

CALIFORNIA TRAFFIC SPECIALISTS

Traffic Accident Reconstruction - Vehicle & Occupant Dynamics - Biomechanics - Vehicle Deformation Analysis - Fraud Investigations

January 4, 2013

Community Police Review Commission
3900 Main Street, 6th Floor
Riverside, California 92522

Re: Fatal Traffic Collision Investigation

Report No.: P12067271
Date of Loss: 5/13/2012
CTS Number: 4582

Traffic Collision Reconstruction Review Report

California Traffic Specialists was retained to review and analyze a vehicle vs. pedestrian fatal traffic collision and provide a report regarding liability and the reconstruction of the collision event by the Riverside Police Department. The traffic collision occurred on May 13, 2012, at approximately 7:49 AM at the intersection of Madison Street and Emerald Street in the City of Riverside, California. The collision involved a 2009 Ford Crown Victoria black and white marked City of Riverside Police vehicle, unit 3934, driven by Officer Michael Boulerville and pedestrian Isabel Pablo.

The specific assignment was to perform all investigative and analytical services as directed by the City Manager and/or designee, to include, but not limited to:

- Conduct a review of a Riverside Police Department fatal traffic accident investigation and all related reports, involving an on-duty Riverside police officer driving a marked City police vehicle on May 13, 2012, at Madison Street and Emerald Street in the City of Riverside involving pedestrian Isabel Pablo to include analysis of:
 - Calculations used by the investigator(s), technology, measurements, photographs, available videos, diagrams, witness statements, opinions and conclusions.

- Produce a comprehensive report at the conclusion of the investigation as directed by the Manager with an executive summary.
- Deliver an oral presentation of the summary report to the Community Police Review Commission as scheduled by the City Manager and/or designee.
- Provide training to the CPRC, if necessary, in order to answer questions of a technical nature concerning traffic accident reconstruction and investigation.

Background:

Officer Michael Boulerice was traveling northbound on Madison Street approaching the intersection of Emerald Street in a marked police vehicle when pedestrian Isabel Pablo walked from the southeast corner of the intersection westbound into the roadway on the south side of the intersection into the path of the approaching police vehicle. Isabel Pablo was struck by the police vehicle and sustained fatal injuries.

The traffic collision report and all supplemental reports, investigations, technology, measurements, photographs, available videos, diagrams, witness statements, opinions and conclusions were reviewed and analyzed by this expert. Officer Greg Matthews was the primary investigator and coordinated the investigation and reconstruction of the collision event. Detective Rick Prince completed a collateral review and investigation of the collision event.

The following is a summary of the investigation and reconstruction of the collision events and the techniques and methodology implemented to investigate and reconstruct the collision event by the officers and employees of the Riverside Police Department and City of Riverside:

- Interview of Officer Michael Boulerice, witnesses Officer Neely Nakamura, and reported witnesses Ma De Los Angeles, Angel Gaytan, Christine Valdez, and Ross Goldstein.
- A comprehensive inspection of the collision scene including the examination, measurements, photography, and documentation of the collision scene and the physical evidence.
- A Nikon NPL-322 Total Station was used for scene and physical evidence measurements. The system is a laser measuring system where the measurements, points, and description codes are interpreted by the Total Station and Crash Zone 9, CAD software, which was utilized to produce the collision scene diagram and the location of the physical evidence.

