Special Study
Pedestrian-Involved Crashes (PIC) Using 2018-2022 Crash Data

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Introduction

Over the past five years (2018-2022) in Alabama there were 3,931 pedestrian crashes of which 559 were fatal crashes causing 563 deaths. In addition, 941 of these crashes resulted in at least one Suspected Serious Injury, and the total number of injured (including fatalities) was 4,043 persons. All of us are pedestrians at some point, even if it is just walking from a car on a store parking lot.

The purpose of this report is to reduce the number of pedestrian crashes as much as possible and thereby reduce the resulting fatalities and injuries. The following cross-tabulation shows how the number of Pedestrian-Involved Crashes (henceforth PICs) have remained fairly constant over the five years of this study. Year 2021 was an exception.

Pedestrian-Involved Crash Severity (C025) by Year (C003) 2018-2022 Cross-tabulation

2018-2022 Alabama Integrated eCrash Crash Data | Pedestrian Involved

Suppress Zero Values: None | Select Cells: | Column: Year ; Row: Crash Severity

	2018	2019	2020	2021	2022	TOTAL
Fatal Injury	107 13.11%	115 13.19%	99 14.06%	126 16.15%	112 14.76%	559 14.22%
Suspected Serious Injury	169 20.71%	203 23.28%	188 26.70%	204 26.15%	177 23.32%	941 23.94%
Suspected Minor Injury	266 32.60%	280 32.11%	229 32.53%	251 32.18%	280 36.89%	1306 33.22%
Possible Injury	189 23.16%	178 20.41%	112 15.91%	123 15.77%	115 15.15%	717 18.24%
Property Damage Only	32 3.92%	34 3.90%	22 3.13%	35 4.49%	34 4.48%	157 3.99%
Unknown	53 6.50%	62 7.11%	54 7.67%	41 5.26%	41 5.40%	251 6.39%
TOTAL	816 20.76%	872 22.18%	704 17.91%	780 19.84%	759 19.31%	3931 100.00%

Generally, the year 2020 could be discounted in many such presentations in that it was the year that COVID caused irregular changes in the crash data. For general studies of the effects of COVID on crashes in 2020 and 2021, please see http://www.safehomealabama.gov/caps-special-studies/ under the topic of COVID-19/Coronavirus.

One thing that stands out in the above is that fatal PIC crashes increased in 2021 (even ignoring 2020). This, despite that the overall number of pedestrian crashes decreased from their 2018-2019 levels (see the bottom line totals). This means that pedestrian crashes became significantly less survivable in 2021 (fewer crashes resulting in more fatalities). There was a more favorable finding for 2022, with the fatal PICs coming down to their 2019 level.

Fatal PICs will be given concentrated study in Section 3 by comparing the fatal PIC causes for the five years against the non-fatal PIC causes. Studies in the past have found that Pedestrian Under the Influence (PUI) of alcohol or drugs has resulted in higher probability of fatal crashes. The explanation was that sober pedestrians take defensive actions to mitigate their crashes, while those under the Influence are not as immediately aware of their situation.

Reason for More Fatalities in 2021 than in Each of the Other Years. Year 2021 had about 17 more fatal pedestrian crashes than the average of the other years (2018, 2019, 2020, and 2022). The following shows some over-representations for 2021, but not for the other years. Other year results are, in order, 2018, 2019, 2020, and 2022.

V015 Primary Contributing Circumstances:

19 Unseen Object/Person/Vehicle	(Other years: 10, 9, 13, and 13; average 11.25)
15 Not Visible	(Other years: 8, 14, 10, and 6; average 9.50)

Clearly, not being seen by motorists is a major contributor to PIC fatalities when compared to pedestrian crashes in general.

C304 and C305 CU Non-Motorist Action at the Time of the Crash #1 and #2:

49 Causal Unit (CU) is not the Pedestrian (Other years 21, 25, 26, and 42; average 28.50)

This indicates that in many of the pedestrian crashes in 2021, the vehicle drivers were more apt to have been at fault than were the pedestrians. This is significantly higher than the same readings in the other four years.

There was no evidence that alcohol and/or other drugs played a greater part in causing the crashes in 2021 than they had in other years. However, the general (overall five years) increased causation of Pedestrian Under the Influence (PUI) for fatal as opposed to non-fatal pedestrian crashes is indicative that this factor is quite instrumental in many fatal pedestrian crashes. From F309 and F310 (in Section 3), we estimate the proportion of PUI to be 36.55% for Alcohol, and 19.83% for Drugs, for a total of 56.38%. None were reported to be under the influence of both alcohol and drugs, although this is not at all uncommon.

This report will begin with an Executive Summary that will give a very short summary of the findings of each of the IMPACT analyses that are given in detail in Sections 2 and 3. Like in the report, the IMPACT brief summaries are divided into two sections, the first for Pedestrian Involved Crashes (PICs) in general, and a second for pedestrian fatalities. This is followed by two sets of recommendations, the first to drivers, and the second to pedestrians. This reflects the reported Causal Unit Types, which showed that for all PICs, 1,501 (38.18%) were caused by the pedestrian, while the remaining 2,430 (61.82%) were caused by motor vehicle drivers. In Section 1.3, filter definitions will be given for the general pedestrian analysis of Section 2.0, and for the pedestrian fatality analysis in Section 3.0.

Variable number nomenclature: for the attribute comparisons in Section 2, the numbering of the variables will be indicated by C followed by the variable number in CARE (e.g., C015). For the fatal to non-fatal comparison in Section 3, the C will be replaced by an F (e.g., F015).

1.0 Executive Summary, Recommendations, and Filter Definitions

1.1 Executive Summary and Abstract of Findings

The following is a brief statement of the CARE IMPACT analyses according to the attribute numbering indicated above, along with the section numbers that appear below. For more details on any of them, see the section referenced.

2.1 C001 County. The large metropolitan areas have the greatest numbers and proportions of pedestrian crashes.

2.2 C002 City. The few exceptions of the urban areas within rural cities might be of interest. In the display given this includes Rural Mobile, Rural Dallas and Rural Baldwin.

2.3 C004 Month. There is not the expected over-representation in the spring and summer months. Some in the autumn could be caused by the time change.

2.4 C006 Day of the Week. Over-representations on weekends would cause us to suspect the effects of alcohol and other drugs.

2.5 C008 Time of Day. Night-time hours are generally over-represented, with 6:00 PM to 5:59 AM all being quite significant in their over-representations. This shows a combination of PUI and DUI as highly contributing causes, as well as pedestrians not being visible in the night-time hours.

2.6 C010 Rural/Urban. While urban PICs are over-represented, those that occur in the rural areas are about twice as likely to be fatal. See the results of the cross-tabulation that comes next.

Cross-tabulation of Rural-Urban by Severity. The proportion of fatal PICs is one in 3.5 PICs for the rural areas, while in the urban areas it is one in 9.5 PICs.

2.7 C011 Highway Classification. Consistent with the rural-urban results, Municipal roads were significantly over-represented; however, private property PICs (which would include those in parking lots) were over four times their expected proportion.

2.8a C015 Primary Contributing Circumstances (PCCs). The following PCCs (with frequencies) are very significantly over-represented: Improper Crossing (831), Unseen Object/Person/Vehicle (688), Failed to Yield Right-of-Way to Pedestrian in Crosswalk (220), Failed to Yield the Right-of-Way (223), Not Visible (192), Pedestrian Under the Influence (130), Lying or Sitting in Roadway (50), Wrong Side of Road (33), Other Failed to Yield (58), Aggressive Operation (97), and Improper Parking/Stopped in Road (33).

2.8b C015 PCC for Fatal Pedestrian Crashes. Of the 495 fatal PICs, 64 were Unseen Object/Person/Vehicle; 53 were Not Visible; and two others were Vision Obstructed, which totals to 119, or about 24% of the fatal pedestrian crashes

2.9 C022 Type of Roadway Junction/Intersection. Four-Way Intersection and T-Intersection had the highest frequency of all intersection types.

2.10 C031 Lighting Conditions. Highly correlated with time of day, the dark conditions were all over-represented, even when the roadway was lighted.

2.11 C025 Crash [Injury] Severity. All of the injury categories were highly significantly over-represented, with the Odds Ratios increasing as the severity increased (from Possible Injury Odds Ratio of 2.145 up to 27.835 for Fatal Injury).

2.12 C033 Locale. Children walking to school need to be reminded of safety rules at least once per month, emphasizing the special dangers that they encounter when they are on or near roadways. School locale had the highest Odds Ratio of any in this attribute.

2.13 C304 Non-Motorist Action #1. This attribute gives the relative causes of pedestrian crashes caused by the pedestrians, as follows (number of crashes in the five-year period): Improper Crossing (671), In Roadway-Standing/On Knees/Lying (314), Not Visible, e.g., Dark Clothing (132), Failure to Yield Right-Of-Way (120), Darting (97), Inattentive (Talking/Eating) (26), Wrong Side of Road (31).

2.14 C305 Non-Motorist Action #2. This is a second potential cause that is recorded. Listed in the same ordering as C304 above: Improper Crossing (145), In Roadway-Standing/On Knees/Lying (115), Not Visible, e.g., Dark Clothing (173), Failure to Yield Right-Of-Way (10), Darting (60), Inattentive (Talking/Eating) (13), Wrong Side of Road (12). These numbers may not be additive with C304.

2.15 C301 CU Non-Motorist Prior Action. This is an indication of what the pedestrians were doing prior to their getting in the crash. The top three by frequency are: (1) Entering of Crossing Roadway; (2) In Roadway – Other (Working/Playing); and (3) Walking/Cycling Along Roadway with Traffic.

The following are distinguished from the above in that above compared PIC with non-PIC crashes. The following compares Fatal PICs with non-Fatal PICs, with the goal of determining the primary causes of pedestrian fatalities.

3.1 F003 Year; Pedestrian Fatality Crashes vs Pedestrian Non-Fatal Crashes. Pedestrian fatal crashes went from being under-represented in 2018 and 2019 to being over-represented in 2021 and 2022 (to a much greater degree in 2021).

3.2 F006 Day of the Week. The over-representations on Saturday and Sunday are typical of fatalities in general, mainly showing the involvement of alcohol and non-alcohol drugs.

3.3 F008 Time of Day. Fatal PICs are even more susceptible to the late night hours than PICs in general. Daylight enables both the driver and the pedestrian to better take evasive action.

3.4 F015 Primary Contributing Circumstances (Items of 3 or less removed). There are a number of PCCs that have a higher frequency and proportion for fatal PICs than for PICs in general.

3.5 Partial Cross-tabulation: F015 Primary Contributing Circumstances by F004 Year. This demonstrates that many PUIs may be recorded as either Unseen or Not Visible.

3.6 F308 CU Non-Motorist Condition. Pedestrian Under the Influence (PUI) are over twice the proportion of fatal as non-fatal Pedestrian Involved Crashes (PICs).

3.7 F309 Non-Motorist Officer's Opinion Alcohol. Alcohol is involved in over twice the proportion of fatal PICs as non-fatal PICs.

3.8 F310 Non-Motorist Officer's Opinion Drugs. Drugs other than alcohol are worse than alcohol, showing close to four times the proportion, with an Odds Ratio of 3.512.

3.9 F130 CU Non-Motorist Maneuvers. The two highest in frequency are Entering or Crossing Roadway, and Walking/Running/Jogging/Playing/Cycling. While Lying or Sitting in Roadway has the highest Odds Ratio (4.906), its frequency is only 21, and 26 other pedestrians were not killed, it is hard to believe that any reasonable person would do this, and we would highly suspect the involvement of alcohol, drugs, or suicidal tendencies.

3.10 F301 CU Non-Motorist Prior Action. This attribute gives an idea of what pedestrians (including bicyclists) were doing prior to the crash. Entering or Crossing the Roadway was over 30% of the items given.

3.11 F304 CU Non-Motorist Action at time of Crash #1. See Section 3.11 for information on this item.

3.12 F305 CU Non-Motorist Action at time of Crash #2. See Section 3.11 for information on this item.

3.13 F306 CU Non-Motorist Location at Time of Crash. This showed that over half of the fatal pedestrian crashes occur outside of crosswalks and/or intersection boundaries.

1.2 Recommendations to Drivers and Pedestrians

Some of the recommendations given below can also be found in a WSFA/ALEA article dated January 19, 2022. We place recommendations to drivers first because the crash reports provided by that Alabama Law Enforcement Agency (ALEA) indicate that the majority of pedestrian crashes are caused by the involved drivers.

1.2.1 Recommendations to Drivers

- Do not assume anything about pedestrian behavior. Or even better, always assume the worst. For example, if you see a pedestrian crossing at a safe distance ahead of you, assume that s/he will trip and fall and you will be required to take some evasive action. Be astute, constantly scan the upcoming roadway looking for pedestrians everywhere.
- Recognize your sight limitations at night, even on a lighted roadway. Pedestrians may not be walking where they should be, and typically they are hard to see at night. Many are not carrying a flashlight or even wearing reflective clothing. This problem is compounded in poorly lit conditions, including dusk/dawn hours, at night and in inclement weather, including fog. We know that most experienced drivers have seen close calls with pedestrians in the past. There is no reason it will not happen again, and the next one might result in a fatality.
- Always yield the right of way to pedestrians. This would certainly include all for pedestrians in crosswalks or where pedestrian signs are posted. But do not assume that they will be obeying the law. Hitting a pedestrian might be as traumatic to you as it is to them, and while it is important to obey all laws, this will not always prevent a tragedy.
- As an exception to this, never stop for a pedestrian if there is a chance that other vehicles will pass you and hit them. Your stopping may give the pedestrian the impression that all is clear, when, in fact, dangerous traffic is continuing.
- Never blindly pass vehicles stopped at crosswalks, intersections, or even in mid-block. They may be stopped to allow individuals to cross the street who will walk right in front of you.
- Never go around a stopped school bus. Children are notorious for assuming that all traffic will stop for them, and we have all seen them mindlessly running to get home. The laws on stopped school buses are very stringent for good reasons.
- Never drive under the influence of alcohol or drugs. Recognize that such can delay your response to a vulnerable pedestrian, or to avoid pedestrians all together.
- Follow speed limits, but do not allow the speed limit to govern your speed in the presence of pedestrians. Slow down at their first appearance, and be ready to stop if necessary.

1.2.2 Recommendations to Pedestrians

The fact that the majority of pedestrian crashes are reportedly caused by motor vehicle drivers should not make those who are walking any less attentive to their own survival responsibilities.

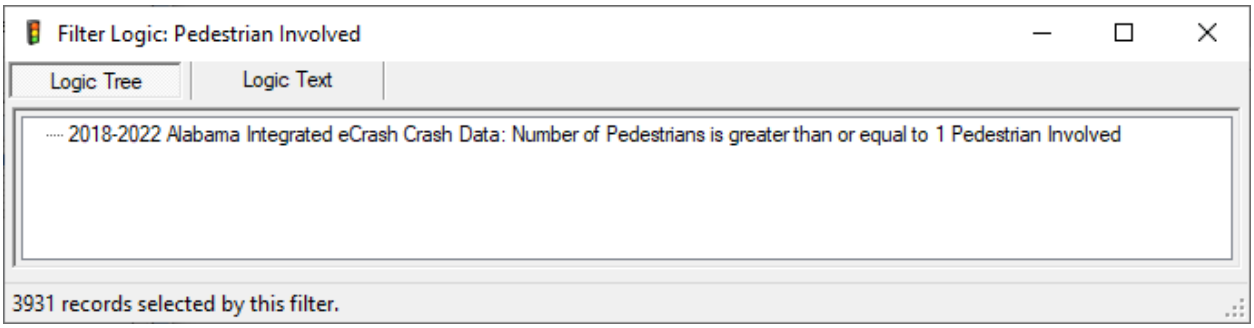
Over the five-year period of this study, 1,501 (38.18%) PICs were caused by the pedestrians themselves. Despite who is listed as at-fault, almost all pedestrian crashes can be avoided by pedestrians taking appropriate precautionary actions.

- Be obviously seen; almost 25% of struck pedestrians were reportedly not seen. Being seen means: wearing contrasting clothing – a large proportion of pedestrians killed were not wearing reflective clothing; what works in daylight may not be adequate for the night, so test the visibility of the clothing, coats and jackets that you plan to wear. Don't blend in.
    - Be visible, and wear bright clothing during the day, and wear reflective materials and carry a flashlight at night.
    - Be cautious night and day when sharing the roadway with vehicles. Never assume the driver sees you. Make eye contact with drivers as they approach.
    - If possible, completely avoid walking after dark; drivers have a hard time seeing you and in some circumstances you become effectively invisible. At least half of pedestrian crashes and about two thirds of pedestrian fatalities occurred after dark.
- Oncoming vehicle lights are no guarantee that they see you – take the initiative, carry a flashlight and keep it on at night while you are walking.
- Children walking to or from school need special training to avoid being struck by motor vehicles. The 135 PICs in School zones was 2.834 times the expected proportion of non-pedestrian crashes (extremely over-represented). Some seem to think that the fact that they often cross the road without looking to/from a school bus means they can do this on a pedestrian cross-walk. This training, which should be repeated at least monthly, should cover all of the recommendations given here.
- Improper crossing of roadways was one of the highest causes of pedestrian mishaps, and it resulted in the most fatal pedestrian crashes (197 PICs and 36 fatal crashes per year). Improper crossing includes J-walking (crossing between intersections), walking out from between parked cars, and not following safe practice in allowing approaching vehicles to pass.
- Your survival may well depend on your being totally sober – not having had even one drink – before or while walking. The effect of drugs and alcohol on causing an otherwise survivable crash to be fatal is well established. Do not attempt to cross a road when under the influence of alcohol or drugs, which impair your judgment and coordination.
    - Avoid all distractions from your safe walking. Putting your cell phone away until you reach either your destination or a safe stopping point away from the roadway.
    - Avoid times and places where drivers may be impaired or distracted; e.g., weekends, nights, and in the proximity of bars.
- Walk on the left side of the road facing oncoming traffic. If a motorist fails to see you, you might be able to quickly jump away from the roadside to save your life. This cannot be done if you are walking with traffic and do not see vehicles that may hit you.
- Stay as far from the traffic flow as possible. This advice applies equally to getting out of disabled vehicles – pull as far off the roadway as is safely possible before getting out of

your car. While your vehicle may be seen, chances are it will be enough of a distraction to prevent drivers from seeing you.
    - Walk on a sidewalk or path when one is available.
    - If no sidewalk or path is available, walk on the shoulder – facing traffic.
- Do not linger on or near the roadway. A total of 426 struck pedestrians were recorded over the five years of this study to have been "In Roadway (Standing/On Knees/Lying)." These incidents were totally preventable by using normal common sense.
- Be extremely careful not to go into open dark spaces in parking lots (505 crashes over the five years). Stay close to the parked vehicles and, to the extent possible, stay in the well-lighted areas.
- Be predictable, and cross streets at designated crosswalks or intersections when possible.
- Be particularly alert at the two types of intersections that had the highest number of pedestrian crashes: Four-Way Intersections and T-Intersections.

