



Exponent®
Engineering & Scientific Consulting

John Campbell, Ph.D., CHFP, PMP

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Professional Profile

Dr. Campbell has over 35 years of experience examining issues related to human factors, driver behavior and performance, and roadway safety. His scientific expertise includes human factors aspects of traffic safety, the capabilities and limitations of road users, and the relative contributions of vehicle, infrastructure, and road user factors to motor vehicle crashes. He has developed guidelines, tools, and training resources to support roadway design, diagnostic assessments, and countermeasure selection.

Dr. Campbell's recent research projects for the National Academy of Sciences include development of the 4th Edition of the Human Factors Guidelines (HFG) for Road Systems, the 2nd Edition of the Highway Safety Manual, and the 8th Edition of A Policy on Geometric Design of Highways and Streets (the Green Book).

His expertise also includes the design and evaluation of advanced driver-vehicle interfaces, including head-up displays, collision warning devices, and navigation systems. Dr. Campbell's on-going research projects for the U.S. Department of Transportation include efforts to address the many challenges for vehicles equipped with driver assistance and driving automation systems, including design of alerts and warnings for advanced safety systems, human-machine interface (HMI) requirements, and evaluations of driver monitoring systems.

Academic Credentials & Professional Honors

Ph.D., Cognitive Psychology, The Claremont Graduate School, 1993

M.A., Human Factors Psychology, California State University, Northridge, 1988

B.A., Psychology, California State University, Northridge, 1984

Arthur H. Brayfield Award, Claremont Graduate School Faculty in Psychology (1993; Most Meritorious Dissertation)

Licenses and Certifications

Certified Human Factors Professional (CHFP)

Project Management Professional (PMP)

Professional Affiliations

Transportation Research Board of the National Academies:

Past Chair (2016-2023), ACH40 - Standing Committee on Human Factors of Infrastructure Design and Operations

Member, AJL70 - Tort Liability and Risk Management

SAE International:

Member, Safety and Human Factors Steering Committee

Member, Driver-Vehicle Interface Committee

- Member, Task Force on Guidelines for Voice Interaction in Driver Vehicle Interface

Vice-chair, Advanced Driver Assistance Systems (ADAS) Committee

- Past Chair, J3265 Task Force on Naming Methodology for Driving Automation Systems (https://www.sae.org/standards/content/j3265_202211/)

Member, Driving Automation Systems Committee

Past Chair, J2830 Task Force on Comprehension Testing of In-Vehicle Symbols (http://standards.sae.org/j2830_201606/)

Human Factors and Ergonomics Society:

Reviewer, Human Factors Journal

Reviewer, Annual HFES Conference Technical Papers

Reviewer, Transportation Research Record

Publications

Campbell, J.L., Hoekstra-Atwood, L., Monk, C., Fraser, A., Torbic, D. & Potts, I. (2024) Diagnostic assessment and countermeasure selection: A toolbox for traffic safety practitioners. (NCHRP Report 1111) Washington, DC: The National Academies Press. <https://doi.org/10.17226/27890>.

Manser M, Wu L, Fincannon T, Campbell J, Krake A, Hoekstra-Atwood L, and Crump C. (2023). Role of system status information in the development of trust and mental models in automated driving systems. 27th International Technical Conference on the Enhanced Safety of Vehicles (ESV), Paper 23-0342-W, in press. <https://www-esv.nhtsa.dot.gov/27th%20ESV%20Abstract.html#25>.

Brown, J.L., Prendez, D. M., Lee, J., Romo, A., Campbell, J.L., Hutton, J., Potts, I., & Torbic, D. (2022). Human Factors Guidelines for Road Systems 2021 Update, Volume 2: Conduct of Research Report. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26474>.

Lee, J., Richard, C.M., Campbell, J.L., Brown, J.L., Hoekstra-Atwood, L., Magee, K., Prendez, D., and Schroeder, J.L. (2021). Principles and Guidance for Presenting Active Traffic Management Information to Drivers. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25994>.

