

**Paul McGinley Goodrum, P.E., Ph.D.**

*Curriculum Vitae*

Nicholas R. Petry Professor of Construction Engineering  
Management  
University of Colorado at Boulder  
Department of Civil, Environmental, and  
Architectural Engineering

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**PROFESSIONAL PREPARATION**

<b>Institution</b>	<b>Field</b>	<b>Degree</b>
<b>University of Texas at Austin</b> Austin, TX	Civil Engineering – Construction Engineering & Project Management	Ph.D., May 2001
<b>University of Texas at Austin</b> Austin, TX	Civil Engineering – Construction Engineering & Project Management	MSE, September 1994
<b>University of Washington</b> Seattle, WA	Civil Engineering	BSCE, June 1993

**APPOINTMENTS**

<b>Nicholas R. Petry Professor of Construction Engineering and Management</b> University of Colorado at Boulder	August 2012 to Present
<b>Professor of Civil, Environmental, and Architectural Engineering</b> University of Colorado at Boulder	August 2012 to Present
<b>Terrell-McDowell Chair of Construction Engineering and Management</b> University of Kentucky	January 2012 to August 2012
<b>Professor of Civil Engineering</b> University of Kentucky	July 2011 to August 2012
<b>Associate Professor of Civil Engineering</b> University of Kentucky	Jul 2006 to June 2011
<b>Assistant Professor of Civil Engineering</b> University of Kentucky	Jul 2001 to June 2006
<b>Research &amp; Teaching Assistant</b> University of Texas at Austin	Jan 1998 to June 2001
<b>Design Civil Engineer (EIT)</b> DDS Engineering	May 1996 to Dec 1997
<b>Project Engineer &amp; Project Safety Engineer</b> W.L. Hailey and Company, Inc.	Sep 1994 to May 1996
<b>Research Assistant</b> University of Texas at Austin	Aug 1993 to Sep 1994

## **PROFESSIONAL REGISTRATION**

Professional Engineer License, No. 20220, State of Kentucky, 1998

## **AWARDS AND HONORS**

1. Distinguished Professor Award, Construction Industry Institute, 2014
2. Outstanding Faculty Award in Civil Engineering, University of Kentucky, 2012.
3. Nominated for University of Kentucky Outstanding Teaching Award, 2010
4. Outstanding Researcher Award, Construction Industry Institute, 2008.
5. Finalist – Provost Teaching Award, University of Kentucky, 2007.
6. Outstanding Faculty Award in Civil Engineering, University of Kentucky, 2006.
7. Finalist – Provost Teaching Award, University of Kentucky, 2005.
8. Chi Epsilon Civil Engineering Honor Society Excellence in Teaching Award for the Cumberland District, 2005.
9. Finalist – Provost Teaching Award, University of Kentucky, 2004.
10. Faculty Initiate into Omicron Delta Kappa National Leadership Society, University of Kentucky, 2003.
11. Outstanding Faculty Award in Civil Engineering, University of Kentucky, 2003.
12. Chi Epsilon Civil Engineering Honor Society Excellence in Teaching Award for the Cumberland District, 2003.

## **\*\*\* RESEARCH\*\*\***

### **AREAS OF RESEARCH SPECIALIZATION**

- Productivity Trends and Industry Measurement
- Building Information Modeling in Construction
- Workforce Issues and Strategies
- Economics of the Construction Industry

### **RESEARCH CONTRACTS AND GRANTS**

#### **FUNDED**

1. Innovative Delivery Methods of Information to the Crafts. PI. Construction Industry Institute. \$110,249. May 1, 2014 to August 30, 2015.
2. Guide for Civil Integrated Management (CIM) in Departments of Transportation. co-PI with Dr. William J. O'Brien (UT-Austin) as PI. National Cooperative Highway Research Program. \$250,000. (CU-Boulder Portion \$101,718). June 1, 2014 to August 30, 2015.
3. Is There a Demographic Craft Labor Cliff that will Affect Project Performance. PI with Dr. Timothy Taylor (UKy) as Co-PI. Construction Industry Institute. \$222,274. (CU-Boulder Portion \$167,990). Sept 1, 2013 to August 31, 2015.
4. Evaluation of Highway Agency Approaches to Consultant Oversight for Construction Engineering and Inspection Services. PI with Dr. Keith Molenaar as co-PI. FHWA Pooled Fund Study through the Colorado Department of Transportation. \$57,536. Aug 15, 2013 to Aug 14, 2014.
5. Community Outreach Best Practices Guide for Accelerated Construction Projects. Co-PI with Dr. Keith Molenaar as PI. FHWA Pooled Fund Study through the Colorado Department of

Transportation. \$87,669. Aug 15, 2013 to Feb 14, 2015.

6. Construction Productivity: Extension of the Prototype Master Code of Accounts to Electrical, Mechanical, and Steel Construction Systems. PI. National Institute of Standards and Technology, \$40,000. From January 2013 to April 1, 2014.
7. Effective Project Scoping Practices to Improve On-Time and On-Budget Delivery of Highway Projects. Co-PI with Dr. Stu Anderson (Texas A&M) PI, and Dr. Timothy Taylor (UKy) as Co-PI, National Cooperative Highway Research Program (NCHRP), \$250,000 (UK Portion \$75,000). From August 1, 2012 to August 1, 2014
8. Construction Productivity: Development of a Prototype Master Code of Accounts related to Electrical and Mechanical Systems. PI, National Institute of Standards and Technology, Office of Applied Economics, \$29,981. From January 1, 2012 to October 30, 2012.
9. Continued Support on the Contractors' Workforce Development Assessment. PI, National Center for Construction Education and Research. \$12,400. From January 1, 2012 to August 30, 2012.
10. Tools for Applying Constructability Concepts to Project Development (FRT 190). Co-PI (Stamadias PI). Kentucky Transportation Center. \$150,000. From August 1, 2011 to June 30, 2013. Stamadias – 50%, Goodrum 50%
11. Contractor Evaluations in the Contractor Selection Process (SPR 12-438). Co-PI (Taylor PI). Kentucky Transportation Center, \$120,000. From July 1, 2011 to June 30, 2013. Taylor – 75%, Goodrum 25%.
12. Construction Productivity: A Path Forward for the development of Reliable Metrics for Selected Sectors and Tasks, PI, National Institute of Standards and Technology, Office of Applied Economics, \$49,473. From November 1, 2010 to November 30, 2011. Goodrum – 100%
13. Updating the Kentucky Contract Time Determination System (KY-CTDS), Co-PI with Taylor as PI, Kentucky Transportation Center, \$130,000. From July 1, 2010 to June 30, 2012. Taylor – 50%, Goodrum – 50%
14. Construction Training for the Current and Next Generation of Technicians, PI. Community Transportation Innovation Academy. \$31,324. From July 1, 2010 to To June 30, 2011. Goodrum -100%
15. Research Support on the Contractors Workforce Development Assessment Survey. PI. National Center for Construction Education and Research. \$19,000. From January 1, 2010 to December 31, 2010. Goodrum – 100%
16. Change Orders and Lessons Learned (SPR 09-384), PI with Taylor as co-PI, Kentucky Transportation Center, \$100,000. From July 1, 2008 to June 30, 2010. Goodrum – 50%, Taylor – 50%
17. National Craft Assessment and Certification Program Analyses Project. PI. National Center for Construction Education and Research. \$17,290. From January 1, 2008 to December 31, 2009. Goodrum – 100%
18. Craft Productivity Research Program, PI, with Dr. Carl Haas (University of Waterloo (UW)) as co-PI and Dr. Carlos Caldas (University of Texas at Austin) as co-PI, Construction Industry Institute, \$907,833 (UK portion (Goodrum) \$320,665, UW portion \$284,950, UT portion \$302,218). From September 1, 2007 to December 31, 2013 (subject to annual approval).

