Special Study

Restraint Issues Problem Identification 2016-2020 Data

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For general information on restraints from NHTSA and other sources, please see "Restraints" in:
http://www.safehomealabama.gov/safety-topics/

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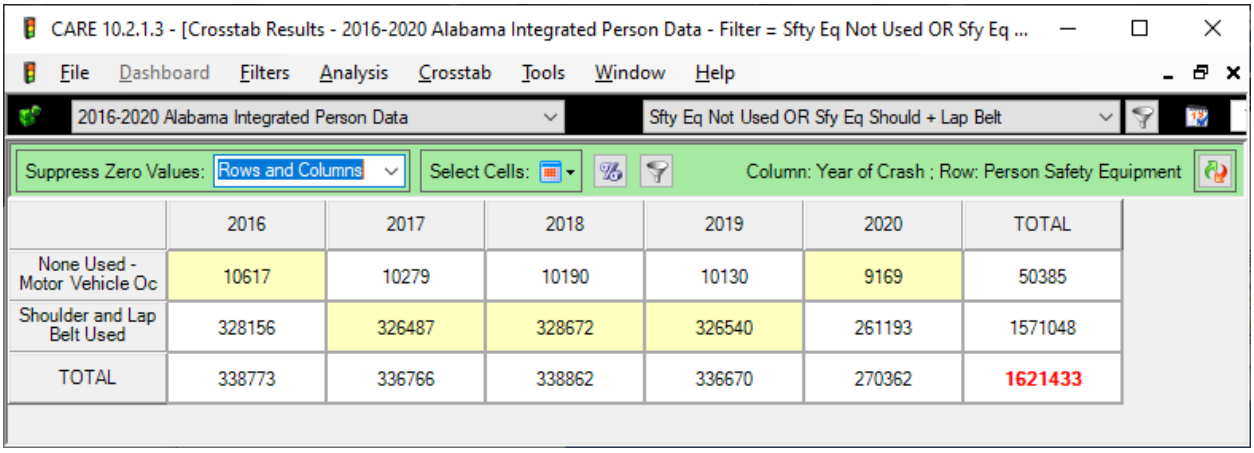
General Introduction

This major section will begin with a discussion of the estimated seatbelt use rate given by the NHTSA mandated scientific statistical sampling plan, and that given by summaries of the corresponding entries within the crash reports. A second section presents the recommendations that resulted from this study, and a third section is a condensed summary of findings from the IMPACT analyses. These sections are presented at the front of this report to spare readers who are only interested in results and recommendations. A second major section will contain all of the IMPACT displays with a brief summary blurb after each.

Comparison of Observational Study with Crash Report Results

The observed rate reported based on a NHTSA-approved sampling plan for the 2022 HSP was 91.3%. The following tables give the summary results from the crash reports over the five years 2016-2020.



	2016	2017	2018	2019	2020	TOTAL
None Used - Motor Vehicle Oc	10617	10279	10190	10130	9169	50385
Shoulder and Lap Belt Used	328156	326487	328672	326540	261193	1571048
TOTAL	338773	336766	338862	336670	270362	1621433

The following gives the reported percentages of proper restraint use based on the two indicators given above: (1) None Used Motor Vehicle Occupant, and (2) Shoulder and Lap Belt Used.

2016	2017	2018	2019	2020	TOTAL
96.9%	96.9%	97.0%	97.0%	96.6%	96.9%

These results are extremely consistent from year to year. The obvious question that arises is: why are these estimates different from the observational study by 5.6%? One factor could be the "Unknown" entries on the crash reports, which were reported on 138,407 (7.34%) of the crash reports. Chances are a good proportion of these Unknown cases were not properly restrained. The other factor is that there is no way in most cases for the reporting officer to witness the use or non-use of restraints. By the time most officers get to the scene most occupants will be out of the vehicles. In these cases the reporting officer would either mark Unknown or take the word of the driver or occupant. However, the crash report results tend to verify that the use rate is at least that found by the more scientific studies.

Recommendations

Typical recommendations to increase restraint use can be found throughout the SafeHomeAlabam.gov web pages that are devoted to restraint issues. These are:

- Child restraints: http://web01-staging.caps.ua.edu/safehome/tag/child-safety-seats/
- Safety belts: http://web01-staging.caps.ua.edu/safehome/tag/safety-belts/
- Click It or Ticket: http://web01-staging.caps.ua.edu/safehome/tag/click-it-or-ticket/

The motivational content given on these web pages will generally not be repeated here. Instead, we will focus on practical guidance that can make the findings of this study useful to those who are involved with restraint nonuse countermeasure development. No priority should be inferred from the ordering; recommendations will be ordered as they were in the report (section numbers will be in parentheses).

Geographical Factors (2.0). Counties, cities and virtual cities (rural areas within counties) that are over-represented should be given additional resources for PI&E and restraint selective enforcement programs. Rural areas adjacent to major metropolitan areas are particularly in need of additional resources. Restraint non-use HotSpots need to be computed for these roadways and SE officers need to be assigned accordingly. Sheriffs' officers should get involved on the county roadways in giving out warnings if nothing else. Shopping or Business locales are the most significantly *under-represented*, and thus, they can be avoided in favor of the rural areas.

Time Factors (3.0). Time of Day and Day of the Week together are some of the best proxies for restraint nonuse, and they are highly correlated with impaired driving (ID) times. Other studies done by CAPS that centered on the causes for the increase in fatalities in 2016 clearly showed the high correlation between ID and failing to use restraints. Thus, the ID days and hours should be the targets of selective enforcement for restraint nonuse. Seatbelt use checks should be closely coupled with ID enforcement.

Crash and Driver Causal Factors (4.0). Restraint non-use was also correlated to other risk-taking behaviors, such as speeding, aggressive operation, running off the road and fatigue/sleep. It is recommended that these behaviors be sought out similar to ID, as indicators of restraint non-use. It is recognized that since these factors tend to cause the crashes, they might be of greater law enforcement interest than the failure to use restraints. However, to reduce fatalities, we strongly recommend that restraint enforcement be performed in conjunction with that of any other behaviors.

Severity Factors (5.0). Research is needed to discover ways to impress risk-takers that the odds are against them. The details are in the numbers, and probably the most impressive is that the chances of getting killed if not wearing a safety belt is 18 times that than if restrained. The problem is that risk-takers think they are immune to getting in a crash in any event. Perhaps emphasizing the fact that close to half of the crashes are not the fault of the unbelted victim drivers would help. There is ample evidence here to make a case, and this case has been made effectively to the vast majority of drivers. But these have not been effective in influencing those who are prone to taking risks. We strongly recommend that psychological research be performed for

this purpose to discover ways to unlock their resistance to what most see as common sense. Questions should be answered as to the value that these individuals place on their own lives, and it they are also prone to be suicidal.

Driver and Vehicle Demographics (6.0). As would be expected, younger male drivers are over-represented mainly because of their affinity toward risk taking. Countermeasures that do not concentrate on trying to change the risk-taking nature of this demographic are not going to be effective. Countermeasures addressing other demographic groups have been extremely effective. While they have already reaped their positive benefits, it is important that they be continued. Since they are proven effective, they should be continued as other countermeasures to risk-taking are developed. It is interesting that the "young age" problem is not isolated to the "under 25" males whose brains generally have not yet developed to the point where they fully understand and appreciate risk. The over-representation was found to be extended up to age 41, although the degree diminished somewhat with age. This is probably largely caused by substance abuse, and this relationship needs to be further established in the 26-41 age group.

Ejection and Back Seat Restraints (7.0). To the extent possible, the statistics developed in the summary and the IMPACT analyses should be presented effectively to increase restraint use. We feel the most effective ones are as follow:

- Non-restrained persons are over 38 times more likely to be totally ejected than those who are properly restrained.
- Being ejected results in a probability of death about 17 times that of those not ejected, so the odds of survival are to those who stay within the protection of the vehicle.
- If all back-seat occupants were properly restrained it would result in an estimated saving of 67 lives per year. Being in the back seat provides minimal protection. To the contrary, those unrestrained in the back seat can become projectiles that can cause injury or death to other passengers.

Findings

The following summarizes the findings of the analysis, corresponding to the respective sections of this report (given in parentheses):

- **Geographical Factors (2.0)**
  - Counties with the greatest overrepresentation factors for unrestrained driver crashes include Walker, Talladega, Cullman, Jackson, Escambia and Marshal,
  - The number of crashes involving drivers who use no restraints is greatly overrepresented in rural areas of counties in comparison to their urban areas.
  - Rural/Urban. The odds ratio for rural areas is about 2.5 times that of what would be expected if rural and urban restraint use were the same.
  - The most overrepresented (worst) areas are *the rural county areas* in Mobile, Walker, Cullman, Talladega, Escambia, Baldwin and Madison Counties.
  - The most underrepresented (best) cities are Birmingham, Montgomery, Huntsville, and Mobile.
  - Crash incidents with no driver restraints being used are greatly overrepresented on county highways, with 2.722 times the expected number of crashes. County and State were the only roadway classification that were overrepresented. Federal, Interstate and Municipal roads were significantly under-represented.
  - In the analysis of locale, crashes involving no restraints are most commonly overrepresented in Open Country areas, some of which may be within city limits. Shopping or Business locales are the most significantly under-represented.

- **Time Factors (3.0)**
  - The weekend days are the most overrepresented days of the week for crashes in which drivers are not properly restrained. This correlates highly with impaired driving crashes. Friday is higher than the other week days, but it is not over-represented compared to restrained drivers.
  - In the evaluation of time of day, overrepresentations occur during the 7:00 PM to 6:00 AM time periods. After that they taper off, with proportions falling back below crashes involving causal drivers who use restraints in the 7 AM to 7 PM time periods.
  - A cross-tabulation was performed for crashes involving unrestrained drivers that showed very high over-representations for early morning Sunday and Saturday. This is very close to what is found for impaired drivers. Very similar results were found when the data were restricted to unrestrained driver crashes in which injuries occurred. Crosstab analyses of time of day by day of the week of crashes in which restraints were not used enables officers to determine target times and days to enforce restraint laws so that severe crashes may be prevented. Two analyses

were performed and compared for all crashes with restraint deficiencies and injury crashes for restraint deficiencies. The late night and early morning over-representations were largely on the weekend days starting on Friday night and ending on Sunday morning.

- **Crash and Driver Causal Factors (4.0), Including Driver Faults and DUI**
  - The Primary Contributing Circumstance overrepresentation factors indicate that certain risk-taking behaviors are often associated with crashes in which restraints are not used, including DUI, Over the Speed Limit, Aggressive Operation, Running off the Road, and Fatigue/Sleep.
  - The speed at impact for restraint-deficient crashes is significantly overrepresented in all of the categories above 45 MPH, indicating that these crashes consistently occur at higher speeds than crashes in which restraints were used by the causal driver. Since this is highly correlated with rural driving and risk taking, the severities will be a much greater number of fatalities for these crashes (see Section 5.1 below).
  - DUI in both alcohol and non-alcohol drugs were highly over-represented in drivers who were not properly restrained. The Odds Ratio for alcohol was 7.712, and that for drugs was even worse at 9.569. DUI, and in some cases the root causes of DUI, also result in little concern for post-crash protection.

- **Severity Factors (5.0)**
  - Fatal, incapacitating, and non-incapacitating injuries are all overrepresented in crashes where drivers were not restrained; this analysis accurately quantified the benefits of the restraint use.
  - Fatal injuries in crashes where no restraints are used are highly overrepresented on interstate, federal and state roadways. "Possible Injuries and Property Damage Only were highly overrepresented on municipal highways.
  - Analysis of number injured shows that the proportion of injuries (including fatalities) in unrestrained driver crashes is overrepresented in all numbers from 1 to 6 injuries per crash. Crashes without restraints are clearly causing much more severe injuries and a greater number of injuries and fatalities per crash. No injury crashes are under-represented by about half of what would be expected in those vehicle crashes where restraints are being properly used.
  - The proportion of fatalities in general as well as the proportions of multiple fatality crashes (up to 5 fatalities per crash) are dramatically overrepresented in crashes where the causal driver is unrestrained.
  - As expected, ejection of the unrestrained driver is overrepresented, indicating one major cause for many fatalities in which safety equipment is not properly utilized.

All three items were extremely over-represented [Odds Ratio]: (1) Totally Ejected [38.107], (2) Trapped within Vehicle [9.968]. and (3) Partially Ejected [14.930].

- An analysis of severity by ejection status showed that fatal and incapacitating injuries were significantly overrepresented in crashes in which the driver was partially ejected, totally ejected, or trapped within the vehicle. The following fatality multipliers (i.e., the amount by which the average fatality rate must be multiplied for the particular classifications) were found for the various ejection categories [multiplier]: (1) Not Ejected – still has a multiplier since no restraint was used in all crashes analyzed [5.79], (2) Partially Ejected [63.42], (3) Totally Ejected [50.84], and (4) Trapped in Vehicle [47.40].

- **Driver and Vehicle Demographics (6.0)**
  - Analysis of individual driver ages indicates that, with very few exceptions, crashes involving no restraints are significantly overrepresented in drivers above the teen driver classification (age range 18-41).
  - Male drivers account for a majority of crashes in which restraints are not used, and they are overrepresented by a factor of 1.332 times their proportion in the properly restrained subset.
  - Crashes attributed to drivers who used no restraints are greatly overrepresented in vehicles with model years 1960-2004, which could be attributed to the lack (or wear-out) of standard safety restraints in some of these older model vehicles, or perhaps the removal of these safety devices over time.

- **Back-Seat Analysis (7.0)**
  - The figures show that the unrestrained probability of being killed in a crash goes up by a factor of about 17 times the probability of being killed given proper restraints.
  - Suspected Serious Injury (most severe short of fatality) has an Odds Ratio of 5.544, while the other two lesser severity crashes have multipliers of 2.495 and 1.179, respectively.
  - If all back-seat occupants were properly restrained it would result in an estimated saving of 67 lives over the five years, or about 13 lives per year.

Restraint Issues Problem Identification

1.0 Introduction to the Problem Identification

The following sections contain the problem identification displays that were conducted based on data from Calendar Years 2016-2020. This was the latest data that were available at the time of the study, and it is quite representative of the restraint picture going forward into FY2022.

CARE was used to process and display the information. Generally, the comparisons made were between those crashes in which the causal drivers were not restrained (represented by the red bars in the charts) and those that were reported to be restrained (represented by the blue bars in the charts). The use of proper restraints by causal drivers is seen to be an excellent proxy for proper restraint use by all passengers in the vehicle.

One goal of this problem identification is to assist the restraint enforcement program within the state in being completely evidence-based, the evidence being derived from past data obtained from crash records. Changes from what appeared from the previous year HSP will only be noted in cases where they are considered to be of significance for decision-making.

