

**I. PERSONAL INFORMATION**

K. Stanton Lewis Professor, Construction Engineering and Management  
Civil, Environmental and Architectural Engineering  
University of Colorado Boulder  
Campus Box 428  
Boulder, Colorado 80309-0428

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**II. RELATED EXPERIENCE**

Associate Dean for Research, July 2017 to Present, College of Engineering and Applied Science  
University of Colorado – Boulder, Colorado  
Associate Dean for Graduate Programs, July 2015 to June 2017, College of Engineering and Applied Science  
University of Colorado – Boulder, Colorado  
Visiting Professor, July 2014 to June 2015, Dept. of Construction Engineering  
Polytechnic University of Valencia – Valencia, Spain  
Professor, July 2011 to Present, Dept. of Civil, Environmental and Architectural Engineering  
University of Colorado – Boulder, Colorado  
Department Chair, July 2010 to July 2014, Dept. of Civil, Environmental and Architectural Engineering  
University of Colorado – Boulder, Colorado  
Associate Professor, July 2006 to June 2011, Dept. of Civil, Environmental and Architectural Engineering  
University of Colorado – Boulder, Colorado  
Visiting Professor, August 2006 to June 2007, Dept. of Civil and Construction Engineering  
Catholic University of Chile – Santiago, Chile  
Assistant Professor, August 1999 to June 2006, Dept. of Civil, Environmental and Architectural Engineering  
University of Colorado – Boulder, Colorado  
Assistant Professor, September 1997 – August 1999, School of Civil and Environmental Engineering  
Georgia Institute of Technology – Atlanta, Georgia  
Instructor/Research Assistant, June 1994 – August 1997, Dept. of Civil, Environmental and Architectural  
Engineering, University of Colorado – Boulder, Colorado  
Pre-Construction Services Consultant, February 1991 – August 1997, Architectural Resource Consultants, Inc. –  
Boulder, Colorado  
Assistant Site Superintendent, June 1988 – February 1991, Spectrum Builders, Inc. – Boulder, Colorado

**III. EARNED DEGREES**

**University of Colorado – Boulder, Colorado**

Doctor of Philosophy, Civil Engineering, Construction Engineering and Management, August 1997  
Master of Science, Civil Engineering, Construction Engineering and Management, December 1995  
Bachelor of Science, Architectural Engineering, May 1990

**IV. AWARDS AND HONORS**

Editor's Choice Award, ASCE Journal of Management in Engineering, 2017 and 2018  
Campus Global Citizen of the Year, Office of International Education, University of Colorado, 2017  
National Academy of Construction, 2017  
Jaume Blasco Award for Innovation, second place paper award at the 18<sup>th</sup> International Congress on Project  
Management and Engineering, Alcañiz, Spain, 2014  
Pan-American Academy of Engineering, 2012  
Excellence in Leadership Fellow, University of Colorado, 2010  
K. Stanton Lewis Chair of Construction Engineering and Management, University of Colorado, 2008-present  
Outstanding Paper, *Journal of Engineering, Construction, and Architectural Management*, 2007  
Fulbright Scholar, Fulbright Commission of Chile, 2006-2007  
Provost Faculty Achievement Award, University of Colorado, 2006  
Top 50 "Trendsetter," Public Works Magazine, 2004  
Toulmin Medal, *The Military Engineer*, Society of American Military Engineers, 2003

## Keith R. Molenaar, Ph.D.

CEAE Young Researcher Award, University of Colorado, 2002  
Design-Build Professional, Charter Designee, Design-Build Institute of America, 2002  
Thomas Finch Rowland Award, *Journal of Construction Engineering and Management*, American Society of Civil Engineers, 2001  
Academic Leadership Award, Design-Build Institute of America, 2000  
Big 12 Faculty Fellowship Award, University of Colorado/University of Oklahoma, 2000  
CRCW Junior Faculty Development Award, University of Colorado, 2000  
Teaching Fellow, Center for the Enhancement of Teaching and Learning, Georgia Tech, 1999  
Engineering Education Scholar, National Science Foundation, 1998  
GAANN Fellowship Recipient, U.S. Department of Education, 1996–97

### V. REFEREED PUBLICATIONS

#### 1. Journal Articles

- [1] Antoine, A., Alleman, D., and Molenaar, K.R. (2019). “Examination of Project Duration, Project Intensity, and Timing of Cost Certainty in Highway Project Delivery Methods,” *ASCE Journal of Management in Engineering*, 35(1), 04018049.
- [2] Gransberg, D. and Molenaar, K.R. (2019). “Critical Comparison of Progressive Design-Build and Construction Manager/ General Contractor Project Delivery Methods,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, Jan 2019, doi 10.1177/0361198118822315.
- [3] Antoine, A. and Molenaar, K.R. (2018). “Timing of Cost Certainty in Highway Construction Project Delivery: Perceptions Versus Empirical Results,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, Sep 2018, doi 10.1177/0361198118798484.
- [4] Minooei, F., Sobin, N., Goodrum, P. and Molenaar, K.R. (2018). “Managing Public Communication Strategies in Accelerated Highway Construction Projects,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*. May 2018, doi 10.1177/0361198118759943.
- [5] Antillon, E.I., Garvin, M.J., Molenaar, K.R., and Javernick-Will, A. (2018). “The Influence of Inter-Organizational Coordination on Life Cycle Design Decision-Making: A Comparative Case Study of Public-Private Partnership Highway Projects,” *ASCE Journal of Management in Engineering*, 34(5), 05018007.
- [6] Ortiz, J.I., Pellicer, E. and Molenaar, K.R. (2018). “Management of Time and Cost Contingencies in Construction Projects: A Contractor Perspective,” *Journal of Civil Engineering and Management*, 24(3), 254–264.
- [7] Oechler, E.F., Molenaar, K.R., Hallowell, M.R. and Scott, S. (2018). “State-of-Practice for Risk-Based Quality Assurance in State Departments of Transportation,” *Engineering, Construction and Architectural Management*, 25(7), 958-970.
- [8] Stanford, M. S. and Molenaar, K.R. (2018) “Influence of Simplified Procurement Methods on Competition for Public Sector Construction,” *ASCE Journal of Construction Engineering and Management*, 144(2), 04017105.
- [9] Beitelmal, W.H., Molenaar, K.R., Javernick-Will, A.J. and Pellicer, E. (2017). “Challenges and Barriers to Establishing Infrastructure Asset Management: A Comparative Study between Libya and the United States,” *Engineering, Construction and Architectural Management*, 24(6), 1184-1202.
- [10] Dicks, E., Molenaar, K.R. and Gibson, G.E. (2017). “Scope Definition of Air Force Design and Construction Projects,” *ASCE Journal of Management in Engineering*, 33(5): 04017028.<sup>1</sup>
- [11] Tran, D., Molenaar, K.R. and Bharath, K.R. (2017). “Implementation of Best-Value Procurement for Highway Design and Construction in the United States,” *Engineering, Construction and Architectural Management*, 24(5), 774-787.
- [12] Beitelmal, W.H., Molenaar, K.R., Javernick-Will, A.J. and Smadi, O. (2017). “Strategies to Enhance Implementation of Infrastructure Asset Management in Developing Countries,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*. 2646, 39-48.
- [13] Alleman, D., Papajohn, D., Gransberg, D., El Asmar, M, and Molenaar, K.R. (2017). “Exploration of Early Work Packaging in Construction Manager/General Contractor Highway Projects,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*. 2630, 68-75.
- [14] Alleman, D., Duval, R. and Molenaar, K.R. (2017). “Roles and Responsibilities of the Independent Cost Estimator in Construction Manager/General Contractor in Highway Construction,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*. 2630, 15-22.

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<sup>1</sup> Editor's Choice, Journal of Management in Engineering.

**Keith R. Molenaar, Ph.D.**

- [15] Alleman, D., Antione, A. Gransberg, D., and Molenaar, K.R. (2017). "Comparison of Qualifications-Based Selection and Best Value Procurement for Construction Manager/General Contractor Highway Construction," *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2630, 59-67.
- [16] O'Har, J.P., Senesi, C.W., Molenaar, K.R. (2017). "Development of a Risk Register Spreadsheet Tool for Enterprise and Program-Level Risk Management," *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2604, 19-27.
- [17] Antillon, E., Molenaar, K. and Javernick-Will, A. (2017). "Evaluating the Effect of Contract Timing on Lifecycle-Design Innovation in Public-Private Partnerships: Comparative Case Study of Highway Projects," *ASCE Journal of Construction Engineering and Management*, 143(4), 05016023.
- [18] Franz, B., Leicht, R., Molenaar, K., and Messner, J. (2017). "Impact of Team Integration and Group Cohesion on Project Delivery Performance." *ASCE Journal of Construction Engineering and Management*. 143(1), 04016088.
- [19] Antione, A.A. and Molenaar, K.R. (2016), "Empirical Study of State of the Practice in Alternative Technical Concepts in Highway Construction Projects," *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2573, 143-148.
- [20] Tran, D., Molenaar, K.R., and Gransberg, D.D. (2016). "Implementing Best-Value Procurement for Design-Bid-Build Highway Projects," *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2573, 26-33.
- [21] Stanford, M.S. Molenaar, K.R. and Sheeran, K.M. (2016). "Application of Indefinite Delivery-Indefinite Quantity Construction Strategies at the Federal Level," *ASCE Journal of Management in Engineering*, 32(5), 04016011.
- [22] Pellicer, E., Sanz, M., Esmaeili, B. and Molenaar, K., (2016), "Exploration of Team Integration in Spanish Multi-Family Residential Construction," *ASCE Journal of Management in Engineering*, 32(5), 05016012.
- [23] Harper, C.M., Molenaar, K.R., and Cannon, J.P. (2016). "Measuring Constructs of Relational Contracting in Construction Projects," *ASCE Journal of Construction Engineering and Management*, 142(10), 04016053.
- [24] Mesa, H., Molenaar, K.R., and Alarcón, L.F. (2016). "Exploring Performance of the Integrated Project Delivery Process on Complex Building Projects," *International Journal of Project Management*, 34(7), 1089-1101.
- [25] Tran, D., Molenaar, K., and Alarcón, L.F. (2016). "A Hybrid Cross-Impact Approach to Predicting Cost Variance of Project Delivery Decisions for Highways," *ASCE Journal of Infrastructure Systems*, 22(1), 04015017.
- [26] Carrasco Torres, V., Uddin, M.M., Goodrum, P.M., and Molenaar, K.R. (2015). "Mapping of State Transportation Agencies' Practices to Consultant Oversight for Construction Engineering and Inspection Services," *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2504, 28-38.
- [27] Tran, D., and Molenaar, K. (2015). "A Risk-Based Project Delivery Selection Model for Highway Design and Construction." *ASCE Journal of Construction Engineering and Management*, 141(12), 04015041.
- [28] Kraft, E. and Molenaar, K.R. (2015). "Quality Assurance Organization Selection Factors for Highway Design and Construction Projects." *ASCE Journal of Management in Engineering*, 31(5), 04014069.
- [29] Tran, D., Hallowell, M., and Molenaar, K. (2015). "Construction Management Challenges and Best Practices for Rural Transit Projects." *ASCE Journal of Management in Engineering*, 31(5), 04014072.
- [30] Senesi, C., Javernick-Will, A., and Molenaar, K.R. (2015). "Benefits and Barriers to Applying Probabilistic Risk Analysis on Engineering and Construction Projects," *Engineering Management Journal*. 27(2), 49-57.
- [31] Tran, D. and Molenaar, K.R. (2014). "Exploring Critical Delivery Selection Risk Factors for Transportation Design and Construction Projects." *Engineering, Construction and Architectural Management Journal*, 21(6), 631-647.
- [32] Kraft, E. and Molenaar, K.R. (2014). "Fundamental Project Quality Assurance Organizations in Highway Design and Construction." *ASCE Journal of Management in Engineering*, 30(4), 04014015.
- [33] Harper, C.M., Molenaar, K.R., Anderson, S., and Schexnayder, C.J. (2014). "Synthesis of Performance Measures for Highway Cost Estimating," *ASCE Journal of Management in Engineering*, 30(3), 04014005.
- [34] Orozco, F.A., Serpell, A.F., Molenaar, K.R., and Forcael, E. (2014). "Modeling Competitiveness Factors and Indexes for Construction Companies: Findings of Chile." *ASCE Journal of Construction Engineering and Management*. 140(4), B4013002.<sup>2</sup>

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<sup>2</sup> This article is published by ASCE in both English and Spanish in the Bilingual Special Issue of the Journal of Construction Engineering and Management.

**Keith R. Molenaar, Ph.D.**

- [35] Leicht, R.M., Franz, B.W., Molenaar, K.R. (2014). “Successful University Research Programs with Extensive Industry Involvement,” *ASCE Practice Periodical on Structural Design and Construction*, 19(1), 57-62.
- [36] Tran, D. and Molenaar, K.R. (2014) “The Impact of Risk on Design-Build Selection for Highway Design and Construction Projects,” *ASCE Journal of Management in Engineering*, 30(2) 153-162.
- [37] Gonzalez, P., González, V., Molenaar, K.R., and Orozco, F.A. (2014), “Analysis of Causes of Delay and Time Performance in Construction Projects,” *ASCE Journal of Construction Engineering and Management*. 140(1), 1-9.
- [38] Tran, D., Harper, C. M., Molenaar, K. R., Haddad, N. F., and Scholfield, M. M. (2013). “A Project Delivery Selection Matrix for Highway Design and Construction.” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2347, 3-10.
- [39] Kraft, E. and Molenaar, K.R. (2013). “Project Quality Assurance Organization for Highway Design and Construction Projects,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2347, 29-37.
- [40] Molenaar, K.R., Javernick-Will, A.N., Bastias, A, Wardwell, A.M, and Saller, K., (2013). “Construction Project Peer Reviews as an Early Indicator of Project Success,” *ASCE Journal of Management in Engineering*, 29(4), 327-333.
- [41] Shane, J.S., Bogus, S.M., and Molenaar, K.R. (2013). “Municipal Water/Wastewater Project Delivery Performance Comparison.” *ASCE Journal of Management in Engineering*, 29(3), 251-258.
- [42] Xia, B., Molenaar, K.R., Chan, A., Skitmore, M., and Zuo, J. (2013). “Determining the Optimal Proportion of Design in Design-Build Request for Proposals.” *ASCE Journal of Construction Engineering and Management*. 139(6), 620-627.
- [43] Hallowell, M.R., Molenaar, K.R. and Fortunato, B.R., (2013). “Enterprise Risk Management Strategies for State Departments of Transportation.” *ASCE Journal of Management in Engineering*, 29(2), 114–121.
- [44] Xia, B., Chan, A., Zuo, J., and Molenaar, K.R. (2013). “Analysis of Selection Criteria for Design-Builders through the Analysis of Request for Proposals (RFPs).” *ASCE Journal of Management in Engineering*. 29(1), 19–24.
- [45] Sobin, N., Molenaar, K.R., and Cahil, E. (2012). “Mapping Goal Alignment of Deployment Programs for Alternative Fuel Technologies: An Analysis of Wide-Scope Grant Programs in the United States Energy Policy.” *Journal of Energy Policy*. 51, 405–416.
- [46] Xia, B., Chan, A., Molenaar, K.R., and Skitmore, M. (2012). “Determining the Appropriate Proportion of Owner-Provided Design in Design-Build Contracts - A Content Analysis Approach.” *ASCE Journal of Construction Engineering and Management*, 138(9), 1017-1022.
- [47] Curtis, J.A., D’Angelo, D., Hallowell, M.R., Henkel, T.A., and Molenaar, K.R. (2012). “Enterprise Risk Management for Transportation Agencies,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2271, 57-65.
- [48] Ashuri, B., Kashani, H., Molenaar, K.R., Lee, S. and Lu, J. (2012). “A Risk-Neutral Pricing Approach for Evaluating BOT Highway Projects with Government Minimum Revenue Guarantee Options,” *ASCE Journal of Construction Engineering and Management*, 138(4), 545-557.
- [49] Patil, S.S. and Molenaar, K.R. (2011). “Risks Associated with Performance Specifications in Highway Infrastructure Procurement,” *Journal of Public Procurement*, 11(4), 482-508.
- [50] Bogus, S.M., Diekmann, J.E., Molenaar, K.R., Harper, C. Patil, S., and Lee, J. (2011). “Simulation of Overlapping Design Activities in Concurrent Engineering,” *ASCE Journal of Construction Engineering and Management*, 137(11), 950-957.
- [51] Alarcón, L.F., Ashley, D.B., Sucre de Hanily, A., Molenaar, K.R., and Ungo, R. (2011). “Risk Planning and Management for the Panama Canal Expansion Program,” *ASCE Journal of Construction Engineering and Management*, 137(10), 762-771.
- [52] Molenaar, K.R. and Navarro, D. (2011). “Key Performance Indicators in Highway Design and Construction,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2228, 51-58.
- [53] Orozco, F., Serpell, A. and Molenaar, K.R. (2011). “Competitiveness Factors and Indexes for Construction Companies: Findings in Chile,” *Revista de la Construcción, (Journal of Construction, Catholic University, Santiago, Chile)*, 10(1), 91-102.
- [54] Touran, A., Gransberg, D.D., Molenaar, K.R. and Ghavamifar, K. (2011). “Selection of Project Delivery Method in Transit: Drivers and Objectives,” *ASCE Journal of Management in Engineering*, 27(1), 21-27.
- [55] Molenaar, K.R., Sobin, N., and Antillón, A.I. (2010). “A Synthesis of Best-Value Procurement Practices for Sustainable Design-Build Projects in the Public Sector,” *Journal of Green Building*, 5(4), 148-157.