19. Kentucky Design-Build Initiative: Case Study, PI with Don Hartman (KTC) as Co-PI, \$146,250. Community Transportation Innovation Academy . From October 1, 2006 to September 30, 2011. Goodrum – 100%
20. Leveraging Technology to Improve Construction Productivity, Co-PI with Dr. Carl Haas (University of Waterloo (UW)) as PI and Dr. Carlos Caldas (University of Texas at Austin) as co-PI, Construction Industry Institute, \$199,747 (UK portion (Goodrum) \$66,560, UW Portion \$66,520, UT portion \$66,667). From September 1, 2006 to December 31, 2009.
21. QC/QA: Evaluation of Effectiveness, Co-PI with Dr. Kamyar Mahboub as PI. Kentucky Transportation Cabinet, \$120,000. From July 1, 2006 to June 30, 2008. Mahboub – 50%, Goodrum 50%.
22. Construction Industry Craft Training, PI with Dr. Carl Haas (University of Waterloo (UW)) as co-PI, Construction Industry Institute, \$172,801 (UK portion (Goodrum) \$97,801, UW portion \$75,000). From September 1, 2005 to December 31, 2007
23. Kentucky CSS Project Information Resource Archive, co-PI with Don Hartman as PI, Community Transportation Innovation Academy, \$30,671. From May 15 to November 30, 2005. Goodrum – 100%
24. Analysis of the Direct and Indirect Costs of Utility and Right-of-Way Conflicts on Construction Roadway Projects, PI with Dr. Hancher as co-PI, Kentucky Transportation Cabinet, \$130,000. From July 1, 2004 to June 30, 2006. Goodrum – 90%, Hancher 10%.
25. Workforce View of Construction Productivity, PI with Dr. Maloney as co-PI, Construction Industry Institute, \$162,000. From January 1, 2004 to December 31, 2006. Goodrum 50%, Maloney – 50%
26. Health and Safety Training Needs in Construction, PI with Drs. Maloney, Duffy and Berger as co-PI, Center to Protect Workers’ Rights, \$20,000. From January 1, 2004 to March 31, 2005. Goodrum – 80%, Maloney - 10%, Duffy - 5%, and Berger - 5%.
27. Rapid Innovation Construction/Reconstruction Methods, PI, Kentucky Transportation Cabinet, \$100,000. From July 1, 2003 to June 30, 2005. Goodrum – 100%.
28. Lessons Learned: Proof of Concept and Implementation, PI, Kentucky Transportation Cabinet, \$28,266. From Aug 23, 2003 to June 30, 2004. Goodrum – 100%
29. The Use of Smart Chip Technology in the Electrical Contracting Industry, PI, National Electrical Contractor’s Association. \$75,000. From Jan. 1, 2003 to June 30, 2004. Goodrum – 100%
30. Lessons Learned on Kentucky Transportation Projects, PI, Kentucky Transportation Cabinet, \$60,000. From Jul 1, 2002 to June 30, 2003. Goodrum – 100%
31. Effectiveness of Safety Incentive Programs in Construction, PI, American Society of Safety Engineers, \$10,000, from May 1, 2002 to June 30, 2004. Goodrum – 100%.
32. Constructability Issues on Kentucky Transportation Projects, Co-PI with Dr. Hancher as PI, Kentucky Transportation Cabinet, \$120,000, from Jul 16, 2001 to Jul 16, 2003. Goodrum – 50%, and Hancher 50%.

## **BOOKS**

1. Goodrum, P., Haas, C., Caldas, C., Shan, Y., Kim, J., and Liu, Y. (2013). The Productivity Handbook. The Construction Industry Institute. Implementation Resource 252-2d. The University of Texas at Austin.

## REFEREED JOURNAL PUBLICATIONS UNDER REVIEW

(Note: Student co-authors are underlined)

1. Albattah, M., Shan, Y., Goodrum, P., and Taylor, T. "The Relation between Periods of Economic Expansion and Craft Workers' Satisfaction and Job Preferences." Submitted to ASCE Journal of Management in Engineering for technical review. Summer 2014.
2. Shan, Y., Zhai, D, Goodrum, P., Haas, C., and Caldas, C. "Benchmarking and Metrics Paper" Submitted to ASCE Management in Engineering for technical review. Spring 2014.
3. Shan, Y., Kim, J., Goodrum, P., Caldas, C., and Haas, C. "Impact of Steel Quick Connection System on Steel Erection Labor Productivity: Case Studies and Simulation Based Analyses." Submitted to CSCE Journal of Civil Engineering for technical review Fall 2013.
4. Shan, Y. and Goodrum, P. "Construction Productivity Impacts of Forecasted Global Warming Trends Utilizing an Integrated Information Modeling Approach." Submitted to Elsevier Journal of Automation in Construction for technical review Spring 2014.
5. Dadi, G., Taylor, T., Goodrum, P., and Maloney, P. "Performance of 3D Computers and 3D Printed Models as a Fundamental Means for Spatial Engineering Information Visualization". Submitted to CSCE Journal of Civil Engineering for technical review Fall 2013.

## REFEREED JOURNAL PUBLICATIONS PENDING

(Note: Student co-authors are underlined)

1. Kim, J., Caldas, C., Haas, C., Goodrum, P., and Zhang, D. "A Method to Assess the Level of Implementation of Productivity Practices on Industrial Projects" Accepted in ASCE Journal of Construction Engineering and Management. Summer 2014.
2. Liu, J., Arash, S., Haas, C., Goodrum, P., Caldas, C. "Validation Methodologies for Construction Engineering and Management Research." Journal of Construction Engineering and Management, ASCE. Accepted Spring 2014

## REFEREED JOURNAL PUBLICATIONS

(Note: Student co-authors are underlined)

1. Shan, Y. and Goodrum, P.M. (2014). "Integration of Building Information Modeling and Critical Path Method Schedules to Simulate the Impact of Temperature and Humidity at the Project Level." Buildings. MDPI. 2014(4). pp. 295-319.
2. Dadi, G.B., Goodrum, P.M., Taylor, T.R.B., and Carswell, C.M. (2014). "Cognitive Workload Demands Using 2D and 3D Spatial Engineering Information Formats." *Journal of Construction Engineering and Management*, ASCE. 140(5). 04014001
3. Dadi, G.B., Goodrum, P.M., and Bonham, D. (2014). "A Prototype Master Code of Accounting Structure to Facilitate Accurate Measures of Construction Labor Productivity across Multiple Projects" *Theoretical Economics Letters*, Scientific Research. 2014(4). pp. 49-59.

4. Stamatiadis, N., Goodrum, P., Shocklee, E., and Wang, C. (2013). "A Quantitative Analysis of a State Transportation Agency's Experience with Constructability Reviews." *Journal of Construction Engineering and Management*. ASCE. [http://dx.doi.org/10.1061/\(ASCE\)CO.1943-7862.0000787](http://dx.doi.org/10.1061/(ASCE)CO.1943-7862.0000787)
5. Nasir, H., Haas, C., Ahmed, H., and Goodrum, P. (2013). "An Analysis of Construction Productivity Differences among a Group of Advanced Economies." *Construction Management and Economics*. Taylor and Francis. <http://dx.doi.org/10.1080/01446193.2013.848995>
6. Thomas, A., Davis, B., Dadi, G., and Goodrum, P. (2013). "A Case Study of the Impact of 100 ksi Steel Reinforcement on Concrete Productivity in Buildings." *ASCE Journal of Construction Engineering and Management*. CID: 04013025
7. Taylor, T., Uddin, M., Goodrum, P., and Shan, Y. (2012). "Change Orders and Lessons Learned: Knowledge from Statistical Analyses of Engineering Change Orders on Kentucky Highway Projects." *ASCE Journal of Construction Engineering and Management*. 138(12). pp. 1360-1369.
8. Zhang, D., Haas, C., Goodrum, P., Caldas, C., and Granger, R. (2012). "Construction Small-Projects Rework Reduction for Capital Facilities." *ASCE Journal of Construction Engineering and Management*. 138(12). pp. 1377-1385.
9. Dai, J. and Goodrum, P. (2012). "Generational Differences on Craft Workers' Perceptions of the Factors Affecting their Labour Productivity." *Canadian Journal of Civil Engineering*. 39(9). pp. 1027-1042.
10. Uddin, M., Mahboub, K., and Goodrum, P. (2012). "A Solution to Non-Normality in Quality Assurance Acceptance Quality Characteristics Data." *National Academies Transportation Research Board Journal of the Transportation Research Record*. 2012(2268). pp. 50-58.
11. Dyer, B., Goodrum, P. Viele, K. (2012). "Construction Industry Productivity: Examining the Effects of Omitted Variable Bias in the Census Construction Price Index Models." *ASCE Journal of Construction Engineering and Management*. 138(4). pp. 558-566.
12. Gouett, C., Haas, C., Goodrum, P., & Caldas, C. (2011). "Activity Analysis for Direct-work Rate Improvement in Construction." *ASCE Journal of Construction Engineering and Management*. 137(12). pp. 1117-1124.
13. Uddin, M., Goodrum, P., and Mahboub, K. (2011). "Severity of Non-Normality in Pavement Quality Assurance Acceptance Quality Characteristics Data and the Adverse Effects on Acceptance and Pay." *National Academies Transportation Research Board Journal of the Transportation Research Record*. Transportation Research Board No. 2228. pp. 70-77.
14. Young, D., Haas, C., Goodrum, P. and Caldas, C. (2011). "Improving Construction Supply Network Visibility via Automated Materials Tracking and Locating Technology." *ASCE Journal of Construction Engineering and Management*. 137(11). pp. 976-984.
15. Goodrum, P., Haas, C., Caldas, C., Zhai, D., Yeiser, J., and Homm, D. (2011). "The Development and Validation of a Model to Predict a Technology's Impact on Construction Productivity." *ASCE Journal of Construction Engineering and Management*. 137(9). pp. 678-688
16. Dai, J. and Goodrum, P. (2011). "A Comparison of the Factors Affecting Construction Productivity between Spanish and English Speaking Craft Workers." *ASCE Journal of Construction Engineering and Management*. 137(9). pp. 689-697.
17. Shan, Y., Goodrum, P. Zhai, D., Haas, C., and Caldas, C. (2011). "Management Practices to Improve Construction Productivity on US Industrial Projects." *E & F.N. Spon Journal of Construction Management and Economic*. 29(3). pp. 305-316.

