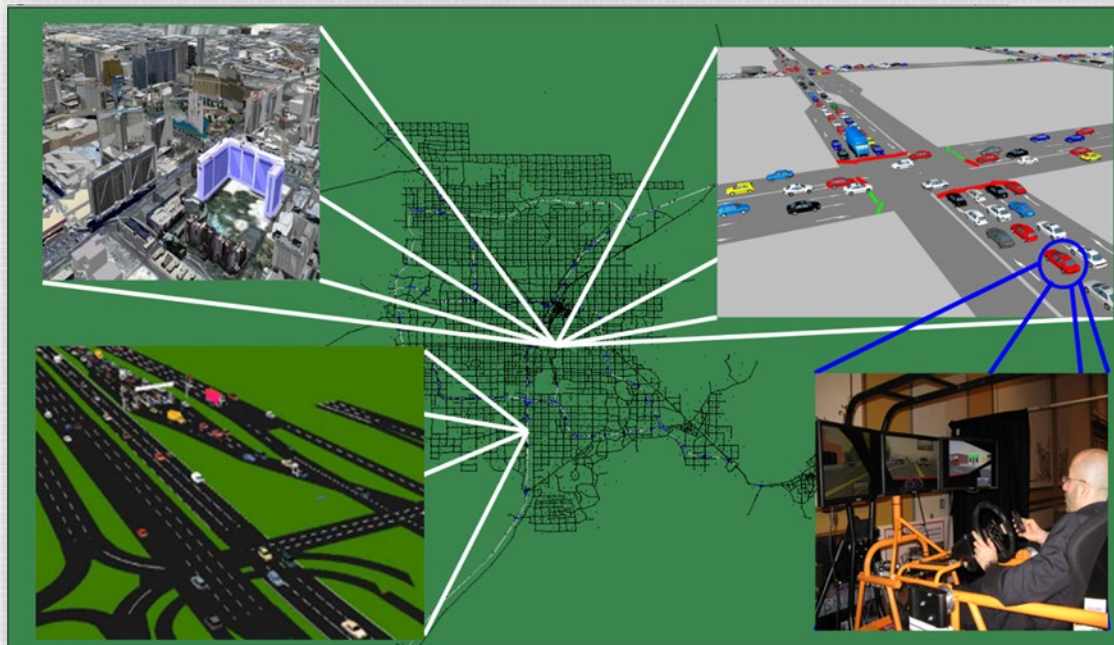


# Transportation Engineering Research





# Transportation Engineering Research



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Dean, College of Engineering  
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Dr. Mohamed Trabia  
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Currently at UNLV, faculty are engaged in studying research on various aspects of transportation systems and their associated infrastructure. These studies are addressing many areas, including:

- Traffic safety engineering
- Geographic Information Systems
- Infrastructure management
- Transportation planning
- Bridge engineering
- Pavement composition research
- Durability of concrete systems
- Foundation engineering
- Geotechnical studies
- Transportation systems analysis and evaluation
- Traffic operations and control

Our researchers are funded by various federal and state agencies. We would like to introduce you to some of our researchers. Please feel to contact us if we can help with future collaboration.



# Transportation Engineering Research Areas of Expertise

- Reinforced concrete structures
- Foundation engineering
- Pavements
- Durability, strength, and the behavior of concrete systems
- Admixtures and supplementary materials in concrete
- Seismic behavior, design, and finite element modeling of reinforced concrete structures
- Extreme loading of structures
- Sustainable design
- Innovative project delivery and contracting methods
- Construction economics and estimating
- Retrofit design and testing
- Fatigue and fracture of steel structures
- Planning for commissioning and startup
- Modular construction
- Construction and highway safety
- Intelligent transportation systems
- Highway monitoring
- Transportation emergency management
- Driver assistance systems
- Traffic and vehicle control systems and sensors
- Signal and video processing
- Internet and smartphone applications
- Questionnaire and survey design, deployment, and analysis
- Urban transportation planning
- Freight transportation
- Tracking of construction resources
- Proximity-based safety control in work zones



# Transportation Engineering Research

## Why UNLV?

- UNLV is situated in the center of a metropolitan area with multiple transportation challenges.
- UNLV has a strong team of multi-disciplinary researchers who are developing new technologies to serve the transportation needs of Las Vegas, the region, and the world.
- UNLV is the home of the Transportation Research Center, which complements and expands the university's existing education, research, and outreach activities.





# Faculty Involved in Transportation Engineering Research

**Dr. Jin Ouk Choi, E.I.T, LEED**

*Assistant Professor, Department of Civil and Environmental Engineering and Construction*

**Dr. Nader Ghafoori**

*Professor, Department of Civil and Environmental Engineering and Construction*

**Dr. David James, P.E., F. NSPE**

*Associate Professor, Department of Civil and Environmental Engineering and Construction*

**Dr. Pushkin Kachroo, P.E.**

*Professor, Department of Electrical and Computer Engineering  
Director, Mendenhall Innovation Program*

**Dr. Moses Karakouzian, P.E.**

*Professor, Department of Civil and Environmental Engineering and Construction*

**Dr. Brendan Morris**

*Associate Professor, Department of Electrical and Computer Engineering*

**Dr. Venki Muthukumar**

*Associate Professor, Department of Electrical and Computer Engineering*

**Dr. Mojdeh Pajouh**

*Assistant Professor, Department of Civil and Environmental Engineering and Construction*

**Dr. Jee Woong Park**

*Assistant Professor, Department of Civil and Environmental Engineering and Construction*

**Dr. Ryan Sherman, P.E.**

*Assistant Professor, Department of Civil and Environmental Engineering and Construction*

**Dr. Pramen Shrestha, P.E.**

*Associate Professor & Graduate Coordinator, Department of Civil and Environmental Engineering and Construction*

**Dr. Hualing (Harry) Teng**

*Professor, Department of Civil and Environmental Engineering and Construction*

**Dr. Ying Tian, P.E.**

*Associate Professor, Department of Civil and Environmental Engineering and Construction*

# Transportation Engineering Research

## Additional Resources

[UNLV Applied Geophysics Center](#)

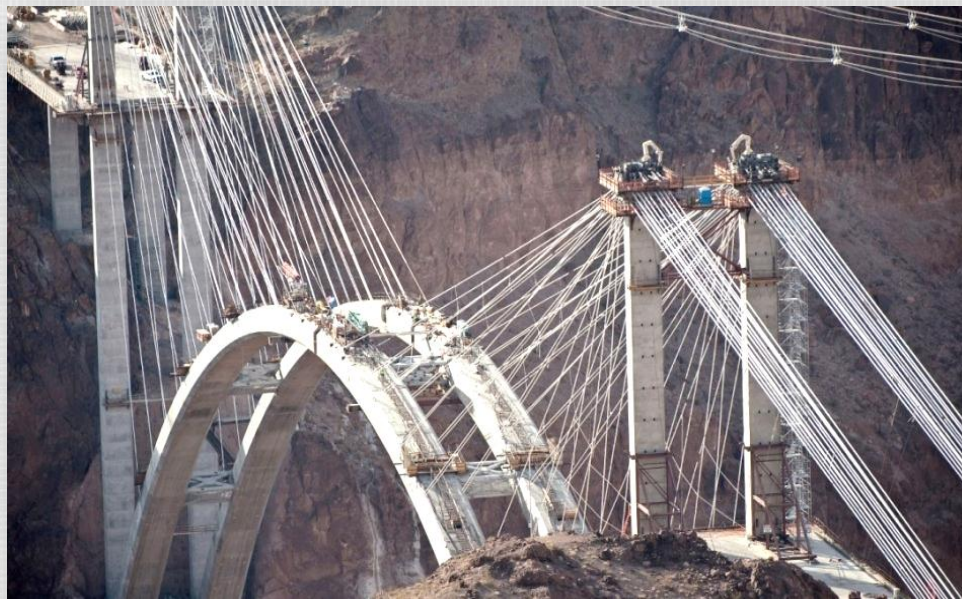
[UNLV Transportation Research Center](#)





