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PRELIMINARY COLLISION RECONSTRUCTION REPORT

Conducted for the El Dorado County District Attorney's Office

May 31, 2023, Major Injury Traffic Collision
Pollock Pines, California

Case No: 63231097

August 21, 2023

Because Quality Reconstruction Is No Accident



RW SNOOK & COMPANY
RECONSTRUCTION SERVICES, LLC

August 21, 2023

District Attorney Vern Pierson, Esq.
Deputy District Attorney Mike Pizzuti, Esq.
El Dorado County District Attorney's Office
778 Pacific Street
Placerville, CA 95667

RE: May 31, 2023, Ford van vs. pedestrians collision in Pollock Pines
RWS Co. Case No: 63231097

Dear Sirs,

Pursuant to your request, we have completed our preliminary analysis and reconstruction of the May 31, 2023, traffic collision that occurred on Pony Express Trail, east of Willow Street, in the town of Pollock Pines, California. Specifically, the traffic collision involved a 2009 Ford E150 cargo van that was traveling west on Pony Express Trail when it struck four children that were crossing the roadway within a marked crosswalk. The children were part of much larger group of children and adults who were crossing Pony Express Trail from south to north.

As part of our investigation, we have reviewed the following material:

1. Closed Circuit Television (CCTV) video surveillance footage from externally-fixed cameras located on the 50 Grand Restaurant and Bar.¹
2. CCTV video surveillance footage from an externally-fixed camera located on the Burger Barn restaurant.²

As part of our continuing investigation, we have completed the following investigative activities:

1. An assessment of the general collision site and surrounding environment was completed during daylight hours on June 4, 2023. The site assessment included:
 - Completion of multiple 3D scans of the site using a FARO Focus 150HD scanner. FARO Scene software was utilized to register the individual scan stations to produce a 3-dimensional model of the site and surrounding environment.

¹ 6401 Pony Express Trail, Pollock Pines, CA. 95726

² 6404 Pony Express Trail, Pollock Pines, CA. 95726



- A topographic and forensic site survey was completed using a Trimble S7 TSSI system that included a TSC3 data collector and MT1000 Multi-track active prism target.
 - An Autel EVO II ProV3 sUAS (small Unmanned Aerial System) drone was utilized to document the crash site and surrounding environment features from elevated positions. The individual digital pictures recorded by the drone were rendered into a scaled orthomosaic³ image of the scene using Pix4D⁴ software.
 - Approximately 369 photographs of the collision site were taken using a Nikon D3500 SLR camera.
 - Five videos of the collision site were recorded using a Sony HDR-XR150 camcorder.
 - Six drive-thru videos were recorded from a moving vehicle traveling west on Pony Express Trail through the traffic collision site between 10:39 am and 2:49 pm. The drive-thru videos were obtained using a Sony HDR-AZ1 mini-cam system affixed to the test vehicle's windshield.
1. An assessment of the 2009 Ford E150 3-door cargo van was conducted on June 13, 2023, at the Extreme Towing impound facility in Placerville. The vehicle assessment included:
 - Completion of multiple 3D scans of the Ford using a FARO Focus 150HD scanner. FARO Scene software was utilized to register the individual scan stations to produce a 3-dimensional model of the vehicle.
 - Approximately 193 photographs of the Ford were taken using a Canon T6 SLR camera.
 - Ten videos of the Ford van were recorded using a Sony HDR-XR150 camcorder. The video captured the overall condition of the Ford, the collision related damage to the front of the vehicle, and forward visibility testing.
 - California Highway Patrol (CHP) personnel weighed the Ford van once our initial examination and testing was completed. The weight of the Ford was determined to be approximately 5,500 pounds.

³ An orthomosaic is a photogrammetrically orthorectified image product from a specific collection of images, where the geometric distortion has been corrected and the imagery has been color balanced to produce a seamless mosaic dataset.

⁴ Pix4D program – version 4.7.5



Collision Event Overview

On the morning of May 31, 2023, two female adults were escorting 19 children and a dog along the south shoulder of Pony Express Trail. The group was reportedly walking westerly along the roadway from the Pine Top Montessori school to a playground at a local church.⁵ The group walked west to a marked crosswalk located approximately 80 feet east of the intersection with Willow Street so they could cross from the south side to the north side of Pony Express Trail. At approximately 10:41 am the adult female leading the group arrived at the crosswalk where she momentarily stopped on the south shoulder and halted the children immediately behind her. At this same point in time the trailing adult female was still walking across the Burger Barn parking lot following the rest of the children. The lead female was observed to turn around (away from) the roadway toward the children immediately behind her. After a short pause, the lead adult female began to walk forward (north) into the roadway while holding the hand of a male child and the dog's leash. Trailing a few feet behind the lead adult female were two male children (who are holding hands) followed closely by two female children (also holding hands). This initial group was walking closely together in pairs as they crossed the roadway in the marked crosswalk. The next group of children were trailing the first group by approximately 10 feet.

Approaching the crosswalk from the east was a 2009 Ford E150 3-door cargo van traveling west on Pony Express Trail. For unknown reason(s) the driver of the van did not observe the pedestrians crossing the roadway ahead of him walking from his left to his right. The lead adult female, dog, and five children, who were all still walking north in the crosswalk, had just crossed into the westbound travel lane when they began to run toward the north shoulder. The lead adult female, dog, and the male child she was holding on to, cleared the travel lane and escaped being struck by the Ford van. The two male children had just crossed onto the north shoulder (still in the crosswalk) when they were struck by the front of the Ford. Virtually simultaneously the two female children were struck by the left front of the Ford. The force of the impact propelled both boys westerly onto the north shoulder where they slid to their points of rest. The two girls were knocked to the ground and came to rest generally in the westbound travel lane; one in the crosswalk and one just west of the crosswalk.

The driver of the Ford brought the van to a stop on the north shoulder of Pony Express Trail west of the crosswalk. The Ford driver exited the vehicle and ran east to the two girls who were laying in the roadway within/near the crosswalk. The Ford driver apparently incorrectly placed the van's transmission in 'Reverse' rather than 'Park' because the vehicle began traveling rearward (easterly) shortly after the driver exited the vehicle. The Ford traveled back through the crosswalk area where the open driver's door struck the Ford driver in his back as he knelt at the side of an injured female child. The driver then chased after the eastbound van and, with the assistance of an uninvolved man, brought the van to a stop.

⁵ Pollock Pines Community Church, 6361 Pony Express Trail, Pollock Pines



Use of “Approximate” for Times, Measurements, etc.

All times, speeds, and measurements referenced in this report are approximate, unless otherwise indicated. Vehicle-based directional references are oriented from the driver’s seat looking forward.

Site Assessment

The site assessment identified specific reference points, highway and environmental features, and the location of the video surveillance cameras. These items and the surrounding environment were documented and measured utilizing the equipment as outlined above. The TSSI survey and aerial drone imagery allowed for the creation of scale diagrams utilizing AutoCAD drawing software (the various scale diagrams are exhibited in the Annex section). A sample of the drone orthomosaic is shown below:



Drone Orthomosaic Photograph

The speed limit for Pony Express Trail was posted at 35 mph within the area of the collision. A speed limit sign for westbound Pony Express Trail was located 355 feet east of the marked crosswalk where this incident occurred. A black and yellow pedestrian crossing warning sign was posted for westbound traffic 512 feet east of the crosswalk. Roadway markings indicating “PED” and “XING” were painted on the pavement within the westbound lane beginning 510 feet east of the crosswalk (refer to the following photographs and the Collision Environment Diagrams in Annex A).



Photo #0072 (cropped)

The following images are scene captures taken during video recorded drive through testing we completed on the morning of June 4, 2023. At 10:42 am the sun was positioned southeasterly of the incident location. The many large trees located along the south side of Pony Express Trail created shadows that extended into the westbound travel lane in the area where the “PED” and “XING” markings were painted on the pavement.



Screen Capture from Drive-thru video “63231097 DT Video 1042 Hrs”



Screen Capture from Drive-thru video "63231097 DT Video 1042 Hrs"

The westbound lane of Pony Express Trail is relatively tangent from the intersection with Sly Park Road with a slight left horizontal curve located between Hub Street and the crosswalk where the collision occurred.

The general topography of the terrain east of the collision site had an elevation gain from east to west. The elevation of the westbound travel lane of Pony Express Trail increased 16 feet along the final 513 feet approaching the area of impact, which equates to a +3.1% vertical curve (ascending grade). A scale profile diagram was created to graphically illustrate the change in elevation and a westbound driver's line-of-sight toward the crosswalk (refer to Profile Diagram in Annex B).

Collision History

The collision history for Pony Express Trail was obtained through an inquiry of the SWITRS database.⁶ SWITRS records showed 16 traffic collisions were reported to have occurred on Pony Express Trail between Oak Street and Forebay Road in the ten years prior to this collision.⁷ Of the 16 reported collisions, only one was a vehicle vs pedestrian type crash. The documented vehicle vs pedestrian collision occurred April 13, 2017, on westbound Pony Express Trail just west of the intersection with Forebay Road; 800 feet east of the location of the May 31, 2023, collision under analysis in this report.

⁶ SWITRS – Statewide Integrated Traffic Records System, maintained by the California Highway Patrol.

