Response of Various Crash Types to COVID Quarantine

Weeks Ending March 10 through November 3, 2020 Data (35 Weeks)
The first 35 Weeks of government recommendations

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1.0 Introduction and Major Recent Findings

1.1 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. Generally, the week ending March 10, 2020 can be viewed as Week 1, although that level was actually determined by an average of a prior weeks in 2020.

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 of these sources are incorrect. They are most likely based on different state or federal data sources, which 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 in Section 1.3. 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 are being compared are 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. To 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 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 Misjudged Stopping Distance
- 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 resulting deaths in Alabama. *Section 3* presents the crash charts that are now being updated every four weeks. 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.

Five additional sections appear after the standardized charts:

- Section 4. COVID Speeding Citation Analysis;
- Section 5. CARE IMPACT comparisons for several of the crash types plotted;
- Section 6. Daily comparison of fatalities in 2020 vs. 2019 starting April 1, 2020;
- Section 7. Same as Section 6, but for the earlier months of 2019 and 2020; and
- Section 8. Correlation analysis showing how total crashes predict AADT.

The chart in Section 8 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.

1.2 Major Recent Findings from the Week 35 Update

The following is a quick summary of the most significant findings for the first 35 weeks of the COVID protection measures, given according to the Section numbers for easy referencing of more detailed information:

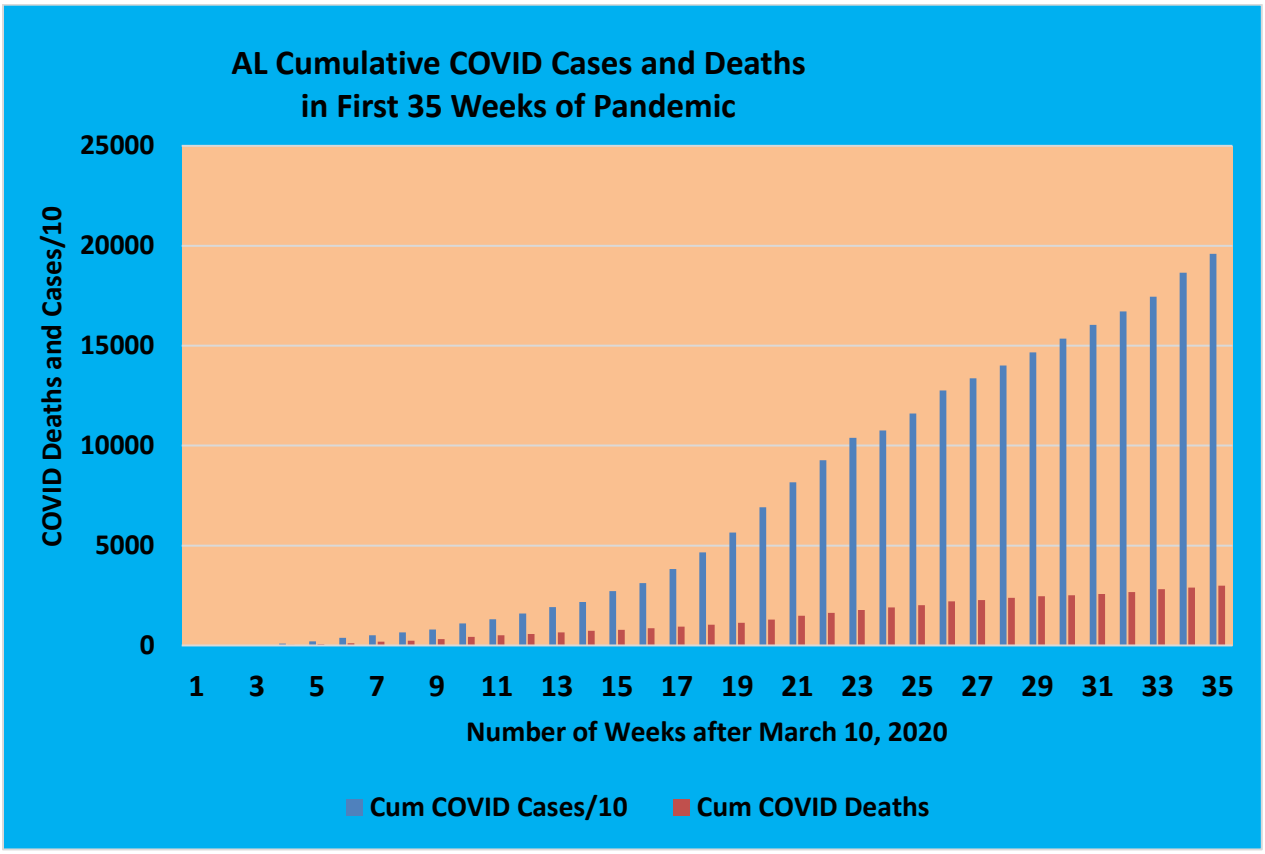
- 3.0 All Crashes and Fatal Crashes. The extremely favorable reduction in Fatal Crashes after Week 25, and especially in Week 33, is extremely welcomed. The most current reading, however, was back up to about 20% higher than the pre-COVID level. Clearly, fatal crashes have not gone down nearly as much as crashes in general. We are hopeful that the recent drop-off in fatal crashes will continue.
- 3.1 Speeding Crashes and Impaired Driving (DUI) Crashes. DUI and Speeding are well established to be major causes of fatal crashes. So their slight reduction in proportion correlated with that of fatal crashes is expected.
- 3.2 Pedestrians and Bicycles. Pedestrian crashes remain at about the All Crash level, while Bicycle crashes have leveled out from Week 25 on, to about 38% higher than its pre-COVID level.
- 3.3 Motorcycles Involved Crashes and Large Truck Caused. Even though Motorcycle crash proportions have declined significantly between Weeks 29 and 35, it is still 50% above its pre-COVID level. Large Truck proportions have not deviated significantly from the All crash proportions.

- 3.4 Aggressive Driving Crashes and Interstate Crashes. Aggressive Driving remains highly correlated with Fatal Crashes, while Interstate Crashes are highly correlated with All Crashes during the COVID period.
- 3.5 Misjudged Stopping Distance and Young (16-20) Driver Caused crashes. Misjudged stopping distance and Young Driver Caused crashes remain highly correlated with All crashes during the COVID period, with the most recent results showing Youth Caused Crashes to be slightly above the All Crash line, and Misjudge Stopping Distance to be slightly below it. Generally misjudging stopping distance is more of a problem with younger drivers than with those with are more experienced.
- 3.6 Rural and Urban. Rural Crashes remain above the All line, while Urban Crashes remain below it, both highly correlated with All crashes during the COVID period.

1.3 Credits for data sources

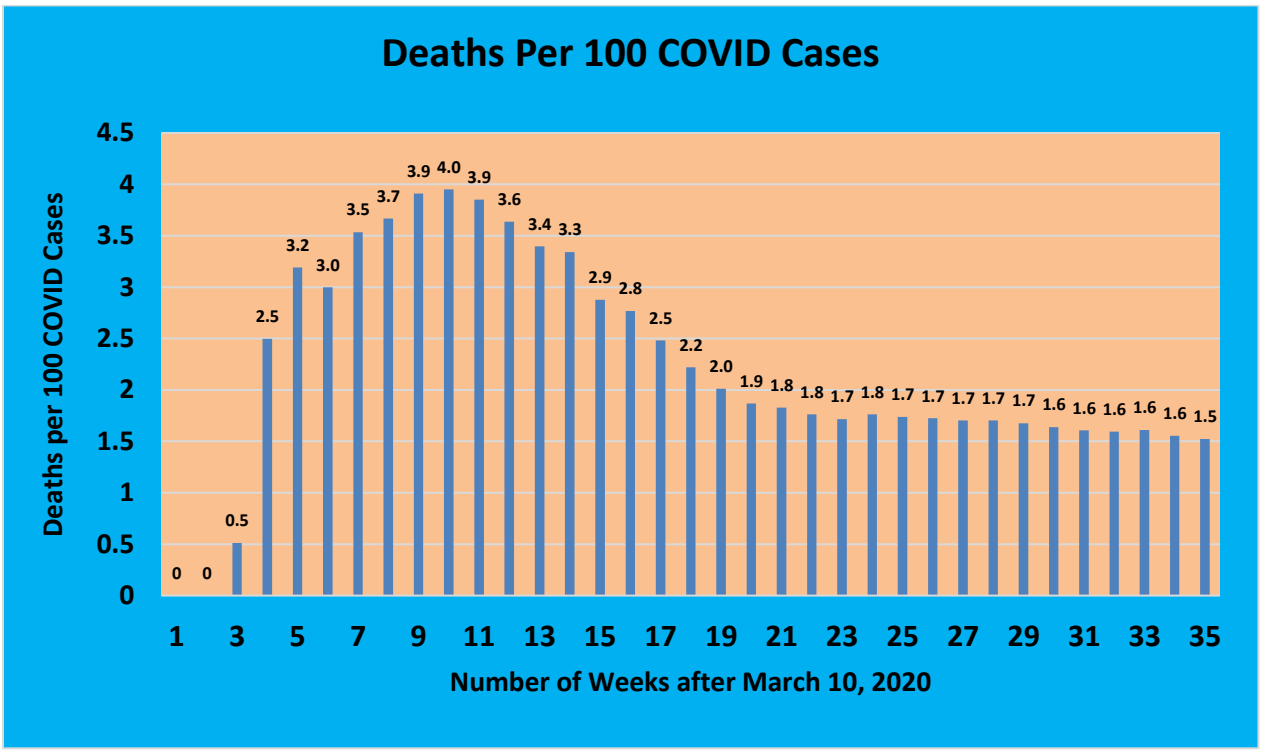
(1) We appreciate the efforts of the Alabama Law Enforcement Agency (ALEA) and local law enforcement agencies in collecting these data, and ALEA's role in maintaining the crash records.
(2) We also appreciate CAPS for the daily annual (2020 vs 2019) comparison of fatalities.
(3) We are updating the new 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.

