Matthew T. Yarnold

Curriculum Vitae

Associate Professor & Director of the Advanced Structural Engineering Laboratory (ASEL)
Department of Civil & Env. Engineering
Auburn University
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Education

Ph.D., Civil Engineering, Drexel University, March 2013
Dissertation: Temperature-Based Structural Identification and Health Monitoring for Long-Span Bridges
Advisor: Franklin L. Moon

M.S., Civil Engineering, Lehigh University, May 2005
Thesis: Trapezoidal Rib Orthotropic Bridge Deck Parametric Analysis
Advisor: John L. Wilson and Ben. T. Yen

B.S., Civil Engineering, Lehigh University, May 2003
Senior Design Project: Steel Bridge Design using Novel Girder Methods

Employment

1/23 – Present	Director of the Advanced Structural Engineering Laboratory, Auburn University.
1/23 – Present	Associate Professor, Department of Civil & Environmental Engineering, Auburn University.
9/17 – 12/22	Assistant Professor, Zachry Department of Civil & Environmental Engineering, Texas A&M University (TAMU).
8/13 – 8/17	Assistant Professor, Department of Civil & Environmental Engineering, Tennessee Technological University (TTU).
1/12 - 3/13	Ph.D. Graduate Research Assistant, Drexel University
1/10 - 12/11 & 3/13 - 8/13	Project Engineer, Intelligent Infrastructure Systems, a Division of Pennoni Associates *Note: Part-time Ph.D. student at Drexel University in 2010 and 2011.*
6/05 - 12/09	Structural Engineer, Ammann & Whitney (now WSP) *Note: Part-time Ph.D. student at Drexel University in 2009.*
8/03 - 5/05	Gibson Fellowship Student & Teaching Assistant, Lehigh University
5/04 - 8/04	Bridge Engineering Intern, HNTB Corporation

Licenses

Professional Engineer (PE) for the states of:
Delaware (active)
New Jersey (deactivated)
Florida (deactivated)

Honors and Awards

- Robert J. Dexter Memorial Award 2021
- AISC Milek Fellowship 2020
- AISC Early Career Faculty Award 2019
- ASCE Excellence in Civil Engineering Education (ExCEEd) Fellow 2018
- NSF NHERI – Summer Institute Award 2018
- AISC Advancing Structural Steel Education Award 2018
- ASCE Nashville Branch Engineering Educator of the Year 2017
- ProQuest's Top 25 Most Accessed Dissertations and Theses (June) 2016
- Teacher-Scholar Award from TTU College of Engineering 2015
- Sciencedirect Top 25 Most Downloaded Article (Engineering) 2015
- ASCE Outstanding Reviewer for the Journal of Bridge Engineering 2014

Publications

Refereed Journals

1. *Davis, S., *Stoddard, E., and Yarnold. M. (2023). "Full-Scale Floor System Testing for Future Hot-Rolled Asymmetric Steel I-Beams," *Journal of Structural Engineering*, 149(2).
2. *Yadav, N., Kang, J.H., Rybkowski, Z.K., Yarnold, M.T., and He, W. (2023). "Stress-weighted Centroidal Voronoi Tessellation for Structural Design," *Finite Elements in Analysis and Design*, 216.
3. *Stoddard, E. and Yarnold, M. (2022). "Residual Stress and Global Deflection Limits for Future Hot-Rolled Steel Asymmetric I-beams," *Journal of Structural Engineering*, 148(1).
4. *Shen, Y. and Yarnold, M. (2021). "A Novel Sensitivity Analysis of Commercial Building Hybrid Energy-Structure Performance," *Journal of Building Engineering*, 43(102808).
5. Golecki, T., Yarnold, M., and Weidner, J. (2021). "Pinned-End Moments in Simple Span Multi-Girder Bridges," *Engineering Structures*, 240: 112398.
6. *Thulaseedharan, N. and Yarnold, M. (2021). "Prioritization of Texas Prestressed Concrete Bridges for Future Truck Platoon Loading," *Bridge Structures Journal*, 16: 155-167.
7. Yarnold, M.T. and *Stoddard, E. (2020). "Future Hot-Rolled Asymmetric Steel I-Beams," *Journal of Structural Engineering* 146(9).
8. *Alexander J. and Yarnold M. (2020). "Quasi-Static Bearing Evaluation and Monitoring—A Case Study". *Frontiers in Built Environment* 6(69).
9. *Tohme, R. and Yarnold, M. (2020). "Steel Bridge Load Rating Impacts due to Autonomous Truck Platoons," *Journal of the Transportation Research Record*.
10. Yarnold, M.T. and J.S. Weidner (2019). "Truck Platoon Impacts on Steel Girder Bridges". *Journal of Bridge Engineering*, 24(7).
11. Yarnold, M., Golecki, T. and Weidner, J. (2018). "Identification of Composite Action through Truck Load Testing." *Frontiers in Built Environment* 4(74).

12. *Murphy, B., J. *Locum, *M. Belser, *K. Bhegani and M. Yarnold (2018). "Dead Load Evaluation through Truss Bridge Deconstruction Monitoring." *Journal of Bridge Engineering* 23(1): 04017115.
13. *Murphy, B. and Yarnold, M. (2018). "Temperature-driven Structural Identification of a Steel Girder Bridge with an Integral Abutment." *Engineering Structures,* 155: 209-221.
14. *James, E. and Yarnold, M.T., (2017). "Rapid Evaluation of a Steel Girder Bridge: Case Study." *Journal of Bridge Engineering,* 22(12).
15. Yarnold, M., *Salaman, S., *James, E. (2017). "Deconstruction Monitoring of a Steel Truss Bridge," *Journal of the Transportation Research Record.*
16. Yarnold, M.T. & Weidner, J.S. (2016). "Monitoring of a Bascule Bridge during Rehabilitation," *Bridge Structures Journal*, 12(1-2), 33-40.
17. Yarnold, M.T., Moon, F.L., Aktan, A.E. (2015). "Temperature-Based Structural Identification of Long-Span Bridges," *Journal of Structural Engineering*, 141(11).
18. Yarnold, M.T., Moon, F.L. (2015). "Temperature-Based Structural Health Monitoring Baseline for Long-Span Bridges," *Engineering Structures*, 86(0), 157-167.
19. Yarnold, M.T. & Dubbs, N.C. (2015). "Bearing Assessment using Periodic Temperature-Based Measurements," *Journal of the Transportation Research Record*, 2481, 115-123.
20. Yarnold, M.T. (2014). "Identification of Bridge Movement Mechanisms," *Engineering*, 6, 584-591.
21. Glisic, B., Yarnold, M.T., Moon, F.L., and Aktan, A.E. (2014). "Advanced Visualization and Accessibility to Heterogeneous Monitoring Data." *Computer-Aided Civil and Infrastructure Engineering*, 29(5), 382-398.
22. Yarnold, M.T., Wilson, J.L., Jen, W.C, Yen, B.T. (2007). "Local Buckling Analysis of Trapezoidal Rib Orthotropic Bridge Deck Systems," *Bridge Structures Journal,* 3:2, 93-103.