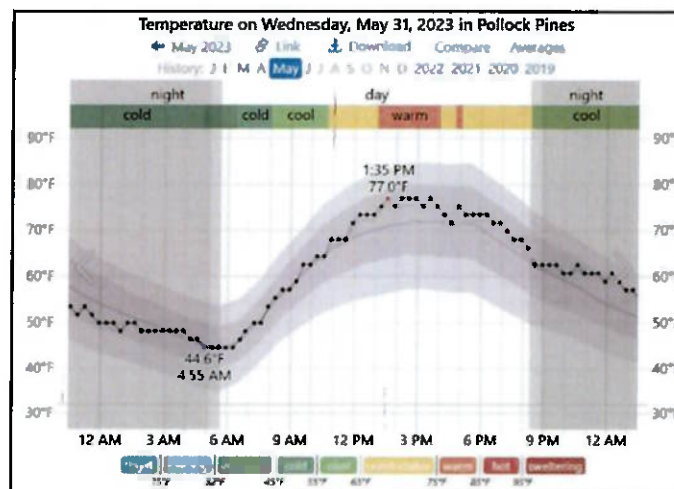
⁷ The SWITRS history was from June 1, 2013, through June 1, 2023



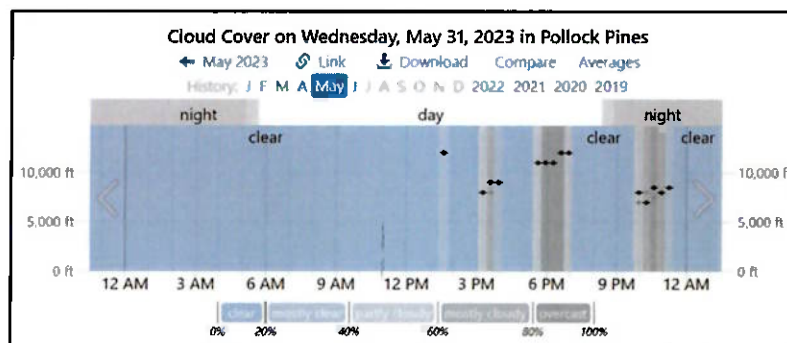
Weather and Lighting Assessment

A weather and lighting assessment for Pollock Pines, California was conducted using www.weatherspark.com and www.suncalc.org. The traffic collision occurred at 10:42 am on May 31, 2023.

- The temperature between 10:35 and 10:55 am ranged between 64 to 68 degrees (F).

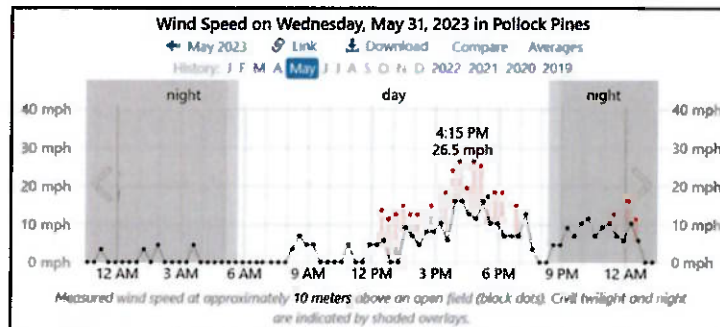


- The sky was clear with no cloud cover during the morning hours.





- Wind speeds were from 0 to 4.6 mph (SW) during the morning hours.



- Sunrise was 5:39 am, with culmination⁸ at 1:00 pm. At 10:42 am, the sun was at an altitude⁹ of 56.11 degrees and an azimuth¹⁰ of 109.59 degrees. The position of the sun would be behind and to the left of a westbound driver as noted in the following graphics:



Screen Capture from 10:42 am Drive-thru video "63231097 DT Video 1042 Hrs"

⁸ Culmination is the moment when over the course of a day the sun reaches its highest point

⁹ Altitude is the angle between the horizon and the center of the sun

¹⁰ Azimuth is the angle between the meridional plane of the earth and the vertical plane of the sun



Vehicle Assessment

An assessment of the Ford E150 3-door cargo van was conducted on June 13, 2023, at the Extreme Towing impound facility. Minor pre-existing external damage was observed around the entire van. Collision related contact and induced damage, consistent with the impact with the two male children, was observed to the plastic bezel surrounding the right front amber parking light and the plastic front grille in the area of the *Ford* emblem (refer to the yellow circles in the following photograph). Blood smears were observed to the left side of the van near the trailing edge of the driver's door.



Photo #4604

The Ford van involved in this incident was equipped with an airbag control module (ACM)¹¹ that controlled the functions of various supplemental restraint systems (SRS) within the vehicle (airbags, seat belt pretensioners, etc.). In addition to its primary function of crash detection, the ACM installed in the Ford was equipped with an Electronically Erasable Programmable Read Only Memory (EEPROM), commonly referred to as an Event Data Recorder (EDR). The EDR function is used to preserve (record) operating data, including collision severity information, and restraint device deployment data. If collision related data was stored in the ACM EDR, it may be retrievable utilizing proprietary hardware and software of the Bosch Crash Data Retrieval (CDR) System.

¹¹ Ford refers to the ACM's installed in their vehicles as Restraint Control Modules, or RCM's



Our licensed Bosch CDR System was connected directly to the Ford's under-dash SAE J1962 Data Link Connector (DLC) utilizing the appropriate cable (#F-00K-108-287). No adapter(s) were required for this year and model Ford van. Once all CDR connections were made, the Ford's ignition was changed to the "run" position which activated the vehicle's electrical system. The ACM EDR was successfully imaged in the approved manner. The complete data record generated by the CDR system is attached to this report in Annex C.

As noted on the first page of the CDR report, the ACM / EDR in the Ford van did not record a collision event.

Visibility Assessment

During the inspection of the Ford, a series of 12 and 18-inch orange traffic cones were placed at three-foot-intervals in front of the stationary vehicle. The furthest pair of cones were located 21 feet ahead of the Ford's front bumper.



Screen Capture from video "63231097 Ford Frontal Damage"



Video footage was recorded from the driver's seat of the Ford looking forward through the van's windshield using a Sony HDR-XR150 video camera held at eye height of a 5-foot 9-inch-tall male.¹² VideoMach video editing software was used to separate the video into individual still-frames. The following frame represents the general view from the driver's seat of the Ford looking forward directly ahead of the van:



VideoMach Image A14.PNG

Line-of-sight visibility assessments were completed at the collision site during the morning hours of June 4, 2023, utilizing video and still photography. The area where the crosswalk traversed Pony Express Trail was easily visible to a westbound driver for a considerable distance due to the tangent alignment of the roadway and the ascending grade toward the collision site.



Google Earth Pro Image (view toward the west from east of Forebay Road)

¹² Refer to video '63231097 Ford LOS Forward 2'



The following image represents the forward view of a driver traveling west on Pony Express Trail from a location 525 feet east of the crosswalk where the pedestrians were crossing the roadway.



Screen Capture from Drive-thru video "63231097 DT Video 1042 Hrs"

Imaged was recorded at 10:42 am on June 4, 2023

The yellow circle highlights a 30-inch traffic cone that was located at the crosswalk

The corresponding view from the pedestrians vantage point is shown in the following image.



Screen Capture from scene video "63231097 Site 3"

View is toward the east from the south shoulder of Pony Express Trail



Surveillance Video Assessment

50 Grand Restaurant and Bar:

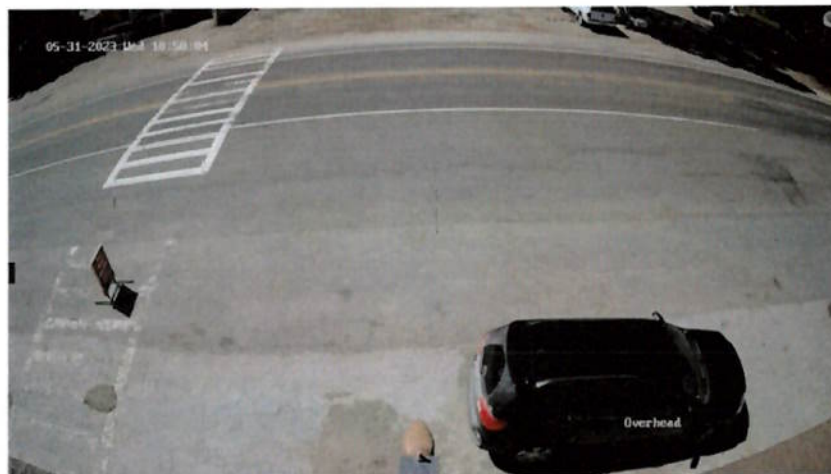
During the site assessment on June 4, 2023, we met with Jim and Kimberly McCarthy who own and operate the 50 Grand Restaurant and Bar located on the northeast corner of the intersection of Pony Express Trail and Willow Street. They confirmed their CCTV surveillance system had captured the traffic collision from four externally-mounted cameras located at the front and west side of the restaurant. Furthermore, they provided us with direct copies of the surveillance videos.

The CCTV system was a LaView Network Video Recorder, model LV-N99xx. While looking at a live view on the monitor screen, the date stamp was accurate but the time stamp was 12-minutes and 4-seconds faster than actual time.

The system used the High Efficiency Video (H.265) Codec with a frame rate of 15 frames per second and converted the videos to the MP4 container.

The four cameras were:

- CH02: Mounted at the top of the restaurant near the roofline capturing a southerly view of Pony Express Trail and the crosswalk
 - ch02_20230531105002.MP4
 - ch02_20230531105245.MP4





- CH03: Mounted above the entrance to the restaurant with a southerly view of the area in front of the door
 - ch03_20230531105245.MP4
 - ch03_20230531114604.MP4



- CH21: Mounted at the front of the restaurant near the eastern-most door with a westerly view of the area directly in front of the building
 - ch21_20230531105245.MP4
 - ch21_20230531105251.MP4
 - ch21_20230531105838.MP4
 - ch21_20230531112115.MP4
 - ch21_20230531114400.MP4





- CH24: Mounted at the east side of the restaurant with a southerly view of the area and Pony Express Trail
 - ch24_20230531105245.MP4
 - ch24_20230531105251.MP4
 - ch24_20230531110724.MP4
 - ch24_20230531112947.MP4



Burger Barn Restaurant:

On June 30, 2023, El Dorado County District Attorney's Office Investigator Jim Applegate delivered video file ch03_20230531104000.MP4 to us. The video was captured by a CCTV surveillance system from the Burger Barn restaurant located along the south edge of Pony Express Trail and east of the intersection with Willow Street. The externally-mounted camera captured video of the traffic collision. The Burger Barn restaurant CCTV system used the Advanced Video Codec with a frame rate of 30 frames per second and converted the video to the MP4 container.





