COVID Follow-up: 2021 to 2019 Crash Comparisons
A Study of the Long-term Effects of the COVID Quarantine

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1.0 Introduction and Summary of Major Recent Findings

1.1 Introduction

This report presents the results of a research effort to establish the continued effects of the COVID pandemic, which had a number of significant effects on traffic safety that began approximately March 10, 2020 and lasted throughout the rest of 2020. The initial impact that the public reaction had to the pandemic in Alabama was studied in a series of reports that can be found on the following SafeHomeAlabama.gov Special Studies page:

http://www.safehomealabama.gov/caps-special-studies/

To continue to study the longer term effects out into 2021, it was determined to compare the history of each of the crash types (considered in the original 2020 study) with those of identical times in 2021. In the report prior to this one, this was for the months of January and February since complete results were not yet available for March 2021.

If the pure comparison of the first 9 weeks of 2020 and 2021 is of interest, see the report on the Special Studies page (URL given above) entitled: "COVID Follow-up: 2021 to 2020 Crash Comparisons." This current report should be viewed as an update to that, extending the number of months being compared from 9 to to 17, and changing the control comparison to 2019 as opposed to the first few months of 2020. As a convenience and for ease of visual comparison, the 9-week charts that were in that first report have been retained below on the same pages as the corresponding to the updated 17 week changes.

Since the COVID pandemic had a considerable impact on the 2020 crash data, it was determined that little new information could be obtained by comparing 2021 weeks with the corresponding 2020 weeks after the week of March 4. It was clear that the best control time would be the 2019 calendar year, since these data would not be affected by the COVID pandemic. We are comparing this against the weeks in 2021 in order to determine if the effects of 2020 have continued, and if so, to what degree.

A possible complicating factor that should be taken into account is the change in the price of gasoline during the 2021 time frame portion of the study. According to https://ycharts.com/indicators/us_gas_price, the price of regular gas bottomed out in the middle of November 2020 at $2.022 per gallon. By the end of February (March 1, 2021), the price had risen to $2.796, and this price rise has continued into 2021 to the end of the 17 weeks under consideration. Such a rise can have a major effect on those with limited incomes, e.g., younger drivers and those with fixed incomes near the poverty level.

1.2 Findings from the 2019 to 2021 Comparisons

Considerable information can be obtained just by comparing the total number of crashes in each of the crash categories over the entire 17 weeks of 2019 and 2021. These results are given in Table 1 below. The conclusions that were drawn from these totals will be discussed as part of the itemized conclusions given below for each crash category.

Table 1. Totals for Each Crash Type over the Entre 17 Weeks

CrashType	2019	2021	2021 Increase	Percent	Significant Increase	Significant Decrease
All Crashes	51954	45389	-6565	-12.6%		***
Fatal Crashes	245	259	14	5.7%	***	
Speeding Involved Crashes	2851	3027	176	6.2%	***	
DUI/ID Alcohol or Drugs	1854	1892	38	2.0%		
Pedestrian Crashes	269	216	-53	-19.7%		***
Bicycle Crashes	57	56	-1	-1.8%		
Motorcycle Crashes	425	372	-53	-12.5%		***
Large Truck Caused Crash	1201	970	-231	-19.2%		***
Aggressive Driving Crashes	938	916	-22	-2.3%		
Interstate Crashes	5619	5096	-523	-9.3%		***
Misjudged Stopping Dx	4893	3737	-1156	-23.6%		***
Youth Caused Crashes	7406	6462	-944	-12.7%		***
Rural Crashes	11390	11527	137	1.2%		
Urban Crashes	39614	33355	-6259	-15.8%		***

Unless otherwise stated, the comparisons discussed below will be for the particular crash type in the first 17 weeks (generally January through April) of 2019 compared with the same weeks of 2021. The following presents a summary of the crash types referenced to the sections that contain the charts for each:

- **2.1 All Crashes.** All crashes showed a reduction in 2021 of 12.6% for the 17 weeks that were compared, which would indicate that the new somewhat reduced driving habits formed after March 10, 2020 to the end of the year have continued. In addition to many people preferring to drive less, there is also currently an issue of significantly higher gas prices discussed above.
- **2.1 Fatal crashes.** As continued to be seen from the COVID period of 2020, fatal crashes did not diminish to the proportion that overall crashes did. In fact, fatal crashes were approximately the same in 2020 as in 2019, despite the obvious reduction in traffic volume. This indicates that the causes of the increase fatality rate of the COVID period

is continuing. This has been given considerable national attention, and it has basically been attributed to the increased speed that, in turn, was supposedly caused by there being fewer vehicles on the road. As the number of vehicles increases, it would be expected that the fatality *rate* would decrease. However, this has not been the observed result during 2021, and at this point, the number of fatalities in 2021 exceeds the number in 2020 by about 12%. It cannot be disputed that speed is the root cause of fatalities in that Alabama crash data has confirmed repeatedly that the probability of a crash resulting in death doubles for every 10 MPH increase in speeds at impact. Other factors that contribute to fatalities will be discussed below.

- **2.2 Speeding Crashes**. Crashes that were caused by speeding according the Primary Contributing Circumstance attribute, increased by 6.2%. This attribute measures the officer's opinion as to whether speed was involved in causing the crash. For any given crash, it is the speed at impact (and not the cause) that results in death. However, this attribute would certainly be correlated to speed at impact, and thus to fatality crashes.
- **2.3 Impaired Driving (DUI) Crashes.** The change in ID crashes was only about 2.0%, which cannot be considered as statistically significant in this subset. So we conclude that there has been very little change in DUI crashes when 2021 is compared to 2019.
- **2.4 Pedestrian Crashes.** Contrary to the reported National trend of increasing pedestrian crashes, Alabama had a reduction in the after-COVID period of close to 20% as compared with 2019. This is not to say that pedestrian crashes are not a major problem in Alabama. Increased programs for pedestrians are justified.
- **2.5 Bicycle Crashes.** Bicycle crashes were extremely high during the COVID period. It is impossible to tell anything definitively about changes in bicycle crash from the data in the first 17 weeks of 2019 and 2021 since the change was only one crash.
- **2.6 Motorcycle Involved Crashes.** Motorcycle crashes were a major problem over the pandemic, and this seems to be improving somewhat in 2021, with a reduction of 53 crashes (-12.5%) in the first 17 weeks of 2021. We mainly attributed the relative increase in motorcycle crashes to be due to new motorcycle drivers who found the lighter traffic inviting. Motorcycle crashes seem to be returning to normal along with other factors.
- **2.7 Large Truck Caused Crashes.** Large Truck caused crashes were found to be significantly fewer (-19.2%) in 2021 than in 2019. We expect this has to do with the continued reduction in heavy trucks and traffic in general on the roadway due to the economy and the overall price of fuel.
- **2.8 Aggressive Driving Crashes.** This attribute needs considerable work since it was found to have a significantly higher proportion than expected during the COVID period, and it was highly correlated with fatal crashes. This comparison shows no significant difference from 2019, with a small reduction so far in 2021 of only 2.3%. While it seems to be returning to its expected level, it still needs to be watched carefully.
- **2.9 Interstate Crashes.** Interstate Crashes are highly correlated with All Crashes, both having reductions in the 10% order of magnitude. Interstate crashes were 9.3% fewer in 2021 than in 2019. The overall reduction in traffic seems to have a greater impact on Interstate crashes, indicating a trend away from longer trips.

- **2.10 Misjudged Stopping Distance Crashes.** The large improvement of 23.6% reduction from 2019 is probably be coming from the crash reductions in the urban areas. Generally Misjudging Stopping Distance (MSD) is more of a problem with younger drivers than with those who are more experienced, and the correlation here is obvious.
- **2.11 Young (16-20) Driver Caused Crashes.** Reductions in misjudged stopping distance and Young Driver Caused crashes remain highly correlated with the All-crashes reduction. However, the 12.7% reduction in this attribute is only about half that of misjudged stopping distance, so we can conclude that a significant MSD reduction is coming from older drivers as well.
- **2.12 Rural Crashes.** There was a 1.2% increase in the 2021 time period over 2019. Generally, rural travelers do not have as much latitude in their mileage as do the urban dwellers. Since the change here is quite small (1.2%), we conclude that rural travel in 2021 has returned to about what it was in 2019. This is not true of urban crashes.
- **2.13 Urban Crashes.** The comparison of urban and rural shows the urban crashes are about three times those of rural, and thus they explain a major part of the changes in crashes in general. This explains the reason that the Urban chart is almost a mirror image of that given for the total of all crashes, which reduced 12.6%. Since rural crashes increased, this decrease has to be reflected in the urban crashes, which were down 15.5%.

As for the lasting effects of habits acquired over the 2020 COVID pandemic period, the most troubling of these seems to be in the persistence in speed-caused crashes and the resulting increase in impact speeds even when speed is not the primary cause. This has resulted in a continuing increase in fatality crashes, which has shown no sign of abating. On the positive side, there appears to be significant reductions continuing in crashes in general, pedestrian, motorcycle, large truck caused, Interstate, misjudged stopping distance, and youth caused crashes.

2.0 Crash Temporal Displays for the First 17 Weeks of 2021

Some will want to compare this 17-week comparison against the previous 9-week comparison. To facilitate this, we have put the two charts over and under. However, please recognize that there is a disparity that prevents them from being a perfect comparison. The 9-week comparison matched the first 9 weeks of 2020 (pre-COVID) with the first 9 weeks of 2021. This was a valid comparison because the 9 weeks of 2020 were purely normal weeks prior to and effects of the COVID pandemic. This could not be said for the first 9 weeks of 2021, since the COVID had already had its effects, and in fact, that is what we were looking for: any residual effects of the pandemic.

