TAO TAO

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EDUCATION

Ph.D. Public Affairs - Urban Planning, University of Minnesota, 2022

Dissertation: Nonlinear and threshold relationships between built environment attributes and travel behavior.

University of Minnesota Doctoral Dissertation Fellowship

M.S. Statistics, University of Minnesota, 2022

M.E. Transportation Planning and Management, Southeast University, China, 2017

B.E. Traffic and Transportation, Southeast University, China, 2012

PROFESSIONAL APPOINTMENT

Postdoctoral research associate, Carnegie Mellon University, 2022-

Graduate research assistant, University of Minnesota, 2017-2022

Graduate instructor, University of Minnesota, 2019, 2021, 2022

Planning intern, Minnesota Department of Transportation, 2019

PUBLICATIONS

(* indicates corresponding author)

Peer-reviewed Articles

1. Tao, T., Liu, Y., Sheng, Z., Qian, S.*, 2026. Impact of traffic stress on mode choice: A data-driven analysis in Maryland. *Travel Behaviour and Society*. [Link]
2. **Tao, T.,** Qian, S.*, 2025. Pavement condition prediction for communities: A low-cost, ubiquitous, and network-wide approach. *Journal of Infrastructure Systems*. [Link]
3. Yang, H., Shi, J., **Tao, T.***, 2025. Where do built environment attributes most effectively influence bike sharing usage? *Transportation Research Part D: Transport and Environment*. [Link]
4. Cao, J.*, **Tao. T.**, 2025. Can an identified environmental correlate of car ownership serve as a practical planning tool? *Transportation Research Part A: Policy and Practice*. [Link]
5. **Tao, T.,** Qian, S.*, 2024. Do smart loading zones help reduce traffic congestion? A causal analysis in Pittsburgh. *Transportation Research Part E: Logistics and Transportation Review*. [Link]
6. **Tao, T.**, Zhong, H.*, 2024. Income moderates the nonlinear influence of built environment attributes on travel-related carbon emissions. *Journal of Transport Geography*. [Link]
7. **Tao, T.***, Lindsey, G., Stern R., Levin, M., 2024. The use of crowdsourced mobile data in estimating pedestrian and bicycle traffic: A systematic review. *Journal of Transport and Land Use*. [Link]
8. **Tao. T.***, Cao, J., 2024. Ineffective built environment interventions: how to reduce driving in American suburbs? *Transportation Research Part A: Policy and Practice*. [Link]
9. Fang, J., Yan, X., **Tao, T.**, Chen, C.*, 2024. Non-linear Effects of Built Environment Factors on Mode Choice: A Tour-Based Analysis. *Journal of Transport and Land Use.* [Link]
10. **Tao, T.**, Cao, J.*, Wu, X., 2024. The road less traveled: Does rail transit matter? *Journal of Planning Education and Research*. [Link]

11. **Tao, T.***, Cao, J., 2023. Exploring nonlinear and collective influences of regional and local built environment characteristics on travel distances by mode. *Journal of Transport Geography*. [Link]
12. Cao, J.*, **Tao, T.**, 2023. Using machine-learning models to understand nonlinear relationships between land use and travel. *Transportation Research Part D: Transport and Environment*. [Link]
13. Qi, C., De Vos, J., **Tao, T.**, Shi, L., Guo, X.*, 2023. Trip chaining patterns of tourists: a real-world case study. *Transportation*. [Link]
14. **Tao, T.**, Wu, X., Cao, J.*, Fan, Y., Das, K., Ramaswami, A., 2023. Exploring the non-linear relationship between the built environment and active travel in the Twin Cities. *Journal of Planning Education and Research*. [Link]
15. **Tao, T.***, Næss., P., 2022. Exploring nonlinear built environment effects on driving with a mixed-methods approach. *Transportation Research Part D: Transport and Environment*. [Link]
16. **Tao, T.***, Cao, J., 2022. Examining motivations for owning autonomous vehicles: Implications for land use and transportation. *Journal of Transport Geography*. [Link]
17. **Tao, T.***, Cao, J., 2021. Exploring the interaction effect of poverty concentration and transit service on highway traffic during the COVID-19 lockdown. *Journal of Transport and Land Use.* [Link]
18. **Tao, T.**, Lindsey, G.*, Cao, J., Wang, J., 2021. The effects of pedestrian and bicycle exposure on crash risk in Minneapolis. *Journal of Transport and Land Use*. [Link]
19. **Tao, T.***, Wang, J., Cao, X., 2020. Exploring the non-linear associations between spatial attributes and walking distance to transit. *Journal of Transport Geography*. [Link]
20. Wu, X., **Tao, T.**, Cao, J.*, Fan, Y., Ramaswami, A., 2019. Examining threshold effects of built environment elements on travel-related carbon-dioxide emissions. *Transportation Research Part D: Transport and Environment*. [Link]
21. Dou, X., Gong, X., Guo, X.*, **Tao, T.**, 2017. Coordination of feeder bus schedule with train service at integrated transport hubs. *Transportation Research Record: Journal of the Transportation Research Board*. [Link]