VideoPad video editor software¹³ was used to trim two of the surveillance videos for ease of analysis purposes:

- Video file ch02_20230531105002.MP4 (from the 50 Grand Restaurant and Bar) was trimmed to a 37 second video segment (from video time stamp 10:53:19 to 10:53:56).
- Video file ch03_20230531104000.MP4 (from the Burger Barn restaurant) was trimmed to a 31 second video segment (from video time stamp 10:42:44 to 10:43:15).

The trimmed video segments were then uploaded to VideoMach video editing software¹⁴ and separated into individual frames. The individual frames were used to locate specific relationships of known fixed objects to the locations of the van and pedestrians as observed in the various surveillance videos. The determined positions / locations were plotted on the scaled diagrams. Time intervals were determined from the individual video frames with corresponding travel distances measured from the scale diagrams.

A diagram was produced depicting the general camera field of views from both the 50 Grand Restaurant and Bar and the Burger Barn restaurant (refer to CCTV Camera Diagram in Annex D). A series of Dynamics Diagrams were produced to graphically depict locations, times, and distances of the Ford van and the six pedestrians (refer to Annex E).

¹³ NCH Software VideoPad Video Editor, version 13.16

¹⁴ Gromada VideoMach, version 5.15.1



Analysis:

- The Burger Barn restaurant video recorded the Ford traveled (pre-collision) 43.3 feet between two fixed points (wood support posts) in 0.8 seconds (refer to Annex F). The Ford's average speed during this segment of its pre-collision motion was calculated to be 37 mph.

D = Distance (in feet)

fps = Feet per second

mph = Miles per hour

t = Time (in seconds)

V = Velocity (in fps or mph as noted)

$$V = \frac{D}{t}$$

$$V = \frac{43.3}{0.8}$$

$$V = 54.1 \text{ fps} \approx 54 \text{ fps}$$

$$\text{mph} = \frac{\text{fps}}{1.467}$$

$$\text{mph} = \frac{54}{1.467}$$

$$\underline{\underline{36.8 \approx 37 \text{ mph}}}$$



- The Ford van traveled 68.5 feet from the point the brake lights illuminated to the vehicle's initial position of rest where it came to a complete stop. The van's effective dynamic coefficient of friction was calculated to be 0.67.

$$\begin{aligned}D &= \text{Distance (in feet)} \\f &= \text{Coefficient of friction (unitless)} \\V &= \text{Velocity (in miles per hour)}\end{aligned}$$

$$f = \frac{V^2}{30D}$$

$$f = \frac{37^2}{(30 \times 68.5)}$$

$$\underline{f = 0.66 \approx 0.67}$$

- The van traveled 22 feet from the onset of braking (illumination of brake lights) to the area of impact with the four children. The van was traveling at a calculated speed of 30 mph when it collided with the four children having decelerated from 37 mph to 30 mph over a lineal distance of 22 feet.

$$\begin{aligned}a &= \text{Acceleration (fps}^2\text{)} \\D &= \text{Distance (in feet)} \\f &= \text{Coefficient of friction (unitless)} \\g &= \text{Gravity} \\V_o &= \text{Initial Velocity (in fps)} \\V_f &= \text{Final Velocity (in fps)}\end{aligned}$$

$$\begin{aligned}a &= fg \\a &= 0.67 \times -32.2 \\a &= -21.57 \text{fps}^2\end{aligned}$$

$$V_f = \sqrt{V_o^2 + 2ad}$$

$$V_f = \sqrt{54^2 + [(2) \times (-21.57) \times (22)]}$$

$$\begin{aligned}V_f &= 44.3 \text{fps} \\V_f &= \underline{30 \text{mph}}\end{aligned}$$



- The video captured from the 50 Grand Restaurant and Bar depicted the male child wearing a black t-shirt was projected forward (west) 59 feet to his position of rest from the area of impact as a direct result of having been struck by the front of the Ford van. The impact speed of the Ford van was calculated to be approximately 30 mph by using a widely recognized forward projection formula:¹⁵

$$D = \text{Distance (in feet)}$$
$$V = \text{Velocity (in miles per hour)}$$

$$V = 2.483D^{0.61}$$

$$V = 2.483 \times 59^{0.61}$$

$$V = 29.8 \approx 30 \text{ mph (base velocity)}$$

(15th and 85th percentile +/- 4.8 mph)

Prediction interval: 25 – 35 mph

Vehicle Dynamics / Time and Position Analysis

The first pedestrians (adult female holding a child's hand and the leash for a dog) began walking north within the marked crosswalk across Pony Express Trail after being stationary for a short period of time. The adult female was closely followed by two male children holding hands (one wearing a black shirt and one wearing a red shirt) and two female children also holding hands (one wearing a blue shirt and one wearing a green shirt). Video analysis determined these six pedestrians were crossing the roadway at a general walking velocity of 3.5 feet per second.

- The analysis of the Burger Barn video determined an elapsed time of 9.6 seconds from the point the lead adult female began walking north within the crosswalk to the point where the four trailing children were struck by the Ford van.
- The six pedestrians continued to walk north across Pony Express Trail within the crosswalk and were eight seconds from impact at the point when the lead adult female and male child crossed the south edge line and stepped into the eastbound travel lane.

¹⁵ Amrit Toor, PH.D., P.ENG.; INTECH Engineering



- The Ford's brake lights illuminated for 0.5 seconds immediately prior to impact with the children while the vehicle decelerated from 37 mph to 30 mph.

a = Acceleration (fps^2)

t = Time (in seconds)

V_o = Initial Velocity (in fps)

V_f = Final Velocity (in fps)

$$t = \frac{V_f - V_o}{a}$$

$$t = \frac{44 - 54}{-21.57}$$

$$t = 0.46 \approx 0.5 \text{ seconds}$$

- Assuming a constant velocity of 37 mph (54 fps), the Ford van traveled 491 feet in the remaining 9.1 seconds prior to the onset of braking (illumination of brake lights).

D = Distance (in feet)

t = Time (in seconds)

V = Velocity (in feet per second)

$$D = Vt$$

$$D = 54 \times 9.1$$

$$D = 491 \text{ feet}$$

- The Ford van was 513 feet east of the area of impact when the lead adult female, male child, and the dog began walking north within the crosswalk across Pony Express Trail from the south shoulder.

491'	Distance traveled in 9.1 seconds at 37 mph
+ 22'	Distance traveled with brake lights illuminated
513'	Total distance



The Ford van began to cross out of the westbound travel lane and onto the north shoulder 30 feet east of the crosswalk based on its trajectory as recorded by the surveillance videos. The Ford was generally straddling the north edge line when it collided with the children as depicted on the Area of Impact Dynamics Diagram (Annex E). The two male children were struck on the north shoulder of Pony Express Trail while the two female children were struck within the crosswalk in the westbound travel lane.

- The Ford van came to its initial point of rest completely on the north shoulder of Pony Express Trail.
- Both male children were projected westerly from being struck by the front of the Ford van. The boys came to rest on the north shoulder of Pony Express Trail near the intersection with Willow Street.
- The two female children were truck and knocked downward onto the pavement by the front left of the Ford van. Both girls came to rest within the westbound lane of Pony Express Trail generally still within/near crosswalk.

Conclusions

Roadway / Environment

- The roadway environment analysis did not reveal any design features or conditions that were determined to have caused or contributed to the occurrence of this collision.
- The SWITRS collision history documented no collisions occurring at Pony Express Trail and the subject crosswalk in the prior ten years.

Vehicle

- No evidence of component / system defect(s), damage, or state(s) of disrepair were alleged or determined to have caused or contributed to the occurrence of this collision.
- The Ford's ACM did not record a collision "event" due to the minor magnitude of the impact with the small children.



Pedestrians

- On the morning of May 31, 2023, two adult females were escorting 19 children west along the south side of Pony Express Trail.
 - One adult female was leading the procession while also holding the hand of a male child and the leash to a large black dog.
 - The second adult female was trailing the group of children while holding the hands of two kids.
 - In between the two adult females were the remainder of the 16 children who were walking in pairs holding hands.
- The lead female adult halted the procession when she arrived at the south end of a marked crosswalk located just east of Willow Street.
- The lead female is observed in surveillance video to have momentarily turned away from the roadway toward the group of children before she started walking forward (north) into the marked crosswalk.
- The Ford van was 9.6 seconds and 513 feet east of the area of impact when the lead adult female began walking north across Pony Express Trail within the crosswalk.
- The Ford van was 8 seconds and 427 feet east of the area of impact when the lead adult female crossed the south edge line of Pony Express Trail and entered the eastbound travel lane
- The Ford van was 6.5 seconds and 346 feet east of the area of impact when the lead adult female crossed the center line of Pony Express Trail and entered the westbound travel lane.
- The lead female and four children directly behind her were walking at a general velocity of 2.4 mph (3.5 fps) as they crossed the roadway (before they began to run immediately prior to the collision).



Ford Van

- The Ford van was traveling west on Pony Express Trail at an estimated speed of 37 mph as it approached the crosswalk located east of Willow Street where the pedestrians were crossing.
 - The Ford van was 513 feet and 9.6 seconds east of the crosswalk (area of impact) when the lead adult female began crossing the roadway within the marked crosswalk.
 - The driver of the Ford had an unobstructed view of all 21 pedestrians crossing the roadway ahead of him based on the horizontal and vertical alignment of Pony Express Trail.
 - The position of the sun was not an issue for the Ford driver because it was behind him to his left. At the time of the collision (10:42 am) the sun was at an angle of 56.11 degrees above the horizon and at a location to the left rear of the westbound van.
- The Ford driver began braking 22 feet prior to reaching the area of impact.
 - The brakes were applied for 0.5 seconds prior to colliding with the four children.
 - The van decelerated from 37 mph to 30 mph at the time it collided with the children.
- The lead female, male child and dog were able to hurriedly get clear of the Ford's path of travel and were not struck. Two male children were struck by the front of the Ford and projected forward onto the north shoulder. Two female children were struck by the left front/side of the Ford and came to initial rest within the crosswalk and westbound lane of Pony Express Trail.
- The Ford driver continued braking and the van traveled an additional 46.5 feet from the area of impact to its initial position of rest along the north shoulder of Pony Express Trail.
 - The Ford driver failed to place the van's transmission in the 'Park' position. The Ford van began to move rearward (easterly) almost immediately upon the exit of the driver.
 - The Ford traveled in reverse easterly back through the collision scene where the open driver's door struck the Ford driver in the back as he attempted to render aid to one of the injured female children.