The major subsections that follow within this problem identification are as follow:

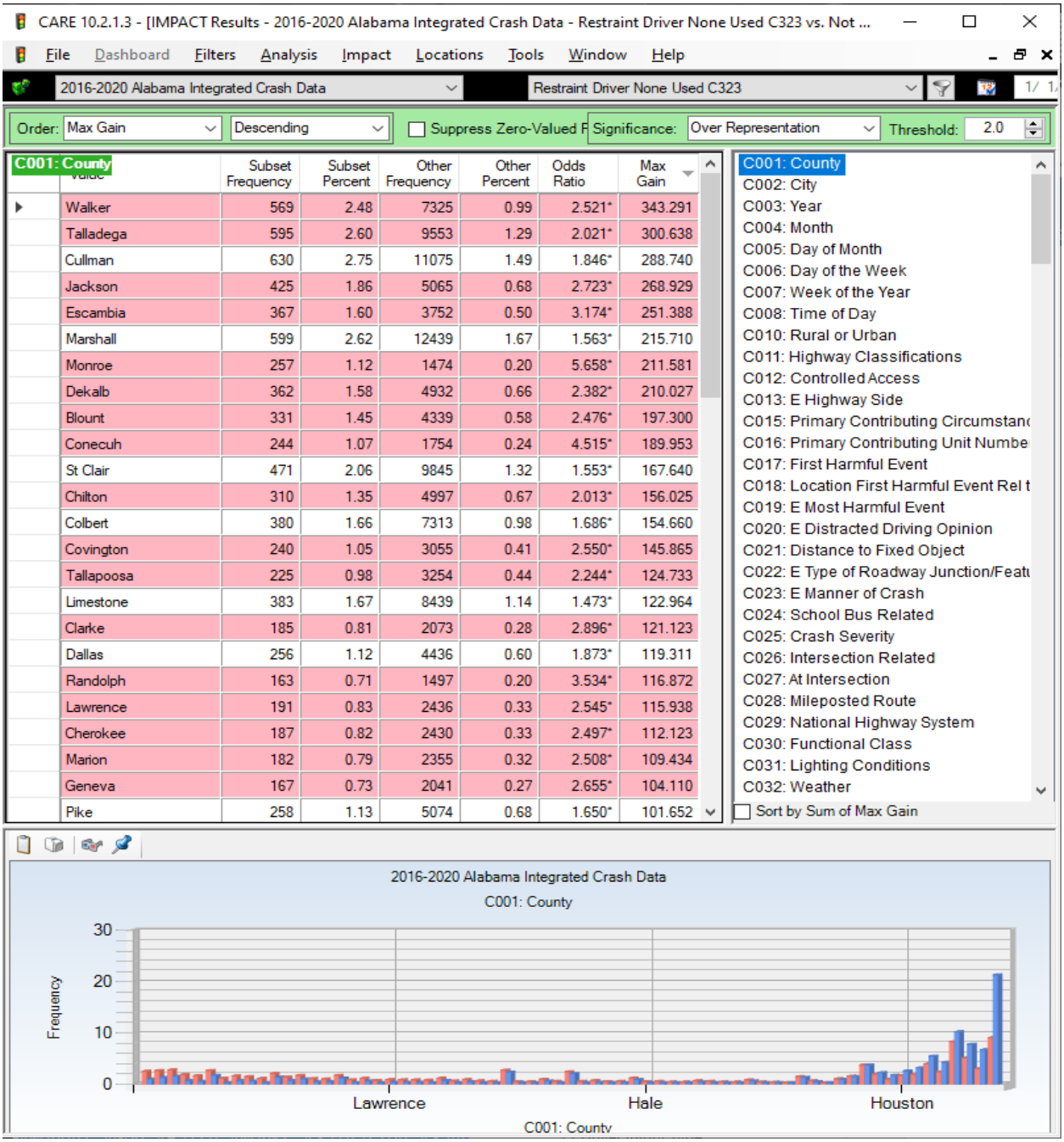
- 2.0 Geographical Factors
- 3.0 Time Considerations
- 4.0 Crash Causal Factors
- 5.0 Severity Factors
- 6.0 Driver Demographics
- 7.0 Analysis for Back Seat Occupants

Most of the IMPACT display tables are arranged in *Max Gain* order, meaning those with the greatest potential for improvement are at the top. *Max Gain* is the number of crashes that could be reduced if the over-representation was reduced to zero. The Odds Ratio is the value of the ratio of the Non-restrained proportion (percent) to the Restrained percent. If this ratio is greater than two, this indicates that the entity had a proportion at least twice Non-restrained as Restrained. In the opposite case, the Odds Ratio will have the value of 0.5 or less indicating that the Restrained percent is twice that of the Non-restrained. In the former case, the background of the item line will be red, and in the latter case it will be green. No statistical tests are done if either of the attributes being tested has a frequency of less than 20. Items in the tables are arranged in *Natural Order* in those attributes for which this presents a more logical display (e.g., times, speeds, number injured, etc.).

2.0 Geographical Factors

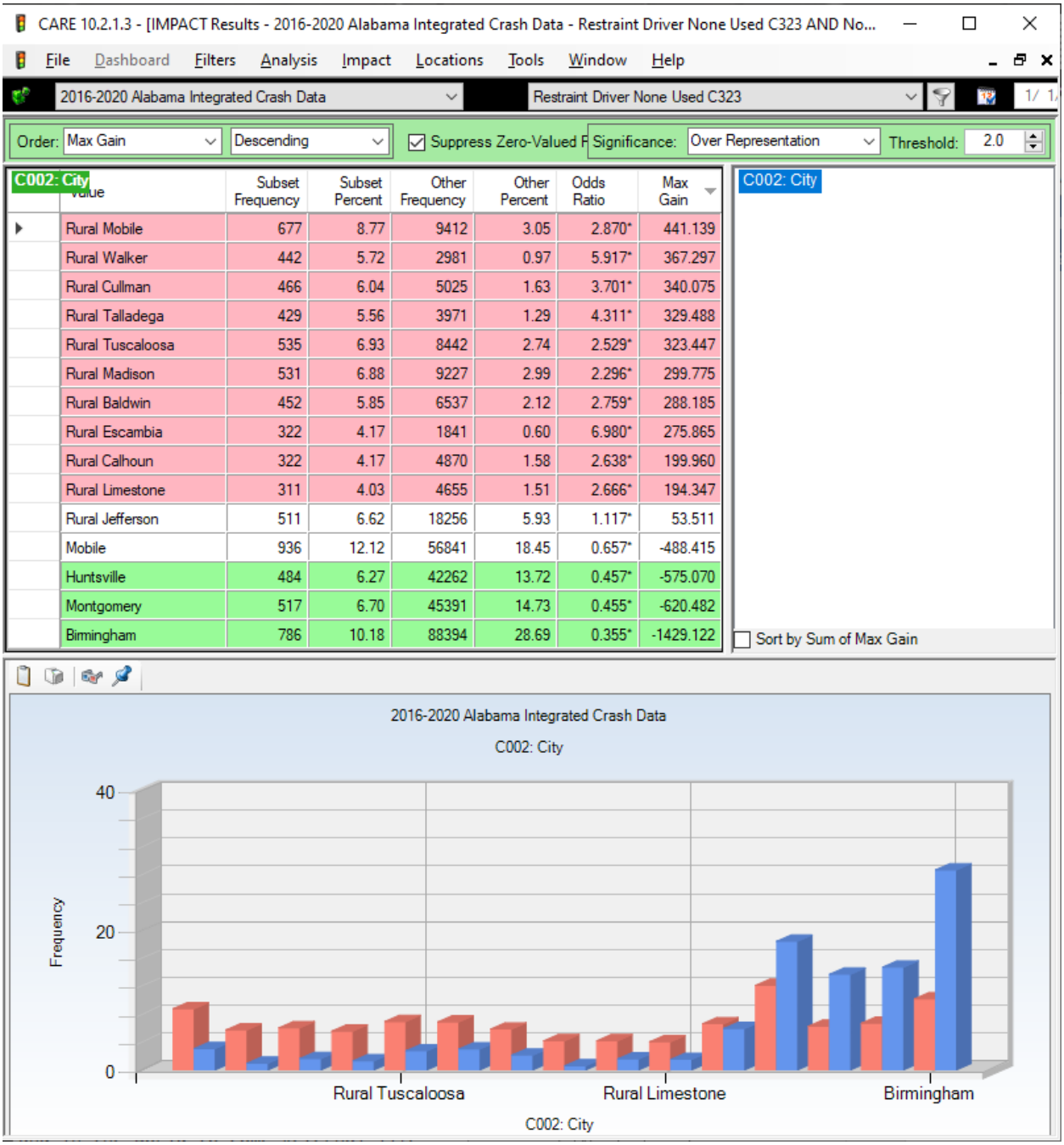
Geographical factors were analyzed in order to determine which areas are overrepresented for crashes involving drivers who did not use restraints. In order to determine these problem areas, geographical factors were analyzed in the following categories: county, city, rural versus urban, highway classification and locale.

2.1 County



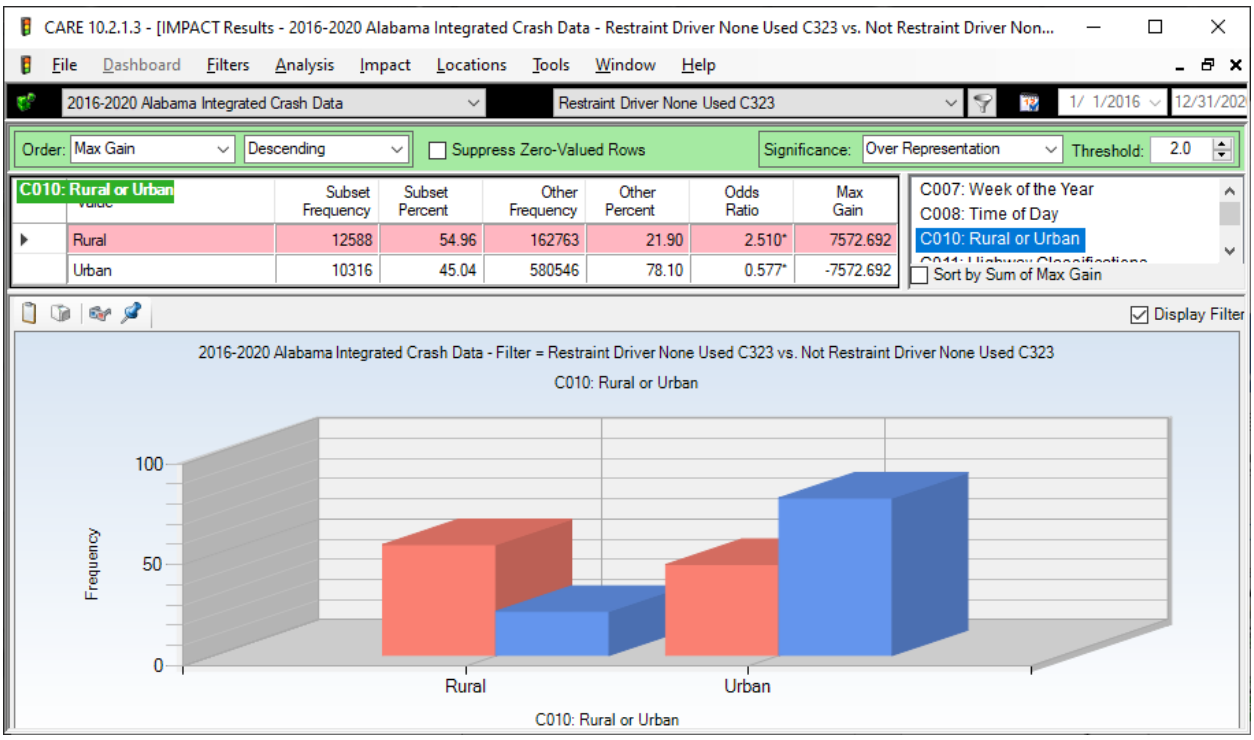
The display above is restricted to those counties that had: (1) at least a Max Gain of 100 crashes in which the driver was reported to be unrestrained, and (2) the county had an over-representation (Odds Ratio) of at least two times their expectation when compared to the proportion of the crashes statewide in which the drivers were restrained. For example, Walker County had a proportion of Drivers not restrained of 2.48% while their statewide proportion of all crashes is only 0.99%, which leads to an Odds Ratio of 2.521. The more populated urbanized counties generally showed the highest occupant restraint use as opposed to those in the table.

2.2 City



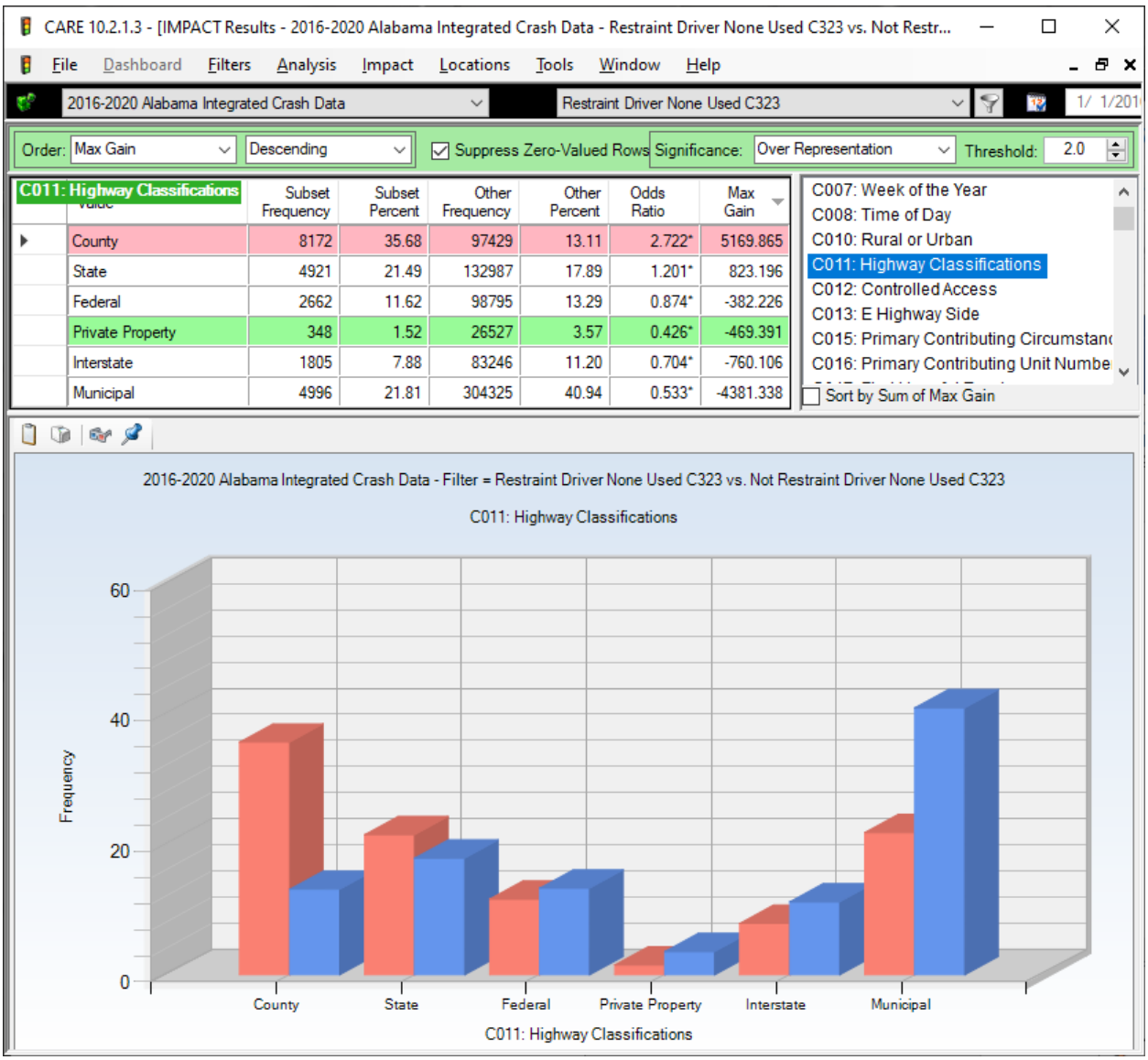
The display above is for all cities that had over 300 or more crashes in which the drivers were not properly restrained. In these crashes the large number of crashes drives up the Max Gain value, which is the potential for non-restrained driver crash reduction. Cities listed at the bottom of the list also have the high number of non-restrained driver crashes, *but their non-restrained proportion is less than their proportion for restrained crashes.* The restraint use rate is roughly proportional to the size of the city. These displays demonstrate the CARE capabilities; if similar runs would be useful with different cities, please contact CAPS (brown@cs.ua.edu).

2.3 Rural/Urban



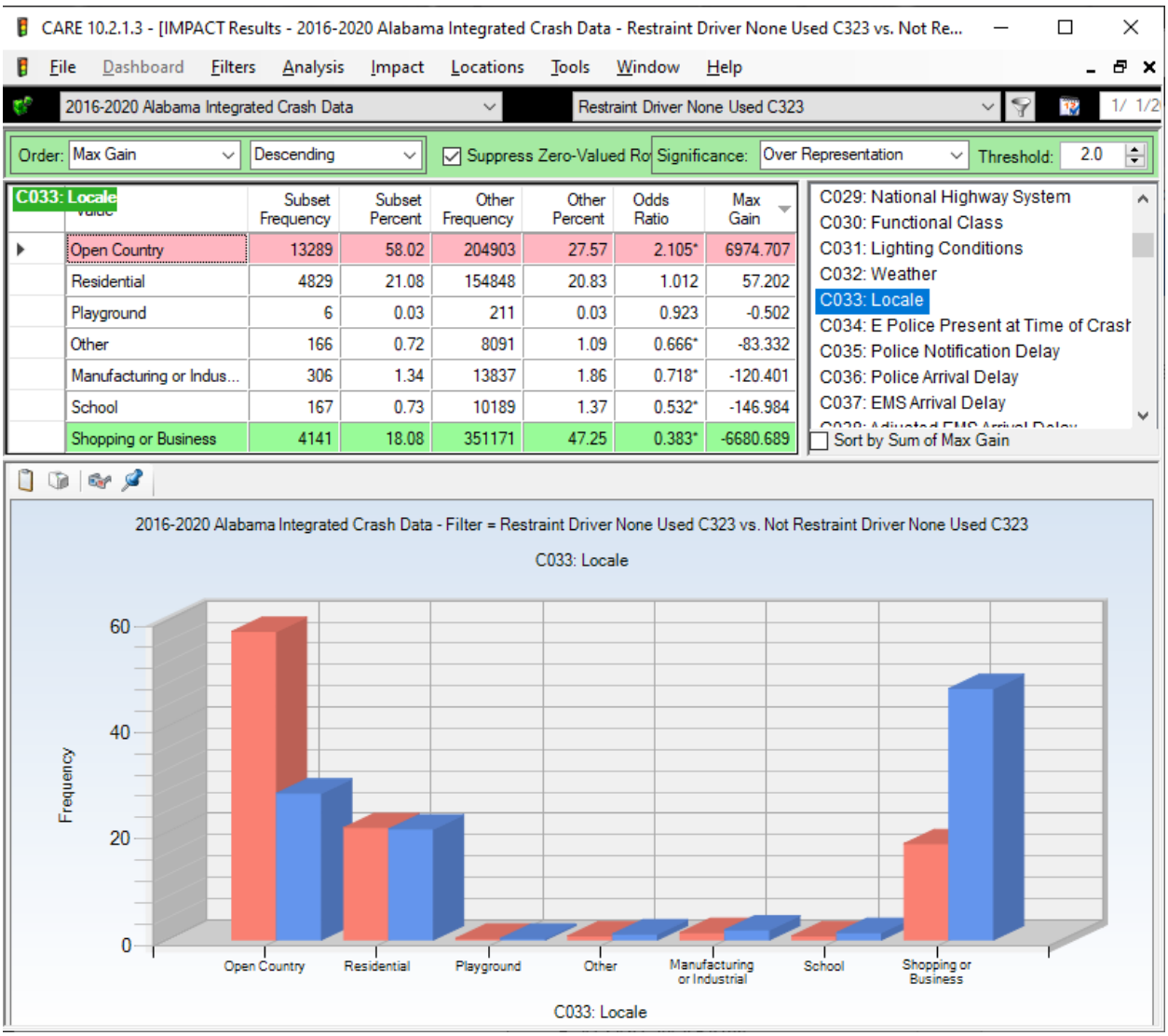
As expected from the city results above, the proportion of crashes involving drivers who use no restraints is greatly overrepresented in rural areas, being well over double what it is in the urban areas. The increased number of crashes in which restraints were used in urban areas might be attributed to greater police presence, newer vehicles, public information and education efforts, and the demographics of urban drivers in general. Speeds are generally much higher in the rural area and thus there is also a very high correlation of fatalities to rural driving. These results are effectively the same as in the former problem identification study.