- The California Highway Patrol (CHP) Inland Division Multidisciplinary Accident Investigation Team (MAIT) was contacted on May 17, 2012, to conduct an airbag control module (ACM) and powertrain control module (PCM) download and analysis of the 2009 Crown Victoria police vehicle, unit 3934.
 - A Crash Data Retrieval (CDR) system was queried via the Data Link Connector to image the ACM and PCM.
 - There was no data captured or recorded on the ACM or PCM due to the very minor threshold of the collision forces at impact and the very minor g-forces that were experienced by the vehicle.
- A vehicle inspection of the 2009 Ford Crown Victoria police vehicle, unit 3934, was completed to examine, measure, and photograph the vehicle and to identify and weigh the contents of the vehicle.
 - The vehicle was placed in MAIT vehicle storage for safe keeping, evidence preservation, and possible future inspections.
- COBAN police vehicle onboard windshield view video camera footage was identified and the video was analyzed from Officer Boulерice's vehicle, unit 3934, and Officer Nakamura's vehicle, unit 3930.
- Video camera footage of City of Riverside buildings near the collision from seven locations:
 - Video camera footage memorializes pedestrian Pablo's activities from Casa Blanc Library to the AOI. The video also memorialized pedestrian Pablo's dog's activities.
 - Video camera footage also memorialized witness Angel Gaytan approaching the scene and witness Cooper driving a vehicle to the scene.
 - The video camera captured the audio and video of Officer Boulерice and witness Cooper's conversation at the scene.
- A satellite view and photographs of the line of sight study from witness Gaytan's residence that was located 275 feet east of Madison Street. The study concluded that witness Gaytan could not have seen the collision but could only have seen the police vehicle skidding 35 to 40 feet into the intersection after the impact occurred.
- Pedestrian Pablo's personal property at the scene was identified, marked, photographed, and booked into evidence. Pedestrian Pablo's personal property included a vodka bottle partially empty.

- A time and distance analysis was conducted of witness Cooper's arrival at the scene from westbound Emerald Street which was approximately 300 feet from the collision scene. Witness Cooper could not have seen the police car's approach to the area of impact (AOI).
- Historical weather data was obtained for May 13, 2012.
- A search warrant was obtained for Officer Boulerville's cell phone records to determine if his cell phone was in use or if he was texting at the time of the collision.
 - Sprint/Nextel security and subpoena compliance department determined that there was no evidence of text messaging or incoming or outgoing cellular telephone calls prior to the collision on May 13, 2012.
- A search warrant was obtained for Isabel Pablo's medical records from Riverside Community Hospital in order to review the toxicology report and to evaluate the injuries sustained by pedestrian Pablo.
- The results of a blood sample collected from Isabel Pablo by the Riverside Sheriff's Coroner's Office that was submitted to Bio-Tox Laboratories for analysis found that Isabel Pablo had a Blood Alcohol Content (BAC) of 0.39%.
- The maintenance records and speedometer calibration certificates were obtained for Officer Boulerville's police vehicle, unit 3934.
- A detailed investigation and analysis was conducted of the collision event and all aspects of the pre-collision Mobile Digital Computer (MDC) usage by Officer Boulerville and all other officers utilizing the MDC prior to the collision.
- A roadway and environment analysis was conducted regarding the termination of the south sidewalk of westbound Emerald Street at the east side of Madison Street. The analysis concluded that there is no crosswalk or unmarked crosswalk that allows a pedestrian to cross Madison Street on the south side of the intersection from Emerald Street. However there is a marked crosswalk at the intersection on the north side of the intersection that would have allowed pedestrian Pablo the opportunity to use a marked crosswalk to cross Madison Street.
- Video footage from Officer Boulerville's vehicle, a short distance prior to the collision, illustrates that pedestrian Pablo can not be seen walking westbound on the south side of Emerald Street approaching the southeast corner of Madison Street. The video footage illustrates that there was a red 2010 Toyota Tacoma four-door pickup truck parked on the east side of Madison Street just south of Emerald Street. A line of sight analysis was also

conducted to reconstruct the position of the red 2010 Toyota Tacoma four-door pickup truck that was parked on Madison Street at the southeast corner of the intersection at the time of the collision to determine if it created a vision obstruction to Officer Boulrice of pedestrian Pablo prior to her walking into the roadway. The analysis concluded that the Toyota Tacoma pickup truck did create a vision obstruction to Officer Boulrice of pedestrian Pablo as she approached the roadway of Madison Street.