18. Uddin, M., Mahboub, K., and Goodrum, P. (2011). "Effects of Non-Normal Distribution on QC/QA Pay Factors." ASCE Journal of Construction Engineering and Management. 137(2). pp. 108-119.
19. Wang, Y., Goodrum, P., Haas, C., Glover, R., and Vazari, S. (2010). "The Benefits and Cost of Craft Training." E & F.N. Spon Journal of Construction Management and Economics. Vol. 28(12). Pp. 1269-1285.
20. Jones, T., Shan, Y., and Goodrum, P. (2010). "Corporate Approaches to Sustainability in the U.S. Engineering and Construction Industry." Spon Journal of Construction Management and Economics . 28: 9, 971 — 983
21. Nasir, H., Haas, C.T., Young, D.A., Razavi, S.N., Caldas, C. and Goodrum, P. (2010). "An Implementation Model for Automated Construction Materials Tracking and Locating." Canadian Journal of Civil Engineering, Vol. 37(4), pp. 588-599.
22. Wang, Y., Goodrum, P., Haas, C., and Glover, R. (2009). "An Analysis of Skill Affinity in Construction." ASCE Journal of Construction Engineering and Management. 135(10). pp. 999-1008.
23. Zhai, D., Goodrum, P., Haas, C., and Caldas, C. (2009). "Relationship between the Automation and Integration of Construction Information Systems and Productivity." ASCE Journal of Construction Engineering and Management, 135(8). pp 746-753.
24. Grau, D., Caldas, C., Goodrum, P., and Haas, C. (2009). "Assessing the Impacts of Materials Tracking Technologies on Construction Craft Productivity." Elsevier Journal of Automation in Construction. (18)2009. Pp. 903-911.
25. Dai, J., Goodrum, P., Maloney, W., and Srinivasan, C. (2009). "Latent Structures of the Factors Affecting Construction Labor Productivity." ASCE Journal of Construction Engineering and Management. 135(5). pp. 397-406.
26. Goodrum, P., Zhai, D. and Yasin, M. (2009). "The Relationship between Changes in Material Technology and Construction Productivity." ASCE Journal of Construction Engineering and Management. 135(4). pp. 278-287.
27. Goodrum, P., Wang, Y., Fenouil, P., (2009). "A Decision making System for Accelerating Roadway Construction" Emerald Journal of Engineering, Construction, and Architectural Management. 16(2). pp. 116-135.
28. Dai, J., Goodrum, P., and Maloney, W. (2008). "Construction Craft Workers' Perceptions of the Factors Affecting Their Productivity." ASCE Journal of Construction Engineering and Management. 134(3). pp. 217-226.
29. Wang, Y., Goodrum, P., Haas, C., and Glover, R. (2008). "Construction Craft Training Experiences Among the US Industrial and Commercial Construction Sector." ASCE Journal of Construction Engineering and Management. 134(10). pp. 795-803.
30. Goodrum, P., Smith, A., and Kari, F. (2008). "Analysis of Utility Conflicts on Construction Roadway Projects and Best Practices in their Avoidance. ASCE J. of Urban Planning and Development. 134(2). Pp. 63-70.
31. Dai, J., Goodrum, P., and Maloney, W. (2007). "Analysis of the Craftsmen's and Foremen's Perception of the Factors Affecting their Construction Labor Productivity." E & F.N. Spon Journal of Construction Management and Economics. 25(11). pp. 1137-1150.

32. Zhai, D., Goodrum, P., Haas, C., and Caldas, C. (2009). "Relationship between the Automation and Integration of Construction Information Systems and Productivity." ASCE Journal of Construction Engineering and Management, 135(8). pp 746-753.
33. Gangwar, M. and Goodrum, P. (2005). "The Effect of Time on Safety Incentive Programs in Construction." Journal of Construction Management and Economics. E & F.N. Spon. 131(9). pp. 1021-1028.
34. Goodrum, P. and Dai, J. (2005). "Occupational Injuries, Illnesses, and Fatalities: Differences among Hispanic and non-Hispanic Construction Workers." ASCE Journal of Construction Engineering and Management. 131(9). pp. 1021-1028.
35. Goodrum, P., Yasin, M., and Hancher, D. (2004). "A Statewide Lessons Learned System for Kentucky Transportation Cabinet." National Academies Transportation Research Board Journal of the Transportation Research Record. Transportation Research Board No. 1900. pp 132-139.
36. Goodrum, P. (2004). "Hispanic and Non-Hispanic Wage Differentials: Implications for the U.S. Construction Industry." ASCE Journal of Construction Engineering and Management. 130(4). pp. 552-559.
37. Goodrum, P., and Gangwar, M. (2004). "The Relationship Between Changes in Equipment Technology and Wages in the U.S. Construction Industry." E & F.N. Spon Journal of Construction Management and Economics. 22(3).
38. Goodrum, P. and Gangwar, M. (2004). "The Effectiveness of Safety Incentives in Construction." ASSE Journal of Professional Safety. July 2004. pp. 24-34.
39. Goodrum, P., and Haas, C. (2004). "The Long-Term Impact of Equipment Technology on Labor Productivity in the U.S. Construction Industry at the Activity Level." ASCE Journal of Construction Engineering and Management. 131(1). pp. 124-133.
40. Hancher, D., Goodrum, P., Pigman, J., Hartman, D., and Mettelle, J. (2003). "Context Sensitive Construction In Kentucky." Transportation Research Board's Transportation Research Record. No. 1861. pp. 122-131.
41. Carley, L., Goodrum, P., Haas, C., Borcharding, J., Glover, R., Tucker, R. (2003). "Experiences with Multiskilling Among U.S. Industrial Construction Craft Workers" Blackwell Science Journal of Engineering, Construction, and Architectural Management. 10(6). pp. 374-381.
42. Goodrum, P., and Haas, C. (2002) "Partial Factor Productivity and Equipment Technology Change at the Activity Level in the U.S. Construction Industry." ASCE Journal of Construction Engineering and Management. 128(6). pp. 463-472.
43. Goodrum, P., Haas, C., and Glover, R. (2002) "The Divergence in Aggregate and Activity Estimates of U.S. Construction Productivity." E & F.N. Spon Journal of Construction Management and Economics. 20(5). pp. 415-423.
44. Haas, C., Rodriguez, A., Glover, R., Goodrum, P. (2001) "Planning and Scheduling a Multiskilled Workforce." E. & F. N. Spon Journal of Construction Management and Economics. 19(6). pp. 633-641.
45. Allmon, E., Haas, C., Borcharding, J., Goodrum, P. (2000) "U.S. Construction Labor Productivity Trends, 1970-1998." Journal of Construction Engineering and Management. ASCE, 126(2). pp. 97-104.

## **BOOK CHAPTER – PEER REVIEWED**



1. Hancher, D. and Goodrum, P. "Constructability Issues and Review Processes." (2007) ASCE Special Publication: Constructability Concepts and Practices. pp. 31-39.

### **TECHNICAL MAGAZINE ARTICLE**

(Note: Student co-authors are underlined)

1. Hancher, D., Brenneman, A., Meagher, R., and Goodrum, P. (2006). "Outsourcing Transportation Project Delivery Functions." TR News. Transportation Research Board of the National Academies. November-December 2006. No. 247. pp. 20-25.

### **REFEREED CONFERENCE PAPERS PENDING**

(Note: Student co-authors are underlined)

### **REFEREED CONFERENCE PAPERS**

(Note: Student co-authors are underlined)

1. Shan, Y., Goodrum, P., Haas, C., Caldas, C., and Zhai, D. (2013). "A Comprehensive Analysis of Project Management Practices to Improve Craft Productivity." 4<sup>th</sup> Construction Specialty Conference of the Canadian Society of Civil Engineers. Montreal, Quebec.
2. Safa, N., Haas, C., Goodrum, P. (2013). "A Method for Choosing Concrete Forming Systems." 4<sup>th</sup> Construction Specialty Conference of the Canadian Society of Civil Engineers. Montreal, Quebec.
3. Safa, N., Haas, C., Goodrum, P. (2013). "A Decision Making Framework for Selecting an Optimal Piping Method." 4<sup>th</sup> Construction Specialty Conference of the Canadian Society of Civil Engineers. Montreal, Quebec.
4. Taylor, T., Brockman, M., Zhai, D., Goodrum, P. (2012). "Accuracy Analysis of Selected Tools for Estimating Contract Time on Highway Construction Projects." 2012 Construction Research Congress. West Lafayette, IN.
5. Shan, Y., Goodrum, P., Haas, C., and Caldas, C. (2012). "Assessing Productivity Improvement of Quick Connection Systems in the Steel Construction Industry Using Building Information Modeling". 2012 Construction Research Congress. West Lafayette, IN.
6. Dadi, G., Safa, M., Goodrum, P., Haas, C., Caldas, C., and MacNeel, D. (2012). "Improving Construction Labor Productivity in Steel Construction through the Use of New and Emerging Innovations." 2012 Construction Research Congress. West Lafayette, IN.
7. Dadi, G., Goodrum, P., Saidi, K., Brown, C., and Betit, J. (2012). "A Case Study of 3D Imagining Productivity Needs to Support Infrastructure Construction." 2012 Construction Research Congress. West Lafayette, IN.
8. Safa, M., Gouett, C., Haas, C., Goodrum, P., and Caldas, C. (2011). "Implementation of Weld-less Innovations on Construction Projects." 2011 CSCE Annual General Meeting and Conference. Ottawa, Ontario. June 2011
9. Zhang, D., Haas, C., Goodrum, P., Caldas, C., and Granger, R. (2011). "Analysis of a Rework Reduction Program for Construction Productivity Continuous Improvement." 2011 CSCE Annual General Meeting and Conference. Ottawa, Ontario. June 2011
10. Lester, W., Taylor, T., Goodrum, P., and Shan, Y. (2011). "Development of a Formal Change Order Pricing Procedure." 2011 CSCE Annual General Meeting and Conference. Ottawa, Ontario. June 2011

