

Juan C. Medina

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Education

Ph.D. Civil and Environmental Engineering - Transportation Systems, 2013.
University of Illinois at Urbana-Champaign.

M.Sc. Civil and Environmental Engineering - Transportation Systems, 2005.
University of Illinois at Urbana-Champaign.

B.Sc. Civil Engineering, 2001.
Pontificia Universidad Javeriana. Bogotá, Colombia.

Research Experience

Research Associate Professor, July 2021 – Present
Department of Civil and Environmental Engineering.
University of Utah.

Research Assistant Professor, Aug 2015 – June 2021
Department of Civil and Environmental Engineering.
University of Utah.

Postdoctoral Research Associate, Oct 2012 – Aug 2015
Department of Civil and Environmental Engineering.
University of Illinois at Urbana-Champaign.

Graduate Research Assistant, Jan 2004 - Oct 2012
Department of Civil and Environmental Engineering.
University of Illinois at Urbana-Champaign.

Researcher on Externally Funded Projects

Principal Investigator

Current Projects

1. Utah Transportation and Public Safety – Crash data Initiative (UTAPS-CDI). Utah Department of Transportation and Utah Department of Public Safety. Oct 2016 – Sept 2026.
2. United States Roadway Assessment Program (usRAP) - Studies for Utah. Utah Department of Transportation. July 2016 – Dec 2020. Extension Jan 2022 – May 2024.
3. Field Evaluations of Pavement Markings by Color Contrast, Wet Retroreflective, and Dry Retroreflective on I-15. Utah Department of Transportation. Oct 2020 – May 2025.
4. Development and Validation of a Methodology and Tool to Estimate Retroreflectivity of Pavement Markings using LiDAR Datasets. Utah Department of Transportation. Sept 2024 – August 2025.

Completed Projects

1. NCHRP 17-86 – Estimating Effectiveness of Safety Treatments in the Absence of Crash Data. Awarded. Subcontract in Progress. Mar 2019 – Dec 2022.

2. Transportation Pooled Fund Study # TPF-5(361) - SHRP2 Naturalistic Driving Study Pooled Fund: Advancing Implementable Solutions. Federal Highway Administration - IDIQ Program. Dec 2010 – Dec 2020 (Phase 1), Jan 2021 – Sept 2022 (Phase 2).
3. Network Effects of Disruptive Traffic Events. National Institute for Transportation and Communities (University Transportation Center and Utah Department of Transportation- NITC). July 2017 – Dec 2021.
4. Field Comparison of 3M Series 90 Wet Reflective Elements with 3M Stamark Series 380 AW Tape. Utah Department of Transportation. Nov 2017 – Mar 2020.
5. Incorporating Maintenance Costs and Considerations into Highway Design Decisions. Utah Department of Transportation and Mountain-Plains Consortium (University Transportation Center). Dec 2016 – Dec 2018.
6. SHRP 2 Safety Implementation: Driver Behavior in the Vicinity of Closely Spaced Interchange Ramps on Urban Freeways – Phase 2. Federal Highway Administration. Jan 2017 – Sept 2018.
7. Safety Effects of Protected and Protected/Permitted Left-Turn Phases. Utah Department of Transportation and Mountain-Plains Consortium (University Transportation Center). Dec 2016 – Dec 2018.

Key Personnel – Completed Projects

8. Work Zone Crash Characteristics and Countermeasure Guidance. NCHRP 17-61. Oct 2015 – Jul 2017.
9. Intersection Crash Prediction Methods for the Highway Safety Manual. NCHRP 17-68. Dec 2016 – Aug 2017.
10. WZ Analysis Methods to Improve Accuracy and Reliability of WZ Planning, Design, Operation, and Traffic Management to Increase WZ Safety. FHWA Safety Grant. Mar 2014 - Aug 2015.
11. Accident Prediction Models using Macro and Micro Scale Analysis. Roadway Safety Institute UTC. Aug 2014 - Aug 2015.
12. Adaptive signal control technologies. Illinois DOT, Oct 2013 - Aug 2015.
13. Analysis of railroad grade crossing accidents. Illinois DOT, ICC, NURail UTC, Oct 2012 - Aug 2015.
14. Development of LED roadway lighting specification. Illinois DOT, Jul 2014 - Dec 2014.
15. Evaluation of microwave-based vehicle detectors. Illinois DOT, Oct 2012 - Dec 2014.
16. Agent-based traffic management with explicit coordination. NEXTRANS UTC, Oct 2012 - May 2014.
17. Multi-objective traffic signal optimization at intersections. NEXTRANS UTC, Oct 2012 - May 2014.
18. Agent-based traffic management. NEXTRANS UTC, Feb 2011 - Oct 2012.
19. Evaluation of microwave-based vehicle detectors. Illinois DOT, Jan 2011 - Oct 2012.
20. LED Street lighting for roadway applications. Illinois DOT, Oct 2010 - Oct 2012.
21. Traffic signal control in oversaturated intersections. NEXTRANS UTC, Aug 2009 - Feb 2011.
22. Evaluation of solar-powered flashing beacons. Illinois DOT, Jul 2008 - Dec 2010.
23. Evaluation of the Sensys wireless vehicle detection. Illinois DOT, Jul 2008 - Dec 2010.
24. Evaluation of vehicular and pedestrian LED modules. Illinois DOT, Jul 2006 - Jul 2008.
25. Evaluation of video detection systems. Illinois DOT, Jul 2005 - Jul 2008.