Conference Papers

1. Bjelland, A., Gasser, C.E., Fish, D.J., Park, S., Helwig, T.A, Engelhardt, M.D., Williamson, E.B., Hebdon, M., Yarnold, M.T., and Hurlebaus, S. (2023) "Stability Bracing Requirements for Lean-on Systems," *Proceedings of the Annual Stability Conference Structural Stability Research Council*, Charlotte, North Carolina.
2. Gasser, C.E., Bjelland, A., Fish, D.J., Park, S., M., Yarnold, M.T., Helwig, T.A, Hurlebaus, S., Williamson, E.B., Engelhardt, M.D., and Hebdon, M. (2023) "Stability Bracing Requirements for Lean-on Systems," *Proceedings of the Annual Stability Conference Structural Stability Research Council*, Charlotte, North Carolina.
3. *Murphy, B. and Yarnold, M. (2019). "Temperature-Driven Structural Performance Evaluation of the Hurricane Bridge via Multiple Model Approach," *The 9th International Conference on SHM of Intelligent Infrastructure*, St. Louis, Missouri.
4. Yarnold, M. and Weidner, J. (2019). "Truck Platoon Impacts on Steel Girder Bridges," *Transportation Research Board, Washington, DC.*
5. Yarnold, M. and Dubbs, N. (2019). "Bridge Reliability Evaluation Method for Asset Management," *Transportation Research Board, Washington, DC.*
6. Yarnold, M.T., *Murphy, B., *Reilly, J. and Glisic, B. (2017). "Damage Identification using Temperature-Driven SHM," *The 8th International Conference on SHM of Intelligent Infrastructure*, Brisbane, Australia.
7. *Reilly, J., *Abdel-Jaber, H., Yarnold, M., and Glisic, B. (2017). "Evaluating the coefficient of thermal expansion using time periods of minimal thermal gradient for a temperature-driven structural health monitoring," *SPIE*, Portland, OR.

8. Yarnold, M., *Alexander, J. and Huff, T. (2017). “Structural Health Monitoring of the Hernando DeSoto Bridge,” *International Bridge Conference*, National Harbor, MD.
9. *Murphy, B.R. & Yarnold, M.T. (2017). “Temperature-Driven Assessment of a Cantilever Truss Bridge,” *ASCE Structures Congress*, Denver, CO.
10. Yarnold, M.T. & *Murphy, B.R. (2016). “Temperature-Based Model Updating of Bridge Structures,” *ASCE Structures Congress*, Phoenix, AZ.
11. Yarnold, M.T. & Weidner, J. (2016). "Monitoring of a Bascule Bridge during Construction," *Transportation Research Board, Washington, DC.*
12. *Reilly, J., *Abdel-Jaber, H., Yarnold, M., Glisic, B. (2016). “Identification of Steady-State Uniform Temperature Distributions to Facilitate a Temperature Driven Method of Structural Health Monitoring,” *SPIE*, Las Vegas, NV.
13. Yarnold, M.T., *Murphy, B., Glisic, B., and *Reilly, J. (2016). "Temperature-Based Evaluation and Monitoring Techniques for Long-Span Steel Bridges," *Transportation Research Board, Washington, DC.*
14. Yarnold, M.T. & Wilson, S. (2015). “Forensic Investigation of the Route 61 Bridge,” *ASCE Structures Congress*, 309-321. Portland, OR.
15. Yarnold, M.T. (2015). “Preparing Engineers for Evaluation of Constructed Systems,” *ASCE Structures Congress*, 2590-2599. Portland, OR.
16. Dubbs, N.C. & Yarnold, M. (2014). “Optimal Sensor Placement for Condition Assessment of a Cantilever Truss Bridge,” *NDE/NDT for Highways and Bridges Conference, American Society for Non-Destructive Testing (ASNT)*, Washington, DC.
17. Weidner, J., Yarnold, M., Dubbs, N. (2014). “Challenges to Successful Implementation of Structural Health Monitoring,” *NDE/NDT for Highways and Bridges Conference, American Society for Non-Destructive Testing (ASNT)*, Washington, DC.
18. Yarnold, M.T., Moon, F.L., Aktan, A.E, Glisic, B. (2012). "Structural Monitoring of the Tacony-Palmyra Bridge using Video and Sensor Integration for Enhanced Data Interpretation," *International Association for Bridge Management and Safety*, Stresa, Italy.
19. Yarnold, M.T., Moon, F.L., Dubbs, N.C., Aktan, A.E. (2012). "Evaluation of a Long-Span Steel Tied Arch Bridge using Temperature-Based Structural Identification," *International Association for Bridge Management and Safety*, Stresa, Italy.
20. Glisic, B., Yarnold, M., Moon, F., Aktan, A.E. (2012). "Advanced Visualization and Accessibility to SHM Results Involving Real-Time and Historic Multi-Parameter Data and Camera Images," *ASCE Structures Congress*, Chicago, Illinois.

