

# COLLISION DYNAMICS

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P.O. BOX 1877  
GLENDDORA, CALIFORNIA 91740  
888-5CD-XPRT (888-523-9778)

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## *Curriculum Vitae*

### **Scott Naramore**

Accredited Traffic Accident Reconstructionist

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## *Professional Experience*

### **Accident Reconstruction Specialist** (1991 to present)

Collision Dynamics, LLC (Principal Consultant since 2006)

Collision Consultants, Inc. (1995 to 2006)

Impact General, Inc. (1994-1996)

- Forensic reconstruction of traffic collisions
- Cause analysis
- Speed and impact force calculations
- Damage consistency
- Expert testimony and consultation for civil (plaintiff and defense) and criminal (prosecution and defense) cases

### **Accident Investigation, Traffic Law Instructor** (1998 to 2008)

Rio Hondo Community College/Police Academy (1998 to 2008)

San Bernardino County Sheriff's Academy (2001-2002)

Citrus Community College (2000-2001)

- Collision investigation methodology and procedures
- California traffic laws and enforcement procedures
- Impaired driver laws, behavior, investigation procedures
- Human factor related issues in driver behavior

### **Certified Instructor; Occupant Protection Systems** (1991-1994)

Passenger Safety Systems (La Puente, California)

- Los Angeles County Court directed educator in motor vehicle occupant protection systems and occupant kinematics
- National Highway Traffic Safety Administration certified instructor; child restraint systems analysis and occupant kinematics

### **Police Officer/Detective, Glendora Police Department** (1981-2004, Retired)

#### *Assignments:*

### **Police Detective (Investigator)** (2001-2004)

- Criminal and forensic investigation
- Assist in criminal prosecution, testimony
- Training of department personnel
- Evidence collection, analysis, and preservation
- Coordination of complex crime and collision scene investigations

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## *Professional Experience (continued)*

### **Senior Traffic Officer (1992-1994)**

- Traffic collision investigation and enforcement coordinator
- Grant author and coordinator
- Occupant protection program coordinator
- Supervision and coordination of collision investigations
- Review of collision investigations
- Training of department traffic personnel
- Traffic collision reconstruction and analysis
- Call-out investigator for fatal traffic collisions
- Responsible for witness and consultant interviews and preparation of cases for court
- Traffic engineering department liaison

### **Traffic Officer (Motorcycle) (1989-1992)**

- Traffic collision reconstruction and investigation
- Traffic law enforcement and education
- Coordination and implementation of DUI /impaired driver task force
- Preparation of cases for court
- Coordination of school safety programs

### **Patrol Officer/Senior Patrol Officer (1981-1989 and 1994-2001)**

- Patrol city streets
- Crime scene investigation
- Evidence collection and photography
- Traffic collision investigation
- Traffic enforcement
- DUI/impaired driver enforcement
- Courtroom testimony
- Field training officer

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## ***Academic Background***

**Bachelor of Arts Degree** (*magna cum laude*)  
Bemidji State University (Bemidji, Minnesota)

### **Technical Training**

Over 1,000 hours of formal training in all aspects of traffic accident investigation, vehicle dynamics, and traffic accident reconstruction including collisions involving automobiles, motorcycles, bicycles, pedestrians, and commercial vehicles. Court certified expertise in accident investigation and reconstruction, low-speed incidents, occupant kinematics, biomechanics and injury potential, speed analysis, damage analysis and consistency, driver impairment, human factors, vehicle data (EDR) analysis, traffic laws, vehicular manslaughter and murder ( including “Watson”) cases.

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## *Accreditation and Certifications*

- Accredited in October 1993 (#274) by the Accreditation Commission of Traffic Accident Reconstruction (ACTAR), an international organization for the accreditation of traffic accident reconstruction experts.
- California Commission on Peace Officer Standards and Training (POST) basic, intermediate, and advanced certificates.