1.3 Filter Definitions: Pedestrians-Involved Crashes (PICs)

The following is a image of the filter for all pedestrians involved in crashes over the five years of this study:



This will consider all pedestrians involved in crashes regardless of who caused the crash.

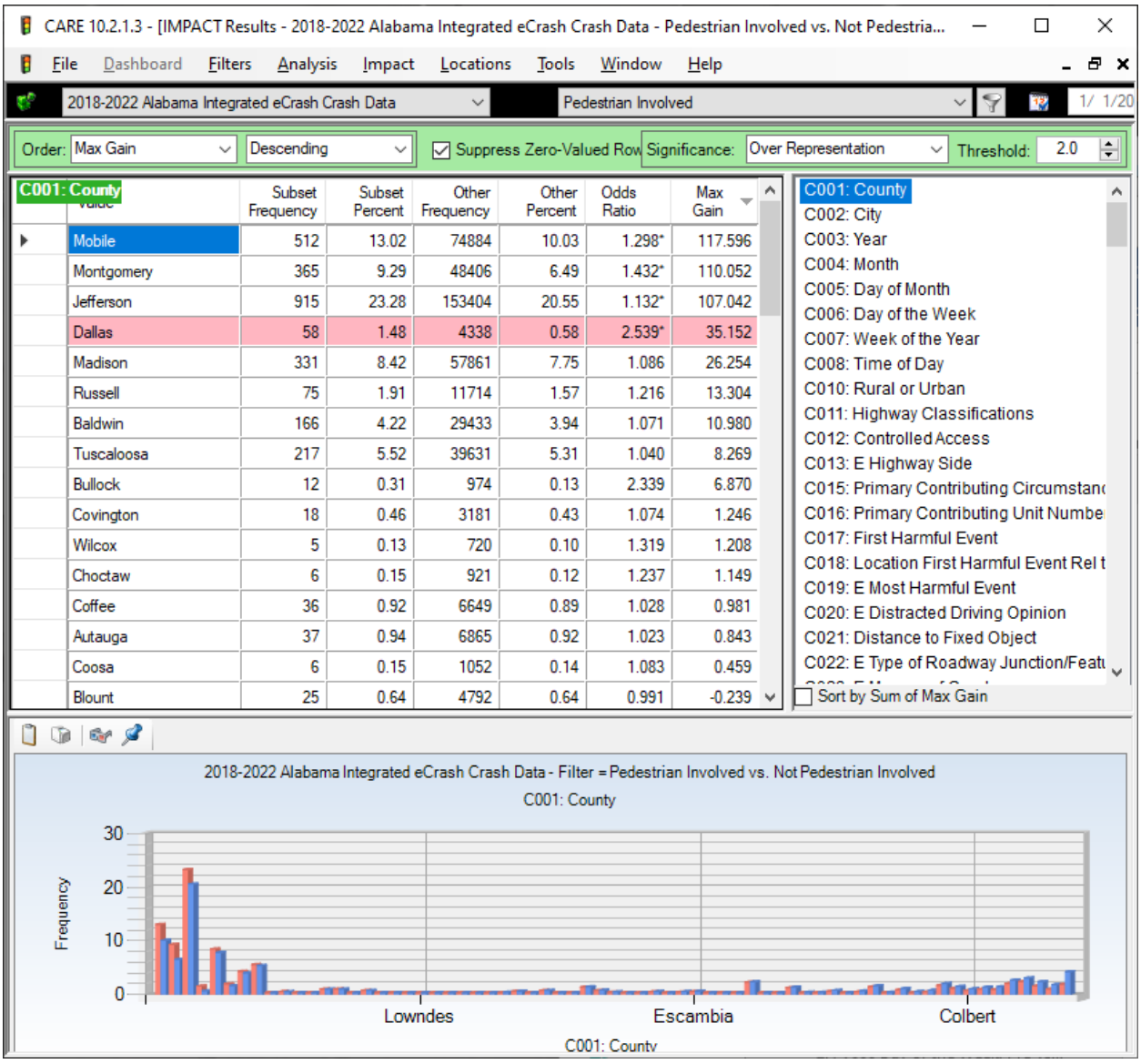
If other filters are required (e.g., pedestrian caused) they will be defined prior to their use.

2.0 Pedestrian-Involved Crash (PIC) Analysis

This section contains several IMPACT comparisons of PIC crashes compared to non-PIC crashes of all types. Section 3 gets into the cause of pedestrian fatalities by comparing fatal PICs with non-fatal PICs.

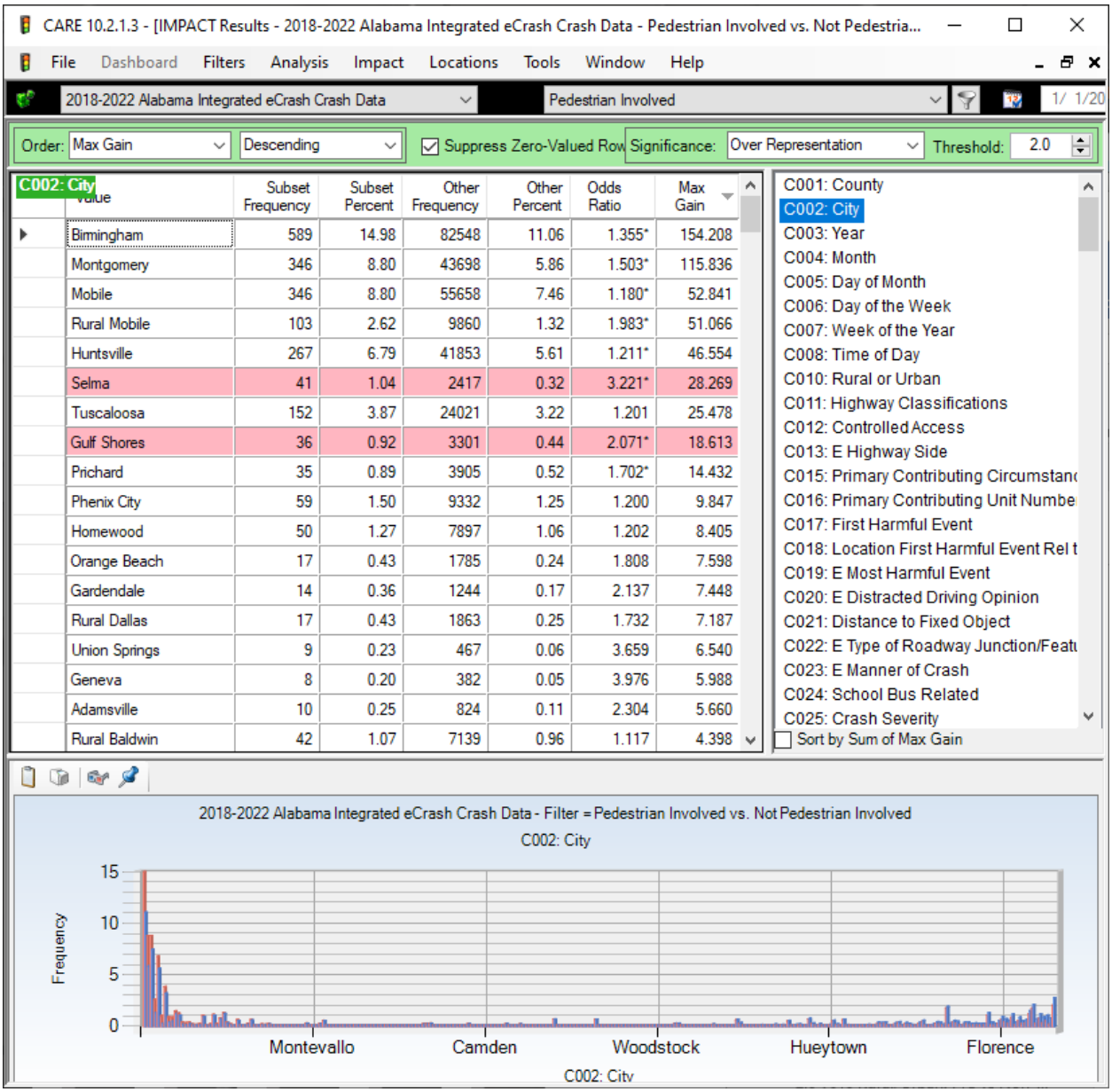
For an explanation of the IMPACT output displays, please see the discussion entitled "General Discussion of IMPACT Output Terms …" at the end of the introduction of this Special Study: http://www.safehomealabama.gov/wp-content/uploads/2023/03/Rural-Urban-IMPACT-Study-v07.pdf

2.1 C001 County; PIC vs Non-PIC All Counties with Odds Ratios > 1



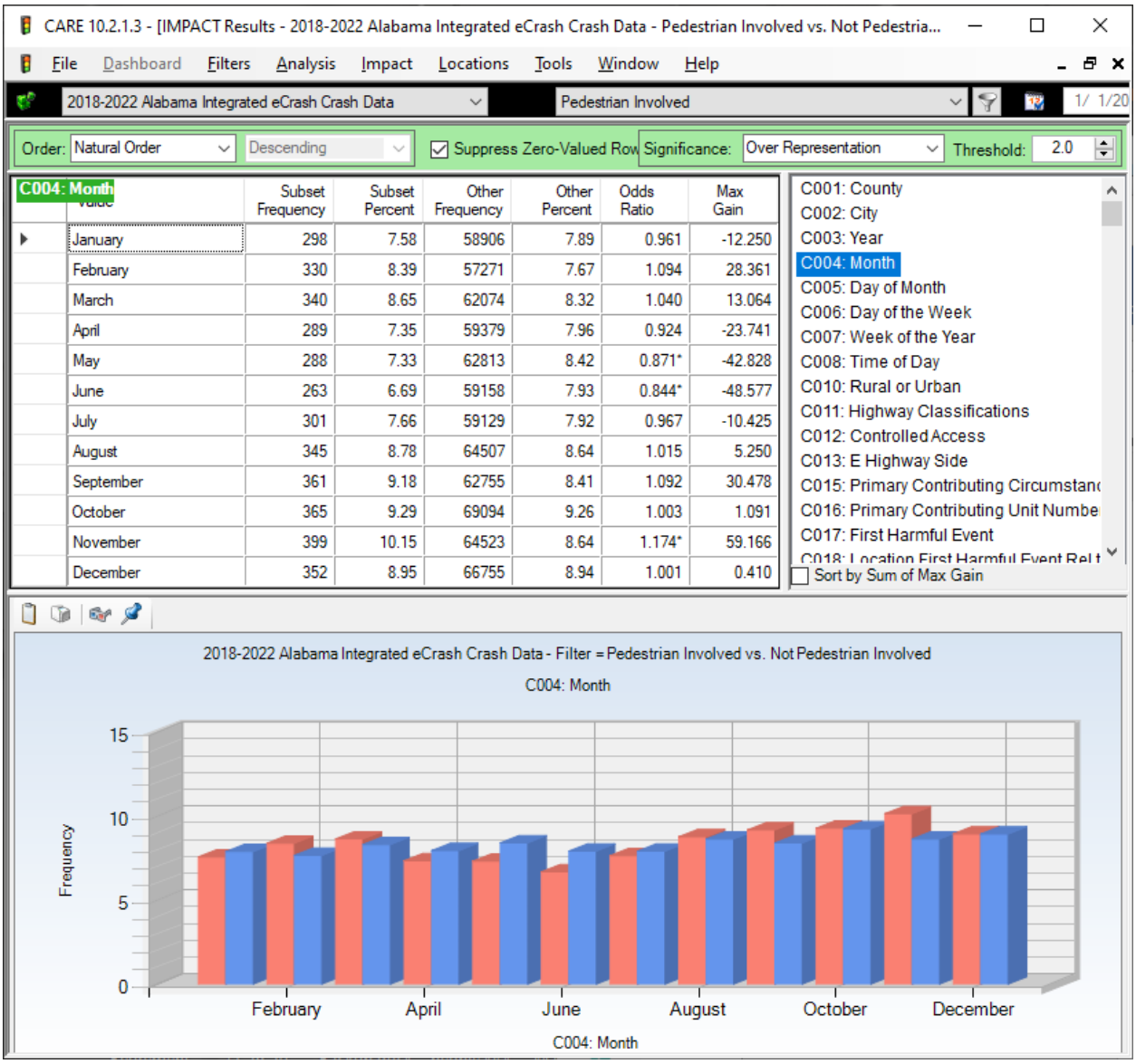
The above are all counties that had a Max Gain of one or more. The large metropolitan areas have the greatest numbers and proportions of pedestrian crashes.

2.2 C002 City; PIC vs Non-PIC All Cities with Max Gains > 5.00



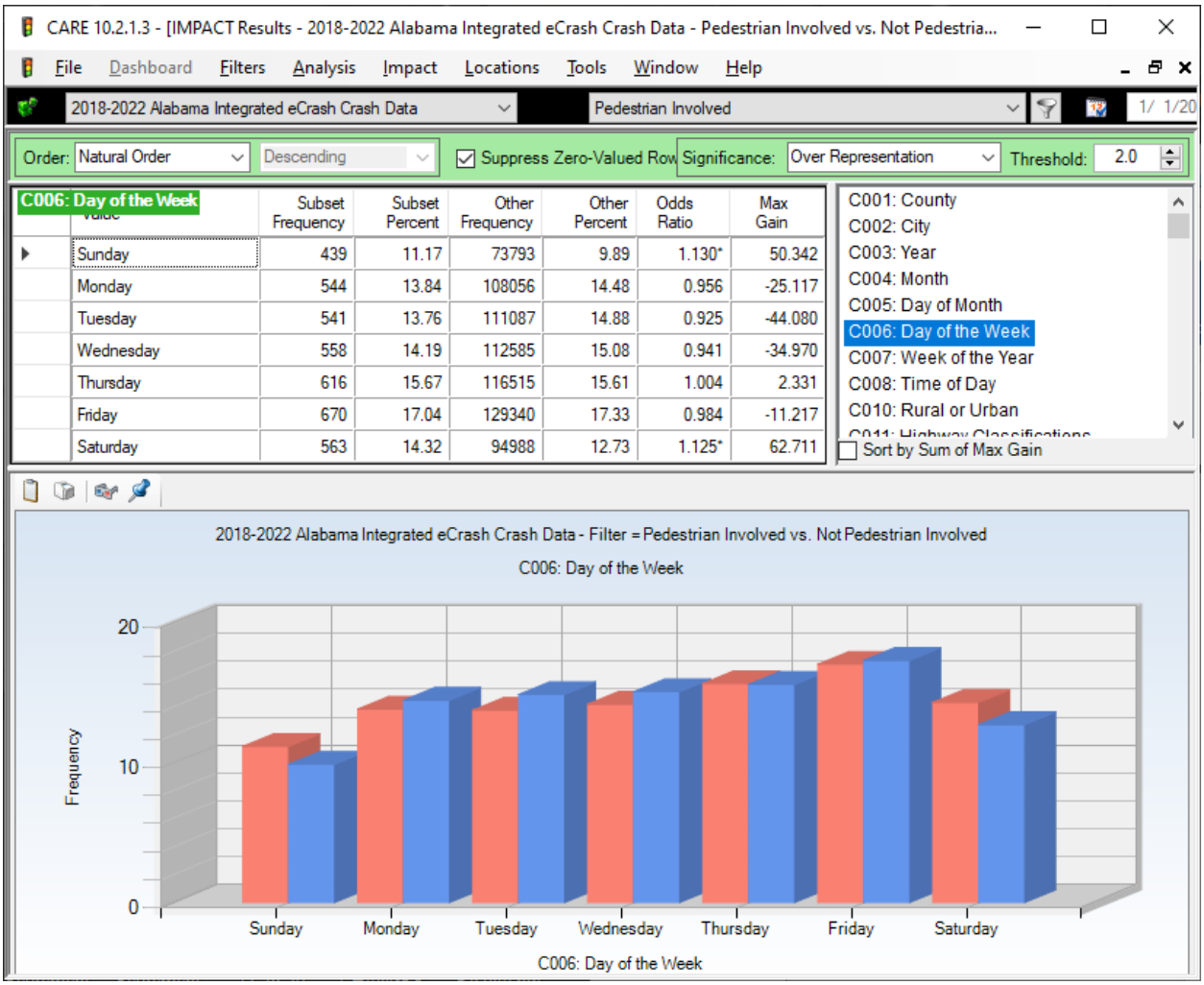
The above are all cities that had a Max Gain of four or more. The large metropolitan areas have the greatest numbers and proportions of pedestrian crashes.