2.4 Highway Classification



Crash incidents in which no restraints were used are greatly overrepresented on county highways with over 2.722 times the expected number of crashes (those with drivers restrained). The restraint deficiencies are about what would be expected on state roads, although there is a small but significant over-representation of about 20% of the proportion. The proportion of crashes in which restraints were used is greater on Federal, private Property, Interstate, and Municipal highway areas.

2.5 Locale

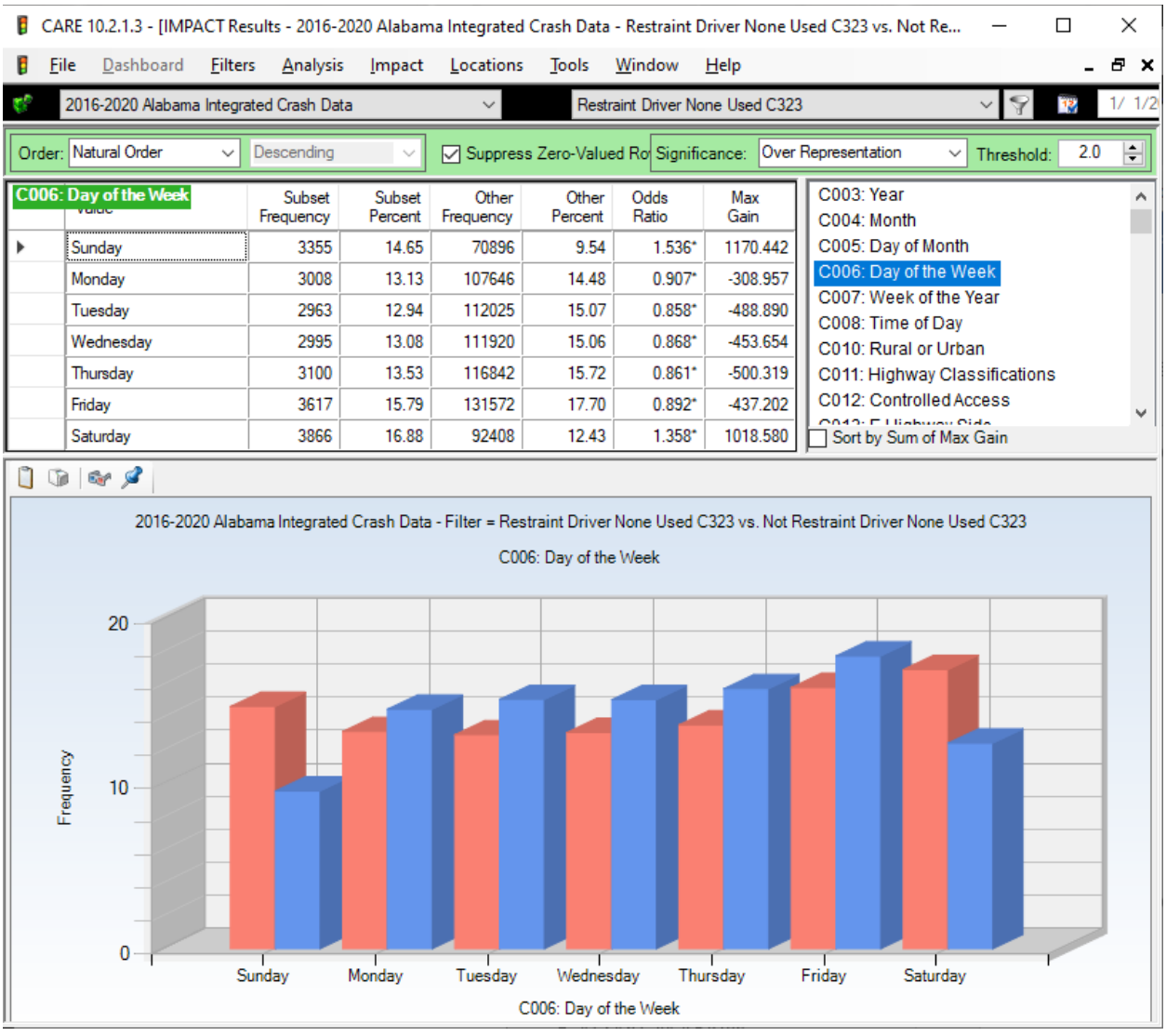


The crash incidents involving no restraints are overrepresented in open country areas, while school and shopping areas are significantly underrepresented indicating that crashes in these areas generally involve drivers who were much more apt to use their restraints. This, along with the Highway Classification, gives the general area of the locations at which restraint enforcement will be most effective.

3.0 Time Considerations

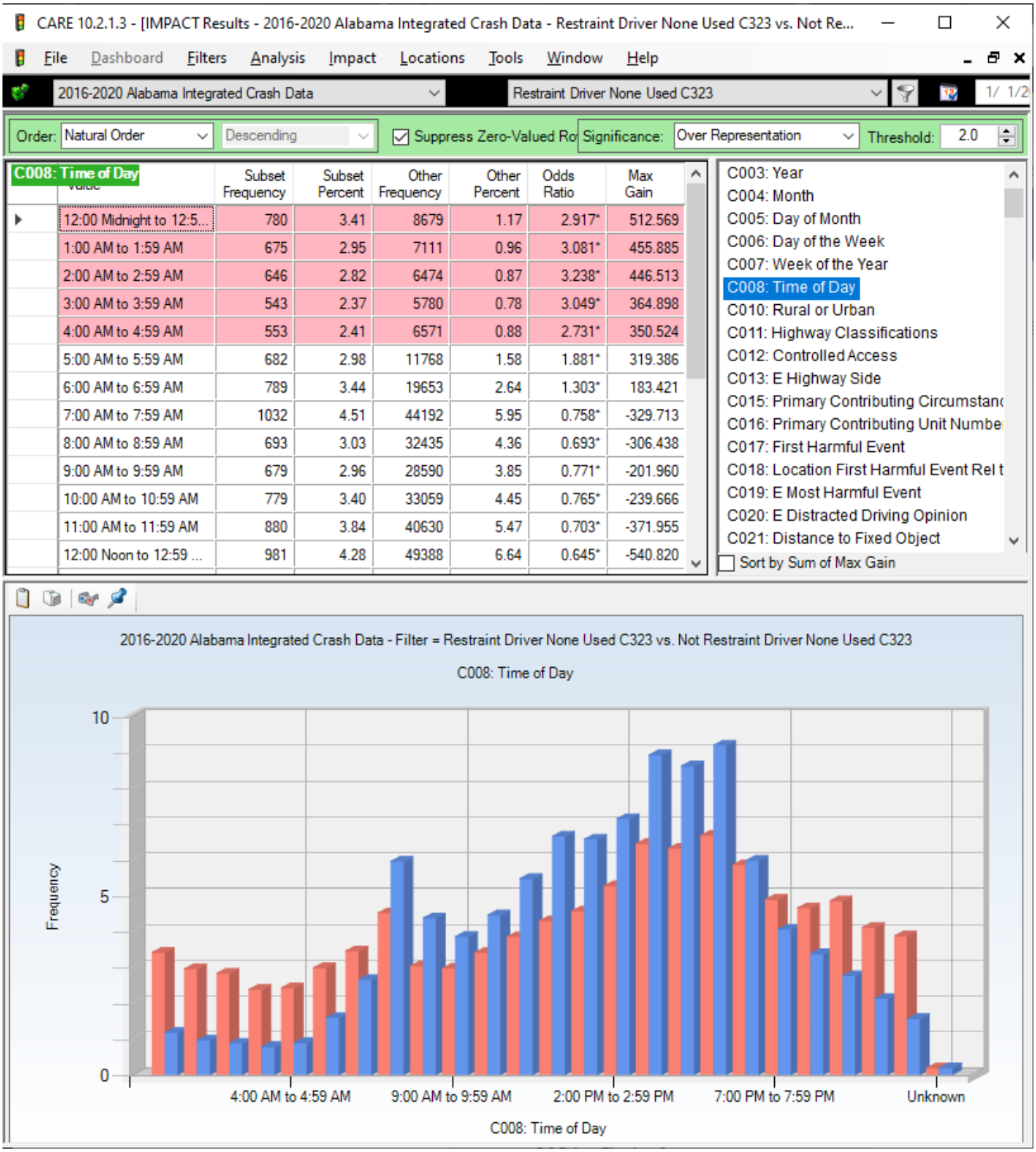
Time factors were analyzed in several different categories to determine overrepresentation for day of the week and time of day. Analysis of these time factors allows for the determination of particular days of week and time of day combinations in which more crashes occur with drivers who are not properly restrained, and thus, those times in which selective enforcement would have a greater effect.

3.1 Day of the Week



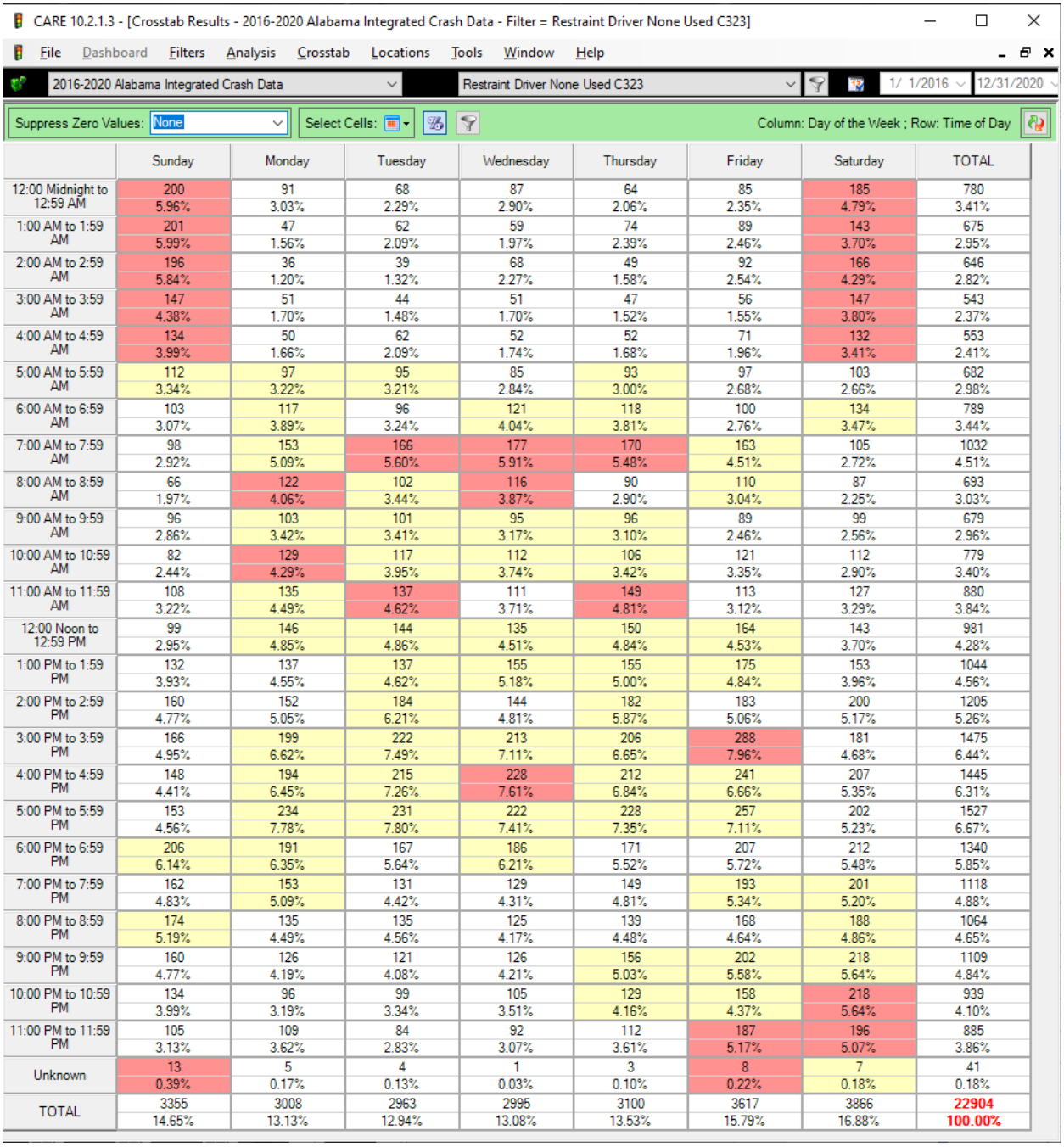
The weekend is overrepresented for crashes involving causal drivers who failed to use restraints, demonstrating a heavy correlation with alcohol-involved crashes. Saturday and Sunday averaged out to about 1.5 times the expected number of crashes involving causal drivers who failed to use restraints.

3.2 Time of Day



The relative probability of crashes involving no restraints is generally greater before and after standard work and rush hours. Overrepresentation peaks during the 12 PM to 5 AM period and then tapers off, falling back below crashes involving causal drivers who use restraints in the 7 AM to 8 AM time period. This chart has a very strong resemblance to its DUI counterpart and the fatality study completed for 2021 showed clearly the lack of restraints correlated heavily with DUI (alcohol or other drugs).