2.0 COVID Case Fatality Rate Change Over the 35 Weeks.



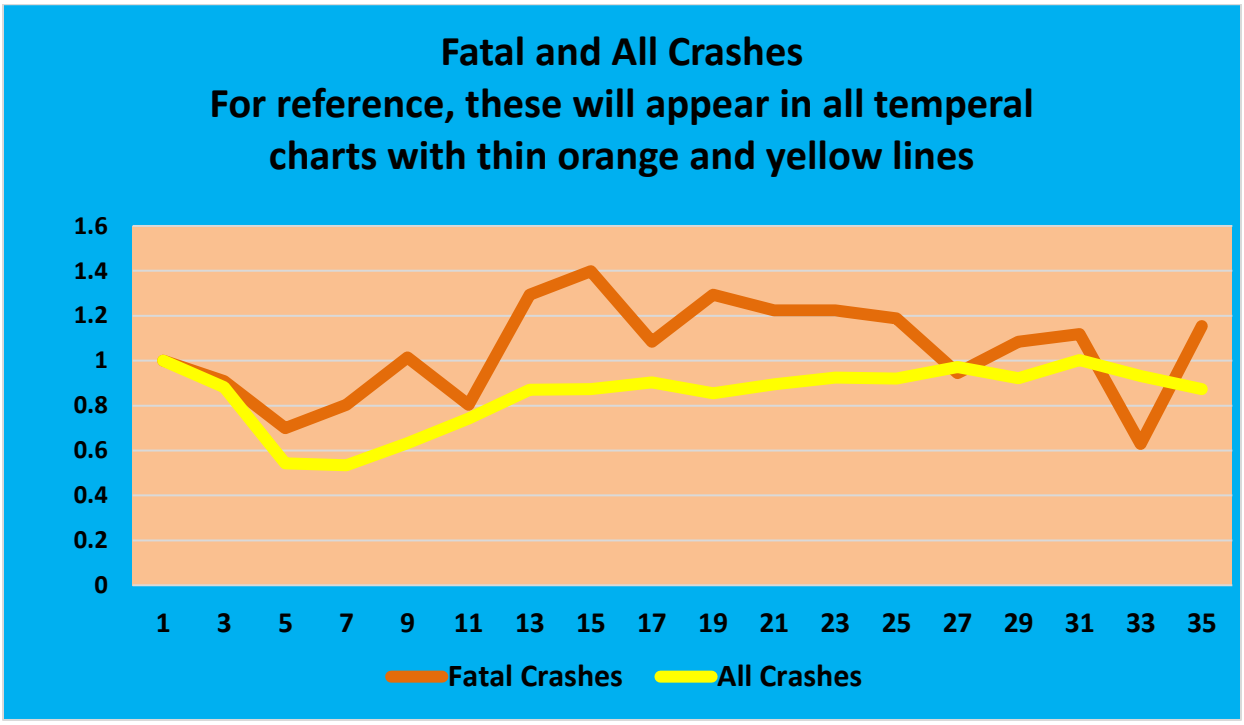
The chart above shows how the cumulative number of COVID cases and the cumulative number of COVID deaths have increased in Alabama over the first 35 weeks of the pandemic. Note that, while the Y-axis gives the actual number of deaths, *the numbers are only 1/10th of the case count*. This was done so 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 35 (ending November 3, 2020) were 195,929 cases and 2,987 fatalities.

The chart below shows how the probability of survival has changed over the 35 weeks. The death rate got up to nearly 4 per hundred cases (4%) in weeks 9-11, but it is now down to about 1.5 deaths in 100 cases. 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
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
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 1.7 1.7 1.7 1.7 1.6 1.6 1.6 1.6 1.6 1.5
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35
Number of Weeks after March 10, 2020

3.0 Crash Response Temporal Displays for the First 35 Weeks

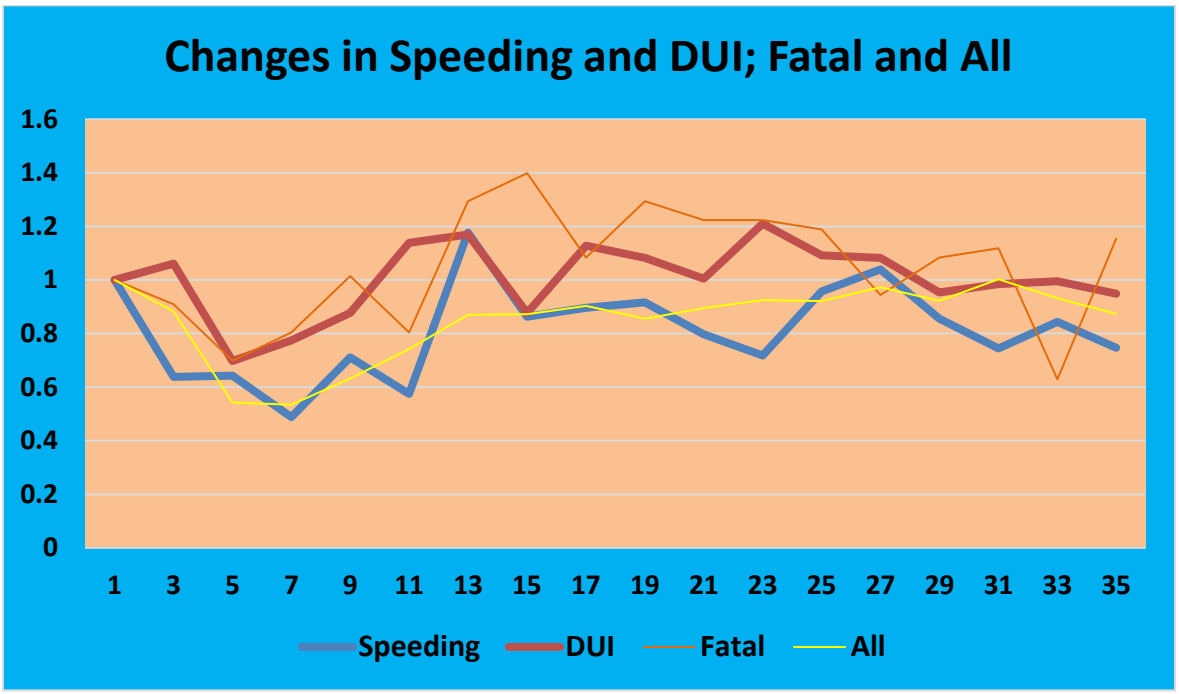
To set the stage for the comparisons to follow in this section, consider the *All Crashes* (yellow) and the *Fatal Crashes* (orange) lines in the chart displayed below. Lighter colors were chosen for these two lines so they would blend into the background of the charts that follow to prevent their being 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.



Fatal Crashes rose in Weeks 12-15 to about 40% higher than the pre-COVID level, and they did not drop until Week 17. It is now at about 11 fatal crashes per week. The extremely favorable reduction in fatal crashes after Week 25 to nearly the same proportion as All Crashes, which has leveled out since Week 23 and is now close to its pre-COVID level. See Sections 6 and 7 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 will continue to be displayed as thin lines in these charts so that they do not distract from the other lines in the charts.

3.1 Speeding Crashes and Impaired Driving (DUI) Crashes

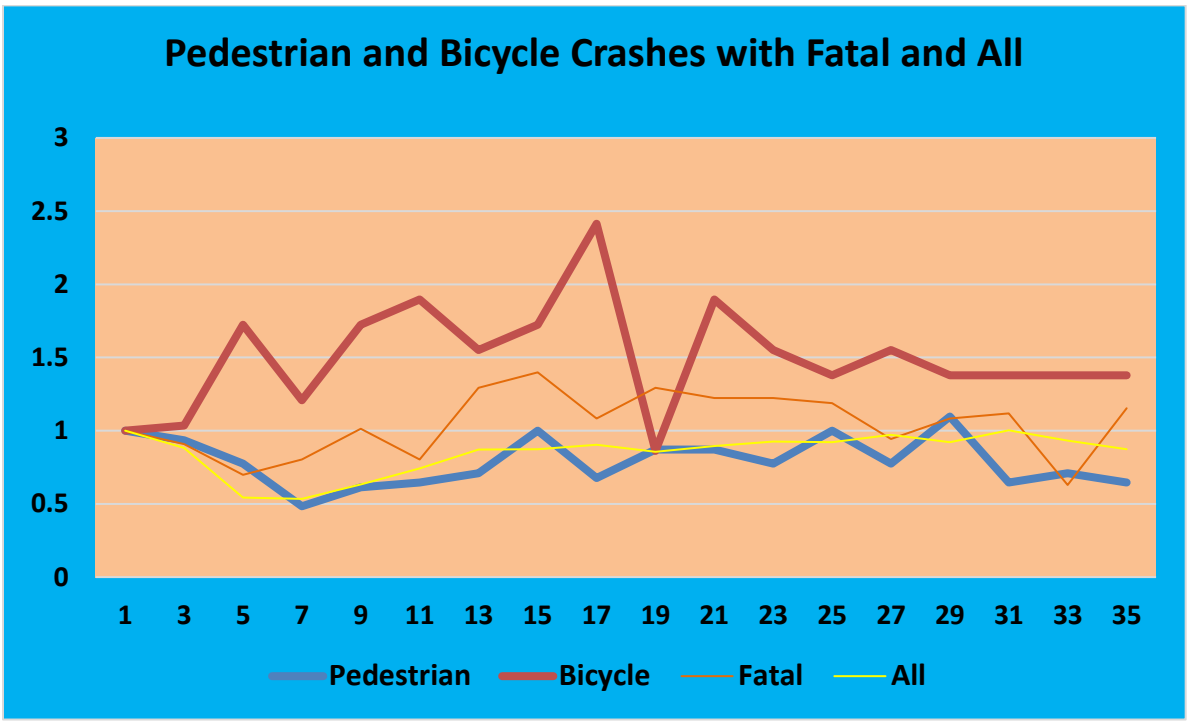


The dark blue speeding curve almost coincided with the red DUI in Weeks 13-15, and right after that it coincided with the All Crashes line. Generally, speeding has been fairly consistent with all crashes (thin yellow), although the fewer crashes make this line much more jagged.

DUI Crashes (red) 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 11-13 and also 17-23, before its recent decrease. It is clear that the DUI proportion has been consistently higher than the speeding values and also for all crashes in general. For more details on Speeding and ID/DUI crashes, please see Section 5.1.

Early Comparison of Fatal Crash Rate. 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 8 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 its expected based on the overall crash reduction of 22.2%*. These rates are generally persisting, with notable exceptions. See Section 5.5 for more on crash severity.

