Vehicle (SUV)	7249	20.37	72741	21.08	0.966*	-253.210
Passenger Car	16860	47.37	168570	48.85	0.970*	-525.622

All items with less than 50 occurrences were removed from this display.

There was a significant increase in pick-ups and motorcycles; and a reduction in SUVs and passenger cars. The increase in the proportion of motorcycles was an additional 52.2% compared to the normal time period (see Section 3.3), which was over 4 times the increase seen in pick-ups. The larger trucks did not appear to have significant increases, as was shown in Section 3.3.
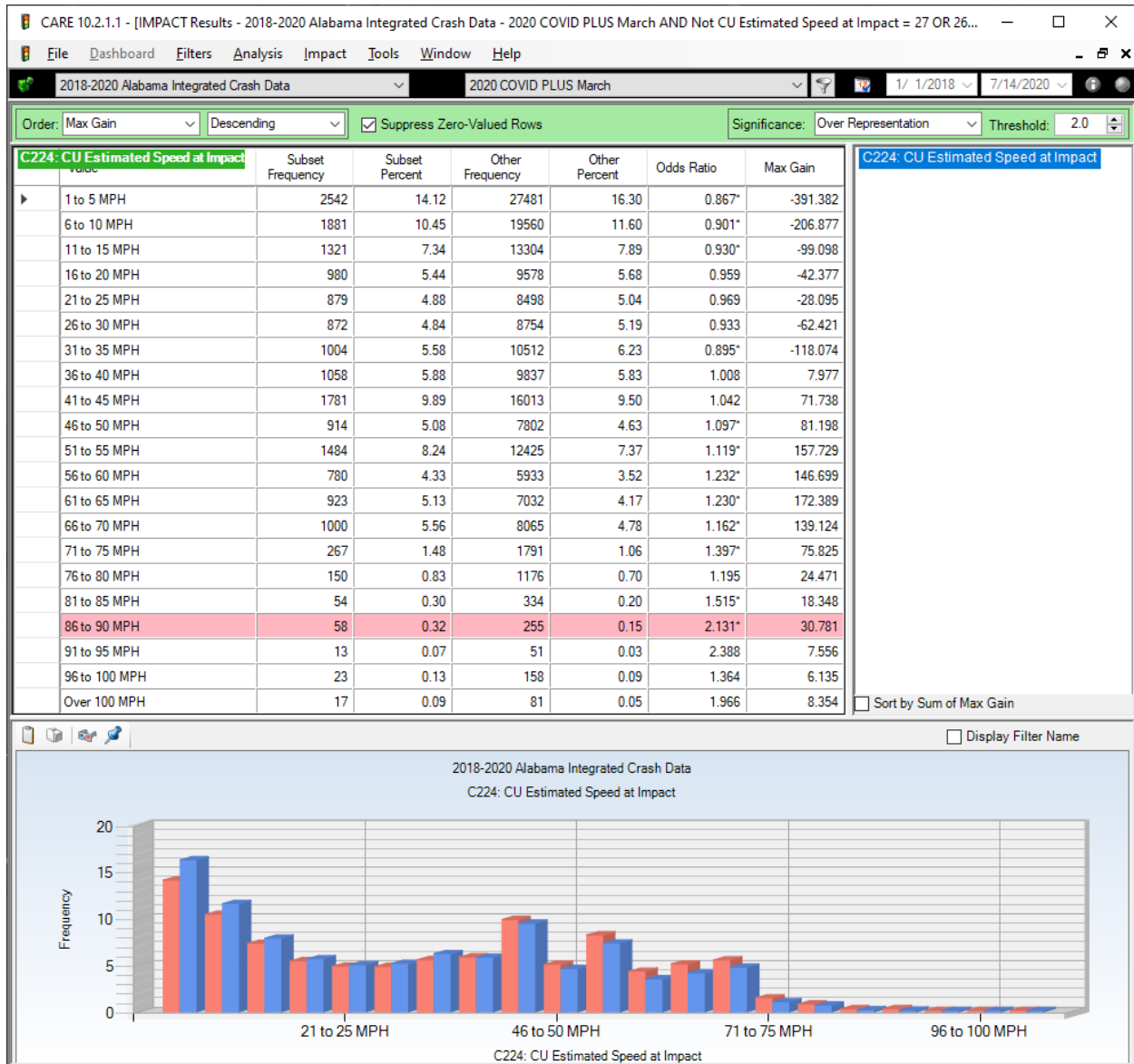
16

