



Curriculum Vitae

Kelly M. Palframan, Ph.D., P.E.



Professional Profile

Dr. Kelly Palframan has dedicated her professional career to the study and understanding of transportation safety incidents involving motorized and non-motorized users, with insight into the human, vehicular, and roadway and surface factors that combine to result in collisions, crashes, and falls. After completing a Bachelor's of Science in Civil Engineering at Florida State, she earned both Masters and Ph.D. degrees in Civil and Environmental Engineering with a focus on Transportation Safety from Virginia Tech. In addition to her academic degrees, she has continued her education with training from the Federal Highway Administration (FHWA), National Highway Institute, Florida Department of Transportation, Society of Automotive Engineers, and others. She has over 14 years of experience as a professional safety researcher and engineer into a wide breadth of engineering design and collision factors, including projects related to crash reconstruction, vehicle dynamics, roadway design, roadside safety design, temporary traffic control, and pedestrian and bicycle facilities.

Dr. Palframan's works have been widely published in leading journals, including the Transportation Research Record, Transportation Research, the International Association of Traffic and Safety Sciences, Society of Automotive Engineers, the Annals of Advances in Automotive Medicine. She has notably been an author on several manuals and guidelines for practitioners that have been adopted and published by leading national standard-setting organizations such as the Federal Highway Administration Office of Safety, Federal Highway Administration Office of Operations, and the American Traffic Safety Services Association. Publication topics include temporary traffic control, maintenance of traffic, transportation engineering design, intelligent transportation systems.

Dr. Palframan has also brought her academic studies and research into focus on several specific collision types involving heavy commercial vehicles and special use vehicles such as emergency vehicles and school buses. Her Master's Thesis evaluated the effectiveness of electronic stability systems in reducing heavy truck rollovers, and her Doctoral Dissertation addressed issues of School Bus Safety and School Bus Stop Safety using intelligent transportation systems. Supplemental projects included research on emergency vehicle crashes and roadside crash patterns.

As a Transportation Engineer at Focus Forensics LLC, Dr. Palframan brings her wide and deep knowledge of human, vehicular, and roadway issues to the Forensic Engineering analysis of collision events and transportation systems involving motorized and non-motorized users. Her engineering consulting practice deals with the investigation and evaluation of incidents involving passenger vehicles, motorcycles, pedestrians, bicyclists, commercial vehicles, buses, emergency vehicles, and other modes of travel. She evaluates roadway geometry, operations, maintenance, construction, signalization, signs and markings, temporary traffic controls, and walking surfaces. She analyzes driver and pedestrian performance and response, kinematics, and related human aspects. By bringing a comprehensive approach to each assignment, Dr. Palframan can help clients understand the full range of contributing factors and potential countermeasures for a given incident or transportation pattern. Dr. Palframan remains actively involved in safety research, publications, and lecturing at higher education institutions. She has testified at deposition as an expert in her field.

Contact Information

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Education

Ph.D. in Civil Engineering
Virginia Polytechnic Institute and State
University (Virginia Tech)
Blacksburg, Virginia

Master of Science in Civil Engineering
Virginia Polytechnic Institute and State
University (Virginia Tech)
Blacksburg, Virginia

Bachelor of Science in Civil Engineering
Florida State University
Tallahassee, Florida

Work Experience

Focus Forensics, LLC
Sr. Engineer: 2023-Present
Engineer: 2017-2022
Consultant: 2016-2017

Leidos (formerly SAIC)
Transportation Consultant and Researcher:
2010-2016

Virginia Tech Center for Infrastructure-Based
Safety Systems
Graduate Researcher: 2014-2015

Virginia Tech Center for Injury Biomechanics
Graduate Researcher: 2011-2013

Virginia Tech College of Engineering
Instructor: 2013

Virginia Tech Center for Sustainable
Transportation Systems
Graduate Researcher: 2009-2010

FSU-FAMU Crashworthiness & Impact
Analysis Lab
Undergraduate Researcher: 2008-2009

Avcon, Inc.
Civil Engineering Intern: 2008



Licensure and Professional Certification

Professional Engineer, State of Florida, # 83340
Professional Engineer, State of Montana, #78206

Certified Accident Reconstruction, Society of Automotive Engineers

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

Professional Affiliations

- Transportation Research Board (TRB)
 - Transportation Safety Management Committee (ANB10)
 - Occupant Protection Committee (ANB45)
- Women's Transportation Seminar
- Tau Beta Pi, Engineering Honor Society, (FL Eta Chapter), 2008

Paper Review Committee Appointments

- Work Zone Traffic Control Committee
- Transportation Safety Management Committee
- Occupant Protection Committee

Professional Development

American Traffic Safety Services Association (ATSSA)

- Florida Advanced Maintenance of Traffic Training, 2016
- Florida Advanced Work Zone Traffic Control Refresher Course, 2020
- Worker Safety Considerations for Nighttime Highway Work Zones, 2022

