



THE UNIVERSITY OF NORTH CAROLINA
**HIGHWAY SAFETY
RESEARCH CENTER**

**ANNUAL OPERATIONS REPORT
JULY 1, 2017 - JUNE 30, 2018**



Since 1965, the UNC Highway Safety Research Center has helped shape the field of transportation safety as a leading research institution. The mission of HSRC is to improve the safety, sustainability and efficiency of all surface transportation modes through a balanced, interdisciplinary program of research, evaluation and information dissemination. We conduct our everyday work with that ideal at the forefront, and in fiscal year 2018 (July 1, 2017 to June 30, 2018), we continued to grow experience and build expertise in conducting cutting-edge transportation safety research, program analysis and implementation.

This operations report provides a summary of FY2018 HSRC activities in the following areas: financials, researchers and staff, publications and presentations, and graphic and website design projects.

HSRC DIVERSITY STATEMENT

The UNC Highway Safety Research Center affirms the University's core values regarding diversity, inclusion and multiculturalism. The HSRC is committed, through its policies, practices, programs and services, to creating and fostering an environment of inclusion, equity, non-discrimination and pluralism, grounded in respect and appreciation for all, and promoting and celebrating individual and collective achievement.

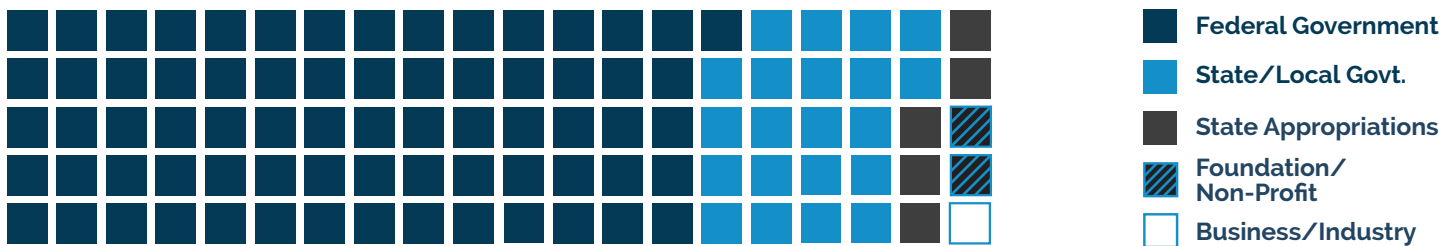
FINANCIAL REPORT

HSRC is a part of the University of North Carolina system, located on the UNC-Chapel Hill campus. Our work is funded through a combination of state and federal-level projects, and corporate- and foundation-sponsored projects.



For each dollar appropriated to HSRC by the state of North Carolina in FY2018, HSRC staff generated **\$16.13** in research and program funding. External revenues to support the mission of HSRC were received from contracts, grants, cooperative agreements and donations.

FY2018 FUNDING SOURCES



HSRC is pleased to have the opportunity to work with a diverse group of government, non-government, corporate and foundation sponsors during the past several years including:

U.S. AND INTERNATIONAL GOVERNMENT SPONSORS

- American Association of State Highway and Transportation Officials
- British Columbia Ministry of Transportation
- California Department of Transportation
- Florida Department of Transportation
- Kansas Bureau of Traffic Safety
- Kansas Turnpike Authority
- Land Transport New Zealand/The Beca Group
- National Institutes of Health
 - National Institute of Child Health and Human Development
 - National Institute on Alcohol Abuse and Alcoholism
- New York City Department of Transportation
- North Carolina Department of Health and Human Services
- North Carolina Department of Transportation
- North Carolina Governor's Highway Safety Program
- Traffic Injury Research Foundation of Canada
- Transportation Research Board of The National Academies
 - National Cooperative Highway Research Program

- University of North Carolina at Chapel Hill
- U.S. Centers for Disease Control and Prevention
- U.S. Department of Transportation
 - Federal Highway Administration
 - National Highway Traffic Safety Administration
 - Office of the Assistant Secretary for Research and Technology
 - Research and Innovative Technology Administration
- U.S. Environmental Protection Agency
- Volpe National Transportation Systems Center
- Wisconsin Department of Transportation

CORPORATE AND FOUNDATION SPONSORS

- AAA Foundation for Traffic Safety
- AAA Kansas
- FedEx Corporation
- FIA Foundation
- General Motors
- Insurance Institute for Highway Safety
- John Rex Endowment
- Motorcycle Safety Foundation
- National Safety Council
- Robert Wood Johnson Foundation
- Safe Kids Worldwide
- Schwinn
- Society for the Advancement of Violence and Injury Research
- State Farm Insurance Company

RESEARCHERS AND STAFF

HSRC has a dynamic team of researchers and staff with extensive expertise in a broad range of disciplines. It is through their creativity, passion, energy and expertise that HSRC has been able to achieve many successes in 2018. This list includes current, former and retired staff who were employed by HSRC during FY2018 (July 1, 2017, to June 30, 2018).