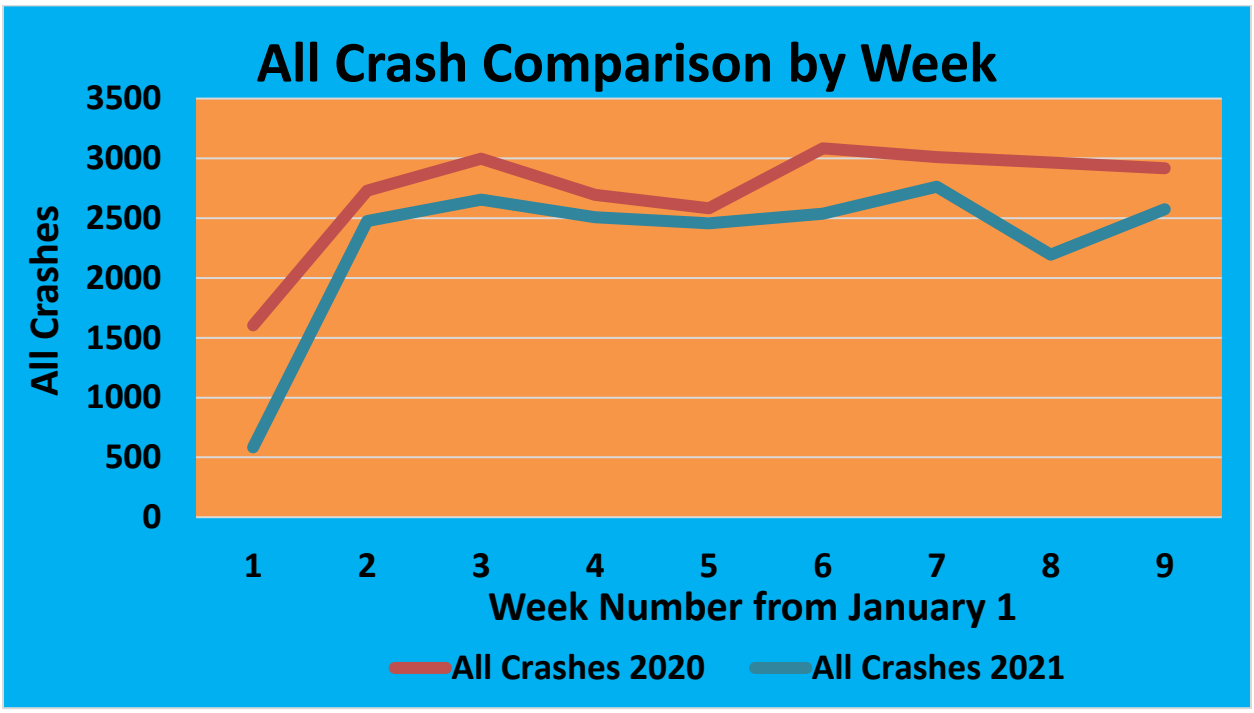
This 17-week comparison is also to determine if there have been lasting effects of the pandemic, and if to, what is their magnitude on the various crash types that we studied during the pandemic. Obviously, it would not satisfy our goal if we used 2020 data after March 10, 2020, since those data would be corrupted by the pandemic itself. (Anyone interested in those data should view any of the comparative reports that were generated in 2020, which are available on the Special Studies page of SafeHomeAlabama.gov – see below.) We felt that the best control year to provide a good comparison and flush out the lingering effects of the pandemic was 2019. Thus, the 17-week comparison is one of comparing the same weeks in 2021 against 2019. Again, note the difference between this and the 9-week comparison – while not that much different, it is still worth noting.

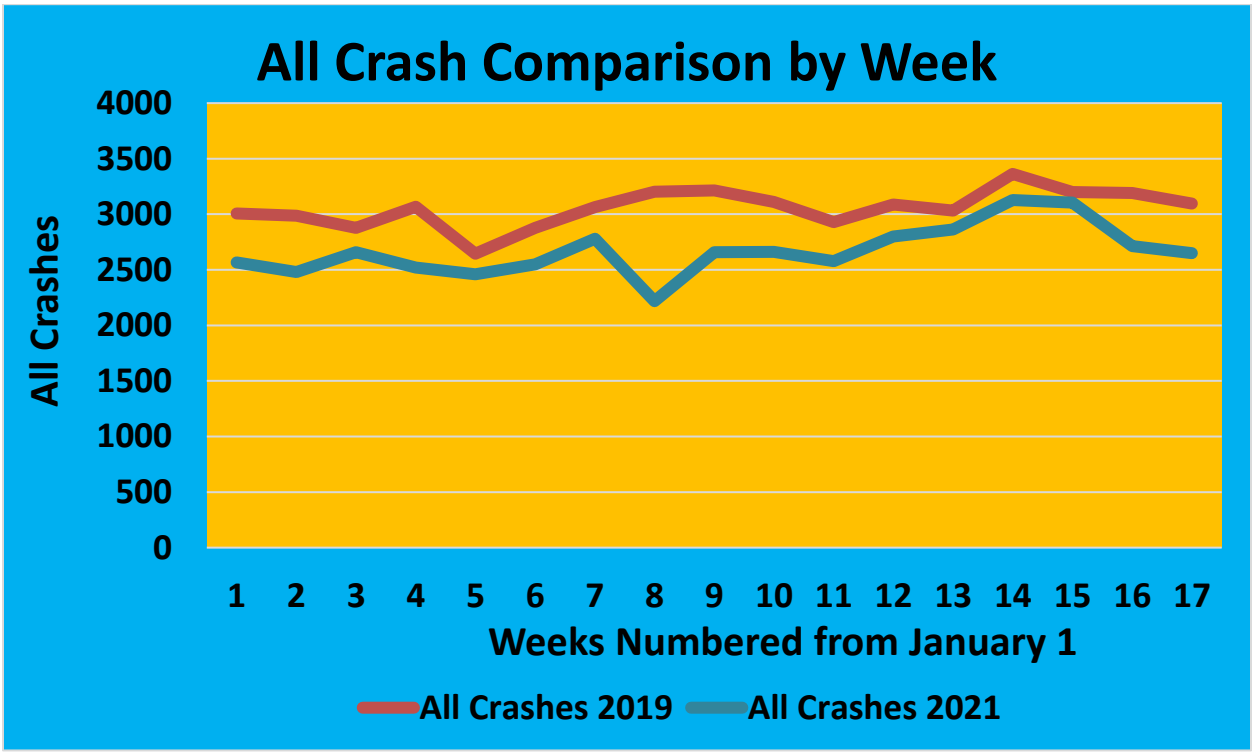
If it is of interest to compare the crash types that increased and decreased in a relative way over the 2020 43-week pandemic period, we recommend you review the entire report, it is here:

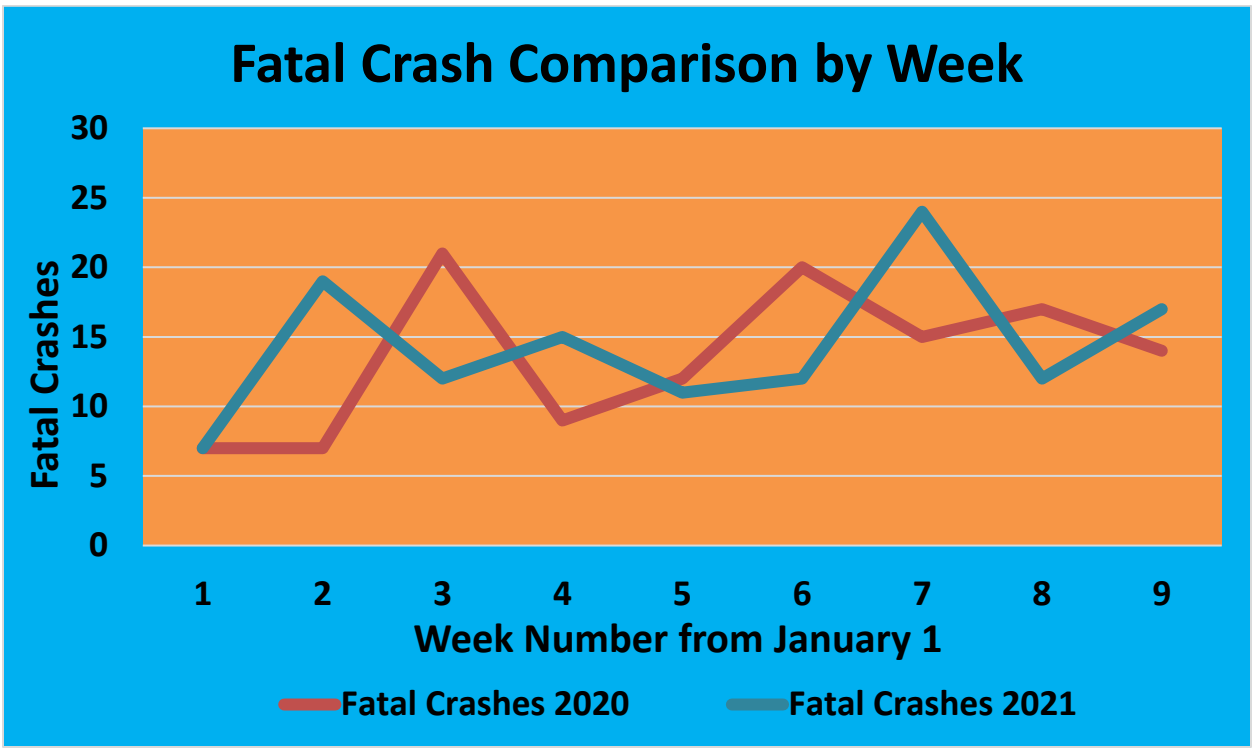
http://www.safehomealabama.gov/wp-content/uploads/2021/01/CovidUpdateWK43.pdf

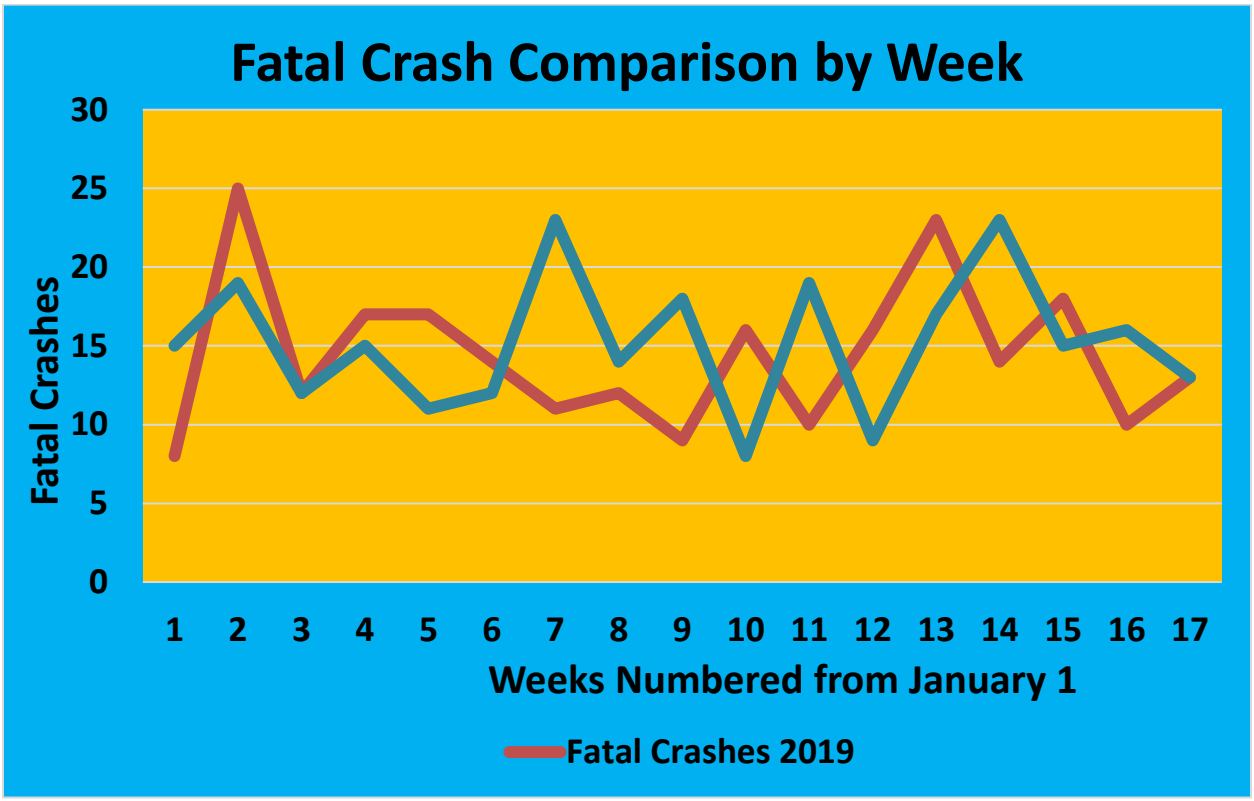
The major objective of the current study was to determine to what extent the reduction experienced in 2020 has continued into 2021. It is also to see in what crash types these increases or decreases may be continuing. We expected that some of the effects of the pandemic in 2020 would carry over into 2021. These difference by week are illustrated in the charts below.