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## *Related Experience*

- Qualified expert witness in traffic accident investigation and reconstruction in municipal and superior courts (Los Angeles, San Bernardino, Orange, Riverside, Solano, Ventura and Kern Counties), civil and criminal.
- Investigation of (“first responder/investigator”) approximately 1,200 traffic collisions; assisted, reconstructed or reviewed over 7,000 additional traffic collisions.
- Event data recorder (“black box”) data retrieval and analysis.
- Driving Under the Influence (DUI) Instructor (Advanced Police Officer Training; Federal Police Training).
- Advisor, California Commission on Peace Officer Standards and Training (POST); Traffic Accident Investigation.
- Member of the Southwestern Association of Technical Accident Investigators (SATAI).
- Member of the California Association of Accident Reconstruction Specialists (CA<sup>2</sup>RS).
- Member of the Illinois Association of Technical Accident Investigators (IATAI).
- Member of the National Association of Professional Accident Reconstructionist Specialists (NAPARS)
- Member of the National Association of Traffic Accident Reconstructionists and Investigators (NATARI)
- Member of the Accident Reconstruction Network (ARC).
- Past Member of the Municipal Motorcycle Officers of California (MMOC).
- Past Member of the City of Glendora Traffic Safety Review Board and Traffic Accident Review Board.
- Past Member, SafetyBelt Safe USA.
- Inspection of over 1000 child and passenger restraint devices for functionality, proper usage, recalls, and defects.

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## *List of Training*

March, 2019 2019 EDR (Event Data Recorder) Summit. Bosch CDR 900 updates and technical demonstration. Analyzing steering, yaw, and lateral acceleration data. Autonomous vehicles and ADAS technology. Determining speed from audio and video recordings. EDR reprogramming. Use of struck vehicle EDR data for motorcycle accident reconstruction. CDR technician troubleshooting. ARC Network-Collision Safety Institute, 20 hours.

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### *List of Training (continued)*

- March, 2018 2018 EDR (Event Data Recorder) Summit. Updated evaluation of vehicle data utilizing Bosch CDR equipment, “infotainment” modules, Bendix equipment and heavy truck modules (DDEC, etc.). Tesla equipment and EDR capability. ARC Network-Collision Safety Institute, 20 hours.
- August, 2017 Crush Measurements, stiffness values and force balance; traffic signal timing plan elements. California Association of Accident Reconstruction Specialists, 8 hours.
- April, 2017 Southwestern Association of Technical Accident Investigators, semi-annual meeting; motorcycle dynamics and obstacle avoidance, motorcycle speed based on crush, computer aided engineering, structural crashworthiness and crash simulation, 16 hours.
- June 2016 Photogrammetry and Intersection Collisions. Evaluation of photographic data to assist in accident reconstruction analysis. Evaluation of traffic signal data to determine causation in signalization disputes. California Association of Accident Reconstruction Specialists, 8 hours.
- Oct. 2015 Pedestrian Accident Reconstruction and CDR (EDR) Analysis. California Association of Accident Reconstruction Specialists. Application of EDR data and technology in collision and reconstruction analysis. Best practices for obtaining and maintaining EDR data. Pedestrian collision methodology and reconstruction procedures, 20 hours.
- August 2015 Techniques in Vehicle Collision Reconstruction and Failure Analysis. Evaluation of available data to assist in accident reconstruction analysis. California Association of Accident Reconstruction Specialists, 8 hours.
- May 2015 Vision, Perception and Attention; Pedestrian Accident Reconstruction Methods. California Association of Accident Reconstruction Specialists, 8 hours.
- Jan. 2015 Low Speed Impact Analysis using IIHS and CDR data. Utilization of IIHS crash test data and EDR data for determining impact speed and force. California Association of Accident Reconstruction Specialists, 8 hours.
- July 2012 Event Data Recorder Use in Traffic Crash Reconstruction, IPTM; University of North Florida. Retrieval and analysis of vehicle “event data recorder” data to assist in, and verify, accident reconstruction conclusions. Calculation and determination of impact and pre-impact speeds, evaluation of driver behavior, and reconciling EDR data with other accident reconstruction evidence. 40 hours.
- May 2011 Vehicle Inspection and Analysis for Repair and Loss Fraud. California Association of Accident Reconstruction Specialists, 8 hours.