BUSINESS SERVICES

Neil Batson
Business Officer

Courtney Blake
Administrative Support Specialist

Matthew Glassman
Technical Support Analyst
10 years of NC service

Daniel Harper
Contract Specialist

Dianne Harrington
Business Manager

Ann Hume
Accounting Technician

Jean Justice
Administrative Support
Retired October 2017

Linette Tyson
Contract Specialist

RESEARCH PROGRAMS

Kristin Blank, M.L.A.
Pedestrian and Bicyclist Projects
Communications Manager

Kristen Brookshire, M.C.R.P.
Research Associate

Daniel Carter, M.S.C.E., P.E.
Senior Engineering
Research Associate
Served as HSRC Interim Director
(Jan. 1-Dec. 2, 2018)**

Michael Clamann, Ph.D.
Senior Human Factors Engineer

Forrest Council, Ph.D.
Senior Research Scientist
Retired July 2017

Rob Foss, Ph.D.
Senior Research Scientist and
Director, Center for the Study
of Young Drivers

Dan Gelinne
Research Associate

Christine Gomola Mullin, M.S.
Embedded Research Librarian

Arthur Goodwin, M.A.
Senior Research Associate and
Associate Director for
Behavioral Sciences Research

Bill Hall, M.A.
Manager, Occupant
Protection Program
Retired December 2017

David Harkey, Ph.D., P.E.
Director
Retired December 2017

Stephanie Harrell, M.A.
Social/Clinical Research Assistant

Stephen Heiny, M.C.R.P.
Junior Research Associate

Bevan Kirley, M.S.
Senior Research Associate

Wesley Kumfer, Ph.D.
Engineering Research Associate

Seth LaJeunesse, M.A., M.C.R.P.
Research Associate and
Assistant Director, National Center
for Safe Routes to School

Bo Lan, Ph.D.
Research Associate
5 years of NC service*

Nancy Lefler, M.C.R.P.
Senior Research Associate
and Program Manager

Daniel Levitt
Research Associate

Richard Lytle
Web Applications Programmer
25 years of NC service

Lauren Marchetti
Senior Strategic Adviser

Marie Melendez
Communications Specialist

RESEARCH PROGRAMS (CONT.)

Caroline Mozingo
Senior Manager of Communications, Education and Outreach and Associate Director, Research Services
*Served as HSRC Interim Deputy Director (Jan. 1-Dec. 2, 2018)***

Krista Nordback, Ph.D., P.E.
Senior Research Associate

Natalie O'Brien, M.S.
Senior Research Associate
*10 years of NC service**

Sarah O'Brien, M.E.S.M.
Senior Research Associate

Colleen Oliver
Communications Manager, Safe Routes to School Programs

Jennifer Palcher-Silliman, M.A.
Communications Manager

Nancy Pullen-Seufert, M.P.H.
Senior Research Associate and Director, National Center for Safe Routes to School

Kristel Robison, M.S.W.
Research Associate

Eric Rodgman, M.P.H.
Senior Database Analyst

Graham Russell
Graphic Designer

Taha Saleem, Ph.D.
Postdoctoral Research Associate

Laura Sandt, Ph.D., M.R.P.
Senior Research Associate and Associate Director, Vulnerable Road User Group

Kari Signor, M.S.
Research Assistant

Sarah Smith
Engineering Research Associate

Raghavan Srinivasan, Ph.D.
Senior Transportation Research Engineer and Associate Director, Engineering and Data Sciences Group
*15 years of NC service**

Libby Thomas, M.S.
Senior Research Associate

Yudan Wang, Ph.D.
Senior Research Associate
5 years of NC service

Jonathon Weisenfeld
Design Services Manager

Carolyn Williams, M.B.A.
Senior Applications Specialist

Charles Zegeer, M.S.C.E., P.E.
Senior Technical Adviser

** All years of service at HSRC*

*** The University of North Carolina UNC at Chapel Hill conducted a national search for the new director of HSRC during FY2018. Interim leadership roles were filled by internal staff, and other various responsibilities were successfully met with the help and support of all current HSRC staff.*

ADVISORY BOARD

The HSRC Advisory Board serves to assist in the identification of strategies and program direction for the Center. The board meets once a year to review HSRC's strategic plan, review progress and discuss future direction.

Dr. Herb Garrison — Chair
Professor of Emergency Medicine, East Carolina University

Dr. Alice Ammerman
Director, Center for Health Promotion and Disease Prevention, UNC-Chapel Hill

Mr. Alan Dellapenna
North Carolina Department of Health and Human Services, Injury and Violence Prevention Branch

Dr. Kelly R. Evenson
Research Professor, Department of Epidemiology, UNC-Chapel Hill

Dr. Stephen Marshall
Director, Injury Prevention Research Center, UNC-Chapel Hill

Colonel Glenn M. McNeill
Commander, North Carolina State Highway Patrol

Dr. Richard F. Pain
Transportation Research Board (retired)

Mr. John F. Sullivan III
North Carolina Division Administrator, Federal Highway Administration

STAFF MILESTONES

Matthew Glassman



Matthew Glassman has worked for UNC for 10 years. He is responsible for day-to-day upkeep of end user computing and troubleshooting, as well as researching newer technologies. In FY2018, Matthew officially

joined the Office of Research Information Systems team and now helps provide quality IT/IS support to research offices, including HSRC, involved in all aspects of the research enterprise at Carolina.

Bo Lan



Bo Lan has been a research associate at HSRC for five years. Bo's research interests are mainly on the application of the state-of-the-art statistical methods in road safety studies including the use of empirical Bayesian, full

Bayesian and tree-based methods.