Axiom Forensic

- Motorcycle Collision Reconstruction, 2018

Collision Safety Institute / ARC

- Annual Crash Conference and Full Scale Crash Testing, 2017

Federal Highway Administration

- Strategic Highway Safety Plan Implementation, 2012
- Highway Safety Manual Training, 2013
- Work Zone Design Course, 2021
- Data-Driven Approach to Improve Work Zone Safety, 2022

Florida Department of Transportation (FDOT)

- FDOT ADA for Design, Construction, and Maintenance, 2022
- ADA Accessible Design, 2023

Focus Forensics, LLC

- Transportation Engineering and Accident Reconstruction Insights, 2022

Lightpoint Scientific, LLC

- Advanced Photogrammetry for Collision Reconstruction, 2017

Northwestern University Center for Public Safety

- Advanced Crash Reconstruction Utilizing Human Factors Research, 2018

Society of Automotive Engineers (SAE)

- Vehicle Crash Reconstruction: Principles and Technology, 2018
- Vehicle Crash Reconstruction: Principles and Technology, 2019
- Accident Reconstruction, The Autonomous Vehicle and ADA, 2020
- Fundamentals of Vehicle Dynamics, 2021
- Applying Automotive EDR Data to Traffic Crash Reconstruction, 2021
- Driver Distraction from Electronic Devices: Insight and Implications, 2022
- Fundamentals of Automotive All-Wheel Drive Systems, 2022

Virginia Tech

- Institutional Review Board (IRB) Human Subject Protections, 2009

Virtual Crash

- Collision Simulation and Reconstruction, 2021



Professional Development Continued

World Reconstruction Exposition (WREX)

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

Seminar and Course Presentations

“Applications of Connected Vehicle Technology for School Buses and School Bus Stops”, *Joint Meeting of the Intelligent Transportation Society of Virginia and the Virginia Section Institute of Transportation Engineers*, Richmond, VA, 2017

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

“Evaluating Driver Responses to In-vehicle “School Bus Stopped Ahead” Messages and Equivalent Roadside Signing” *Transportation Research Board 94th Annual Meeting*, Washington, D.C., 2016

“Evaluation of Fatal School Bus Related Crashes and Associated Crash Characteristics” *Transportation Research Board 93rd Annual Meeting*, Washington, D.C., 2015

“School Bus Stop Examination: An Interactive Tool for Improving Student Safety (poster)” *Women Transportation Seminar Annual Conference*, Chicago, IL 2015

“Evaluation of Fatal School Bus Related Crashes and Associated Crash Characteristics (poster)” *Civil and Environmental Engineering Research Symposium*, Blacksburg, VA, 2014

“Illuminating the Road Ahead” *Virginia Tech TEDX Event*, Blacksburg, VA, 2014

“Analysis of Firetruck Crashes and Associated Firefighter Injuries in the United States” *Association for the Advancement of Automotive Medicine*, Seattle, WA, 2012

“Safety Benefits of Stability Control Systems for Tractor-Semitrailers Estimated with Hardware-in-the-loop Simulation” *Transportation Research Board 91st Annual Meeting*, Washington, D.C., 2012

“Analysis of Firetruck Crashes and Associated Firefighters Injuries in the United States (poster)” *11th Annual Graduate Student Research Symposium*, Blacksburg, VA, 2012

“Development of Hardware-in-the-loop Testbed for Evaluating Truck Safety Systems” *Transportation Research Board 90th Annual Meeting*, Washington, D.C., 2011

“Low Risk Deployment Airbag Star Rating System (poster)” *10th Annual Graduate Student Research Symposium*, Blacksburg, VA 2011

Publications

Melcher, D., Przyblyla, J., Palframan, K., Rush, T., “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

Przyblyla, J., Rush, T., Palframan, K., Melcher, D., “Introduction to Traffic Signal Data Loggers and their Application to Accident Reconstruction.” *SAE Technical Paper*, 2018-01-0527, 2018

Atkinson, J., Dixon, K., Jones, J., Donoughe-Palframan, K., Colety, M., Pratt, M. “Scale and Scope and Safety Assessment Methods in the Project Development Process” *Federal Highway Administration*, 2016

Donoughe, K., Alden, B., Mayer, B. “Final Report of Reducing School Bus/ Light-Vehicle Conflicts through Connected Vehicle Communications.” *Under Review for Connected Vehicle UTC*, 2015

Donoughe, K., Katz, B. “A Survey of Stated Driver Behavior around Stopped School Buses.” *Under Review for Transportation Research Part F.*, 2015

Donoughe, K., Katz, B. “Evaluation of Fatal School Bus Related Crashes and Near-term Crash Mitigation Strategies.” *IATSS Research, Volume 38, Issue 2*, 2015

