



CENTER *for* ADVANCED
PUBLIC SAFETY

WORK ZONE ANALYSIS

For questions of comments, contact:

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For more information of Work Zones, please see:

<http://www.safehomealabama.gov/tag/work-zones/>

March 19, 2014

THE UNIVERSITY OF
ALABAMA

General Extent of the Problem

Five-Year Trend

TRUE or FALSE:

Over the past five years (2008-2012) the number of work zone crashes increase by 50%.

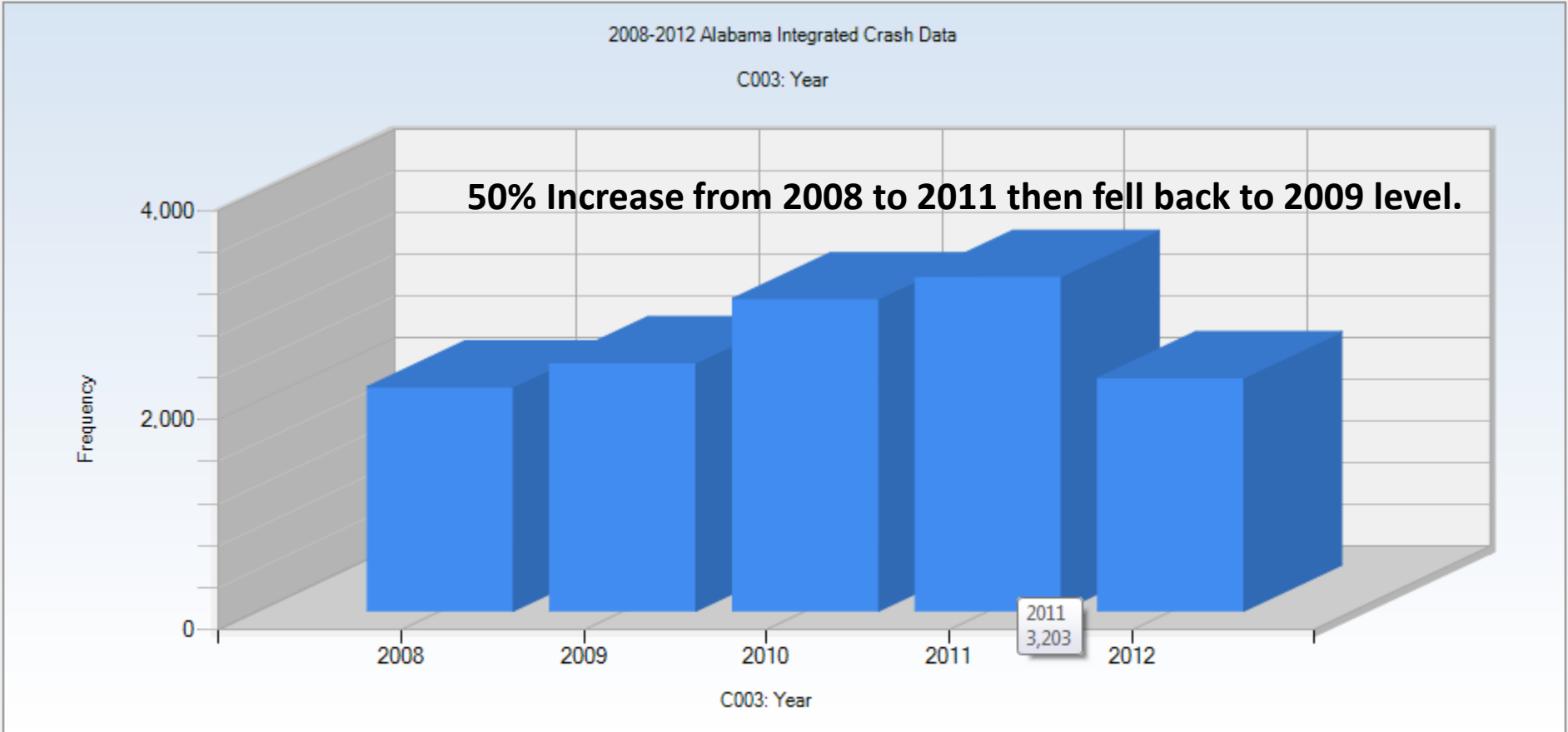
The overall number of crashes has remained relative stable.