26. Speed photo enforcement in Illinois work zones. Illinois DOT, Jul 2005 - Jul 2007.
27. Pedestrian safety study in big campus areas. University of Illinois, Jun 2005 - Jul 2007.
28. ITS data analysis for I-30 work zone. Science App. Intl. Corp, Sep 2004 - Feb 2005.
29. Identification of high-accident locations on highways. Illinois DOT, Jan 2004 - Jul 2004.

Peer-Reviewed Papers in Journals

1. Medina, J.C., Srinivasan, R., Saleem, T., Lan, B. Incorporating Driver Behavior Metrics derived from Naturalistic Driving data into Macroscopic Safety Modeling. Transportation Research Record, National Research Council, Washington, D.C., Accepted for Publication.
2. Zhou, Y., Medina, J.C., Taylor, J., Liu, X. "Empirical Verification of Car-Following Parameters using Naturalistic Driving Data on Freeway Segments". Journal of Transportation Engineering, Part A: Systems, 148, No.2, 04021108, 2022.
3. Hossain, F, Medina, J. "Verification of usRAP Risk Assessments for run-off and head-on crashes using field data". Transportation Research Record, National Research Council, Washington, D.C., Vol 2675, No 12, pp. 1187-1201, 2021.
4. Hossain, F., Medina, J. "Effects of Operating Speed and Traffic Flow on Severe and Fatal Crashes using the US Road Assessment Program Methodology and Field Data Verification." Transportation Research Record, National Research Council, Washington, D.C., Vol 2674, No 11, pp. 30-41, 2020.
5. Mathew, J., Benekohal, R.F., Medina, J.C. Nested Sorting and Clustering for Visualization of Accidents at Highway-Rail Grade Crossings. Transportation Research Record, National Research Council, Washington, D.C., No. 2608, pp. 46-57, 2017.
6. Medina, J.C., Benekohal, R.F. Microwave Radar Vehicle Detection Performance at Railroad Grade Crossings with Quad Gates in Normal and Adverse Weather Conditions. Transportation Research Record, National Research Council, Washington, D.C., No. 2545, pp. 123-130, 2016.
7. Medina, J.C., Benekohal, R.F. Macroscopic Models for Accident Prediction at Railroad Grade Crossings - Comparisons with the U.S. Department of Transportation Accident Prediction Formula. Transportation Research Record, National Research Council, Washington, D.C., No. 2476, pp. 85-93, 2015.
8. Medina, J.C., Lo, E.G., Benekohal, R.F. Multi-Attribute Decision Making Methods for Optimal Selection of Traffic Signal Control Parameters in Multimodal Analysis. Transportation Research Record, National Research Council, Washington, D.C., No. 2438, pp. 64-71, 2014.
9. Medina, J.C., Benekohal, R.F. Dual Microwave Radar Vehicle Detection System at Quad Gate Railroad Grade Crossing. Transportation Research Record, National Research Council, Washington, D.C., No. 2458, pp. 110-117, 2014.
10. Medina, J.C., Hajbabaie, A., Benekohal, R.F. Effects of Metered Entry Volume on an Oversaturated Network with Dynamic Signal Timing. Transportation Research Record, National Research Council, Washington, D.C., No. 2356, pp. 53-60, 2013.
11. Medina, J.C., Ramezani, H., Benekohal, R.F. Evaluation of Microwave Radar Vehicle Detectors at Signalized Intersection under Adverse Weather Conditions. Transportation Research Record, National Research Council, Washington, D.C., No. 2356, pp. 100-108, 2013.
12. Medina, J.C., Avrenli, K., Benekohal, R.F. Field and Software Evaluation of Illuminance from LED Luminaires for Roadway Applications. Transportation Research Record, National Research Council, Washington, D.C., No. 2384, pp. 55-64, 2013.
13. Medina, J.C., Hajbabaie, A., Benekohal, R.F. Detection Performance of Wireless Magnetometers at Signalized Intersection and Railroad Grade Crossing under Different Weather Conditions. Transportation Research Record, National Research Council, Washington, D.C., No. 2259, pp. 233-241, 2011.