* *Indicates students*

Textbooks and Reports

1. R. Craig Henderson and Matthew T. Yarnold (2022 Submitted). “Statics,” *Great River Publishing*.
2. Bjorn Birgisson, Curtis A Morgan, Matthew Yarnold, Jeffery Warner, Brianne Glover, Maxwell P Steadman, Sunkari Srinivasa, Shengxin Cai, Dahye Lee (2020). “Evaluate Potential Impacts, Benefits, Impediments, and Solutions of Automated Trucks and Truck Platooning on Texas Highway Infrastructure”, *Report No. FHWA/TX-21/0-6984-R1*.
3. Shahram Pezeshk, Mitch Withers, Jim Bollwerk, Chris McGoldrick, Greg Steiner, Mathew Yarnold (2018). “Hernando Desoto I-40 Bridge Seismic Instrumentation Upgrade”, *Report No. RES2016-26*.

Presentations

2023:

1. "Design of Steel Girder Bridge using Lean-on Bracing," *Alabama Transportation Conference*, Montgomery, AL.
2. "Auburn Steel Research Update," *Steel Bridge Task Force Meeting*, Robert J. Dexter Award Presentation, *Orlando, FL.*
3. "Industry Engagement to Develop Continuous for Live Load Steel ABC Bridges," *Transportation Research Board, Washington, DC.*

2022:

4. "Behavior of Hot Rolled Asymmetric Steel I-Beams," *Arkansas University*, Fayetteville, AR.
5. "Bridge Weigh-in-Motion Approach to Measure Live Load on Texas Highways," *ASCE Texas CECON*, San Marcos, TX.
6. "Bridge Weigh-in-Motion - An Approach to Measure Truck Loading on Texas Highways," *HNTB – Research in Infrastructure Group*, Virtual.
7. "TxDOT Steel Bridge Research Updates," *Texas Steel Quality Council Meeting*, Austin, TX.
8. "Develop Bridge Weigh-in-Motion (B-WIM) Approach to Measure Live Loads on Texas Highways," *TxDOT Structures & Hydraulics Research Oversight Committee*, Austin, TX.
9. "Bridge Weigh-in-Motion - An Approach to Measure Truck Loading on Texas Highways," *Texas Transportation Short Course - Bridge Session*, College Station, TX.
10. "Steel Bridge Research from Local Buckling to Lean-On Bracing," *Steel Bridge Task Force Meeting*, Robert J. Dexter Award Presentation, *Orlando, FL.*
11. "Development of a Continuous for Live Load Prefabricated Steel ABC Unit for Texas Bridges," *Transportation Research Board (AKB20 Meeting), Washington, DC.*
12. "Develop Bridge Weigh-in-Motion Approach to Measure Live Loads on Texas Highways," *Transportation Research Board (AKB40 Meeting), Washington, DC.*

2021:

13. "Develop Bridge Weigh-in-Motion (B-WIM) Approach to Measure Live Loads on Texas Highways," *TxDOT Structures & Hydraulics Research Oversight Committee*, Austin, TX.

2020:

14. "Behavior of Hot Rolled Asymmetric Steel I-Beams," *Tennessee Tech University, Civil & Environmental Engineering Seminar Series*, Virtual Presentation.
15. "Steel Bridge Load Rating Impacts due to Autonomous Truck Platoons," *Transportation Research Board, Washington, DC.*
16. "Steel Bridge Load Rating Impacts due to Autonomous Truck Platoons," *ASCE Structures Congress*, *St. Louis, Missouri.* (Cancelled due to COVID19)

2019:

17. "Truck Platoon Impacts on Multi-Girder Bridges," *Ohio Transportation Engineering Conference, Columbus, Ohio.*
18. "Temperature-Driven Structural Performance Evaluation of the Hurricane Bridge via Multiple Model Approach," *Conference on Structural Health Monitoring of Intelligent Infrastructure, St. Louis, Missouri.*
19. "Truck Platoon Impacts on Steel Girder Bridges," *Transportation Research Board, Washington, DC.*
20. "Bridge Reliability Evaluation Method for Asset Management," *Transportation Research Board, Washington, DC.*

2018:

21. "Deconstruction Monitoring," *ASCE Structures Congress*, Fort Worth, TX.

22. "Structural Identification of a Steel Girder Bridge," *ASCE Structures Congress, Fort Worth, TX.*

2017:

23. "Damage Identification using Temperature-Driven SHM," *The 8th International Conference on SHM of Intelligent Infrastructure*, Brisbane, Australia. (PhD student presenter)
24. "Structural Health Monitoring of the Hernando DeSoto Bridge," *International Bridge Conference*, National Harbor, MD.
25. "Deconstruction Monitoring of a Steel Truss Bridge," *Transportation Research Board, Washington, DC.*
26. "Temperature-Driven Assessment of a Cantilever Truss Bridge," *ASCE Structures Congress*, Denver, CO. (PhD student presenter)

2016:

27. "Structural Identification and Monitoring of the Hurricane Bridge," *TN Engineers' Conference*, Nashville, TN.
28. "Structural Identification and Structural Health Monitoring of Bridge Structures," *TNSEA*, Nashville, TN.
29. "Temperature-Based Model Updating of Bridge Structures," *ASCE Structures Congress*, Phoenix, AZ.
30. "Monitoring of a Bascule Bridge during Construction," *Transportation Research Board, Washington, DC.*
31. "Temperature-Based Evaluation and Monitoring Techniques for Long-Span Steel Bridges," *Transportation Research Board, Washington, DC.*
32. "Rapid Evaluation of Steel Girder Bridges," *Transportation Research Board, Washington, DC.*

2015:

33. "Forensic Investigation of the Route 61 Bridge," *Tennessee Engineers' Conference*, Murfreesboro, TN.
34. "Preparing Engineers for Evaluation of Constructed Systems," *ASCE Structures Congress*, Portland, OR.
35. "Forensic Investigation of the Route 61 Bridge," *ASCE Structures Congress*, Portland, OR.
36. "Bearing Assessment using Periodic Temperature-Based Measurements," *Transportation Research Board 94th Annual Meeting*, Washington, D.C.

2013:

37. "Structural Health Monitoring Temperature-Driven Baseline," *Conference of the ASCE Engineering Mechanics Institute*, Northwestern University, Evanston, IL
38. "Temperature-Based Structural Identification and Health Monitoring for Long-Span Bridges," *Transportation Research Board 92nd Annual Meeting*, Washington, D.C.