Richard Lytle



Richard Lytle has worked for UNC for 25 years. With an extensive background in programming, Richard serves as a web applications programmer for the Center. In his role, he creates and maintains various

web applications and works in the development and maintenance of HSRC's many databases.

Natalie O'Brien



Natalie O'Brien joined UNC 10 years ago. Her research focuses primarily on examining factors that contribute to the high crash rates among teen drivers and identifying effective policies and programs to reduce

travel-related deaths and injuries.



From left: David Harkey, Rob Foss, Mark Ezzell, Bill Hall.

Three HSRC researchers awarded top NC civilian honors

The Governor of North Carolina awarded three of the state's highest civilian honors to HSRC researchers in December 2017. Bill Hall and Rob Foss were inducted into the Order of the Long Leaf Pine, and HSRC Director David Harkey received the Old North State Award. These prestigious honors were bestowed by NC Governor's Highway Safety Program Director Mark Ezzell on behalf of Governor Roy Cooper during a retirement celebration in Chapel Hill.

Raghavan Srinivasan



Raghavan "Srini" Srinivasan, a senior transportation research engineer, has been with HSRC for 15 years. His areas of research include traffic engineering and safety, human factors and the application of statistics and econometric methods.

Yudan Wang



Yudan Wang has worked in the UNC system for five years, joining HSRC as a senior research associate in 2016. She has worked on policy and program evaluation projects using multiple administrative data sources, field data and census data.

PUBLICATIONS AND PRESENTATIONS

- Anarkooli, A.J., Persaud, B., Hosseinpour, M., & Saleem, T. (2018). Comparison of univariate and two-stage approaches for estimating crash frequency by severity—Case study for horizontal curves on two-lane rural roads. *Accident Analysis & Prevention*. doi:10.1016/j.aap.2018.08.015.
- Anarkooli, A.J., Hosseinpour, M., Persaud, B., & Saleem, T. (2018, January). Development and evaluation of a two-stage modeling approach for estimating crash frequency for horizontal curves on two-lane rural roads (TRB Paper 18-06609). Paper presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Blackburn, L., Zegeer, C., & Brookshire, K. (2018, January). Guide for improving pedestrian safety at uncontrolled crossing locations (Report FHWA-SA-17-072). Washington, D.C.: Federal Highway Administration.
- Carter, D. (2017, October). Wrong way driving in North Carolina. Presented at the NCDOT Safety and Operations Roundtable Meeting, Raleigh, NC.
- Carter, D., Gelinne, D., Kirley, B., Sundstrom, C., Srinivasan, R., & Palcher-Silliman, J. (2017, November). Road safety fundamentals: Concepts, strategies, and practices that reduce fatalities and injuries on the road (Report FHWA-SA-18-003). Washington, DC: Federal Highway Administration Office of Safety.
- Carter, D. (2017, November). Resources for road safety professionals. Presented at the Annual Meeting of the North Carolina Section of the Institute for Transportation Engineers, Raleigh, NC.
- Carter, D. (2017, November). Identifying vertical curves using SHRP2 RID data. Remotely presented to the SHRP2 Safety Data Oversight Committee, Washington, DC.
- Carter, D., Hunter, W., & Signor, K. (2018, March). Strategies to reduce wrong way movements (Report FHWA-NC-2017-12). Raleigh, NC: North Carolina Department of Transportation Research and Analysis Group.
- Cherry, C., Hezaveh, A.M., Noltenius, M., Khattak, A., Merlin, L., Dumbaugh, E., Ragland, D., & Sandt, L. (2018, April). Completing the picture of traffic injuries: Understanding data needs and opportunities for road safety. Chapel Hill, NC: Collaborative Sciences Center for Road Safety.
- Clamann, M. (2018, May). Sharing the road with robots: Considerations for incorporating automated vehicle technology into a safe roadway system. Presented at the CSCRS Coffee & Conversation: A safe systems exploration of transportation, UNC Chapel Hill, NC.
- Combs, T., Sandt, L., McDonald, N., & Clamann, M. (2018, January). Limitations in detection technologies for automated driving systems and implications for pedestrian safety. Presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Curry, A.E., Foss, R., & Williams, A.F. (2017). Graduated driver licensing for older novice drivers: critical analysis of the issues. *American Journal of Preventive Medicine*, 53(6), 923–927. doi:10.1016/j.amepre.2017.06.014.
- Evenson, K.R., LaJeunesse, S., & Heiny, S. (2018). Awareness of Vision Zero among United States' road safety professionals. *Injury Epidemiology*, 5, 1-6. doi:10.1186/s40621-018-0151-1.
- Findley, D., Warchol, S., Chase, T., & Thomas, L. (2018). Developing guidelines and documentation of engineering studies for establishing NC speed limits. NCDOT Project 2017-10. Raleigh, NC: North Carolina Department of Transportation: Research and Analysis Group.
- Foss, R. (2017, December 13). Reducing teen driver crashes with an effective driver licensing system. Testimony to Ohio House of Representatives, Committee on Transportation and Public Safety, Columbus, OH.
- Foss, R. (2017, December). Windfall! Gains in teen driver safety remain readily available to most states. Western Pacific Injury Prevention Network Webinar.
- Gelinne, D., Thomas, L., Lang, K., Zegeer, C., & Goughnour, E. (2017). How to develop a pedestrian and bicycle safety action plan. Washington, DC: Federal Highway Administration Office of Safety.
- Goodwin, A. (2018, April). Enforcement with teenage drivers. Presentation at the NC Traffic Safety Conference and Expo, Wilmington, NC.
- Goodwin, A. (2018, April). Everything you wanted to know about distracted driving. Presentation at the NC Traffic Safety Conference and Expo, Wilmington, NC.

