Curriculum Vitae

Nemanja Dobrota, PhD

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SCIENTIFIC AND PROFESSIONAL ACCOUNTS

Research Gate:	https://www.researchgate.net/profile/Nemanja-Dobrota
Google Scholar:	https://scholar.google.com/citations?user=z-megeoAAAAJ&hl=en
LinkedIn:	www.linkedin.com/in/nemanjadobrota
Publons:	https://publons.com/researcher/4159319/nemanja-dobrota/

EDUCATION

PhD	University of Pittsburgh, Pittsburgh, PA, USA Civil Engineering (major Transportation)	May 2022
MSc	Florida Atlantic University, Boca Raton, FL, USA Civil Engineering (major Transportation)	July 2019
MSc	University of Belgrade, Belgrade, Serbia Faculty of Transport and Traffic Engineering (major Traffic Engineering)	October 2015
BSc	University of Belgrade, Belgrade, Serbia Faculty of Transport and Traffic Engineering (major Urban Transportation)	October 2014

EMPLOYMENT/EXPERIENCE

09/2022 – present	**Engineering Associate**, Kittelson & Associates, Inc. 100 M St SE #910, Washington, DC 20003, USA.
05/2022 – 09/2022	**Postdoctoral Research Associate**, Department of Civil and Environmental Engineering, University of Pittsburgh, Pittsburgh, PA, USA. Lab Director: Dr. Aleksandar Stevanovic.
09/2019 – 05/2022	**Research and Teaching Assistant**, Department of Civil and Environmental Engineering, University of Pittsburgh, Pittsburgh, PA, USA. Advisor: Dr. Aleksandar Stevanovic.

08/2017 – 08/2019	**Research and Teaching Assistant**, Department of Civil, Environmental and Geomatics Engineering, Florida Atlantic University, Boca Raton, FL, USA. Advisor: Dr. Aleksandar Stevanovic.
05/2016 – 08/2017	**Traffic Engineer**, TTK Traffic, Belgrade, Serbia.
04/2015 – 05/2016	**Research Assistant,** Department of Urban Road Traffic, at Faculty of Transport and Traffic Engineering, University of Belgrade, Belgrade, Serbia. Advisor: Dr. Nikola Celar.

PUBLICATIONS

Manuscripts

1. Dobrota, N. (2022). Analysis of various performance measurements of traffic signals PhD Thesis. University of Pittsburgh. Thesis advisor: Dr. Aleksandar Stevanovic.
2. Dobrota, N. (2019). Modifying signal retiming procedures and policies: a case of high-fidelity modeling with medium-resolution data. MSc Thesis, Florida Atlantic University. Thesis advisor: Dr. Aleksandar Stevanovic.
3. Dobrota, N. (2015). Cost-effective measures for increasing the effectiveness of two-lane highways. MSc Thesis, Faculty of Traffic and Transportation Engineering, University of Belgrade, Serbia. Thesis advisor: Dr. Vladan Tubic.
4. Dobrota, N. (2014). Auxiliary lanes on uphill road sections. BSc Thesis, Faculty of Traffic and Transportation Engineering, University of Belgrade, Serbia. Thesis advisor: Dr. Vladan Tubic.

