

# Nathan David Obeng-Amoako, E.I.T.

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## RESEARCH INTERESTS

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- Intelligent Transportation Systems
- Advanced Traffic Signal Control
- Machine Learning and Deep Learning
- Transportation Demand Forecasting
- Transit Operations and Management
- Bicycle and Pedestrian Transportation

## EDUCATION

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**Doctor of Philosophy in Civil Engineering (Transportation)** Sep 2023 - Present

Northeastern University, Boston, MA (GPA: 4.00/4.00)

**Research Advisor:** Professor Peter Furth

**Master of Science in Civil Engineering (Transportation)** Sep 2023 – Apr 2025

Northeastern University, Boston, MA (GPA: 4.00/4.00)

**Bachelor of Science in Civil Engineering** Aug 2018 - Sep 2022

Kwame Nkrumah University of Science and Technology (KNUST), Kumasi

**Recognition:** Best Graduating Student, Class of 2022

## RESEARCH EXPERIENCE

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**Graduate Research Assistant, Northeastern University, Boston, MA** Sep 2023 - Present

- Development of advanced traffic signal controls and simulations
- Investigation of barriers to low-stress bicycle network connectivity

**Research Assistant, Civil Engineering Department, KNUST** Jan 2022 - Sep 2022

- Empirical investigation of aggregate retention benefits of waste-modified asphalt
- Analysis of mechanical and durability properties of asphalt mixtures

## SPONSORED RESEARCH PROJECTS

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**Project:** Bicycle Level of Traffic Stress at Intersections (xLTS) Jun 2024 – Present

**Funding Agency:** United States Department of Transportation (USDOT)

- Assessing the impact of high-stress crossings on bike network connectivity
- Developing algorithms and data structures for traffic stress network analysis

**Project:** Accessible Bus Stop Design in the Presence of Bike Lanes Sep 2023 – Jun 2024

**Funding Agency:** Massachusetts Department of Transportation (MassDOT)

- Studied bus rider and bicyclist behavior at floating and constrained bus stops
- Proposed design improvements to reduce bus-rider-and-bicyclist conflicts

## JOURNAL PUBLICATIONS

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- 2025 1. Joshua Kofi Asamoah, Blessing Agyei Kyem, **Nathan David Obeng-Amoako**, Armstrong Aboah, SAAM-ReflectNet: Sign-Aware Attention-Based Multitasking Framework for Integrated Traffic Sign Detection and Retroreflectivity Estimation, *Expert Systems With Applications* (2025), doi: <https://doi.org/10.1016/j.eswa.2025.128003>

## Submitted and under review:

- 2025 2. Peter Furth, Ray Saeidi-Razavi, **Nathan David Obeng-Amoako** and Milad Tahmasebi. TSP-Friendly Underlying Traffic Signal Control, An Essential Complement of Transit Signal Priority. *Future Transportation*.
3. Yu-Min (Thomas) Yanga, Dewan Tanvir Ahammed, **Nathan David Obeng-Amoako**, Chengbo Ai, Peter Furth and Eleni Christofa. Community-Engaged Informed Floating Bus Stop Guidelines. *Transportation Research Record*.

## RESEARCH REPORTS

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- 2024 1. Eleni Christofa, Chengbo Ai, Peter Furth, Yu-Min Yang, Dewan Tanvir Ahammed, and **Nathan David Obeng-Amoako**. (2024). *Accessible Bus Stop Design in the Presence of Bike Lanes*. Massachusetts Department of Transportation (MassDOT), Office of Transportation Planning. Report No. 24-060. Retrieved from <https://rosap.ntl.bts.gov/view/dot/79327>

