CTIPS

Center for Transformative Infrastructure Preservation and Sustainability

USDOT Region 8 University Transportation Center

CONSORTIUM MEMBERS

Colorado State University
Fort Lewis College
North Dakota State University
South Dakota State University
United Tribes Technical College
University of Colorado Denver
University of Denver
University of North Dakota
University of Utah
University of Wyoming
Utah State University

CTIPS.org

Friends,

Thank you for your interest in the Center for Transformative Infrastructure Preservation and Sustainability (CTIPS). We are the USDOT University Transportation Center for Region 8, which includes the Upper Great Plains and Intermountain West. The region is characterized by vast, sparsely populated regions and climate extremes and punctuated by large and vibrant metropolitan areas.

The transportation system in this region ranges from rural gravel roads to multilane urban freeways, from bike paths to rural and metropolitan transit systems, and from major coast-to-coast rail lines to short line railroads serving small towns. That network connects the nation's transportation hubs and serves as a conduit for this region's natural resources and agricultural and energy production. Our region is also home to several Native American Tribes that face systemic equity issues stemming from the relatively poor quality of Tribal and rural roads.

Preserving and sustaining that network will be essential to supporting the increasing demand for personal and freight mobility against a backdrop of rapidly evolving technology, challenging budgets, and a need to reduce environmental impacts. At the same time, the inequities that exist with regard to rural and Tribal roads demand to be addressed. Doing so demands new approaches and the implementation of emerging technology in creative new ways.

The 11 universities that make up CTIPS are home to faculty and staff with an extraordinary array of expertise and capabilities. I am excited to see what their creativity and research prowess can accomplish as they collaboratively address the challenges of preserving and maintaining our complex transportation system.

As you review the strengths and capabilities of the CTIPS partners as outlined in this booklet, I believe that you'll be impressed with the team we've assembled. I hope that you will continue to follow our work in the future.
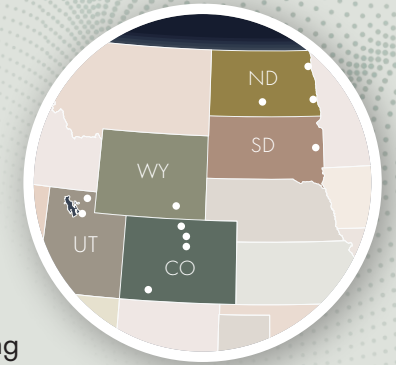
Best regards,

Denver O. Tolliver

Denver Tolliver

CTIPS DIRECTOR:
Denver Tolliver

CTIPS

Center for Transformative Infrastructure Preservation and Sustainability

USDOT Region 8 University Transportation Center

OUR MISSION:

To revolutionize the preservation of existing transportation systems through the integration of advanced sensing technologies and automation in data collection and analysis. The Center's research will also address systemic equity issues in the region, especially those stemming from the relatively poor quality of Tribal and rural roads.

ACCOMPLISHING THE MISSION:

CTIPS initiatives represent a transformative approach to preserving the transportation system. By integrating advanced technologies, automation, the Internet of Things, and artificial intelligence, CTIPS programs are revolutionizing infrastructure condition monitoring and assessment, leading to safer, more reliable, and more sustainable transportation infrastructure.

In partnership with state departments of transportation, transportation companies, and technology firms, CTIPS research, technology transfer, and workforce development programs are transforming asset management while preparing transportation workers to function in a dynamic highly automated work environment. Some areas of early implementation include management of non-highway assets, fault detection of rail lines and yard infrastructure, more frequent and cost-effective monitoring of low-volume roads and remote highway facilities, and disaster assessment and response.

Through its two Tribal-serving institutions and the Northern Tribal Technical Assistance Program, CTIPS has deep connections to Tribal communities, allowing the Center to reach Native American leaders and practitioners.

Colorado State University

Colorado State University, located in Fort Collins, CO, is a land-grant university with an enrollment of more than 33,000 students. The university is a Carnegie Class 1 research institution with a significant focus on sustainability.

PROGRAM COORDINATOR:
Yanlin Guo
yanlin@colostate.edu

RESEARCH FOCUS AREA:

- **Development of novel sensing technologies to inform decisions regarding maintenance and management of transportation infrastructure.** Researchers are developing integrated uncrewed aerial system (UAS) platforms equipped with manipulators for contact-based inspections, such as ultrasonic, magnetic, or eddy current testing. They will use novel sensing technologies such as cosmic ray neutron rovers for monitoring the moisture of unpaved roads.