- A line of sight evaluation of the curbing, planters, and vegetation growth from the sidewalk to the fog line at the southeast corner of the intersection of Madison Street and Emerald Street were conducted. The analysis concluded that the vegetation growth from the planters would create a vision obstruction to Officer Boulrice of pedestrian Pablo as she approached the roadway of Madison Street from the southeast corner of the intersection.
- **Speed Analysis:** Officer Greg Matthews contacted Forensic Audio Video Technician expert Daniel Shattuck who is an audio video expert from Riverside County District Attorney's Office. Daniel Shattuck determined a video timeline of Officer Boulrice's police vehicle as it approached the intersection of Madison Street and Emerald Street. A timeline was established from specific measured reference points by Officer Matthews. The distance between the reference points was determined to be 125.3 feet from each other and the police vehicle traveled that distance in 2.135 seconds. The resultant calculation indicated that the police vehicle was traveling at a speed of 56.6 fps (feet per second) or **40 mph** as it approached the intersection of Madison Street and Emerald Street.
 - A second speed analysis was conducted of the police vehicle, unit 3934, which is equipped with a Placer GPS 450 mobile device. The recorded GPS speed of the police vehicle was **41 mph** at a distance of 108 feet south of the AOI.
- Expert Autostats was used to determine the acceleration rate of an original equipped manufacturer (OEM) model 2009 Ford Crown Victoria police vehicle. The maximum OEM acceleration rate of a vehicle traveling from 28 to 40 mph is indicated to be 11.0 - 15.7 ft/sec/sec or .34 - .49 g's.
- An acceleration rate for the police vehicle, unit 3934, using the vehicle's GPS from two data points during its approach to the AOI from 28-40 MPH in 11 seconds determined that Officer Boulrice's police vehicle was accelerating at 1.6 ft/sec/sec or .04 g's which is a very slow acceleration rate.

- Pedestrian Pablo's walking speed was determined by Officer Boulerville's COBAN video camera that was analyzed by Forensic Audio Video Technician expert Daniel Shattuck. It was determined that pedestrian Pablo walked a distance of 6.49 feet in 1.635 seconds which indicates a walking speed of 3.97 fps or 2.7 mph. The Institute of Police Traffic Management Pedestrian Accident Investigation and Reconstruction Manual indicates that the average 50 year old female crossing a street travels at 4.25 fps or 2.9 mph. Pedestrian Pablo was walking just slightly slower than the average 50 year old female.
- The video camera in Officer Boulerville's police vehicle illustrates that pedestrian Pablo did not look south towards the approaching police car as she entered the roadway and began walking across Madison Street from the southeast corner of the intersection.
- The video camera in Officer Nakamura's police vehicle illustrates Officer Boulerville's vehicle traveling ahead of Officer Nakamura's police vehicle approaching the intersection of Madison Street and Emerald Street. Just prior to the intersection, the rear brake lights of Officer Boulerville's vehicle were activated and illuminated, and the vehicle turned to the left in an attempt to avoid striking pedestrian Pablo who had walked into the roadway.
- A coefficient of friction braking test was conducted with Officer Boulerville's police vehicle, unit 3934, using an onboard Vericom VC-300 brake test computer. The average coefficient of friction was determined to be .85 g's.
- A time and distance analysis was conducted once Officer Boulerville's vehicle's speed and deceleration factor were determined. The required braking distance at 40 mph to a stop is 62.73 feet. The time required to stop from 40 mph is 2.14 seconds.
- Officer Boulerville's vehicle collided with pedestrian Pablo a distance of 18.5 feet after the beginning of vehicle braking. The impact speed was 33.58 mph which required the time of .34 seconds from brake application to impact. If Officer Boulerville's vehicle was traveling at 35 mph, the vehicle would have struck pedestrian Pablo at 30.89 mph.
- A speed survey was conducted on August 2008, on Madison Street in the vicinity of the collision by the City of Riverside's Department of Public Works Traffic Engineering Division. The speed survey concluded that the 85th percentile that the average vehicle travels on Madison Street in the vicinity of the collision was 38 mph. The recommended posted speed limit was 35 mph; however a posted speed limit of 40 mph would have been more appropriate at the intersection of Madison Street and Emerald Street.