14. Hajbabaie, A., Medina, J.C., Wang M-H., Benekohal, R.F., Chitturi, M. Sustained and Halo Effects of Various Speed Reduction Treatments in Highway Work Zones. *Transportation Research Record*, National Research Council, Washington, D.C., No. 2265, pp. 118-128, 2011.
15. Medina, J.C., Chitturi, M., Benekohal, R.F. Effects of Fog, Snow, and Rain on Video Detection Systems at Signalized Intersections. *Transportation Letters*, Vol. 2, Issue 1, pp. 13-25, 2010.
16. Chitturi, M., Benekohal, R.F., Hajbabaie, A., Wang M-H., Medina, J.C. Effectiveness of Automated Speed Enforcement in Work Zones. *Journal of the Institute of Transportation Engineers*. Vol. 80 (6). 2010.
17. Chitturi, M., Medina, J.C., Benekohal, R.F. Effects of Shadows and Time of Day on Performance of Video Detection Systems at Signalized Intersections. *Transportation Research Part C: Emerging Technologies*, Vol. 18, Issue 2, pp. 176-186, 2010.
18. Chitturi, M., Medina, J.C., Benekohal, R.F. Testbed for Evaluation of Vehicular Detection Systems. *Journal of Advanced Transportation*. Vol. 44, Issue 3, pp.123-133, 2010.
19. Medina, J.C., Benekohal, R.F, Chitturi, M. Changes in Video Detection Performance at Signalized Intersections Over Different Illumination Conditions. *Transportation Research Record*, National Research Council, Washington, D.C., No. 2129, pp. 111-120, 2009.
20. Medina, J.C., Benekohal, R.F, Hajbabaie, A., Wang, M.H., Chitturi, M. Downstream Effects of Speed Photo Enforcement and Other Speed Reduction Treatments on Work Zones. *Transportation Research Record*, National Research Council, Washington, D.C., No. 2107, pp. 24-33, 2009.
21. Benekohal, R.F, Wang, M.H., Chitturi, M., Hajbabaie, A., Medina, J.C. Speed Photo-Radar Enforcement and Its Effects on Speeds in Work Zones. *Transportation Research Record*, National Research Council, Washington, D.C., No. 2096, pp. 89-97. 2009.
22. Benekohal, R.F., Chitturi, M., Hajbabaie, A., Wang, M.H., Medina, J.C. Automated Speed Photo Enforcement Effects on Speed in Work Zones. *Transportation Research Record*, National Research Council, Washington, D.C., No. 2055, pp. 11-20, 2008.
23. Kang, S., Medina, J.C., Ouyang, Y. Optimal Operations of Transportation Fleet for Unloading Activities at Container Ports, *Transportation Research Part B: Methodological*, Vol 42, No 10, 2008.

Peer-Reviewed Conference Papers and Presentations

1. Wen, Z., Medina, J., Exploration of Impacts of Police Enforcement on Freeway Crash. Presented at the Transportation Research Board 103th Annual Meeting, Washington D.C., 2024.
2. Medina, J., Srinivasan, R., Saleem, T., Lan, B. Incorporating Driver Behavior Metrics derived from Naturalistic Driving data into Macroscopic Safety Modeling. Presented at the Transportation Research Board 103th Annual Meeting, Washington D.C., 2024.
3. Shea, M.S., Medina, J. Approach-level Statistical Road Safety Modeling for Estimating the Effects of Road, Vehicle, and Occupant Characteristics on Crash Type and Injury Severity Outcomes at Signalized Intersections. Presented at the Transportation Research Board 103th Annual Meeting, Washington D.C., 2024.
4. Shea, M.S., Medina, J. Site-Level Statistical Crash Severity Modeling using Maximum Abbreviated Injury Scale (MAIS) Scores at Signalized Intersections. Presented at the Transportation Research Board 103th Annual Meeting, Washington D.C., 2024.
5. Mashhadi, A. H., Rashidi, A., Medina, J., Markovic, N. Comparing Performance of Different Machine Learning Methods for Predicting Severity of Construction Work Zone Crashes. Presented at the ASCE International Conference on Computing in Civil Engineering 2023: Resilience, Safety, and Sustainability. ASCE. Corvallis, Oregon, 2023.
6. Mashhadi, A. H., Rashidi, A., Medina, J., Markovic, N. An Automated Federal Highway Administration Roadside Safety Rating System for Rural Roadways Using Computer Vision. Presented at the Transportation Research Board 102th Annual Meeting, Washington D.C., 2023.