2.1 Fatal and All Crashes Comparisons First 9 and 17 Weeks of 2019 and 2021






Fatal Crash Comparison by Week
Fatal Crashes
30
25
20
15
10
5
0
1
2
3
4
5
6
7
8
9
Week Number from January 1
Fatal Crashes 2020
Fatal Crashes 2021


Fatal Crash Comparison by Week
Fatal Crashes
30
25
20
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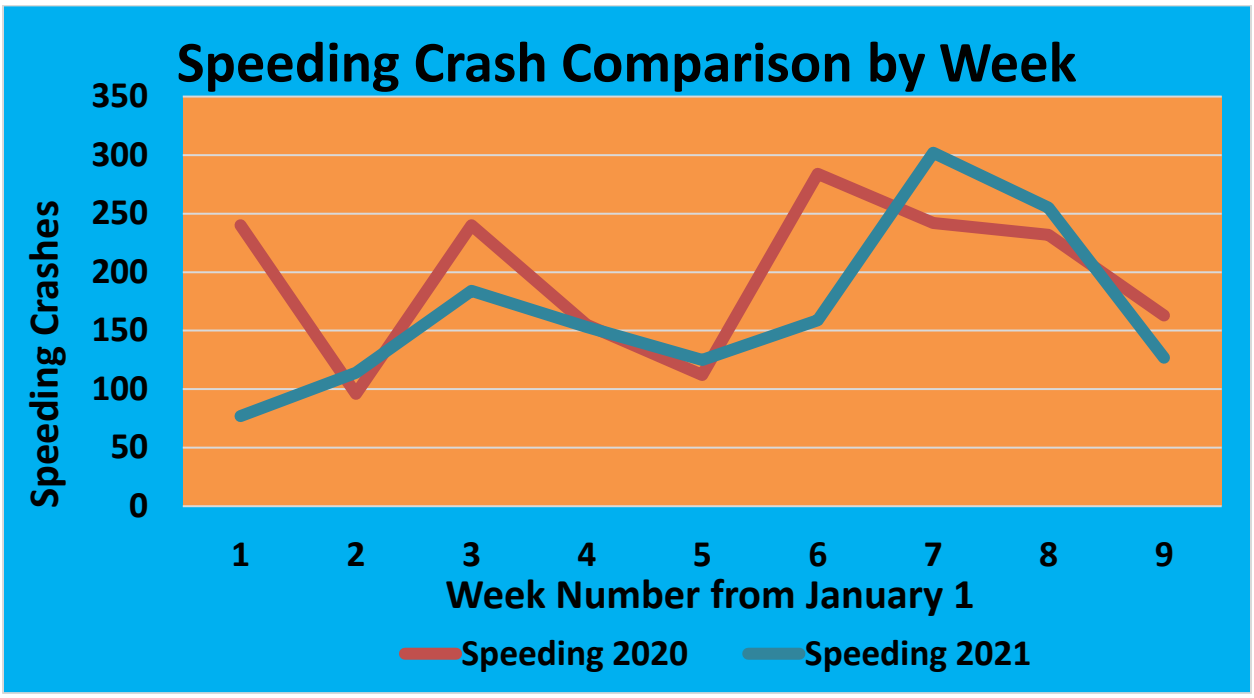
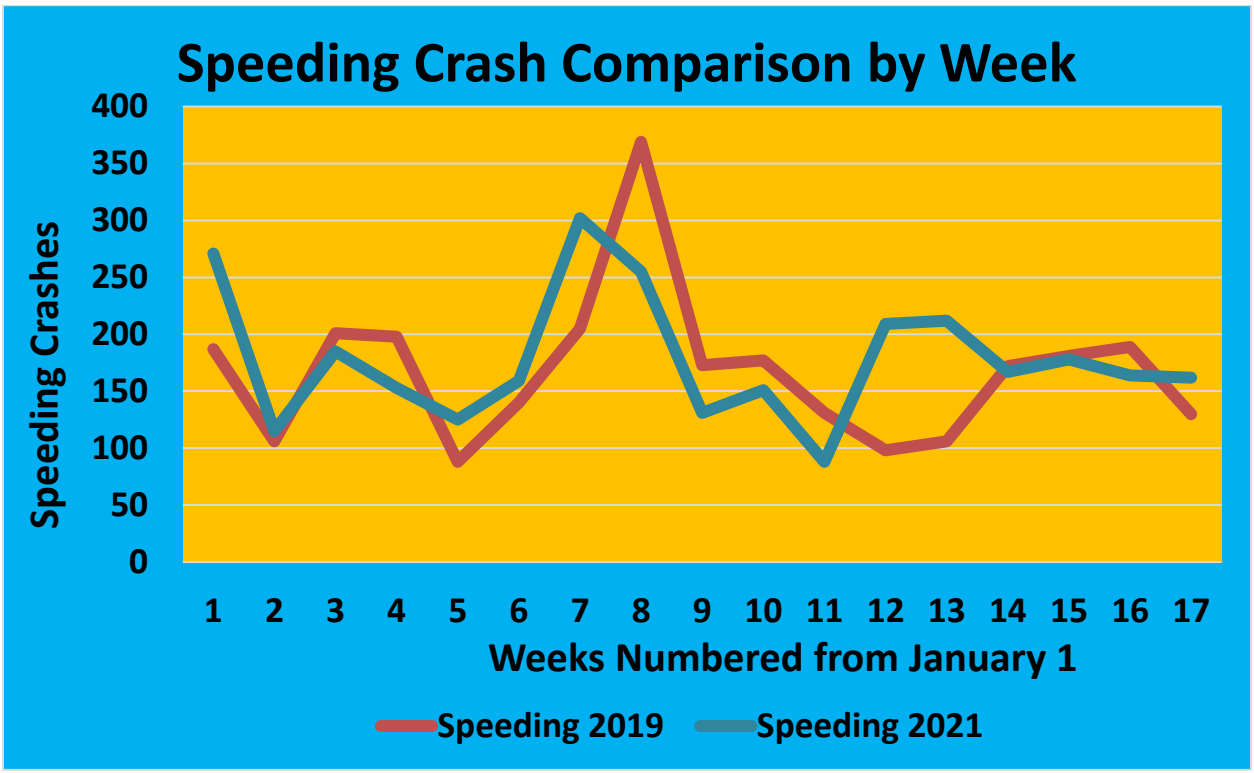
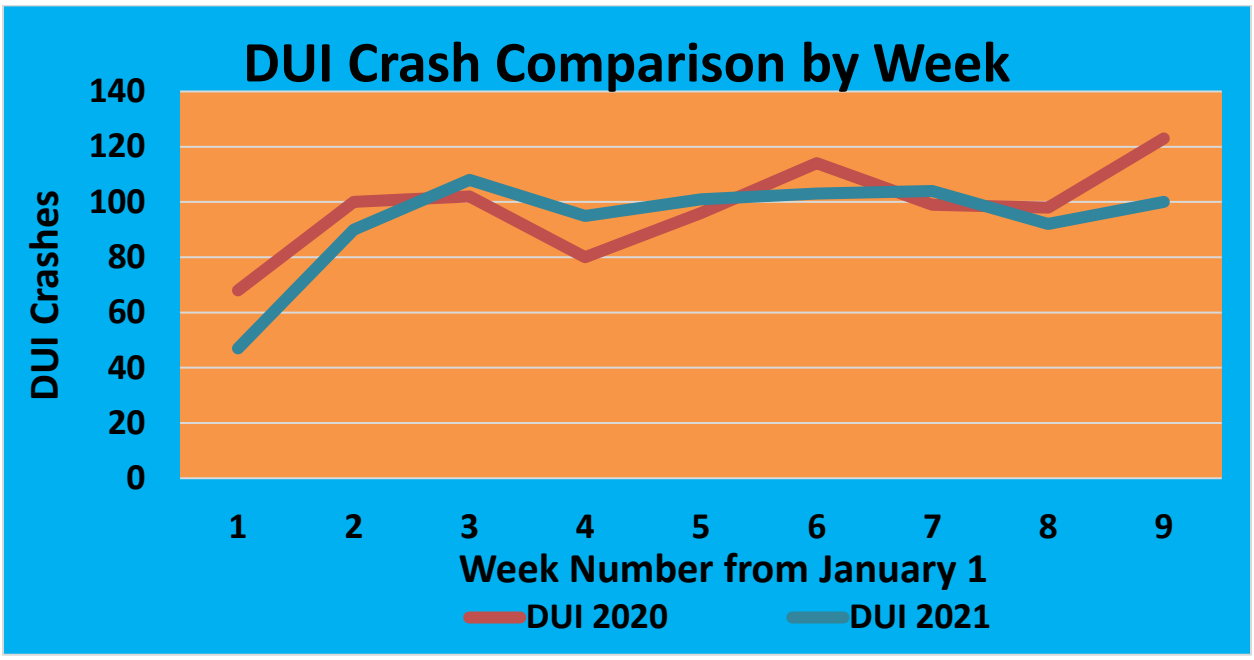
17
Weeks Numbered from January 1
Fatal Crashes 2019