2.3 C004 Month; PIC vs Non-PIC



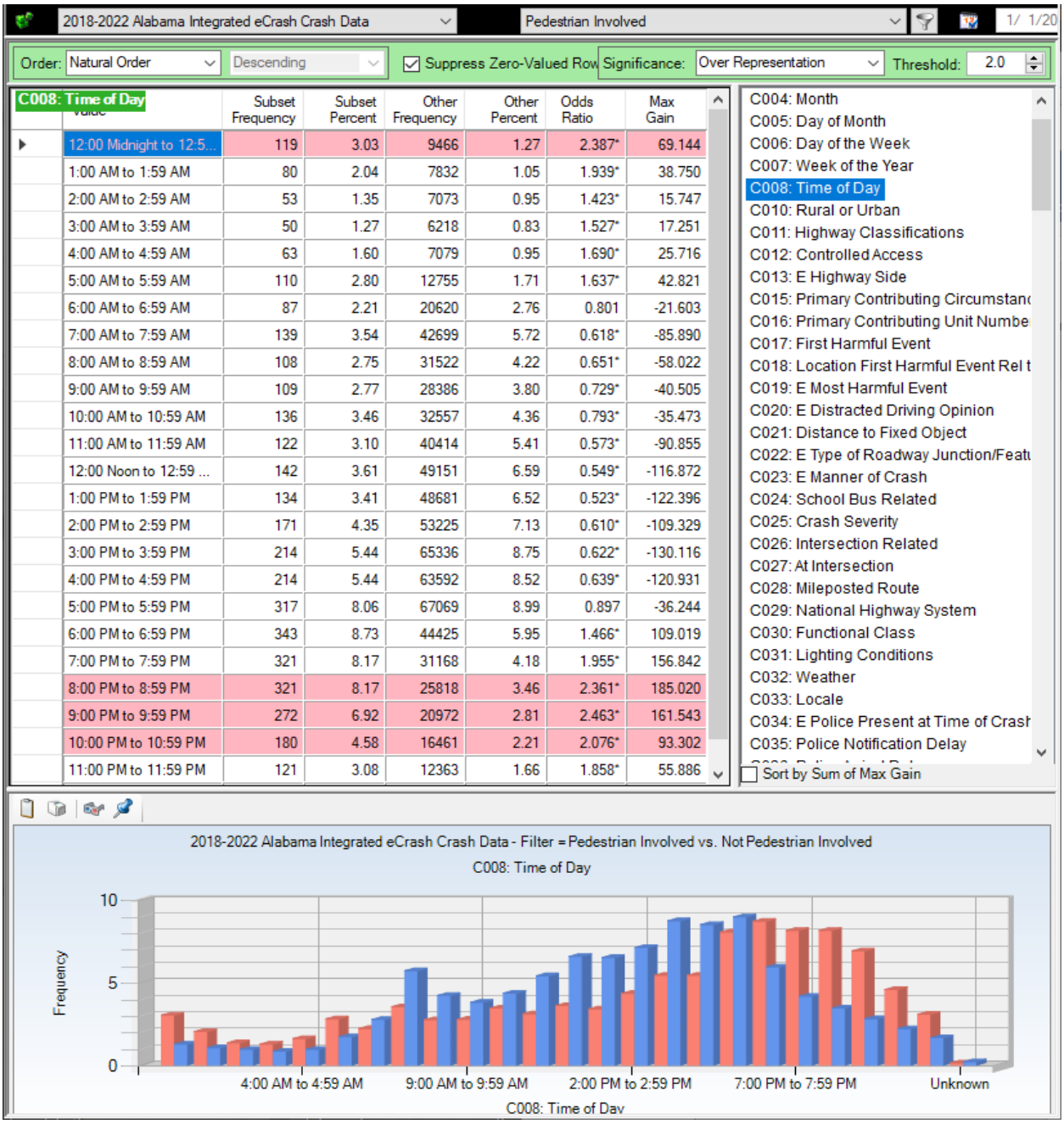
September, October and November, collectively, are significantly over-represented, while most of the winter months are under-represented. Surprisingly, February and March are also over-represented, perhaps some getting into walking again after the severity of the winter months.

2.4 C006 Day of the Week; PIC vs Non-PIC



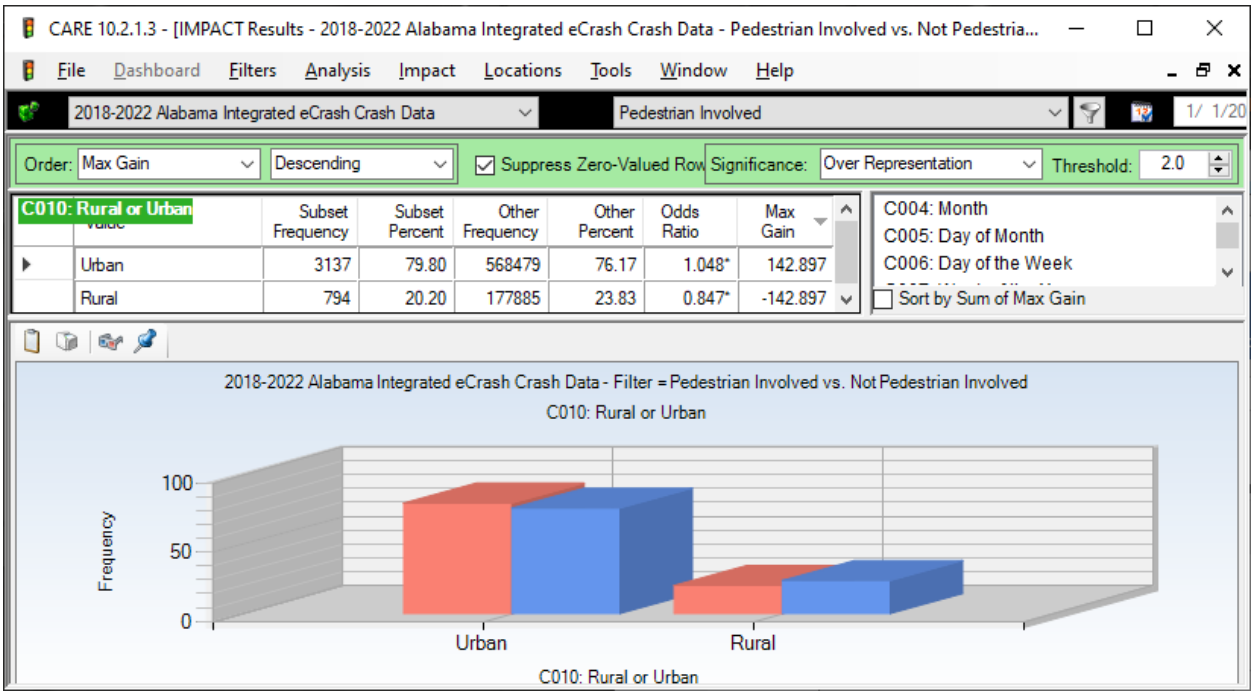
Saturday and Sunday are significantly over-represented; all other days are under-represented but they are not significantly different from the control subset.

2.5 C008 Time of Day; PIC vs Non-PIC



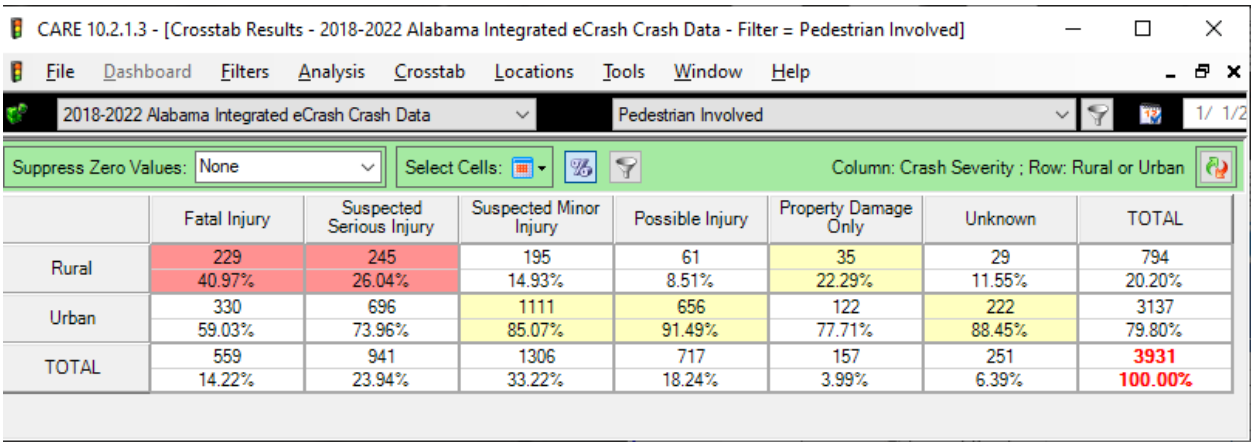
The time of day distribution for PICs matches closely to that of impaired driving, which we will look into more below. Night-time hours are generally over-represented, with 6:00 PM to 5:59 AM all being quite significant in their over-representations.

2.6 C010 Rural/Urban; PIC vs Non-PIC Crashes



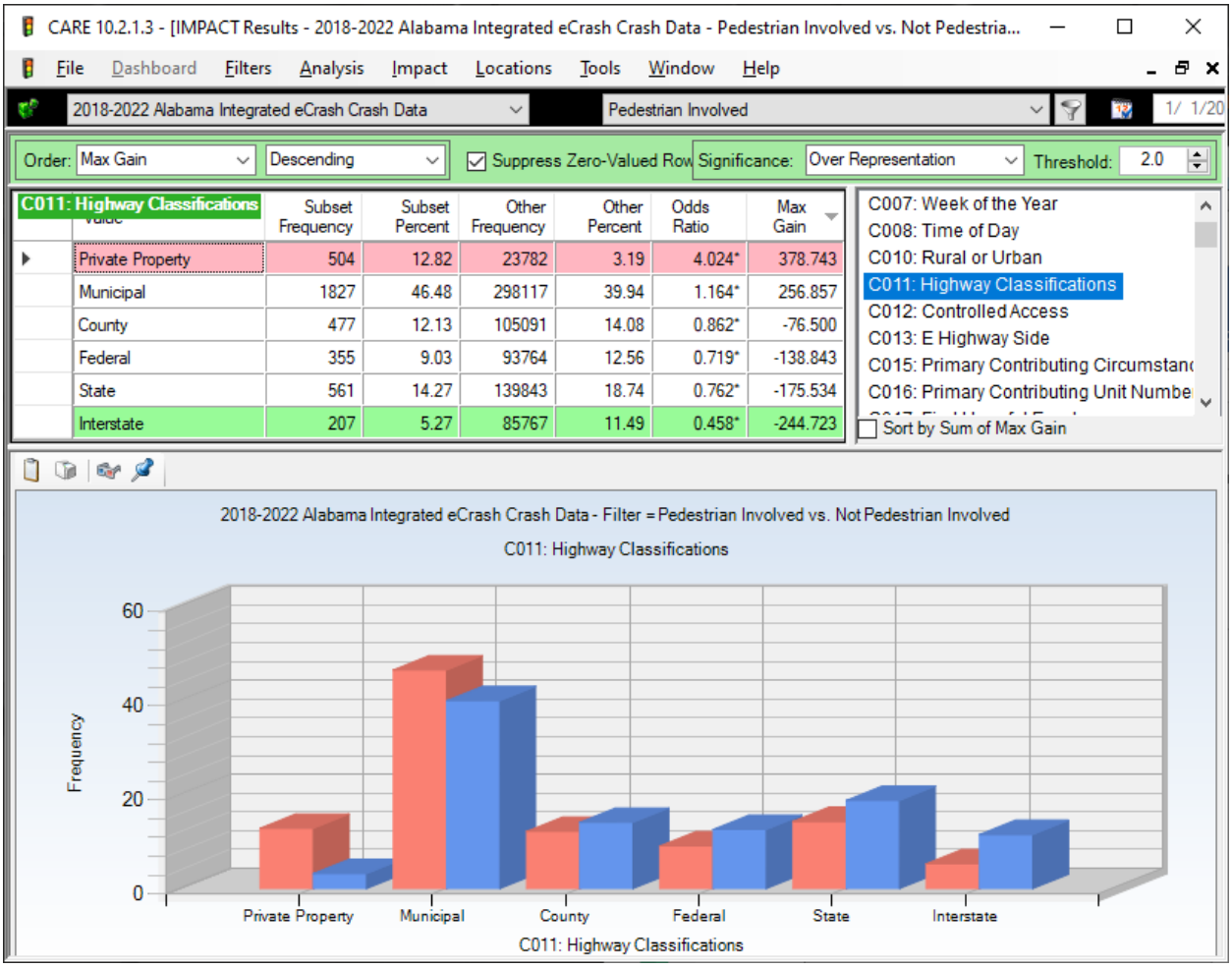
Nearly 80% of PICs occur in Urban areas, which is a proportion of about 5% more than expected from the control subset of traffic crashes in general. However, PICs in the rural areas tend to have higher severities, with over 40% (about twice that expected) of fatal crashes occurring in the rural areas. See below.

Cross-tabulation of Rural-Urban by Severity



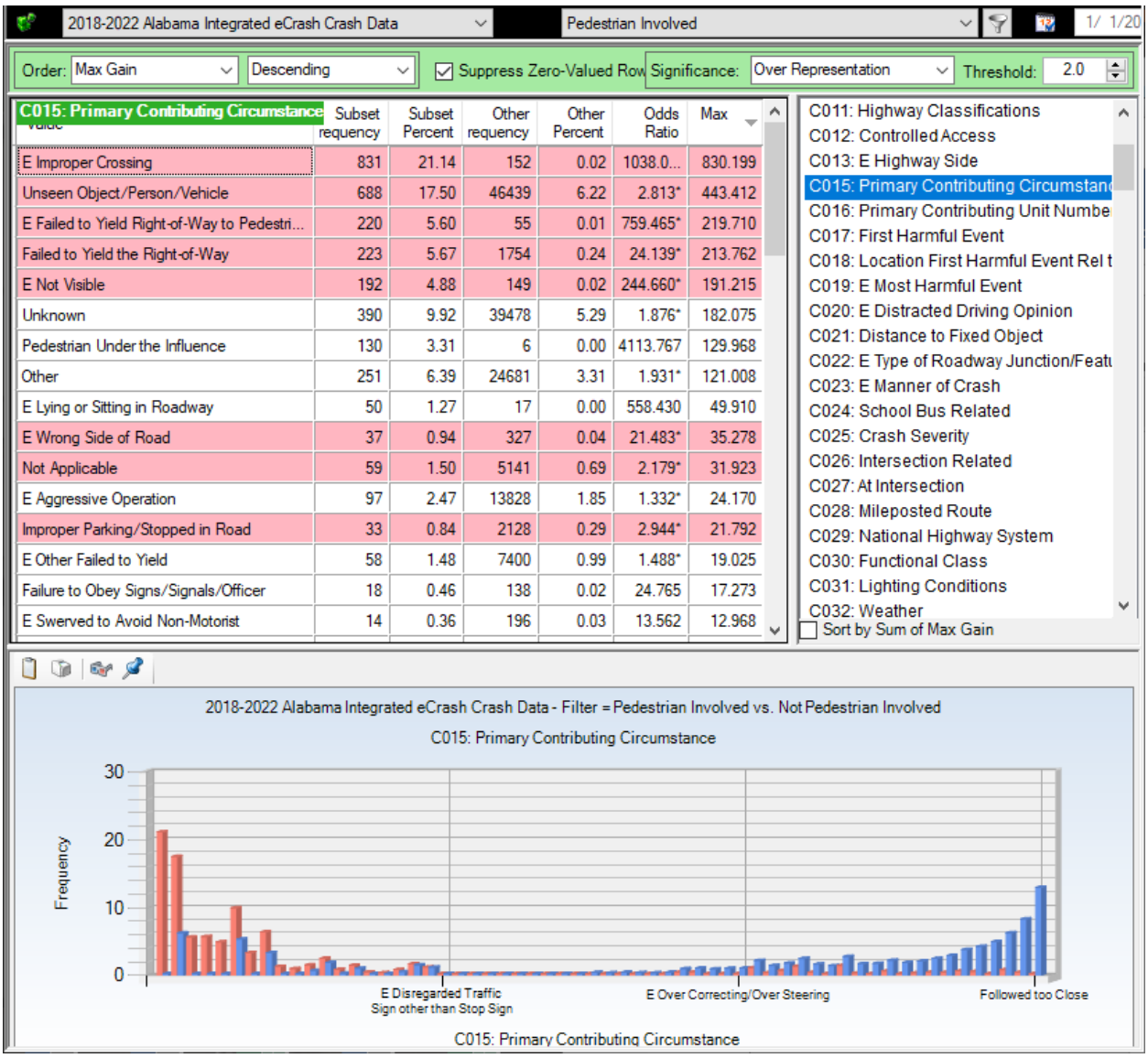
	Fatal Injury	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	Property Damage Only	Unknown	TOTAL
Rural	229 40.97%	245 26.04%	195 14.93%	61 8.51%	35 22.29%	29 11.55%	794 20.20%
Urban	330 59.03%	696 73.96%	1111 85.07%	656 91.49%	122 77.71%	222 88.45%	3137 79.80%
TOTAL	559 14.22%	941 23.94%	1306 33.22%	717 18.24%	157 3.99%	251 6.39%	3931 100.00%

2.7 C011 Highway Classification; PIC vs Non-PIC Crashes



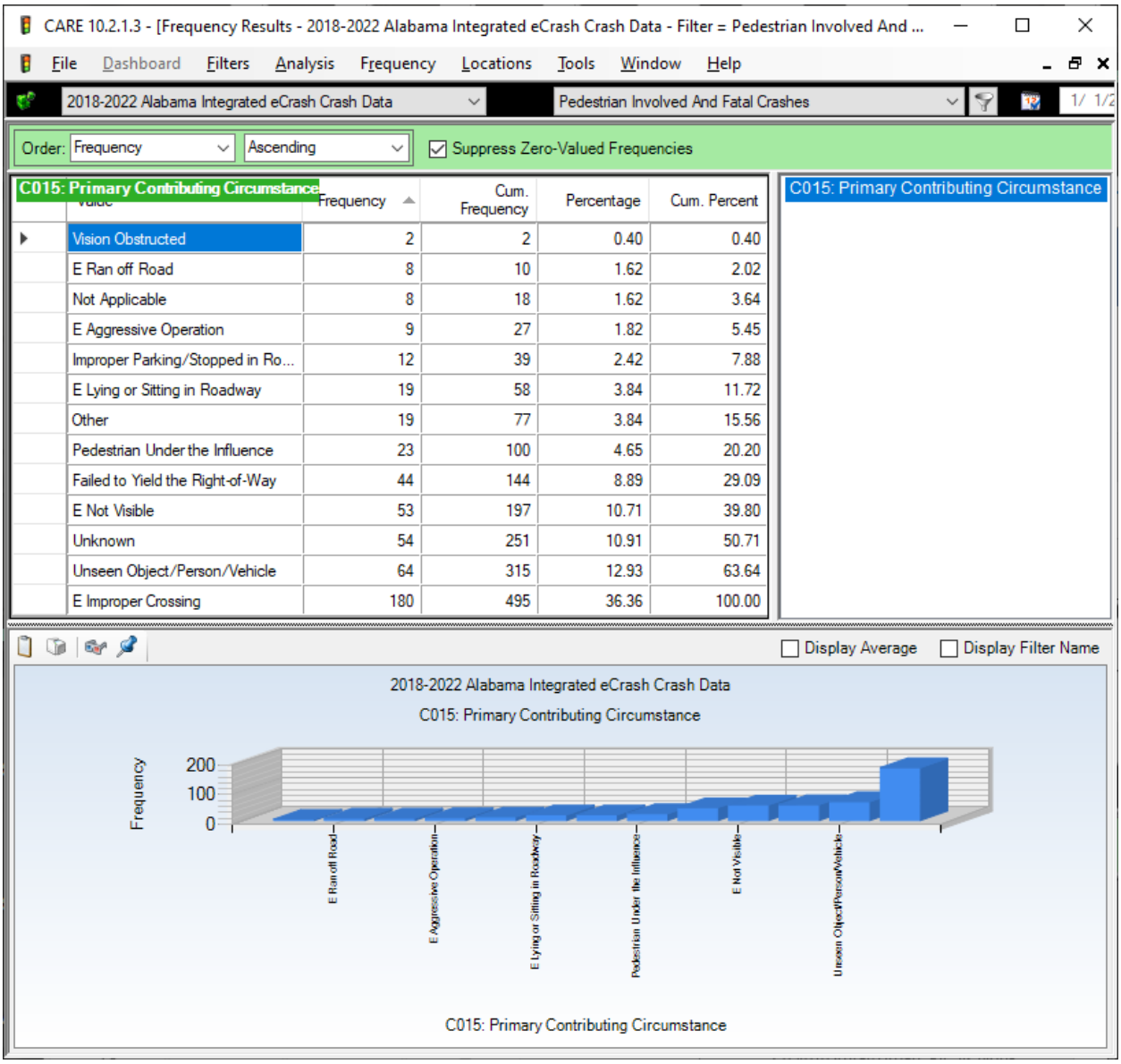
Private Property would include parking lots, which we see are over-represented for PICs by over four times the proportion for other crash types. As expected, Municipal roads are over-represented, while those on other roadway classifications are under-represented in comparisons to general (Non-PIC) crashes on these roadway types.