7. Hossain, F., Medina, J. Calibration of Segment-Level Risk Assessments from the United States Road Assessment Program: A Methodology for Systemic Analysis Tools. Presented at the Transportation Research Board 102th Annual Meeting, Washington D.C., 2023.
8. Medina, J., Malekloo, A., Liu, C.X. Inferencing Driver Characteristics Using Microscopic Driving Behavior Analysis from Naturalistic Data on Freeway Segments. Presented at the Transportation Research Board 102th Annual Meeting, Washington D.C., 2023.
9. Zhou, Y., Medina, J., Taylor, J., Liu, X.C. Empirical Verification of Car-Following Parameters Using Naturalistic Driving Data on Freeway Segments. Accepted for Presentation at the Transportation Research Board 100th Annual Meeting, Washington D.C., 2021.
10. Hossain, F., Medina, J. Verification of usRAP Risk Assessments for Run-off and Head-on Crashes using Field Data. Accepted for Presentation at the Transportation Research Board 100th Annual Meeting, Washington D.C., 2021.
11. Hossain, F., Medina, J. "Effects of Operating Speed and Traffic Flow on Severe and Fatal Crashes using the US Road Assessment Program Methodology and Field Data Verification." Presented at the Transportation Research Board 99th Annual Meeting, Washington D.C., 2020.
12. Medina, J., Silcox, C. The Utah Crash Data Initiative – A Unified Safety Management System Across Agencies. Presented at the ATSIP Traffic Records Forum. Austin, TX, 2019.
13. Hossain, F., Medina, J. Implications of Spatial Distribution of Crashes on the Safety Analysis of Closely-Spaced Entrance-Exit Ramps. Presented at the Transportation Research Board 98th Annual Meeting, Washington D.C., 2019.
14. Azra, N., Medina, J.C. Exploration of a Lane-Specific Approach to Locate Intersection Crashes. Presented at the 97th Annual Meeting of the Transportation Research Board. Washington, D.C. January 2018.
15. Shea, M.S., Medina, J.C. Approach-level Safety Comparison of Permissive-Protected and Protected Left Turn Phasing to Flashing Yellow Arrows. Presented at the 97th Annual Meeting of the Transportation Research Board. Washington, D.C. January 2018.
16. Taylor, J., Medina, J.C., Porter, R.J. Driver Behavior near Urban Interchanges with Closely Spaced Ramps. Presented at the Tenth SHRP 2 safety Data Symposium. Washington, D.C. October 2017.
17. Shea, M.S., Medina, J.C., Porter, R.J. Safety Evaluation of Permitted Flashing Yellow Arrow Indications Considering Intersection Geometric Characteristics. Presented at the Urban Street Symposium 5. Raleigh, NC. May 2017.
18. Mathew, J., Benekohal, R.F., Medina, J.C. Nested Sorting and Clustering for Visualization of Accidents at Highway-Rail Grade Crossings. Presented at the 96th Annual Meeting of the Transportation Research Board. Washington, D.C. January 2017.
19. Mathew, J., Medina, J.C., Benekohal, R.F. Dynamic Tree Data Visualization Method for Grade Crossing Accidents. Presented at the 14th Global Level Crossing and Trespass Prevention Symposium. Finland, June, 2016.
20. Medina, J.C., Benekohal, R.F. Microwave Radar Vehicle Detection Performance at Railroad Grade Crossings with Quad Gates in Normal and Adverse Weather Conditions. Presented at the 95th Annual Meeting of the Transportation Research Board. Washington, D.C. January 2016.
21. Medina, J.C., Benekohal, R.F. Vehicle Detection Design and the Performance of Congested Traffic Networks. Presented at the 18th International IEEE Annual Conference on Intelligent Transportation Systems. Canary Islands, Spain, 2015.
22. Medina, J.C., Benekohal, R.F. Macroscopic Models for Accident Prediction at Railroad Grade Crossings and Comparisons with the U.S. DOT Accident Prediction Formula. Presented at the 94th Annual Meeting of the Transportation Research Board. Washington, D.C. 2015.