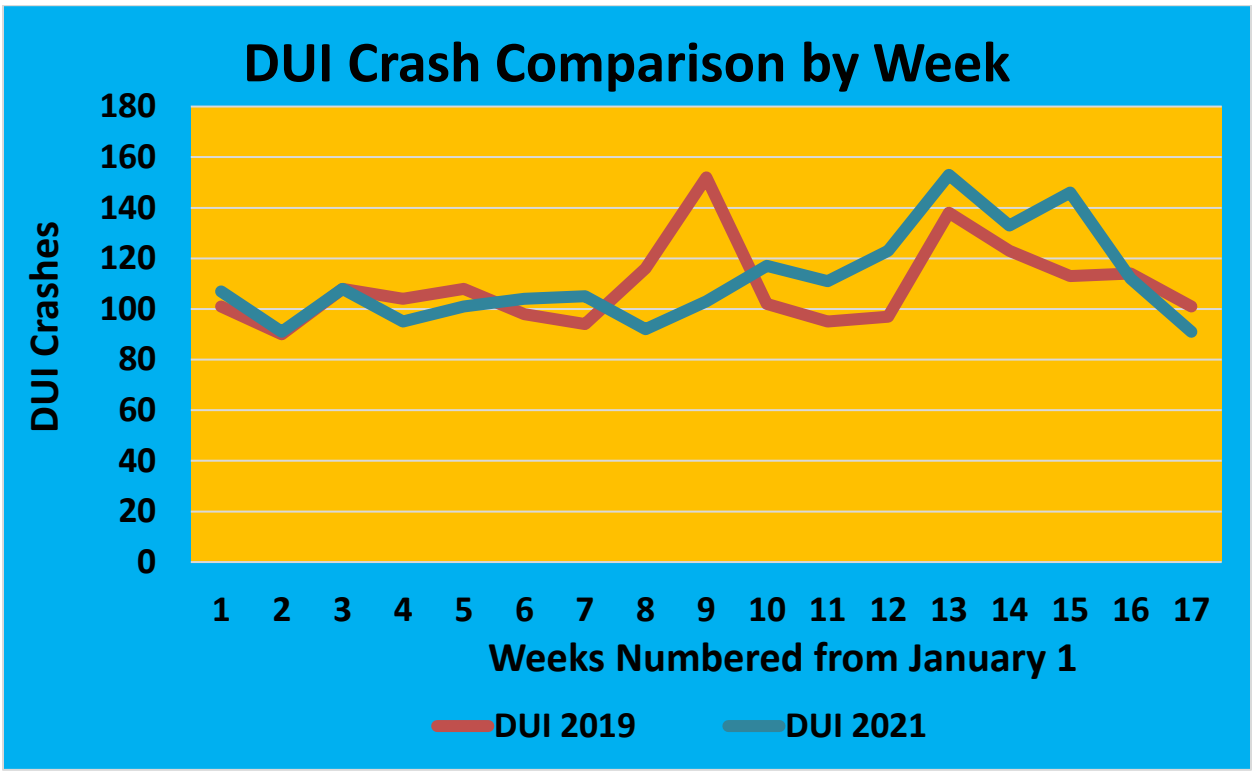
2.2 Speeding Crashes Compared First 9 and 17 Weeks 2019 and 2021



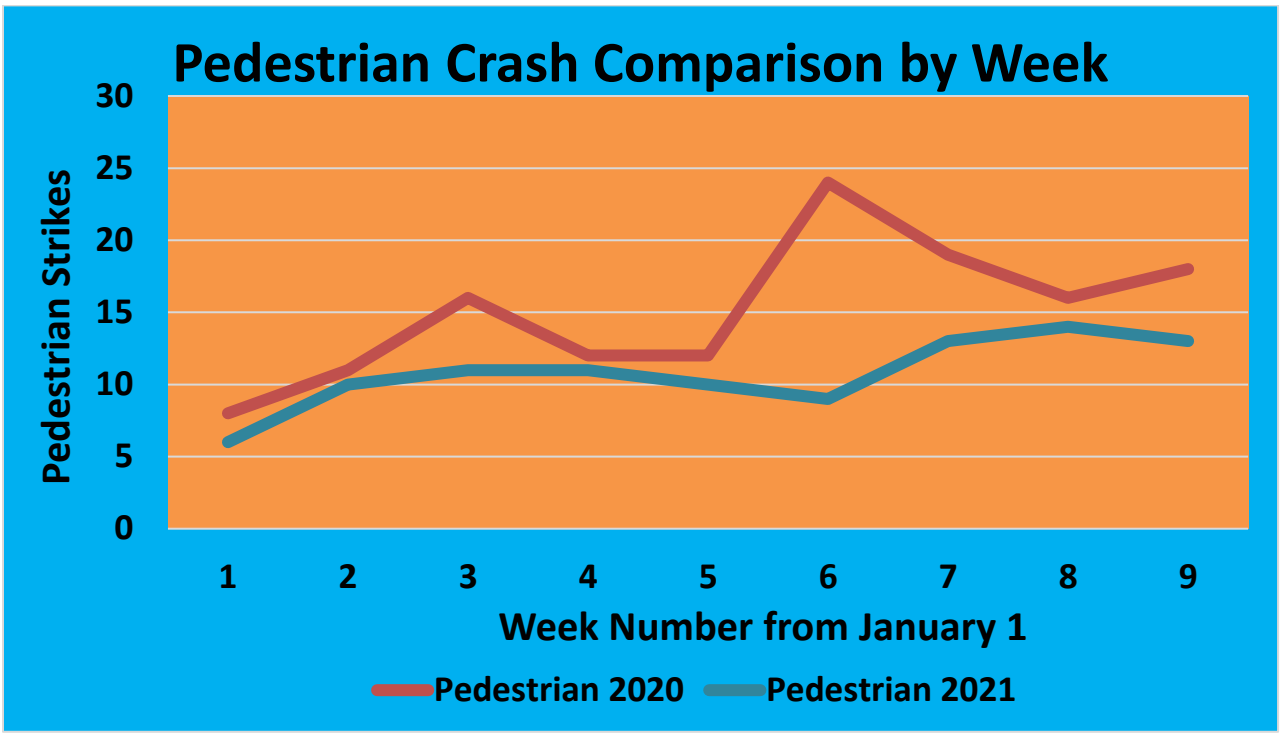


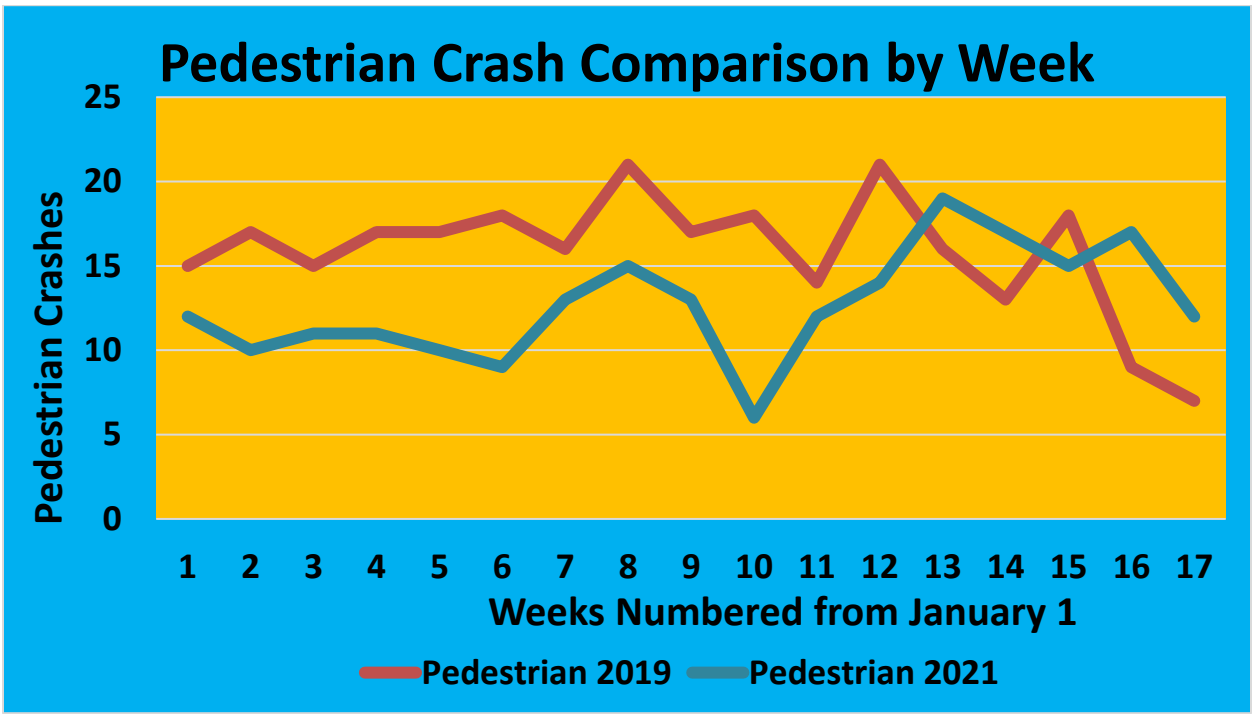
2.3 Impaired Driving (DUI) Crash Comparisons