**Keith R. Molenaar, Ph.D.**

- [56] Apipattanavis, S., Sabol, K., Molenaar, K.R., Rajagopalan, B., Xi, Y., Blackard, B., Patil, S. (2010). “An Integrated Framework for Quantifying and Predicting Weather Related Highway Construction Delays,” *ASCE Journal of Construction Engineering and Management*, 136(11), 1160-1168.
- [57] Hallowell, M.R., Protzman, J.B., and Molenaar, K.R. (2010). “Mobile Barrier Trailer: A Critical Analysis of an Emerging Workzone Protection System,” *ASCE Journal of Professional Safety*, 55(10), 31-38.
- [58] Olumide, N., Anderson, S., and Molenaar, K.R. (2010). “Sliding Scale Contingency for the Project Development Process,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2151, 21-27.
- [59] Touran, A., Molenaar, K.R. and Gransberg, D.D. (2010). “A Method for Selecting Airport Project Delivery Systems,” *Journal of Airport Management*, 4(4), 360-373.
- [60] Bogus, S.M., Shane, J.S., and Molenaar, K.R. (2010). “Contract Payment Provisions and Project Performance,” *Journal of Public Works Management and Policy*, 15(1), 20-31.
- [61] Bastias, A., and Molenaar, K.R. (2010). “A Learning Model for Design-Build Project Selection in the Public Sector,” *Revista Ingeniería de Construcción (Journal of Construction Engineering, Catholic University, Santiago, Chile)*, 25(1), 5-20.
- [62] Shane, J.S., Molenaar, K.R., Anderson, S.D., Schexnayder, C.J. (2010). “Highway Cost Estimating and Estimate Management: A Concept to Completion Process Approach,” *AACE Journal of Cost Engineering*, 52(5), 19-29.
- [63] Touran, A., Molenaar, K.R., Gransberg, D.D., and Ghavamifar, K. (2009). “Decision Support System for Project Delivery Method Selection in Transit,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2080, 148-157.
- [64] Shane, J.S., Molenaar, K.R., Anderson, S.D., Schexnayder, C.J. (2009). “Construction Project Cost Escalation Factors,” *ASCE Journal of Management in Engineering*, 25(4), 221-229.
- [65] Molenaar, K.R., Park, J. and Washington, S. (2009) “A Framework for Measuring Corporate Safety Culture and Its Impact on Construction Safety Performance,” *ASCE Journal of Construction Engineering Management*, 135(6), 488-496.
- [66] Blacud, N., Bogus, S.M., Diekmann, J.E., Molenaar, K.R. (2009). “Sensitivity of Construction Activities Under Design Uncertainty,” *ASCE Journal of Construction Engineering and Management*, 135(3), 199-206.
- [67] González, V., Alarcón, L.F., and Molenaar, K.R. (2009) “Multiobjective Design of Work-in-Process Buffer for Scheduling Repetitive Building Projects,” *Automation in Construction*, 18(2), 95-108.
- [68] Gransberg, D.D. and Molenaar, K.R. (2008). “Does Design-Build Project Delivery Affect the Future of the Public Engineer?” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2080, 3-8.
- [69] Molenaar, K.R., Triplett, J.E., Porter, J.C., DeWitt, S.D., and Yakowenko, G. (2007). “Early Contractor Involvement and Target Pricing in US and UK Highways,” *Transportation Research Record: Journal of the Transportation Research Board, National Academies*, 2040, 3-10.
- [70] Schexnayder, C.J., Molenaar, K.R. and Shane J.S. (2007). “Estimating Large Complex Projects,” *Revista Ingeniería de Construcción (Journal of Construction Engineering, Catholic University, Santiago, Chile)*, 22(2), 91-98.
- [71] Chinowsky, P.S., Molenaar, K.R., and Bastias, A.G. (2007). “Measuring Achievement of Learning Organizations in Construction,” *Engineering, Construction and Architectural Management Journal*, 14(3), 215-227.<sup>3</sup>
- [72] Chinowsky, P.S., Molenaar, K.R., and Realph, A. (2007). “Learning Organizations in Construction” *ASCE Journal of Management in Engineering*, 23(1), 27-34.
- [73] Bogus, S.M., Molenaar, K.R., and Diekmann, J.E. (2006). “Strategies for Overlapping Dependent Design Activities,” *Construction Management and Economics*, 24(8), 829–837.
- [74] Bogus, S.M., Molenaar, K.R., and Diekmann, J.E. (2005). “A Concurrent Engineering Approach to Reducing Design Delivery Time,” *ASCE Journal of Construction Engineering and Management*, 131(11), 1179-1185.
- [75] Molenaar, K.R. (2005). “Programmatic Cost Risk Analysis for Highway Mega-Projects,” *ASCE Journal of Construction Engineering and Management*, 131(3), 343-353.
- [76] Corotis, R.B., Frangopol, D.M., Diekmann, J.E., Molenaar, K.R., and Hearn, G. (2005) “An Educational Experiment to Address Critical Infrastructure Needs.” *The International Journal of Critical Infrastructure*. 1(2/3), 169-180.

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<sup>3</sup> Winner of outstanding paper for 2007 in the Journal of Engineering, Construction, and Architectural Management.

## Keith R. Molenaar, Ph.D.

- [77] Gransberg, D.D. and Molenaar, K.R. (2004). "Life Cycle Cost Award Algorithms for Design-Build Highway Pavement Projects," *ASCE Journal of Infrastructure Systems*, 10(4), 167-175.
- [78] Molenaar, K.R. (2004). "Framework for Comparing Project Delivery Costs," *AACEI Journal of Cost Engineering*, 46(11), 24-32.
- [79] Gransberg, D.D. and Molenaar, K.R. (2004). "Analysis of Owner's Design and Construction Quality Management Approaches in Design-Build Projects," *ASCE Journal of Management in Engineering*, 20(4), 162-169.
- [80] Molenaar, K.R., Bogus, S.M., and Priestley, J.M. (2004). "Design-Build for Water/Wastewater Facilities: State of the Industry Survey and Three Case Studies," *ASCE Journal of Management in Engineering*, 20(1), 16-24.
- [81] Gransberg, D.D. and Molenaar, K.R. (2003). "A Synthesis of Public Design-Build Source Selection Methods," *International Journal of Construction Procurement*, 9(2), 40-51.
- [82] Molenaar, K.R. and Saller, B.J. (2003). "Educational Needs Assessment for Design-Build Project Delivery," *ASCE Journal of Professional Issues in Engineering Education and Practice*, 129(2), 106-114.
- [83] Molenaar, K.R., Brown, H.M., Caile, S., and Smith, R. (2002). "Corporate Culture: A Study of Firms with Outstanding Construction Safety," *ASCE Journal of Professional Safety*, 47(7), 18-27.
- [84] Molenaar, K.R. and Songer, A.D. (2001). "Web-Based Decision Support Systems: A Case Study in Project Delivery," *ASCE Journal of Computing in Civil Engineering*, 15(4), 259-267.
- [85] Molenaar, K.R. and Gransberg, D.D. (2001). "Design-Builder Selection for Small Highway Projects," *ASCE Journal of Management in Engineering*, 17(4), 214-223.
- [86] Molenaar, K.R., Washington, S., and Diekmann, J.E. (2000). "A Structural Equation Model of Construction Contract Dispute Potential," *ASCE Journal of Construction Engineering and Management*, 126(4), 261-267.<sup>4</sup>
- [87] Molenaar, K.R., Songer, A.D., and Barash, M. (1999). "Public Sector Design-Build Evolution and Performance," *ASCE Journal of Management in Engineering*, 9(2), 54-62.
- [88] Molenaar, K.R. and Songer, A.D. (1998). "Model for Public Sector Design-Build Project Selection," *ASCE Journal of Construction Engineering and Management*, 124(6), 467-479.
- [89] Songer, A.D. and Molenaar, K.R. (1997). "Appropriate Project Characteristics for Public Sector Design-Build Projects," *ASCE Journal of Construction Engineering and Management*, 123(1), 34-40.
- [90] Diekmann, J.E., Featherman, D., Moody, R., Molenaar, K.R., and Rodriguez-Guy, M. (1996). "Project Cost Analysis Using Influence Diagrams," *PMI Project Management Journal*, 28(4), 23-30.
- [91] Songer, A.D. and Molenaar, K.R. (1996). "Selecting Design-Build: Private and Public Sector Owner Attitudes," *ASCE Journal of Engineering Management*, 12(6), 47-53.
- [92] Songer, A.D., Molenaar, K.R., and Robinson, G. (1996). "Selection Factors and Success Criteria for Design-Build in the U.S. and U.K.," *International Journal of Construction Procurement*, 2(2), 69-82.

### 2. Journal Articles Accepted for Publication

- [93] Ortiz, J.I., Pellicer, E. and Molenaar, K.R. (2018). "Determining Contingencies in the Management of Construction Projects," *Accepted for International Journal of Project Management Journal*.
- [94] Mesa, H., Molenaar, K.R., and Alarcón, L.F. (2016). "Comparative Analysis between Integrated Project Delivery and Lean Project Delivery," *Accepted for International Journal of Project Management*.

## VI. RESEARCH REPORTS

- [95] O'Har, J.P., Senesi, C. and Molenaar, K.R. (2016). "Development of a Risk Register Spreadsheet Tool," *National Cooperative Highway Research Program, Report -9-36(126)*, Washington, DC, September 2016, 37 pp.
- [96] Torres, V., Bonham, D., Minooei, F., Goodrum, P. M., Molenaar, K.R., and Unddin, M. (2015). "Construction Engineering Inspection Services Guide," *Colorado Department of Transportation, Research Report No. CDOT-2015-13*, December 2015, 185 pp.
- [97] Minooei, F., Sobin, N. Goodrum, P. M., and Molenaar, K.R., (2015). "Community Outreach Tools and Strategies for Accelerated Highway Construction Projects: Implementation Guide," *Colorado Department of Transportation, Research Report No. CDOT-2015-13*, December 2015, 21 pp.
- [98] Minooei, F., Sobin, N. Goodrum, P. M., and Molenaar, K.R., (2015). "Community Outreach Tools and Strategies for Accelerated Highway Construction Projects: Implementation Guide," *Colorado Department of Transportation. Research Report No. CDOT-2015-14*, December 2015, 75 pp.

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<sup>4</sup> Winner of the Thomas Finch Rowland Award for best paper of the year from the American Society of Civil Engineers in the Journal of Construction Engineering and Management.

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- [99] Anderson, S., Molenaar, K.R., and Schexnayder, C. (2015). "Independent Cost Estimates for Design and Construction of Transit Facilities in Rural and Small Urban Areas, National Cooperative Highway Research Program, Research Results Digest 397, Washington, DC, December 2015, 56 pp.
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- [210] Fard, B.J., Touran, A., Molenaar, K.R., and Gransberg, D.D. (2011). "A Computerized System for Selecting Project Delivery Method in Airport," *2nd International Conference on Transportation Construction Management, Federal Highway Administration*, Orlando Florida, February 2011.

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<sup>6</sup> Winner of the Jaime Blasco Award for Innovation, second place paper award.

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- [212] Ashuri, B., Kashani, H., Molenaar, K., and Lee, S. (2010). "A Valuation Model for Choosing the Optimal Minimum Traffic Guarantee (MTG) in a Highway Project: A Real-Option Approach," *ASCE Construction Research Congress*, Banff Canada, May 2010.
- [213] Bogus, S.M., Shane, J.S., and Molenaar, K.R. (2010). "Comparison of Water/Wastewater Project Performance by Project Delivery System and Payment Provision," *ASCE Construction Research Congress*, Banff Canada, May 2010.
- [214] Sobin, N., Molenaar, K.R., and Gransberg, D.D. (2010). "Sustainability By... A Synthesis of Procurement Approaches for High Performance Buildings," *ASCE Construction Research Congress*, Banff Canada, May 2010.
- [215] Gransberg, D.D. and Molenaar, K.R. (2009). "Quality Management Organizations for Design-Build Transportation Projects," *1st International Conference on Transportation Construction Management, Federal Highway Administration*, Orlando Florida, February 2009.
- [216] Touran, A., Gransberg, D.D. and Molenaar, K.R. (2009). "Transit Project Delivery Methods: A Case Study Analysis," *1st International Conference on Transportation Construction Management, Federal Highway Administration*, Orlando Florida, February 2009.
- [217] Molenaar, K.R., and Wilson, C.R. (2009). "A Risk-Based Approach to Contingency Estimation in Highway Project Development," *ASCE Construction Research Congress*, Seattle, WA, May, 2009.
- [218] Shane, J.S., Molenaar, K.R. (2008) "Design and Procurement of U.S. Highway Design-Build Projects," Paper CO-B6, Canadian Society for Civil Engineering 2<sup>nd</sup> International Construction Specialty Conference, Quebec City, Quebec, Canada, June 2008.
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- [221] Molenaar, K.R., Won, S., and Smith, R. (2007). "Expectations for Accuracy in Highway Design-Build Cost Estimates," *ASCE/CIB Construction Research Congress*, Grand Bahama Island, May, 2007.
- [222] Blacud, N.A., Bogus, S.M., Molenaar, K.R., and Diekmann, J.E. (2007). "Beginning Construction Under Design Uncertainty," *ASCE/CIB Construction Research Congress*, Grand Bahama Island, May, 2007.
- [223] Lee, J.S., Molenaar, K.R., Bogus, S.M and Diekmann, J.E. (2006). "An Activity Overlapping Algorithm For Construction" *ASCE, CIB Joint International Conference on Computing and Decision Making in Civil and Building Engineering*, Montreal, Canada, June 14-16, 2006.
- [224] Shane, J.S, and Molenaar, K.R. (2006). "Appropriate Scope Definition for Highway Design-Build Projects," *Canadian Society of Civil Engineers, 1st International Construction Specialty Conference*, Calgary, Alberta, Canada, May 23-26, 2006.
- [225] Bielefeldt, A.R., Amadei, B, Summers, R.S., Strzepek, K.M., Chinowsky, P.S., and Molenaar, K.R. (2006). "An Educational Initiative to Address Earth Systems Engineering for Developing Communities," *W107 Construction in Developing Economies International Symposium Construction in Developing Economies: New Issues and Challenges*, Santiago, Chile, January 18-20, 2006.
- [226] Schexnayder, C., Molenaar, K.R. and Shane J.S. (2006). "Estimating Large Complex Projects," *W107 Construction in Developing Economies International Symposium Construction in Developing Economies: New Issues and Challenges*, Santiago, Chile, January 18-20, 2006.
- [227] Shane, J.S., Won, S. and Molenaar, K.R. (2006). "Variations in State Highway Agency Design-Build Programs," *Paper # 06-2640 Transportation Research Board 85<sup>th</sup> Annual Meeting*, Washington, D.C., January 2006.
- [228] Bastias, A.G. and Molenaar, K.R. (2005), "Classification and Analysis of Decision Support Systems for the Construction Industry," *ASCE International Conference on Computing in Civil Engineering*, Cancun, Mexico, July 2005.
- [229] Bogus, S.M., Molenaar, K.R., and Diekmann, J.E. (2005). "Consequences of Overlapping Dependent Activities to Reduce Project Delivery Time," *ASCE Construction Research Congress*, San Diego, CA, April 2005.
- [230] Chinowsky, P. and Molenaar, K.R. (2005). "Learning Organizations in Construction," *ASCE Construction Research Congress*, San Diego, CA, April 2005.