23. Medina, J.C., Benekohal, R.F. Simple Feature-based Function Approximation for Reinforcement Learning Traffic Signals in Oversaturated Networks. Presented at the 94th Annual Meeting of the Transportation Research Board. Washington, D.C. 2015.
24. Medina, J.C., Benekohal, R.F. Combination of Macroscopic and Microscopic Models for Analysis of Accidents at Railroad Grade Crossings. Presented at the Global Level Crossing – Safety and Trespass Prevention Symposium, Urbana, IL, 2014.
25. Medina, J.C., Benekohal, R.F., Shen, S. Microscopic Analysis for Accident Data at Railroad Grade Crossings. Presented at the T&DI Congress of the ASCE, Orlando, 2014.
26. Medina, J.C., Benekohal, R.F., Lo, E.G. Analyzing Pedestrian Behavior during Pedestrian Exclusive Phases for Improved Intersection Signal Timing. Presented at the T&DI Congress of the ASCE, Orlando, 2014.
27. Medina, J.C., Benekohal, R.F. Sensitivity of Reinforcement Learning Agents to Aggregated Sensor Data in Congested Traffic Networks. Presented at the T&DI Congress of the ASCE, Orlando, 2014.
28. Medina, J.C., Benekohal, R.F. Dual Microwave Radar Vehicle Detection System at Quad Gate Railroad Grade Crossing. Presented at the 93rd Annual Meeting of the Transportation Research Board. Washington, D.C. 2014.
29. Medina, J.C., Lo, E.G., Benekohal, R.F. Exploring Multi-attribute Decision Making Methods for Optimal Selection of Traffic Signal Control Parameters in Multimodal Analysis. Presented at the 93rd Annual Meeting of the Transportation Research Board. Washington, D.C. 2014.
30. Medina, J.C., Benekohal, R.F. Corridor-based Coordination of Learning Agents for Traffic Signal Control by Enhancing the Max-plus Algorithm. Presented at the 93rd Annual Meeting of the Transportation Research Board. Washington, D.C. 2014.
31. Medina, J.C., Hajbabaie, A., Benekohal, R.F. Effects of Metered Entry Volume on an Oversaturated Network with Dynamic Signal Timing. Presented at the 92nd Annual Meeting of the Transportation Research Board. Washington, D.C. 2013.
32. Medina, J.C., Ramezani, H., Benekohal, R.F. Evaluation of Microwave Radar Vehicle Detectors at Signalized Intersection under Adverse Weather Conditions. Presented at the 92nd Annual Meeting of the Transportation Research Board. Washington, D.C. 2013.
33. Medina, J.C., Avrenli, K., Benekohal, R.F. Field and Software Evaluation of Illuminance from LED Luminaires for Roadway Applications. Presented at the 92nd Annual Meeting of the Transportation Research Board. Washington, D.C. 2013.
34. Medina, J.C., Benekohal, R.F. Traffic Signal Control using Reinforcement Learning and the Max-Plus Algorithm as a Coordinating Strategy. Presented at the 15th International IEEE Annual Conference on Intelligent Transportation Systems. Anchorage, AK, 2012.
35. Medina, J.C., Benekohal, R.F. Q-learning and Approximate Dynamic Programming for Traffic Control: Case Study for an Oversaturated Network. Presented at the 91st Annual Meeting of the Transportation Research Board. Washington, D.C. 2012.
36. Medina, J.C., Hajbabaie, A., Benekohal, R.F. A Comparison of Approximate Dynamic Programming and Simple Genetic Algorithm for Traffic Control in Oversaturated Conditions – Case Study of a Simple Symmetric Network. Presented at the 14th International IEEE Annual Conference on Intelligent Transportation Systems. Washington, DC, 2011.
37. Medina, J.C., Hajbabaie, A., Benekohal, R.F. Evaluation of Wireless Magnetometers for Vehicle Detection. Presented at the T&DI Congress of the ASCE, Chicago, 2011.
38. Medina, J.C., Benekohal, R.F. Reinforcement Learning Agents for Traffic Signal Control in Oversaturated Networks. Presented at the T&DI Congress of the ASCE, Chicago, 2011.
39. Medina, J.C., Hajbabaie, A., Benekohal, R.F. Detection Performance of Wireless Magnetometers at Signalized Intersection and Railroad Grade Crossing under Different Weather Conditions. Presented at the 90th Annual Meeting of the Transportation Research Board. Washington, D.C. 2011.