# Transportation Engineering

## Research Highlights









# Transportation Engineering Research

**Dr. Jin Ouk Choi, E.I.T., LEED Green Associate, A.M. ASCE**  
Assistant Professor,  
Department of Civil and Environmental Engineering and Construction



## Recent Publications

- Choi, J.; O'Connor, J.T.; Kwak, Y.H.; Shrestha, B. (2019) "Modularization Business Case Analysis Model for Industrial Projects," *ASCE Journal of Management in Engineering*. Publication on Jan. 15, 2019. Available at <<https://ascelibrary.org/doi/abs/10.1061/%28ASCE%29ME.1943-5479.0000683>>
- Choi, J.; Chen, X.; Kim, T. (2017) "Opportunities and Challenges of Modular Methods in Dense Urban Environment," *International Journal of Construction Management*. Published online Oct. 09, 2017. Available at <<http://dx.doi.org/10.1080/15623599.2017.1382093>>
- Han, S.; Choi, J. (Corresponding); O'Connor, J.T., (2017) "Quality of Baseline Schedule: Learnings from Higher Education Capital Projects", *ASCE Journal of Professional Issues in Engineering Education and Practice*. July 20, 2016.
- O'Connor, J.T.; Choi, J. (Corresponding); Winkler, M., (2016) "Critical Success Factors for Commissioning and Start-up of Capital Projects", *ASCE Journal of Construction Engineering and Management*, 10.1061/(ASCE)CO.1943-7862.0001179, 04016060, May 12, 2016.
- Choi, J.; O'Connor, J.T.; Kim, T., (2016) "Recipes for Cost and Schedule Successes for Industrial Modular Projects: Qualitative Comparative Analysis Approach", *ASCE Journal of Construction Engineering and Management*, 10.1061/(ASCE)CO.1943-7862.0001171, 04016055, May 2, 2016.
- Gad, G.M.; Shane, S.J.; Strong, K.; Choi, J. (Corresponding), (2016) "Rethinking Trust in Construction Contracts' Formation: The Dispute Resolution Method Selection", *ASCE Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, 10.1061/(ASCE)LA.1943-4170.0000191, 04516003. April 1, 2016.
- Bhatla, A.; Pradhan, Bulu; Choi, J. (Corresponding), (2016) "Identifying Wastes in Construction Process and Implementing the Last Planner System in India", *KICEM Journal of Construction Engineering and Project Management*, 10.6106/JCEPM.2016.4.12.033. March 2016.
- O'Connor, J.T.; O'Brien, W.J.; Choi, J. (Corresponding) (2016) "Industrial Project Execution Planning: Modularization vs. Stick-built", *ASCE Practice Periodical on Structural Design and Construction*, 10.1061/(ASCE)SC.1943-5576.0000270, Dec. 7, 2015.
- Choi, J. (Corresponding); Bhatla, A.; Stoppel, C.M.; Shane, J.S. (2015) "LEED Credit Review System and Optimization Model for Pursuing LEED Certification", *Sustainability*, 7(10), 13351-13377; doi:10.3390/su71013351, Sept. 29, 2015. Available at <<http://www.mdpi.com/2071-1050/7/10/13351>>.
- O'Connor, J.; O'Brien, W.; Choi, J. (Corresponding) (2015) "Standardization Strategy for Modular Industrial Plants", *ASCE Journal of Construction Engineering and Management*, 10.1061/(ASCE)CO.1943-7862.0001001, 04015026, April 3, 2015.



# Transportation Engineering Research

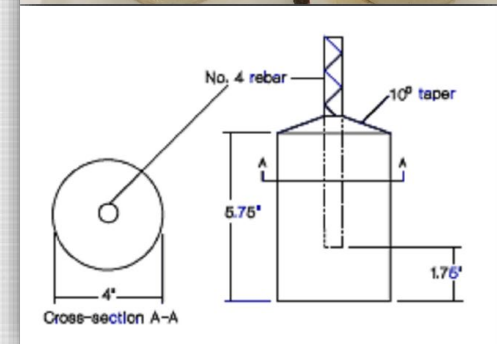
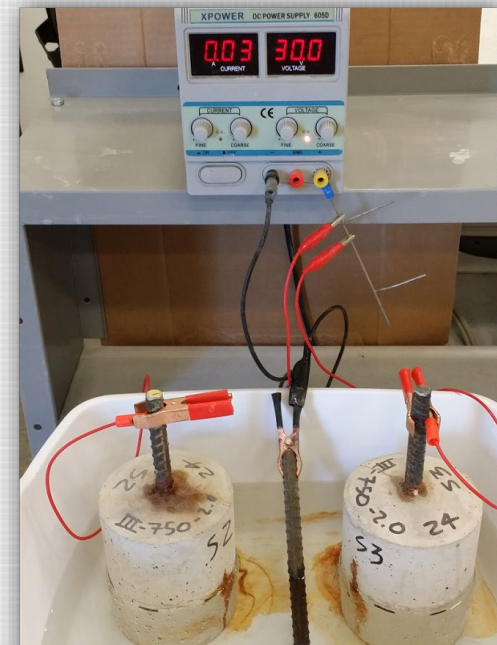
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- Expertise
  - Durability, strength, and the behavior of concrete systems
  - Design and performance of advanced construction materials
  - Rheology and workability of cement-based materials
  - Optimization of chemical admixtures and supplementary cementitious materials in concrete
  - Use of industrial by-products and recycled aggregates in concrete