RESEARCH EXPERTISE:

- Civil engineering, including structural, transportation, hydrology, geotechnical engineering, and sustainable construction
- System engineering
- Mechanical engineering

WORKFORCE DEVELOPMENT FOCUS AREAS:

- **Training students with knowledge in advanced analytical and modeling skills.** Undergraduate and graduate students are trained with student-led research projects with a focus on aligning the skills of the workforce with the demands of employers.
- **Developing courses.** As an example, a new undergraduate course "Engineering with Drones" incorporates the latest technology into the engineering curriculum.

SPECIALIZED LABS:

- Colorado State University Drone Center
- Christman Airfield
- Fu Hua Chen Geotechnical Laboratory
- Graduate Geotechnical Engineering Laboratory
- Adaptive Robotics Lab
- Cement and Concrete Research Lab (CCR-Lab)

FORT LEWIS COLLEGE

Fort Lewis College in Durango, CO, is a Native American-serving, non-Tribal institution that awards more bachelor's degrees to Native American and Alaska Native students each year than any other four-year school. About 54% of the 3,500 students enrolled are students of color and 44% are first-generation students.

PROGRAM COORDINATOR:
Yiyan Li
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RESEARCH FOCUS AREAS:

- **Instrument design for the applications in civil engineering and biomedical engineering.** Researchers specialize in designing instruments tailored for detecting biological markers in environmental samples, with applications in both civil engineering and biomedical engineering.
- **Robot development and artificial intelligence.** Researchers are developing robots tailored for specific applications such as object detection, autonomous vehicles, and undergraduate education.

RESEARCH EXPERTISE:

- Integrated circuit design
- Embedded systems/FPGAs
- Instrument design
- Robots

WORKFORCE DEVELOPMENT AREAS:

- **System prototyping, artificial intelligence, and data processing.** Graduates excel in problem-solving across broad engineering topics and have secured employment in diverse industry sectors including defense, private engineering, embedded systems, software development, and chip design companies.
- **Transportation, environmental sustainability, and healthcare.** A wide range of research and development projects help students apply engineering skills to solve real-world problems.
- **Bridge monitoring and surveys. This project aims to leverage student skills to address pressing challenges in these areas.** With training in GPS data acquisition, circuit board design, software development for civil engineering applications, and new scour monitoring technologies, this initiative will prepare students for careers in survey equipment design and transportation system preservation.

SPECIALIZED LABS:

- Embedded systems and robotics labs
- Optics lab
- Environmental engineering lab
- Nano fabrication lab
- Mechanical shop

NDSU | UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

NDSU is a student-focused land-grant research university located in Fargo, ND, with an enrollment of about 12,000 students. It is an R1 research institution as defined by the Carnegie Classification of Institutions of Higher Education, a designation presented to only the top research institutions in the country.

PROGRAM COORDINATOR:
Kimberly Vachal
Kimberly.Vachal@ndsu.edu

NDSU | UPPER GREAT PLAINS TRANSPORTATION INSTITUTE
NORTH DAKOTA LOCAL TECHNICAL ASSISTANCE PROGRAM

North Dakota LTAP, located at North Dakota State University, is committed to providing technical assistance and training to local transportation agencies to enhance their capabilities and improve transportation infrastructure across the state.

LTAP DIRECTOR:
Bryon Fuchs
bryon.fuchs@ndsu.edu

RESEARCH FOCUS AREAS:

- **Noncontact sensing of railroad infrastructure.** Researchers are developing autonomous flight plans and operations and incorporating new sensing capabilities, such as multispectral and thermal cameras (in addition to visual cameras) into UAS-assisted railroad inspection systems. Automated condition assessments based on UAS-generated images and data will be compared to (and used in conjunction with) in-vehicle and wayside sensor data.
- **Automated assessment of track infrastructure on short line railroads.** The use of automated, low-cost continual track monitoring systems using smartphones, LiDAR, and other advanced sensors placed in hi-rail vehicles will be investigated. Multiway comparisons and data fusion will lead to AI-automated/calibrated methods of assessing track uniformity and abnormalities from traversals of hi-rail vehicles and drone flights.
- **Tribal and rural road safety.** Researchers are developing agile and low-cost traffic monitoring and low-volume/unpaved crash risk-modeling tools.

They are also examining multimodal opportunities for safety improvements through improved data streams, system resiliency, and asset management techniques.