3.2 Pedestrians and Bicycles

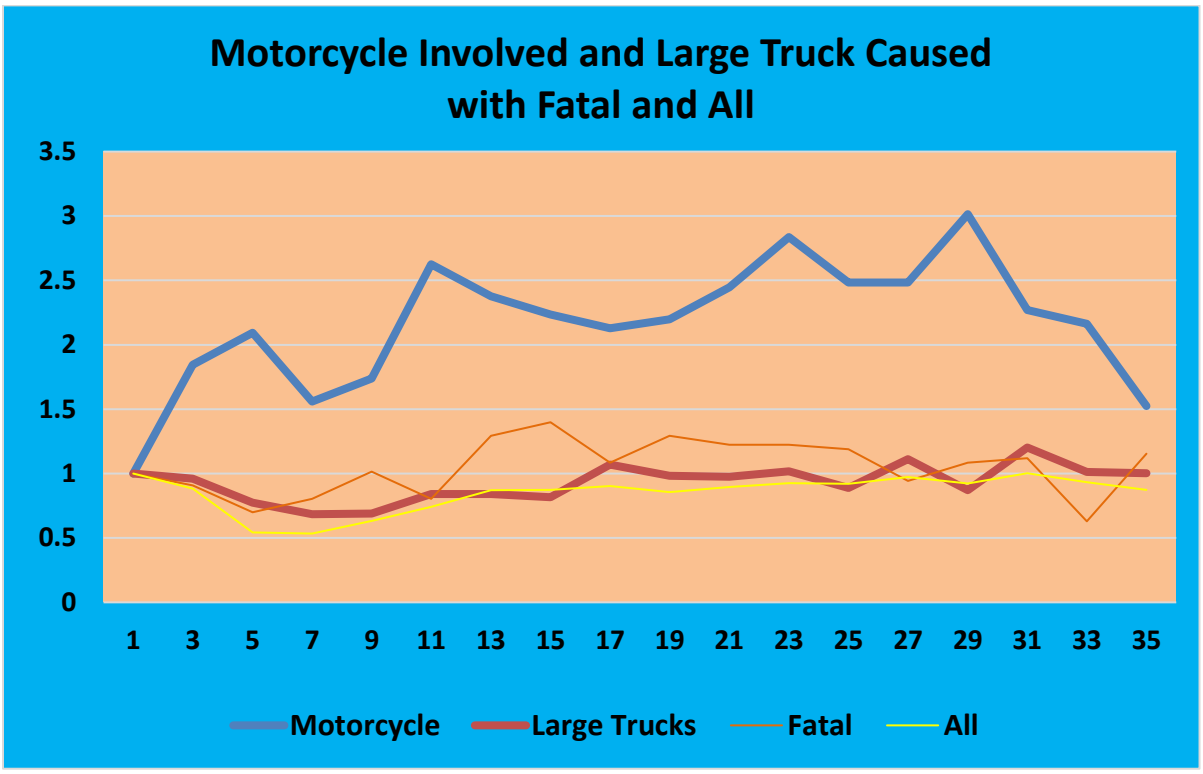


Pedestrian Crash proportions (dark blue) had a slight rise in Weeks 15, 25 and 29, but their proportion is generally below the All Crash level. The most current pedestrian crash proportions are less than All Crashes.

Bicycles (red line), on the other hand, had a dramatic increase in crashes relative to the other crash proportions, and currently their proportion has remained higher that either All Crashes or Fatal Crashes. This 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 Week 19, this was clearly an exception, and it has shown consistently higher levels in all of the other weeks including the most recent. Pedestrian crashes are now below the all crash level, while Bicycle crashes have leveled out from Week 25 on to about 38% higher than its pre-COVID level.

Pedestrians have averaged about 12 crashes per week during the COVID period, while bicycles have averaged about 4.5 crashes per week. For more details on Pedestrian and Bicycle crashes, please see Section 5.3.

3.3 Motorcycles Involved Crashes and Large Truck Caused



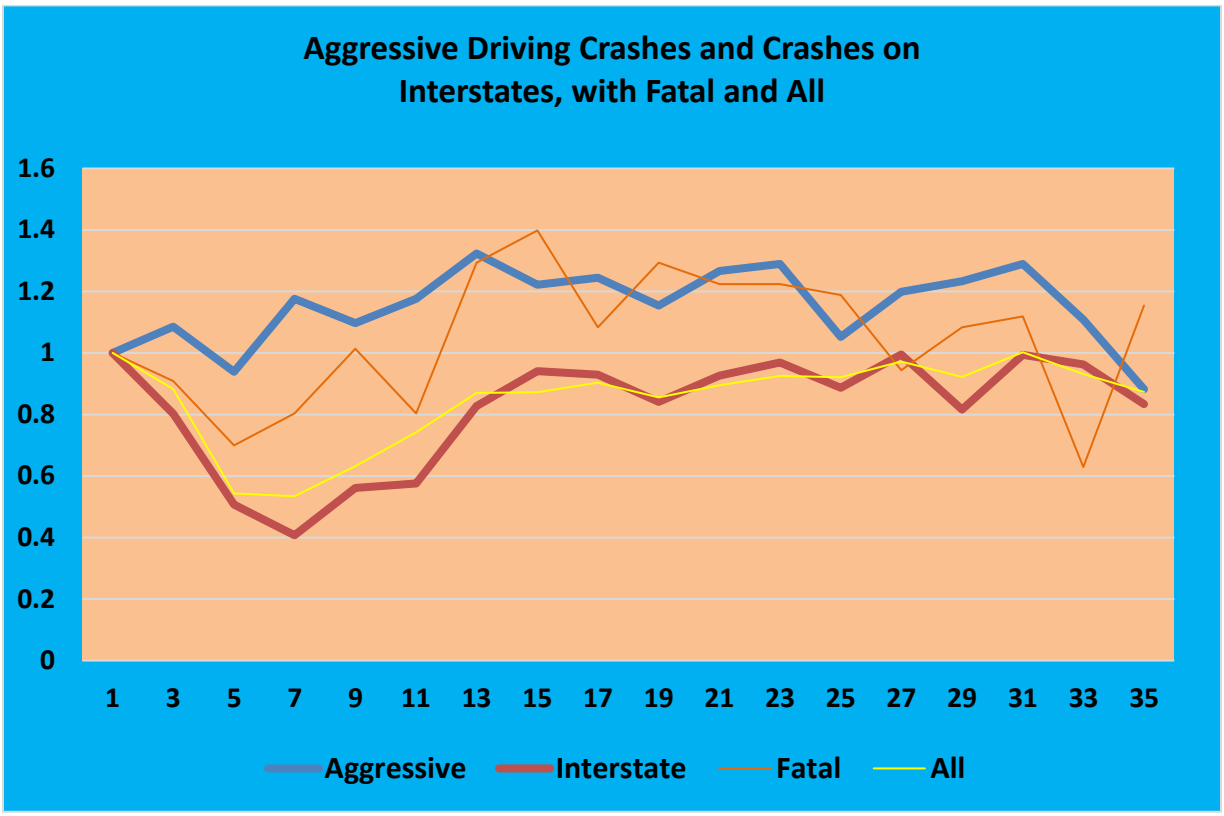
It was speculated that since the number of trucks on the road had not decreased nearly as much as passenger vehicles, that truck crashes might have relatively higher comparative proportion. This has not been the case, as can be seen by the red line on the chart. A significant proportion of two-vehicle crashes involving a truck 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. These (red line) have been almost totally consistent with All 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 have been on the road during the COVID period, which also might be an effort to save fuel costs. Even though Motorcycle crash proportions have declined significantly between Weeks 29 and 35, it is still 50% above its pre-COVID level.

For more information on causal unit types, please see Section 5.4.

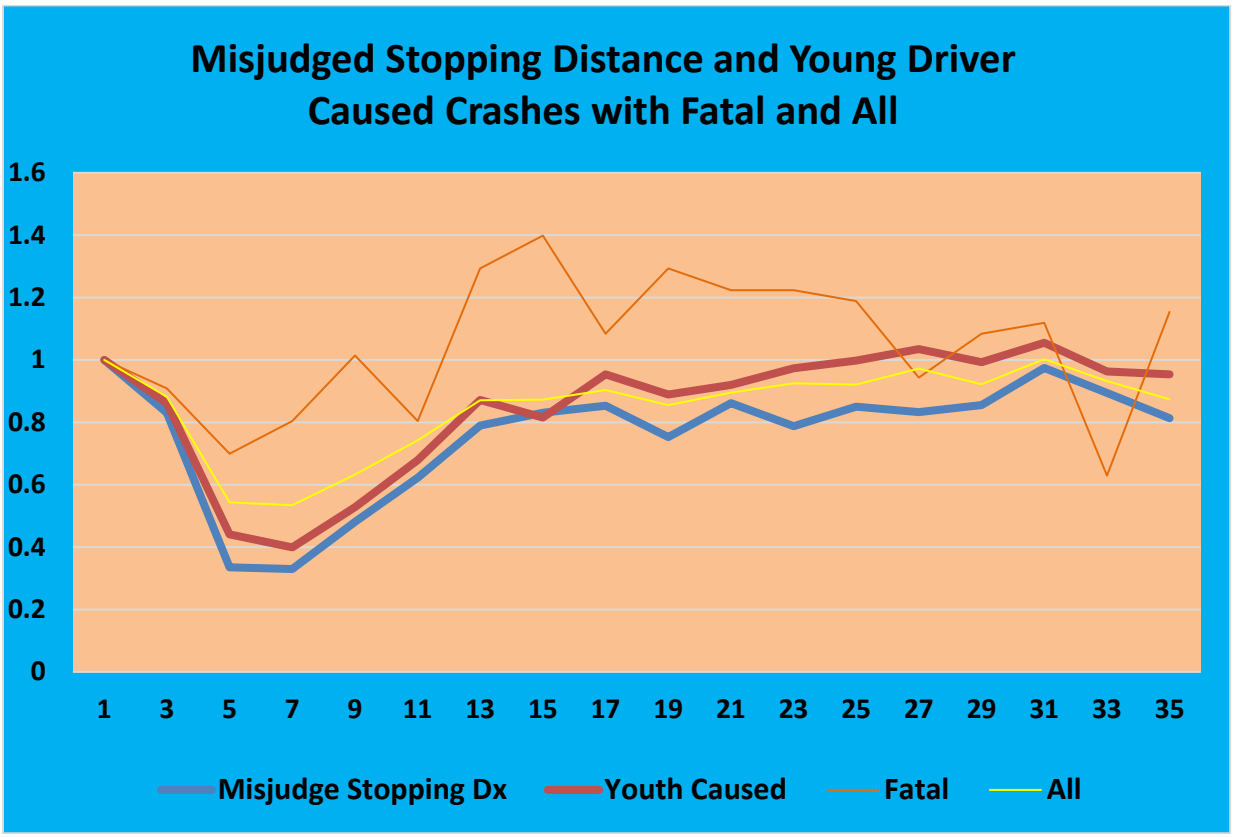
3.4 Aggressive Driving Crashes and Interstate Crashes



Prior to Week 13, Interstate travel (red line) crashes dropped off as much or more than either fatal crashes or total crashes, which probably indicates that fewer longer trips were being taken early in the COVID period. After week 13, it has been quite consistent with the All Crash.