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National Academies Press. <https://doi.org/10.17226/26473>.

Palac, D., Scully, I. D., Jonas, R. K., Campbell, J. L., Young, D., & Cades, D. M. (2021). Advanced Driver Assistance Systems (ADAS): Who's driving what and what's driving use? Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 65(1), 1220–1224. <https://doi.org/10.1177/1071181321651234>.

Campbell, J. L., Venkatraman, V., Hoekstra-Atwood, L., Lee, J., & Richard, C. (2020). HMI Design for Automated, Connected, and Intelligent Vehicles. In, D.L. Fisher, W.J. Horrey, J.D. Lee and M. A. Regan, (Eds.), Handbook of Human Factors for Automated, Connected, and Intelligent Vehicles. Boca Raton, FL: CRC Press/Taylor & Francis.

Hoekstra-Atwood, L., Campbell, J. L., Hoover, C., Katz, B., Kehoe, N. (2020). Use of Color Changeable Message Signs (FHWA-HOP-18-067). McLean, VA: Federal Highway Administration.

Campbell, J. L., Tignor, S., Biondi, F., Lingham, V. (2020). Meeting the Information Needs of The Road User. Transportation Research Board. Retrieved from <http://onlinepubs.trb.org/onlinepubs/centennial/papers/AND20-Final.pdf>

Graving, J. L., Bacon-Abdelmoteleb, P., & Campbell, J. L. (2019). Human factors for connected vehicles transit bus research (Report No. DOT HS 812 652). Washington, DC: National Highway Traffic Safety Administration.

Cades, D., Senatore, C., Campbell, J.L., Harrington, R., & Wood, D. (2019) Automated and assistive vehicle technology: Opportunities and challenges. The Brief, Tort Trial and Insurance Practice Section Vol. 49(1)

Hoekstra-Atwood, L., Prendez, D., Campbell, J. L., & Richard, C. M. (2019). Some on-road glances are more equal than others: Measuring engagement in the driving task. In, Proceedings of the Human Factors and Ergonomics Society 63rd Annual Meeting, Seattle, WA.

Lee, J., Venkatraman, V., Campbell, J. L., & Richard, C. M. (2019). Workload and Attention Management in Automated Vehicles. In, Human Performance in Automated and Autonomous Systems: Current Theory and Methods. Boca Raton, FL: CRC Press.

Graving, J. L.; Bacon-Abdelmoteleb, P.; & Campbell, J. L. (2019). Human factors for connected vehicles transit bus research (Report No. DOT HS 812 652). Washington, DC: National Highway Traffic Safety Administration.

Pan, D., Hamdar, S.H., Campbell, J.L., & Farrahi, A., (2018). Measuring the impact of motivations on travelers' strategic decisions in different traffic conditions: Data collection, analysis, and modeling. In, Proceedings of the Transportation Research Board 97th Annual Meeting, No. 18-05179

Brown, J., Morgan, J. F., Campbell, J., Hoover, C., & Jerome, C. (2017). Validations of Integrated Driver Vehicle Interface (DVI) Configurations. In Proceedings of the Human Factors and Ergonomics Society Annual Meeting (Vol. 61, No. 1, pp. 1431-1435). Sage CA: Los Angeles, CA: SAGE Publications.

Campbell, J.L., Kar, K., Szymkowski, R.Y., Tignor, S., & Tuddao, J.B., (2016). Applying the Human Factors Guidelines for Road Systems (HFG) to the Road Safety Audit (RSA) process. In, Proceedings of the Transportation Research Board 95th Annual Meeting, No. 16-3078.

Tignor, S.C., Campbell, J.L. and Donnell E.T., (2016) Emphasizing Human Factors in Highway Safety: Tools for Identifying Road User Needs to Reduce Crashes," ITE Journal, November 2016, 14-19.