Research Reports

22. Bermudez, D., Tao, T., Qian, S., 2025. Impact of Work Zones on Crash Occurrence: A Texas Case Study. Safety 21. [Link]
23. Qian, S., Guengerich, Q., Tao, T., 2024. Mitigating Crash Risks in Work Zones: Causal Inference and Crash Modification Factors. Safety 21. [Link]
24. Cao, J., **Tao, T.**, Johnson I., Huang, H., 2023. The value of dedicated right of way (ROW) to transit ridership and carbon emissions. Humphrey School of Public Affairs, University of Minnesota. [Link]
25. Webb, A., **Tao, T.**, Khani, A., Cao, J., Wu, X., 2021. Impact of transitways on travel on parallel and adjacent roads and park-and-ride facilities. Department of Civil, Environmental, and Geo-Engineering, University of Minnesota. [Link]
26. Lindsey, G., **Tao, T.**, Wang, J., Cao, J., 2019. Pedestrian and bicycle crash risk and equity: implications for street improvement projects. Humphrey School of Public Affairs, University of Minnesota. [Link]

27. Tomhave, B., Zhang, Y., Khani, A., Hourdos, J., Dirks, P., Olsson, J., **Tao, T.**, Wu, X., Cao, J., 2018. After study of the bus rapid transit A Line impacts. Department of Civil, Environmental, and Geo-Engineering, University of Minnesota. [Link]

RESEARCH EXPERIENCE

1. Develop a mode choice model to estimate walk and bike trips in the statewide model, sponsored by Maryland Department of Transportation, 2023-2024
2. Mitigating Crash Risks in Work Zones: Causal Inference and Crash Modification Factors, sponsored by Safety 21 University Transportation Center, 2023-2024
3. Data-driven predictive pavement management system for Smart Communities, sponsored by Pennsylvania Infrastructure Technology Alliance, 2022-2023
4. Testing and Evaluation of Curb Management and Integrated Strategies to Catalyze Market Adoption of Electric Vehicles, sponsored by US Department of Energy, 2022-2024
5. The values of dedicated right of way to transit ridership and carbon emissions, 2022-2023 (PI: Jason Cao; Investigator: **Tao Tao**), sponsored by Metropolitan Council and Hennepin County, $75,000
6. Mobile-device data, non-motorized traffic monitoring, and estimation of annual average daily bicyclist and pedestrian flows, sponsored by Road Safety Institution, 2021
7. Connecting the smart-city paradigm with a sustainable urban infrastructure systems framework to advance equity in communities, sponsored by National Science Foundation, 2020
8. Impact of transitways on travel on parallel and adjacent roads and park-and-ride facilities, sponsored by Minnesota Department of Transportation, 2019-2020
9. Exploring the pedestrian and bicycle crash risk in highway intersections: systemic approach applied in the Twin Cities metro area, sponsored by Minnesota Department of Transportation, 2019
10. Pedestrian and bicycle crash risk and equity: implications for street improvement projects, sponsored by Minnesota Department of Transportation, 2018
11. Integrated urban infrastructure solutions for environmentally sustainable, healthy and livable cities, sponsored by National Science Foundation, 2018
12. After study of the bus rapid transit A Line impacts, sponsored by Minnesota Department of Transportation, 2017