On the other hand, the Aggressive Driving proportion 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 current week. Aggressive Driving is highly correlated with fatal crashes, while Interstate crashes are highly correlated with All crashes during the COVID period.

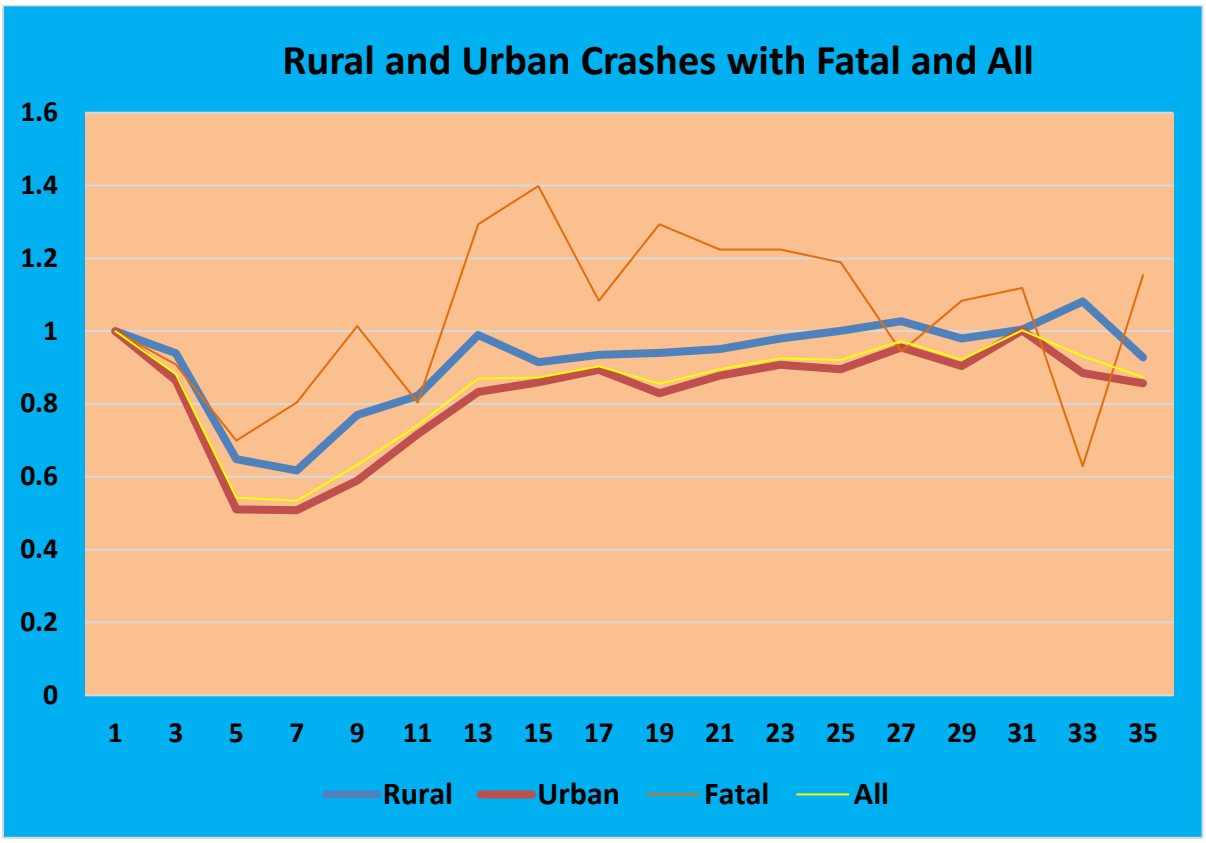
3.5 Misjudge Stopping Distance and Young (16-20) Driver Caused Crashes



Misjudging Stopping Distance and Youth Driver (aged 16-20) caused crashes were quite close to each other, both following the general All Crash trend in their reductions. Both of these generally had a greater proportionate reduction than the overall crashes in the first 16 weeks. After that Youth-Caused crashes have consistently exceeded the All Crash line, although the differences have not been nearly as great as many of the other disparities discussed above. We feel this has resulted from a greater number of younger drivers being on the road after Week 16.

Misjudged stopping distance and Young Driver Caused crashes both remain highly correlated with All Crashes during the COVID period.

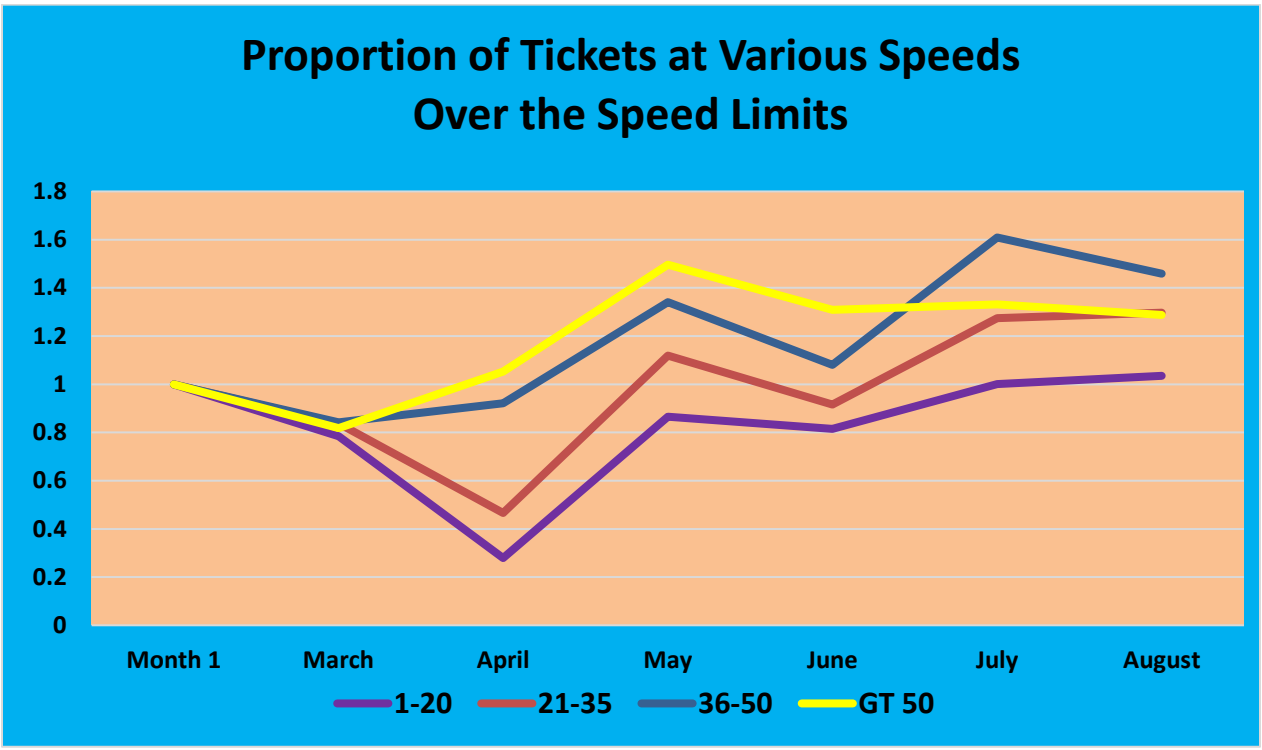
3.6 Rural and Urban



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 slightly below it. This indicates that rural driving did not fall off proportionally as much as city driving, a fact that could be due to the need for rural dwellers in securing the necessities of life. In the most recent weeks, Rural Crashes have remained above the All Crash line, while Urban Crashes remain below it, both being highly correlated with the All Crash proportions during the COVID period.

4.0 COVID Speeding Citation Analysis

This Section contains the results of an analysis that was performed using Alabama citation data. These data included the excess speed in Miles Per Hour (MPH) for which the citations were issued over the time period prior to the COVID period (referenced as "Month 1" in the chart) through August. The following chart plots these changes over the first five COVID months.



These data clearly indicate that for citations at all speeds over the speed limits, all speed violations dropped about the same in March 2020 due to the greatly reduced traffic in the early weeks of the COVID period: The following summarizes the effects for the various speed violations:

1. One to 20 MPH over the speed limit. [Approximate odds of crash resulting in death at this speed=1 in 500; these are best estimates, and they will also be given for the other speeds in brackets below.] This speed violation range, given by the purple line, continued to drop after March. It recovered to 80% of its pre-COVID level in May and June. In July and August, it was fairly stable near its Pre-COVID level.
2. 21 to 35 MPH over the speed limit. [1 in 30 probability of death.] Although not with the same degree of reduction, this level of violation (given by the red line) closely mirrors the One to 20 violation MPH line. However, it jumped slightly above its pre-COVID level in

May. It stayed at about that level until July, when it exceeded its pre-COVID level by about 30%, which is where it is was in August.

3. 36 to 50 MPH over speed limit (blue line). [1 in 15 chance of death.] Lower in March and April, it went up to slightly higher than 35% above its expected normal in May. After that, it dropped almost to its expected value in June before dramatically increasing to almost 60% higher than its expected normal in July. It then came down in August to slightly above the 40% level.
4. Greater than 50 MPH over speed limit. [1 in 5 chance of death.] From the dip seen in all other speed violations, GT 50 MPH (yellow line) increased to its expectation in April, and then went way beyond that in May and June, at 50% and 30% higher than expected, respectively. After that, it seems to have stabilized at about 30% higher than its pre-COVID expected value.

A study of speed caused fatal crashes is being performed that will give more clues to demographics. The common speculation on it is that drivers took advantage of there being fewer cars on the road as well as the unfounded belief that enforcement was down. The above chart confirms that enforcement has been fairly consistent throughout the COVID period. See a typical news article at https://www.foxnews.com/us/speeding-violations-spiked-during-pandemic.

The information value in the chart above comes from comparing the degrees of violation over time. It is interesting how well correlated the lower three speed violations are, as well as their inconsistency with the GT 50 category after June. All of the violation types had some decline early in the COVID period. However, the two lower violations (1-20 and 21-35) had steep declines in the next month (April). After that, the lowest violations came back to its expected pre-COVID level for July and August (purple line). However, in July and August the 21-35 exceeded its pre-COVID rates by about 30% for July and August (red line).

The top two violations (36-50 and GT 50) were well correlated through June. After that, the highest violation (yellow) leveled out at about 30% higher than its pre-COVID rate. The 36-50 (blue) topped out at 60% higher in July before coming back to about 40% higher in August.