## CONFERENCE PRESENTATIONS

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- 2025 1. **Nathan David Obeng-Amoako** and Peter Furth. (May 2024). Underlying Traffic Signal Control: The Key to Effective Transit Signal Priority – A Case Study of MBTA Bus Route 39 along South Huntington Avenue, Boston, MA. *2025 MassDOT Transportation Innovation Conference*, Worcester, MA.
2. Yu-Min (Thomas) Yanga, Dewan Tanvir Ahammed, **Nathan David Obeng-Amoako**, Eleni Christofa, Chengbo Ai, and Peter Furth. Design Guidelines for Accessible Floating Bus Stops. *International Conference on Transportation and Development 2025, ASCE*, Glendale, AZ.
- 2024 3. Yu-Min (Thomas) Yanga, Dewan Tanvir Ahammed, **Nathan David Obeng-Amoako**, Eleni Christofa, Chengbo Ai, and Peter Furth. (April 2024). Accessible Bus Stop Design in the Presence of Bike Lanes. Poster. *2024 MassDOT Transportation Innovation Conference*, Worcester, MA.
- 2023 4. **Nathan David Obeng-Amoako**, Arthur Louis Senaya, Bundu Kassim, Francisca Owusu-Ansah, Eugene Damoah, Santus Worclachie, and Kenneth A. Tutu. (April 2023). Modification of Bitumen with Waste Materials for Enhanced Aggregate Retention in Surface-Dressed Roads. *Lectern. 3rd IRF Africa Regional Congress & Exhibition*, Accra, Ghana.

## JOURNAL REVIEWS

1. Transportation Research Board

Aug 2024 – Present

## SELECTED GRADUATE-LEVEL TERM PAPERS

Spring 2025	<b>Performance Evaluation of Emerging and Traditional Bus Transit Systems</b> This project compared Fixed Route, Fixed Route with Deviation, and Demand Responsive Transit systems using a simulation model developed in Python to evaluate performance metrics like waiting time, ridership, and unserved demand under varying conditions.
Fall 2024	<b>Assessing the Impact of Electric Bikes on Urban Mobility in Boston</b> Analyzed Greater Boston's Bluebikes data to evaluate the impact of electric bicycles on mode choice and urban transportation dynamics. Applied statistical models to assess changes in demand for public bike-sharing systems.  <b>XGBoost-Driven Demand Prediction for Optimized Electric Vehicle Charging</b> Developed an integrated framework combining predictive modeling and optimization techniques to enhance the efficiency of electric vehicle charging infrastructure, leveraging the Adaptive Charging Network dataset from Caltech.

## TEACHING EXPERIENCE

<b>Northeastern University, Boston, MA</b>	
Summers of 2024, 2025	<b>Teaching Assistant, Sustainable Transportation Summer School Program</b> Location: Technische Universiteit Delft, The Netherlands <ul style="list-style-type: none"><li>Facilitate logistical, academic and evaluative support for an intensive 5-week program</li><li>Assist in teaching Vision Zero safety principles to 25 students</li><li>Explore strategies for car-free and car-lite zones to enhance active transportation</li></ul>
Fall 2024	<b>Graduate Teaching Assistant, Statics and Solid Mechanics</b> <ul style="list-style-type: none"><li>Tutored fundamental concepts of Newtonian physics and solid mechanics</li><li>Evaluated students' test performance and offered comprehensive feedback</li></ul>
<b>Kwame Nkrumah University of Science and Technology, Kumasi, Ghana</b>	
Spring 2022	<b>Teaching Assistant, Irrigation &amp; Drainage Engineering</b> <ul style="list-style-type: none"><li>Activity-oriented instruction of drainage design using <i>Autodesk Civil 3D</i>®</li><li>Development of course outlines and preparation of lecture materials</li></ul>

## NOTABLE DISTINCTIONS AND ACHIEVEMENTS

• Grant Recipient, New England African Business Expo, Worcester, MA	<b>May 2025</b>
• Civil and Environmental Engineering Distinguished Fellowship Award, Northeastern Univ	<b>Aug 2023</b>
• Associated Consultants Ltd. Award for Best Graduating Student, KNUST	<b>Jul 2023</b>
• Provost Award for Best & Excellent Students in College of Engineering, KNUST (x4)	<b>2019 - 2022</b>
• Academic Excellence Award, Ghana Engineering Students' Association, Ghana	<b>Sep 2022</b>

- Global Finalist, Unilever Future Leaders League Business Pitch Competition, U.K. **Jul 2022**
- Scholar, Tullow Oil Scholarship Scheme, Ghana **Apr 2019**
- Semifinalist, National Science and Maths Quiz (NSMQ), Ghana **Jul 2018**

## PROFESSIONAL EXPERIENCE

### Assistant Transportation Engineer, BHM Construction International UK Ltd. **Oct 2022 – July 2023**

- Conducted over 20 quality control tests daily on construction materials to ensure strict standard compliance
- Supported site reporting and coordination with a team of 5 engineers to improve workflow efficiency