## Keith R. Molenaar, Ph.D.

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- [232] Molenaar, K.R. and Shane, J.S. (2005). "Classification of United States Highway Design-Build Procurement Methods," *CIB W92/T23/W107 International Symposium on Procurement Systems*, Las Vegas, Nevada, February 2005.
- [233] Gransberg, D.D. and Molenaar, K.R. (2005). "Applying Life Cycle Evaluation Criteria to Design-Build Highway Projects," *CIB W92/T23/W107 International Symposium on Procurement Systems*, Las Vegas, Nevada, February 2005.
- [234] Molenaar, K.R., DeWitt, S., and Yakowenko, G. (2005). "International Construction Management Practices," *Paper #05-1816 Transportation Research Board 84th Annual Meeting*, Washington, D.C., January 2005.
- [235] Molenaar K.R., D'Angelo, J., and Whited, G.C. (2004). "European Asphalt Pavement Warranties," *Association of Asphalt Paving Technologists International, Symposium on Design and Construction of Long Lasting Asphalt Pavements*, Auburn, Alabama, June 2004.
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- [238] Gransberg, D.D. and Molenaar, K.R. (2003). "Lifecycle Design Criteria for Design-Build Transportation Projects," *ASCE Construction Research Congress*, Honolulu, HI, March 2003.
- [239] Bogus, S.M., Diekmann, J.E., and Molenaar, K.R. (2002). "A Methodology to Reconfigure the Design-Construction Interface for Fast-Track Projects," *ASCE & EG-ICE Joint Conference on Information Technology in Civil Engineering*, Washington, D.C., November 2002.
- [240] Molenaar, K.R. (2002). "Innovative Contract Administration: A Report of the European Contract Administration Scan Tour," *Proceedings of the CIB's 10th International Symposium on the Organization and Management of Construction, Construction Innovation, and Global Competitiveness*, Cincinnati, OH, September 2002.
- [241] Molenaar, K.R., Smith, R., and Spencer, J. (2000). "Stakeholder Input in Design-Build Highway Construction," *ASCE Proceedings of the Construction Congress VI*, Orlando, FL, February 2000, 611-620.
- [242] Molenaar, K.R., Vanegas, J., and Martinez, H. (2000). "Appropriate Risk Allocation in Design-Build RFPs," *ASCE Proceedings of the Construction Congress VI*, Orlando, FL, February 2000, 1083-1092.
- [243] Shin, K.C. and Molenaar, K.R. (2000). "Predicting Construction Disputes in Change Issues," *ASCE Proceedings of the Construction Congress VI*, Orlando, FL, February 2000, 534-542.
- [244] Molenaar, K.R. (1999). "Selecting Appropriate Projects for Design-Build Procurement," *Proceedings of the CIB Procurement Systems Conference*, Chiang Mai, Thailand, January 1999.
- [245] Molenaar, K.R. and Martinez, H.S. (1998). "Web-Based Decision Support Systems," *Proceedings of the First International Conference on New Information Technologies for Decision Making in Civil Engineering – Vol. 2*, Montreal, Canada, October 1998, pp. 1127-1138.
- [246] Molenaar, K.R. and Songer, A.D. (1998). "Design-Build Selector (DBS): An Automated Tool for Project Selection," *ASCE Proceedings of the International Computing Congress*, Boston, MA, October 1998, pp. 147-156.
- [247] Molenaar, K.R., Songer, A.D., and Barash, J. (1997). "An Automated Prediction Tool for Design-Build Projects," *ASCE Proceedings of the Construction Congress V*, Minneapolis, MN, October 1997, pp. 582-589.

### 2. Other Conference Proceedings

- [248] Gransberg, D.D., Molenaar, K.R., and Scott, S. (2004). A Framework for Classifying Best-Value Award Systems for Highway Construction Projects, *FHWA/ASHTO/DBIA Conference on Design-Build for Transportation*, Baltimore, MD, April 2004.
- [249] Molenaar, K.R. and Johnson, D. (2001). "Engineering the Procurement Process to Achieve Best Value," *FHWA/ASHTO/DBIA Conference on Design-Build for Transportation*, Denver, CO, April 2001.
- [250] Nicholson, M. and Molenaar, K.R. (2000). "Building Commissioning, Ensuring Quality and Savings," *ASCE Proceedings of the Construction Congress VI*, Orlando, FL, February 2000, pp. 1074-1082.
- [251] Songer, A.D. and Molenaar, K.R. (1996). "Design-Build Selector: A Predictive Tool for the Selection for Public Sector Design-Build," *AIA/DBIA Conference on Design-Build*, Washington, DC, October 1996.

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**XI. OTHER INTELLECTUAL PROPERTY**

DBS: Design-Build Selector (Software) – A web-based tool for public sector design-build project selection.  
Developed through work supported by the National Science Foundation under Grant No. CMS-9410683.  
(Available at <http://www.colorado.edu/engineering/civil/db>)

**XII. RESEARCH SUPPORT**

**1. Current**

- [A] Strategic Highway Renewal Program R-09 Probabilistic Template Update, *FHWA Next Generation Transportation Construction Management Pooled Fund Study, Colorado Department of Transportation Lead State*, PI-Molenaar, Jul. 2018 – Jun. 2020.  
(\$49,000 Total CU)
- [B] Efficiency Study of Design-Build Program, *South Carolina Department of Transportation*, Co-PIs Molenaar and Torres-Machi, Mar. 18 – Mar. 20.  
(\$262,442 Total CU)
- [C] Revisiting Project Delivery Performance, *Charles Pankow Foundation and the Construction Industry Institute*, PI Molenaar, Co-PIs Molenaar and Franz, Feb. 2018 – Jan. 2019.  
(\$68,525 Total – \$26,595 CU)
- [D] Optimizing the Overlap of Product Design, Facility Design and Construction to Maximize Value in the Manufacturing & Life Sciences Sector, *Construction Industry Institute, CII-2017-MLS-1-A*, PI Molenaar, Co-PI Franz and Kremer, May 17 – Sep. 19.  
(\$525,897 Total - \$235,827 CU)
- [E] A Guidebook for Implementing Alternative Technical Concepts into Project Delivery Methods, *National Cooperative Highway Research Program Project 08-112*, PI Gransberg, Co-PIs Molenaar, Loulakis, Rueda, Gad, May 17 – Feb. 2019.  
(\$450,000 Total – \$73,000 CU)
- [F] Guidebook for Post-Award Contract Administration for Highway Projects Delivered Using Alternative Contracting Methods, *National Cooperative Highway Research Program Project 08-104*, PI Molenaar, Co-PIs El Asmar and Goodrum, Sep. 2016 – Mar. 2019.  
(\$500,000 Total – \$500,000 CU)

**2. Completed**

- [G] Effective Construction Project Staffing Strategies for Transportation Agencies, *National Cooperative Highway Research Program Project 20-107*, PI Taylor, Co-PIs Goodrum and Molenaar, Jun. 2016 – Jun. 2018.  
(\$500,000 Total – \$220,000 CU)
- [H] Building Envelop Portfolio Analytics, BLUEFIN, PI Molenaar, Jan. 2017 – Dec. 2017.  
(\$64,000 Total)
- [I] Quantification of Cost, Benefits and Risk Associated with Alternative Contracting Methods and Accelerated Performance Specifications, *Federal Highway Administration Project DTFH61-11-D-00009*, PI Molenaar, Co-PIs Tran and Scott, Sep. 2013 – Sep. 2017.  
(\$507,365 Total – \$256,471 CU)
- [J] A Case Study Comparing Conventional Project Delivery and Public-Private Partnership, *San Francisco County Transportation Authority*, PI Qui, Co-PIs Javernick-Will and Molenaar, Sep. 2013 – Sep. 2017.  
(\$500,000 Total – \$179,694 CU)
- [K] Alternative Contracting Research Support, *Task Order Contract with the Minnesota Department of Transportation, Parsons Brinkerhoff*, PI Molenaar, Jun. 2012 – Jun. 2017.  
(\$15 Million Total Prime Contract – Work Orders 1-3, \$50,000 Total CU)
- [L] Optimizing the Risk and Cost of Materials Quality Assurance Programs, NCHRP Project 10-92, *National Cooperative Highway Research Program*, PI Scott, Co-PIs Hollowell and Molenaar, Sep. 2013 – Aug. 2016.  
(\$400,000 Total – \$155,272 CU)
- [M] Owner’s Guide to Maximizing Success in Integrated Projects, *Charles Pankow Foundation and the Construction Industry Institute*, PI Molenaar, Co-PIs Messner and Leitch, Aug. 2012 – Dec. 2015.  
(\$485,000 Total – \$110,000 Multi-University Match)
- [N] Guide for Civil Integrated Management (CIM) in Departments of Transportation, NCHRP Project 10-96, *National Cooperative Highway Research Program*, PI O’Brien, Co-PIs Goodrum, Khwaja, Leite, Molenaar and Pawsey and Apr. 2014 – Jul. 2015.  
(\$250,000 Total - \$100,000 CU)

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- [O] Guidebook for Selecting Highway Project Delivery Methods and Alternative Contracting Strategies, *FHWA Next Generation Transportation Construction Management Pooled Fund Study, Colorado Department of Transportation Lead State*, PI Molenaar, Apr. 2012 – Jun. 2015.  
(\$335,000 Total - \$50,000 CU Match)
- [P] Community Outreach Best Practices Guide for Accelerated Construction Projects, *FHWA Next Generation Transportation Construction Management Pooled Fund Study, Colorado Department of Transportation Lead State*, PI-Goodrum, Co-PI Molenaar, Aug. 2013 – Jun. 2015.  
(\$111,411 Total - \$23,743 CU Match)
- [Q] Development and Delivery of Cost and Schedule Risk Analysis Template, *Federal Highway Administration Project DTFH61-11-D-00009*, PI Molenaar, Co-PIs Tran and Raghavendra, Sep. 2013 – Apr. 2015.  
(\$144,749 Total - \$27,653 CU)
- [R] Successful Implementation of Enterprise Risk Management in State Transportation Agencies, NCHRP Project 08-36, Task 121, *National Cooperative Highway Research Program*, PI Rose, Co-PIs Hallowell, Javernick-Will and Molenaar, Oct. 2013 – Sep. 2014.  
(\$100,000 Total - \$74,967 CU)
- [S] Evaluation of Highway Agency Approaches to Consultant Oversight for Construction Engineering and Inspection Services, *FHWA Next Generation Transportation Construction Management Pooled Fund Study, Colorado Department of Transportation Lead State*, PI-Goodrum, Co-PI Molenaar, Aug. 2013 – Aug. 2014.  
(\$73,118 Total - \$15,582 CU Match)
- [T] Alternative Quality Systems for Highway Construction, NCHRP Project 10-83, *National Cooperative Highway Research Program*, PI Molenaar, Co-PIs Gransberg and Sillars, Aug. 2010 – Jan. 2014.  
(\$500,000 Total - \$232,000 CU)
- [U] Methods for Dealing with Uncertainty: Applying Probabilistic Controls in Construction, *Construction Industry Institute*, Co-PIs Molenaar and Javernick-Will, Jan. 2010 – Mar. 2013.  
(\$222,000 Total CU)
- [V] Performance Specifications for Rapid Highway Renewal, *NCHRP SHRPII R07, National Cooperative Highway Research Program, Transportation Research Board of the National Academies*, PI Scott, Co-PIs Molenaar, et al., May 2007 – May 2012.  
(\$3,000,000 Total – \$95,000 CU)
- [W] Construction Management Practices for Rural Projects – An Assessment, NCHRP Project 20-65(40), *National Cooperative Highway Research Program*, PI Hallowell, Co-PI Molenaar, Jun. 2011 – Jun. 2012.  
(\$70,000 Total - \$68,000 CU)
- [X] AASHTO Practical Guide to Estimating, *National Cooperative Highway Research Program*, NCHRP 20-7(278), PI Molenaar, Co-PIs Anderson and Schexnayder, Dec. 2009 – Dec. 2011.  
(\$135,000 Total - \$60,000 CU)
- [Y] Project Delivery Case Studies and Academic Forum, *Barchan Foundation*, PI Molenaar, Aug. 2010 – Aug. 2011.  
(\$72,500 Total CU)
- [Z] Executive Strategies for Risk Management by State Departments of Transportation, NCHRP Project 20-24(74), *National Cooperative Highway Research Program*, Co-PIs Hallowell and Molenaar, Jun. 2010 – Mar. 2011.  
(\$50,000 Total - \$42,000 CU)
- [AA] A Guidebook for the Evaluation of Highway Project Delivery Methods, *Federal Highway Administration*, PI Molenaar, Dec. 2009 – Jun. 2010.  
(\$30,000 Total CU)
- [BB] Influence of Project Delivery Method on Achieving Sustainable, High Performance Buildings, CPF Research Project 01-08, *Charles Pankow Foundation*, PI Molenaar, Co-PIs, Gransberg, Horman, Riley, and Korkmaz, Sep. 2008 – Nov. 2010.  
(\$200,000 Total – \$50,000 CU – \$142,000 Multi-University Match)
- [CC] Key Performance Indicators for Public-Private Partnerships, *Federal Highway Administration*, PI Molenaar, Co-PIs Gordon and Proctor, Jun. 2009 – Feb. 2010.  
(\$65,000 Total – \$40,000 CU)
- [DD] Guidebook on Risk Analysis Tools and Management Practices to Control Transportation Project Costs, *NCHRP 8-60, National Cooperative Highway Research Program, Transportation Research Board of the National Academies*, PI Molenaar, Co-PIs Diekmann, Anderson, Schexnayder and Ferragut, Jun. 2007 – Apr. 2009.  
(\$200,000 Total CU)



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- [EE] Independent Comparative Evaluation of Design-Build v. Conventional Project Delivery for Municipal Water and Wastewater Facilities, *Water Design-Build Council*, Bogus PI, Co-PIs, Shane and Molenaar, Jan. 2008 – Apr. 2009.  
(\$100,000 Total – \$10,000 CU)
- [FF] Cost Estimating Process Improvement and Organizational Integration, *Minnesota Department of Transportation and the Center for Transportation Studies at the University of Minnesota*, PI Pat Hughes, Co-PIs Anderson, Molenaar and Shane, May 2007 – Dec. 2008.  
(\$800,000 Total – \$150,000 CU)
- [GG] A Guidebook for the Evaluation of Project Delivery Methods, TCRP G-08, *Transit Cooperative Research Program, Transportation Research Board of the National Academies*, PI Touran, Co-PIs Molenaar and Gransberg, Oct. 2006 – Apr. 2008.  
(\$350,000 Total – \$50,000 CU)
- [HH] Right of Way Methods and Tools to Control Cost Escalation, NCHRP 8-36, *National Cooperative Highway Research Program, Transportation Research Board of the National Academies*, PI Anderson, Co-PIs Molenaar and Schexnayder, Jun. 2006 – Jun. 2007.  
(\$100,000 Total – \$8,600 CU)
- [II] Caltrans Innovative Procurement Practices, *California State Department of Transportation*, Co-PI Molenaar, Oct. 2005 – Oct. 2007.  
(\$350,000 Total – \$62,889 CU)
- [JJ] A Methodology to Reconfigure the Design Construction Interface for Fast-Track Projects, *National Science Foundation (CMS-0324342)*, Co-PIs Diekmann and Molenaar, Sep. 2003 – Sep. 2007.  
(\$253,331 Total CU)
- [KK] WSDOT Design-Build Procurement Review, *Washington State Department of Transportation*, PI-Molenaar, Aug. 05 – July 06.  
(\$50,000 Total CU)
- [LL] Procedures for Cost Estimation and Management of Highway Projects During Planning, Programming, and Preconstruction, NCHRP 8-49, *National Cooperative Highway Research Program, Transportation Research Board of the National Academies*, PI Anderson, Co-PIs Molenaar and Schexnayder, Mar. 2004 – Jun. 2006.  
(\$300,000 Total – \$80,000 CU)
- [MM] How to Achieve a Learning Organization: Best Practices, Tools, & Techniques, *Construction Industry Institute (RT201)*, Co-PIs Chinowsky and Molenaar, Jan. 2003 – Sep. 2005.  
(\$212,000 Total – \$150,000 CU – \$57,000 Univ. Match)
- [NN] Recommended AASHTO Design-Build Procurement Guide, *NCHRP 20-7/172, National Cooperative Highway Research Program, Transportation Research Board of the National Academies*, PI Molenaar, Aug. 2004 – Aug. 2005.  
(\$75,000 Total CU)
- [OO] Quantify Construction Delays Due to Weather, *Federal Highway Administration, Central Federal Land Highway Division*, Co-PIs, Xi, Balaji, and Molenaar, Oct. 2003 to Jun. 2005.  
(\$80,000 Total CU)
- [PP] Develop Lifecycle Evaluation Criteria for Design-Build Transportation Projects, *Foundation for Integrated Services (Formerly the Design-Build Education and Research Foundation)*, Co-PIs Gransberg and Molenaar, Jan. 2002 – Jan. 2005.  
(\$45,000 Total – \$17,000 CU)
- [QQ] Construction Peer Excellence Web Portal Development, *US General Services Administration*, PI Molenaar, January 2004 to October 2004.  
(\$52,618 Total CU)
- [RR] Report to U.S. Congress on the Effectiveness of Design-Build, *Federal Highway Administration (FHWA DTFH61-98-C-00074)*, PI Dornan, Co-PI Molenaar, Sep. 2002 – Aug. 2004.  
(\$317,000 Total – \$60,000 CU – \$17,000 Univ. Match)
- [SS] Best-Value Procurement Methods for Highway Construction Projects, NCHRP 8-49, *National Cooperative Highway Research Program, Transportation Research Board of the National Academies*, PI Scott, Co-PIs Molenaar and Gransberg, Apr. 2002 – Aug. 2004.  
(\$325,000 Total – \$89,000 CU – \$25,000 Univ. Match)
- [TT] Report Facilitator – European Asphalt Warranty Scanning Tour, *International Technology Program, Federal Highway Administration*, PI Molenaar, Mar. 2002 – Jan. 2004.  
(\$13,000 Total CU)