Published Refereed Journal Papers

1. Dobrota, N., Cesme, B., Gault, S., Warchol, S., Rahman, R., & Rouphail, N. (2024). Traffic Signal Systems Solutions Toolbox: A Case Study from Pennsylvania. ***Transportation Research Record***, 03611981241230507.
2. Dobrota, N., Cesme, B., Fisher, C., Mead, P., Tahmasebi, M., & Shastri, A. (2024). Data-driven statewide prioritization of corridors for signal retiming projects. ***International Journal of Transportation Science and Technology***.
3. Ardalan, T., Sarazhinsky, D., Dobrota, N., & Stevanovic, A. (2024). Investigation of Analyzable Solutions for Left-Turn-Centered Congestion Problems in Urban Grid Networks. ***Sustainability***, *16*(11), 4777.
4. Ardalan, T., Sarazhinsky, D., Dobrota, N., Gavric, S., & Stevanovic, A. (2024). Overview and Modeling Capabilities of an Event-Based Signal Controller. ***Symmetry***, *16*(2), 157.
5. Dobrota, N., Stevanovic, A., Mitrovic, N., Alshayeb, S., and Zlatkovic, M. (2023). Development and evaluation of performance measures for capacity utilization of traffic signals. ***Transportation Research Record***, 2677, 11337-1355
6. Gavric, S., Sarazhinsky, D., Stevanovic, A., Dobrota, N. (2023). Development and evaluation of non-traditional pedestrian timing treatments for coordinated signalized intersections. ***Transportation Research Record***, 2677, 1460-474
7. Gavric, S., Dobrota, N., Erdagi, I. G., Stevanovic, A., Osman, O. (2023). Estimation of Arrivals on Green at Signalized Intersections Using Stop-Bar Video Detection. ***Transportation Research Record***, 2677, 6797-811

8. Dobrota, N., Stevanovic, A., Yang, Y., Alshayeb, S. (2023) Investigation of Resonant Signal Timing Plans through Comprehensive Evaluation of Various Optimization Approaches. *CivilEng*, 2023. 4, 2416-432
9. Mitrovic, N., Dobrota, N., Pereira, M. B., Espino, E., Stevanovic, A. (2023). Data-Driven Decision Support Platform for Selection of Intersections for Adaptive Traffic Signal Control. ***Transportation Research Record***, 3611981231159870
10. Babatunde, J., Osman, O., Stevanovic, A., Dobrota, N. (2023). Fuel-Based Nash Bargaining Approach for Adaptive Signal Control in an N-Player Cooperative Game. ***Transportation Research Record***, 2023. 3611981231161620
11. Alshayeb, S., Stevanovic, A., Stevanovic, J., Dobrota, N. (2023). Optimizing of Traffic-Signal Timing Based on the FCIC-PI—A Surrogate Measure for Fuel Consumption. *Future Transportation*, 3, 2663-683
12. Dobrota, N., Stevanovic, A., Mitrovic, N. (2022). A novel model to jointly estimate delay and arrival patterns by using high-resolution signal and detection data. *Transportmetrica A: Transport Science*, 2022. 12055
13. Dobrota, N., Mitrovic, N., Gavric, S., Stevanovic, A. (2022). Comprehensive data analysis approach for appropriate scheduling of signal timing plans. *Future transportation*, 2, 2482-500
14. Jovanovic, Al., Stevanovic, A., Dobrota, N., Teodorovic, D. (2022). Ecology based network traffic control: A bee colony optimization approach. *Engineering Applications of Artificial Intelligence*, 115, 105262
15. Dobrota, N., A. Stevanovic, A., and Mitrovic, N. (2021). Modifying Signal Retiming Procedures and Policies by Utilizing High-Fidelity Modeling with Medium-Resolution Traffic Data, ***Transportation Research Record***, 03611981211055668.
16. Alshayeb, S., Stevanovic, A., & Dobrota, N. (2021). Impact of Various Operating Conditions on Simulated Emissions-Based Stop Penalty at Signalized Intersections. *Sustainability*, 13(18), 10037.
17. Alshayeb, S., Dobrota, N., Stevanovic, A., and Mitrovic, N. (2021). Assessment of Arterial Signal Timings based on Various Operational Policies and Optimization Tools. ***Transportation Research Record***, 03611981211011165.
18. Dobrota, N., Stevanovic, A., and Mitrovic, N. (2020). Development of Assessment Tool and Overview of Adaptive Traffic Control Deployments in the US. ***Transportation Research Record***, 0361198120957313.
19. Niels, T., Mitrovic, N., Dobrota, N., Bogenberger, K., Stevanovic, A., and Bertini, R. (2020). Simulation-Based Evaluation of a New Integrated Intersection Control Scheme for Connected Automated Vehicles and Pedestrians. ***Transportation Research Record***, 0361198120949531.