2.8a C015 Primary Contributing Circumstances (PCCs); PIC vs Non-PIC Crashes; Odds Ratio > 10



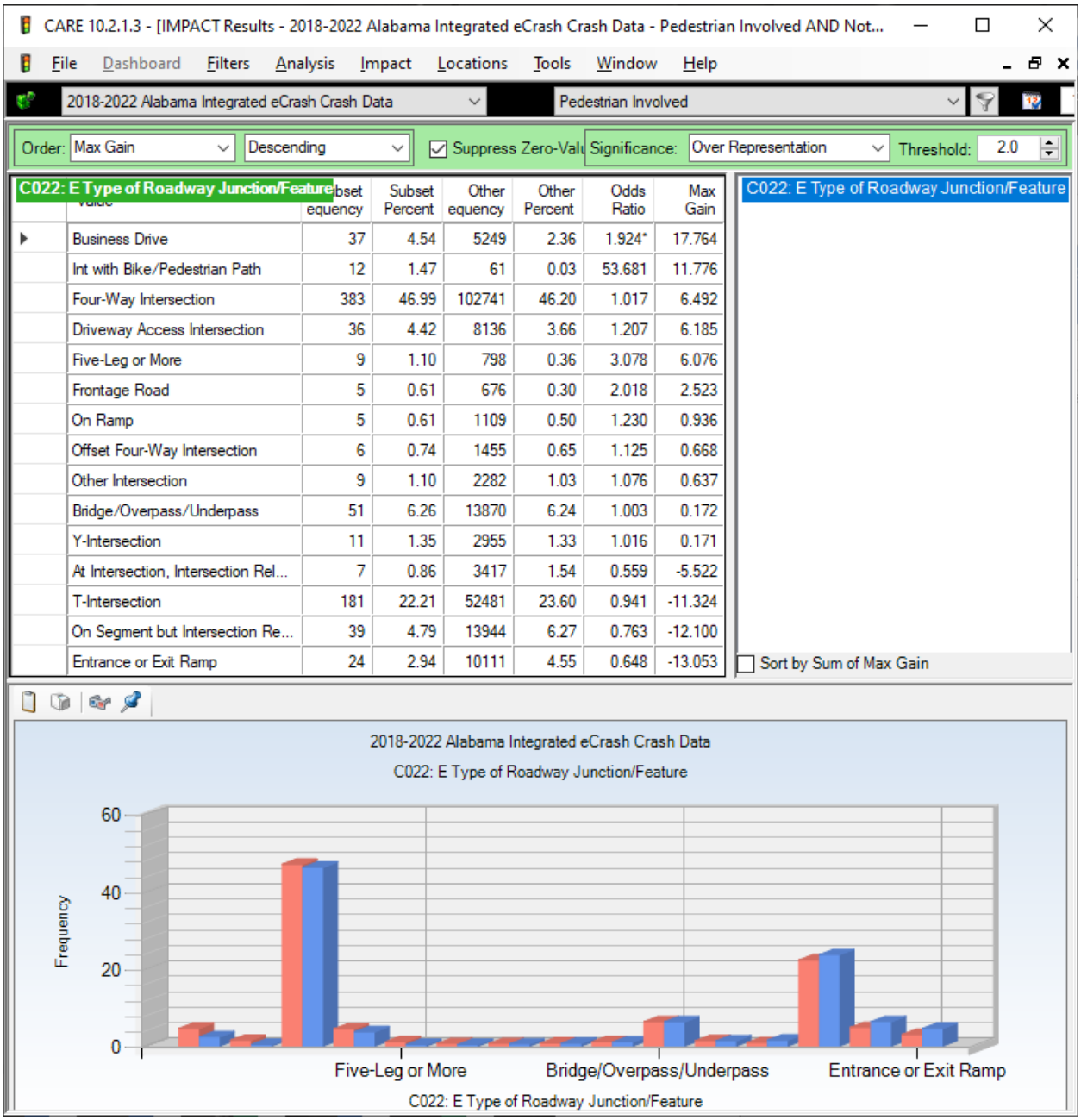
The following (frequencies) are very significantly over-represented: Improper Crossing (831), Unseen Object/Person/Vehicle (688), Failed to Yield Right-of-Way to Pedestrian in Crosswalk (220), Failed to Yield the Right-of-Way (223), Not Visible (192), Pedestrian Under the Influence (130), Lying or Sitting in Roadway (50), Wrong Side of Road (33), Other Failed to Yield (58), Aggressive Operation (97), and Improper Parking/Stopped in Road (33). The above lists all PCCs with Odds Ratios of 10 or more.

2.8b C015 PCCs for Fatal Pedestrian Crashes



The above partial frequency distribution restricted to pedestrian fatality crashes shows the value of pedestrians being seen. Of the 495 fatal crashes, 64 were Unseen Object/Person/Vehicle; 53 were Not Visible; and two others were Vision Obstructed. This was a total of 119, or about 24% of the fatal pedestrian crashes. How many of these would be alive today if they just took the precautions to wear reflective clothing and carry a light at night.

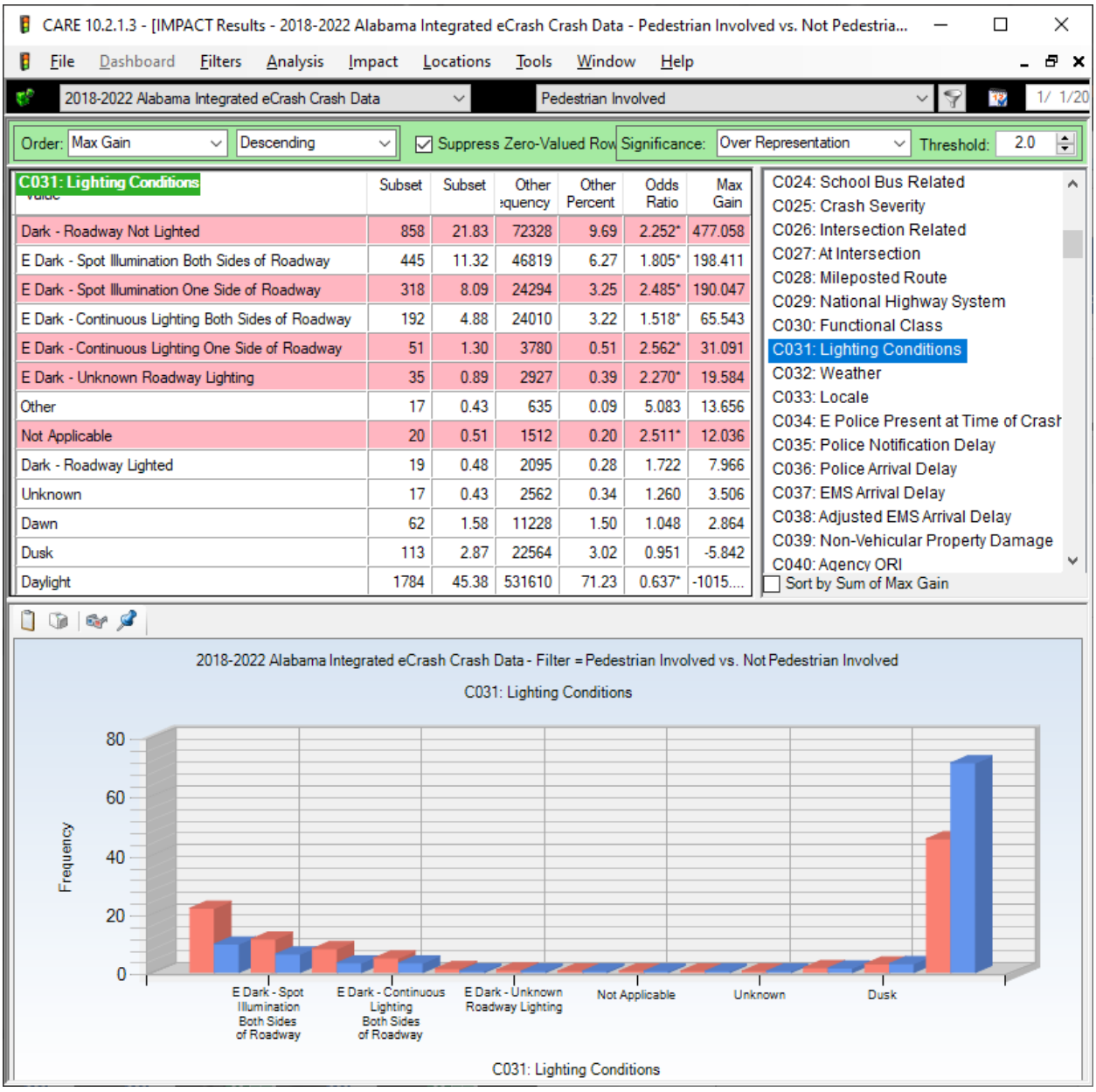
2.9 C022 Type of Roadwayv Junction/Intersection; 5 or More PIC vs Non-PIC Crashes



C022: E Type of Roadway Junction/Feature	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
Business Drive	37	4.54	5249	2.36	1.924*	17.764
Int with Bike/Pedestrian Path	12	1.47	61	0.03	53.681	11.776
Four-Way Intersection	383	46.99	102741	46.20	1.017	6.492
Driveway Access Intersection	36	4.42	8136	3.66	1.207	6.185
Five-Leg or More	9	1.10	798	0.36	3.078	6.076
Frontage Road	5	0.61	676	0.30	2.018	2.523
On Ramp	5	0.61	1109	0.50	1.230	0.936
Offset Four-Way Intersection	6	0.74	1455	0.65	1.125	0.668
Other Intersection	9	1.10	2282	1.03	1.076	0.637
Bridge/Overpass/Underpass	51	6.26	13870	6.24	1.003	0.172
Y-Intersection	11	1.35	2955	1.33	1.016	0.171
At Intersection, Intersection Rel...	7	0.86	3417	1.54	0.559	-5.522
T-Intersection	181	22.21	52481	23.60	0.941	-11.324
On Segment but Intersection Re...	39	4.79	13944	6.27	0.763	-12.100
Entrance or Exit Ramp	24	2.94	10111	4.55	0.648	-13.053

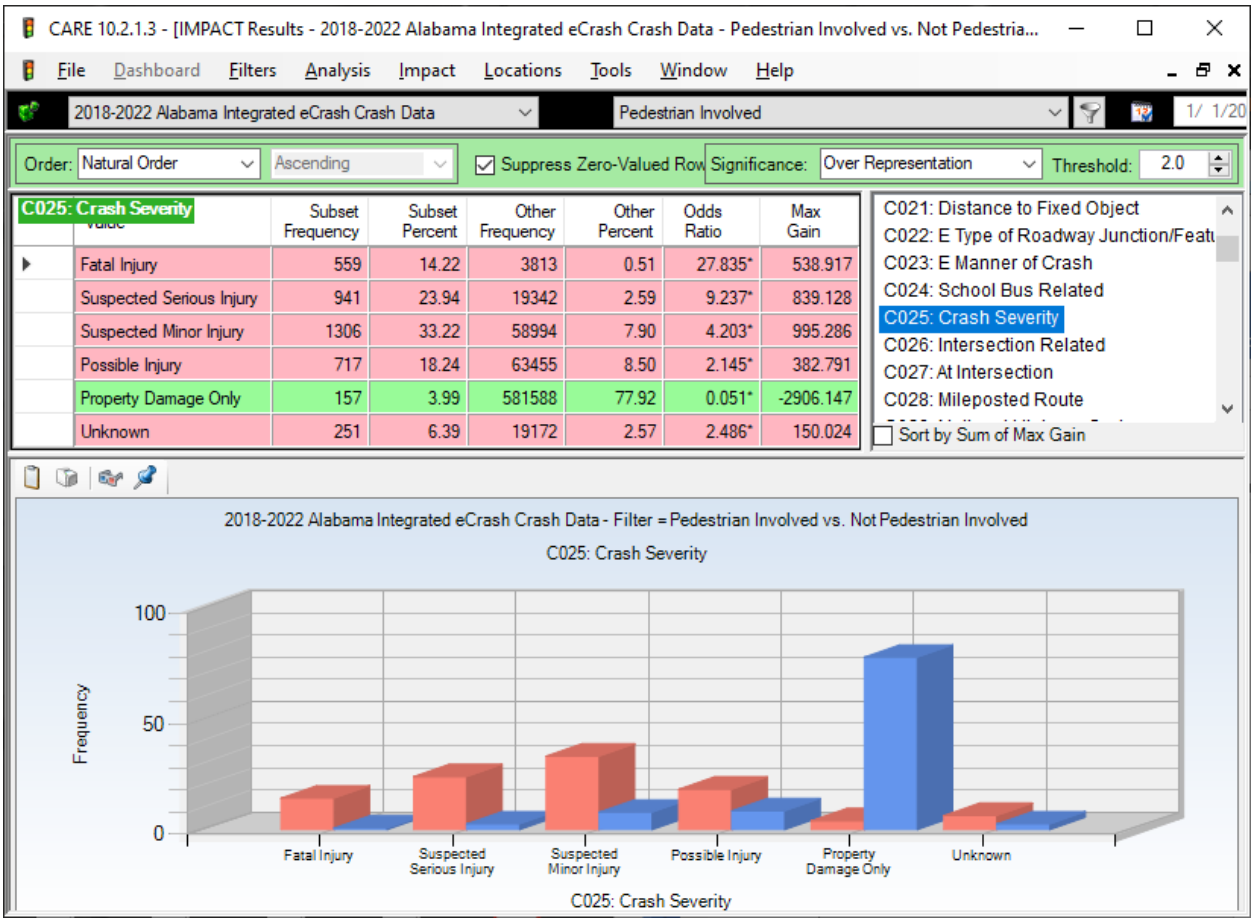
This is an important attribute in that the location of a crash gives great insight into what caused the crash. Pedestrians should be aware that a pedestrian path does not give them the right-of-way, and even where it does, they need to be very careful in entering the traffic way.

2.10 C031 Lighting Conditions; PIC vs Non-PIC Crashes



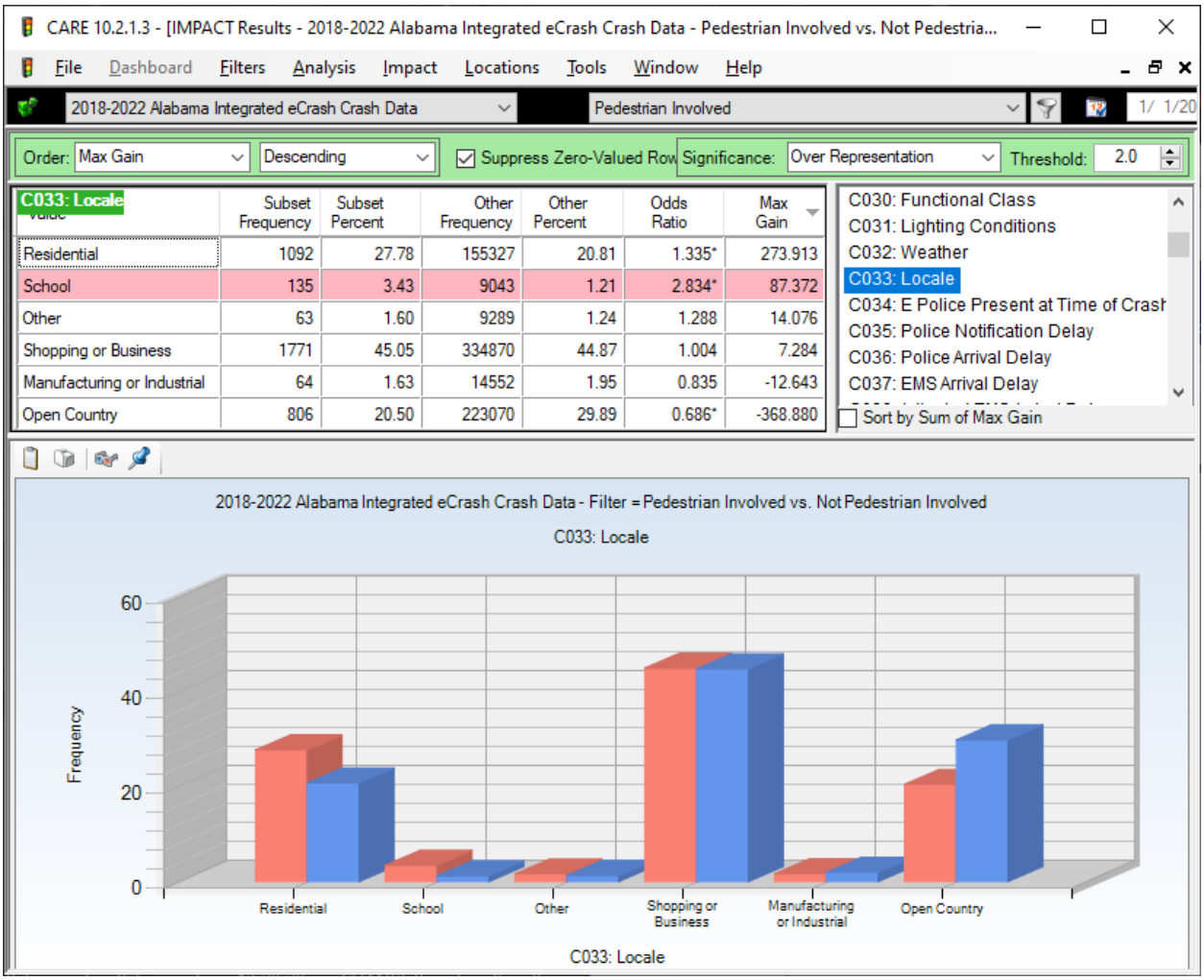
Pedestrians should avoid the dark hours if at all possible. For specifics on over-represented hours, see Section 2.5.