Corrosion with schematic



# Transportation Engineering Research

**Dr. Nader Ghafoori**

Professor,

Department of Civil and Environmental Engineering & Construction



## Recent Publications

- Islam, M.S., Ghafoori, N. A new approach to evaluate alkali-silica reactivity using loss in concrete stiffness (2018). *Construction and Building Materials*, 167, pp. 578-586.
- Ghafoori, N., Batilov, I., Najimi, M. Effects of blaine and tricalcium aluminate on the sulfate resistance of nanosilica-containing mortars (2018). *Journal of Materials in Civil Engineering*, 30 (2), art. no. 04017272.
- Ghafoori, N., Batilov, I., Najimi, M. Influence of dispersion methods on sulfate resistance of nanosilica-contained mortars (2017). *Journal of Materials in Civil Engineering*, 29 (7), art. no. 04017038.
- Ghafoori, N., Spitek, R., Najimi, M. Transport properties of limestone-containing self-consolidating concrete (2017). *ACI Materials Journal*, 114 (4), pp. 527-536.
- Islam, M.S., Ghafoori, N. Influence of cement alkalis on mortar expansion of ASTM C 1260 (2017). *Proceedings of Institution of Civil Engineers: Construction Materials*, 170 (3), pp. 153-161.
- Islam, M.S., and Ghafoori, N., "Suppressing Alkali-Silica Reactivity Using Class F Fly Ash: An Experimental and Analytical Investigations," *Journal of Materials (ACI)*, Vol. 113, Issue 1, 2016, pp. 13-24.
- Islam, M.S., and Ghafoori, N., "Experimental Study and Empirical Modeling of Lithium Nitrate for Alkali-Silica Reactivity," *Journal of Construction and Building Materials*, *Journal of Materials (ACI)*, Vol. 121, Issue 9, 2016, pp. 717-726.
- Ghafoori, N., Batilov, I., Najimi, M., "Sulfate Resistance of Nanosilica and Microsilica Contained Mortars", *Journal of Materials (ACI)*, Vol. 113(4), 2016, pp. 4595-469.
- Ghafoori, N., Spitek, R., Najimi, M., "Effects of Limestone Size and Content on Transport Properties of Self-Consolidating Concrete", *Journal of Construction and Building Materials*, Vol. 127, 2016, pp. 5885-5951.
- Ghafoori, N., Najimi, M., Radke, B., "Natural Pozzolan-Based Geopolymers for Sustainable Construction", *Journal of Environmental Earth Sciences*, In print, DOI: 10.1007/s12665-016-5898-5, 2016.



# Transportation Engineering Research

**Dr. Dave James, P.E., F.NSPE**

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- Expertise
  - Evaluation of survey data for margins of error
  - Paved road and vacant land dust emissions
  - Dust control
- Relevant Projects
  - Paved Road Dust emissions, Sponsor: Clark County Department of Air Quality and Environmental Management.
  - Refined Emission Factors for Native Desert and Disturbed Open Land Area. Sponsored by Clark County Department of Air Quality and Environmental Management





# Transportation Engineering Research

**Dr. Dave James, P.E., F.NSPE**

Associate Professor,

Department of Civil and Environmental Engineering and  
Construction



## Recent Publications

- James, David E., Schraw, G., & Kuch, F. (2019). Using the margin of error statistic to examine the effects of aggregating student evaluations of teaching. *Assessment & Evaluation in Higher Education*, 1-11.
- James, David E., Schraw, G. & Kuch F. (2015) Using the sampling margin of error to assess the interpretative validity of student evaluations of teaching, *Assessment & Evaluation in Higher Education*, 40:8, 1123-1141.
- China, S. and D. James. (2012). "Influence of pavement macrotexture on PM10 emissions from paved roads: A controlled study" *Atmospheric Environment*, v.63: 313-326.
- China, S, and D. James. (2012). Comparison of Laser-based and Sand Patch Measurements of Pavement Surface Macrotexture, in *ASCE Journal of Transportation Engineering*, v.138(2): 176–181.
- James, David E., Vinod Vasudevan, Ping Xi, Srinivas S. Pulugurtha, Dominic K. Chan and Avinash Kaiparambil. (2009). Development of Mobile Vehicle Fleet Activity Input Files for Metropolitan Southern Nevada Using On-board Data Loggers (Paper # 09-0478). *Transportation Research Board 88th Annual Meeting*, Compendium of Papers, DVD-ROM. Washington, DC, January 11-15.
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# Transportation Engineering Research

**Dr. Pushkin Kachroo, P.E.**

Professor,

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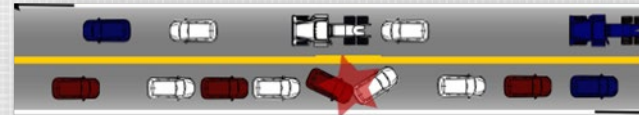
Director, Mendenhall Innovation Program

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- Expertise

- Intelligent Transportation Systems
- Transportation Safety Systems
- Data processing, collection, and analysis
- Traffic and vehicle control systems and sensors
- Signal and video processing
- Database design, development, and visualization
- Internet and smartphone applications
- Questionnaire and survey design, deployment, and analysis
- Mathematical modeling, analysis, simulation, and statistics



Simulator used to study driver behavior in various traffic conditions.



# Transportation Engineering Research

**Dr. Pushkin Kachroo, P.E.**

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Department of Electrical and Computer Engineering

Director, Mendenhall Innovation Program



## Recent Publications

- Kachroo P., Özbay K.M.A. (2018) Feedback Routing via Congestion Pricing. In: Feedback Control Theory for Dynamic Traffic Assignment. *Advances in Industrial Control*. Springer, Cham.
- Kachroo P., Özbay K.M.A. (2018) Dynamic Routing Problem in Distributed Parameter Setting Using Semigroup Theory. In: Feedback Control Theory for Dynamic Traffic Assignment. *Advances in Industrial Control*. Springer, Cham.
- S Contreras, S Agarwal, P Kachroo, Quality of Traffic Observability on Highways with Lagrangian Sensors, *IEEE Transactions on Automation Science and Engineering*, 2017.
- P Kachroo, S Agarwal, B Piccoli, K Ozbay, Multi-scale Modeling and Control Architecture for V2X Enabled Traffic Streams, *IEEE Transactions on Vehicular Technology*, 2017.
- P Kachroo, S Agarwal, S Sastry, Inverse Problem for Non-viscous mean Field Control: Example from Traffic, *IEEE Transactions on Automatic Control* 61 (11), 3412-3421, 2016.
- S Agarwal, P Kachroo, E Regentova, A Hybrid Model using Logistic Regression and Wavelet Transformation to Detect Traffic Incidents, *IATSS Research* 40 (1), 56-63, 2016.
- P Verma, H Yang, P Kachroo, S Agarwal, Modeling and Estimation of the Vehicle-Miles Traveled Tax Rate Using Stochastic Differential Equations, *IEEE Transactions on Systems, Man, and Cybernetics: Systems* 46 (6), 818-828, 2016.
- P Kachroo, S Sastry, Traffic Assignment using a Density-Based Travel-Time Function for Intelligent Transportation Systems, *IEEE Transactions on Intelligent Transportation Systems* 17 (5), 1438-1447, 2016.
- S Agarwal, P Kachroo, S Contreras, A Dynamic Network Modeling-Based Approach for Traffic Observability Problem, *IEEE Transactions on Intelligent Transportation Systems* 17 (4), 1168-1178, 2016.
- S Contreras, P Kachroo, S Agarwal, Observability and Sensor Placement Problem on Highway Segments" A Traffic Dynamics Approach, *IEEE Transactions on Intelligent Transportation Systems* 17 (3), 848-858, 2016.