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- [UU] Design-Build Pilot Project Evaluation, *Washington State Department of Transportation*, PI Molenaar, Feb. 1999 – Dec. 2002.  
(\$135,000 Total – \$120,000 CU – \$15,000 Univ. Match)
- [VV] Design-Build for Water/Wastewater Treatment, *Black & Veatch, CH2MHill, HDR, Jacobs, Filanc, Haskell, Design-Build Research Foundation*, PI Molenaar, Aug. 2001 – Oct. 2002.  
(\$45,000 Total – \$30,000 CU)
- [WW] Report Facilitator – European Contract Administration Scanning Tour, *International Technology Program, Federal Highway Administration*, PI Molenaar, Sep. 2000 – Sep. 2002.  
(\$13,000 Total CU)
- [XX] Study of Corporate Culture in Companies with Outstanding Safety Records, *American Society of Safety Engineers*, PI Molenaar, Jan. 2000 – May 2001.  
(\$5,000 Total CU)
- [YY] Design-Build Education Needs Assessment, *Design-Build Education and Research Foundation*, PI Molenaar, May 2000 - May 2001.  
(\$5,000 Total CU)
- [ZZ] Development of a Risk-Based Best-Value Selection Methodology for Federal, State and Local Governments, *University of Colorado*, PI Molenaar, Jan. 1999 – Jan. 2000.  
(\$5,000 Total CU)
- [AAA] Georgia Construction Economic Impact Analysis, *ABC, AGC, GHC, NECA, HBAG, GACEC, CECA, MCAA, & CAAG*, PI Chinowsky, Co-PI Molenaar, Jan. 1999 – Oct. 1999  
(\$50,000 Total Georgia Tech)
- [BBB] A Guide to Project Delivery for Federal Buildings, *U.S. General Services Administration*, Co-PIs Molenaar, Zimring, and Augenbroe, Sep. 1998 – Dec. 1998  
(\$15,000 Total Georgia Tech)

### XIII. INDIVIDUAL STUDENT GUIDANCE

#### 1. Ph.D. Students – Principal Advisor

Calahorra, Maria, Principal Dual Doctoral Advisor at University of Colorado with Luis Fernando Alarcon, Principal Dual Doctoral Advisor Catholic University of Chile, Spring 2016-Present.

Gregory, Scott, Principal Doctoral Advisor, Spring 2017-Present.

Beardmore, Desiree, Principal Doctoral Advisor, Spring 2017-Present.

Alleman, Douglas, Principal Doctoral Advisor, Fall 2015-Present.

Oguz Erkal, Elif, Principal Doctoral Advisor, Spring 2019-Present.

Antoine, Arthur, Principal Doctoral Advisor, Graduated – December 2017, “Performance-Based Project Delivery Selection for Highway Design and Construction Projects.”

Stanford, M. Scott, Principal Doctoral Advisor, Graduated – August 2017, “Competition and Price Analysis of Indefinite Delivery Indefinite Quantity Contracts for Construction.”

Mesa, Harrison,<sup>7</sup> Principal Dual Doctoral Advisor at University of Colorado with Luis Fernando Alarcon, Principal Dual Doctoral Advisor Catholic University of Chile, Graduated – August 2016, “Modeling Performance of Integrated Project Delivery Systems in Design and Construction.”

Antillon, Eric, Co-Principal Doctoral Advisor w/Javernick-Will, Graduated – August 2016, “An Exploration of the Influence of Public-Private-Partnerships on the Life Cycle Design Decision-Making Process of Highway Projects in the U.S.”

Beitelmal, Wesam,<sup>8</sup> Co-Principal Doctoral Advisor w/Javernick-Will, Graduated – May 2016, “Towards an Infrastructure Asset Management Organizational Model for Developing Countries.”

Sanz, Amalia,<sup>9</sup> Co-Principal Advisory with Eugenio Pellicer at the Polytechnic Institute of Valencia, Graduated – January 2016, “The Influence of Collaborative Behavior in the Construction of Spanish Residential Building Construction.”

Harper, Christofer,<sup>10</sup> Principal Doctoral Advisor, Graduated – August 2014, “Measuring Project Integration Using Relational Contract Theory.”

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<sup>7</sup> Assistant Professor, Catholic University of Chile, Santiago, Chile

<sup>8</sup> Lecturer at Misurata University, Misurata, Lybia

<sup>9</sup> Associate Professor at Polytechnic Institute of Valencia, Valencia, Spain

<sup>10</sup> Assistant Professor at Louisiana State University, Baton Rouge, LA

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- Tran, Dan,<sup>11</sup> Principal Doctoral Advisor, Graduated – August 2013, “A Risk-Based Model to Select Delivery Methods for Highway Design and Construction Projects.”
- Sobin, Nat, Principal Doctoral Advisor, Graduated – August 2013, “A Methodology for Building Evaluation Capacity in Alternative Fuel Deployment Programs.”
- Kraft, Elizabeth, Principal Doctoral Advisor, Graduated – May 2013, “Alternative Quality Assurance Organizations for Highway Design and Construction Projects.”
- Won, Spencer, Principal Doctoral Advisor, Graduated – May 2011, “Risk Analysis and Allocation in Design-Build Warranty Projects.”
- Lee, Sangjoo, Principal Doctoral Advisor, Graduated – August 2007, “Entry and Exit Decisions for Unsolicited Build-Operate-Transfer (BOT) Highway Projects.”
- Shane, Jennifer,<sup>12</sup> Principal Doctoral Advisor, Graduated – August 2006, “A Fundamental Study of Scope Definition in Early Highway Project Development.”
- Bastias, Alfonso,<sup>13</sup> Principal Doctoral Advisor, Graduated – August 2006, “Towards the Application of Learning Systems for Decision Support in Construction Engineering and Management.”
- Gransberg, Douglas,<sup>14</sup> Principal Doctoral Advisor, Graduated – December 2004, “Life Cycle Evaluation Criteria for Design-Build Highway Pavement Projects.”
- Chang, Kyungsoo, Principal Doctoral Advisor, Graduated – August 2004, “Linear, Additive, Value Function-Based Best-Value Selection Model for Public Design-Build Projects.”
- Bogus, Susan,<sup>15</sup> Co- Principal Doctoral Advisor w/Diekmann, Graduated – December 2003, “A Methodology to Reconfigure the Design-Construction Interface for Fast-Track Projects.”
- Shin, Kyoochul,<sup>16</sup> (KC), Co- Principal Doctoral Advisor w/Vanegas, Graduated – December 2000, “Identification of Critical Dispute Characteristics (CDC’s) During Construction Project Operations.”

### 2. Ph.D. Students – Committee Member

- Bhandari, Siddharth, Member Doctor Committee, Spring 2018-Present.
- Minooei, Farzad, Member Doctor Committee, Spring 2018-Present.
- Papajohn, Dean, Member Doctoral Committee, Arizona State University, Spring 2018-Present.
- Mulholland, Sean, Member Doctoral Committee, University of Colorado Denver, Spring 2018-Present.
- Nevett, Guillermo, Member Doctoral Committee, Fall 17-Present.
- Al-Haddad, Sara, Member Doctoral Committee, Fall 17 – Present.
- Gaviria, Ed, Member Doctoral Committee (University of Colorado at Denver), 2013 – Present.
- Opdyke, Aaron, Member Doctoral Committee, Graduated Spring 2017. “Resilient and Sustainable Infrastructure Systems: A Comparative Analysis of Post-Disaster Shelter Coordination, Stakeholder Participation, and Training.”
- Kwiatkowski, Kyle, Member Doctoral Committee, Graduated, Spring 2017. “Modeling Climate Change Adaptation in Transportation Infrastructure Organizations.”
- Poleacovschi, Cristina, Member Doctoral Committee, Graduated, Spring 2017. “The Role of Social and Governance Mechanisms on the Process of Knowledge Seeking in Engineering Organizations.”
- Albattah, Mohammed, Member Doctoral Committee, Graduated Fall 2016. “A Critical Analysis of the Structural Changes Related To Craft Demographics Influencing Craft Supply And Demand in the United States across Multiple Dimensions.”
- Bonham, David, Member Doctoral Committee, Graduated Fall 2015. “Development of a Master Code of Accounts for Mechanical and Electrical Construction.”
- Ortiz González, José Ignacio, Member Doctoral Committee, Polytechnic University of Valencia, Spain, Graduated Spring 2015. “Risk Management in the Contingencies from the Perspective of the Construction Company.”
- Torres M, Cristina,<sup>17</sup> Member Doctoral Committee, Dual Degree Program, Catholic University of Chile and Polytechnic University of Valencia, Spain, Graduated Spring 2015. “Multi-objective Optimization Heuristics for the Management of Transportation Infrastructure.”

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<sup>11</sup> Assistant Professor at University of Kansas, Lawrence, KS

<sup>12</sup> Associate Professor at Iowa State University, Ames, IA

<sup>13</sup> Visiting Professor at University of Colorado, Boulder, CO

<sup>14</sup> Emeritus Professor at Iowa State University, Ames, IA

<sup>15</sup> Associate Professor at University of New Mexico, Albuquerque, NM

<sup>16</sup> Professor at Keimyung University in Daegu, Korea

<sup>17</sup> Assistant Professor at University of Colorado, Boulder, CO

## Keith R. Molenaar, Ph.D.

- Fischhaber, Pamela, Member Doctoral Committee (University of Colorado at Denver), Graduated Spring 2014. "Development of Light Rail Crossing Specific Crash Prediction Models."
- Shan, Yongwei, Member Doctoral Committee, Graduated Fall – 2013. "Integrated Information Modeling of Construction Project Productivity."
- Kaminsky, Jessica, Member Doctoral Committee, Graduated Fall – 2013. "Sustainable Sanitation."
- Alsamadni, Rayyan, Member Doctoral Committee, Graduated Fall – 2013. "Safety Social Networks."
- Albert, Alex, Member Doctoral Committee, Graduated Fall – 2013. "Hazard Recognition."
- Esmaeili, Behzad, Member Doctoral Committee, Graduated Fall – 2012. "Identifying and Quantifying Construction Safety Risks at the Attribute Level."
- Nordback, Krista, Member Doctoral Committee (University of Colorado at Denver), Graduated – Fall 2012. "Quantifying Bicycle Use and its Health Impacts in Cities."
- Kashani, Hamed, Member Doctoral Committee, (Georgia Tech), Graduated – Spring 2012. "A Real Options Model for the Financial Valuation of Infrastructure Systems under Uncertainty."
- Dehghan, Reza, Member Doctoral Committee, (University of Calgary, Calgary, British Columbia, Canada), Graduated – Fall 11. "A New Model to Optimize Activity Overlapping in Construction Projects."
- Orozco, Francisco, Member Doctoral Committee (Pontificia Universidad Católica de Chile), Graduated – Fall 2011. "Modeling the Competitiveness Factors and Indexes for Construction Companies."
- Sanchez, Leonardo, Member Doctoral Committee, Graduated – Summer 2008, "Game Theory Applications in Tunneling Project Management."
- González, Vicente, Member Doctoral Committee (Pontificia Universidad Católica de Chile), Graduated – Fall 2008, "Uncertainty Management in Repetitive Building Projects Using Work-In-Process Buffers."
- Ghavamifar, Kamran, Member Doctoral Committee (Northeastern University). Fall 2007-Present.
- Galadari, Abdula Member Doctoral Committee, Graduated – Spring 2008, "Evaluation of Road Construction Alternatives: A Regret Approach."
- Tsung, Nilo, Member Doctoral Committee, 2001-2006.
- Son, Bygonsok, Member Doctoral Committee, 2002-2005.
- Thaessler, Patricia, Member Doctoral Committee (Georgia Tech), Graduated – May 2005, "A Methodology to Develop an Integrated Engineering System to Estimate Quantities for Bridge Repairs at the Pre-Design Stage."
- Ozer, Cinicioglu, Member Doctoral Committee, Graduated – Spring 2005, "In-Situ Shear Strength by Centrifuge Modeling."
- Nasr, Elhami, Member Doctoral Committee, Graduated – Summer 2004, "An Integrated Project Planning And Control System Approach for Measuring Project Performance."
- Petcherdchoo, Aruz, Member Doctoral Committee, Graduated – Fall 2004, "Maintaining Condition and Safety of Deteriorating Bridges by Probabilistic Models and Optimization."
- Prasad, Krishna Chandra, Member Doctoral Committee, Graduated – Spring 2004, "Socioeconomic Module for Decision Support for Water Resource Management in South Africa."
- Thiengburanathan, Poon, Member Doctoral Committee, Graduated – Fall 2003, "Design of Construction Production Systems: Representation, Taxonomy and Design Framework."
- Kononov, Jake, Member Doctoral Committee, Graduated – Fall 2001, "Road Accident Prediction Modeling and Diagnostics of Accident Causality: A Comprehensive Methodology."
- Kong, Jung, S., Member Doctoral Committee, Graduated – Spring 2001, "Lifetime Maintenance Strategies for Deteriorating Structures."
- Burkes, Angela, Member Doctoral Committee, Graduated – Summer 1998, "Multimedia Data Definition and Requirements for Construction Applications."
- Goodman, Robin, Member Doctoral Committee, Graduated – Summer 1998, "Taxonomy of Knowledge Requirements for Construction Industry Executives."
- Sillars, David, Member Doctoral Committee, Graduated – Spring 1998, "Pre-Operational Attributes as Predictors of Organizational Success within a Joint Venture."

### 3. Postdoctoral Researchers Advised

- Bastias, Alfonso, Civil Engineering Visiting Professor/Research Associate, Fall 2018-Present, Project Delivery and Risk Analysis.
- Sobin, Nathaniel, Civil Engineering Postdoctoral Researcher, Fall 2013, Project Delivery Success and Communication Best Practices for Accelerated Construction.
- Esmaeili, Behzad, Civil Engineering Postdoctoral Researcher, Fall 2012-Spring 2013, Project Delivery Success.<sup>18</sup>

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<sup>18</sup> Assistant Professor, University of Nebraska, Lincoln, NE

## Keith R. Molenaar, Ph.D.

Orozco, Francisco,<sup>19</sup> Civil Engineering Postdoctoral Research, Fall 2010, Competitiveness Factors and Indices in Construction Companies.

Forcael, Eric,<sup>20</sup> Civil Engineering Postdoctoral Researcher, Fall 2010, Methods for Dealing with Uncertainty.

Patel, Shekar, Civil Engineering Postdoctoral Researcher, Fall 2007-Spring 2008, Cost, Schedule and Risk Analysis on Transportation Projects.

### 4. M.S. Students – Primary Thesis and Report Advisor

Therrien, Alan, Chair MS Committee, Graduated Fall 2018, “Performance Measures for Alternative Project Delivery Methods on Highway Transportation Projects.”

Girish, Ashnil, Chair MS Committee, Graduated Spring 2018, “An Exploration of First Order Determinants for Management of Horizontal Asset Portfolios.”

Shuka, Ahmad, Chair MS Committee, Graduated Spring 2017, “An Exploration of the Relationship between Construction Cost and Duration in Highway Projects.”