Order: Natural Order Ascending Suppress Zero-Valued Frequencies

	Value	Frequency	Cum. Frequency	Percentage	Cum. Percent
▶	2008	2145	2145	16.57	16.57
	2009	2376	4521	18.36	34.93
	2010	2988	7509	23.08	58.01
	2011	3203	10712	24.75	82.76
	2012	2232	12944	17.24	100.00

C003: Year

Display Average Display Filter Name



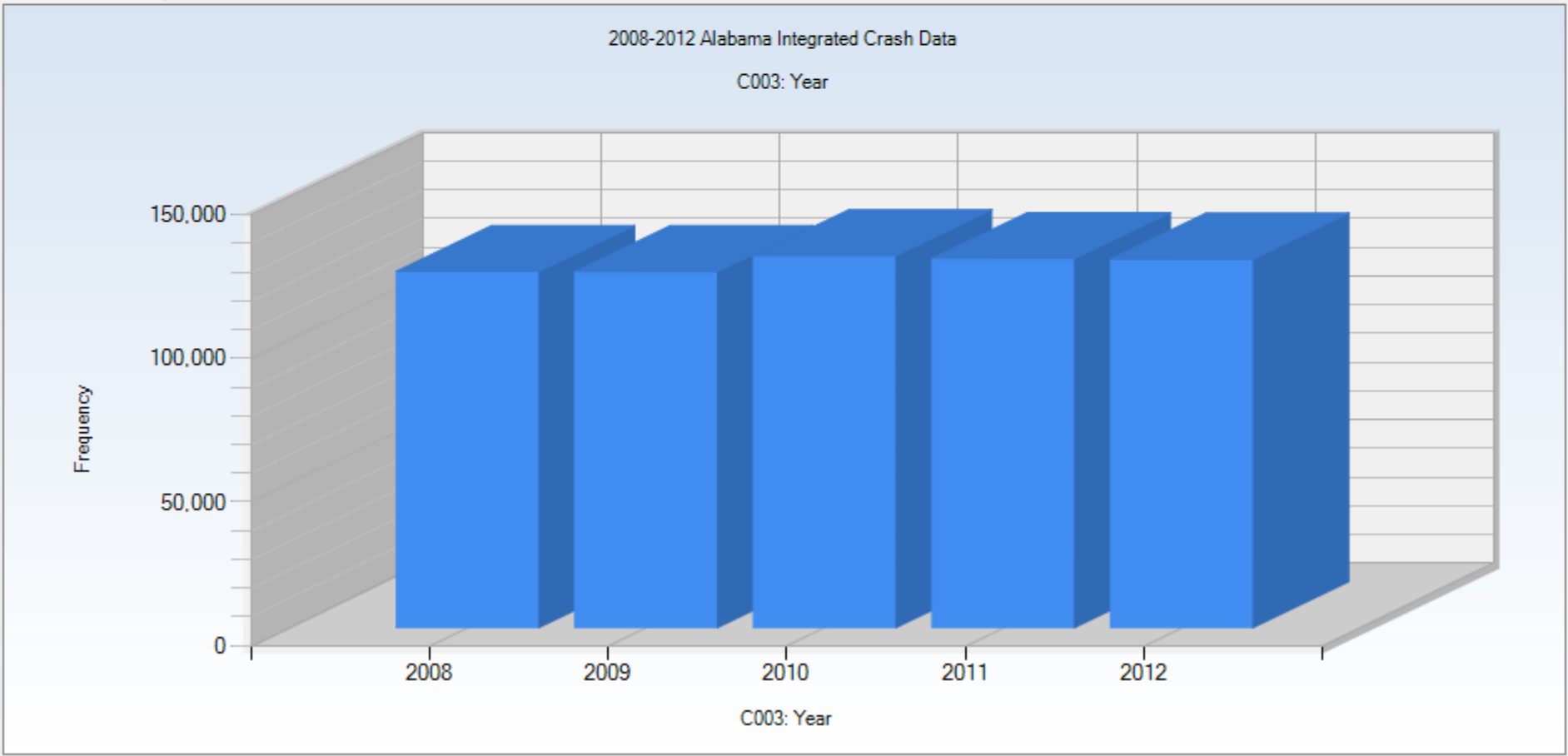
Order: Natural Order Ascending Suppress Zero-Valued Frequencies

	Value	Frequency	Cum. Frequency	Percentage	Cum. Percent
▶	2008	123992	123992	19.55	19.55
	2009	123975	247967	19.54	39.09
	2010	129529	377496	20.42	59.51
	2011	128501	505997	20.26	79.77
	2012	128318	634315	20.23	100.00

C003: Year



Display Average Display Filter Name



“OVER-REPRESENTATED”



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Over-represented means that the probability of the attribute value is significantly higher than expected when compared (in this case) to crashes not related to WZs.

In the following graph, year 2011 is over-represented in WZ crashes (by about 15%).

