

International Conference on Transportation and Development 2025

**Transportation Safety and Emerging
Technologies**

Selected Papers from the International Conference on
Transportation and Development 2025

Glendale, Arizona, USA

8-11 June 2025

Editor:

Heng Wei

ISBN: 979-8-3313-2188-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2025) by American Society of Civil Engineers
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact American Society of Civil Engineers
at the address below.

American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191
USA

Phone: (800) 548-2723
Fax: (703) 295-6333

www.asce.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

Contents

Transportation Safety

Components of Road Transport Infrastructure Development in Kaski District, Gandaki Province, Nepal.....	1
Mahendra B. Baniya, Tika Karki Baniya, Arjun Baniya, Rocky Talchabhadel, Laxmi P. Bhandari, Asmit Pokhrel, Satish Subedi, and Dhan Subedi	
Highway Workers' Perception of Autonomous Truck-Mounted Attenuator: A Case Study in Indiana's DOT	8
Chi Tian, Yunfeng Chen, Yiheng Feng, and Jiansong Zhang	
An Interactive Geospatial Tool for Post-Crash Emergency Response Planning and Analysis	18
Namratha Kommineni and H. M. Abdul Aziz	
A Study of Factors Contributing to Highway Fatalities in the Gulf of Mexico Region	31
Tharwat Khalaf Alswaeer, Elnaz Safapour, Behzad Rouhanizadeh, Michael D. Anderson, and Mohammadsoroush Tafazzoli	
Evaluating Restricted Crossing U-Turn (RCUT) Intersections on Reducing Rear-End and Angle Crashes	43
Tathagatha Khan, Salim Al Adawi, Mustafa Abdekhalek, Kirolos Haleem, Arunabha Banerjee, and Rahul Raoniar	
Role of Solar Radiation and Roadway Features on Crash Severity along Arterial Roads in Kentucky	55
Rahul Raoniar, Tathagatha Khan, Kirolos Haleem, and Arunabha Banerjee	
Analyzing Spatial and Temporal Traffic Crash Dynamics across Rural and Urban Areas of North Dakota	69
Mulugeta D. Amare and Daba S. Gedafa	
Investigating the Contributing Factors to Crashes with and without the Presence of Work Zone Workers Using Machine Learning Techniques	81
Isaac Baah and Mohamed Ahmed	
Investigating Crash Contributing Factors at Public Highway-Railroad Grade Crossings in Kentucky	94
Arunabha Banerjee, Dylan Justice, Alrose Noronha, Trenten Cissell, Luke Southard, Shamar Crump, Tathagatha Khan, Rahul Raoniar, and Kirolos Haleem	

Understanding Driving Behaviors and Traffic Crashes among University Commuter Drivers	108
Abdulaziz H. Alshehri	
Investigating the Impact of Temporal and Directional Traffic Distribution on Crash Frequencies	121
Guanhao Xu, Jinghui Yuan, and Vikash V. Gayah	
Innovating Transportation Research through Driving Simulations.....	134
Eazaz Sadeghvaziri, Ramina Javid, and Maxwell Wood	
Comprehensive Analysis of Multi-Modal Road User Behavior Using Big Data: Implications for Intersection Safety	146
Mehrdad Nasri, Shuyi Yin, and Yinhai Wang	
Leveraging AI and Machine Learning for Safety Assessments: Analyzing Connected Vehicle Data for Turning Movement Counts at Intersections	160
Mehrdad Nasri, Shuyi Yin, and Yinhai Wang	
Older Driver Safety: Impact of Demographic Factors on Crash Frequency and Severity	171
Samantha Islam and Heloisa P. Murphy	
Factors Associated with Vulnerable Road Users on Freeways in North Carolina	183
Youngseob Eum and Yuting Chen	
An Analysis of General and Specific Deterrence Perception of Drivers Using Structural Equation Modeling	194
Mohammad Khojastepour, Sina Sahebi, and Mohammad SafariTaherkhani	
Assessment of Strategies and Technologies for Improving Highway-Rail Grade Crossings Safety	207
Pei-Sung Lin, Zhenyu Wang, Priyanka Alluri, Rama Kolla, Ela Białkowska-Jelińska, and Mostafa Soltaninejad	
Assessing the Safety Impacts of Roundabouts in California and the San Joaquin Valley	220
Alexis Perez, Jerome Martizano, and Aly M. Tawfik	
Influence of Wrong-Way Driving (WWD)-Related Dynamic Message Signs (DMS) on Traffic Behavior	231
Abdallah Kineri and Priyanka Alluri	