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### *List of Training (continued)*

- May 2010     ARC Network-Collision Safety Institute Crash Conference (Vehicle-to-vehicle/motorcycle/commercial vehicle crash tests, photogrammetry in reconstruction, PDOF (“thrust”) and applied angle physics, accelerometer testing and usage, motorcycle accident reconstruction, low speed impact analysis and biomechanics, conspicuity in traffic accident reconstruction, motion equations, 28 hours.
- June 2008     ARC Network-Collision Safety Institute Crash Conference (Vehicle-to-vehicle/motorcycle/“pedestrian” crash tests, photogrammetry in reconstruction, human factors in collision avoidance/witness recall, motorcycle crash analysis, pedestrian collision analysis, video applications in reconstruction, rollover collision analysis, engine idle acceleration, airborne analysis and rotation), 28 hours.
- Dec. 2007     Diagramming with CrashZone (Basic and Advanced);  
FactualDiagrams.com (Utilization of CrashZone for forensic computer drafting/CAD and animation), 40 hours.
- June 2007     ARC Network-Collision Safety Institute Crash Conference (Vehicle-to-vehicle crash tests, low speed rear-end crash tests, human factors in perception/response times, airbag injuries, seatbelt analysis, night-time pedestrian collisions, pre-crash data (CDR) analysis, reconstruction at traffic signals), 28 hours.
- Jan. 2007     CDR System Technician Training, Collision Safety Institute/Vetronix, 8 hours.
- Sept. 2006     Illinois Association of Technical Accident Investigators Crash Conference (Vehicle-to-vehicle crash tests, airbag deployments, seatbelt examination, forensic evidence examination, crash data retrieval (CDR) systems, vehicle technology, reconstruction updates), 24 hours.
- June 2006     Beyond the Basics of Traffic Collision Photography, California Association of Accident Reconstruction Specialists, 8 hours.
- June 2005     ARC Network-Collision Safety Institute Crash Conference (Vehicle-to-vehicle crash tests, vehicle-to-pedestrian/hybrid crash tests, chain reaction crash tests, airbag deployments, seatbelt examination, commercial vehicle event data recorders, crash data retrieval (CDR) system), 28 hours.
- Feb. 2004     Lamp Analysis, California Association of Accident Reconstruction Specialists, 8 hours.
- June 2003     ARC Network-Collision Safety Institute Crash Conference (Vehicle-to-vehicle crash tests, vehicle-to-barrier crash tests, airbag deployments, airborne events, crush analysis, collision trauma biomechanics, low speed collisions, GM and Ford event data recorders), 28 hours.

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### *List of Training (continued)*

- Oct. 2001      Low Speed Crash Tests, Collision Consultants. Twenty-five vehicle-to-vehicle, occupant equipped impacts including sideswipe, broadside, and rear-end events, 3 hours.
- July 2001      Southwestern Association of Technical Accident Investigators, semi-annual meeting (staged collision test, rollover crash dynamics, occupant motions and injury biomechanics, crash severity analysis), 16 hours.
- Nov. 2000      Southwestern Association of Technical Accident Investigators, semi-annual meeting (no math reconstruction, biomechanics and functional anatomy, modern restraint systems), 16 hours.
- Nov. 1999      Southwestern Association of Technical Accident Investigators, semi-annual meeting (traffic signal timing, low-speed collisions, legal issues in accident reconstruction, pedestrian collision reconstruction), 16 hours.
- July 1998      Southwestern Association of Technical Accident Investigators, semi-annual meeting (motorcycle and vehicle-to-vehicle crash tests, motorcycle dynamics, vehicle aerodynamics), 12 hours.
- June 1998      Low-Speed Crash Tests, Collision Consultants, Inc. Eleven vehicle-to-vehicle, occupant equipped collisions including sideswipe, broadside, and rear-end events, 3 hours.
- March 1998      Southwestern Association of Technical Accident Investigators, semi-annual meeting (low velocity impacts and fraud, vehicle damage measurements, biomechanics and injury causation), 12 hours.
- March 1996      Southwestern Association of Technical Accident Investigators, semi-annual meeting (human factors, PC Crash computer animation, low-speed impact dynamics, biomechanics), 16 hours.
- Nov. 1995      Accidental Injury: Biomechanics and Prevention, U.C. San Diego School of Medicine. Biomechanics of human injury, human tolerance, mechanisms of injury, techniques of injury prevention, 16 hours.
- Sept. 1995      Biomechanics of Accidents, Texas A&M University. Principal direction of force and speed ( $\Delta V$ ) determination, occupant kinematics, injury classification systems, injury analysis and injury correlation, occupant restraint systems, speed analysis from injuries, 40 hours.
- July 1995      Southwestern Association of Technical Accident Investigators, semi-annual meeting (thirty-five staged low-speed collision tests, minor impact investigation and analysis, introduction to biomechanics), 16 hours.
- March 1995      Southwestern Association of Technical Accident Investigators, semi-annual meeting (fraudulent accident schemes, accident reconstruction involving the plaintiff and defense), 16 hours.