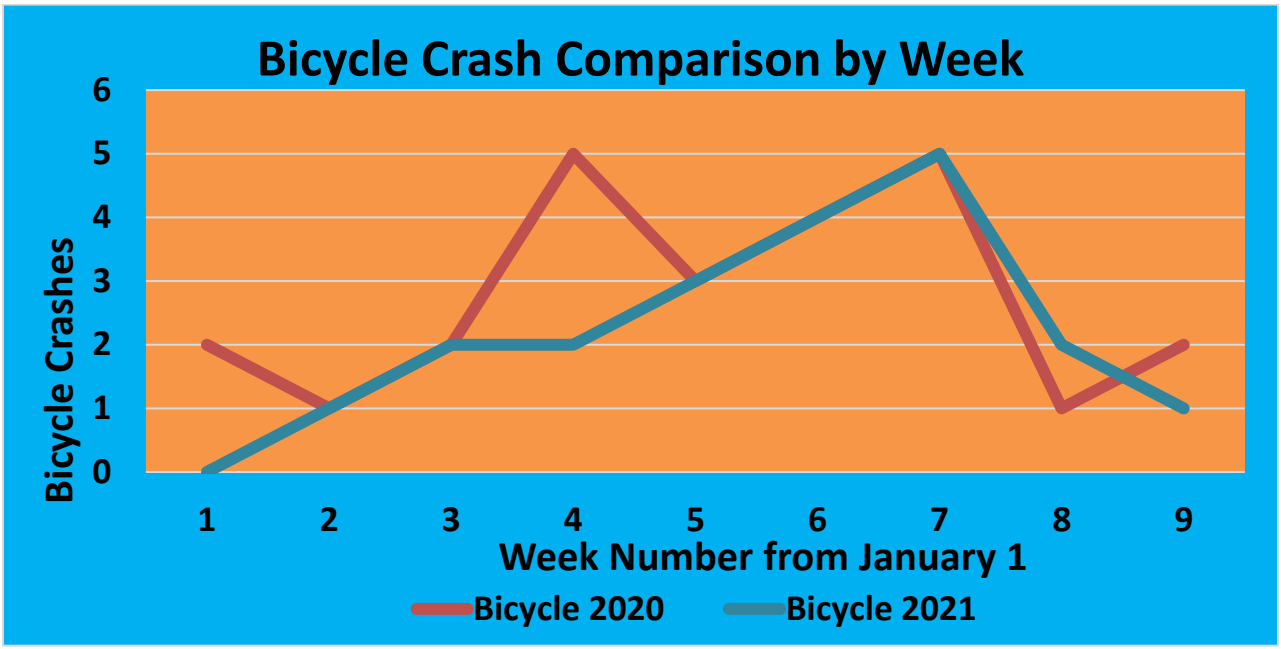


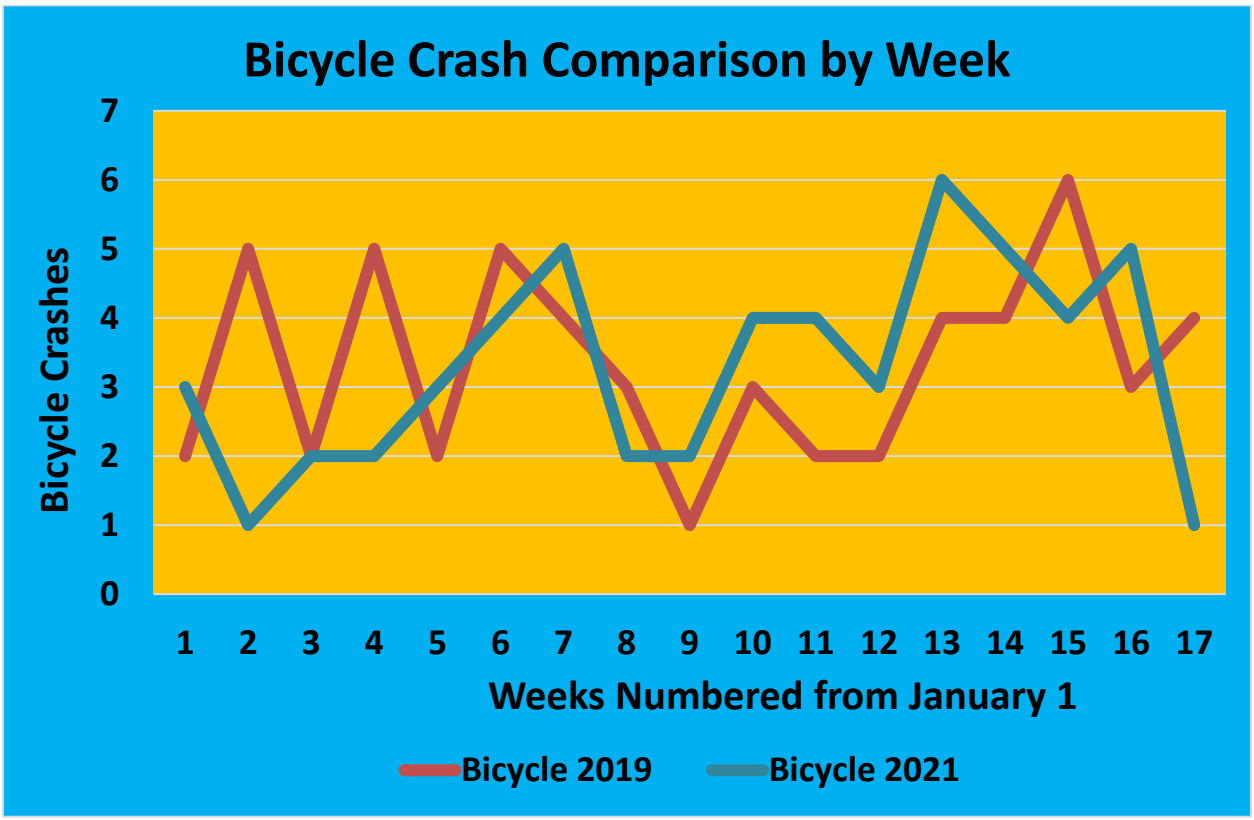
2.4 Pedestrian Strikes Comparisons





2.5 Bicycle Crash Comparisons





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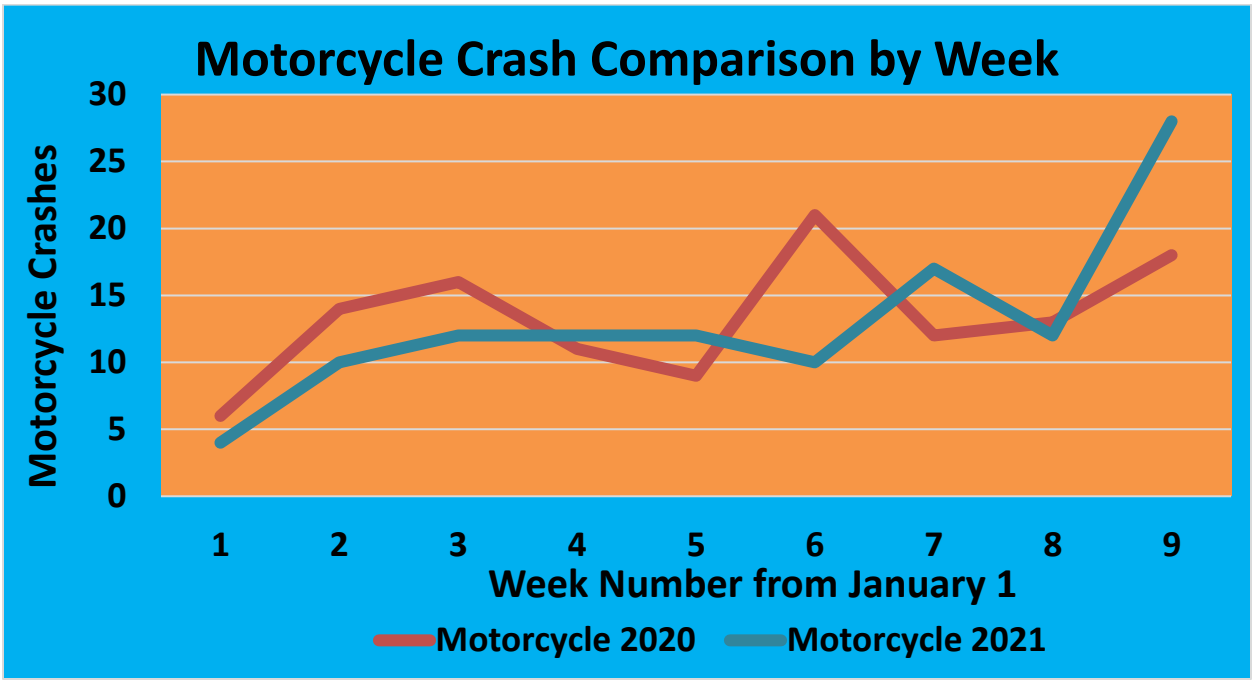
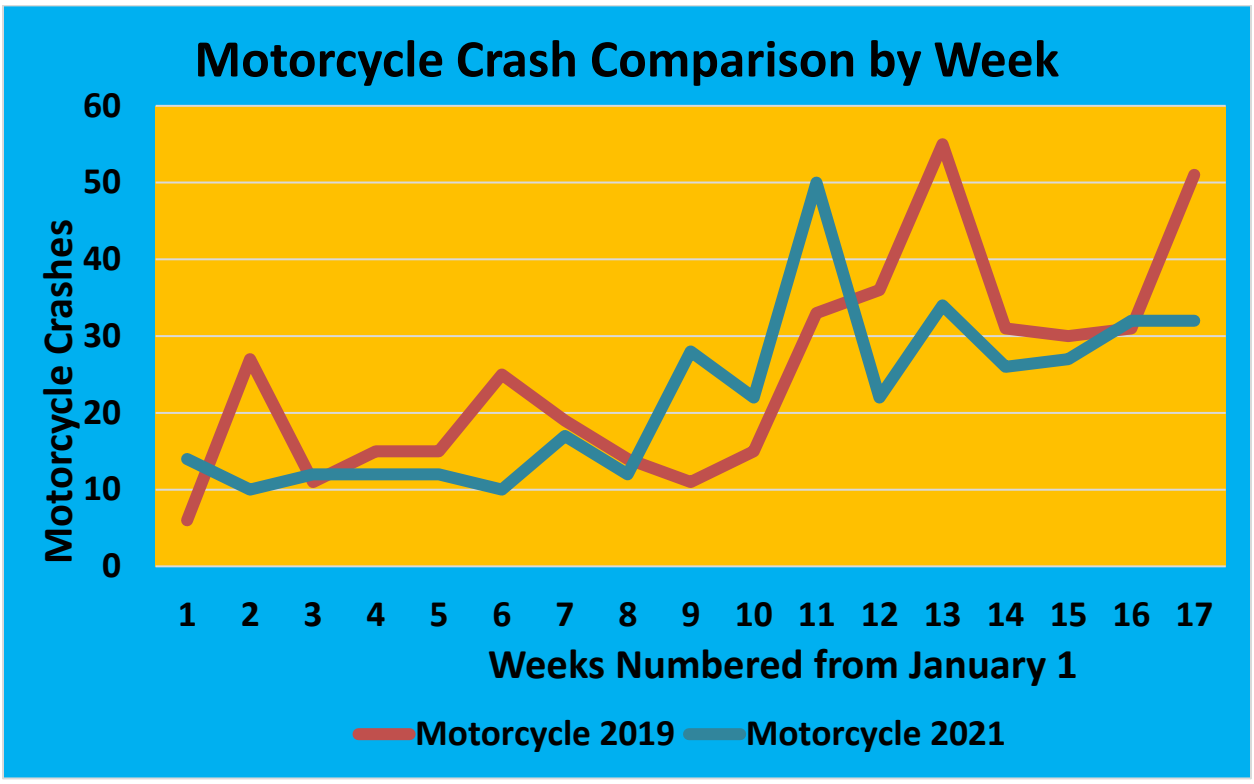
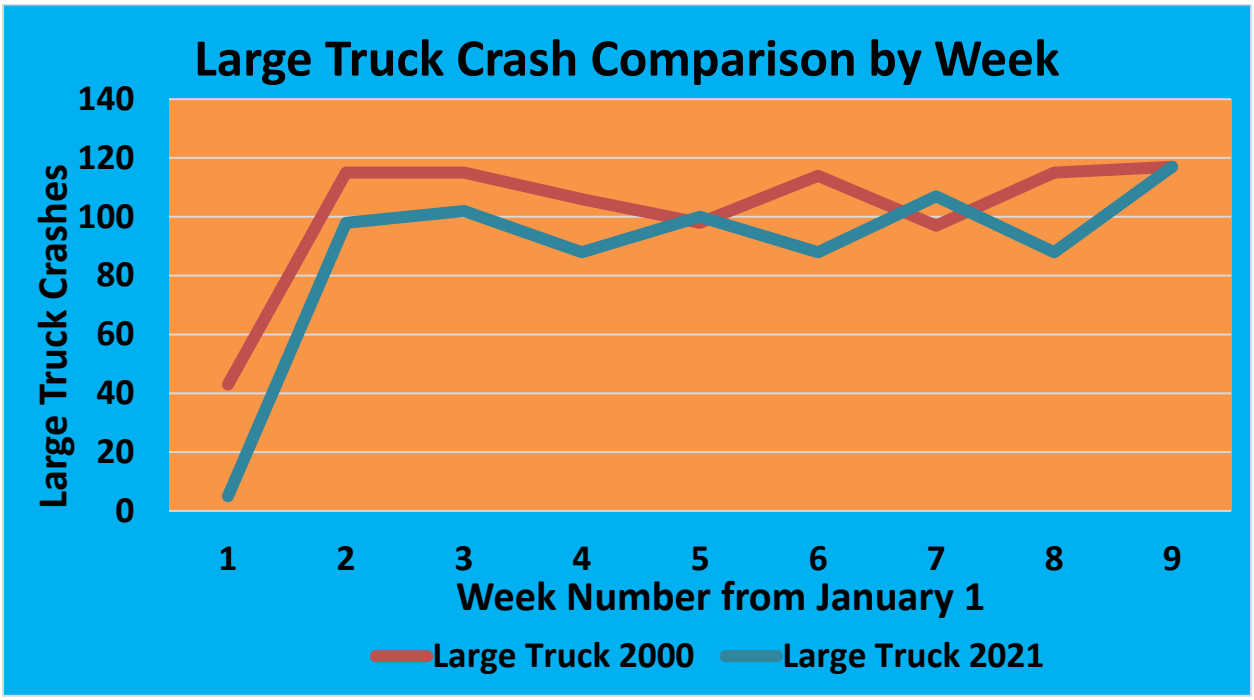
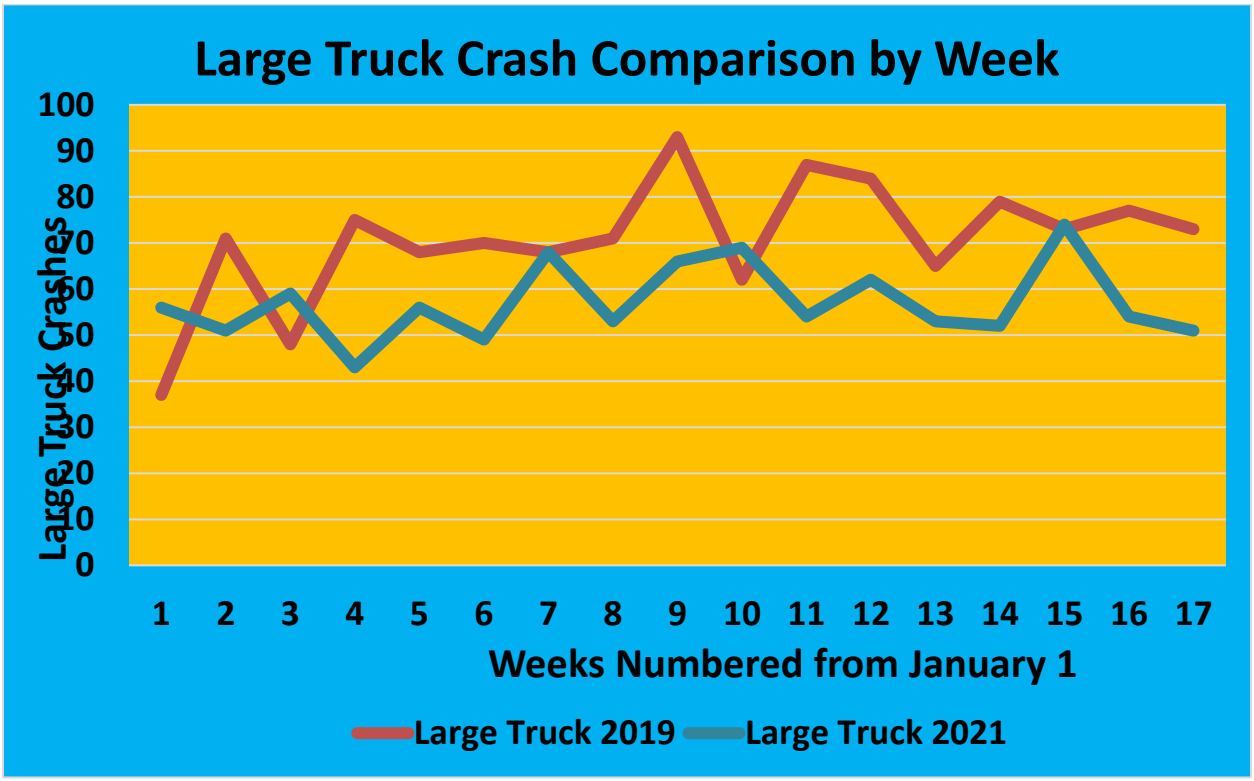


