



# Pedestrian/Bicycle Crash Analysis



Instructors: Tony Becker / Mike Reade

Date: 09-Oct-08

Place: Bedford Hills, New York

Vehicle: 1995 Lexus ES300  
 VIN: JT8GK13T7S0125857  
 OL: 15.67 Feet  
 OW: 5.83 Feet  
 WB: 8.58 Feet  
 FOH: 3.75 Feet  
 ROH: 3.33 Feet

Hood H: 29 Inches

The above data was collected from Expert AutoStats a product of 4N6XPRT Systems.

**Searle Using Angle:**

$$V = \frac{\sqrt{2 \times \mu \times g \times d}}{[\cos \theta + (\mu \times \sin \theta)]}$$

**Searle Maximim:**

$$V_{\max} = \sqrt{2 \times \mu \times g \times d}$$

**Searle Minimum:**

$$V_{\min} = \sqrt{\frac{2 \times \mu \times g \times d}{1 + \mu^2}}$$

(The results of the above formulas (fps) are converted to MPH results.)

Crash Data:	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
Ped Ht (in.):	63	63	63	63	63	63
Ped C/M Ht (in.):	39	39	39	38	40	40
Ped Slide D (ft.):	4.9	5.17	7.5	21.6	7.4	7.4
Airborne D (ft.):	22.4	48	34.75	75.6	76.9	76.9
Ped f-Value:	0.66	0.79	0.79	0.79	0.79	0.79
Throw D (ft.):	27.3	53.17	42.25	96	84.3	84.3
Takeoff (Min):	10	10	10	10	10	10
Takeoff (Max.):	20	20	20	20	20	20
1st Evid. (ft):	4.7	0.0	0.0	-1.0	2.6	2.6
<b>Vehicle Data:</b>						
Hood Height (in.):	29	29	29	29	29	29
C/M - Hood Change (in.):	10	10	10	9	11	11
Braking (Yes=Y/No=N):	Y	Y	Y	N	Y	Y
Skid Total (ft.):	30.3	63	59	0	0	0
Skid Impact (ft.):	10	15	23.4	0	0	0
Road f-Value:	0.81	0.74	0.71	0.73	0.73	0.73
Vericom (Impact):	0	32.7	27.5	0	0	0
Video (Impact):	21.8	30.4	28	38.1	38.1	38.1
Radar (Start Braking):	0	0	0	0	0	0
Radar (Impact):	20	26	30	37	37	37

Disclaimer: Documentaion is provided to supplement IPTM Crash Testing.  
 Additional training required to fully understand the technical analysis.

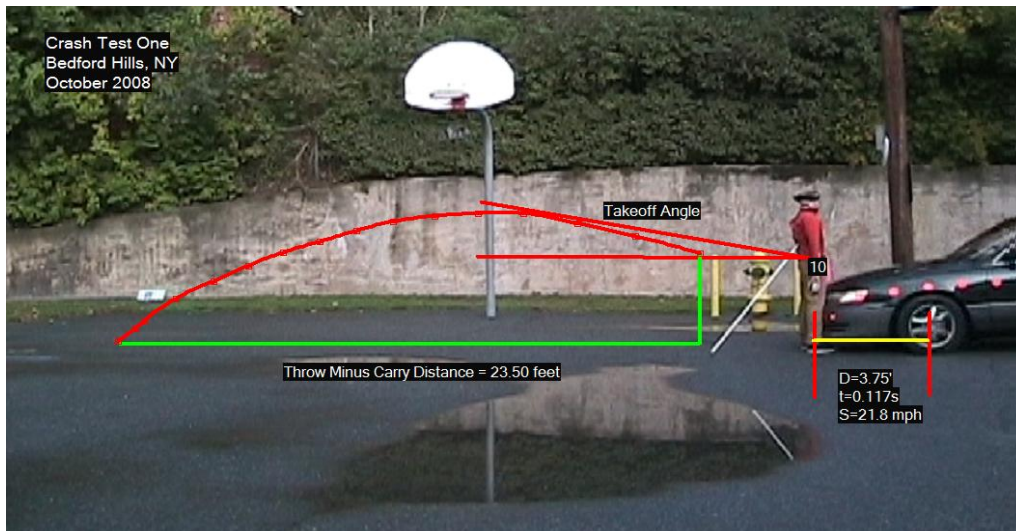


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## Test 1



### **Pedestrian Speed Analysis:**

Searle (10 Degree) Takeoff:	21.15 mph
Searle (20 Degree) Takeoff:	19.95 mph
Searle Minimum Formula:	19.40 mph
Searle Maximum Formula:	23.25 mph