3.3 Time of Day by Day of the Week for all Unrestrained Causal Driver Crashes



	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	TOTAL
12:00 Midnight to 12:59 AM	200 5.96%	91 3.03%	68 2.29%	87 2.90%	64 2.06%	85 2.35%	185 4.79%	780 3.41%
1:00 AM to 1:59 AM	201 5.99%	47 1.56%	62 2.09%	59 1.97%	74 2.39%	89 2.46%	143 3.70%	675 2.95%
2:00 AM to 2:59 AM	196 5.84%	36 1.20%	39 1.32%	68 2.27%	49 1.58%	92 2.54%	166 4.29%	646 2.82%
3:00 AM to 3:59 AM	147 4.38%	51 1.70%	44 1.48%	51 1.70%	47 1.52%	56 1.55%	147 3.80%	543 2.37%
4:00 AM to 4:59 AM	134 3.99%	50 1.66%	62 2.09%	52 1.74%	52 1.68%	71 1.96%	132 3.41%	553 2.41%
5:00 AM to 5:59 AM	112 3.34%	97 3.22%	95 3.21%	85 2.84%	93 3.00%	97 2.68%	103 2.66%	682 2.98%
6:00 AM to 6:59 AM	103 3.07%	117 3.89%	96 3.24%	121 4.04%	118 3.81%	100 2.76%	134 3.47%	789 3.44%
7:00 AM to 7:59 AM	98 2.92%	153 5.09%	166 5.60%	177 5.91%	170 5.48%	163 4.51%	105 2.72%	1032 4.51%
8:00 AM to 8:59 AM	66 1.97%	122 4.06%	102 3.44%	116 3.87%	90 2.90%	110 3.04%	87 2.25%	693 3.03%
9:00 AM to 9:59 AM	96 2.86%	103 3.42%	101 3.41%	95 3.17%	96 3.10%	89 2.46%	99 2.56%	679 2.96%
10:00 AM to 10:59 AM	82 2.44%	129 4.29%	117 3.95%	112 3.74%	106 3.42%	121 3.35%	112 2.90%	779 3.40%
11:00 AM to 11:59 AM	108 3.22%	135 4.49%	137 4.62%	111 3.71%	149 4.81%	113 3.12%	127 3.29%	880 3.84%
12:00 Noon to 12:59 PM	99 2.95%	146 4.85%	144 4.86%	135 4.51%	150 4.84%	164 4.53%	143 3.70%	981 4.28%
1:00 PM to 1:59 PM	132 3.93%	137 4.55%	137 4.62%	155 5.18%	155 5.00%	175 4.84%	153 3.96%	1044 4.56%
2:00 PM to 2:59 PM	160 4.77%	152 5.05%	184 6.21%	144 4.81%	182 5.87%	183 5.06%	200 5.17%	1205 5.26%
3:00 PM to 3:59 PM	166 4.95%	199 6.62%	222 7.49%	213 7.11%	206 6.65%	288 7.96%	181 4.68%	1475 6.44%
4:00 PM to 4:59 PM	148 4.41%	194 6.45%	215 7.26%	228 7.61%	212 6.84%	241 6.66%	207 5.35%	1445 6.31%
5:00 PM to 5:59 PM	153 4.56%	234 7.78%	231 7.80%	222 7.41%	228 7.35%	257 7.11%	202 5.23%	1527 6.67%
6:00 PM to 6:59 PM	206 6.14%	191 6.35%	167 5.64%	186 6.21%	171 5.52%	207 5.72%	212 5.48%	1340 5.85%
7:00 PM to 7:59 PM	162 4.83%	153 5.09%	131 4.42%	129 4.31%	149 4.81%	193 5.34%	201 5.20%	1118 4.88%
8:00 PM to 8:59 PM	174 5.19%	135 4.49%	135 4.56%	125 4.17%	139 4.48%	168 4.64%	188 4.86%	1064 4.65%
9:00 PM to 9:59 PM	160 4.77%	126 4.19%	121 4.08%	126 4.21%	156 5.03%	202 5.58%	218 5.64%	1109 4.84%
10:00 PM to 10:59 PM	134 3.99%	96 3.19%	99 3.34%	105 3.51%	129 4.16%	158 4.37%	218 5.64%	939 4.10%
11:00 PM to 11:59 PM	105 3.13%	109 3.62%	84 2.83%	92 3.07%	112 3.61%	187 5.17%	196 5.07%	885 3.86%
Unknown	13 0.39%	5 0.17%	4 0.13%	1 0.03%	3 0.10%	8 0.22%	7 0.18%	41 0.18%
TOTAL	3355 14.65%	3008 13.13%	2963 12.94%	2995 13.08%	3100 13.53%	3617 15.79%	3866 16.88%	22904 100.00%

The over-represented times for improperly restrained drivers is almost a perfect correlation with DUI (alcohol or other drugs). The correlation with age and DUI is also extremely high. If seat-belts are going to expand in their life-saving capabilities, some way will have to be found to get the impaired drivers to buckle up. In the past there has been a tendency to give up on these drivers, and this may be the result.

3.4 Time of Day by Day of the Week: INJURY Unrestrained Causal Drivers

CARE 10.2.1.3 - [Crosstab Results - 2016-2020 Alabama Integrated Crash Data - Filter = Restraint Driver None Used C323]

File Dashboard Filters Analysis Crosstab Locations Tools Window Help

2016-2020 Alabama Integrated Crash Data | Restraint Driver None Used C323 | 1/ 1/2016 | 12/31/2020

Suppress Zero Values: None | Select Cells: | Column: Day of the Week ; Row: Time of Day

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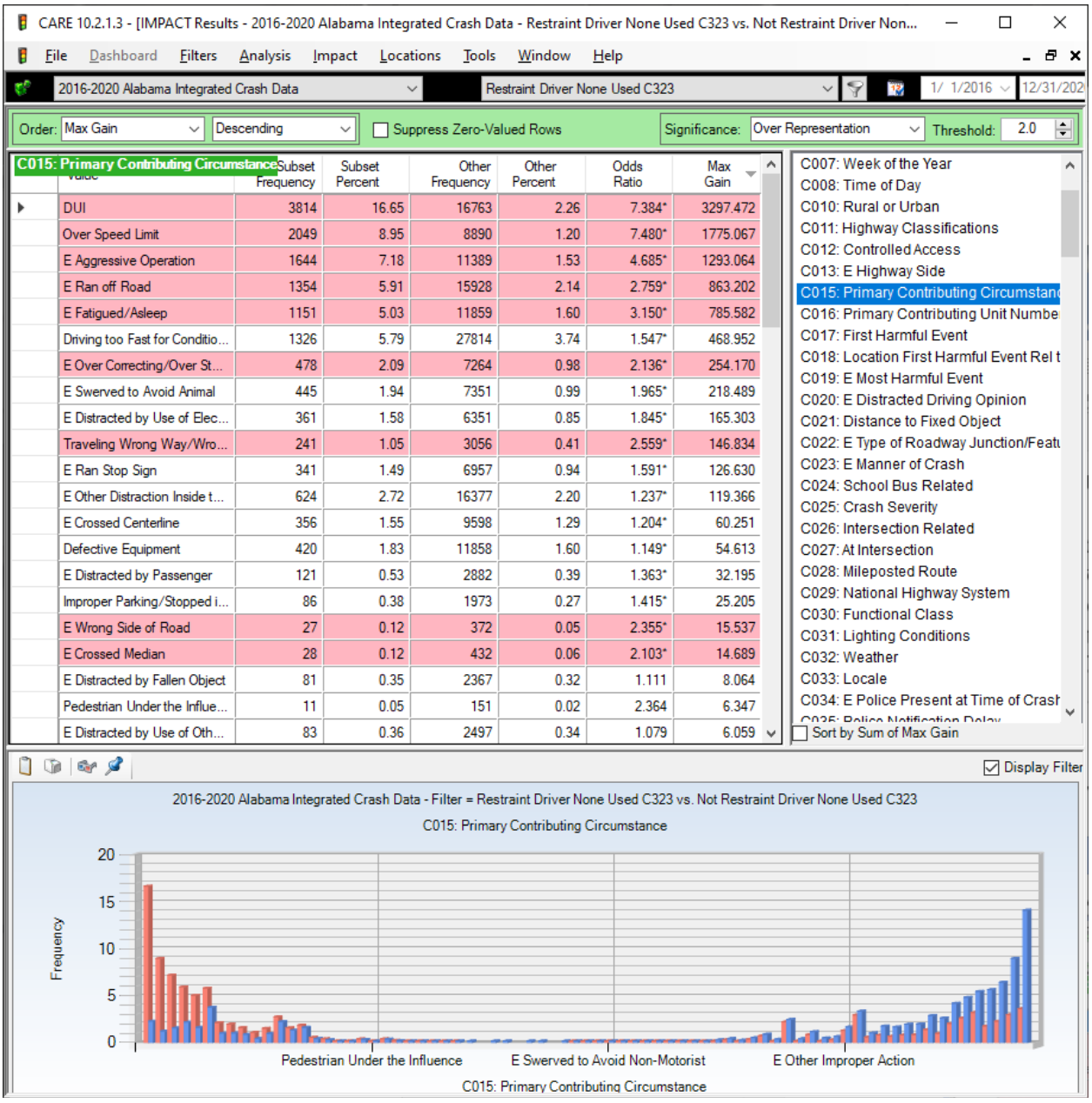
5:00 AM to 5:59 AM	112 3.34%	97 3.22%	95 3.21%	85 2.84%	93 3.00%	97 2.68%	103 2.66%	682 2.98%
6:00 AM to 6:59 AM	103 3.07%	117 3.89%	96 3.24%	121 4.04%	118 3.81%	100 2.76%	134 3.47%	789 3.44%
7:00 AM to 7:59 AM	98 2.92%	153 5.09%	166 5.60%	177 5.91%	170 5.48%	163 4.51%	105 2.72%	1032 4.51%
8:00 AM to 8:59 AM	66 1.97%	122 4.06%	102 3.44%	116 3.87%	90 2.90%	110 3.04%	87 2.25%	693 3.03%
9:00 AM to 9:59 AM	96 2.86%	103 3.42%	101 3.41%	95 3.17%	96 3.10%	89 2.46%	99 2.56%	679 2.96%
10:00 AM to 10:59 AM	82 2.44%	129 4.29%	117 3.95%	112 3.74%	106 3.42%	121 3.35%	112 2.90%	779 3.40%
11:00 AM to 11:59 AM	108 3.22%	135 4.49%	137 4.62%	111 3.71%	149 4.81%	113 3.12%	127 3.29%	880 3.84%
12:00 Noon to 12:59 PM	99 2.95%	146 4.85%	144 4.86%	135 4.51%	150 4.84%	164 4.53%	143 3.70%	981 4.28%
1:00 PM to 1:59 PM	132 3.93%	137 4.55%	137 4.62%	155 5.18%	155 5.00%	175 4.84%	153 3.96%	1044 4.56%
2:00 PM to 2:59 PM	160 4.77%	152 5.05%	184 6.21%	144 4.81%	182 5.87%	183 5.06%	200 5.17%	1205 5.26%
3:00 PM to 3:59 PM	166 4.95%	199 6.62%	222 7.49%	213 7.11%	206 6.65%	288 7.96%	181 4.68%	1475 6.44%
4:00 PM to 4:59 PM	148 4.41%	194 6.45%	215 7.26%	228 7.61%	212 6.84%	241 6.66%	207 5.35%	1445 6.31%
5:00 PM to 5:59 PM	153 4.56%	234 7.78%	231 7.80%	222 7.41%	228 7.35%	257 7.11%	202 5.23%	1527 6.67%
6:00 PM to 6:59 PM	206 6.14%	191 6.35%	167 5.64%	186 6.21%	171 5.52%	207 5.72%	212 5.48%	1340 5.85%
7:00 PM to 7:59 PM	162 4.83%	153 5.09%	131 4.42%	129 4.31%	149 4.81%	193 5.34%	201 5.20%	1118 4.88%
8:00 PM to 8:59 PM	174 5.19%	135 4.49%	135 4.56%	125 4.17%	139 4.48%	168 4.64%	188 4.86%	1064 4.65%
9:00 PM to 9:59 PM	160 4.77%	126 4.19%	121 4.08%	126 4.21%	156 5.03%	202 5.58%	218 5.64%	1109 4.84%
10:00 PM to 10:59 PM	134 3.99%	96 3.19%	99 3.34%	105 3.51%	129 4.16%	158 4.37%	218 5.64%	939 4.10%
11:00 PM to 11:59 PM	105 3.13%	109 3.62%	84 2.83%	92 3.07%	112 3.61%	187 5.17%	196 5.07%	885 3.86%
Unknown	13 0.39%	5 0.17%	4 0.13%	1 0.03%	3 0.10%	8 0.22%	7 0.18%	41 0.18%
TOTAL	3355 14.65%	3008 13.13%	2963 12.94%	2995 13.08%	3100 13.53%	3617 15.79%	3866 16.88%	22904 100.00%

Crosstab analysis of time of day by day of the week for crashes in which restraints were not used by causal drivers helps target specific times in which officers should increase patrols in order to prevent these crashes. The above applies to all crashes in which the causal driver was not properly restrained, and it correlates very closely to Impaired Driving (alcohol and other drugs).

4.0 Crash and Driver Causal Factors (driver behavior)

Analysis of crash causal factors determines which factors are the most likely contributors to crashes involving drivers who did not use restraints. The primary contributing circumstances of the crashes were analyzed, and overrepresentation values indicate certain risk-taking behaviors associated with this type of crash. Vehicle model year and speed at impact were also evaluated to characterize factors that are consistently associated with crashes in which drivers are not properly restrained.

4.1 Primary Contributing Circumstance



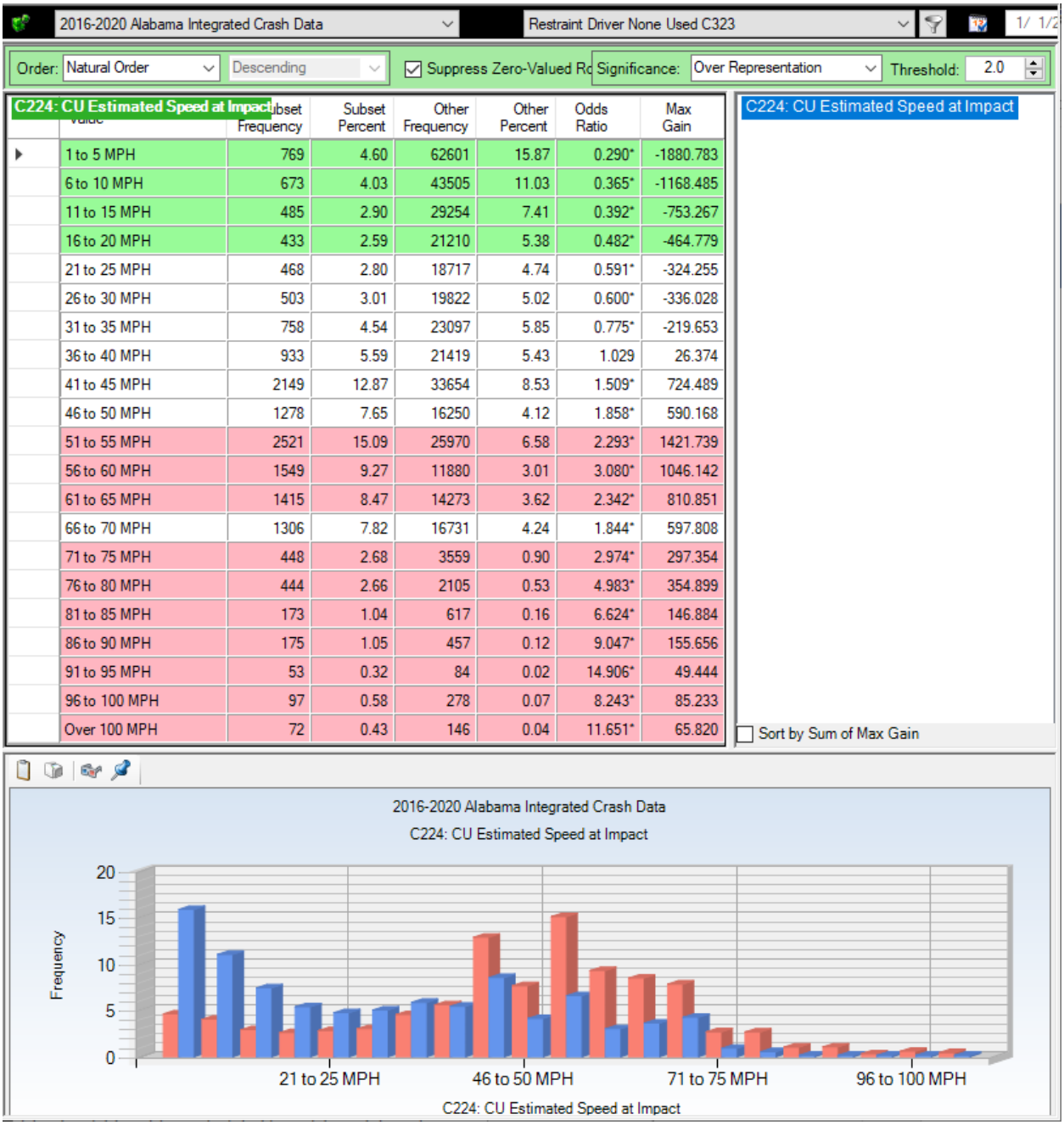
4.1a Discussion on Primary Contributing Circumstances (PCCs)

The table listing in the display above includes all of the PCC categories that have statistically significant over-representations. Over-representation factors indicate that certain risk-taking behaviors are highly correlated with crashes in which causal drivers do not use restraints. In order of maximum potential expected gain (Max Gain), these include: DUI, Over the Speed Limit (ranked even higher when combined with "Driving too Fast for Conditions"), Aggressive Operation, Ran off the Road and Fatigued/Asleep. DUI for Non-restrained drivers was determined to be 7.384 times the proportion that it was for Restrained drivers, further reinforcing the time findings with regard to impaired driving given above. A recent ID/DUI problem identification for the Impaired Driving Plan revealed that one of the primary reason for fatalities in ID crashes is a failure to buckle up. That same study showed that in FY2017 the impact speeds of ID crashes has decreased to a point that a 17% reduction in ID fatalities was observed in FY2017 from the previous year, giving the indication that the behavior of ID drivers is possible.

Overrepresented contributing circumstances include several things that are correlated with impairment and/or speed: Aggressive Operation, Ran off Road, Driving Too Fast for Conditions, Over Correcting/Over Steering, Swerved to Avoid Animal, and Traveling the Wrong Way are some examples. Aggressive operation is 4.685 times its proportion in comparisons with crashes in which the causal driver is restrained, and Over the Speed Limit is over seven times the expected proportion. Distracted driving is also an issue with the proportion of unrestrained drivers distracted by the use of an electronic device being about 84.5% higher than that of those properly restrained.

It is generally recognized that the presence of seat belts will not have a large impact on the causation of these crashes, although the increased ability to maintain control in adverse situations should not be minimized as a restraint benefit. However, the correlation here would be the result of risk acceptance in general, and the inability or unwillingness of those who are impaired to consider the life-saving benefits of restraint use. Additionally, analysis of other contributing circumstances presented similar risk-taking behaviors associated with crashes in which causal drivers did not use restraints. It is imperative that countermeasures be developed to convince risk takers that it is almost certain that at some point in time they will be involved in a severe crash.