How does all of this map collectively into the minds of the drivers who have an inclination to speed? That is hard to say, but starting with the extreme GT50, it seems that many drivers were just going wild with their new perceived freedom, and this lasted through May. At that point perhaps the increase in the fatality rate and safety warnings got through to them and they started to back off somewhat. They were still at 25% higher than pre-COVID in June through August.

It appears that those who chose not to be so excessive continued to speed, but at the 36-50 range, which can be a major improvement when it comes to fatality reduction. Of course, they might also have decided to stay within the One to 20 range, which would be a much wiser decision. The decrease in the highest speed violation range seems to be inversely correlated with increases in the other speeding ranges. So, viewing the increase in the lower violations as resulting from a decline in the higher violations would seem to be a logical conclusion.

5.0 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 then applicable COVID time frame in 2020 (March 11-July 14, 2020 = 18 weeks) 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.

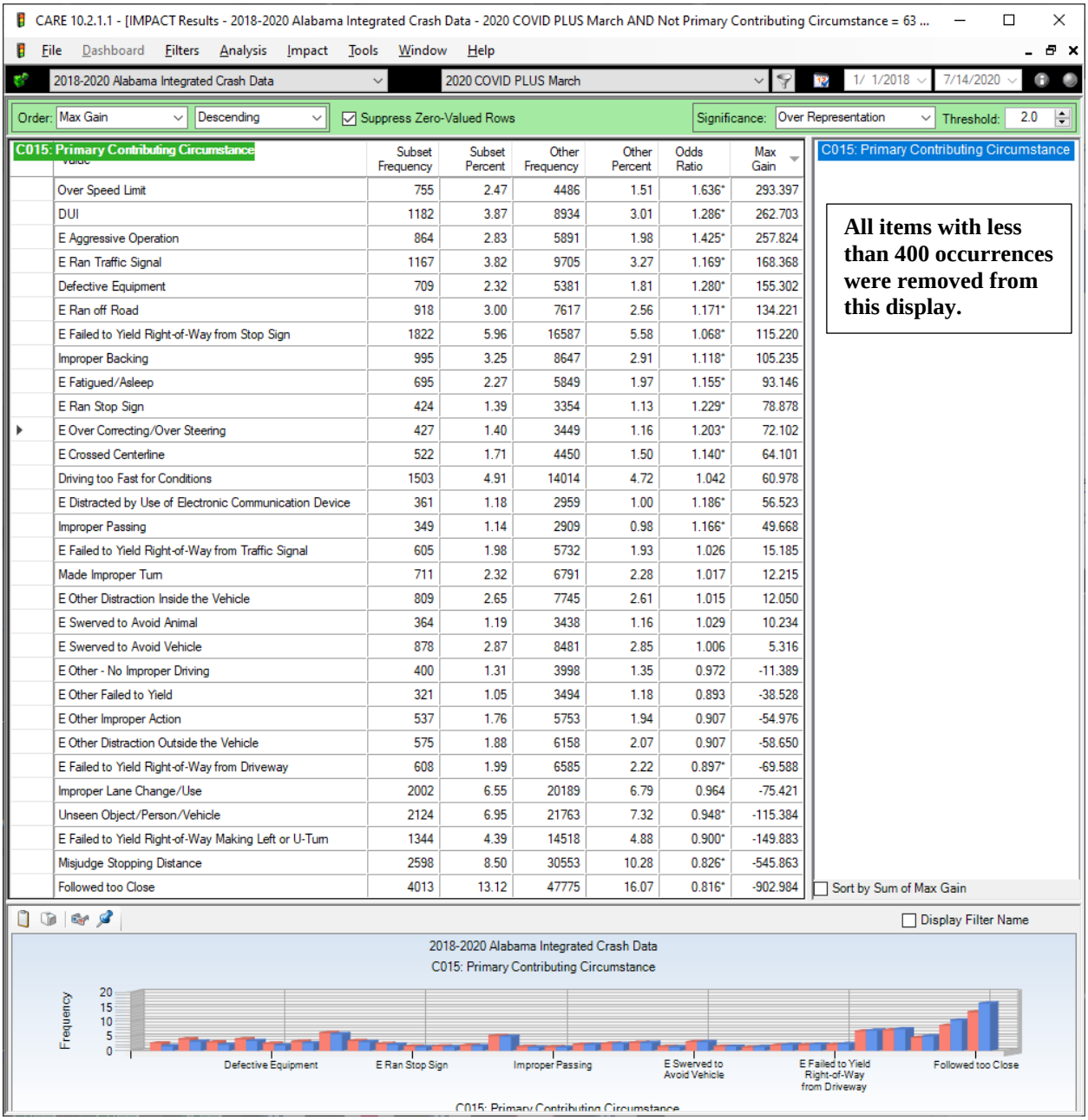
The Pre-COVID time period is also referenced as "Normal" in some of the comments below.

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

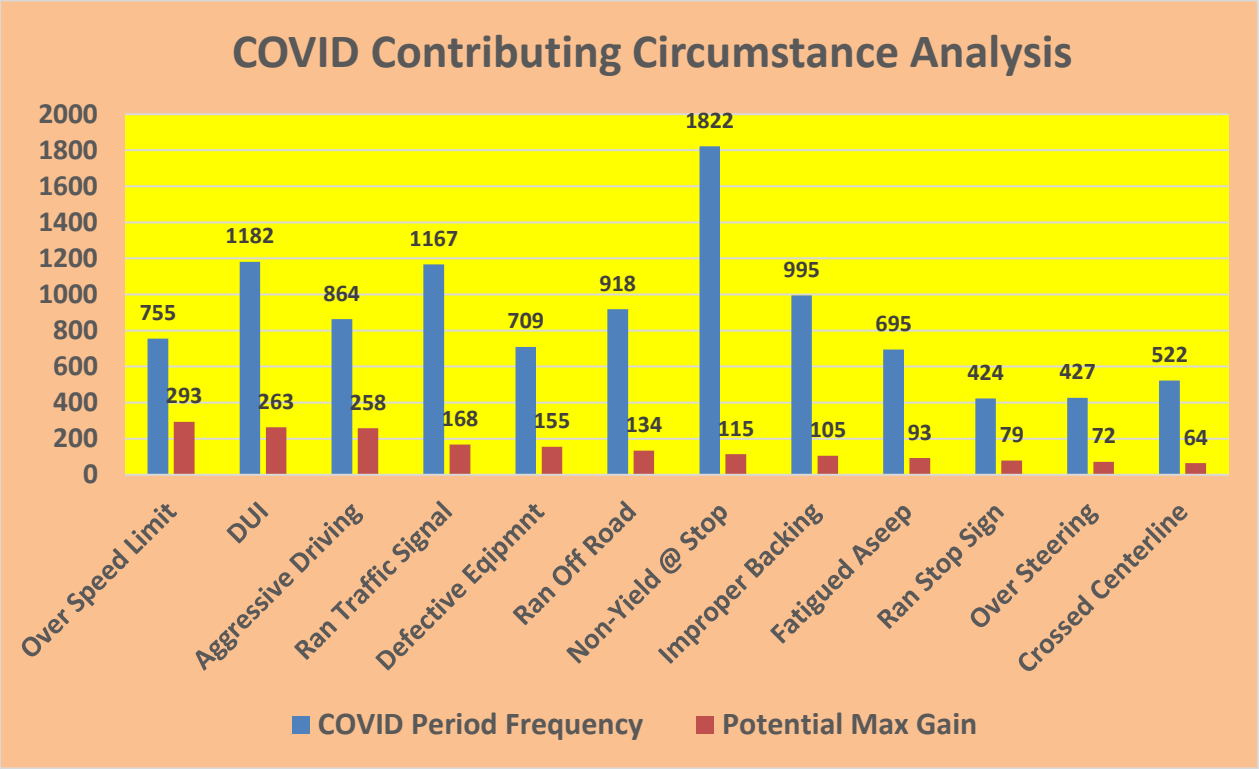
Please contact us if you have any questions or see any way we can help.

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



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.

5.2 Comparison of All Significantly Over-Represented PCCs.

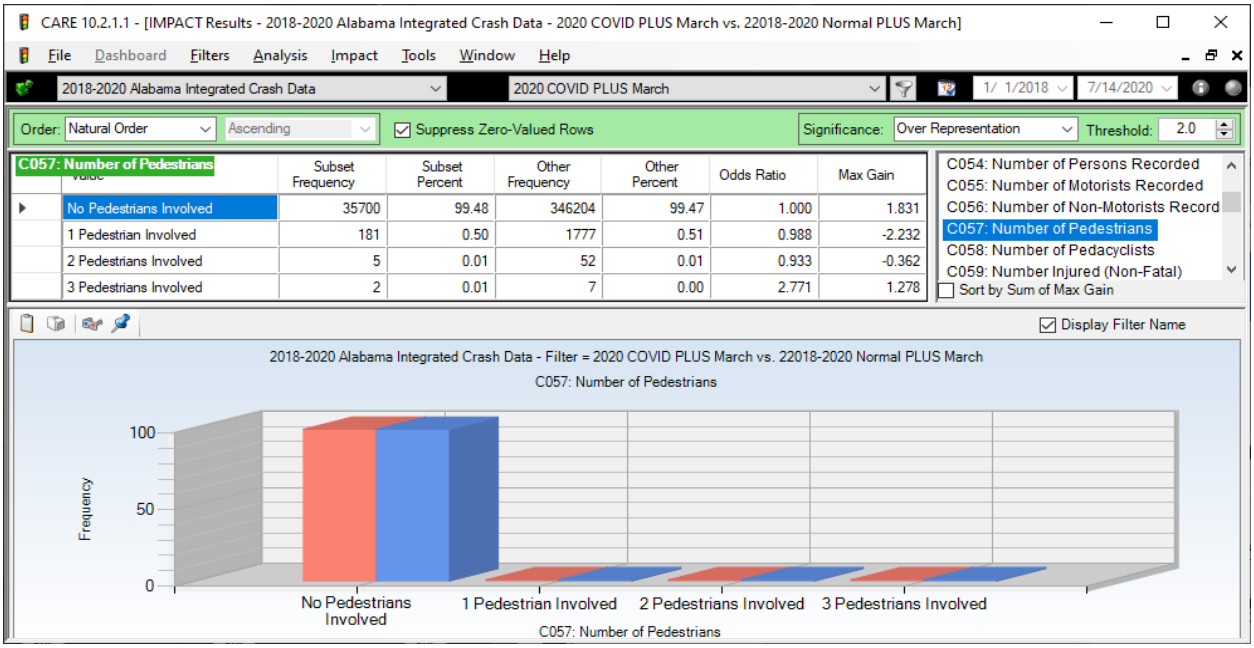


This chart has been updated with data to the middle of July, with reporting drop-off on July 12-14 due to reports not getting into the system at the time of data availability. The over-represented PCCs are ordered left to right from those that have the highest potential for crash reduction (Max Gain) 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).