4.5 Crash Severity
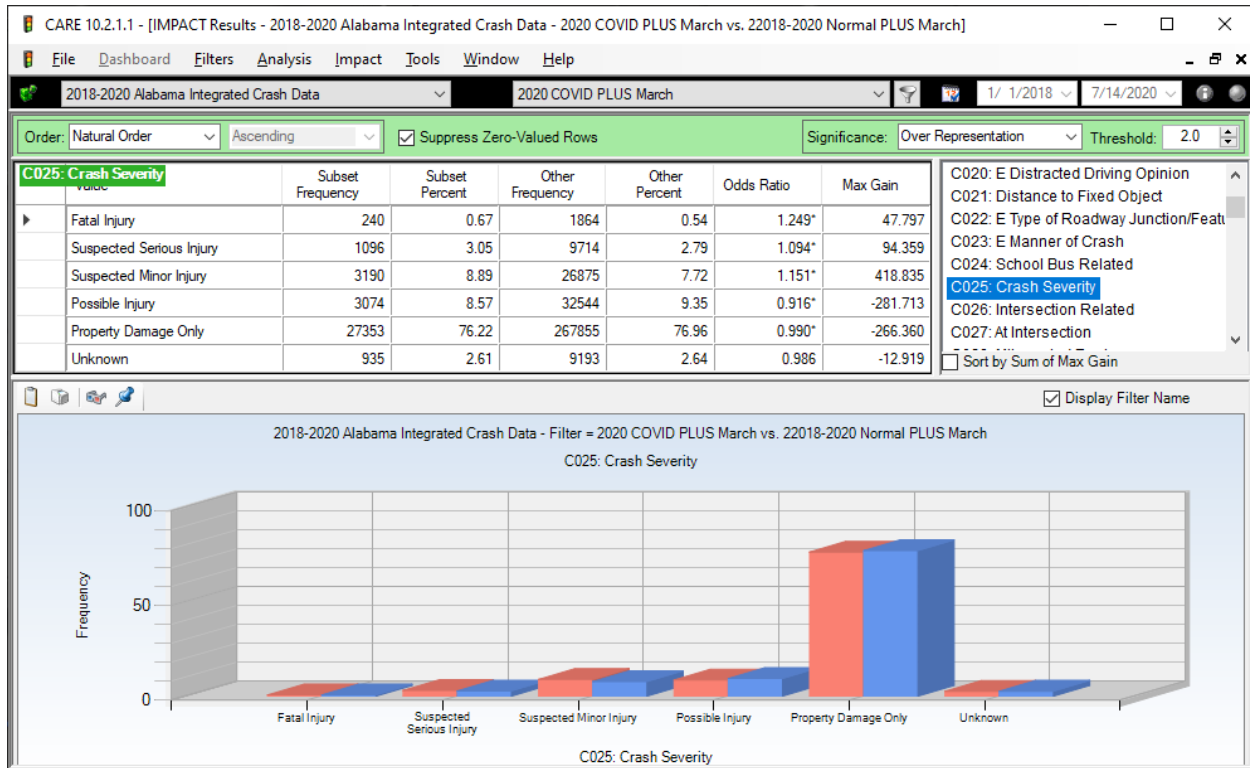
This result indicates that the proportion of fatal injury crashes for the COVID period it 1.249 times that of the Normal comparison period, which is being used for the control. Its Max Gain is 47.8, which indicates that had the same driving habits and environment been in effect in the COVID period as the Normal period, about 48 fatal crashes would have been reduced. See the chart on the next page for the estimates for all of the injury classifications of the effect of COVID period drivers maintaining their pre-COVID behaviors.

Generally, the causes of this severity increase in these crashes are given by the Primary Contributing Circumstances covered in Section 4.1. Suspected Serious Injury and Suspected Minor Injury were also both over-represented, adding more evidence that the COVID period crashes produced greater injury than Normal. On the other hand, the under-representation in Possible Injury and Property Damage Only were both statically significant.

