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**ADECA Special Study Report**

**ANALYSIS OF FATAL CRASHES IN  
ALABAMA OVER THE FIRST EIGHT  
MONTHS OF 2016**

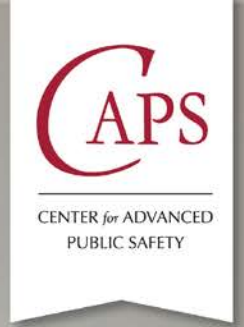
**November 2016**

THE UNIVERSITY OF  
**ALABAMA**

# Introduction: PPT Organization

- **Fatality picture for 2016**
- **Analysis of the data**
- **Countermeasure recommendations**
- **Supporting IMPACT Results**

# FATALITY PICTURE: 2016 END-OF-YEAR PROJECTIONS



Estimates Based on the First 10 Months 2016

	2015	2016
Average Fatalities/Day	2.3	2.9 (+26.1%)
Average Fatalities/Month	71	88
<b>Projected</b> Dec. 31	849 (actual)	<b>1054</b>

**2015 Fatality Total of 849 Occurred Oct. 20, 2016**

**As of 15-Nov-2016 = 2016/2015 = 938/747 = +25.6%**

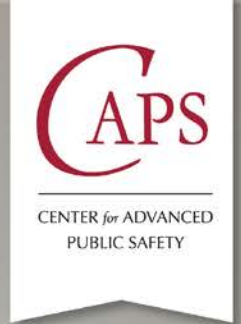
# 2014 vs. 2016 Crashes by Severity

## CARE Crosstab Results - 2014-2016 Crash Data

### 2014 OR 2016 Jan-Aug -- Year vs. Crash Severity

	First Eight Months	
	2014	2016
<b>Fatal Injury</b>	483	616
	0.56%	0.60%
<b>Incapacitating Injury</b>	3929	4032
	4.57%	3.95%
<b>Non-Incapacitating Injury</b>	6541	7638
	7.60%	7.48%
<b>Possible Injury</b>	7659	9753
	8.90%	9.56%
<b>Property Damage Only</b>	64576	77388
	75.07%	75.83%
<b>Unknown</b>	2836	2621
	3.30%	2.57%
<b>TOTAL</b>	86024	102048
	45.74%	54.26%

# 2014 VS. 2016 COMPARISON OF FATALITY CRASH INCREASES



Comparing the First 8 Months 2016 with 2014

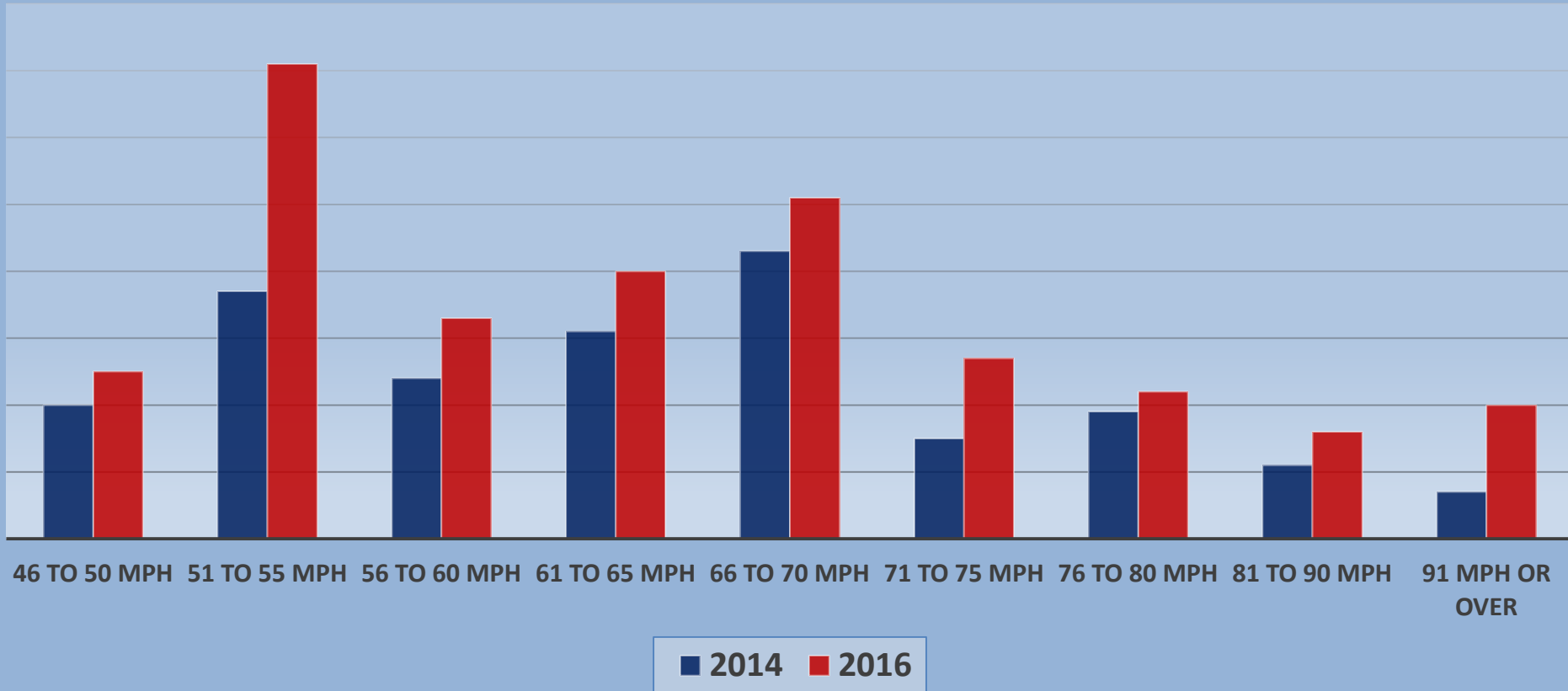
	2014	2016
Total Crashes	86,024	102,048 (+18.6%)
Fatality Crashes	483	616 (+27.5%)
Fatalities	536	695 (+29.7%)

## Analytics Methodology (why 8 months, 2014?):

- Isolate Attributes with Most Significant Increases
- Perform Analytics on Causes Comparing 2016 with 2014
- Recommend New Countermeasure and Enhancements

# Impact Speed

Increases 2014 to 2016 for Fatal Crashes



**Frequencies for 2016 fatality crashes increased for all impact speeds above 45 MPH.**

Filter = 2014 OR 2016 Jan-Aug FATAL -- Year vs. CU Estimated Speed at Impact

	2014	2016	Increase	% Increase	% of <b>133</b> Fatal Crashes
46 to 50 MPH	20	25	5	25.0%	3.8%
51 to 55 MPH	37	71	34	91.9%	25.6%
56 to 60 MPH	24	33	9	37.5%	6.8%
61 to 65 MPH	31	40	9	29.0%	6.8%
66 to 70 MPH	43	51	8	18.6%	6.0%
71 to 75 MPH	15	27	12	80.0%	9.0%
76 to 80 MPH	19	22	3	15.8%	2.3%
81 to 90 MPH	11	16	5	45.5%	3.8%
91 MPH +	7	20	13	185.7%	9.8%
<b>TOTAL</b>	<b>207</b>	<b>305</b>	<b>98</b>	<b>47.3%</b>	<b>73.7%</b>
<b>ALL FATALS</b>	<b>483</b>	<b>616</b>	<b>133</b>	<b>27.5%</b>	

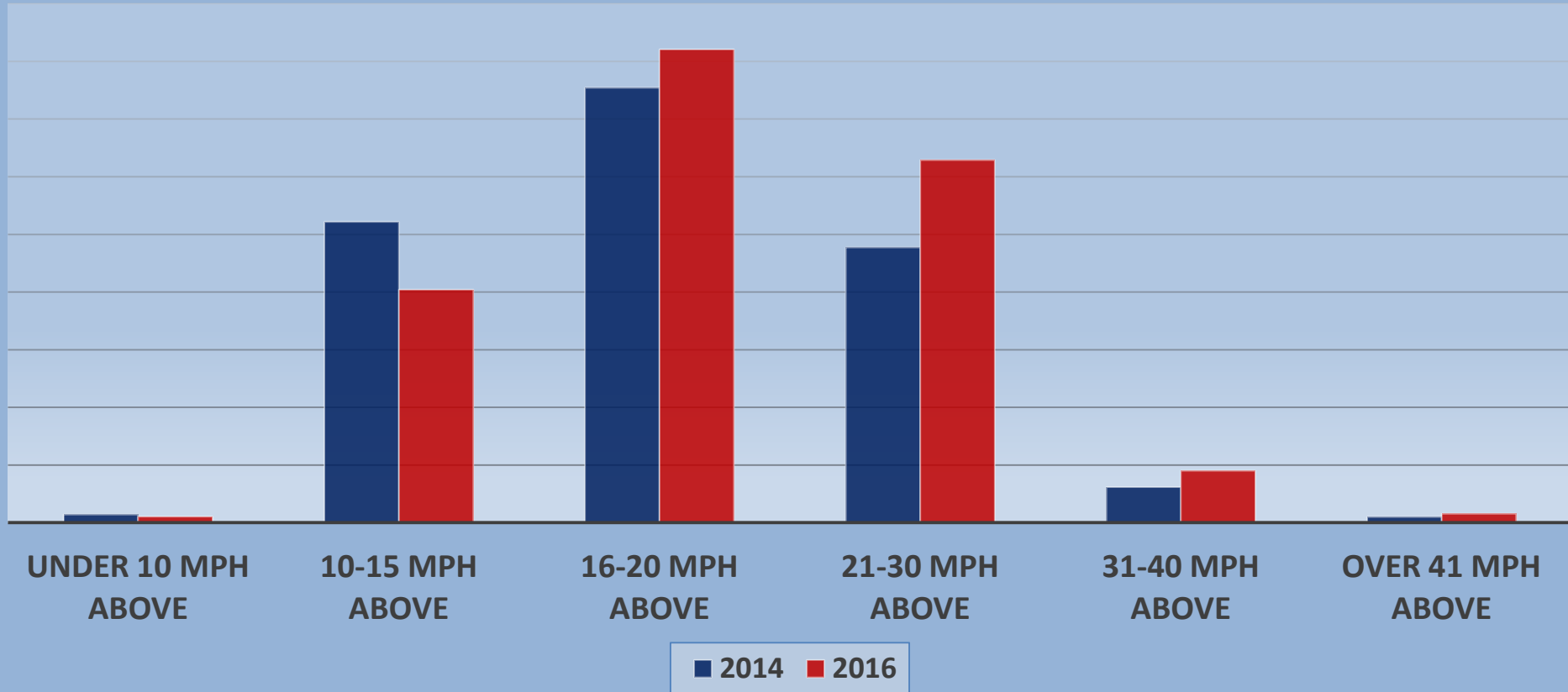
Explains as much as 73.7% of the fatality crash increases.

*Pr(fatality) is doubled for every 10MPH impact speed increase:*

<http://www.safehomealabama.gov/SafetyTopics/Enforcement/EnforcementStudies.aspx>

# Citations

Number Written for Speeding Above the Speed Limit



**A Second Indicator of Average Speed Increases**



<b>MPH Above Posted Speed Limit</b>	<b>2014</b>	<b>2016</b>	<b>Increase</b>	<b>% Increase</b>
<b>Under 10 MPH Above</b>	<b>695</b>	<b>515</b>	<b>-180</b>	<b>-25.9%</b>
<b>10-15 MPH Above</b>	<b>26090</b>	<b>20214</b>	<b>-5876</b>	<b>-22.5%</b>
<b>16-20 MPH Above</b>	<b>37711</b>	<b>41041</b>	<b>3330</b>	<b>8.8%</b>
<b>21-30 MPH Above</b>	<b>23879</b>	<b>31450</b>	<b>7571</b>	<b>31.7%</b>
<b>31-40 MPH Above</b>	<b>3080</b>	<b>4506</b>	<b>1426</b>	<b>46.3%</b>
<b>Over 41 MPH Above</b>	<b>503</b>	<b>785</b>	<b>282</b>	<b>56.1%</b>
<b>TOTAL</b>	<b>91958</b>	<b>98511</b>	<b>6553</b>	<b>7.1%</b>