2.11 C025 Crash Severity; PIC vs Non-PIC Crashes



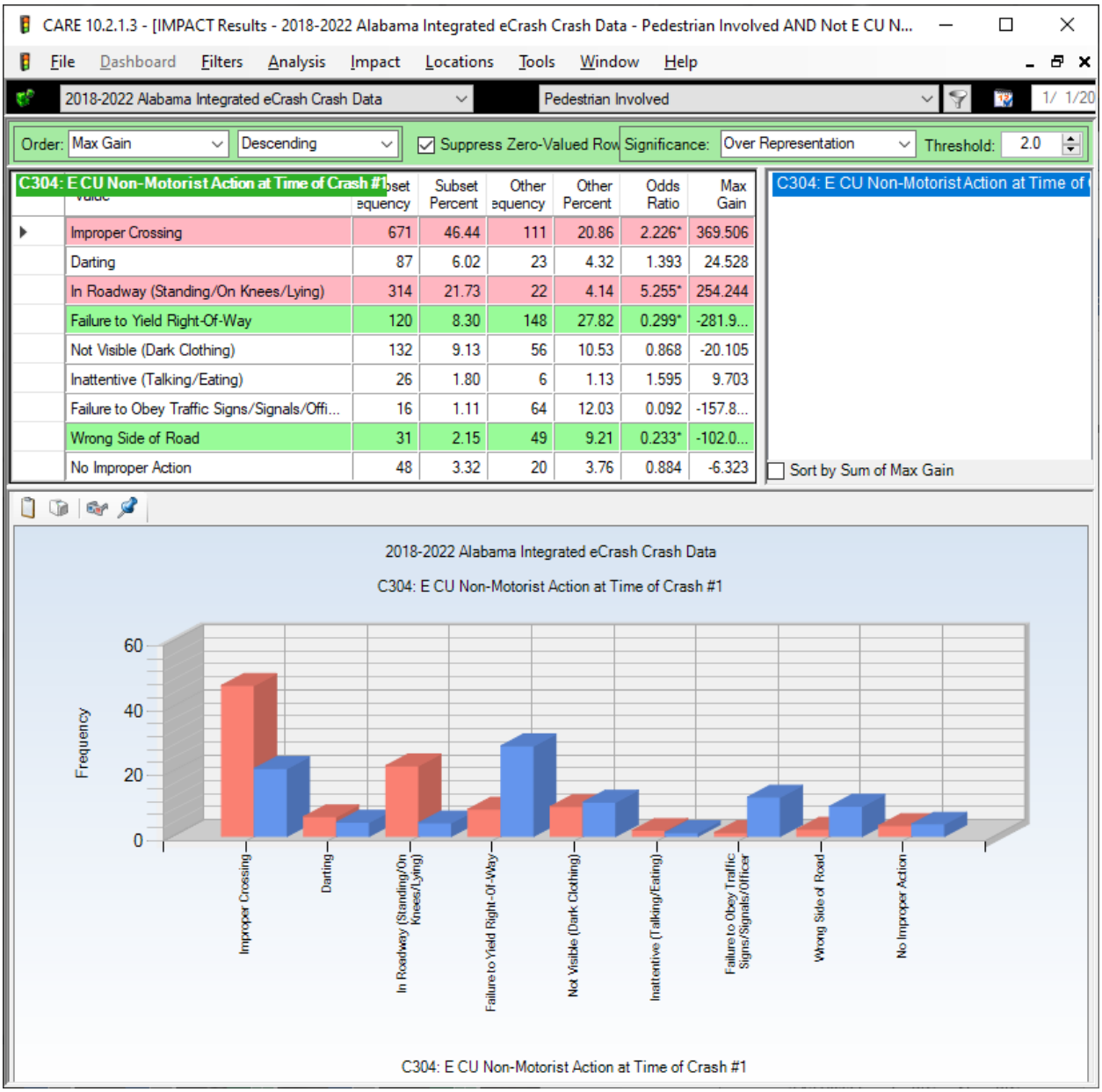
The above indicates that the extremely high relative severity of all Pedestrian-Involved crashes that caused injury. For example, fatalities occur nearly 28 times that of Non-PIC crashes.

2.12 C033 Locale; PIC vs Non-PIC Crashes



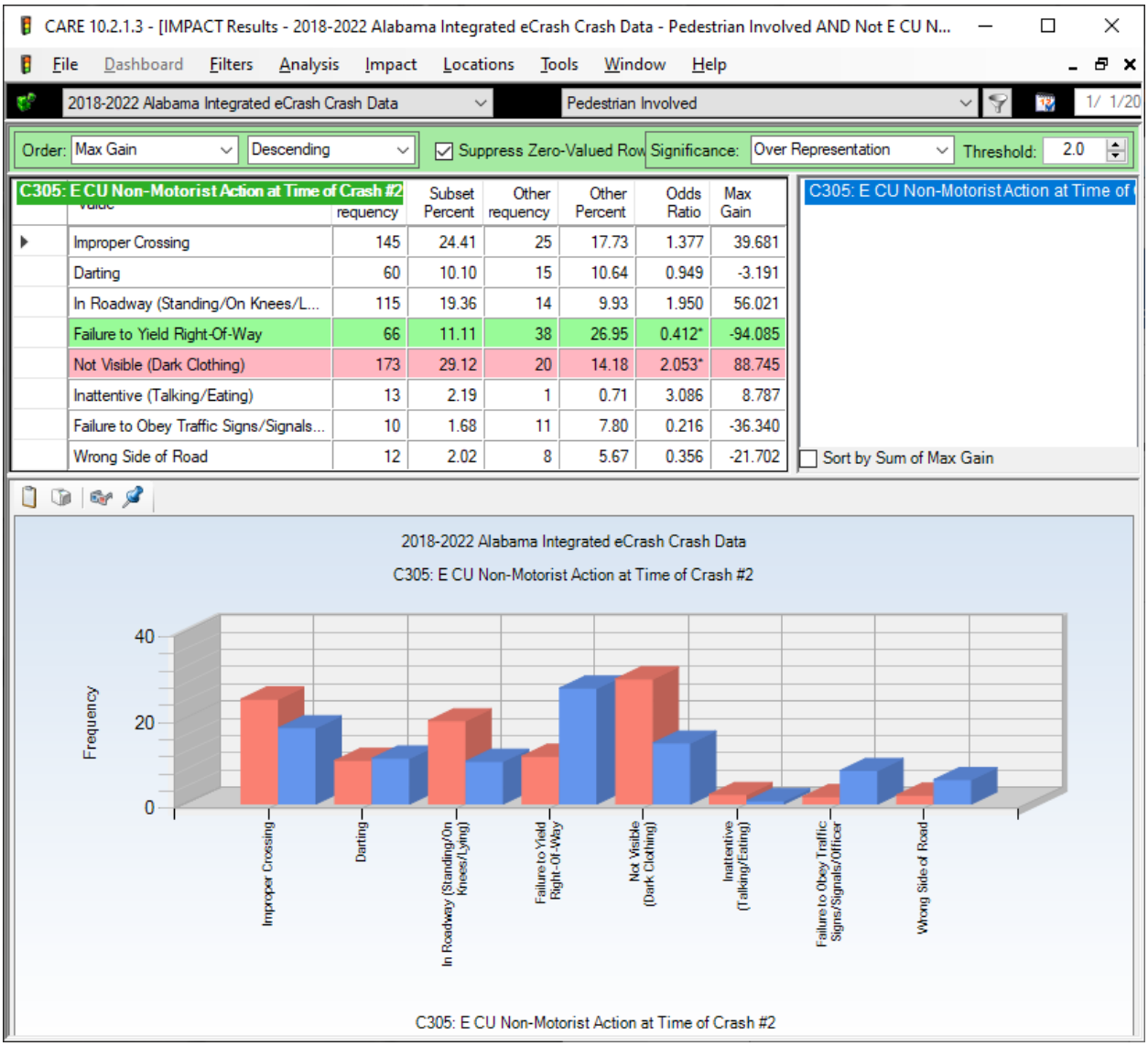
Residential and School areas are significantly over-represented. The proportion in School areas is 2.834 times that found from non-PIC crashes. Children walking to school need to be reminded of safety rules at least once per month, emphasizing the special dangers that they encounter when they are on or near roadways.

2.13 C304 Non-Motorist Action #1; PIC vs Non-PIC Crashes



This attribute gives the relative causes of pedestrian crashes caused by the pedestrians, as follows (number of crashes in the five-year period): Improper Crossing (671), In Roadway-Standing/On Knees/Lying (314), Not Visible, e.g., Dark Clothing (132), Failure to Yield Right-Of-Way (120), Darting (97), Inattentive (Talking/Eating) (26), Wrong Side of Road (31).

2.14 C305 Non-Motorist Action #2; PIC vs Non-PIC Crashes

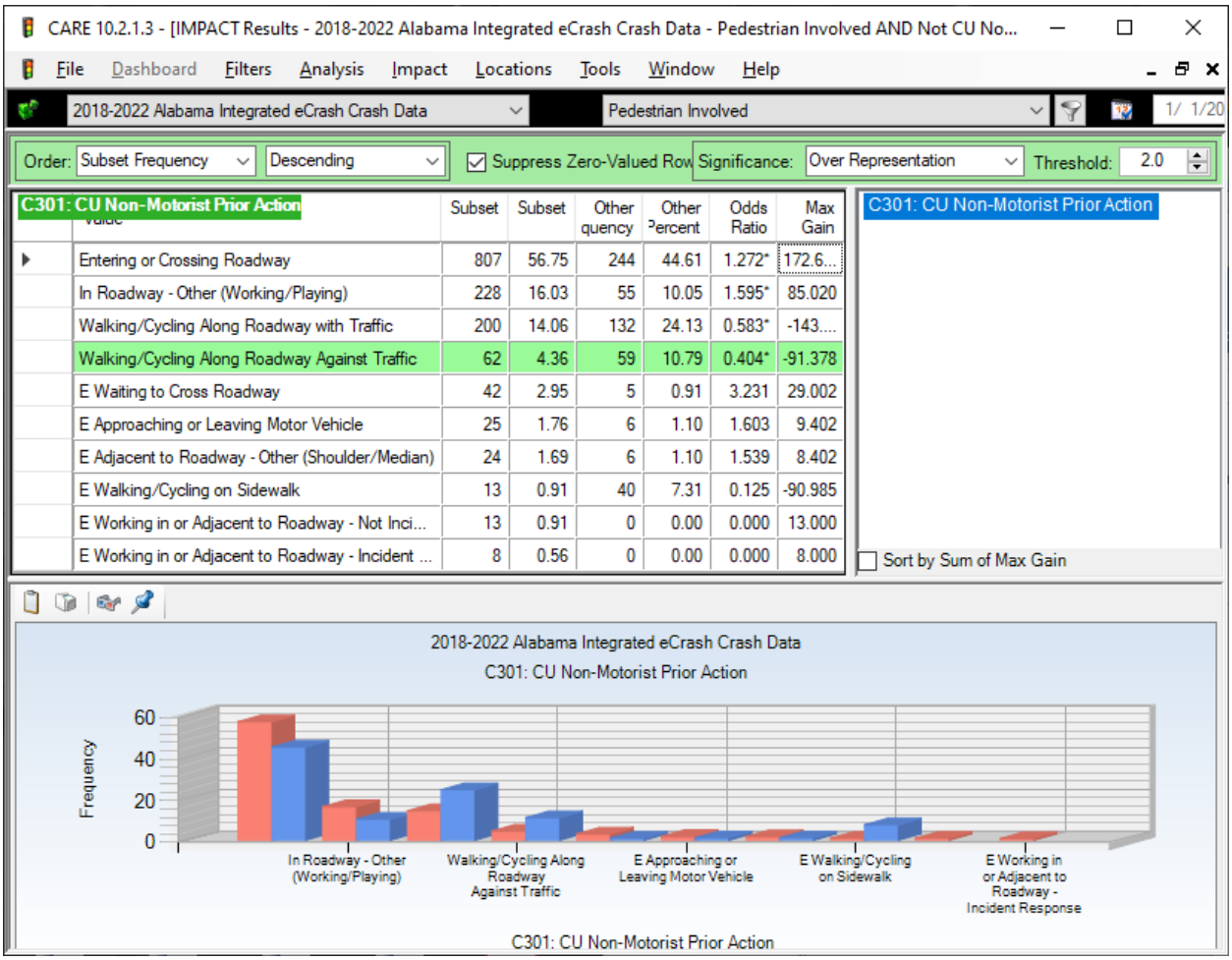


C305: E CU Non-Motorist Action at Time of Crash #2	Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
Improper Crossing	145	24.41	25	17.73	1.377	39.681
Darting	60	10.10	15	10.64	0.949	-3.191
In Roadway (Standing/On Knees/L...	115	19.36	14	9.93	1.950	56.021
Failure to Yield Right-Of-Way	66	11.11	38	26.95	0.412*	-94.085
Not Visible (Dark Clothing)	173	29.12	20	14.18	2.053*	88.745
Inattentive (Talking/Eating)	13	2.19	1	0.71	3.086	8.787
Failure to Obey Traffic Signs/Signals...	10	1.68	11	7.80	0.216	-36.340
Wrong Side of Road	12	2.02	8	5.67	0.356	-21.702

In the same order as given above for #1:
Improper Crossing (145), In Roadway-Standing/On Knees/Lying (115), Not Visible, e.g., Dark Clothing (173), Failure to Yield Right-Of-Way (10), Darting (60), Inattentive (Talking/Eating) (13), Wrong Side of Road (12).

These numbers may not be additive with C304.

2.15 C301 CU Non-Motorist Prior Action; PIC vs Non-PIC Crashes



C301: CU Non-Motorist Prior Action	Subset	Subset	Other quency	Other Percent	Odds Ratio	Max Gain
Entering or Crossing Roadway	807	56.75	244	44.61	1.272*	172.6...
In Roadway - Other (Working/Playing)	228	16.03	55	10.05	1.595*	85.020
Walking/Cycling Along Roadway with Traffic	200	14.06	132	24.13	0.583*	-143....
Walking/Cycling Along Roadway Against Traffic	62	4.36	59	10.79	0.404*	-91.378
E Waiting to Cross Roadway	42	2.95	5	0.91	3.231	29.002
E Approaching or Leaving Motor Vehicle	25	1.76	6	1.10	1.603	9.402
E Adjacent to Roadway - Other (Shoulder/Median)	24	1.69	6	1.10	1.539	8.402
E Walking/Cycling on Sidewalk	13	0.91	40	7.31	0.125	-90.985
E Working in or Adjacent to Roadway - Not Inci...	13	0.91	0	0.00	0.000	13.000
E Working in or Adjacent to Roadway - Incident ...	8	0.56	0	0.00	0.000	8.000

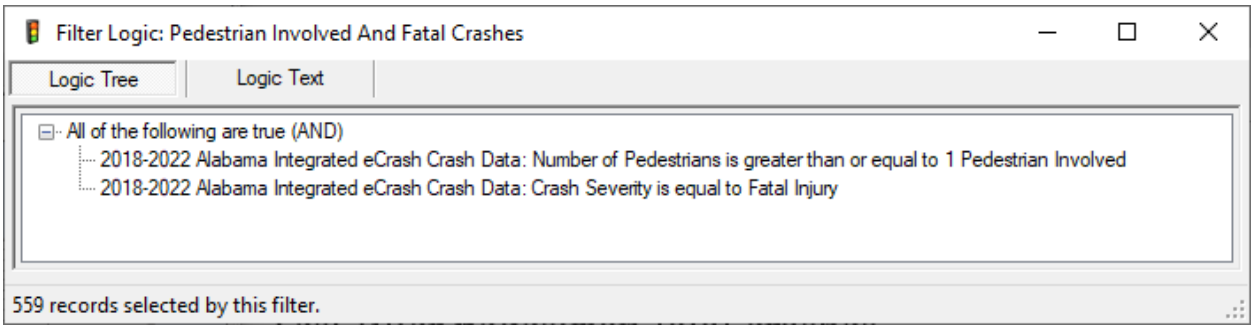
The "Other Frequency" column may not be comparable since it is for Non-Pedestrians. The following are ordered by highest frequency first:

Entering or Crossing Roadway	807
In Roadway - Other (Working/Playing)	228
Walking/Cycling Along Roadway with Traffic	200
Walking/Cycling Along Roadway Against Traffic	62
E Waiting to Cross Roadway	42
E Approaching or Leaving Motor Vehicle	25
E Adjacent to Roadway - Other (Shoulder/Median)	24
E Walking/Cycling on Sidewalk	13
E Working in or Adjacent to Roadway - Not Incident Response	13
E Working in or Adjacent to Roadway - Incident Response	8

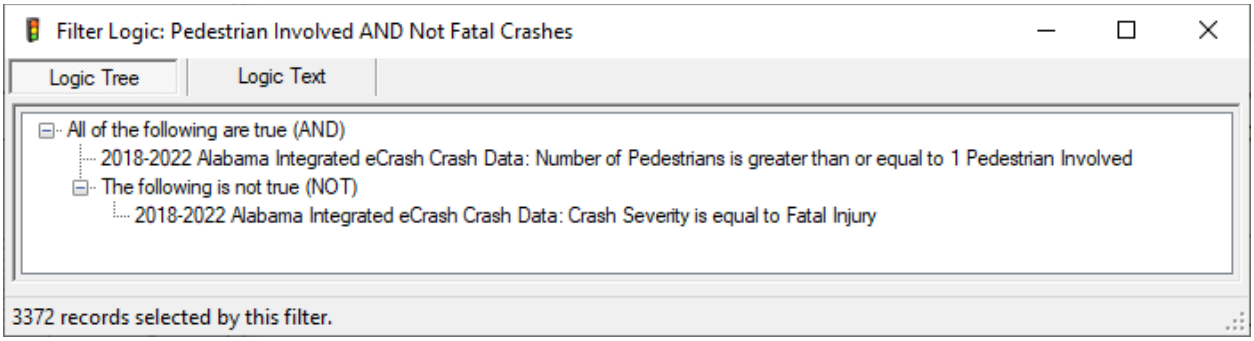
3.0 Pedestrian Fatality Analysis

The IMPACT comparisons for those given in this section will be Pedestrian Fatalities against Pedestrian Non-Fatal crash according to the filters given below.