### Civil Engineering Trainee, China Henan International Corporation Ltd. **Sep 2021 – Dec 2021**

- Supervised 15+ artisans daily to ensure strict adherence to project specifications and timelines
- Contributed to precise structural detailing for reinforced concrete components

## CERTIFICATIONS

- **Engineer-in-Training (EIT), FE Civil – ([Verify](#))** **Sep 2024**  
Massachusetts Board of Registration of Professional Engineers & Professional Land Surveyors
- **Basic Life Support (CPR & AED) Provider – ([Verify](#))** **Apr 2024**  
American Heart Association

## RELEVANT SOFTWARE AND SKILLS

- **Python, R, MATLAB** machine learning, deep learning, advanced data analysis
- **PTV Vissim/Vistro** traffic flow simulations, traffic signal analysis, traffic impact analysis
- **Synchro** traffic flow modeling, traffic signal timing optimization
- **ArcGIS, QGIS** mapping, visualizing and analyzing spatial data for informed decision making
- **AutoCAD** precision drafting and technical drawings, 2D and 3D
- **HTML/CSS/JavaScript** developing web applications
- **Minitab, MS Excel** data visualization, statistical computing, data organization

## SELECTED NEWS AND PRESS

1. College of Engineering, Northeastern University. (August 2024). “PhD Student Reflects on the Sustainable Transportation Dialogue of Civilizations in Holland.” <https://coe.northeastern.edu/news/a-reflection-on-the-sustainable-transportation-dialogue-of-civilizations-course-in-holland/>
2. Twitter. (June 2024). “Transit-friendly traffic signal timing can reduce MBTA Bus 39 delay by 90% at two intersections” by Peter Furth. <https://x.com/PeterFurth/status/1801694153098858812>

## PROFESSIONAL AFFILIATIONS

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|---|---------------------------|
| • American Society of Civil Engineers (ASCE)                | <b>Feb 2025 – Present</b> |
| • Boston Society of Civil Engineers Section (BSCES) of ASCE | <b>Feb 2025 – Present</b> |
| • New England Intelligent Transportation Society (NEITS)    | <b>Sep 2023 - Present</b> |
| • Institute of Transportation Engineers (ITE)               | <b>Jan 2024 – Present</b> |

## LEADERSHIP EXPERIENCE

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| <b>Department Rep., College of Engineering. PhD Council, Northeastern Univ.</b>  | <b>Jun 2024 – Present</b>  |
| <ul style="list-style-type: none"><li>• Meeting with advisor to discuss novel ways of improving student experience</li><li>• Organizing weekly coffee hours and semesterly happy hours for PhD students</li></ul>              |                            |
| <b>Executive C'ttee Member, CEE Graduate Student Council, Northeastern Univ.</b>   |                            |
| <ul style="list-style-type: none"><li>• Brainstorming and implementing strategies to enhance graduate student experience</li><li>• Serving as a liaison between the departmental chair and the graduate student body</li></ul> | <b>Feb 2024 – Present</b>  |
| <b>Communications Director, Young Professionals and Youth Coalition, Ghana</b>   | <b>Jan 2021 - Dec 2021</b> |
| <ul style="list-style-type: none"><li>• Social media management to curate consistent communications content</li><li>• Organization of in-person and virtual engagements with members and partners</li></ul>                    |                            |
| <b>President, Civil Engineering Students' Association, KNUST</b>   | <b>Feb 2020 - Sep 2021</b> |
| <ul style="list-style-type: none"><li>• Coordination of fundraising events to secure administrative equipment</li><li>• Establishment of academic support scheme for underachieving students</li></ul>                         |                            |

## VOLUNTEER EXPERIENCE & COMMUNITY INVOLVEMENT

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- **Judge**, Massachusetts Science and Engineering Fair, Worcester (April 2025)
- **Cycling Activist**, Boston Cycling Union, Boston, MA (Feb 2025 – Present)
- **Executive Vice President**, Student Energy Society, KNUST (Jan 2022 – Oct 2022)
- **Community Outreach Coordinator**, Nat'l Society of Black Engineers, KNUST (Jan 2022 – Sep 2022)
- **Project Coordinator**, Engineers Without Borders, KNUST (Aug 2021 - Jul 2022)

## REFERENCES

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*Available upon request*