

## **CURRICULUM VITAE**

### **DEAN L. SICKING, Ph.D., P.E.**

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#### **PROFESSIONAL INTERESTS**

Crash Worthiness Design  
Computational Mechanics  
Race Track and Roadside Safety

#### **EDUCATION**

*Texas A&M University, College Station, Texas:*  
Doctor of Philosophy - December 1992  
Master of Science - Civil Engineering, May 1987  
Bachelor of Science - Mechanical Engineering, May 1980, Summa Cum Laude

#### **EXPERIENCE**

- 2009- Associate Chair & Leonard A. Lovell Professor of Civil Engineering,  
Director, Midwest Roadside Safety Facility, University of Nebraska-Lincoln
- 2004-2009 Leonard A. Lovell Professor of Civil Engineering  
Director, Midwest Roadside Safety Facility, University of Nebraska-Lincoln
- 2001-2004 Professor, Civil Engineering, Director, Midwest Roadside Safety Facility,  
University of Nebraska-Lincoln
- 1997-2001 Associate Professor, Civil Engineering,  
Director, Midwest Roadside Safety Facility, University of Nebraska-Lincoln
- 1992-1997 Assistant Professor, Civil Engineering, Director, Midwest Roadside Safety Facility  
University of Nebraska-Lincoln
- 1989-1992 Associate Research Engineer, Texas Transportation Institute, Texas A&M University
- 1985-1989 Assistant Research Engineer, Texas Transportation Institute, Texas A&M University
- 1981-1988 Lecturer, Civil Engineering Department, Texas A&M University
- 1980-1985 Engineering Research Associate, Texas Transportation Institute

#### **PROFESSIONAL LICENSES**

Registered Professional Engineer: Texas - Mechanical Engineer, 1985, No. 57617  
Nebraska - Mechanical Engineer, 1993, No. 7659  
Arizona - Civil Engineer, 1990, No. 24602

## HONORS and AWARDS

**National Medal of Technology and Innovation** – the nation’s highest award for technological achievement - presented by President George W. Bush in recognition of contribution to roadside and racetrack safety.

**Ken Stonex Award** presented by TRB Committee on Roadside Safety Design in recognition of a lifetime of achievement in crashworthiness design

**2009 Best Paper Award** presented by TRB Committee on Roadside Safety Design for paper entitled “Guidelines for Cable Median Barrier Implementation”

**2008 Best Paper Award** presented by TRB Committee on Roadside Safety Design for paper entitled “Midwest Guardrail System Adjacent to 2:1 Slope”

**2007 Practice Ready Paper Award** from the National Academy of Science, Transportation Research Board, Design Division, in recognition of a paper entitled, “Guardrail Run-Out Length Design Procedures Revisited”

**2005 Vision Award** from the Texas Motorsports Hall of Fame for contribution to racing safety

**2005 Best Paper Award** presented by TRB Committee on Roadside Safety Design for paper entitled “Midwest Guardrail System for Standard and Special Applications”

**2004 Pioneering and Innovation Award** from Autosport Magazine

**2004 Bill France Award of Excellence** from the Pocono Raceway

**2004 Herb Porter Award** from Indianapolis Motor Speedway

**2003 Bill France Junior Award of Excellence**, from NASCAR

**2003 R&D 100 Award** from Research and Development (R&D) Magazine

**2002 Star of the Year**, Presented by Lincoln Journal Star

**2002 Best of What’s New Award**, Popular Science Magazine

**2002 Top 100 Technical Innovations**, Popular Science Magazine

**2002 Best Paper Award** presented by TRB Committee on Roadside Safety Design for paper entitled “Development of the Midwest Guardrail System,”

**2002 Motorsports Engineering Award**, Society of Automotive Engineers and the Specialty Equipment Market Association (SEMA)

**2002 Louis Schwitzer Award**, Society of Automotive Engineers and Borg Warner Inc.

**1999 Best Paper Award**, Transportation Research Board Committee AFB20 for paper entitled “Development of Flared Energy-Absorbing Terminal for W-beam Guardrails,”

**1999 Dean’s Recognition For Exemplary Classroom Performance**, College of Engineering, University of Nebraska

**1997 Region 7 Safety Award**, Federal Highway Administration, Region 7,

**1997 Parents Certificate of Recognition for Contributions to Students**, University of Nebraska,

**1995 Best Paper Award**, Transportation Research Board Committee AFB20 for paper entitled “Slotted RailGuardrail Terminal”

**1994 Best Paper Award**, Transportation Research Board Committee AFB20 for paper entitled “Box-Beam Guardrail End Terminal,”

**1992 Federal Highway Administration Safety Award**, Presented to the Texas Department of Transportation for Funding Development of Guardrail Extruding Terminal (Dr. Sicking lead development effort.)

**1986 Fred Burggraf Award**, National Academy of Science, Transportation Research Board, for paper entitled, "Guidelines for Positive Barrier Use in Work Zones,"

**1980 C. M. Simmang Award**, Texas A&M University, 1980.

Pi Tau Sigma; Tau Beta Pi; & Phi Kappa Phi

## PATENTS

1. Rohde, J., R. Faller, Sicking, D. et al., U.S. Patent No. 7,690,687, *Cable Release Lever*, March 29, 2011.
2. Reid, J.D., J.R. Rohde, K.K. Mak, and D.L. Sicking U.S. Patent No. 7,690,687, *Trailer Mounted Attenuator with Breakaway Axle Assembly*, April 6, 2010, Licensed to Gregory Industries, Canton, Ohio. \*
3. Faller, R.K., D.L. Sicking, et al., U.S. Patent No. 7,410,320, *High Impact Energy Absorbing Vehicle Barrier System*, August 12, 2008, Licensed to Motor Sports Technologies, Inc., (MST), Indianapolis, Indiana.
4. Humphries, E.C. S.D. Barratt, R.K. Faller, K.J. Kurz, and D.L. Sicking, U.S. Patent No. 7,220,077, *Traffic Noise Barrier System*, May 27, 2007, Licensed to Cyro, Inc., Parsippany, NJ.
5. Reid, J.D., J.R. Rohde, D.L. Sicking, *Single Sided Crash Cushion System*, U.S. Patent No. 7,147,088, December 12, 2006, Licensed to Road Systems, Inc., Big Spring, Texas. \*
6. Sicking, D.L. and B.G. Pfeifer, U.S. Patent No. 7,111,827, *Energy Absorption System*, September 26, 2006, Licensed to Interstate Steel Inc., Big Spring, Texas.
7. Reid, J.D., J.R. Rohde, D.L. Sicking, and K.K. Mak U.S. Patent No. 7,100,752, *Bridge Pier Crash Cushion System*, September 5, 2006, Licensed to Road Systems, Inc., Big Spring, Texas.
8. Reid, J.D., J.R. Rohde, D.L. Sicking, and K.K. Mak, *End Splice Assembly for Box-Beam Guardrail and Terminal Systems*, U.S. Patent No. 7,086,508, August 8, 2006, Licensed to Road Systems Inc., Big Spring, Texas.
9. Faller, R.K., D.L. Sicking, et. al., U.S. Patent No. 6,926,461 *High Impact Energy Absorbing Vehicle Barrier System*, August 9, 2005, Licensed to Motor Sports Technologies, Inc., Indianapolis, Indiana.\*
10. Reid, J.D., J.R. Rohde, and D.L. Sicking, U.S. Patent No. 6,668,989, *Trailer Mounted Bursting Energy Absorption System*, December 30, 2003. Licensed to Road Systems Inc., Big Spring, Texas.\*
11. Sicking, D.L. and B.G. Pfeifer, U.S. Patent No. 6,505,820, *Guardrail Terminal*, January, 2003, Licensed to Kothmann Enterprises, Inc. Big Spring, Texas.