### **Vehicle Speed Analysis:**

Speed - Start of Braking (Skid):	27.13 mph
Speed - Impact (Skid):	22.21 mph
Speed - Start of Braking (Radar):	N/A mph
Speed - Impact (Radar):	20.00 mph
Speed - Impact (Vericom):	N/A mph
Speed - Impact (Video):	21.80 mph

### **Other Calculations:**

Speed (With Adjusted Data):	19.62 mph
Throw Minus Carry Distance(ft):	23.50 feet
Location of First Evidence (ft.):	4.7 feet
% of Speed Attained (Ped):	87%
Difference (C/M vs. Hood H (in.):	10 inches
Takeoff From Video (Degrees):	10 Degrees
Carry Distance (ft.):	3.80 feet

*(Percentage is determined by dividing Searle Minimum result by Vehicle Impact Speed)*

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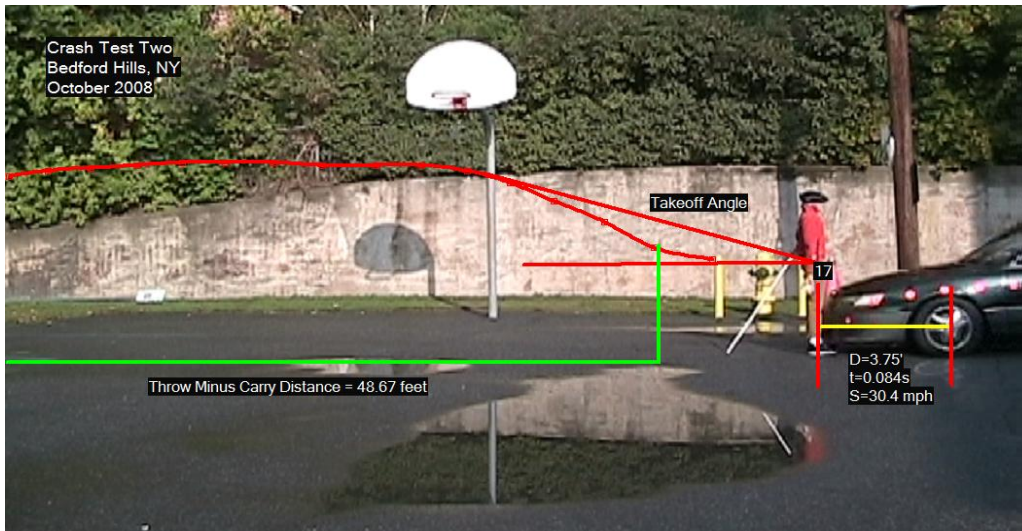


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## Test 2



### Pedestrian Speed Analysis:

Searle (10 Degree) Takeoff:	31.64 mph
Searle (20 Degree) Takeoff:	29.34 mph
Searle Minimum Formula:	27.85 mph
Searle Maximum Formula:	35.50 mph

### Vehicle Speed Analysis:

Speed - Start of Braking (Skid):	37.40 mph
Speed - Impact (Skid):	32.64 mph
Speed - Start of Braking (Radar):	N/A mph
Speed - Impact (Radar):	26.00 mph
Speed - Impact (Vericom):	32.70 mph
Speed - Impact (Video):	30.40 mph

### Other Calculations:

Speed (With Adjusted Data):	28.61 mph
Throw Minus Carry Distance(ft):	48.67 feet
Location of First Evidence (ft.):	0.0 feet
% of Speed Attained (Ped):	85%
Difference (C/M vs. Hood H (in.):	10 inches
Takeoff From Video (Degrees):	17 Degrees
Carry Distance (ft.):	4.50 feet