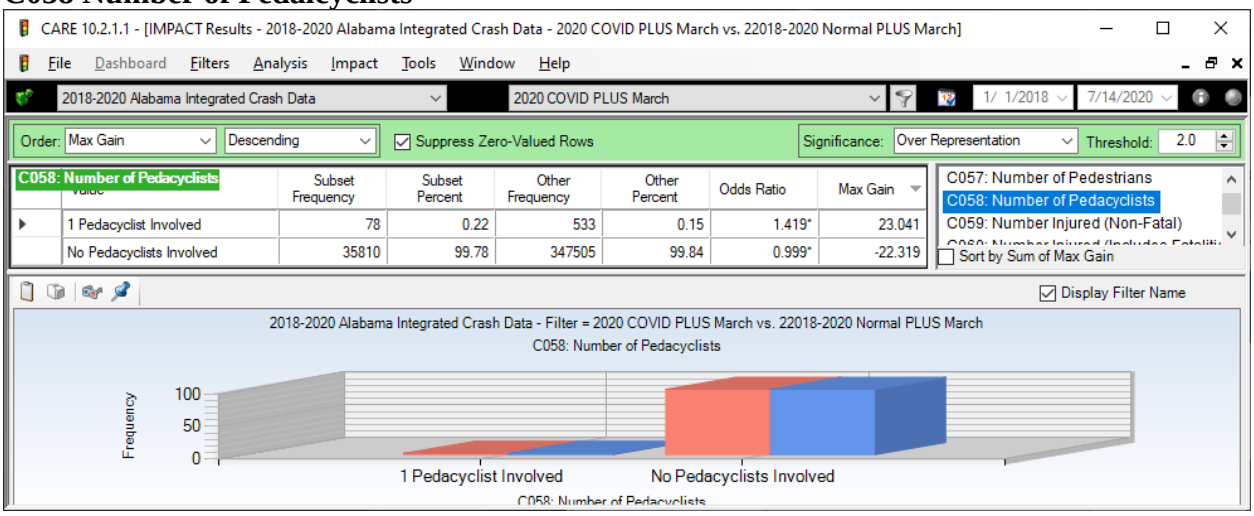
The top three (Over Speed Limit, DUI and Aggressive Operation) have well over 200 potential crash reductions each, and they largely account for the reason that fatalities have not gone down as much as overall crashes have. The next tier of three (Ran Traffic Signal, Defective Equipment, and Ran off Road) 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.

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

C057 Number of Pedestrians

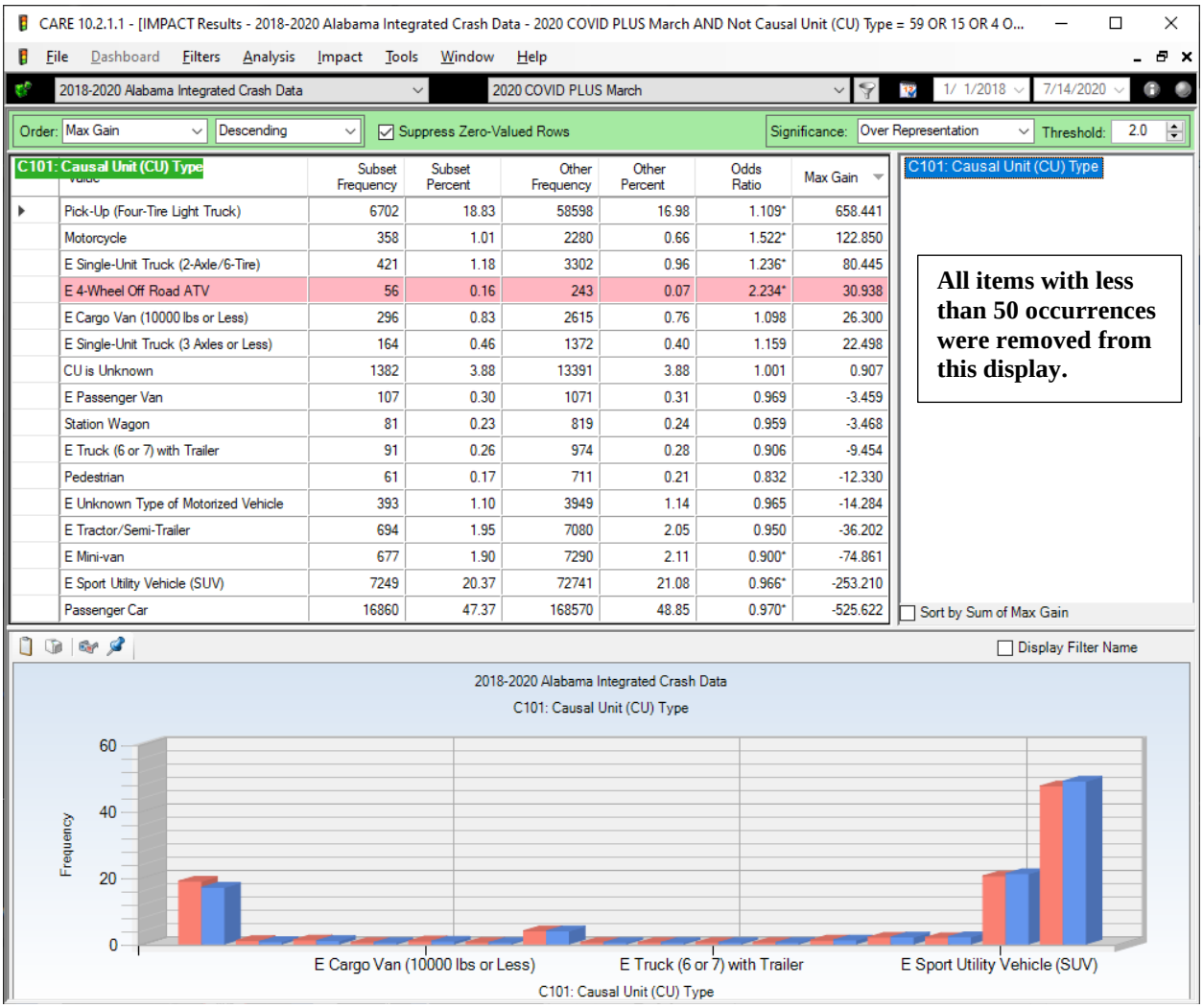


C058 Number of Pedalcyclists



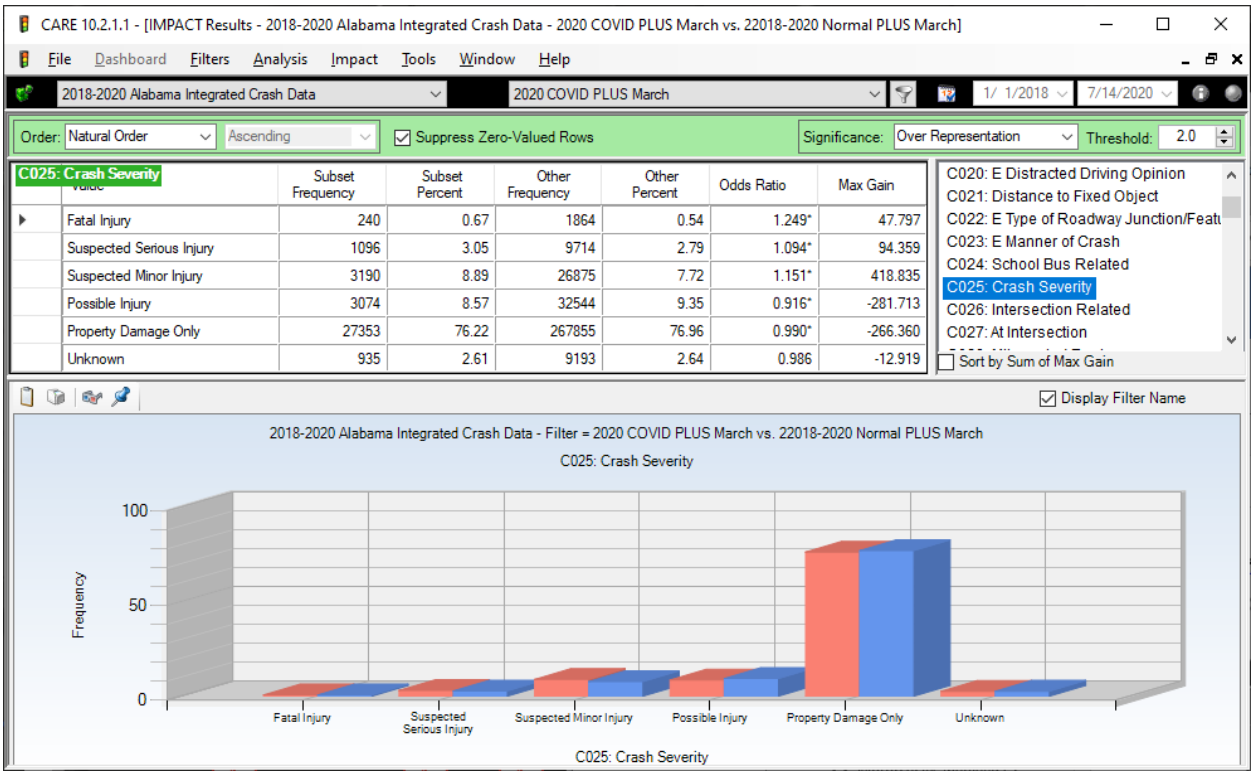
Bicycles had a much greater proportionate increase than did pedestrians as was shown in Section 3.2. Pedestrian count changes were not above what could be expected from random variation. On the other hand, the bicycle proportion increased by a factor that was 41.9% higher for the COVID period than for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