## **Citations:**

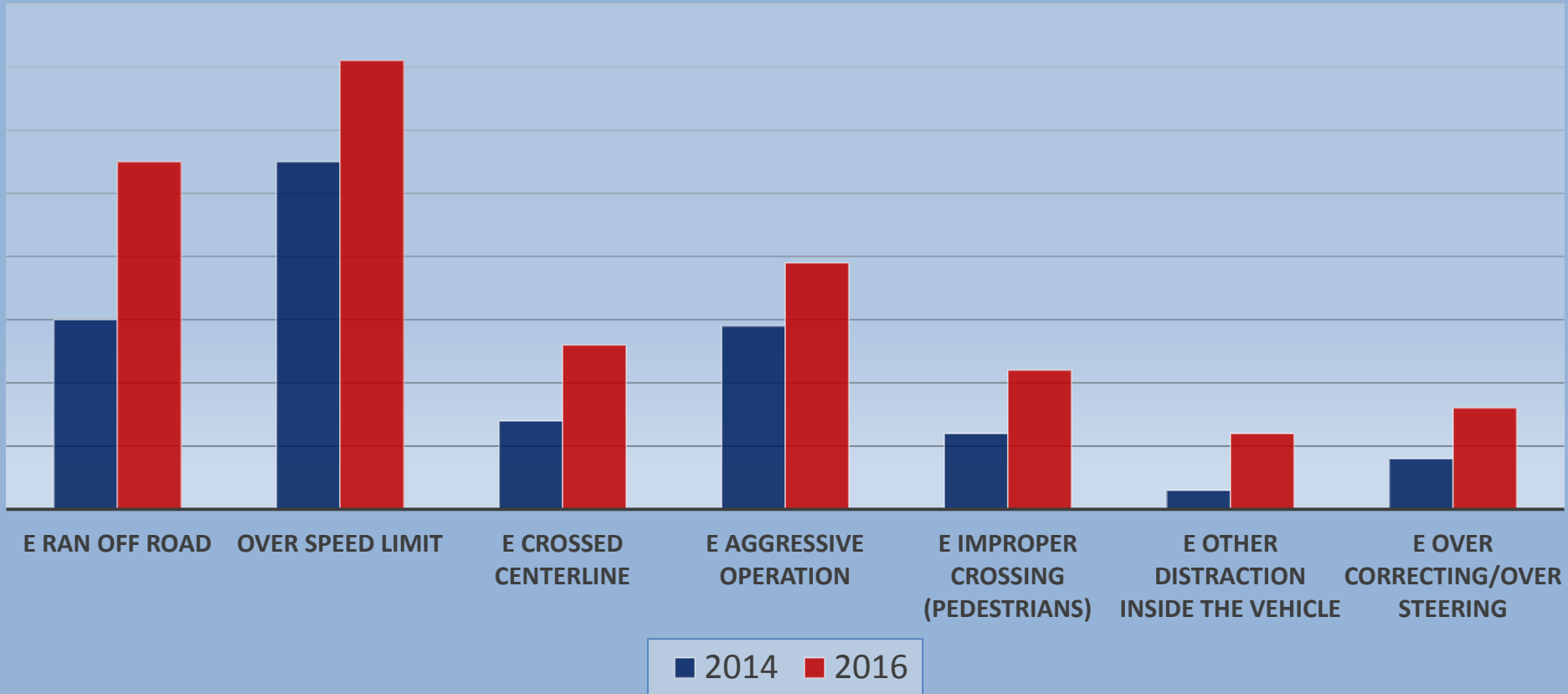
**Overall increase in speeding citations issued = 7.1%**

**Decrease in the lower speed intervals indicates:**

- Higher speeds overall**
- Easy to catch extreme violators**
- Reluctance to cite lower violations**

# Primary Contributing Circumstances

## Top Fatal Crash Increases 2014 to 2016



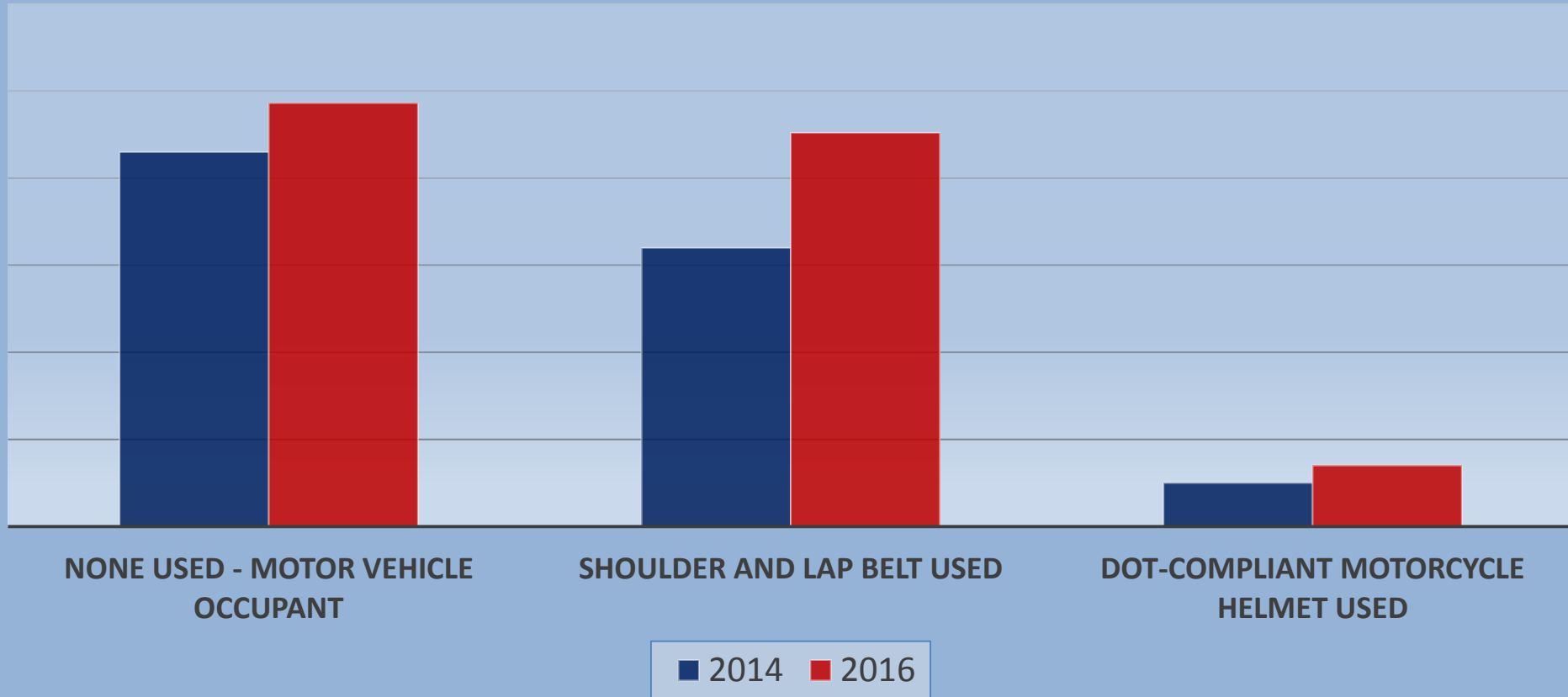
Primary Contributing Circumstance	2014	2016	Increase	% Increase	% of 133 fatal crashes
E Ran off Road	30	55	25	83.3%	18.8%
Over Speed Limit	55	71	16	29.1%	12.0%
E Crossed Centerline	14	26	12	85.7%	9.0%
E Aggressive Operation	29	39	10	34.5%	7.5%
E Improper Crossing (Pedestrians)	12	22	10	83.3%	7.5%
E Other Distraction Inside the Vehicle	3	12	9	300.0%	6.8%
E Over Correcting/Over Steering	8	16	8	100.0%	6.0%

## Primary Contributing Circumstances:

- Some of these categories can be addressed by roadway improvements.
- Most of these categories are either caused or intensified by speed.
- Numbers drop off quickly

# Restraint and Protective Equipment

Use Compared 2014 vs 2016 Fatal Crashes



**At least half of those killed would have been saved had they been properly restrained.**

	2014	2016	Increase	% Increase	% of 133
None Used – Motor Vehicle Occupant	215	243	28	13.0%	9.9%
Shoulder and Lap Belt Used	160	226	66	41.3%	31.3%
Dot-Compliant Motorcycle Helmet Used	25	35	10	40.0%	30.3%
REDUCED TOTAL	400	504	104	26.0%	19.7%
TOTAL ALL FATALITY CRASHES	483	616	133	27.6%	20.9%
Percent of fatalities Properly Restrained	42.7	48.2			

**Overall seatbelt rate is above 90%; for fatalities it is 40-50%**

# Death Probability Calculations (2011-2015)

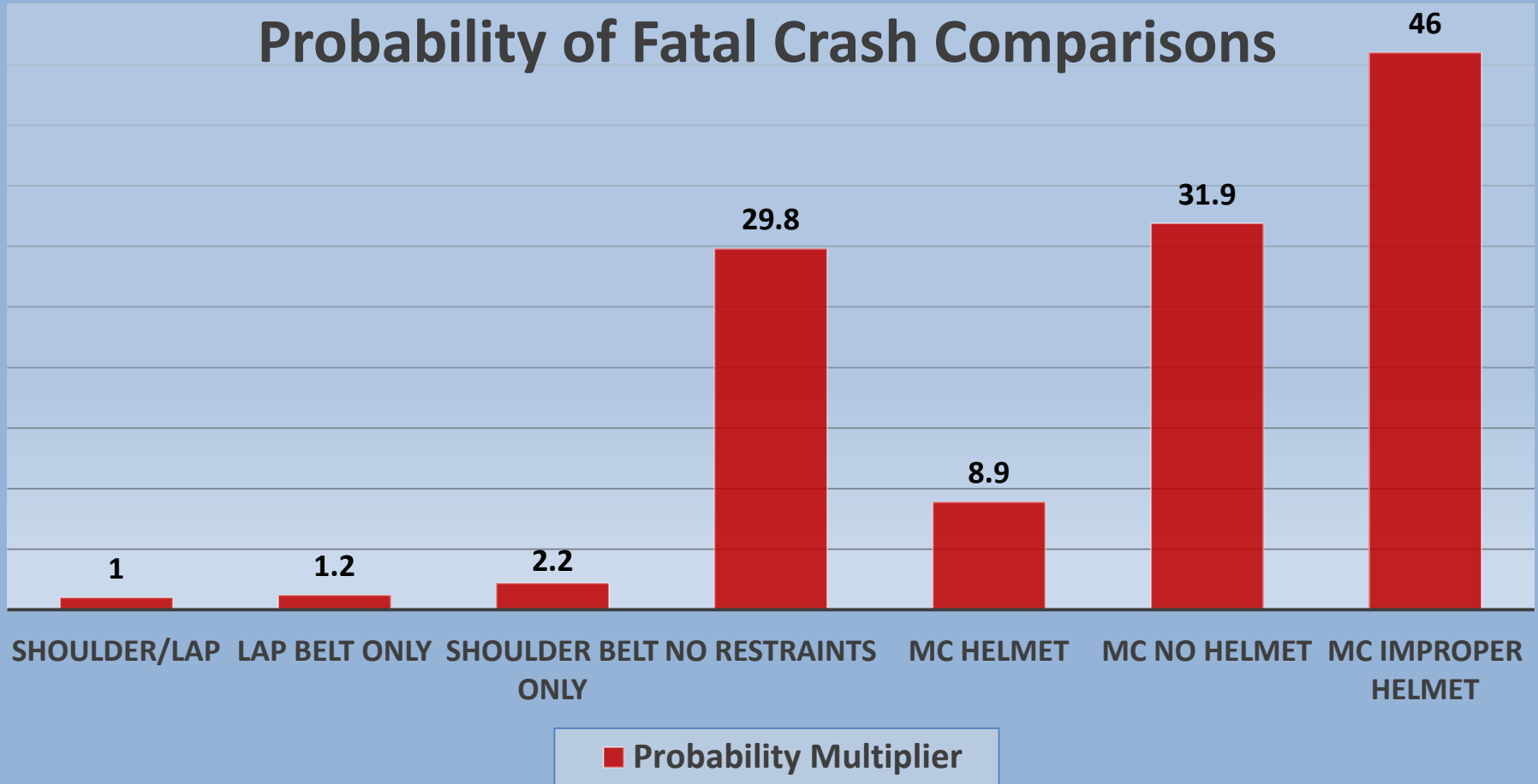
*Probability of the given crash causing at least one fatality*



	Fatal	Incapac	Non-Incap	Possible	PDO	TOTAL	Pr(Fatal)	1 in XXX	Times Base
None Used - Motor Vehicle Occupant	881	2698	2725	1014	4207	11756	0.075	13	29.8
Shoulder and Lap Belt Used	792	11096	22144	30205	243743	314966	0.003	398	1.0 (Base)
Lap Belt Only Used	3	38	71	94	773	1028	0.003	343	1.2
Shoulder Belt Only Used	5	33	70	91	657	908	0.006	182	2.2
Dot-Compliant Mot Helmet Used	109	640	746	149	473	2142	0.051	20	20.2
E Helmet Used	5	52	77	19	64	224	0.022	45	8.9
E Other Motorcycle Helmet Used	17	42	55	11	19	147	0.116	9	46.0
No Motorcycle Helmet Used	15	96	52	5	18	187	0.080	12	31.9
<b>TOTAL</b>	<b>2164</b>	<b>16470</b>	<b>29179</b>	<b>35707</b>	<b>292992</b>	<b>387537</b>	<b>0.006</b>	<b>179</b>	<b>2.2</b>