The above preliminary analysis and opinions are current through August 21, 2023. Our investigation and reconstruction of this event will only continue at your direction. Please forward any additional information that may become available in this matter.

Respectfully submitted,

RW Snook

CA Swift

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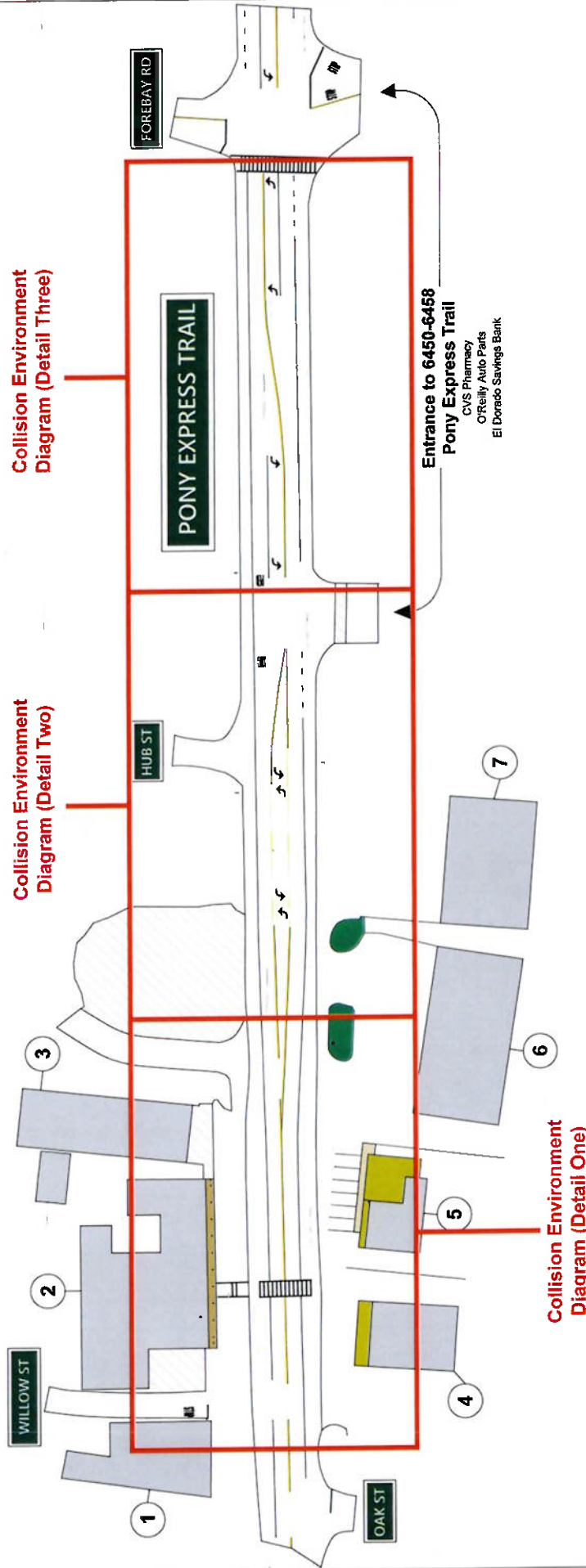


Annex A

COLLISION ENVIRONMENT DIAGRAMS

COLLISION ENVIRONMENT DIAGRAM

(Overview)



Collision Environment
Diagram (Detail Three)

Collision Environment
Diagram (Detail Two)

Collision Environment
Diagram (Detail One)

- 1 = Pony Express Shipping (6395)
- 2 = 50 Grand Restaurant and Bar (6401)
- 3 = 6411 Pony Express Trail
- 4 = 6396 Pony Express Trail
- 5 = Burger Barn (6404)
- 6 = Pollock Pines True Value Hardware (6416)
- 7 = El Dorado County Fire Protection District - Station 17 (6430)

70'
70'
Scale: 1" = 70'
0'

 RW SNOOK & COMPANY P.O. Box 1000, Oakdale, CA 95361	
COLLISION ENVIRONMENT DIAGRAM (Overview)	Pony Express Trail East of Willow Street Drawn By: C. Smith July 2023
RWS Civil Inc. 8321967	

COLLISION ENVIRONMENT DIAGRAM
(Detail One)

North

Scale: 1" = 20'

0' 20' 20'

50 Grand Restaurant and Bar

Surveillance Camera

Asphalt Concrete Cold Patch

Pony Express Trail

Bar 12, Bar 8, Bar 4, Bar 1

Bar 5, Bar 6

Burger Barn

TSSI

Legend:

- 1 = White Stop Bar
- 2 = Asphalt Concrete Seam
- 3 = White Edge Line
- 4 = Double Yellow Center Line
- 5 = Designated Pedestrian Cross Walk
- 6 = Six-Foot High Chain-Length Fence
- 7 = El Dorado County Fire Protection District - Station 17 (6430)

Willow St

STOP

Light Post

Surveillance Camera

COLLISION ENVIRONMENT DIAGRAM
(Detail One)

Pony Express Trail East of Willow Street

Drawn By: C. Smith
July 2005

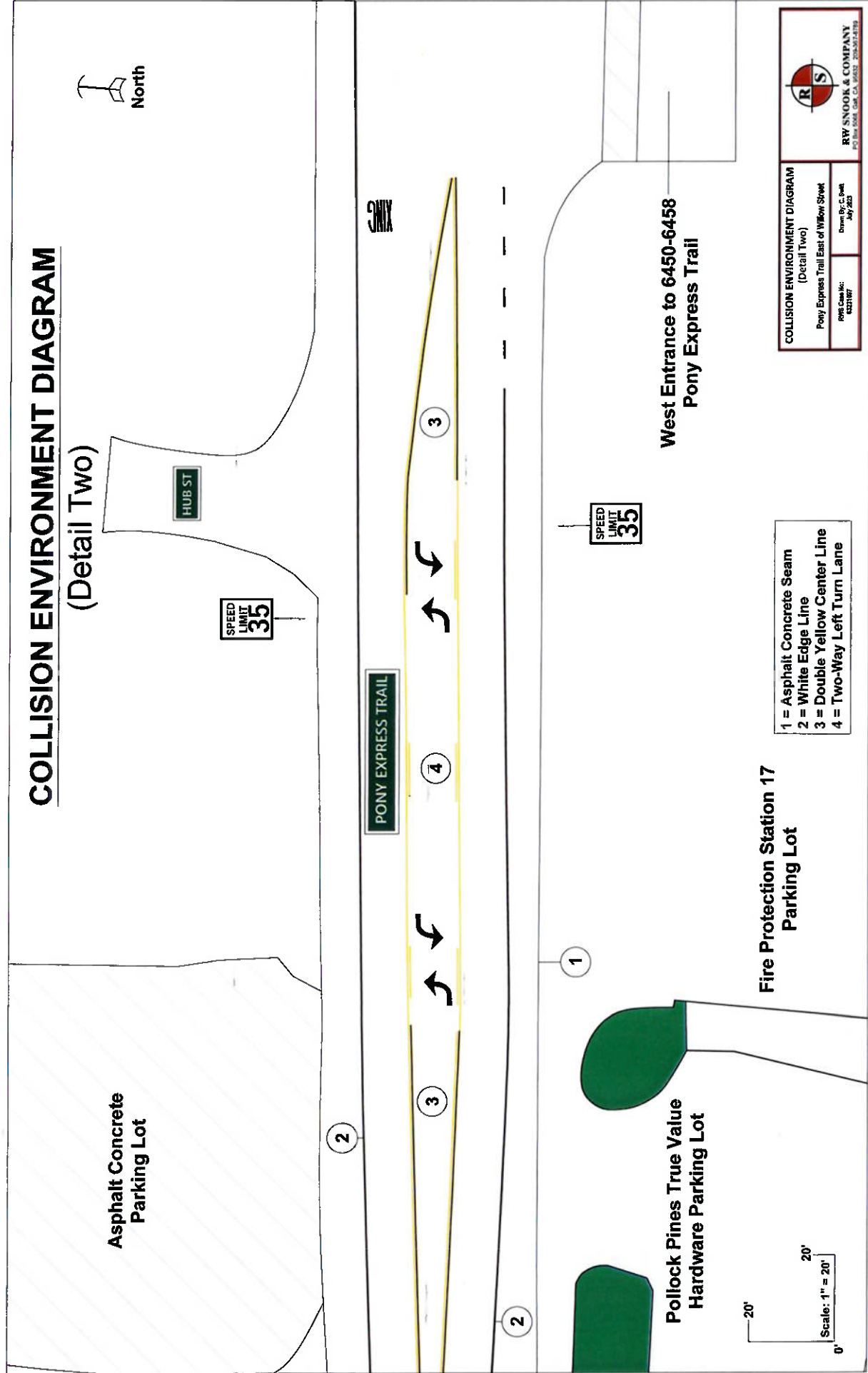
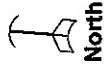
RW SNOOK & COMPANY
PO Box 1005 Oak, CA 94612 708-937-7770

- | | |
|--|--|
| COLLISION ENVIRONMENT DIAGRAM
(Detail One) | Project: Pony Express Trail East of Willow Street
Drawn By: C. Swift
Date: July 2003 |
| RIMS Case No: 5321497 | |