12. Reid, J.D., J.R. Rohde, and D.L. Sicking, U.S. Patent No. 6,457,570, *Rectangular Bursting Energy Absorber*, October 1, 2002, Licensed to Road Systems Inc., Big Spring, Texas.\*
13. Sicking, D.L., J.D. Reid, R.K. Faller, B.G. Pfeifer, B.T. Rosson, and J.R. Rohde, U.S. Patent No. 6,416,041, *Guardrail System*, July 9, 2002 .
14. Reid, J.D., J.R. Rohde, and D.L. Sicking, U.S. Patent No. 6,308,809, October 30, 2001, *Crash Attenuation System*, Licensed to Road Systems Inc., Big Spring, Texas.\*
15. Sicking, D.L., J.D. Reid, R.K. Faller, B.G. Pfeifer, B.T. Rosson, and J.R. Rohde, U.S. Patent No. 6,260,827, *Guardrail System*, July 17, 2001.
16. Rohde, J.R., J.D. Reid and D.L. Sicking, U.S. Patent No. 6,254,063 *Energy Absorbing Breakaway Steel Guardrail Post*, July 3, 2001, Licensed to Road Systems Inc., Big Spring, Texas.
17. Reid, J.D., J.R. Rohde, and D.L. Sicking U.S. Patent No. 6,244,571, *Controlled Kinking Breakaway Cable Terminal*, June 12, 2001.
18. Sicking, D.L., J.D. Reid and J.R. Rohde, U.S. Patent No. 6,109,597, *Anchor Cable Release Mechanism for a Guardrail System*, August 29, 2000, Licensed to Road Systems Incorporated, Big Spring, Texas.
19. Sicking, D.L. and B. G. Pfeifer, U.S. Patent No. 6,022,003, *Guardrail Cutting Terminal*, February 8, 2000, Licensed to Interstate Steel Incorporated, Big Spring, Texas.
20. Sicking, D.L., J.D. Reid, and J.R. Rohde, U.S. Patent No. 5,988,598, *Breakaway Steel Guardrail Post*, November 23, 1999, Licensed to Road Systems Incorporated, Big Springs, Texas. \*
21. Sicking, D.L., J.D. Reid, and G.W. Paulsen, U.S. Patent No. 5,931,448, *Reverse Twist Turned-Down Terminal for Road Guardrail Systems*, August 3, 1999.
22. Sicking, D.L., J.D. Reid, and J.R. Rohde, U.S. Patent No. 5,924,680, *Foundation Sleeve for A Guardrail System*, July 20, 1999, Licensed to Road Systems Incorporated, Big Spring, Texas.
23. Sicking, D.L., J.D. Reid, and J.R. Rohde, U.S. Patent No. 5,775,675, *Sequential Kinking Guardrail Terminal*, July 7, 1998, Licensed to Road Systems Incorporated, Big Spring, Texas.\*
24. Mak, K.K., R.P. Bligh, D.L. Sicking, and H.E. Ross, Jr., U.S. Patent No. 5,547,309, *Thrie-Beam Terminal With Breakaway Post Cable Release*, August 20, 1996, Licensed to Trinity Industries, Dallas, Texas.

25. Mak, K.K., R.P. Bligh, D.L. Sicking, and H.E. Ross, Jr., U.S. Patent No. 5,503,495, *Thrie-Beam Terminal With Breakaway Post*, April 2, 1996, Licensed to Trinity Industries, Dallas, Texas.\*
26. Sicking, D.L., R.P. Bligh, K.K. Mak, and H.E. Ross, Jr., U.S. Patent No 5,407,298, *Slotted Rail Terminal*, April 18, 1995, Licensed to Trinity Industries, Dallas, Texas.\*#
27. Ivey, D.L., C.E. Buth, K.K. Mak, and D.L. Sicking, U.S. Patent No. 5,391,016, *Metal Beam Rail Terminal*, February 21, 1995, Licensed to Trinity Industries, Dallas, Texas.
28. Sicking, D.L., A. Qureshy, H.E. Ross, Jr., and C.E. Buth, U.S. Patent No. 5,078,366, *Guardrail Extruder Terminal*, January 7, 1992 Licensed to Trinity Industries, Dallas, Texas.\*@
29. Buth, C.E., H.E. Ross, Jr., A. Qureshy, and D.L. Sicking, U.S. Patent No. 4,928,928, *Guardrail Extruder Terminal*, May 29, 1990, Licensed to Trinity Industries, Dallas, Texas.\*
30. Sicking, D.L. and H.E. Ross Jr., U.S. Patent No. 4,815,565, *Low Maintenance Crash Cushion End Treatment*, March 28, 1989, Licensed to Energy Absorption Systems Incorporated, Chicago, Illinois.\*

\* Foreign patents also issued.

# Sales of in excess of \$100,000,000.

@ Sales of in excess of \$600,000,000.

## BOOKS

1. Mak, K.K., D.L Sicking, S.F.D. de Albuquerque, B.A. Coon, "Identification of Vehicular Impact Conditions Associated With Serious Ran-Off-Road Crashes," National Cooperative Highway Research Program Report 492, Transportation Research Board, Washington D.C., 2010.
2. Sicking, D.L., K.K. Mak, J.R. Rohde, and J.D. Reid, "Manual for Assessment of Safety Hardware," American Association of State Highway and Transportation Officials, Washington, D.C., 2009.
3. Sicking, D.L. K.A. Lechtenberg, and S.A. Peterson, "Guidelines for Guardrail Implementation," National Cooperative Highway Research Program Report 638, Transportation Research Board, Washington D.C., 2009.
4. Mak, K.K. and D.L. Sicking, "Roadside Safety Analysis Program (RSAP), Engineer's Manual," National Cooperative Highway Research Program Report 492, Transportation Research Board, Washington D.C., 2003.

5. Ross, H. E., Jr., R.A. Krammes, D.L. Sicking, K.D. Tyer, and H.S. Perera, "Traffic Barriers and Control Treatments for Restricted Work Zones," National Cooperative Highway Research Program Report 358, Transportation Research Board, Washington D.C., 1994.
6. Ross, H.E. Jr., D.L. Sicking, R.A. Zimmer, and J. Michie, "Recommended Procedures for the Safety Performance Evaluation of Highway Features," National Cooperative Highway Research Program Report 350, Transportation Research Board, Washington D.C., 1993, 132 pp.
7. Ross, H.E. Jr., H.S. Perera, D.L. Sicking, and R.P. Bligh, "Roadside Safety Design for Small Vehicles," National Cooperative Highway Research Program, Report 318, Transportation Research Board, 1989, 70 pp.

#### REFEREED JOURNAL PUBLICATIONS

1. de Albuquerque , F.D.B., D.L. Sicking, C.S. Stolle, "*Roadway Departure and Impact Conditions*" Submitted to the Journal of the Transportation Research Record 2195, Journal of the Transportation Research Board, Washington, D.C., November 2010.
2. Sicking, D.L., K.A. Lechtenberg, F.D.B. Albuequerque, C.S. Stolle, *Guidelines for Implementation of Cable Median Barrier*, Transportation Research Record No. 2120, Journal of the Transportation Research Board, Washington D.C., November 2009, pgs. 82-92.
3. Reid, J.D., J.A. Hascall, D.L. Sicking, and R.K. Faller, *Inertial Effects During Impact Testing*, Transportation Research Record No. 2120, Journal of the Transportation Research Board, Washington D.C., November 2009, pgs. 39-46.
4. Rosenbaugh, S.K., R.K. Faller, R.W. Bielenberg, K.A. Lechtenberg, and D.L. Sicking, *High Performance Aesthetic Bridge Rail and Median Barrier*, Transportation Research Record No. 2120, Journal of the Transportation Research Board, Washington D.C., November 2009, pgs. 60-73.
5. Faller, R.K., J.D. Reid, D.E. Kretschmann, J.A. Hascall, and D.L.Sicking, *Midwest Guardrail System with Round Timber Posts*, Transportation Research Record No. 2120, Journal of the Transportation Research Board, Washington D.C., November 2009, pgs. 47-59.
6. Reid, J.D., B.D. Kuipers, D.L. Sicking, and R.K. Faller, *Impact Performance of W-Beam Guardrail Installed at Various Flare Rates*, International Journal of Impact Engineering, Vol. 36, No. 3, March, 2009, pages 476-485.

