



Curriculum Vitae

**Thomas N. Rush, P.E.**



### **Professional Profile**

Mr. Rush is a Professional Engineer and consultant with experience, education, and training in the fields of civil engineering, transportation engineering, and forensic engineering. He holds a bachelor's degree from Iowa State University and a master's degree from North Carolina State University in civil engineering, with emphases on transportation safety engineering. He is an Accredited Traffic Accident Reconstructionist with the Accreditation Commission for Traffic Accident Reconstruction (ACTAR), a certified Crash Data Retrieval (CDR) Technician and Analyst, and a certified work zone Traffic Control Supervisor.

Mr. Rush is active in ongoing engineering research at Focus Forensics, and manages projects in the Midwest Region for the consulting engineering firm. He has completed the engineering investigation and evaluation of vehicle, driver, and roadway issues in hundreds of cases across the entire United States. His areas of expertise include transportation safety issues related to pedestrians, bicycles, motorcycles, commercial vehicles, highway-rail grade crossings, traffic signals, signs and markings, roadside barriers, and temporary traffic control. Mr. Rush has lectured in university engineering programs and has published peer-reviewed research papers and journal articles related to his fields of engineering expertise. He has testified as an expert witness in depositions and trials related to Accident Reconstruction, Work Zone Maintenance of Traffic, and Transportation Engineering.

### **Licensure**

- Professional Engineer, State of Alabama, #36045-E
- Professional Engineer, State of Arizona, #68678
- Professional Engineer, State of Illinois, #62-064674
- Professional Engineer, State of Indiana, #PE11300573
- Professional Engineer, State of Iowa, #PE22745
- Professional Engineer, State of Minnesota, #54115
- Professional Engineer, State of Nebraska, #E-15528
- Professional Engineer, State of Texas, #PE121232
- Professional Engineer, State of Wisconsin, #45492-6

### **Contact Information**

Cell: (312) 513-3988  
Tom@focusforensics.com

### **Minneapolis Office**

7635 W. 148<sup>th</sup> Street, Suite 250  
Apple Valley, MN 55124

### **Education**

North Carolina State University  
*Raleigh, North Carolina*  
Master of Civil Engineering, 2013

Iowa State University  
*Ames, Iowa*  
Bachelor of Science in Civil Engineering, 2008

### **Work Experience**

Focus Forensics, LLC  
Managing Engineer: 2021-Present  
Senior Engineer: 2014-2021

Armstrong Forensic Engineers, Inc.  
Engineer: 2009-2014

Kimley-Horn and Associates  
Roadway Design Analyst: 2008-2009  
Roadway Design Intern: 2007

Iowa State University  
Roadway Design Teacher Assistant: 2008  
Concrete Design Lab Assistant: 2007

E&A Consulting Group, Inc.  
Survey Crew: 2006



**Professional Certification**

Accreditation as a Traffic Accident Reconstructionist, ACTAR # 2302

Certified Accident Reconstructionist  
*Society of Automotive Engineers*

Certified Crash Data Retrieval (CDR) Technician and Analyst

Certified Traffic Control Supervisor  
*American Traffic Safety Services Association (ATSSA)*

Work Zone Traffic Control Supervisor  
*Minnesota Department of Transportation*

Remote Pilot – Small Unmanned Aircraft System  
*Federal Aviation Administration*

**Professional Development**

**A12-3D Forensics**

- Cloud Compare, 2023
- iPhone LIDAR for Crash & Crime Scene Reconstruction, 2023

**American Road and Transportation Builders Association**

- Local Transportation Management Virtual Conference, 2012

**American Traffic Safety Services Association**

- Florida Advanced Training, 2010
- Roadway Safety Guidelines for Incident Responders, 2011
- Motorcycle Safety: Roadway Hazards and How to Address Them, 2014
- Florida Advanced Work Zone Traffic Control Refresher Course, 2014
- Minnesota Traffic Control Supervisor, 2019

**ASTM International**

- Pedestrian/ Walkway Safety and Footwear, 2014

**Axiom Forensic**

- Motorcycle Collision Reconstruction, 2018

**Claims & Litigation Management Alliance (CLM)**

- E-Discovery & Transportation: The Changing Scope of the Post Event Investigation, 2016

**Collision Safety Institute / ARC**

- CDR Technician Certification, 2010
- CDR Data Analyst Certification, 2010
- Annual Crash Conference and Full Scale Crash Testing, 2012
- Annual Crash Conference and Full Scale Crash Testing, 2017

**Driver Research Institute/ Crash Safety Solutions**

- Nighttime Recognition on Unlit Roads, 2020
- IDRR User Forum, 2022
- Nighttime Crash Scene Investigation, 2024