Dicks, Evan, Chair MS Committee, Graduated Fall 2016, “Scope Definition of Air Force Design and Construction Projects.”

Oechler, Erick, Co-Chair MS Committee with Matthew Hallowell, Graduated – Fall 2015, “Risk Based Quality Assurance for Highway Construction.”

Tonnessen, Jacob, Chair MS Committee, Graduated – Summer 2014, “Renovation Markup Factors for Public and Private Campus Construction.”

McGuire, Timothy, Chair MS Committee, Graduated – Summer 2014, “Enterprise Risk Management in State Departments of Transportation.”

Matsumura, Kristen, Chair MS Thesis Committee, Graduated – Fall 2012, “Causes of Poor Performance in World Bank Water and Sanitation Projects.”

Crawford, McCullough, Chair MS Thesis Committee, Graduated – Fall 2012, “An Exploration of Enterprise Risk Management Maturity Factors within Transportation Organizations.”

Issa, Ibrahim, Chair MS Report Committee, Graduated – Fall 2011, “Barriers to Alliancing Project Delivery in the United States.”

Navarro, Desiderio, Chair MS Thesis Committee, Graduated – May 2011, “Project Delivery Methods and Intensity of Infrastructure Delivery.”

Antillon, Eric, Co-Chair MS Thesis Committee, Graduated – December 2010, “A Research Synthesis on the Interface between Lean Construction and Safety Management.”

Jouandou, Remi, Co-Chair MS Thesis Committee, Graduated – December 2010, “Dealing With Uncertainty: Selecting a Risk-Analysis Tool on the Basis of Project Characteristics and Phases.”

Jones, Tyler, Chair MS Report Committee, Graduated – August 2010, “Highway Project Delivery, Procurement and Contracting Methods.”

Raitman, Ross, Chair MS Thesis Committee, Spring 2009 to Present, “Simulation of Concurrent Engineering Design and Construction Activities.”

Wilson, Craig, Chair MS Thesis Committee, Graduated – Spring 2009, “Contingency Management in Highway Project Development.”

Harder, Joe, Chair MS Report Committee, Graduated – Spring 2009, “The Cost Impact of LEED Certification in Municipal Construction.”

Grimes, Morgan, Chair MS Report Committee, Graduated – Summer 2009, “Environmental Costs and Benefits of Recycling C&D Debris.”

Wimmer, Todd, Chair MS Report Committee, Graduated – Fall 2008, “Multiple Award Contract Procurement Methods.”

Steinert, Jesse, Chair MS Report Committee, Graduated – Summer 2008, “Developing World Sustainable Building Practices.”

Novak, Ryan, Chair MS Thesis Committee, Graduated – Fall 2005, “A Framework for Learning Leadership Through Group Projects.”

Wardwell, Meredith, Chair MS Thesis Committee, Graduated – Fall 2004, “The Use of Peer Audits to Determine Critical Construction Project Success Factors.”

Sabol, Kevin, Chair MS Report Committee, Graduated – Fall 2004, “Quantify Construction Delays Due to Weather.”

Shane, Jennifer, Chair MS Thesis Committee, Graduated – Fall 2003, “Design-Build Highway Construction: An Examination of Special Experimental Project Number 14 Performance.”

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<sup>19</sup> Assistant Professor, Pan-American University, Guadalajara, Mexico

<sup>20</sup> Assistant Professor, University of Bio-Bio, Chile

## Keith R. Molenaar, Ph.D.

- Won, Spencer, Chair MS Thesis Committee, Graduated – Fall 2003, “Classification of Life Cycle Cost Criteria in Design-Build Transportation Project RFPs.”
- Saller, Brian, Chair MS Report Committee, Graduated – Fall 2002, “Core Competencies for Design-Builders.”
- Park, Joeng-il, Chair MS Report Committee, Graduated – Fall 2001, “A Structural Equation Model of Corporate Culture in Companies with Outstanding Construction Safety.”
- Wang, Yang, Co-Chair w/Diekmann MS Report Committee, Graduated – Fall 2001, “The Application of Production Scheduling Techniques in Construction.”
- Caile, Shreve, Chair MS Report Committee, Graduated – Spring 2001, “A Study of Corporate Culture in Companies with Outstanding Construction Safety.”
- Escobar, Katia, Chair MS Report Committee, Graduated – Fall 2000, “Technology Applications for Construction Project Control.”
- Chang, Kyungsoo, Chair MS Thesis Committee, Graduated – Fall 2000, “Appropriate Assessment Methods for Best-Value Selection in Public Design-Build Projects.”
- Chelette, Christopher, Chair MS Report Committee, Graduated – Spring 1999, “Qualification Based Selection for Contractors: Private Perspective.”
- China, Jose, Chair MS Report Committee, Graduated – Spring 1999, “Alternative Financing for Highway Construction.”
- Jimenez, Luis Raul, Chair MS Report Committee, Graduated – Spring 1999, “A Case Study of Design-Build for Highway Construction.”
- Nicholson, Marc, Chair MS Report Committee, Graduated – Spring 1999, “Building Commissioning: The Next Step for Design-Build?”
- Sencer, Justin, Chair MS Report Committee, Graduated – Spring 1999, “Qualification Based Selection for Contractors: Public Perspective.”
- Vogel, Burr, Chair MS Report Committee, Graduated – Spring 1999, “Incentive and Disincentive Contracting in Highway Project.”
- Williams, Laura, Chair MS Report Committee, Graduated – Winter 1998, “A Model for Incorporating Finance into Design-Build Organizations.”
- Legrand, Roberto, Chair MS Report Committee, Graduated – Summer 1998, “A Comparison of Safety Plans for Offshore Oil Platforms.”
- Mazariegos, Guillermo, Chair MS Report Committee, Graduated – Summer 1998, “Effects of High Inflation in Construction Planning, Scheduling and Estimating.”
- Blohm, Karsten, Chair MS Report Committee, Graduated – Spring 1998, “Computer Simulation for Productivity Improvement in Construction Engineering.”
- Fischer, David, Chair MS Report Committee, Graduated – Spring 1998, “A Process Model for the Integration of Estimating and Accounting in Construction.”
- King, Willie Lee, Chair MS Report Committee, Graduated – Fall 1997, “Strategic Planning for Construction.”

### 5. M.S. Students – Thesis and Report Committee Member

- White, Shelby, Member, MS Thesis Committee, Graduated – Fall 2016, “Impacts of LED Lighting on 16<sup>th</sup> Street Mall.”
- Miller, Jeffery, Member, MS Thesis Committee, Graduated – Fall 2015, “Innovative Information Systems for Craft Deliverables.”
- Carrasco, Valerie, Member, MS Thesis Committee, Graduated – Spring 2014, “Construction Engineering and Inspection in the Highway Transportation Sector.”
- Skaggs, Michael, Member, MS Thesis Committee, Graduated – Spring 2014, “Hazard Recognition Trends in Industrial Construction.”
- Duarte, Marcos, Member, MS Thesis Committee, Graduated – Spring 2014, “Utility of Safety Investments.”
- Prades, Marc, Member, MS Thesis Committee, Graduated – Fall 2014, “Predicting Injuries in Industrial Projects.”
- Yugar-Arias, Ivo, Member, MS Thesis Committee, Graduated – Fall 2014, “Using Photovoice to Explore Safety Challenges for Hispanic Workers.”
- Berteaux, Florence, Member, MS Thesis Committee, Graduated – Spring 2013, “Adaptation vs. Integration.”
- Choi, Jung Kue, Member, MS Thesis Committee, Graduated – Spring 2013, “Real Estate Challenges of Songdo City.”
- Senesi, Christopher, Member, MS Thesis Committee, Graduated – Spring 2012, “Benefits and Barriers to Probabilistic Risk Management in Design and Construction.”
- Calhoun, Matt, Member MS Thesis Committee, Graduated – Fall 2010, “Interrelationships among highly-effective injury prevention strategies.”

## Keith R. Molenaar, Ph.D.

- Whittaker, Tyler, MS Report Committee, Graduated – Spring 2009, “Implementation of 4D Modeling.”
- Nonaka, Sara, Member MS Report Committee, Graduated – Spring 2009, “Evaluation the Performance of Low-Emitting Building Materials.”
- Tabata, James, Member MS Report Committee, Graduated – Fall 2008, “Safety Program Implementation in State Departments of Transportation.”
- Stonecypher, Rachael, Member MS Report Committee, Graduated – Fall 2008, “Learning Organizations in Construction.”
- Harper, Chris, Member MS Report Committee, Graduated – Summer 2007, “Using Concurrent Engineering and Simulations to Analyze Design Activities in a Construction Project.”
- Cocker, Jason, Member MS Thesis Committee, Graduated – Summer 2007, “A Simulation-based Analysis of Concurrent Engineering Applications in the Architecture, Engineering and Construction Industry.”
- Hosfelt, Samuel, Member MS Report Committee, Graduated Summer 2007, “The Efficacy of Building Information Models.”
- Realph, Allison, Member MS Thesis Committee, Graduated – Fall 2005, “Learning Organizations in Construction.”
- Doherty, Daniel, Member MS Report Committee, Graduated – Summer 2005, “Effects of Strategic Management on Project Management.”
- Matsumoto, Masato, Member MS Report Committee, Graduated – Spring 2005, “Development of a Lifetime Maintenance Strategy for Highway Structures.”
- Loeb, Jaime, Member MS Report Committee, Graduated – Fall 2004, “Emotional Quotient in Engineering Education.”
- Paul Burdett, Member MS Report Committee, Engineering Management, Graduated – Spring 2004, “Development of an Operations and Procedures Manual for Mays Concrete Inc.”
- Guttridge, Mark, Member MS Thesis Committee, Graduated – Spring 2004.
- Bundy, Trace, Member MS Thesis Committee, Graduated – Summer 2003, “Modeling Water Use in Steam Power Plants.”
- Mark Krewedl, Member MS Report Committee, Graduated – Fall 03, “Evaluation of the Construction Value Stream”
- Stewart, Travis, Member MS Report Committee, Graduated – Spring 2002, “Introduction to Lean Construction.”
- Allen, Linda, Associate Advisor, MS Thesis Committee, Naval Postgraduate School, Monterey, CA, Graduated – Fall 2001, “Comparison of Design-Build to Design-Bid-Build as a Project Development Method.”
- Derosier, Mike, Member MS Report Committee, Graduated – Spring 2001, “Use of Computer Modeling in Traffic Control Planning for Highway Construction.”
- Javernick, Amy, Member MS Report Committee, Graduated – Spring 2001, “The Designer’s Obligation for Cost Overruns in Design-Build Contracts.”
- Rodriguez, Peter, Member MS Report Committee, Graduated – Spring 2001, “Design-Build-Finance: Real Estate Development Opportunities in the A/E/C Industry.”
- Escobar, Jamie, Member MS Report Committee, Graduated – Fall 2000, “Low Income Housing: A Case Study Analysis for a Better Project Management Practice.”
- Stabile, Dana, Member MS Report Committee, Graduated – Fall 2000, “Real Estate Development and Construction: When Do We Begin? Where Do We End?”
- Ward, Steve, Member MS Report Committee, Graduated – Fall 2000, “The Future of Quality in Army Corps of Engineers: ‘Bullish’ on ISO 9000.”
- Corotis, Lindsay, Member MS Report Committee, Graduated – Spring 2000, “The Success of RSA.”
- Island, Kristine, Member MS Report Committee, Graduated – Spring 2000, “The Success of the St. Joseph’s School Project.”
- Elliott, Kathy, Member MS Thesis Committee, Graduated – Summer 1998, “Environmental Impacts of Fast-Track Construction.”

### 6. M.S. Students – Non-Thesis Research and Independent Study Advising

- Paulze D'Ivoy, Nicolas, Graduate Research, Alternative Contracting Methods for Highway Projects, Spring 2014.
- Babjack, Pamela, Graduate Independent Study, 3 credit hours, Pavement Management, Fall 2004.
- Harwood, Michelle. Graduate Independent Study, 3 credit hours, Construction Equipment and Methods, Fall 2004.
- Balonick, Joshua, Graduate Independent Study, 3 credit hours, Construction Cost Estimating, Spring 2004.
- Priestley, Jennifer, Graduate Research, Design-Build for Water/Wastewater Survey Design and Administration, Fall 2001.

## Keith R. Molenaar, Ph.D.

Busby, Katherine, Graduate Research, Construction Engineering and Management Affiliates Construction Information Technology Benchmarking Study, Fall 2001.

Curtis, Sarah, Graduate Independent Study, 3 credit hours, Cost Estimating, Spring 2000.

### 7. B.S. Students – Non-Thesis Research and Independent Study Advising

Sheeran, Kelley, Discovery Learning Apprentice, Contract Administration Methods for Highway Construction, Fall 2016 – Fall 2018.

Zheng, Dingyin, Discovery Learning Apprentice, Measuring International Research Collaboration, Fall 2016 – Spring 2017.

Maguire, Joseph, Undergraduate Researcher, Water/Wastewater Project Delivery Selection, Fall 2016 – Spring 2017.

Souder, Nicole, Discovery Learning Apprentice, Alternative Contracting Methods for Highway Construction, Fall 2015 – Spring 2016.

Sheeran, Kelley, Discovery Learning Apprentice, Indefinite Delivery for Public Sector Construction, Fall 2015 – Spring 2016.

Gordon, Alec, Undergraduate Research, Alternative Contracting Methods, Fall 2014 - Spring 2015.

Chifala, Michael, Undergraduate Research, Alternative Contracting Methods, Fall 2014 - Spring 2015.

Guillies, Samantha, Undergraduate Research, Alternative Contracting Methods, Fall 2014 - Spring 2015.

Ardent, Kayleigh, Undergraduate Independent Study, 3 credit hours, Project Partnering Success, Spring 2014.

White, Shelby, Undergraduate Research, Integrated Project Delivery, Summer 2013 - Spring 2014.

Doyle, Brian, Undergraduate Research, Integrated Project Delivery, Summer 2013 - Spring 2014.

Anderson, Lars, Undergraduate Research, Integrated Project Delivery, Summer 2013 - Spring 2014.

Ardent, Kayleigh, Undergraduate Research, Integrated Project Delivery, Summer 2013 - Spring 2014.

McCullough, Crawford, Undergraduate Independent Study, 1 credit hour, International Risk Management, Spring 2011.

Kassouf, Ronald, Undergraduate Independent Study, 1 credit hour, Cost Benefit Analysis and Risk Assessment for use of Mobile Barriers in Highway Workzones, Spring 2010.

Dewlaney, Katie, Advisor for Undergraduate Research Opportunity Grant, Cost Benefit Analysis and Risk Assessment for use of Mobile Barriers in Highway Workzones, Fall 2010.

Antillon, Eric, Advisor for Summer Multicultural Advancement in Research and Training (SMART), 3 credit Hours, Procurement Methods of High Performance Public Buildings through Design-Build Project Delivery, Summer 2009.

Antillon, Eric, Advisor for Undergraduate Research Opportunity Grant, Applications of High-Performance Public Buildings using Design-Build Delivery, Fall 2009.

Ponder, Dan, Undergraduate Independent Study, 1 credit hour, Case Studies of Major Civil Infrastructure Projects: Alaska Way Viaduct, Panama Canal Expansion, Hood Canal Bridge, and San-Francisco-Oakland Bay Bridge, Spring 2009.

Wolff, Josh, Undergraduate Independent Study, 1 credit hour, Construction Shoring Design and Application, Spring 2009.

Santorno, Chris, Undergraduate Independent Study, 1 credit hour, High Performance Buildings: A case study of the Williams Village II Dormitory, Spring 2009.

Taziri, Ben, Undergraduate Independent Study, 1 credit hour, Mobile Traffic Barriers, Spring 2009.

Fahl, Brian, Undergraduate Independent Study, 1 credit hour, Mobile Traffic Barriers, Spring 2009.

Gross, Isaac, Undergraduate Independent Study, 1 credit hour, Mobile Traffic Barriers, Spring 2009.

Webb, William, Undergraduate Independent Study, 1 credit hour, Mobile Traffic Barriers, Spring 2009.

Valdez, Jonathon, Undergraduate Independent Study, 2 credit hours, Concrete Formwork Design, Fall 2008.

Valleie, Nema, Undergraduate Independent Study, 2 credit hours, Concrete Formwork Design, Fall 2008.

Haag, Steve, Undergraduate Independent Study, 1 credit hour, Risk Assessment and Analysis for Highway Construction, Fall 2008.

Raitman, Ross, Advisor, Undergraduate Independent Study, 1 credit hour, Simulation of Concurrent Engineering Design and Construction, Fall 2008.