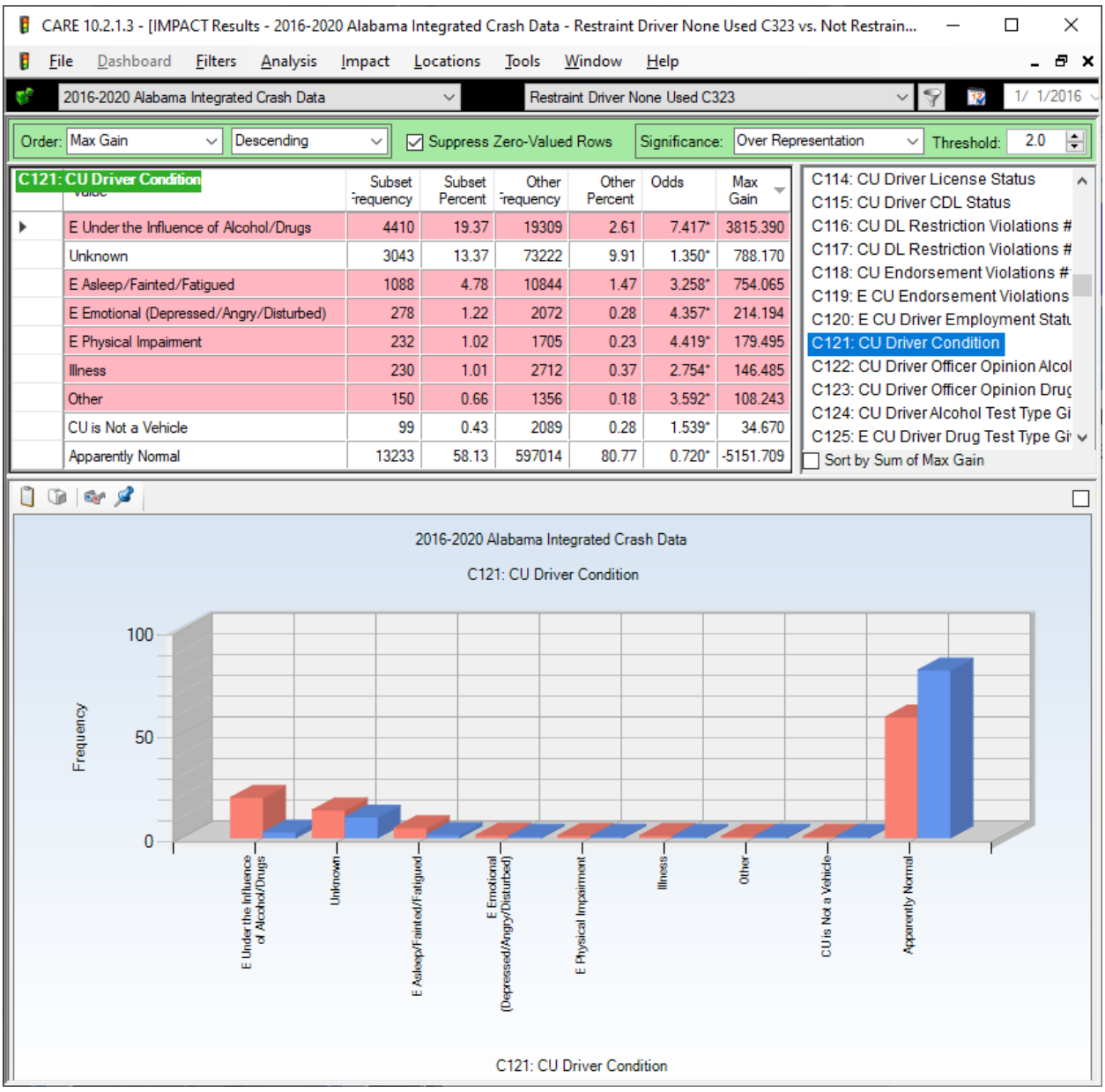
4.2 Speed at Impact



C224: CU Estimated Speed at Impact	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
1 to 5 MPH	769	4.60	62601	15.87	0.290*	-1880.783
6 to 10 MPH	673	4.03	43505	11.03	0.365*	-1168.485
11 to 15 MPH	485	2.90	29254	7.41	0.392*	-753.267
16 to 20 MPH	433	2.59	21210	5.38	0.482*	-464.779
21 to 25 MPH	468	2.80	18717	4.74	0.591*	-324.255
26 to 30 MPH	503	3.01	19822	5.02	0.600*	-336.028
31 to 35 MPH	758	4.54	23097	5.85	0.775*	-219.653
36 to 40 MPH	933	5.59	21419	5.43	1.029	26.374
41 to 45 MPH	2149	12.87	33654	8.53	1.509*	724.489
46 to 50 MPH	1278	7.65	16250	4.12	1.858*	590.168
51 to 55 MPH	2521	15.09	25970	6.58	2.293*	1421.739
56 to 60 MPH	1549	9.27	11880	3.01	3.080*	1046.142
61 to 65 MPH	1415	8.47	14273	3.62	2.342*	810.851
66 to 70 MPH	1306	7.82	16731	4.24	1.844*	597.808
71 to 75 MPH	448	2.68	3559	0.90	2.974*	297.354
76 to 80 MPH	444	2.66	2105	0.53	4.983*	354.899
81 to 85 MPH	173	1.04	617	0.16	6.624*	146.884
86 to 90 MPH	175	1.05	457	0.12	9.047*	155.656
91 to 95 MPH	53	0.32	84	0.02	14.906*	49.444
96 to 100 MPH	97	0.58	278	0.07	8.243*	85.233
Over 100 MPH	72	0.43	146	0.04	11.651*	65.820

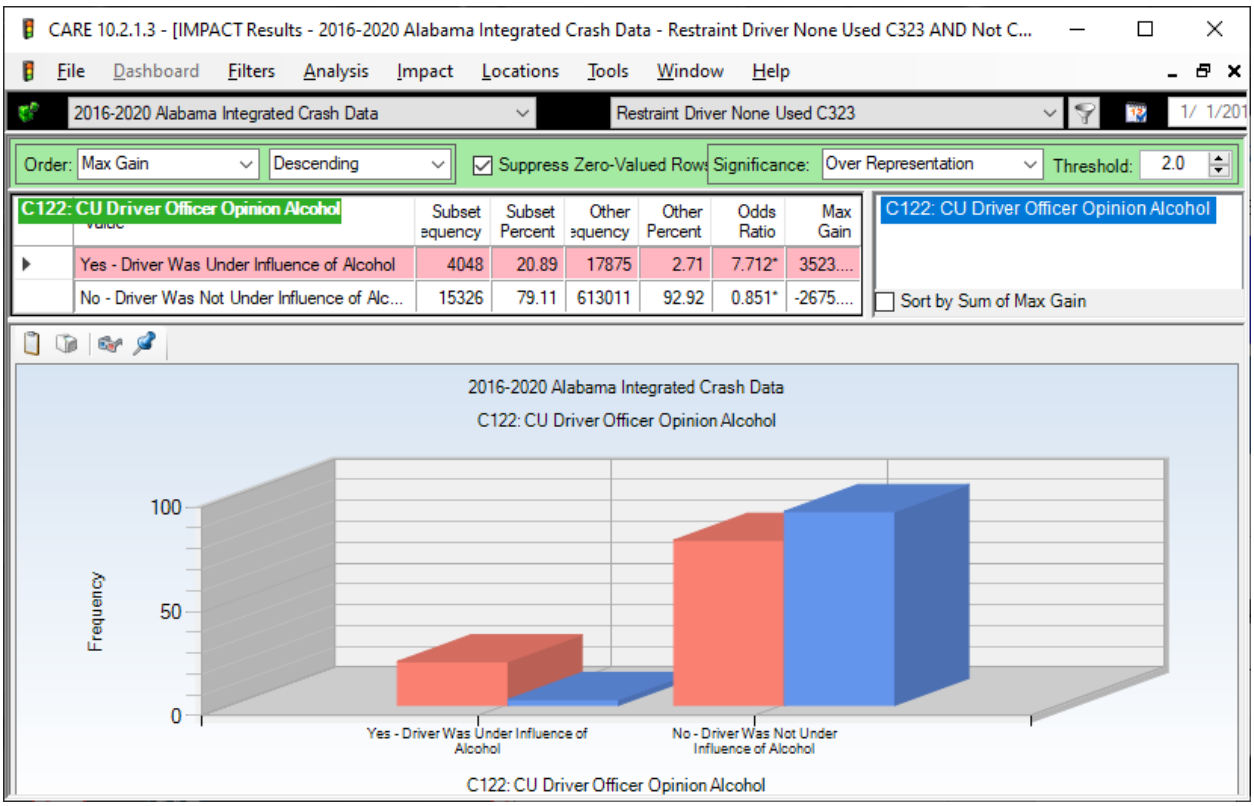
Speed at impact for crashes in which drivers failed to use restraints is most highly overrepresented in the range of 91-95 MPH and over. Crashes in which restraints are not used consistently occur at higher speeds than crashes in which restraints were used by the causal driver. This confirms the rural-urban finding, in that speeds are generally higher in the rural areas. Since speed is an excellent proxy for risk-taking, this shows the correlation between improper restraints and other risk-taking behaviors. It also exacerbates the problem, resulting in greater severity caused by the high-speed, unrestrained driver and passenger situations. Other severity factors are considered immediately below.

4.3 CU Driver Condition



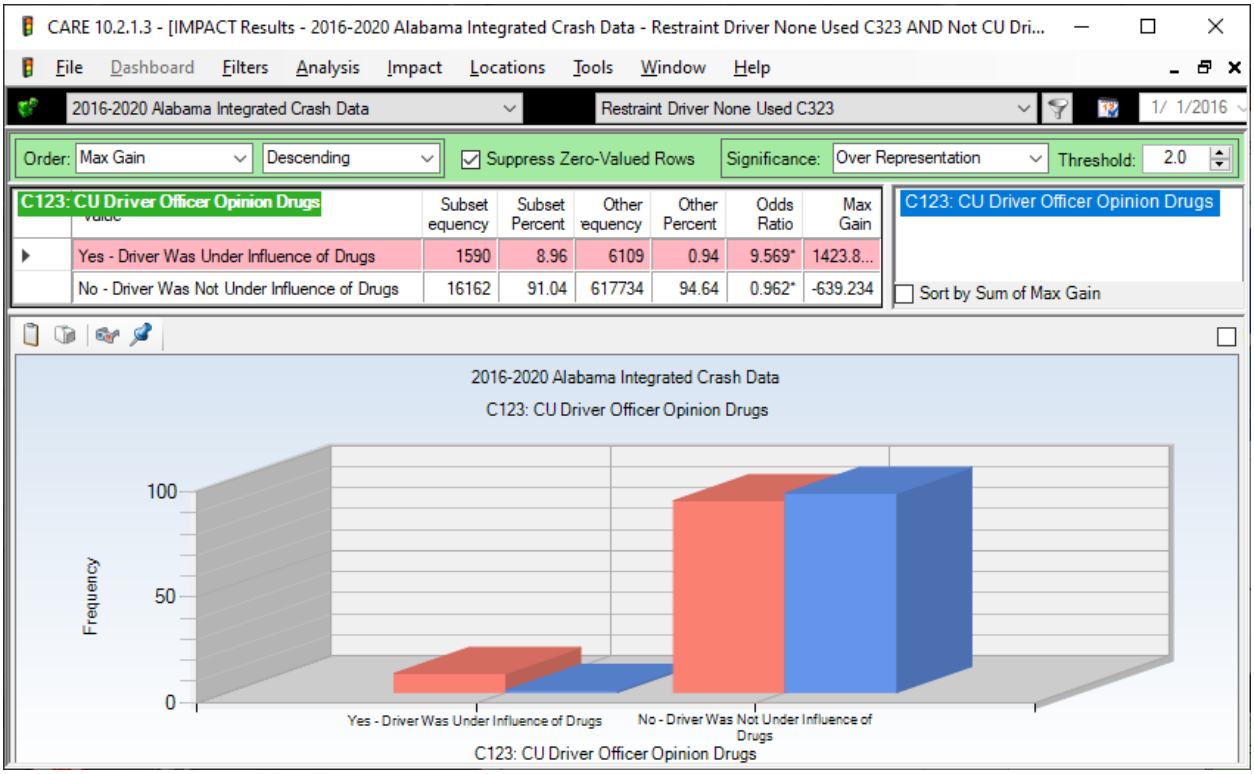
This attribute tells the reason that many of the drivers were not properly restrained. Of course, there is no principle that states that just because a driver is inebriated, s/he cannot buckle up. But the fact is, an extremely larger proportion of them do not, and they are found with much more severe injuries for this reason. The next two attributes look at alcohol and other drugs specifically. We say "other drugs" because we do not wish to infer that alcohol is not a drug; it is a very addictive drug.

4.4 DUI Alcohol



Drivers who failed to use proper restraints had a proportion of DUI alcohol that was 7.712 times that of those drivers who were properly restrained.

4.5 DUI Drugs



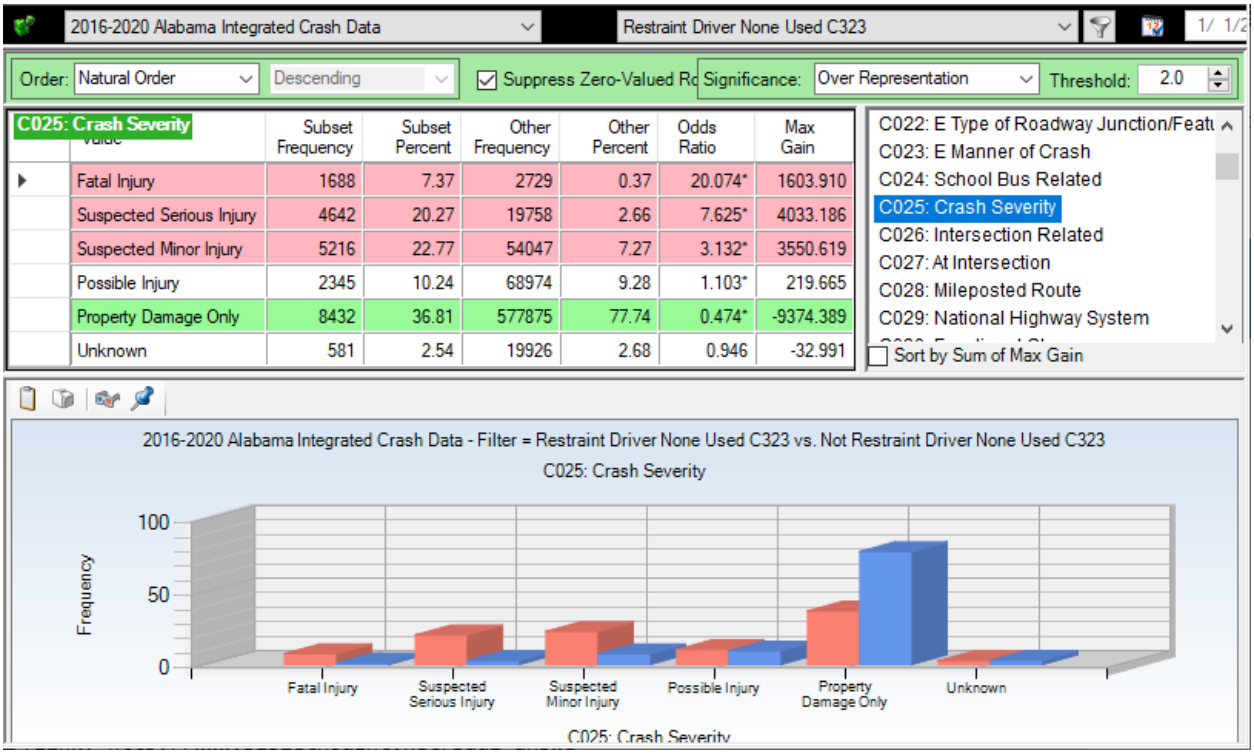
Drugs other than alcohol had a higher Odds Ratio multiplier than did alcohol. The above indicates that drivers who failed to use proper restraints had a proportion of DUI drugs that was 9.569 times that of those drivers who were properly restrained.

In the cases above, we repeat that the failure to use proper restraints is not the cause of the DUI – it is important to recognize that those who are under the influence do not take their health and wellbeing as seriously as sober individuals. Getting through to this group is a major problem that has generally only been addressed from the point of view of reducing DUI in general. This is probably because setting up special programs for those who are going to drink and drive could infer its social acceptance.

5 Severity Factors

The sections above generally relate to both crash severity and causation. This section considers crash severity per se. Generally, restraints do not prevent crashes, although on some occasions they might help to keep the driver firmly behind the wheel and in a position to avoid or mitigate a crash. But in general occupant restraints serve to reduce the severity of crashes when they occur. Severity factors were analyzed in several different categories to determine to what extent the use of restraints affects the safety of drivers and passengers. These factors analyzed include crash severity, crash severity in urban versus rural areas, number injured, number killed, driver ejection status, and driver injury type.