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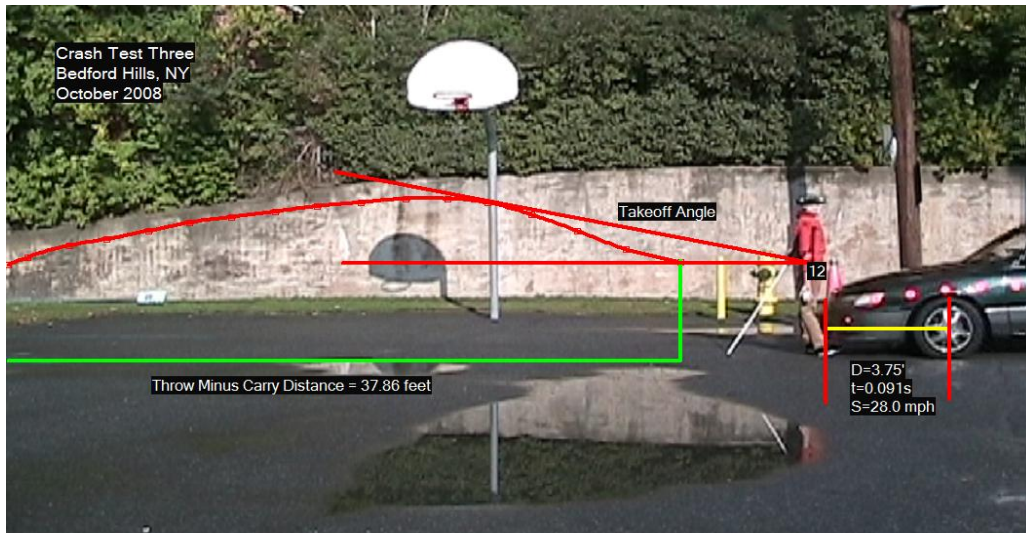


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## Test 3



### Pedestrian Speed Analysis:

Searle (10 Degree) Takeoff:	28.20 mph
Searle (20 Degree) Takeoff:	26.15 mph
Searle Minimum Formula:	24.83 mph
Searle Maximum Formula:	31.64 mph

### Vehicle Speed Analysis:

Speed - Start of Braking (Skid):	35.45 mph
Speed - Impact (Skid):	27.54 mph
Speed - Start of Braking (Radar):	N/A mph
Speed - Impact (Radar):	30.00 mph
Speed - Impact (Vericom):	27.50 mph
Speed - Impact (Video):	28.00 mph

### Other Calculations:

Speed (With Adjusted Data):	26.22 mph
Throw Minus Carry Distance(ft):	37.86 feet
Location of First Evidence (ft.):	0.0 feet
% of Speed Attained (Ped):	90%
Difference (C/M vs. Hood H (in.):	10 inches
Takeoff From Video (Degrees):	12 Degrees
Carry Distance (ft.):	4.39 feet

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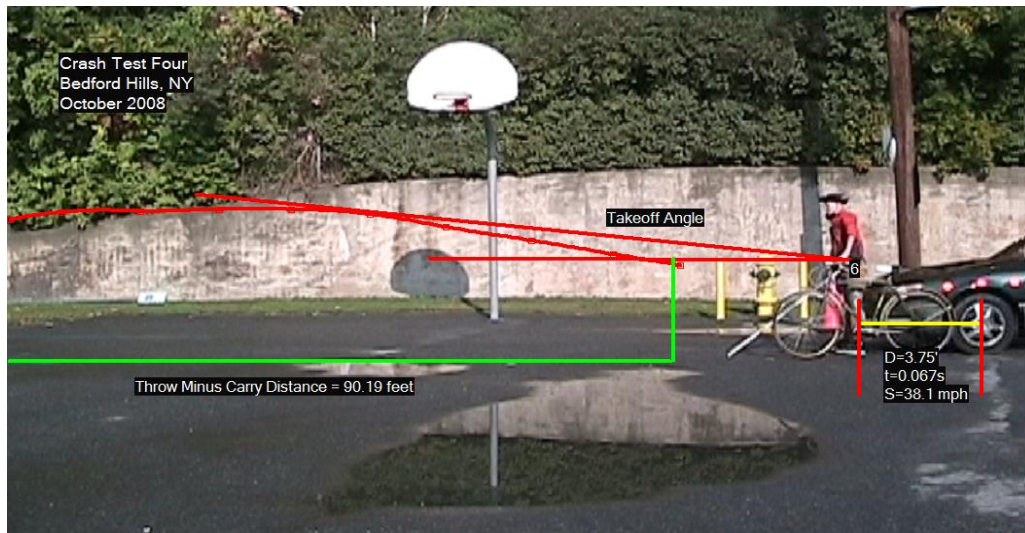