Ashwood, Wesley, Advisor, Undergraduate Research Opportunity Grant, Barriers to Fog Collection in Developing Communities, A Case Study in Paposo, Chile, Spring-Fall 2007.

Griego, Danielle, Advisor, Undergraduate Research Opportunity Grant, Barriers to Fog Collection in Developing Communities, A Case Study in Paposo, Chile, Spring-Fall 2007.

Kumar, Manish, Undergraduate Independent Study, 1 credit hour, Construction Cost Engineering, Fall 2005.

Lindgren, Pia, Undergraduate Independent Study, 1 credit hour, Construction Cost Engineering, Fall 2005.

Burns, John, Undergraduate Independent Study, 1 credit hour, Construction Cost Engineering, Fall 2005.



## Keith R. Molenaar, Ph.D.

- Kolesar, Michael, Undergraduate Independent Study, 1 credit hour, Construction Planning and Scheduling, Spring 2005.
- Lopez, Paola, Undergraduate Independent Study, 1 credit hour, Estimating the Effects of Inflation in Highway Construction, Spring 2005.
- Henao, Alejandro, Undergraduate Independent Study/Undergraduate Research, 3 credit hours, Summer Multicultural Advancement in Research and Training (SMART Program), Cost Estimating for Highway Construction, Summer 2005.
- Saller, Kevin, Undergraduate Independent Study, 2 credit hours, U.S. General Services Administration Peer Review Process, Fall 2004.
- Ruderman, Nicholas, Undergraduate Independent Study, 3 credit hours, Construction Management, Spring 2004.
- Shintaku, Justin, Undergraduate Independent Study, 1 credit hour, International Highway Construction Management, Fall 2003.
- Rosa, Maria, Undergraduate Independent Study/Undergraduate Research, 3 credit hours, Summer Multicultural Advancement in Research and Training (SMART Program), Best-Value Procurement for Highway Construction, Summer 2002.
- Probst, Eric, Undergraduate Research, European Asphalt Warranties, Spring 2002.
- Coffman, Ben, Undergraduate Independent Study, 1 credit hour, Construction Equipment and Methods Multimedia Compact Disk Project, Spring 2002.
- Sengul, Serkan, Undergraduate Independent Study, 1 credit hour, Construction Equipment and Methods Multimedia Compact Disk Project, Spring 2002.
- Colburn, Candace, Undergraduate Independent Study, 1 credit hour, Construction Crane Safety and Selection, Fall 2002.
- Wilke, Jordan, Undergraduate Research, European Contract Administration, Spring 2001.
- Ramirez, Jude, Undergraduate Independent Study, 1 credit hour, Construction Equipment and Methods Multimedia Compact Disk Project, Fall 2001.
- Santangelo, Neal, Undergraduate Independent Study, 1 credit hour, Construction Equipment and Methods Multimedia Compact Disk Project, Fall 2001.
- Wilke, Jordan, Undergraduate Research, European Highway Construction Contract Administration, Fall 2000.
- Stewart, Travis, Undergraduate Research, Washington State Department of Transportation Design-Build Pilot Project Evaluation, Fall 2000.
- Wardwell, Meredith, Undergraduate Research, Web-Based Peer Evaluation Project, Spring 2000.
- Chapman, Randall, Undergraduate Research, Cross Impact Analysis for Design-Build Project Selection, Spring 2000.
- Brumely Michael, Undergraduate Research, American Society of Civil Engineers CoCOA Web Page Assistance, Spring 2000.
- Smith, Roger, Undergraduate Independent Study, 2 credit hours, Corporate Safety Culture, Spring 2000.
- Glenn, Jason, Undergraduate Independent Study, 1 credit hour, Parametric Cost Estimating, Spring 2000.

### XIV. COURSE INSTRUCTION

#### 1. University of Colorado

*AREN 4317, AREN Senior Design*, Co-Instructor, Undergraduate Core Requirement

- Spring 2014, 44 students
- Spring 2012, 49 students
- Spring 2011, 51 students
- Spring 2010, 60 students
- Spring 2009, 55 students
- Spring 2008, 54 students

*AREN 4416 Construction Costs/Estimating*, Undergraduate Technical Elective

- Spring 2005, 52 students
- Spring 2001, 32 students
- Spring 2001, 56 students

*AREN 4420 Construction Costs Engineering*, Undergraduate Core Requirement

- Spring 2010, 71 students
- Spring 2009, 87 students
- Spring 2006, 45 students

*AREN 4506 Preconstruction Estimating and Scheduling*, Undergraduate Technical Elective

- Fall 2016, 30 students

## Keith R. Molenaar, Ph.D.

CVEN 3246 *Introduction to Construction*, Undergraduate Core Requirement

- Summer 2000, 12 students
- Fall 1999, 44 students

CVEN 3256 *Construction Equipment and Methods*, Undergraduate Core Requirement

- Fall 2009, 76 students
- Fall 2008, 51 students
- Fall 2007, 59 students
- Fall 2005, 51 students
- Fall 2004, 50 students
- Fall 2003, 50 students
- Fall 2002, 52 students
- Fall 2001, 51 students
- Fall 2000, 36 students

CVEN 5326 *Construction Project Controls*, Graduate Core Requirement

- Spring 2009, 14 students
- Spring 2008, 22 students
- Spring 2006, 13 students
- Spring 2005, 13 students
- Spring 2004, 16 students
- Spring 2001, 16 students

CVEN 5276 *Engineering Risk and Decision Analysis*, Graduate Core Requirement

- Fall 2017, 24 students
- Fall 2015, 22 students
- Fall 2013, 15 students
- Fall 2012, 20 students
- Fall 2011, 26 students
- Fall 2009, 12 students

CVEN 5336 *Construction Project Delivery*, Graduate Technical Elective

- Spring 2003, 10 students
- Spring 2002, 23 students
- Spring 2001, 16 students

CVEN 5836 *Construction Engineering and Management Fundamentals*, Graduate Core Requirement

- Fall 2018, 25 students

CVEN 6836 *Research Methodology*, Co-Instructor, Graduate Core Requirement

- Fall 2008, 14 students

### 2. Catholic University, Chile

ICC 3801 *Topics in Engineering and Management of Construction*, Graduate Elective

- Fall 2006, 18 students

### 3. Georgia Institute of Technology

CE 4003 *Construction*, Undergraduate Core Requirement

- Fall 1998, 42 students
- Summer 1998, 48 students
- Fall 1997, 32 students

CE 4043 *Basic Planning and Estimating Methods*, Undergraduate Elective

- Winter 1998, 60 students

CE 4083 *Advanced Planning and Estimating Methods*, Undergraduate Elective

- Spring 1999, 44 students
- Spring 1998, 49 students

CE 6023 *Construction Engineering and Management II*, Graduate Core Requirement

- Spring 1999, 16 students
- Spring 1998, 23 students

CE 8061 *Construction Seminar*, Graduate Core Requirement

- Winter 1998, 21 students
- Fall 1997, 28 students

## Keith R. Molenaar, Ph.D.

### 4. University of Colorado (as Instructor)

*AREN 4416 Construction Costs/Estimating*, Undergraduate Elective

- Spring 1997, 43 students
- Spring 1996, 27 students

## XV. COURSE DEVELOPMENT

### 1. New Courses

Spring 04, *AREN 4420 Construction Cost Engineering*, Undergraduate Core Requirement, 3 credit hours.

Created new core requirement course for Architectural Engineering undergraduate students focusing on construction cost analysis and cost engineering. This course is intended to correct a joint evaluation committee (JEC) suggestion for improvement in Architectural Engineering.

Spring 02, *CVEN 5336 Construction Project Delivery*, Graduate Technical Elective, 3 credit hours.

Created new technical elective course for Construction Engineering and Management MS and PhD students focusing on innovative delivery of civil infrastructure projects, including design-build and public-private partnerships.

Spring 01, *CVEN 5326 Construction Project Controls*, Graduate Core Requirement, 3 credit hours.

Created new core requirement course for Construction Engineering and Management MS students focusing on advanced scheduling, estimating, and project control techniques, including the use of new technologies.

Fall 00, *CVEN 3256 Construction Equipment and Methods*, Undergraduate Core Requirement, 3 credit hours.

Created new core requirement course for Civil and Environmental Engineering undergraduate students focusing on construction engineering. This course is intended to correct an ABET deficiency in Environmental Engineering.

### 2. Major Revision of Existing Courses

Fall 09, *CVEN 5276 Engineering Decision and Risk Analysis*, Graduate Core Requirement, 3 credit hours.

Revised core requirement course for Construction Engineering and Management and Systems Engineering students. Developed new case studies and course assignments for the San Francisco-Oakland Bay Bridge, Panama Canal Expansion, and Hood Canal Bridge. Introduced new Monte Carlo simulation software.

Fall 99, *CVEN 3246 Introduction to Construction*, Undergraduate Core Requirement, 3 credit hours.

Revised syllabus, created new lectures, developed new five-module semester project, developed new group project to promote industry interaction, developed four new individual assignments.

## XVI. TEACHING AND EDUCATION WORKSHOPS

CETL Teaching Fellows, Georgia Institute of Technology, January-March, 1999.

NSF Engineering Education Scholars Workshop, Carnegie Mellon University, July 19-24, 1998.

NSF/SUCCEED Effective Teaching Workshop, Georgia Tech, October 2-3, 1997.

NSF/EDUTECH Design Education Workshop, Georgia Tech, September 8-9, 1997.

## XVII. PRESENTATIONS AND INVITED LECTURES

“Alternative Contracting Method Performance for Highway Construction,” *Federal Highway Administration Peer Exchange*, Columbia, SC, November 2018.

“Best-Value Procurement for Highway Construction,” *Federal Highway Administration Peer Exchange*, Columbia, SC, November 2018.

“Revisiting Project Delivery Performance,” *Keynote, Design-Build Institute of America Annual Conference*, New Orleans, LA, November 2018.

“Design-Build in the Public Sector,” *Design-Build Institute of America, Rocky Mountain Chapter, Owners’ Forum*, Lakewood, CO, October 2018.

“Public Owners’ Role in Project Integration,” *Design-Build Institute of America and Society of American Military Engineer’s Owners’ Forum*, Washington, D.C., May 2018.

“Maximizing Success on Integrated Projects: An Owner’s Guide,” *American Institute of Architects Project Delivery Symposium*, Washington, D.C., March 2018.

“Overview of Agency Risk Management Practices,” *Transportation Research Board 97<sup>th</sup> Annual Meeting*, Washington, D.C., January 2018.

“The Genesis of Design-Build Work on a University Campus,” *Design-Build Institute of America Annual Conference*, Philadelphia, PA, November, 2017.

“Innovative Delivery Methods for Highway Infrastructure,” *Keynote, National Infrastructure Conference, University of Lost Andes*, Bogota, Columbia, October 2017.

**Keith R. Molenaar, Ph.D.**

- “Alternative Project Delivery Methods for University Design and Construction,” *Associated General Contractors Owner’s Round Table*, Denver, May 2017.
- “Costs, Benefits and Risks of Using Alternative Contracting Methods for Highway Construction,” *Federal Highway Administration Webinar*, May 2017.
- “Optimizing the Risk and Cost of Materials Quality Assurance,” *National Cooperative Highway Research Program Webinar*, October 2017.
- “An Emperical Study of the State-of-Practice in Alternative Technical Concepts (ATCs) in Highway Projects,” *Poster Presentation at Transportation Research Board 96<sup>th</sup> Annual Meeting*, Washington, D.C., January 2017.
- “Program Risk Management Approach to Reducing Cost Uncertainty in Highway Projects,” *Poster Presentation at Transportation Research Board 96<sup>th</sup> Annual Meeting*, Washington, D.C., January 2017.
- “Project Delivery Selection for Water/Wastewater Projects,” *RMSAWWA/RMWEA Joint Annual Conference*, Keystone, CO, September, 2016.
- “Alternative Contracting Method Performance on Highway Projects,” *Plenary Session, AASHTO Subcommittee on Construction Conference*, Big Sky, MT, August, 2016.
- “Best-Value Procurement for Highway Projects” *Transportation Research Board National Webinar*, Washington, DC, April, 2016.
- “Alternative Contracting Method Performance on Highway Projects,” *Plenary Session, Design-Build Institute of America’s Transportation Conference*, Charlotte, NC, April, 2016.
- “Maximizing Success on Integrated Projects: An Owner’s Guide,” *Design-Build Institute of America’s Pacific Region Conference*, Phoenix, AZ, March, 2016.
- “State-of-Practice for Risk-Based Quality Assurance in State Departments of Transportation,” *Poster Presentation at Transportation Research Board 95<sup>th</sup> Annual Meeting*, Washington, D.C., January 2016.
- “Maximizing Success on Integrated Projects: An Owner’s Guide,” *Plenary Session, Design-Build Institute of America’s Design-Build Conference and Exposition*, Denver, CO, November, 2015.
- “Maximizing Success on Integrated Projects: An Owner’s Guide,” *American Association of Port Authorities Annual Conference*, San Diego, CA, October, 2015.
- “Maximizing Success on Integrated Projects: An Owner’s Guide,” *Plenary Session, Design-Build Institute of America’s Federal Project Delivery Symposium*, Washington, DC, August, 2015.
- “Maximizing Success on Integrated Projects: An Owner’s Guide,” *Construction Industry Institute Annual Conference*, Boston, MA, August, 2015.
- “Maximizing Success on Integrated Projects: An Owner’s Guide,” *Keynote at the Associated General Contractors of Colorado Breakfast with the Board & General Contractor Showcase*, Greenwood, CO, July, 2015.
- “Effects of Project Integration in the United States and Spain,” *Strategies in Construction Innovation*, Valencia, Spain, May 2015.
- “Practices for Developing Transparent Best Value Selection Procedures,” *Transportation Research Board Annual Conference*, Washington, DC, January 2015.
- “The Impact of Project Integration on Project Success,” *National Webinar for the Association of General Contractors*, Washington, DC, January 2015.
- “Project Delivery Selection for Highway Design and Construction Projects,” *National Webinar for the Federal Highway Administration*, November 2014.
- “Design-Build Management Practices for Highway Construction,” *Federal Highway Administration, Federal Lands Highway Program*, Lakewood, CO, October 2014.
- “Project Delivery Selection Processes,” *Advanced Methodologies for Construction Management*, Catholic University of Chile and Chilean Association of Construction, Santiago, Chile, September 2014.
- “The Impacts of Project Delivery on Project Performance,” *Advanced Methodologies for Construction Management*, the Catholic University of Chile and Chilean Association of Construction, Santiago, Chile, September 2014.
- “Cost and Schedule Risk Analysis on Large Projects,” *Keynote Presentation, 18<sup>th</sup> International Congress on Project Management and Engineering*, Alcañiz, Spain, July 2014.
- “Impacts of Project Delivery Methods on Project Outcomes” *Construction Management Association of America, Capital Projects Symposium*, Baltimore, Maryland, May 2014.
- “Quality Management for Design-Build Highway Projects,” *New York State Department of Transportation Design-Build Peer Exchange*, Rochester, NY, April 2014.
- Strategic Planning for Civil Engineering Programs,” *ASCE Department Heads Committee Meeting*, Oklahoma City, OK, April 2014.