- Goodwin, A. (2018, April). What works (and what doesn't) to improve teen driver safety. Presentation at the Child Fatality Prevention System Summit. Raleigh, NC.
- Goodwin, A. (2018, January). Social norms and traffic safety. Invited presentation to the Executive Committee for Highway Safety, Raleigh NC.
- Goodwin, A. (2018, January). Motorcycle licensing & training: Future research needs. Presentation at the 97th Transportation Research Board Annual Meeting, Washington, DC.
- Goodwin, A. (2018, January). New technologies and methods in motorcycle safety: Hybrid session. Workshop moderator at the 97th Transportation Research Board Annual Meeting, Washington, DC.
- Goodwin, A., Harrell, S., O'Brien, N., Kirley, B., & Foss, R. (2018). Orientation sessions for parents of young novice drivers: An assessment of U.S. programs and recommendations. Washington, DC: AAA Foundation for Traffic Safety.
- Goodwin, A., Kirley, B., & Foss, R. (2018). Motorcycle safety: A review of the state of the knowledge. Washington, DC: National Highway Traffic Safety Administration. (under review).
- Granados, M., Persaud, B., Rajeswaran, T., & Saleem, T. (2018, January). Using microsimulation to evaluate the impact of automated vehicles on safety performance of signalized intersections (TRB Paper 18-05956). Paper presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Harrell, S. (2017, October 28). The Future of Driving: Implications for Teen Drivers. NCPDSA Conference. Greensboro, NC.
- Harrell, S. (2018, April 14). Safer vehicles for teens. Presentation at the NCPDSA Conference, Greensboro, NC.
- Harrell, S. (2018, April 24). The future of driving: Implications for teen drivers. Presentation at the Montana Traffic Educators Association, Bozeman, MT.
- Injury Surveillance Workgroup. (2017). Consensus recommendations for pedestrian injury surveillance (p. 8g). Atlanta, GA: Alliance, Safe States.
- Jiang, K., Ling, F., Feng, Z., Ma, C., Kumfer, W., Shao, C., & Wang, K. (2018). Effects of mobile phone distraction on pedestrians' crossing behavior and visual attention allocation at a signalized intersection: An outdoor experimental study. *Accident Analysis and Prevention*, No. 115, pp. 170-177.
- Johnstone D., Nordback, K., & Lowry, M. (2017, September). Collecting network-wide bicycle and pedestrian data: Guidebook for when and where to count (Report WA-RD 875.2). Olympia, WA: Washington State Department of Transportation.
- Johnstone, D., Nordback, K., & Kothuri, S. (2018, January). Annual average non-motorized traffic estimates from manual counts: Quantifying error (TRB Paper 18-05290). Paper presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Kirley, B., & Robison, K. (2018, May). Transition from booster to belt. Presented at the Safe Kids North Carolina Conference, Concord, NC.
- Kirley, B., Wang, Y., Foss, R., Harrell, S., & Goodwin, A. (2018). Estimating motorcycle vehicle miles travelled (VMT) from state annual safety inspection data. Washington, DC: National Highway Traffic Safety Administration. (under review).
- Kothuri, S., Nordback, K., Schrope, A., Phillips, T., & Figliozzi, M. (2017). Bicycle and pedestrian counts at signalized intersections using existing infrastructure. *Transportation Research Record: Journal of the Transportation Research Board*, 2644, 11-18. doi:10.3141/2644-02.
- LaJeunesse, S. (2017, August). Vision Zero: What is it, where did it come from, and how might it work in Chapel Hill? Presented at the Chapel Hill Transportation and Connectivity Advisory Board Meeting, Chapel Hill, NC.
- LaJeunesse, S. (2017, October). Vision Zero and Safe Systems Part I: Traditional vs. Safe Systems approaches to roadway safety. Invited lecture for the UNC Department of City and Regional Planning PLAN 636 course, Chapel Hill, NC.
- LaJeunesse, S. (2017, October). Vision Zero and Safe Systems Part II: Cultural approaches toward improving road user safety. Invited lecture for the UNC Department of City and Regional Planning PLAN 636 course, Chapel Hill, NC.