40. Hajbabaie, A., Medina, J.C., Wang M-H., Benekohal, R.F., Chitturi, M. Sustained and Halo Effects of Various Speed Reduction Treatments in Highway Work Zones. Presented at the 90th Annual Meeting of the Transportation Research Board. Washington, D.C. 2011.
41. Medina, J.C., Hajbabaie, A., Benekohal, R.F. Arterial Traffic Control Using Reinforcement Learning Agents and Information from Adjacent Intersections in the State and Reward Structure. Presented at the 13th International IEEE Annual Conference on ITS. Madeira, Portugal, 2010.
42. Hajbabaie, A., Medina, J.C., Benekohal, R.F. Effects of ITS-based Left Turn Policies on Network Performance. Presented at the 13th International IEEE Annual Conference on Intelligent Transportation Systems. Madeira, Portugal, 2010.
43. Medina, J.C., Hajbabaie, A., Benekohal, R.F. Wireless Magnetometers for Traffic Data Collection at Signalized Intersections. Presented at the Traffic Flow Theory Committee Summer Meeting - Transportation Research Board. Annecy, France, 2010.
44. Hajbabaie, A., Benekohal, R.F., Chitturi, M., Wang, M.H., Medina, J.C. Comparison of Effects of Automated Speed Enforcement and Police Presence on Speeding in Work Zones. Presented at the 88th Annual Meeting of the Transportation Research Board. Washington, D.C. 2009.
45. Benekohal, R.F., Wang, M.H., Chitturi, M., Hajbabaie, A., Medina, J.C. Speed Photo-Radar Enforcement and Its Effects on Speeds in Work Zones. Presented at the 88th Annual Meeting of the Transportation Research Board. Washington, D.C. 2009.
46. Medina, J.C., Benekohal, R.F., Hajbabaie, A., Wang, M.H., Chitturi, M. Downstream Effects of Speed Photo Enforcement and Other Speed Reduction Treatments on Work Zones. Presented at the 88th Annual Meeting of the Transportation Research Board. Washington, D.C. 2009.
47. Medina, J.C., Benekohal, R.F., Chitturi, M. Changes in Video Detection Performance at Signalized Intersections Over Different Illumination Conditions. Presented at the 88th Annual Meeting of the Transportation Research Board. Washington, D.C. 2009.
48. Benekohal, R.F., Chitturi, M., Hajbabaie, A., Wang, M.H., Medina, J.C. Automated Speed Photo Enforcement Effects on Speed in Work Zones. Presented at the 87th Annual Meeting of the Transportation Research Board. Washington, D.C. 2008.
49. Medina, J.C., Benekohal, R.F., Wang, M.H., In-Street Pedestrian Crossing Signs and Effects on Pedestrian-Vehicle Conflicts at University Campus Crosswalks. Presented at the 87th Annual Meeting of the Transportation Research Board. Washington, D.C. 2008.
50. Medina, J.C., Chitturi, M., Benekohal, R.F. Illumination and Wind Effects on Video Detection Performance at Signalized Intersections. Presented at the 87th Annual Meeting of the Transportation Research Board. Washington, D.C. 2008.
51. Medina, J.C., Chitturi, M., Benekohal, R.F. Impact of Snow in Video Detection Systems. Fourth National Conference on Surface Transportation Weather. Transportation Research E-Circular No. E-C126. Indianapolis, 2008.
52. Medina, J.C., Kang, S, Ouyang, Y. Optimal Planning and Management of Transportation Fleet at Container Ports. Presented at the 86th Annual Meeting of the Transportation Research Board. Washington, D.C. 2007.
53. Benekohal, R.F., Wang, M.H., Medina, J.C. Pedestrian-Vehicle Interaction and Conflicts under Various Crosswalk Treatments. Presented at the International Conference on Road Safety and Simulation. Roma, 2007.
54. Chitturi, M., Medina, J.C., Benekohal, R.F. Accuracy of Video Detection Systems for Traffic Counting. Proceedings of the 2007 ITE International Annual Meeting and Exhibit, August 5-8, 2007.
55. Medina, J.C., Benekohal, R.F. Analysis of Drivers' Opinions on the Effectiveness of Traffic and In-Vehicle Receiver Control Devices at Rail-Highway Crossings. Presented at the 85th Annual Meeting of the Transportation Research Board. Washington, D.C. 2006.