TEACHING EXPERIENCE

Independent Instructor

1. 12-644/94-893 Introduction to Transportation Systems Analysis, Fall 2024 at CMU
2. 12-645/94-845 Smart Cities: Growth with Intelligent Transportation Systems, Fall 2024 at CMU
3. PA 5234 Urban Transportation Planning and Policy, Spring 2021 at UMN
4. PA 5928 Data Management and Visualization with R, Fall 2019, Spring 2021, Spring 2022 at UMN

Guest Speaker

5. PA 5290 Topics in Planning: Transportation Engineering Principles for Planners, Spring 2022
6. PA 5234 Urban Transportation Planning and Policy, Spring 2022
7. PA 5231 Transit Planning and Management, Fall 2020

8. PA 5205 Statistics for Planning, Spring 2020
9. PA 5234 Urban Transportation Planning and Policy, Spring 2020
10. PA 8202 Networks and Places: Transportation, Land Use, Design, Spring 2019

PRESENTATIONS AND TALKS

Conference Presentations

1. The causal impact of smart loading zones on traffic speed. In 2023 ACSP Annual Conference.
2. Heterogenous nonlinear effects of built environment attributes on travel-related carbon-dioxide emissions in different income-level areas. In: 2023 IACP Annual Conference.
3. Scrutinizing built environment interventions for driving mitigation in American suburbs. In: 2023 TRB Annual Conference.
4. Heterogeneous nonlinear relationships between built environment attributes and VMT in suburban and urban areas. In 2022 ACSP Annual Conference.
5. Heterogeneous nonlinear relationships between built environment attributes and VMT in suburban and urban areas. In 2022 NECTAR Annual Conference.
6. Scrutinizing built environment interventions for driving mitigation in American suburbs. In: 2022 IACP Annual Conference.
7. Nonlinear and threshold associations of built environment attributes with travel behavior. In: 2022 TRB Annual Conference.
8. Collective influences of regional and local built environment characteristics on mode-specific distances. In: 2022 TRB Annual Conference.
9. Examining motivations for owning autonomous vehicles: Implications for land use and transportation. In: 2022 TRB Annual Conference.
10. Exploring the nonlinear and threshold effects of the built environment on driving behavior with a mixed-method approach. In: 2022 TRB Annual Conference.
11. Examining the motivations for the willingness to own autonomous vehicles in the Twin Cities. In: 2021 Annual CTS Transportation Research Conference.
12. Exploring nonlinear relationships with machine learning. Roundtable panelist. In: 2021 ACSP Annual Conference.
13. Examining the motivations for the willingness to own autonomous vehicles in the Twin Cities. In: 2021 ACSP Annual Conference.
14. Exploring nonlinear relationships with machine learning. Roundtable panelist. In: 2021 IACP Annual Conference.
15. Exploring the heterogeneous nonlinear effects of built environment attributes on driving, transit use, and active travel. In: 2021 IACP Annual Conference.
16. Examining the motivations for the willingness to own autonomous vehicles in the Twin Cities. In: 2021 IACP Annual Conference.
17. Exploring the interaction effect of poverty concentration and transit service on highway traffic during the COVID-19 lockdown. In: 2021 WSTLUR Annual Conference.
18. The road less traveled: Does rail transit matter? In: 2020 ACSP Annual Conference.
19. The road less traveled: Does rail transit matter? In: 2020 Bridging Transportation Researchers Conference.