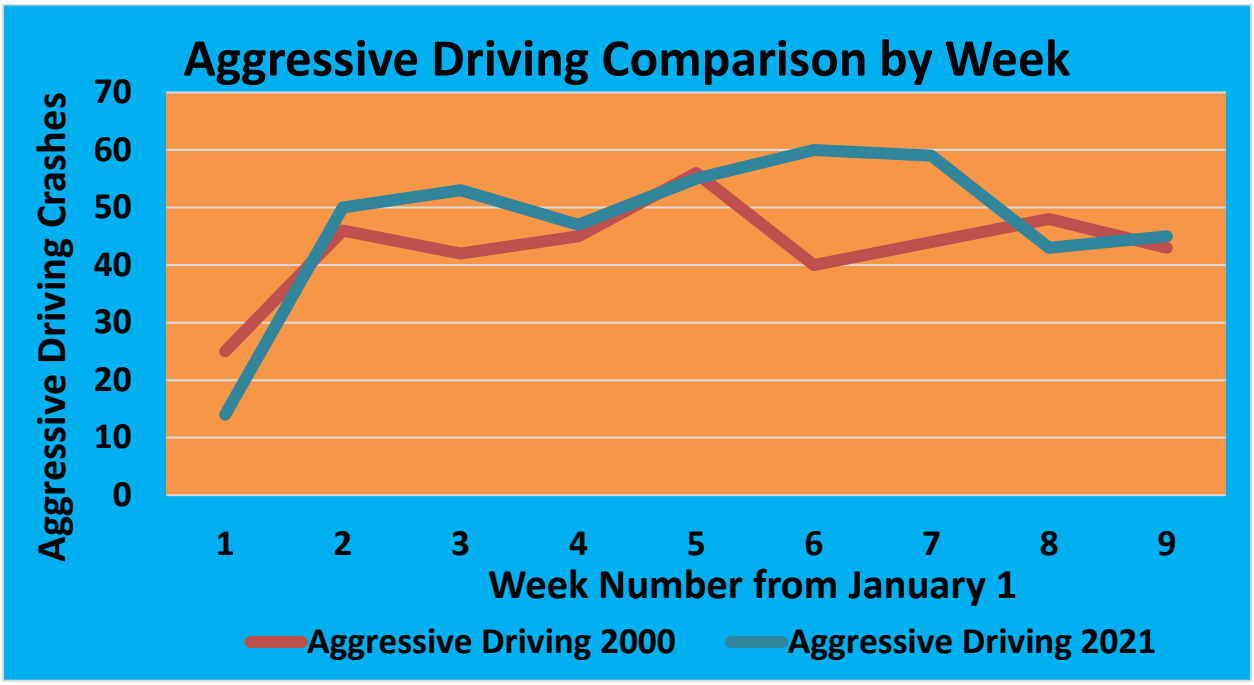


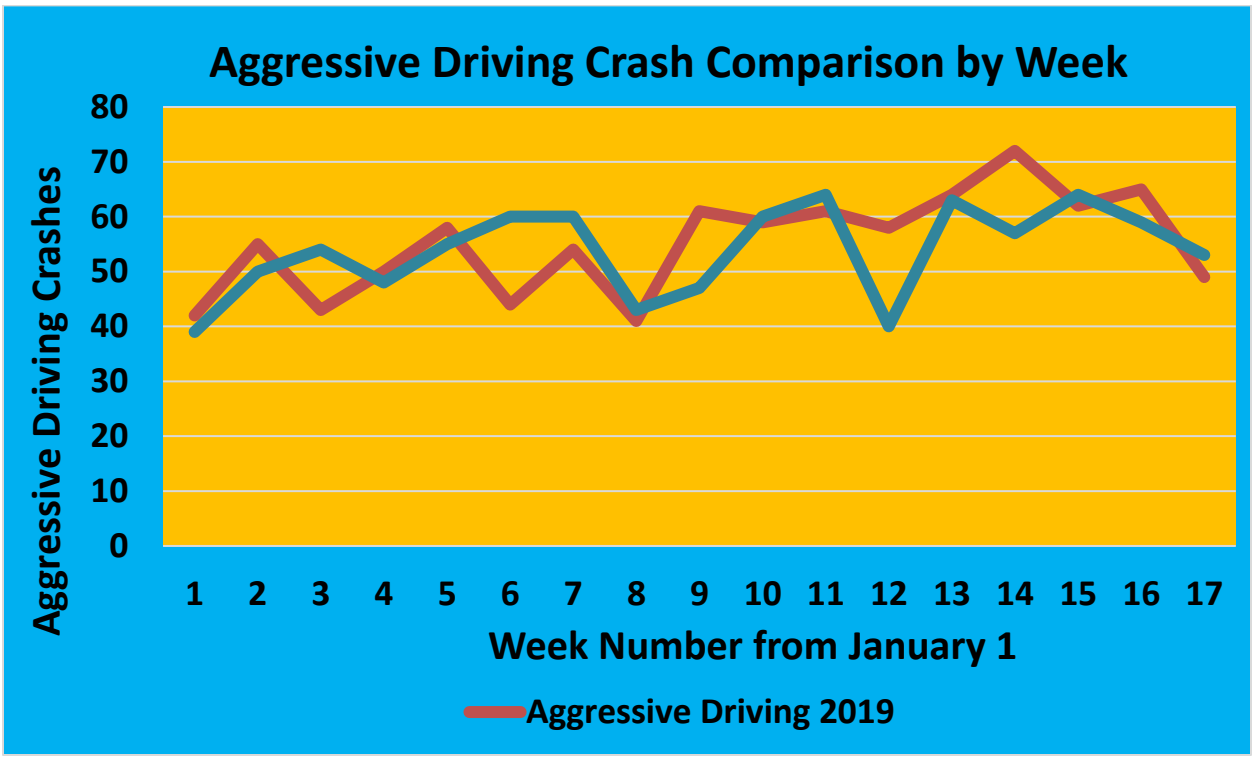
2.7 Large Truck Crash Comparisons



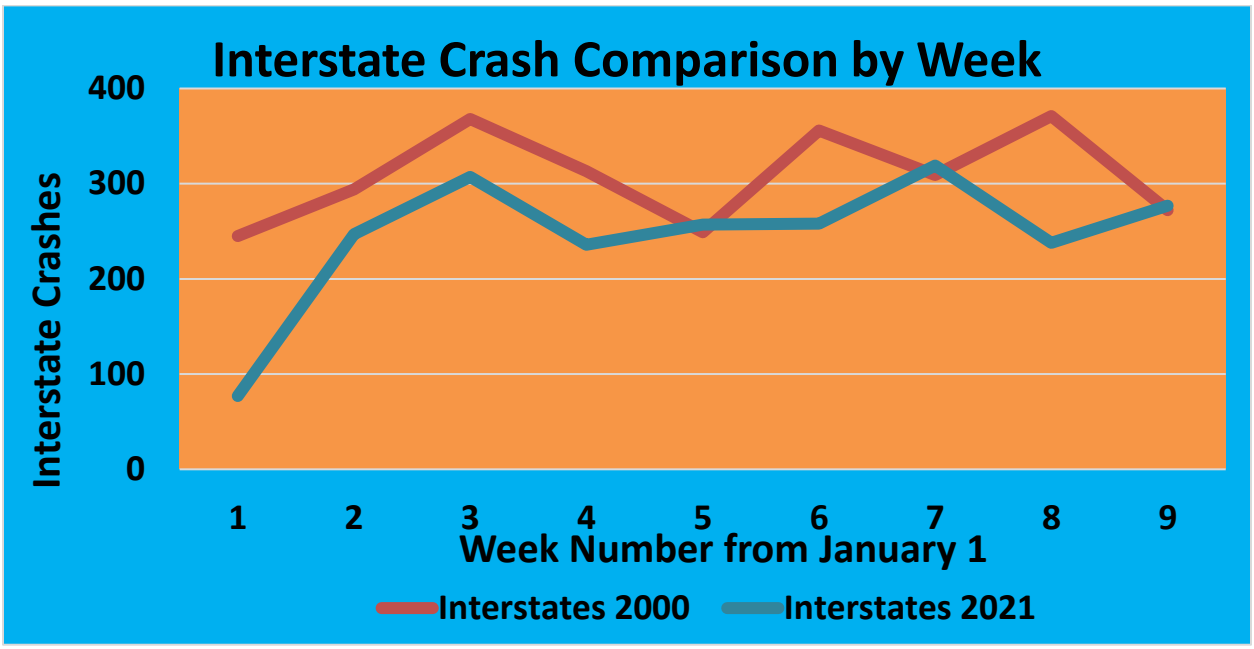


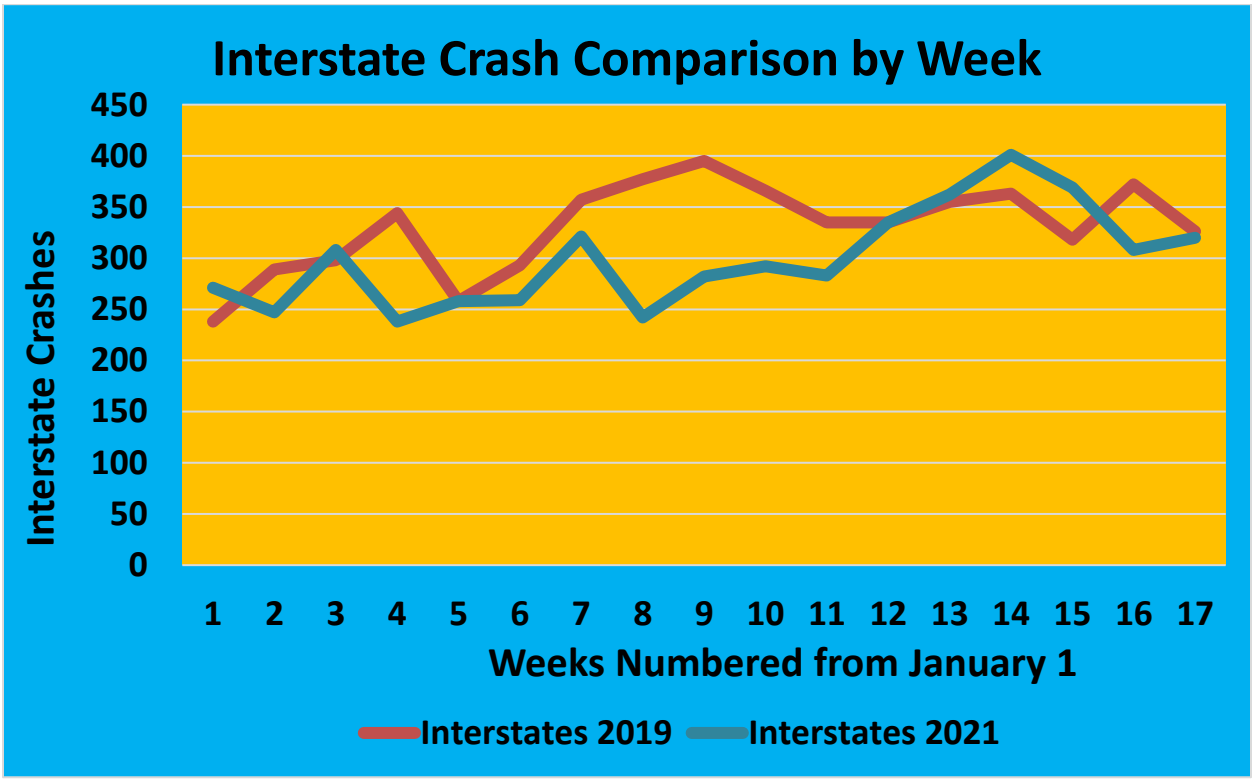
2.8 Aggressive Driving Crash Comparisons



