MAIT SUPPLEMENTAL

This investigation was conducted by the California Highway Patrol (CHP) Central Division Multidisciplinary Accident Investigation Team (MAIT).

MAIT PERSONNEL

Sergeant J. Lawson, ID 12547, Central Division MAIT Team Leader
Officer J. Kolter, ID 14623, Central Division MAIT Investigator
Officer J. Machado, ID 16517, Central Division MAIT Investigator
Officer R. Shaw, ID 16879, Central Division MAIT Investigator
Caltrans Senior Transportation Engineer D. Haas, ID S118322, Central Division MAIT Investigator
Motor Carrier Specialist I K. Weaver, ID A15685, Central Division MAIT Investigator

SUBPOENAS FOR MAIT PERSONNEL SHOULD BE DIRECTED TO:

California Highway Patrol
Central Division MAIT
5179 North Gates Avenue
Fresno, California 93722-6414

Attention: Sergeant J. Lawson
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</tr>
</thead>
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</tr>
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<tr>
<td>67-68</td>
<td>K.W.</td>
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<td>69-79</td>
<td>J.K.</td>
</tr>
<tr>
<td>80-81</td>
<td>J.K.</td>
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<th>NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>J.K.</td>
<td>Investigator J. Kolter</td>
</tr>
<tr>
<td>K.W.</td>
<td>Investigator K. Weaver</td>
</tr>
</tbody>
</table>
INVESTIGATIVE SUMMARY

02-02-2016: CHP Central Division Special Services Commander, Captain D. M. Troxell, ID 13163, requested the assistance of Central Division MAIT in the investigation of this fatal traffic collision. Sergeant Lawson and Investigators Kolter, Machado, Shaw, Haas, and Weaver responded immediately to the request. MAIT investigators measured and photographed the collision scene.

02-04-2016: Investigator Kolter responded to Action Towing and Dive Team, Incorporated, 2822 East California Avenue, Fresno, California 93721, to photograph and measure Vehicle 2 (Combination) for a damage description and damage profile.

02-10-2016: Investigator Kolter responded to Action Towing and Dive Team, Incorporated, to photograph and measure Vehicle 1 (Ram) for a damage description and damage profile.

Investigator Weaver responded to Action Towing and Dive Team, Incorporated, to begin a mechanical inspection of Vehicle 2 (Combination).

02-25-2016: Investigator Kolter responded to Action Towing and Dive Team, Incorporated, and accompanied Mr. Rene Casteneda, of Casteneda Engineering, 4652 East Carmen Avenue, Fresno, California 93703, in order to access data that may have been stored in the Electronic Control Module (ECM) of Vehicle 2 (Combination).

04-20-2016: Investigator Kolter responded to Action Towing and Dive Team, Incorporated, and inspected the restraints of Vehicle 1 (Ram).

04-21-2016: Investigator Kolter conducted coefficient of friction testing at the collision scene.

05-25-2016: Investigator Weaver responded to Action Towing and Dive Team, Incorporated, to inspect Vehicle 2B (Reliance).

07-15-2016: This investigation was released for publication.
FACTS

NOTIFICATION

On Tuesday, February 2, 2016, Central Division MAIT received a request from CHP Central Division Special Services Commander, Captain D. M. Troxell, ID 13163, to assist in the investigation of a fatal traffic collision. The collision occurred within the intersection of East South Avenue and South Buttonwillow Avenue on February 2, 2016, at 0812 hours, in an unincorporated area of Fresno County, California. Central Division MAIT investigators responded immediately to the request.

ISSUES

This investigation was limited to the collection of data necessary to prepare Physical Evidence and Dynamics Diagrams, prepare vehicle damage descriptions and vehicle damage profiles of the involved vehicles, document the pre- and post-collision mechanical condition of Vehicle 2 (Combination), perform calculations necessary to determine the pre-collision velocities of Vehicle 1 (Ram) and Vehicle 2 (Combination), and conduct a time-position analysis.
FACTS

ROADWAY DESCRIPTION

GENERAL DESCRIPTION

This collision occurred within the intersection of East South Avenue and South Buttonwillow Avenue in an unincorporated area of Fresno County, California.

East South Avenue and South Buttonwillow Avenue intersect at approximately ninety degrees.
FACTS

ROADWAY DESCRIPTION

GENERAL DESCRIPTION (continued)

East South Avenue

East South Avenue was an east-west roadway owned and maintained by Fresno County. The roadway surface was comprised of asphalt concrete and was in good condition.

East South Avenue was a straight, flat roadway with one lane for eastbound and one lane for the westbound direction of travel. The lanes were delineated by broken yellow lines, until they approached the intersection with South Buttonwillow Avenue, where the lanes were delineated by solid yellow lines and broken yellow lines. There were solid white limit lines at the entrance to the intersection with South Buttonwillow Avenue for eastbound and westbound traffic.

The north side of East South Avenue was bordered by a dirt shoulder and a vacant dirt field west of the intersection, and a dirt shoulder and an orchard east of the intersection.

The south side of East South Avenue was bordered by a dirt shoulder and a vineyard west of the intersection, and a dirt shoulder and commercial buildings east of the intersection.

![East South Avenue west of South Buttonwillow Avenue, viewed from west to east.](CL-002-16 02-02-16 JM-A (4) cropped)
ROADWAY DESCRIPTION

GENERAL DESCRIPTION (continued)

South Buttonwillow Avenue

South Buttonwillow Avenue was a north-south roadway owned and maintained by Fresno County. The roadway surface was comprised of asphalt concrete and was in good condition.

South Buttonwillow Avenue was a straight, flat roadway with one lane in the northbound and one lane in the southbound direction of travel. The lanes were delineated by broken yellow lines until they approached the intersection with East South Avenue, where the lanes were delineated by solid yellow lines and broken yellow lines.

The west side of South Buttonwillow Avenue was bordered by a dirt shoulder and a vacant dirt field north of the intersection, and a dirt shoulder and a vineyard south of the intersection.

The east side of South Buttonwillow Avenue was bordered by a dirt shoulder and an orchard north of the intersection, and a dirt shoulder and commercial buildings south of the intersection.

South Buttonwillow Avenue north of East South Avenue, viewed from north to south.
CL-002-16 02-02-16 JM-A (29) cropped
FACTS

ROADWAY DESCRIPTION

COEFFICIENT OF FRICTION

On Thursday, April 21, 2016, Investigator Kolter conducted friction tests on the roadway surface of the intersection of South Buttonwillow Avenue and East South Avenue utilizing a Vericom VC4000DAQ performance computer. The roadway surface was inspected and was determined to be free of contaminants. The Vericom VC4000DAQ was installed in a CHP 2006 Ford Crown Victoria Police Interceptor patrol vehicle with a vehicle identification number of 2FAHP71W86X141070. The tires installed on the patrol vehicle were Goodyear Eagle P235/55R17, inflated to 35 pounds per square inch. Tests were conducted with the anti-lock braking system (ABS) disabled. Note: Run numbers 1-10 did not pertain to this investigation.

The tests (run numbers 11-13) were conducted in the southbound direction on South Buttonwillow Avenue within the intersection. The table below lists the results of the testing:

<table>
<thead>
<tr>
<th>RUN NUMBER</th>
<th>TIME (SECONDS)</th>
<th>ACCELERATION (g’s)</th>
<th>SPEED (MPH)</th>
<th>DISTANCE (FEET)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>2.030</td>
<td>0.788</td>
<td>35.08</td>
<td>52.320</td>
</tr>
<tr>
<td>12</td>
<td>2.000</td>
<td>0.785</td>
<td>34.46</td>
<td>50.755</td>
</tr>
<tr>
<td>13</td>
<td>2.250</td>
<td>0.774</td>
<td>38.19</td>
<td>62.863</td>
</tr>
</tbody>
</table>

The average friction value, or drag factor, for the patrol vehicle stopping on the asphalt concrete surface of the intersection of South Buttonwillow Avenue and East South Avenue with the ABS disabled was determined to be 0.782.

\[ f_i = 0.782 \]
FACTS

ROADWAY DESCRIPTION

TRAFFIC CONTROLS

Motorists traveling north or south on South Buttonwillow Avenue approaching the intersection of East South Avenue were not required to stop at the intersection. The posted maximum speed limit for South Buttonwillow Avenue, to the north and south of the intersection with East South Avenue was 55 miles per hour. There were no posted speed limit signs for southbound traffic on South Buttonwillow Avenue for four miles north of the intersection.

Motorists traveling east or west on East South Avenue approaching the intersection of South Buttonwillow Avenue were required to stop at posted stop signs. There was a “STOP AHEAD” pavement legend on the roadway surface of eastbound East South Avenue, and an associated stop ahead warning sign, located approximately 562 feet west of the solid white limit line for eastbound traffic on East South Avenue.

The posted speed limit for East South Avenue, to the east and west of the intersection with South Buttonwillow Avenue, was 45 miles per hour. The nearest posted speed limit sign facing eastbound motorists was located approximately one mile east of the intersection of East South Avenue and South Buttonwillow Avenue. The speed limit sign was in good condition.

There were solid white limit lines and stop signs for eastbound and westbound traffic on East South Avenue at the entrance to the intersection.

All stop signs and roadway legends were visible and in good condition when inspected by MAIT investigators on the day of the collision, and are shown in the images below:

The “STOP AHEAD” legend and the associated warning sign for eastbound East South Avenue.

The stop sign facing eastbound motorists on East South Avenue at South Buttonwillow Avenue.
FACTS

ROADWAY DESCRIPTION

WEATHER AND LIGHTING

The following weather data was obtained from the Weather Underground Web site <http://www.wunderground.com>. The location of the reading station was the Fresno Yosemite Airport. The reading was for Tuesday, February 2, 2016, at 0753 hours. The reading station at the airport was approximately 19 miles northwest of the collision scene.

- **Air Temperature:** 37.9 degrees Fahrenheit
- **Dew Point:** 32.0 degrees Fahrenheit
- **Barometric Pressure:** 30.30 inches of mercury
- **Relative Humidity:** 79 percent
- **Winds:** Southeast at 5.8 mph
- **Visibility:** 10 miles
- **Conditions:** Overcast

The reported weather conditions were consistent with those observed at the scene by MAIT investigators.

The following sun and Moon data was obtained from the United States Naval Observatory Astronomical Applications Department Web site <http://aa.usno.navy.mil/cgi-bin/aa_pap.pl>, and was provided for Fresno, Fresno County, California:

- **Moonrise:** February 2, 2016, 0140 hours
- **Begin Civil Twilight:** February 2, 2016, 0633 hours
- **Sunrise:** February 2, 2016, 0701 hours
- **Moonset:** February 2, 2016, 1225 hours
- **Sunset:** February 2, 2016, 1725 hours
- **End Civil Twilight:** February 2, 2016, 1753 hours

The phase of the Moon was waning crescent with 34% of the Moon’s visible disk illuminated. The collision occurred approximately one hour and eleven minutes after sunrise. Therefore, this collision occurred during daylight hours.
FACTS

ROADWAY DESCRIPTION

WEATHER AND LIGHTING (continued)

This collision occurred at 0812 hours, with sunrise occurring at 0701 hours. An examination of the sun position with respect to the positions of motorists approaching the intersection of East South Avenue and South Buttonwillow Avenue was conducted.

According to the United States Naval Observatory Astronomical Applications Department, at 0812 hours, the altitude of the sun was 12.13 degrees and the azimuth of the sun was 122.05 degrees.

Altitude is the angle up from the horizon. Zero degrees altitude means exactly on the local horizon, and 90 degrees is "straight up". Azimuth is the angle along the horizon, with zero degrees corresponding to North, and increasing in a clockwise fashion. Thus, 90 degrees is east, 180 degrees is south, and 270 degrees is west. Using these two angles, one can describe the apparent position of an object (such as the sun) at a given time.

The altitude and azimuth values are for the center of the apparent disk of the sun. The altitude values include the effect of standard atmospheric refraction when the object is above the horizon. The azimuth values are computed with respect to true north.

In the image below, Line 1 represents the approximate azimuth of the sun at sunrise (approximately 0701 hours). Line 2 represents the approximate azimuth position of the sun at the time of the collision (approximately 0812 hours). Line 3 represents the approximate azimuth of the sun at sunset (approximately 1725 hours). As illustrated in the image below, the sun was located to the southeast of the intersection at the time of the collision.

Source: www.suncalc.org
INTRODUCTION

CHP Fresno Area officers responded to the collision scene and secured the area until the arrival of MAIT investigators. The collision scene was examined and measured by MAIT investigators using the total station method of surveying with a Leica TCRA 1103 Plus surveying instrument. The total station instrument was set up 114.500 feet south of the south road edge prolongation of East South Avenue and 2.555 feet east of the west road edge of South Buttonwillow Avenue. The coordinates of the setup were established as 0.000 feet east and 0.000 feet north. A backsight was established in the southbound lane of South Buttonwillow Avenue north of East South Avenue 105.785 feet north of the south road edge prolongation of East South Avenue and 3.794 feet east of the west road edge of South Buttonwillow Avenue. The backsight was aligned as north, and as a baseline direction used to locate physical evidence. The coordinates of the backsight were 0.001 feet east and 220.300 feet north.

DESCRIPTION AND LOCATION

The item numbers on the Physical Evidence Diagram and the Physical Evidence Detail Diagram correspond to the item numbers in this section of the report. All measurements are in units of feet. Measurements were taken to the center of the items unless otherwise noted. For clarity in the following narrative, the intersection of East South Avenue and South Buttonwillow Avenue will hereinafter be referred to as “the intersection.”

1. Tire friction mark

Item 1 was a tire friction mark, which was 25.26 feet in length. Item 1 began in the southbound lane of South Buttonwillow Avenue north of East South Avenue, continued in a southerly direction, and ended within the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25 width</td>
<td>2.486</td>
<td>157.201</td>
</tr>
<tr>
<td>0.35 width</td>
<td>2.241</td>
<td>148.066</td>
</tr>
<tr>
<td>0.35 width</td>
<td>2.265</td>
<td>139.978</td>
</tr>
<tr>
<td>0.25 width</td>
<td>2.321</td>
<td>131.948</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

2. Tire friction mark

Item 2 was a tire friction mark, which was 24.18 feet in length. Item 2 began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>3.576</td>
<td>156.734</td>
</tr>
<tr>
<td>0.55 width</td>
<td>3.447</td>
<td>151.291</td>
</tr>
<tr>
<td>0.70 width</td>
<td>3.365</td>
<td>143.284</td>
</tr>
<tr>
<td>0.55 width</td>
<td>3.454</td>
<td>137.254</td>
</tr>
<tr>
<td>point</td>
<td>3.338</td>
<td>132.560</td>
</tr>
</tbody>
</table>

3. Gouge

Item 3 was a gouge, which was 3.30 feet in length. Item 3 was located in the southbound lane of South Buttonwillow Avenue north of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05 width</td>
<td>5.194</td>
<td>154.817</td>
</tr>
<tr>
<td>0.05 width</td>
<td>5.240</td>
<td>151.520</td>
</tr>
</tbody>
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4. Gouge

Item 4 was a gouge, which was 2.10 feet in length. Item 4 was located in the southbound lane of South Buttonwillow Avenue north of the intersection. The location of this item was:

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<tr>
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<td>0.05 width</td>
<td>5.738</td>
<td>154.478</td>
</tr>
<tr>
<td>0.05 width</td>
<td>5.740</td>
<td>152.375</td>
</tr>
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</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

5. Tire friction mark

Item 5 was a tire friction mark, which was 18.56 feet in length. Item 5 began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.60 width</td>
<td>9.358</td>
<td>153.119</td>
</tr>
<tr>
<td>0.65 width</td>
<td>9.343</td>
<td>143.925</td>
</tr>
<tr>
<td>0.50 width</td>
<td>9.390</td>
<td>134.562</td>
</tr>
</tbody>
</table>

6. Tire friction mark

Item 6 was a tire friction mark, which was 18.36 feet in length. Item 6 began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.65 width</td>
<td>8.246</td>
<td>152.745</td>
</tr>
<tr>
<td>0.65 width</td>
<td>8.270</td>
<td>143.944</td>
</tr>
<tr>
<td>0.50 width</td>
<td>8.292</td>
<td>134.382</td>
</tr>
</tbody>
</table>

7. Tire friction mark

Item 7 was a tire friction mark, which was 13.16 feet in length. Item 7 began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.30 width</td>
<td>10.323</td>
<td>149.566</td>
</tr>
<tr>
<td>0.40 width</td>
<td>10.553</td>
<td>143.309</td>
</tr>
<tr>
<td>0.30 width</td>
<td>10.345</td>
<td>136.413</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

8. Tire friction mark

Item 8 was a tire friction mark, which was 14.23 feet in length. Item 8 began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.35 width</td>
<td>2.419</td>
<td>150.879</td>
</tr>
<tr>
<td>0.40 width</td>
<td>2.335</td>
<td>143.047</td>
</tr>
<tr>
<td>0.35 width</td>
<td>2.406</td>
<td>136.647</td>
</tr>
</tbody>
</table>

9. Tire friction mark

Item 9 was a tire friction mark, was 10.30 feet in length, and was located within the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.30 width</td>
<td>4.154</td>
<td>137.532</td>
</tr>
<tr>
<td>0.60 width</td>
<td>3.932</td>
<td>133.581</td>
</tr>
<tr>
<td>0.70 width</td>
<td>3.825</td>
<td>127.236</td>
</tr>
</tbody>
</table>