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- “On-Line Learning in Civil Engineering Programs,” *ASCE Department Heads Committee Meeting*, Oklahoma City, OK, April 2014.
- “Developing Design Criteria for Design-Build Highway Projects,” *New York State Department of Transportation Design-Build Peer Exchange*, Syracuse, NY, April 2014.
- “Risk Management in State Departments of Transportation: A Research Perspective,” *FHWA Risk Management Peer Exchange*, Atlanta, GA, March 2014.
- “Cost and Schedule Risk Management for Large Infrastructure Projects,” *Catholic University of Chile, Santiago, Chile*, March 2014.
- “Project Delivery History and Future Trends,” *Transportation Research Board 93<sup>rd</sup> Annual Meeting*, Washington, D.C., January 2014.
- “Management Practices in Various Future Delivery Methods,” *American Society of Civil Engineering, Texas Section Centennial Conference*, Dallas, TX, September 2013.
- “Next-Generation Transportation Construction Management,” *American Association of State Highway Transportation Officials Subcommittee on Construction Annual Conference*, Detroit, MI, August 2013.
- “Project Delivery Selection,” *Design-Build Institute of America Rocky Mountain Region Annual Conference*, Denver, CO, May, 2013.
- “Cost and Schedule Risk Analysis for Major Infrastructure Projects” *Association for the Advancement of Cost Engineering International*, Denver, CO, April 2013.
- “Managing Risk on Rapid Renewal Highway Projects” *Design-Build Institute of America Transportation Conference*, Orlando, FL, March 2013.
- “Design-Build Project Delivery: Project Selection, RFP Development and Alternative Technical Concepts,” *Federal Highway Administration, Rhode Island Design-Build Exchange*, Providence, RI, January 2013.
- “Design-Build Project Delivery: Project Selection and Cost Estimation,” *Federal Highway Administration, Northeast Design-Build Peer Exchange*, Boston, MA, February 2013.
- “Project Delivery Selection for Highway Design and Construction Projects,” *Federal Highway Administration, Every Day Counts Summit*, Providence, RI, January 2013.
- “Project Delivery Selection for Highway Design and Construction Projects,” *Federal Highway Administration, Every Day Counts Summit*, Atlanta, GA, January 2013.
- “Incorporating Risk Management into Programming and Planning,” *Transportation Research Board 92<sup>nd</sup> Annual Meeting*, Washington, D.C., January 2013.
- “Risk Assessment and Management,” *Transportation Research Board 92<sup>nd</sup> Annual Meeting*, Washington, D.C., January 2013.
- “Enterprise Risk Management: Why Does it Matter,” *Transportation Research Board 92<sup>nd</sup> Annual Meeting*, Washington, D.C., January 2013.
- “Selection of Project Quality Assurance Organizations for Highway Design and Construction Projects,” *Transportation Research Board 92<sup>nd</sup> Annual Meeting, Poster Session*, Washington, D.C., January 2013.
- “A Project Delivery Selection Matrix for Highway Design and Construction,” *Transportation Research Board 92<sup>nd</sup> Annual Meeting, Poster Session*, Washington, D.C., January 2013.
- “Project Delivery Selection for Highways,” *Federal Highway Administration, Every Day Counts Summit*, Atlanta, GA, November 2012.
- “Project Delivery Selection for Highways,” *Federal Highway Administration, Every Day Counts Summit*, Sacramento, CA, November 2012.
- “Design-Build Procurement Methods,” *Federal Highway Administration, Design-Build Peer Exchange*, Orlando, FL, October 2012.
- “Why Enterprise Risk Management?” *Transportation Research Board 5<sup>st</sup> Annual Workshop on Transportation Law*, New Orleans, Louisiana. July 2012.
- “International Risk Management Scan,” *Federal Highway Administration, National Webinar*, August, 2012.
- “Risk Management for Transportation Projects,” *American Association of State Highway Transportation Officials, Subcommittee on Construction Annual Meeting*, San Francisco, CA, August 2012.
- “Probabilistic Risk Management in Design and Construction Projects,” *Construction Industry Institute Annual Conference*, Baltimore, MD, July 2012.
- “Project Delivery Selection Matrix for Transportation Projects,” *Western American Association of State Highway Transportation Officials Annual Conference*, Colorado Springs, CO, July 2012.
- “Measuring Project Delivery Performance,” *Pankow Foundation Board of Directors Meeting*, Denver, CO, June 2012.
- “BOLD Redshirt Program at the University of Colorado,” *ASCE Department Heads Conference*, New York, NY, June 2012.

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- “Project Delivery Selection Matrix for Transportation Projects,” *Design-Build Institute of America Transportation Conference*, Phoenix, AZ, April 2012.
- “Engineering for the Americas,” *Moderator, Pan American Convention of Engineering XXXIII UPADI*, Havana, Cuba, April 2012.
- “Enterprise Risk Management for Highways,” *FHWA Western States Leadership Meeting*, Lakewood, CO, February 2012.
- “Selecting Project Delivery Systems,” *Colorado Department of Transportation, Construction Manager/General Contractor Training Conference*, Denver, CO, February, 2012.
- “Enterprise Risk Management: Benefits and Barriers,” *Transportation Research Board 91<sup>st</sup> Annual Meeting*, Washington, D.C., January 2012.
- “A Lessons Learned Case Study Design Phase Management on Two Major Military Design-Build Projects at Ft. Carson, CO.” *Design-Build Institute of America, Federal Design-Build Symposium*, Washington, DC, August 2011.
- “Cost, Schedule and Risk Analysis on Major Infrastructure Projects,” *Georgia Institute of Technology*, Atlanta, GA, April, 2011.
- “Risk Assessment Methods for Highway Projects,” *Colorado DOT/Colorado Contractor’s Association/American Consulting Engineers Innovative Contracting Committee Conference*, Denver, CO, February, 2011.
- “Key Performance Indicators in Highway Design and Construction,” *Transportation Research Board 90<sup>th</sup> Annual Meeting*, Washington, D.C., January 2011.
- “Selecting Project Delivery Methods for Sustainable Design and Construction,” *Construction Owners’ Association of America*, Tampa, FL, November 2010.
- “Risk Management Planning for the Panama Canal Expansion,” *Virginia Tech/National Science Foundation Conference on Construction Engineering*, Blacksburg, VA, September, 2010.
- “Risk Analysis Tools and Management Practices in Transportation Planning,” *TRB-Mn/DOT Capacity Building Workshop*, Minneapolis, MN, August, 2010.
- “Key Performance Indicators in Highway Design and Construction,” *Federal Highway Administration*, Webinar, June, 2010.
- “Influence of Project Delivery Methods on Sustainable Design and Construction,” *Associated General Contractors 91<sup>st</sup> Annual Convention*, Orlando, FL, March 2010.
- “Key Performance Indicators in Public-Private Partnerships,” *Transportation Research Board, Project Delivery Committee Meeting*, Washington, DC, January, 2010.
- “State-of-Practice Report for Project Delivery Methods and High Performance Buildings,” *DBIA Annual Convention*, Washington, DC, October 2009.
- “Transportation Construction Management,” *AASHTO Subcommittee on Construction Annual Meeting*, Chicago IL, August, 2009.
- “Key Performance Indicators in Public-Private Partnerships,” *FHWA Expert Task Group Meeting*, Washington, DC, August 2009.
- “Risk Management in the Highway Planning Process,” *TRB Planning Committee Conference*, Seattle, WA, July 2009.
- “Cost and Schedule Risk Analysis on Major Infrastructure Projects,” Invited lecture for the Phoenix chapter of the Institute of Transportation Engineers, Phoenix, Arizona, March 2009.
- “Design-Build Team Selection Essentials,” *DBIA Water/Wastewater Conference*, Denver, Colorado, March 2009.
- “Influence of Project Delivery Method on Achieving Sustainable, High Performance Buildings,” *DBIA Annual Convention*, Las Vegas, NV, October 2008.
- “Risk Analysis Tools and Management Practices to Control Project Costs,” *TRB Planning Committee Conference*, Atlanta, GA, September 2008.
- “Cost Estimating and Cost Management for Highway Construction,” *TRB Planning Committee Conference*, Atlanta, GA, September 2008.
- “A Strategic Approach to Project Delivery Selection for Airport Construction,” *TRB International Airport Conference*, Denver, CO, May 2008.
- “Federal Highway Administration Approach to Risk Management,” *DBIA Transportation Conference*, Louisville, KY, April, 2008.
- “Quality Assurance and Quality Control in Design-Build Highway Construction,” *DBIA Transportation Conference*, Louisville, KY, April, 2008.
- “Risk Analysis Tools and Management Practices to Control Project Costs,” *TRB-Mn/DOT Capacity Building Workshop*, Minneapolis, MN, April, 2008.

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- “Risk Assessment and Allocation Workshop,” *FHWA workshop for the Virginia Department of Transportation*, January 2008.
- “Current State of Design-Build Education,” *DBIA Water/Wastewater Conference*, Atlanta, GA, February 2008.
- “Risk Assessment and Allocation Workshop,” *FHWA workshop for the Colorado Department of Transportation*, January 2008.
- “Expectations for Accuracy in Highway Design-Build Cost Estimates,” *ASCE/CIB Construction Research Congress*, Grand Bahama Island, May 2007.
- “Cost and Schedule Risk Analysis on Large Projects,” *Ingendesa Construction Engineering and Management Seminar*, Santiago, Chile, June 2007.
- “Design-Build Project Delivery for Mining Projects,” *Codelco Mining Short Course in conjunction with the Catholic University of Chile*, Santiago, Chile, June 2007.
- “Construction Risk Management,” *Short Course for the University of Piura Faculty*, Piura, Peru April, 2007.
- “Cost and Schedule Risk Analysis on Large Projects,” *Peruvian Civil Engineering Society*, Piura, Peru, April, 2007.
- “Design-Build Project Delivery in the United States,” *Chilean Chamber of Construction Short Course in conjunction with the Catholic University of Chile*, Santiago, Chile, March 2007.
- “Early Contractor Involvement and Target Pricing in US and UK Highways,” *Transportation Research Board 86th Annual Meeting*, Washington, D.C., January 2007.
- “Engineering in Developing Communities activities at the University of Colorado,” *Presentation to the Students of the University of Chile*, Santiago, Chile, October 4, 2006.
- “The State of Construction Engineering and Management in the United States,” *Presentation to the Faculty of the University of Chile*, Santiago, Chile, October 4, 2006.
- “The State of Design-Build Education in Engineering Programs,” *Design-Build Educators Conference, California Center for Construction Education*, San Luis Obispo, California, May 31, 2006.
- “Risk Analysis on Large Complex Projects,” *AACE International Chapter Meeting*, Denver, CO, March 21, 2006.
- “Design-Build Procurement Review,” *Washington State Department of Transportation/Associated General Contractors Association/American Consulting Engineering Companies Joint Design-Build Committee*, Olympia, Washington, March 16, 2006.
- “An Educational Initiative to Address Earth Systems Engineering for Developing Communities,” *W107 Construction in Developing Economies International Symposium Construction in Developing Economies: New Issues and Challenges*, Santiago, Chile, January 18-20, 2006.
- “Estimating Large Complex Projects,” *W107 Construction in Developing Economies International Symposium Construction in Developing Economies: New Issues and Challenges*, Santiago, Chile, January 18-20, 2006.
- Moderator – *W107 Construction in Developing Economies International Symposium Construction in Developing Economies: New Issues and Challenges*, Santiago, Chile, January 18-20, 2006.
- “Innovative Contracting and Partnering in Highway Construction,” *Western Association of American State Highway Transportation Officials Web-X Conference*, Broadcast from Lakewood Colorado, December 2005.
- “Risk Allocation in Highway Construction Management,” *FHWA Construction Management Expert Technical Group Meeting*, Alexandria, VA, October 2005.
- “Strategies, Methods and Tools for Estimating Highway Construction,” *Minnesota Department of Transportation (Mn/DOT) and Texas Transportation Institute (TTI) Peer Exchange on Estimation and Management for Highway Projects*, Maplewood, MN, September 2005.
- “Leadership in a Knowledge Era,” *Construction Industry Institute Annual Conference*, Grapevine, TX, July 2005.
- “Recommended AASHTO Design-Build Procurement Guide,” *Association of American State Transportation Officials Subcommittee on Design Annual Meeting*, Chicago, IL, June 2005.
- “The State of Construction Management Education: Is our Industry at Risk?” *Town Hall Meeting, Construction Management Association of America, Annual Conference*, Denver, Colorado, May 2005.
- “International Construction Management Practices,” *Transportation Research Board 84th Annual Meeting*, Washington, D.C., January 2005.
- “Design-Build Highway Procurement Methods,” *Association of American State Transportation Officials Design-Build Task Force*, Charleston, NC, November 2004.
- “Design-Build Project Delivery,” *Keynote Address for the Inaugural Meeting of the Utah Section of the Design-Build Institute of America Rock Mountain Chapter*, Salt Lake City, UT, November 2004.
- “European Project Delivery Methods: Construction Management, Warranties and Contract Administration,” *Koch Performance Roads*, Wichita, KS, October 2004.

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- “Cost Estimating for Highway Mega Projects,” *AACE International Chapter Meeting*, Denver, CO, October 2004.
- “Alternative Project Delivery Methods,” *Denver Metro Wastewater Reclamation District*, Denver, CO, September 2004.
- “European Construction Management Methods,” *Association of American State Transportation Officials Subcommittee on Construction*, Albuquerque, NM, August 2004.
- “Cost Estimating Strategies, Methods and Tools for Highway Construction Projects,” *Transportation Research Board Mid-Year Meeting*, Park City, UT, July 2004.
- “Design-Build Scope Definition and Risk Allocation,” *1-Day Seminar for the Washington State Department of Transportation*, Fife, WA, January 2004.
- “The Past and Future of Cost Engineering An Academic Perspective,” *AACE International Chapter Meeting*, Lakewood, CO, November 2003.
- “Best-Value Procurement Methods for Highway Construction Projects,” *AASHTO Subcommittee on Construction Annual Meeting*, Asheville, SC, August 2003.
- “Responding to Design-Build Request for Proposals,” *DBIA Rocky Mountain Chapter Meeting*, Lakewood, CO, May, 2003.
- “Report of the 2002 European Asphalt Warranties Scan Tour,” *FHWA/MDOT Pavement Warranties Conference: Policy, Development and Implementation*, Grand Rapids, MI, May 2003.
- “Project Delivery Approaches,” *University of Colorado/Design-Build Institute of America, Rocky Mountain Owner’s Design-Build Forum*, Boulder, CO, May 2003.
- “Design-Build Pilot Project Evaluation: A measurement of performance for the process, time, cost and quality,” *DBIA/AASHTO/FHWA/ASCE 2003 Design-Build for Transportation Conference*, Marina del Rey, CA, April 2003.
- “Asphalt Warranties in US and European Highway Construction,” *Colorado DOT Rocky Mountain Asphalt Conference*, Denver, CO, February 2003.
- “Best Practices for Design-Build in the Water/Wastewater Industry,” *DBIA/WEF/AWWA Design-Build for Water & Wastewater Facilities*, San Antonio, TX, January 2003.
- “Critical Needs of Design-Build Education,” *DBIA/WEF/AWWA Design-Build for Water & Wastewater Facilities*, San Antonio, TX, January 2003.
- “Research Plan for Report to U.S. Congress on the Effectiveness of Design-Build,” *AASHTO Design-Build Task Force Spring Meeting*, St. Petersburg, FL, January 2003.
- “Non-Traditional Contracting Practices in the Building Industry,” *FHWA Innovative Contracting Conference*, Norfolk, VA, December 2002.
- “Asphalt Warranties in European Highway Construction,” *Arizona DOT Pavements/Materials Conference*, Phoenix, AZ, November 2002.
- Moderator – Innovative Project Delivery Session, *CIB’s 10<sup>th</sup> International Symposium on the Organization and Management of Construction, Construction Innovation, and Global Competitiveness*, Cincinnati, OH, September 2002.
- “Design-Build Contracting – Executive Seminar,” *U.S. National Park Service*, Denver, CO, July 2002.
- “Design-Build and Lean Construction,” *Seminar Co-Presented with Greg Howell of the Lean Construction Institute for the Management Assistance Partnership*, Las Vegas, NV, March 2002.
- “The Past and Future of Construction Estimating,” *American Society of Professional Estimators – Rocky Mountain Chapter*, Denver, CO, March 2002.
- “Design-Build Contracting – Executive Seminar,” *Washington State Department of Transportation*, Olympia, WA, January 2002.
- “European Contract Administration Tour: Results and Implementation,” *Transportation Research Board Annual Conference*, Washington, DC, January 2002.
- “Design-Build Contracting – Executive Presentation,” *New York Transit Authority*, Long Island, NY, December 2001.
- “Design-Build in the Public Sector,” *Arizona State University, Alliance for Construction Excellence, Alternative Delivery Conference*, Phoenix, AZ, November 2001.
- “Design-Build Educational Needs Assessment,” *2001 Professional Design-Build Institute of America Annual Conference*, Boston, MA, October 2001.
- “Project Delivery Options,” *Los Alamos National Laboratory*, Albuquerque, NM, October 2001.
- “European Contract Administration Tour: Results and Implementation,” *AASHTO Conference for Subcommittee on Construction*, Wichita, KS, August 2001.
- “Design-Build Roles and Relationships,” *National Electrical Contractor’s Association – Rocky Mountain Chapter*, Denver, CO, January 2001.