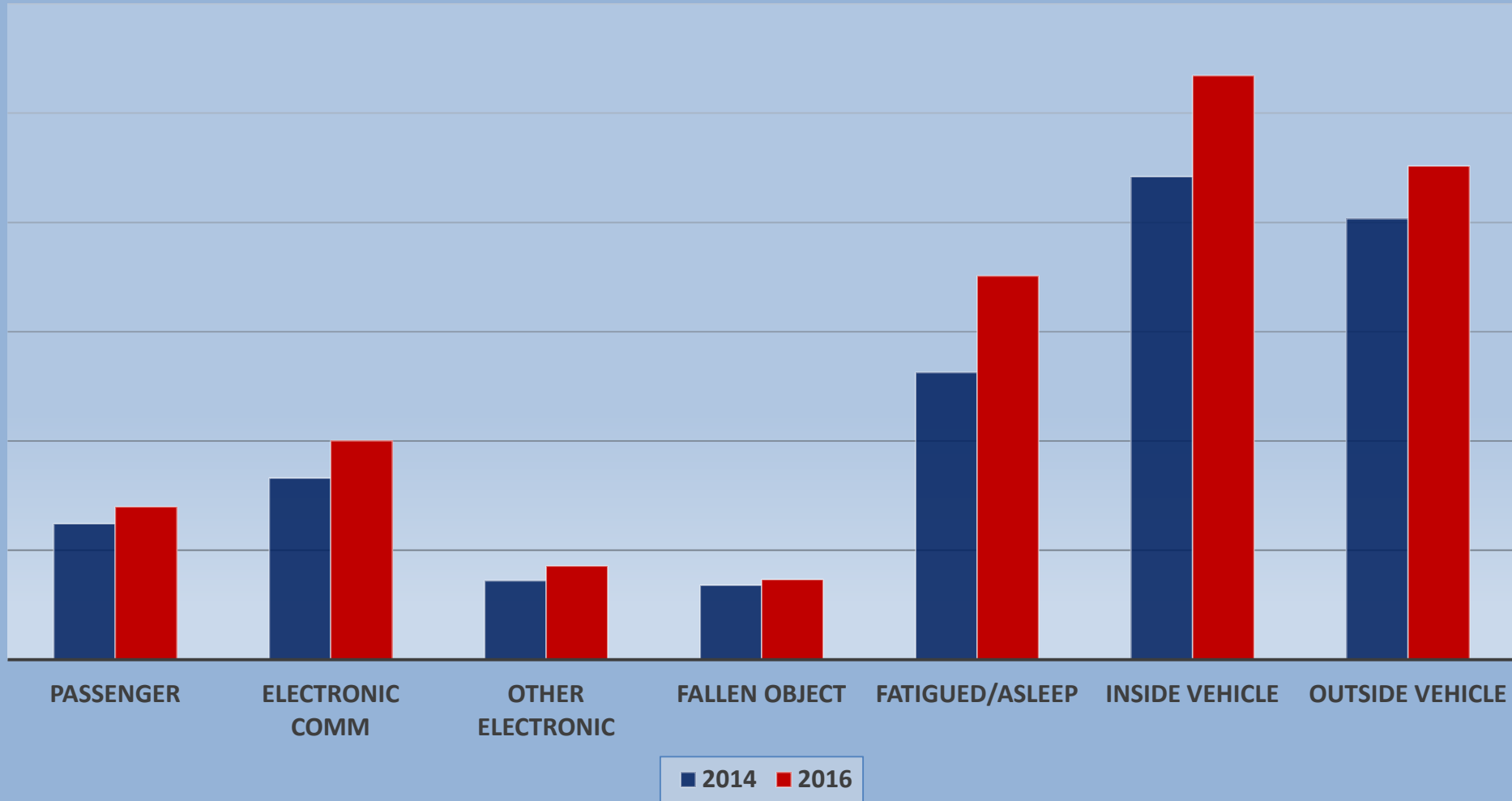
# Safety Equipment

## Probability of Fatal Crash Comparisons



**Best case motorcycle situation is 8.9 times worse than the best case passenger car, i.e., with restraints used.**

## Distracted Driving Increases 2014 to 2016



**NHTSA estimates of 10% of fatality crashes caused by distractions was confirmed by Alabama data**



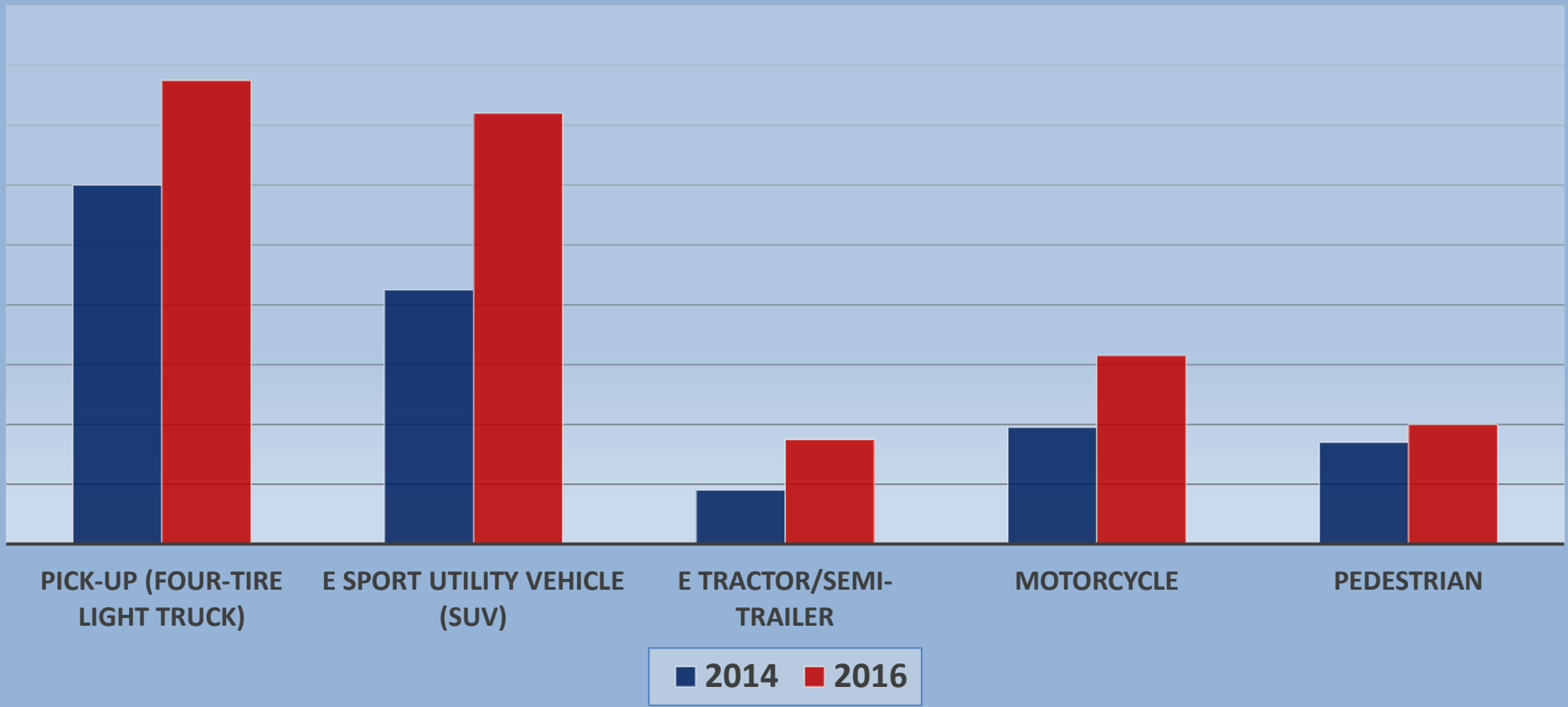
## Data for Distracted Driving Chart

<b>Distracted by ...</b>	<b>2014</b>	<b>2016*</b>	<b>Increase</b>
<b>Passenger</b>	<b>1244</b>	<b>1397</b>	<b>153</b>
<b>Elect. Communication</b>	<b>1662</b>	<b>2002</b>	<b>340</b>
<b>Other Electronic</b>	<b>720</b>	<b>856</b>	<b>136</b>
<b>Fallen Object</b>	<b>680</b>	<b>734</b>	<b>54</b>
<b>Fatigued/Asleep</b>	<b>2626</b>	<b>3509</b>	<b>883</b>
<b>Other Inside Vehicle</b>	<b>4419</b>	<b>5343</b>	<b>924</b>
<b>Other Outside Vehicle</b>	<b>4034</b>	<b>4516</b>	<b>482</b>
<b>Totals</b>	<b>15385</b>	<b>18356</b>	<b>2972</b>

**\*CY2016 prorated estimate for a full year**

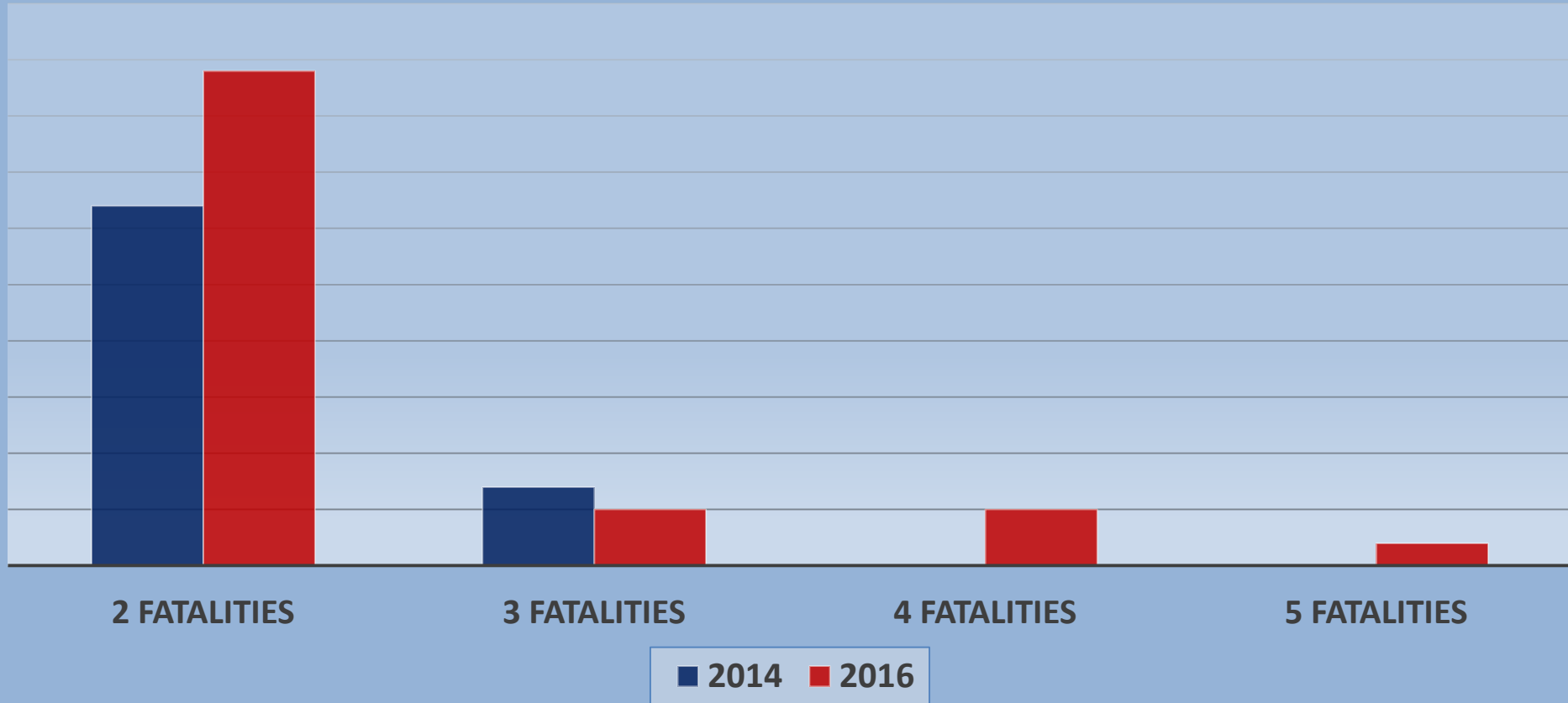
# Involved Vehicle Type

## Fatality Crash Increases 2014-2016 Comparisons



# Multiple-Fatality Crashes

Increases 2014-2016 Comparisons



			> Total	%	Added
	2014	2016	Fatalities	Increases	Fatalities
1 Fatality	444	560	116	26.1%	0
2 Fatalities	32	44	24	75.0%	24
3 Fatalities	7	5	-6	-85.7%	-6
4 Fatalities	0	5	20	~	20
5 Fatalities	0	2	10	~	10
<b>TOTAL</b>	<b>483</b>	<b>616</b>	<b>164</b>		<b>48</b>

- There were 48 additional fatalities from the *additional* multi-fatal crashes in 2016 over 2014
- This amounts to  $48/148 = 32.5\%$
- Thus, very close to  $1/3$  of the *additional* fatalities are attributable to multi-fatality crashes.