10. Tire friction mark

Item 10 was a tire friction mark, was 9.07 feet in length, and was located within the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>2.942</td>
<td>136.226</td>
</tr>
<tr>
<td>0.60 width</td>
<td>2.847</td>
<td>132.456</td>
</tr>
<tr>
<td>0.60 width</td>
<td>2.762</td>
<td>127.160</td>
</tr>
</tbody>
</table>
## FACTS

### PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

#### DESCRIPTION AND LOCATION (continued)

11. **Tire friction mark**

Item 11 was a tire friction mark, was 10.30 feet in length, and was located within the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>Description</th>
<th>East</th>
<th>North</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>8.871</td>
<td>136.704</td>
</tr>
<tr>
<td>0.65 width</td>
<td>8.819</td>
<td>133.804</td>
</tr>
<tr>
<td>0.70 width</td>
<td>8.728</td>
<td>126.409</td>
</tr>
</tbody>
</table>

12. **Tire friction mark**

Item 12 was a tire friction mark, was 9.39 feet in length, and was located within the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>Description</th>
<th>East</th>
<th>North</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.45 width</td>
<td>9.987</td>
<td>135.888</td>
</tr>
<tr>
<td>0.65 width</td>
<td>9.908</td>
<td>132.313</td>
</tr>
<tr>
<td>0.65 width</td>
<td>9.845</td>
<td>126.503</td>
</tr>
</tbody>
</table>

13. **Tire friction mark**

Item 13 was a tire friction mark, which was 35.89 feet in length. Item 13 began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>Description</th>
<th>East</th>
<th>North</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50 width</td>
<td>8.985</td>
<td>131.799</td>
</tr>
<tr>
<td>0.50 width</td>
<td>8.933</td>
<td>124.168</td>
</tr>
<tr>
<td>0.50 width</td>
<td>9.109</td>
<td>114.450</td>
</tr>
<tr>
<td>0.50 width</td>
<td>9.764</td>
<td>103.716</td>
</tr>
<tr>
<td>0.60 width</td>
<td>10.375</td>
<td>95.951</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

14. Tire friction mark

Item 14 was a tire friction mark, which was 24.93 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.30 width</td>
<td>10.017</td>
<td>126.422</td>
</tr>
<tr>
<td>0.45 width</td>
<td>9.970</td>
<td>118.445</td>
</tr>
<tr>
<td>0.60 width</td>
<td>10.174</td>
<td>111.259</td>
</tr>
<tr>
<td>0.55 width</td>
<td>10.533</td>
<td>103.849</td>
</tr>
<tr>
<td>0.55 width</td>
<td>10.621</td>
<td>101.503</td>
</tr>
</tbody>
</table>

15. Tire friction mark

Item 15 was a tire friction mark, which was 89.56 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.45 width</td>
<td>2.326</td>
<td>128.054</td>
</tr>
<tr>
<td>0.45 width</td>
<td>2.186</td>
<td>122.241</td>
</tr>
<tr>
<td>0.45 width</td>
<td>1.618</td>
<td>107.625</td>
</tr>
<tr>
<td>0.45 width</td>
<td>0.924</td>
<td>94.316</td>
</tr>
<tr>
<td>0.45 width</td>
<td>0.137</td>
<td>77.841</td>
</tr>
<tr>
<td>0.70 width</td>
<td>0.009</td>
<td>69.910</td>
</tr>
<tr>
<td>0.80 width</td>
<td>-0.085</td>
<td>58.695</td>
</tr>
<tr>
<td>0.80 width</td>
<td>0.611</td>
<td>51.695</td>
</tr>
<tr>
<td>0.50 width</td>
<td>3.193</td>
<td>45.681</td>
</tr>
<tr>
<td>point</td>
<td>6.050</td>
<td>39.801</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

16. Tire friction mark

Item 16 was a tire friction mark, which was 79.91 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.65 width</td>
<td>3.050</td>
<td>127.819</td>
</tr>
<tr>
<td>0.65 width</td>
<td>2.642</td>
<td>106.585</td>
</tr>
<tr>
<td>0.35 width</td>
<td>2.442</td>
<td>102.331</td>
</tr>
<tr>
<td>0.70 width</td>
<td>1.978</td>
<td>94.228</td>
</tr>
<tr>
<td>0.55 width</td>
<td>1.365</td>
<td>84.258</td>
</tr>
<tr>
<td>0.70 width</td>
<td>0.771</td>
<td>60.089</td>
</tr>
<tr>
<td>0.70 width</td>
<td>1.349</td>
<td>52.913</td>
</tr>
<tr>
<td>point</td>
<td>2.834</td>
<td>48.238</td>
</tr>
</tbody>
</table>

17. Tire friction mark

Item 17 was a tire friction mark, which was 86.41 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.70 width</td>
<td>4.084</td>
<td>127.546</td>
</tr>
<tr>
<td>0.70 width</td>
<td>4.126</td>
<td>116.449</td>
</tr>
<tr>
<td>0.75 width</td>
<td>4.571</td>
<td>106.610</td>
</tr>
<tr>
<td>0.65 width</td>
<td>6.300</td>
<td>82.986</td>
</tr>
<tr>
<td>0.70 width</td>
<td>8.589</td>
<td>63.502</td>
</tr>
<tr>
<td>0.70 width</td>
<td>10.544</td>
<td>50.495</td>
</tr>
<tr>
<td>0.70 width</td>
<td>12.160</td>
<td>41.639</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

18. Tire friction mark

Item 18 was a tire friction mark, which was 95.20 feet in length. This item began within the intersection and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.60 width</td>
<td>11.282</td>
<td>123.282</td>
</tr>
<tr>
<td>0.75 width</td>
<td>12.630</td>
<td>116.447</td>
</tr>
<tr>
<td>0.75 width</td>
<td>14.391</td>
<td>102.928</td>
</tr>
<tr>
<td>0.70 width</td>
<td>15.718</td>
<td>89.865</td>
</tr>
<tr>
<td>0.75 width</td>
<td>16.381</td>
<td>84.136</td>
</tr>
<tr>
<td>0.60 width</td>
<td>17.513</td>
<td>74.248</td>
</tr>
<tr>
<td>0.70 width</td>
<td>18.666</td>
<td>64.605</td>
</tr>
<tr>
<td>0.65 width</td>
<td>21.077</td>
<td>51.161</td>
</tr>
<tr>
<td>0.75 width</td>
<td>23.904</td>
<td>39.180</td>
</tr>
<tr>
<td>0.70 width</td>
<td>26.539</td>
<td>29.466</td>
</tr>
</tbody>
</table>

19. Tire friction mark

Item 19 was a tire friction mark, which was 49.47 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.70 width</td>
<td>9.168</td>
<td>121.981</td>
</tr>
<tr>
<td>0.30 width</td>
<td>8.463</td>
<td>104.936</td>
</tr>
<tr>
<td>0.50 width</td>
<td>7.730</td>
<td>95.233</td>
</tr>
<tr>
<td>0.40 width</td>
<td>5.936</td>
<td>72.631</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

20. Tire friction mark

Item 20 was a tire friction mark, which was 52 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50 width</td>
<td>8.115</td>
<td>122.458</td>
</tr>
<tr>
<td>0.60 width</td>
<td>7.746</td>
<td>112.343</td>
</tr>
<tr>
<td>0.60 width</td>
<td>6.654</td>
<td>94.814</td>
</tr>
<tr>
<td>0.40 width</td>
<td>5.160</td>
<td>70.540</td>
</tr>
</tbody>
</table>

21. Tire friction mark

Item 21 was a tire friction mark, which was 12.71 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.30 width</td>
<td>4.851</td>
<td>121.639</td>
</tr>
<tr>
<td>1.50 width</td>
<td>5.707</td>
<td>118.844</td>
</tr>
<tr>
<td>1.50 width</td>
<td>5.972</td>
<td>117.344</td>
</tr>
<tr>
<td>point</td>
<td>7.359</td>
<td>109.204</td>
</tr>
</tbody>
</table>

22. Tire friction mark

Item 22 was a tire friction mark, which was 97.97 feet in length. This item began within the intersection, crossed the solid yellow and broken yellow lines south of the intersection, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.70 width</td>
<td>4.945</td>
<td>121.189</td>
</tr>
<tr>
<td>0.65 width</td>
<td>5.633</td>
<td>106.739</td>
</tr>
<tr>
<td>0.60 width</td>
<td>7.411</td>
<td>83.744</td>
</tr>
<tr>
<td>0.50 width</td>
<td>9.855</td>
<td>62.497</td>
</tr>
<tr>
<td>0.30 width</td>
<td>11.257</td>
<td>53.043</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION

22. Tire friction mark (continued)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.30 width</td>
<td>13.198</td>
<td>42.736</td>
</tr>
<tr>
<td>point</td>
<td>18.735</td>
<td>24.582</td>
</tr>
</tbody>
</table>

23. Tire friction mark

Item 23 was a tire friction mark, which was 15.26 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.45 width</td>
<td>2.334</td>
<td>122.010</td>
</tr>
<tr>
<td>0.45 width</td>
<td>1.718</td>
<td>106.767</td>
</tr>
</tbody>
</table>

24. Tire friction mark

Item 24 was a tire friction mark, which was 8.21 feet in length. This item began within the intersection and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.60 width</td>
<td>14.757</td>
<td>121.479</td>
</tr>
<tr>
<td>0.90 width</td>
<td>14.441</td>
<td>118.246</td>
</tr>
<tr>
<td>0.30 width</td>
<td>14.881</td>
<td>113.313</td>
</tr>
</tbody>
</table>

25. Fluid trail

Item 25 was a fluid trail that was approximately 16.46 feet in length and approximately 1.76 feet in width. This item began within the intersection and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>perimeter</td>
<td>18.176</td>
<td>123.798</td>
</tr>
<tr>
<td>perimeter</td>
<td>16.694</td>
<td>120.921</td>
</tr>
<tr>
<td>perimeter</td>
<td>15.487</td>
<td>116.090</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION

25. Fluid trail (continued)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>perimeter</td>
<td>15.713</td>
<td>113.170</td>
</tr>
<tr>
<td>perimeter</td>
<td>15.190</td>
<td>110.527</td>
</tr>
<tr>
<td>perimeter</td>
<td>15.433</td>
<td>108.015</td>
</tr>
<tr>
<td>perimeter</td>
<td>15.981</td>
<td>107.486</td>
</tr>
<tr>
<td>perimeter</td>
<td>16.463</td>
<td>108.837</td>
</tr>
<tr>
<td>perimeter</td>
<td>16.731</td>
<td>112.435</td>
</tr>
<tr>
<td>perimeter</td>
<td>17.148</td>
<td>115.519</td>
</tr>
<tr>
<td>perimeter</td>
<td>17.607</td>
<td>116.876</td>
</tr>
<tr>
<td>perimeter</td>
<td>18.067</td>
<td>119.708</td>
</tr>
<tr>
<td>perimeter</td>
<td>18.485</td>
<td>122.080</td>
</tr>
</tbody>
</table>

26. Tire friction mark

Item 26 was a tire friction mark, which was 10.67 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.30 width</td>
<td>11.023</td>
<td>116.660</td>
</tr>
<tr>
<td>0.30 width</td>
<td>11.491</td>
<td>106.001</td>
</tr>
</tbody>
</table>

27. Tire friction mark

Item 27 was a tire friction mark, which was 91.21 feet in length. This item began within the intersection, crossed the solid yellow and broken yellow lines south of the intersection, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.60 width</td>
<td>8.685</td>
<td>118.182</td>
</tr>
<tr>
<td>0.70 width</td>
<td>9.202</td>
<td>101.814</td>
</tr>
<tr>
<td>0.70 width</td>
<td>10.402</td>
<td>82.803</td>
</tr>
<tr>
<td>0.40 width</td>
<td>12.519</td>
<td>63.838</td>
</tr>
<tr>
<td>0.40 width</td>
<td>20.253</td>
<td>28.007</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

28. Tire friction mark

Item 28 was a tire friction mark, which was 35.16 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.80 width</td>
<td>4.945</td>
<td>121.189</td>
</tr>
<tr>
<td>0.80 width</td>
<td>5.995</td>
<td>116.267</td>
</tr>
<tr>
<td>0.80 width</td>
<td>6.410</td>
<td>112.837</td>
</tr>
<tr>
<td>0.75 width</td>
<td>7.382</td>
<td>105.058</td>
</tr>
<tr>
<td>0.75 width</td>
<td>8.304</td>
<td>98.703</td>
</tr>
<tr>
<td>0.60 width</td>
<td>9.510</td>
<td>86.349</td>
</tr>
</tbody>
</table>

29. Tire friction mark

Item 29 was a tire friction mark, which was 87.07 feet in length. This item began within the intersection and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75 width</td>
<td>3.050</td>
<td>127.819</td>
</tr>
<tr>
<td>0.75 width</td>
<td>3.032</td>
<td>116.348</td>
</tr>
<tr>
<td>0.70 width</td>
<td>3.477</td>
<td>106.657</td>
</tr>
<tr>
<td>0.60 width</td>
<td>5.244</td>
<td>82.761</td>
</tr>
<tr>
<td>0.70 width</td>
<td>7.525</td>
<td>63.180</td>
</tr>
<tr>
<td>0.70 width</td>
<td>9.489</td>
<td>50.309</td>
</tr>
<tr>
<td>0.55 width</td>
<td>11.223</td>
<td>41.280</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

30. Tire friction mark

Item 30 was a tire friction mark, which was 55.50 feet in length. This item began in the southbound lane of South Buttonwillow Avenue south of the intersection, crossed the solid yellow and broken yellow lines, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75 width</td>
<td>10.174</td>
<td>111.259</td>
</tr>
<tr>
<td>0.75 width</td>
<td>10.316</td>
<td>100.943</td>
</tr>
<tr>
<td>0.60 width</td>
<td>11.507</td>
<td>82.959</td>
</tr>
<tr>
<td>0.60 width</td>
<td>13.558</td>
<td>64.109</td>
</tr>
<tr>
<td>point</td>
<td>14.589</td>
<td>55.981</td>
</tr>
</tbody>
</table>

31. Tire friction mark

Item 31 was a tire friction mark, which was 18.91 feet in length. This item was located in the northbound lane of South Buttonwillow Avenue south of the intersection, and traversed the roadway in a southeasterly direction. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>18.291</td>
<td>90.822</td>
</tr>
<tr>
<td>0.65 width</td>
<td>18.893</td>
<td>89.615</td>
</tr>
<tr>
<td>0.40 width</td>
<td>22.114</td>
<td>84.902</td>
</tr>
<tr>
<td>0.40 width</td>
<td>25.063</td>
<td>79.870</td>
</tr>
<tr>
<td>point</td>
<td>27.877</td>
<td>74.556</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

32. Tire friction mark/track mark

Item 32 was a tire friction mark that transitioned to a track mark. This item was 99.47 feet in length. This item began in the northbound lane of South Buttonwillow Avenue south of the intersection, and traversed the roadway in a southeasterly direction. Item 32 transitioned to a track mark on the east dirt shoulder of South Buttonwillow Avenue. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.40 width</td>
<td>16.559</td>
<td>85.962</td>
</tr>
<tr>
<td>0.45 width</td>
<td>20.745</td>
<td>77.096</td>
</tr>
<tr>
<td>0.15 width</td>
<td>25.206</td>
<td>67.218</td>
</tr>
<tr>
<td>0.60 width</td>
<td>29.824</td>
<td>57.761</td>
</tr>
<tr>
<td>0.80 width</td>
<td>33.929</td>
<td>48.739</td>
</tr>
<tr>
<td>0.70 width</td>
<td>42.582</td>
<td>31.218</td>
</tr>
<tr>
<td>1.00 width</td>
<td>51.316</td>
<td>12.267</td>
</tr>
<tr>
<td>1.50 width</td>
<td>54.786</td>
<td>2.966</td>
</tr>
<tr>
<td>1.00 width</td>
<td>54.363</td>
<td>0.202</td>
</tr>
<tr>
<td>1.00 width</td>
<td>51.833</td>
<td>-4.302</td>
</tr>
</tbody>
</table>

33. Fluid trail

Item 33 was a fluid trail. This item was approximately 8.74 feet in length and approximately 0.7 feet in width at its midpoint. This item began in the southbound lane of South Buttonwillow Avenue south of the intersection, crossed the solid yellow and broken yellow lines south of the intersection, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>12.757</td>
<td>76.954</td>
</tr>
<tr>
<td>point</td>
<td>13.921</td>
<td>68.293</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

34.  Tire friction mark

Item 34 was a tire friction mark, which was 39.73 feet in length. This item began in the southbound lane of South Buttonwillow Avenue south of the intersection, traversed the roadway in a southeasterly direction, crossed the solid yellow and broken yellow lines south of the intersection, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>6.722</td>
<td>60.131</td>
</tr>
<tr>
<td>0.35 width</td>
<td>8.736</td>
<td>49.431</td>
</tr>
<tr>
<td>0.60 width</td>
<td>11.997</td>
<td>37.282</td>
</tr>
<tr>
<td>0.40 width</td>
<td>15.625</td>
<td>28.544</td>
</tr>
<tr>
<td>point</td>
<td>19.684</td>
<td>23.135</td>
</tr>
</tbody>
</table>

35.  Tire friction mark

Item 35 was a tire friction mark, which was 13.39 feet in length. This item was located in the northbound lane of South Buttonwillow Avenue south of the intersection, traversed the roadway in a southeasterly direction, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>22.149</td>
<td>64.696</td>
</tr>
<tr>
<td>0.60 width</td>
<td>22.507</td>
<td>63.584</td>
</tr>
<tr>
<td>point</td>
<td>26.141</td>
<td>51.915</td>
</tr>
</tbody>
</table>

