



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 Pennsylvania, #PE096394
- Professional Engineer, State of Texas, #PE121232
- Professional Engineer, State of Wisconsin, #45492-6

Contact Information

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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
- Recon-3D, 2024

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/Response User Forum, 2022
- Nighttime Crash Scene Investigation, 2024
- IDRR/Response User Forum, 2025

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



Professional Development Continued

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
- Transportation Engineering and Accident Reconstruction Insights, 2025
 - EDR Extraction and Analysis Methods for Video Radar Decision Units (VRDU)
 - Acquisition and Analysis Methods for Temporary Roadway Conditions
 - LIDAR Scanning and Data Processing
 - Air Brake Testing Standards and Techniques
 - Heavy Vehicle EDR Extraction and Analysis Methods
 - Drone Mapping Techniques and Processing
 - Data Processing and Analysis with Cloud Compare
 - Photogrammetry Software Methods and Techniques
 - Technology for Capturing Photo/ Video Demonstratives of Available Driver Views
 - Telemetry Overlay Software Techniques and Processing
 - VCrash Animations and Simulations for Pedestrian and Bicycle Collisions
 - Monte Carlo Statistical Analysis for Uncertainty Ranges
 - Human Factors Analysis of Road User Detection and Response
 - Transportation Engineering Design and Limitations for Micromobility Vehicles on Sidewalks
 - EDR Vehicle Yaw and Steering Data Simulation, Analysis and Modeling
 - Contextual Evaluation of Slow-Moving Lead Vehicle Scenarios and Looming Calculations
 - Comprehensive Context Points for Collision Reconstructions

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



Professional Development Continued

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 27th 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 24th 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 10th ITAI International Conference on Collision Investigation, Interpretation and Reconstruction*, 2011

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

Seminar and Course Presentations

“Traffic Signal Data Loggers – Black Boxes for signals,” Twin Cities Claims Association, 2026

“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



Seminar and Course Presentations Continued

“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, 2021-2024

National Association of Professional Accident Reconstruction
Specialists (NAPARS)

Society of Automotive Engineers (SAE)
Company Representative



Select Project Experience

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