

GEORGE HEARN is associate professor of civil engineering at the University of Colorado at Boulder. Prof. Hearn has more than forty years' experience in bridge inspection, design, rehabilitation and management. Prof. Hearn has served as principal investigator for bridge-related projects sponsored by the National Science Foundation, the National Academies, AASHTO, the US Federal Highway Administration and the State of Colorado. He is the author of the 2022 AASHTO Guide to Bridge Preservation Actions¹, author of the 2021 AASHTO guide to bridge preservation actions², the principal investigator for the AASHTO study of design details for durable highway bridges, the principal investigator for NCHRP project 14-36 for development of guides to bridge preservation, the principal investigator for the FHWA study of States' advice for preservation actions, the author of the 2014 synthesis on practices for bridge load posting³, the author of the 2012 case studies of bridge management practices in Idaho, Michigan and Virginia⁴, the author of the 2010 NCHRP scan report on *Bridge Management Decision Making*⁵, author of NCHRP Synthesis 375 *Bridge Inspection Practices*⁶ (2007), the principal investigator for NCHRP Project 14-15 *Developing a National Database System for Maintenance Actions on Highway Bridges*⁷ (2010), and the principal investigator in evaluation of bridge preservation costs for Colorado DOT⁸ (2012). He evaluated bridge deck durability for Colorado DOT⁹ (2007), designed modular reaction walls for CU's structures testing laboratory, wrote the report for the international scan trip on bridge preservation and maintenance¹⁰ (2005), developed a conceptual plan for a Colorado DOT system for maintenance management of retaining walls and sound barriers¹¹ (2003), evaluated the effects of non-divisible loads on fatigue life of steel bridges for Colorado DOT (2001), established procedures for the use of NDE test data in element-level condition reports for the FHWA (2000), studied the reliability of field testing methods applied to highway bridges for the National Science Foundation (1998), developed methods for segmental inspections as a refinement to element-level condition reports for Colorado DOT (1997), and created the NBI translator for element-level condition data for the FHWA (1994 and 1997 revision). George Hearn is a member of the FHWA expert task group for bridge preservation, member of the NAS review committee for the FHWA long term infrastructure performance program¹², and chair of the NAS expert task group on long term bridge performance¹³.

¹ AASHTO (2022). ISBN: 978-1-56051-786-3. <https://store.transportation.org/Item/CollectionDetail?ID=240>

² AASHTO (2021). ISBN: 978-1-56051-745-0. <https://store.transportation.org/Item/CollectionDetail?ID=220>

³ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_453.pdf

⁴ <http://www.fhwa.dot.gov/asset/hif12029/hif12029.pdf>

⁵ http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-68A_07-05.pdf

⁶ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_375.pdf

⁷ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_668.pdf

⁸ <http://www.coloradodot.info/programs/research/pdfs/2012/pontis.pdf/view>

⁹ <http://www.coloradodot.info/programs/research/pdfs/2007/bridgedecklife.pdf/view>

¹⁰ <http://international.fhwa.dot.gov/pubs/pl05002/pl05002.pdf>

¹¹ <http://www.coloradodot.info/programs/research/pdfs/2003/retainingwallmgt.pdf/view>

¹² <https://www.nationalacademies.org/our-work/review-of-federal-highway-administration-infrastructure-rd>

¹³ <https://www.nationalacademies.org/our-work/review-of-federal-highway-administration-infrastructure-rd---expert-task-group-on-bridges>

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DES 1989 Columbia University
MS 1982 Columbia University
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Research Projects

Preparation of 2nd Edition, AASHTO Guide to Bridge Preservation Actions (BPA-1). (2023-2024). Sponsor: AASHTO. Revision of BPA-1 to incorporate changes in Federal regulations on bridge inspection and preservation.

Implementation of NCHRP 14-36 Bridge and Deck Preservation Guides. (2022-2023). Sponsor: National Academies. Preparation of presentations, exercises, and technical recourses for national workshops on bridge and bridge deck preservation. Sponsor: National Academies.

Best Practices in Bridge Detailing that Result in Better Durability by Focusing on Constructability. (2020-2021). Sponsor: AASHTO. Synthesis of best design details for highway bridges.

Agency Rules for Bridge Preservation. (2017-2019). Sponsor: USDOT FHWA. Synthesis of practice and development of method to calibrate rules to guide selection of bridge preservation actions.