# Transportation Engineering Research

## Dr. Moses Karakouzian

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- Expertise
  - Geotechnical engineering
  - Foundation engineering
  - Construction materials
  - Highway and pavement materials



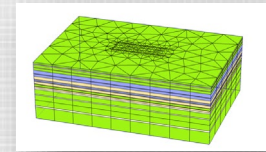


# Transportation Engineering Research

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## Recent Publications

- S. Mahmoud Motahari Karein, MohammadBalapour, MosesKarakouzian. Improving the hardened and transport properties of perlite incorporated mixture through different solutions: Surface area increase, nanosilica incorporation or both. *Construction and Building Materials*, Volume 209, 10 June 2019, Pages 187-194.
- Jazaei R, Karakouzian M, O'Toole B, Moon J, Gharehdaghi S. Failure Mechanism of Cementitious Nanocomposites Reinforced by Multi-Walled and Single-Walled Carbon Nanotubes Under Splitting Tensile Test. ASME. *ASME International Mechanical Engineering Congress and Exposition, Volume 9: Mechanics of Solids, Structures, and Fluids* (:Vo09T12A012. doi:10.1115/IMECE2018-88512.
- Shrestha, P., Sharma, R., Karakouzian, M., and Singh, A. (2015), "Comparing Performance and Impediments of Construction and Professional Disadvantaged Business Enterprises in Transportation." *J. Prof. Issues Eng. Educ. Pract.* , 10.1061/(ASCE)EI.1943-5541.
- M. Khalili, M. Karakouzian (2015). "Feasibility of ultrasonic measurements for characterizing rheological properties of asphalt binders", *Construction and Building Materials* 75, pp.220–226.
- Xiao, F., Amirkhanian, S., Karakouzian, M. and Khalili, M. (2015), "Rheology evaluations of WMA binders using ultraviolet and PAV aging procedures", *Construction and Building Materials* 79, pp.56–64.
- Karakouzian, M., Afsharhasani, R., and Kluzniak, B. (2015), *Elastic Analysis of Drilled Shaft Foundations in Soil Profiles with Intermediate Caliche Layers*. IFCEE 2015: pp. 922-928.
- Stone, R, Karakouzian, M., and Afsharhasani, R.(2013), *The Stiffening Effect of a Caliche Layer on Pile Foundations*, Proceedings of the 38th Annual Conference on Deep Foundations, 2013, Phoenix, AZ, USA (DFI).
- A. Puli, M. Karakouzian, X. Xu (2012). "Identification of Graffiti Countermeasures for Highway Facilities", *Procedia - Social and Behavioral Sciences*, 12/43 pp.681–691.



# Transportation Engineering Research

**Dr. Brendan Morris**

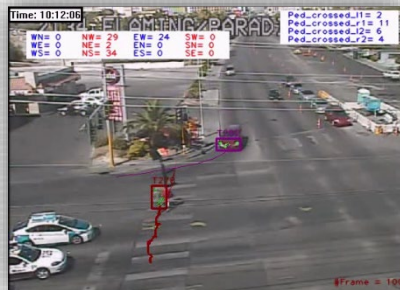
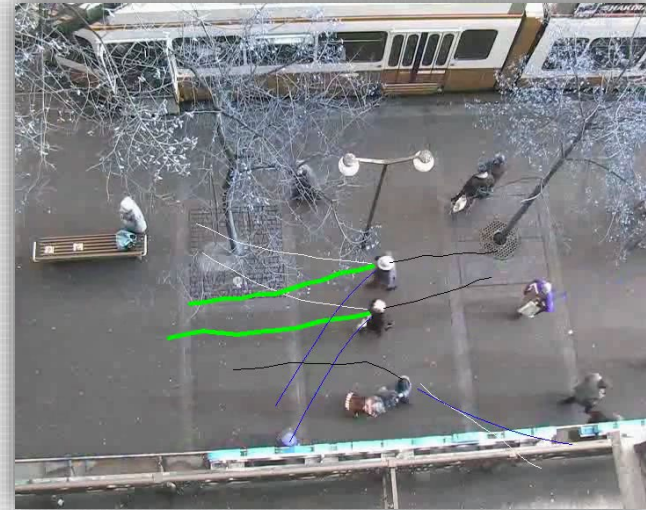
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Email: [brendan.morris@unlv.edu](mailto:brendan.morris@unlv.edu)

Website: <http://rtis.oit.unlv.edu>

- Expertise
  - Intelligent transportation systems
  - AI and deep learning
  - Self-driving vehicles
  - Safety
  - Real-time activity analysis



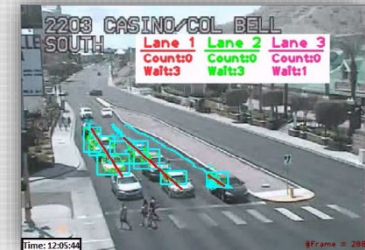


# Transportation Engineering Research

**Dr. Brendan Morris**

Associate Professor,

Department of Electrical and Computer Engineering



## Recent Publications

- N. Nikhil and B. T. Morris, "Convolutional neural network for trajectory prediction," in *European Conference on Computer Vision Workshop*, Munich, Germany, Sep. 2018.
- M. S. Shirazi and B. T. Morris, "Investigation of safety analysis methods using computer vision techniques," *Journal of Electronic Imaging*, vol. 26, no. 5., pp. 051404, 2017.
- B. T. Morris and M. S. Shirazi, "Intersection monitoring using computer vision techniques for capacity, delay, and safety analysis," John Wiley & Sons, Ltd. 2017.
- M. S. Shirazi and B. T. Morris, "Looking at intersections: A survey of intersection monitoring, behavior & safety analysis of recent studies," in *IEEE Trans. Intell. Transp. Syst.*, vol. 18, no. 1., pp. 4-24, Jan. 2017.
- M. S. Shirazi and B. T. Morris, "Vision-based pedestrian behavior analysis at intersections," in *Journal of Electronic Imaging*, pp. 051203, March, 2016.
- M. S. Shirazi, B. Morris, "Vision-Based Turning Movement Monitoring: Count, Speed and Waiting Time Estimation," in *IEEE Intelligent Transportation Systems Magazine* 8 (1), pp. 23-34, January, 2016.
- M. S. Shirazi, B. T. Morris, "A Typical Video-based Framework for Counting, Behavior and Safety Analysis at Intersections," in *IEEE Intelligent Vehicles Symposium*, pp. 1264-1269, June 2015, Seoul, Korea.
- M. S. Shirazi, B. Morris, "Observing Behaviors at Intersections: A Review of Recent Studies & Developments," in *IEEE Intelligent Vehicles Symposium*, pp. 1258-1263, June 2015, Seoul, Korea.
- B. Tian, B. Morris, M. Tang, Y. Liu, Y. Yao, C. Gou, D. Shen, and S. Tang, "Hierarchical and Networked Vehicle Surveillance in ITS: A Survey," in *IEEE Transactions on Intelligent Transportation Systems*, vol. 16, no. 2, pp. 557-580, April 2015.
- B. T. Morris, C. Tran, G. Scora, M. M. Trivedi, and M. J. Barth, "Real-Time Video-Based Traffic Measurement and Visualization System for Energy/Emissions," *IEEE Trans. Intell. Transp. Syst.*, vol. 13, no. 4, pp. 1667-1678, Dec. 2012.
- B. T. Morris and M. M. Trivedi, "Trajectory Learning for Activity Understanding: Unsupervised, Multilevel, and Long-Term Adaptive Approach," *IEEE Trans. Pattern Anal. Mach. Intell.*, vol. 33, no. 11, pp. 2287-2301, Nov. 2011.