Journal Papers Under Revision and In Preparation

1. Cesme, B., Barrios, J., Koonce, P., Haines, M., Bame, C., Dobrota, N. Comprehensive Evaluation of Next-Generation Transit Signal Priority Systems using Emerging Data Sources: A Case Study from Portland, Oregon. Under revision in the ***Transportation Research Record***.
2. Nichols, A., Cesme B., Dobrota, N. Probe-vehicle-based approach for traffic signal performance monitoring: An operator's perspective. Under revision in the ***Transportation Research Record***.

Conference Papers
(Peer-Reviewed)

1. Shams, A., Dobrota, N., Cesme, B., Day, C. Objective-Driven Traffic Signal Actuation Using Vehicle Trajectory Data: Dilemma Zone Protection, Split Failure Mitigation, and Dynamic Coordination. 104th TRB Annual Meeting, January 2025, Washington DC.
2. Cesme, B., Bonneson, J., Zhao, L., Dobrota, N., Wood, J., Day, C. Crash Modification Factors for Arterials Operated with Automated Traffic Signal Performance Measures. 104th TRB Annual Meeting, January 2025, Washington DC.
3. Nichols, A., Cesme B., Dobrota, N. Probe-vehicle-based approach for traffic signal performance monitoring: An operator's perspective. 104th TRB Annual Meeting, January 2025, Washington DC.
4. Dobrota, N., Cesme, B., Gault S., Warchol S., Rahman R., and Rouphail, N. (2024). Traffic Signal Systems Solutions Toolbox: A Case Study from Pennsylvania. 103rd TRB Annual Meeting, January 2024, Washington DC.
5. Shams, A., Dobrota, N., Cesme, B., and Day, C. (2024). Integration of Real-Time Vehicle Trajectories into Actuated Traffic Signals to Improve Local Intersection and Arterial Control. 103rd TRB Annual Meeting, January 2024, Washington DC.
6. Dobrota, N., Stevanovic, A. (2023). Development and evaluation of arrival-based performance measures for estimating the progression quality of traffic signals. 102nd TRB Annual Meeting, January 2023, Washington DC.
7. Erdagi, I.G., Dobrota, N., Gavric, S., Stevanovic, A. (2023). Cycle-by-cycle Delay Estimation at Signalized Intersections by using Machine Learning and Simulated Video Detection Data. 8th International Conference on Models and Technologies for Intelligent Transportation Systems (MT-ITS), IEEE, 45298
8. Gavric, S., Dobrota, N., Erdagi, I. G., Stevanovic, A., Osman, O. (2023). Estimation of Arrivals on Green at Signalized Intersections Using Stop-Bar Video Detection. 102nd TRB Annual Meeting, January 2023, Washington DC.
9. Mitrovic, N., Dobrota, N., Pereira, M. B., Espino, E., Stevanovic, A. (2023). Data-Driven Decision Support Platform for Selection of Intersections for Adaptive Traffic Signal Control. 102nd TRB Annual Meeting, January 2023, Washington DC.
10. Babatunde, J., Osman, O., Stevanovic, A., Dobrota, N. (2023). Fuel-Based Nash Bargaining Approach for Adaptive Signal Control in an N-Player Cooperative Game. 102nd TRB Annual Meeting, January 2023, Washington DC.
11. Alshayeb, S., Stevanovic, A., Stevanovic, J., Dobrota, N. (2023). Optimizing of Traffic-Signal Timing Based on the FCIC-PI—A Surrogate Measure for Fuel Consumption. 102nd TRB Annual Meeting, January 2023, Washington DC.
12. Gavric, S; Sarazhinsky, D; Stevanovic, A; Dobrota, N. (2022). Evaluation of Pedestrian Timing Treatments for Coordinated Signalized Intersections. Proceedings of the Transportation Research Board 101st Annual Meeting, Washington, DC, USA, 2022. 45548
13. Dobrota, N., Stevanovic, A., Mitrovic, N., Al Shayeb, S., and Zlatkovic, M. (2022). Development and evaluation of traffic signal performance measures for capacity utilization. 101st TRB Annual Meeting, January 2022, Washington DC.
14. Al Shayeb, S., Dobrota, N., and Stevanovic, A. (2022). Impact of Various Operating Conditions on Emissions-based Stop Penalty at Signalized Intersections. 101st TRB Annual Meeting, January 2022, Washington DC.
15. Dobrota, N., and Stevanovic, A. (2021). Modelling of Delay for Protected/Permitted Left Turning Vehicles Using Multigene Genetic Programming. 2nd International Conference on Civil Engineering Fundamentals and Applications (ICCEFA'21) Seoul, South Korea - November 2021.