11. Dyer, B., Goodrum, P., and Viele, K. (2011). "Construction Productivity: A Proposed Model to Improve Construction Price Indices in the United States." 2011 CSCE Annual General Meeting and Conference. Ottawa, Ontario. June 2011
12. Dai, J., Goodrum, P. (2011). "Generational Difference in Craft Workers' Perceptions of the Factors Affecting their Labour Productivity." 2011 CSCE Annual General Meeting and Conference. Ottawa, Ontario. June 2011
13. Goodrum, P., Taylor, T., Uddin, M., McCoy, A., and Shan, T. (2011). "Change Orders and Lessons Learned: Knowledge from Statistical Analyses of Construction Change Orders on Kentucky Highway Projects." 2<sup>nd</sup> Annual Transportation and Construction Management (TCM-2) Conference in Orlando, Fl. February 2011.
14. Safa, M., Gouett, C., Haas, C., Goodrum, P., and Caldas, C. (2010). "A Fuzzy-Logic Decision Making Approach for Using Innovations in the Construction industry Case Study: Weld-Less Pipe Joining." 2010 Conference on Innovations in Architecture, Engineering, and Construction. University Park, PA.
15. Uddin, M., Mahboub, K., and Goodrum, P., (2010). "An Innovative Approach to QC/QA Highway Construction Data Analysis." 2010 Conference on Innovations in Architecture, Engineering, and Construction. University Park, PA.
16. Shan, Y. and Goodrum, P. (2010). "Worker Satisfaction and Work-life Related Characteristics in the U.S. Construction Industry." 2010 ASCE Construction Congress. Banff, AB. Canada.
17. Young, D., Nasir, H., Razavi, S., Haas, C., Goodrum, P., and Caldas, C. (2010). "Automated Materials Tracking and Locating: Impact Modeling and Estimation." 2010 ASCE Construction Congress. Banff, AB. Canada.
18. Grau, D., Caldas, C., Haas, C., Goodrum, P., and Gong, J. (2009). Impact of Fast Automated Tracking of Construction Components on Labor Productivity. 2009 Proceedings of the 26<sup>th</sup> International Symposium of Automation and Robotics in Construction. Austin, TX.
19. Dyer, B. and Goodrum, P. "Construction Industry Productivity: Examining the Effects of Omitted Variable Bias in the Census' Price Index Models." 2009. ASCE Construction Congress. Seattle, WA.
20. Zhai, D., and Goodrum, P. "The Relationship between Information Technology and Construction Productivity: View from Country-level Data." 2009. ASCE Construction Congress. Seattle, WA.
21. Razavi, S., Young, D., Nasir, H., Haas, C., Caldas, C., and Goodrum, P. (2008). "Field Trial of Automated Material Tracking in Construction" . 2008 Canadian Society of Civil Engineering Annual Conference, Quebec, QC. June 2008.
22. Dai, J., Goodrum, P., and Maloney, W. (2007). "Construction Productivity Improvement: Accessing Untapped Resources." 2007 ASCE Construction Congress (Peer Reviewed). Bahamas Islands. May 6-8, 2007.
23. Glover, R., Goodrum, P., and Haas, C. (2006). "Construction Industry Craft Training: Experience to Date and the Path Forward." 2006 ASCE/CIB 2<sup>nd</sup> Specialty Conference on Leadership and Management in Construction and Engineering "International Perspectives". May 4-6, 2006.
24. Wang, Y. and Goodrum. (2006). "Rapid Construction Method Decision-Making System for Roadway Projects." Proceedings of the National Research Council's Transportation Research

Board's 85<sup>th</sup> Annual Meeting (compact disk), paper no. 06-0429. Washington, DC. January 22-26, 2006.

25. Dai, J., Goodrum, P., Maloney, W., and Sayers, C. (2005). "Analysis of Focus Group Data Regarding Construction Craft Workers' Perspective of the Factors Affecting their Productivity." 2005 ASCE Construction Congress (Peer Reviewed). San Diego, CA. March, 2005.
26. Wang, Y. and Goodrum, P. (2005). "The Use of Conceptual Road User Costs for a Rapid Roadway Construction Decision Making System" 2005 ASCE Construction Congress (Peer Reviewed). San Diego, CA. March, 2005.
27. Goodrum, P. and Gangwar, M. (2004). "The Effectiveness of Safety Incentive Programs in Construction." 2004 American Society of Safety Engineers Annual Conference. (Invited Paper). Las Vegas, NV. June 9, 2004.
28. Goodrum, P. (2004). "Occupational Injuries, Illnesses, and Fatalities: Differences Among Hispanic and non-Hispanic Construction Workers." 2004 ASCE Specialty Conference: Management and Leadership Issues in Construction (Peer Reviewed). Hilton Head, South Carolina. March 25-26, 2004.
29. Goodrum, P. (2002). "Hispanic and Non-Hispanic Wage Differentials: Implications for the U.S. Construction Industry." First International Conference on Construction in the 21<sup>st</sup> Century (Peer Reviewed). Miami, Florida. April 25-26, 2002.
30. Goodrum, P., Hancher, D., and Yasin, M. (2002) "A Review of Constructability Practices and Issues in Highway Construction." 2003 ASCE Construction Congress Proceeding (Peer Reviewed). Honolulu, Hawaii. March 19-21, 2003.
31. Goodrum, P. (2002) "Changes in Worker Satisfaction in the U.S. Construction Industry." 2003 ASCE Construction Congress Proceeding (Peer Reviewed). Honolulu, Hawaii. March 19-21, 2003.
32. Goodrum, P., and Gangwar, M. (2002). "A Micro Level Analysis Of The Relationship Between Changes In Equipment Technology And Wages In The U.S. Construction Industry." International Symposium on Automation and Robotics in Construction Conference Proceeding (ISARC) (Peer Reviewed). Washington, D.C. September 2002.
33. Goodrum, P., and Haas, C. (2000) "Variables Affecting Innovation Performance in the U.S. Construction Industry." ASCE Construction Congress VI Proceedings (Peer Reviewed). February 20-22, 2000. pp. 525-533.
34. Goodrum, P., Haas, C. (2000) "Case Studies of U.S. Construction Labor Productivity Trends, 1970-1998." ASCE Construction Congress VI Proceedings (Peer Reviewed). February 20-22, 2000. pp. 808-817.

## **OTHER SIGNIFICANT PEER REVIEWED PUBLICATIONS**

1. Caldas, C., Goodrum, P., Haas, C. (2013). Best Productivity Practice Implementation Index for Industrial Projects. Implementation Resource 252-3d. Construction Industry Institute. The University of Texas at Austin.
2. Haas, C., Goodrum, P., and Caldas (2013). Best Productivity Practice Implementation Index for Infrastructure Projects. Implementation Resource 252-4d. Construction Industry Institute. The University of Texas at Austin.