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



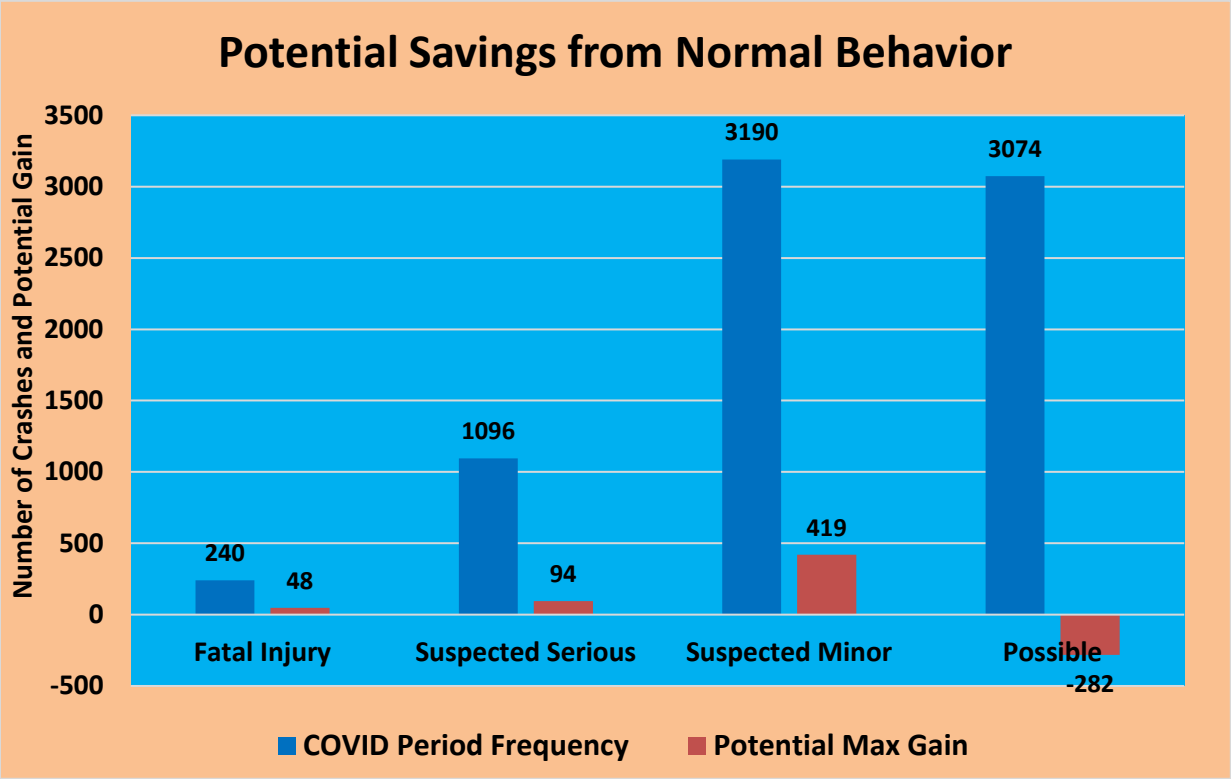
There was a significant increase in pick-ups and motorcycles; and a reduction in SUVs and passenger cars. The increase in the proportion of motorcycles was an additional 52.2% compared to the normal time period (see Section 3.3), which was over 4 times the increase seen in pick-ups. The larger trucks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

5.5 Crash Severity



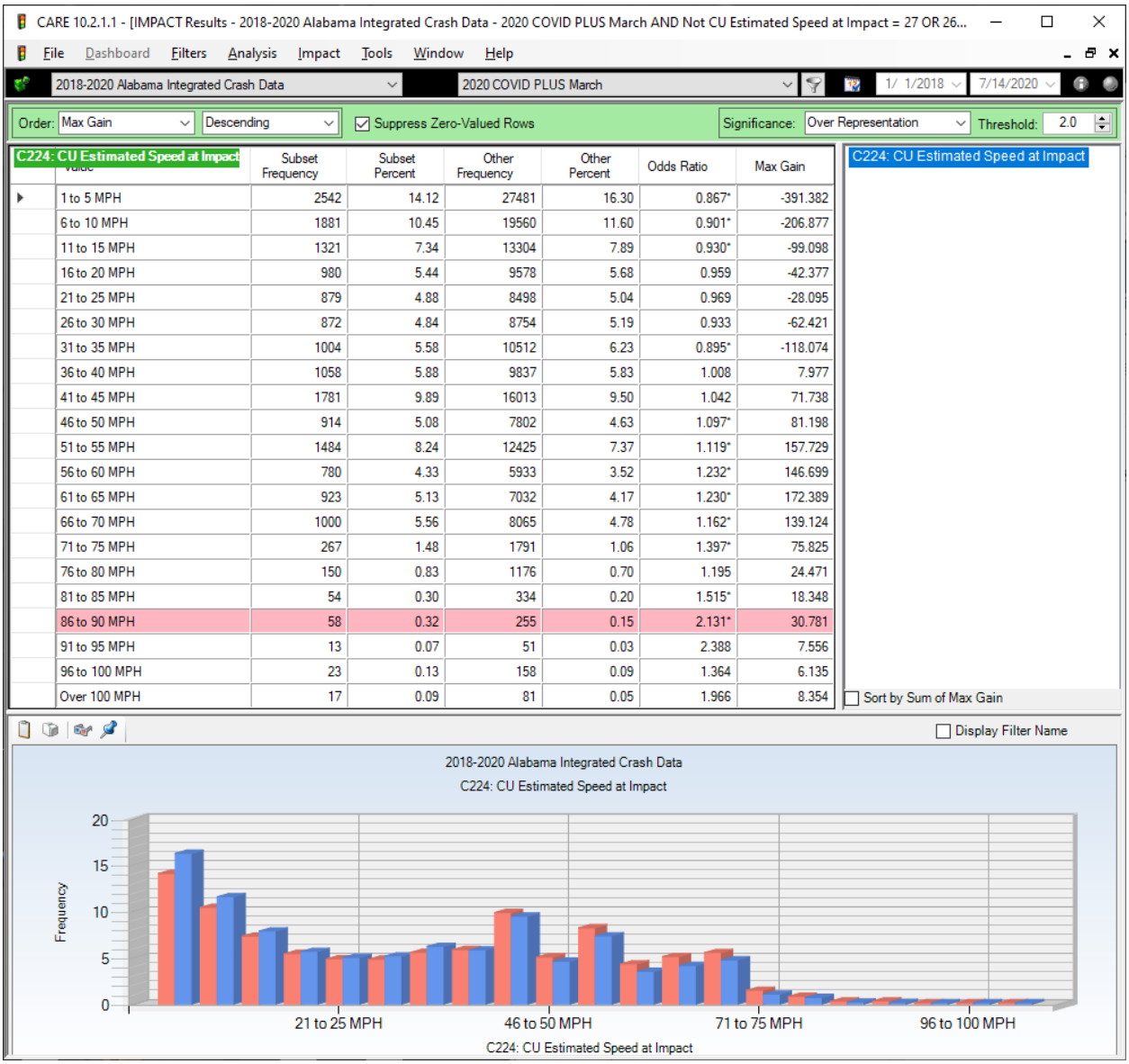
This result indicates that the proportion of fatal injury crashes for the COVID period it 1.249 times that of the Normal comparison period, which is being used for the control. Its Max Gain is 47.8, which indicates that had the same driving habits and environment been in effect in the COVID period as 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 5.1. 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.



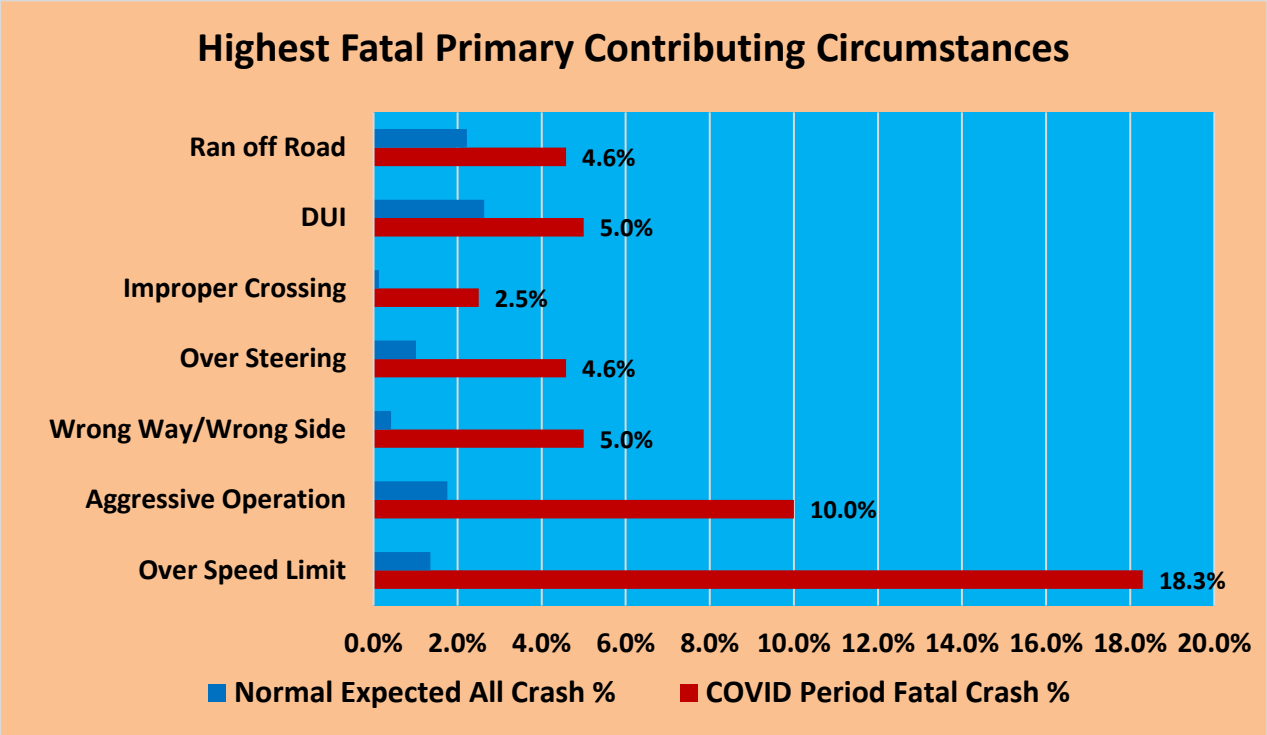
The blue bars on the chart above show the actual number of crashes in each of the severity classifications. The red bars show the effect of a resumption of behavior of drivers to before the COVID period.