# Transportation Engineering Research

## Dr. Venki Muthukumar

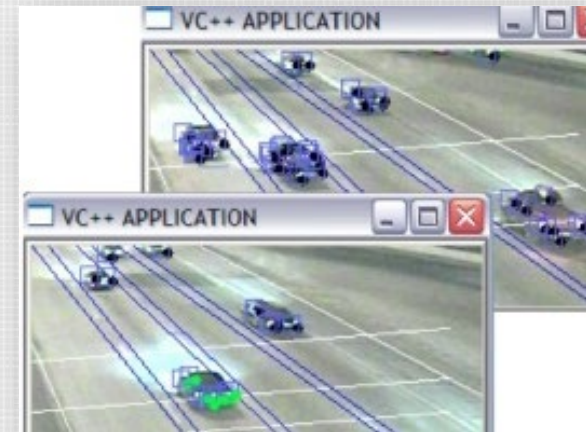
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- Expertise
  - High performance and real-time embedded systems for ITS applications
  - Video processing for vehicle and pedestrian detection, tracking, and conflict analysis
  - UAV systems and their applications in ITS
  - Traffic safety, distracted driving deterrents
  - Embedded sensors for smart traffic data collection, archiving, and visualization





# Transportation Engineering Research

**Dr. Venki Muthukumar**

Associate Professor,  
Department of Electrical and Computer Engineering



## Recent Publications

### Articles

- Farideh Foroozandeh Shahraki, Ali Pour Yazdanpanah, Emma E. Regentova, and Venkatesan Muthukumar. A Trajectory Based Method of Automatic Counting of Cyclist in Traffic Video Data. *International Journal on Artificial Intelligence Tools* 2017 26:04.
- F. Shahraki, A. Yazdanpanah, E. Regentova, V. Muthukumar. Bicycle Detection Using HOG, HSC and MLBP. 2015. *International Symposium on Visual Computing*, 554-562
- H. Teng, X. Xu, V. Muthukumar, A. Reed Gibby. Test a Queue Detection System for Special Events in Nevada. *Journal of Transportation Technologies* Vol.4 No.1, Pub. Date: January 26, 2014. DOI: 10.4236/jtts.2014.41013.
- N. Chintalacheruvu and V. Muthukumar, "Video Based Vehicle Detection and its Application in Intelligent Transportation Systems," *Journal of Transportation Technologies*, Vol. 2 No. 4, 2012, pp. 305-314. DOI: 10.4236/jtts.2012.24033.
- Daggu Venkateshwar Rao, Shruti Patil, Naveen Anne Babu, V. Muthukumar (2006). Implementation and Evaluation of Image Processing Algorithms on Reconfigurable Architecture using C-based Hardware Descriptive Languages. In the *International Journal of Theoretical and Applied Computer Sciences (IJTACS)*, Vol. 1(1), 2006, pp. 9-34, GBS Publishers.
- V. Muthukumar, E. Regentova, J. Zheng, A. Ponzio, T. Wu, Z. Devlin (2006). Non-Intrusive Eye Detection and Tracking System for Gaze Differentiation. In *International Journal of Computational Intelligence Theory and Practice*, Serial Pub., pp. 43-57, Vol. 1(1), 2006.
- V. Muthukumar, D. Venkateshwar Rao (2006). Image Processing Algorithms on Reconfigurable Architecture using Handel-C. *Journal of Engineering and Applied Science*, Medwell Pub., 1(2):103-111, 2006.



# Transportation Engineering Research

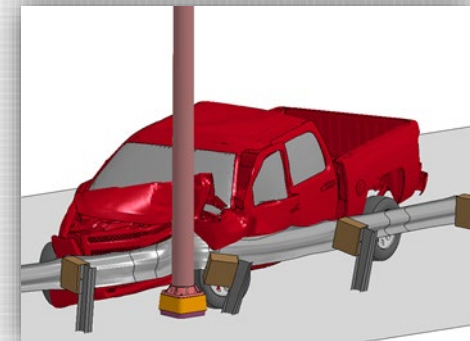
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- Expertise
  - Extreme load engineering
  - Design of resilient and sustainable infrastructural systems
  - Design of roadside safety barriers
  - Numerical modeling and impact engineering
  - Full-scale crash testing
  - Geotechnical Earthquake Engineering

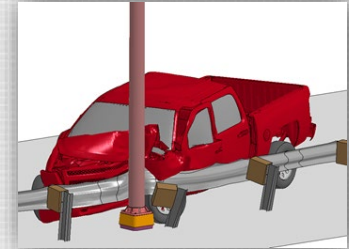




# Transportation Engineering Research

## Dr. Mojdeh Pajouh

Assistant Professor, Department of Civil and Environmental Engineering and Construction



## Recent Publications

- Asadollahi Pajouh, M., Lechtenberg, K.A., Faller, R., Pile Design for Use in High-Tension Cable Median Barriers. *ASCE Geocongress 2019*, Philadelphia, PA, March 2019.
- Bielenberg, R.W., Schmidt, J.D., Faller, R.K., Asadollahi Pajouh, M., Reid, J. D., and Emerson, E. (2018). Development of Retrofit, Low-Deflection Portable Concrete Barrier System, *Journal of Transportation Safety and Security*, DOI: 10.1080/19439962.2017.1420717.
- Asadollahi Pajouh, M. Schmidt, J.D., Bielenberg, R.W., Reid, J. D., and Faller, R.K. Simplified Soil-Pile Interaction Modeling under Impact Loading. Proceedings of 5th *Geotechnical Earthquake Engineering and Soil Dynamics Conference*, ASCE GEESDV 2018, Austin, Texas.
- Asadollahi Pajouh, M., Schmidt, J.D., Bielenberg, R.W., Faller, R.K., Reid, J. D., and Emerson, E. (2017). Development of a Transition between Free-Standing and Reduced-Deflection Portable Concrete Barriers. *Journal of Transportation Research Board*, No. 18-05516.
- Asadollahi Pajouh, M., Ramen, J.D., Stolle, C.S., Reid, J. D., and Faller, R.K. (2017). Rail Height Effects on Safety Performance of Midwest Guardrail System. *Journal of Traffic Injury Prevention*. Taylor & Francis, DOI: 10.1080/15389588.2017.1353687.
- Asadollahi Pajouh, M., Bielenberg, R.W., Schmidt J., Faller, R.K. (2017). Safe Placement of Breakaway Luminaire Poles behind Midwest Guardrail System. *International Journal of Crashworthiness*. DOI: 10.1080/13588265.2017.1359367.
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- Asadollahi Pajouh, M., Reid, J. D., Bielenberg, R.W., Schmidt, J.D., and Faller, R.K. (2017). Pole Placement near The Midwest Guardrail System. Proceedings of *ASME International Mechanical Engineering Congress and Exposition IMECE2017*