Proposed AASHTO Guide for Bridge Preservation Actions. (2015-2020) Sponsor: NAS-TRB. Preparation of new AASHTO guide to preservation of highway bridges.

Bridge Load Posting Practices of US State DOTs. (2012-2013) Sponsor: NAS-TRB. Collection and reporting on US nationwide policies on posting of highway bridges for weight restrictions.

Bridge Deterioration and Cost Data. (2008-2011) Sponsor: Colorado DOT. Development of model data for Pontis bridge management system.

Bridge Management Decision Making. (2009). NCHRP Project 20-07. Participant and report author for scan on bridge maintenance and management.

National Bridge Maintenance Database. (2005-2010) NCHRP Project 14-15. Development of a national database for bridge maintenance actions.

Bridge Inspection Practices. (2005-08) NCHRP Synthesis Project 37-05. Synthesis on US and international practices for bridge inspection.

NEES Lab Improvement. (2004-06) Sponsor: NEES/NSF. Design and fabrication of post-tensioned modular reaction wall for CU's earthquake simulation lab.

Bridge Deck Performance. (2004-07) Sponsor: Colorado DOT. Study of condition histories, construction costs and maintenance costs to determine annualized costs of four types of Colorado DOT bridge decks.

FHWA/AASHTO Scan Report. (2004) Sponsor: FHWA. Preparation of the report of the 2003 Scan Trip on Bridge Preservation.

Retaining Wall Management System. (2003) Sponsor: Colorado DOT. Conceptual development of an element-based maintenance management system for retaining walls along highway corridors.

Independent Facing for Mechanically Stabilized Walls. (2002). Sponsor: Colorado DOT. Review of final report on construction and performance of an IFF wall along I-25 in Denver.

Computational Simulation of Aerodynamic Response of the Bronx-Whitestone Bridge. (2001) Sponsor: National Science Foundation. Use of computational fluid dynamics to investigate aerodynamic stability of the Bronx-Whitestone bridge.

Nondivisible Load Study. (2000) Sponsor: Colorado DOT. Evaluation of effects on fatigue life of highway bridges of non-divisible loads from concrete precasting plants.

Patents

Flex Post Fence, US Patent 5,299,781 Hearn, G., Barrett,R.K., and McMullen,M.L. rights assigned to State of Colorado. Description: Self-resetting, cable net fence capable of large elastic deformations during impact by falling boulders.

Independent Facing for Mechanically Stabilized Earth Walls, US Patent 5,456,554, Hearn,G., Barrett,R.K., Henson, H. and McMullen,M.L., rights assigned to State of Colorado. Description: Flexible anchoring system for facing panels for mechanically stabilized earth walls.

Recent Publications

Hearn,G. (2022). *Guide to Preservation of Highway Bridge Decks*. AASHTO GPHBD-1, ISBN 978-1-56051-786-3, 186p.

Hearn,G. (2021). *Guide to Bridge Preservation Actions*. AASHTO BPA-1, ISBN 978-1-56051-745-0, 375p.

Hearn,G. (2020). *Proposed AASHTO Guides for Bridge Preservation Actions*. NCHRP Rpt 950, 127p.

Hearn,G. (2019). *Guide for Bridge Preservation Actions*. Approved by AASHTO COBS, 350p.

Hearn,G., (2017). *Bridge Element Condition Reports in Performance Measures for Bridge Preservation*. Trans. Res. Rec. 2612, doi 10.3141/2612-16.

Hearn,G., (2016). *A Bridge Preservation Index and Its Relation to National Performance Management Measures*. TRB Annual Mtg., Paper 16-2301, 14p.

Hearn,G., (2015). *Element-Level Performance Measures for Bridge Preservation*. Trans. Res. Rec. 2481, p10-17.

Hearn,G. (2014). *State Bridge Load Posting Processes and Practices*. Natl Acad., NCHRP Synthesis 453. 136p.

Hearn,G. (2014). *Status of Posting for Load Among U.S. Bridges and Culverts*. TRB Annual Mtg., Paper 14-3072, 15p.

Hearn,G, Juntunen,D., Ahmad,A.S., and Johnson,B.V. (2013). *Performance Measures for Bridge Preservation*. Trans. Res. Rec. 2360, p45–51.

Hearn,G., Pan,S-Y, and Casey,W.F. (2013). *Bridge Management Practices in Idaho, Michigan and Virginia*. TRB Annual Mtg., Paper 13-0869, 14p.