Technical Reports

1. Porter, R.J., Dunn, M., Kersavage, K., Gayah, V., Eccles, K., Medina, J. Estimating Effectiveness of Safety Treatments in the Absence of Crash Data. Final Report from NCHRP 17-86. Federal Highway Administration. Washington D.C. 2023. URL: <https://trid.trb.org/View/2260073>.
2. Porter, R.J., Kersavage, K., Gayah, V., Dunn, M., Eccles, K., Persaud, B., Medina, J. Estimating Effectiveness of Safety Treatments in the Absence of Crash Data: A Guide. Federal Highway Administration. Washington D.C. 2023. URL: <https://trid.trb.org/View/2260068>.
3. Medina, J., Taylor, J., Porter, R.J., Zlatkovic, M., Musunuru, A. Incorporating Maintenance Costs and Considerations into Highway Design Decisions. Final Report under Review. Utah. Dept. of Transportation. 2022. URL: <https://rosap.ntl.bts.gov/view/dot/61078>.
4. Torbic, D.J., Cook, D.J., Bauer, K.M., Grotheer, J.R., Harwood, D. W., Potts, I.B., Porter, R.J., Medina, J.C., Taylor, J. Intersection Crash Prediction Methods for the Highway Safety Manual – Final Report from NCHRP 17-68. Federal Highway Administration. Washington D.C. 2021. URL: <https://www.trb.org/Main/Blurbs/182055.aspx>
5. Medina, J. Comparison of Wet Reflective Elements with Tape – A Pavement Marking Study Based on Field Measurements. Submitted to the Utah Department of Transportation. April, 2021. Utah. Dept. of Transportation. Research Division. URL: <https://rosap.ntl.bts.gov/view/dot/56417>.
6. Mathew, J., Benekohal, R.F., Medina, J.C. Accident Prediction Models using Macro and Micro Scale Analysis: Dynamic tree and Zero inflated negative binomial models with Empirical Bayes Accident History Adjustment. Report Number CTS 19-02. Roadway Safety Institute. Minneapolis, MN. February, 2019. URL: <http://www.its.umn.edu/Publications/ResearchReports/reportdetail.html?id=2748>
7. Taylor, J. Medina, J.C., SHRP2 Safety Implementation: Driver Behavior in the Vicinity of Closely Spaced Interchange Ramps on Urban Freeways – Phase 2. Submitted to FHWA. 2019.
8. Medina, J.C., Shea, M.S., Azra, N. Safety Effects of Protected and Protected/Permissive Left-Turn Phases. Report Number UT-19.04. Utah Department of Transportation. Salt Lake City, UT. 2018. URL: <https://www.udot.utah.gov/main/uconowner.gf?n=6210438273326899>
9. Ullman, G.L., Pratt, M., Fontaine, M. D., Porter, R.J., Medina, J.C. NCHRP Web-Only Document 240: Analysis of Work Zone Crash Characteristics and Countermeasures. Federal Highway Administration. Washington D.C. 2018. The National Academies Press. <https://doi.org/10.17226/25006>.
10. Ullman, G.L., Pratt, M., Fontaine, M. D., Porter, R.J., Medina, J.C. NCHRP Research Report 869: Estimating the Safety Effects of Work Zone Characteristics and Countermeasures – A Guidebook. Federal Highway Administration. Washington D.C. 2018. The National Academies Press. <https://doi.org/10.17226/25007>.
11. Medina, J.C., Shen, S., Benekohal, R.F. Micro and Macro Level Analysis at Railroad Grade Crossings. National University Rail Center – NURail. University of Illinois at Urbana-Champaign. Project ID: NURail 2012-UIUC-R02. 2016.
12. Benekohal, R.F., Gregerson, G., Medina, J.C. LED Street Lighting Evaluation - Phase II: LED Specification and Life-Cycle Cost Analysis. Illinois Center for Transportation. FHWA-ICT-15-001. 2015
13. Medina, J.C., Benekohal, R.F. Agent-Based Real-Time Signal Coordination in Congested Networks. Nextrans University Transportation Center. Project No. 104IPY04. 2014.
14. Lo, E.G., Medina, J.C., Benekohal, R.F. Dynamic Multi Modal Multi-Objective Intersection Signal Priority Optimization. Nextrans University Transportation Center. Project No. 102IPY04. 2013.
15. Medina, J.C., Benekohal, R.F., Ramezani, H. Field Evaluation of Smart Sensor Vehicle Detectors at Railroad Grade Crossings – Volume 3: Performance in Favorable Weather Conditions. Illinois Center for Transportation. FHWA-ICT-13-028. 2013.
16. Medina, J.C., Benekohal, R.F., Ramezani, H. Field Evaluation of Smart Sensor Vehicle Detectors at Intersections – Volume 2: Performance under Adverse Weather Conditions. Illinois Center for Transportation. FHWA-ICT-13-014. 2013.

17. Medina, J.C., Benekohal, R.F. Agent-Based Traffic Management and Reinforcement Learning in Congested Intersection Network. Nextrans University Transportation Center. Project No. 072IY03. 2012.
18. Medina, J.C., Benekohal, R.F., Ramezani, H. Field Evaluation of Smart Sensor Vehicle Detectors at Intersections – Volume 1: Normal Weather Conditions. Illinois Center for Transportation. FHWA-ICT-12-016. 2012.
19. Avrenli, K.A., Benekohal, R.F., Medina, J.C. LED Roadway Lighting, Volume 2: Field Evaluations and Software Comparisons. Illinois Center for Transportation. FHWA-ICT-12-013. 2012.
20. Avrenli, K.A., Benekohal, R.F., Medina, J.C. LED Roadway Lighting, Volume 1: Background Information. Illinois Center for Transportation. FHWA-ICT-12-012. 2012.
21. Hajbabaie, A. Medina, J.C., Benekohal, R.F. Traffic Signal Coordination and Queue Management in Oversaturated Intersection. Nextrans University Transportation Center. Project No. 047IY02. 2011.
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26. Benekohal, R.F., Hajbabaie, A., Medina, J.C., Wang, M.H., Chitturi, M. Speed Photo-Radar Enforcement Evaluation in Illinois Work Zones. Illinois Center for Transportation. FHWA-ICT-10-064. 2010.
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33. Benekohal, R.F., Wang, M.H., Medina, J.C. Crosswalk Signing and Marking Effects on Conflicts and Pedestrian Safety in UIUC Campus. FHWA-IL/UI-TOL-22. 2007.
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36. Medina, J.C., Benekohal, R.F., Wang, M.H. Analysis of Pedestrian and Drivers Opinions on Crosswalk Safety at UIUC Campus. Traffic Operations Laboratory. FHWA-IL/UI-TOL-19. 2007.
37. Medina, J.C., Benekohal, R.F. High Tension Cable Median Barrier: A Scanning Tour Report. Traffic Operations Laboratory. FHWA-IL/UI-TOL-18. 2006.