RW SNOOK & COMPANY
200 Blue Skies, Gar. CA 94032 209-367-8789

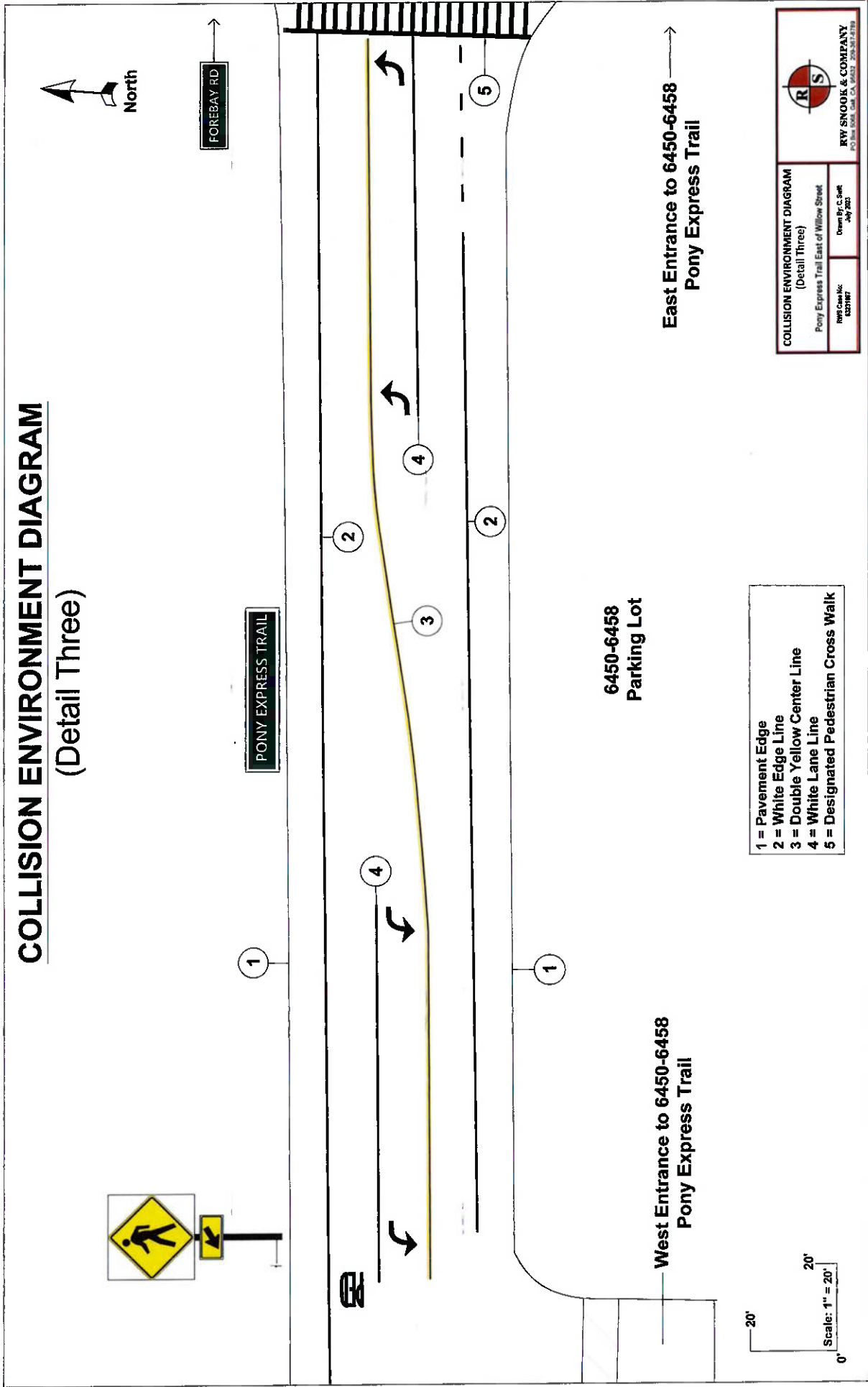
COLLISION ENVIRONMENT DIAGRAM

(Detail Two)



COLLISION ENVIRONMENT DIAGRAM (Detail Two)		 RW SNOOK & COMPANY P.O. Box 5048, Oak, CA 94632 208-367-8789
Project Name: 6450-6458	Drawn By: C. Smith July 2007	

COLLISION ENVIRONMENT DIAGRAM (Detail Three)





Annex B

PROFILE DIAGRAM

PROFILE DIAGRAM

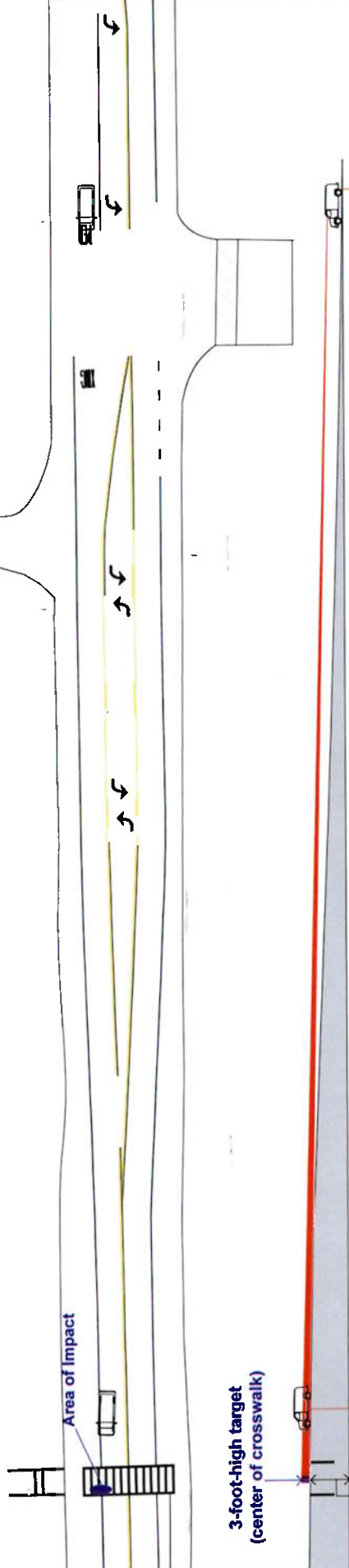
(Line of Sight)



← WILLOW ST

PONY EXPRESS TRAIL

HUB ST



3-foot-high target
(center of crosswalk)

16 feet

The van's location, 22 feet east of the AOI, when the brake lights illuminated

Westbound Pony Express Trail had a vertical rise of 16 feet (3.1%-grade) over the 513 feet

The van's location, 513 feet east of the AOI, when the first pedestrians entered the crosswalk walking north

40'
Scale: 1" = 40'
0'

PROFILE DIAGRAM (Line of Sight)	
Pony Express Trail East of Willow Street	
Map Case No: 1531942	Drawn By: S. Smith July 2020
RW SNOOK & COMPANY 100 West 50th St. Suite 200 San Jose, CA 95128	



Annex C

FORD CDR REPORT

IMPORTANT NOTICE: Robert Bosch LLC and the manufacturers whose vehicles are accessible using the CDR System urge end users to use the latest production release of the Crash Data Retrieval system software when viewing, printing or exporting any retrieved data from within the CDR program. Using the latest version of the CDR software is the best way to ensure that retrieved data has been translated using the most current information provided by the manufacturers of the vehicles supported by this product.

CDR File Information

User Entered VIN	1FTNE1EW8ADA23840
User	R. Snook
Case Number	63231097
EDR Data Imaging Date	06/13/2023
Crash Date	05/31/2023
Filename	1FTNE1EW8ADA23840_ACM.CDRX
Saved on	Tuesday, June 13 2023 at 09:43:57
Imaged with CDR version	Crash Data Retrieval Tool 23.1.1
Imaged with Software Licensed to (Company Name)	RW Snook & Company
Reported with CDR version	Crash Data Retrieval Tool 23.1.1
Reported with Software Licensed to (Company Name)	RW Snook & Company
EDR Device Type	Airbag Control Module
ACM Adapter Detected During Download	No
Event(s) recovered	None

Comments

Inspection Location: Extreme Towing, Placerville
Individuals Present: Officers Whitley, #19793, and Callaway, #18466
Observed Restraint Deployment(s): None

Vehicle Battery Status: 12.3v
Auxiliary Power Source Used: No

Tires (OEM sticker): 225/75R16
Tires (mounted): 245/75R16

Other Notes: DLC, No Adapter

This file was named using the vehicle's VIN (Vehicle Identification Number) with the "original file" identified by the *.CDRx file extension. This file should only be opened and viewed with the latest version of the Bosch Crash Data Retrieval (CDR) system software. The .CDRx file should be preserved in its native unedited format. Improper use of the file, such as attempting to view the file with a "text viewer," may corrupt the .CDRx file which may/can prevent it from being opened again in the CDR tool software. The raw data as found in the .CDRx file is a direct image (copy) of the data stored in the vehicle's modules that were accessed by the CDR software. For general viewing, please only open and view the associated *.pdf version of the file.

Recipients of this report should read the following Data Limitations section which may describe or suggest conditions and / or characteristics of the data which may be confusing or require more thorough investigation and analysis. The CDR data is not necessarily meant to be a "stand alone" reporting of the facts / nuances associated to the information obtained. For these reasons and others, I strongly advise that a situationally complete analysis of the crash event or incident under study be undertaken to fully evaluate the meaning and applicability of the recovered data found in this report.

The retrieval of this data has been authorized by the vehicle's owner, or other legal authority such as a court order or search warrant, as indicated by the CDR tool user on Tuesday, June 13 2023 at 09:43:57.

Data Limitations

Restraints Control Module Recorded Crash Events:

Deployment Events cannot be overwritten or cleared from the Restraints Control Module (RCM). Once the RCM has deployed any airbag device, the RCM must be replaced. The data from events which did not qualify as deployable events can be overwritten by subsequent events. The RCM can store up to two deployment events.

Airbag Module Data Limitations:

- Restraints Control Module Recorded Vehicle Forward Velocity Change reflects the change in forward velocity that the sensing

system experienced from the point of algorithm wake up. It is not the speed the vehicle was traveling before the event. Note that the vehicle speed is recorded separately five seconds prior to algorithm wake up. This data should be examined in conjunction with other available physical evidence from the vehicle and scene when assessing occupant or vehicle forward velocity change.