# Countermeasure Categories



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- **Speed Reduction**
- **Target Groups for**
  - ✓ **Seatbelt Use**
  - ✓ **Multi-Fatality Crashes**
  - ✓ **Pedestrian Crashes**

# Countermeasure Development



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## Speed Reduction

*Analysis: Fatal Crash AND Speed vs  
Fatal and NOT Speeding*

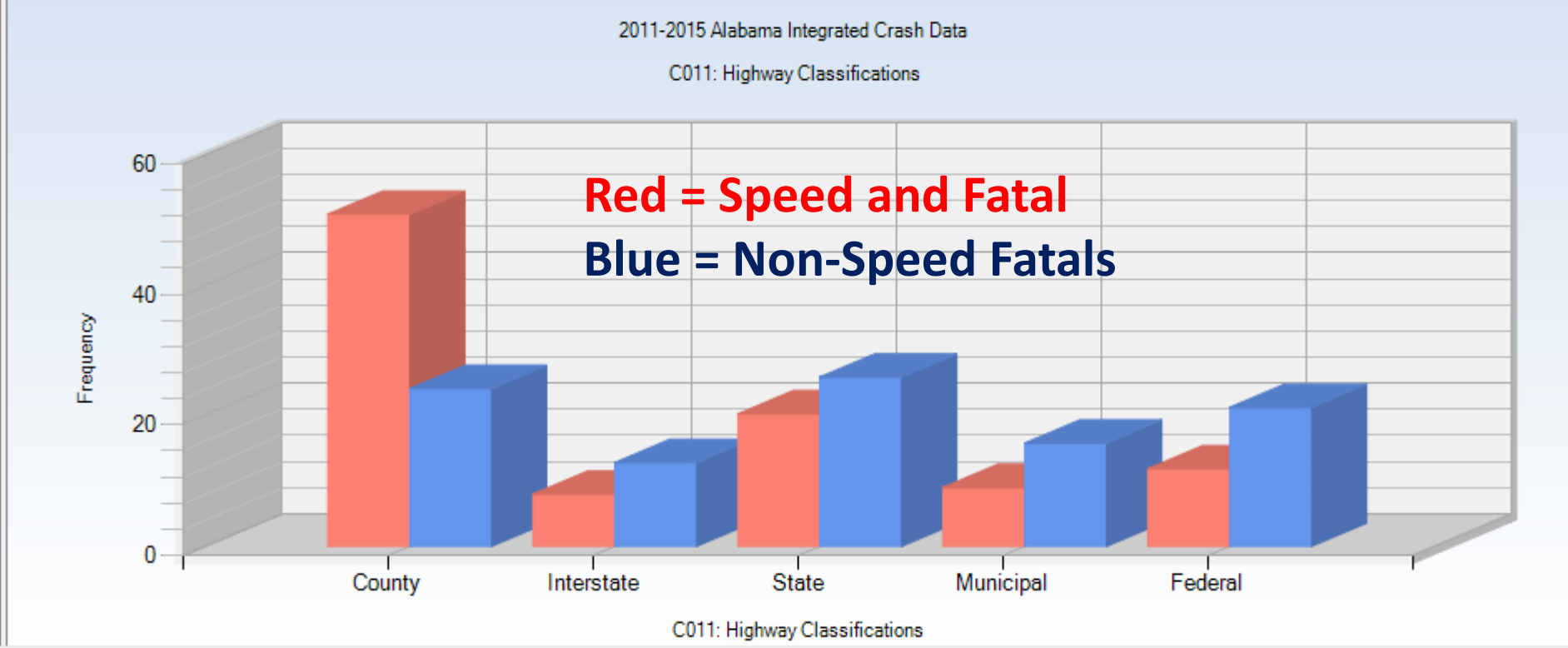
- Rural roadways (>77%)
- County roads (>50%)

value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
County	497	50.87	705	24.17	2.105*	260.872
Interstate	78	7.98	374	12.82	0.623*	-47.265
State	198	20.27	756	25.92	0.782*	-55.209
Municipal	88	9.01	461	15.80	0.570*	-66.404
Federal	116	11.87	621	21.29	0.558*	-91.993

C011: Highway Classifications

# Speed

Sort by Sum of Max Gain



# Countermeasure Development

## Speed Reduction

*Analysis: Fatal Crash AND Speed vs Fatal and NOT Speeding*

- Rural roadways (>77%)
- County roads (>50%)
- Younger Drivers 16-24 (32% vs 16% of ages)
- Potential Immediate Actions:
  - ✓ Increase in patrol officers ALEA and local
    - Demonstration speed reduction project (comprehensive)
    - Legislative action to recognize problem
  - ✓ Assure compliance with selective enforcement targeting
  - ✓ Roadway improvements: trees, rollovers, utility poles, culverts, ditches, embankments (Most Harmful Event)



# Countermeasure Development

## Seatbelt Use Target Groups

*Analysis: Fatal NOT Restrained vs Fatal Properly Restrained*

- **DUI**
- **Other Severe Violations (e.g., Speed, Aggressive)**
- **Age 21-37 (correlation with DUI)**
- **Single Vehicle Crashes (“**
- **Potential Immediate Actions**
  - ✓ **Get Budweiser to promote seatbelt use (“save our customers”)**
  - ✓ **PI&E targeting the worst offenders**
    - **Their friends and relatives – people of influence over them**
    - **Need to draw from intensive psychological studies**

# Countermeasure Development



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## Multi-Fatality Crash Target Groups

*Analysis: Multiple Fatality Crashes vs Single Fatality Crashes*

- **Age 16-30**
- **State/Federal Roads as Opposed to County**
- **Severest of Violations**
  - ✓ **Cross centerline, wrong way, aggressive driving**
  - ✓ **DUI same as for single fatality crashes & seatbelts**
- **Collisions with other Vehicles**
  - ✓ **As opposed to roadside objects (e.g., trees)**
- **Countermeasures Must Target Worst Offenders**

# Countermeasure Development



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## Pedestrian Fatality Target Groups

*Analysis: Pedestrian Fatalities vs. Pedestrian Non-Fatal*

- **All Roadway Types other than Municipal**
- **Impaired Walking (ID = DUI > IW = WUI)**
  - ✓ 8 times the drug use indicators (including prescription)
  - ✓ 2 times the alcohol use indicators
- **Time of Day Validates Drug/Alcohol Use**
- **“Not Visible” and Other Pedestrian Violations**
  - ✓ Validates lack of concern
  - ✓ No good data on distractions – but ample anecdotal evidence
- **CMs: Target IW/DW Same as for ID/DD**
  - ✓ Combined Impaired DUI/WUI = ID/IW PI&E efforts
  - ✓ Combined Distracted DD/DW PI&E efforts



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**The following slides are for reference  
if there are questions about  
the conclusions presented.**

# Countermeasure Development



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## Speed Reduction

Fatal crash and speed vs fatal and not speeding

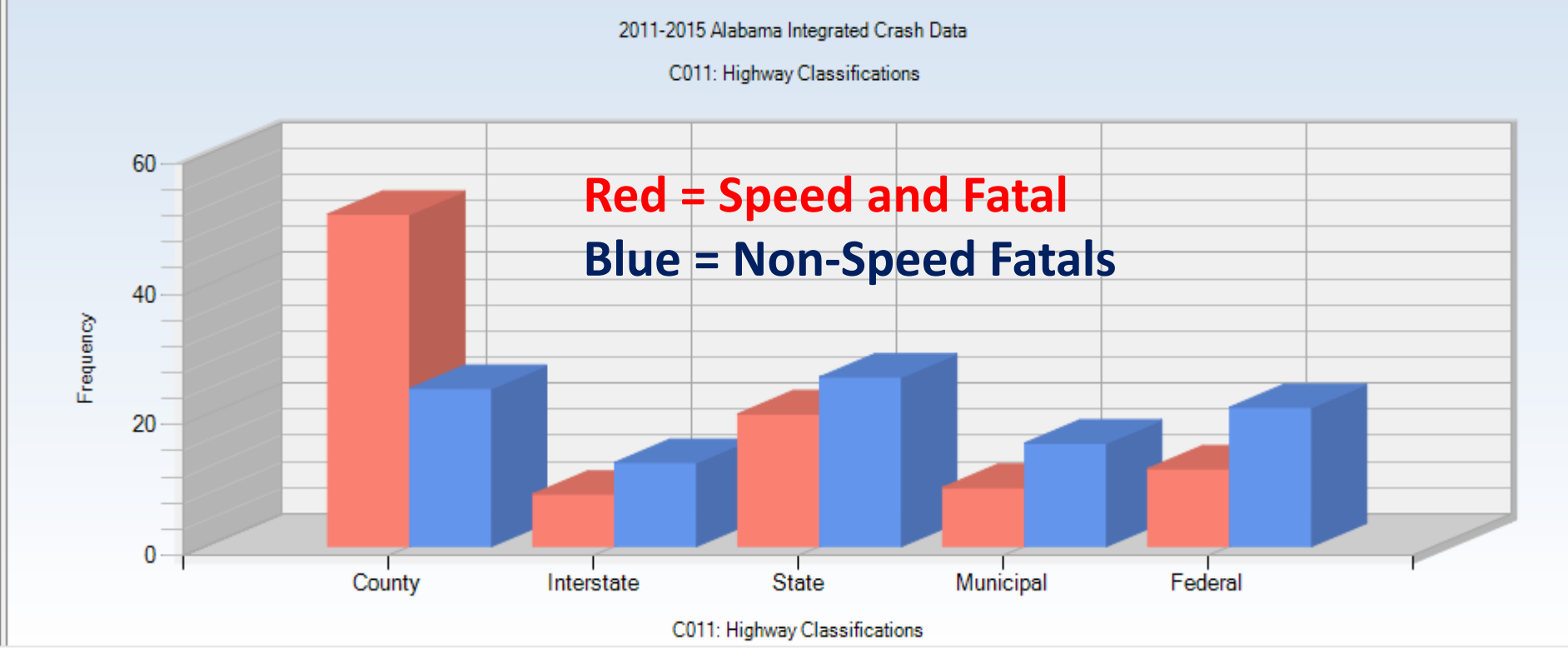
- Rural roadways (>77%)
- County roads (>50%)
- Younger Drivers 16-24
- Potential Immediate Actions:
  - ✓ Demonstration speed reduction program
  - ✓ Legislative promotion
  - ✓ Re-target selective enforcement (fine-tune)

Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
County	497	50.87	705	24.17	2.105*	260.872
Interstate	78	7.98	374	12.82	0.623*	-47.265
State	198	20.27	756	25.92	0.782*	-55.209
Municipal	88	9.01	461	15.80	0.570*	-66.404
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C011: Highway Classifications

# Speed

Sort by Sum of Max Gain



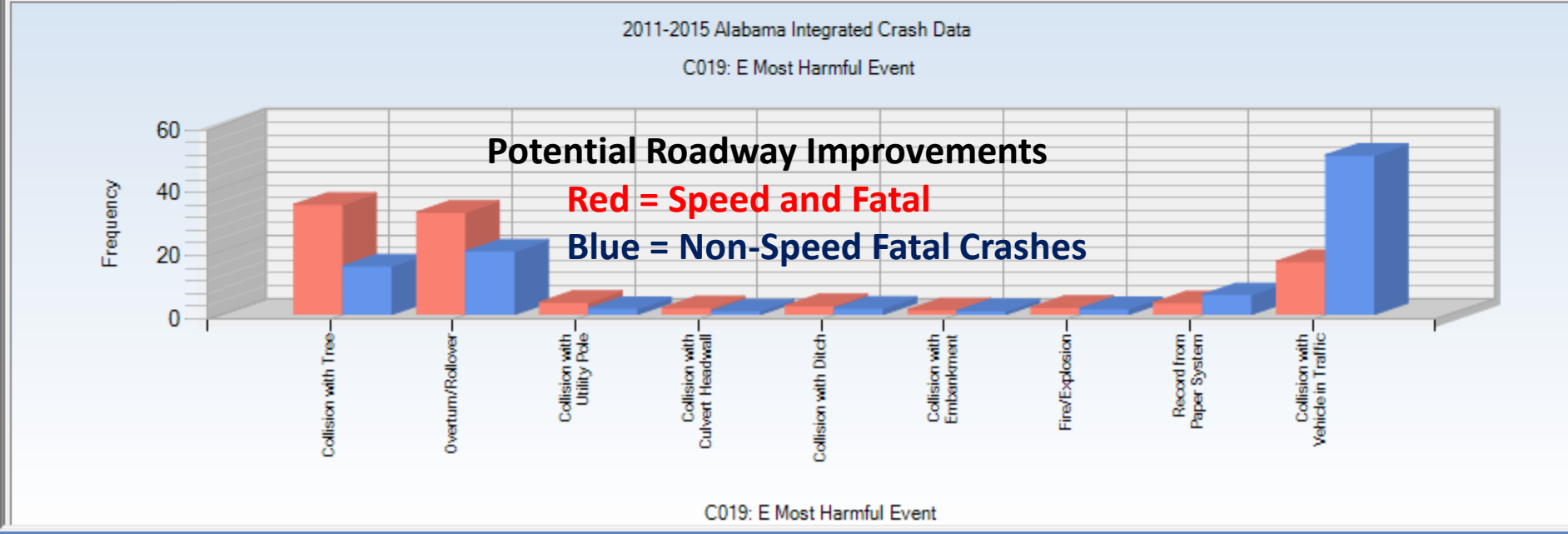
C019: E Most Harmful Event		Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
▶	Collision with Tree	312	34.94	355	15.37	2.273*	174.764
	Overtum/Rollover	290	32.47	463	20.04	1.620*	111.013
	Collision with Utility Pole	34	3.81	43	1.86	2.045*	17.377
	Collision with Culvert Headwall	18	2.02	24	1.04	1.940	8.722
	Collision with Ditch	24	2.69	44	1.90	1.411	6.990
	Collision with Embankment	13	1.46	25	1.08	1.345	3.335
	Fire/Explosion	19	2.13	42	1.82	1.170	2.764
	Record from Paper System	33	3.70	144	6.23	0.593*	-22.668
	Collision with Vehicle in Traffic	150	16.80	1170	50.65	0.332*	-302.299