36.  Fluid trail

Item 36 was a fluid trail, which was 61.49 feet in length. This item began on the solid yellow and broken yellow lines south of the intersection, traversed the roadway in a southeasterly direction, and ended in the vicinity of the east road edge of South Buttonwillow Avenue south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>13.019</td>
<td>62.371</td>
</tr>
<tr>
<td>0.80 width</td>
<td>18.571</td>
<td>36.152</td>
</tr>
<tr>
<td>9.40 width</td>
<td>29.312</td>
<td>3.170</td>
</tr>
</tbody>
</table>
**Facts**

**Physical Evidence Description and Location**

**Description and Location (continued)**

37. **Tire friction mark with scrapes**

Item 37 was a tire friction mark with scrapes. This item was 6.61 feet in length. This item was located in the southbound lane of South Buttonwillow Avenue, south of the intersection and traversed the roadway in a southeasterly direction. The location of this item was:

<table>
<thead>
<tr>
<th>Description</th>
<th>East</th>
<th>North</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>7.889</td>
<td>34.147</td>
</tr>
<tr>
<td>0.80 width</td>
<td>8.799</td>
<td>30.707</td>
</tr>
<tr>
<td>point</td>
<td>10.235</td>
<td>28.029</td>
</tr>
</tbody>
</table>

38. **Tire friction mark/track mark**

Item 38 was a tire friction mark that transitioned to a track mark. This item was 7.96 feet in length. This item began in the northbound lane of South Buttonwillow Avenue south of the intersection, traversed the roadway in a southeasterly direction, and transitioned to a track mark on the east dirt shoulder of South Buttonwillow Avenue. The location of this item was:

<table>
<thead>
<tr>
<th>Description</th>
<th>East</th>
<th>North</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.70 width</td>
<td>28.129</td>
<td>17.229</td>
</tr>
<tr>
<td>0.70 width</td>
<td>31.078</td>
<td>9.839</td>
</tr>
</tbody>
</table>

39. **Tire friction mark/track mark**

Item 39 was a tire friction mark that transitioned to a track mark. This item was 9.12 feet in length. This item began in the northbound lane of South Buttonwillow Avenue south of the intersection, traversed the roadway in a southeasterly direction, and transitioned to a track mark on the east dirt shoulder of South Buttonwillow Avenue. The location of this item was:

<table>
<thead>
<tr>
<th>Description</th>
<th>East</th>
<th>North</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.70 width</td>
<td>27.164</td>
<td>16.685</td>
</tr>
<tr>
<td>0.70 width</td>
<td>30.477</td>
<td>8.187</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

40. Area of gouges

Item 40 was an area of gouges. This item was approximately 2.62 feet in length and approximately 1.20 feet in width. This item was located in the southbound lane of South Buttonwillow Avenue south of the intersection and traversed the roadway in a southeasterly direction. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>perimeter</td>
<td>7.605</td>
<td>21.578</td>
</tr>
<tr>
<td>perimeter</td>
<td>7.981</td>
<td>20.838</td>
</tr>
<tr>
<td>perimeter</td>
<td>8.680</td>
<td>20.530</td>
</tr>
<tr>
<td>perimeter</td>
<td>8.440</td>
<td>19.655</td>
</tr>
<tr>
<td>perimeter</td>
<td>8.229</td>
<td>19.032</td>
</tr>
<tr>
<td>perimeter</td>
<td>7.634</td>
<td>19.949</td>
</tr>
<tr>
<td>perimeter</td>
<td>7.838</td>
<td>20.392</td>
</tr>
<tr>
<td>perimeter</td>
<td>7.409</td>
<td>20.463</td>
</tr>
</tbody>
</table>

41. Area of scrapes

Item 41 was an area of scrapes. This item was approximately 15.23 feet in length and approximately 5.95 feet in width. This item was located in the southbound and northbound lanes of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>perimeter</td>
<td>6.805</td>
<td>18.916</td>
</tr>
<tr>
<td>perimeter</td>
<td>6.910</td>
<td>16.340</td>
</tr>
<tr>
<td>perimeter</td>
<td>12.139</td>
<td>8.038</td>
</tr>
<tr>
<td>perimeter</td>
<td>18.250</td>
<td>8.867</td>
</tr>
<tr>
<td>perimeter</td>
<td>17.316</td>
<td>11.619</td>
</tr>
<tr>
<td>perimeter</td>
<td>12.092</td>
<td>15.438</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

42. Gouge

Item 42 was a gouge, which was 3.84 feet in length. This item was located in the southbound lane of South Buttonwillow Avenue south of the intersection, and traversed the roadway in a southeasterly direction. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.30 width</td>
<td>5.688</td>
<td>17.662</td>
</tr>
<tr>
<td>0.30 width</td>
<td>6.079</td>
<td>15.891</td>
</tr>
<tr>
<td>0.30 width</td>
<td>6.555</td>
<td>13.918</td>
</tr>
</tbody>
</table>

43. Tire friction mark

Item 43 was a tire friction mark, which was 27.06 feet in length. This item was located in the northbound lane of South Buttonwillow Avenue south of the intersection, traversed the roadway in a southeasterly direction, and ended at the east road edge of South Buttonwillow Avenue. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50 width</td>
<td>18.722</td>
<td>21.745</td>
</tr>
<tr>
<td>0.50 width</td>
<td>29.251</td>
<td>-3.184</td>
</tr>
</tbody>
</table>

44. Tire friction mark

Item 44 was a tire friction mark, which was 15.95 feet in length. This item was located in the northbound lane of South Buttonwillow Avenue south of the intersection, traversed the roadway in a southeasterly direction, and ended at the east road edge of South Buttonwillow Avenue. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.40 width</td>
<td>22.899</td>
<td>13.759</td>
</tr>
<tr>
<td>0.60 width</td>
<td>25.452</td>
<td>7.612</td>
</tr>
<tr>
<td>0.50 width</td>
<td>29.276</td>
<td>-0.860</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

45.  Gouge

Item 45 was a gouge, which was 1.09 feet in length. This item was located in the northbound lane of South Buttonwillow Avenue south of the intersection, traversed the roadway in a southeasterly direction, and ended at the east road edge of South Buttonwillow Avenue. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 width</td>
<td>28.120</td>
<td>1.206</td>
</tr>
<tr>
<td>0.10 width</td>
<td>29.193</td>
<td>1.045</td>
</tr>
</tbody>
</table>

46.  Furrow

Item 46 was a furrow, which was 11.04 feet in length. This item was located on the east dirt shoulder of South Buttonwillow Avenue south of the intersection, and was curvilinear from a southeasterly to a southerly direction. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.40 width</td>
<td>32.327</td>
<td>-3.157</td>
</tr>
<tr>
<td>0.30 width</td>
<td>36.160</td>
<td>-6.929</td>
</tr>
<tr>
<td>0.30 width</td>
<td>38.385</td>
<td>-12.066</td>
</tr>
</tbody>
</table>

47.  Gouge/furrow

Item 47 was a gouge that transitioned into a furrow. This item was 33.48 feet in length. Item 47 began in the southbound lane of South Buttonwillow Avenue south of the intersection, traversed the roadway in a southeasterly direction, crossed the solid yellow and broken yellow lines south of the intersection, traversed the northbound lane, and exited the east road edge of South Buttonwillow Avenue south of East South Avenue. The gouge transitioned to a furrow at the east pavement edge of South Buttonwillow Avenue. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 width</td>
<td>12.615</td>
<td>7.447</td>
</tr>
<tr>
<td>0.50 width</td>
<td>13.741</td>
<td>5.093</td>
</tr>
<tr>
<td>0.20 width</td>
<td>14.593</td>
<td>4.163</td>
</tr>
<tr>
<td>0.20 width</td>
<td>17.592</td>
<td>1.613</td>
</tr>
<tr>
<td>0.20 width</td>
<td>19.544</td>
<td>0.541</td>
</tr>
<tr>
<td>0.20 width</td>
<td>23.546</td>
<td>-1.073</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION

47. Gouge/furrow (continued)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.20 width</td>
<td>25.274</td>
<td>-1.753</td>
</tr>
<tr>
<td>0.10 width</td>
<td>26.229</td>
<td>-2.146</td>
</tr>
<tr>
<td>0.20 width</td>
<td>29.265</td>
<td>-3.665</td>
</tr>
<tr>
<td>0.30 width</td>
<td>32.012</td>
<td>-5.527</td>
</tr>
<tr>
<td>0.30 width</td>
<td>35.311</td>
<td>-9.369</td>
</tr>
<tr>
<td>0.30 width</td>
<td>36.430</td>
<td>-13.579</td>
</tr>
</tbody>
</table>

48. Gouge

Item 48 was a gouge, which was 10.96 feet in length. Item 48 was located in the northbound lane of South Buttonwillow Avenue south of the intersection, and traversed the roadway in a southeasterly direction. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>perimeter</td>
<td>17.127</td>
<td>9.435</td>
</tr>
<tr>
<td>perimeter</td>
<td>18.143</td>
<td>8.794</td>
</tr>
<tr>
<td>perimeter</td>
<td>17.575</td>
<td>8.142</td>
</tr>
<tr>
<td>0.60 width</td>
<td>18.988</td>
<td>6.072</td>
</tr>
<tr>
<td>0.20 width</td>
<td>20.498</td>
<td>3.044</td>
</tr>
<tr>
<td>0.20 width</td>
<td>22.271</td>
<td>-0.245</td>
</tr>
</tbody>
</table>

49. Gouge

Item 49 was a gouge, which was 6.91 feet in length. Item 49 was located in the northbound lane of South Buttonwillow Avenue south of the intersection, and traversed the roadway in a southeasterly direction. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 width</td>
<td>22.750</td>
<td>-1.051</td>
</tr>
<tr>
<td>0.10 width</td>
<td>23.713</td>
<td>-3.446</td>
</tr>
<tr>
<td>0.15 width</td>
<td>24.524</td>
<td>-5.557</td>
</tr>
<tr>
<td>0.20 width</td>
<td>25.041</td>
<td>-6.545</td>
</tr>
<tr>
<td>0.20 width</td>
<td>25.283</td>
<td>-7.469</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

50. Gravel

Item 50 was spilled gravel that was approximately 81.44 feet in length and approximately 36.93 feet in width. Item 50 was located south of the intersection and encompassed both traffic lanes, as well as the east dirt shoulder of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>perimeter</td>
<td>-2.024</td>
<td>17.524</td>
</tr>
<tr>
<td>perimeter</td>
<td>12.905</td>
<td>14.720</td>
</tr>
<tr>
<td>perimeter</td>
<td>21.250</td>
<td>2.416</td>
</tr>
<tr>
<td>perimeter</td>
<td>32.009</td>
<td>-13.902</td>
</tr>
<tr>
<td>perimeter</td>
<td>35.231</td>
<td>-34.633</td>
</tr>
<tr>
<td>perimeter</td>
<td>38.299</td>
<td>-45.829</td>
</tr>
<tr>
<td>perimeter</td>
<td>29.872</td>
<td>-57.407</td>
</tr>
<tr>
<td>perimeter</td>
<td>14.565</td>
<td>-53.820</td>
</tr>
<tr>
<td>perimeter</td>
<td>1.238</td>
<td>-42.995</td>
</tr>
<tr>
<td>perimeter</td>
<td>-3.973</td>
<td>-22.215</td>
</tr>
</tbody>
</table>

51. Displaced chain link fence

Item 51 was a section of displaced chain link fence. The length of the displaced section of fence was approximately 50 feet. Item 51 was located east of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>54.783</td>
<td>36.476</td>
</tr>
<tr>
<td>point</td>
<td>55.008</td>
<td>26.205</td>
</tr>
<tr>
<td>point</td>
<td>56.728</td>
<td>26.282</td>
</tr>
<tr>
<td>point</td>
<td>55.285</td>
<td>16.058</td>
</tr>
<tr>
<td>point</td>
<td>58.244</td>
<td>15.845</td>
</tr>
<tr>
<td>point</td>
<td>55.301</td>
<td>6.125</td>
</tr>
<tr>
<td>point</td>
<td>59.559</td>
<td>5.122</td>
</tr>
<tr>
<td>point</td>
<td>55.605</td>
<td>0.424</td>
</tr>
<tr>
<td>point</td>
<td>58.875</td>
<td>-0.474</td>
</tr>
<tr>
<td>point</td>
<td>55.447</td>
<td>-4.084</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION

51. Displaced chain link fence (continued)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>56.731</td>
<td>-4.593</td>
</tr>
<tr>
<td>point</td>
<td>56.388</td>
<td>-9.206</td>
</tr>
<tr>
<td>point</td>
<td>55.606</td>
<td>-13.204</td>
</tr>
</tbody>
</table>

52. Fuel tank

Item 52 was a fuel tank that was approximately 5.57 feet in length and approximately 1.40 feet in width. Item 52 was located on the dirt shoulder east of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>41.625</td>
<td>-36.592</td>
</tr>
<tr>
<td>point</td>
<td>47.050</td>
<td>-35.351</td>
</tr>
</tbody>
</table>

53. Tire friction mark

Item 53 was a tire friction mark, which was 15.94 feet in length. This item began in the southbound lane of South Buttonwillow Avenue, crossed the broken/solid yellow line and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.30 width</td>
<td>12.104</td>
<td>42.989</td>
</tr>
<tr>
<td>0.30 width</td>
<td>13.218</td>
<td>37.658</td>
</tr>
<tr>
<td>point</td>
<td>16.069</td>
<td>28.492</td>
</tr>
</tbody>
</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

54. Tire friction mark

Item 54 was a tire friction mark, which was 15.94 feet in length. This item was located in the southbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>3.993</td>
<td>110.693</td>
</tr>
<tr>
<td>0.20 width</td>
<td>4.631</td>
<td>101.737</td>
</tr>
<tr>
<td>point</td>
<td>5.140</td>
<td>94.798</td>
</tr>
</tbody>
</table>

55. Gouge

Item 55 was a gouge, which was 0.58 feet in length. This item was located in the northbound lane of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50 width</td>
<td>28.620</td>
<td>0.434</td>
</tr>
<tr>
<td>0.50 width</td>
<td>28.957</td>
<td>-0.036</td>
</tr>
</tbody>
</table>

56. Track mark

Item 56 was a track mark, which was 13.81 feet in length. This item was located in the east dirt shoulder of South Buttonwillow Avenue, south of the intersection. The location of this item was:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>point</td>
<td>37.489</td>
<td>52.213</td>
</tr>
<tr>
<td>0.70 width</td>
<td>40.513</td>
<td>44.961</td>
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<tr>
<td>point</td>
<td>42.706</td>
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</table>
FACTS

PHYSICAL EVIDENCE DESCRIPTION AND LOCATION

DESCRIPTION AND LOCATION (continued)

Points of Rest

VEHICLE 1 (RAM)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>EAST</th>
<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right rear tire and wheel assembly</td>
<td>48.683</td>
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<td>Left rear tire and wheel assembly</td>
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<tr>
<td>Right front corner of the hood</td>
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<tr>
<td>Left corner of the front bumper</td>
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VEHICLE 2 (COMBINATION)

Vehicle 2 (Combination) was a combination vehicle as defined in California Vehicle Code §34501(b)(1). Vehicle 2 (Combination) consisted of Vehicle 2A (Peterbilt) and Vehicle 2B (Reliance). For clarity, the axles of Vehicle 2 (Combination) were numbered sequentially from front to rear.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
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<th>NORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle 2A (Peterbilt)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axle 1 right tire and wheel assembly</td>
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<td>Axle 2 right tire and wheel assembly</td>
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<td>Axle 3 right tire and wheel assembly</td>
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<td>Vehicle 2B (Reliance)</td>
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<tr>
<td>Axle 4 left tire and wheel assembly</td>
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<tr>
<td>Axle 5 left tire and wheel assembly</td>
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<td>-14.613</td>
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PASSENGER 5 (GUADARRAMA)

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>51.630</td>
<td>17.850</td>
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<tr>
<td>Right foot</td>
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<tr>
<td>Left foot</td>
<td>54.695</td>
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**FACTS**

**EVIDENCE LOG**

Items 1 through 8 were booked into evidence by CHP Fresno Area officers. The following items were booked into evidence at the CHP Fresno Area office by MAIT investigators, under evidence number E20160047, as a result of this investigation:

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
<th>SEIZED/BOOKED BY</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>7</td>
<td>Four Digital Versatile Discs (DVDs) and two Compact Discs (CD) containing original MAIT digital photographic images, and one CD of photographs taken by CHP Air Operations.</td>
<td>Investigator Kolter</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>CD containing Vericom VC 4000DAQ Performance Computer data</td>
<td>Investigator Kolter</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>CD containing GSI and CSV files of MAIT scene measurements</td>
<td>Investigator Kolter</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>CD containing Leica High Definition Survey ScanStation data of the involved vehicles</td>
<td>Investigator Kolter</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>CD containing the MAIT report in a Portable Document File (PDF) format</td>
<td>Investigator Kolter</td>
</tr>
</tbody>
</table>

The CHP Fresno Area office is the custodian of records for this investigation. All requests related to physical evidence shall be directed to:

CHP Fresno Area  
1382 West Olive Avenue  
Fresno, California 93728  
(559) 441-5441
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM)

Vehicle Identification

Year/Make/Model: 2001 Dodge Ram 3500 15-passenger van
Color: White
Date of Manufacture: March 2001
License: 1039213 California (exempt)
Expiration Date: December 31, 2099
Vehicle Identification Number (VIN): 2B5WB35Z61K535923
Odometer: 83,739 miles
CA Number: 90018
Gross Vehicle Weight Rating: 8,700 pounds
Front Axle Weight Rating: 4,000 pounds
Rear Axle Weight Rating: 5,740 pounds
Inspection Dates: Wednesday, February 10, 2016
Wednesday, April 20, 2016
Location: Action Towing and Dive Team, Incorporated
2822 East California Avenue
Fresno, California 93721
(559) 498-9999
Registered Owner: California Conservation Corps
1719 24th Street
Sacramento, California 95816
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM) (continued)

Introduction

Vehicle 1 (Ram) was impounded as evidence pursuant to California Vehicle Code §22655.5 on Tuesday, February 2, 2016, by CHP Fresno Area Officer G. Perez, ID 18865. Vehicle 1 (Ram) was towed to Action Towing and Dive Team, Incorporated, where it was placed in a fenced and locked outdoor facility. Vehicle 1 (Ram) was photographed and measured for a vehicle damage description and vehicle damage profile by Investigator Kolter on Wednesday, February 10, 2016.