2012:

39. "Extracting Knowledge from Structural Response Data," *International Association for Bridge Management and Safety Conference*, Stresa, Italy

2011:

40. "Structural Health Monitoring of the Tacony-Palmyra Bridge," *International Bridge Conference*, Pittsburgh, PA

2010:

41. "Health Monitoring of the Tacony-Palmyra Bridge Bascule Span," *International Association for Bridge Management and Safety Conference*, Philadelphia, PA

Awarded Projects ($6.3M with $2.2M my share)

1. Drop-In Top Flange Connections for Increased Speed of Steel Erection

- Award Amount: $192,472 ($158,000 from AISC, plus $34,472 of in-kind support)
- My Credit: **$115,483** (or 60%)
- Investigators: **M. Yarnold (PI)** and K. Sener (Co-PI)
- Agency: AISC
- Start Date: 1/1/2023 (2-years)
- Project Tasks:
    1. A-Priori Analysis and Concept Development
    2. Full-Scale Testing Program
    3. Refined Analysis
    4. Concept Finalizing and Reporting
- Role: Project lead in charge of student and post-doc advising, meetings, schedule, project execution, and reporting. Supervisor for all technical and logistical aspects of the study.

2. Girder-Slab System Experimental Testing
    - Award Amount: $388,508
    - My Credit: **$194,254** (or 50%)
    - Investigators: **M. Yarnold (PI)**, K. Sener (Co-PI), and D. Roueche (Co-PI)
    - Industry Sponsor: Girder-Slab Technologies
    - Start Date: 1/15/2023 (2.5-years)
    - Project Tasks: (not provided due to a non-disclosure agreement)
    - Role: Project lead in charge of student and post-doc advising, meetings, schedule, project execution, and reporting. Supervisor for all technical and logistical aspects of the study.
3. Load Rating of Girder Stringer Floorbeam Bridges
    - Award Amount: $100,000 (TAMU portion - $43,541)
    - My Credit: **$43,541** (or 100% of TAMU)
    - Investigators: C. Henderson (Lead PI – TTU), T. Huff (Co-PI), and **M. Yarnold (PI - TAMU)**
    - Agency: Tennessee DOT
    - Start Date: 3/15/2022 (12-months)
    - Project Tasks:
        1. Initial Investigation
        2. Field Test Planning and Preparations
        3. Bridge Instrumentation and Load Testing
        4. Dissemination of Findings
    - Role: Project lead for the field experimental testing (instrumentation design, sensor installation, data acquisition, data processing, and data interpretation). In addition, assist with the analytical study and project reporting.
4. Sheet Pile Interlock Testing
    - Award Amount: $148,796
    - My Credit: **$68,796** (or 46%)
    - Investigators: **M. Yarnold (PI)**, P. Keating, and C. Droddy
    - Industry Sponsor: Gerdau
    - Start Date: 3/1/2022 (12-months)
    - Project Tasks:
        1. Plan Refinement
        2. Experiment Design, Fabrication, and Assembly
        3. Experimental Testing
        4. Reporting

- Role: Project manager in charge of student advising, meetings, schedule, project execution, and reporting. Supervisor for the laboratory testing conducted at the Center for Infrastructure Renewal, data analysis, and data interpretation.

5. Development of a Continuous for Live Load Prefabricated Steel Accelerated Bridge Construction (ABC) Unit for Texas Bridges
   - Award Amount: $689,995 (TAMU portion - $570,376)
   - My Credit: **$114,075** (or 20% of TAMU)
   - Investigators: **M. Yarnold (Lead PI - TAMU)**, J. Mander (Co-PI), S. Hurlebaus (Co-PI), P. Sideris (Co-PI), K. Skillen (Co-PI), and J. Weidner (PI - UTEP)
   - Agency: TxDOT
   - Start Date: 9/1/2021 (3-years)
   - Project Tasks:
     1. Literature Review and Field Assessment
     2. System Development
     3. Laboratory Validation and Analytical Modeling
     4. Analytical/Design Approach
   - Role: Project lead in charge of student advising, meetings, schedule, project execution, and reporting. In charge of assembling the industry review panel and conducting a full-day workshop. Supervise the field investigation (includes short-term monitoring), the full-scale laboratory testing at the Center for Infrastructure Renewal, and the finite element model calibration and parametric studies.
6. Develop A New Tool for Evaluating Infrastructure and Planning Impacts from Changes in Truck Traffic and Truck Technologies
   - Award Amount: $470,000
   - My Credit: **$94,000** (or 20%)
   - Investigators: B. Birgisson (PI), C. Morgan (Co-PI), **M. Yarnold (Co-PI)**, et al.
   - Agency: TxDOT
   - Start Date: 9/1/2021 (2-years)
   - Project Tasks:
     1. Determination of Key Features and Requirements for the Network Modeling of Freight System Components
     2. Acquisition of Performance/Condition Data and Design Conditions for Texas Highways Freight Network Assets
     3. Quantification of the Systematic Impacts of Different Truck Traffic and Truck Technologies
     4. Finalization of Web-Based User interface and Visualization Options for the Fast Network Analysis Tool
   - Role: Refine the analytical study performed in TxDOT, "Evaluate Potential Impacts, Benefits, Impediments, and Solutions of Automated Trucks and Truck Platooning on Texas Highway Infrastructure." Also attend project meetings, support data transfer, and support the project reporting.
7. Refined Design Methods for Lean-on Bracing
   - Award Amount: $980,000 (TAMU portion - $380,000)
   - My Credit: **$254,600** (or 67%)
   - Investigators: T. Helwig (Lead PI - UT), M. Engelhardt (Co-PI), E. Williamson (Co-PI), **M. Yarnold (PI - TAMU)**, and S. Hurlebaus (Co-PI)
   - Agency: TxDOT

- Start Date: 9/1/2020 (3-years)
- Project Tasks:
    1. Background Studies and Literature Review
    2. Review of Recent Bridge Designs Utilizing Lean-On Bracing
    3. Field Instrumentation Plans
    4. Field Instrumentation and Monitoring Throughout Construction
    5. Live Load Testing on Completed Bridges
    6. Parametric Finite Element Analyses for of Lean-On Bracing in Steel Bridges
    7. Development of Enhancements of Design Methodology with Examples
- Role: Project lead for the field experimental testing (instrumentation design, sensor installation, data acquisition, data processing, and data interpretation). In addition, advise graduate students, assist with the analytical modeling, and project reporting.