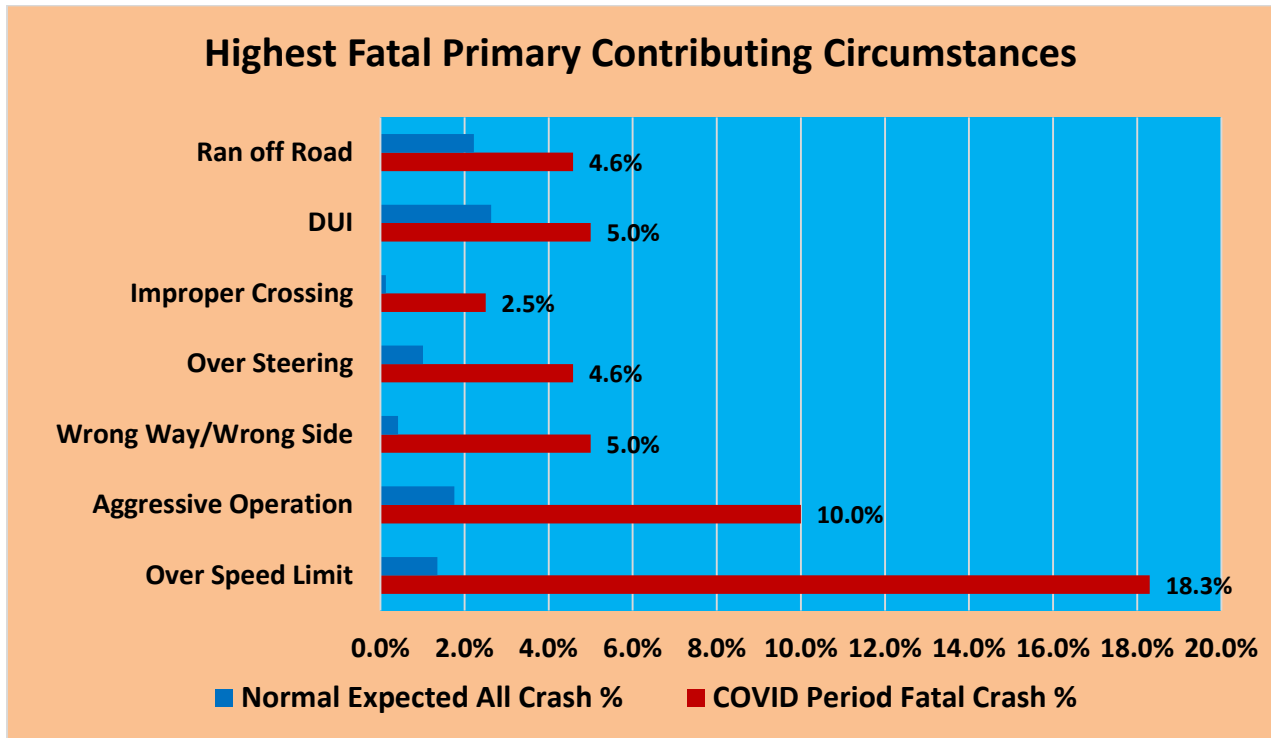**Potential Savings from Normal Behavior**
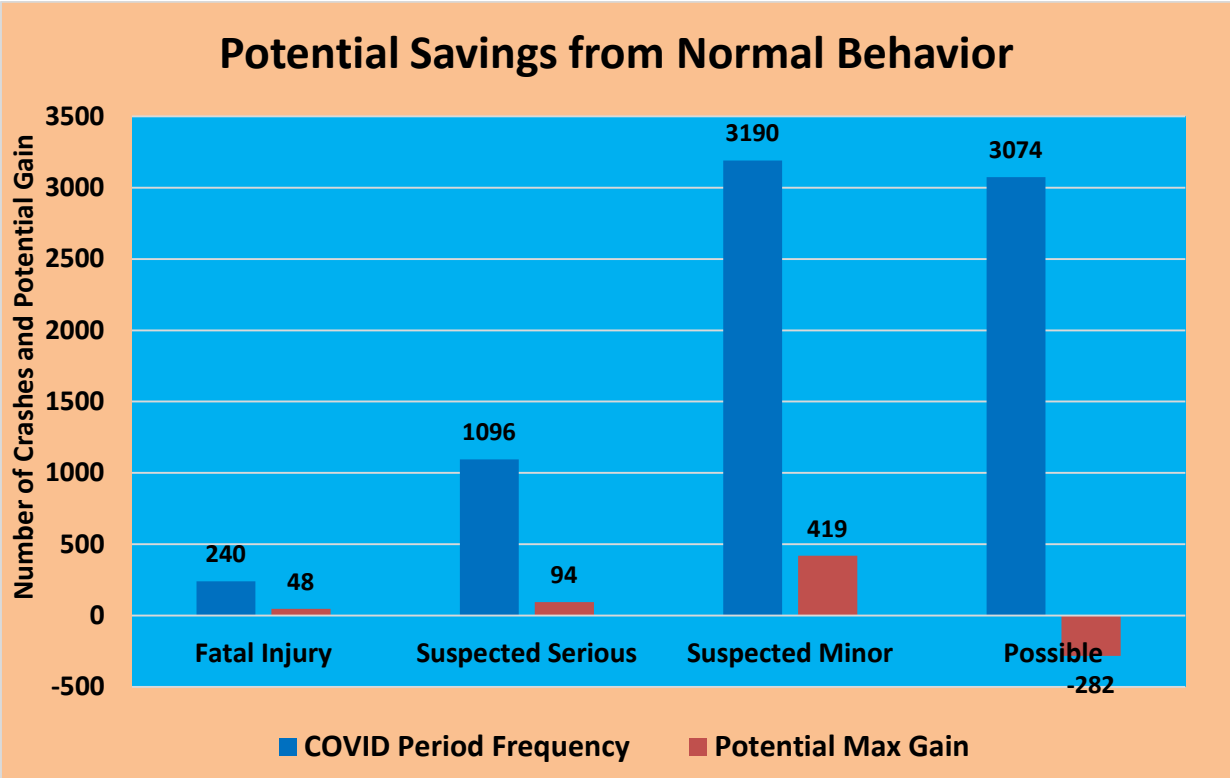
The blue bars on the chart above show the actual number of crashes in each of the severity classifications. The red bars show the effect of a resumption of behavior of drivers to before the COVID period.