7. Rohde, J.R., J.D. Reid, D.L. Sicking, and K.K. Mak, "Trailer Truck-Mounted Attenuator", *International Journal of Crashworthiness*, Vol. 13, No. 1, pgs. 77 - 87
8. Polivka, K.A., R.K. Faller, D.L. Sicking, and R.W. Bielenberg, *Midwest Guardrail System Adjacent to a 2:1 Slope*, Transportation Research Record No. 2060, Journal of the Transportation Research Board, Washington D.C., November 2008, pgs. 67-73.
9. Sicking, D.L., J.D. Reid, R.W. Bielenberg, R.K. Faller, J.R. Rohde, and K.A. Polivka, *Safety Grates for Cross Drainage Culverts*, Transportation Research Record No. 2060, Journal of the Transportation Research Board, Washington D.C., November 2008, pgs. 74-84.
10. Polivka, K.A., B.A. Coon, D.L. Sicking, R.K. Faller, R.W. Bielenberg, J.R. Rohde, and J.D. Reid, *Development of the Midwest Guardrail System (MGS) W-Beam to Thrie Beam Transition*, Transportation Research Record No. 2025, Journal of the Transportation Research Board, Washington D.C., November 2007.
11. Bielenberg, R.W., R.K. Faller, D.L. Sicking, J.R. Rohde, and J.D. Reid, *Midwest Guardrail System for Long Span Culvert Applications*, Transportation Research Record No. 2025, Journal of the Transportation Research Board, Washington D.C., November 2007.
12. Faller, R.K., D.L. Sicking, R.W. Bielenberg, J.R. Rohde, K.A. Polivka, and J.D. Reid, *Performance of Steel-Post W-Beam Guardrail Systems*, Transportation Research Record No. 2025, Journal of the Transportation Research Board, Washington D.C., November 2007.
13. Melvin, J.W., P.C. Begeman, R.K. Faller, D.L. Sicking, S.B. McClellan, E. Maynard, M.W. Donegan, A.M. Mallott, and T.W. Gideon, "Crash Protection of Stock Car Racing Drivers - Application of Biomedical Analysis of Indy Car Crash Research," *Stapp Car Crash Journal*, November, 2006.
14. B.A. Coon, D.L. Sicking, and K.K. Mak, "Guardrail Run-Out Length Design Procedures Revisited," Transportation Research Record No. 1984, Journal of the Transportation Research Board, Washington D.C., January 2006.
15. Faller, R.K., K. Kurz, K.A. Polivka, D.L. Sicking, E. Humphries, and J. Hascall, *A Test Level 4 Noise Wall for Attachment to Concrete Traffic Barriers*, Transportation Research Record No. 1984, Journal of the Transportation Research Board, Washington D.C., January 2006.
16. Bielenberg, R.W., R.K. Faller, D.L. Sicking, J.R. Rohde, and J.D. Reid, *Tie-Downs and Transitions for Temporary Concrete Barriers*, Transportation Research Record No. 1984, Journal of the Transportation Research Board, Washington D.C., January 2006.

17. Bielenberg, R.W., J.R. Rohde, D.L. Sicking, J.D. Ried, "*SKT and FLEAT End Terminals for the Midwest Guardrail System (MGS)*, Transportation Research Record No. 1984, Journal of the Transportation Research Board, Washington D.C., April 2005, pp 46-53.
18. Faller, R.K., K.A. Polivka, B.D. Kuipers, B.W. Bielenberg, J.D. Reid, J.R. Rohde, and D.L. Sicking, "Midwest Guardrail System for Standard and Special Applications" *Transportation Research Record No. 1890*, Transportation Research Board, Washington D.C., January 2004, pp 19-33.
19. Sicking, D.L., J.R. Rohde, and J.D. Reid, "Development of Trailer Attenuating Cushion for Variable Message Signs and Arrow Boards," *Transportation Research Record No. 1851*, TRB, National Research Council, Washington, D.C., January 2003. pp. 65-74.
20. Polivka, K.A., R.K. Faller, J.D. Reid, J.R. Rohde, and D.L. Sicking, "Guardrail Connection for Low-Fill Culverts," *Transportation Research Record No. 1851*, Transportation Research Board, Washington, D.C., January 2003.
21. Bielenberg, B.W., R.K. Faller, J.D. Reid, J.R. Rohde, and D.L. Sicking, "Design and Testing of Tie-Down Systems for Temporary Barriers," *Transportation Research Record No. 1851*, Transportation Research Board, Washington, D.C., January 2003.
22. Reid, J.D., R.K. Faller, J.C. Holloway, J.R. Rohde, and D.L. Sicking, "A New Energy-Absorbing High-Speed Safety Barrier," *Transportation Research Record No. 1851*, Transportation Research Board, Washington, D.C., January 2003.
23. Rohde, J.R., D.L. Sicking, and J.D. Reid, "The Box-Beam Burster Energy Absorbing Tube - Bridge Pier Protection System," *Transportation Research Record No. 1851*, Transportation Research Board, Washington, D.C., January 2003.
24. Sicking, D.L., J.D. Reid, and J.R. Rohde, "Development of the Midwest Guardrail System," *Transportation Research Record 1797*, Transportation Research Board, Washington, D.C., January 2002.
25. Rohde, J.R., J.D. Reid, and D.L. Sicking, "Flared Energy Absorbing Terminal - Median Barrier (FLEAT-MT)," *Transportation Research Record 1797*, Transportation Research Board, Washington, D.C., January 2002.
26. Polivka, K.A., R.K. Faller, J.R. Rohde, and D.L. Sicking, "Crash Testing and Analysis of Work Zone Sign Supports," *Transportation Research Record 1797*, Transportation Research Board, Washington, D.C., January 2002.



27. J.D. Reid, J.R. Rohde, and D.L. Sicking, "*Box-Beam Burster Energy Absorbing Single-Sided Crash Cushion*," Transportation Research Record 1797, Transportation Research Board, Washington, D.C., January 2002.
28. Reid, J.D., J.R. Rohde, and D.L. Sicking, "Box-Beam Bursting Energy Absorbing Terminal," ASCE Journal of Transportation Engineering, Vol. 128, No. 3, May/June 2002, pp. 287-294.
29. Polivka, K.A., D.L. Sicking, R.K. Faller, and J.R. Rohde, "A W-Beam Guardrail Adjacent to a Slope," Transportation Research Record 1743 (2001) 80-87.
30. Faller, R.K., D.L. Sicking, K.A. Polivka, J.R. Rohde, and R.W. Bielenberg, "A Long-Span Guardrail System for Culvert Applications," Transportation Research Record 1720, Transportation Research Board, Washington, D.C., January 2001, 19-29.
31. Sicking, D.L., J.R. Rohde, and J.R. Reid, "Design and Development of Steel Breakaway Posts," Transportation Research Record 1720, Transportation Research Board, Washington, D.C., January 2001, 59-66.
32. Sicking, D.L., J.D. Reid, and J.R. Rohde, "Development of a Flared Energy Absorbing Terminal for W-Beam Guardrail," Transportation Research Record 1690, TRB, National Research Council, Washington, D.C., November 1999, pp. 8-16.
33. J.D. Reid and D.L. Sicking, "Design and Simulation of a Sequential Kinking Guardrail Terminal," International Journal of Impact Engineering, Vol. 21, No. 9, 1998, pp. 761-772.
34. Mak, K.K., D.L. Sicking, and K.J. Zimmerman, "Roadside Safety Analysis Program," Transportation Research Record 1647, Transportation Research Board, National Research Council, Washington D.C., November, 1998. pp 67-74.
35. Sicking, D.L., J.D. Reid, and J.R. Rohde, "Development of the SKT-350 Guardrail Terminal," Submitted to Transportation Research Record 1647, Transportation Research Board, Washington D.C., November, 1998.
36. Pfiefer, B.J. and D.L. Sicking, "NCRHP Report 350 Compliance Testing of the Beam-Eating Steel Terminal System," Submitted to Transportation Research Record 1647, Transportation Research Board, Washington D.C., November 1998.
37. Reid, J.D., D.L. Sicking, and R.P. Bligh, "Critical Impact Point for Longitudinal Barriers," Journal of Transportation Engineering, American Society of Civil Engineers, Vol 124, No. 1, January-February 1998. pp 65-72.

38. Wolford, D., and D.L. Sicking, "Guardrail Need: Embankments and Culverts," Transportation Research Record 1599 Transportation Research Board, Washington D.C., December, 1997. pp 48-56.
39. Reid, J.D., D.L. Sicking, R.K. Faller, and B.G. Pfeifer, "Development of a New Guardrail System," Transportation Research Record 1599, Transportation Research Board, National Research Council, Washington D.C., December 1997. pp 72-80
40. Wolford, D. and D.L. Sicking, "Guardrail Runout Lengths Revisited," Transportation Research Record 1528, Transportation Research Board, November 1996.
41. Faller, R.F., K. Soyland, and D.L. Sicking, "Approach Guardrail Transition for Single Slope Barriers," Transportation Research Record 1528, Transportation Research Board, November 1996.
42. Holloway, J.C., D.L. Sicking, and R.K. Faller, "Reduced Height Performance Level 2 Bridge Rail," Transportation Research Record 1528, Transportation Research Board, November 1996.
43. Pfeiffer, B.G., and D.L. Sicking, "Development of a Metal Cutting Guardrail Terminal," Transportation Research Record 1528, Transportation Research Board, November 1996.
44. Reid, J.D., D.L. Sicking, and G. Paulsen, "Design and Analysis of Approach Terminal Sections Using Simulation," Journal of Transportation Engineering, American Society of Civil Engineers, Volume 122, No. 5, 1996.
45. Mak, K. K., R. P. Bligh, H. E. Ross, Jr., and D.L. Sicking, "Slotted Rail Guardrail Terminal," Transportation Research Record 1500, Transportation Research Board, November, 1995.
46. Mak, K. K. and D. L. Sicking, "Analysis of Bridge Rail Accidents", Transportation Research Record 1468, Transportation Research Board, January 1995.
47. Sicking, D. L., K. K. Mak, and W. Wilson, "Box Beam Guardrail End Terminal," Transportation Research Record 1468, Transportation Research Board, January 1995.
48. Reid, J. D. and D. L. Sicking, "Design Concepts for Collapsing Turned Down Guardrail," Society of Automotive Engineers, Paper No. 951086, April 1995.
49. Schapery, R. A. and D. L. Sicking, "On Nonlinear Constitutive Equations for Elastic and Viscoelastic Composites with Growing Damage," Proceedings of the 7<sup>th</sup> International Conference on Mechanical Behavior of Materials, May 28-June 2, 1995, The Hague.