Enhanced Lighting Signals for Safety and Efficiency—Experiments with Addressable LEDs.....	244
Todd Osborn, Stanley Young, Qichao Wang, Andrew Duvall, and Faizan Mir	

Improving Pedestrian Safety at Intersections Using Probabilistic Models and Monte Carlo Simulations.....	252
Alben Rome Bagabaldo and Jürgen Hackl	

Public Perceptions and Behavioral Intentions Regarding Impaired Driving: Analysis of Educational and Enforcement Strategies	262
Luwei Zeng and Claudia Marin	

Investigating Truck Driver Behavior under Distracted Conditions to Enhance Road Safety	273
A. Alireza, S. Nasim, and J. Mansoureh	

Artificial Intelligence in Transportation

Enhanced Road Surface Temperature Prediction Using Random Forest Model and NWS Weather Forecast Data	286
Pooya Darghiasi, Mina Zamanian, Sushil Bhatta, and Mohsen Shahandashti	

Exploring the Use of Time Series Foundation Model for Car-Following Behavior Analysis.....	299
Luwei Zeng and Runze Yan	

Comparative Case Study: Traffic Monitoring Using YOLOv11-Based Object Detection and Two Tracking Algorithms with Small Uncrewed Aerial Systems.....	311
Rajrup Mitra, Md. Abdullah Ali Sourav, Sunghwan Kim, Berk Gulmezoglu, and Halil Ceylan	

Impact of Smart Parking on University Parking Occupancy.....	322
Hao Wang, Sai Sneha Channamallu, Sharareh Kermanshachi, Jay Michael Rosenberger, Apurva Pamidimukkala, Chen Kan, and Greg Hladik	

Behavioral and Financial Outcomes of Smart Parking Systems.....	332
Sai Sneha Channamallu, Atusa Javaheri, Hao Wang, Sharareh Kermanshachi, Jay Michael Rosenberger, Apurva Pamidimukkala, Chen Kan, and Greg Hladik	

EV Charging Infrastructure Optimization: Overcoming Scalability and Grid Management Challenges	343
Mohammadsoroush Tafazzoli, Elnaz Safapour, Eazaz Sadeghvaziri, and Iffat Haq	