Torbic, D., Campbell, J., and Amjadi, R. (2015). Putting safety solutions to the test. Public Roads, 78(5), <http://www.fhwa.dot.gov/publications/publicroads/15marapr/03.cfm>

Jerome, C., Monk, C., & Campbell, J. (2015). Driver Vehicle Interface Design Assistance for Vehicle-to-Vehicle Technology Applications. 24th International Technical Conference on the Enhanced Safety of Vehicles (ESV), Paper Number 15-0452, National Highway Traffic Safety Administration, 11p.

Blatt, A., Pierowicz, J., Flanigan, M., Lin, P.-S., Kourtellis, A., Lee, C., Jovanis, P., Jenness, J., Wilaby, M., Campbell, J., . . . Hoover, M. (2015). Naturalistic driving study: Field data collection (Report No. S2-S07-RW-1). Washington, DC: Transportation Research Board. Naturalistic Driving Study: Field Data Collection [The National Academies Press

Sanquist, T., Jackson, J.E., Campbell, J.L., McCallum, M.C., Lee, E.B., Van Dongen, H.P.A., McCauley, P., and Minor, H. (2014). Identifying and Reducing Workforce Fatigue in Rapid Renewal Projects. Washington, DC: The National Academies Press. <https://doi.org/10.17226/22610>.

Sanquist, T., Jackson, J.E., Campbell, J.L., McCallum, M.C., Lee, E.B., Van Dongen, H.P.A., McCauley, P., and Minor, H. (2014). Guide to Identifying and Reducing Workforce Fatigue in Rapid Renewal Projects. Washington, DC: The National Academies Press. <https://doi.org/10.17226/22611>.

Campbell, J. L., Richard, C. M., Bacon, L. P., and Doerzaph, Z. R. (2014). Human factors design principles for the driver-vehicle interface (DVI). AutomotiveUI '14 Adjunct Proceedings of the 6th International Conference on Automotive User Interfaces and Interactive Vehicular Applications. New York: ACM. doi: 10.1145.2667239.2667305

Campbell, J.L., Richard, C., Atkins, R., Lichty, M., and Brown, James L. (2013). Not So Fast! An Investigation of Real-World Speeding Behaviors and Underlying Attitudes. In: Proceedings of the Seventh International Driving Symposium in Human Factors in Driver Assessment, Training and Vehicle Design, June 17-20, 2013, Bolton Landing, New York. Iowa City, IA: Public Policy Center, University of Iowa, 2013: 2-8. <https://doi.org/10.17077/drivingassessment.1459>.

Jackson, J. E., Sanquist, T., Campbell, J., Lee, E. B., and van Dongen, H. P. A. (2013) Fatigue in highway construction workers: Risks and countermeasures in rapid renewal project schedules. Transportation Research Record, 2347, 11-18. doi: 10.3141/2347-02

Richard, C. M., Campbell, J. L., Brown, J. L., Lichty, M. G., Chrysler, S., and Atkins, R. (2013). Investigating speeding behavior using naturalistic approaches: Methodological lessons learned. Transportation Research Record, 2365, 58-65. doi: 10.3141/2365-08

Richard, C. M., Campbell, J. L., and Brown, J. L. (2008). A procedure for developing warning message prioritization rules in integrated collision warning systems for heavy trucks. Proceedings of the 52nd Annual Meeting of the Human Factors and Ergonomics Society, vol. 52: pp. 1860-1864.

Campbell, J. L., Kludt, K., and Kiefer, R.J. (2007). Evaluation of in-vehicle symbols for an intersection crash avoidance system. 14th Asia Pacific Automotive Engineering Conference (2007-01-3518). Warrendale, PA: Society of Automotive Engineers.

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Telematics, and Seating Comfort.)

McCallum, M. C., Campbell, J. L., Richman, J., Brown, J. L., and Wiese, E. (2004). Speech recognition and in-vehicle telematics devices: Potential reductions in driver distraction. *International Journal of Speech Technology*, 7, 25-33.