8. Behavior of Hot Rolled Asymmetric Steel I-Beams
    - Award Amount: $200,000
    - My Credit: **$200,000** (or 100%)
    - Investigators: **M. Yarnold (PI - TAMU)**
    - Agency: AISC (Milek Fellowship)
    - Start Date: 5/1/2020 (4-years)
    - Project Tasks:
        1. Manufacturing Study
        2. Initial Concept Design and System Experiment #1
        3. Initial Sizing Study for Residential Facilities
        4. Finite Element Modeling Calibration and Parametric Study
        5. Concept Refinement and System Experiment #2
        6. Final Shape Study
    - Role: Project lead in charge of student advising, meetings, schedule, project execution, and reporting. Supervisor for all technical and logistical aspects of the study.
9. Evaluation of Corrosion Prevention and Mitigation Approaches Used on Texas Bridges
    - Award Amount: $856,910
    - My Credit: **$214,228** (or 25%)
    - Investigators: S. Hurlebaus (PI), A. Birely (Co-PI), **M. Yarnold (Co-PI)**, A. Noshadravan (Co-PI), and H. Castaneda-Lopez (Co-PI))
    - Agency: TxDOT
    - Start Date: 12/1/2019 (4-years)
    - Project Tasks:
        1. Review State-of-the-Art and State-of-the-Practice
        2. Field Evaluation to Investigate Effectiveness of Corrosion Mitigation
        3. Perform Laboratory Tests
        4. Develop Decision Tool for Effective Corrosion Prevention and Mitigation
        5. Develop Decision Tool Projecting Service Life of Weathering Steel Structures
    - Role: Support the field and experimental assessment efforts for corrosion prevention and mitigation of steel bridges. This includes accessing bridge data through the AssetWise Database, attending weekly meetings, and review of documents.
10. Develop Bridge Weigh-in-Motion Approach to Measure Live Loads on Texas Highways
    - Award Amount: $414,611
    - My Credit: **$207,306** (or 50%)
    - Investigators: **M. Yarnold (PI)**, J. Mander (Co-PI), S. Hurlebaus (Co-PI), D. Middleton (Co-PI), and L. Walubita (Co-PI)

- Agency: TxDOT
- Start Date: 11/1/2019 (3-years)
- Project Tasks:
    1. Review State-of-the-Art and State-of-the-Practice
    2. B-WIM Development and Preliminary Testing
    3. Selection of Bridges for B-WIM
    4. B-WIM Deployment on In-Service Bridges
    5. Live Load Data Analysis and Validation
    6. Bridge Evaluation and Load Rating
    7. Final B-WIM Guidelines for Future Implementation
- Role: Project lead in charge of student advising, meetings, schedule, project execution, and reporting. Supervise extensive field research, algorithm development, bridge assessments, and future guidelines.

11. Performance and Improvement of Texas Poor Boy Continuous Bridge Deck Details
    - Award Amount: $731,114
    - My Credit: **$241,268** (or 33%)
    - Investigators: A. Birely (PI), **M. Yarnold (Co-PI)**, and S. Hurlebaus (Co-PI)
    - Agency: TxDOT
    - Start Date: 7/1/2019 (4-years)
    - Project Tasks:
        1. Project Management and Research Coordination
        2. Literature Search and Survey of State-of-the-Practice
        3. Survey of Inventory
        4. Develop Candidate Details
        5. Modeling Behavior of Current and Modified Details
        6. Full-Scale Experimental Tests
        7. Design Methods and Recommended Details
    - Role: Project lead for the field experimental testing of five bridges (instrumentation design, sensor installation, data acquisition, data processing, and data interpretation). In addition, assist with the analytical studies, full-scale laboratory testing, and future recommended design methods and details.
12. Deconstruction Monitoring of a Cast-in-Place Segmental Concrete Box Girder Bridge
    - Award Amount: $57,500
    - My Credit: **$51,750** (or 90%)
    - Investigators: **M. Yarnold (PI)** and J. Mander (Co-PI)
    - Agency: ACIF
    - Start Date: 6/11/2019 (4-years)
    - Project Tasks:
        1. Preparations and Field Installation
        2. In-Service Monitoring
        3. Access during the Transition
        4. Deconstruction Monitoring
        5. Data Analysis and Dissemination
    - Role: Project lead in charge of student advising, meetings, schedule, project execution, and reporting. Supervisor for the field testing, data analysis, and data interpretation.
13. Biomimetic Interlocking Modules for Rapid Emergency Shelter Fabrication
    - Award Amount: $33,910 (internal random selection)
    - My Credit: **$11,306** (or 33%)

- Investigators: H. Kang (PI), Z. Rybkowski (Co-PI), and **M. Yarnold (Co-PI)**
- Agency: TAMU T3 Grant
- Start Date: 1/1/2019 (2-years)
- Project Tasks:
    1. Develop a Micro-Scale Interlocking Module
    2. Finite Element Analysis
    3. Produce Interlocking Modules using 3D Printing
    4. Experimental Testing
    5. Structural Performance Evaluation
- Role: Support the research team with a structural engineering perspective. This included attending regular meetings, reviewing finite element analysis results, and reviewing reports.

14. Evaluate Potential Impacts, Benefits, Impediments, and Solutions of Automated Trucks and Truck Platooning on Texas Highway Infrastructure
    - Award Amount: $448,240
    - My Credit: **$112,060** (or 25%)
    - Investigators: B. Birgisson (PI), C. Morgan, **M. Yarnold (Co-PI)**, et al.
    - Agency: TxDOT
    - Start Date: 9/1/2018 (2-years)
    - Project Tasks:
        1. Determination of State-of-Practice
        2. Assessment of Planning and Policy Impacts of Platooning and Automation of Trucks on Texas Highways
        3. Evaluate How Platooning and Automated Truck Operations Would Affect Existing Receiving Agency Plans and Planning Process
        4. Assessment Potential Technical/Performance Impacts of Platooning and Truck Automation on Texas Infrastructure
        5. Impacts of Truck Platooning and Truck Automation on the Vulnerability of the Texas Highway System
        6. Analysis of Overall Economic Impact of Platooning and Truck Automation on Texas Highways
        7. Final Assessment of Potential Impacts of Benefits, Impediments, and Solutions of Automated Trucks and Truck Platooning on the Texas Highway Infrastructure
    - Role: Project lead on the impact of automated truck platoons on bridges. Supervised an extensive analytical study that prioritized thousands of bridges for the state of Texas.
15. IMAGINE Grant
    - Award Amount: $21,064 (Equipment Only)
    - My Credit: **$21,064** (or 100%)
    - Investigators: **M. Yarnold (PI)**
    - Industry Sponsor: Campbell Scientific
16. Hernando Desoto I-40 Bridge Seismic Instrumentation Upgrade
    - Award Amount: $200,000 (TTU portion - $25,583)
    - My Credit: **$25,583** (or 100% of TTU)
    - Investigators: S. Pezeshk (Lead PI - Memphis) and **M. Yarnold (PI - TTU)**
    - Agency: Tennessee DOT
    - Start Date: 6/29/2015 (12-months)
    - Project Tasks:
        1. Instrumentation Design