# Transportation Engineering Research

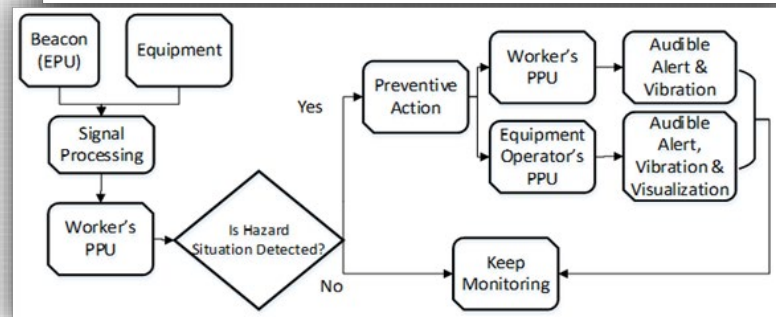
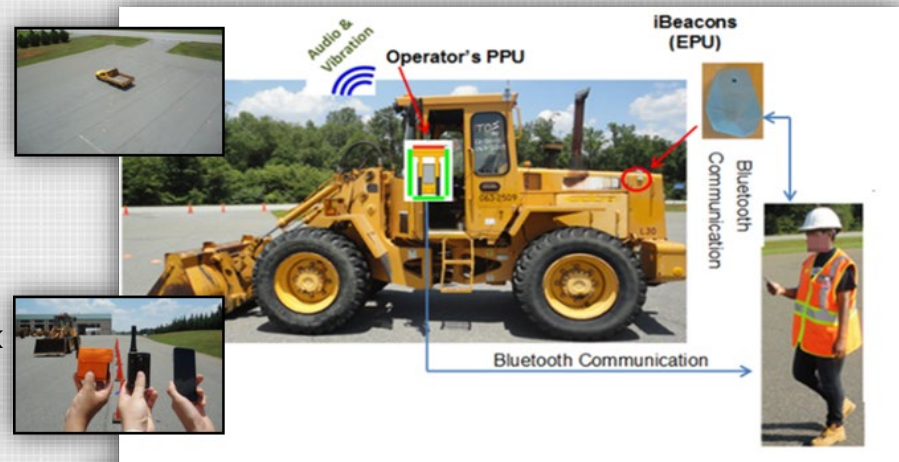
## Dr. Jee Woong Park

Assistant Professor, Department of Civil and Environmental Engineering and Construction

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- Expertise
  - Construction engineering and project management
  - Information and sensing technology
  - Proximity-based safety control in work zone
  - Tracking of construction resources
  - Construction safety





# Transportation Engineering Research

**Dr. Jee Woong Park**

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## Recent Publications

- Park, J., Yang, X., Cho, Y.K. and Seo, J. (2017). Improving dynamic proximity sensing and processing for smart work-zone safety. *Automation in Construction*, 84, pp.111-120.
- Park, J., Cho, Y.K., (2017). Development and Evaluation of a Probabilistic Local Search Algorithm for Complex Dynamic Indoor Construction Sites. *Journal of Computing in Civil Engineering*, 31(4), p.04017015.
- Park, J., Chen, J., Cho, Y. (2017) "Self-Corrective Knowledge-based Hybrid Tracking System Using BIM and Multimodal Sensors," *Journal of Advanced Engineering Informatics*, 32, pp. 126-138, 10.1016/j.aei.2017.02.001.
- Park, J., Kim, K., Cho, Y. (2016) "Framework of Automated Construction-Safety Monitoring using Cloud-enabled BIM and BLE Mobile Tracking Sensors," *Journal of Construction Engineering and Management*, 143(2), p.05016019, 10.1061/(ASCE)CO.1943-7862.0001223.
- Park, J., Cho, Y., Martinez, D. (2015) "A BIM and UWB integrated Mobile Robot Navigation System for Indoor Position Tracking Applications," *Journal of Construction Engineering and Project Management*, Vol. 6, Issue 2., pp. 30-39.
- Park, J., Marks E., Cho, Y., Suryanto, W. (2015) "Performance Test of Wireless Technologies for Personnel and Equipment Proximity Sensing in Work Zones," *Journal of Construction Engineering and Management*, 142(1), p. 04015049, 10.1061/(ASCE)CO.1943-7862.0001031.
- Park, J., Cho, Y., Wang, C. (2015) "Analytic Hierarchical Procedure and Economic Analysis of Pneumatic Pavement Crack Cleaning Methods," *Journal of Construction Engineering and Project Management*, Vol. 5, Issue 2., pp. 44-52.
- Park, J., Cho, Y. K. "Use of a Mobile BIM Application Integrated with Asset Tracking over a Cloud," *21<sup>st</sup> International Conference on Advancement of Construction Management and Real Estate*, Hong Kong, Dec. 14-16, 2016.
- Park, J., Cho, Y. K., Kim, K. "Field Construction Management Application through Mobile BIM and Location Tracking Technology," *Proceedings of the 33rd International Symposium on Automation and Robotics in Construction (ISARC)*, Auburn, Alabama, July 18-21, 2016.
- Park, J., Cho, Y. K., Simalsina, S. K. "Direction Aware Bluetooth Low Energy Based Proximity Detection System for Construction Work Zone Safety," *Proceedings of the 33rd International Symposium on Automation and Robotics in Construction (ISARC)*, Auburn, Alabama, July 18-21, 2016.
- Park, J., Kim, K., Cho, Y. K. "Using BIM Geometric Properties for BLE-based Indoor Location Tracking," *4<sup>th</sup> Seoul International Conference on Applied Science and Engineering*, Seoul, South Korea, July 5-7, 2016.



# Transportation Engineering Research

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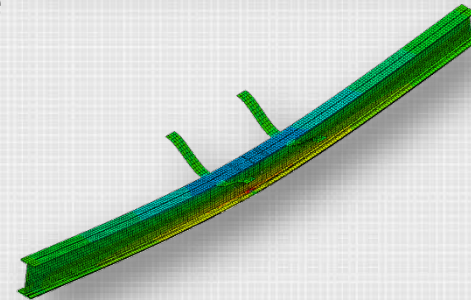
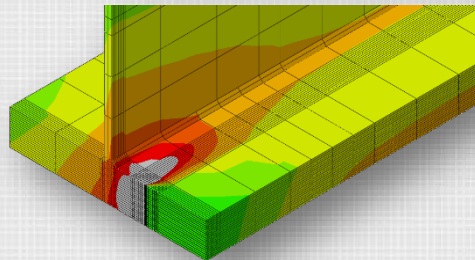
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- Expertise

- Fatigue and fracture of steel structures
- Retrofit design and testing
- Fitness-for-service evaluation
- Large-scale structural testing
- Field monitoring and testing of structures
- Redundancy of structural systems
- Bridge design, fabrication, construction, and performance
- Evaluation and preservation of historic structures





# Transportation Engineering Research



**Dr. Ryan Sherman, P.E.**

Assistant Professor,

Department of Civil & Environmental Engineering & Construction

## Recent publications

### Journal Articles

- Sherman, R., Connor, R. (2019). "Development of a Fatigue Design Load for High-Mast Lighting Towers." *ASCE Journal of Structural Engineering*, 145(1), 04018228.
- Hebdon, M., Sherman, R., Connor, R. (2018). "Hardness Variation in Driven Rivets for Bridge Evaluation." *ASCE Journal of Materials in Civil Engineering*, 30(10), 04018246.
- Collins, W., Sherman, R., Connor, R., Leon, R. (2016). "State-of-the-Art Fracture Characterization. I: Master Curve Analysis of Legacy Bridge Steels." *Journal of Bridge Engineering*, 04016097.
- Collins, W., Sherman, R., Connor, R., Leon, R. (2016). "State-of-the-Art Fracture Characterization. II: Correlations between Charpy V-Notch and the Master Curve Reference Temperature,  $T_0$ ." *Journal of Bridge Engineering*, 04016098.
- Sherman, R., Hebdon, M., Connor, R. (2016). "Fatigue Testing and Retrofit Details of High-Mast Lighting Towers." *Engineering Journal*, 53(1).