- LaJeunesse, S. (2018, January). Kids and common values: Elevating the dialogue on race and ethnicity to advance pedestrian equity. Presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- LaJeunesse, S. (2018, January). A Vision for Vision Zero and Safe Systems in NC. Presented at the NC Vision Zero Task Force Meeting, Raleigh, NC.
- LaJeunesse, S. (2018, February). Complete Streets as Safe Systems. Invited lecture for the UNC Department of City and Regional Planning PLAN 590 course, Chapel Hill, NC.
- LaJeunesse, S. (2018, April). The Watch for Me NC pedestrian and bicycle safety program. Presented at the NC Traffic Safety Summit, Wilmington, NC.
- Lan, B., Srinivasan, R., Carter, D., Persaud, B., & Eccles, K. (2018, January). Safety evaluation of cable median barriers in combination with rumble strips on divided roads (TRB Paper 18-03788). Paper presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Lococo, K.H., Staplin, L., Mastromatto, T., Brooks, J.O., Srinivasan, R., & Sifrit, K.J. (2017, July). Older-driver foot movements (Report DOT HS 812 431). Washington, DC.: National Highway Traffic Safety Administration.
- Nordback, K., & Kothuri, S. (2017, August). Pedestrian and bicycle counting. [Workshop]. Institute of Transportation Engineers, Toronto, Canada.
- Nordback, K., Johnstone, D., & Kothuri, S. (2017, December). Optimizing short duration bicycle and pedestrian counting in Washington State (Report WA-RD 875.1). Olympia, WA: Washington State Department of Transportation.
- Nordback, K., Kothuri, S., Lan, B., Gibson, G., Ferenchak, N., & Marshall, W. (2018, January). Bicyclist safety performance functions for road segments in a U.S. city (TRB Paper 18-06245). Paper presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Nordback, K., Kothuri, S., Lan, B., Gibson, G., Ferenchak, N., & Marshall, W. (2018, January). Bicyclist safety performance functions for road segments in a U.S. city. Poster presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Nordback, K. (Producer). (2018). Conversations with colleagues: FHWA's travel monitoring analysis system (TMAS) - How to input bicycle and pedestrian data [Video webinar].
- Nordback, K. (Producer). (2018). Conversations with colleagues: Big data – implications for bicycle and pedestrian traffic analysis [Video webinar].
- Poole, B., Johnson, S., & Thomas, L. (2017). An overview of automated enforcement systems and their potential for improving pedestrian and bicyclist safety. Washington, DC: Federal Highway Administration, 15p.
- Pullen-Seufert, N. (2018, February). Vision zero for youth initiative: Saving lives while building healthy active lifestyles-starting with children. Presented at the Vision Zero Advocate Conference, Toronto, Canada.
- Pullen-Seufert, N. (2018, March). Plenary remarks – Progress of NC SRTS program. NC Safe Routes to School Conference, Greensboro, NC.
- Saleem, T., & Persaud, B. (2017). Another look at the safety effects of horizontal curvature on rural two-lane highways. *Accident; Analysis and Prevention*, 106, 149–159. doi:10.1016/j.aap.2017.04.001.
- Sandt, L. (2017, July). AVs and ped/bike safety. Presented at the Automated Vehicle Symposium, San Francisco, CA.
- Sandt, L. (2017, August). Introduction to the automated vehicles series. PBIC Webinar.
- Sandt, L. (2018, January). Human factors workshop on automated vehicles. 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Sandt, L. (2018, April). Automated vehicles and ped/bike safety. Presented at the Lifesavers Conference, San Antonio, TX.
- Sandt, L. (2018, April). Explaining the rise in pedestrian fatalities: A systems science perspective. Presented remotely at the USDOT Office of the Secretary and Pedestrian Safety Committee meeting, Washington, DC.
- Sandt, L. (2018, May). Action planning workshop. Presented at the Watch for Me NC meeting, New Bern, NC.

