

Exponent®
Engineering & Scientific Consulting

Ryan Bickhaus

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Professional Profile

Mr. Bickhaus' areas of expertise include vehicle crash analysis, full-scale crash testing, and computer simulation. He has worked in the field of roadside safety since 2018 and has experience in the design, development, and full-scale crash testing of various roadside safety installations.

Mr. Bickhaus is experienced in vehicle and guardrail impact computer simulation software, 3D laser scanning, and conducting vehicle and site inspections. His research includes the evaluation of flared approach guardrail transition installations through both computer simulation and full-scale crash testing, as well as the dynamic behavior of breakaway sign supports, and vehicle suspension modeling.

Prior to joining Exponent, Mr. Bickhaus had three years of experience in roadside safety working as a Graduate Research Assistant for the Midwest Roadside Safety Facility in Lincoln, Nebraska. His responsibilities included vehicle and guardrail simulation studies, roadside barrier system development, and full-scale crash testing and documentation.

Academic Credentials & Professional Honors

M.S., Mechanical Engineering and Applied Mechanics, University of Nebraska, Lincoln, 2021

B.S., Physics and Mathematics, Illinois College, 2018

Dwight D. Eisenhower Transportation Fellowship, 2019, 2020, 2021

Licenses and Certifications

FAA Part 107 Certified Commercial Drone Pilot

Prior Experience

Graduate Research Assistant, Midwest Roadside Safety Facility, 2018-2021

Engineering Intern, Nestlé USA, 2016-2018

Professional Affiliations

Society of Automotive Engineers - SAE

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Publications

Bickhaus, R.F., “Evaluation of Flared Approach Guardrail Transitions and MASH 2270P Ram Vehicle Model Improvements”, M.S. Thesis, University of Nebraska-Lincoln, Lincoln, NE, 2021.

Presentations

Bickhaus RF. Guidelines for Flaring Approach Guardrail Transitions (AGTs) Away from the Traveled Roadway. Poster Presentation, Transportation Research Board Annual Meeting, Washington, D.C., 2021.

Bickhaus RF. Investigation of Flared Approach Guardrail Transitions. Presentation, American Council of Engineering Companies (ACEC) of Nebraska Conference, Lincoln, NE, 2020.

Bickhaus RF. Guidelines for Flaring Approach Guardrail Transitions (AGTs) Away from the Traveled Roadway. Presentation, Transportation Research Board Annual Meeting, Washington, D.C., 2020.

Bickhaus RF. Determination of Zone of Intrusion Envelopes under MASH Impact Conditions for Rigid Barriers. Presentation, Transportation Research Board Annual Meeting, Washington, D.C., 2019.

Project Experience

Performed a computer simulation study to identify the critical flare rate for a thrie-beam approach guardrail transition installation and conducted full-scale crash testing of the identified flared installation.

Performed a dynamic sign behavior analysis for breakaway sign supports to identify the point of sign panel contact on the impacting vehicle.

Utilized 3D laser scanning to measure maximum vehicle occupant compartment deformation on roof and windshield following a breakaway sign support impact.

Additional Education & Training

Advanced Photogrammetry for Collision Reconstruction, March 2022

Northwestern University Traffic Crash Reconstruction, October 2022