3. Haas, C., Goodrum, P., and Caldas, C. (2013). Construction Craft Productivity Program – Phase V. Research Summary 252-1. Construction Industry Institute. The University of Texas at Austin, Austin, Texas.
4. Goodrum, P., Haas, C., and Caldas, C. (2012). Construction Craft Productivity Program – Phase IV. Research Summary 252-1. Construction Industry Institute. The University of Texas at Austin, Austin, Texas.
5. Goodrum, P., Haas, C., Caldas, C., Christian, D., Gouett, C., Granger, R., Stofega, M., and Toon, S. (2011). Innovations in Mechanical Construction Productivity. Implementation Resource 252-2. Construction Industry Institute. University of Texas at Austin.
6. Haas, C., Zhang, D., Goodrum, P., Caldas, C., and Granger, R. (2011). Rework Reduction Guide. Implementation Resource 252-2b. Construction Industry Institute. University of Texas at Austin
7. Goodrum, P., Haas, C., and Caldas, C. (2011). Construction Craft Productivity Program – Phase III. Research Summary 252-1. Construction Industry Institute. University of Texas at Austin, Austin, Texas.
8. Haas, C., Gouett, C., Goodrum, P., Caldas, C., Stofega, M., Toon, S., Granger, R., and Christian, D. (2010). Guide to Activity Analysis. Implementation Resource 252-2a. Construction Industry Institute. University of Texas at Austin.
9. Goodrum, P., Haas, C., and Caldas, C. (2010). Construction Craft Productivity Program – Phase II. Research Summary 252-1. Construction Industry Institute. University of Texas at Austin, Austin, Texas.
10. Goodrum, P., Haas, C., and Caldas, C. (2009). Construction Craft Productivity Program – Phase I. Research Summary 252-1. Construction Industry Institute. University of Texas at Austin, Austin, Texas.
11. Goodrum, P. (2009). “Technical Change and its Impact on Construction Productivity.” Commissioned paper for The National Research Council of the National Academies appearing in the National Research Council’s report on Advancing the Competitiveness and Productivity of the U.S. Construction Industry. Washington, DC. July 2009.
12. Haas, C., Goodrum, P., and Caldas, C. (2008). Leveraging Technology to Improve Construction Productivity. Research Summary 240-1. Construction Industry Institute. University of Texas at Austin, Austin, Texas.
13. Goodrum, P., Haas, C., and Glover, B. (2007). Construction Craft Training in US and Canada. Research Summary 231-1. Construction Industry Institute. University of Texas at Austin, Austin, Texas.
14. Goodrum, P., and Dai, J. (2006). The Work Force View of Construction Productivity. Research Summary 215-1. Construction Industry Institute. University of Texas at Austin, Austin, Texas.

## **TECHNICAL REPORTS**

1. Goodrum, P.M., Haas, C.T., Caldas, C.H., , Shan, Y., Dadi, G., Gouett, C., Safa, M., Zhang, D., Benzekri, M., and Kim, J.Y. (2013). Construction Productivity Research Program-Phase IV. Construction Industry Institute. Research Team 252, Research Report 252-11c. The University of Texas at Austin.
2. N. Stamatiadis, R. Sturgill, P. Goodrum, E. Shocklee, C. Wang. (2013). Tools for Applying Constructability Concepts to Project Development (Design). KTC-13-15/FRT190-11-1F Kentucky Transportation Center, Lexington, Kentucky.

3. T. Taylor, P. Goodrum, M. Brockman, B. Bishop, Y. Shan, R. Sturgill, K. Hout. (2013). Updating the Kentucky Contract Time Determination System. KTC-13-22/SPR411-11-1F
4. Goodrum, P., Uddin, M., and Faulkenberg, B. (2013). A Case Study Analysis of the Kentucky Transportation Cabinet's Design/Build Pilot Project. Report KTC-13-10/TA25-06-1F. Kentucky Transportation Center, Lexington, Kentucky.
5. Goodrum, P.M., Haas, C.T., Caldas, C.H., Zhai, D., Shan, Y., Dadi, G., Gouett, C., Safa, M., Zhang, D., Benzekri, M., and Kim, J.Y. (2012). Construction Productivity Research Program-Phase III. Construction Industry Institute. Research Team 252, Research Report 252-11. The University of Texas at Austin.
6. Saidi, K.S., Cheok, G.S., Franaszek, M., Brown, C.U., Swerdlow, J., Lipman, R.R., Katz, I., Golparvar-Fard, M., Goodrum, P., Akula, M., Dadi, G., Ghadirni, B. (2011). Development and Use of the NIST Intelligent and Automated Construction Job Site Testbed, NIST TN-1726, Gaithersburg, MD: National Institute of Standards and Technology.
7. Goodrum, P., Taylor, T., Lester, W., McCoy, A., Uddin, M., and Shan, Y. (2011). Change Orders and Lessons Learned. Research Report KTC-10-17/SPR-384-09-IF. Kentucky Transportation Center, Lexington, Kentucky.
8. Haas, C., Goodrum, P., and Caldas, C. (2010). Leveraging Technology to Improve Construction Productivity – Historical Data Analyses. Research Report 240-13. Construction Industry Institute. Austin, Texas.
9. Haas, C., Goodrum, P., and Caldas, C. (2008). Leveraging Technology to Improve Construction Productivity – The Field Trials. Research Report 240-11. Construction Industry Institute. Austin, Texas.
10. Mahboub, K., Goodrum, P., Glasgow, A., Enlow, J., Hendrix, N., and Uddin, M. (2008). QC/QA Evaluation of Effectiveness in Kentucky. Research Report KTC-08-19/SPR347-07-IF. Kentucky Transportation Center, Lexington, Kentucky.
11. Goodrum, P., Wang, Y., Haas, C., and Glover, R. (2007). Construction Industry Craft Training in the United States and Canada. Research Report 231-11. Construction Industry Institute. Austin, Texas.
12. Goodrum, P., McLaren, M., and Durfee, A. (2007). The Use of Smart Chip Technology in the Electrical Contracting Industry. ELECTRI International – The Foundation for Electrical Construction, Inc. Bethesda, MD.
13. Goodrum, P., Dai, J., and Maloney, W. (2006). The Work Force View of Construction Productivity. Research Report 215-2. Construction Industry Institute. Austin, Texas.
14. Goodrum, P. Kari, F., Smith, A., Slaughter, B., Jones, C., (2006). An Analysis of the Direct and Indirect Costs of Utility and Right-of-Way Conflicts on Construction Roadway Projects. (Research Report KTC-06-14/SPR-05-04-1F). Kentucky Transportation Center, Lexington, Kentucky, 2006.
15. Goodrum, P., Wang, Y., Jones, C., Fenouil, P., and Hancer, D. (2005). Innovative Rapid Construction/Reconstruction Methods. (Research Report KTC-05-14/SPR-283-04-1F). Kentucky Transportation Center, Lexington, Kentucky, 2005.

16. Goodrum, P., Dai, J., Wood, C., and King, M. (2004). The Use of the Concrete Maturity Method In the Construction of Industrial Facilities: A Case Study. FIATECH. The University of Texas at Austin, Austin, Texas, 2004
17. Goodrum, P., Yasin, M., and Hancher, D. (2003). Lessons Learned System for Kentucky Transportation Projects. (Research Report KTC-03-25/SPR-262-03-1F). Kentucky Transportation Center, Lexington, Kentucky, 2003.
18. Hancher, D., Thozhal, J., Goodrum, P. (2003). Constructability Issues on KyTC Projects. (Research Report KTC-03-17/SPR-236-02-1F). Kentucky Transportation Center, Lexington, Kentucky, 2003.
19. Goodrum, P., Haas, C., and Kim, C. (2003). Breakthrough Strategy Committee Process and Charter. Report to the Construction Industry Institute. The University of Texas at Austin, Austin, Texas.
20. Goodrum, P. (2001). Impact of Equipment Technology on Productivity in the US Construction Industry. PhD Dissertation (Advisor: Dr. Carl Haas). Department of Civil Engineering. The University of Texas at Austin.
21. Haas, C.T., Borcharding, J.D., Allmon, E., Goodrum, P. (1999) U.S. Construction Labor Productivity Trends, 1970-1998. Alfred P. Sloan Center for Construction Industry Studies, Report No. 7, The University of Texas at Austin. 1999.
22. Haas, C., Burleson, R., Goodrum, P. (1995), A Multimedia Design Aid for Project Hazard Identification and Remediation Part I: Functional Capabilities and Design of the "Design for Safety Toolbox" Prototype (Source Doc. 107), The Construction Industry Institute, Austin, Texas, 1995.
23. Goodum, P. (1993). Functional Specifications and Design of the Multimedia Design for Safety Toolbox. MS Thesis (Advisor: Dr. Carl Haas). Department of Civil Engineering. The University of Texas at Austin

## **DISCUSSIONS**

1. Goodrum, P., and Haas, C. (2001) "Closure to Discussion of U.S. Construction Labor Productivity Trends, 1970-1998." ASCE Journal of Construction Engineering and Management. 127(5). pp. 427-429.

## **MEDIA MENTON**

1. "Big Increase in Gulf Coast Projects Equals Big Demand for Skilled Workers." By Ryan Wilder. The Cornerstone. National Center for Construction Education and Research. pp. 16-20. Spring 2013.
2. "CII Research shows potential for safety, productivity gains." By Scott Judy and Janice Tuchman, Engineering New Record. August 8, 2013.
2. "Contractors Confront the Growing Costs of Rework." By Paula Moore, Engineering News Record. November 28, 2012.
3. "When Does it Pay to Use Innovative Concrete Products?" by Tudor Van Hampton, Engineering News Record. July 26, 2011.

