Transportation Engineering Research

Currently at UNLV, faculty are engaged in studying research on various aspects of the transportation systems and the infrastructure associated with them. These studies are addressing many areas, including:

- Pavement studies
- Durability of concrete systems
- Foundation engineering
- Geotechnical studies
- Transportation systems analysis, and
- Traffic operations and control.

Our researchers are funded by various federal and state agencies. We would like to introduce you to some of our researchers. Please feel to contact us if we can help with future collaboration.

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Dr. Mohamed Trabia
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Transportation Engineering
Research Areas of Expertise

- Reinforced concrete structures
- Geotechnical and geophysical engineering
- Seismic site characterization and ground motion estimations
- Non-destructive investigation of highway embankment stability
- Foundation engineering
- Pavements
- Durability, strength, and the behavior of concrete systems
- Admixtures and supplementary materials in concrete
- Seismic behavior, design, and finite element modeling of reinforced concrete structures
- Extreme loading of structures
- Sustainable design
- Innovative project delivery and contracting methods
- Construction economics and estimating

- Construction and highway safety
- Intelligent Transportation Systems
- Highway monitoring
- Transportation emergency management
- Driver assistance systems
- Transportation Safety Systems
- Traffic and vehicle control systems and sensors
- Signal and video processing
- Internet and smartphone applications
- Questionnaire and survey design, deployment, and analysis
- Transportation networks
- Urban transportation planning
- Freight transportation
Why UNLV?

- UNLV is situated in the center of a metropolitan area that has multiple transportation challenges.

- UNLV has a strong team of multi-disciplinary researchers who are developing new technologies that can serve transportation needs of Las Vegas, the region, and the world.

- UNLV is the home of the Nevada University Transportation Center, which complements and expands the university’s existing education, research, and outreach activities.
Faculty Involved in Transportation Engineering Research

Dr. Nader Ghafoori, P.E.
Professor, Department of Civil and Environmental Engineering and Construction

Dr. Pushkin Kachroo
Professor, Department of Electrical and Computer Engineering
Director, Transportation Research Center

Dr. Moses Karakouzian
Professor, Department of Civil and Environmental Engineering and Construction

Dr. Barbara Luke, P.E., D.GE, F.ASCE
Professor, Department of Civil and Environmental Engineering and Construction

Dr. Brendan Morris
Assistant Professor, Department of Electrical and Computer Engineering

Dr. Venki Muthukumar
Associate Professor, Department of Electrical and Computer Engineering

Dr. Alexander Paz
Associate Professor, Department of Civil and Environmental Engineering and Construction

Dr. Aly Said, P.E.
Associate Professor, Department of Civil and Environmental Engineering and Construction
Director, Center for Materials and Structures

Dr. Pramen Shrestha, P.E.
Associate Professor, Department of Civil and Environmental Engineering and Construction

Dr. Hualing (Harry) Teng
Associate Professor, Department of Civil and Environmental Engineering and Construction

Dr. Ying Tian, P.E.
Assistant Professor, Department of Civil and Environmental Engineering and Construction
Transportation Engineering Research

Dr. Nader Ghafoori, P.E.
Professor,
Department of Civil and Environmental Engineering & Construction
Nader.Ghafoori@unlv.edu

- Expertise
  - Reinforced concrete structures
  - Structural foundations
  - Pavements
  - Durability, strength, and the behavior of concrete systems
  - Admixtures and supplementary materials in concrete
Dr. Pushkin Kachroo
Professor,
Department of Electrical and Computer Engineering
Director, Transportation Research Center
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- Expertise
  - Intelligent Transportation Systems
  - Transportation Safety Systems
  - Data processing, collection, and analysis
  - Traffic and vehicle control systems and sensors
  - Signal and video processing
  - Database design, development, and visualization
  - Internet and smartphone applications
  - Questionnaire and survey design, deployment, and analysis
  - Mathematical modeling, analysis, simulation, and statistics

Simulator used to study driver behavior in various traffic conditions.