C019: E Most Harmful Event

# Speed

Sort by Sum of Max Gain

Display Filter Name



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

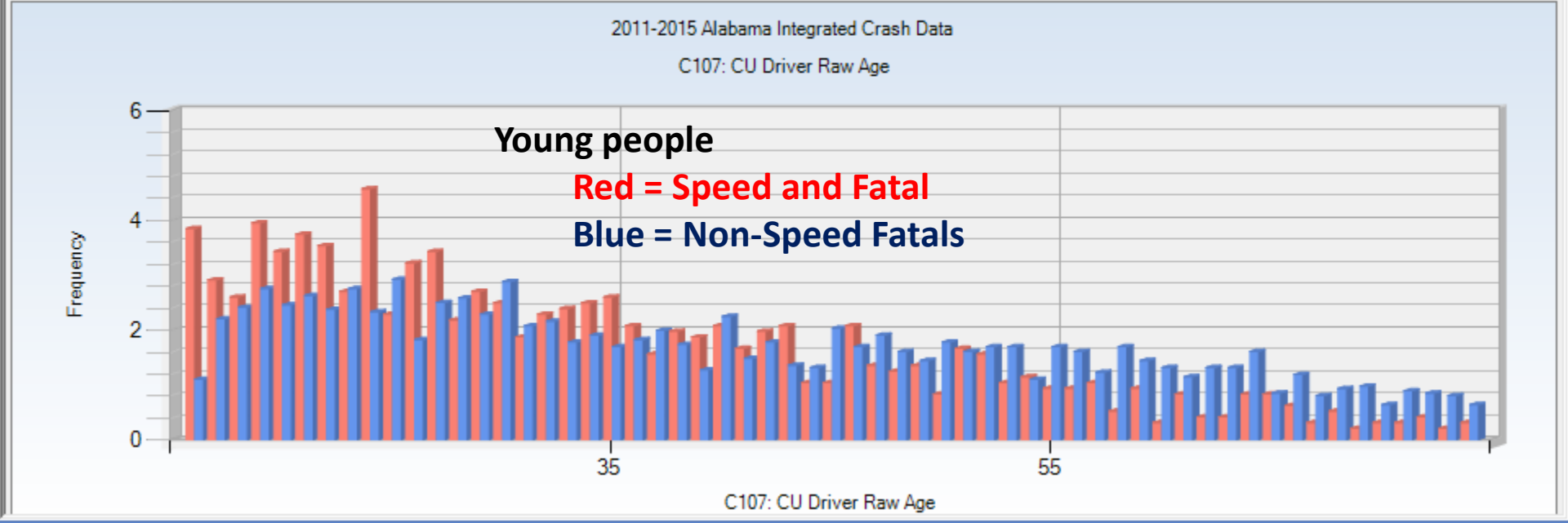
Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
16	37	3.84	26	1.10	3.492*	26.404
17	28	2.91	52	2.20	1.321	6.808
18	25	2.60	57	2.41	1.076	1.771
19	38	3.95	65	2.75	1.435	11.510
20	33	3.43	58	2.45	1.396	9.363
21	36	3.74	62	2.62	1.425	10.733
22	34	3.53	56	2.37	1.490	11.178
23	26	2.70	65	2.75	0.982	-0.490
24	44	4.57	55	2.33	1.963*	21.586

C107: CU Driver Raw Age

# Speed

Sort by Sum of Max Gain

Display Filter Name





# Countermeasure Development

## Seatbelt Use

Fatal not properly restrained vs fatal properly restrained

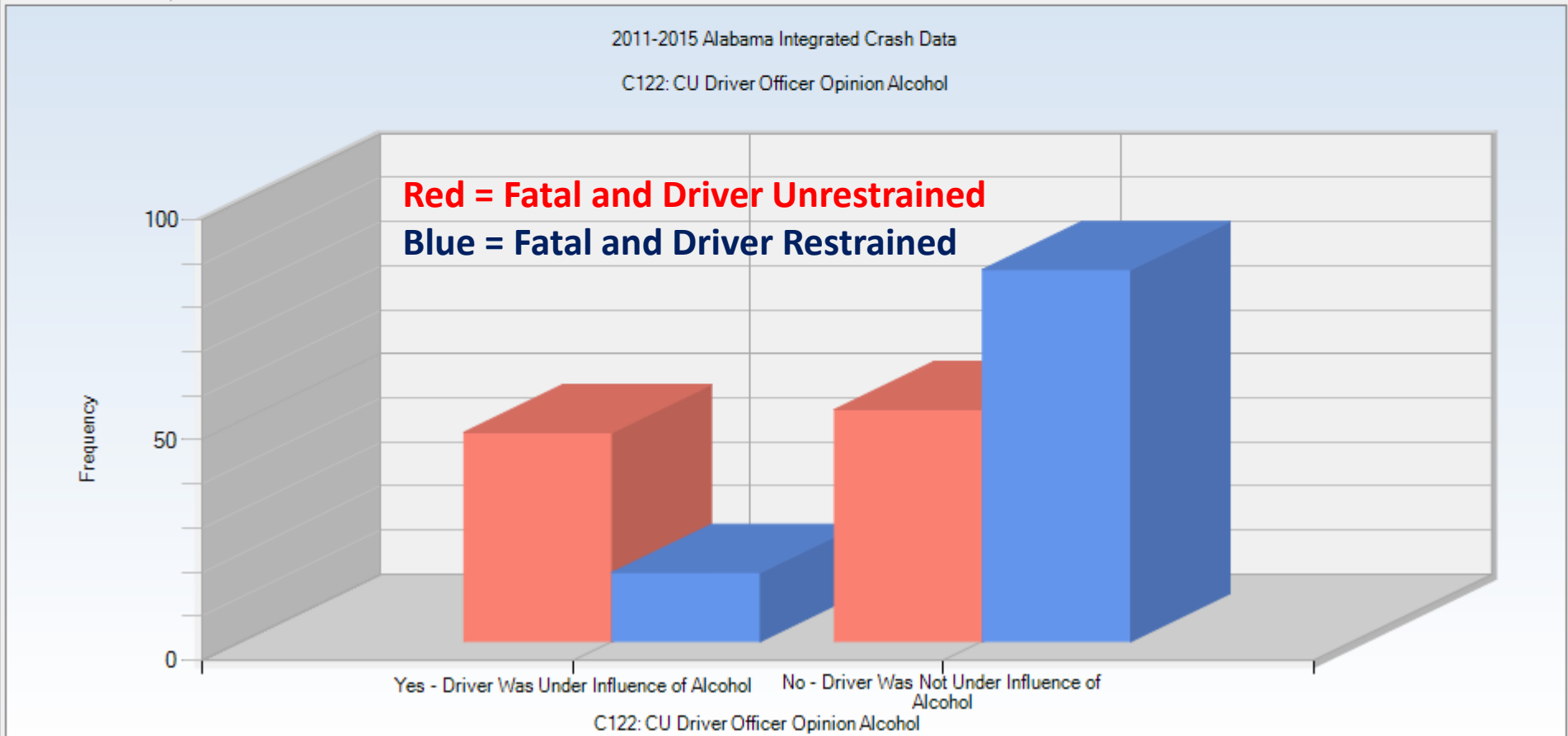
- **DUI**
- **Other Severe Violations (e.g., Speed)**
- **Age 21-37**
- **Single Vehicle Crashes**
- **Potential Immediate Actions**
  - ✓ **Get Budweiser to promote seatbelt use**
  - ✓ **PI&E targeted toward worst offenders**

value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
Yes - Driver Was Under Influen...	467	47.41	169	15.63	3.033*	313.008
No - Driver Was Not Under Infl...	518	52.59	912	84.37	0.623*	-313.008

C122: CU Driver Officer Opinion Alcohol

# Restrains

Sort by Sum of Max Gain



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

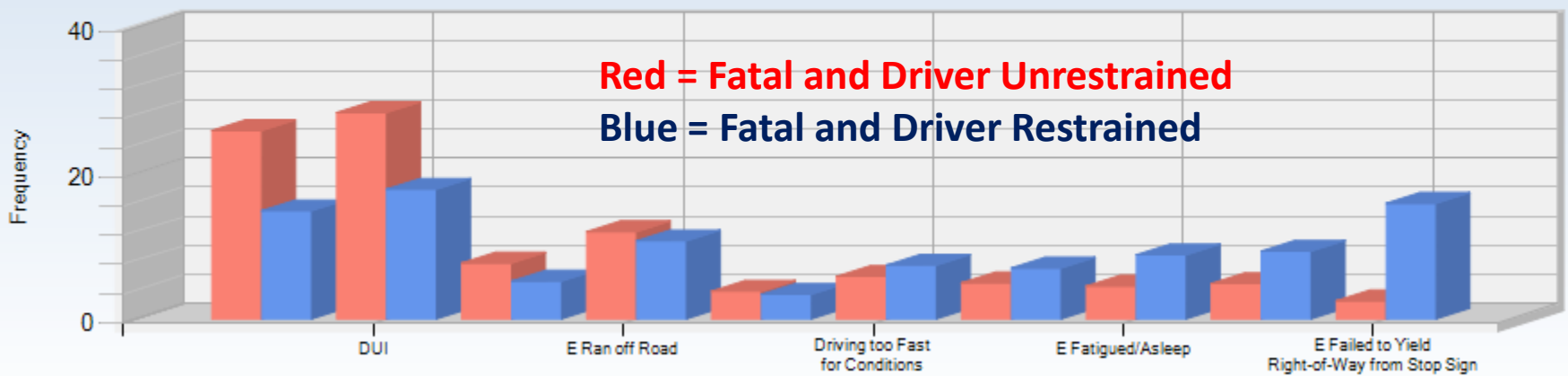
C015: Primary Contributing Circumstance	Substet Value	Substet Frequency	Substet Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
Over Speed Limit		294	25.83	115	14.82	1.743*	125.353
DUI		322	28.30	138	17.78	1.591*	119.624
E Aggressive Operation		87	7.64	40	5.15	1.483	28.340
E Ran off Road		136	11.95	83	10.70	1.117	14.281
E Over Correcting/Over Steering		43	3.78	26	3.35	1.128	4.871
Driving too Fast for Conditions		66	5.80	57	7.35	0.790	-17.590
Traveling Wrong Way/Wrong ...		56	4.92	54	6.96	0.707	-23.191
E Fatigued/Asleep		51	4.48	68	8.76	0.511*	-48.722
E Crossed Centerline		55	4.83	72	9.28	0.521*	-50.588
E Failed to Yield Right-of-Way ...		28	2.46	123	15.85	0.155*	-152.379