Vehicle 1 (Ram) was measured with a Leica High Definition Survey ScanStation. The data obtained was used with AutoCAD software to prepare a vehicle damage profile.

Overview

All references to direction are oriented from the driver’s seat of the vehicle looking forward through the windshield. Vehicle 1 (Ram) sustained major collision damage to its left side. The following damage description is not inclusive of all the damage sustained by Vehicle 1 (Ram).

Vehicle 1 (Ram) at Action Towing and Dive Team, Incorporated.
CL-002-16 02-10-16 JK (5) cropped
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM) (continued)

Front

The hood was dislodged from its opening due to lateral displacement of the left and right fenders. There was chipped paint on the corners of the hood. The windshield was cracked but was retained in the windshield opening. The grille assembly was missing, and the left headlamp was partially dislodged.

![The damage to the front of Vehicle 1 (Ram).](CL-002-16 02-10-16 JK (2) cropped)
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM) (continued)

Right

There was induced damage to the entire right side of Vehicle 1 (Ram). The upper section was displaced to the left, while the lower section was displaced to the right.

The front door was dislodged, with the roof line above the trailing edge of the door displaced downward. There were creases to the midline of the front door. The rear sliding passenger door was cut from its front latch by rescue personnel, and was held in place via plastic tie wraps. The upper door slide assembly was dislodged. The window glass of the sliding door was shattered and missing. The roof line near the trailing edge of the passenger door was displaced downward.

The window glass between the C- and the D-pillar was intact, but the panel below the window sustained induced damage consisting of an inward vertical fold. This damage created a gap between the lower edge of the window and the displaced panel. There was an induced gap to the body panels that joined together at the D-pillar. The rear axle was displaced to the right.

The damage to the right side of Vehicle 1 (Ram).

CL-002-16 02-10-16 JK (8) cropped
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM) (continued)

Rear

The rear window glass of the left and right access doors was shattered. The lower section of the rear of Vehicle 1 (Ram) was displaced to the right. There was induced damage to the access doors and the E-pillars. The damage consisted of angular creases to the door panels, compression and expansion of the various door gaps, and pulling of the right lower door hinge.

There were angular scrapes across the right side of the bumper. The scrapes transitioned to lateral abrasions on the plastic cover mounted to the top of the bumper. There was an angular fold to the lower left corner of the license plate.

The damage to the rear of Vehicle 1 (Ram).
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM) (continued)

Left

The trailing edge of the fender was displaced to the right, while the leading edge of the fender was displaced to the left. The top of the front tire and wheel assembly was displaced to the right. The front door was dislodged, and rescue personnel had cut the latch assembly. The door window glass was intact. The front door was held in place by plastic tie wraps. The trailing edge of the door below the handle displayed contact damage that consisted of a black abrasion which appeared to be a tire imprint. The length of the imprint was approximately 0.7 feet long.

The area between the B- and the D-pillars sustained contact damage that consisted of displacement to the right. The roof was folded upward in this area. There were numerous vertical and horizontal scrapes and imprints within the area of contact damage. All of the window glass in this area was shattered and missing. There were several tears, with lead-in abrasions and paint transfers, in the lower portion of the sheet metal, in addition to several hexagonal imprints. There were several red paint transfers in the area of the contact damage.

A black transfer that appeared to be a tire imprint was located forward of the D-pillar. The imprint was approximately 0.3 feet in length.

There was an induced gap in the body panels at the D-pillar. The gap was approximately 0.35 feet in width. The window glass between the D- and E-pillars was shattered and missing. The corner of the brake lamp lens was broken.
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM)

Left (continued)

The contact damage to the left side of Vehicle 1 (Ram).
CL-002-16 02-10-16 JK (34) cropped
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM)

Left (continued)

The tire imprint to the front door of Vehicle 1 (Ram).
   CL-002-16 02-10-16 JK (22) cropped

The tire imprint to the quarter panel of Vehicle 1 (Ram).
   CL-002-16 02-10-16 JK (30) cropped
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM) (continued)

Roof

The left side was displaced to the right and the center was buckled upward, with numerous induced folds.

The damage to the roof of Vehicle 1 (Ram).

CL-002-16 02-10-16 JK (5) cropped
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM) (continued)

Interior

The driver and right front passenger air bags were deployed. The dash panel mounted push-pull type headlamp switch was pulled outward to the “on” position. The air conditioning and heater controls were in the windshield defrost position and the temperature was in the warmest setting.

The driver’s seat was displaced to the right as a result of floor pan displacement, and the seat base was compressed. The right front passenger seat was tilted to the left, but the seat was undamaged.

The Row 2 and Row 3 seats were intact, but the left side of the seats were compressed and displaced to the right due to contact with the displaced left side of the vehicle. The right side of the Row 3 seat was compressed downward against the right interior panels. The Row 2 seat was compressed into the seat base of the Row 3 seat, and the Row 3 seat was compressed into the seat base of the Row 4 seat.

The Row 4 seat base cushion was creased as a result of seat base frame displacement. The displaced left side panel of the vehicle was in contact with the left side of the seat base. The Row 4 seat back was leaning rearward.

The Row 5 seat was undamaged and located in its proper position in the vehicle.

Inspection revealed numerous interior panels were fractured and displaced. There was shattered glass located throughout the interior.
VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 1 (RAM) (continued)

Vehicle Damage Profile

Exemplar 2001 Ram 3500 Van
Drawn by: Investigator Machado

Vehicle 1 (Ram)
Drawn by: Investigator Kolter
VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2 (COMBINATION)

Vehicle 2 (Combination) was a combination vehicle as defined in California Vehicle Code §34501(b)(1). Vehicle 2 (Combination) consisted of Vehicle 2A (Peterbilt) and Vehicle 2B (Reliance), and will be referenced as such in the following narrative.

VEHICLE 2A (PETERBILT)

Vehicle Identification

Year/Make/Model: 1996 Peterbilt Model 379 three-axle truck tractor
Color: White/Red
Month and Year of Manufacture: December 1995
License: 7N76291 California
Expiration Date: February 28, 2016
Vehicle Identification Number (VIN): 1XP5LR9X8TD412907
Odometer: 824,124 miles
CA Number: CA335980
Inspection Date: Thursday, February 4, 2016
Wednesday, February 10, 2016
Location: Action Towing and Dive Team, Incorporated
2822 East California Avenue
Fresno, California 93721
(559) 498-9999
Registered Owner: Steve Soria, DBA Valley Soil/Forest Products
21434 East Manning Avenue
Reedley, California 93654
VEHICLE 2A (PETERBILT) (continued)

Introduction

Vehicle 2A (Peterbilt) was impounded as evidence pursuant to California Vehicle Code §22655.5 on February 2, 2016, by CHP Fresno Area Officer D. Morrison, ID 17088. Vehicle 2A (Peterbilt) was towed to Action Towing and Dive Team, Incorporated, where it was placed in a fenced and locked outdoor facility. Vehicle 2A (Peterbilt) was inspected for a vehicle damage description and vehicle damage profile by Investigator Kolter on February 4, 2016.

Vehicle 2A (Peterbilt) was measured with a Leica High Definition Survey ScanStation. The data obtained was used with AutoCAD software to prepare a vehicle damage profile.

Overview

All references to direction are oriented from the driver’s seat of the vehicle looking forward through the windshield. Vehicle 2A (Peterbilt) sustained moderate collision damage to its front end. The following damage description is not inclusive of all the damage sustained by Vehicle 2A (Peterbilt).

Vehicle 2A (Peterbilt) at its point of rest at the collision scene.
VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2A (PETERBILT) (continued)

Front

The entire front of Vehicle 2A (Peterbilt) sustained contact damage. The hood, grille and fenders were displaced to the left. The bumper, grille and grille shell were misshapen and displaced rearward. There were several tears in the grille. Both headlamp assemblies were displaced rearward, and each of the individual lamps were broken and dislodged within their housings. The right side of the bumper was folded rearward approximately one foot into the fender assembly. There were miscellaneous scrapes and abrasions on the bumper.
VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2A (PETERBILT) (continued)

Right

The leading edge of the fender was displaced rearward into the tire and wheel assembly of axle 1, with the midpoint of the fender folded upward. The front of the hood was displaced rearward, while the rear of the hood was pushed upward. The side of the hood was buckled.

The damage to the right side of Vehicle 2A (Peterbilt).

CL-002-16 02-02-16 JM-A (196) cropped
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2A (PETERBILT) (continued)

Rear

Vehicle 2A (Peterbilt) displayed miscellaneous scrapes and scratches, which were determined to be pre-collision damage.

The rear of Vehicle 2A (Peterbilt).
CL-002-16 02-04-16 JK (9) cropped
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2A (PETERBILT) (continued)

Left

The leading edge of the fender was displaced rearward into the tire and wheel assembly of axle 1, with the fender folded upward. The leading edge of the hood was displaced to the rear. The trailing edge of the hood was pushed rearward, overriding the leading edge of the cowl. The side of the hood was buckled and there was a dent with a black transfer on the top edge of the hood approximately one foot rearward of the leading edge of the hood. The bottom step below the passenger compartment was bent upward.

The damage to the left side of Vehicle 2A (Peterbilt).

CL-002-16 02-04-16 JK (6) cropped
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2A (PETERBILT) (continued)

Vehicle Damage Profile

Exemplar 1996 Peterbilt Tractor
Drawn by: Investigator Kolter

Vehicle 2A (Peterbilt)
Drawn by: Investigator Kolter
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2B (RELIANCE)

Vehicle Identification

Year/Make/Model: 1996 Reliance transfer dump two-axle trailer

Color: White/Red

Year of Manufacture: 1996

License: 4DX8692 California

Expiration Date: December 31, 2016

Vehicle Identification Number (VIN): 1REFA5201TC961465

Inspection Date: February 4, 2016

Location: Action Towing and Dive Team, Incorporated
2822 East California Avenue
Fresno, California 93721
(559) 498-9999

Registered Owner: Robert C. Soria, DBA Valley Soil/Forest Products
21415 East Manning Avenue
Reedley, California 93654
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2B (RELIANCE) (continued)

Introduction

Vehicle 2B (Reliance) was impounded as evidence pursuant to California Vehicle Code §22655.5 on February 2, 2016, by CHP Fresno Area Officer G. Perez, ID 18865. Vehicle 2B (Reliance) was towed to Action Towing and Dive Team, Incorporated, where it was placed in a fenced and locked outdoor facility. Vehicle 2B (Reliance) was inspected for a vehicle damage description and vehicle damage profile by Investigator Kolter on February 4, 2016.

Vehicle 2B (Reliance) was measured with a Leica High Definition Survey ScanStation. The data obtained was used with AutoCAD software to prepare a vehicle damage profile.

Overview

All references to direction are oriented from rear to front. Vehicle 2B (Reliance) sustained minor collision damage to its right side. The following damage description is not inclusive of all the damage sustained by Vehicle 2B (Reliance).
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2B (RELIANCE) (continued)

Front

The front of Vehicle 2B (Reliance) was unremarkable.
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2B (RELIANCE) (continued)

Right

The front fender was misshapen, and displaced upward and rearward, with several creases at the outboard edge. The front fender’s leading support bar was pushed upward and rearward, and the marker lamp at the end of the bar was shattered.

There were numerous diagonal scrapes along the entire side of the container. The rear fender was displaced rearward, with the trailing section of the fender pushed upward. The marker lamp located at the end of the rear fender trailing support bar was dislodged from its housing.
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2B (RELIANCE) (continued)

Rear

The rear of Vehicle 2B (Reliance) displayed miscellaneous scrapes and scratches which were determined to be pre-collision damage.

The rear of Vehicle 2B (Reliance).
CL-002-16 02-04-16 JK (64) cropped
FACTS

VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2B (RELIANCE) (continued)

Left

The left side of Vehicle 2B (Reliance) displayed miscellaneous scrapes and scratches which were determined to be pre-collision damage.
VEHICLE DAMAGE DESCRIPTIONS

VEHICLE 2B (RELIANCE) (continued)

Vehicle Damage Profile

Exemplar 1996 Reliance Trailer
Drawn by: Investigator Kolter

Vehicle 2B (Reliance)
Drawn by: Investigator Kolter
VEHICLE 2A (PETERBILT)

Introduction

Vehicle 2A (Peterbilt) was a 1996 Peterbilt 379 truck tractor and was the power unit of Vehicle 2 (Combination). The axles of Vehicle 2 (Combination) were numbered from the front to rear, one through five.
MECHANICAL INSPECTIONS

VEHICLE 2A (PETERBILT) (continued)

Brake System

DESCRIPTION

The brake system consisted of a compressor, reservoirs, valves, S-cam brake assemblies, spring parking brakes, lines, and fittings. The dual brake system was split front to rear. The front wheel brakes (secondary system) comprised one system while the rear wheel brakes (primary system), the other system.

INSPECTION

Brake adjustment was checked on Vehicle 2A (Peterbilt) using air supplied by CHP vehicle C3033F. All measurements were taken using 90 pounds of air pressure. All brake system measurements are in inches. The following observations were noted:

<table>
<thead>
<tr>
<th>Type of Brake</th>
<th>S-Cam</th>
<th>S-Cam</th>
<th>S-Cam</th>
<th>S-Cam</th>
<th>S-Cam</th>
<th>S-Cam</th>
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<tbody>
<tr>
<td>Lining Type</td>
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<tr>
<td>Adjuster Type</td>
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<td>Adjustment</td>
<td>1 1/4”</td>
<td>1 1/4”</td>
<td>1 7/8”</td>
<td>1 1/2”</td>
<td>1 5/8”</td>
<td>1 1/2”</td>
</tr>
<tr>
<td>Brake Chamber Size</td>
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<td>24L</td>
<td>30/30</td>
<td>30/30</td>
<td>30/30</td>
<td>30/30</td>
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</table>

MANUFACTURER’S SPECIFICATIONS

<table>
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<th>Adjustment Limit</th>
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<th>2”</th>
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</thead>
</table>
FACTS

MECHANICAL INSPECTIONS

VEHICLE 2B (RELIANCE)

Introduction

Vehicle 2B (Reliance) was a 1996 Reliance transfer dump two axle trailer and was the towed unit of Vehicle 2 (Combination). Vehicle 2B (Reliance) was inspected on Wednesday, May 25, 2016.
MECHANICAL INSPECTIONS

VEHICLE 2B (RELIANCE) (continued)

Brake System

DESCRIPTION

The brake system consisted of reservoirs, valves, S-cam brake assemblies, spring parking brakes, lines, and fittings.

INSPECTION

Brake adjustment was checked on Vehicle 2B (Reliance) using air supplied by CHP vehicle C3033F. All measurements were taken using 90 pounds of air pressure. All brake system measurements are in inches. The following observations were noted:

<table>
<thead>
<tr>
<th>AXLE 4</th>
<th>AXLE 5</th>
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<tbody>
<tr>
<td>LEFT</td>
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<tr>
<td>Type of Brake</td>
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<td>Lining Type</td>
<td>Rivet</td>
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<tr>
<td>Adjuster Type</td>
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<tr>
<td>Adjustment</td>
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<tr>
<td>Brake Chamber Size</td>
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</tbody>
</table>

MANUFACTURER'S SPECIFICATIONS

Adjustment Limit | 2” |

|  | 2” |
FACTS

RESTRAINT INSPECTION

VEHICLE 1 (RAM)

Introduction

Vehicle 1 (Ram) was equipped with seating positions for fifteen occupants, including the driver. Based on the CHP Fresno Area Traffic Collision Report and the location of the occupants of Vehicle 1 (Ram) upon the arrival of MAIT investigators, there were six occupants in Vehicle 1 (Ram) at the time of the collision.

The driver and right front occupant seating positions consisted of individual “captain’s chairs” type seats, while the remaining four seats in the vehicle were “bench” type seats. The restraint inspection was visual and no component disassembly was conducted.

DRIVER’S RESTRAINT

The driver’s restraint was a Type 2, three-point continuous loop lap/shoulder combination belt that employed an emergency locking retractor (ELR) mounted to the left side of the seat base. The restraint webbing was designed to go over the lap of the driver, through a sliding latch plate, then up and across the torso and over the left shoulder of the driver, through an adjustable height guide loop mounted above and to the rear of the upper portion of the B-pillar, and then down to the ELR. The end of the restraint webbing was bolted to the side of the seat assembly via a metal anchor plate. The buckle assembly was located on the right side of the seat, and employed a red button at the top of the buckle assembly to release the latch plate upon depression. The driver’s restraint appeared to be original equipment and did not appear to have been modified.