Transportation Engineering Research
Dr. Moses Karakouzian
Professor,
Department of Civil and Environmental Engineering & Construction
mkar@unlv.edu
• Expertise
  • Geotechnical engineering
  • Foundation engineering
  • Construction materials
  • Highway and pavement materials
Dr. Barbara Luke, P.E., D.GE, F.ASCE
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- Expertise
  - Geotechnical and geophysical engineering
  - Seismic site characterization and ground motion estimations
  - Characterization of pavement subgrades
  - Identifying cavities beneath highways
  - Non-destructive investigation of highway embankment stability
  - Site investigation for structural foundations
  - Effectiveness of alternative fill materials

Top: UNLV’s ‘mini-vibe’ seismic source.
Bottom: 3-D model of shear wave velocities for shallow sediments of the Las Vegas Valley.
Dr. Brendan Morris
Assistant Professor,
Department of Electrical and Computer Engineering
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- Expertise
  - Intelligent Transportation Systems
  - Highway monitoring
  - Intelligent vehicles
  - Driver assistance systems
  - Driver safety systems
  - Real-time activity analysis

Top: Monitoring the surroundings of a vehicle for dangerous obstacles. Colored regions: critical safety zones. Z₁ and Z₃ are blind spots.
Bottom: Studies to predict, two seconds before, a driver’s intention to change lanes. Lower right graphs: the green line indicates the probability that a lane change will occur in two seconds, and the gray line indicates the lane position.
Dr. Venki Muthukumar
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• Expertise
  • Intelligent Transportation Systems (ITS)
  • Smart traffic data collection, archiving, and visualization
  • Traffic incident management (TIM)
  • Video processing for vehicle and pedestrian detection, tracking, and conflict analysis
  • High performance real-time embedded systems with sensor fusion for ITS applications
Transportation Engineering Research

Dr. Alexander Paz
Associate Professor,
Department of Civil and Environmental Engineering & Construction
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• Expertise
  • Traffic safety
  • Transportation economics and statistics
  • Transportation networks
  • Transportation systems analysis
  • Urban transportation planning
  • Traffic operations and control
  • Traffic flow theory
  • Intelligent transportation systems (ITS)
  • Business Intelligence for Transportation and Infrastructure Systems
Dr. Aly Said, P.E.
Associate Professor,
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• Expertise
  • Structural performance of new materials
  • Behavior of beam-column joints under cyclic loading
  • Fiber-reinforced plastic applications in infrastructures
  • Knowledge-based systems applications in structural and civil engineering
  • Seismic behavior, design, and finite element modeling of reinforced concrete structures
  • Sustainable design
  • Durability of concrete structures
  • Use of nano-particles in concrete materials
Dr. Pramen Shrestha, P.E.
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- **Expertise**
  - Innovative project delivery and contracting methods
  - Benchmarking of construction projects
  - Construction economics and estimating
  - Heavy highway construction materials
  - Sustainability
  - Construction safety
  - Highway safety
  - Work zone safety
  - Quantitative methods
  - Transportation emergency management
Transportation Engineering Research

Dr. Hualing (Harry) Teng
Assistant Professor,
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• Expertise
  • Intelligent transportation systems (ITS)
  • Air quality analysis
  • Freight transportation

Emission measurements from mobile sampling technology and their true distribution. Evaluation of speed monitoring displays for work zones in Las Vegas. The difference in gaps between cars of a container train (foreground) and box car train (background.)
Dr. Ying Tian
Assistant Professor,
Department of Civil and Environmental Engineering & Construction
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• Expertise
  • Seismic evaluation and rehabilitation of bridges
  • Advanced non-linear dynamic response analyses
  • Earthquake engineering
  • Extreme loading of structures
  • Design and behavior of reinforced concrete structures

Bridge collapse during the 1989 Loma Prieta earthquake in the San Francisco Bay area of northern California.
Transportation Engineering Research

Faculty CVs and Publications
Transportation Engineering Research

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• Expertise
  • Reinforced concrete structures
  • Structural foundations
  • Pavements
  • Durability, strength, and the behavior of concrete systems
  • Admixtures and supplementary materials in concrete
Dr. Nader Ghafoori, P.E.
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Recent Publications