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- Lloyd, J., Hebdon, M., Sherman, R., Connor, R. (2014). "Comparative Study of Data Acquisition Systems for Controlled Load Testing of Rural Steel Bridges." Purdue University. West Lafayette, IN.
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- Connor, R., Varma, A., Marcu, S., Sherman, R. (2012). "Evaluation of Effects of Fire on the I-465 Mainline Bridges – Volume 1." *Joint Transportation Research Program*, Indiana Department of Transportation, and Purdue University. West Lafayette, IN.

### Conference Proceedings

- Sherman, R., Collins, W., Connor, R. (2018). "A Potential Framework for Exploiting the Benefits of High-Toughness Steel." *2018 World Steel Bridge Symposium*. Baltimore, MD.
- Sherman, R., Collins, W., Connor, R. (2016). "Towards an Integrated Fracture Control Plan." *2016 World Steel Bridge Symposium*. Orlando, FL.



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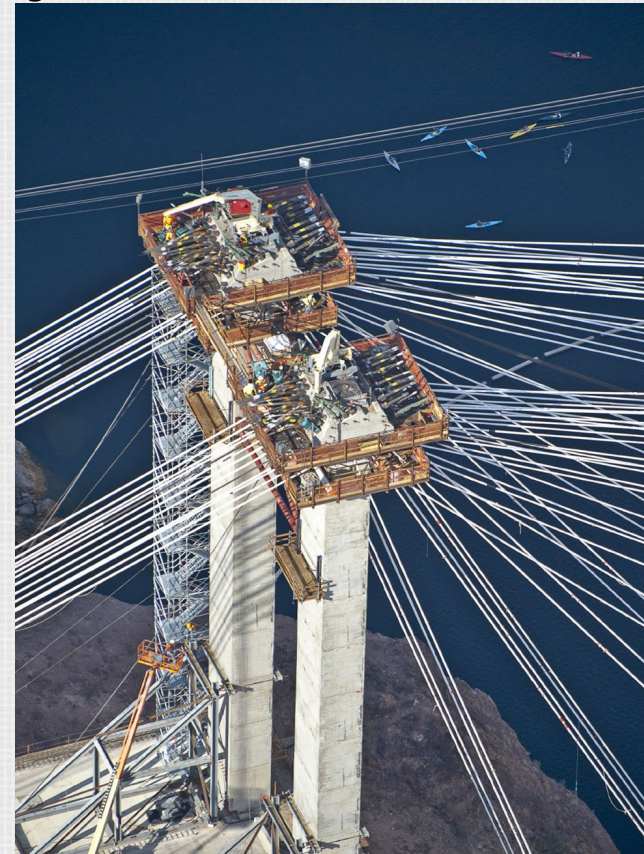
## Dr. Pramen Shrestha, P.E.

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- Expertise
  - Innovative project delivery and contracting methods
  - Benchmarking of construction projects
  - Heavy highway construction materials
  - Sustainability
  - Construction safety
  - Highway safety
  - Work zone safety
  - Quantitative methods
  - Transportation emergency management
  - Life cycle cost analysis



Hoover Dam Bypass Bridge Construction



# Transportation Engineering Research

Dr. Pramen Shrestha, P.E.

Associate Professor,

Department of Civil and Environmental Engineering & Construction



## Recent Publications

- Shrestha, P.P. and Maharjan, R. "Change Orders and the Effects on Cost and Schedule for Small Low-Bid Highway Contracts." *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, ASCE, January, 2019 (in press).
- Gad, G. M., Davis, B., Shrestha, P. P., and Harder, P. "Lessons Learned from Progressive Design-Build Implementation on Major Airport Projects." *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, ASCE, January, 2019 (in press).
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- Shrestha, P.P. and Maharjan, R. "Effect of Change Orders with Cost Growth, Schedule Growth, and Construction Intensity of Large Highway Projects." *Proceedings of ASCE Construction Institute Conference*, Fort Worth, TX, March 1-3, 2018.
- Maharjan, R. and Shrestha, P.P. "Relationship between Project Performance and Contract Procurement Factors in Design-Bid-Build Highway Projects." *Proceedings of ASCE Construction Research Congress Conference*, Baton Rouge, LA, April 2-5, 2018.
- Fathi, M. and Shrestha, P.P. "Performance Comparison of Design-Build Projects for Highways and Buildings." *Proceedings of ASCE Construction Research Congress Conference*, Baton Rouge, LA, April 2-5, 2018.
- Shrestha, P.P., and Dhakal, D. "Maintenance Practices for Chloride-Induced Corrosion in Reinforced-Concrete Bridge-Pier Columns." *Proceedings of ASCE Construction Research Congress Conference*, Baton Rouge, LA, April 2-5, 2018.
- Shrestha, P.P., Shrestha, K., and Lidder, M., "Quality of Road Maintenance Works Performed by State Force versus Private Contractors in Nevada," *Journal of Practice Periodical on Structural Design and Construction*, ASCE, 22(4), 10.1061/(ASCE)SC.1943-5576.0000326, 04017012 (1-8), 2017.
- Shrestha, K., Shrestha, P.P., and Shrestha, G., "Carbon Dioxide Emissions by the Transportation Sector and its Impact on Health in the Kathmandu Valley, Nepal," *Journal of Civil Engineering and Architecture*, doi: 10.17265/1934-7359/2017.02.009, 111 (2017), 184-193.
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# Transportation Engineering Research

**Dr. Hualiang (Harry) Teng**

Professor,

Department of Civil and Environmental Engineering and Construction

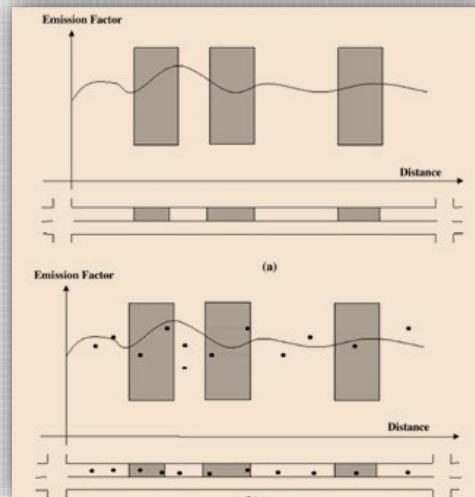
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- Expertise
  - Railroad and high speed rail
  - Intelligent transportation systems (ITS)
  - Air quality analysis



Evaluation of speed monitoring displays for work zones in Las Vegas.