**Drone Launch Academy**

- FAA Part 107 Remote Pilot Exam Prep Course, 2017

**Engineering Dynamics Corporation**

- Hands-On HVE 2-D, 2010

**Eos Systems, Inc./ PhotoModeler Technologies**

- PhotoModeler Collision Investigation, 2012

**FARO Technologies, Inc.**

- FARO Laser Scanner Training and Operation, 2015
- FARO Reality for Crash Reconstruction, 2016

**Federal Aviation Administration**

- Part 107 Small UAS Recurrent, 2021
- Part 107 Small UAS Recurrent, 2023

**Focus Forensics, LLC**

- Transportation Engineering and Accident Reconstruction Insights, 2022
- Transportation Engineering and Accident Reconstruction Insights, 2024
  - Human Factors for Driver Response
  - Traffic Signal Design and Operation
  - Transportation Engineering Sight Distance Standards
  - Automotive Mechanical Systems and Data Acquisition
  - Photogrammetric Methods
  - Video Analysis with Telemetry Data
  - LIDAR Scanning and Data Processing
  - Virtual Crash Applications for Simulation and Animation
  - PC Crash Applications for Steering and Yaw Rate
  - Expert Testimony Regulations and Standards
  - Commercial Vehicle EDR Data Extraction and Analysis
  - Vehicle EDR Systems for Toyota and General Motors



## Professional Development Continued

### FORCON International

- Walkway Auditor Training Class on ASTM F2948, 2014

### Institute of Transportation Engineering

- Midwestern/ Great Lakes ITE Conference, 2016

### Kimley-Horn & Associates

- Accident Investigation Training, 2008

### Lightpoint Scientific

- Advanced Photogrammetry for Collision Reconstruction, 2024

### Minnesota Department of Transportation

- MnDOT Traffic Control Supervisor, 2024

### Minnesota Trucking Association

- Safety Conference, 2018

### Northwestern University Center for Public Safety

- Accident Investigation 1, 2009
- Accident Investigation 2, 2009
- Traffic Accident Reconstruction 1, 2009
- Traffic Accident Reconstruction 2, 2009
- Heavy Vehicle Crash Reconstruction, 2010
- Advanced Crash Reconstruction Utilizing Human Factors, 2014

### Society of Automotive Engineers

- Accessing and Interpreting Heavy Vehicle Event Data Recorders, 2011
- Applying Automotive EDR Data to Traffic Crash Reconstruction, 2013
- World Congress and Exhibition, 2014
- Commercial Vehicle Braking Systems, 2015
- World Congress Experience, 2018
- Vehicle Crash Reconstruction: Principles and Technology, 2019
- Accident Reconstruction, The Autonomous Vehicle and ADAS, 2020
- Fundamentals of Vehicle Dynamics, 2020
- Accident Reconstruction Digital Summit, 2022
- Advanced Applications of Heavy Vehicle EDR Data, 2023

### U.S. DOT Transportation Safety Institute

- U.S. DOT Motor Carrier Safety Compliance, 2014
- U.S. DOT CMV Periodic Inspection & Maintenance Course, 2016

## Vertical Aspect

- RTK GPS and Collision Scene Mapping, 2021

## Virtual Crash

- Collision Simulation and Reconstruction, 2021

## World Reconstruction Exposition (WREX)

- World Reconstruction Exposition (WREX), 2016
- World Reconstruction Exposition (WREX), 2023

## Technical Reports and Publications

“A New Source of Collision Evidence: Traffic Signal Data Loggers,” American Bar Association, Committee News Commercial Transportation Litigation, 2018

“Big Data Analysis – Combining GPS with Traffic Signal Data Logger Records,” Proceedings of the 27<sup>th</sup> Annual Congress of the European Association for Accident Research and Analysis (EVU), 2018

“Introduction to Traffic Signal Data Loggers and their Application to Accident Reconstruction.” SAE Technical Paper 2018-01-0527, 2018

“Testing Methodology to Evaluate Reliability of a “Frozen” Speedometer Reading in Motorcycle/ Scooter Impacts with Pre-Impact Braking.” SAE Technical Paper 2016-01-1482, 2016

“Photogrammetric Reconstruction Methodology and Engineering Validation for Video-Captured Pedestrian Collisions”, Proceedings of the 24<sup>th</sup> Annual Congress of the European Association for Accident Research and Analysis (EVU), 2015

“Glass Debris Field Longevity for Rollover Accident Reconstruction.” SAE Technical Paper 2015–01–1427, 2015

“Video Analysis and Analytical Modeling of Actual Vehicle/ Pedestrian Collisions,” SAE Technical Paper 2014-01-0483, 2014

