Transportation Engineering Research

September 2016
Currently at UNLV, faculty are engaged in studying research on various aspects of transportation systems and their associated infrastructure. These studies are addressing many areas, including:

- Traffic safety engineering
- Geographic Information Systems
- Infrastructure management
- Transportation planning
- Pavement composition research
- Durability of concrete systems
- Foundation engineering
- Geotechnical studies
- Transportation systems analysis and evaluation
- 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.
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
- Traffic safety
- 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 with multiple transportation challenges.

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

• UNLV is the home of the Transportation Research 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, Mendenhall Innovation Program

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
Director, Transportation Research Center

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. David James
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
## Additional Resources

- [UNLV Applied Geophysics Center](#)
- [UNLV Transportation Research Center](#)
Transportation Engineering

Research Highlights
Transportation Engineering Research

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

Phone: (702) 895-2531
Email: Nader.Ghafoori@unlv.edu

- Expertise
  - Durability, strength, and the behavior of concrete systems
  - Design and performance of advanced construction materials
  - Rheology and workability of cement-based materials
  - Optimization of chemical admixtures and supplementary cementitious materials in concrete
  - Use of industrial by-products and recycled aggregates in concrete
Transportation Engineering Research

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

Recent Publications

Transportation Engineering Research

Dr. Pushkin Kachroo
Professor,
Department of Electrical and Computer Engineering
Director, Mendenhall Innovation Program

Phone: (702) 895-4926
Email: Pushkin.Kachroo@unlv.edu

- 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
Dr. Pushkin Kachroo
Professor,
Department of Electrical and Computer Engineering
Director, Mendenhall Innovation Program

Recent Publications

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

Phone: (702) 895-0959
Email: mkar@unlv.edu

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

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

Recent Publications

Transportation Engineering Research

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

Phone: (702) 895-1568
Email: Barbara.Luke@unlv.edu
Website: http://faculty.unlv.edu/bluke

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

Recent Publications

Transportation Engineering Research

Dr. Brendan Morris
Assistant Professor,
Department of Electrical and Computer Engineering
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Website: http://www.ee.unlv.edu/~blmorris/

- 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. Color 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.
Recent Publications

Dr. Venki Muthukumar  
Associate Professor,  
Department of Electrical and Computer Engineering  
Phone: (702) 895-3566  
Email: Venkatesan.Muthukumar@unlv.edu  
Website: http://www.ee.unlv.edu/vm

- Expertise
  - High performance and real-time embedded systems for ITS applications
  - Video processing for vehicle and pedestrian detection, tracking, and conflict analysis
  - Development and evaluation of intelligent transportation systems (ITS) and traffic incident management (TIM)
  - Smart traffic data collection, archiving, and visualization
Transportation Engineering Research

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

Recent Publications

Articles


Books edited

Dr. Alexander Paz
Associate Professor, Department of Civil and Environmental Engineering and Construction
Director, Transportation Research Center (TRC)
Phone: (702) 895-0571  Email: apaz@unlv.edu

Expertise
• Traffic engineering and safety
• Transportation economics and statistics
• Transportation networks and systems analysis
• Intelligent transportation systems (ITS)
• Infrastructure management
• Traveler behavior and learning

UNLV
College of Engineering
September 2016
Transportation Engineering Research

Dr. Alexander Paz
Associate Professor, Department of Civil and Environmental Engineering & Construction
Director, Transportation Research Center

Recent Publications

Primers

Book Chapters

Journal Papers
Dr. Pramen Shrestha, P.E.
Associate Professor,
Department of Civil and Environmental Engineering and Construction
Phone: (702) 895-3841
Email: Pramen.Shrestha@unlv.edu

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

Recent Publications


Transportation Engineering Research

Dr. Hualieng (Harry) Teng
Associate Professor,
Department of Civil and Environmental Engineering and Construction
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- Expertise
  - Intelligent transportation systems (ITS)
  - Air quality analysis
  - Freight transportation

Top left: Emission measurements from mobile sampling technology and their true distribution.
Top right: Evaluation of speed monitoring displays for work zones in Las Vegas.
Bottom: The difference in gaps between cars of a container train (foreground) and box car train (background).
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
Dr. Ying Tian
Assistant Professor,
Department of Civil and Environmental Engineering and Construction
Phone: (702) 895-4917
Email: Ying.Tian@unlv.edu

• 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

Dr. Ying Tian  
Assistant Professor,  
Department of Civil and Environmental Engineering and Construction

Recent Publications

Dr. Dave James, PE  
Associate Professor,  
Department of Civil and Environmental Engineering and Construction  
Phone: (702) 895-5804  
Email: dave.james@unlv.edu

- **Expertise**
  - Unpaved road and vacant land dust emissions and control  
  - Engine starts  
  - Water quality

- **Relevant Projects**
Transportation Engineering Research

Dr. Dave James, PE
Associate Professor,
Department of Civil and Environmental Engineering and Construction

Recent Publications