Red = WZ Involved Crashes

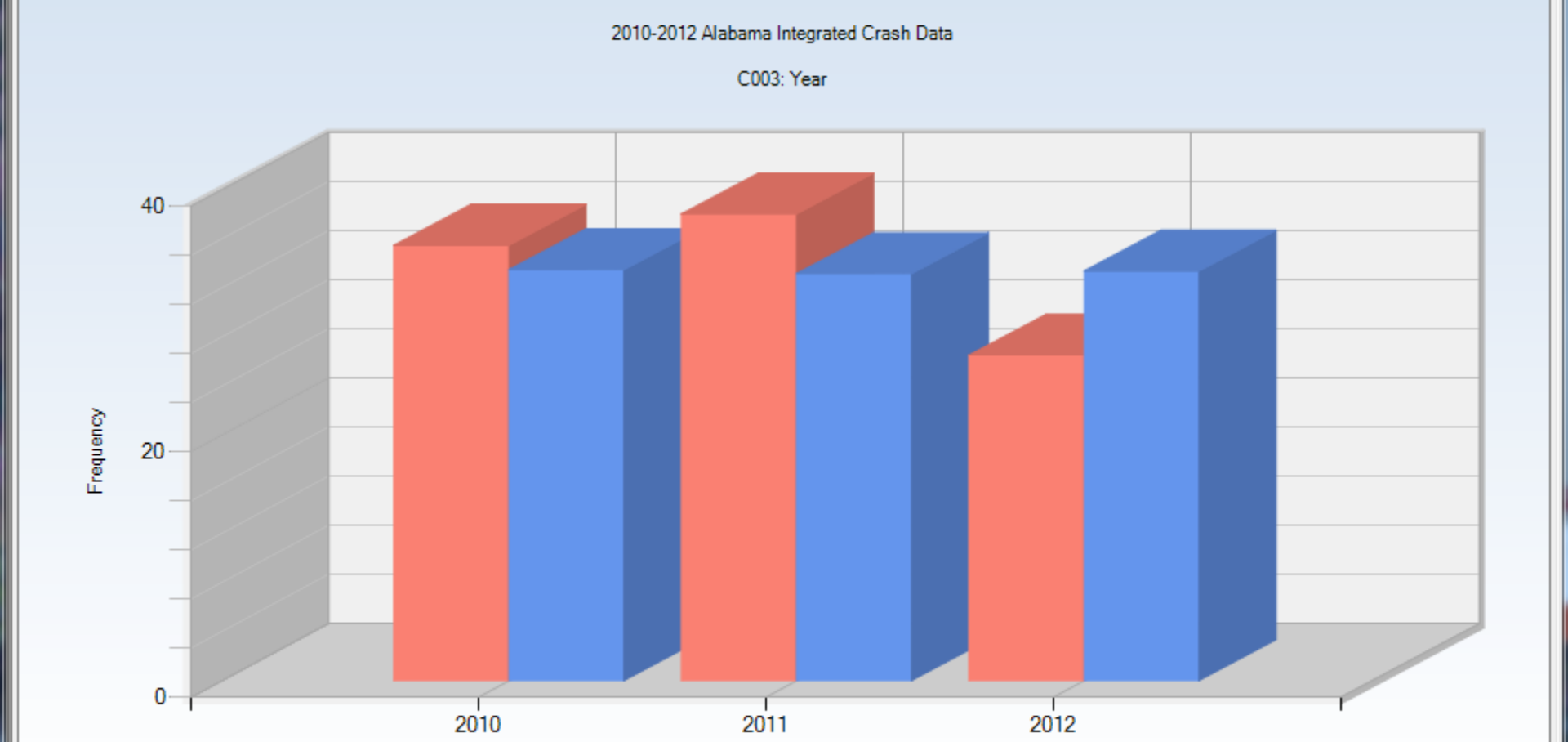
Blue = Crashes that Did Not Involve WZ

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

C003: Year							
	Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
▶	2010	2988	35.47	126546	33.48	1.059*	167.683
	2011	3203	38.02	125307	33.15	1.147*	410.296
	2012	2233	26.51	126127	33.37	0.794*	-577.979

C001: County
 C002: City
 C003: Year
 C004: Month
 C005: Day of Month
 Sort by Sum of Max Gain

Remaining Comparison Use Data from These Three Years Display Filter Name



General Extent of the Problem

Severity

TRUE or FALSE

WZ involved crashes produce about 15% more fatal crashes than those non-WZ.