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- “U.S. Design-Build Theory and Practice,” *2-Day Seminar for the Lean Construction Institute of Brazil*, Sao Palo, Brazil, October 2000.
- “European Contract Administration Desk Scan,” *International Program of the Federal Highway Administration*, Washington, DC, October 2000.
- “Program Execution Strategies,” *U.S. Department of State Foreign Building Operations Symposium*, Washington, DC, December 2000.
- Moderator – Computer Applications Session, Delivery Methods and Risk Session, and Business and Management Session, *ASCE Construction Congress VI*, Orlando, FL, February 2000.
- “The Design-Build Contracting Practice: Newest Tools for Owners, Design-Build Consultants, and Practitioners,” *DBIA/WEF/AWWA Design-Build for Water & Wastewater Facilities*, Phoenix, AZ, December 1999.
- “WSDOT Design-Build Pilot Project,” *1999 Professional Design-Build Conference, Design-Build Institute of America Annual Conference*, Dallas, TX, October 1999.
- “Colorado AIA/AGC/ACEC Roundtable Discussion on Owner’s Representation in the Construction Industry,” *Meeting of the Denver AIA/AGC/ACEC Joint Committee*, Denver, CO, October 1999.
- “Design-Build for Highway Construction,” *Georgia Quality Initiative, Federal Highway Administration and Georgia Department of Transportation*, Athens, GA, January 1999.
- “Solicitation and Selection of Design-Build Proposals in Transportation,” *Georgia Department of Transportation*, Atlanta, GA, November 1998.
- Moderator – Decision Tools in Civil Engineering Session, *ASCE International Computing Congress*, Boston, MA, October 1998.
- “New Innovations in Project Management,” *Construction Management Association of America National Conference*, St. Petersburg, FL, October 1998.
- “Project Delivery for Federal Buildings,” *U.S. General Services Administration Construction Excellence Symposium*, Washington, DC, September 1998.
- “Design-Build and Innovative Contracting,” *Georgia Department of Transportation*, Atlanta, Georgia, June 1998.
- “Current Design-Build Research and Resources,” *Society for Marketing of Professional Services*, Atlanta, GA, June 1998.
- “Construction at the Georgia Institute of Technology,” *American Society of Professional Estimators*, Atlanta, GA, February 1998.
- Moderator – Changing Project Delivery Systems Session, *ASCE Construction Congress V*, Minneapolis, MN, October 1997.
- “Organizational Structure for Successful Design-Build,” *ASCE Construction Congress IV*, San Diego, CA, October 1995.

### XVIII. PROFESSIONAL CONTINUING EDUCATION

- “Risk Management,” *2-Day Department of Energy Course*, Washington, DC, July, 2016.
- “Design-Build Project Administration,” *2-Day Short Course for the American Society of Civil Engineering and the Panama Canal Authority*, Panama City, Panama, April, 2011.
- “Cost Estimating and Cost Management,” *3-Day Course for Minnesota DOT*, Minneapolis, MN, November, 2009.
- “Cost Estimating and Cost Management,” *3-Day Course for Minnesota DOT*, Minneapolis, MN, November, 2009.
- “Design-Build Contracting,” *2-Day Short Course for the American Society of Civil Engineering*, San Antonio, TX, January, 2009.
- “Design-Build Contracting,” *2-Day Short Course for the American Society of Civil Engineering*, Seattle, WA, March, 2009.
- “Uncertainty in Cost Estimating,” *2-Day National Highway Institute Course*, Sterling, VA, October, 2008.
- “Design-Build Contracting,” *2-Day Short Course for the American Society of Civil Engineering*, San Jose, Costa Rica, September, 2008.
- “Risk Management,” *3-Day National Highway Institute Course*, Reston, VA, June, 2008.
- “Risk Management,” *3-Day National Highway Institute Course*, Oklahoma City, OK, June, 2008.
- “European Construction Management Methods,” *Texas Department of Transportation Short Course*, College Station, TX, October 2004.
- “Cost Engineering,” *2-Day Short Course for the Alaska Department of Transportation and Housing*, Anchorage, AK, November, 2004.

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- “Design-Build Contracting,” *2-Day Short Course for the U.S. Air Force*, Peterson Air Force Base, Colorado Springs, CO, August 2004.
- “Fundamentals of Project Delivery,” *1-Day Seminar for the Design-Build Institute of America Rocky Mountain Chapter*, Denver, CO, April 2004.
- “Design-Build Contracting,” *2-Day Short Course for the American Society of Civil Engineering*, Las Vegas, NV, April, 2004.
- “Design-Build Contracting,” *2-Day Short Course for the U.S. Department of the Navy*, Yuma, CA, August 2003.
- “Design-Build Contracting,” *2-Day Short Course for the American Society of Civil Engineering*, Manchester, NH, February, 2003.
- “Design-Build Contracting,” *2-Day Short Course for the U.S. National Park Service*, Denver, CO, July 2002.
- “RFQ and RFP Design-Build Contract Development for Highway Projects,” *2-Day Short Course for the Washington State Department of Transportation*, Seattle, WA, September and January 2002.
- “Design-Build Contract Administration for Highway Projects,” *3-Day Short Course for the Washington State Department of Transportation*, Seattle, WA, January 2002.
- “Design-Build Contracting,” *2-Day Short Course for the Federal Highway Administration*, Washington, DC, Denver, CO, and Vancouver, WA, 3 Courses in 2000-2001.
- “Advanced Design-Build Project Management,” *3-Day Short Course for the U.S. Department of the Navy*, San Diego, CA, 3 Courses 2000-2001.
- “Design-Build Contracting,” *2-Day Short Course for the Long Island Railroad*, New York, NY, November 2001.
- “Best Practices in Design-Build Project Management,” *2-Day Short Course for the University of California/Design-Build Institute of America*, San Diego, CA, November 2001.
- “Construction Cost Engineering,” *2-Day Short Course for the American Society of Civil Engineering*, Orlando, FL, June 2001.
- “Best Practices in Design-Build Project Management,” *2-Day Short Course for the University of Colorado/Design-Build Institute of America*, Denver, CO, June 2001.
- “Advanced Design-Build Contracting,” *2-Day Short Course for the University of Colorado/Design-Build Institute of America*, Denver, CO, April 2000.
- “Design-Build Project Management: The Art and Science,” *2-Day Short Course for Georgia Tech/Design-Build Institute of America*, Atlanta, GA, April 1999.
- “Advanced Techniques in Design-Build Project Delivery & Finance,” *2-Day Short Course for Arizona State University/Design-Build Institute of America*, Phoenix, AZ, November 1998.
- “Advanced Techniques in Design-Build Project Delivery & Finance,” *2-Day Short Course for Georgia Tech/Design-Build Institute of America*, Atlanta, GA, May 1998.
- “Design-Build Management,” *2-Day Short Course for Georgia Tech/Associated General Contractors*, Atlanta, GA, February 1998.

## XIX. SERVICE ACTIVITIES

### 1. Professional Contributions

#### *Society Membership*

- AACE – Association for the Advancement of Cost Engineering International, 2001-2019.
- ASPE – American Society of Professional Estimators, 1994-1999.
- CMAA – Construction Management Association of America, 1998-2019.
- DBIA – Design-Build Institute of America, 1995-2019.
- IABMS – International Association for Bridge Maintenance and Safety, 2001-2002.

#### *Society Committees*

- AACE – Association for the Advancement of Cost Engineering International
- Committee Member, Construction Special Interest Group, 2001-2007.
- ABC – Associated Builders and Contractors of Colorado
- Committee Judge, Award of Excellence, 2003.
- AGC – Associated General Contractors of Colorado
- Committee Judge, Award for Construction Excellence (ACE), 2000 and 2010.
- ASCE – American Society of Civil Engineers
- Department Heads Executive Committee, 2011-2015.
  - International Activities Committee, ASCE Lead Representative to the Union of Pan-American Engineering Associations, 2008-2014.

## Keith R. Molenaar, Ph.D.

- Construction Research Council, Member 1997-2019, Secretary 2002, Vice-Chair 2003, Chair 2004, and Past Chair 2005.
  - Constructability Committee, Member 2003-2006.
  - Peurifoy Construction Engineering and Management Award Committee, 2001, 2003-2005.
  - Control Group Member, of the Technical Council on Computing and Information Technology's Coordination of Computing Activities (CoCOA), 1997-2001.
  - Member, Computing in Construction Committee, 1997-2000.
- Beavers Heavy Engineering Construction Association
- Academic Member, 2011-2019.
- Construction Industry Institute
- Funded Studies Committee Member, 2016-2019.
  - Academic Subcommittee Member, 2019
- CMAA – Construction Management Association of America
- Board Member, Southeast Atlantic Chapter, 1998-1999.
- DBIA – Design-Build Institute of America
- Registration Board Member, 2009-2019, Vice-Chair, 2015-2016, Chair, 2016-18.
  - Faculty Advisor, Design-Build of America Student Competition Team, 2012, 2015-2017.
  - Water/Wastewater Subcommittee Member, Rocky Mountain Chapter, 2014-2019.
  - National Research Committee, 2008-2014.
  - Awards Committee for Distinguished Leadership Awards, 2003 and 2004.
  - Subcommittee Chair for Member Education, Education and Research Committee, 1999-2002.
  - Board Member/Education Committee Chair, Rocky Mountain Chapter, 2002-2003.
  - Civil Infrastructure Committee Member, 2000-2005.
- GQI – Georgia Quality Initiative U.S. Department of Transportation/Federal Highway Administration/Georgia Department of Transportation
- Alternative Contracting Subcommittee Member, 1998.
- TRB – Transportation Research Board
- Project Delivery Committee, Founding Member, 2009-2010.
  - Construction Management Committee Member, 2014-2019.
- Federal Committees*
- DOE – Department of Energy
- Project Leadership Institute, Advisory Board Chair, 2015-2019.
- FHWA – Federal Highway Administration
- Bridge Bundling Technical Working Group (TWG), 2017-2019.
  - Accelerated Construction Technology Team – Innovative Contracting Expert, 2003-2010.
  - Construction Management Expert Technical Group (ETG), 2004-2010.
  - Performance Specification Strategic Road Map Committee, 2005-2006.
- GSA – U.S. General Services Administration
- Construction Excellence Peer Review Committee, 2000-2019.
- State Committees*
- CDOT – Colorado Department of Transportation
- Co-Chair – Innovative Contracting Advisory Committee, 2010-2019.
- Conference Planning Committees*
- AIA/AGC/ACEC – American Institute of Architects/Associated General Contractors/American Consulting Engineers Council Joint Liaison Committee of Colorado
- Conference Planning Committee, *Owner's Project Delivery Conference*, 1999.
- ASCE – American Society of Civil Engineers
- Technical Committee, *Construction Research Congress*, 2016.
  - Technical Chair/Proceedings Editor, Conference Planning Committee, *Construction Research Congress*, 2003.
  - Conference Planning Committee, *Fully Integrated and Automated Project Processes*, 2002.
  - Conference Planning Committee, *Construction Congress VI*, 1999.
- CSCCE – Canadian Society for Civil Engineering

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- Planning Committee, *International Construction Specialty Conference of the Canadian Society for Civil Engineering*, 2005-2006.
- DBIA – Design-Build Institute of America
- Conference Planning Committee, *Design-Build in Water/Wastewater Treatment Conference*, 2001, 2003, 2004 and 2005.
  - Conference Planning Committee, *Design-Build in Transportation Conference*, 2003 and 2004.
  - Organizer, *Rocky Mountain Design-Build Institute of America, Owner's Summit on Project Delivery*, 2003 and 2015.
- Federal Highway Administration
- Program Committee Co-Chair, 1<sup>st</sup> International Construction Management Conference, 2007-2009.
  - Technical Committee Chair, 2<sup>nd</sup> International Construction Management Conference, 2010-2011.
- ISEC 09 - Ninth International Structural Engineering and Construction Conference
- Scientific Committee Member, 2017.
- NSF – National Science Foundation
- Conference Planning Committee, *Construction Engineering and Management Research Methods Workshop*, 2004.
  - Conference Planning Committee, *Earth Systems Engineering*, 2001.
- TRB – Transportation Research Board
- Conference Planning Committee, *Project Delivery Committee*, 2009-2010.

### *National Science Foundation (NSF)*

Proposal Panelist Reviewer – Three panel reviews between 1999 and 2006.

### *Publication Editorial Board Member*

Co-Editor, Special Bilingual Issue in Spanish and English on “Engineering in the Americas,” ASCE Journal of Construction Engineering and Management, 2010-2014.

Revista Ingeniería de Construcción (Journal of Construction Engineering), Catholic University of Chile, 2006-2019.

### *Publications Reviewer*

ASCE Journal of Construction Engineering and Management  
ASCE Journal of Computing in Civil Engineering  
ASCE Journal of Management in Engineering  
ASCE Journal of Professional Issues in Engineering Education and Practice  
Automation in Construction  
Construction Management and Economics  
Engineering Economist  
Facilities  
International Journal of Construction Procurement

### *Book Reviews*

Peurifoy, R.L. and Schexnayder C.J. (2003). *Construction Planning, Equipment, and Methods*, 7<sup>th</sup> Edition, McGraw-Hill Companies, Inc. Boston, MA.

Pena-Mora, F., Sosa, C. and McCone, S. (2001). *Resolution in Large Scale Civil Engineering*, Pearson Education, Upper Saddle River, New Jersey.

ACEC (2001). *Multiple Project Delivery Systems: The Design Professional's Handbook, Design-Build Project Delivery*, American Consulting Engineers Council, Washington, DC

Best, R., De Valence, G. (1999). *Building in Value*. Arnold, London

Rojas, E. (1999). *Construction Cost Estimating for Decision-Makers*. Prentice Hall, New Jersey.

## **2. Campus Contributions**

### *University of Colorado – Campus*

Research & Innovation Office Advisory Board, 2017-2019.

National Security Working Group, Workforce Chair, 2017-2018.

Programming Committee, Boulder NEXT, 2017.

Graduate School, BS/MS Advisory Committee, 2017.

Graduate School, Professional Masters Innovation Committee, 2016-2017.

Office of International Education, Study Abroad Committee Member, 2015-2017.

## Keith R. Molenaar, Ph.D.

Search Committee, Graduate Teaching Program Director, 2016.  
Internal Reviewer for Leeds School of Business, ARPAC Program Review, 2013-2014.  
Responsible Conduct of Research Committee, Committee Member, 2009-2010.  
Advisor, Summer Multicultural Advancement in Research and Training (SMART Program), 2002, 2005 and 2009.  
Speaker, Undergraduate Research Opportunity Symposium, February 2010.

### *University of Colorado – College of Engineering and Applied Science*

Branding Committee Member, Fall 2013.  
Chair, Blue Ribbon Committee on Energy and Environmental Sustainability, 2012.  
First-Year Task Force, Committee Member, 2010.  
Instructor, High School Honors Program, 2002, 2010.  
Strategic Planning Mini-Retreat Co-leader, 2007-2008.  
Faculty Leadership Advancement Group, 2006-2009.  
Mentor, Freshmen Engineering Honors Program, 2007-2009.

### *University of Colorado – Department of Civil, Environmental, and Architectural Engineering*

Construction Engineering and Management and Building Systems Search Committee, 2017.  
Construction Engineering and Management Search Committee, 2016.  
Department Chairman, Civil, Environmental and Architectural Engineering, 2010-2014.  
Executive Committee, 2007-2010.  
Curriculum Committee, 2005-2006, 2007-2010.  
Construction Engineering and Management, Joint Evaluation Committee Lead, 2008.  
Graduate Committee, 2000-2005, 2015-2018.  
Geotech Faculty Search Committee, 2003-2004.  
Consortium on Advanced Life Cycle Engineering for Sustainable Civil Environments (COALCESCE) Committee, 2001-2006.  
Computing Committee, 2000-2002.  
ABET Ad Hoc Committee, 2001-2002 and 2006.  
Construction Engineering and Management Computer Applications Laboratory Coordinator, 1999-2010.  
Construction Engineering and Management Faculty Search Committee, 2000-2002.  
Bridges to Prosperity Student Chapter Advisory, 2017-2018.  
DBIA Student Chapter Faculty Advisor, 2000-2002, 2007-2010.  
ABC Student Chapter Faculty Advisor, 2001-2002.  
AGC Student Chapter Faculty Advisor, 2011-2012.

### **3. Consulting**

California Department of Transportation  
Carter-Burgess  
Denver Water  
Emerging Solutions, Inc./Constructware  
Federal Highway Administration  
Golder Associates  
J.A. Jones/Metric Constructors  
Hennepin County, Minnesota  
Koch Materials  
M.A. Mortenson Construction  
Montgomery Watson Harza Engineering  
New York State Thruway  
Panama Canal Authority  
Parsons Brinkerhoff  
Seattle Public Utilities  
Talisman Partners  
U.S. Department of Energy  
U.S. Federal Highway Administration  
U.S. Naval Facilities Engineering Command  
Washington State Department of Transportation  
Washington State Joint Legislative Review Committee

**Keith R. Molenaar, Ph.D.**

Zachary Infrastructure