4.6 Causal Unit Estimated Speed at Impact

| C224: CU Estimated Speed at Impact Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
1 to 5 MPH	2542	14.12	27481	16.30	0.867*	-391.382
6 to 10 MPH	1881	10.45	19560	11.60	0.901*	-206.877
11 to 15 MPH	1321	7.34	13304	7.89	0.930*	-99.098
16 to 20 MPH	980	5.44	9578	5.68	0.959	-42.377
21 to 25 MPH	879	4.88	8498	5.04	0.969	-28.095
26 to 30 MPH	872	4.84	8754	5.19	0.933	-62.421
31 to 35 MPH	1004	5.58	10512	6.23	0.895*	-118.074
36 to 40 MPH	1058	5.88	9837	5.83	1.008	7.977
41 to 45 MPH	1781	9.89	16013	9.50	1.042	71.738
46 to 50 MPH	914	5.08	7802	4.63	1.097*	81.198
51 to 55 MPH	1484	8.24	12425	7.37	1.119*	157.729
56 to 60 MPH	780	4.33	5933	3.52	1.232*	146.699
61 to 65 MPH	923	5.13	7032	4.17	1.230*	172.389
66 to 70 MPH	1000	5.56	8065	4.78	1.162*	139.124
71 to 75 MPH	267	1.48	1791	1.06	1.397*	75.825
76 to 80 MPH	150	0.83	1176	0.70	1.195	24.471
81 to 85 MPH	54	0.30	334	0.20	1.515*	18.348
86 to 90 MPH	58	0.32	255	0.15	2.131*	30.781
91 to 95 MPH	13	0.07	51	0.03	2.388	7.556
96 to 100 MPH	23	0.13	158	0.09	1.364	6.135
Over 100 MPH	17	0.09	81	0.05	1.966	8.354

Alabama data has shown that for every ten miles per hour of impact speed over 45 MPH, the probability doubles that the crash will be fatal. There can be no doubt that impact speeds during the COVID period have been significantly higher than Normal. All of the impact speed above 46-50 (effectively 50 MPH) showed significant increases in their proportions during the COVID period. The only exceptions are the three highest speeds, two for which significance is not calculated (less than 20 sample size). However, these Odds Ratios are quite high, and the Max Gains show the consequences of such excessive speeds.

4.7 C015 Analysis of Fatal Crashes

Highest Fatal Primary Contributing Circumstances

Circumstance	COVID Period Fatal Crash %
Ran off Road	4.6%
DUI	5.0%
Improper Crossing	2.5%
Over Steering	4.6%
Wrong Way/Wrong Side	5.0%
Aggressive Operation	10.0%
Over Speed Limit	18.3%

■ Normal Expected All Crash % ■ COVID Period Fatal Crash %

Clearly speed is the primary cause of the increased severity during the COVID period. Surprisingly, crash reports indicate that Aggressive Operation is the second most critical cause. Four of the remaining five are in the 4.6% to 5.0% range, while Improper Crossing (an issue only with pedestrians) is the least frequency, it is still a very important factor in fatality reduction.