- Red = WZ Involved Crashes
- Blue = Crashes that Did Not Involve WZ

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

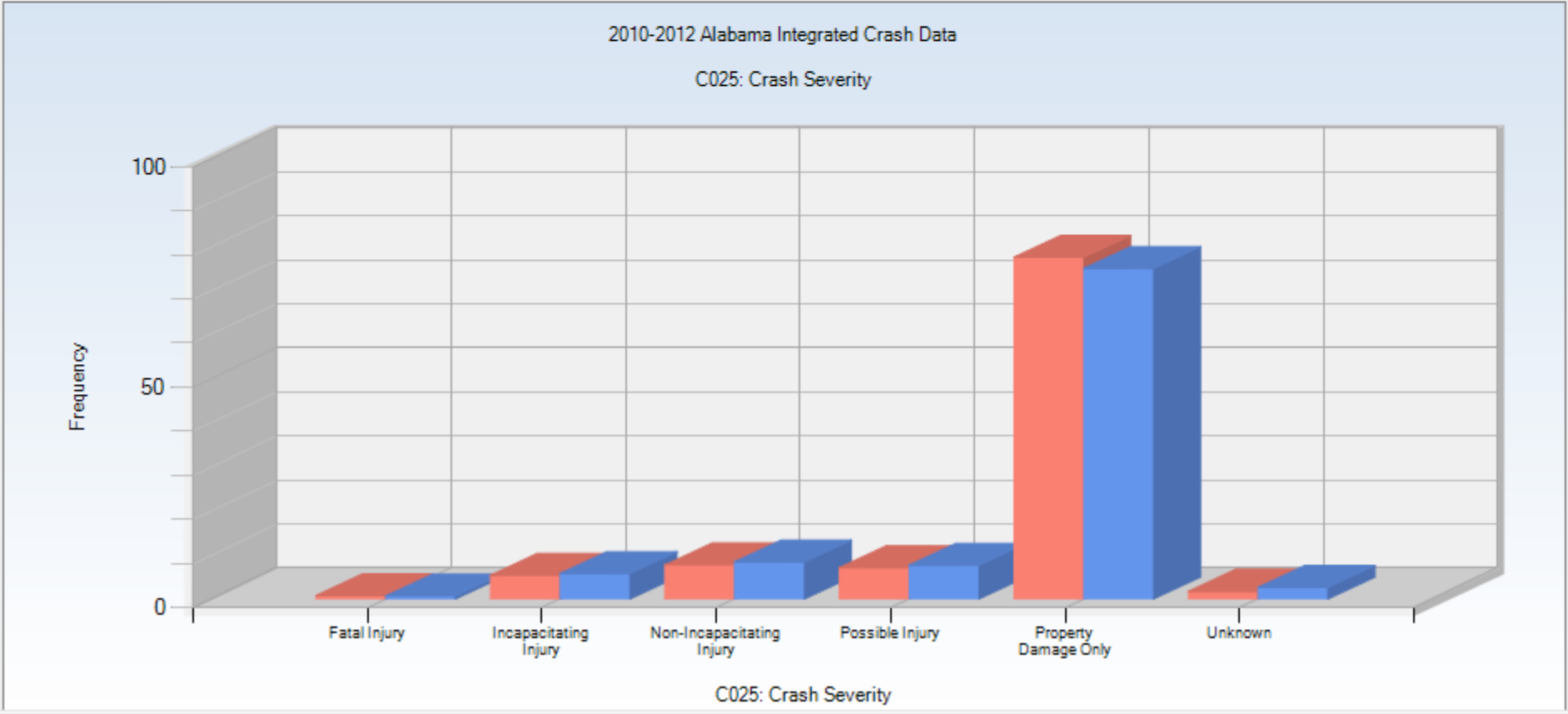
C025: Crash Severity

	Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
▶	Fatal Injury	61	0.72	2366	0.63	1.157	8.269
	Incapacitating Injury	449	5.33	21703	5.74	0.928	-34.692
	Non-Incapacitating Injury	645	7.66	31714	8.39	0.913*	-61.807
	Possible Injury	595	7.06	28835	7.63	0.926	-47.643
	Property Damage Only	6532	77.54	283474	75.00	1.034*	214.245
	Unknown	142	1.69	9888	2.62	0.644*	-78.373

- C022: E Type of Roadway Junction/Fea
 - C023: E Manner of Crash
 - C024: School Bus Related
 - C025: Crash Severity
 - C026: Intersection Related
 - C027: At Intersection
 - C028: Mileposted Route
 - C031: Lighting Conditions
- Sort by Sum of Max Gain



Display Filter Name



Work Zone Type

Activity in Workzone

TRUE or FALSE

The vast majority of WZ crashes involve major construction projects.

- Red = WZ Involved Crashes
- Blue = Crashes that Did Not Involve WZ

Order: Subset Frequency Descending Suppress Zero-Valued Rows Significance: Over Representation Threshold: 2.0