C015: Primary Contributing Circumstance

# Restrains

Sort by Sum of Max Gain

Display Filter Name



C015: Primary Contributing Circumstance

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

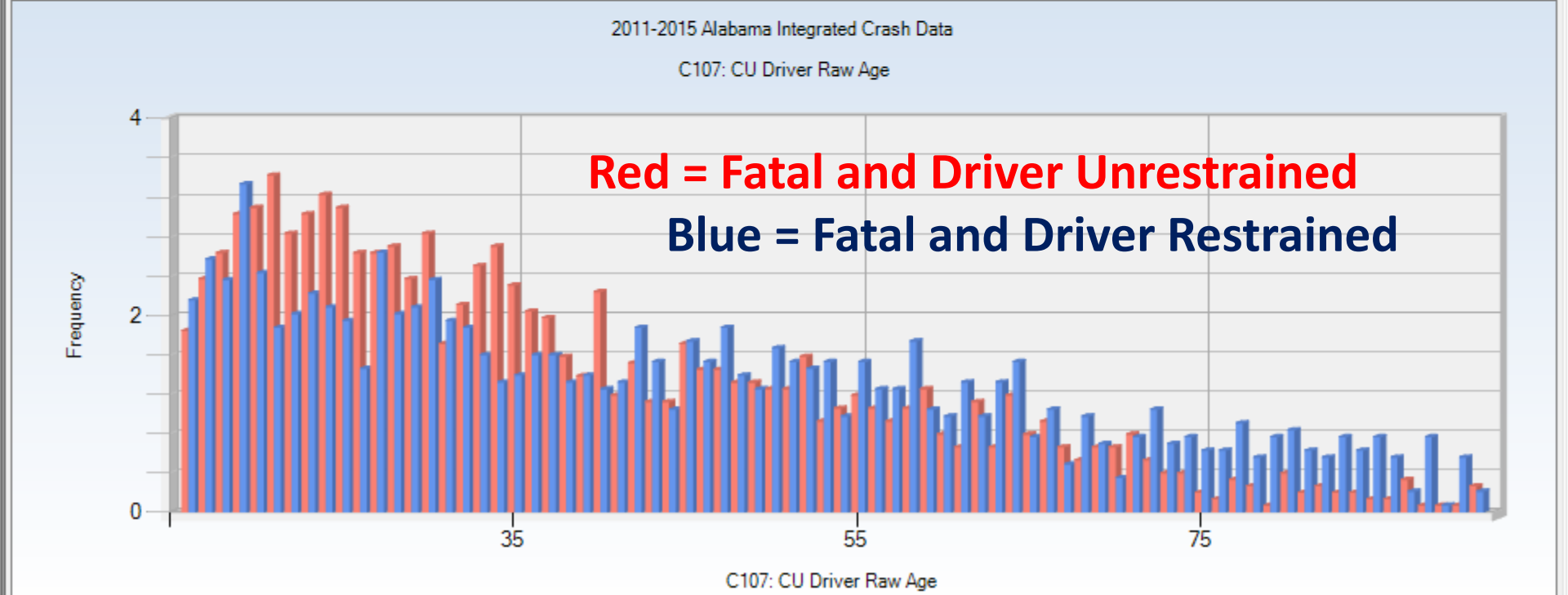
Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
16	28	1.84	31	2.15	0.856	-4.701
17	36	2.37	37	2.57	0.922	-3.030
18	40	2.63	34	2.36	1.115	4.135
19	46	3.03	48	3.33	0.908	-4.633
20	47	3.09	35	2.43	1.273	10.080
21	52	3.42	27	1.88	1.826*	23.519
22	43	2.83	29	2.01	1.406	12.409
23	46	3.03	32	2.22	1.363	12.244

C107: CU Driver Raw Age

# Restrains

Sort by Sum of Max Gain

Display Filter Name



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

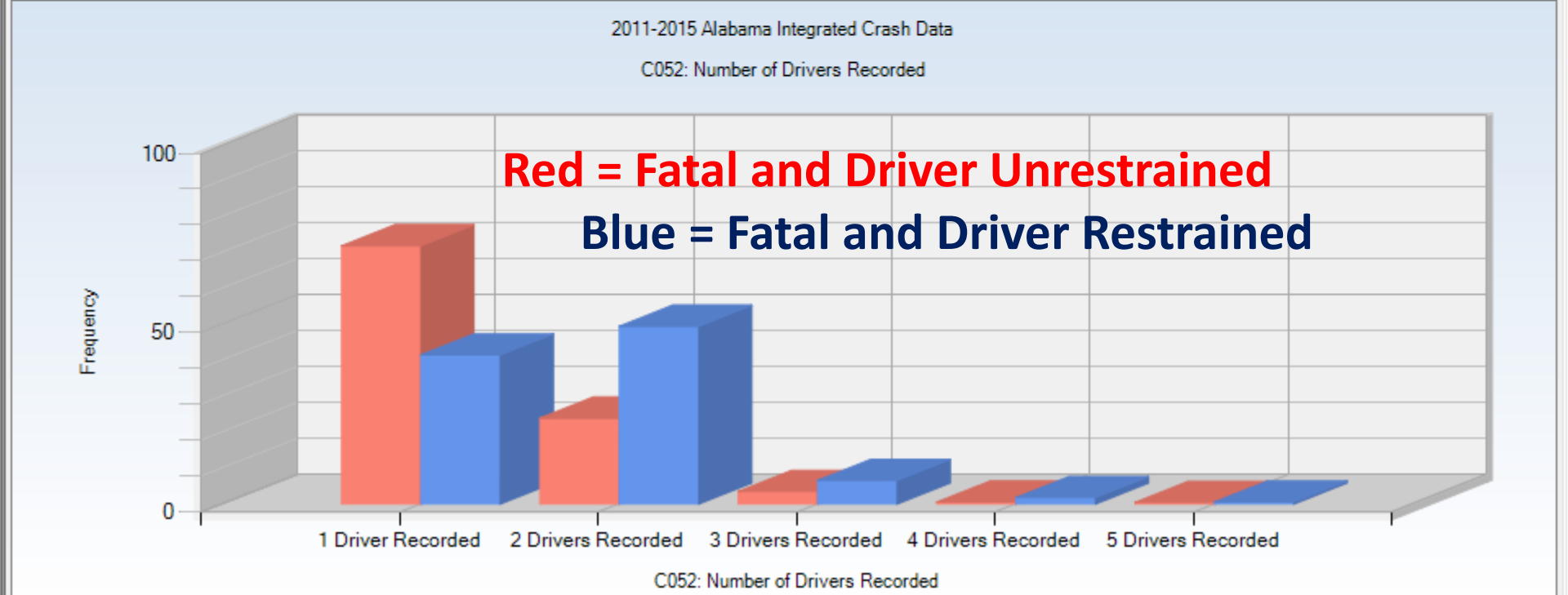
C052: Number of Drivers Recorded	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
1 Driver Recorded	1112	71.93	599	41.54	1.732*	469.799
2 Drivers Recorded	370	23.93	714	49.51	0.483*	-395.495
3 Drivers Recorded	54	3.49	95	6.59	0.530*	-47.852
4 Drivers Recorded	8	0.52	26	1.80	0.287	-19.875
5 Drivers Recorded	2	0.13	8	0.55	0.233	-6.577

C052: Number of Drivers Recorded

# Restrains

Sort by Sum of Max Gain

Display Filter Name



# Countermeasure Development



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## Multi-Fatality Crashes

### Multiple Fatality Crashes vs Single Fatality Crashes

- **Age 16-30**
- **State/Federal Roads as Opposed to County**
- **Severest of Violations**
  - ✓ **Cross centerline, wrong way, aggressive driving**
  - ✓ **DUI same as for single fatality crashes**
- **Collisions with other Vehicles**
  - ✓ **As opposed to roadside objects (e.g., trees)**
- **Countermeasures Must Target Worst Offenders**

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

C107: CU Driver Raw Age	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
16	7	2.41	56	1.69	1.424	2.085
17	5	1.72	75	2.27	0.760	-1.583
18	8	2.76	74	2.24	1.232	1.505
19	16	5.52	87	2.63	2.095	8.364
20	11	3.79	80	2.42	1.567	3.978
21	10	3.45	88	2.66	1.295	2.276
22	10	3.45	80	2.42	1.424	2.978
23	8	2.76	83	2.51	1.098	0.715
24	9	3.10	90	2.72	1.139	1.100
25	6	2.07	85	2.57	0.804	-1.461
26	10	3.45	64	1.94	1.780	4.383
27	8	2.76	84	2.54	1.085	0.627
28	5	1.72	78	2.36	0.730	-1.846
29	9	3.10	71	2.15	1.444	2.768
30	13	4.48	81	2.45	1.829	5.890

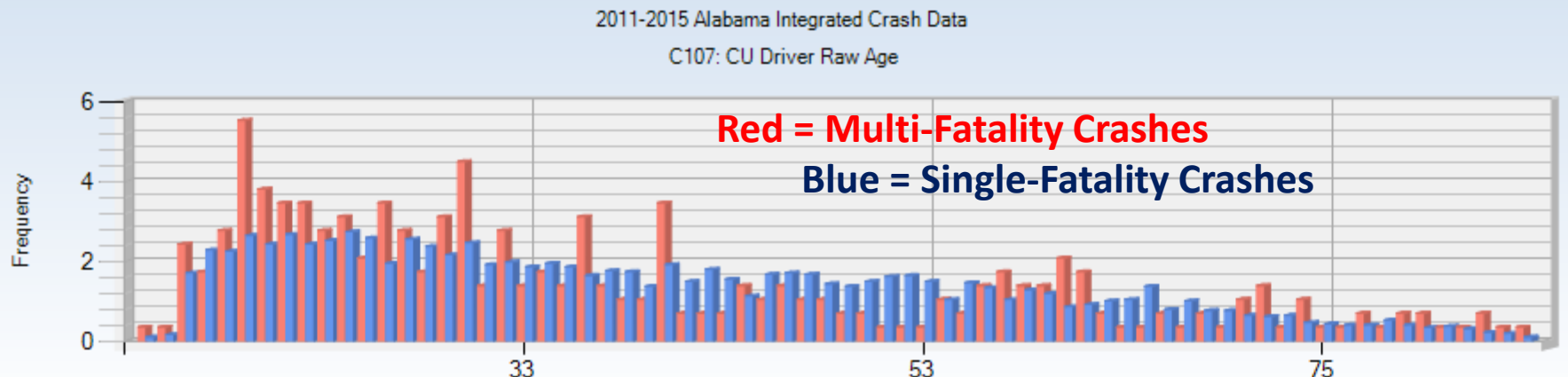
C107: CU Driver Raw Age

# Multi-Fatality

Sort by Sum of Max Gain

Display Filter Name

2011-2015 Alabama Integrated Crash Data C107: CU Driver Raw Age



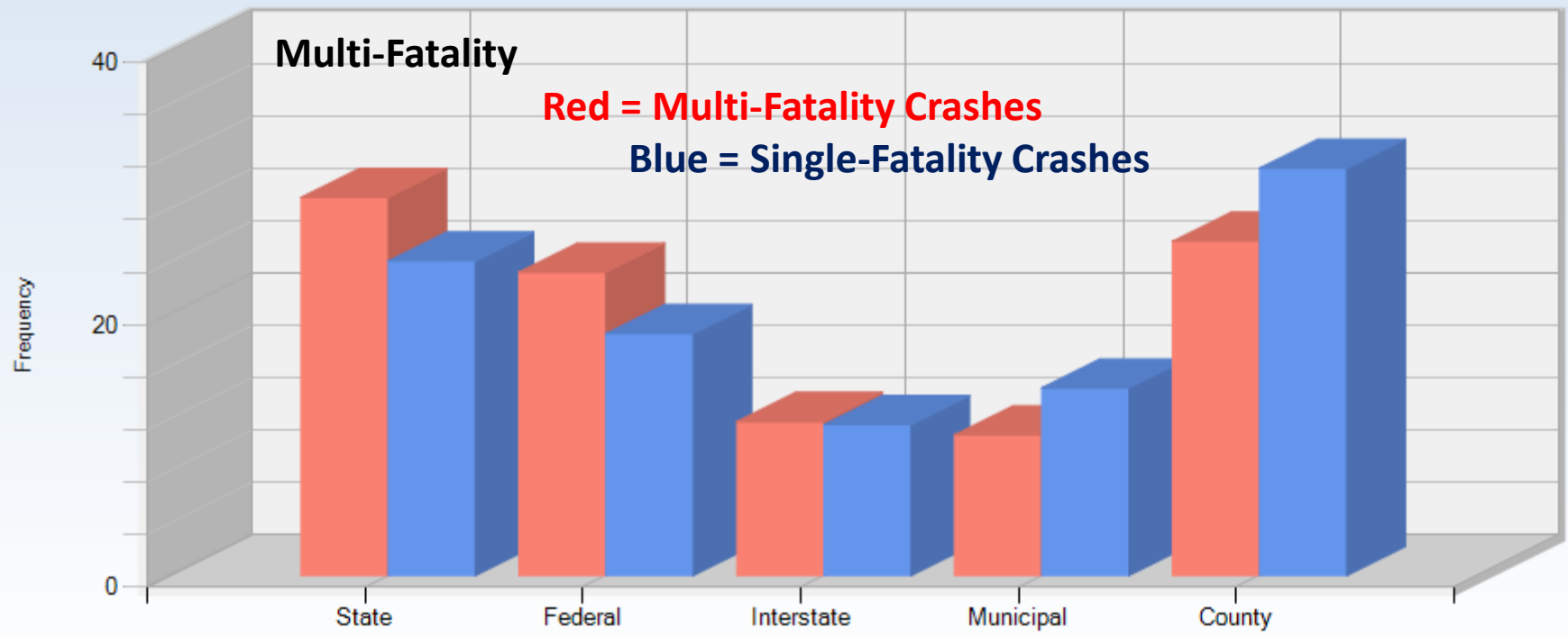
Order: Max Gain Descending  Suppress Zero-Valued Rows Significance: Over Representation Threshold: 2.0

Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
State	86	28.86	871	23.99	1.203	14.516
Federal	69	23.15	670	18.45	1.255	14.012
Interstate	35	11.74	418	11.51	1.020	0.694
Municipal	32	10.74	520	14.32	0.750	-10.677
County	76	25.50	1129	31.09	0.820	-16.658

- C212: CU License Tag State
  - C115: CU Driver CDL Status
  - C010: Rural or Urban
  - C210: CU Body (Passenger Cars Only)
  - C011: Highway Classifications**
  - C219: CU Attachment
  - C004: Month
- Sort by Sum of Max Gain

Display Filter Name

2011-2015 Alabama Integrated Crash Data - Filter = Fatality - Multiple vs. Fatality - Single  
C011: Highway Classifications



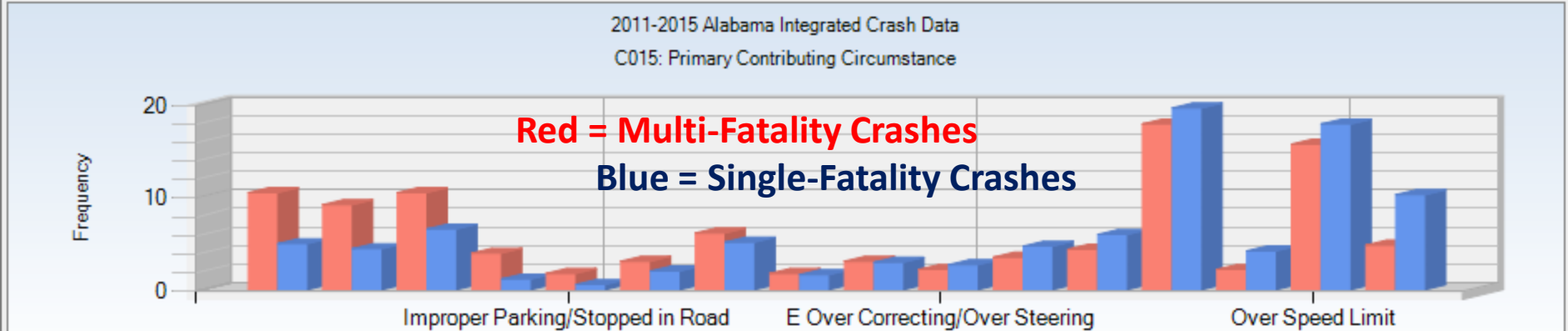


	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
E Crossed Centerline	24	10.43	126	4.95	2.110*	12.626
Traveling Wrong Way/Wrong ...	21	9.13	112	4.40	2.077*	10.890
E Aggressive Operation	24	10.43	166	6.51	1.602	9.016
Improper Passing	9	3.91	29	1.14	3.438	6.382
Improper Parking/Stopped in ...	4	1.74	14	0.55	3.165	2.736
E Ran Stop Sign	7	3.04	51	2.00	1.521	2.396
Driving too Fast for Conditions	14	6.09	130	5.10	1.193	2.265
Defective Equipment	4	1.74	41	1.61	1.081	0.299
E Failed to Yield Right-of-Way ...	7	3.04	75	2.94	1.034	0.230
E Over Correcting/Over Steer...	5	2.17	68	2.67	0.815	-1.138
E Fatigued/Asleep	8	3.48	119	4.67	0.745	-2.742
E Failed to Yield Right-of-Way ...	10	4.35	151	5.93	0.734	-3.630
DUI	41	17.83	498	19.54	0.912	-3.953
Unseen Object/Person/Vehicle	5	2.17	106	4.16	0.523	-4.568
Over Speed Limit	36	15.65	454	17.82	0.878	-4.981
E Ran off Road	11	4.78	260	10.20	0.469	-12.469

C015: Primary Contributing Circumstance

# Multi-Fatality

Sort by Sum of Max Gain



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

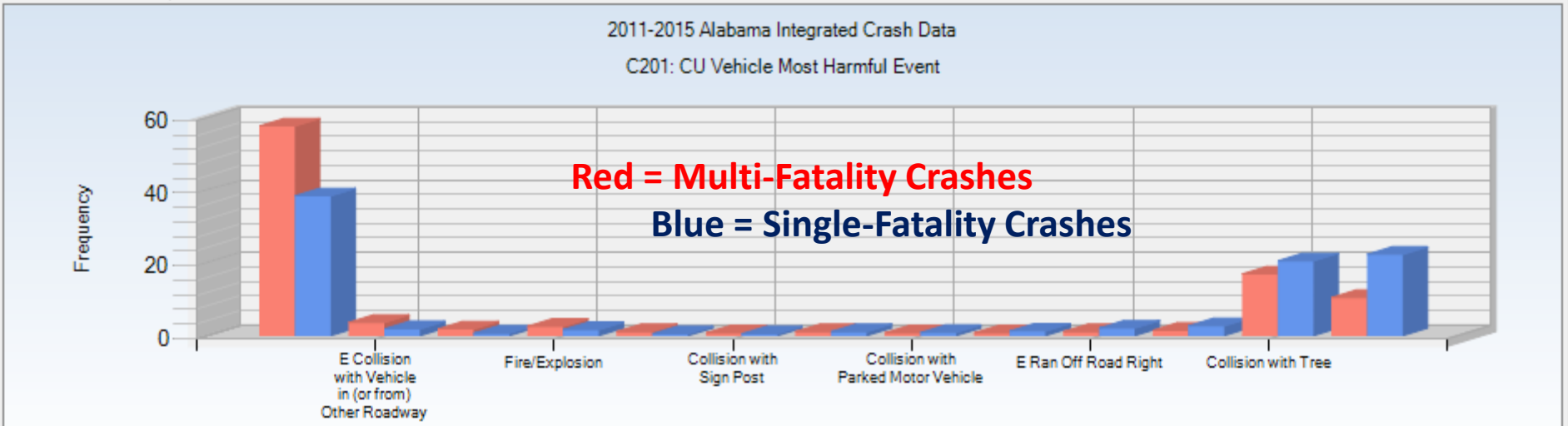
C201: CU Vehicle Most Harmful Event	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
Collision with Vehicle in Traffic	160	57.76	1150	38.51	1.500*	53.319
E Collision with Vehicle in (or fr...	10	3.61	55	1.84	1.960	4.898
Collision with Railway Vehicle/...	5	1.81	19	0.64	2.837	3.237
Fire/Explosion	7	2.53	48	1.61	1.572	2.547
Immersion	3	1.08	9	0.30	3.593	2.165
Collision with Sign Post	2	0.72	6	0.20	3.593	1.443
Collision with Other Fixed Object	3	1.08	32	1.07	1.011	0.031
Collision with Parked Motor Ve...	2	0.72	24	0.80	0.898	-0.226
Collision with Culvert Headwall	2	0.72	37	1.24	0.583	-1.432
E Ran Off Road Right	3	1.08	61	2.04	0.530	-2.659
Collision with Utility Pole	4	1.44	80	2.68	0.539	-3.421
Collision with Tree	47	16.97	615	20.60	0.824	-10.051
Overtum/Rollover	29	10.47	668	22.37	0.468*	-32.968

C201: CU Vehicle Most Harmful Event

# Multi-Fatality

Sort by Sum of Max Gain

Display Filter Name



# Countermeasure Development



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PUBLIC SAFETY

## Pedestrian Fatalities

### Pedestrian Fatalities vs. Pedestrian Non-Fatal

- All Roadway Types other than Municipal
- Close to 8 times the Drug Use Indicator
- Over 2 times the Alcohol Use Indicator
- Time of Day Validates Drug/Alcohol Use
- Not Visible and Other Pedestrian Violations
- Countermeasures: Similar to Seatbelts

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

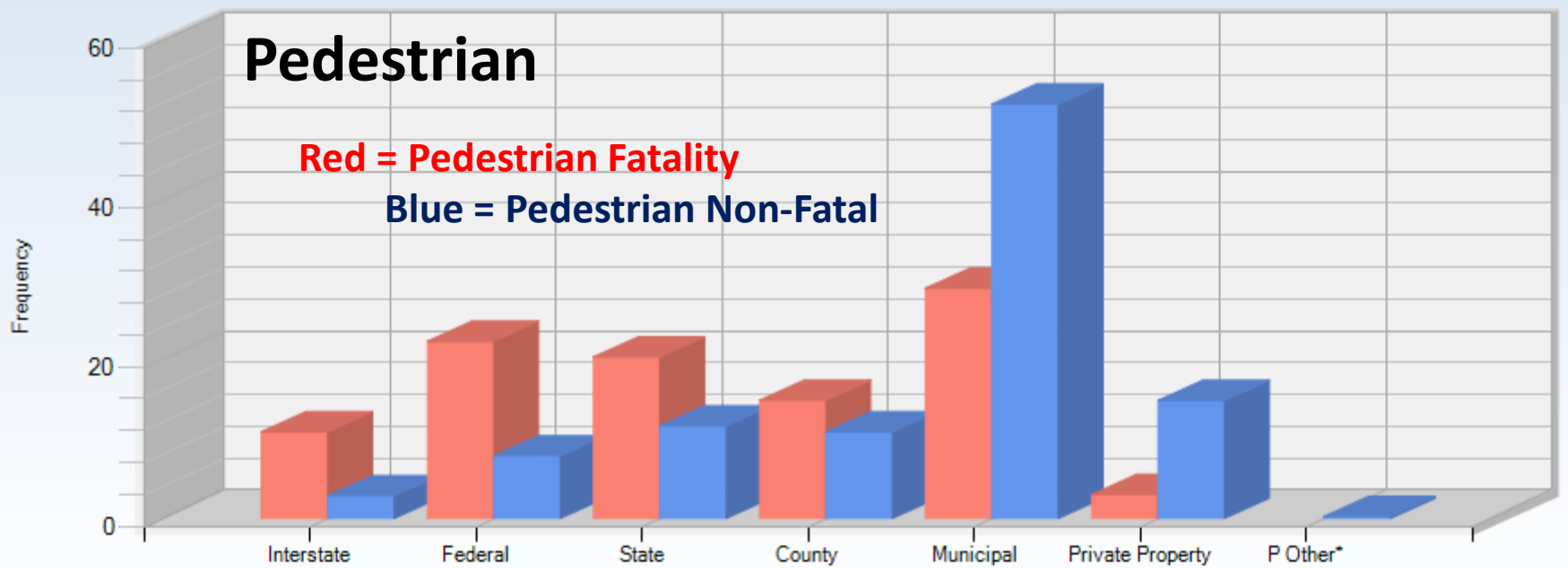
Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
Interstate	44	10.86	94	2.83	3.844*	32.554
Federal	90	22.22	261	7.85	2.832*	58.219
State	82	20.25	386	11.61	1.745*	34.998
County	60	14.81	361	10.85	1.365*	16.042
Municipal	117	28.89	1730	52.01	0.555*	-93.658
Private Property	12	2.96	492	14.79	0.200	-47.910
P Other*	0	0.00	2	0.06	0.000	0.000

- C025: Crash Severity
- C060: Number Killed
- C058: Number Injured (Non-Fatal)
- C328: CU Driver/Non-Motorist Injury Type
- C028: Mileposted Route
- C011: Highway Classifications
- C002: City
- C308: CU Non-Motorist Condition
- C223: CU Speed Limit
- C226: CU Vehicle Damage
- Sort by Sum of Max Gain

Display Filter Name

2011-2015 Alabama Integrated Crash Data - Filter = Pedestrian Involved And Fatal Crashes vs. Pedestrian Involved And Not Fatal Crashes

C011: Highway Classifications



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

	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
Yes - Non-Motorist Was Under...	24	25.81	30	3.32	7.776*	20.914
No - Non-Motorist Was Not U...	69	74.19	874	96.68	0.767*	-20.914