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Bittner, A.C., Jr., Simsek, O., Levison, W.H., and Campbell, J. L. (2002). On-road versus simulator data in driver model development: Driver performance model experience (Paper No. 02-4103) *Transportation Research Record* 1803, 38-44.

Nakata, A., Campbell, J. L., and Richman, J.B. (2002). Driver acceptance of general vs. specific icons for in-vehicle information [CD-ROM]. *Proceedings of the 46th Annual Meeting of the Human Factors and Ergonomics Society*, Vol 46, 1799-1803.

Campbell, J. L., McCallum, M.C., and Richman, J. (2002). Development of Icon IDEA: Icon Interactive Development and Evaluation Assistant (CD-ROM). *ITS America 11th Annual Meeting*. Washington, DC: ITS America.

Richman, J.B., Campbell, J. L., and McCallum, M.C. (2002). Effective IVIS comprehension research: Context and response scaling methods [CD-ROM]. *Proceedings of the 46th Annual Meeting of the Human Factors and Ergonomics Society*, 1939-1943.

Campbell, J. L., Carney, C., Monk, C., Granda, T., & Lee, J. D. (2000). Design guidelines for in-vehicle icons. *ITS AMERICA, 10th Annual Meeting*. Washington, DC: ITS America.

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Campbell, J. L., Carney, C., & Kantowitz, B. H. (1999). Developing effective human factors design guidelines: A case study. *Transportation Human Factors*, 1(3), 207-224.

Campbell, J. L., Pittenger, J. L., & Everson, J. H. (1999). Human factors research issues for the integration of ITS devices (SAE Technical Paper Series No. 99-01-0815). In: *Intelligent Vehicle Initiative (IVI) Technology: Advanced Controls (SP-1428)*. Warrendale, PA: Society of Automotive Engineers.

Lee, J. D., Gore, B. F., & Campbell, J. L. (1999). Display alternatives for in-vehicle warning and sign information: Message style, location, and modality. *Transportation Human Factors*, 1(4), 347-375.

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Campbell, J. L. (1998). Evaluation of human factors design guidelines for traveler information systems.

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Campbell, J. L., Bittner Jr., A. C., Pierowicz, J. C., & Lloyd, M. M. (1998). Development of human factors design guidelines for the transportation community. In S. Kumar (Ed.), *Advances in occupational ergonomics and safety II* (pp. 834-838). Amsterdam: IOS Press.

Carney, C., Campbell, J. L., and Mitchell, E. A. (1998). In-vehicle display icons and other information elements: Literature Review (FHWA-RD-98-164). McLean, VA: Federal Highway Administration.

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Jovanis, P.P., Campbell, J. L., Klaver, K., and Chen, W-H. (1997). Driver preferences for visual and auditory collision warning alerts. *Proceedings of the ITS 4th World Congress*, Berlin.

Campbell, J. L., Carney, C., & Kantowitz, B. H. (1997). Design guidelines for advanced traveler information systems (ATIS): The user requirements analysis. *Proceedings of the Human Factors and Ergonomics Society 41st Annual Meeting*, Vol. 41, 954-958.

Campbell, J. L., Moyer, M. J., Granda, T. M., Kantowitz, B. H., Hooey, B. L., & Lee, J. D. (1997). Applying human factors research tools for ITS (SAE Technical Paper Series No. 972670). In: *Advances in intelligent transportation system design* (SP-1285). Warrendale, PA: Society of Automotive Engineers.

Campbell, J. L., Hooey, B. L., Carney, C., Hanowski, R. J., Gore, B. F., Kantowitz, B. H., & Mitchell, E. (1996). Investigation of Alternative Displays for Side Collision Avoidance Systems (DOT HS 808 579) Washington, DC: National Highway Traffic Safety Administration

Kantowitz, B.H., Granda, T.M., Moyer, M.J., and Campbell, J. L. (1996). Using simulators to study driver response to advanced in-vehicle systems. *Proceedings of the Third Annual ITS World Congress*. Orlando, FL: ITS AMERICA.