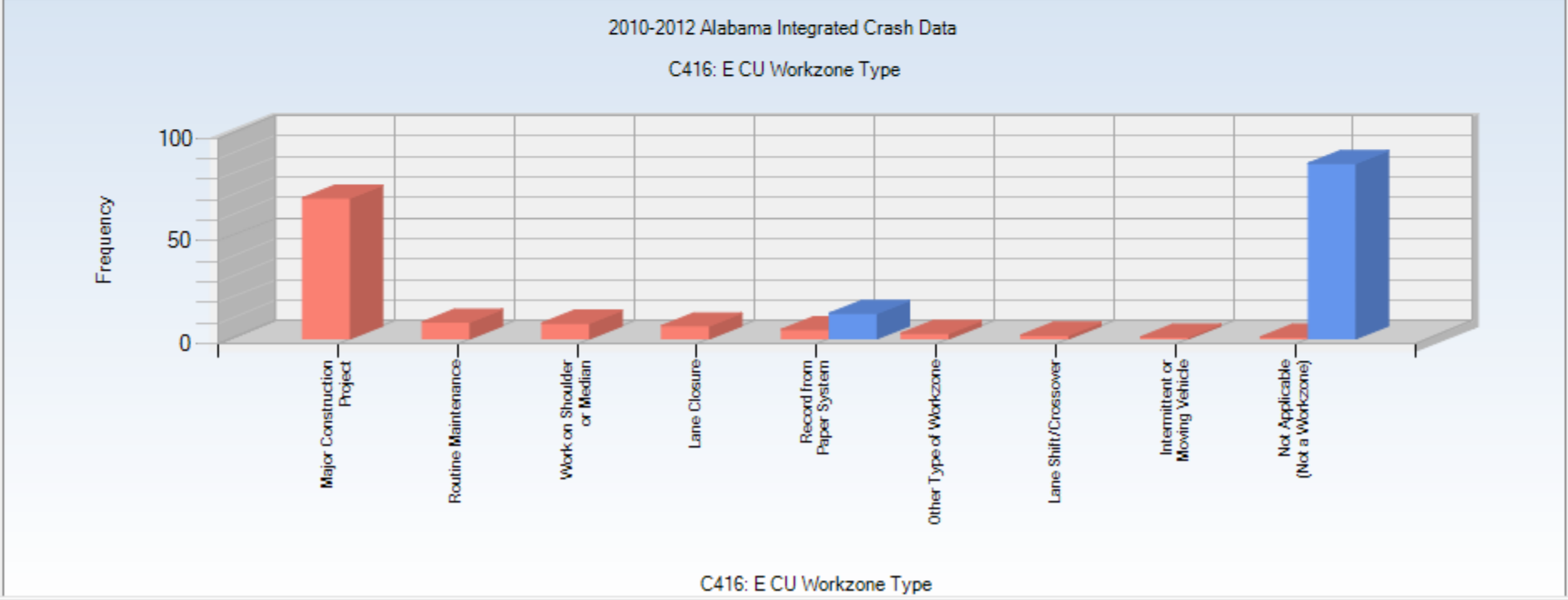
C416: E CU Workzone Type

	Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
▶	Major Construction Project	5769	68.48	0	0.00	0.000	5769.000
	Routine Maintenance	682	8.10	0	0.00	0.000	682.000
	Work on Shoulder or Median	639	7.59	0	0.00	0.000	639.000
	Lane Closure	528	6.27	0	0.00	0.000	528.000
	Record from Paper System	376	4.46	46626	12.34	0.362*	-663.149
	Other Type of Workzone	219	2.60	0	0.00	0.000	219.000
	Lane Shift/Crossover	143	1.70	0	0.00	0.000	143.000
	Intermittent or Moving Vehicle	50	0.59	0	0.00	0.000	50.000
	Not Applicable (Not a Workzone)	18	0.21	322593	85.35	0.003	-7171.596

- C415: CU Workzone Related
 - [C416: E CU Workzone Type](#)
 - C417: E CU Workers Present
 - C418: E CU Law Enforcement Present
 - C028: Mileposted Route
 - C011: Highway Classifications
 - [C046: HasRTMP](#)
 - C411: CU Opposing Lane Separation
 - C002: City
 - C043: Agency ORI
 - C012: Controlled Access
 - C045: HasGPS
- Sort by Sum of Max Gain



Display Filter Name



Workers Present Activity in Workzone

TRUE or FALSE

Workers were not present in about 50% of the WZ crashes.