Predicting Rideshare Ratings with Trip Characteristics	355
Deema Almaskati, Sharareh Kermanshachi, Jay Michael Rosenberger, Apurva Pamidimukkala, and Ann Foss	
A Review of Benefits Using Artificial Intelligence in Construction	367
Mohammadamin Zohourian, Apurva Pamidimukkala, and Sharareh Kermanshachi	
Application of Blockchain Technology in the Transportation Industry.....	378
Mohammadamin Zohourian, Apurva Pamidimukkala, and Sharareh Kermanshachi	
Enhancing Occupant Evacuation Simulation Using LLMs and Retrieval-Augmented Generation	389
Amir Rafe, Peter J. Lawrence, Ruggiero Lovreglio, Michael Spearpoint, and Patrick A. Singleton	
Mode Choice Prediction: Comparing Econometric Models with Combination of Machine Learning Models.....	401
Tribikram Rajaure	
Real-Time Road Damage Detection Using YOLOv8.....	411
Joseph Aina, Nakisa Haghi, Benjamin Famewo, Terine Lambert, David Owolabi, and Steve Efe	
Dynamic Toll Prediction Using Historical Data on Toll Roads: Case Study of I-95 Interstate Highway	419
Rutvikumar Rushikumar Dave, Musab Banyhany, and Evangelos I. Kaisar	
Edge AI-Enhanced Traffic Monitoring and Anomaly Detection Using Multimodal Large Language Models.....	429
Ryan Peruski, Abhilasha Saroj, Wenjun Zhou, Seddik Djouadi, and Charles Cao	
Land Cover Classification Using U-Net for Calibration of Rainfall-Induced Slope Susceptibility Maps	439
Sushil Bhatta, Abhijit Roy, and Mohsen Shahandashti	
Deep Learning-Based Automated Slope Condition Assessment Using Satellite Imagery	449
Sushil Bhatta, Abhijit Roy, and Mohsen Shahandashti	
AI-Powered Technologies: Specification Review and Cost Analysis of Transportation Construction Projects.....	458
Manuel Joy and Alexander Abraham	
A Machine Learning Method to Decide the Start Position of Mandatory Lane Changes before Expressway Exits	469
Yunkuan Cui, Ziyuan Yang, Boyu Li, Danya Yao, and Jianming Hu	

Connected and Automated Vehicle Impacts

Autonomous Vehicle Traffic Delay Incident and Rapid Response482
 Lei Zhu, J. Sam Lott, and Stanley E. Young

Evaluating Students' Perceptions of Fully Autonomous Vehicles and Shared Mobility.....493
 Deema Almaskati, Apurva Pamidimukkala, Sharareh Kermanshachi, Jay Michael Rosenberger, Greg Hladik, and Ann Foss

How to Make Roundabout Operations Manageable in a Connected Mobility Environment?505
 Heng Wei, Wei Lin, and Zhixia Li

Dynamic Lane Assignment with Signal Optimization for Connected Autonomous Vehicle (CAV): A Synthesis of Literature514
 Mansura Sharmin, Sikai Chen, Andrea Bill, and David A. Noyce

Understanding the Causes of Autonomous Vehicle Crashes in California526
 Ramina Javid, Eazaz Sadeghvaziri, and Mansoureh Jeihani

Multi-Scale Temporal Analysis of Connected Vehicle Data for Safety Analysis.....533
 Kundan Parajulee, Joshua Q. Li, and Cody Hamblin

Data Quality Assessment Process for Real-Time Data-Driven Traffic Microsimulation of Smart Corridor.....544
 Abhilasha Saroj, Somdut Roy, Angshuman Guin, and Michael Hunter

Evaluating the Platooning Parameters and Future Impacts of CAVs at Freeway Merging Segments554
 Saumik Sakib Bin Masud, Mohamadamin Asgharzadeh, Soheil Sajjadi, Seyedeh Mahgam Tabatabaei Touran Poshti, and Alexandra Kondyli

Cybersecurity-Focused Anomaly Detection in Connected Autonomous Vehicles Using Machine Learning.....566
 Prathyush Kumar Reddy Lebaku, Lu Gao, Yunpeng (Jack) Zhang, Zhixia Li, Yongxin Liu, and Tanvir Arafin

Data Sensing and Analytics

A Smartphone-Based Data Collection Method for Roadway Lighting Measurements.....581
 Amin Golkarfard, Sajjad Karimi, Ganesh Rangali, and Robert Kluger