16. Dobrota, N., A. Stevanovic, A., and Mitrovic, N. (2021). Application of Analytical Methods for Traffic Delay Estimation Using High-resolution Signal and Detection Data. 100th TRB Annual Meeting, January 2021, Washington DC.
17. Al Shayeb, S., Dobrota, N., Stevanovic, A., and Mitrovic, N. (2021). Assessment of Arterial Signal Timings based on Various Operational Policies and Optimization Tools. 100th TRB Annual Meeting, January 2021, Washington DC.
18. Dobrota, N., Alfaro-Carcoba, R., Mitrovic, N., and A. Stevanovic (2020). Identifying Time-Of-Day Breakpoints Based on Clustering and Visual Analytics. 99th TRB Annual Meeting, January 2020, Washington DC.
19. Niels, T., Mitrovic, N., Dobrota, N., Bogenberger, K., Stevanovic, A., and Bertini, R. (2019). Integrated Intersection Control for Connected, Automated Vehicles and Pedestrians - Simulation-Based Evaluation. 99th TRB Annual Meeting, January 2020, Washington DC.
20. Dobrota, N., Stevanovic, A., Mitrovic, N., and Chowdhury, S. (2019). Signal Retiming based on Comprehensive Field Data Analysis and High-Fidelity Simulation Modeling. 98th TRB Annual Meeting, January 2019, Washington DC.
21. Dobrota, N., Stevanovic, A., Stevanovic, J., Mitrovic, N., and Kergaye, C. (2018) Comprehensive Analysis of GLOSA's Efficiency and Safety on Urban Streets. 25th ITS World Congress, Copenhagen, July 2018, Denmark.
22. Stevanovic, A., Mitrovic, N., Dobrota, N., Mitrovic, Dj., and Chowdhury S-E-S., GLOSA (Green Light Optimal Speed Advisory) - Concept for Future Connected and Automated Vehicles. Miami Book Fair, November 2017, Miami, FL.
23. Tubic, V., Lipovac, K., Dobrota, N., (2016). Analysis of European Experience of 2+1 Two-lane Highways Usage From Traffic Safety Aspect. Second Serbian Road Congress, Belgrade, June 2016, Serbia.
24. Dobrota, N., Milutinović, S., (2015) Estimation of Capacity and Level of Service at Signalized Intersections According to the HCM 2010 Method. Techniques of Traffic Management-2015 (TES-2015), Sombor, October 2014, Serbia.