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- Expertise
  - Intelligent Transportation Systems
  - Transportation Safety Systems
  - Data processing, collection, and analysis
  - Traffic and vehicle control systems and sensors
  - Signal and video processing
  - Database design, development, and visualization
  - Internet and smartphone applications
  - Questionnaire and survey design, deployment, and analysis
  - Mathematical modeling, analysis, simulation, and statistics
Transportation Engineering Research

Dr. Pushkin Kachroo
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Recent Publications


Transportation Engineering Research

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• Expertise
  • Geotechnical engineering
  • Foundation engineering
  • Construction materials
  • Highway and pavement materials
Transportation Engineering Research

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Recent Publications


Transportation Engineering Research

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• Expertise
  • Geotechnical and geophysical engineering
  • Seismic site characterization and ground motion estimations
  • Characterization of pavement subgrades
  • Identifying cavities beneath highways
  • Non-destructive investigation of highway embankment stability
  • Site investigation for structural foundations
  • Effectiveness of alternative fill materials
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- Expertise
  - Intelligent Transportation Systems
  - Highway monitoring
  - Intelligent vehicles
  - Driver assistance systems
  - Driver safety systems
  - Real-time activity analysis
Dr. Brendan Morris  
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Recent Publications

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- Expertise
  - Intelligent Transportation Systems (ITS)
  - Smart traffic data collection, archiving, and visualization
  - Traffic incident management (TIM)
  - Video processing for vehicle and pedestrian detection, tracking, and conflict analysis
  - High performance real-time embedded systems with sensor fusion for ITS applications
Transportation Engineering Research

Dr. Venki Muthukumar
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Recent Publications

Articles

Books edited
Transportation Engineering Research

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- Expertise
  - Traffic safety
  - Transportation economics and statistics
  - Transportation networks
  - Transportation systems analysis
  - Urban transportation planning
  - Traffic operations and control
  - Traffic flow theory
  - Intelligent transportation systems (ITS)
  - Business Intelligence for Transportation and Infrastructure Systems

Top: Work zone and incident management. Middle and Bottom: Traffic operations and intelligent transportation systems (ITS).
Transportation Engineering Research

Dr. Alexander Paz
Associate Professor,
Department of Civil and Environmental Engineering & Construction

Recent Publications

Books

Articles
Transportation Engineering Research

Dr. Aly Said, P.E.
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• Expertise
  • Structural performance of new materials
  • Behavior of beam-column joints under cyclic loading
  • Fiber-reinforced plastic applications in infrastructures
  • Knowledge-based systems applications in structural and civil engineering
  • Seismic behavior, design, and finite element modeling of reinforced concrete structures
  • Sustainable design
  • Durability of concrete structures
  • Use of nano-particles in concrete materials
Dr. Aly Said, P.E.
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Recent Publications

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- Expertise
  - Innovative project delivery and contracting methods
  - Benchmarking of construction projects
  - Construction economics and estimating
  - Heavy highway construction materials
  - Sustainability
  - Construction safety
  - Highway safety
  - Work zone safety
  - Quantitative methods
  - Transportation emergency management
Dr. Pramen Shrestha, P.E.
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- Expertise
  - Intelligent transportation systems (ITS)
  - Air quality analysis
  - Freight transportation
Transportation Engineering Research

Dr. Hualing (Harry) Teng
Associate Professor,
Department of Civil and Environmental Engineering & Construction

Recent Publications

Intelligent Transportation Systems


Freight and Railroad Transportation


Air Quality Analysis

Transportation Engineering Research

Dr. Ying Tian
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• Expertise
  • Seismic evaluation and rehabilitation of bridges
  • Advanced non-linear dynamic response analyses
  • Earthquake engineering
  • Extreme loading of structures
  • Design and behavior of reinforced concrete structures
Transportation Engineering Research

Dr. Ying Tian
Assistant Professor,
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Recent Publications


Transportation Engineering Research

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