A portion of the driver’s restraint webbing was found withdrawn from the ELR and laying outside the open driver’s door of Vehicle 1 (Ram). The webbing was found threaded through the latchplate and laying on the dirt shoulder adjacent to the open driver’s door. The remaining portion of the restraint webbing was located hanging from the guide loop. The restraint webbing was cut approximately 4.7 feet from the restraint anchor on the seat base. The cut appeared to be made by a sharp instrument. The webbing was locked in the retractor. Inspection of the restraint webbing revealed evidence of loading, which consisted of stiffness and waviness of the webbing selvage in the vicinity of the driver’s seat back.
FACTS

RERAINT INSPECTION

VEHICLE 1 (RAM)

DRIVER’S RESTRAINT (continued)

The driver’s restraint at the collision scene.  The cut driver’s restraint webbing.

The buckle assembly was located to the right of the driver’s seat, was in good condition, and the latch plate opening was not obstructed. The red release button was in good condition and exhibited sufficient spring tension when depressed. The latch plate was then inserted into the buckle assembly and was securely locked into place. Depression of the red release button adequately released the latch plate.

Based on the driver’s restraint webbing being partially withdrawn from the ELR, the fact the restraint webbing was locked in the ELR and was cut by a sharp instrument, and the evidence of loading on the restraint webbing, it was determined the provided occupant restraint was in use at the time of the collision.
FACTS

RESTRANIT INSPECTION

VEHICLE 1 (RAM) (continued)

RIGHT FRONT PASSENGER RESTRAINT

The right front passenger restraint was similar in type and construction to the driver’s restraint. The right front passenger restraint appeared to be original equipment and did not appear to have been modified.

Inspection revealed the restraint webbing was locked in a retracted position. There was no evidence of loading on the exposed section of restraint webbing. The latch plate was hanging freely from the restraint webbing and was located to the rear of the right front passenger’s seat back.

The buckle assembly was in good condition and the latch plate opening was not obstructed, however the buckle assembly and its associated plastic scabbard was located to the rear of the right front passenger seat. The red release button was in good condition and exhibited sufficient spring tension. As a result of the passenger’s restraint webbing being locked in the retracted position, insertion of the latch plate into the buckle assembly was not possible without ELR disassembly.

Based on the right front passenger’s restraint webbing being locked in a retracted position and the lack of evidence of loading on the exposed webbing, the position and location of the latch plate and the buckle assembly, it was determined the right front passenger restraint was not in use at the time of the collision.
FACTS

RERAINT INSPECTION

VEHICLE 1 (RAM) (continued)

ROW TWO, LEFT PASSENGER RESTRAINT

The Row Two, left passenger restraint was a Type 2, three-point continuous loop lap/shoulder combination belt that employed an ELR positioned at the outboard left side of the Row Two seat. The restraint webbing was designed to go over the lap of the occupant, through a sliding latch plate, then up and across the torso and over the occupant’s left shoulder, through a guide loop mounted to the roof rail, and then down to the ELR. The end of the restraint webbing was bolted to the side of the seat assembly via an anchor plate. The buckle assembly was located in the bight of the seat to the right of the passenger, and employed a red button to release the latch plate upon depression. The buckle was attached to a length of webbing and bolted to the rear of the seat via an anchor plate. The Row Two, left passenger restraint appeared to be original equipment and did not appear to have been modified.

Inspection revealed the Row Two, left passenger’s restraint webbing was withdrawn from the retractor, and the shoulder portion and lap portion of the restraint webbing was located in front of Passenger 2 (Shackelford) upon arrival of MAIT investigators. The latch plate was located hanging freely in front of Passenger 2 (Shackelford), but was not inserted into the buckle assembly. Inspection of the restraint webbing revealed evidence of loading, which consisted of stiffness and waviness of the webbing.

The buckle assembly was in good condition and the latch plate opening was not obstructed. The buckle assembly was properly positioned in the bight of the seat, but was displaced to the right. The red release button was in good condition and exhibited sufficient spring tension. The latch plate was inserted into the buckle assembly. The locking mechanism of the buckle assembly securely locked the latch plate within the buckle assembly. Movement of the latch plate within the buckle assembly did not result in a release of the latch plate. The red release button was depressed and the latch plate was properly ejected from the buckle assembly.

Based on the Row Two, left passenger’s restraint webbing being partially withdrawn from the ELR and in front of Passenger 2 (Shackelford), the ability to adequately fasten the restraint latch plate into the buckle assembly, and the evidence of loading on the restraint webbing, it was determined the provided passenger restraint was in use at the time of the collision. The latch plate was likely released from the buckle assembly by rescue personnel following the collision.
FACTS

RERAINT INSPECTION

VEHICLE 1 (RAM) (continued)

ROW TWO, CENTER PASSENGER RESTRAINT

The Row Two, center passenger restraint was a Type 1, two-point lap restraint that employed a locking latch plate for passenger sizing, a length of restraint webbing, and a quick-release buckle assembly. The end of the restraint webbing was bolted to the rear of the seat assembly via a metal anchor plate. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle assembly was attached to a length of webbing, an anchor plate, and was bolted to the seat frame. The Row Two, center passenger restraint appeared to be original equipment and did not appear to have been modified.

Inspection revealed the Row Two, center passenger’s latch plate was pulled to the end of the webbing, and the latch plate and the webbing was located on the seat. Inspection of the restraint webbing did not reveal any evidence of loading, there was a loose overhand knot in the webbing.

The buckle assembly was in good condition and the latch plate opening was not obstructed. The buckle assembly was properly positioned in the bight of the seat, but was displaced to the right. The red release button was in good condition and exhibited sufficient spring tension. The latch plate was inserted into the buckle assembly. The locking mechanism of the buckle assembly securely locked the latch plate within the buckle assembly. Movement of the latch plate within the buckle assembly did not result in a release of the latch plate. The red release button was depressed and the latch plate was properly ejected from the buckle assembly.

Based on the Row Two, center passenger restraint’s locking latch plate being pulled to the end of the available webbing, the presence of the loose overhand knot in the webbing, the fact the latch plate was not fastened into the buckle assembly, and the lack of evidence of loading on the restraint webbing, it was determined the Row Two, center passenger restraint was not in use at the time of the collision.
FACTS

RESTRAINT INSPECTION

VEHICLE 1 (RAM) (continued)

ROW TWO, RIGHT PASSENGER RESTRAINT

The Row Two, right passenger restraint was a Type 1, two-point lap restraint that employed a locking latch plate for passenger sizing, a length of restraint webbing, and a quick-release buckle assembly. The end of the restraint webbing was bolted to the rear of the seat assembly via a metal anchor plate. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle assembly was attached to a length of webbing, an anchor plate, and was bolted to the seat frame. The Row Two, right passenger restraint appeared to be original equipment and did not appear to have been modified.

Inspection revealed the Row Two, right passenger restraint’s latch plate was pulled to the end of the available webbing. The latch plate and the restraint webbing were not located in the bight of the seat, but were located behind the seat, on the floor of the vehicle. The restraint webbing was wavy and the selvages were frayed.

The buckle assembly was in good condition and the latch plate opening was not obstructed. The buckle assembly was located on the floor behind the seat. The red release button was in good condition and exhibited sufficient spring tension. The latch plate was inserted into the buckle assembly, and the locking mechanism of the buckle assembly securely locked the latch plate. Movement of the latch plate within the buckle assembly did not result in a release of the latch plate. The red release button was depressed and the latch plate was properly ejected from the buckle assembly.

The Row 2, right passenger restraint webbing. The Row 2, right passenger restraint buckle assembly.

Based on the Row Two, right passenger restraint’s latch plate being pulled to the end of the available webbing, the location of the latch plate and the buckle assembly behind the seat, the fact the latch plate was not fastened into the buckle assembly, and the lack of evidence of loading on the restraint webbing, it was determined the Row Two, right passenger restraint was not in use at the time of the collision.
FACTS

RERAINT INSPECTION

VEHICLE 1 (RAM) (continued)

ROW THREE, LEFT PASSENGER RESTRAINT

The Row Three, left passenger restraint was a Type 2, three-point continuous loop lap/shoulder combination restraint that employed an ELR positioned at the outboard left rear of the Row 3 seat. The end of the restraint webbing was bolted to the side of the seat assembly via a metal anchor plate. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle was attached to a length of webbing and was bolted to the seat frame via a metal anchor plate. The Row 3, left passenger restraint appeared to be original equipment and did not appear to have been modified.

Inspection revealed the Row 3, left passenger’s restraint webbing was fully retracted into the ELR, with the restraint webbing and sliding latch plate hanging freely adjacent to the Row Three seat. The restraint webbing was locked in the retractor. Inspection of the restraint webbing revealed minor waviness.

The buckle assembly was not positioned in the bight of the seat, but located behind the seat and not available to an occupant. Due to the front to rear compression of the all the bench seats to each other, access to the restraint components was not possible without further disassembly.

Based on the Row Three, left passenger’s restraint webbing being retracted and locked into the ELR, and the location of the buckle assembly behind the seat and its lack of availability to an occupant, it was determined the Row Three, left passenger restraint was not in use at the time of the collision.

ROW THREE, CENTER PASSENGER RESTRAINT

The Row 3, center passenger restraint was a Type 1, two-point lap restraint that consisted of a locking latch plate for passenger sizing, a length of restraint webbing, and a quick-release buckle assembly. The end of the restraint webbing was bolted to the rear of the seat assembly via a metal anchor plate. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle assembly was attached to a length of webbing, an anchor plate, and was bolted to the seat frame.

Inspection revealed the Row Three, center passenger restraint assembly was located under and behind the seat. None of the restraint components were available for occupant use. Due to the compression of the all the bench seats against each other as a result of the collision, access to the restraint components was not possible without further disassembly.

Based on the Row Three, center passenger’s restraint webbing being under and behind the seat and not available for occupant use, it was determined the Row Three, center passenger restraint was not in use at the time of the collision.
RESTRANIT INSPECTION

VEHICLE 1 (RAM) (continued)

ROW THREE, RIGHT PASSENGER RESTRAINT

The Row Three, right passenger restraint was a Type 1, two-point lap restraint that consisted of a locking latch plate for passenger sizing, a length of restraint webbing, and a quick-release buckle assembly. The end of the restraint webbing was bolted to the rear of the seat assembly via a metal anchor plate. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle assembly was attached to a length of webbing, an anchor plate, and was bolted to the seat frame.

Inspection revealed the Row Three, right passenger restraint assembly was located under and behind the seat. A section of the webbing was positioned to the right adjacent to the bight of the seat, and was compressed between the seat base and the right side interior panel. The buckle assembly was not through the bight of the seat and therefore was not available for occupant use. Due to the compression of the all the bench seats against each other as a result of the collision, access to the restraint components was not possible without further disassembly.

Based on the Row Three, right passenger’s restraint webbing being compressed within the displaced seat and the right side interior panel, the location of the buckle assembly behind the seat and not available for occupant use, it was determined the Row Three, right passenger restraint was not in use at the time of the collision.

ROW FOUR, LEFT PASSENGER RESTRAINT

The Row Four, left passenger restraint was a Type 2, three-point continuous loop lap/shoulder combination restraint that employed an ELR positioned at the outboard left rear of the Row Four seat. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle was attached to a length of webbing and was bolted to the seat frame via a metal anchor plate. The Row Four, left passenger restraint appeared to be original equipment and did not appear to have been modified.

Inspection revealed the Row Four, left passenger’s restraint webbing being fully retracted into the retractor, with the restraint webbing and sliding latch plate hanging freely, adjacent to the Row 4 seat. The webbing could be withdrawn from the retractor; however, webbing and spool movement was restricted due to collision damage. Inspection of the restraint webbing revealed minor waviness.

The buckle assembly was not positioned through the bight of the seat, but was located behind the seat and not available to an occupant. Due to the compression of the bench seats against each other as a result of the collision, access to the restraint components was not possible without further disassembly.

Based on the Row Four, left passenger’s restraint webbing being fully retracted into the ELR and the latch plate hanging freely, adjacent to the Row 4 seat, the location of the buckle assembly behind the seat and not available for occupant use, it was determined the Row Four, left passenger restraint was not in use at the time of the collision.
STATE OF CALIFORNIA
DEPARTMENT OF CALIFORNIA HIGHWAY PATROL
MULTIDISCIPLINARY ACCIDENT INVESTIGATION TEAM NARRATIVE/DIAGRAM
CHP 558D (Rev. 9-08) OPI 065 (MAIT use only)

FACTS

RERAINT INSPECTION

VEHICLE 1 (RAM) (continued)

ROW FOUR, CENTER PASSENGER RESTRAINT

The Row Four, center passenger restraint was a Type 1, two-point lap restraint that consisted of a locking latch plate for passenger sizing, a length of restraint webbing, and a quick-release buckle assembly. The end of the restraint webbing was bolted to the rear of the seat assembly via a metal anchor plate. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle assembly was attached to a length of webbing, an anchor plate, and was bolted to the seat frame.

Inspection revealed the Row Four, center passenger’s restraint webbing was found positioned to the left side of the seat at the seat bight, and the latch plate was located under the left side of the seat. The latch plate was positioned at the end of the available length of webbing. None of the remaining restraint components were available for occupant use. Due to the compression of the bench seats against each other as a result of the collision, access to the restraint components was not possible without further disassembly.

Based on the Row Four, center passenger’s restraint webbing being pulled to the left side of the seat, and the remaining components of the restraint under and behind the seat and not available for occupant use, it was determined the Row Four, center passenger restraint was not in use at the time of the collision.

ROW FOUR, RIGHT PASSENGER RESTRAINT

The Row Four, right passenger restraint was a Type 1, two-point lap restraint that consisted of a locking latch plate for passenger sizing, a length of restraint webbing, and a quick-release buckle assembly. The end of the restraint webbing was bolted to the rear of the seat assembly via a metal anchor plate. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle assembly was attached to a length of webbing, an anchor plate, and was bolted to the seat frame.

Inspection revealed the Row Four, right passenger’s restraint assembly was located under and behind the seat. The buckle assembly was not available for occupant use. Due to the compression of the bench seats against each other as a result of the collision, access to the restraint components was not possible without further disassembly.

Based on the Row Four, right passenger restraint webbing being located behind and under the seat and not available for occupant use, it was determined the Row Four, right passenger restraint was not in use at the time of the collision.
RETAINT INSPECTION

VEHICLE 1 (RAM) (continued)

ROW FIVE, LEFT PASSENGER RESTRAINT

The Row Five, left passenger restraint was a Type 2, three-point continuous loop lap/shoulder combination restraint that employed an ELR positioned at the outboard left rear of the Row 5 seat. The buckle assembly employed a red button at the assembly to release the latch plate upon button depression. The buckle was attached to a length of webbing and was bolted to the floor of the vehicle via a metal anchor plate. The Row Five, left passenger restraint appeared to be original equipment and did not appear to have been modified.

Inspection revealed the Row Five, left passenger’s restraint webbing was fully retracted into the retractor, with the restraint webbing and sliding latch plate hanging freely, adjacent to the Row Five seat. The webbing could be withdrawn from the retractor, however rapid withdrawal of the restraint webbing from the retractor did not result in the locking of the restraint. Inspection of the restraint webbing revealed minor waviness.

The buckle assembly was not positioned through the bight of the seat, but located behind the seat and not available for use by an occupant.

Based on the Row Five, left passenger’s restraint webbing being retracted into the ELR, the latch plate hanging freely adjacent to the Row Five seat, and the location of the buckle assembly behind the seat and not available to an occupant, it was determined the Row Five, left passenger restraint was not in use at the time of the collision.

ROW FIVE, CENTER LEFT PASSENGER RESTRAINT

The Row Five, center left passenger restraint was a Type 1, two-point lap restraint that consisted of a locking latch plate for passenger sizing, a length of restraint webbing, and a quick-release buckle assembly. The end of the restraint webbing was bolted to the floor of the vehicle via a metal anchor plate. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle assembly was attached to a length of webbing, an anchor plate, and was bolted to the floor of the vehicle.

Inspection revealed the Row Five, center left passenger’s restraint webbing, latch plate and buckle assembly were located under and behind the seat, and not available for occupant use.

Based on the Row Five, center left passenger’s restraint components being located under and behind the seat and not available for occupant use, it was determined the Row Five, center left passenger restraint was not in use at the time of the collision.
FACTS

RESTRAINT INSPECTION

VEHICLE 1 (RAM) (continued)

ROW FIVE, CENTER RIGHT PASSENGER RESTRAINT

The Row Five, center right passenger restraint was a Type 1, two-point lap restraint that consisted of a locking latch plate for passenger sizing, a length of restraint webbing, and a quick-release buckle assembly. The end of the restraint webbing was bolted to the floor of the vehicle via a metal anchor plate. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle assembly was attached to a length of webbing, an anchor plate, and was bolted to the floor of the vehicle.

Inspection revealed the Row 5, center right passenger’s restraint webbing, latch plate and buckle assembly were located under and behind the seat, and not available for occupant use.

Based on the Row 5, center right passenger’s restraint components being located under and behind the seat and not available for occupant use, it was determined the Row 5, center right passenger restraint was not in use at the time of the collision.

ROW FIVE, RIGHT PASSENGER RESTRAINT

The Row Five, right passenger restraint was a Type 2, three-point continuous loop lap/shoulder combination restraint that employed an ELR positioned at the outboard left rear of the Row Five seat. The buckle assembly employed a red button at the top to release the latch plate upon button depression. The buckle assembly was attached to a length of webbing and was bolted to the floor of the vehicle via a metal anchor plate. The Row Five, right passenger restraint appeared to be original equipment and did not appear to have been modified.