# 5 Daily % Reductions in Crash Fatalities after April 1, 2020.
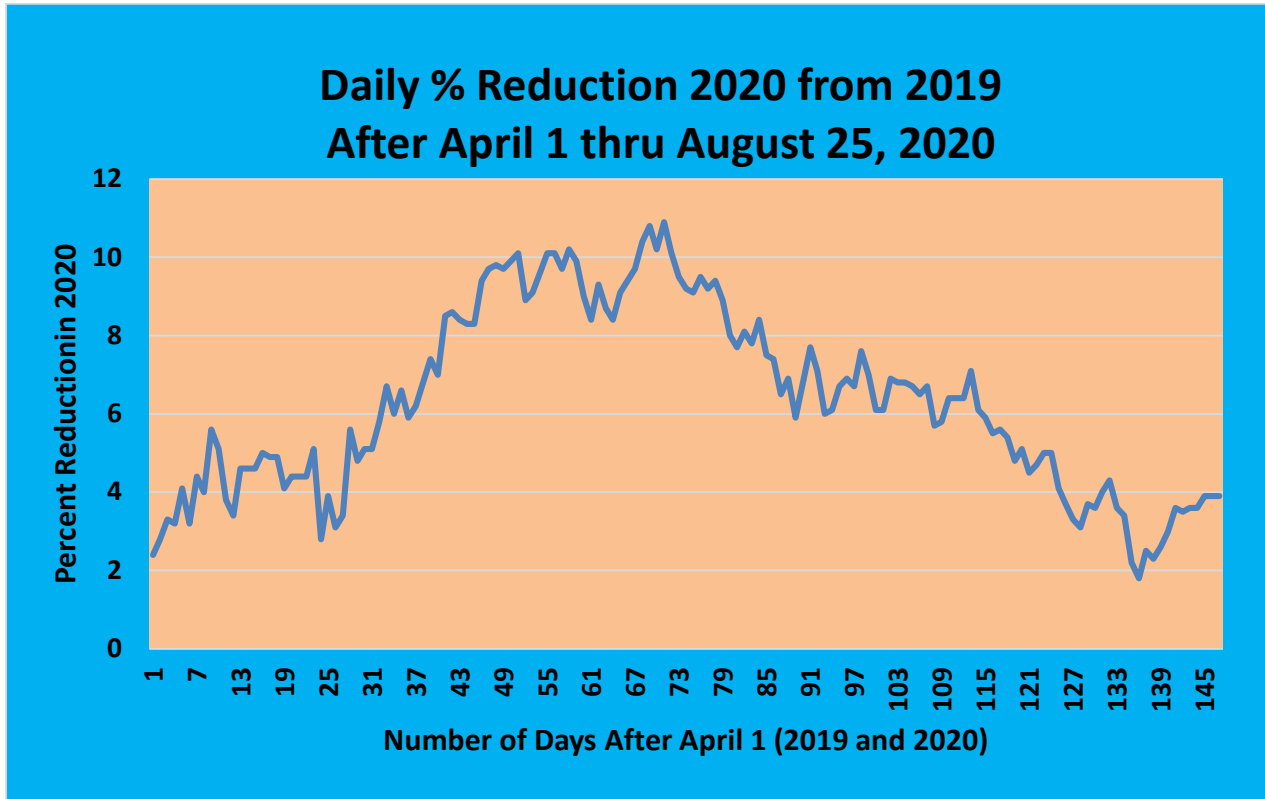
The chart above gives the percent fatality reduction for each day in 2020 compared to the identical days in 2019 from April 1 through August 25 of both years. These are *daily readings* as opposed to the charts in Section 3, which are the changes in the various types of crashes over two-week periods. This chart, as well as the one on the following page, are also reporting *actual fatalities* as opposed to *fatal crashes*, which are what is reported in the charts in Section 3.

Rather than starting on January 3, 2020 (as is true of the graph in the next section), this chart starts in April 1, 2020. The numbers on the X-axis here are the number of days after April 1, 2020. The exact readings for August 25 are: 588 fatalities in 2019; and 565 fatalities in 2020; a reduction of 3.9% as of that date. Unfortunately, the general trend of this metric is down from above 10% in June 7-11, 2020, which was the high on the chart (Days 69-71). We are quite hopeful that the recent trend reversal continues

See the next section for a review of the same metric. but from the beginning of the year until May 26, 2020. It is quite interesting how fatalities were increasing dramatically prior to the COVID period (which started March 10, 2020), and was reversed over the next few weeks by the overall reduction in traffic. According to the chart above, that reversal lasted until it was again reversed after June 7-11.