Emission measurements from mobile sampling technology and their true distribution.



# Transportation Engineering Research

**Dr. Hualing (Harry) Teng**

Professor,

Department of Civil and Environmental Engineering & Construction



## Recent Publications

- Yongjun Ni, Jiayu Chen, Hualiang Teng, and Hui Jiang, Influence of Earthquake Input Angle on Seismic Response of Curved Girder Bridge, *Journal of Traffic and Transportation Engineering*, Volume 2, Issue 4, August 2015, Pages 233–241.
- Masinick, J., H. Teng, and N. Orochena, "The Impact of Rubbernecking on Urban Freeway Traffic", *Journal of Transportation Technologies*, Vol.4 No.1, pp. 116-125, January 2014.
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- Teng H., Xu X., Xin L., Kwigizile V., and Gibby A.R., "Evaluation of the Speed Monitoring Display for Work Zones in Las Vegas", *Journal of Transportation Research Record* 2107, pp. 46-56, 2009.
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- QiY., Teng H., and Martinelli D.R. "An Investigation of Incident Frequency, Duration and Lanes Blockage for Determining Traffic Delay", *Journal of Advanced Transportation*, Vol. 43, No. 3, pp. 275-299, 2009.
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# Transportation Engineering Research

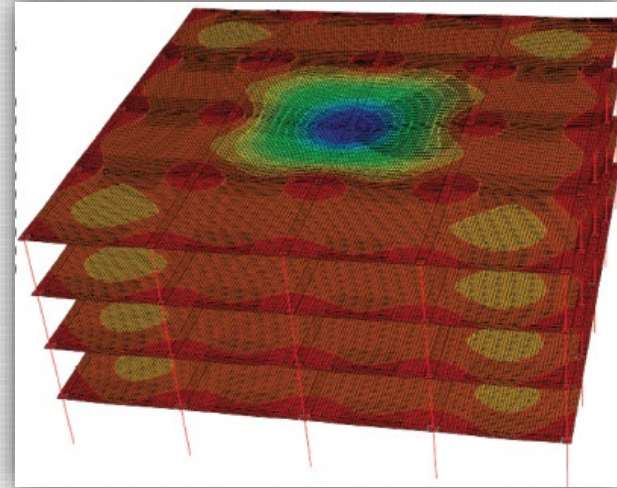
**Dr. Ying Tian, P.E.**

Associate Professor,  
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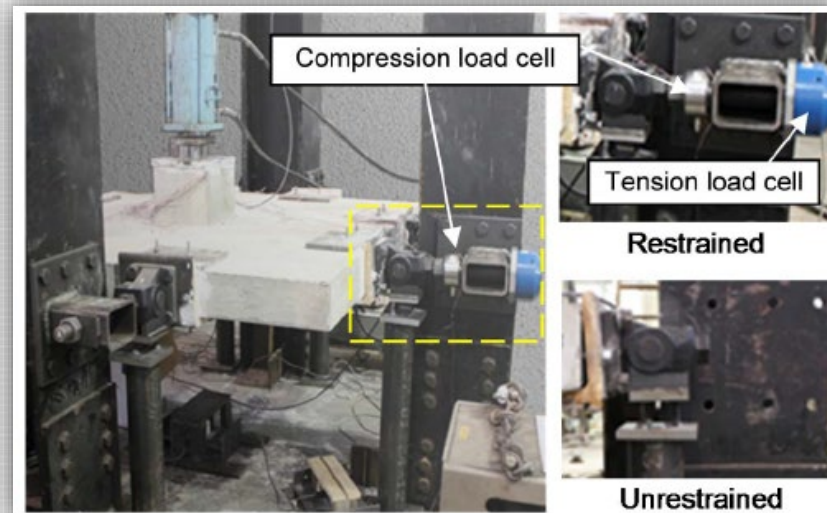
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  - Advanced non-linear dynamic response analyses
  - Earthquake engineering
  - Extreme loading of structures
  - Design and behavior of reinforced concrete structures

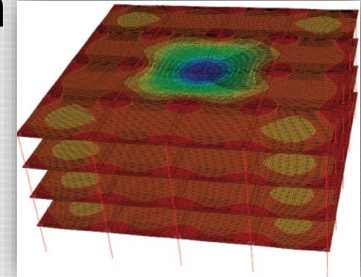


Collapse of a building caused by interior column removal.





# Transportation Engineering Research



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- Jawdhari, A., Orton, S., Al-Zuheriy, A., and Tian, Y. (2019). "Response of Flat-Plate Slab-Column Connections under Dynamic Loads during Collapse," *ACI Structural Journal*, accepted.
- Wang, L., Tian, Y., Luo, W., Li, G., Zhang, W., Liu, S., and Zhang, C. (2019). "Experimental Study of Seismic Performance of Axially Restrained Reinforced Concrete Frame Beams," *Journal of Structural Engineering, ASCE*, 145(5), 04019019.
- Xue, H., Gilbert, B. P., Guan, H., Lu, X., Li, Y., and Tian, Y. (2018). "Load Transfer and Collapse Resistance of RC Flat Plates under Interior Column Removal Scenario," *Journal of Structural Engineering, ASCE*, 144(7), 04018087.
- Wu, L., Tian, Y., Su, Y., and Chen, H. (2018). "Seismic Performance of Precast Composite Shear Walls Reinforced by Concrete-Filled Steel Tubes," *Engineering Structures*, 162, 72-83.
- Peng, Z., Orton, S.L., Liu, J., Tian, Y. "Effects of in-plane restraint on progression of collapse in flat-plate structures" (2017) *Journal of Performance of Constructed Facilities*, 31 (3), art. no. 04016112.
- Orton, S., Peng, Z., Tian, Y. "Post-punching capacity of flat-plate floor systems" (2016) *American Concrete Institute, ACI Special Publication*, 2016-January (SP 309), pp. 55-65.
- Qian, K., Li, B., Tian, Y. "Recent progress in understanding of load resisting mechanisms for mitigating progressive collapse" (2016) *American Concrete Institute, ACI Special Publication*, 2016-January (SP 309), pp. 67-83.
- Peng, Z., Orton, S., Tian, Y. "Experimental dynamic response of reinforced concrete flat plate sub-structure under collapse scenario" (2015) *Proceedings of the 2015 Structures Congress*, pp. 1090-1100.
- Liu, J., Tian, Y., Orton, S.L. "Resistance of Flat-Plate Buildings against Progressive Collapse. II: System Response" (2015) *Journal of Structural Engineering (United States)*, 141 (12), art. no. 04015054.
- Liu, J., Tian, Y., Orton, S.L., Said, A.M. "Resistance of Flat-Plate Buildings against Progressive Collapse. I: Modeling of Slab-Column Connections" (2015) *Journal of Structural Engineering (United States)*, 141 (12), 04015054.