5.6 Causal Unit Estimated Speed at Impact



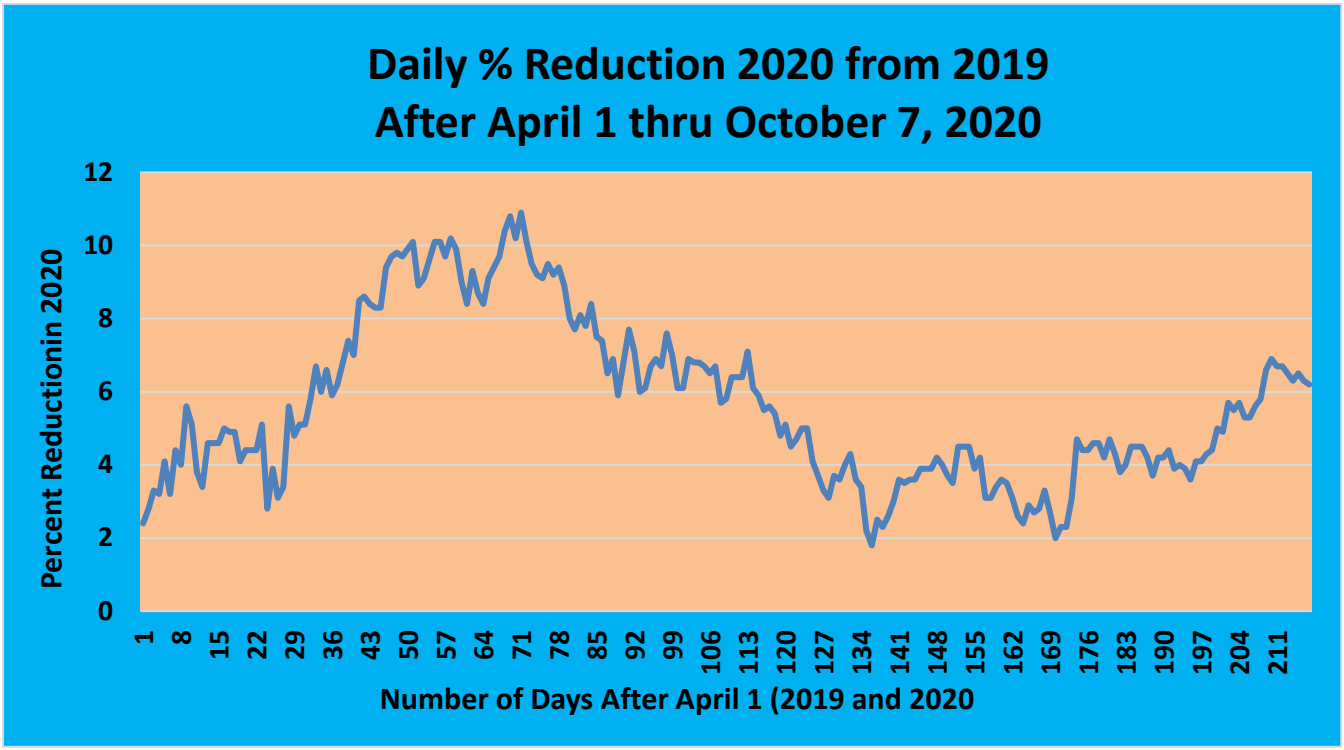
Alabama data has shown that for every ten miles per hour of impact speed over 45 MPH, the probability doubles that the crash will be fatal. There can be no doubt that impact speeds during the COVID period have been significantly higher than Normal. All of the impact speed above 46-50 (effectively 50 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.

5.7 C015 Analysis of Fatal Crashes



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.

6.0 Daily % Reductions in Crash Fatalities after April 1, 2020.



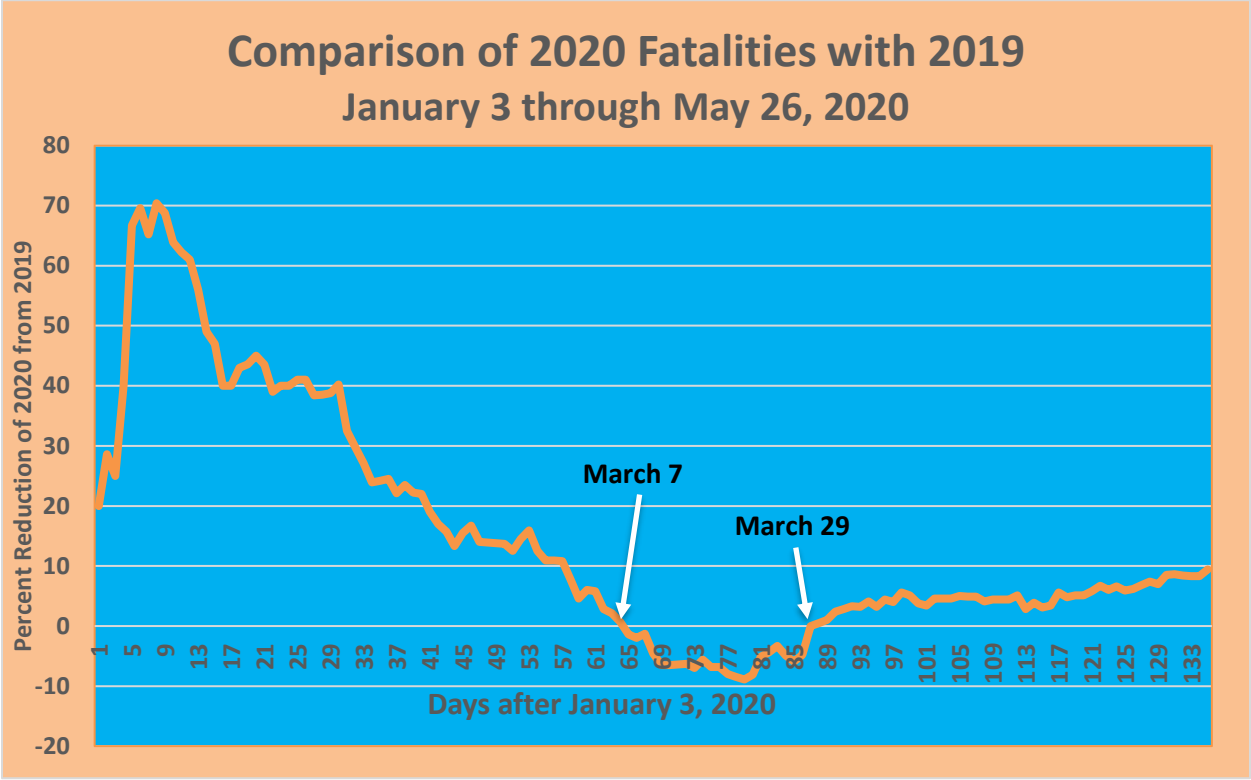
The chart above gives the percent fatality reduction for each day in 2020 compared to the identical days in 2019 from April 1 through November 3 of both years. These are *daily readings* as opposed to the charts in Section 3 that are the changes in the various types of crashes over two-week periods. 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 (like the graph in the next section), the chart above 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 November 3 are: 792 fatalities in 2019; and 743 fatalities in 2020; a reduction of 6.2% as of that date. The general trend of this metric had been down from above 10% in June 7-11, 2020, the high on the chart (Days 69-71). This down-trend seems to have been reversed on about September 20th, and since then there have been a number of reductions in the 6-7% range. We hope that this upward reduction trend continues for the rest of the year.

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), but this 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, after which the fatalities in 2020 increased considerably.

7.0 Percent Reduction in 2020 Traffic Fatalities vs. 2019.

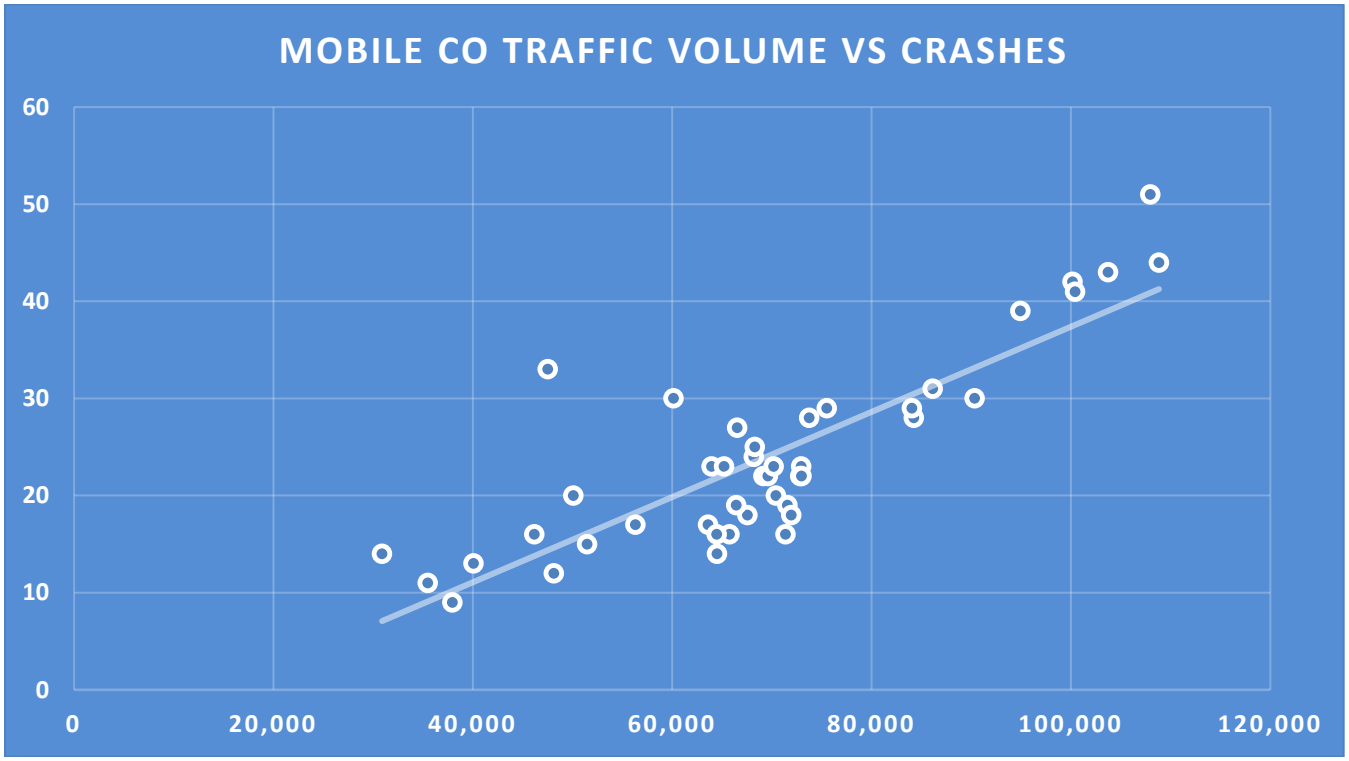
The following is for the first four months of the two years.



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 like the one in Section 6 is.

8.0 Correlation Analysis: Relationship between ADT and Crash Frequency



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.