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## Test 4



### **Pedestrian Speed Analysis:**

Searle (10 Degree) Takeoff:	42.51 mph
Searle (20 Degree) Takeoff:	39.42 mph
Searle Minimum Formula:	37.43 mph
Searle Maximum Formula:	47.70 mph

### **Vehicle Speed Analysis:**

Speed - Start of Braking (Skid):	N/A mph
Speed - Impact (Skid):	N/A mph
Speed - Start of Braking (Radar):	N/A mph
Speed - Impact (Radar):	37.00 mph
Speed - Impact (Vericom):	N/A mph
Speed - Impact (Video):	38.10 mph

### **Other Calculations:**

Speed (With Adjusted Data):	42.92 mph
Throw Minus Carry Distance(ft):	90.19 feet
Location of First Evidence (ft.):	-1.0 feet
% of Speed Attained (Ped):	98%
Difference (C/M vs. Hood H (in.):	9 inches
Takeoff From Video (Degrees):	6 Degrees
Carry Distance (ft.):	5.81 feet

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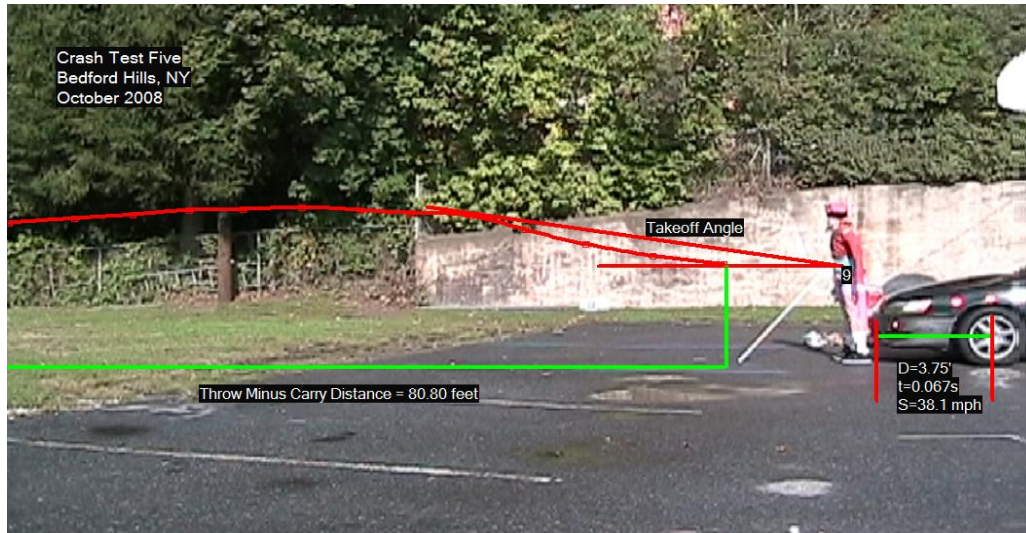


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## Test 5



### **Pedestrian Speed Analysis:**

Searle (10 Degree) Takeoff:	39.84 mph
Searle (20 Degree) Takeoff:	36.94 mph
Searle Minimum Formula:	35.07 mph
Searle Maximum Formula:	44.70 mph

### **Vehicle Speed Analysis:**

Speed - Start of Braking (Skid):	N/A mph
Speed - Impact (Skid):	N/A mph
Speed - Start of Braking (Radar):	N/A mph
Speed - Impact (Radar):	37.00 mph
Speed - Impact (Vericom):	N/A mph
Speed - Impact (Video):	38.10 mph