2. Installation of Equipment
3. Quality Control Field Checks
4. Setup of Data Visual Display
5. Alerting System

- Role: Project lead for the quasi-static structural monitoring system (instrumentation design, sensor installation, data acquisition, data processing, and data interpretation). In addition, assisted with the project reporting.

17. Structural Health Monitoring using Temperature Related Data
    - Award Amount: $309,668 (TTU portion - $189,676)
    - My Credit: **$189,676** (or 100% of TTU)
    - Investigators: **M. Yarnold (Lead PI - TTU)** and B. Glisic (PI - Princeton)
    - Agency: NSF CMMI (HMSE)
    - Start Date: 8/1/2014 (3-years)
    - Project Tasks:
        1. Temperature-Driven Structural Identification Framework Creating
        2. Temperature-Driven Structural Health Monitoring Framework Creating
        3. Field Implementation and Validation
        4. Dissemination of Results
    - Role: Project lead in charge of student advising, meetings, schedule, project execution, and reporting. Supervised extensive analytical modeling and field experimental tasking.
18. Data Collection of Internal Forces during Dismantling of a Steel Bridge
    - Award Amount: $24,810
    - My Credit: **$24,810** (or 100%)
    - Investigators: **M. Yarnold (PI)**
    - Agency: NSF CMMI (HMSE - RAPID)
    - Start Date: 8/15/2014 (12-months)
    - Project Tasks:
        1. Existing Data Collection and Review
        2. Experiment Design
        3. Data Collection
        4. Data Processing and Dissemination
        5. Data Interpretation and Numerical Simulation Studies
        6. Dissemination of Results
    - Role: Project lead in charge of student advising, meetings, schedule, project execution, and reporting. Supervised the analytical modeling and field experimental tasking.
19. Structural Health Monitoring of the Tacony-Palmyra Bridge Arch Span
    - Award Amount: $20,000
    - My Credit: **$20,000** (or 100%)
    - Investigators: **M. Yarnold (PI)**
    - Industry Sponsor: Intelligent Infrastructure Systems
    - Start Date: 6/11/2014 (12-months)
    - Project Tasks:
        1. Evaluation of the Current Data and Monitoring System
        2. Algorithm Logic
        3. Threshold Criteria and Alert Indicators
        4. Code Development and Validation
    - Role: Project lead in charge of the execution of all tasks.

Select Professional Experience

- Bayonne Bridge Structural Health Monitoring (SHM), Staten Island, NY (*IIS: 2013*)
  - Client: Port Authority of New York and New Jersey
  - Description: The project included the design and installation of a temporary SHM system for the long-span steel arch bridge. The system was capable of tracking key structural properties during normal service in the bridge's existing state to establish a baseline to then track performance under the future major rehabilitation project. The system included a network of data acquisition equipment that remotely provided engineers with wind speed and weather information, variation in intrinsic strains globally (across the structure) and locally (across a single member), and variation in dynamic strains. Additionally, a detailed ambient vibration survey was conducted to establish global structural properties relevant for refined finite element model calibration.
  - Responsibilities: Assisted with the instrumentation plan, finite element modeling, contract drawing review, reporting, and sensor installation.
- Milliard Tydings Bridge Live Load Testing, MD (*IIS: 2013*)
  - Client: Maryland Transportation Authority (MDTA)
  - Description: A live load test was conducted on the long-span cantilever truss bridge for the purpose of obtaining refined live load ratings for specific structural members and gusset plate connections. The structural identification process was implemented, which included model-experiment correlation and parameter identification. The field testing also addressed fatigue concerns at select locations.
  - Responsibilities: Lead engineer for the finite element modeling and instrumentation plan.
- Structural Evaluation of the Ford Island Bridge, Honolulu, HI (*IIS: 2011*)
  - Client: Naval Facilities Engineering Command (NAVFAC)
  - Description: The project included a detailed structural performance assessment and identification of the key vulnerabilities of the system. A comprehensive 3D finite element (FE) model was developed, and a series of parametric studies were conducted. To assess the load-carrying capacity, a thorough load rating was performed according to the AASHTO LRFR method, with the demands obtained from the FE model. In addition, two types of field testing were performed. The first included global assessment through ambient vibration and forced impact testing of the structure. The second utilized several non-destructive evaluation (NDE) techniques to assess the condition of the prestressed concrete piles. Overall, the information obtained from the structural evaluation allowed for informed decisions regarding the preservation of the bridge.
  - Responsibilities: Associate project manager and lead engineer.
- Crum Creek Viaduct Evaluation, Philadelphia, PA (*IIS: 2011*)
  - Client: Southeastern Pennsylvania Transportation Authority (SEPTA)
  - Description: An in-depth evaluation was performed on a 1000 ft railroad structure. The instrumentation and testing included ambient vibration monitoring, impact testing, and measurement of displacement and strain at select locations. In addition, finite element analysis and parameter identification were performed.
  - Responsibilities: Static field testing of the structure and interpretation of the data.
- Riegelsville Bridge Rehabilitation, Riegelsville, PA (*AW: 2009-2010*)
  - Client: Delaware River Joint Toll Bridge Commission (DRJTBC)
  - Description: A 100-year-old suspension bridge was rehabilitated to improve the safety and serviceability of the structure. The project included an assessment of the existing structure, design of the rehabilitation, and construction support services.