5.1 Crash Severity



Fatal, incapacitating, and non-incapacitating injuries are all extremely overrepresented in crashes that occurred without the use of restraints, as given by the Odds Ratios that show the proportions of fatal, Incapacitation Injury and Non-incapacitating injury were about 20, 8 and 3 times expected, respectively, compared to the same for restrained drivers. While overrepresentations in these severity classifications were certainly expected, these results further quantify the effects of the benefits of restraint use. Property damage only was far more common in crashes in which drivers employed the use of restraints.

5.2 Crash Severity by Highway Classification for Driver Not Restrained

CARE 10.2.1.3 - [Crosstab Results - 2016-2020 Alabama Integrated Crash Data - Filter = Restraint Driver None Used C323]

File Dashboard Filters Analysis Crosstab Locations Tools Window Help

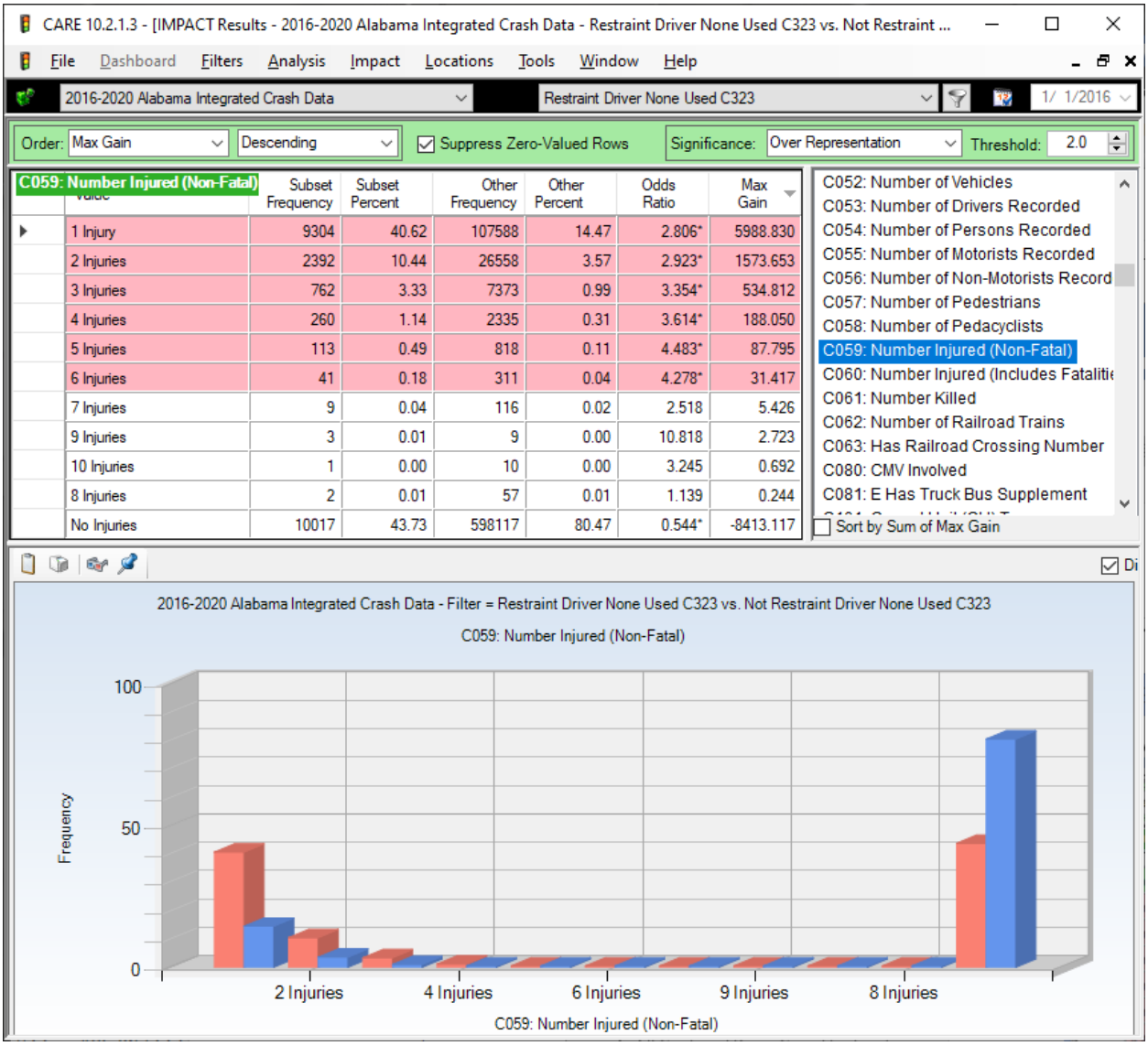
2016-2020 Alabama Integrated Crash Data | Restraint Driver None Used C323 | 1/ 1/2016

Suppress Zero Values: Rows and Columns | Select Cells: | Column: Highway Classifications ; Row: Crash Severity

	Interstate	Federal	State	County	Municipal	Private Property	TOTAL
Fatal Injury	148 8.20%	221 8.30%	481 9.77%	610 7.46%	224 4.48%	4 1.15%	1688 7.37%
Suspected Serious Injury	374 20.72%	616 23.14%	1143 23.23%	1869 22.87%	626 12.53%	14 4.02%	4642 20.27%
Suspected Minor Injury	404 22.38%	612 22.99%	1131 22.98%	2002 24.50%	1027 20.56%	40 11.49%	5216 22.77%
Possible Injury	162 8.98%	307 11.53%	529 10.75%	657 8.04%	653 13.07%	37 10.63%	2345 10.24%
Property Damage Only	695 38.50%	854 32.08%	1508 30.64%	2840 34.75%	2294 45.92%	241 69.25%	8432 36.81%
Unknown	22 1.22%	52 1.95%	129 2.62%	194 2.37%	172 3.44%	12 3.45%	581 2.54%
TOTAL	1805 7.88%	2662 11.62%	4921 21.49%	8172 35.68%	4996 21.81%	348 1.52%	22904 100.00%

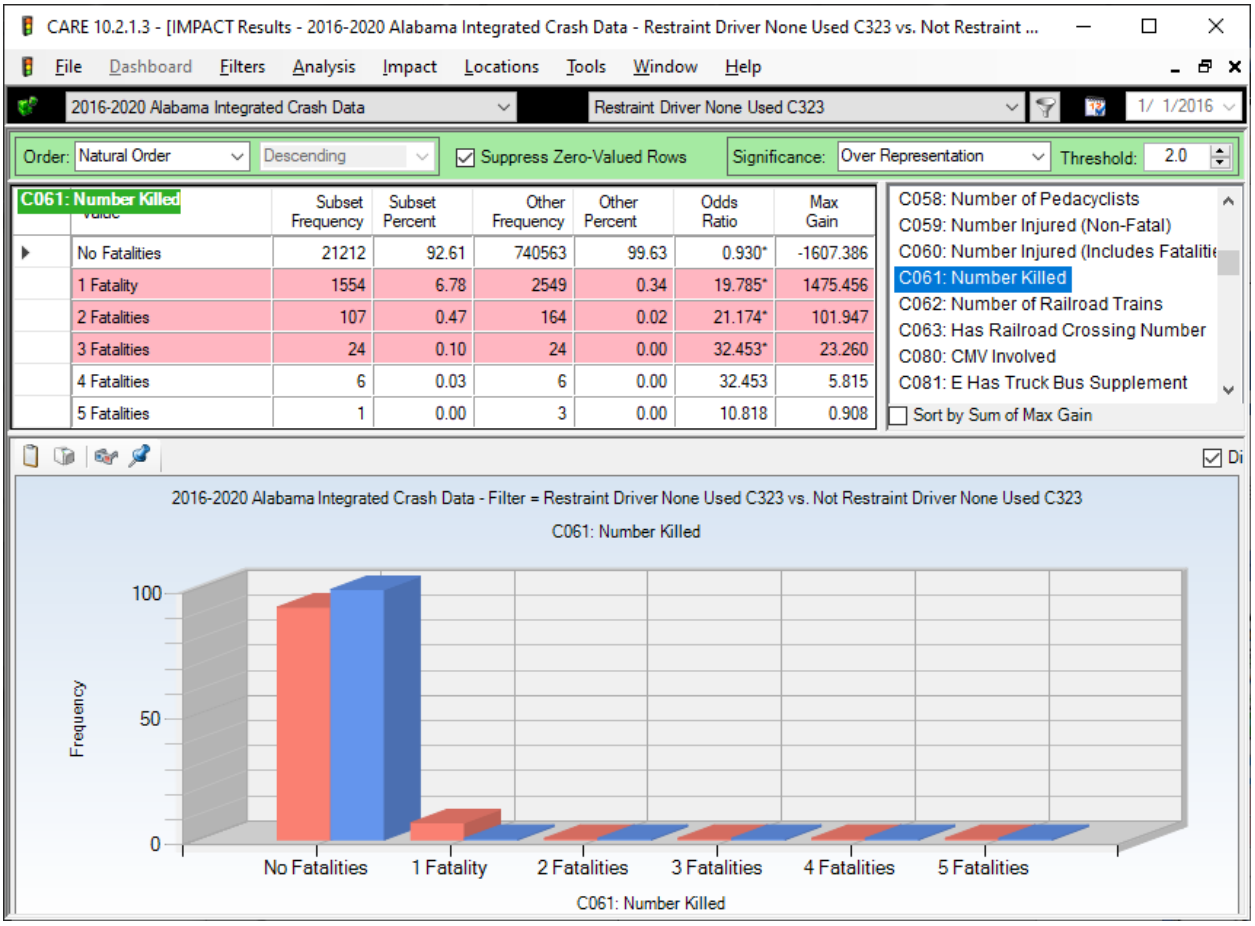
Analysis of crash severity by highway classification *for crashes in which the causal driver did not use restraints* shows that fatal injuries were overrepresented by greater than 10% higher proportions only on State roadways. Fatality crashes are also over-represented on Interstates, Federal and County roads, the proportion of fatal crashes there were only about one or two percent higher than their overall crash proportions. Possible injuries and Property Damage Only were highly overrepresented on municipal highways and private property.

5.3 Number Injured



All of the multiple injury categories that apply are given above along with the No Injuries and the 1 Injury classifications. The fact that all multiple injury classifications are over-represented is a good indication that the use of the unrestrained driver is an excellent proxy for the passengers in that vehicle also being unrestrained. Track down the Odds Ratio column and see how the multiple injuries generally increase in their over-representations right up to 7 injuries, and then they are dramatically over-represented in the 9 and 11 injuries categories. No statistical tests are done if either of the attributes being tested has a frequency of less than 20. So while any hard conclusions regarding crashes above 6 injuries should be avoided, no doubt these high-injury crashes are greatly over-represented when considered collectively. These results show quite plainly that crashes in which the causal driver was not restrained are much more severe in their effects to all passengers and not just the causal driver. The overrepresentation of multiple injuries in the causal vehicle might also indicate a tendency of unrestrained drivers to travel with multiple individuals in the vehicle.

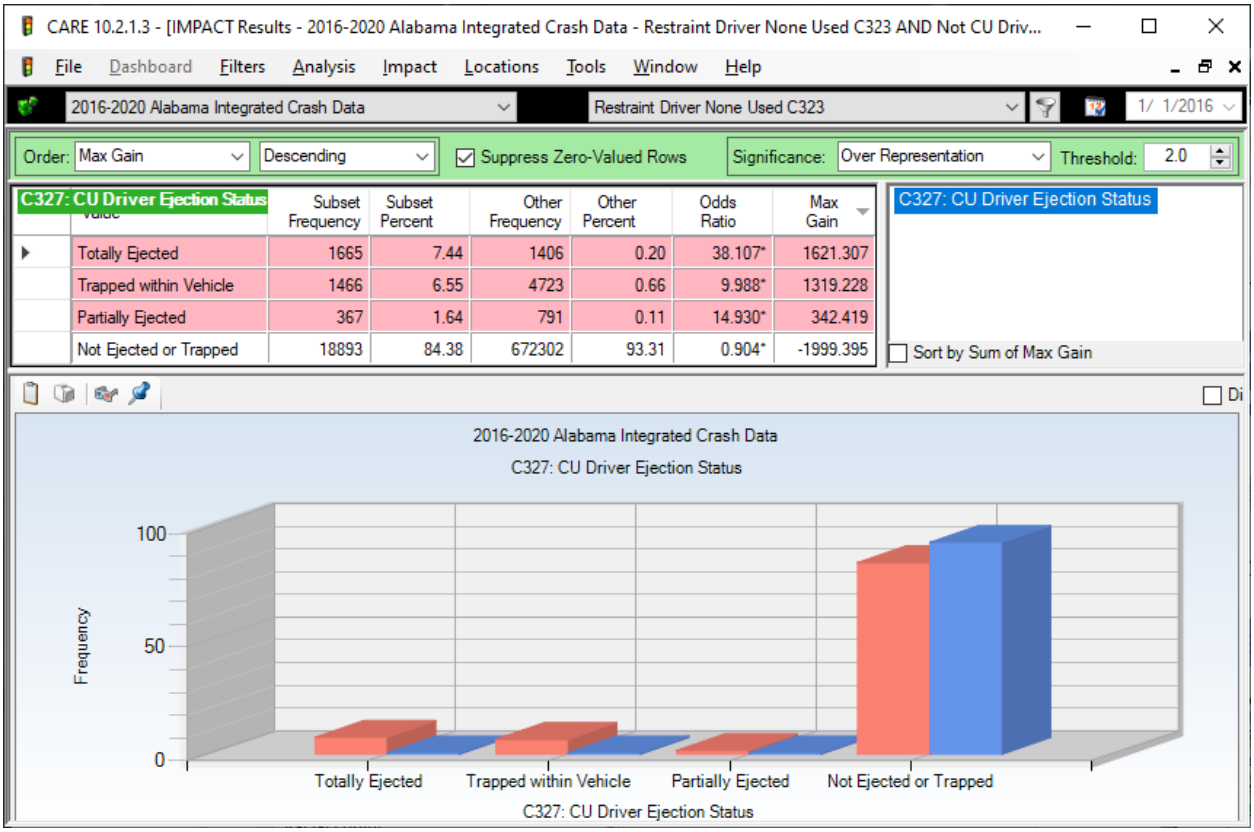
5.4 Number Killed



The proportion of fatalities in general as well as the proportion of multiple fatality crashes is dramatically overrepresented when restraints are not used by drivers (and inferred most other passengers) in the causal vehicle. The following Odds Ratios are indicative of ow much more severe the crashes are when the causal driver is not restrained:

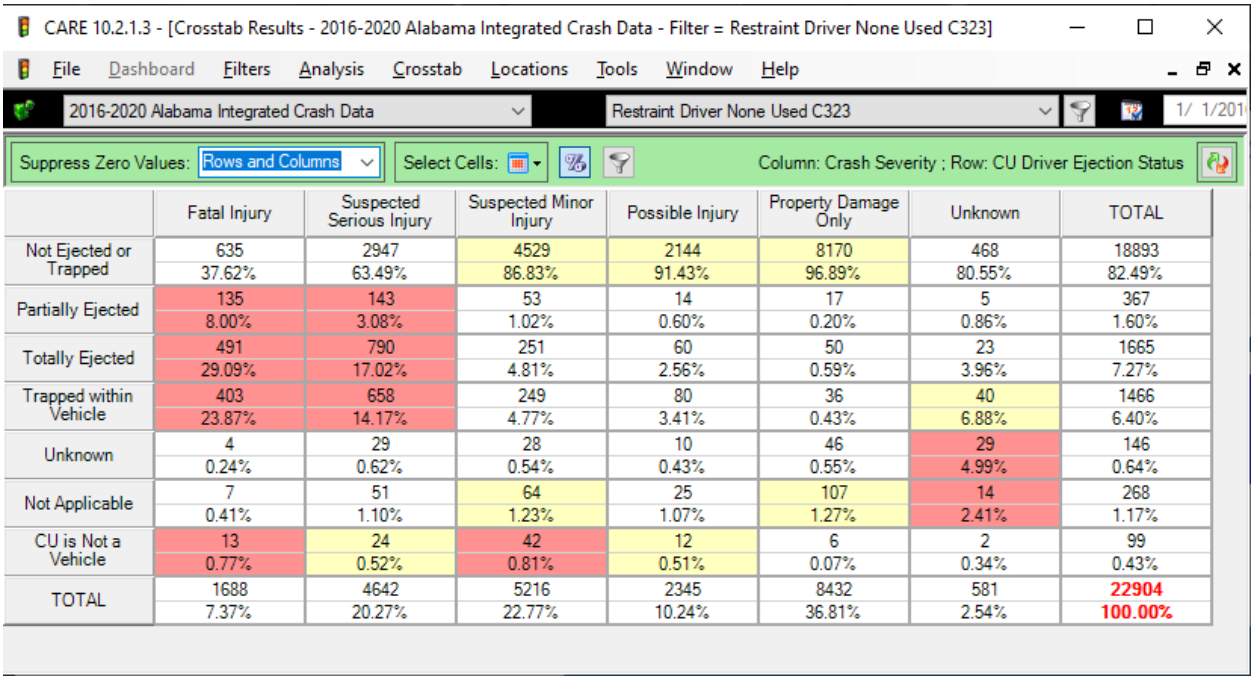
	Number	Odds Ratio
1 Fatality	1554	19.785
2 Fatalities	107	21.174
3 Fatalities	24	32.453
4 Fatalities	6	32.453
5 Fatalities	1	10.818

5.5 Driver Ejection Status



Driver Totally Ejected is overrepresented by a factor of over 38. This extremely high Odds Ratio speaks to the effectiveness of seatbelts in preventing one of the most lethal events that can occur in a crash – being ejected from the vehicle. See the next section on the severity increases when ejection is involved. Partial ejection and entrapment in the vehicle are also greatly overrepresented (14.930 and 9.988, respectively), which is also expected in crashes in which safety equipment is not properly utilized.