50. Mak, K.K. and D.L. Sicking, "Rollover Caused by Concrete Safety Shaped Barrier," Transportation Research Record 1258, Transportation Research Board, 1992.
51. Roschke, P.N., D.L. Sicking, and M. F. Thompson, "Selection of Rubber Materials and Shapes for Energy-Absorbing Elements," Journal of Materials in Civil Engineering, Vol. 2, No. 4, ASCE, 1990.
52. Sicking, D.L., P.N. Roschke, and H.E. Ross, Jr., "Low-Maintenance Rubber Crash Cushion," Journal of Transportation, Vol. 116 No. 3, ASCE, 1990.
53. Ivey, D.L., H.E. Ross, Jr., D. L. Sicking, and C.C. MacAdam, "Truck Losses of Control Produced by Pavement Edge and Shoulder Conditions," Surface Characteristics of Roadways: International Research and Technologies, ASTM STP 1031, 1990.
54. Sicking, D.L., A.B. Qureshy, and H.E. Ross, Jr., "Development of Guardrail Extruder Terminal," Transportation Research Record 1233, Transportation Research Board, 1990.
55. Sicking, D.L., A.B. Qureshy, and H.E. Ross, Jr., "Development of Slotted-Rail Terminal Break-Away Cable Terminal," Transportation Research Record 1233, Transportation Research Board, 1990.
56. Bligh, R.P. and D.L. Sicking, "Applications of Barrier VII in the Design of Flexible Barriers," Transportation Research Record 1233, Transportation Research Board, 1990.
57. Bligh, R.P., D.L. Sicking, and H.E. Ross, Jr., "Development of a Strong Beam Guardrail to Bridge Rail Transition," Transportation Research Record 1198, Transportation Research Board, 1988.
58. Sicking, D.L., and H.E. Ross, Jr., "Structural Optimization of Strong Post W-Beam Guardrail," Transportation Research Record 1133, Transportation Research Board, 1987.
59. Sicking, D.L. and H.E. Ross, Jr., "Benefit/Cost Analysis of Roadside Safety Alternatives," Transportation Research Record 1065, 1986.
60. Sicking, D.L., and H.E. Ross, Jr., "A Low-Maintenance End Treatment for Concrete Barriers," Transportation Research Record 1065, Transportation Research Board, 1986.
61. Mak, K.K., D.L. Sicking, and H.E. Ross, Jr., "Real World Impact Conditions for Ran-Off-the-Road Accidents," Transportation Research Record 1065, Transportation Research Board, 1986.
62. Ivey, D.L., and D.L. Sicking, "The Influence of Pavement Edge and Shoulder Characteristics on Vehicle Handling and Stability," Transportation Research Record 1084, Transportation Research Board, 1986.

63. Sicking, D.L., "Guidelines for Positive Barrier Use in Construction Zones," Transportation Research Record 1035, Transportation Research Board, 1985.
64. Ross, H.E. Jr., and D.L. Sicking, "Guidelines for Placement of Longitudinal Barriers on Slopes," Transportation Research Record 970, Transportation Research Board, 1984.
65. Sicking, D.L., H.E. Ross, Jr., T.J. Hirsch, and D.L. Ivey, "A Portable Traffic Barrier for Work Zones," Transportation Research Record 942, Transportation Research Board, 1983.
66. Sicking, D.L., and H.E. Ross, Jr. "A Crash Cushion for Narrow Objects," Transportation Research Record 942, Transportation Research Board, 1983.
67. Ross, H.E., Jr., D.L. Sicking, et al., "Safety Treatment of Roadside Drainage Structures," Transportation Research Record No. 868, Transportation Research Board, with H. E. Ross, et al., 1982.

**SUBMITTED FOR CONSIDERATION FOR PUBLICATION/  
PUBLICATION PENDING**

1. Rosenbaugh, S.K., R.K. Faller, R.W. Bielenberg, K.A. Lechtenberg, and D.L. Sicking, *Development of a Head Ejection Envelope for Use in Barrier Design*, Submitted to Journal of Transportation Engineering, American Society of Civil Engineers, (Accepted 3/2011, publication pending).
2. de Albuquerque , F.D.B. and D.L. Sicking, "*Guidelines for Safety Treatment of Cross Drainage Culverts*," Submitted to Journal of Transportation Engineering, American Society of Civil Engineers. (Accepted 11/2010, publication pending).
3. Thiele, J.C., D.L. Sicking, R.K. Faller, K.A. Lechtenberg, J.D. Reid, S.K. Rosenbaugh, "*Development of Low-Cost Energy-Absorbing Bridge Rail*," Submitted to the Journal of the Transportation Research Board, (Accepted 11/2010, publication pending).
4. Stolle, C.S., J. Bohlken, K.A. Lechtenberg, D.L. Sicking, J.D. Reid, S.K. Rosenbaugh, "*Recommendations for Impact Conditions Used in Side-Impact and Nontracking Testing*" Submitted to Accident Analysis and Prevention.
5. Lechtenberg, K.A., R.K. Faller, D.L. Sicking, J.D. Reid, J.R. Rohde, S.K. Rosenbaugh, "*Nonblocked, Midwest Guardrail System for Gabion Wall Applications*" Submitted to the Journal of the Transportation Research Board, (Accepted 11/2010, publication pending).

## REFEREED CONFERENCE PAPERS

1. Stolle, C.S., J. Bohlken, K.A. Lechtenberg, D.L. Sicking, J.D. Reid, S.K. Rosenbaugh, "Recommendations for Impact Conditions Used in Side-Impact and Nontracking Testing" Submitted to Accident Analysis and Prevention.
2. Reid, J.D., B.D. Kuipers, D.L. Sicking, and R.K. Faller, *Guardrail Flare Rates* Paper No. 07-0517, Presented at the Annual Meeting of the Transportation Research Board and Published in the Compendium of Papers CD-ROM, TRB AFB20 Committee on Roadside Safety Design, Transportation Research Board, Washington D.C., January 2007.
3. Faller, R.K., R.W. Bielenberg, D.L. Sicking, J.R. Rohde, and J.D. Reid, Development and Testing of the SAFER Barrier - Version 2, SAFER Barrier Gate, and Alternative Backup Structure, Paper No. 2006-01-3612, Publication No. P-399, Proceedings of the 2006 SAE Motorsports Engineering Conference and Exhibition, Dearborn, Michigan, December 5-7, 2006.
4. Kretschmann, D.E., R.K. Faller, J.D. Reid, J.A. Hascall, D.L. Sicking, and J.R. Rohde, Small-Diameter Roundwood, Strong-Post W-Beam Guardrail Systems, Proceedings of the 9th World Conference on Timber Engineering (WCTE), August 6-10, 2006, Portland, Oregon.
5. Bielenberg, R.W., R.K. Faller, D.L. Sicking, J.R. Rohde, J.D. Reid, K.A. Polivka, and J.C. Holloway, "Initial In-Service Performance Evaluation of the SAFER Racetrack Barrier" Proceedings of the 2004 SAE Motorsports Engineering Conference, Paper 2004-01-3526, pp 213 - 224.
6. Reid, J.D., R.K. Faller, and D.L. Sicking, "High Speed Crash Barrier Investigation Using Simulation," Crashworthiness, Occupant Protection and Biomechanics in Transportation Systems - 2000, ASME, November 2000.
7. Reid, J.D. and D.L. Sicking, "Design of the SKT-350 Using LS-DYNA3D," TRB Paper 980352, Transportation Research Board 77th Annual Mtg, January 1998.
8. Sicking, D.L. and K.K. Mak, "Severity Estimates for Ran-Off-Road Accidents," Transportation Research Board 76th Annual Meeting, January 12-16, 1997.
9. Reid, J.D. and D.L. Sicking, "Design Concepts for a Collapsing Turned-Down Guardrail," IX International Conference on Vehicle Structural Mechanics and CAE, SAE P-290, 1995, pp. 61-68.