  - Responsibilities: Field condition evaluation and finite element analysis of the existing and proposed floor system retrofit.
- Lowries Run Bridge Replacement, Pittsburgh, PA (*AW: 2009-2010*)
  - Client: Pennsylvania Department of Transportation (PADOT)
  - Description: The project focused on the replacement of an 80 ft long thru-girder bridge. The new structure was built under staged construction and supported on integral abutments behind the existing foundations.
  - Responsibilities: Preliminary superstructure design and final design of the integral abutments.
- Berlin-Crosskeys Bridge Widening, Washington Township, NJ (*AW: 2009 to 2010*)
  - Client: South Jersey Transportation Authority (SJTA)
  - Description: The existing four-span bridge was widened to increase traffic capacity. The project complexities included jacking the existing bridge superstructure prior to widening to achieve adequate vertical clearance.
  - Responsibilities: Final design and detailing of the prestressed beams and pier widening.
- Rhode Island Avenue Metro Station Pedestrian Bridge, Washington, DC (*AW: 2008-2009*)
  - Client: District of Columbia Department of Transportation (DDOT)
  - Description: A new pedestrian bridge from the Metropolitan Branch Trail to Rhode Island Ave. Metro Station was designed. The project included a 200 ft steel truss bridge and over 500 ft of approach ramps.
  - Responsibilities: Lead engineer and designer of the steel truss bridge, reinforced concrete ramps, and substructure units.
- Johnsonburg Bypass, Elk County, PA (*AW: 2008-2009*)
  - Client: Pennsylvania Department of Transportation (PADOT)
  - Description: The project included preliminary engineering and the final design of a newly constructed 1200 ft viaduct. The project complexities included unique geometry and difficult site conditions.
  - Responsibilities: Final design and detailing of all seven bridge piers.

Courses

Texas A&M University[1]:

- Structural Steel Design (Undergraduate)
  - Terms: F17, F18, S21, F21, F22 (2 sections)
  - Course Evaluations: 4.86, 4.62, 4.73, 4.82, 4.89, and 4.83
- Behavior and Design of Steel Structures (Graduate)
  - Term: S18
  - Course Evaluation: 4.51
- System Identification (Graduate)
  - Term: S19
  - Course Evaluation: 4.81
- Theory of Structures (Undergraduate)
  - Term: F19, S20, and F20
  - Course Evaluations: 4.68, 4.67, and 4.59

[1] *Starting Fall 2020 the course evaluations switched from PICA to AEFIS (normalized). Each evaluation is out of 5.0.*

Tennessee Tech University:

- Structural Steel Design (Undergraduate)
  - Term: S14, S15, S16, and S17
  - Course Evaluation Raw Scores (average):
    - Teacher: 4.7 / 5.0
    - Course: 4.5 / 5.0
    - ABET Evaluation: 3.7 / 4.0
- Advanced Steel Design (Undergraduate and Graduate)
  - Term: S16 and S17
  - Course Evaluation Raw Scores (average):
    - Teacher: 4.9 / 5.0
    - Course: 4.9 / 5.0
- Bridge Design (Undergraduate and Graduate)
  - Term: F13, F14, F15 and F16
  - Course Evaluation Raw Scores (average):
    - Teacher: 4.8 / 5.0
    - Course: 4.6 / 5.0
    - ABET Evaluation: 3.7 / 4.0
- Structural Identification of Constructed Systems (Graduate)
  - Term: F14
  - Course Evaluation Raw Scores:
    - Teacher: 4.8 / 5.0
    - Course: 4.8 / 5.0
- Special Problems – Light Gage Steel Design (Graduate)
  - Term: F13
- Special Problems – Advanced Steel Design (Graduate)
  - Term: S16
- Special Problems – Deconstruction Monitoring (Graduate)
  - Term: F16

Research Advising

Post-Doctoral Associates

1. Robel Wondimu Alemayehu
   - Duration: 3/1/2023 to present

PhD Students

1. Claire Gasser
   - Thesis Title: Refined Methods for Lean-on Bracing
   - Expected Auburn Graduation: May 2024
2. Chase Ottmers
   - Thesis Title: Full-Scale Testing and Numerical Simulation of Residential Composite Floor Systems
   - Expected TAMU Graduation: May 2025 [Advised remotely]
3. Jiacai Guo
   - Thesis Title: Continuous for Live Load Prefabricated Steel Accelerated Bridge Construction Unit for Texas Bridges

- Expected TAMU Graduation: May 2025 [Advised remotely]

4. Shengyi Shi
   - Thesis Title: Bridge Weigh-in-Motion Approach to Measure Live Loads with Automated Bridge Assessment
   - Expected TAMU Graduation: May 2023
5. Yang Shen
   - Thesis Title: Hybrid Building Energy-Structure Performance
   - TAMU Graduation: August 2022
6. Eric Stoddard
   - Thesis Title: Behavior of Hot Rolled Asymmetric Steel I-Beams
   - TAMU Graduation: May 2022
7. Brittany Murphy
   - Thesis Title: Structural Evaluation and Monitoring using Temperature Related Data
   - TAMU Graduation: May 2019

MS Students

1. Emily Doody
   - Thesis Title: Drop-In Top Flange Connections for Increased Speed of Steel Erection
   - Expected Auburn Graduation: May 2024
2. George Cowles
   - Thesis Title: TBD
   - Expected Auburn Graduation: May 2024
3. Joren Falcon
   - Thesis Title: Experimental Testing of Prefabricated Steel Accelerated Bridge Construction Units
   - Expected TAMU Graduation: May 2024 [Advised remotely]
4. Ashlynne Smith
   - Project Title: Sheet Pile Interlock Testing
   - Expected TAMU Graduation: May 2023 [Advised remotely]
5. Claire Barden
   - Project Title: Automated Bridge Evaluation using Bridge Weigh-in-Motion Data
   - TAMU Graduation: December 2022
6. Sheyenne Davis
   - Thesis Title: Full-Scale Floor System Testing for Future Hot Rolled Asymmetric Steel I-Beams
   - TAMU Graduation: May 2022
7. Nandhu Pillay Thulaseedharan
   - Thesis Title: Impacts of Autonomous Truck Platoons on the Texas Bridge Inventory
   - TAMU Graduation: May 2020
8. Taylor Newcomb
   - Research: Reliability-Based Evaluation Method for Railway Bridges
   - TAMU Withdrawal for Personal Reasons: May 2020
9. Rita Tohme
   - Thesis Title: The Effects of Truck Platoons on Steel Bridge Load Ratings
   - TAMU Graduation: May 2019
10. Brittany Murphy
    - Project Title: Temperature-Driven Assessment of a Cantilever Truss Bridge