- Sandt, L. (2018, June). PBIC and CSCRS 2018 Updates. Presented remotely at the mid-year meeting of the TRB Technical Committee for Non-Motorized Transportation, Franklin, TN.
- Sandt, L. (2018, June). PBIC and CSCRS 2018 Updates. Presented at the GHSA Executive Board Meeting, Dearborn, Michigan.
- Sandt, L., Cohn, J., West, A., Johnson, S., Moose, W., & LaJeunesse, S. (2017). The role of law enforcement in supporting pedestrian and bicycle safety: Lessons and examples from North Carolina's Watch for Me NC Program. Chapel Hill, NC: Pedestrian and Bicycle Information Center.
- Sandt, L., & Owens, J.M. (2017). Discussion guide for automated and connected vehicles, pedestrians, and bicyclists. Chapel Hill, NC: Pedestrian and Bicycle Information Center.
- Scopatz, B., Brown, R., Zhou, Y., Benac, J., Peach, K., Bryson, M., & Lefler, N. (2017, December). Crash data improvement program guide (Report DOT HS 812 419). Washington, DC.: National Highway Traffic Safety Administration.
- Srinivasan, R. (2017, May). Safety evaluation of flashing yellow arrow treatment (Report P18-21627). Best of the 5th urban street symposium. Presented at 776 Operational Effects of Innovative Intersection and Interchange Designs, Raleigh, NC.
- Srinivasan, R. (2017, December 6-8). Identification of Crash types, risk factors, and countermeasures to implement systemic safety, Presented at the Transportation Engineering and Safety Conference, State College, Pennsylvania.
- Srinivasan, R. (2017, December 6-8). Update of crash modification factors for the Highway Safety Manual. Presented at the Transportation Engineering and Safety Conference, State College, Pennsylvania.
- Srinivasan, R. (2017, December 6-8). Improved prediction models for crash types and severities. Presented at the Transportation Engineering and Safety Conference, State College, Pennsylvania.
- Srinivasan, R. (2017, July 31 – August 2). Empirical Bayes versus propensity score methods in traffic safety countermeasure evaluations: A comparison, Session Title: Development of Crash Modification Factors – Project A6: Synthesis of Papers, Joint Statistical Meeting, American Statistical Association, Baltimore, Maryland.
- Srinivasan, R., Carter, D., & Lan, B. (2018). Investigation of driver performance in different horizontal and vertical curve combinations using SHRP2 naturalistic driving data. *Advances in Transportation Studies: An International Journal, Special Issue Volume 1*, 121-136.
- Srinivasan, R., Carter, D., & Lan, B. (2017, October). Investigation of driver performance in different horizontal and vertical curve combinations using SHRP2 naturalistic driving data. Presented at RSS2017 – Road Safety and Simulation International Conference, The Hague, Netherlands.
- Srinivasan, R., Lan, B., Carter, D., Smith, S., & Signor, K. (2018, January). Crash modification factors for the flashing yellow arrow treatment at signalized intersections (TRB Paper 18-01776). Paper presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Srinivasan, R., Carter, D., Lyon, C., & Albee, M. (2018, January). A before-after evaluation of the realignment of horizontal curves on rural two-lane roads (TRB Paper 18-01803). Paper presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Srinivasan, R., Carter, D., Lyon, C., & Albee, M. (2018, May 15). Before-after evaluation of the realignment of horizontal curves on rural two-lane roads. *Transportation Research Record: Journal of the Transportation Research Board*. doi.org/10.1177/0361198118758011.
- Srinivasan, R., Carter, D., Lyon, C., & Albee, M. (2018, April). Safety evaluation of horizontal curve realignment on rural, two-lane roads. Washington, DC: Federal Highway Administration.
- Srinivasan, R., Lan, B., Carter, D., Persaud, B., & Eccles, K. (2017, August). Safety evaluation of cable median barriers in combination with rumble strips on divided roads (Report FHWA-HRT-17-070). Washington, DC: Federal Highway Administration.
- Srinivasan, R. (2018, January). NCHRP 17-72: Update of crash modification factors for the Highway Safety Manual. Poster presented at the 97th Annual Meeting of the Transportation Research Board, Washington, DC.
- Teoh, E., Carter, D., Smith, S., & McCartt, A.T. (2017, September). Crash risk factors for interstate large trucks in North Carolina. *Journal of Safety Research*, 62, 13-21. doi: 10.1016/j.jsr.2017.05.002.

- Thomas, L. (2018, April 30). Trends in US pedestrian fatalities. Webinar presented for the Pedestrian & Bicycle Information Center.
- Thomas, L. (2018, June 12). NCHRP 17-73: Systemic pedestrian safety analysis. Presented at the 2018 AASHTO Technical Committee for Non-motorized Transportation Annual Meeting, Franklin, TN.
- Thomas, L., Lan, B., Sanders, R.L., Frackelton, A., Gardner, S., & Hintze, M. (2017). Changing the future? Development and application of pedestrian safety performance functions to prioritize locations in Seattle, Washington. *Transportation Research Record: Journal of the Transportation Research Board*, 2659, 212-223.
- Thomas, L., Gelinne, D., Brookshire, K., LaJeunesse, S., & Sundstrom, C. (2018, January). Coordinating road safety reviews with bicycle and pedestrian project prioritization: Final report on development and implementation of a guide for North Carolina agencies. (FHWA/NC/2016-14). Raleigh, NC: North Carolina Department of Transportation.
- Thomas, L., Sandt, L., Zegeer, C., Kumfer, W., Lang, K., & Lan, B. (2018, May). Systemic pedestrian safety analysis: Final guidebook. NCHRP.
- Thomas, L., Sandt, L., Zegeer, C., Kumfer, W., Lang, K., & Lan, B. (2018, May). Systemic pedestrian safety analysis: Final technical report. NCHRP.
- Thomas, L., Vann, M., & Levitt, D. (2018). North Carolina bicycle crash facts, 2011-2015. (RP 201742). Raleigh, NC: North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation.
- Thomas, L., Vann, M., & Levitt, D. (2018). North Carolina bicycle crash types, 2011-2015. (RP 201742). Raleigh, NC: North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation.
- Thomas, L., Vann, M., & Levitt, D. (2018). North Carolina pedestrian crash types, 2011-2015. (RP 201742). Raleigh, NC: North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation.
- Thomas, L., Gelinne, D., Brookshire, K., Sundstrom, C., & LaJeunesse, S. (2018, January). North Carolina pedestrian and bicycle road safety assessment guide: A guide for local agencies to improve pedestrian and bicycle safety. (FHWA/NC/2016-14). Raleigh, NC: North Carolina Department of Transportation.
- Wang, Y. (2018). 180-second session: Current HSRC projects on GDL and young drivers. Presented at the TRB Young Driver Committee Mid-Year meeting.
- Zegeer, C., Lyon, C., Srinivasan, R., Persaud, B., Lan, B., Smith, S., Carter, D., Thirsk, N.J., Zegeer, J., Ferguson, E., Van Houten, R., & Sundstrom, C. (2017). Development of crash modification factors for uncontrolled pedestrian crossing treatments. *Transportation Research Record: Journal of the Transportation Research Board*, 2636, 1-8. doi:10.3141/2636-01.
- Zegeer, C., Lyon, C., Srinivasan, R., Persaud, B., Lan, B., Smith, S., Carter, D., Thirsk, N.J., Zegeer, J., Ferguson, E., Van Houten, R., & Sundstrom, C. (2017). NCHRP Report 841: Development of crash modification factors for uncontrolled pedestrian crossing treatments. Washington, DC: Transportation Research Board. doi:10.17226/24627.
- Zegeer, C., Thomas, L., & Gelinne, D. (2018, June 12). The past, present, and future of pedestrian crossing research and policy. Webinar presented for Safe Transportation for Every Pedestrian, USDOT, ITE Learning Hub.