Hearn,G. (2012) *Deterioration and Cost Information for Bridge Management*. Colorado DOT, CDOT-2012-4, 354p.

Hearn,G. (2012). *Bridge Management Practices in Idaho, Michigan and Virginia*. USDOT FHWA, <http://www.fhwa.dot.gov/asset/hif12029/hif12029.pdf>, 42p.

Hearn,G. and Johnson,B.V. (2011). *An Overview of Identification and Tracking of Highway Bridge Maintenance Actions*. NAS-TRB, Transp. Res. Rec. No 2220, p12-20

- Hearn, G., Thompson P.D., Mystkowski,W., and Hyman,W. (2010) *Framework for a National Database System for Maintenance Actions on Highway Bridges*. Natl Acad NCHRP, Report 668, 96p. Appendices A thru E, 191p.
- Hearn, G. Weykamp,P., Kimball,T., Johnson,B.V., Ramsey,K., D'Andrea,A. and Becker,S. (2010) *Best Practices in Bridge Management Decision-Making*. Natl Acad NCHRP, 20-68A Scan 07-05, 256p.
- Weykamp,P., Kimball,T., Johnson,B.V., Becker,S., D'Andrea,A. Hearn,G., and Capers,H. (2010). *Taming the Bridge Inventory*. Roads and Bridges, V48, No3, p30-34.
- Hearn, G. (2007). *Bridge Inspection Practices*. Natl Acad NCHRP, Synthesis 375, Washington, 199p.
- Hearn,G. and Xi, Y-P (2007). *Service life and cost comparisons for four types of Colorado DOT bridge decks*. Colorado DOT, CDOT-DTD-R-2007-2, 100p
- Hearn,G., and Adams,E. (2006). *Shape selection for lattice structures*. ASCE Jou. Struct. Engrg., Vol 132, No 11, 1713-1720.
- Hearn,G., Puckett,J., Friedland,I., Everett,T., Hurst,K., Romack,G., Christian,G., Shepard,R., Thompson, T., and Young,R. (2005). *Bridge preservation and maintenance in Europe and South Africa*. FHWA Int'l Prog., FHWA-PL-04-007, Washington, 150p.
- Puckett,J. and Hearn,G., (2005). *Summary of AASHTO and FHWA international scanning tour for Bridge preservation and maintenance*. Trans. Res. Rec., CD-11S, p517-523.
- Hearn,G., Abu-Hejleh,N., and Koucherik,J. (2004). *Inventory system for retaining walls and sound barriers*. Trans. Res. Rec. 1866, TRB, Washington, p85-91.
- Hearn,G. (2003). *Feasibility of a management system for retaining walls and sound barriers*. Colorado DOT, CDOT-DTD-R-2003-8. Denver, 106p.
- Hearn, G., Abu-Hejleh,N., McMullen,M., Zornberg,J.G. (2003). *MSE walls with independent full-height facing panels*. NAS TRB 82nd Annual Mtg, Washington, DC. 8p.
- Abu-Hejleh,N., McMullen,M., Hearn,G., and Zornberg,J.G. (2001). *Design and construction guidelines for MSE walls with independent full-height facing panels*. Colorado DOT, CDOT-DTD-R-2001-5, Denver, 120p.
- Hearn,G. (2000). *Fatigue Evaluation of Four Steel Bridges Under Nondivisible Loads*. For TMS Consultants, Boulder, 385p.
- Hearn,G. and Shim,H. (2000). *Integration of nondestructive testing and bridge management systems*. Federal Highway Administration, 281p.
- Hearn,G. (2000). *Segmental inspection for improved condition reporting in BMS*. NAS TRB, Trans. Res. Circ. 498, Washington, DC, 8p.
- Hearn,G. (2000). *NDE in bridge management systems*. NAS TRB, Trans. Res. Circ. 498, Washington, DC. 13p.
- Hearn,G. (2000). *Condition states for highway bridges*. ASCE 2000 Structures Congress, Mohamed Elgaaly,ed, Philadelphia, PA, CD ROM, 8p.
- Hearn,G. Purvis,R.L., Thompson,P., Bushman,W.H., McGhee,K.K., McKeel,W.T.,Jr. (2000) *Bridge maintenance and management: a look to the future*. Transportation in the New Millennium, TRB, Washington, 7p.