    - TTU Graduation: May 2017
11. Wyatt Sherry
    - Thesis Title: Determination of Intrinsic Stresses using the Hole-Drilling Method
    - TTU Graduation: May 2017
12. Justin Alexander
    - Thesis Title: Structural Health Monitoring of the Hernando de Soto Bridge
    - TTU Graduation: May 2017
13. Eric James
    - Thesis Title: Development of a Rapid Field Evaluation Method for Steel Girder Bridges
    - TTU Graduation: May 2016
14. Stephen M Salaman
    - Thesis Title: Identification of the Force Distribution for Steel Truss Bridges
    - TTU Graduation: May 2016
15. James Lawrence
    - Project Title: Building Design using BIM Software
    - TTU Graduation: December 2014

Undergraduate Students

1. John Nickson
    - Honors Research Study: Thermal Behavior of a Cast-in-Place Segmental Concrete Box Girder Bridge
    - TAMU Fall 2020 to Spring 2021
2. Santiago Chavez
    - Research Study: Composite Behavior of Asymmetric Steel I-beams
    - TAMU Spring 2021
3. Hilaire Garza
    - Honors Research Study: Development of a Bridge Weigh-in-Motion System
    - TAMU Spring 2021 to Fall 2021
4. Kaitlyn Speck
    - Research Assistant Role
    - TTU Summer 2016
5. Brandon Wenger
    - Research Assistant Role
    - TTU Spring 2015 to Spring 2017
6. Lydia Holmes
    - Project Title: Instrumentation of an Old Steel Truss Bridge
    - TTU Fall 2014 and Spring 2015
7. Danilo Alves da Silva
    - Project Title: Measurement of Residual Stresses using the Hole-Drilling Strain Gage Method
    - TTU 2014 Summer Research Project

Service Activities

Texas A&M University

- Steel Bridge Faculty Advisor (2019 – 2022)
- Summer Camp BUILD – Lead of Foamcore Beam Module (2019 – 2022)

- Aggieland Saturday Advising (2018 – 2022)
- Graduate committee member for:
  - Mutaz Mohammed (PhD)
  - Andrew Pearson (PhD)
  - Arash Rockey (PhD)
  - Negar Mohammadgholibeyki (PhD)
  - Neeraj Yadav (PhD)
  - Pranav Pradeep Kumar (PhD)
  - Codi McKee (PhD)
  - Yong Yoo (PhD)
  - Benjamin Hayes (MS)
  - Hongrak Pak (PhD)
  - Eldho Shajan (MS)
  - Daron Smith (MS)
  - Hao Chen (PhD)
- Academy for Future Faculty Mentor
  - Negar Mohammadgholibeyki (2021)
  - Hongrak Pak (2021)
  - Eric Stoddard (2020)

Tennessee Tech

- Rising Renaissance Engineer Spectrum Awards Committee (2014 – 2017)
- Steel Bridge Faculty Advisor (2013 – 2017)
- Participant in the COE Academic Integrity Initiative (2016)
- Created the CEE Graduate Student Endowment (2016)
- Organized the CEE Golf Outing and BBQ to raise money for graduate students (2016 – 2017)
- Search Committee Chair for a 2017 Instructor Position (2016 – 2017)
- Graduate committee member for:
  - Dillon Bane (MS)
  - Jared Thompson (MS)

National & International

- TRB Standing Committee on Innovative Highway Structures and Appurtenances (AKB10)
  - Role: Member
  - Dates: 2017-Present
- TRB Standing Committee on Steel Bridges (AKB20)
  - Role: Member
  - Dates: 2016-Present
- SEI/ASCE Technical Committee on Structural Identification of Constructed Systems
  - Role: Member
  - Dates: 2015-2021
- SEI/ASCE Technical Committee on Methods of Monitoring Structural Performance
  - Role: Member
  - Dates: 2015-2021
- Editorial Board for Structural Sensing (part of Frontiers Journal) (2018-present)
- PhD committee for Jack Reilly at Princeton University (2017 – 2019)

- Reviewer for Engineering Structures Journal, ASCE Journal of Bridge Engineering, ASCE Journal of Structural Engineering, ASCE Journal of Computing in Civil Engineering, Journal of Constructional Steel Research, Advances in Structural Engineering, Marine Structures, Steel and Composite Structures, Frontiers in the Built Environment, Sensors, and TRB (2013 – Present)
- Proposal reviewer (2x) for Transportation Consortium of South-Central States (2020 – 2021)

Workshops / Courses Attended

- Granite Workshop - Campbell Scientific (12/2019)
- Collaboration Meeting - AASHTO/NSBA (10/2019)
- Educator Workshop - AISC (7/2018)
- Excellence in Civil Engineering Education (ExCEEd) - ASCE (7/2018)
- NEHRI Summer Institute Workshop - NSF (6/2018)
- Civil Engineering Active Learning Workshop - TAMU (2/2018)
- NDE/SHM Workshop - Federal Highway Administration (6/2016)
- Principal Investigator and Award Manager Workshop - TTU Research Office (3/2014)
- New Faculty Workshop - TTU Research Office (9/2013)
- Learning about Learning Course - TTU STEM Center (2013-2014)

Professional Affiliations

American Society of Civil Engineers (ASCE)
Structural Engineering Institute (SEI)
American Institute of Steel Construction (AISC)
American Iron and Steel Institute (AISI)
Engineering Mechanics Institute (EMI)
Structural Engineers Association of Texas (SEAoT)
American Society of Highway Engineers (ASHE)
American Segmental Bridge Institute (ASBI)
American Society of Nondestructive Testing (ASNT)
American Concrete Institute (ACI)
International Society for Structural Health Monitoring of Intelligent Infrastructure (ISHMII)