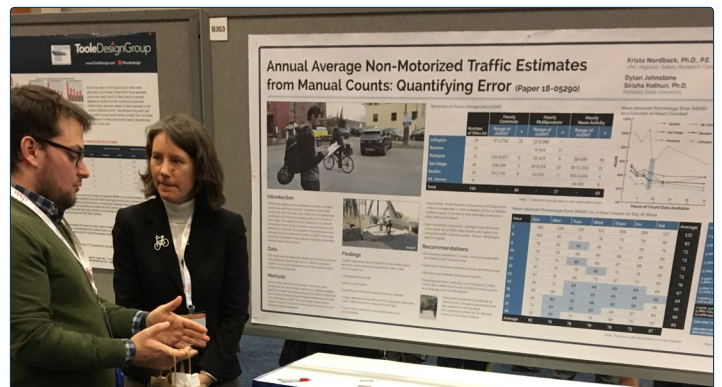
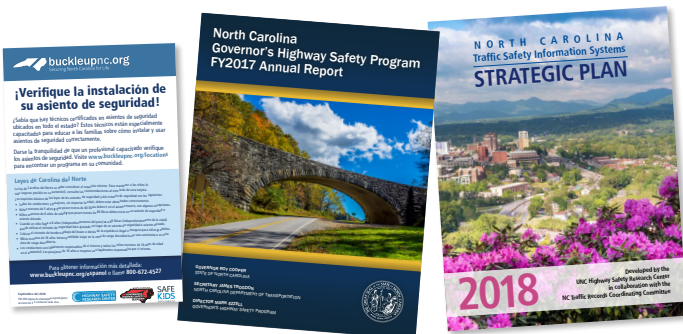
DESIGN SERVICES

HSRC's experienced Design Services and communications teams work closely with researchers to envision, create and support many program and project needs by building web interfaces, creating program collateral, formatting reports, and managing other multimedia projects.



RECENT PROJECTS INCLUDE:

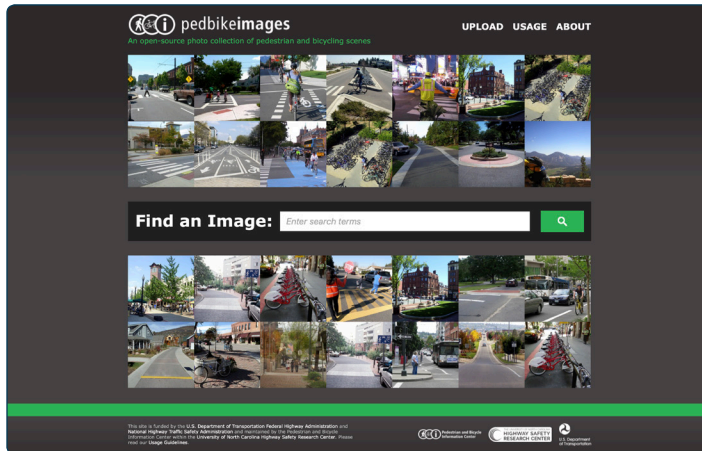
- Creating promotional fliers, conference posters, display booths and event signage
- Conducting webinar editing and processing for video projects
- Designing research project reports and whitepapers, including infographics and illustrations
- Developing and managing multimedia websites and web tools
- Envisioning and updating logos and brand identities
- Managing and building dynamic, customized databases and database-driven web tools
- Programming and designing digital newsletters, email blasts and user-generated certificates



GRAPHIC/WEBSITE DESIGN AND SOCIAL MEDIA

HSRC maintains dozens of websites for various highway safety-related projects. In this section of the annual report, we highlight newly created websites or websites that have undergone major design changes in FY2018, as well as a selection of others that continue to be maintained by HSRC.

NEW AND UPDATED WEBSITES



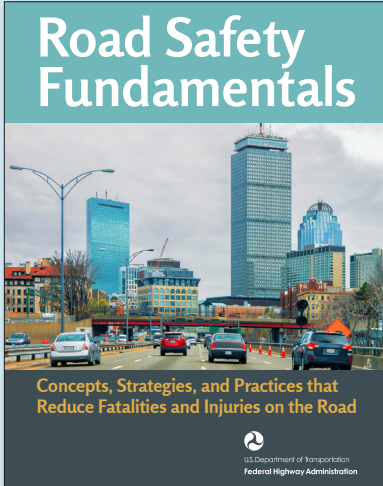
PedBikeImages pedbikeimages.org

An open access collection of pedestrian- and bicyclist-related images maintained by the Pedestrian and Bicycle Information Center.



Vision Zero for Youth visionzeroforyouth.org

A website for Vision Zero for Youth, an organization working to accelerate getting to zero traffic deaths, starting with children.