- Red = WZ Involved Crashes
- Blue = Crashes that Did Not Involve WZ

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

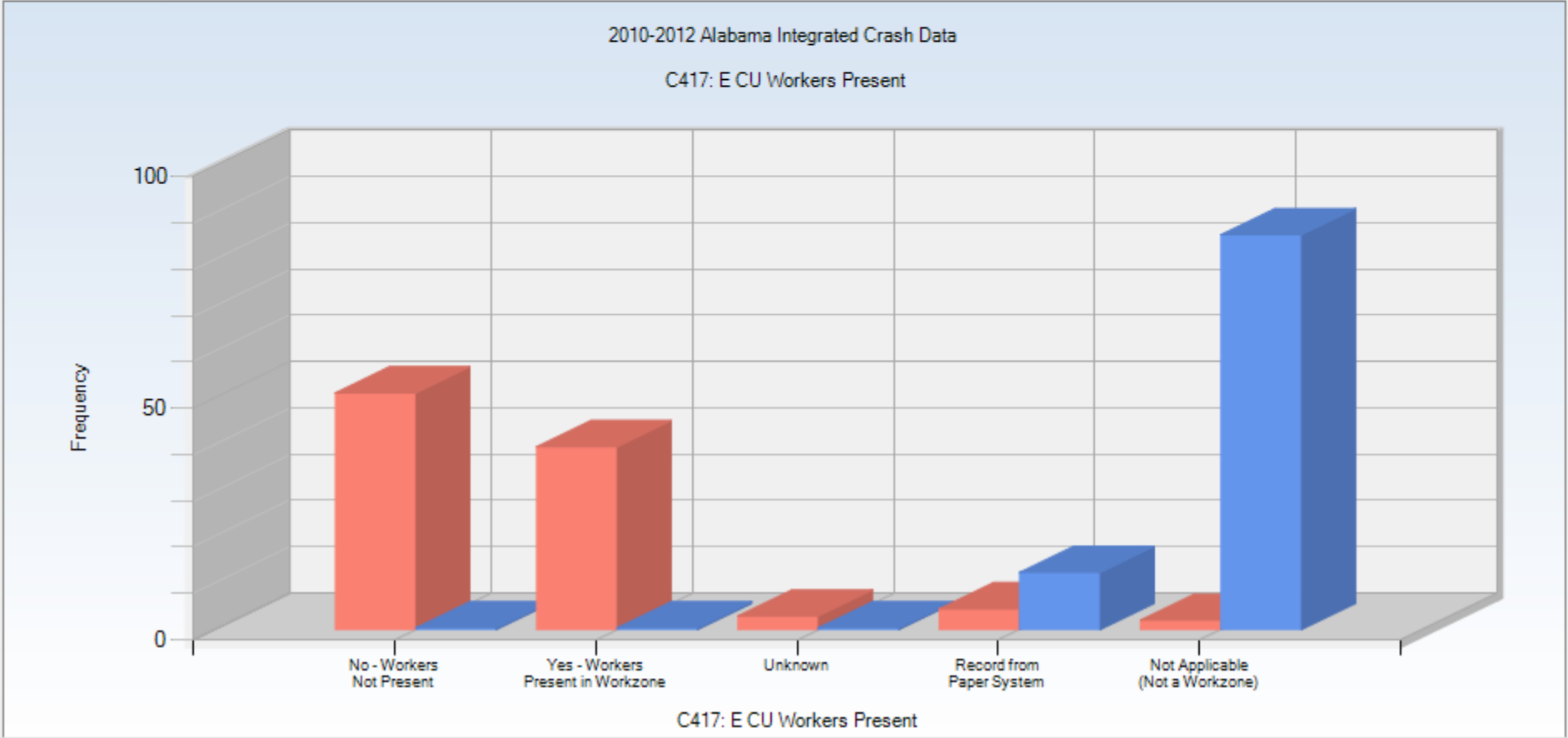
C417: E CU Workers Present

	Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
	No - Workers Not Present	4306	51.12	177	0.05	1091.569*	4302.055
	Yes - Workers Present in Work...	3326	39.48	1	0.00	149235.693	3325.978
	Unknown	246	2.92	2	0.00	5518.939	245.955
▶	Record from Paper System	376	4.46	46626	12.34	0.362*	-663.149
	Not Applicable (Not a Workzone)	170	2.02	322413	85.30	0.024*	-7015.584

- C415: CU Workzone Related
 - C416: E CU Workzone Type
 - C417: E CU Workers Present**
 - C418: E CU Law Enforcement Present
 - C028: Mileposted Route
 - C011: Highway Classifications
 - C046: HasRTMP
- Sort by Sum of Max Gain



Display Filter Name



Location

Highway Classification

TRUE or FALSE

Less than 20% of WZ crashes involved Interstate highways.

- Red = WZ Involved Crashes
- Blue = Crashes that Did Not Involve WZ

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

C011: Highway Classifications							
	Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
	Interstate	3833	45.50	32483	8.59	5.295*	3109.055
	Federal	1730	20.54	61844	16.36	1.255*	351.689
▶	Other	1	0.01	48	0.01	0.935	-0.070
	Private Property	4	0.05	5741	1.52	0.031	-123.949
	State	1394	16.55	70225	18.58	0.891*	-171.097
	County	413	4.90	62382	16.50	0.297*	-977.301
	Municipal	1049	12.45	145257	38.43	0.324*	-2188.327

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 - C002: City
- Sort by Sum of Max Gain Display Filter Name



2010-2012 Alabama Integrated Crash Data
C011: Highway Classifications



Crash Type

Manner of Crash

TRUE or FALSE

The largest proportion of WZ crashes are rear-ends caused by following too close.

- Red = WZ Involved Crashes
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Order: Max Gain Descending Suppress Zero-Valued Rows Significance: Over Representation Threshold: 2.0