20. Exploring the pedestrian and bicycle crash risk in highway intersections: systemic approach applied in the Twin Cities metro area. In: 2020 TRB Annual Conference.
21. Exposure, crash risk, and equity: models of pedestrian and bicycle crashes in Minneapolis. In: 2020 TRB Annual Conference.
22. How does built environment affect activity space of people living in different income level areas? In: 2019 Annual CTS Transportation Research Conference.
23. New methods for accessing pedestrian and bicycle exposure to risk, crash risk, and equity. In: 2019 ACSP Annual Conference.
24. Pedestrian and bicycle crashes in Minneapolis: an equity perspective. In: 2019 Minnesota Transportation Conference.
25. Exploring the non-linear relationship between built environment characteristics and people's active travel. In: 2019 TRB Annual Conference.
26. Methods and measures for assessing pedestrian exposure to risk, crash risk, and equity. In: 2018 Annual CTS Transportation Research Conference.
27. Exploring nonlinear influences of built environment characteristics on carbon emissions of daily travel in Minneapolis. In: 2018 ACSP Annual Conference.
28. Exploring built environment correlates of walking distance of transit access in the Twin Cities: A Machine Learning Approach. In: 2018 IACP Annual Conference.
29. Analysis of operating patterns of the public bicycling sharing system in the Twin Cities. In: 2018 Sharing Economy Research Forum.
30. Operating characteristics of a public bicycle sharing system based on the status of stations: a case study in Nanning City, China. In: 2017 TRB Annual Conference.
31. Path to success: investment and public opinions are reforming the taxi industry in China. In: 2017 TRB Annual Conference.

Invited Talks

32. The causal impact of smart loading zones on traffic speed. By: Arizona State University, 2023.
33. Exploring nonlinear built environment effects on driving with a mixed-methods approach. By: Southwest Jiaotong University, 2022.
34. Examining threshold effects of built environment elements on travel-related carbon-dioxide emissions. By: Kunming University of Science and Technology, 2022.
35. Examining threshold effects of built environment elements on travel-related carbon-dioxide emissions. By: Chang'an University, 2021.
36. Threshold effects of urban form on travel and associated carbon emissions. By: Climate Change AI, 2021.
37. Exploring the nonlinear relationship between the built environment and active travel in the Twin Cities. By: Southeast University, 2021.
38. Non-linear and threshold effects in land use and transportation research. By: Beijing Jiaotong University, 2020.
39. The road less traveled: Does rail transit matter? By: Peking University, 2020.

PROFESSIONAL ORGANIZATIONS

International Association for China Planning: Board of Directors, 2021-2025

Association of Collegiate Schools of Planning: Member, 2017-present

Transportation Research Board Standing Committee on Economic Development and Land Use, Standing Committee on Bicycle Transportation, Standing Committee on Traveler Behavior and Values: Friend

SELECTED PROFESSIONAL SERVICES

Journal Referee

- Transportation Research Part D (EAB member)
- Journal of Planning Education and Research
- Transportation Research Part A
- Journal of Transport and Geography
- Nature Cities
- Transportation
- Transportation Research Record
- Journal of Public Transportation
- Urban Studies
- Sustainable Cities and Society
- Energy for Sustainable Development
- Journal of Asian Architecture and Building Engineering
- International Journal of Sustainable Transportation

Conference Referee

- Transportation Research Board Annual Meeting
- COTA International Conference of Transportation Professionals
- World Symposium on Transport and Land Use Research
- Bridging Transportation Researchers Conference
- IACP Annual Conference

Grant Referee

- Climate Change AI Innovation Grants Program

AWARDS AND HONORS

IACP Karen R. Polenske Best Student Paper Award, 2022

ACSP GPEIG Student Travel Award, 2022

Doctoral Dissertation Fellowship, University of Minnesota, 2021

Summer Fellowship, Humphrey School of Public Affairs, 2021

John S. Adams Award for Excellence in Transportation Research and Education, Center for Transportation Studies, 2021

Outstanding Reviewer for Transportation Research Part D: Transport and Environment, 2021-2024

TRB Annual Meeting Travel Award, Center for Transportation Studies, 2018, 2019, 2020, 2021

IACP Annual Meeting Travel Award, International Association for China Planning, 2018

Jiangsu Daqin Alumni Fellowship, Southeast University, 2015

China Road and Bridge Corporation Alumni Fellowship, Southeast University, 2011