4. "Rethinking Wrench Time" by Bruce Buckley, *Engineering News Record* (Cover Story), McGraw-Hill, June 6, 2011.
5. "The Prize Predicament" by Bruce Buckley, *Engineering News Record*, McGraw-Hill, August 16, 2010.
6. "CII Reveals Productivity Gains for Mechanical Trades" by Scott Blair, *Engineering News Record*, McGraw-Hill, August 12, 2009.
7. "Test Projects Show Great Potential for Tracking Technology" by Tom Sawyer, *Engineering News Record*, McGraw-Hill, August 27, 2008.
8. "CII Study Shows Craft Training Can Generate Big Cost Impact" by Debra Rubin, *Engineering News Record*, McGraw-Hill, August 20, 2007.
9. "Productivity Benchmarking Effort Produces Results" by Janice Tuchman, *Engineering News Record*, McGraw-Hill, August 7, 2006.
10. "Hispanics Need Support of Friends and Neighbors" by Michael Longinow, *Lexington Herald Leader*, February 6, 2005.
11. "Researchers are Getting Serious about Electronic Tracking Tags" by Tom Sawyer, *Engineering News Record*, McGraw-Hill, December 13, 2004.
12. "Measuring Productivity: An Industry Challenge" by Harvey M. Bernstein, *Civil Engineering*, ASCE December 2003.

#### **ORAL PRESENTATIONS** (\* indicates principal speaker)

1. Goodrum, P.\*, Toon, S., Christian, D., and Whyte, D. "Construction Productivity Research Program". (2013). European Construction Institute. (Invited Speaker). London, England. June 13, 2013.
2. Goodrum, P.\*, Toon, S., Gustafson, D., and Whyte, D. "Craft Productivity Research Program – Phase IV" (2012). Construction Industry Institute Annual Conference. (Invited Speaker). Baltimore, MD. July 28, 2012
3. Goodrum, P. "The Construction Workforce Development Assessment Process". Construction Users Roundtable Annual Conference. (Invited Speaker). Chandler, AZ. November 9, 2011
4. Goodrum, P. "Return-on-Investment of Construction Craft Training." Associated General Contractor Training and Education Conference. (Invited Speaker). Kansas City, Mo. October 3<sup>rd</sup>, 2011
5. Goodrum, P. "Construction Productivity Research Program." NIST/ASTM/CII Productivity Workshop. (Invited Speaker). Houston, TX. April 28<sup>th</sup>, 2011.
6. Goodrum, P. "The Science and Challenge of Measuring and Improving Construction Productivity." McGraw-Hill *Engineering News Record*/Construction Users Roundtable Construction Business Forum: The Road to Recovery. (Invited Speaker). Washington, DC. June 15, 2010.
7. Goodrum, P. "Construction Productivity: Advances and Opportunities for Improvement." National Institute of Standards and Technology Workshop: Measurement Science Needs for Advancing Infrastructure Delivery. (Invited Speaker). Gaithersburg, MD. May 19, 2010.
8. Goodrum, P. "Construction Craft Productivity Program." Central Gulf Coast Industry Alliance Fall Conference. (Invited Speaker). Mobile, AL. September 24, 2009.

9. Granger, R\*, Goodrum, P., Hopkins, S., Adamson, W., and Stofega, M. "Craft Productivity Research Program – Phase I." (2009). Construction Industry Institute Annual Conference. (Invited Speaker). Reno, NV. July 28, 2009.
10. Goodrum, P. "Craft Productivity Research and Perspectives." National Institute of Standards and Technology. (Invited Speaker). Gaithersburg, MD. May 2009.
11. Goodrum, P\* and Zhai, D. "A Review of the National Craft Assessment and Certification Analyses." Board of Directors Meeting of the National Center for Construction Education and Research. (Invited Speaker). Dallas, TX. April 8, 2009.
12. Goodrum, P.\* and Haas, C.\* "Craft Training in the Industrial Construction Sector: Lessons Learned and Potential Strategies for the Highway Construction Sector." 2009 Transportation Research Board Conference Washington, DC. January 11-15, 2009.
13. Goodrum, P. "Technical Change and its Impact on Construction Productivity." National Research Council Workshop on Advancing the Competitiveness and Productivity of the U.S. Construction Industry. Washington, DC. November 2008.
14. Goodrum, P. "The Workforce View of Construction Productivity." The Center to Protect Workers' Rights on Construction Productivity. Silver Spring, MD. November 2008.
15. Goodrum, P.\* and Zhai, D. "Analyses of the National Craft Assessment and Certification Program". (2008). National Center for Construction Education and Research Workforce Development Conference. (Invited Speaker). Corpus Christ, TX. October 2, 2008.
16. Dixit, S.\*, Goodrum, P., Caldas, C., Haas, C., Kendra, S., and Davis, S. "Leveraging Technology to Improve Construction Productivity." (2008). Construction Industry Institute Annual Conference. (Invited Speaker). Keystone, CO. August 6, 2008
17. Carter, R. \*, Goodrum, P., Frame, J., and Whyte, D. "Construction Craft Training: Generating Big Cost Savings for Owners." (2007). Construction Users Roundtable National Conference. (Invited Speaker). Naples, FL. November 7, 2007.
18. James, T.\*, Haas, C., Goodrum, P\*, Tomlinson, R., and Whyte, D. \* "Implementation: Construction Craft Training." (2007). Construction Industry Institute Annual Conference. Orlando, FL. August 1, 2007.
19. Crew, W., and Goodrum, P.\* (2007). "Work Force View of Construction Productivity." Canadian Construction Sector Council National Owners' Forum. (Invited Speaker) Ottawa, Canada. June 28, 2007.
20. Goodrum, P\*, Edmonds, D., Stover, A., Young, J., and Fannin, R. (2006). "Things that Help and Things that Hinder Construction Productivity." Construction Users Roundtable National Conference. (Invited Speaker). Tucson, AZ. November 14, 2006.
21. Goodrum, P.\* (2006). "The Use of Active RFID for Tool Tracking in Construction." National Research Council's Transportation Research Board's Research Opportunities in Radio Frequency Identification (RFID) Transportation Applications Conference. (Invited Speaker). Washington, DC. October 17-18, 2006.
22. Sulsar, R.\*, Goodrum, P., Edmonds, B., Stover, A., and Young, J. (2006). "Implementation: Work Force View of Construction Productivity." Construction Industry Institute Annual Conference. San Diego, CA. July 27, 2006.
23. Goodrum, P.\* (2006). "Research Overview of Work Force View of Construction Productivity." The Construction Users Roundtable Workshop: Improving Construction Labor Productivity (Invited Speaker). St. Louis, MO. June 14, 2006.



24. Goodrum, P.\* (2005). "Industry Measures of Construction Productivity." Productivity Forum Sponsored by the Associated General Contractors and Building Futures Council. (Invited Speaker). Las Vegas, NV. March 16, 2005.
25. Goodrum, P.\* (2005). "Safety Incentives in Construction." 2005 American Industrial Hygiene Conference and Exposition. (Invited Speaker). Anaheim, CA. May 21, 2005.
26. Goodrum, P.\* and Wang, Y. (2005). "The Use of Conceptual Road User Costs for a Rapid Roadway Construction Decision Making System." 2005 Construction Management Committee, 2005 Annual Transportation Research Board, Washington, DC. January 11, 2005.
27. Goodrum, P.\* and Yasin, M. (2004). "A Statewide Lessons Learned System for the Kentucky Transportation Cabinet." 2004 KYTC Annual Partnering Meeting. (Invited Speaker). Louisville, KY. August 15, 2004.
28. Goodrum, P.\* and Gangwar, M. (2004). "The Effectiveness of Safety Incentive Programs in Construction." 2004 American Society of Safety Engineers Annual Conference. (Invited Speaker). Las Vegas, NV. June 9, 2004.
29. Goodrum, P.\* (2004). "Occupational Injuries, Illnesses, and Fatalities: Differences Among Hispanic and non-Hispanic Construction Workers." 2004 ASCE Specialty Conference: Management and Leadership Issues in Construction Hilton Head, South Carolina. March 25-26, 2004.
30. Hancher, D. and Goodrum, P.\* (2004). "Constructability Issues on Kentucky Transportation Cabinet Projects." 2004 Transportation Research Board Conference Washington, DC. January 12-15, 2004.
31. Goodrum, P.\*, Yasin, M., and Hancher, D. (2004). "A Statewide Lessons Learned System for the Kentucky Transportation Cabinet." 2004 Transportation Research Board Conference, Washington, DC. January 12-15, 2004.
32. Goodrum, P.\*, Hancher, D., and Yasin, M. (2003). "A Review of Constructability Practices and Issues in Highway Construction." 2003 ASCE Construction Congress. Honolulu, Hawaii. March 19-21, 2003.
33. Goodrum, P.\* (2003). "Changes in Worker Satisfaction in the U.S. Construction Industry." 2003 ASCE Construction Congress Proceeding. Honolulu, Hawaii. March 19-21, 2003.
34. Goodrum, P.\* (2002). "A Micro Level Analysis Of The Relationship Between Changes In Equipment Technology And Wages In The U.S. Construction Industry." International Symposium on Automation and Robotics in Construction Conference (ISARC). Washington, D.C. September 24, 2002.
35. Goodrum, P.\* (2002). "Environmental Commitments and Issues Relating to Context Sensitive Construction." Kentucky Transportation Cabinet Resident Engineer's Meeting, March 7, 2002.
36. Goodrum, P.\* (2001). "Design for Construction Safety". American Society of Safety Engineers Central Texas Chapter Meeting. Austin, Texas, March 19, 2001
37. Goodrum, P.\* (2000). "Case Studies of U.S. Construction Labor Productivity Trends, 1970-1998". ASCE Construction Congress VI. Orlando, Fl., February 21, 2000.
38. Goodrum, P.\* (2000). "Variables Affecting Innovation Performance in the U.S. Construction Industry". ASCE Congress VI. Orlando, Fl., February 21, 2000.