Test filter: Pedestrian Involved and Fatal Crashes

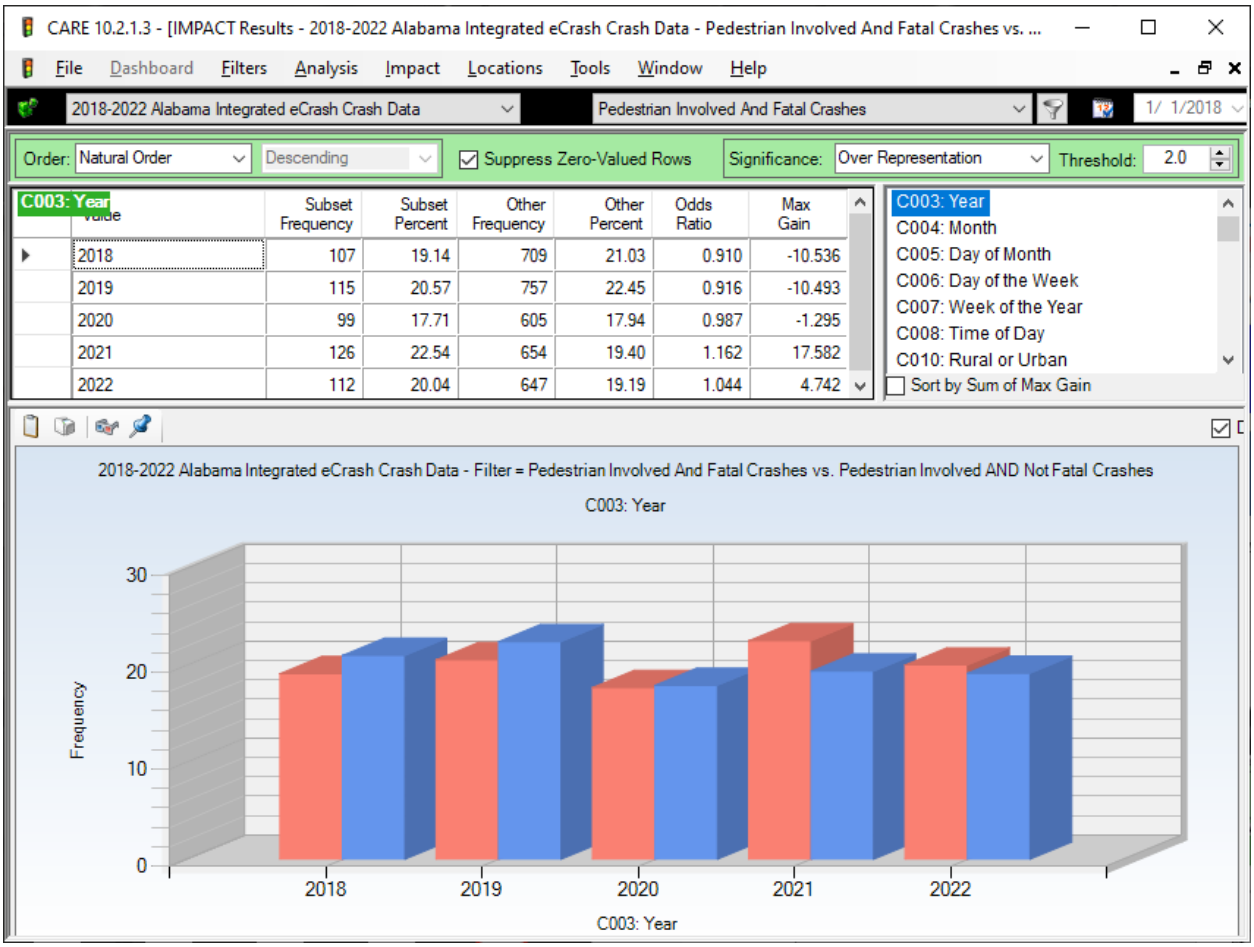


Control filter: Pedestrian Involved and Non-Fatal Crashes



Many of the attributes analyzed below after Section 3.5 did not appear in the prior pedestrian studies because they were recently added as Alabama became NHTSA Model Minimum Uniform Crash Criteria (MMUCC) compliant.

3.1 F003 Year; Pedestrian Fatality Crashes vs Pedestrian Non-Fatal Crashes



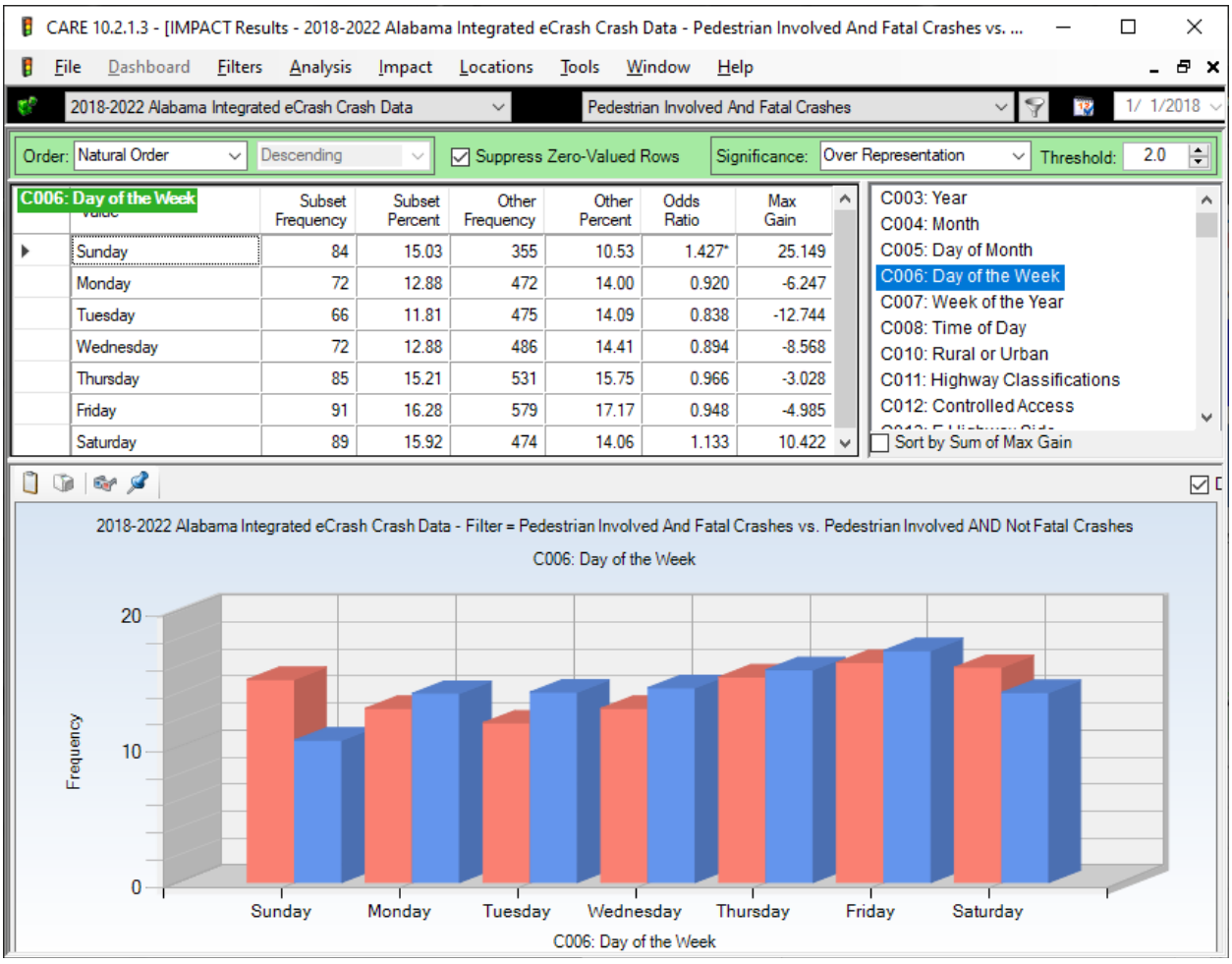
This display is comparable to the cross-tab in Section 1.5. Year 2021 is the major result that prompted this fatality analysis. The following are the proportion of pedestrian fatal crashes to pedestrian non-fatal crashes for the various years:

2018 13.11%
2019 13.19%
2020 14.06%
2021 16.15%
2022 14.76%

At this point we are looking at the causes for all fatal pedestrian crashes over the five-year period. There is no reason to believe at this point that the issues that cause fatal pedestrian crashes would be any different in 2021, but we will investigate that possibility. However, it seems clear that pedestrian fatal crashes went from being under-represented in 2018 and 2019 to being over-represented in 2021 and 2022. None of these were statistically significant.

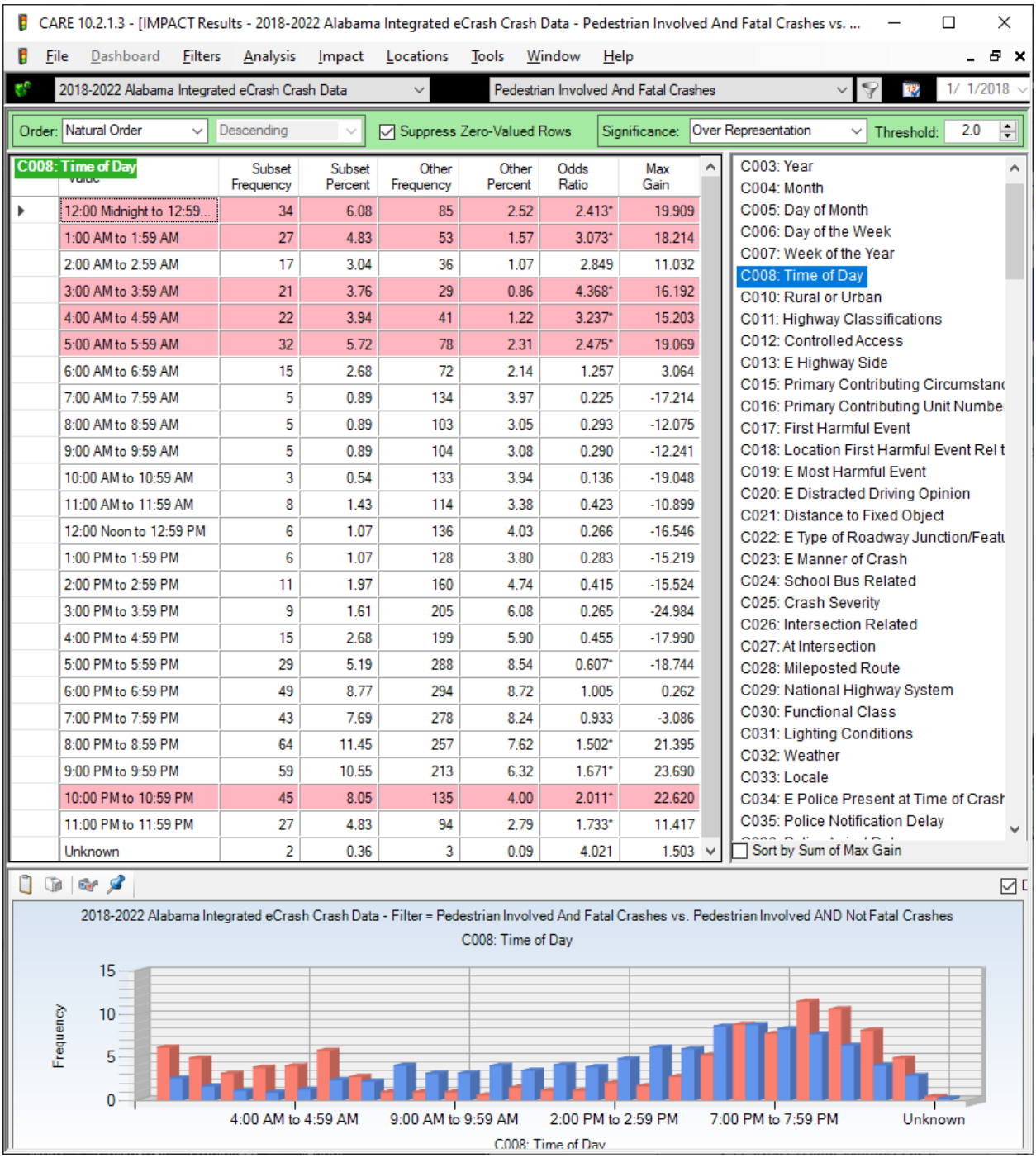
3.2 F006 Day of the Week

Both the Day of the Week and the Time of Day reflect impaired driving times; in this case both impaired driving and walking.



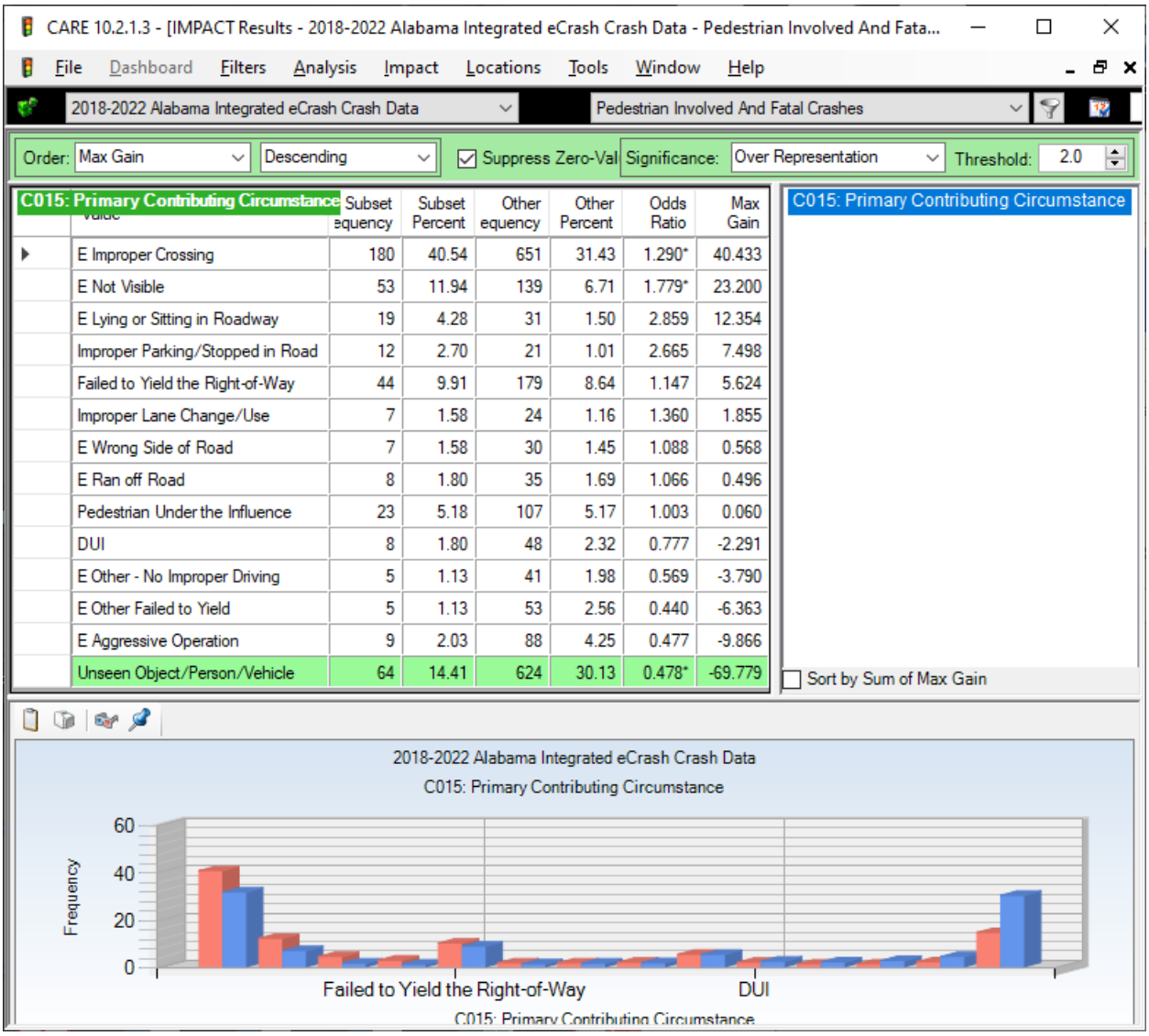
The weekend days of Saturday and particularly Sunday are significantly over-represented. All other days are under-represented, none significantly. See Sections 3.7 and 3.8 with regard to the influence of alcohol and drugs in these findings.

3.3 F008 Time of Day



Times from 6 PM throughout the night to 6:59 AM are in the early morning hours highly over-represented. Wise pedestrians will avoid all times after dark if at all possible.