Donoughe, K., Balk, S. “Vehicle to Pedestrian Technical Scan Summary Database” *Intelligent Transportation System Joint Program Office (ITS JPO) Connected Vehicle Program*, 2015



Publications Continued

Atkinson, J., Chandler, B., Betkey, V., Weiss, K., Dixon, K., Giragosian, A., Donoughe, K., O'Donnell, C. "Manual for Selecting Safety Improvements of High Risk Rural Roads" *Federal Highway Administration*, 2014

Atkinson, J., Chandler, B., Rigdon, H., Donoughe, K. "Work Zone Road Safety Audit Guidelines and Prompt Lists" *Federal Highway Administration*, 2013

Katz, B., O'Donnell, C., Donoughe, K., Atkinson, J., Finley, M., Bouke, K., Kuhn, B., Warren, D. "Guidelines for the use of Variable Speed Limit Systems in Wet Weather." *Federal Highway Administration*, 2012

Donoughe, K., Whitestone, J. Gabler, H.C. "Analysis of Firetruck Crashes and Associated Firefighter Injuries in the United States" *Annals of Advances in Automotive Medicine, Volume 56*, 2012

Park, S., Donoughe, K., Rakha, H. "Safety Benefits of Stability Control Systems for Tractor-Semitrailers Estimated with Hardware-in-the-loop Simulation" *Transportation Research Record*, 2281, 2012

Donoughe, K. "Guidelines for the Use of Dynamic Lane Merging Strategies" *American Traffic Safety Services Association*, 2012

Donoughe, K. "Guidance on the Use of Automated Flagger Assistance Devices" *American Traffic Safety Services Association*, 2012

Katz, B., O'Donnell, C., Donoughe, K., Atkinson, J., Finley, M.D., Balke, K., Kuhn, B., et al. "Variable Speed Limit Systems in Wet Weather" *Federal Highway Administration*, 2012

Donoughe, K., Rakha, H., Swanson, W., Park, S., Bryson, J. "Development of Hardware-in-the-loop Testbed for Evaluating Truck Safety Systems" *Transportation Research Record*, 2265, 2011

Thesis/ Dissertation

"Addressing Issues of School Bus and School Bus Stop Safety Using Intelligent Transportation Systems and Connected Vehicle Technology" Ph.D. Dissertation, Virginia Tech, 2016

"Evaluating the Effectiveness of Electronic Stability Systems in Reducing Truck Rollovers" Master's Thesis, Virginia Tech, 2010

Leadership Roles

- President of the Virginia Tech Alliance of Transportation Engineers (2011-2012)
- Vice President of the Virginia Tech Alliance of Transportation Engineers (2010-2011)
- President, Florida State University Chapter of Tau Beta Pi "The Engineering Honor Society" (2008-2009)
- Regional Board Member, Odyssey of the Mind Creative Problem Solving Competition (2006-2012)

Awards

- Helen M. Overly Scholarship, Women's Transportation Seminar, Virginia Chapter, Winner, 2012
- Patricia F. Waller Award, Transportation Research Board, Finalist, 2011
- Best Safety-Related paper, International Road Federation, Winner, 2011
- Via Master's Fellowship, Department of Civil Engineering at Virginia Tech, Recipient, 2009-2010
- Best Research Presentation, Institute of Transportation Engineers, Big Bend Chapter, Winner, 2008



Select Project Experience

Dr. Palframan is an experienced transportation engineer and crash reconstructionist, often combining both fields to generate a full understanding of the factors that contribute to any given crash.

Transportation Safety Engineering

Given her expertise in the fundamentals of transportation facility design and traffic safety, Dr. Palframan 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. Her transportation safety practice focuses on:

- Highway Work Zone Safety, Temporary Traffic Control, and Maintenance of Traffic
- 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 Design
- Highway-Rail Grade Crossings
- Pedestrian Facility Design
- Maintenance of Pedestrian Facilities

Vehicular Accident Investigation and Reconstruction

Given her training and expertise in vehicle investigation and crash reconstruction, Dr. Palframan's reconstruction practice focuses on:

- Automobiles
- Buses
- Emergency Vehicles
- Motorcycles
- Pedestrians and Bicyclists
- Trains and Light Rail Transit
- Vehicle Kinematics (Accelerating, Braking, Steering)
- Human Factors (Driver Response and Visibility)
- Immediate Response Site and Vehicle Inspections
- Data Collection
- Scene Mapping
- Sequence Determination
- Speed, Delta-V, and Principal Direction of Force (PDOF) Calculations'
- Vehicle Rollovers
- Occupant Restraint Systems'
- Headlamp Analyses
- Avoidance Analysis
- Distance-Time Evaluations
- Diagrams, Graphics, Demonstrative Evidence, and Written Reports
- Expert Testimony
- Electronic Data Recorder (EDR) and "black box" data downloads and analysis