10. Faller, R.F., B.T. Rosson, M.A. Ritter, and D.L. Sicking "Design and Evaluation of Two Low-Volume Bridge Railings," *Transportation Research Record, Sixth International Conference on Low Volume Roads, Volume II*, National Academy Press, Washington, D.C. 1995.

#### **INVITED CONFERENCE PROCEEDINGS**

1. Sicking, D.L and K.K. Mak, "Improving Roadside Safety by Computer Simulation," in Transportation in the New Millenium, Transportation Research Board, Washington, D.C. January 2000.
2. Sicking, D.L., "Alternative Techniques for Evaluating Roadside Safety Systems," *Transportation Research Circular No. E-C02*, July, 1998, Transportation Research Board, National Research Council, pp 12-15.
3. Sicking, D.L., "Applications of Simulation in Design and Analysis of Roadside Safety Features," *Transportation Research Circular No. 435*, January 1995. Transportation Research Board, National Research Council.
4. Sicking, D.L., "Energy Dissipation Characteristics of Rubber Cylinders," *Proceedings, Ninth Conference on Engineering Mechanics, Engineering Mechanics Division of the American Society of Civil Engineers*, May. 1992, pp. 139-142.
5. Sicking, D.L., "Update of NCHRP Report 230, Recommended Procedures for the Safety Performance Evaluation of Highway Appurtenances," *Transportation Research Circular 374*, July 1991, Author of Part 2, Section C.
6. Ross, H.E. Jr. and D.L. Sicking, "Selection of Performance Levels for Longitudinal Barriers," *Proceedings, American Society of Civil Engineers Specialty Conference on Effectiveness of Highway Safety Improvements*, Mar. 1986, pp. 231-241.
7. Sicking, D.L., and H.E. Ross, Jr., "Evaluation of Safety Alternatives by Benefit/Cost Analysis," *Proceedings, American Society of Civil Engineers Specialty Conference on Effectiveness of Highway Safety Improvements*, Mar. 1986, pp. 159-171.

#### **RESEARCH REPORTS**

Dr. Sicking has authored or co-authored more than 200 technical reports published by the University of Nebraska-Lincoln and the Texas Transportation Institute. Most of these technical reports are available through the National Technical Information Service. A complete list can be provided upon request.

## **SCHOLARLY PRESENTATIONS**

1. "Guidelines for Median Barrier Implementation," Presented at the Transportation Research Board 88th Annual Meeting, January 10-13, 2009.
2. "Isolating Inertial Effects During Dynamic Strength Testing," Presented at the Transportation Research Board 88th Annual Meeting, January 10-13, 2009.
3. "Comments During Balloting of MASH," Presented at meeting of AASHTO's Technical Committee on Roadside Safety, Savannah, GA, Sept. 29, 2008.
4. "Guidelines for Median Barrier Implementation," Presented to the Kansas Department of Transportation, August 26, 2008.
5. "Roadside and Race Track Safety Research," Presented to Osher Life Long Learning Institute, Lincoln, NE, Feb. 12, 2008.
6. "Safety Research at UNL," Presented at Science & Math Focus Program, Lincoln Public Schools, Lincoln, NE, Jan. 12, 2008
7. "Roadside Safety Research at UNL," Presented at International Conference on Advance Materials and Construction Technologies," Lincoln, NE, Dec. 6, 2007.
8. "Final Revisions to the Manual on Assessment of Safety Hardware," Presented at meeting of AASHTO's Technical Committee on Roadside Safety, Seattle, WA, Sept. 9, 2007
9. "Future Needs for Cable Barrier Systems," Presented at the Workshop on Cable Barrier Systems, sponsored by Transportation Research Board AFB20 - Roadside Safety Design Committee, Rapid City, SD, July August 8-11, 2007
10. "Guardrail Flare Rates," Presented at the Transportation Research Board 86th Annual Meeting, January 22-26, 2007.
11. "Manufacturing the SAFER Barrier", Presented at the Society of Manufacturing Engineers, Motorsports Indianapolis Industry Meeting, Indianapolis, IN, January 26, 2007
12. "Maintenance and Repair of the SAFER Barrier," Presented at the NASCAR Security/Track Services Summit, January 12-13, 2007.
13. "Improving Safety in Motorsports," Expert Panel Discussion at SAE Motorsports Engineering Conference and Exhibition, Dearborn, Michigan, December 5-7, 2006.

14. "Proposed Changes in NCHRP Report 350," Presented at a joint meeting of AASHTO /ARTBA/AGC Join Task Force 13 and AASHTO's Technical Committee on Roadside Safety, Toronto, CA October 6, 2006.
15. "Guardrail Guidelines," Presented at AASHTO's Technical Committee on Roadside Safety Annual Meeting, Toronto, CA October 6, 2006.
16. "Using RSAP to Develop Guidelines for Positive Protection in Work Zones," Presented at the Workshop on Positive Protection in Work Zones, sponsored by Transportation Research Board AFB20 - Roadside Safety Design Committee and AHB55 - Work Zone Traffic Control, Jackson, CA, August 8-10, 2006.
17. "Guardrail Length," Presented at the 85<sup>th</sup> Annual Meeting of the Transportation Research Board, Washington, D.C., January 21-26, 2006.
18. "Recent Advances in Roadside Safety," Presented the Transportation Engineering and Safety Conference, Sponsored by Penn State University, State College, PA, December 6-9, 2005.
19. "Son of NCHRP Report 350", Presented at the *How To Conference*, Sponsored by the Heart of America Chapter of the American Traffic Safety Services Association, Kansas City, MO, December 5, 2005.
20. "Test Matrices for the Update to NCHRP Report 350," Presented at *Highway Safety Workshop*, Sponsored by the Transportation Research Board AFB20 - Roadside Safety Design Committee, St. George, Utah, July 10-13, 2005.
21. "Guidelines for Repairing the SAFER Barrier," Presented to Indy Racing League Officials and Emergency Crew, Kansas City, Kansas, July 1, 2005.
22. "Guidelines for Repairing the SAFER Barrier," Presented to NASCAR's Nextel Cup, Busch, and Craftsman Truck Series Officials, Charlotte, NC, May 25, 2005.
23. "Crash, Bang, But No Ouch," Presented to the MOVITE, ITS Heartland Annual Conference, Topeka, KS, March 16, 2005.
24. "Collaboration Between NDOR and the University of Nebraska," Presented with Moe Jamshidi to the Nebraska Highway Commission, Lincoln, NE, February 25, 2005.
25. "Recent Advancements in Roadside Safety," Presented to the Kansas Engineers Conference, Overland Park, KS, November 22, 2004.



26. "DOR's Cooperative Research Program" Presented with Moe Jamshidi to the North Platte Rotary Club, North Platte, NE, Aug. 14, 2004.
27. "Proposed Revisions to Test Matrices," Presented at *Workshop on the Update to NCHRP Report 350*, Sponsored by Transportation Research Board AFB20 - Roadside Safety Design Committee, Overland Park, KS, July 18-21, 2004.
28. "Test Vehicle Selection," Presented at *Workshop on the Update to NCHRP Report 350*, Sponsored by Transportation Research Board AFB20 - Roadside Safety Design Committee, Overland Park, KS, July 18-21, 2004.
29. "Why Do We Continue to Build Safety Shaped Barriers," Presented at *Workshop on the Update to NCHRP Report 350*, Sponsored by Transportation Research Board AFB20 - Roadside Safety Design Committee, Overland Park, KS, July 18-21, 2004.
30. "Development of the SAFER Barrier," Presented to the Downtown Kiwanis Club, Lincoln, NE, October 7, 2003.
31. "Development of the SAFER Barrier," Presented to the Westminster Presbyterian Men's Breakfast Club, Lincoln, NE, October 7, 2003.
32. "Recent Developments at the MwRSF," Presented to the AASHTO RAC Region III Conference, Lincoln, NE, September 9, 2003.
33. "Has The Clear Zone Concept Outlived Its Usefulness?," Presented at *Context Sensitive Utilization of Roadside Safety Features*, Sponsored by Transportation Research Board A2A04 - Roadside Safety Design Committee, Minneapolis, MN, July 14, 2003.
34. "Updating NCHRP Report 350," Presented at *Context Sensitive Utilization of Roadside Safety Features*, Sponsored by Transportation Research Board A2A04 - Roadside Safety Design Committee, Minneapolis, MN, July 14, 2003.
35. "Guardrails On Slopes," Presented at the Minnesota Roadside Safety Forum, Sponsored by the Minnesota Department of Transportation, Minneapolis MN, May, 18-19, 2003.
36. "Median Treatments," Presented at the Minnesota Roadside Safety Forum, Sponsored by the Minnesota Department of Transportation, Minneapolis MN, May, 18-19, 2003.
37. "Safety Improvements to Cable Median Barrier," Presented to the Roadside Safety Features Committee, Transportation Research Board, Annual Meeting, January, 13, 2003.
38. "Safety Research at the Midwest Roadside Safety Facility," Presented to the Nebraska Safety Council, Lincoln Nebraska, March 12, 2002.