SELECTED PROJECT EXPERIENCE

1. **NCHRP Synthesis 20-05/Topic 56-12, Practices on Management, Operation, and Maintenance of Automated Traffic Signal Performances Measures (ATSPMs); Nationwide, USA.** The objective of this synthesis study is to document state DOT practices for enhancing traffic signal management, operations, and maintenance along networks and corridors through the deployment and use of ATSPM systems. Dr. Dobrota is working on the development of a survey for 51 US State Department of Transportation (including Washington DC), synthesizing the knowledge on DOT's use of ATSPMs, reviewing relevant literature and writing final synthesis study report.
2. **NCHRP 7-32, Guide for Long-Term Automated Traffic Signal Performance Measurement Systems Applications; Nationwide, USA.** The objective of this research is to develop a guide to assist state DOTs and public agencies with long-term management of Automatic Traffic Signal Performance Measurement (ATSPM) systems applications for scalability, transferability, and CAV integration. Dr. Dobrota supports all research activities during the course of the project, such as literature review, conducting interviews with State DOTs and ATSPMs vendors, identifying research gaps and generating guide documents for long-term applications of ATSPMs.
3. **NCHRP 17-109, Crash Modification Factors for Automated Traffic Signal Performance Measures; Nationwide, USA.** The objectives of this research are to (1) identify and organize automated traffic signal performance measure (ATSPM) signal retiming and/or associated operational improvements with respect to site characteristics (e.g., geometry, volumes, etc.), (2) quantify crash modification factors (CMF) and/or functions associated with ATSPM

signal retiming (for all modes for specific conflict types and severity) at a quality that could facilitate inclusion in the Highway Safety Manual or Crash Modification Factors Clearinghouse, (3) develop guidance for the use of ATSPM signal-retiming-related CMFs, and (4) document case study costs and benefits associated with safety improvements resulting from ATSPM signal retiming (expanding on information in FHWA-HOP-20-003). Dr. Dobrota assists on all aspects of the project starting from literature review, data collection and processing, development of CMFs for ATSPMs, and development of guidance documents.

4. **Prioritization of Corridors for Retiming for Ohio DOT; Statewide, OH.** Ohio DOT owns 800 signalized corridors. In this effort, a method for prioritization of corridors for retiming was conducted. Dr. Dobrota managed this effort and assisted in various project activities, such as a review of existing models and methods for corridor prioritization, data collection, and analysis, development of methods for prioritization, and development of MS-Excel-based ranking tools.
5. **FHWA Ops Complete Street Primer; Nationwide, USA.** The objective of this project is to develop a Primer document on Transportation Systems Management and Operations (TS) and Complete Streets. The primer is intended to be a higher-level piece that frames the implications of the operation (accommodation of all modes and delay for all modes) and ways in which operations can support and enhance Complete Streets. Dr. Dobrota supported this task by reviewing relevant literature, synthesizing the impact of various operational strategies on the efficiency and safety of complete streets, and final report writing.
6. **Connecticut DOT ATSPM Support; Statewide, CT.** The objective of this project is to implement automated traffic signal performance measure (ATSPM) and adaptive signal control technology (ASCT) systems on two corridors for the Connecticut Department of Transportation's (CTDOT) Bureau of Highway Operations. CTDOT needed to replace their antiquated computer traffic signal system and aging signal equipment with a system which would allow for remote monitoring of the signal status and intersection operations. Dr. Dobrota assisted the deployment of the state's first ATSPM system, including the integration of the system into CTDOT's computer system, onboarding of the target corridors, and validation and verification of the system. Dr. Dobrota also supported in the validation of the ASCT system, developing the necessary systems engineering documents for both systems.
7. **N Sycamore-I-66 Operational and Safety Analysis Report; Arlington County, VA**. The purpose of this project is to improve traffic operations, safety, and connectivity for non-motorized users, specifically pedestrians, and bicycles, on a segment of N Sycamore Street between Langston Boulevard (US Route 29) and 19th Street N. Dr. Dobrota conducted traffic analysis for existing conditions and evaluated future conditions for the proposed design. Dr. Dobrota assisted in the development of new signal timing plans to accommodate all network users.
8. **N Mead Street Interchange Access Report; Arlington County, VA.** The purpose of this project is to support the Two-Way Traffic Operation on Fort Myer Drive Phase II (N Meade St) Improvement Project. Also, this effort analyzes the potential impact of closing the Route 50 (Arlington Boulevard) exit at N Queen Street as an alternative within the overall improvement project. Dr. Dobrota supports various activities during the project scope, such as volume balancing, development and calibration of simulation models (Synchro/Simtraffic and PTV Vissim), actual analysis, and final report writing.
9. **DDOT Signal Optimization; Washington, DC.** Dr. Dobrota supported the configuration of Transit Signal Priority (TSP) modems, the installation and maintenance of phase selector cards, and antennas at identified TSP locations. Dr. Dobrota performed maintenance activities for Opticom On-Site Central Management Server to monitor TSP activities. Dr. Dobrota performed field troubleshooting for a malfunctioning TSP intersection.
10. **Independence Avenue SW Urban Design; Washington, DC.** Dr. Dobrota supports continued work with the National Capital Planning Commission to redesign Independence