5.6 Ejection Status by Severity



	Fatal Injury	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	Property Damage Only	Unknown	TOTAL
Not Ejected or Trapped	635 37.62%	2947 63.49%	4529 86.83%	2144 91.43%	8170 96.89%	468 80.55%	18893 82.49%
Partially Ejected	135 8.00%	143 3.08%	53 1.02%	14 0.60%	17 0.20%	5 0.86%	367 1.60%
Totally Ejected	491 29.09%	790 17.02%	251 4.81%	60 2.56%	50 0.59%	23 3.96%	1665 7.27%
Trapped within Vehicle	403 23.87%	658 14.17%	249 4.77%	80 3.41%	36 0.43%	40 6.88%	1466 6.40%
Unknown	4 0.24%	29 0.62%	28 0.54%	10 0.43%	46 0.55%	29 4.99%	146 0.64%
Not Applicable	7 0.41%	51 1.10%	64 1.23%	25 1.07%	107 1.27%	14 2.41%	268 1.17%
CU is Not a Vehicle	13 0.77%	24 0.52%	42 0.81%	12 0.51%	6 0.07%	2 0.34%	99 0.43%
TOTAL	1688 7.37%	4642 20.27%	5216 22.77%	2345 10.24%	8432 36.81%	581 2.54%	22904 100.00%

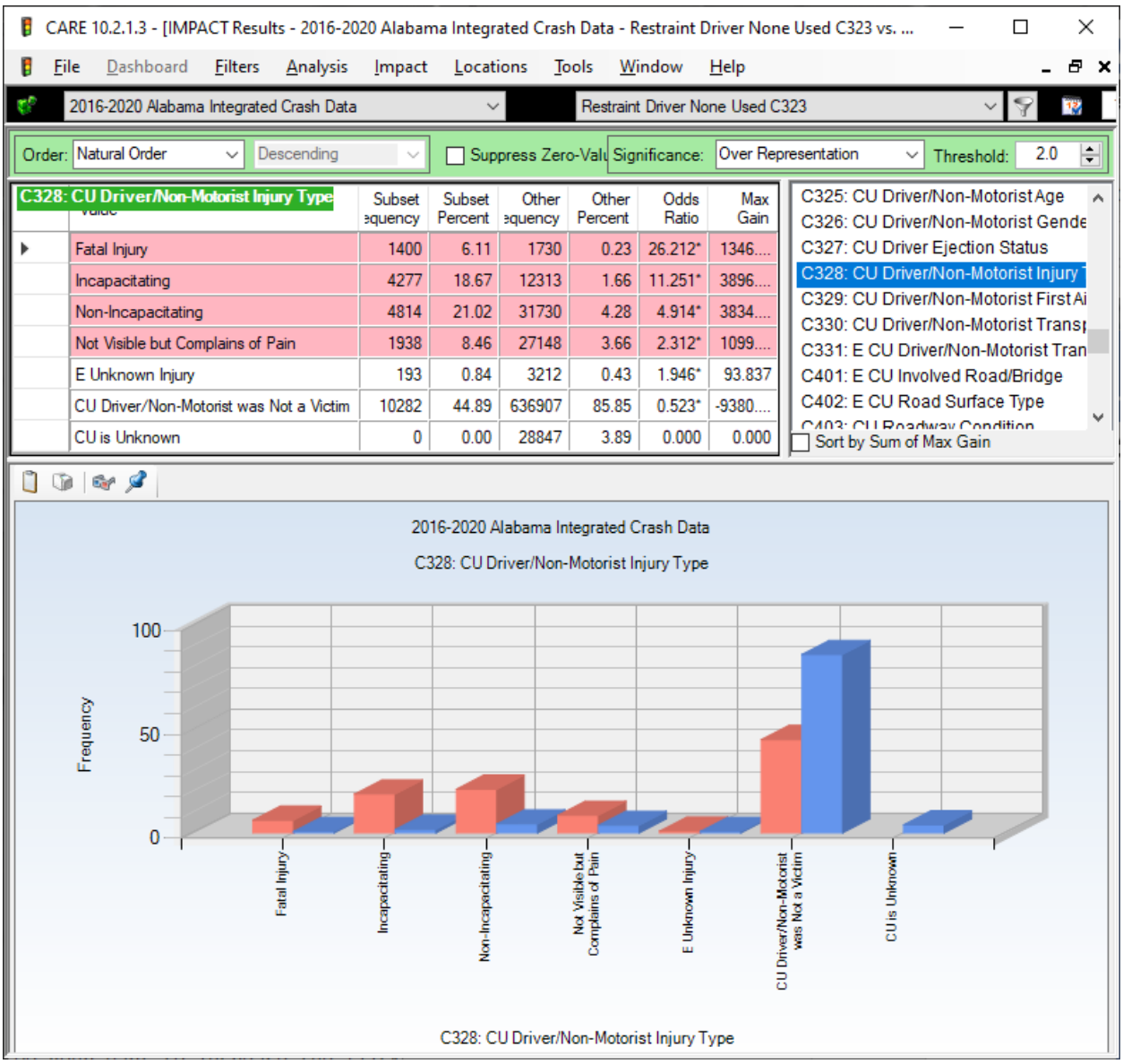
All crashes in the above cross-tabulation involved drivers who were not properly restrained. In evaluating crash severity by ejection status, data show that fatal and incapacitating injuries were significantly overrepresented in crashes in which the driver was partially ejected, totally ejected, or trapped within the vehicle. Because the ejection status is strongly associated with the use of restraints, this data indicates that failure to use restraints results in a dramatic increase in the severity of injuries in those crashes. The table given above quantifies this increase in severity. The probability of any given crash being fatal over the five years (2016-2020) of the study was 0.58% (including all crashes whether the driver/passengers were restrained or not). The following table give the multipliers to this probability (0.57%) of a crash being a fatal crash for the various ejection conditions.

Fatality Multipliers for Unrestrained Driver Persons Involved

Ejection Status	Probability of Fatality	Multiplier from All Crashes	All=1 in 175
Not Ejected	3.36%	5.79	1 in 29.47
Partially Ejected	36.78%	63.42	1 in 1.58
Totally Ejected	29.49%	50.84	1 in 1.97
Trapped in Vehicle	27.49%	47.40	1 in 2.11

The non-ejection has a multiplier of 5.79 because it is being compared to all crashes, of which a large number (over 90% of passengers) are restrained. Partial Ejection is the worst case scenario with a multiplier of over 63, and the probability of being killed is one in 1.58. For Totally Ejected it is one in 1.97, and for Trapped in Vehicle the odds are one in 2.11.

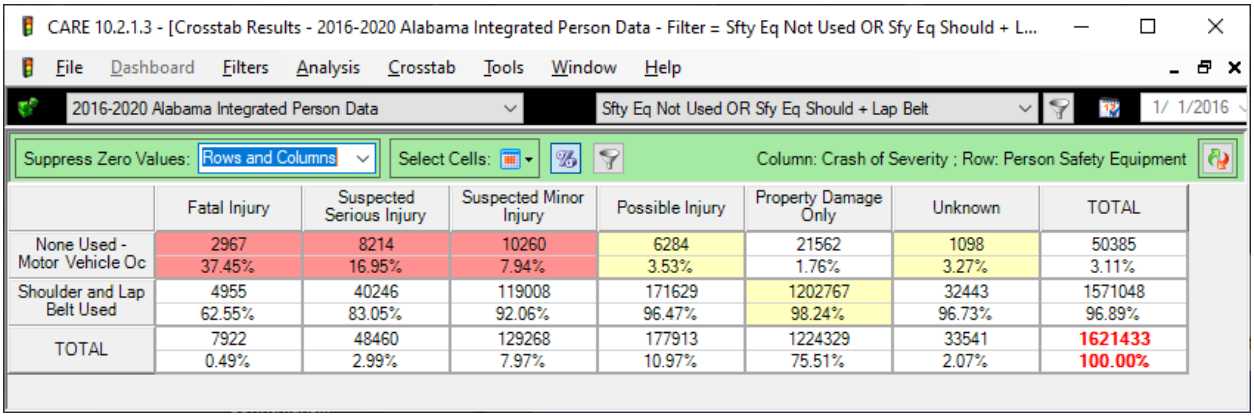
5.7 Driver Injury Type



All of the types of driver injuries, including fatalities, are consistently overrepresented in crashes where no restraints were used by the driver. The only under-represented item is Not a Victim (no injury). Fatalities in these crashes are overrepresented by a factor of over 26.212. In crashes in which safety restraints were used, drivers were far less likely to be injured. All three non-fatal injury classifications were also significantly over-represented at about 11, 5 and 2 times their expectations, respectively.

5.8 Fatality and Injury Probabilities by Restraint Use

The following is for all crashes:



	Fatal Injury	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	Property Damage Only	Unknown	TOTAL
None Used - Motor Vehicle Oc	2967	8214	10260	6284	21562	1098	50385
	37.45%	16.95%	7.94%	3.53%	1.76%	3.27%	3.11%
Shoulder and Lap Belt Used	4955	40246	119008	171629	1202767	32443	1571048
	62.55%	83.05%	92.06%	96.47%	98.24%	96.73%	96.89%
TOTAL	7922	48460	129268	177913	1224329	33541	1621433
	0.49%	2.99%	7.97%	10.97%	75.51%	2.07%	100.00%

The probability that any given crash will be classified as a fatal crash is calculated by the number in any specific category divided by the total number in that general category. From the above (which includes both restrained and non-restrained occupants), the probability of a fatality of those who are properly restrained is given by:

Total Persons Involved Restraint Used Crashes: 4,955 Fatal Crashes/1,571,048 total = 0.31539% (about 1 in every 309 crashes).

The same calculation for the None Used (top) row is:

Total Persons Involved None Used Crashes: 2,967 Fatal Crashes/50,385 total = 5.89% = (about 1 in every 17 crashes).

These figures show that the probability of being killed in a crash goes up by a factor of over 18 times the probability of being killed given proper restraints.

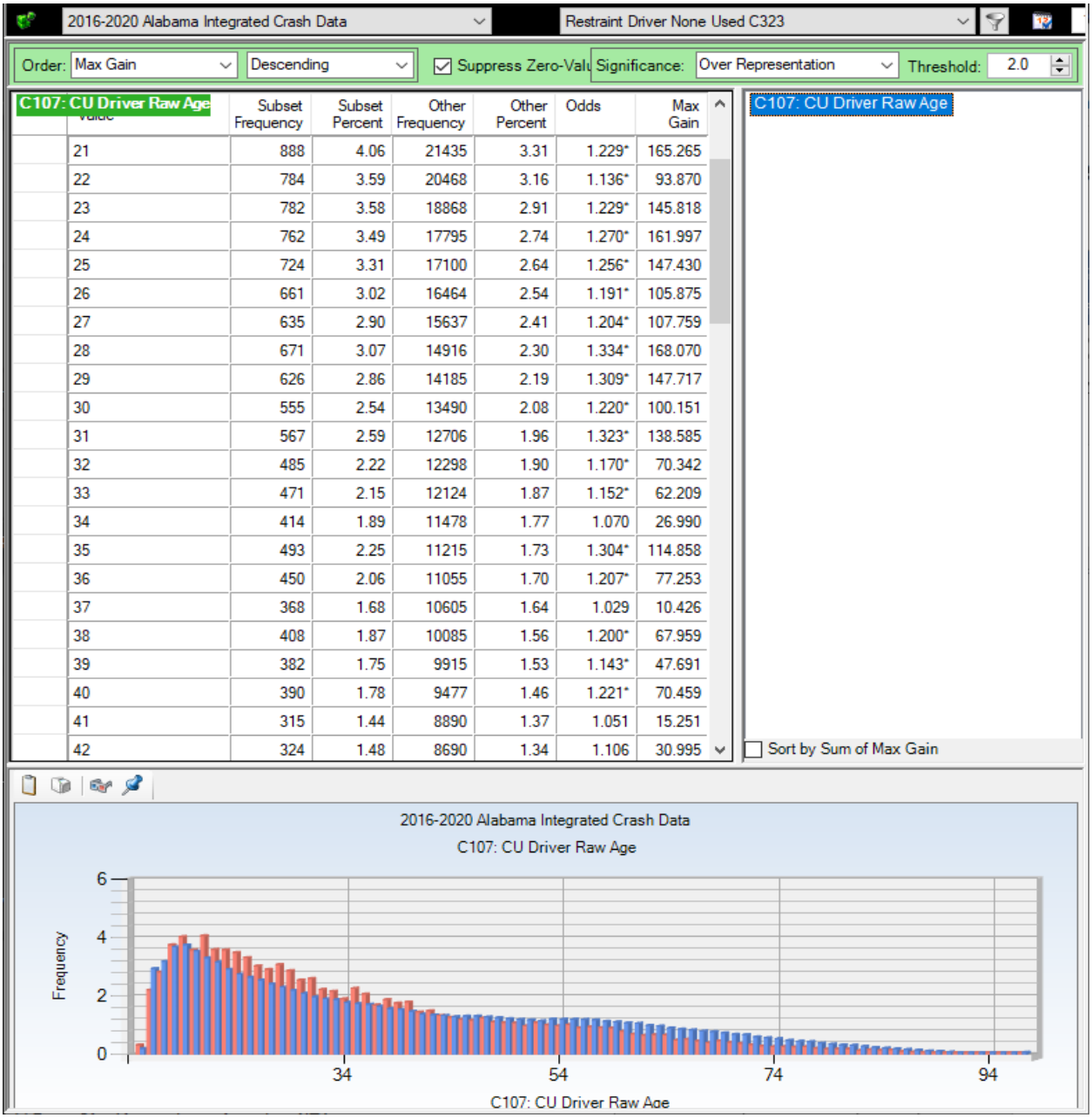
The IMPACT run comparing severity of restrained with non-restrained is given on the next page. It is interesting to see that the Odds Ratio multiplier is approximately the same as the multiplier calculated above. The other severity levels also show that being unrestrained shows very poor judgment on the part of the vehicle occupant. Suspected Serious Injury (most severe short of fatality) has an Odds Ratio of 6.364, while the other two lesser severity crashes have multipliers of 2.688 and 1.142, respectively.

These same analyses will be repeated for the back seat passengers in Section 7.

6 Driver and Vehicle Demographics

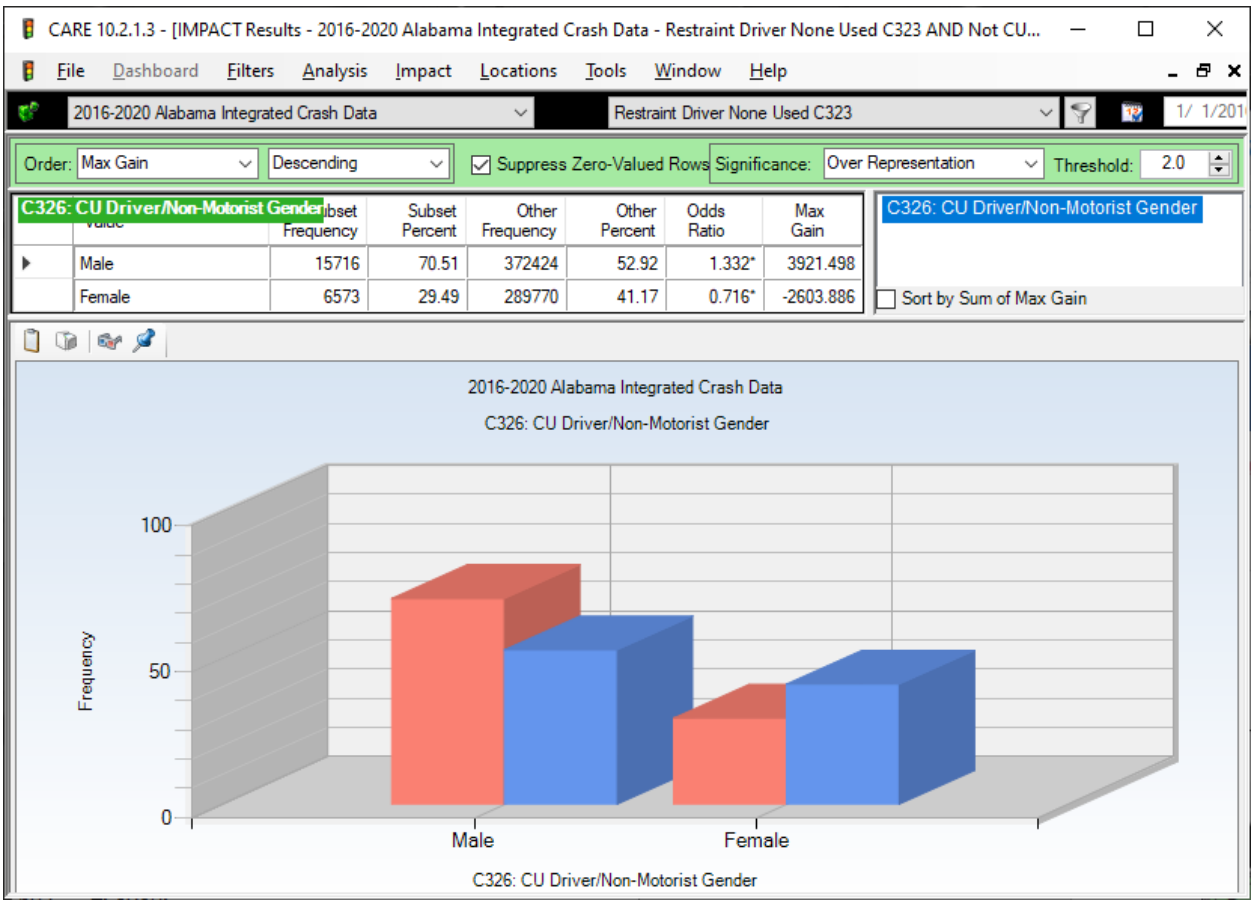
The study of driver demographics provides information about which gender or age groups are more likely to be involved in these crashes in which no restraints are used. Determination of overrepresentation can help to target the gender or age group that is more likely to be involved in this type of crash. Vehicle demographics also give clues as to where and when the restraint issues arise by the type of vehicles that are correlated with non-use.