- Pedestrian impact trajectory calculations were performed to determine Officer Boulerville's vehicle's speed at impact. Using the industry accepted calculations of Searl, the impact speed was estimated to be 29.37 - 35.19 mph at impact. Using the industry accepted calculations of Collins, the impact speed was estimated to be 32.12 mph.
- A perception and reaction time for Officer Boulerville was determined using video footage from Officer Boulerville's vehicle and a time and distance analysis. Officer Boulerville's perception and reaction time from when he first saw pedestrian Pablo become visible to when the police vehicle began braking was 1.697 seconds.
- A time and distance analysis was conducted based upon Officer Boulerville's vehicle traveling at 40 mph and his 1.697 second perception and reaction time. The distance the vehicle would travel during Officer Boulerville's perception and reaction time would be a distance of 99.55 feet and the braking to stop distance would be 67.73 feet which is a total required stopping distance of 162.28 feet. Officer Boulerville's vehicle was 137.90 feet from pedestrian Pablo when she was first visible and 127.82 feet from pedestrian Pablo when she was at the east fog line before entering the northbound lane. At a speed of 35 mph the distance the police vehicle would travel during Officer Boulerville's perception and reaction time would be a 87.11 feet and the braking to a stop distance would be 48.13 feet which is a total required stopping distance of 135.24 feet.

Summary:

Based upon the above investigation and reconstruction, Deputy Greg Matthews and Detective Rick Prince both concluded that pedestrian Isabel Pablo was the sole cause of the collision and was in violation of California Vehicle Code Section 21954 (a) at the time of the collision.

Section 21954 (a) indicates: Every pedestrian upon a roadway at any point other than within a marked crosswalk or within an unmarked crosswalk at an intersection shall yield the right-of-way to all vehicles upon the roadway so near as to constitute an immediate hazard. (b) The provisions of this section shall not relieve the driver of a vehicle from the duty to exercise due care for the safety of any pedestrian upon a roadway.

Analysis:

It is this expert's opinion that the investigation and reconstruction of the collision events and the techniques and methodology implemented to investigate and reconstruct the collision event by the officers and employees of the Riverside Police Department and City of Riverside were extremely thorough, precise, accurate, and exceptional in every way possible.

This expert conducted an independent evaluation and analysis of Officer Boulerville's response to the path intrusion by pedestrian Isabel Pablo based upon the information reconstructed by the Riverside Police Department in order to determine if the collision could have been avoided. A human factors computer program titled Integrated Driver Response Research by Crash Safety Research Program from the University of Connecticut was used to evaluate if Officer Boulerville could have avoided the collision. It was concluded that Officer Boulerville could not have avoided the collision. The results of the analysis and evaluation are attached.

Conclusion:

It is this expert's opinion that pedestrian Isabel Pablo was the sole cause of the collision and that Officer Boulerville was not traveling at an unsafe speed at the time of the collision. Officer Boulerville did an exemplary job in an attempt to avoid the collision but he did not have the available time or distance to avoid the immediate hazard of pedestrian Isabel Pablo walking into the roadway directly into his police vehicle's immediate path of travel.

By virtue of Officer Boulerville's immediate perception and reaction to the presence and hazard of pedestrian Isabel Pablo in the roadway and his immediate collision avoidance attempt in applying his police vehicle's brakes and steering his police vehicle left to avoid the collision, it is concluded that Officer Boulerville was attentive to his driving and the environment by his observation and rapid perception and reaction of pedestrian Isabel Pablo 1.69 seconds after she entered the roadway and was visible to him.

It is this expert's opinion that the collision was avoidable by pedestrian Isabel Pablo had she crossed Madison Street in the required marked crosswalk on the north side of the street or had she looked south on Madison Street prior to entering the roadway where she could have clearly seen the police vehicle approaching so close to her that it created an immediate hazard.

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Finally, it is this expert's opinion that Officer Boulerville did not have the opportunity to avoid this collision based on the negligent act of pedestrian Isabel Pablo. Officer Boulerville shares no responsibility for the causation of this collision.

I sincerely appreciate this opportunity to be of service to the City of Riverside and the Community Police Review Commission. Should you have any questions or require additional information, please contact California Traffic Specialists.