# 6 Percent Reduction in 2020 Traffic Fatalities vs. 2019.

The following is for the first four months of the two years.
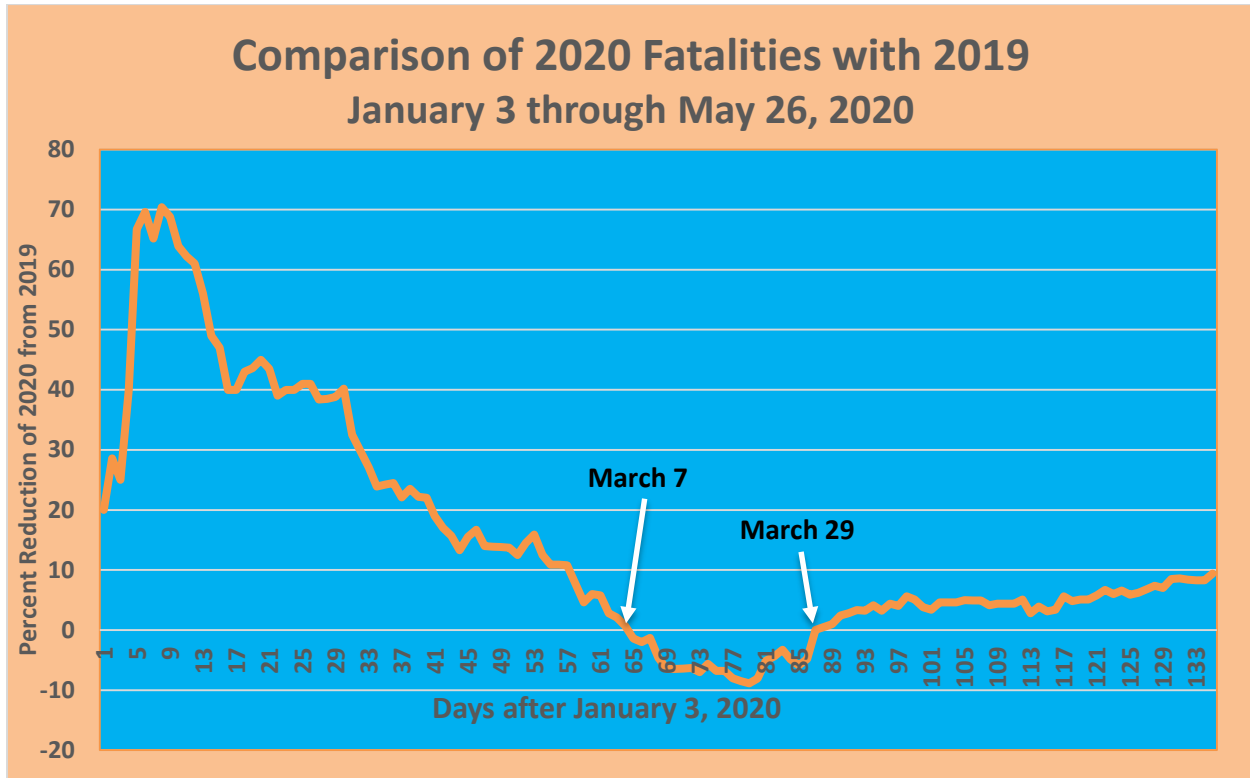
Alabama started off year 2020 with major reductions in fatalities compared to 2019. At one point it had a 70% reduction, but this was early in the year before there were enough daily numbers to do any reasonable statistical comparison. From this high, it slid down in almost a straight line until March 7, when it reached the zero break-even point (same in both years). At that point in time the 2020 fatalities numbered exactly what they did in 2019 – no percent reduction.

March 7 is within our "Week 1" (March 3-9, 2020) for the charts in Section 3. Recall that Week 1 was the last week before the COVID quarantines took effect, but the number of crashes for the comparisons have been updated to be the average of the first ten weeks in 2020. It is strictly coincidental that this was the week in which the fatality counts for 2019 and 2020 became identical. As can be seen from the chart, the 2020 increase in fatalities continued past March 7, and it was not zero again until March 29, well after the first quarantines had taken effect. This chart extends until May 16, 2020, and it will not be updated.