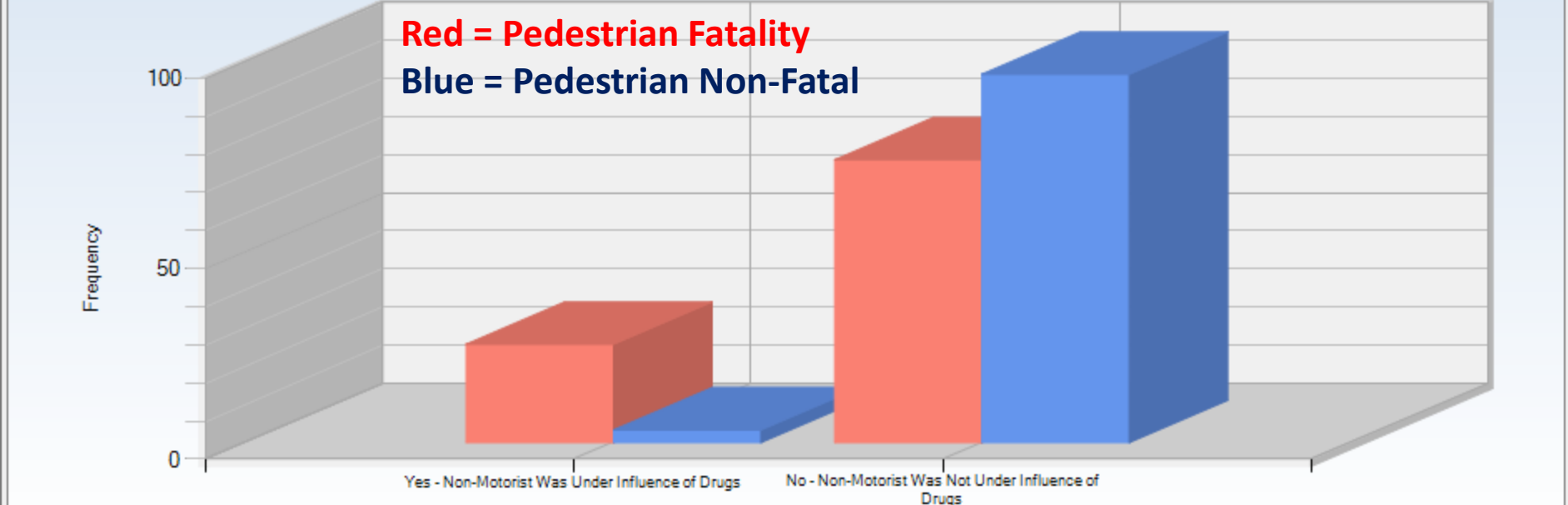
C310: CU Non-Motorist Officer Opinion Dru

# Pedestrian

Sort by Sum of Max Gain

Display Filter Name

2011-2015 Alabama Integrated Crash Data  
C310: CU Non-Motorist Officer Opinion Drugs



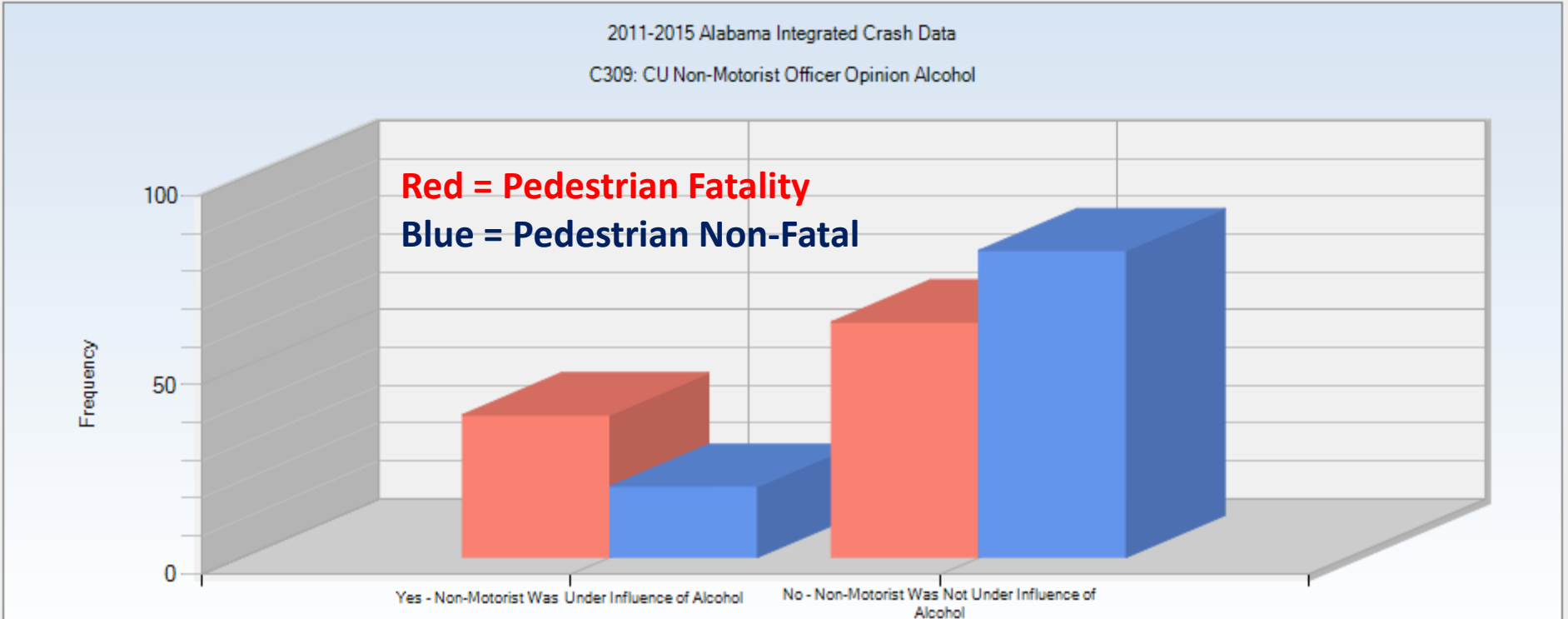
Order: Max Gain Descending  Suppress Zero-Valued Rows Significance: Over Representation Threshold: 2.0

	Value	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
▶	Yes - Non-Motorist Was Under...	46	37.70	185	18.76	2.010*	23.110
	No - Non-Motorist Was Not U...	76	62.30	801	81.24	0.767*	-23.110

C309: CU Non-Motorist Officer Opinion Alco

# Pedestrian

Sort by Sum of Max Gain



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

C008: Time of Day	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
12:00 Midnight to 12:59 AM	19	4.69	76	2.29	2.053	9.746
1:00 AM to 1:59 AM	13	3.21	50	1.50	2.135	6.912
2:00 AM to 2:59 AM	14	3.46	51	1.53	2.254	7.790
3:00 AM to 3:59 AM	16	3.95	35	1.05	3.754	11.738
4:00 AM to 4:59 AM	11	2.72	29	0.87	3.115	7.469
5:00 AM to 5:59 AM	14	3.46	50	1.50	2.299	7.912
6:00 AM to 6:59 AM	13	3.21	76	2.29	1.405	3.746

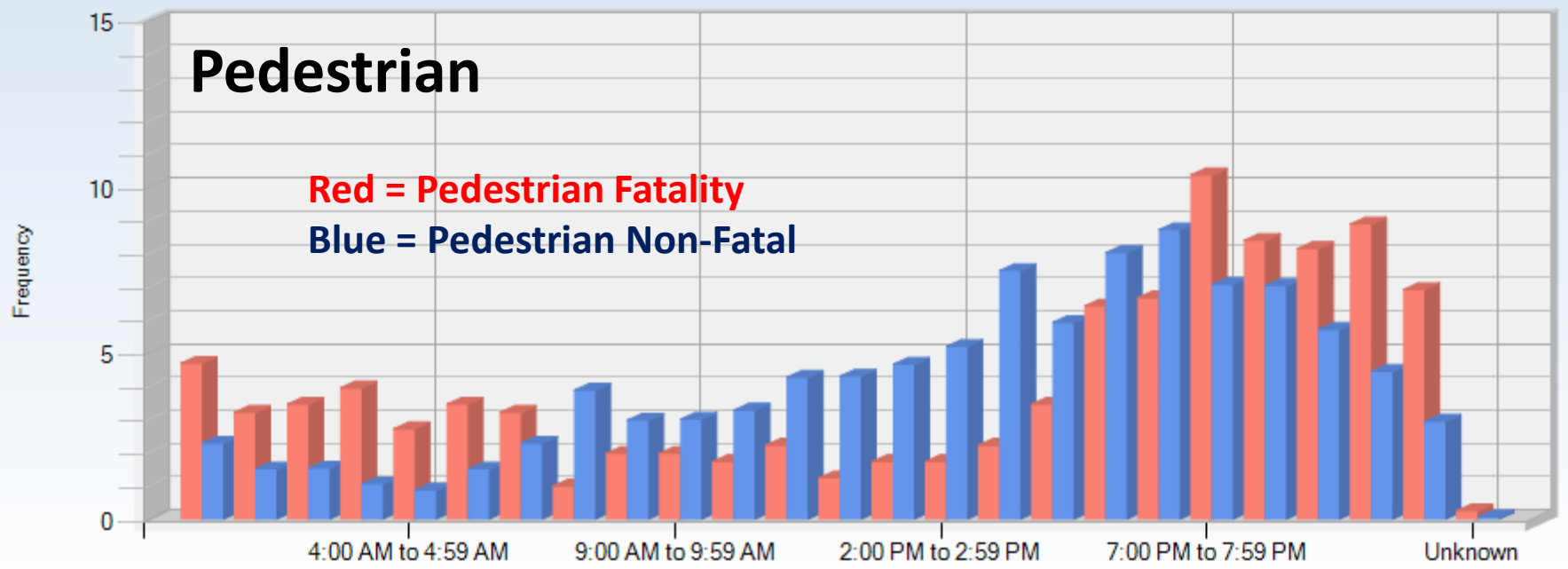
- C224: CU Estimated Speed at Impact
  - C125: E CU Driver Drug Test Type Given
  - C230: CU Areas Damaged #1
  - C107: CU Driver Raw Age
  - C127: E CU Driver Drug Test Results
  - C309: CU Non-Motorist Officer Opinion A
  - C008: Time of Day**
  - C126: CU Driver Alcohol Test Results
  - C330: CU Driver/Non-Motorist Transport
  - C331: F CU Driver/Non-Motorist Transp
- Sort by Sum of Max Gain



Display Filter Name

2011-2015 Alabama Integrated Crash Data - Filter = Pedestrian Involved And Fatal Crashes vs. Pedestrian Involved And Not Fatal Crashes

C008: Time of Day



	Subset Frequency	Subset Percent	Other Frequency	Other Percent	Odds Ratio	Max Gain
E Not Visible	32	10.74	102	5.35	2.006*	16.044
Pedestrian Under the Influence	36	12.08	130	6.82	1.770*	15.664
E Lying or Sitting in Roadway	10	3.36	13	0.68	4.917	7.966
P Pedestrian Violation	13	4.36	52	2.73	1.598	4.866
Improper Parking/Stopped in ...	7	2.35	18	0.94	2.486	4.184
E Wrong Side of Road	9	3.02	39	2.05	1.475	2.899
DUI	17	5.70	91	4.78	1.194	2.765
E Improper Crossing	81	27.18	541	28.40	0.957	-3.629
Failed to Yield the Right-of-Way	38	12.75	273	14.33	0.890	-4.706
Unseen Object/Person/Vehicle	55	18.46	646	33.91	0.544*	-46.054

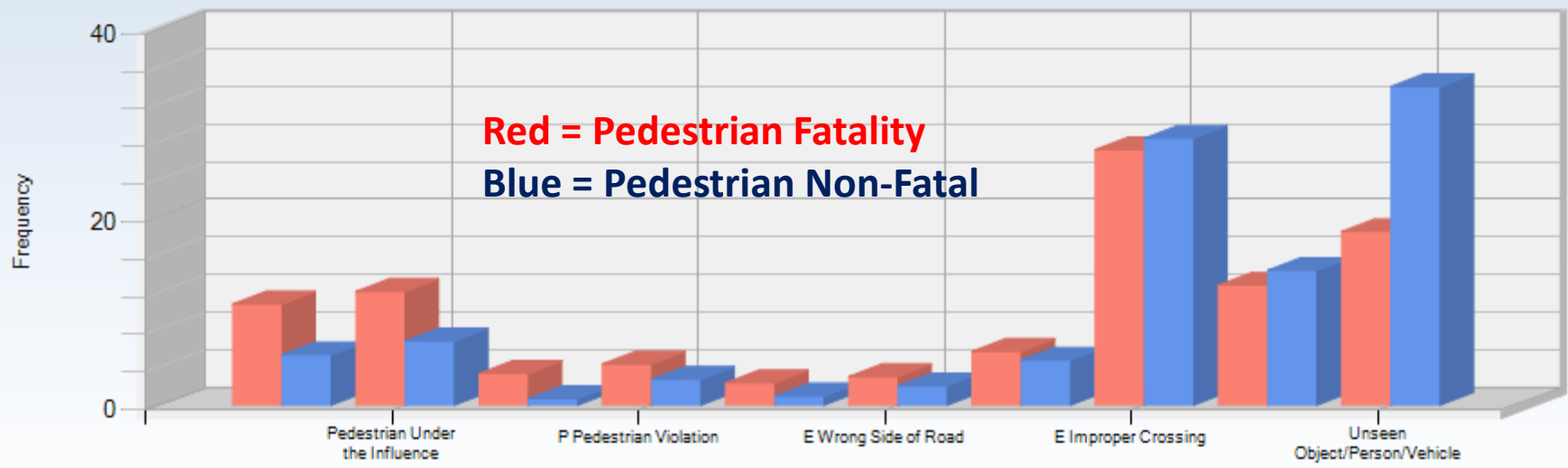
C015: Primary Contributing Circumstance

# Pedestrian

Sort by Sum of Max Gain

Display Filter Name

2011-2015 Alabama Integrated Crash Data  
C015: Primary Contributing Circumstance







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# THANK YOU

## Q&A SESSION

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