39. "Roadside Safety Improvements," Presented to the Nebraska Advocates for Safety, Lincoln Nebraska, February 22, 2002.
40. "Development of the SAFER Barrier," Presented at a joint meeting of the Lincoln Engineers Club and the Lincoln Section of the National Society of Professional Engineers, November 21, 2002.
41. "Expected Revisions to Safety Performance Evaluation Criteria," Joint Meeting of the AASHTO Task Force for Roadside Safety and AASHTO/ARTBA/AGC Task Force 13, Sept 23-25, 2002, St. Louis, MO.
42. "Zones of Intrusion", Meeting of the AASHTO Task Force for Roadside Safety, September 26, 2002, St. Louis, MO.
43. "Updating Safety Performance Evaluation Criteria," *TRB A2A04 - Roadside Safety Features Committee*, Pacific Grove, CA, July 21, 2002.
44. "Development of an Energy-Absorbing Barrier for High-Speed Racetrack Applications," Presented at NASCAR's Safety meeting for the Winston Cup Racing Series, Indianapolis, IN, July 9 and 15, 2002.
45. "Development of the Midwest Guardrail System," Presented at the Transportation Research Board 81st Annual Meeting, January 12-17, 2002
46. "Ongoing and Future Research," Presented at the FHWA and NDOR Roadside Safety Hardware Workshop, Sponsored by the Federal Highway Administration, Midwest States Pooled Fund, and the Nebraska Department of Roads, Clifford Hardin Nebraska Center for Continuing Education, Lincoln, Nebraska, April 3, 2002.
47. "Roadside Safety Analysis Program," Presented at the FHWA and NDOR Roadside Safety Hardware Workshop, Sponsored by the Federal Highway Administration, Midwest States Pooled Fund, and the Nebraska Department of Roads, Clifford Hardin Nebraska Center for Continuing Education, Lincoln, Nebraska, April 3, 2002.
48. "Development of a Trailer Attenuator," Presented to the Roadside Safety Features Committee, Transportation Research Board, Annual Meeting, January, 2001.
49. "NCHRP Report 350 for Roadside Safety Features," Presented at the Kansas Consulting Engineer Conference, Topeka, Kansas, October 25, 2001.
50. "Reconstruction of Dale Earnhardt's Accident at Daytona 500," Presented at NASCAR Press Conference to Summarize Findings of Investigation of Dale Earnhardt's Crash at the 2001 Daytona 500, Atlanta, GA, August 21, 2001.

51. "Guardrail Runout Lengths Revisited," Presented to the Roadside Safety Features Committee, Transportation Research Board, Annual Meeting, January, 2001.
52. "Light Gauge Guardrail," Presented to the Roadside Safety Features Committee, Transportation Research Board, Annual Meeting, January, 2001.
53. "Build It, Crash It, and Walk Away," Presented at the Nebraska Cooperative Research Conference," Sponsored by the Nebraska Department of Roads, Lincoln, NE, October 12, 2000
54. "Safety Treatment of Narrow Medians," Presented at Issues in Roadside Safety, Sponsored by the Transportation Research Board, Woods Hole, Massachusetts, August 20-23, 2000.
55. "Practical Safety Treatments for Fixed Objects in Narrow Medians," Presented at the Western Association of State Highway and Transportation Officials, Rapid City, South Dakota, June 18-21, 2000.
56. "Recent Developments in Roadside Safety," Presented at the AASHTO Subcommittee on Design Annual Meeting, Rapid City, South Dakota, June 20-23, 2000.
57. "Impact Performance of Work Zone Signs and Traffic Control Devices," Smart Work Zone Conference, Sponsored by the Mid-America Transportation Center, Omaha, Nebraska, January 24-25, 2000.
58. "Development of a Breakaway Steel Guardrail Post," Transportation Research Board 79<sup>th</sup> Annual Meeting, January 10-13, 2000
59. "Meeting NCHRP Report 350 Impact Performance Guidelines," Presented at the Federal Highway Administration Region 1 Safety Conference, Hartford, Connecticut, March 14-15, 1999.
60. "Development of Flared Energy Absorbing Terminal," Transportation Research Board 78<sup>th</sup> Annual Meeting, January 12-15, 1999
61. "Development of Sequential Kinking Terminal," Transportation Research Board 77<sup>th</sup> Annual Meeting, January 11-15, 1998.
62. "Development of BEST-350," Transportation Research Board 77<sup>th</sup> Annual Meeting, January 11-15, 1998.
63. "Problems Created by NCHRP Report 350 Safety Standards," Ohio Transportation Conference, Columbus, Ohio, November 21, 1997.

64. "Alternative Techniques for Evaluating Roadside Safety Devices," Presented at Roadside Safety Testing Issues, Sponsored by the Transportation Research Board, Woods Hole, Massachusetts, July 26-28, 1997.
65. "Severity Estimates for Ran-Off-Road Accidents," Transportation Research Board 76<sup>th</sup> Annual Meeting, January 12-16, 1997.
66. "Guardrail Performance with Light Trucks," 78th Annual Kansas Transportation Engineering Conference, April 11-12, 1996.
67. "Guardrail Performance With Light Trucks," Annual Maintenance Conference sponsored by Nebraska Department of Roads, Kearney, Nebraska, April 10, 1996.
68. "Nebraska's New Guardrail Terminals," Annual Maintenance Conference sponsored by Nebraska Department of Roads, Kearney, Nebraska, April 10, 1996.
69. "Roadside Barriers, How They Function and Why They Sometimes Fail," Great Lakes Highway Hardware Workshop, Sponsored by Federal Highway Administration, Madison, Wisconsin, March 25-27, 1996.
70. "Computer Simulation of Roadside Safety Features," Great Lakes Highway Hardware Workshop, Sponsored by Federal Highway Administration, Madison, Wisconsin, March 25-27, 1996.
71. "Wood Guardrail Post Specifications, Why Current Standards are Inappropriate," Great Lakes Highway Hardware Workshop, Sponsored by Federal Highway Administration, Madison, Wisconsin, March 25-27, 1996.
72. "Recent and Future Research at Midwest Roadside Safety Facility," Great Lakes Highway Hardware Workshop, Sponsored by Federal Highway Administration, Madison, Wisconsin, March 25-27, 1996.
73. "Guardrail for Light Trucks," Project Engineers Conference, Sponsored by the Nebraska Department of Roads, Columbus, Nebraska, March 10, 1996.
74. "Guardrail Runout Lengths Revisited," Transportation Research Board 75<sup>th</sup> Annual Meeting, January 7-11, 1996.
75. "Approach Guardrail Transition for Single Slope Barriers," Transportation Research Board 75<sup>th</sup> Annual Meeting, January 7-11, 1996.
76. "Reduced Height Performance Level 2 Bridge Rail," Transportation Research Board 75<sup>th</sup> Annual Meeting, January 7-11, 1996.

77. "Development of a Metal Cutting Guardrail Terminal," Transportation Research Board 75<sup>th</sup> Annual Meeting, January 7-11, 1996.
78. "A Procedure for Developing and Validating Safety Hardware Impact Severities," Presented to the Severity Indices Task Force, August 10, 1995, Irvine, California.
79. "Guardrail Terminals - A Changing Landscape", Presented at the AASHTO Subcommittee on Design, Annual Meeting, Branson, Missouri, June 21-23, 1995.
80. "Fundamentals of Guardrail Performance," Midwest Highway Hardware Workshop, Lincoln, NE, March 13 & 14, 1995.
81. "Development of the BEST Guardrail Terminal," Midwest Highway Hardware Workshop, Lincoln, NE, March 13 & 14, 1995.
82. "Warrants for Multiple Performance Level Safety Hardware," Midwest Highway Hardware Workshop, Lincoln, NE, March 13 & 14, 1995.
83. "Applications of Simulation in Design and Analysis of Roadside Safety Features," Presented at Roadside Safety Issues, Sponsored by the Transportation Research Board, Woods Hole, Massachusetts, August 11-13, 1994.
84. "Box-Beam Guardrail Terminal" presented at the 73<sup>rd</sup> Annual Meeting of the Transportation Research Board, Washington, D.C., January 11, 1994.
85. "Full Scale Crash Testing of Guardrails and Bridge Rails," presented at the 14<sup>th</sup> Annual Concrete Paving Workshop, Nebraska Chapter of America Concrete Pavement Association, February 4, 1993.
86. "Energy Dissipation Characteristics of Rubber Cylinders," Presented at the Ninth Conference on Engineering Mechanics, Engineering Mechanics Division of the American Society of Civil Engineers, May. 1992, pp. 139-142.
87. "Pavement Edges and Automobile Stability," Presented at the 1991 Torts Litigation Seminar, Philadelphia, Pennsylvania, August 1991.
88. "Development of Guardrail Extruder Terminal," Presented at the 68th Annual Transportation Research Board Meeting, Washington, D.C., Jan 1989.
89. "Feasibility of Incorporating Rubber Attenuation Elements in Conventional Crash Cushions," Presented at the 62nd Annual Highway and Transportation Short Course, Texas A&M University, October 1988.