Kantowitz, B. H. and Campbell, J. L. (1996). Pilot workload and flight deck automation. In R. Parasuraman and M. Mouloua (Eds.), *Human performance in automated systems* (pp. 117-136). Mahwah, NJ: Lawrence Erlbaum Associates.

Campbell, J. L. (1996). The development of human factors design guidelines. *International Journal of Industrial Ergonomics*, 18(5-6), 363-371.

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Campbell, J. L. (1995). Development of human factors design guidelines: Science and art. In A.C. Bittner, Jr. and P.C. Champney (Eds.), *Advances in Industrial Ergonomics and Safety VII* (pp. 105-112). London: Taylor and Francis.

Campbell, J. L., Kantowitz, B.H., and Hanowski, R. (1995). Human factors design of in-vehicle traveler information systems. *Proceedings of the Second World Congress on Intelligent Transport Systems*, 1721-1726. Yokohama, Japan: Intelligent Transportation Systems.

Campbell, J. L., Kinghorn, R.A., and Kantowitz, B.H. (1995). Driver acceptance of system features in an Advanced Traveler Information System (ATIS). *Proceedings of the 1995 Annual Meeting of ITS America*, 967-973.

Spiker, A., Walls, W.F., and Campbell, J.L. (1992). Development of job cards for mechanical maintenance. Conference Record for the 1992 Fifth Conference on Human Factors and Power Plants, 227-233

Schaeffer, M.S. and Campbell, J. L. (1988). Vertical disparity in advanced automotive displays. Proceedings of the 32nd Annual Meeting of the Human Factors Society. vol. 32, pp. 1443-1447, Santa Monica, CA: Human Factors Society.

Design Handbooks

Campbell, J. L., Brown, J. L., Graving, J. S., Richard, C. M., Lichty, M. G., Bacon, L. P., ... & Sanquist, T. (2018). Human factors design guidance for level 2 and level 3 automated driving concepts (Report No. DOT HS 812 555). Washington, DC: National Highway Traffic Safety Administration. https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13494_812555_I2I3automationhfguidance.pdf

Campbell, J. L., Brown, J. L., Graving, J. S., Richard, C. M., Lichty, M. G., Sanquist, T., ... & Morgan, J. L. (2016). Human factors design guidance for driver-vehicle interfaces (Report No. DOT HS 812 360). Washington, DC: National Highway Traffic Safety Administration. https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812360_humanfactorsdesignguidance.pdf

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Campbell, J. L., Carney, C., & Kantowitz, B.H. (1998). Human factors design guidelines for advanced traveler information systems (ATIS) and commercial vehicle operations (CVO), (FHWA-RD-98-057). Washington, DC: Federal Highway Administration. <https://www.fhwa.dot.gov/publications/research/safety/98057/toc.cfm>

Lecture, Panel, and Workshop Presentations

Legal Implications of the Use of Engineering Judgment in Transportation Operations. The Role of Human Factors in Engineering Judgement. July, 2024. TRB 62nd Annual Workshop on Transportation Law.

Who Is Responsible and Who Pays When an Automated Vehicle Crashes: A Case Study of the Tempe, Arizona Tragedy. Human Factors Considerations. January, 2024, TRB 103rd Annual Meeting, Event 4009

Roadway Infrastructure Facts for Automated Vehicle Developers: Human factors aspects of infrastructure design and AV development. September, 2023 (TRB Straight to Recording: Roadway Infrastructure Facts for Automated Vehicle Developers)

Human Factors Challenges for AVs Panel Discussion, Session 3: Game Changer or Same Law, Different Day: Consumer Expectations, Liability, Regulations and Policy for AV's, TRB 61st Annual Workshop on Transportation Law; July 2023

Legal and Risk Management Considerations Related to Safe System and Road to Zero Strategies. Panel

Discussion, Event 3013, TRB 102nd Annual Meeting, January 2023

Legal and Risk Management Considerations Related to the Safe System/Road to Zero Strategies. Panel Discussion, Session 12; July 2022