- Event Recording Complete will indicate if data from the recorded event has been fully written to the RCM memory or if it has been interrupted and not fully written.
- If power to the Airbag Module is lost during a crash event, all or part of the crash record may not be recorded.
- For 2011 Ford Mustangs, the Steering Wheel Angle parameter indicates the change in steering wheel angle from the previously recorded sample value and does not represent the actual steering wheel position.

Airbag Module Data Sources:

- Event recorded data are collected either INTERNALLY or EXTERNALLY to the RCM.
 - INTERNAL DATA is measured, calculated, and stored internally, sensors external to the RCM include the following:
 - > The Driver and Passenger Belt Switch Circuits are wired directly to the RCM.
 - > The Driver's Seat Track Position Switch Circuit is wired directly to the RCM.
 - > The Side Impact Sensors (if equipped) are located on the side of vehicle and are wired directly to the RCM.
 - > The Occupant Classification Sensor is located in the front passenger seat and transmits data directly to the RCM on high-speed CAN bus.
 - > Front Impact Sensors (right and left) are located at the front of vehicle and are wire directly to the RCM.
 - EXTERNAL DATA recorded by the RCM are data collected from the vehicle communication network from various sources such as Powertrain Control Module, Brake Module, etc.

02007_RCM-RC6_r002

System Status at Time of Retrieval

VIN as programmed into RCM at factory	1FTNE1EW8ADA23840
Current VIN from PCM	1FTNE1EW8ADA23840
Ignition cycle, download (first record)	N/A
Ignition cycle, download (second record)	N/A
Restraints Control Module Part Number	AC24-14B321-BA
Restraints Control Module Serial Number	3102313200000000
Restraints Control Module Software Part Number (Version)	9E53-14C028-AB
Left/Center Frontal Restraints Sensor Serial Number	0C75B00A
Left Side Restraint Sensor 1 Serial Number	00000000
Left Side Restraint Sensor 2 Serial Number	00000000
Right Frontal Restraints Sensor Serial Number	00000000
Right Side Restraint Sensor 1 Serial Number	00000000
Right Side Restraints Sensor 2 Serial Number	00000000

Hexadecimal Data

Data that the vehicle manufacturer has specified for data retrieval is shown in the hexadecimal data section of the CDR report. The hexadecimal data section of the CDR report may contain data that is not translated by the CDR program. The control module contains additional data that is not retrievable by the CDR system.

00 00 00 00

41 43 32 34 2D 31 34 42 33 32 31 2D 42 41 00 00 00 00 00 00 00 00 00 00

33 31 30 32 33 31 33 32 30 30 30 30 30 30 30 30

39 45 35 33 2D 31 34 43 30 32 38 2D 41 42 00 00 00 00 00 00 00 00 00 00

0C 75 B0 0A 00 00 00 00 00 00 00 00 00 00 00 00

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

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00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

31 46 54 4E 45 31 45 57 38 41 44 41 32 33 38 34 30

31 46 54 4E 45 31 45 57 38 41 44 41 32 33 38 34 30 00 00 00 00 00 00 00

[illegible]



Printed on: Tuesday, June 13 2023 at 09:45:30

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Disclaimer of Liability

The users of the CDR product and reviewers of the CDR reports and exported data shall ensure that data and information supplied is applicable to the vehicle, vehicle's system(s) and the vehicle ECU. Robert Bosch LLC and all its directors, officers, employees and members shall not be liable for damages arising out of or related to incorrect, incomplete or misinterpreted software and/or data. Robert Bosch LLC expressly excludes all liability for incidental, consequential, special or punitive damages arising from or related to the CDR data, CDR software or use thereof.



Annex D

CCTV CAMERA DIAGRAM

CCTV CAMERA DIAGRAM

(Approximate Camera Views)

50 Grand
Restaurant and Bar

WILLOW ST

STOP

PONY EXPRESS TRAIL

Burger
Barn

20'

20'

Scale: 1" = 20'

0'



	CCTV CAMERA DIAGRAM
	Pony Express Trail East of Willow Street
RWS Case No: 020187	Drawn By: C. Smith July 2022
RW SNOOK & COMPANY PO Box 2008, Oak, CA 95321 209-587-5760	



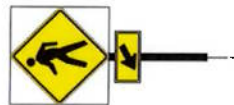
Annex E

DYNAMICS DIAGRAMS

DYNAMICS DIAGRAM

(One)

- Adult and child
- Male child in black shirt
- Male child in red shirt
- Female child in blue shirt
- Female child in green shirt



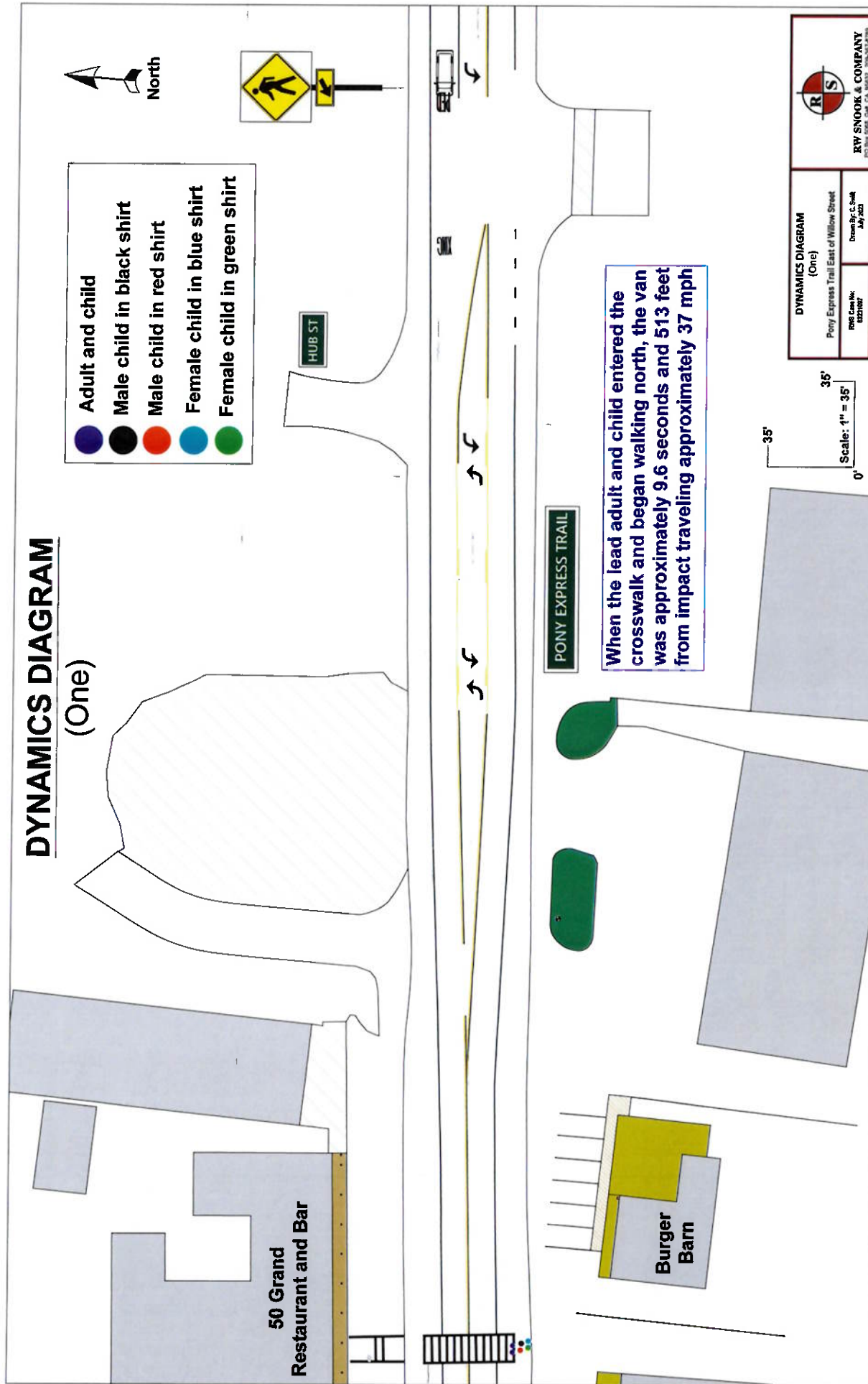
HUB ST

PONY EXPRESS TRAIL

When the lead adult and child entered the crosswalk and began walking north, the van was approximately 9.6 seconds and 513 feet from impact traveling approximately 37 mph

35'
35'
0'
Scale: 1" = 35'