Inspection revealed the Row Five, right passenger’s restraint webbing was fully retracted into the retractor, with the restraint webbing and sliding latch plate hanging freely, adjacent to the Row Five seat. The webbing could be withdrawn from the retractor, however rapid withdrawal of the restraint webbing from the retractor did not result in the locking of the restraint. Inspection of the restraint webbing revealed minor waviness.

The buckle assembly was not positioned through the bight of the seat, but was located behind the seat and not available to an occupant.

Based on the Row Five, right passenger’s restraint webbing being retracted into the ELR and the latch plate hanging freely, adjacent to the Row Five seat, and the location of the buckle assembly behind the seat and not available to an occupant, it was determined the Row Five, right passenger restraint was not in use at the time of the collision.
FACTS

PHOTO LOG

DISC A

Folder File Name: CL-002-16 02-02-16 JM-A
Date Digital Photographs Taken: February 2, 2016
Photographer: Investigator Machado
Camera: Nikon D3100
Subject: Collision scene
Number of Digital Photographs: 286
Digital Photograph File Names: CL-002-16 02-02-16 JM-A (1) to CL-002-16 02-02-16 JM-A (286)

Folder File Name: CL-002-16 02-02-16 JM-B
Date Digital Photographs Taken: February 2, 2016
Photographer: Investigator Machado
Camera: Nikon D3100
Subject: Collision scene
Number of Digital Photographs: 191
Digital Photograph File Names: CL-002-16 02-02-16 JM-B (1) to CL-002-16 02-02-16 JM-B (191)

Folder File Name: CL-002-16 02-02-16 AB
Date Digital Photographs Taken: February 4, 2016
Photographer: Officer A. Brown, Central Division Air Operations
Camera: Canon Rebel XT
Subject: Aerial photos of the collision scene
Number of Digital Photographs: 21
Digital Photograph File Names: CL-002-16 02-02-16 AB (1) to CL-002-16 02-02-16 AB (21)

Folder File Name: CL-002-16 02-04-16 JK
Date Digital Photographs Taken: February 4, 2016
Photographer: Investigator Kolter
Camera: Canon EOS 70D
Subject: Vehicle 2 (Combination) damage inspection
Number of Digital Photographs: 107
Digital Photograph File Names: CL-002-16 02-04-16 JK (1) to CL-002-16 02-04-16 JK (107)

Folder File Name: CL-002-16 02-10-16 JK
Date Digital Photographs Taken: February 10, 2016
Photographer: Investigator Kolter
Camera: Canon EOS 70D
Subject: Vehicle 1 (Ram) damage inspection
Number of Digital Photographs: 46
Digital Photograph File Names: CL-002-16 02-10-16 JK (1) to CL-002-16 02-10-16 JK (46)
FACTS

PHOTO LOG

DISC A (continued)

Folder File Name: CL-002-16 02-10-16 KW
Date Digital Photographs Taken: February 10, 2016
Photographer: Investigator Weaver
Camera: Canon EOS 70D
Subject: Vehicle 2 (Combination) mechanical inspection
Number of Digital Photographs: 150
Digital Photograph File Names: CL-002-16 02-10-16 KW (1) to CL-002-16 02-10-16 KW (150)

Folder File Name: CL-002-16 04-20-16 JK
Date Digital Photographs Taken: April 20, 2016
Photographer: Investigator Kolter
Camera: Canon EOS 70D
Subject: Vehicle 1 (Ram) restraint inspection and exemplar vehicle restraints
Number of Digital Photographs: 123
Digital Photograph File Names: CL-002-16 04-20-16 JK (1) to CL-002-16 04-20-16 JK (123)

During the course of this investigation 924 digital photographs were taken by MAIT investigators and CHP Air Operations. At the conclusion of this investigation, the digital photographs, stored on a DVD, were delivered to the CHP Fresno Area office with this report.

The CHP Fresno Area is the custodian of records for this investigation. All requests related to the photographs associated with this investigation shall be directed to:

CHP Fresno Area
1382 West Olive Avenue
Fresno, California 93728
(559) 441-5441
PHYSICAL EVIDENCE ANALYSIS

1. Tire friction mark

Item 1 was a tire friction mark on the asphalt concrete roadway. Item 1 was 25.26 feet in length. It began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. Based on the dynamics analysis, item 1 was deposited by a right side tire of Vehicle 2B (Reliance).

2. Tire friction mark

Item 2 was a tire friction mark on the asphalt concrete roadway. Item 2 was 24.18 feet in length. It began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. Based on the dynamics analysis, item 2 was deposited by a right side tire of Vehicle 2B (Reliance).

3. Gouge

Item 3 was a gouge in the asphalt concrete roadway. Item 3 was 3.30 feet in length, and was located in the southbound lane of South Buttonwillow Avenue north of the intersection. Based on the dynamics analysis, item 3 was created by the undercarriage of Vehicle 2B (Reliance).

4. Gouge

Item 4 was a gouge in the asphalt concrete roadway. Item 4 was 2.10 feet in length, and was located in the southbound lane of South Buttonwillow Avenue north of the intersection. Based on the dynamics analysis, item 4 was created by the undercarriage of Vehicle 2B (Reliance).

5. Tire friction mark

Item 5 was a tire friction mark on the asphalt concrete roadway. Item 5 was 18.56 feet in length. It began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. Based on the dynamics analysis, item 5 was deposited by a left side tire of Vehicle 2B (Reliance).

6. Tire friction mark

Item 6 was a tire friction mark on the asphalt concrete roadway. Item 6 was 18.36 feet in length. It began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. Based on the dynamics analysis, item 6 was deposited by a left side tire of Vehicle 2B (Reliance).
PHYSICAL EVIDENCE ANALYSIS (continued)

7. Tire friction mark

Item 7 was a tire friction mark on the asphalt concrete roadway. Item 7 was 13.16 feet in length. It began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. Based on the dynamics analysis, item 7 was deposited by the left front tire of Vehicle 2A (Peterbilt).

8. Tire friction mark

Item 8 was a tire friction mark on the asphalt concrete roadway. Item 8 was 14.23 feet in length. It began in the southbound lane of South Buttonwillow Avenue north of the intersection, continued in a southerly direction, and ended within the intersection. Based on the dynamics analysis, item 8 was deposited by a right side tire of Vehicle 2 (Combination).

9. Tire friction mark

Item 9 was a tire friction mark on the asphalt concrete roadway. Item 9 was 10.30 feet in length, and was located within the intersection. Based on the dynamics analysis, item 9 was deposited by a right side tire of Vehicle 2 (Combination).

10. Tire friction mark

Item 10 was a tire friction mark on the asphalt concrete roadway. Item 10 was 9.07 feet in length, and was located within the intersection. Based on the dynamics analysis, item 10 was deposited by a right side tire of Vehicle 2 (Combination).

11. Tire friction mark

Item 11 was a tire friction mark on the asphalt concrete roadway. Item 11 was 10.30 feet in length, and was located within the intersection. Based on the dynamics analysis, item 11 was deposited by a left side tire of Vehicle 2 (Combination).

12. Tire friction mark

Item 12 was a tire friction mark on the asphalt concrete roadway. Item 12 was 9.39 feet in length, and was located within the intersection. Based on the dynamics analysis, item 12 was deposited by a left side tire of Vehicle 2 (Combination).
ANALYSIS AND OPINION

PHYSICAL EVIDENCE ANALYSIS (continued)

13. **Tire friction mark**

Item 13 was a tire friction mark on the asphalt concrete roadway. Item 13 was 35.89 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 13 was deposited by a left side tire of Vehicle 2 (Combination).

14. **Tire friction mark**

Item 14 was a tire friction mark on the asphalt concrete roadway. Item 14 was 24.93 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 14 was deposited by a left side tire of Vehicle 2 (Combination).

15. **Tire friction mark**

Item 15 was a tire friction mark on the asphalt concrete roadway. Item 15 was 89.56 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 15 was deposited by a right side tire of Vehicle 2B (Reliance).

16. **Tire friction mark**

Item 16 was a tire friction mark on the asphalt concrete roadway. Item 16 was 79.91 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 16 was deposited by a right side tire of Vehicle 2B (Reliance).

17. **Tire friction mark**

Item 17 was a tire friction mark on the asphalt concrete roadway. Item 17 was 86.41 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 17 was deposited by a right side tire of Vehicle 2A (Peterbilt).

18. **Tire friction mark**

Item 18 was a tire friction mark on the asphalt concrete roadway. Item 18 was 95.20 feet in length. It began within the intersection, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 18 was deposited by the left front tire of Vehicle 2A (Peterbilt).
ANALYSIS AND OPINION

PHYSICAL EVIDENCE ANALYSIS (continued)

19.  Tire friction mark

Item 19 was a tire friction mark on the asphalt concrete roadway. Item 19 was 49.47 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 19 was deposited by a right side tire of Vehicle 2B (Reliance).

20.  Tire friction mark

Item 20 was a tire friction mark on the asphalt concrete roadway. Item 20 was 52.00 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 20 was deposited by a left side tire of Vehicle 2B (Reliance).

21.  Tire friction mark

Item 21 was a tire friction mark on the asphalt concrete roadway. Item 21 was 12.71 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 21 was deposited by the left rear tire of Vehicle 1 (Ram).

22.  Tire friction mark

Item 22 was a tire friction mark on the asphalt concrete roadway. Item 22 was 97.97 feet in length. It began within the intersection, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 22 was deposited by a right side tire of Vehicle 2B (Reliance).

23.  Tire friction mark

Item 23 was a tire friction mark on the asphalt concrete roadway. Item 23 was 15.26 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 23 was deposited by a right side tire of Vehicle 2B (Reliance).

24.  Tire friction mark

Item 24 was a tire friction mark on the asphalt concrete roadway. Item 24 was 8.21 feet in length. It began within the intersection, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 24 was deposited by the left front tire of Vehicle 1 (Ram).
ANALYSIS AND OPINION

PHYSICAL EVIDENCE ANALYSIS (continued)

25.  Fluid trail

Item 25 was a fluid trail on the asphalt concrete roadway. Item 25 was approximately 16.46 feet in length and approximately 1.76 feet in width. It began within the intersection, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 25 was deposited by Vehicle 1 (Ram).

26.  Tire friction mark

Item 26 was a tire friction mark on the asphalt concrete roadway. Item 26 was 10.67 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 26 was deposited by a left side tire of Vehicle 2 (Combination).

27.  Tire friction mark

Item 27 was a tire friction mark on the asphalt concrete roadway. Item 27 was 91.21 feet in length. It began within the intersection, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 27 was deposited by a left side tire of Vehicle 2 (Combination).

28.  Tire friction mark

Item 28 was a tire friction mark on the asphalt concrete roadway. Item 28 was 35.16 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 28 was deposited by a right side tire of Vehicle 2A (Peterbilt).

29.  Tire friction mark

Item 29 was a tire friction mark on the asphalt concrete roadway. Item 29 was 87.07 feet in length. It began within the intersection, and ended in the southbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 29 was deposited by a right side tire of Vehicle 2A (Peterbilt).

30.  Tire friction mark

Item 30 was a tire friction mark on the asphalt concrete roadway. Item 30 was 55.50 feet in length. It began within the intersection, and ended in the northbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 30 was deposited by a left side tire of Vehicle 2 (Combination).
ANALYSIS AND OPINION

PHYSICAL EVIDENCE ANALYSIS (continued)

31. Tire friction mark

Item 31 was a tire friction mark on the asphalt concrete roadway. Item 31 was 18.91 feet in length. It was located in the northbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 31 was deposited by the right rear tire of Vehicle 1 (Ram).

32. Tire friction mark/track mark

Item 32 was a tire friction mark on the asphalt concrete roadway that transitioned into a track mark on the dirt shoulder east of South Buttonwillow Avenue. Item 32 was 99.47 feet in length. It began in the northbound lane of South Buttonwillow Avenue south of the intersection. Item 32 traversed the roadway and onto the dirt shoulder east of South Buttonwillow Avenue. Item 32 traveled in a southeasterly direction, then arced in a southwesterly direction, and ended on the dirt shoulder. Based on the dynamics analysis, item 32 was deposited by the left rear tire of Vehicle 1 (Ram).

33. Fluid trail

Item 33 was a fluid trail on the asphalt concrete roadway south of the intersection. This item was approximately 8.74 feet long and approximately 0.7 feet wide at its midpoint. Item 33 began in the southbound lane of South Buttonwillow Avenue, crossed the broken/solid yellow line, and ended in the northbound lane of South Buttonwillow Avenue. Based on the dynamics analysis, item 33 was deposited by Vehicle 2 (Combination).

34. Tire friction mark

Item 34 was a tire friction mark on the asphalt concrete roadway. Item 34 was 39.73 feet in length. It began in the southbound lane of South Buttonwillow Avenue south of the intersection, crossed the broken/solid yellow line, and ended in the northbound lane of South Buttonwillow Avenue. Based on the dynamics analysis, item 34 was deposited by a left side tire of Vehicle 2B (Reliance).

35. Tire friction mark

Item 35 was a tire friction mark on the asphalt concrete roadway. Item 35 was 13.39 feet in length. It was located in the northbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 35 was deposited by the left front tire of Vehicle 1 (Ram).

36. Fluid trail

Item 36 was a fluid trail on the asphalt concrete roadway. Item 36 was 61.49 feet in length. It began on the broken/solid yellow line of South Buttonwillow Avenue south of the intersection, and ended at the east pavement edge of South Buttonwillow Avenue. Based on the dynamics analysis, item 36 was deposited by Vehicle 2A (Peterbilt).
PHYSICAL EVIDENCE ANALYSIS (continued)

37. Tire friction mark with scrapes

Item 37 was a tire friction mark with scrapes on the asphalt concrete roadway. Item 37 was 6.61 feet in length. It was located in the southbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 37 was deposited by the right side of Vehicle 2B (Reliance).

38. Tire friction mark/track mark

Item 38 was a tire friction mark/track mark. Item 38 was 7.96 feet in length. This item was located in the northbound lane of South Buttonwillow Avenue south of the intersection, traversed the roadway in a southeasterly direction, exited the east pavement edge, and ended on the east dirt shoulder of South Buttonwillow Avenue. Based on the dynamics analysis, item 38 was deposited by a left side tire of Vehicle 2A (Peterbilt).

39. Tire friction mark/track mark

Item 39 was a tire friction mark/track mark. Item 39 was 9.12 feet in length. This item was located in the northbound lane of South Buttonwillow Avenue south of the intersection, traversed the roadway in a southeasterly direction, exited the east pavement edge, and ended on the east dirt shoulder of South Buttonwillow Avenue. Based on the dynamics analysis, item 39 was deposited by a left side tire of Vehicle 2A (Peterbilt).

40. Area of gouges

Item 40 was an area of gouges in the asphalt concrete roadway. Item 40 was approximately 2.62 feet in length and approximately 1.20 feet in width. This item was located in the southbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 40 was created by the right side of Vehicle 2B (Reliance).

41. Area of scrapes

Item 41 was an area of scrapes in the asphalt concrete roadway. Item 41 was approximately 15.23 feet in length and approximately 5.95 feet in width. This item was located in the southbound lane of South Buttonwillow Avenue south of the intersection, crossed the broken/solid yellow line, and ended in the northbound lane of South Buttonwillow Avenue. Based on the dynamics analysis, item 41 was created by right side of Vehicle 2B (Reliance).

42. Gouge

Item 42 was a gouge in the asphalt concrete roadway. Item 42 was 3.84 feet in length. This item was located in the southbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 42 was created by the right side of Vehicle 2B (Reliance).
ANALYSIS AND OPINION

PHYSICAL EVIDENCE ANALYSIS (continued)

43.  Tire friction mark

Item 43 was a tire friction mark on the asphalt concrete roadway. Item 43 was 27.06 feet in length. It was located in the northbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 43 was deposited by a right side tire of Vehicle 2A (Peterbilt).

44.  Tire friction mark

Item 44 was a tire friction mark on the asphalt concrete roadway. Item 44 was 15.95 feet in length. It was located in the northbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 44 was deposited by a right side tire of Vehicle 2A (Peterbilt).

45.  Gouge

Item 45 was a gouge in the asphalt concrete roadway. Item 45 was 1.09 feet in length. It was located in the northbound lane of South Buttonwillow Avenue south of the intersection, near the pavement road edge. Based on the dynamics analysis, item 45 was created by the right side of Vehicle 2B (Reliance).

46.  Furrow

Item 46 was a furrow on the east dirt shoulder of South Buttonwillow Avenue south of the intersection. Item 46 was 11.04 feet in length. Based on the dynamics analysis, item 46 was created by the right side of Vehicle 2B (Reliance).

47.  Gouge/furrow

Item 47 was a gouge that transitioned into a furrow. This item was 33.48 feet in length. Item 47 began in the southbound lane of South Buttonwillow Avenue south of the intersection, crossed the solid/broken yellow lines, traversed the northbound lane, and exited the east pavement edge of South Buttonwillow Avenue south of the intersection. The gouge transitioned to a furrow and ended on the east dirt shoulder of South Buttonwillow Avenue. Based on the dynamics analysis, item 47 was created by the right side of Vehicle 2B (Reliance).

48.  Gouge

Item 48 was a gouge in the asphalt concrete roadway. This item was 10.96 feet in length. Item 48 was located in the northbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 48 was created by the right side of Vehicle 2B (Reliance).