**POSTER PRESENTATIONS** (\* indicates principal speaker)

1. Shan, Y., and Goodrum, P. (2013). “An Approach to Model the Global Impacts of Forecasted Warming Trends on Construction Productivity Utilizing Integrated Information Models.” 2013 CII Annual Conference
2. Shan, Y. and Goodrum, P. (2010). “Worker Satisfaction and Work-life Related Characteristics in the U.S. Construction Industry.” 2010 CII Annual Conference.
3. Young, D\*, Haas, C., Goodrum, P. and Caldas, C. “Improving Construction Supply Network Visibility via Automated Materials Tracking and Locating Technology.” 2009 CII Annual Conference – Received Best Poster Award
4. Wang, Y\*, Goodrum, P. (2006), “A Rapid Construction Methods Decision Making System for Roadway Projects”. Transportation Research Board Annual Conference. Washington, D.C., January 23, 2006.

**\*\*\*TEACHING\*\*\***

**COURSES TAUGHT**

CE 303 – Introduction to Construction Engineering

**Course Description:** A study of the planning, administration, management, and cost of construction projects and an introduction to the methodology utilized in executing specified designs. Emphasis is placed on organization of construction firms, development of construction documents, theory of estimating and quantity take-off, contractual and management systems, scheduling, project administration and inspection of construction operations.

CE 403 – Construction Methodology

**Course Description:** A study of the methodology used in heavy construction and building construction with an emphasis on equipment selection, productivity, concrete formwork design, and building systems. The importance of cost, safety, and quality is stressed.

CE 602 – Construction Project Management

**Course Description:** Management of construction projects: pre-project planning; ; construction labor relations; productivity management. The course will emphasize construction productivity improvement by group field studies. In-depth study of the way overtime, changes, weather, and staffing levels influence productivity. Industrial engineering techniques are applied to the construction environment to improve the use of equipment, human, and material resources.

CE 699-005 – Discrete Event and Building Information Modeling for Construction

**Course Description:** The course focuses on advanced information systems used to control and predict project performance (cost and schedule) in construction. Discrete Simulation Modeling is used take both a stochastic and probabilistic approach of predicting project performance of repetitive systems in construction. Building Information Modeling is examined as a systems approach of integrating design and construction for the benefit of developing construction work packages, 4D simulations, and clash detection.

CVEN 5285 – Design of Construction Operations

**Course Description:** Design of construction operation: pre-project planning; construction labor relations; productivity management. The course will emphasize construction productivity improvement by group field studies and discrete event simulation modeling. In-depth study of the way overtime, changes, weather, and staffing levels influence productivity. Industrial engineering techniques are applied to the construction environment to improve the use of equipment and human and material resources.

## CVEN 5386 – Building Information Modeling for Construction

**Course Description:** The course focuses on advanced information systems used to control and predict project performance (cost and schedule) in construction. Building Information Modeling is examined as a systems approach of integrating design and construction for the benefit of developing construction work packages, 4D simulations, clash detection, and status visualization of material availability and system installation.

## SPECIAL EDUCATION ACTIVITIES

1. Participant in 2002 ASCE Excellence in Civil Engineering Education (ExCEED) Teaching Workshop, West Point, NY.
2. Lecturer of FE Review Seminar for Engineering Economics, Fall 2001 to Spring 2010.
3. Instructor for Context Sensitive Solutions Workshop, Kentucky Transportation Cabinet, Fall 2001 through Fall 2002.
4. Participant (two-day) at the Civil Engineering Information Table for the University of Kentucky, College of Engineering Career Day, October 13-14, 2006.
5. Civil Engineering Co-op Faculty Debrief. University of Kentucky. 2005-2012.

## PH.D. SUPERVISION COMPLETED

1. Mohammed F. Yasin – 2005. Dissertation Title: A Taxonomy and Analysis of the Relationship Between Changes in Material Technology and Construction Productivity.
2. Jiukun Dai – 2006. Dissertation Title: Latent Factors Influencing Construction Craft Productivity.
3. Yinggang Wang – 2008. Dissertation Title: A Quantitative Analysis of Training Outcomes and Strategies in Construction.
4. Bryan Dyer – 2010. Dissertation Title: Construction Industry Productivity: Examining the Effects of Omitted Variable Bias in the Census Construction Price Index Models.
5. Dong Zhai – 2010. Dissertation Topic: The Relationship Between Automation and Integration Technologies and Construction Productivity.
6. Moin Uddin – 2011. Co-Supervisor with Dr. Kamyar Mahboub (UK) - Dissertation Topic: Robust Statistical Methods for QC/QA Data Analyses in Transportation Projects .
7. Gabe Dadi – 2013– Dissertation Topic: Applying Cognitive Principles in the Delivery of Engineering Information by Different Mediums.
8. Yongwei Shan –2013- Dissertation Topic: Modeling the Impact of Weather on Construction Productivity Using Building Information Modeling

## PH.D. STUDENTS IN PROGRESS

1. Mohammed AlBattah – Supervisor –Dissertation Topic: Workforce Shortages in the US and Canadian Construction Industries.
2. Omar Alruwaythi – Supervisor – Dissertation Topic: The Utilization of Building Information Modeling and physical 3D printers for Transferring Engineering Information to Construction Workforce.
3. Joshua Johnson – Supervisor – Dissertation Topic: A Civil Integrated Model Maturity

## PH.D. COMMITTEES COMPLETED

1. Yuhong Wang – 2003. University of Kentucky. Dissertation Title: Predicting Flexible Pavement Deterioration for Pavement Management Systems
2. Kyle Perry – 2010. University of Kentucky. Dissertation Title: Development of Modern Sealing Techniques for Underground Coal Mining

3. Elizabeth Kraft – 2012. University of Colorado at Boulder. Dissertation Title: Alternative Quality Management Systems for Highway Construction,

### **POST-DOCTORAL SUPERVISION**

1. Dong Zhai – 2011. Construction Training for the Current and Next Generation of Technicians

### **M.S. STUDENTS IN PROGRESS**

1. Dave Bonham – Supervisor – MS Topic: Development of a Master Code of Accounts for Mechanical and Electrical Construction. Graduation Date: Summer 2014
2. Jack Sweany – Supervisor – MS Topic: Cognitive Analyses of the Effects of Information Delivery Through Different Mediums. Graduate Date: Fall 2014.
3. Jeff Miller – Supervisor – MS Topic: Innovative Information Systems for Craft Deliverables. Graduation Date: Fall 2015.

### **M.S. SUPERVISION COMPLETED**

1. Mohammed F. Yasin. M.S. Report: Constructability Issues on KyTC Projects. M.S. Graduation Date: December 2002.
2. Mike Schneider. M.S. Report: The Use of Smart Chip Technology in Commercial Construction. M.S. Graduate Date: May 2003.
3. Adam Durfee. M.S. Report: The Use of Smart Chip Technology in the Electrical Contracting Industry. M.S. Graduate Date: December 2003.
4. Manish Gangwar. M.S. Report: The Impact of Safety Incentives in Construction. M.S. Graduation Date: May 2004.
5. Matt McLaren. M.S. Report: Prototypes and Implementation of RFID for Small Tool Tracking in Electrical Construction. M.S. Graduation Date: May 2004.
6. Colwyn Sayers. M.S. Report: Analysis of Focus Group Data Regarding Craft Worker Perceptions of the Factors Affecting their Productivity. M.S. Graduation Date: August 2004.
7. Yinggang Wang. M.S. Report: A Decision Support System for Innovative Rapid Construction Methods of Transportation Projects. M.S. Graduation Date: December 2004.
8. Philippe Fenouil. M.S. Report: A Survey of Innovative Rapid Construction Methods of Transportation Projects. M.S. Graduation Date: December 2004.
9. Eswra Burra. M.S. Report: The Factors Affecting Productivity. M.S. Graduation Date: May 2005.
10. Naga Suram. M.S. Report: Non-Value Added Activities in Construction: A Lean Perspective. M.S. Graduation Date: May 2005.
11. Jason Murphy. M.S. Report: Diffusion Adoption of New Technology in the Construction Industry. Graduation Date: August 2005
12. Ben Slaughter. M.S. Report: Utility Issues and Costs on Highway Construction Projects. Graduation Date: August 2005.
13. Adam Smith. M.S. Report: Right-of-Way Issues and Costs on Highway Construction Projects. Graduation Date: August 2005.
14. Tiantian Sun. M.S. Report: Content Analyses: A Comparison of Owner and Engineering/Construction Firms Business Objectives in the U.S. Construction Industrial Sector. Graduation Date: August 2005.
15. Terrance Sterret. M.S. Report: Lean Construction with an Emphasis on Value Stream Mapping. Graduation Date: August 2005.
16. Daniel Rogers. M.S. Report: Analysis of Craft Workers Suggestions to Improve Construction Productivity. Graduation Date: December 2005
17. Chris Jones. M.S. Report: Improvements to Avoid Utility Conflicts of Construction Roadway Projects. Graduation Date: May 2006.