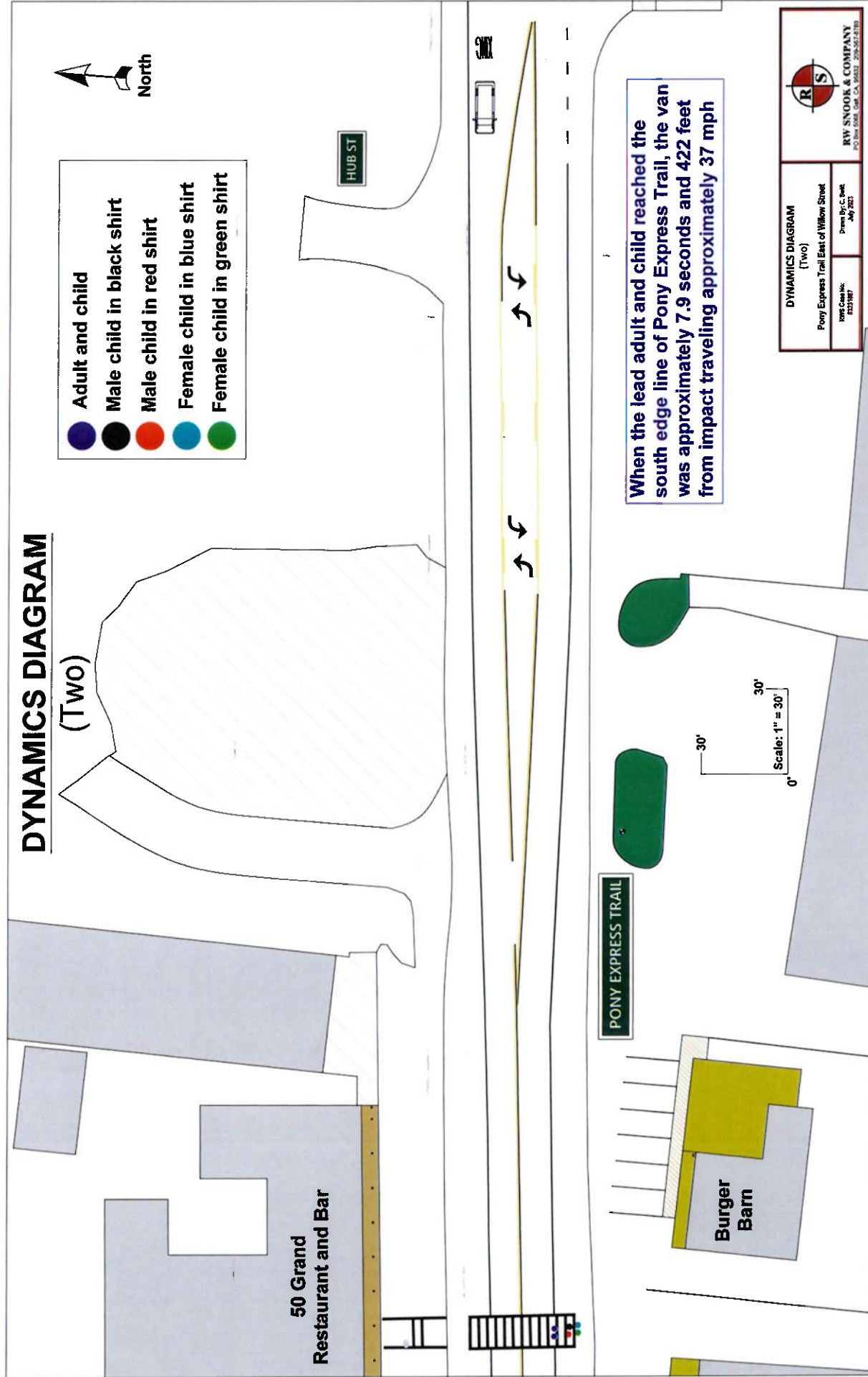
DYNAMICS DIAGRAM (One)	
Pony Express Trail East of Willow Street	
R/S Case No: 822107	Drawn By: C. Smith July 2023
R/S SNOOK & COMPANY 10000 10th Ave, CA 94024	



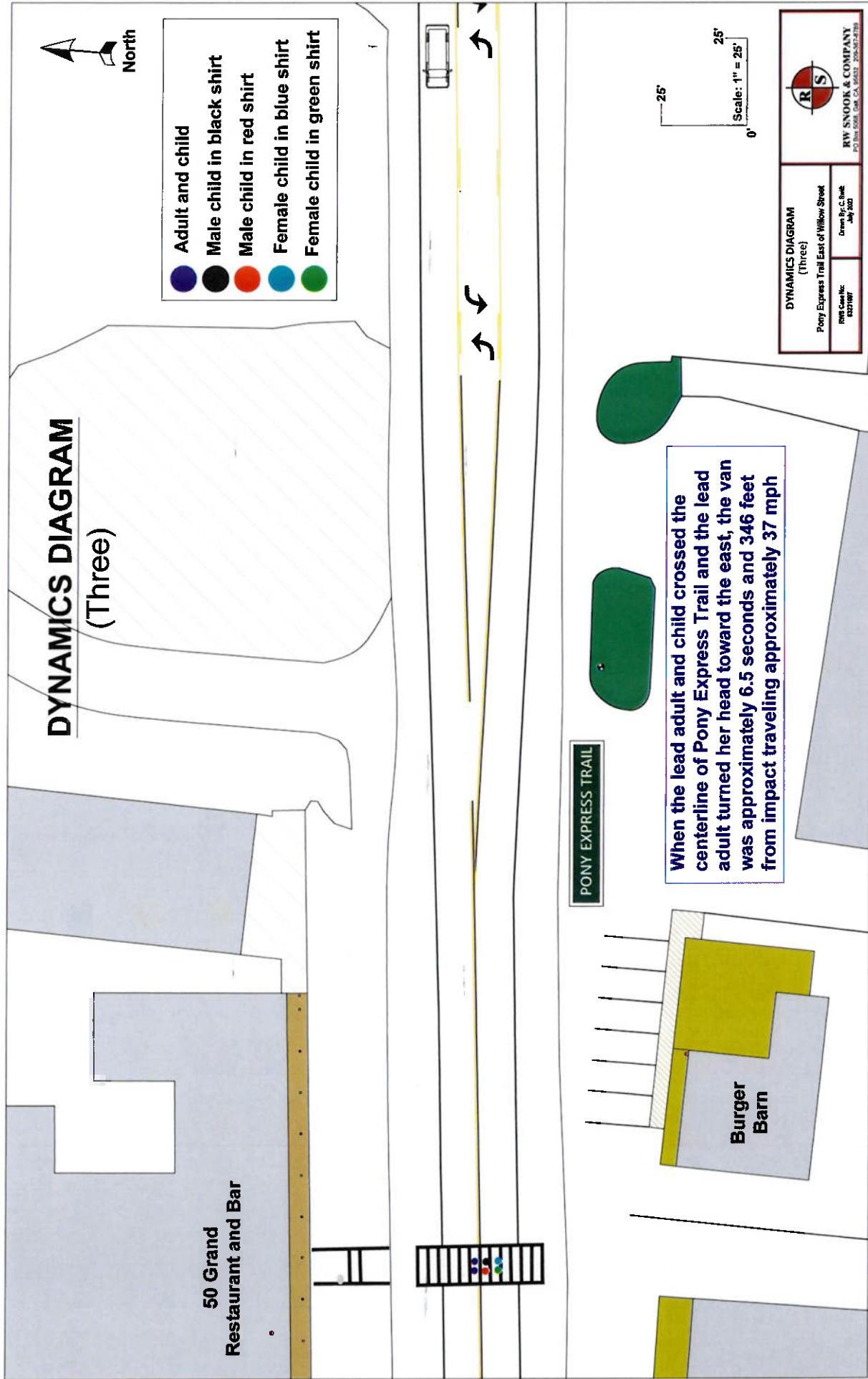
DYNAMICS DIAGRAM

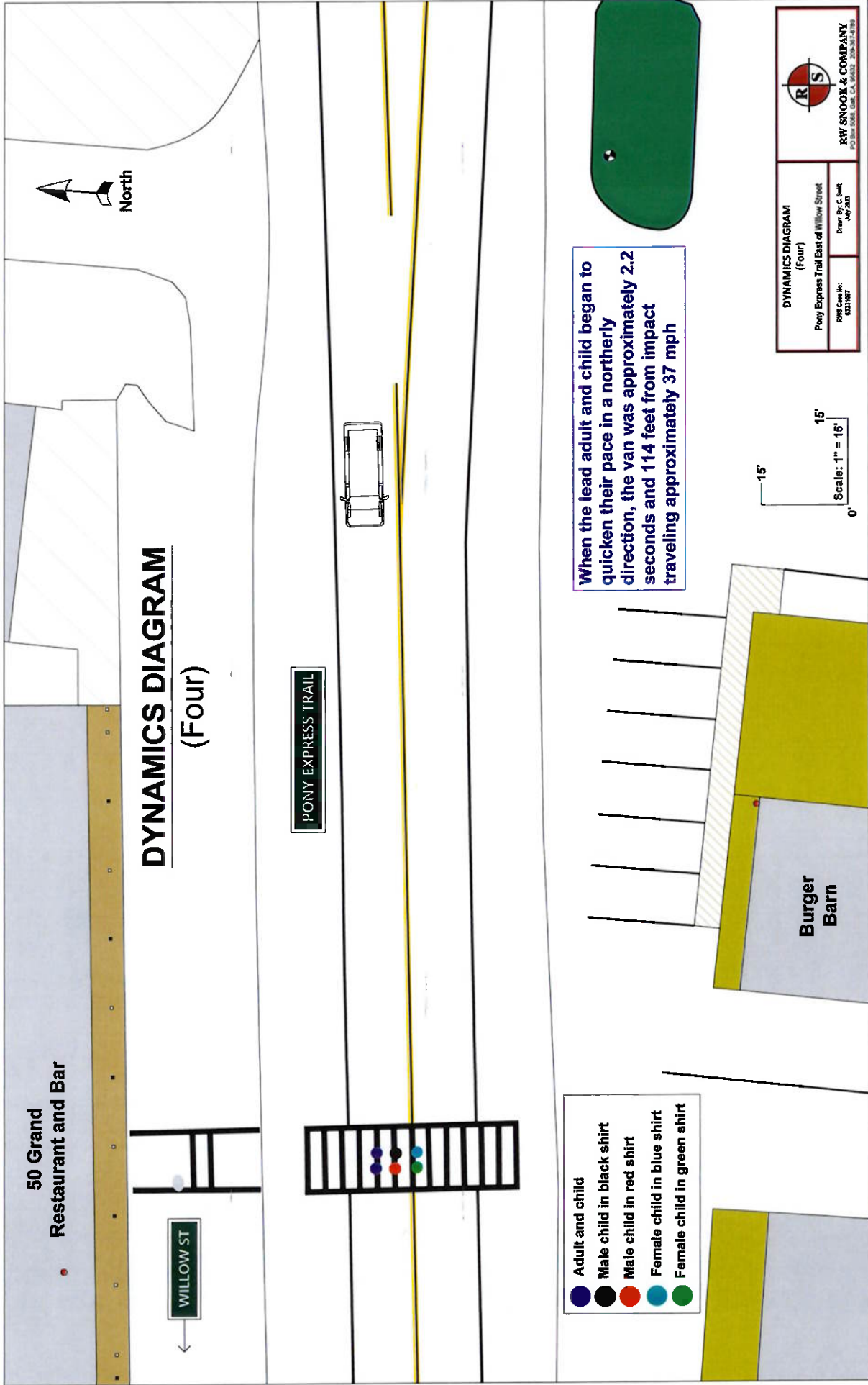
(Two)