7 Correlation Analysis: Relationship between ADT and Crash Frequency

MOBILE CO TRAFFIC VOLUME VS CRASHES
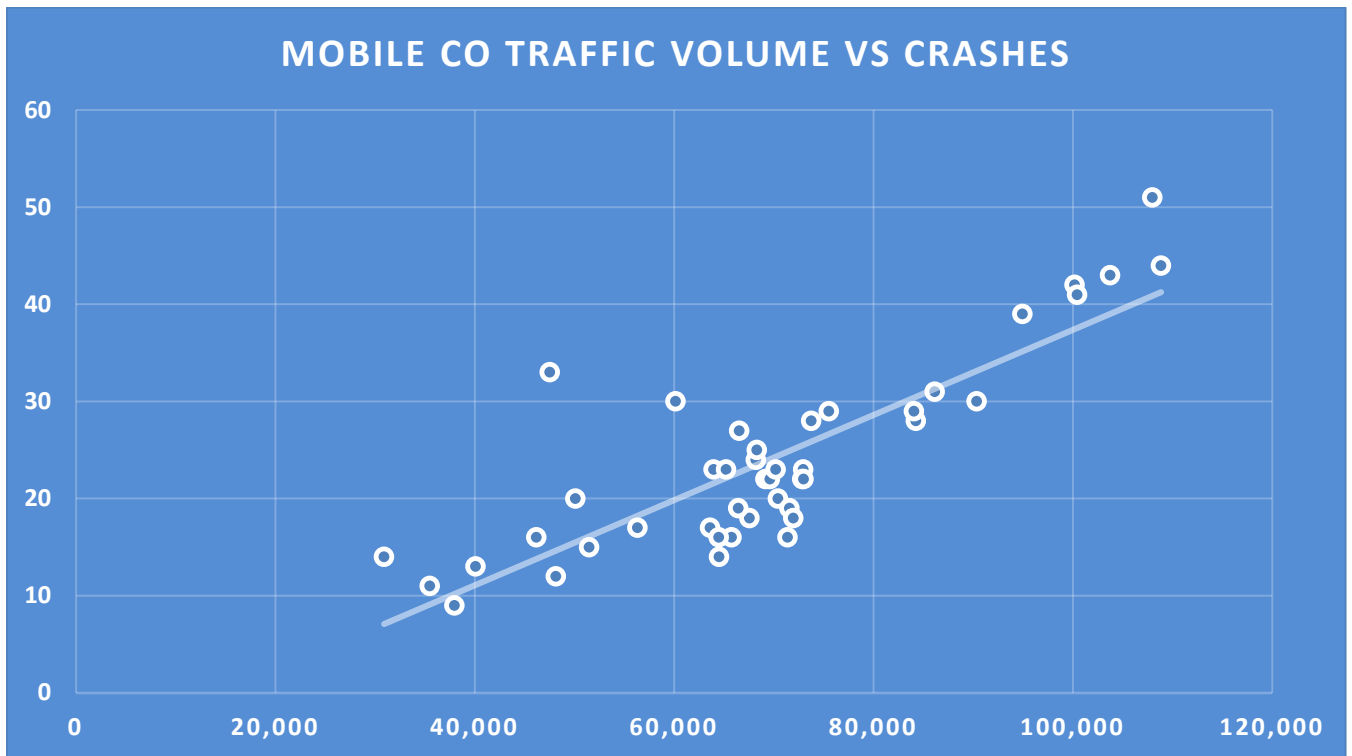
The regression above, with a correlation coefficient = 0.8430, indicates a nearly perfect relationship between Crashes and Average Daily Traffic (ADT). This analysis, which considered the identical roadway and a similar traffic mix, was performed where the differences in traffic volumes were due solely to the quarantine caused by COVID. Volume and crashes were compared over 43 days from 3/9/2020 to 4/23/2020, and the correlation coefficient of the resulting least-squares regression line was 0.8430, which indicates an extremely high correlation. The sample of traffic volume was obtained from I-10 at Milepost 3.

The conclusion that can be drawn from this is that the major portion (virtually all) of the variations experienced after Week 1 (March 3-9) were due to the reduction in traffic volume. The only other cause of it could have been that the drivers remaining on the road (after the COVID quarantine went into effect) were of superior skill and experience. While we believe this is true, and that it had some effect, its effect would be relatively small compared to the reduction in traffic volume.