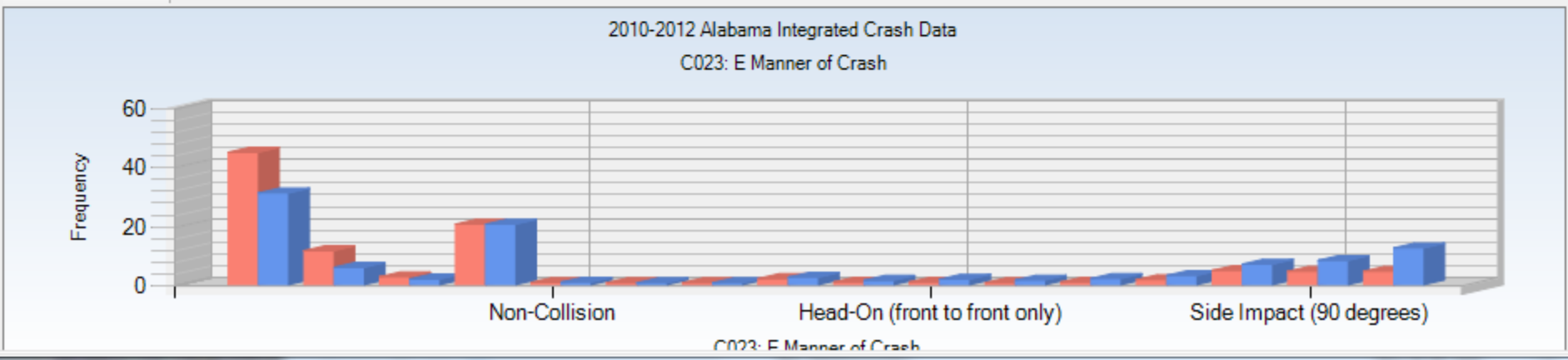
C023: E Manner of Crash

	Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
▶	Rear End (front to rear)	3762	44.66	116715	30.88	1.446*	1160.785
	Sideswipe - Same Direction	962	11.42	21977	5.81	1.964*	472.201
	Other	218	2.59	7021	1.86	1.393*	61.524
	Single Vehicle Crash (all types)	1715	20.36	76971	20.36	1.000	-0.444
	Non-Collision	57	0.68	3006	0.80	0.851	-9.994
	Unknown	8	0.09	1120	0.30	0.320	-16.961
	Causal Veh Backing: Rear to R...	5	0.06	1476	0.39	0.152	-27.895
	Angle (front to side) Same Direc...	167	1.98	9315	2.46	0.804*	-40.602
	Sideswipe - Opposite Direction	69	0.82	5372	1.42	0.576*	-50.725
	Head-On (front to front only)	71	0.84	6764	1.79	0.471*	-79.749
	Causal Veh Backing: Rear to Si...	37	0.44	5626	1.49	0.295*	-88.386
	Angle Oncoming (frontal)	66	0.78	7682	2.03	0.385*	-105.208
	Angle (front to side) Opposite Di...	137	1.63	11524	3.05	0.533*	-119.834
	Side Impact (angled)	400	4.75	26002	6.88	0.690*	-179.504
	Side Impact (90 degrees)	374	4.44	30783	8.14	0.545*	-312.057
	Record from Paper System	376	4.46	46626	12.34	0.362*	-663.149

- C012: Controlled Access
 - C045: HasGPS
 - C412: CU Trafficway Lanes
 - C223: CU Speed Limit
 - C033: Locale
 - C409: CU Traffic Control
 - C001: County
 - C562: V2 Speed Limit
 - C023: E Manner of Crash**
 - C015: Primary Contributing Circumstan
 - C592: V2 Trafficway Lanes
 - C413: E CU Turn Lanes
 - C019: E Most Harmful Event
 - C204: E CU Sequence of Events #1
 - C589: V2 Traffic Control
 - C110: CU Driver Residence Distance
 - C205: E CU Sequence of Events #2
 - C027: At Intersection
 - C202: CU Contributing Circumstance
 - C129: CU Vehicle Maneuvers
- Sort by Sum of Max Gain