6.1 Driver Age



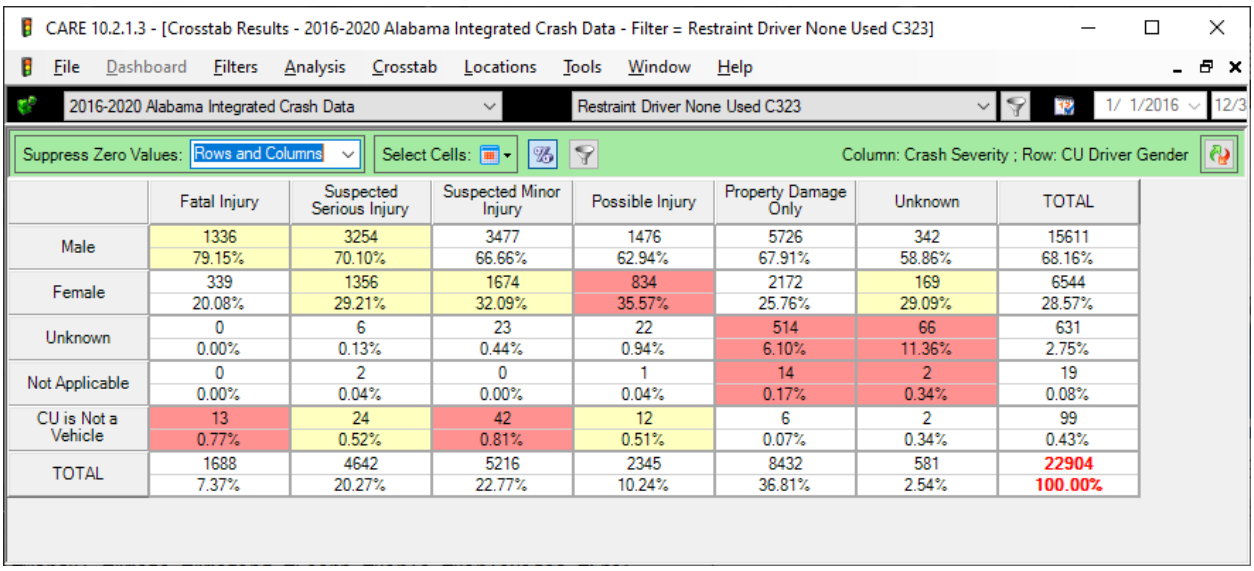
Analysis of individual driver ages indicates that crashes involving unrestrained drivers are significantly overrepresented in the following: 21-40. The 16-20 drivers are more likely to use safety equipment, perhaps due to the emphasis on it placed during training. However, there is still a large proportion of 16-20 year olds who are unrestrained, and this problem is multiplied by their overrepresentation in crashes in general. Note that, for crashes in general, they are at least twice the average of the other ages. The tendency toward risk-taking is generally thought to end at age 25. This distribution correlates very strongly with crashes in which the causal driver was impaired by drugs (including alcohol), in the significant over-representations being in the ages above 20. This could be a combination of social drinking and problem drinking.

6.2 Driver Gender



Males account for 70.51% of crashes in which restraints are not used, and they are overrepresented by a factor of 1.332. Since males also do the majority of the driving, they become a clear target for restraint countermeasures.

6.3 Driver Gender by Severity for Unrestrained Causal Drivers



	Fatal Injury	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	Property Damage Only	Unknown	TOTAL
Male	1336 79.15%	3254 70.10%	3477 66.66%	1476 62.94%	5726 67.91%	342 58.86%	15611 68.16%
Female	339 20.08%	1356 29.21%	1674 32.09%	834 35.57%	2172 25.76%	169 29.09%	6544 28.57%
Unknown	0 0.00%	6 0.13%	23 0.44%	22 0.94%	514 6.10%	66 11.36%	631 2.75%
Not Applicable	0 0.00%	2 0.04%	0 0.00%	1 0.04%	14 0.17%	2 0.34%	19 0.08%
CU is Not a Vehicle	13 0.77%	24 0.52%	42 0.81%	12 0.51%	6 0.07%	2 0.34%	99 0.43%
TOTAL	1688 7.37%	4642 20.27%	5216 22.77%	2345 10.24%	8432 36.81%	581 2.54%	22904 100.00%

The only injury proporrtion that deviated by more that 10% of its expected value for unrestrained drivers of all genders was the 834 (35.57%) for Female drivers who sustained Possible Injuries. Generally, the distribution of severity is skewed toward more severe injuries for unrestrained male drivers in the Fatal and Incapacitating Injury categories.

6.4 Vehicle Age – Model Year

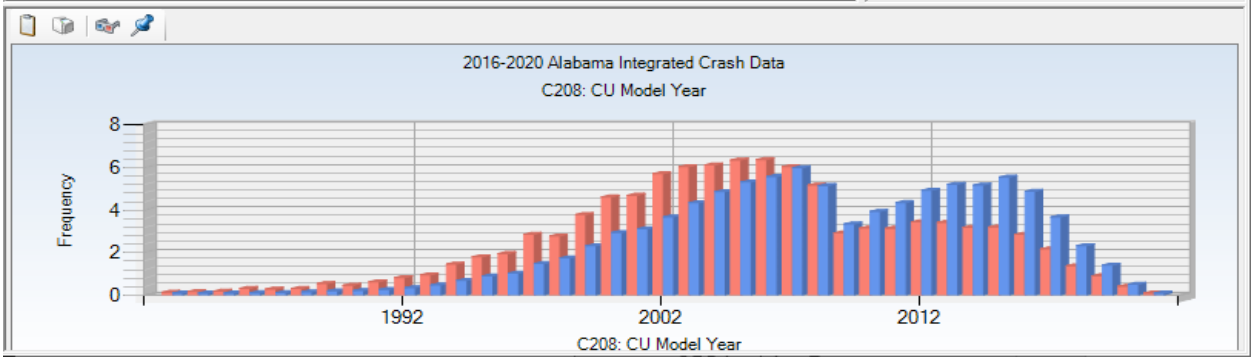
2016-2020 Alabama Integrated Crash Data | Restraint Driver None Used C323

Order: Max Gain | Descending | Suppress Zero-Valued Rc | Significance: Over Representation | Threshold: 2.0

C208: CU Model Year	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
1983	24	0.11	189	0.03	3.941*	17.910
1984	33	0.15	330	0.05	3.104*	22.367
1985	37	0.17	460	0.07	2.496*	22.178
1986	66	0.30	614	0.09	3.336*	46.216
1987	58	0.26	660	0.10	2.727*	36.734
1988	64	0.29	927	0.13	2.143*	34.131
1989	116	0.52	1230	0.18	2.927*	76.367
1990	98	0.44	1304	0.19	2.332*	55.983
1991	134	0.60	1669	0.24	2.492*	80.222
1992	179	0.80	2233	0.32	2.488*	107.049
1993	208	0.93	3125	0.45	2.066*	107.308
1994	320	1.43	4614	0.67	2.152*	171.330
1995	397	1.78	6121	0.88	2.013*	199.772
1996	431	1.93	7007	1.01	1.909*	205.223
1997	633	2.84	10126	1.46	1.940*	306.724
1998	616	2.76	11968	1.73	1.597*	230.372
1999	840	3.77	15900	2.30	1.640*	327.677
2000	1025	4.60	20263	2.93	1.570*	372.094
2001	1043	4.68	21495	3.11	1.506*	350.397
2002	1270	5.69	25339	3.66	1.555*	453.538
2003	1343	6.02	29968	4.33	1.391*	377.384
2004	1362	6.11	33546	4.85	1.260*	281.095
2005	1413	6.34	36680	5.30	1.196*	231.113
2006	1418	6.36	38479	5.56	1.144*	178.146

C208: CU Model Year

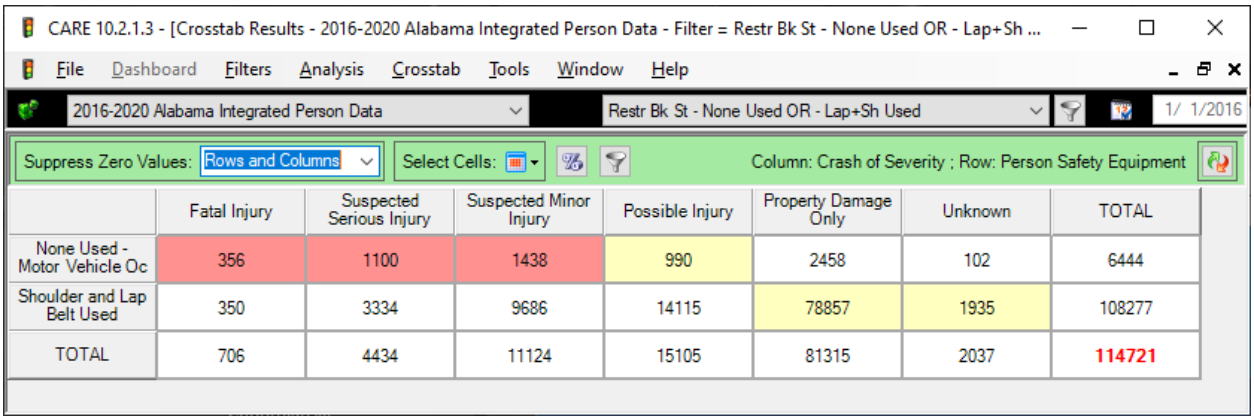
Sort by Sum of Max Gain



The listing in the display above contains all of the model years that had a statistically significant over-representation. Crashes attributed to drivers who used no restraints are greatly overrepresented in vehicles with model years 1983-2006. This might be attributed to the lack of current safety restraints (or their removal) in the oldest model vehicles. Vehicles with model years 2007 and later indicated a statistically significant higher proportion involving causal drivers using restraints as compared to those who were not restrained. One factor that would increase the rural problem could well be the economic disadvantages of those in the rural areas, and thus their use of older vehicles.

7.0 Analysis of Back Seat Occupants

The following is for back-seat crashes over the calendar year 2016-2020 time frame.



	Fatal Injury	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	Property Damage Only	Unknown	TOTAL
None Used - Motor Vehicle Oc	356	1100	1438	990	2458	102	6444
Shoulder and Lap Belt Used	350	3334	9686	14115	78857	1935	108277
TOTAL	706	4434	11124	15105	81315	2037	114721

The probability that any given crash will be classified as a fatal crash is calculated by the number in any specific category divided by the total number in that general category. From the above, the probability of a fatality of those who are properly restrained is given by:

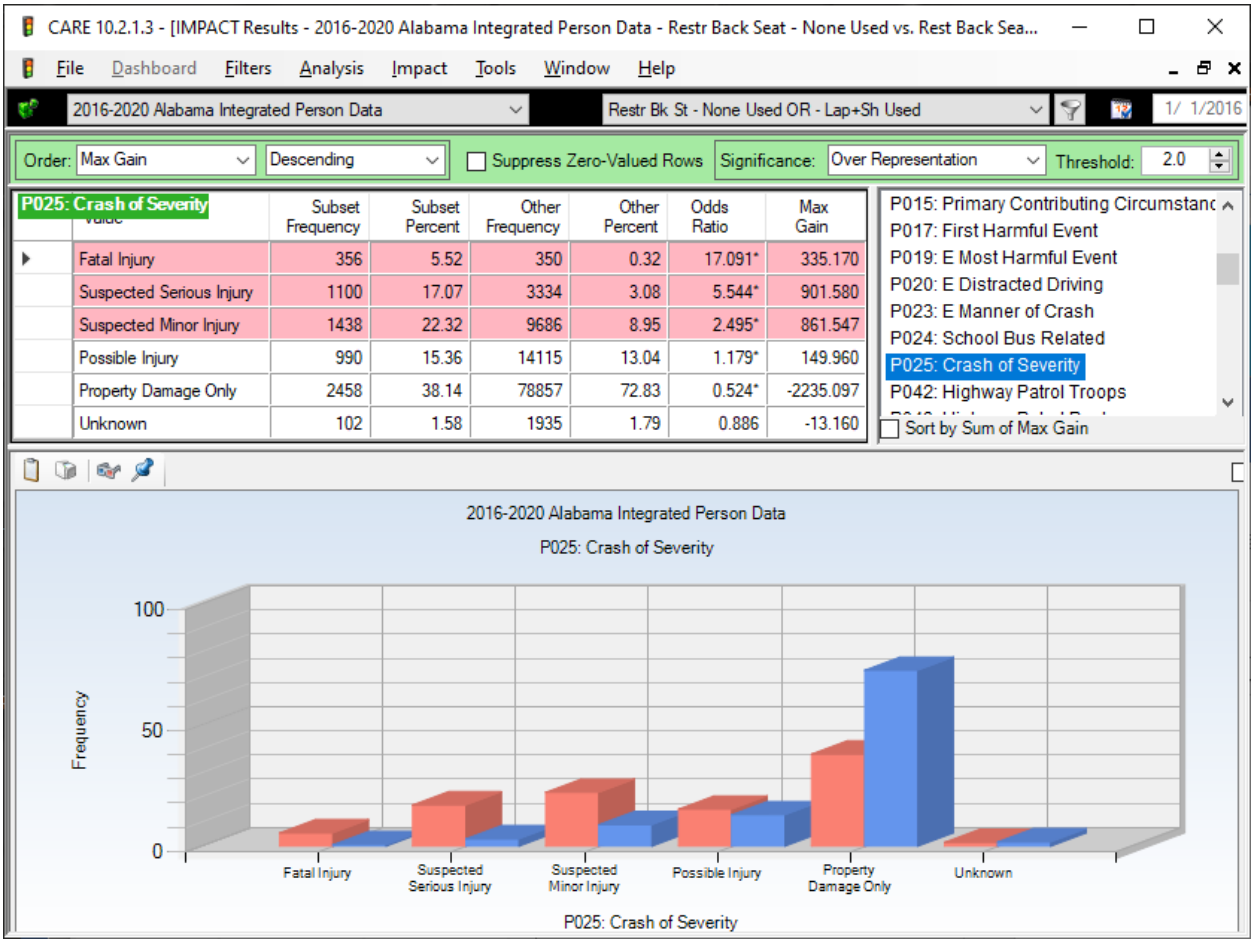
Total Restraint Used Crashes: 350 persons were involved in Fatal Crashes/108,277 = 0.32325% (about 1 in every 309 crashes).

The same calculation for the None Used (top) row is:

Total None Used Crashes: 356 persons were involved in Fatal Crashes/6,444 = 5.52% = (about 1 in every 18 crashes).

These figures show that the probability of being killed in a crash goes up by a factor of about 17 times the probability of being killed given proper restraints.

The IMPACT run comparing restrained with non-restrained is given on the next page. It is interesting to see that the Odds Ratio multiplier is approximately the same as the multiplier calculated above. The other injury severity levels also indicate that being unrestrained shows very poor judgment on the part of the vehicle occupant. Suspected Serious Injury (most severe short of fatality) has an Odds Ratio of 5.544, while the other two lesser severity crashes have multipliers of 2.495 and 1.179, respectively.



For general information on restraints from NHTSA and other sources, please see “Restraints” in: http://www.safehomealabama.gov/safety-topics/