Sincerely,

California Traffic Specialists

Steven J. Bellino

Steven J. Bellino, President
Traffic Accident Reconstructionist



See Attachments:

PATH INTRUSION		S BELLINO © CSS, LLC	
5. Hazard & Appro Response Unknown ***DEFAULT***		Pedestrian Isabel Pablo	
4. Road/HI Fidelity Sim	***DEFAULT***	<input type="checkbox"/> Check if using Mobile Phone	
1. Response to one object	Offset @ start of Intrs	7.4	1. Driving
CALCULATE ECCENTRICITY	Dist to Intruder	127.8	0. SV Not Turning
1. Straight Road	Eccentricity	3.3	1. Day
3. Full Response (250 ms veh delay)	1. Subj did not discern other unit stop		
<input type="checkbox"/> Check if hovering brake			
Braking Adj + (413 x Tr) + 30E + 224Lt + 716O - 496Tp - 164M + 261Tn + 350(D - 1) + 7		eq.1	
0 + (413 x 3) + 30x3.3 + 224x1 + 716x1 - 496x1 - 164x1 + 261x0 + 350 x (1 - 1) + 7		eq.2	
85th percentile response			
AVERAGE PRI		2.3 sec	
Equation	1.7 sec	Individuals	
A2B studies	1.6 sec		
Resp to Vehicle	1.8 Sec	Min Avg	Max Avg
Resp to Ped.	1.8 Sec	1.4 Sec	2.1 Sec
Resp to Object	1.8 Sec	1.5 Sec	2.0 Sec
	1.8 Sec	1.5 Sec	2.1 Sec
	1.8 Sec	1.4 Sec	2.0 Sec
Response Distance = $\sqrt{1.7 \times 35 \times 1.467}$		eq.3	
Distance to Stop = $(35 \times 1.467)^2 / (2 \times 32.2 \times 0.8)$		eq.4	
Total Stopping Distance = 88 feet + 51 feet		eq.5	
Time to Brake = $\text{SQRT}(2d / (g \times f)) = 2 \text{ sec}$		eq.6	
TOT. STOPPING DIST. 139 feet		eq.5	
AVG. Response Dist. 88 feet		eq.3	
85th percentile response Dist. 119 feet			
Stopping Dist. 51 feet		eq.4	
85th percentile response			
85th %ile STOPPING DIST. 170 feet			

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AVERAGE PRI Equation		1.7 sec 1.6 sec																					
A2B studies Resp to Vehicle Resp to Ped Resp to Object		<table border="1"> <thead> <tr> <th>85th percentile response</th> <th>Max Avg</th> <th>Min Avg</th> <th>Scenarios</th> </tr> </thead> <tbody> <tr> <td>2.3 sec</td> <td>2.1 Sec</td> <td>1.4 Sec</td> <td></td> </tr> <tr> <td></td> <td>2.0 Sec</td> <td>1.5 Sec</td> <td></td> </tr> <tr> <td></td> <td>2.1 Sec</td> <td>1.5 Sec</td> <td></td> </tr> <tr> <td></td> <td>2.0 Sec</td> <td>1.4 Sec</td> <td></td> </tr> </tbody> </table>		85th percentile response	Max Avg	Min Avg	Scenarios	2.3 sec	2.1 Sec	1.4 Sec			2.0 Sec	1.5 Sec			2.1 Sec	1.5 Sec			2.0 Sec	1.4 Sec	
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RESPONSE TO PATH INTRUSION		Officer Boulrice Primary Driver																					
Initial Speed 40.0 mph Braking Respon 3.0 Avg. Deceleration factor 0.8 gs		eq.3 eq.4 eq.5 eq.6 eq.5 eq.3 eq.4																					
Response Distance = $\sqrt{1.7 \times 40 \times 1.467}$ Distance to Stop = $(40 \times 1.467)^2 / (2 \times 32.2 \times 0.8)$ Total Stopping Distance = 100 feet + 67 feet Time to Brake = $\text{SQRT}(2d / g \times f) = 2.3 \text{ sec}$ TOT. STOPPING DIST: 167 feet AVG. Response Dist. 100 feet 85th percentile response Dist. 136 feet Stopping Dist. 67 feet		85th percentile respo 85th %ile STOPPING DIST: 203 feet																					