The Development of Mental Models and Trust in ADS. Panel discussion, Session 2126: Mental Models of Automated Driving at the 2020 Automated Vehicles Symposium; July, 2020

Disruption in Dealerships. Panel discussion at the SAE International Government/Industry Meeting, Washington, DC: January, 2020

Human-Machine Interface (HMI) Design Recommendations and Considerations. Lecture and panel presentation at the 2019 AAA Foundation for Traffic Safety Forum: Impact of Vehicle Technologies and Automation on Users Design & Safety Implications, San Diego, CA: November 2019

How I Stopped Worrying and Learned to Love My AV: Design Strategies for Improving Driver-vehicle Interactions. Lecture presentation at the 2019 Automated Vehicles Symposium, Orlando, FL: July 2019

Guiding the Design of Partially Automated Vehicles; HF Guidelines for the HMI. Workshop presentation at the 98th Annual Meeting of the Transportation Research Board, Washington, D.C.: January, 2019

Shared Responsibility in AVs – Opportunities for Improved Human-machine Interfaces. Lecture presentation at the University of Michigan, Center for Connected Automated Transportation (U-M CCAT) Global Symposium on Connected and Automated Transportation, Ann Arbor, MI: February 2019

Highly Automated Vehicle Technology: The Good, the Bad, & The Ugly. Lecture and panel presentation at the ABA 2019 Emerging Issues in Motor Vehicle Product Liability Conference, San Diego, CA: April, 2019

The Driver-Vehicle Interface (DVI) for Heavy Vehicles: Current Research Status and Future Research Needs. Lecture presentation at the 2018 SAE Government/Industry Meeting, Washington, D.C.: January 2018

Roadway Design and Operation - Using Human Factors to Guide Data-Driven Decision-Making. Workshop presentation at the 97th Annual TRB Meeting, Washington, D.C.: January, 2018

Emphasizing Human Factors in Highway Safety: Recognizing Road User Needs. Lecture presentation (Session 565) at the 95th Annual TRB Meeting, Washington, D.C.: January, 2016

Human Factors in Engineering and Design. Lecture presentation to the Washington Traffic Safety Conference, Seattle, WA: October, 2015

Human Factors of Connected Vehicles: Development of DVI Design Principles. Lecture presentation at the SAE 2014 World Congress, Detroit, MI: April, 2014

SHRP2 Naturalistic Driving Study: Data Collection is Complete - Now What? Keynote speech presented at the 2014 Northwest Transportation Conference, Corvallis, OR: March, 2014

Human Factors DVI Design Principles for Heavy Trucks: Development Procedures and Future Applications. Lecture presentation at the SAE Commercial Vehicle Congress, Washington, DC: October 2013

Road Weather Messages and 511: Driver Information Needs. Lecture presentation at the 90th Annual TRB Meeting, Washington, D.C.: January, 2011

Impact of Information on Traveler Decision and Driver Behavior: US Research. Panel presentation at the

90th Annual TRB Meeting, Washington, D.C.: January, 2011

Human Factors for the Integrated Vehicle-Based Safety Systems (IVBSS) Program. Lecture presentation at the 2010 SAE Government Industry Meeting, Washington, D.C.: January, 2010

Developing Useful Human Factors Guidelines for Transportation Systems: Practical Tools and Procedures. Workshop presentation at the 87th Annual TRB Meeting, Washington, D.C.: January, 2008

Development of the Technical Compendium and Summary of IVI Human Factors Research. Lecture presentation at the 48th Annual Meeting of the Human Factors and Ergonomics Society, New Orleans, LA: October, 2004

Comprehension testing of active safety symbols. Lecture presentation at the SAE World Congress, Detroit, MI: February, 2004

Improving safety in transportation systems: Strategies and tactics for human factors programs. Lecture presentation at 10th Brazilian Ergonomics Congress, Rio de Janeiro, November, 2000