49.  Gouge

Item 49 was a gouge in the asphalt concrete roadway. This item was 6.91 feet in length. Item 49 was located in the northbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 49 was created by the right side of Vehicle 2B (Reliance).
ANALYSIS AND OPINION

PHYSICAL EVIDENCE ANALYSIS (continued)

50. Gravel

Item 50 was spilled gravel on the asphalt concrete roadway and east dirt shoulder of South Buttonwillow Avenue south of the intersection. Item 50 was approximately 81.44 feet in length and approximately 36.93 feet in width. Based on the dynamics analysis and paperwork located within Vehicle 2A (Peterbilt), item 50 originated from Vehicle 2B (Reliance).

51. Displaced chain link fence

Item 51 was a section of displaced chain link fence. Item 51 was approximately 50 feet in length. This item was located on the east dirt shoulder of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis and the point of rest of Vehicle 1 (Ram), item 51 was displaced by Vehicle 1 (Ram).

52. Fuel tank

Item 52 was a fuel tank. Item 52 was approximately 5.57 feet in length and approximately 1.40 feet in width. This item was located on the east dirt shoulder of South Buttonwillow Avenue south of the intersection. Based on the damage sustained by Vehicle 1 (Ram), item 52 originated from Vehicle 1 (Ram).

53. Tire friction mark

Item 53 was a tire friction mark on the asphalt concrete roadway. Item 53 was 15.05 feet in length. It started in the southbound lane of South Buttonwillow Avenue south of the intersection, crossed the broken/solid yellow line and ended in the northbound lane of South Buttonwillow Avenue. Based on the dynamics analysis, item 53 was deposited by a right side tire of Vehicle 2 (Combination).

54. Tire friction mark

Item 54 was a tire friction mark on the asphalt concrete roadway. Item 54 was 15.94 feet in length. It was located in the southbound lane of South Buttonwillow Avenue south of the intersection. Based on the dynamics analysis, item 54 was deposited by a right side tire of Vehicle 2 (Combination).

55. Gouge

Item 55 was a gouge in the asphalt concrete roadway. Item 55 was 0.58 feet in length. It was located in the northbound lane of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 55 was created by Vehicle 2B (Reliance).

56. Track mark

Item 56 was a track mark on the east dirt shoulder. Item 56 was 13.81 feet in length. It was located on the east dirt shoulder of South Buttonwillow Avenue, south of the intersection. Based on the dynamics analysis, item 56 was created by the right rear tire of Vehicle 1 (Ram).
ANALYSIS AND OPINION

VEHICLE DAMAGE ANALYSIS

The damage sustained by the involved vehicles were examined to determine the orientation of the vehicles relative to one another at impact.

Vehicle 1 (Ram)

The post-collision condition of Vehicle 1 (Ram) was consistent with a primary single collision and a minor secondary collision. The following observations were made of the damage to Vehicle 1 (Ram):

- The left side of Vehicle 1 (Ram) was displaced to the right, with associated contact damage to the left side of the vehicle, and induced damage consisting of bowing and separation of the right side doors and sheet metal body panels.
- There were numerous impressions, transfers, and tears to the left side sheet metal of Vehicle 1 (Ram).
- As indicated by the displacement of the left side of the vehicle, the Principal Direction of Force (PDOF) was directed from the left to the right.

The damage to the left side of Vehicle 1 (Ram).
CL-002-16 02-10-16 JK (4) cropped
ANALYSIS AND OPINION

VEHICLE DAMAGE ANALYSIS

Vehicle 1 (Ram) (continued)

Evidence of a secondary collision was located on the rear of Vehicle 1 (Ram). This damage consisted of the following:

- There were diagonally positioned scrapes located on the rear bumper, and the associated plastic bumper cover, of Vehicle 1 (Ram).
- The lower left corner of the rear license plate was bent upward.
- The damage indicated a PDOF from left to right.

The damage to the rear bumper and license plate of Vehicle 1 (Ram).

CL-002-16 02-10-16 JK (7) cropped
VEHICLE DAMAGE ANALYSIS (continued)

Vehicle 2A (Peterbilt)

The post-collision condition of Vehicle 2A (Peterbilt) was consistent with a primary single collision. The following observations were made of the damage to Vehicle 2A (Peterbilt):

- The front of Vehicle 2A (Peterbilt) was displaced to the rear, with associated contact damage to the front of the vehicle. The grille shell and fenders were displaced upward and rearward, and the steering box was damaged.
- As indicated by the displacement of the front of the vehicle, the PDOF of this impact was applied through this area of damage, and was directed from the front to the rear of Vehicle 2A (Peterbilt).
ANALYSIS AND OPINION

VEHICLE DAMAGE ANALYSIS

Vehicle 2A (Peterbilt) (continued)

A comparison of the damage to the left side of Vehicle 1 (Ram) and front of Vehicle 2A (Peterbilt) was conducted, and match points between the two vehicles were located.

The left side of Vehicle 1 (Ram).
CL-002-16 02-10-16 JK (4) cropped

The front of Vehicle 2A (Peterbilt).
CL-002-16 02-04-16 JK (4) cropped

As shown above, the front bumper of Vehicle 2A (Peterbilt) deposited several impressions, a red paint transfer, and tears to the left side of Vehicle 1 (Ram).
VEHICLE DAMAGE ANALYSIS (continued)

Vehicle 2B (Reliance)

The post-collision condition of Vehicle 2B (Reliance) was consistent with a secondary collision that occurred during the post-impact travel of Vehicle 2 (Combination). The following observations were made of the damage to Vehicle 2B (Reliance):

- The right side of Vehicle 2B (Reliance) displayed diagonal scrapes, and the front and rear fenders were displaced upward, rearward, and to the left.
- As indicated by the damage, Vehicle 2B (Reliance) sustained overturn damage, loss of load, and was consistent with the location of this vehicle at its point of rest.
ANALYSIS AND OPINION

CALCULATIONS

INTRODUCTION

The following calculations were performed to determine the pre-impact velocity of Vehicle 2 (Combination). The calculations were based on the principle of conservation of momentum. The physical evidence, vehicle damage, mechanical inspections, scene testing, and the dynamics analysis were used as the basis for the calculations data.

The post-impact velocity of Vehicle 1 (Ram) was determined by using friction factors which were based on field tests conducted at the scene, Society of Automotive Engineers (SAE) technical paper 830612, “Friction Application in Accident Reconstruction,” and SAE Technical Paper 980368, “The Measured Rolling Resistance of Vehicles for Accident Reconstruction.”

The collision between the front of Vehicle 2 (Combination) and the left side of Vehicle 1 (Ram) was a complete collision, which resulted in the centers of mass of both vehicles attaining a common velocity at maximum engagement. The post-impact velocity of Vehicle 1 (Ram) was quantified, and the post-impact velocity of Vehicle 2 (Combination) was set equal to the calculated post-impact velocity for Vehicle 1 (Ram).

To determine velocities at impact, the principle of conservation of momentum was used. This principle states the sum of the initial momentums is equal to the sum of the final momentums. Momentum is a vector quantity and is equal to the product of the mass of an object and its velocity.

Measurements used in the calculations were determined from the Physical Evidence and Dynamics Diagrams.

To determine the involved vehicles’ correlating spatial relationships and velocities during the phases of the collision sequence, a time-position analysis was conducted. The time-position calculations were based on the equations of motion with constant acceleration and the equations of motion with constant velocity.
ANALYSIS AND OPINION

CALCULATIONS

SYMBOLS AND EQUATIONS

Symbols

\begin{align*}
a & \text{ Acceleration (feet per second}^2) \\
d & \text{ Distance traveled (feet)} \\
\text{fps} & \text{ Feet per second} \\
f & \text{ Coefficient of friction (unitless)} \\
g & \text{ Acceleration due to gravity (32.2 feet per second}^2) \\
\text{mph} & \text{ Miles per hour} \\
t & \text{ Time (seconds)} \\
V & \text{ Velocity (feet per second or miles per hour)} \\
V_{11} & \text{ Impact velocity of Vehicle 1 (Ram) (feet per second or miles per hour)} \\
V_{21} & \text{ Impact velocity of Vehicle 2 (Combination) (feet per second or miles per hour)} \\
V_{12} & \text{ Post-impact velocity of Vehicle 1 (Ram) (feet per second or miles per hour)} \\
V_{22} & \text{ Post-impact velocity of Vehicle 2 (Combination) (feet per second or miles per hour)} \\
V_i & \text{ Initial velocity (feet per second)} \\
V_f & \text{ Final velocity (feet per second)} \\
W & \text{ Weight (pounds)} \\
W_1 & \text{ Weight of Vehicle 1 (Ram) (pounds)} \\
W_2 & \text{ Weight of Vehicle 2 (Combination) (pounds)}
\end{align*}

Subscript numbers or words after the symbols refer to different values. Refer to calculations data for specific details.
ANALYSIS AND OPINION

CALCULATIONS

SYMBOLS AND EQUATIONS (continued)

Equations

1. The equation to calculate the rolling friction factor when vehicle weight distribution and axle friction factors are known. (unitless)

$$V_{1,rolling} = (W_{\text{front percent}})(f) + (W_{\text{rear percent}})(f)$$

2. Resultant friction factor when vehicle weights and friction factors are known. (unitless)

$$f = \frac{[(W1)(f_1)+ (W2)(f_2)]}{(W1+W2)}$$

3. Combined speed equation. (feet per second)

$$V = \sqrt{2g[(d_1)(f_1)+ (d_2)(f_2)+ (d_n)(f_n)]}$$

4. X-axis momentum equation, impact velocity of Vehicle 2 (Combination). (feet per second)

$$V_{21} = \frac{(W1)(V_{12})+(W2)(V_{22})}{(W2)}$$

5. Velocity conversion from feet per second to miles per hour, or miles per hour to feet per second.

$$V_{\text{mph}} = V_{\text{fps}} \left(\frac{3,600 \text{ seconds/hour}}{5,280 \text{ feet/mile}}\right) \text{ or } V_{\text{fps}} = V_{\text{mph}} \left(\frac{5,280 \text{ feet/mile}}{3,600 \text{ seconds/hour}}\right)$$

6. Elapsed time where final velocity, initial velocity, and friction factor are known. (seconds)

$$t = \frac{V_f-V_i}{f g}$$

7. Elapsed time where initial velocity equals zero, and the distance and acceleration rate are known. (seconds)

$$t = \sqrt{\frac{2d}{a}}$$
ANALYSIS AND OPINION

CALCULATIONS

WEIGHTS

VEHICLE 1 (RAM)

The weight of Vehicle 1 (Ram) was obtained from Expert AutoStats. The weights of Party 1 (Finnell), Passenger 2 (Shackleford), Passenger 3 (Cruz), Passenger 4 (VanMeter), and Passenger 5 (Guadarrama) were obtained from California Department of Motor Vehicles’ records. The weight of Passenger 1 (Christman) was based on Centers for Disease Control and Prevention growth charts (http://www.cdc.gov/growthcharts/clinical_charts.htm). The 90th percentile weight value was used.

\[
\begin{align*}
\text{Weight of Vehicle 1 (Ram) without occupants:} & \quad 4,899 \text{ pounds} \\
\text{The weight of Party 1 (Finnell):} & \quad 190 \text{ pounds} \\
\text{The weight of Passenger 1 (Christman):} & \quad 190 \text{ pounds} \\
\text{The weight of Passenger 2 (Shackleford):} & \quad 100 \text{ pounds} \\
\text{The weight of Passenger 3 (Cruz):} & \quad 150 \text{ pounds} \\
\text{The weight of Passenger 4 (VanMeter):} & \quad 190 \text{ pounds} \\
\text{The weight of Passenger 5 (Guadarrama):} & \quad 185 \text{ pounds} \\
\end{align*}
\]

\[W_1 = 5,904 \text{ pounds}\]

VEHICLE 2 (COMBINATION)

The weight of Vehicle 2 (Combination) was determined by examining a weight receipt located in the passenger compartment of Vehicle 2 (Combination) at the collision scene. Ticket number 1714000734, dated “2/2/16,” listed the weight of Vehicle 2 (Combination) as “39.99 tons.” This equaled 79,980 pounds. The weight of Party 2 (Oh) was included in the total weight of Vehicle 2 (Combination).

\[
\begin{align*}
\text{Weight of Vehicle 2 (Combination):} & \quad 79,980 \text{ pounds} \\
\end{align*}
\]

\[W_2 = 79,980 \text{ pounds}\]
ANALYSIS AND OPINION

CALCULATIONS

CALCULATIONS DATA (continued)

Friction Factors

Friction tests were conducted for the roadway in the post-collision direction of travel of Vehicle 1 (Ram). The average friction value for the test vehicle braking with ABS disabled, while traveling in a southerly direction on the asphalt concrete surface of the southbound lane of South Buttonwillow Avenue at the intersection of East South Avenue, was determined to be 0.782.

\[ f_1 = 0.782 \]

Vehicle 2 (Combination) was a commercial vehicle equipped with heavy truck tires. Due to the nature of the construction and compound of heavy truck tires, the tested roadway friction factor for an automobile tire was reduced by 0.2, and was obtained from Society of Automotive Engineers (SAE) Technical Paper 830612, which was sourced from “Accident Reconstruction” by James Collins, Ph.D.

\[ f_2 = 0.582 \]

The following friction factor for an automobile tire sliding on dirt was obtained from Society of Automotive Engineers (SAE) Technical Paper 830612, “Friction Applications in Accident Reconstruction,” which was sourced from “Accident Reconstruction” by James Collins, Ph.D.

\[ f_3 = 0.650 \]

The following friction factors for free-rolling automobile tires were obtained from SAE Technical Paper 980368, “The Measured Rolling Resistance of Vehicles for Accident Reconstruction.”

Free-rolling non-drive axle automobile tire:
\[ f_4 = 0.021 \]

Free-rolling drive axle automobile tire:
\[ f_5 = 0.136 \]

Utilizing the friction factors for free-rolling automobile tires and the approximate weight distribution of Vehicle 1 (Ram) obtained from Expert AutoStats, the resultant rolling friction of Vehicle 1 (Ram) was calculated:

\[ f_6 = (W_{\text{front \ percent}})(f_4) + (W_{\text{rear \ percent}})(f_5) \]
\[ f_6 = (0.57)(0.021) + (0.43)(0.136) \]
\[ f_6 = 0.070 \]

The rolling friction factor for Vehicle 1 (Ram):
\[ f_6 = 0.070 \]
ANALYSIS AND OPINION

CALCULATIONS DATA

Friction Factors (continued)

Vehicle 1 (Ram) and Vehicle 2 (Combination) traveled together as a unit from maximum engagement until separation. Utilizing the tested friction factor for an automobile tire sliding on asphalt ($f_1 = 0.782$), the adjusted friction factor for a heavy truck tire sliding on asphalt ($f_2 = 0.582$), and the weight of the associated vehicles, a friction factor for Vehicle 1 (Ram) and Vehicle 2 (Combination) as a unit was calculated:

\[
f_7 = \frac{(W1)(f_1)+(W2)(f_2)}{(W1+W2)}
\]

\[
f_7 = \frac{[(5,904)(0.782)+(79,980)(0.582)]}{(5,904+79,980)}
\]

\[
f_7 = 0.596
\]

The friction factor for Vehicle 1 (Ram) and Vehicle 2 (Combination) as a unit: $f_7 = 0.596$
ANALYSIS AND OPINION

CALCULATIONS DATA (continued)

Distances and Heading Angles

The heading angles and the distances traveled during the post-impact travel of the center of mass of Vehicle 1 (Ram) were measured from the Dynamics Diagram, and are shown in tabular form below. The heading angle is defined as the difference, in degrees, between the direction a vehicle is traveling and the direction the front of the vehicle is pointing. The final 12.5 feet of Vehicle 1’s (Ram) post-impact travel was presumed to be free-rolling to its point of rest.

<table>
<thead>
<tr>
<th>HEADING ANGLE</th>
<th>DISTANCE</th>
<th>ROADWAY SURFACE MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 degrees or less</td>
<td>26.6 feet</td>
<td>Asphalt</td>
</tr>
<tr>
<td>20 degrees or more</td>
<td>13.1 feet</td>
<td>Asphalt</td>
</tr>
<tr>
<td>20 degrees or more</td>
<td>66.0 feet</td>
<td>Dirt</td>
</tr>
<tr>
<td>20 degrees or less</td>
<td>5.2 feet</td>
<td>Dirt</td>
</tr>
</tbody>
</table>

The distance traveled by the center of mass of Vehicle 1 (Ram) from the solid white limit line of East South Avenue to the area of impact, as measured from the Dynamics Diagram, was 25.8 feet ($d_5$).

\[ d_5 = 25.8 \text{ feet} \]

The distance traveled by the combined center of mass of Vehicle 1 (Ram) and Vehicle 2 (Combination) from maximum engagement to separation of the vehicles, as measured from the Dynamics Diagram, was 26.5 feet ($d_6$).

\[ d_6 = 26.5 \text{ feet} \]
ANALYSIS AND OPINION

CALCULATIONS

Post-Impact Velocities

The following analysis was performed to determine the post-impact velocity of Vehicle 1 (Ram). The analysis was based on the damage sustained by Vehicle 1 (Ram), the physical evidence located at the collision scene, scene testing, published data, and the point of rest of Vehicle 1 (Ram).

Following the collision with Vehicle 2 (Combination), Vehicle 1 (Ram) traveled in a counterclockwise translational yaw about its vertical axis to its point of rest. In order to determine the post-impact velocity of Vehicle 1 (Ram), the post-impact travel of Vehicle 1 (Ram) was separated into phases. These phases consisted of the locations where the vehicle was free-rolling and possessed a heading angle (the angle between the center of mass path and the vehicle heading) of less than 20 degrees, and locations where the vehicle was in a sideslip, and possessed a heading angle greater than 20 degrees.