### **Other Calculations:**

Speed (With Adjusted Data):	39.38 mph
Throw Minus Carry Distance(ft):	80.80 feet
Location of First Evidence (ft.):	2.6 feet
% of Speed Attained (Ped):	92%
Difference (C/M vs. Hood H (in.):	11 inches
Takeoff From Video (Degrees):	9 Degrees
Carry Distance (ft.):	3.50 feet

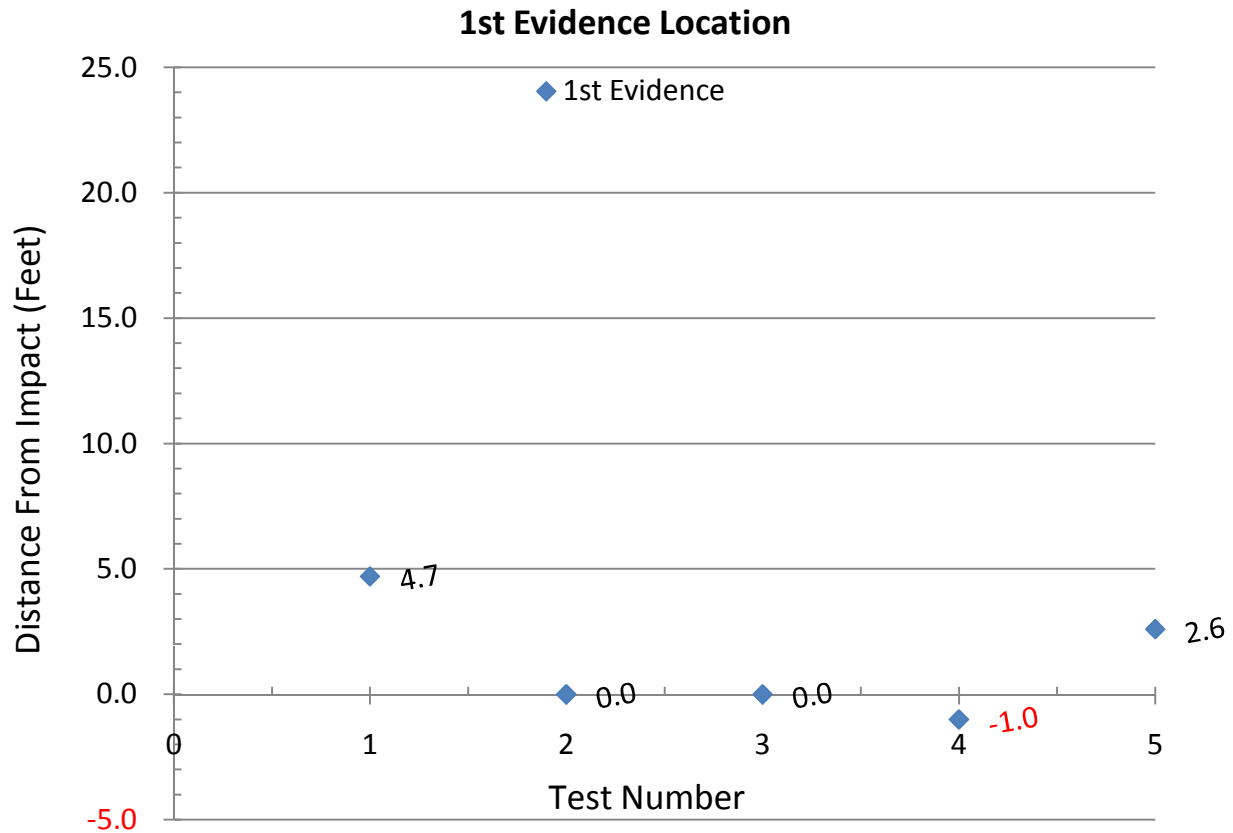
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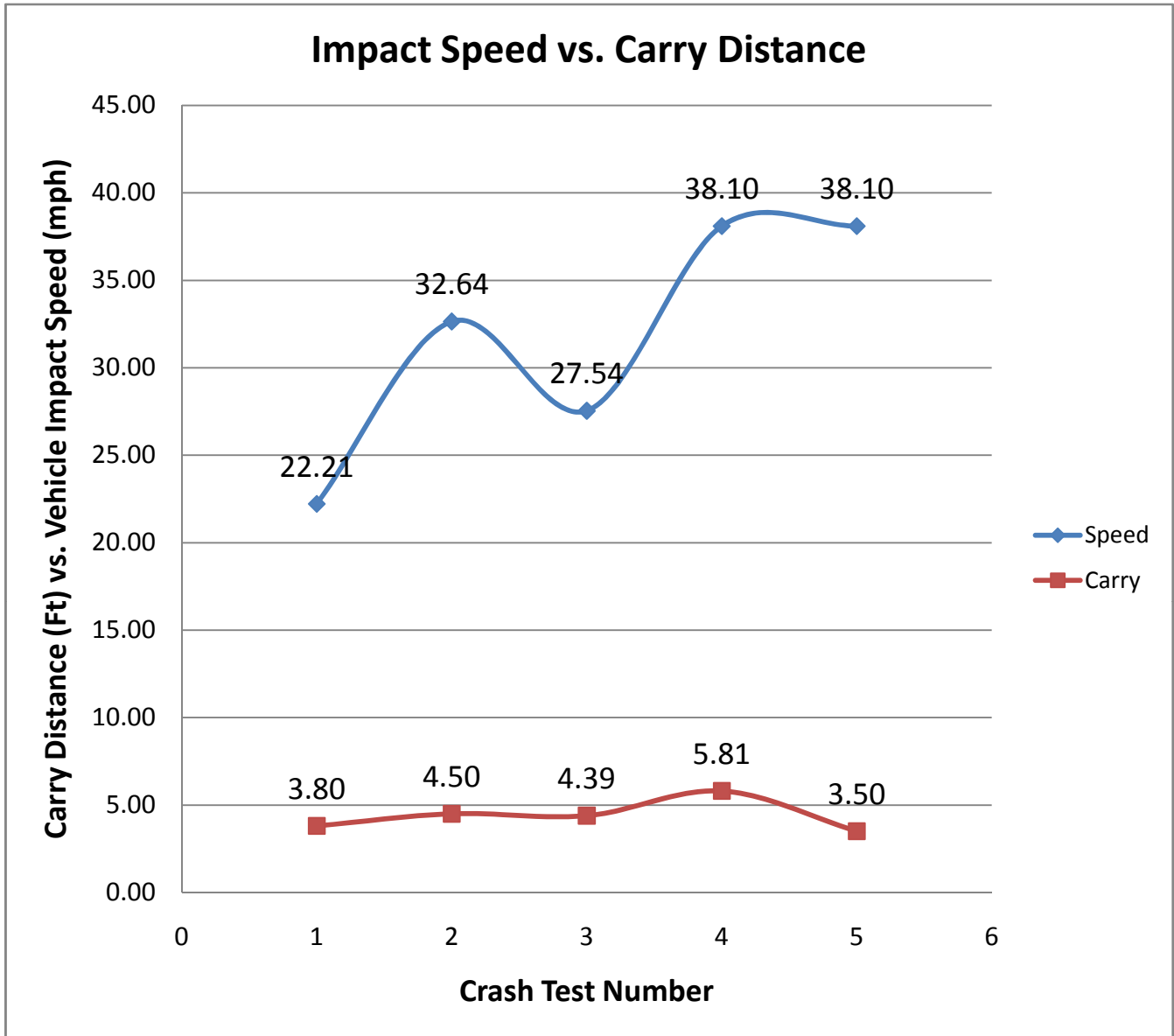


The above graph represents the location of the "1st" Evidence after impact. The longitudinal distance was measured from the impact location either forward or backward. In cases where the 1st Evidence lands before impact, the value is shown as a "RED" negative number.



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Data	Speed	Carry
Test 1:	22.21	3.80
Test 2:	32.64	4.50
Test 3:	27.54	4.39
Test 4:	38.10	5.81
Test 5:	38.10	3.50

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