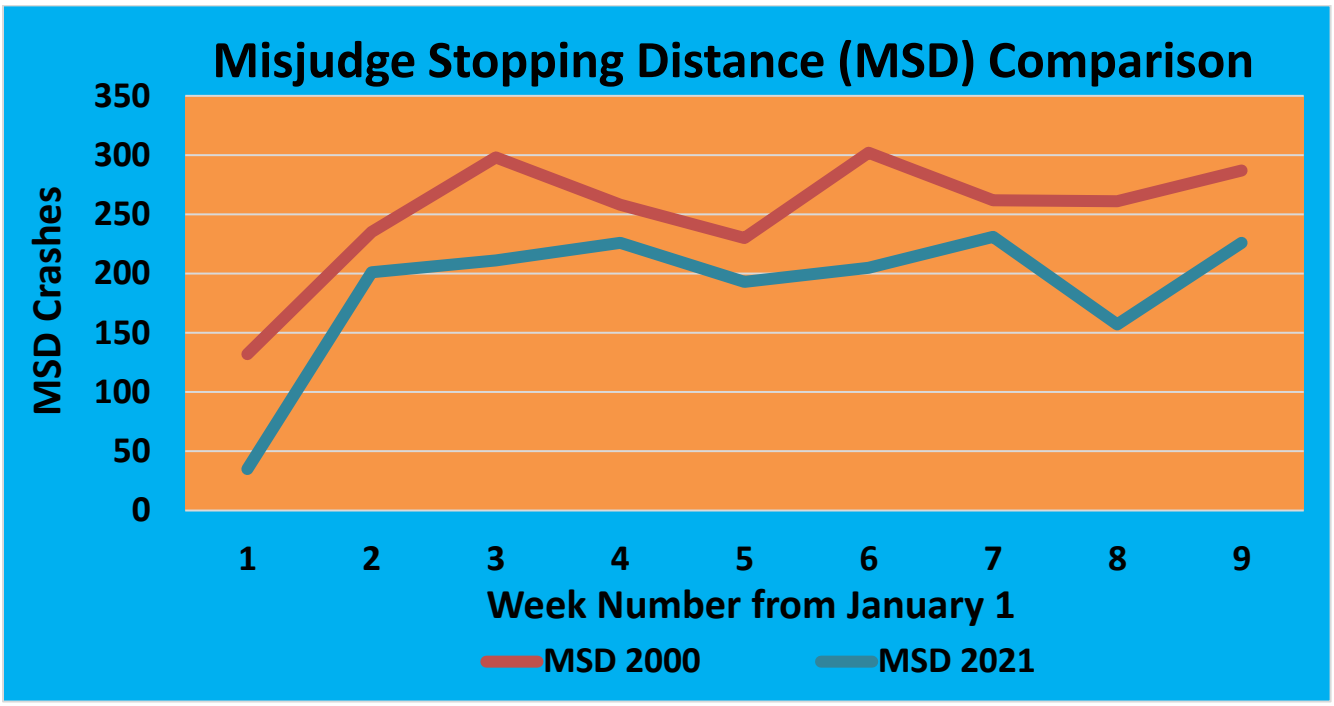


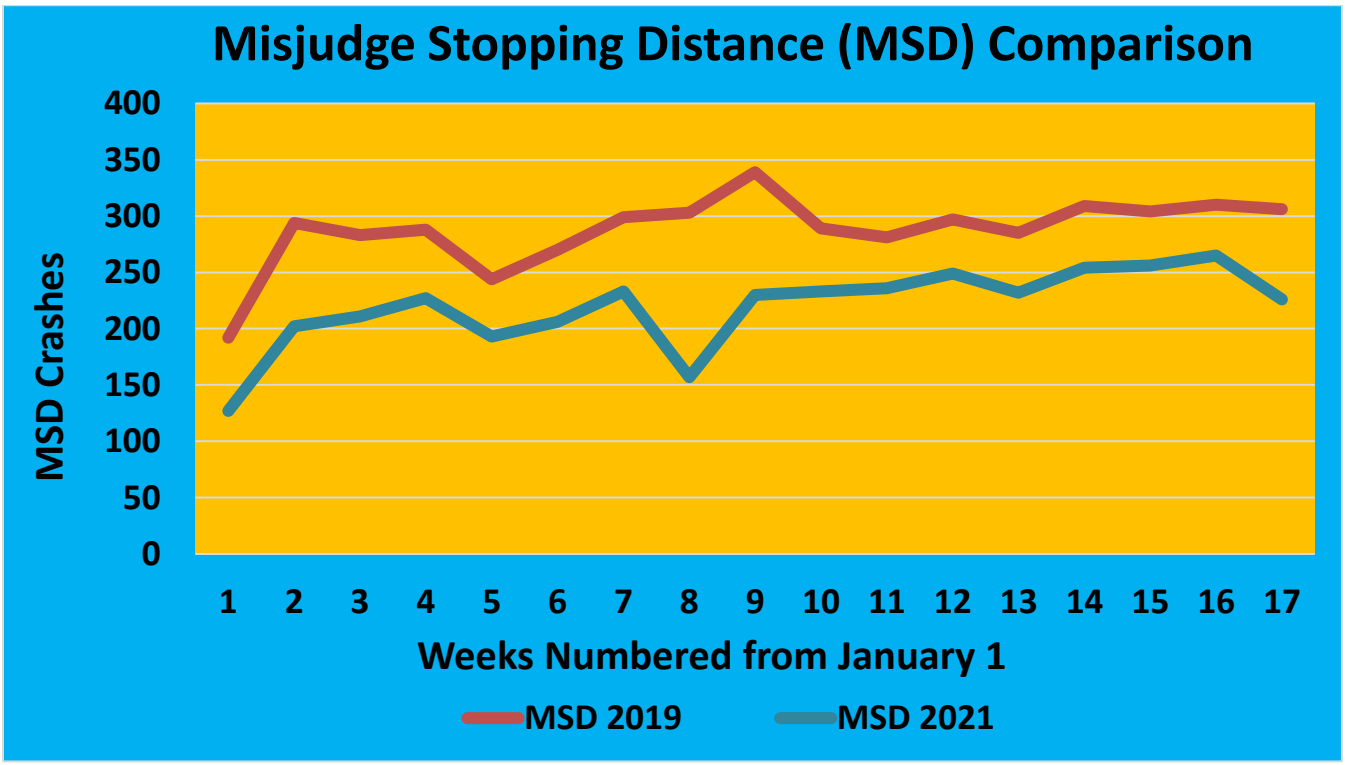
2.9 Interstate Crash Comparisons



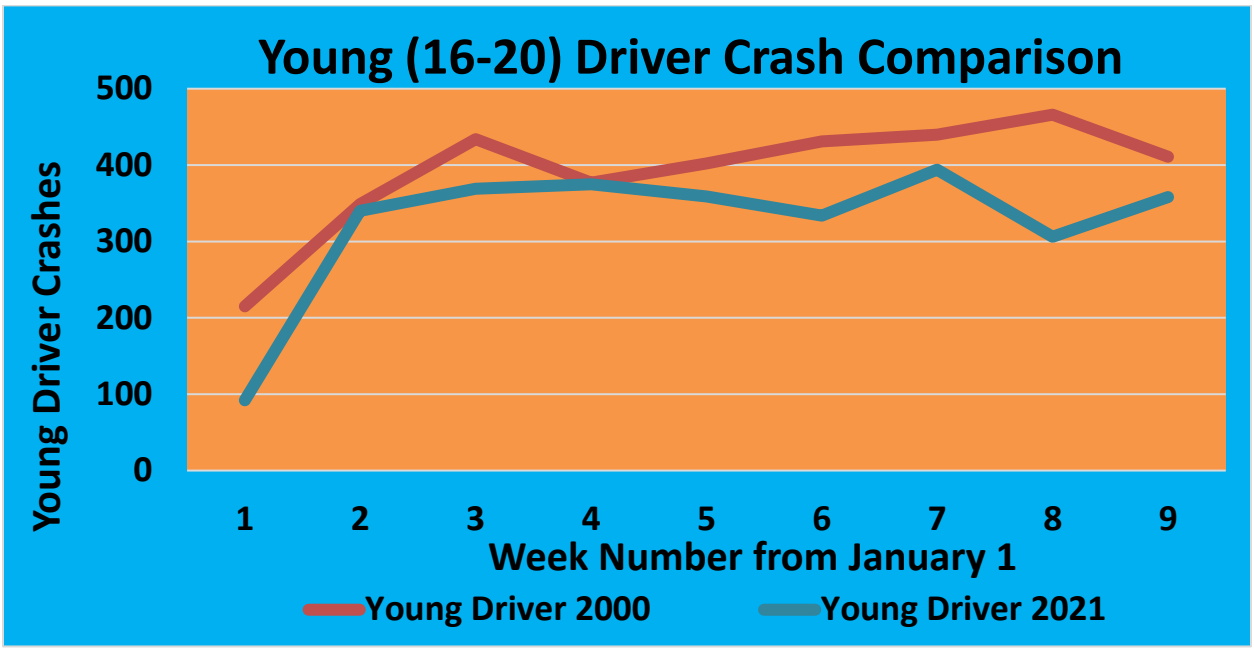


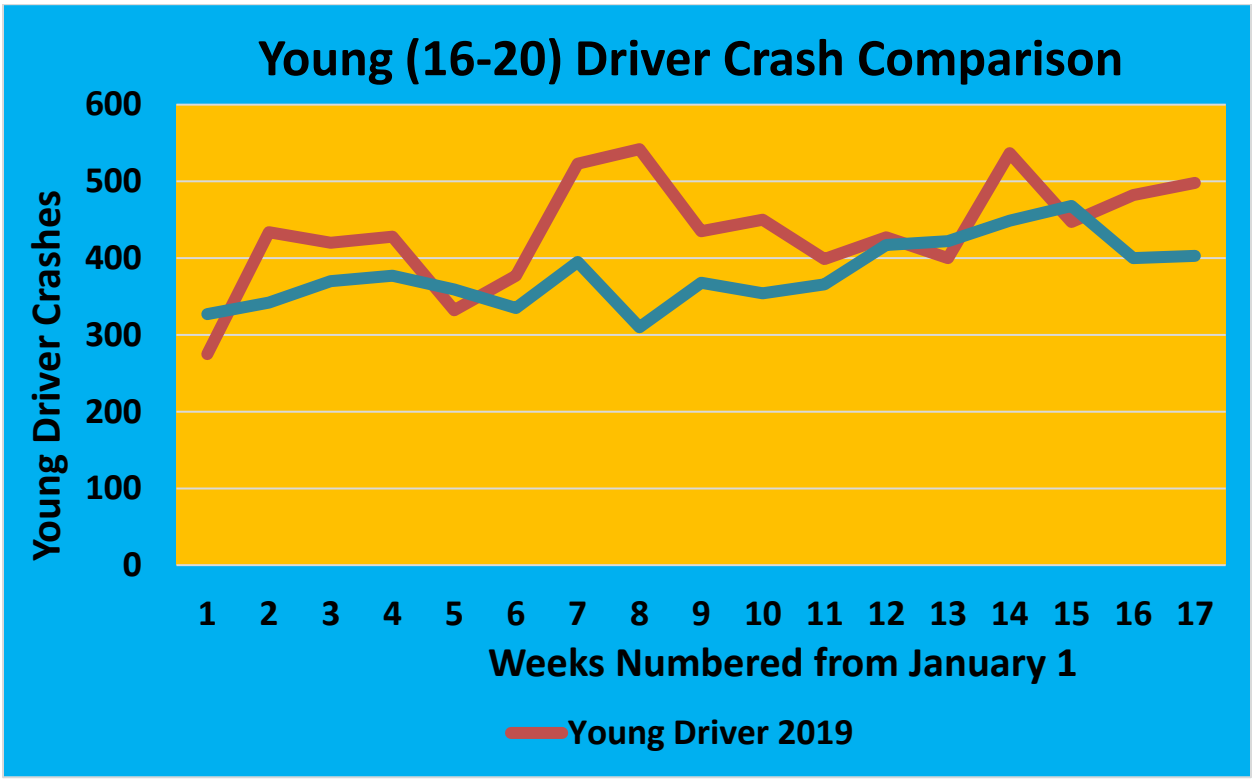