18. Fady Kari. M.S. Report: Analysis of Best Practices to Avoid Utility Conflicts on Construction Roadway Projects. Graduation Date: December 2006
19. Jason Enlow. M.S. Report: QC/QA in Kentucky. Graduation Date: August 2007
20. Eric Marks. M.S. Report: Technology/Innovation Implementation in Small Businesses. Graduation Date: August 2007.
21. Jordan Yeiser. M.S. Report: Prototype of a Predictive Tool for Estimating a Technology's Impact on Construction Productivity: December 2007
22. Nicholas Hendricks. M.S. Report: Statistical Analysis of Kentucky QC/QA Data: May 2008
23. Tim Jones. M.S. Report: Variations in Corporate Motivations towards Sustainability in the US. May 2008.
24. Andy Glasgow. M.S. Report: Contractor Experiences of Quality Control/Quality Assurance Highway Construction Projects. Summer 2008.
25. Daniel Cruz. M.S. Report: Women in Engineering: Retention Loss or Gain?. Summer 2008
26. Daniel Himm. M.S. Report: Validation and Implementation of Predictive Tool for Estimating Technology's Impact on Construction Productivity. Fall 2008.
27. Yongwei Shan. M.S. Report: Best Practice Productivity Implementation Index: Conceptual Design. Fall 2008.
28. William Hinkle. M.S. Report: Best Practice Productivity Implementation Index: Conceptual Design. May 2009.
29. Brad Faulkenberg. M.S. Report: Transportation Design Build Projects in Kentucky: A Case Study. Summer 2009
30. Kishore Acharya. M.S. Report: Method for Facilities Assessment in University Settings. Summer 2009
31. Chandra Foley. M.S. Report: The Impact of Mechanical Innovations on the CII Model Plant. May 2009.
32. Alex McCoy. M.S. Report: Data Analyses of Change Order Data on Kentucky Roadway Projects. Fall 2009.
33. Mark Smith. M.S. Report Topic: The Impact of ACI 100KSI Steel Reinforcement Standard on Craft Productivity. Fall 2010.
34. Ashley Suazo. M.S. Report Topic: CWDA: Contractors Workforce Development Assessment. Summer 2012.
35. Zachary Miller – MS Topic: Analysis of Building Characteristics and Energy Consumption in New Residential Construction. Graduation Date: August 2012
36. Kevin Hout – MS Topic: Contract Time Estimate of Small Highway Construction Projects in Kentucky. Graduation Date: August 2012.
37. Emily Shocklee – MS Topic: Analysis of Constructability Reviews within the Kentucky Transportation Cabinet. Graduation Date: August 2012.
38. Omar Alruywathi – Supervisor – MS Topic: Utilization of Four Dimensional Animations for Productivity Analyses. Graduation Date: Spring 2013.
39. Pierre Bannoun – Supervisor – MS Topic: Characteristics of Overcrowding Situation on Construction Jobsites. Graduation Date: Spring 2014
40. Valerie Torres – Supervisor – MS Topic: Effective Oversight of Outsourced Construction Engineering and Inspection Services on Transportation Projects. Graduation Date: Spring 2014

**\*\*\* SERVICE\*\*\***

## **SOCIETY MEMBERSHIP**

1. American Society of Civil Engineers
2. Construction Research Council

## **PROFESSIONAL SOCIETY COMMITTEES**

1. Construction Economics Research Network (CERN), Core Member, 2005-2012
2. Transportation Research Board, Construction Management Committee (Committee Research Coordinator), 2005 – Present
3. Transportation Research Board, Information Technology in Construction Subcommittee, Co-Chair, 2010 - 2013t
4. Construction Industry Institute, Breakthrough Strategy Committee, 1999 – Present
5. Construction Industry Institute, Academic Committee (elected Secretary 2005 to 2008, appointed Co-Chair 2011-2012, and appointed Chair 2012-2013), 2005-Present
6. Construction Industry Institute, Strategic Communications Committee, Academic Liason, 2013-Present.

## **REVIEWER**

1. Practice Periodical of Structural Design and Construction, American Society of Civil Engineering  
-Editor of Special Issue dedicated to the Construction Engineering Conference in Seattle, Washington in April 2014
2. Journal of Construction Engineering and Management, American Society of Civil Engineering  
- Journal Specialty Editor for Labor and Personnel Issues, 2007 – Present  
- Best Paper Selection Committee, 2009-2012.  
- Co-Editor of Special Issue dedicated to the Construction Engineering Conference at Virginia Tech University, 2010.
3. National Academies National Cooperative Highway Research Program Synthesis Panel – Fall 2011.
4. National Sciences and Engineering Research Council (NSERC) of Canada – Discovery Grant Reviewer – Winter 2008, Winter 2012, and Winter 2013
5. Journal of Management in Engineering, American Society of Civil Engineering
6. Canadian Journal of Civil Engineering, National Research Council Canada
7. National Science Foundation Review Panel (Spring 2002 and Summer 2006)
8. Journal of Computing in Civil Engineering, American Society of Civil Engineering
9. Journal of Automation in Construction, Elsevier Press.
10. Journal of Construction Management and Economics, E & F.N. Spon

## **UNIVERSITY COMMITTEES**

1. Graduate Committee, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, 2012 – 2013
2. Executive Committee, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, 2012 – Present
3. Faculty Search Committee in Architectural Engineering, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, 2012-2013.
4. Construction Faculty Liason to Architectural Engineering Graduate Program, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, 2012-2013.
5. Secretary to the Construction Engineering and Management Industry Advisory Board and Executive Committee, Department of Civil, Environmental, and Architectural Engineering, University of Colorado at Boulder, 2012-Present.
6. Secretary and Treasurer to the Construction Executive Committee, Department of Civil Engineering, University of Kentucky, 2008-2012
7. Sturgill Graduate Education Award Committee, Graduate School, University of Kentucky, 2011.

8. Department Chair Renewal Committee, Department of Civil Engineering, University of Kentucky, 2009
9. Department Student Appeals Committee, Department of Civil Engineering, University of Kentucky, 2004-2012
10. Departmental Chair Search Committee, Department of Civil Engineering, University of Kentucky, 2005
11. Research Committee, Department of Civil Engineering, University of Kentucky, 2004-2005
12. Education Committee, Department of Civil Engineering, University of Kentucky 2003- 2004, 2011-Present
13. Service Committee, Department of Civil Engineering, University of Kentucky 2001-2012

## **K-12 OUTREACH ACTIVITIES**

1. Roger's Scholars- Summer Experience for Exceptional High School Students, Lecturer for Civil Engineering. Somerset, Ky. July 2006.
2. Content Consultant to ABDO Publishing, Edina, Minnesota for a children's book series titled Mighty Machines. July 2008. Credit for consulting on the series provided on individual book covers by the publisher. Individual book titles include:
  - a. Mighty Machines: Dump Trucks
  - b. Mighty Machines: Cranes
  - c. Mighty Machines: Bull Dozers
  - d. Mighty Machines: Tractors
  - e. Mighty Machines: Fire Trucks
  - f. Mighty Machines: Garbage Trucks
3. Organized Construction Engineering Display, 2005 and 2008 E-Day, College of Engineering, University of Kentucky

## **OTHER SERVICE ACTIVITIES**

1. Section Manager for the Construction Management Group within the Kentucky Transportation Center – Fall 2009 to Summer 2012.
2. Assistant organizer for workshop at 2010 TRB Annual Meeting: Using Information Technologies to Support Better Construction Management IV.
3. Session Organizer on Workforce Issues in the Highway Construction Industry at 2009 TRB Annual Meeting.
4. Panel Moderator for Construction Economics and Research Network on Construction Productivity, Baltimore, MD. November 2008.
5. Assistant organizer for workshop at 2008 TRB Annual Meeting: Using Information Technologies to Support Better Construction Management IV.
6. Technical Committee Member for the 2007 ASCE Construction Congress.
7. Assistant organizer for workshop at 2007 TRB Annual Meeting: Using Information Technologies to Support Better Construction Management III.
8. Assistant organizer for workshop at 2006 TRB Annual Meeting: Using Information Technologies to Support Better Construction Management II.
9. Session Moderator for the 2005 Construction Research Congress. San Diego, CA. March, 2005.
10. Assistant organizer for workshop at 2005 TRB Annual Meeting: Project Management Tools for Construction Management: A Review of Current Approaches.
11. Academic Advisor for Associated General Contractors Student Chapter, University of Kentucky, 2004 – 2009