Avenue SW from 15th Street to 3rd Street SW. Dr. Dobrota is the lead engineer for the operational analysis of the study area. The project scope encompasses network volume balancing, the development of Synchro models for multiple peak periods and design alternatives, analysis of alternatives, and final report writing.

HONORS AND AWARDS

January 2023	Received Best Research Paper Award at TRB AM by the Traffic Signal Systems Committee for the work: "Mitrovic, N., **Dobrota, N.**, Pereira, M. B., Espino, E., Stevanovic, A. (2023). Data-Driven Decision Support Platform for Selection of Intersections for Adaptive Traffic Signal Control. Transportation Research Record, 3611981231159870"
November 2021	Received Best Paper Award at 2nd International Conference on Civil Engineering Fundamentals and Applications (ICCEFA'21) Seoul, South Korea for the work: "**Dobrota, N.**, and Stevanovic, A. (2021). Modelling of Delay for Protected/Permitted Left Turning Vehicles Using Multigene Genetic Programming. 2nd International Conference on Civil Engineering Fundamentals and Applications (ICCEFA'21) Seoul, South Korea - November 2021."
2020 – 2022	Graduate Research Scholarship at University of Pittsburgh.
2019 – 2020	Graduate Teaching Scholarship at University of Pittsburgh.
2017 – 2019	Graduate Research Scholarship at Florida Atlantic University.
2010 – 2015	Serbian Governmental Scholarship.

REVIEWER OF PAPERS SUBMITTED TO (IN ALPHABETIC ORDER):

1. Applied Sciences
2. Case Studies on Transport Policy
3. CivilEng
4. IEEE Conferences
5. Journal of Transportation Engineering, Part A: Systems
6. Sustainability
7. Transportation Research Record
8. Transportation Research Board (TRB) Annual Meetings

PROFESSIONAL AFFILIATIONS

Handling Editor, Transportation Research Record, official journal of Transportation Research Board, January 2024 - Present

Member, Institute of Transportation Engineers (ITE), The Mid-Atlantic Section of ITE, October 2022 - Present

Friend, Transportation Research Board (TRB) Standing Committee on Highway Capacity Manual, January 2023 - Present

Friend, Transportation Research Board (TRB) Standing Committee on Artificial Intelligence and Advanced Computing Applications, January 2021 - Present

Friend, Transportation Research Board (TRB) Standing Committee on Traffic Simulation, January 2021 - Present

Friend, Transportation Research Board (TRB) Standing Committee on Traffic Signal Systems, April 2020 - Present

Co-founder**,** Women in Transportation (WTS) Student Chapter at University of Pittsburgh, October 2021

Member, American Society of Civil Engineers (ASCE), September 2019 - Present

Vice President, Institute of Transportation Engineers (ITE) student chapter at FAU, 2018-2019

Member, Institute of Transportation Engineers (ITE) student chapter at FAU, 2017-2018

COMPUTER SKILLS AND COMPETENCES

Scripting Languages	Python, MATLAB, Visual Basic for Applications (VBA)
Traffic Simulation	PTV Vissim (including COM), Aimsun, Corsim, PTV Visum, PTV Vistro, Synchro, HCS, TruTraffic
Design	Auto CAD, Corel Draw, MS Visio
Geographic Information System	ArcGIS