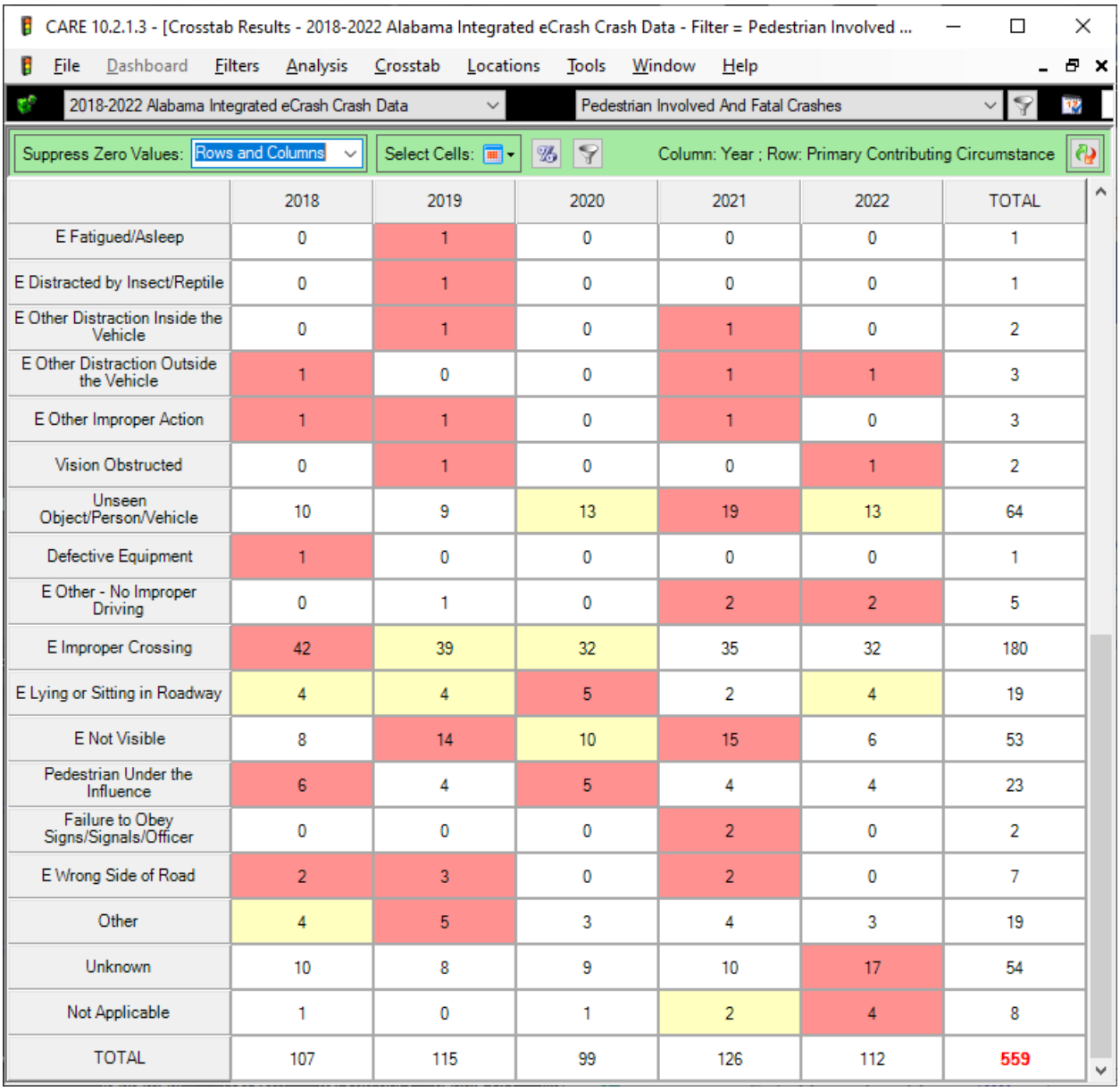
3.4 F015 Primary Contributing Circumstances (Items of 3 or less removed)



C015: Primary Contributing Circumstance	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
E Improper Crossing	180	40.54	651	31.43	1.290*	40.433
E Not Visible	53	11.94	139	6.71	1.779*	23.200
E Lying or Sitting in Roadway	19	4.28	31	1.50	2.859	12.354
Improper Parking/Stopped in Road	12	2.70	21	1.01	2.665	7.498
Failed to Yield the Right-of-Way	44	9.91	179	8.64	1.147	5.624
Improper Lane Change/Use	7	1.58	24	1.16	1.360	1.855
E Wrong Side of Road	7	1.58	30	1.45	1.088	0.568
E Ran off Road	8	1.80	35	1.69	1.066	0.496
Pedestrian Under the Influence	23	5.18	107	5.17	1.003	0.060
DUI	8	1.80	48	2.32	0.777	-2.291
E Other - No Improper Driving	5	1.13	41	1.98	0.569	-3.790
E Other Failed to Yield	5	1.13	53	2.56	0.440	-6.363
E Aggressive Operation	9	2.03	88	4.25	0.477	-9.866
Unseen Object/Person/Vehicle	64	14.41	624	30.13	0.478*	-69.779

We have seen where the time of day and day of the week distributions implicate Pedestrian Under the Influence (PUI). While only 23 Pedestrians Under the Influence (PUI) are recorded over the five years of the study, we believe that this could be under-reported because there are so many other PCC items that may far more obvious (especially for drug involvement). It is reasonable that sober pedestrians will be much more apt to take defensive action to save their lives than those who were under the influence. The cross-tabulation that follows gives a further indication of a potential reason for under-reporting of PUI as well as expected behavior of those who are PUI.

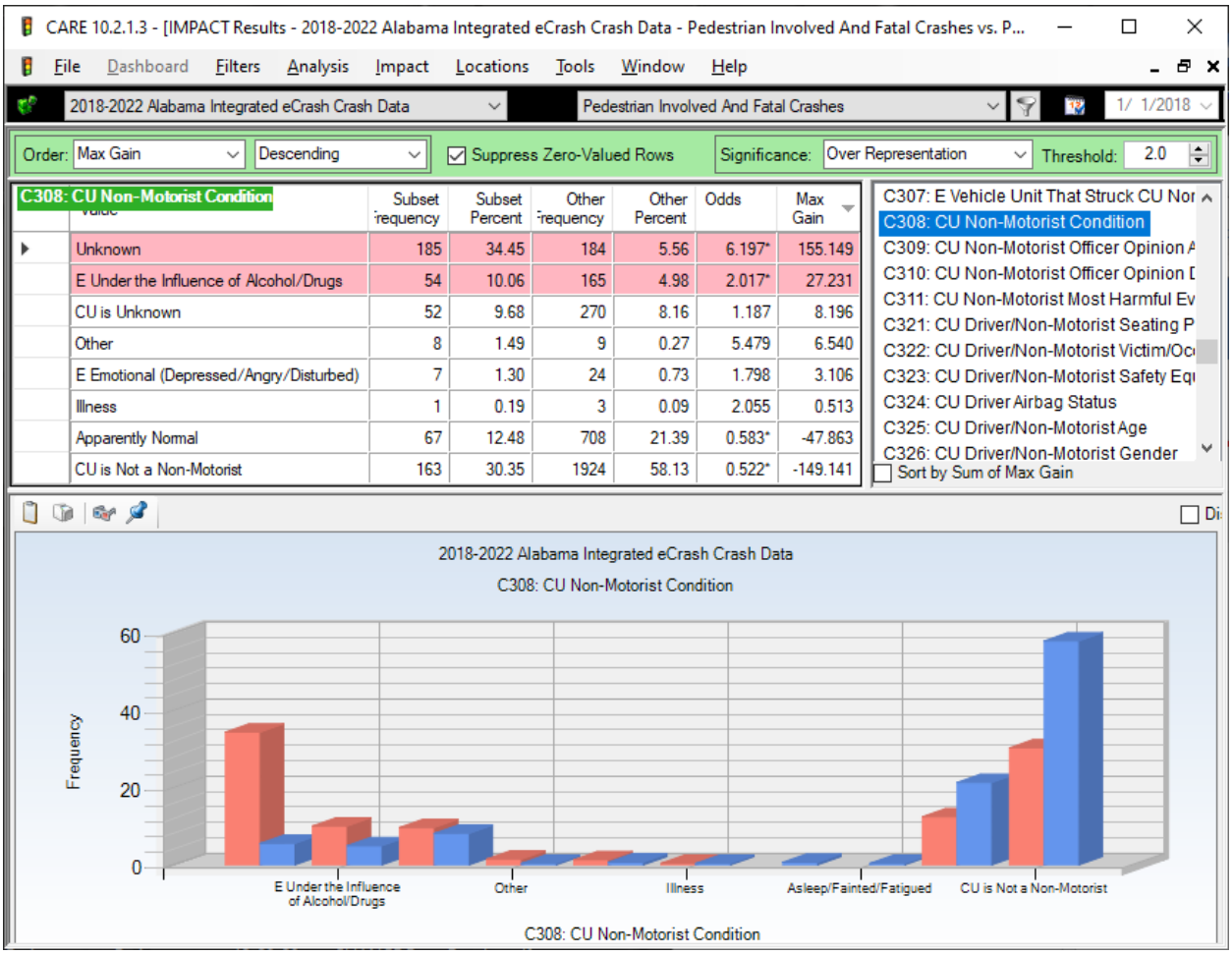
3.5 Partial Cross-tabulation: F015 Primary Contributing Circumstances by F004 Year



	2018	2019	2020	2021	2022	TOTAL
E Fatigued/Asleep	0	1	0	0	0	1
E Distracted by Insect/Reptile	0	1	0	0	0	1
E Other Distraction Inside the Vehicle	0	1	0	1	0	2
E Other Distraction Outside the Vehicle	1	0	0	1	1	3
E Other Improper Action	1	1	0	1	0	3
Vision Obstructed	0	1	0	0	1	2
Unseen Object/Person/Vehicle	10	9	13	19	13	64
Defective Equipment	1	0	0	0	0	1
E Other - No Improper Driving	0	1	0	2	2	5
E Improper Crossing	42	39	32	35	32	180
E Lying or Sitting in Roadway	4	4	5	2	4	19
E Not Visible	8	14	10	15	6	53
Pedestrian Under the Influence	6	4	5	4	4	23
Failure to Obey Signs/Signals/Officer	0	0	0	2	0	2
E Wrong Side of Road	2	3	0	2	0	7
Other	4	5	3	4	3	19
Unknown	10	8	9	10	17	54
Not Applicable	1	0	1	2	4	8
TOTAL	107	115	99	126	112	559

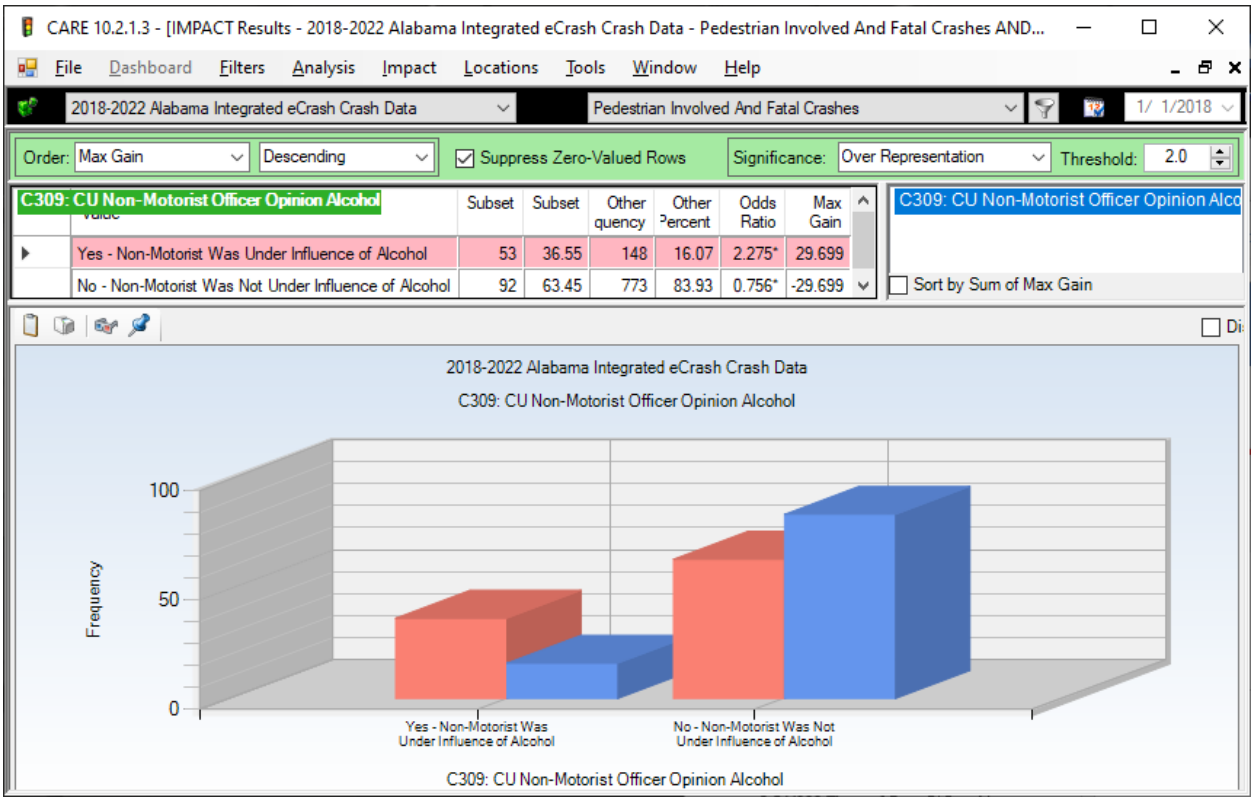
Consider 2021, the year that had the highest number of pedestrians killed (126). While Improper Crossing has the highest frequency (35), this is actually less than its five-year average (36). On the other hand, "Not Visible" and "Unseen" total to 34 fatal crashes, which is significantly higher than the five-year average for these two items combined ((64+53)/5=23.4). It is reasonable that those who are PUI would not take precautions to dress and/or locate themselves to increase their visibility.

3.6 F308 CU Non-Motorist Condition



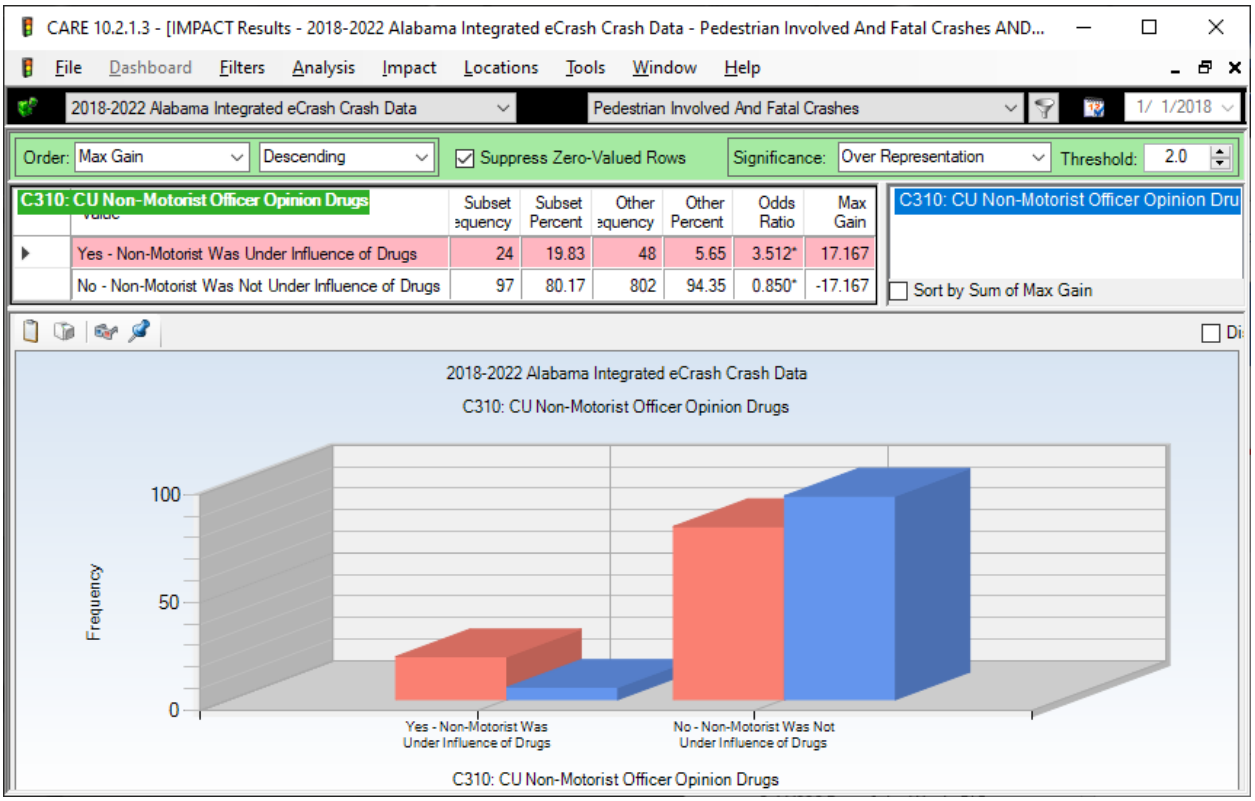
The large number of unknowns here is reasonable in that it might be impossible under the circumstances to know of the pedestrian condition. The over-representation of the pedestrian being Under the Influence of Alcohol/Drugs (over twice the expected proportion) reflects the findings above with regard to Time of Day and Day of the Week.

3.7 F309 Non-Motorist Officer's Opinion Alcohol

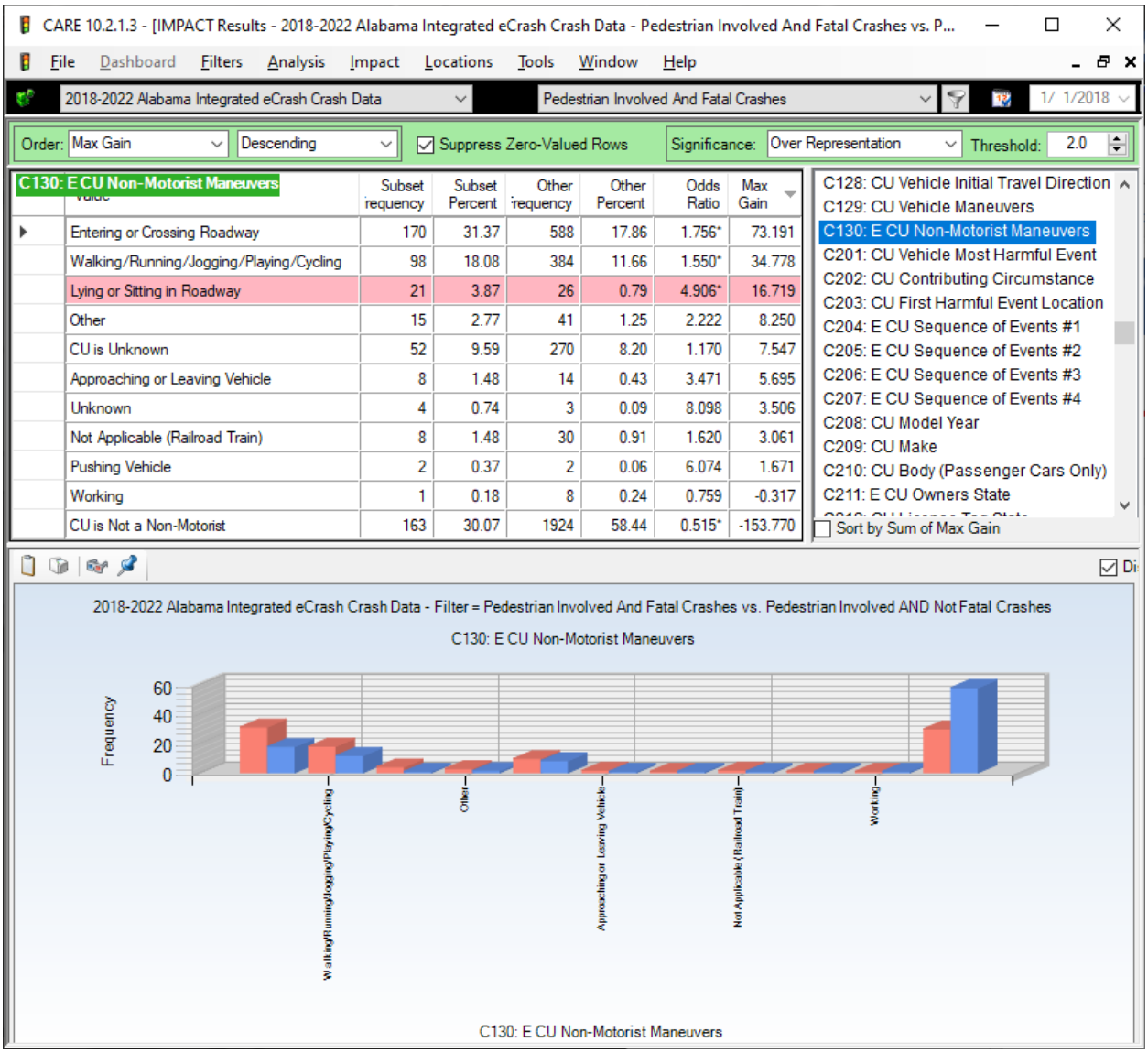


It is interesting that the number of PUI cases where the officer specified alcohol or drugs is 53 + 24 = 77, as compared to the number reported in the same Non-Motorist Condition category was only 54. There is no doubt that PUI contributes heavily to pedestrian deaths. The over-representation odds ratio is 2.275 for alcohol and even higher, 3.512, for drugs.