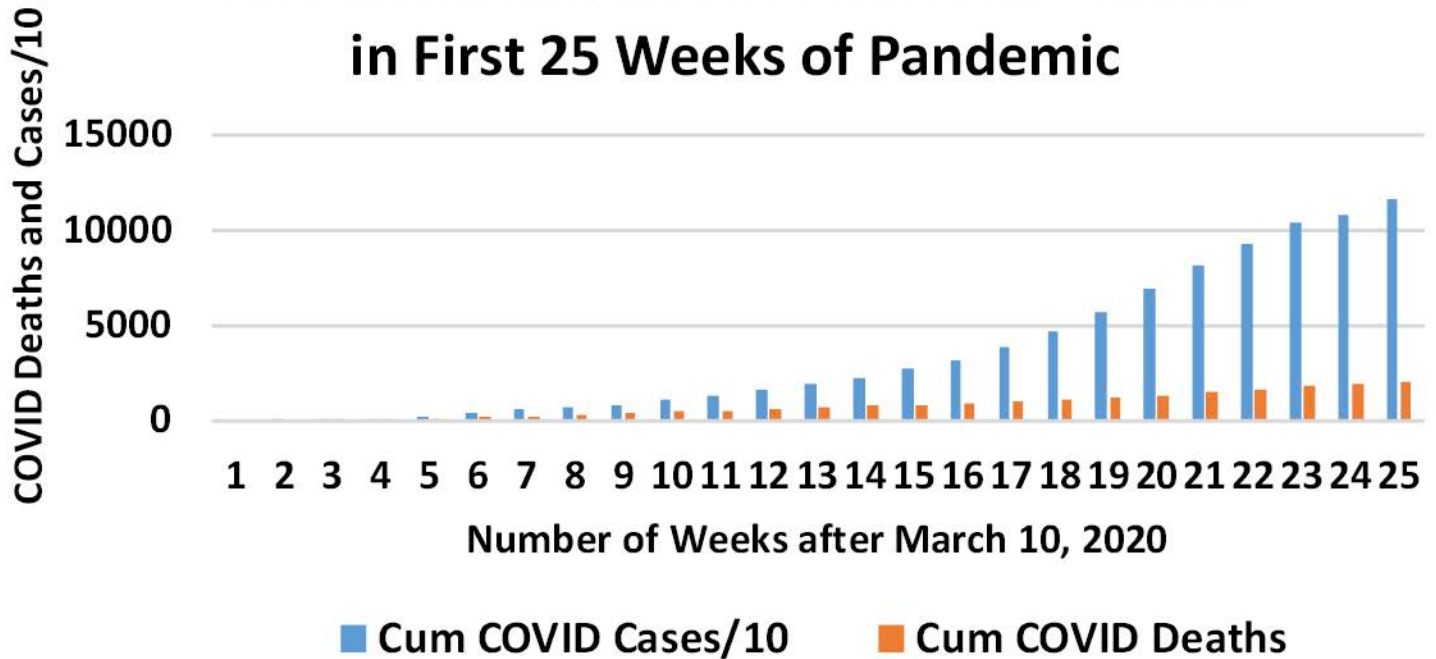Driver Response in Terms of Speeding, DUI, Fatal, and All Crashes
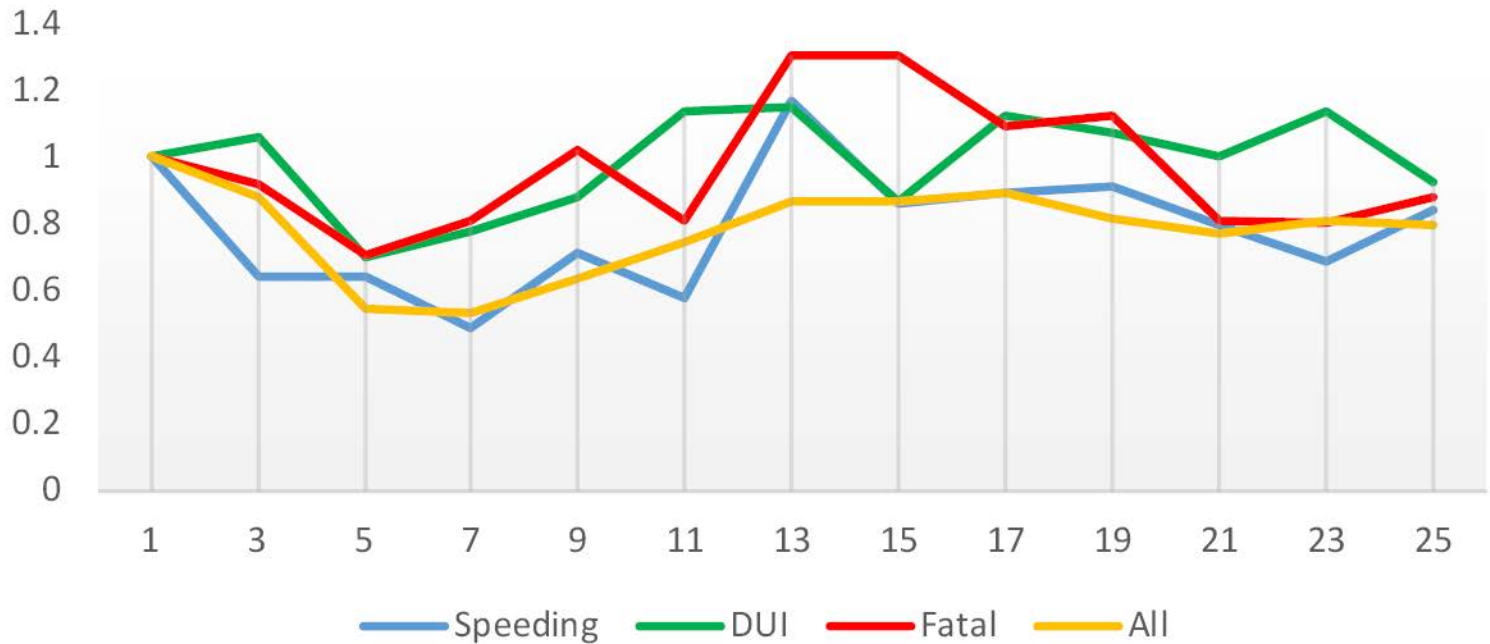
The total number of crashes was reduced to around 90% of its pre-COVID numbers in Week 25.

The number of crashes caused by alcohol and other drugs decreased during Week 25.

Please note that each point in the Weeks section is an average of two-week periods.

AL Cumulative COVID Cases and Deaths in First 25 Weeks of Pandemic

Y-axis: COVID Deaths and Cases/10 (0, 5000, 10000, 15000)

X-axis: Number of Weeks after March 10, 2020 (1–25)

Legend: ■ Cum COVID Cases/10   ■ Cum COVID Deaths

In Week 25, the total number of COVID-19 cases in Alabama is still increasing.

The total number of COVID-19 deaths in the state continues to rise.