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### *List of Training (continued)*

- Jan. 1995      Vehicle Acceleration and the Vericom VC2000 Computer, Vericom Computers (use of accelerometers in collision investigation and reconstruction), 12 hours.
- March 1994    Southwestern Association of Technical Accident Investigators, semi-annual meeting (two staged test collisions, vehicle documentation and measurement, in-line momentum analysis, speed analysis from skidmarks), 16 hours.
- Jan. 1994      Occupant Restraint System Violator Instructor Training, SafetyBelt Safe USA, 24 hours.
- Nov. 1993      Southwestern Association of Technical Accident Investigators, semi-annual meeting (conservation of momentum, computer-aided reconstruction, kinetic energy), 16 hours.
- July 1993      Occupant Protection Usage and Enforcement Instructor Training, National Highway Traffic Safety and Administration, 24 hours.
- March 1993    Occupant Protection Usage and Enforcement, National Highway Traffic Safety and Administration (analysis of occupant restraint systems and the enforcement of related laws), 8 hours.
- Jan. 1993      Impaired Driver Enforcement, California Highway Patrol, VAIDEP task force (effects of alcohol and drugs on driver behavior, perception and reaction, physiology), 8 hours.
- Nov. 1992      Southwestern Association of Technical Accident Investigators, semi-annual meeting (vehicle safety systems, air bags and seatbelts in collisions, radar and laser use), 16 hours.
- Feb. 1992      Commercial Vehicle Enforcement and Accident Investigation, California Highway Patrol, 8 hours.
- Oct. 1991      Traffic Accident Reconstruction, Sacramento Public Safety Center, 80 hours.
- April 1991     Seat Belt Analysis and Occupant Kinematics, National Institute of Forensic Studies, 8 hours.
- April 1991     Motorcycle Dynamics and Technical Training, Kawasaki Motors Corporation, 16 hours.
- Feb. 1991      Child Occupant Restraint Systems, SafetyBelt Safe USA, 8 hours.
- Dec. 1990      Advanced Traffic Accident Investigation, San Diego Police Department, 80 hours.
- Oct. 1989      Police Motorcycle Training, Los Angeles Police Department, 80 hours.

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### *List of Training (continued)*

- Sept. 1989 Intermediate Traffic Accident Investigation, San Diego Police Department, 40 hours.
- May 1989 Basic Traffic Accident Investigation, San Bernardino Sheriff's Department, 40 hours.
- April 1989 Commercial Vehicle Safety and Inspection, Los Angeles County Sheriff's Department, 40-hour course.
- August 1988 Intoxilyzer Training, Los Angeles County Sheriff's Department, 8 hours.
- August 1986 Defensive Driver Training in Enforcement, Academy of Defensive Driving, 8 hours.
- April 1986 Basic Forensic Photography, Glendora Police Department, 12 hours.
- Feb. 1986 Radar Enforcement and Operation, Los Angeles County Sheriff's Department, 40 hours.
- July 1982 Police Academy, Los Angeles County Sheriff's Department; inclusive of accident investigation and traffic laws (Class 210).