3.8 F310 Non-Motorist Officer's Opinion Drugs

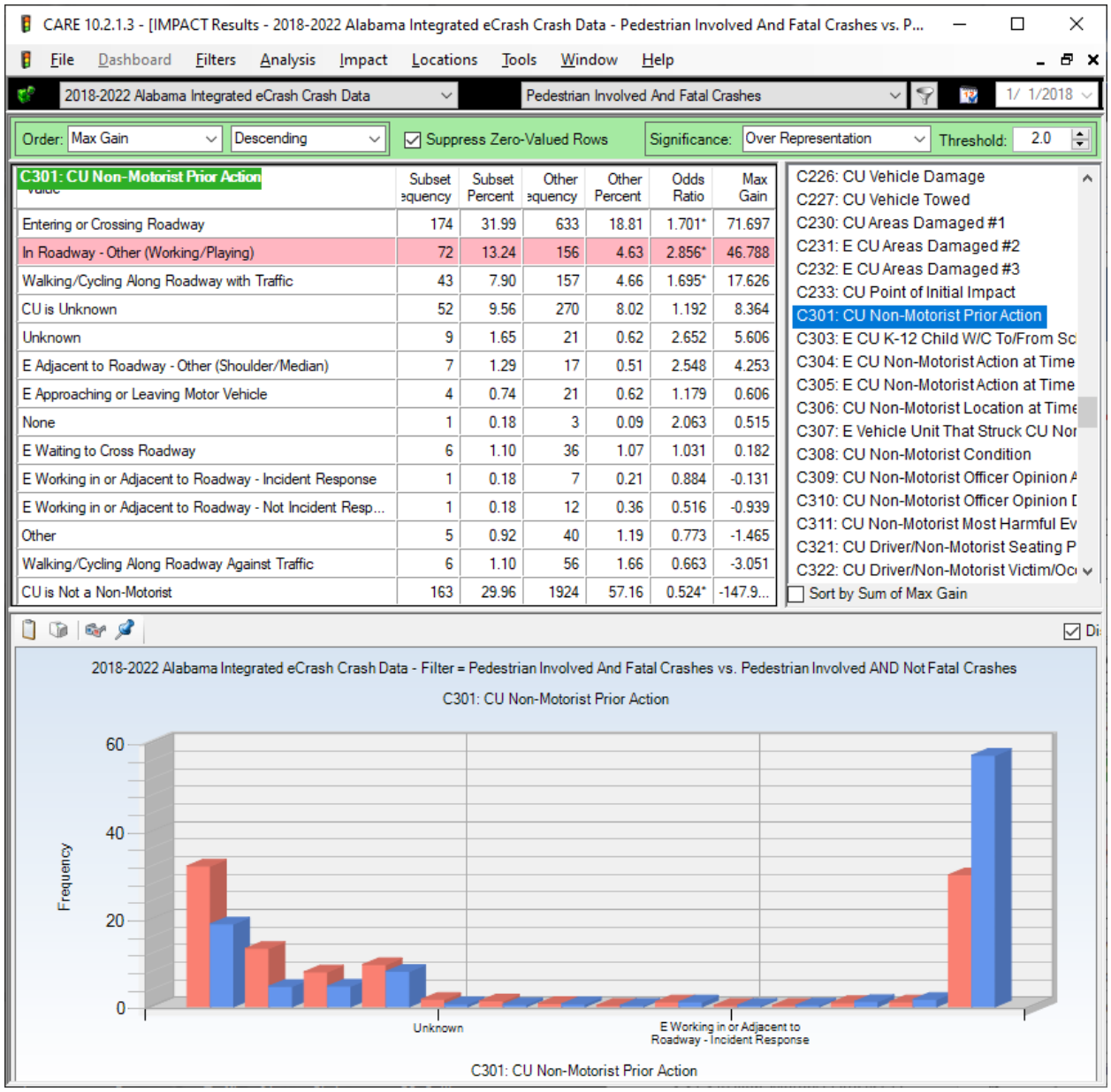


3.9 F130 CU Non-Motorist Maneuvers



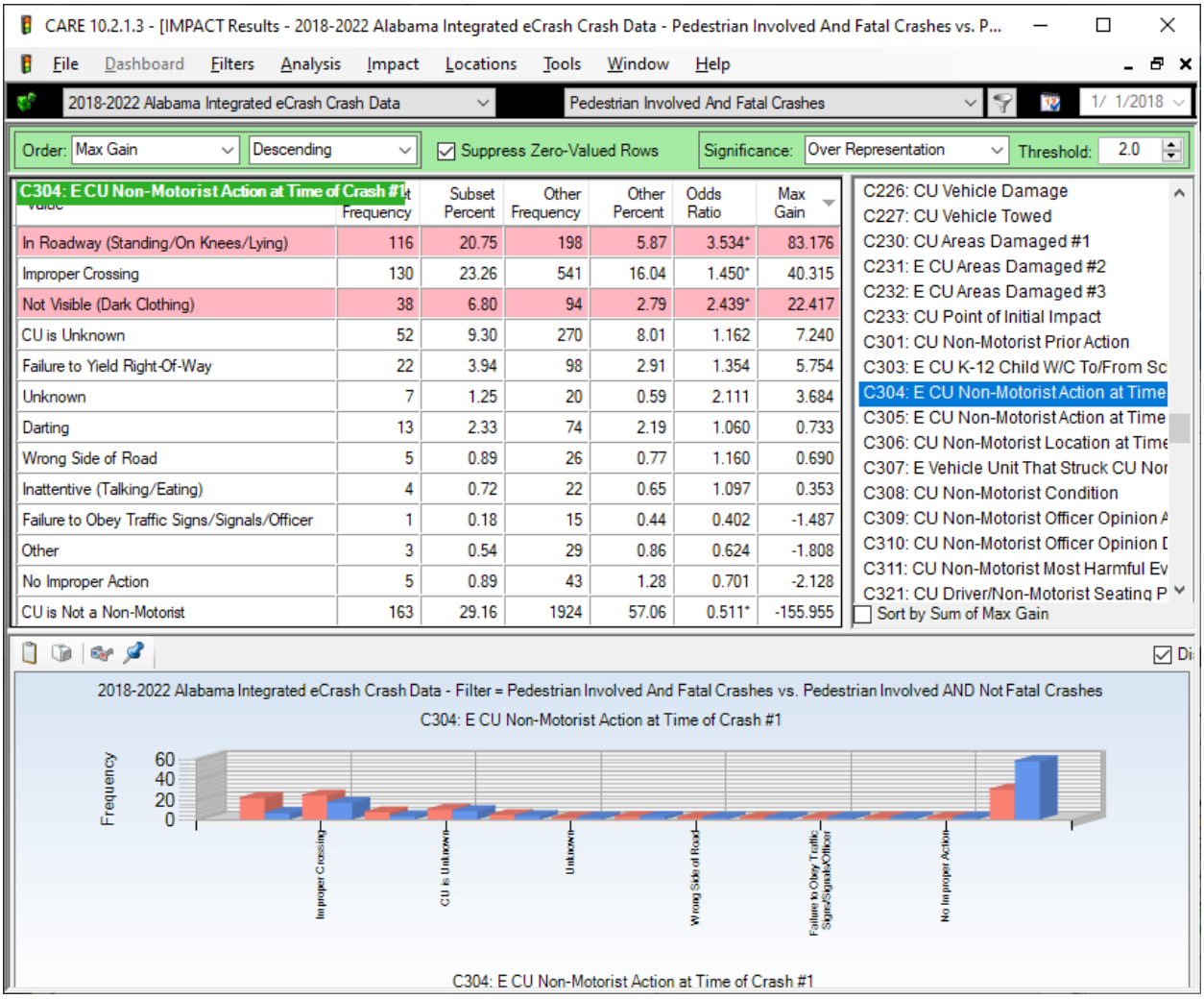
The highest significantly over-represented Non-Motorist Maneuver is that of Entering or attempting to Cross the Roadway. This is followed by Walking/Running/Jogging/Playing/Cycling. Which had a bit more than half of the highest. The most over-represented was Lying or Sitting in the Roadway, which had a relatively low frequency even though it was over-represented. It might be questionable how many of these are suicides, but with the alcohol and drugs numbers so high, these could be a factor as well.

3.10 F301 CU Non-Motorist Prior Action



Although the actual numbers may not be perfectly accurate, this does show that walking with the traffic direction is generally much more dangerous that walking against the traffic direction. Bicycle laws require that bicyclists travel with the traffic.

3.11 F304 CU Non-Motorist Action at time of Crash #1

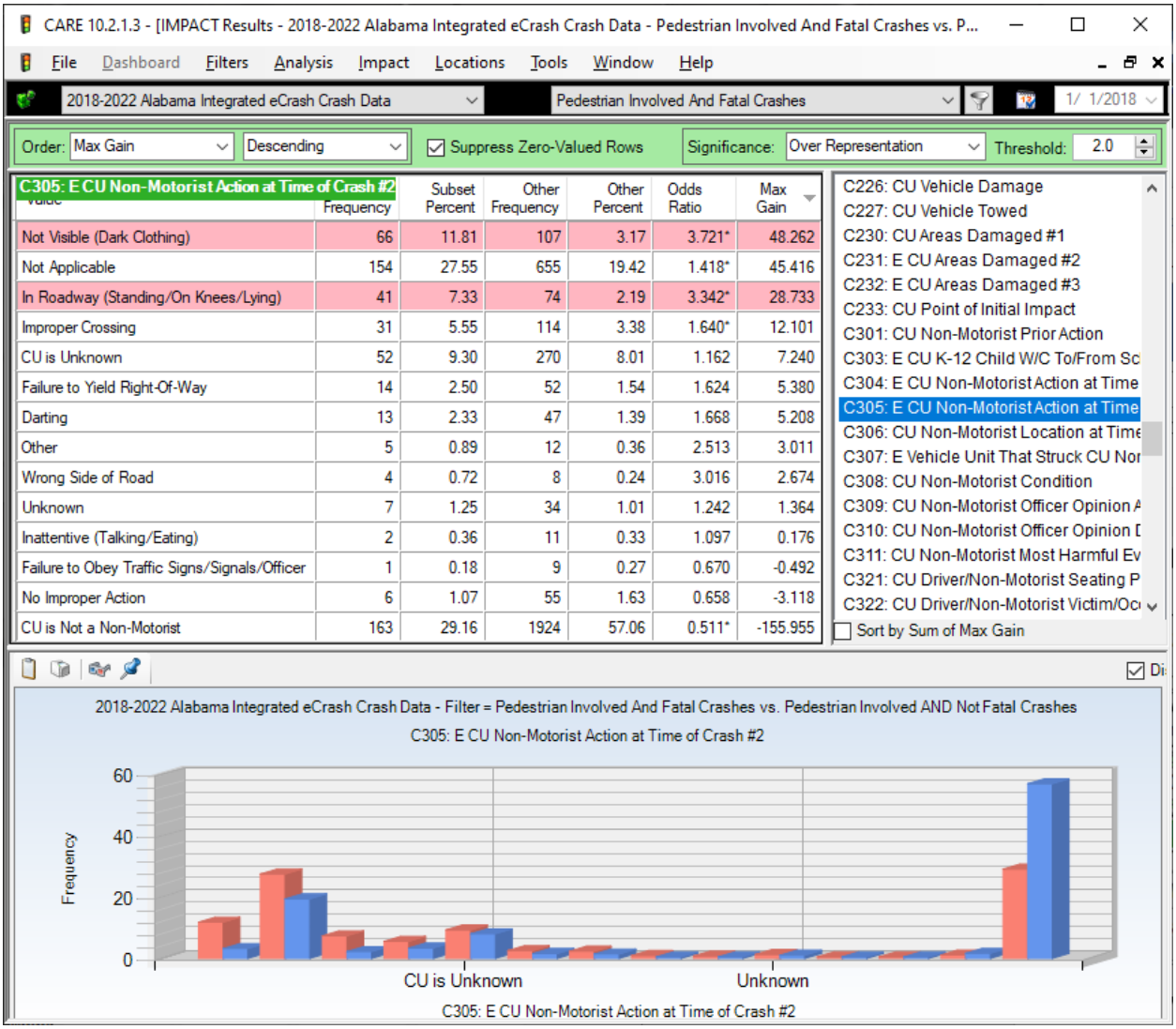


The following demonstrates how fatal pedestrian crashes have roughly the same proportion as all PICS that were given in Section 2.13, ordered from first to last (fatal totals include v305):

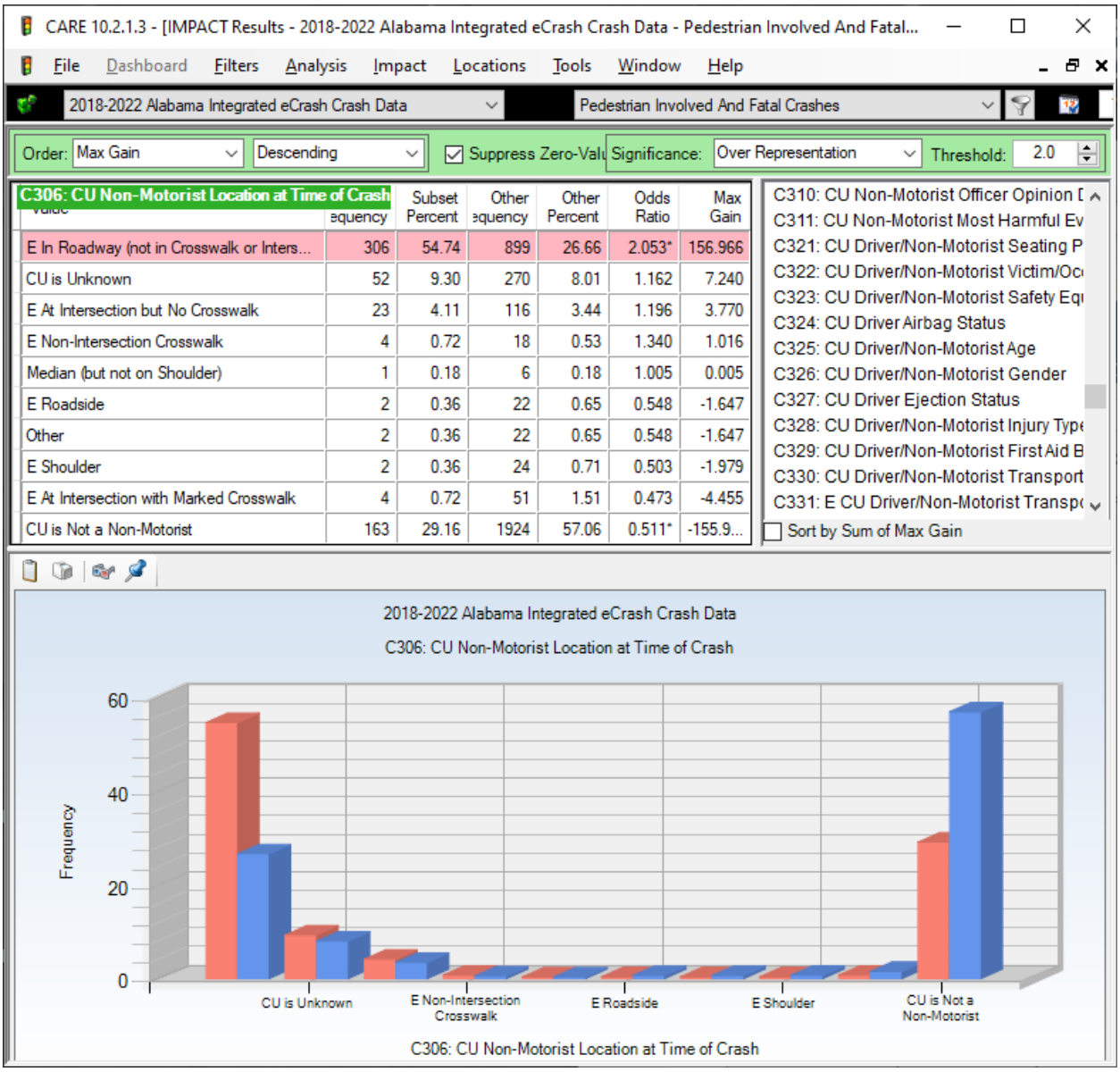
ALL Pedestrian		FATAL Pedestrian	
Improper Crossing	(824)	Now first	(130+31 = 161)
In Roadway-Standing/On Knees/Lying	(426)	Now second	(116+41 = 157)
Not Visible, e.g., Dark Clothing	(317)	Now third	(38+66=104)
Failure to Yield Right-Of-Way	(198)	Now 4th	(22+14 = 36)
Darting	(164)	Now 5th	(13+13 = 26)
Inattentive (Talking/Eating)	(47)	Now 7th	(4+2 = 6)
Wrong Side of Road	(38)	Now 6th	(5+4 = 9)

Generally, the proportion of fatalities remains constant with the cause for all pedestrian crashes.

3.12 F305 CU Non-Motorist Action at time of Crash #2



3.13 F306 CU Non-Motorist Location at Time of Crash



This may be one of the most significant findings of this section. It shows that over half of the fatal pedestrian crashes occur outside of crosswalks and/or intersection boundaries. This (54.74%) compares with 26.66% of the non-fatal pedestrian crashes.