Graduate Student Advising

- Zihao Wen. Ph.D. Student. Preliminary Exam Spring 2024.
- Sadia Meesha. M.S. Student. Expected Graduation Spring 2024.
- Carlos Cogollo. Ph.D. Student. Preliminary Exam Spring 2023.
- Jeffrey Taylor. Ph.D. Student. Currently not Registered.
- Fahmid Hossain, Ph.D. Student. Graduated Spring 2023.
- M. Scott Shea. Ph.D. Student. Graduated Spring 2023.
- Arman Malekloo, Ph.D. Student. Preliminary Exam Spring 2022.
- Kian Kai Chee. M.S. Student. Graduated Spring 2021.
- Roghayeh Zoleikani. M.S. Student. Graduated Spring 2019.
- Nuzhat Azra. M.S. Student. Graduated Spring 2018.

External Service/Professional Affiliations

- Handling Editor for the Transportation Research Record: A Journal of the Transportation Research Board. Since 2020.
- Transportation Research Board (TRB)
Former Chair, Subcommittee on Future Directions in Safety Analysis (ANB20)
Member of the Standing Committee on Safety Performance and Analysis (ACS20)
Reviewer for papers submitted to Annual Meeting
Friend of the following Committees: ANF20, ANB25, AHB60, AHB15, ANF10, AHB45, AHB25, AHB55
- Member Association of Transportation Safety Information Professionals (ATSIP). Since 2019.
- Microsoft Certified Professional. Administering Microsoft SQL Server 2012 Databases. 2015.
- Institute of Electrical and Electronic Engineers (IEEE) and ITS Society. Member since 2010
Reviewer for papers submitted to ITS Society Conference and the IEEE Transactions on ITS
- Institute of Transportation Engineers (ITE)
University of Illinois, Student Chapter
President (2007 - 2008), Vice-president (2006 - 2007), Secretary (2005 - 2006)
- Reviewer for the Intelligent Transportation Society of America (ITS America)
- Reviewer for the International Journal of Engineering Management and Economics
- Reviewer for the Journal of Intelligent Transportation Systems
- Reviewer for ACM Computing Surveys
- Reviewer for Neural Computing and Applications
- Reviewer for the Journal of Transportation Engineering. ASCE.

Professional Experience

Civil Engineer. National Learning Service (SENA) - National Headquarters. *Jan 2001 - Jan 2003*
Bogota, Colombia.

Honors and Awards

- C.E. Deleuw Travel Award. *Aug, 2010*
Civil and Environmental Engineering, University of Illinois at Urbana-Champaign
- ITE Student Paper Award. *Jan, 2009*
Institute of Transportation Engineers - Illinois Section
- Committed Students Award. *Apr, 2008*
Engineering Council. University of Illinois at Urbana-Champaign

Teaching Experience and Selected Invited Talks

- Invited Panel Member. North Carolina eCrash Modernization Peer Exchange. Shared experience in development of UTAPS-CDI with other selected crash management programs led by university teams. February 26-27, 2020. Chapel Hill, NC.
- Key person developing material and teaching 1.5-day FHWA training course for DOTs and Practitioners: WZ Analysis Methods to Improve Accuracy and Reliability of WZ Planning, Design, Operation, and Traffic Management to Increase WZ Safety. August 11-12, 2015. Ames, Iowa.
- William W. Hay Railroad Engineering Seminar. Invited Talk. Railroad Grade Crossing Accident Analysis at Microscopic and Macroscopic Levels. Nov 14, 2014. Urbana, IL.
- Key person developing material and teaching 4-hour workshop to DOT and practitioners: Calibration and Output Analysis of Micro-Simulation Models. Traffic Engineering and Safety Conference. I-Hotel and Convention Center. Oct 14, 2014.
- Substitute lecturer for Highway Capacity Analysis (Graduate Course). *2010 – 2014*
- Substitute lecturer for Traffic Flow Theory (Graduate Course). *2010 – 2014*
- Substitute lecturer for Highway Capacity Software Classes. *2010 – 2014*