Display Filter Name



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

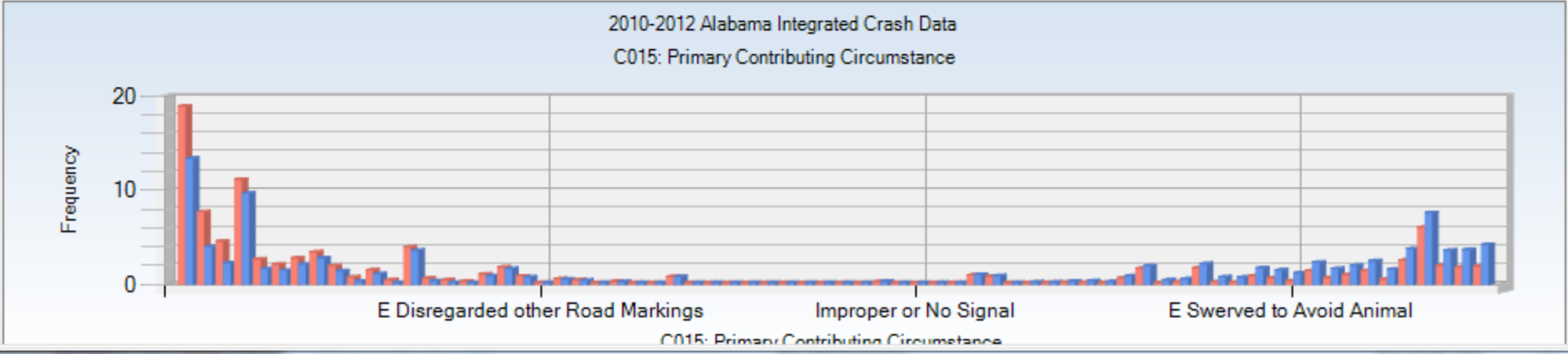
C015: Primary Contributing Circumstance

	Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
▶	Followed too Close	1595	18.93	50656	13.40	1.413*	466.035
	Improper Lane Change/Use	649	7.70	15074	3.99	1.932*	313.047
	E Swerved to Avoid Vehicle	387	4.59	8561	2.26	2.028*	196.202
	Misjudge Stopping Distance	940	11.16	36557	9.67	1.154*	125.258
	E Other Distraction Outside the ...	226	2.68	6281	1.66	1.614*	86.016
	E Other Improper Action	180	2.14	5541	1.47	1.458*	56.508
	E Other Distraction Inside the ...	236	2.80	8091	2.14	1.309*	55.677
	Other	290	3.44	10637	2.81	1.223*	52.934
	E Fatigued/Asleep	166	1.97	5372	1.42	1.387*	46.275
	E Failed to Yield Right-of-Way ...	66	0.78	1318	0.35	2.247*	36.626
	E Other - No Improper Driving	128	1.52	4216	1.12	1.362*	34.038
	E Disregarded Traffic Sign oth...	40	0.47	342	0.09	5.248*	32.378
	Driving too Fast for Conditions	334	3.96	13667	3.62	1.097	29.405
	Cargo Fell or Load Shift	55	0.65	1388	0.37	1.778*	24.066
	E Swerved to Avoid Object	40	0.47	815	0.22	2.202*	21.836
	E Roadway/Sign/Signal Defect	26	0.31	250	0.07	4.666*	20.428

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Display Filter Name



Crash Type

Most Harmful Event

TRUE or FALSE

Most WZ crashes involve two or more vehicles and do not involve obstacles in the work zone.

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

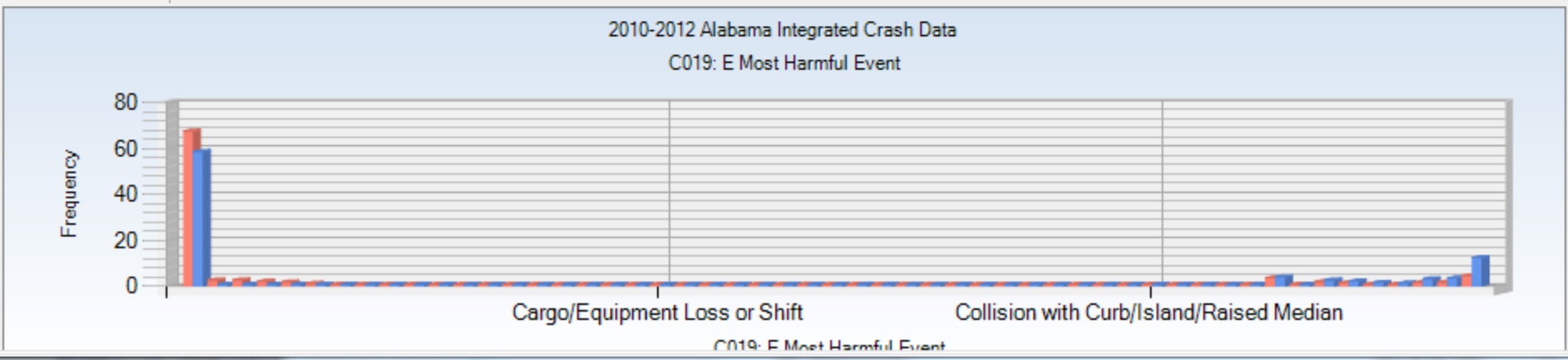
C019: E Most Harmful Event

	Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
▶	Collision with Vehicle in Traffic	5688	67.52	221524	58.61	1.152*	750.918
	Collision with Sign Post	210	2.49	1772	0.47	5.317*	170.508
	Collision with Concrete Barrier	215	2.55	2035	0.54	4.741*	169.646
	Collision with Work Zone/Main...	167	1.98	142	0.04	52.769*	163.835
	Collision with Other Non-Fixed ...	145	1.72	2532	0.67	2.570*	88.570
	Collision with Guardrail Face	94	1.12	2552	0.68	1.653*	37.124
	Collision with Guardrail End	38	0.45	671	0.18	2.541*	23.045
	Other Non-Collision	35	0.42	560	0.15	2.804*	22.519
	Collision with Other Traffic Barrier	23	0.27	101	0.03	10.218*	20.749
	Collision with Other Post/Pole/...	31	0.37	684	0.18	2.034*	15.756
	Collision with Falling/Shifting C...	25	0.30	557	0.15	2.014*	12.586
	Collision with Bridge Abutment/...	42	0.50	1390	0.37	1.356	11.021
	Thrown or Falling Object	14	0.17	258	0.07	2.435	8.250
	Collision with Impact Attenuator	8	0.09	9	0.00	39.884	7.799
	Collision with Non-Motorist: Pe...	41	0.49	1491	0.39	1.234	7.770
	Vehicle Defect/Component Fai...	15	0.18	377	0.10	1.785	6.598

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CENTER for ADVANCED
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**Thank you for your concern for traffic safety
and
For observing speed limits in work zones**

For more information on work zones, please see:

<http://www.safehomealabama.gov/tag/work-zones/>