90. "Rollover Caused by Concrete Safety Shaped Barriers," Presented at the 62nd Annual Highway and Transportation Short Course, Texas A&M University, October 1988.
91. "Development of a Strong Beam Guardrail to Bridge Rail Transition," Presented at the 67th Annual Transportation Research Board Meeting, Washington, D.C., January 1988.
92. "A New End Treatment for Guardfence," Presented at the 61st Annual Highway and Transportation Short Course, Texas A&M University, October 1987.
93. "Performance of Roadside Safety Features for Mini-Cars," Presented at the 61st Annual Highway and Transportation Short Course, Texas A&M University, October 1987.
94. "Structural Optimization of Strong Post W-Beam Guardrail," Presented at the 66th Annual Transportation Research Board Meeting, Washington, D.C., January 1987.
95. "A Low-Maintenance End Treatment for Concrete Barriers," presented at the 60th Annual Highway and Transportation Short Course, Texas A&M University, October 1986.
96. "Evaluation of Safety Alternatives by Benefit/Cost Analysis," Presented at a Specialty Conference on "Effectiveness of Highway Safety Improvements" sponsored by the American Society of Civil Engineers, Nashville, Tennessee, March 24-26, 1986.
97. "A Low-Maintenance End Treatment for Concrete Barriers," Presented at the 65th Annual Transportation Research Board Meeting, Washington, D.C., January 1986.
98. "Benefit/Cost Analysis of Highway Safety Alternatives," Presented at 1985 American Society of Civil Engineering Spring Convention, Denver, Colorado, May 1985.
99. "Guidelines for Positive Barrier Use in Construction Zones," Presented at the 64th Annual Transportation Research Board Meeting, Washington, D.C., January 1985.
100. "A Portable Traffic Barrier for Work Zones," Presented at 62nd Annual Transportation Research Board Meeting, Washington, D.C., January 1983.
101. "A Crash Cushion for Narrow Objects," Presented at 62nd Annual Transportation Research Board Meeting, Washington, D.C., January 1983.

## **CONFERENCES AND WORKSHOPS ORGANIZED**

**Workshop on the Update to NCHRP Report 350**, Sponsored by Transportation Research Board Committee AFB20 - Roadside Safety Design, Overland Park, KS, July 18-21, 2004.

**Context Sensitive Utilization of Roadside Safety Features**, Sponsored by Transportation Research Board Committee A2A04: Roadside Safety Design, Minneapolis, MN, July 13-16, 2003.

**Midwest Highway Hardware Workshop**, Sponsored by Federal Highway Administration-Region 7 in Cooperation with the Midwest Roadside Safety Facility and the Center for Infrastructure Research, Lincoln, Nebraska, March 9-10, 1998.

**Great Lakes Highway Hardware Workshop**, Sponsored jointly by the Wisconsin DOT and Federal Highway Administration, Madison, Wisconsin, March 24-25, 1996.

**Midwest Highway Hardware Workshop**, Sponsored by Federal Highway Administration-Region 7 in Cooperation with the Midwest Roadside Safety Facility and the Center for Infrastructure Research, Lincoln, Nebraska, March 14-15, 1995.

**Computer Simulation of Impact with Roadside Safety Features**, Conference Session presented at 74<sup>th</sup> Annual Transportation Research Board Meeting, Washington, D.C., January 22, 1995.

## **PROFESSIONAL COMMITTEE ASSIGNMENTS:**

Member, Transportation Research Board, Committee AFB20, "Committee on Roadside Safety Features," 2003-2009.

Chairman, Transportation Research Board Committee AFB20, "Roadside Safety Design Committee," 2003-2006

Chairman, Transportation Research Board, Subcommittee A2A04(1), "Computational Mechanics Subcommittee," 1994-2001.

Member, Transportation Research Board, Committee A2A04, "Committee on Roadside Safety Features," 1992-2001.

Member, AAHSTO-FHWA Task Force on Implementation of NCHRP Report 350, 1998.

Member, Transportation Research Board, Committee A3B12, "Committee on Motor Vehicle Technology," 1986-1994.

Member, Transportation Research Board, Subcommittee A2A04(1), "Subcommittee on Computational Mechanics," 1986-present.

Member, National Cooperative Highway Research Program, Project Panel 22-14, "Update of Recommended Procedures for the Safety Performance Evaluation of Highway Appurtenances," 1996-2000.

Member, National Cooperative Highway Research Program, Project Panel 17-11, "Recovery-Area Distance Relationships for Highway Roadside," 1996-2004.

Member, National Cooperative Highway Research Program, Project Panel 20-5, "Synthesis of Guardrail Systems," 1994.

### **SHORT COURSES DEVELOPED**

- Roadside Safety Analysis Program**, 6 hours Presented to the Kansas Department of Transportation, November 14, 2008
- Advanced Roadside Safety**, 8 hours Presented to Minnesota Department of Transportation, June 21-23, 2004.
- Evolving Issues in Roadside Safety**, 8 hours Presented to Minnesota Department of Transportation, April 23-25, 2002.
- Roadside Design for Safety** - 12 Hours, Presented to Missouri Department of Transportation August 14-15, 1996.
- NDOR's New Safety Standards** - 28 Hours of instruction, Presented to 120 engineers from Nebraska Department of Roads and local consultants.
- Applications of Computer Simulation in Roadside Safety Design**, " Eight day Short course presented at the Institute National de Recherche Sur Les, Transports et Leur Securite (INRETS), Lyon, France, October 1989.

### **COURSES TAUGHT**

- Graduate:** Fracture Mechanics, Failure of Structural Materials, Energy Methods, Impact Analysis, Structural Dynamics, Advanced Structural Analysis, Plasticity, Transportation Safety
- Undergraduate :** Introduction to Civil Engineering, Introduction to Structural Engineering, Advanced Structural Analysis, Reinforced Concrete Design, Steel Design, Strength of Materials, Strength of Materials Laboratory, Civil Engineering Materials, Ethics and Professional Practice, Senior Design

### **GRADUATE STUDENTS**

- Cody Stolle, Doctor of Philosophy, Expected Graduation, December 2011,  
Topic: "Improving the Performance of Cable Median Barriers"
- Jennifer Schmidt, Doctor of Philosophy, Expected Graduation, December 2011,  
Topic: "Low Cost Energy Absorbers for High Performance Safety Barriers"
- Kevin Schrum, Doctor of Philosophy, Expected Graduation , May 20014,  
Topic "Constitutive Relations for Portland Cement Concrete Subjected to Impact"
- Scott Rosenbaugh, Doctor of Philosophy, Expected Graduation, May 2014,  
Topic: "TBA"



Daniel Benício, Doctor of Philosophy, August, 2011, Topic: “In-Service Performance Evaluation of Concrete Barriers”

Brian Coon, Doctor of Philosophy, August 2003, (sponsored & supervised but not chair)  
Topic: Reconstruction Procedures for Ran-Off-Road Crashes.”

Ronald K. Faller, Doctor of Philosophy, May 1998. Thesis topic: “Elasto-Plastic Beam Bending Under Monotonic and Alternating Yield Conditions.” (Applied to the design of bridge rails for wooden bridges.)

Brian G. Pfeiffer, Doctor of Philosophy, May 1997.  
Topic: “Energy Dissipation by Shearing Steel Plates.”

Eric Jowsa, Master of Science-Civil Engineering, expected graduation, December, 2011  
Topic: “Development of a Mechanical Fuse For Guardrail Posts,”

Kevin Schrum,, Master of Science-Civil Engineering, expected graduation, May, 2011  
Topic: “Determining the Risk of Serious or Fatal Injury on Roadside Slopes,”

Ben Dickey, Master of Science-Civil Engineering, expected graduation, August, 2011  
Topic: “Factors Affecting the Capacity of Epoxy Anchors,”

Jennifer Schmidt, Master of Science-Civil Engineering, December 2009,  
Topic: “Crashworthiness of Temporary Signs”

Jeff Thiele, Master of Science-Civil Engineering, December 2009  
Topic: “Energy Absorbing Bridge Rails”

Steve Arens, Master of Science-Civil Engineering, December 2008  
Topic: “Development of Breakaway Steel Guardrail Posts”

Scott Peterson, Master of Science-Civil Engineering, May 2009,  
Topic: “Guardrail Placement Guidelines.”