2.10 Misjudged Stopping Distance Crash Comparisons



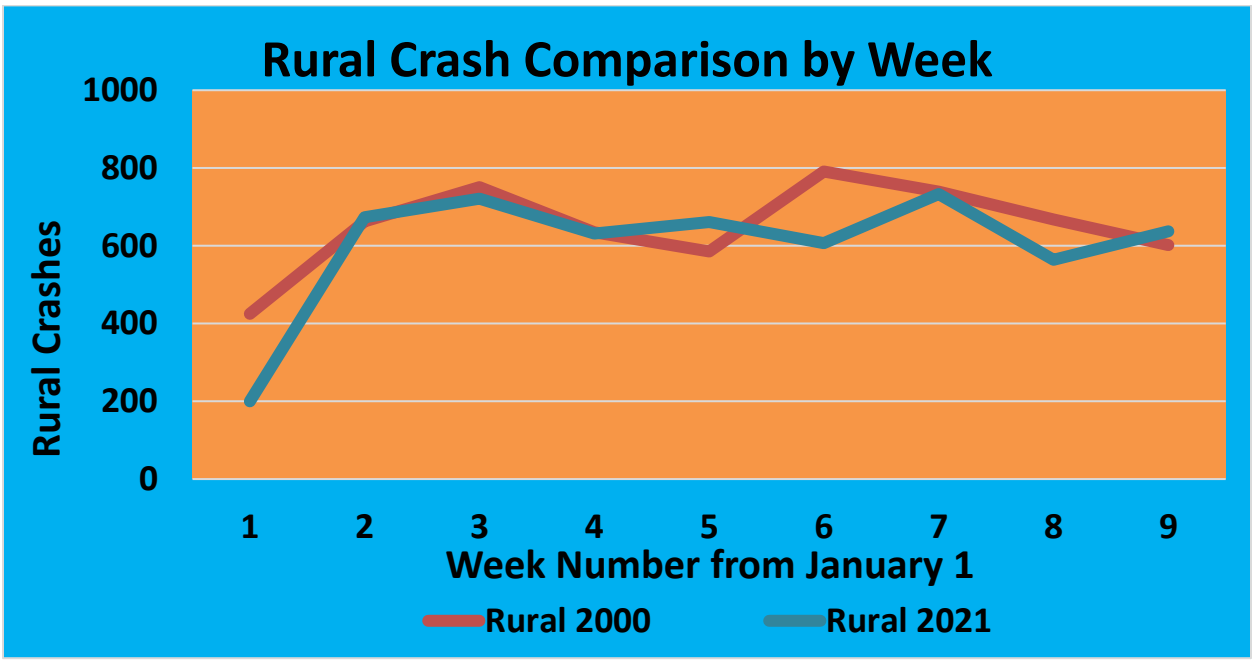


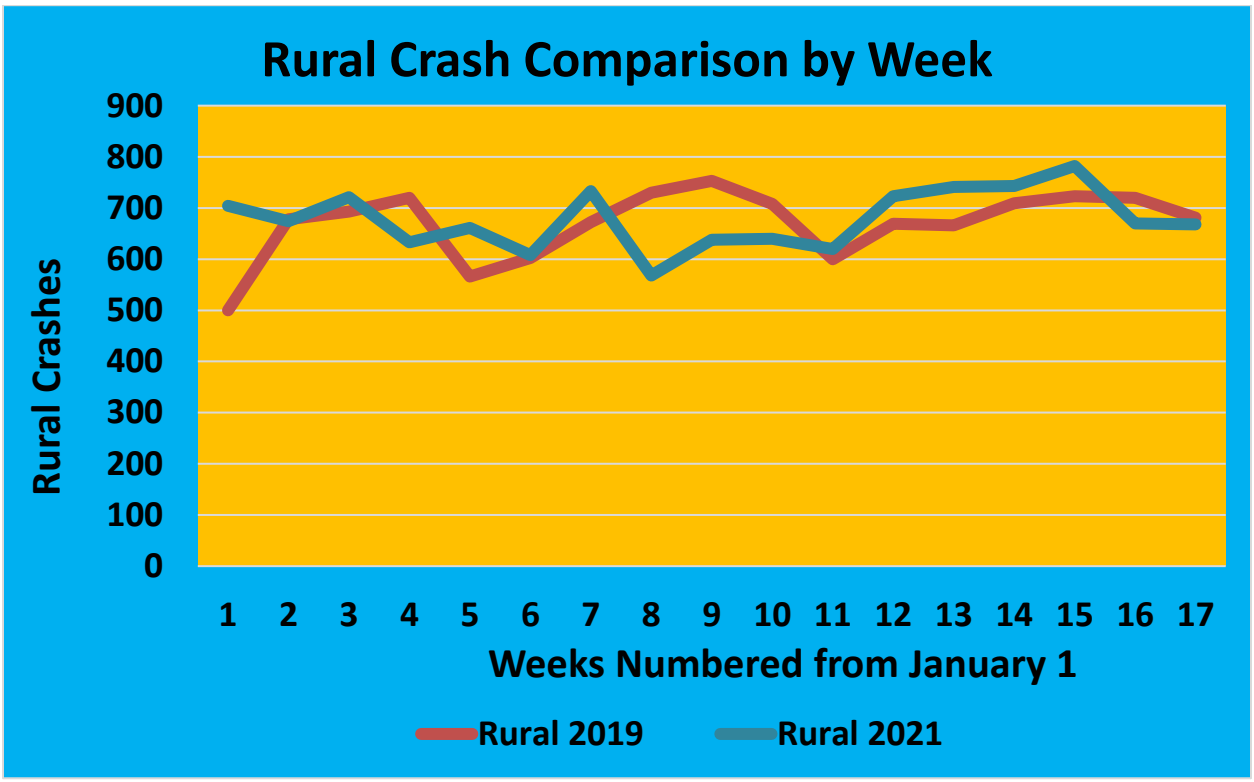
2.11 Youth Crashes Comparisons





2.12 Rural Crash Comparisons





2.13 Urban Crash Comparisons