- Adult and child
- Male child in black shirt
- Male child in red shirt
- Female child in blue shirt
- Female child in green shirt

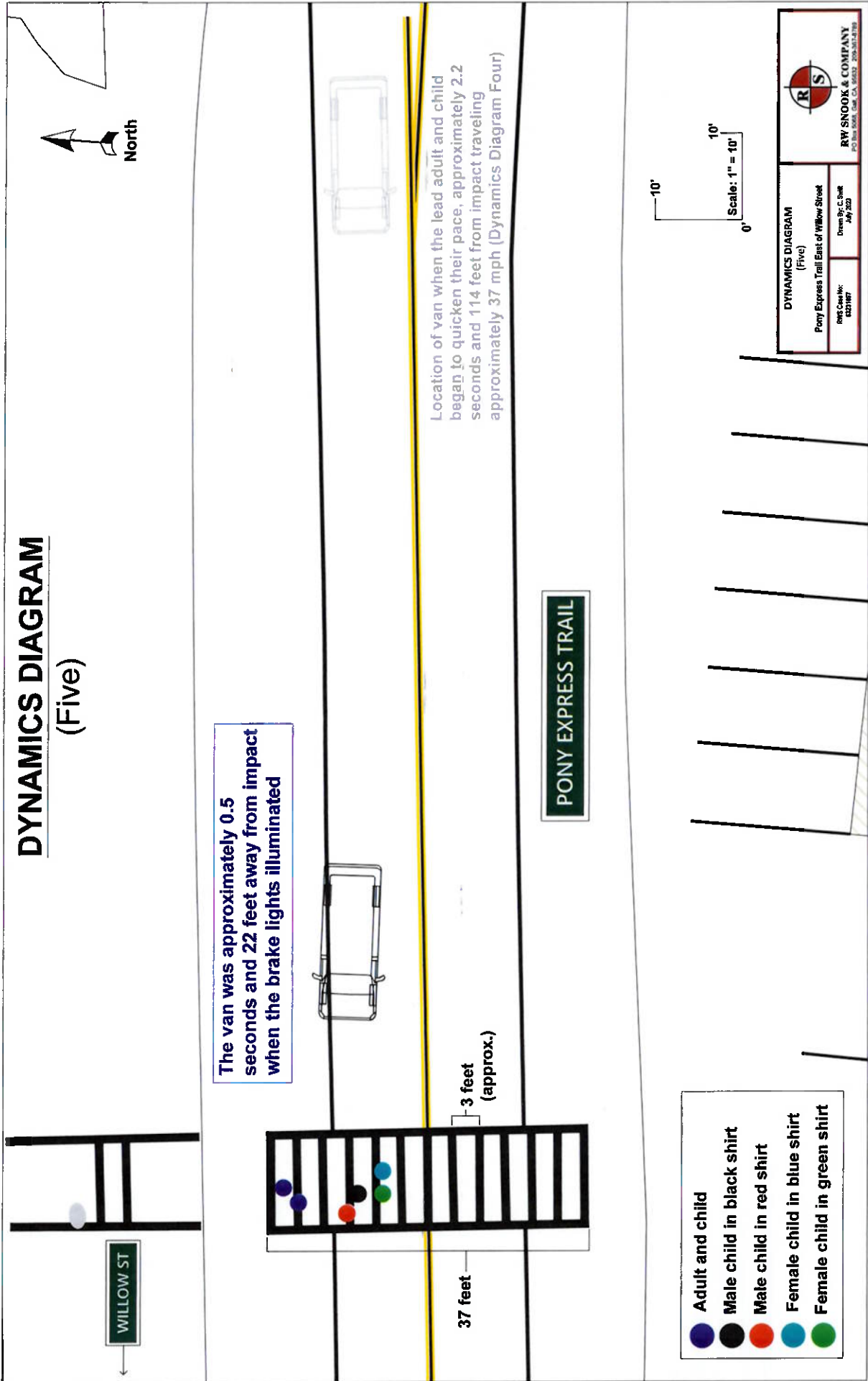


		DYNAMICS DIAGRAM (Two)
Pony Express Trail East of Willow Street		Drawn By: C. Bent July 2023
RW Snook & Company P.O. Box 5046, Oak, CA 94632 208-562-8789		





DYNAMICS DIAGRAM (Five)



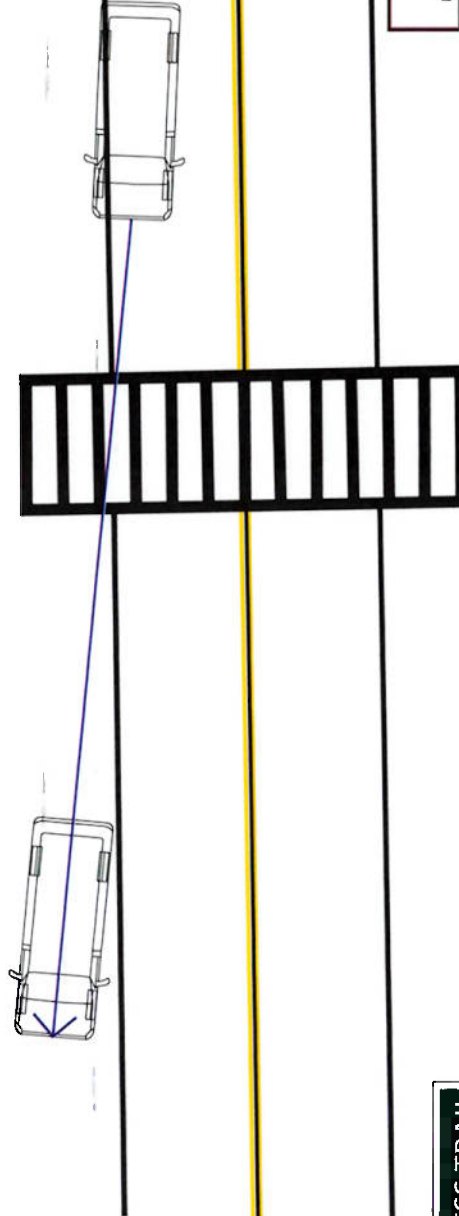
DYNAMICS DIAGRAM (Six)

WILLOW ST

10'
10'
Scale: 1" = 40'



From the point the van's brake lights illuminated (at 37 mph) to its initial position of rest, it traveled a distance of approximately 68.5 feet



PONY EXPRESS TRAIL

	
DYNAMICS DIAGRAM (Six)	
Pony Express Trail East of Willow Street Date: 7/2/2003 Drawn By: S. Smith July 2003	RW SNOOK & COMPANY P.O. Box 10000, Oak, CA 94621 206-387-8789

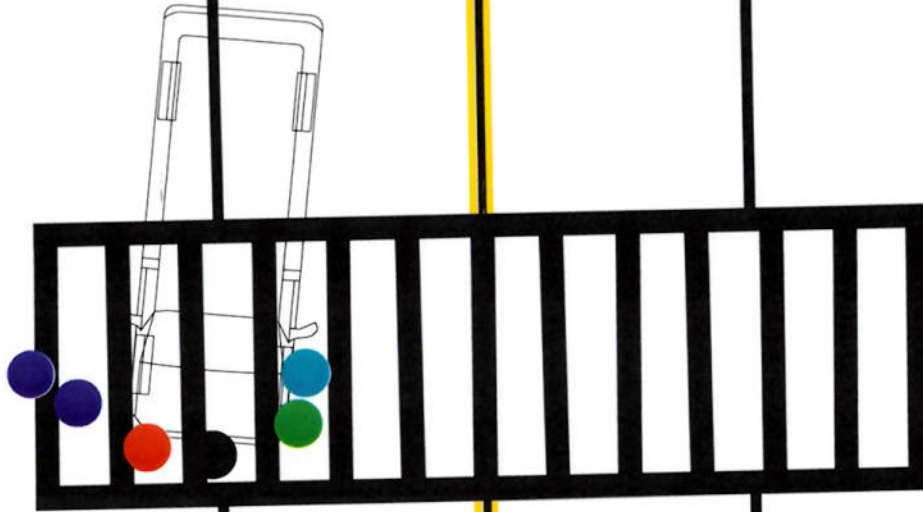
DYNAMICS DIAGRAM

(Area of Impact)

WILLOW ST
←



PONY EXPRESS TRAIL



From the point the van's brake illuminated to the Area of Impact, the van traveled approximately 22 feet and slowed from 37 mph to approximately 30 mph

- Adult and child
- Male child in black shirt
- Male child in red shirt
- Female child in blue shirt
- Female child in green shirt

5'
0' Scale: 1" = 5'

DYNAMICS DIAGRAM (Area of Impact)	
Pony Express Trail East of Willow Street	
Map Case No: 1001001	Drawn By: C. Snel July 2002

RW SNOOK & COMPANY
PO Box 5086, Oak, CA 94621 209-867-6789



Annex F

SPEED ANALYSIS DIAGRAM

SPEED ANALYSIS DIAGRAM

50 Grand
Restaurant and Bar

WILLOW ST

North

PONY EXPRESS TRAIL

The Burger Barn's CCTV camera captured the van traveling west, and south of two fixed objects (awning posts). The van traveled a distance of 43.3 feet in 0.8 seconds with an average speed of 37 mph

Burger
Barn

15'

Scale: 1" = 15'

0'

	
SPEED ANALYSIS DIAGRAM	
Pony Express Trail East of Willow Street	
Prepared By: C. Smith	Drawn By: C. Smith
02/20/20	July 2020
RW SNOOK & COMPANY PO Box 5068, Oak, CA 94652 209-367-4789	