HSRC Staff Create Road Safety Fundamentals Textbook

HSRC staff wrote and designed "Road Safety Fundamentals: Concepts, Strategies, and Practices that Reduce Fatalities and Injuries on the Road." This textbook is free and was designed to educate professionals in road safety and can be used in the classroom or on the job to better understand the basic principles, data and methods of managing road safety. The book was funded by the U.S. Department of Transportation's Federal Highway Administration under the Highway Safety Information System contract.

To download this document visit:

<https://rspcb.safety.fhwa.dot.gov/rsf/>

WEBSITES HSRC MAINTAINS

Accessible Pedestrian Signals: A Guide to Best Practices

apsguide.org

A comprehensive source of information on Accessible Pedestrian Signals (APS), including recommended or required features, and how to design intersection corners to accommodate APS appropriately.

Bicycle Safer Journey

pedbikeinfo.org/bicyclesaferjourney

An online educational resource that introduces kids and teens to bicycle safety skills.

BIKESAFE Guide & Countermeasure Selection System

pedbikesafe.org/bikesafe

An online guide that provides practitioners with up-to-date information, such as engineering or enforcement treatments, for improving the safety and mobility of bicyclists.

BuckleUpNC.org

buckleupnc.org

A comprehensive website that provides information about North Carolina's seat belt and child passenger safety laws, tips for choosing and using car seats, and a listing of locations where families can go for education and assistance with car seat installation.

Center for the Study of Young Drivers

csyd.unc.edu

A website that provides insight into why motor-vehicle crashes are the leading cause of death among teenagers and information on the research being conducted to investigate this issue.

Collaborative Sciences Center for Road Safety

roadsafety.unc.edu

The website for CSCRS. Contains information on the research, education and professional development activities of CSCRS, a National University Transportation Center supporting the FAST Act research priority of promoting safety.

 @CSCRInfo
  facebook.com/CSCRInfo

Crash Modification Factors Clearinghouse

cmfclearinghouse.org

A searchable database of crash modification factors, helpful tools in evaluating road safety engineering countermeasures.

Highway Safety Information System

hsisinfo.org

A multi-state database that contains crash, roadway inventory and traffic volume data for a select group of states and urban centers.

Highway Safety Research Center

hsrc.unc.edu

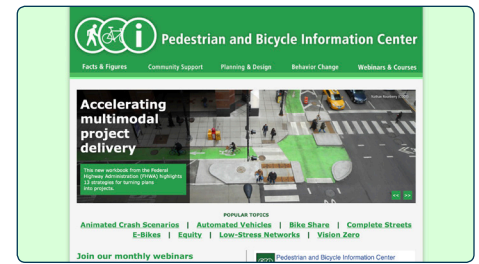
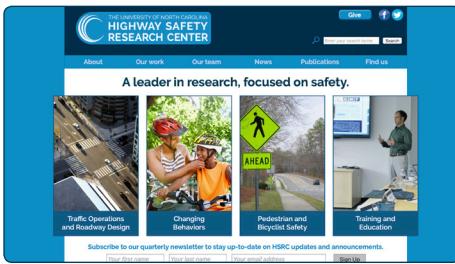
HSRC's own website where visitors can access information including updates about our work, publication lists, news updates, staff bios and contact information.

 @HSRCInfo
  facebook.com/HSRCInfo

North Carolina Crash Data Query

nccrashdata.hsrc.unc.edu

A data analysis tool to create tables reflecting North Carolina crash, vehicle and driver/occupant information for crashes.



Pedestrian and Bicycle Information Center

pedbikeinfo.org

A clearinghouse for pedestrian and bicycle resources, with information about health and safety, engineering, advocacy, education, enforcement and access and mobility. Hosted first Twitter chat about Vision Zero.

@pedbikeinfo [facebook.com/pedbikeinfo](https://www.facebook.com/pedbikeinfo)

Pedestrian Safer Journey

pedbikeinfo.org/pedsaferjourney

Curriculum for teaching pedestrian safety to children and teens, available in both English and Spanish.

PEDSAFE Guide and Countermeasure Selection System

pedbikesafe.org/pedsafe

An online guide intended to provide practitioners with the latest information including engineering, education or enforcement treatments, for improving the safety and mobility of pedestrians.

Road Safety Academy

rsa.unc.edu

The Road Safety Academy is the training and education arm of HSRC. Through this site, the RSA offers both in-person and web-based trainings that cover a broad range of road safety topics.

Safe Kids Orange County

safekidsorangenc.org

A website that provides the Orange County, North Carolina, community with information and resources to decrease injury, disability and death, and the costs to the community that are associated with injuries.

Safe Routes Wake County

saferouteswakecounty.org

A website created to support Safe Routes Wake County, an effort to improve safety and to encourage children to walk or bike to school.

Walk and Bike to School

walkbiketoschool.org

A website with information about National Walk and Bike to School events in the U.S., how to get involved and resources to help plan an event in your community.

[facebook.com/walkbiketoschoolday](https://www.facebook.com/walkbiketoschoolday)

Walk Friendly Communities

walkfriendly.org

A website that recognizes communities that are working to improve a wide range of conditions related to walking including safety, mobility, access and comfort.

@walkfriendly

Watch for Me NC

watchformenc.org

A website about the Watch for Me NC education and enforcement campaign aimed to encourage safety among pedestrians, bicyclists and drivers.



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 **@HSRCINFO**

 **FACEBOOK.COM/HSRCINFO**

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