Daniel Benício, Master of Science-Civil Engineering, December 2007  
Topic: “Evaluation of Safety Treatments for Roadside Culverts”

Scott Rosenbaugh, Master of Science-Civil Engineering, August 2007,  
Topic: “Anchorage Requirements for Concrete Traffic Barriers”

Jason Hascal, Master of Science-Civil Engineering, August 2006,  
Topic: “Dynamic Strength Characteristics of Alternative Wood Species.”

Ryan Nelson, Master of Science-Civil Engineering, May 2003, Topic: “Cable Guardrail Installed Adjacent to Steep Roadside Slopes.”

Matthew Goeller, Master of Science - Civil Engineering, May 2000, “Soil Behavior During a Guardrail Post Impact.”

Brian Coon, Master of Science - Civil Engineering, December 1999. Thesis “Dynamic Impact Testing and Simulation of Guardrail Posts Embedded in Soil”

Robert W. Bielenberg, Master of Science - Mechanical Engineering, Thesis: Finite Element Simulation of a Bullnose Median Barrier System, August, 1999

Dan Wolford, Master of Science - Civil Engineering, May 1997. Thesis topic: “Methods for

Selecting Guardrail Length of Need.”

Karl Zimmerman, Master of Science - Civil Engineering, December 1996. Thesis topic: “Cost-Effectiveness Analysis Procedures.”

James C. Holloway, Jr., Master of Science - Civil Engineering, December 1993; Thesis: “Safety Performance Evaluation of Vehicular Impacts on Mountable Curbs.” (Co-Chair)

James K. Luedke, Master of Science - Civil Engineering, December, 1993, Thesis: “Development of Equivalent Dynamic Forcing Functions of Vehicle Impacts on Bridge Rails.”

### **EXTRAMURAL RESEARCH FUNDING**

Dr. Sicking has been principle or co-principal investigator on research projects with total extramural funding in excess of \$25 million. Research sponsors include: Research and Innovation Technology Administration, Federal Highway Administration, U.S. Department of Agriculture, National Cooperative Highway Research Program, 15 States, NASCAR, Indy Racing League, General Motors, Ford, Syro Steel, Trinity Industries, Buffalo Specialty Products, Road Systems Inc., Interstate Steel, Union Pacific, Dow, Owens Corning, and assorted smaller companies. Research projects undertaken during the last 4 years are listed on the following pages. Note that funding levels include only extramural funding without any university match or in-kind contributions. A complete listing is available upon request.

<b>Sponsor</b>	<b>Description</b>	<b>Duration</b>	<b>Total Budget</b>
Union Pacific	Impact Management System for Next Generation Rail Tank Car	2007-2012	\$63,641
Pooled Fund	Pooled Fund Program for Roadside Safety, Year 17	2007-2008	\$545,000
NYDOT	Evaluation of Type I and II End Terminal for Box Beam	2007-2008	\$95,524
NYDOT	Evaluation of Box Beam Stiffening for Temp Concrete Barrier	2007-2008	\$100,603
MST	SAFER Training and Maintenance Program	2007-2008	\$16,300
FHWA	Enhancement of Research Infrastructure at the MwRSF	2007-2011	\$216,250
FHWA	FHWA Development of Crash Testing for Wire Mesh Phase I	2007-2011	\$100,000
FHWA	FHWA Development of Crash Testing for Wire Mesh Phase II	2007-2008	\$150,000
NYDOT	Evaluation of Box Beam Stiffening of Temp Concrete Barrier	2007-2008	\$53,109
NYDOT	Analysis of the Type I End Terminal for Box Beam	2007-2011	\$41,753
Pooled Fund	Pooled Fund Program for Roadside Safety, Year 18	2007-2009	\$545,000
WV DOT	Development of TL-2 Steel Bridge Rails for Laminated Bridge Decks	2007-2009	\$49,848
WV DOT	Development of Test Level 1 Timber Curb Railing for Bridge Decks	2007-2009	\$108,079
MST	Continued Evaluation of SAFER Applications	2007-2009	\$55,409
MATC	Safety Investigation of Work Zone Devices	2007-2011	\$60,000
FHWA	FHWA Development of Crash Testing for Wire Mesh (add on)	2008-2009	\$150,000
NYDOT	Dynamic Evaluation of Box Beam End Terminal	2008-2009	\$180,093
FHWA	Enhancement of Research Infrastructure at the MwRSF	2008-2009	\$216,250
KSDOT	Testing & Evaluation of a New TCB for FRP Bridge Decks	2008-2011	\$56,120
Pooled Fund	Development of High Tension Cable Barrier	2008-2011	\$219,260
Pooled Fund	Phase I - Guidelines for Post Socketed Foundations for Cable Barrier	2008-2011	\$73,549
Pooled Fund	Further Development of the MGS Transition	2008-2011	\$78,288
Pooled Fund	Annual Consulting Services Support	2008-2011	\$31,711
Pooled Fund	Annual LS-DYNA Enhancement Support Year 3	2008-2009	\$21,936
Pooled Fund	Phase II - Development of an MGS Bridge Rail	2008-2009	\$157,256
MST	Project 16 - Continued SAFER Research and Evaluation	2008-2009	\$6,151
Valmont	Certification of Valmont Industries' Impact Testing Facility	2008-2009	\$13,145
KSDOT	RSAP Data Analysis	2008-2009	\$9,175
NYDOT	Dynamic Evaluation of NYDOT's Temporary Concrete Barrier	2009-2010	\$48,801
NYDOT	Dynamic Evaluation of a Modified Type IIA Box Beam Terminal	2009-2010	\$112,626
NYDOT	Dynamic Evaluation of an Aluminum Pedestrian Pole	2009	\$40,842
Median Wind	Evaluation of Safety of Wind Turbines on Median Barriers	2008-2011	\$56,745
WISDOT	Evaluation of MGS Performance with Native Wood Species	2008-2011	\$69,804
WISDOT	Roadside Grading Guidance	2008-2011	\$78,391
WISDOT	Concrete Traffic Barrier Attachment to Deck using Epoxy	2008-2011	\$113,619
WISDOT	Low Deflection TCB	2008-2011	\$178,914
NDOR, WISDOT	Synthesis of Crash Cushion Guidance	2008-2011	\$112,275
NDOR, WISDOT	Evaluation of the Safety of Various Erosion Control Features	2008-2011	\$48,733
Pooled Fund	Impact Evaluation of Free-Cutting Brass Breakaway Couplings	2008-2011	\$37,461

<b>Sponsor</b>	<b>Description</b>	<b>Duration</b>	<b>Total Budget</b>
Pooled Fund	Guidelines for Post-Socketed Foundations for 4 Cable System	2008-2011	\$92,207
Pooled Fund	High Tension Cable Barrier on Level Terrain	2008-2011	\$52,888
Pooled Fund	Terminal for Midwest 4-Cable High Tension Barrier Systems	2008-2011	\$159,193
Pooled Fund	Maximum MGS Guardrail Height	2008-2011	\$166,9
Pooled Fund	Annual Consulting Services Support	2008-2011	\$39,699
Pooled Fund	Annual LS-DYNA Enhancement Support Year 4	2008-2011	\$37,634
Pooled Fund	Contingency	2008-2010	\$13,695
NDOR, NYDOT	Dynamic Evaluation of NY State's Pinned Temporary Concrete Barrier	2008-2011	\$57,734
MST	Concept Development of Crash Cushion for High Speed Race Tracks	2008-2011	\$68,802
FHWA	Adaptation of the SAFER Barrier for Roadside and Median Applications	2008-2010	\$990,000
IADOT	Safety Investigation and Guidance for Work Zone Devices	2010	\$50,000
Delta Bloc	Delta Bloc Temporary Barrier	2010-2011	\$94,180
WISDOT	Guidance for Retrofitting Existing Approach Guardrail Transition	2010	\$100,251
Safence	Safence High Tension Cable Barrier	2010-2013	\$143,001
WISDOT	WIS Short Radius Guardrail for Larger Radii	2010-2013	\$57,929
WISDOT	WIS Downstream Anchoring Design	2010-2013	\$235,065
WISDOT	WIS Minimum Effective Guardrail Length	2010-2013	\$122,477
		4 Yr Total	\$6,699,189