This method utilizes the frictional forces developed at the tire-roadway interface by analyzing the vehicle sideslip, combined with the translational motion. This method presumes that all wheels were capable of rolling freely, and the only forces acting to slow the vehicle were the frictional forces developed at the four tires as a result of vehicle sideslip. It was assumed that any steer angle of the front wheels, if applicable, would have had a negligible effect and was ignored.

Utilizing the heading angles, the distances the center of mass the vehicle traveled through the differing phases, the appropriate drag factors associated with the differing heading angles as well as the appropriate roadway surfaces, the post-impact velocity of Vehicle 1 (Ram) was calculated.
ANALYSIS AND OPINION

CALCULATIONS

Post-Impact Velocities (continued)

The post-impact velocity of Vehicle 1 (Ram) was calculated using the combined speed equation:

\[ V_{12} = \sqrt{2g \left[ (d_1)(f_1) + (d_2)(f_2) + (d_n)(f_n) \right]} \]

\[ V_{12} = \sqrt{2g \left[ (d_6)(f_7) + (d_1)(f_6) + (d_2)(f_1) + (d_3)(f_3) + (d_4)(f_6) \right]} \]

\[ V_{12} = \sqrt{(2)(32.2)[(26.5)(0.596) + (26.6)(0.070) + (13.1)(0.782) + (66.0)(0.650) + (5.2)(0.070)]} \]

\[ V_{12} = 67.70 \text{ feet per second} \]

The post-impact velocity of Vehicle 1 (Ram) \( (V_{12}) \) was approximately 67.70 feet per second.

\[ V_{12} = 67.70 \text{ feet per second} \]

This velocity is considered a minimum because the collision between Vehicle 1 (Ram) and the chain link fence located on the southeast corner of the intersection was not quantified.

The post-impact velocity of Vehicle 2 (Combination) \( (V_{22}) \) was set equal to the post-impact velocity of Vehicle 1 (Ram).

\[ V_{22} = 67.70 \text{ feet per second} \]
CALCULATIONS

Impact Velocity

VEHICLE 2 (COMBINATION)

The principle of conservation of momentum was used to determine the impact velocity of Vehicle 2 (Combination).

\[
V_{21} = \frac{(W_1)(V_{12})+(W_2)(V_{22})}{(W_2)}
\]

\[
V_{21} = \frac{(5,904)(67.70)+(79,980)(67.70)}{79,980}
\]

\[
V_{21} = 72.70 \text{ feet per second}
\]

\[
V_{21} = V_{fps} \left( \frac{3,600 \text{ seconds/hour}}{5,280 \text{ feet/mile}} \right)
\]

\[
V_{21} = 49.57 \text{ miles per hour}
\]

Vehicle 2 (Combination) was traveling at a minimum speed of approximately 50 miles per hour at impact with Vehicle 1 (Ram).
ANALYSIS AND OPINION

CALCULATIONS

Time-Position Analysis

INTRODUCTION

Based on the physical evidence located at the scene and the dynamics analysis, it was determined the area of impact between Vehicle 1 (Ram) and Vehicle 2 (Combination) was located within the intersection of South Buttonwillow Avenue and East South Avenue. Vehicle 1 (Ram) was determined to have been traveling east on East South Avenue and Vehicle 2 (Combination) was determined to have been traveling south on Buttonwillow Avenue.

Previous calculations have shown Vehicle 2 (Combination) was traveling at a calculated minimum speed of approximately 50 miles per hour when it struck Vehicle 1 (Ram).

The first item of physical evidence to indicate the location of the front of Vehicle 2 (Combination) was item 7 (tire friction mark). The beginning of item 7 was approximately 25 feet north of the area of impact between Vehicle 1 (Ram) and Vehicle 2 (Combination). This location signified the end of the perception and response time of the driver of Vehicle 2 (Combination).

To illustrate the location of Vehicle 2 (Combination) with respect to the location of Vehicle 1 (Ram), the following time-position analysis was performed. The physical evidence, vehicle damage, dynamics analysis, and the Dynamics Diagram were used as the basis for the calculations. The time-position calculations were based on the equations of motion with constant velocity and constant acceleration.
CALCULATIONS

Time-Position Analysis (continued)

DISTANCE REQUIRED TO STOP VEHICLE 2 (COMBINATION)

The distance Vehicle 2 (Combination) needed to stop from a calculated minimum velocity of 72.70 feet per second was calculated. The adjusted tire/roadway coefficient of friction of 0.582 was used ($f_2 = 0.582$).

\[
d_{\text{brake}} = \frac{V^2}{2gf}
\]

\[
d_{\text{brake}} = \frac{72.70^2}{2(32.2)(0.582)}
\]

\[
d_{\text{brake}} = 141.01 \text{ feet}
\]

It would take the driver of Vehicle 2 (Combination) approximately 141 feet to stop from a calculated minimum speed of approximately 50 miles per hour.

The total perception and response time for the driver of Vehicle 2 (Combination) was calculated. A baseline perception and response time of 1.5 seconds was utilized, as well as an average mechanical lag time of 0.50 seconds that would be consistent with the brake system found on Vehicle 2 (Combination).

\[
t_{\text{total PR}} = t_{PR} + t_{\text{lag}}
\]

\[
t_{\text{total PR}} = 1.5 + 0.50
\]

\[
t_{\text{total PR}} = 2.0 \text{ seconds}
\]

The total perception and response time for the driver of Vehicle 2 (Combination) was approximately 2.0 seconds.
ANALYSIS AND OPINION

CALCULATIONS

Time-Position Analysis

DISTANCE REQUIRED TO STOP VEHICLE 2 (COMBINATION) (continued)

The calculated minimum velocity of approximately 72.70 feet per second ($V_{21}$) was multiplied by the total perception and response time. This calculation was performed to determine the distance traveled by Vehicle 2 (Combination) during the driver’s perception and response time.

$$d_{total \ PR} = (t_{total \ PR})(V_{21})$$

$$d_{total \ PR} = (2.0)(72.70)$$

$$d_{total \ PR} = 145.40 \text{ feet}$$

The distance traveled by Vehicle 2 (Combination) during the perception and response time for the driver of Vehicle 2 (Combination) was approximately 145 feet.

The total distance required to stop Vehicle 2 (Combination) was calculated:

$$d_{total} = d_{brake} + d_{total \ PR}$$

$$d_{total} = 141.01 + 145.40$$

$$d_{total} = 286.41 \text{ feet}$$

It would take the driver of Vehicle 2 (Combination) a total distance of approximately 286 feet to stop from a calculated minimum velocity of 72.70 feet per second (approximately 50 miles per hour).
ANALYSIS AND OPINION

CALCULATIONS

Time-Position Analysis (continued)

TIME REQUIRED TO STOP VEHICLE 2 (COMBINATION)

The time required to stop Vehicle 2 (Combination) from a calculated minimum velocity of 72.70 feet per second was calculated. The friction factor for Vehicle 2 (Combination) was a negative value as a result of the vehicle being brought to a stop.

\[ t_{\text{brake}} = \frac{V_f - V_i}{f_2g} \]

\[ t_{\text{brake}} = \frac{0 - 72.70}{(-0.582)(32.2)} \]

\[ t_{\text{brake}} = 3.88 \text{ seconds} \]

It would take the driver of Vehicle 2 (Combination) 3.88 seconds to apply the brakes of Vehicle 2 (Combination) and stop from a calculated minimum velocity of 72.70 feet per second (approximately 50 miles per hour).

The time required for the driver to stop Vehicle 2 (Combination) from a calculated minimum velocity of 72.70 feet per second was combined with the driver’s total perception and response time to obtain a total time required to stop Vehicle 2 (Combination).

\[ t_{\text{total}} = t_{\text{brake}} + t_{\text{total PR}} \]

\[ t_{\text{total}} = 3.88 + 2.0 \]

\[ t_{\text{total}} = 5.88 \text{ seconds} \]

It would take the driver of Vehicle 2 (Combination) 5.88 seconds to stop Vehicle 2 (Combination) from a calculated minimum velocity of 72.70 feet per second (approximately 50 miles per hour).
ANALYSIS AND OPINION

CALCULATIONS

Time-Position Analysis (continued)

TIME REQUIRED FOR VEHICLE 1 (RAM) TO CLEAR THE SOUTHBOUND LANE OF SOUTH BUTTONWILLOW AVENUE

The time required for the driver of Vehicle 1 (Ram) to accelerate from a stopped position behind the solid white limit line at East South Avenue, enter the intersection, and clear the southbound lane of South Buttonwillow Avenue, was calculated. A “normal” acceleration rate for a passenger vehicle was utilized, and was determined to be 4.8 feet per second$^2$. This value was obtained from Northwestern University Traffic Accident Reconstruction, page 62-38.

The distance traveled by the center of mass of Vehicle 1 (Ram) from the limit line to where the rear bumper of Vehicle 1 (Ram) cleared the southbound lane of South Buttonwillow Avenue was measured from the Dynamics Diagram, and was determined to be 40.72 feet.

\[
t_{V1} = \sqrt{\frac{2d}{a}}
\]

\[
t_{V1} = \sqrt{\frac{2(40.72)}{4.8}}
\]

\[
t_{V1} = 4.12 \text{ seconds}
\]

It would take the driver of Vehicle 1 (Ram) 4.12 seconds to accelerate Vehicle 1 (Ram) from a stopped position behind the painted white limit line of East South Avenue to a location where the rear bumper of Vehicle 1 (Ram) would clear the southbound lane of South Buttonwillow Avenue.
ANALYSIS AND OPINION

CALCULATIONS

Time-Position Analysis (continued)

DISTANCE REQUIRED BY VEHICLE 2 (COMBINATION) FOR VEHICLE 1 (RAM) TO CLEAR THE SOUTHBOUND LANE OF SOUTH BUTTONWILLOW AVENUE

The speed limit of South Buttonwillow Avenue was 55 miles per hour, and vehicles traveling on South Buttonwillow Avenue at the intersection with East South Avenue were not required to stop at the intersection. The time Vehicle 1 (Ram) needed to safely clear the southbound lane of South Buttonwillow Avenue was 4.12 seconds. The distance that Vehicle 2 (Combination) would have traversed in 4.12 seconds was calculated.

\[ V_{1\text{fps}} = \frac{V_{\text{mph}} \times 5,280 \text{ feet/mile}}{3,600 \text{ seconds/hour}} \]

\[ V_{1\text{fps}} = 55 \frac{5,280 \text{ feet/mile}}{3,600 \text{ seconds/hour}} \]

\[ V_{1\text{fps}} = 80.67 \text{ feet per second} \]

\[ d = (V_{1\text{fps}})(t_{V1}) \]

\[ d = (80.67)(4.12) \]

\[ d = 332.36 \text{ feet} \]

In order for Vehicle 1 (Ram) to safely traverse the southbound lane of South Buttonwillow Avenue, Vehicle 2 (Combination) would need to be at least 332 feet north of the intersection.

As previously calculated, the driver of Vehicle 2 (Combination) traversed 145.40 feet during his perception and response time. Vehicle 2 (Combination) deposited evidence of braking approximately 25 north of Area of Impact 1. This indicated the driver of Vehicle 1 (Ram) entered the intersection when Vehicle 2 (Combination) was approximately 170 feet north of the intersection.

The time required for the driver of Vehicle 1 (Ram) to traverse the southbound lane of South Buttonwillow Avenue (4.12 seconds), when compared to the time required by the driver of Vehicle 2 (Combination) to recognize Vehicle 1 (Ram) as an immediate hazard, apply the brakes of Vehicle 2 (Combination), and stop Vehicle 2 (Combination) from a calculated minimum velocity of 72.70 feet per second (approximately 50 miles per hour) (5.88 seconds), coupled with the distance calculations shown above, indicated the driver of Vehicle 1 (Ram) entered the intersection when Vehicle 2 (Combination) was close enough to constitute an immediate hazard.
ANALYSIS AND OPINION

AREAS OF IMPACT

AREA OF IMPACT 1: VEHICLE 2 (COMBINATION) VERSUS VEHICLE 1 (RAM)

This area of impact occurred within the intersection of South Buttonwillow Avenue and East South Avenue.

The area where the front of Vehicle 2 (Combination) struck the left side of Vehicle 1 (Ram) was located approximately 10 feet east of the west road edge prolongation of South Buttonwillow Avenue and 14 feet south of the north road edge prolongation of East South Avenue.

This area of impact corresponded with Total Station coordinates 6.627 feet East and 124.601 feet North.

This area of impact was determined by the following:

1. The dynamics analysis.
2. The damage to Vehicle 1 (Ram) and Vehicle 2 (Combination).
3. The location of physical evidence items 14, 21, 24 (tire friction marks), and item 25 (fluid trail).
ANALYSIS AND OPINION

AREAS OF IMPACT

AREA OF IMPACT 2: VEHICLE 1 (RAM) VERSUS CHAIN LINK FENCE

The area where the rear bumper of Vehicle 1 (Ram) struck the chain link fence located south of the intersection of South Buttonwillow Avenue and East South Avenue was located approximately 26 feet east of the east pavement edge of South Buttonwillow Avenue and 97 feet south of the south road edge prolongation of East South Avenue.

This area of impact corresponded with Total Station coordinates 55.263 feet East and 16.871 feet North.

The area of impact was determined by the following:

1. The dynamics analysis.
2. The damage to Vehicle 1 (Ram).
3. The location of physical evidence items 32 and 56 (tire friction mark), and item 51 (damaged chain link fence).
CONCLUSIONS

FINDINGS

The following conclusions were made as a result of this investigation:

- The posted speed limit for South Buttonwillow Avenue was 55 miles per hour. Traffic on northbound and southbound South Buttonwillow Avenue were not required to stop at the intersection with East South Avenue.

- The traffic controls at the intersection of South Buttonwillow Avenue and East South Avenue were visible to motorists approaching from the west, and in good condition.

- It was daylight at the time of the collision. The location of the sun was not a factor to either party in this collision.

- Visibility at the time of the collision was approximately ten miles.

- The roadways approaching the intersection were straight, flat, and in good condition, with no sight restrictions between Vehicle 1 (Ram) and Vehicle 2 (Combination).

- The mechanical inspection of Vehicle 2 (Combination) did not reveal any preexisting mechanical conditions which would have affected the functionality of Vehicle 2 (Combination) upon the highway.

- There were six occupants in Vehicle 1 (Ram) at the time of the collision, however only the driver of Vehicle 1 (Ram) and Passenger 2 (Shackelford) were utilizing the occupant restraints.

- The majority of the restraints in Vehicle 1 (Ram) were not readily available for use by the passengers of the vehicle. The major components of the restraints were either under or behind the passenger seats, and appeared to have been in that condition for some time.

- Passenger 5 (Guadarrama) was ejected from Vehicle 1 (Ram).

- Vehicle 1 (Ram) sustained major damage as a result of this collision.

- Vehicle 2 (Combination) sustained moderate damage as a result of the collision.

- Vehicle 2 (Combination) was traveling at a minimum speed of approximately 50 miles per hour at the time of the impact.

- Party 2 (Oh) began braking Vehicle 2 (Combination) approximately 25 feet north of Area of Impact 1.
CONCLUSIONS

FINDINGS (continued)

- Vehicle 2 (Combination), traveling at a minimum speed of 50 miles per hour, would have required a braking distance of approximately 141 feet to stop.

- Given the posted speed limit on South Buttonwillow Avenue, in order for Vehicle 1 (Ram) to safely traverse the southbound lane of South Buttonwillow Avenue, Vehicle 2 (Combination) would have needed to be at least 332 feet north of the intersection.

- The driver of Vehicle 1 (Ram) entered the intersection when Vehicle 2 (Combination) was approximately 170 feet north of the intersection.

- The physical evidence and calculations, coupled with the statement evidence documented in CHP Fresno Area Traffic Collision Report 9435-2016-2473, indicated the proximity of Vehicle 2 (Combination) with respect to Vehicle 1 (Ram) was close enough to constitute an immediate hazard, when the driver of Vehicle 1 (Ram) entered the intersection.
CONCLUSIONS

VIOLATIONS OF LAW

The following violations of law were determined:

1. Party 1 (Finnell) was in violation of California Vehicle Code §21802 (a), which states:

   The driver of any vehicle approaching a stop sign at the entrance to, or within, an intersection shall stop as required by Section 22450. The driver shall then yield the right-of-way to any vehicles which have approached from another highway, or which are approaching so closely as to constitute an immediate hazard, and shall continue to yield the right-of-way to those vehicles until he or she can proceed with reasonable safety.

   This violation was evidenced by the location of the physical evidence within the intersection, the location of physical evidence item 7 (tire friction mark), the statement of Witness 2 (Lara), the damage sustained by Vehicle 1 (Ram) and Vehicle 2 (Combination).

2. Party 1 (Finnell) was in violation of California Vehicle Code §27315 (d)(1), which states in part:

   A person shall not operate a motor vehicle on a highway unless that person and all passengers 16 years of age or over are properly restrained by a safety belt.

   This violation was evidenced by the condition and location of the occupant restraints in Vehicle 1 (Ram).

3. Passenger 1 (Christman), Passenger 3 (Cruz), Passenger 4 (VanMeter), and Passenger 5 (Guadarrama) were in violation of California Vehicle Code §27315 (e), which states in part:

   A person 16 years of age or over shall not be a passenger in a motor vehicle on a highway unless that person is properly restrained by a safety belt.

   These violations were evidenced by the condition and location of the occupant restraints in Vehicle 1 (Ram), and the ejection of Passenger 5 (Guadarrama) from Vehicle 1 (Ram).