“Light Bulb Filament Distortion Thresholds by Voltage and Delta-V,” SAE Technical Paper 2013-01-0752, 2013

“Applications of GPS Data in Collision Reconstruction,” *Collision Magazine*, 2011

“Applications of GPS Data in Collision Reconstruction,” *Proceedings of the 10<sup>th</sup> ITAI International Conference on Collision Investigation, Interpretation and Reconstruction*, 2011

“Roadway Maintenance Factors in Collision Reconstruction,” *Proceedings of the 1<sup>st</sup> International Road Safety Conference*, Republic of South Africa Road Traffic Management Corporation, 2009



## Seminar and Course Presentations

“Accident Reconstruction 201: Advanced Crash Course on Motor Vehicle Accident,” Twin Cities Claims Association, 2023

“Crash Course on Crashes: Forensics Accident Reconstruction & Human Factors in Collision,” Institute of Transportation Engineers, 2022

“Gathering, Preserving, and Using Nontraditional Sources of Electronic Data in Your Trucking Case,” DRI Trucking Law Committee, 2019

“Car Crash Reconstruction 101,” Minnesota Association for Justice Car Crash Seminar, 2019

“Forensic Applications of Survey Technology for Motor Vehicle Collisions,” American Society of Civil Engineers, 2018

“Accident Reconstruction: Investigation and Analysis,” SIGMA Transportation Conference, 2018

“Introduction to Traffic Signal Data Loggers and their Application to Accident Reconstruction,” Society of Automotive Engineers 2018 World Congress Experience, 2018

“Commercial Vehicle Inspections and Improving Your Compliance, Safety, and Accountability Scores,” Claims & Litigation Management Conference, 2016

“Assessment of Intersection Visibility of Various Temporary Traffic Control Device Setups,” Midwestern/ Great Lakes ITE Conference, 2016

“Maintenance of Traffic and Roadway Design Analysis,” World Reconstruction Exposition, 2016

“You’ve Just Been Notified of a Serious Collision, Now What?” Claims & Litigation Management Transportation Conference, 2015

“Video Analysis and Analytical Modeling of Actual Vehicle/ Pedestrian Collisions,” Society of Automotive Engineers 2014 World Congress & Exhibition, 2014

“Evaluating Hit-and-Run or Uninsured Motorist Claims Through an Engineering Accident Damage Analysis,” Advanced Insurance Fraud Seminar, 2013

“Photomodeler for Inverse Project and Scaled Diagramming,” Armstrong Forensic Engineers, 2012

“Collision Reconstruction,” University of Illinois, 2013

“Collision Reconstruction and Forensic Applications of Civil Engineering,” North Carolina State University, 2013

## Professional Affiliations

Institute of Transportation Engineers (ITE)  
Member (Transportation Safety Council)  
Vice Chair of Transportation Forensics and Risk  
Management Standing Committee

Society of Automotive Engineers (SAE)  
Company Representative



## Select Project Experience

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### **Vehicular Accident Investigation and Reconstruction**

Mr. Rush began conducting accident reconstructions in 2009 with Armstrong Forensic Engineers. Since then, he has been professionally consulting on collision causes and countermeasures for insurance, litigation, corporate, and government clients.

- Automobiles
- Tractor-Trailers / Commercial Vehicles
- Buses
- Motorcycles
- Pedestrians
- Bicycles
- Trains and Light Rail Transit
- Tire analysis
- Immediate Response Site and Vehicle Inspections
- Data Collection
- Scene Mapping
- Sequence Determination
- Speed, Delta-V, and Principal Direction of Force (PDOF) Calculations
- Distance-Time Evaluations
- Avoidance Analysis
- Driver Perception, Response, and Visibility Studies
- Diagrams, Graphics, Demonstrative Evidence, and Written Reports

### **Transportation Safety Engineering**

Due to his expertise in the fundamentals of transportation and traffic safety, Mr. Rush has provided engineering design and litigation support evaluating the safety characteristics of transportation facilities, including roadways, intersections, parking lots, driveway transit stations, and pedestrian paths.

- Highway Work Zone Safety and Temporary Traffic Control
- Intersection Sight Distance
- Traffic Signals and Pedestrian Signals
- Signs, Pavement Markings, and Traffic Control Devices
- Roadside Hazards and Barriers
- Geometric Design of Curves, Hills, Lanes, Medians, and Shoulders
- Advanced Warning and Positive Guidance for Motorists
- Federal, State, and Local Standards and Guidelines
- Parking Lot and Pedestrian Facility Design
- Highway-Rail Grade Crossings