Comparative Analysis of Single- and Multi-Passenger Rideshare Trips	591
Hao Wang, Deema Almaskati, Sharareh Kermanshachi, Jay Michael Rosenberger, Apurva Pamidimukkala, Chen Kan, and Ann Foss	
Investigating Rideshare Patterns and Passenger Distribution: A Case Study.....	601
Hao Wang, Deema Almaskati, Sharareh Kermanshachi, Jay Michael Rosenberger, Apurva Pamidimukkala, Chen Kan, and Ann Foss	
The Sensor Dilemma in Intelligent Transportation Systems: Evaluating Radar, Lidar, and Camera	610
Faizan Mir, Rimple Sandhu, Stanley Young, Qichao Wang, and Todd Osborn	
Machine Learning-Based Evaluation of Traction Force in Locked Wheel Skid Trailer on New Mexico Interstate Highways.....	622
B. S. Pushpendue Biswas, Md. Saddam Hossain, and Rafiqul A. Tarefder	
AI Model and Data Analytics for Estimating Environmental Footprint Parameters for Automobiles in the US	637
Ritvik Gaur, Amneek Chalotra, and Aly Tawfik	
Exploring 14 Years of Fresno Traffic Patterns: A Data-Driven Study Utilizing Machine Learning Models.....	649
Pratham Aggarwal, Ritvik Gaur, and Aly Tawfik	
Transformative Location Service Platforms: Comparing Geospatial Data, APIs, Features, and Applications	662
Ritvik Gaur, Pratham Aggarwal, Saugat Paudal, Amneek Chalotra, and Aly Tawfik	
Applications of Video and Signal Processing in Monitoring Transportation Infrastructure Health	673
Claudia Marin-Artieda, Manish Niure, and Bishesh Adhikari	
Impact of Employer Transportation Benefit Programs and Social Factors on Commute Mode Choices in Downtown Denver	685
Shahryar Monghasemi, Moatassem Abdallah, Wesley Marshall, Andrew Iltis, and Max Gesten	
<i>Mobility on Demand and as a Service</i>	
From Proximity to Priority: Optimizing Demand-Responsive Transit with Value of Waiting Time (VOWT)	698
Doreen N. Jehu-Appiah and Venktesh Pandey	

Assessing Rideshare Satisfaction among a University Community710
 Deema Almaskati, Sharareh Kermanshachi, Jay Michael Rosenberger,
 Apurva Pamidimukkala, Chen Kan, and Ann Foss

**Mitigation of Congestion of Public Transport Network with Inclusion of
 Shared Autonomous Vehicles723**
 Samra Sarwar and Sergi Saurí

**Insights into On-Demand Transit: A Case Study of the Houston
 METRO's curb2curb Transit Services737**
 LaQuinton Armbrister, Stanley Young, J. Sam Lott, Bonnie Powell,
 Alejandro Henao, and Michael Andrade

**Mobility Behavior and Patterns Using Cell Phone Trace Data:
 A Case Study of Fresno, California.....750**
 Alexis Zane E. Alexander and Aly M. Tawfik

**Demand-Responsive Transport and Transit Synchronization Using
 Adaptive Large Neighborhood Search.....762**
 Antonio D. Masegosa, Arka Ghosh, Samra Sarwar, Jenny Fajardo Calderín,
 Itziar Salaberria Larrauri, Marios Giouroukelis, Charis Chalkiadakis,
 Eleni Mantouka, and Eleni Vlahogianni

Uncrewed Aerial Systems

**State of the Practice for Streaming Unmanned Aerial System Video during
 Incident Management Events776**
 Adam W. Hill, Grant G. Schultz, and Nathan G. Warner

**Automated Pavement Inspection and Progress Monitoring Using Uncrewed
 Aerial Systems (UAS): MDOT Case Study788**
 Reihaneh Samsami, Colin N. Brooks, Richard Dobson, and Chris Cook

**Low-Altitude sUAS Flights for Remote Sensing of Submillimeter Hairline
 Cracks: A Case Study.....800**
 Kunle S. Oguntoye, Md. Abdullah Ali Sourav, Rajrup Mitra, Abby Jenkins,
 Halil Ceylan, Sunghwan Kim, Berk Gulmezoglu, Yunjeong Mo, and Colin Brooks

**Utilizing Unmanned Aerial Systems for Asset Management,
 Maintenance, and Inspection in Railroad Projects.....810**
 Nequan Isaac, Sarbjeet Singh, and Joseph Yurman