RESEARCH EXPERTISE:
- Tribal and rural road safety
- Remote sensing
- UAS systems
- Railroad safety and infrastructure assessment
- AI and machine learning applications
- Traffic modeling
- Rural transportation asset management

WORKFORCE DEVELOPMENT AREAS:
- Roadway safety and maintenance
- Infrastructure management
- Gravel road maintenance

SPECIALIZED LABS:
- Advanced Traffic Analysis Center
- Center for Surface Mobility Applications and real-time simulation environments
- Commercial Vehicle Safety Center
- DOT Support Center
- Transportation Learning Network

LTAP FOCUS AREAS:
- **Roadway safety and maintenance.** North Dakota LTAP focuses on enhancing roadway safety and maintenance through training and technical assistance, including sharing best practices for road construction, maintenance techniques, and safety protocols to ensure safer travel for all road users.
- **Infrastructure management.** The program improves infrastructure management by providing guidance on asset management, pavement preservation, and innovative infrastructure solutions to help local agencies optimize resources and extend the lifespan of transportation assets.

- **Workforce development and training.** North Dakota LTAP offers training programs, including workshops, seminars, and hands-on training sessions, to improve the skills and knowledge of transportation professionals.

LTAP EXPERTISE:
- Transportation safety. Expertise in developing and implementing safety measures for roadways.
- Asset management. Guidance and training on managing transportation infrastructure assets.
- Pavement preservation. Specialized knowledge in techniques and strategies for maintaining and extending pavement life.

NDSU | UPPER GREAT PLAINS TRANSPORTATION INSTITUTE
NORTHERN TRIBAL TECHNICAL ASSISTANCE PROGRAM

TTAP DIRECTOR:
Ron Hall
Ronald.Hall@ndsu.edu

TTAP DIRECTOR:
Bryon Fuchs
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NTTAP, located at North Dakota State University, provides transportation outreach and technical assistance to tribes across the Upper Great Plains and Inter-mountain West. The program works with American Indian Tribal governments to build Tribal capacity in program management, grow the Tribal workforce, cultivate and coordinate partnerships, facilitate technology transfer and the implementation of innovations, and share results of similar initiatives across the country.

NTTAP COLLABORATORS:
- Montana State University/ Western Transportation Institute
- South Dakota State University/SDLTAP
- University of Nebraska Lincoln/Nebraska LTAP
- University of Wyoming/Wyoming T2 Center

NTTAP FOCUS AREAS:
- Providing comprehensive transportation training and technical assistance to Tribal communities
- Building skills and expertise to ensure the safety and maintenance of Tribal roads

NTTAP EXPERTISE:
- Transportation safety
- Asset management
- Pavement preservation
- Asphalt maintenance
- Asphalt paving
- Culvert installation
- Defensive driving
- Geotextiles
- Personnel management
- Risk management

SOUTH DAKOTA STATE UNIVERSITY

SDSU is the state's largest, most comprehensive higher education institution. As South Dakota's land-grant university, SDSU has an enrollment of more than 11,500 students from 48 states and 74 countries. The university is a leader in bioprocessing, agriculture and precision agriculture, remote sensing, and life sciences.

PROGRAM COORDINATOR:
Mostafa Tazarv
Mostafa.Tazarv@sdstate.edu

RESEARCH FOCUS AREAS:
- **All major areas of civil engineering.** Researchers conduct work on structures, transportation, pavements and materials, environments, geotechnics, and water resources and hydraulics.

RESEARCH EXPERTISE:
- Bridge engineering
- Transportation infrastructure
- Soil stability and deep foundations
- Water/wastewater treatment processes

SPECIALIZED LABS:
- The Lohr Structures Lab
- The Fluid Mechanics Lab
- The HDR Environmental Lab
- The Asphalt Lab
- The Materials and Concrete Lab
- The Geotechnical Lab
- The Transportation Lab

LTAP DIRECTOR:
Gregory Vavra
Gregory.vavra@sdstate.edu

SDLTAP, located at South Dakota State University, translates the latest highway and bridge technology into understandable terms for local government entities throughout the state.

LTAP FOCUS AREAS:
- SDLTAP keeps local government officials informed about new publications, techniques, and training opportunities that may benefit their communities.

LTAP EXPERTISE AREAS:
- Asphalt maintenance
- Asphalt paving
- Culvert installation
- Defensive driving
- Geotextiles
- Personnel management
- Risk management
- Safety awareness
- Surveying
- Winter maintenance
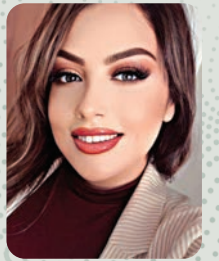- Work zone traffic control
- Gravel roads

UNITED TRIBES TECHNICAL COLLEGE

PROGRAM COORDINATOR:
Matthew Mastel
mmastel@uttc.edu

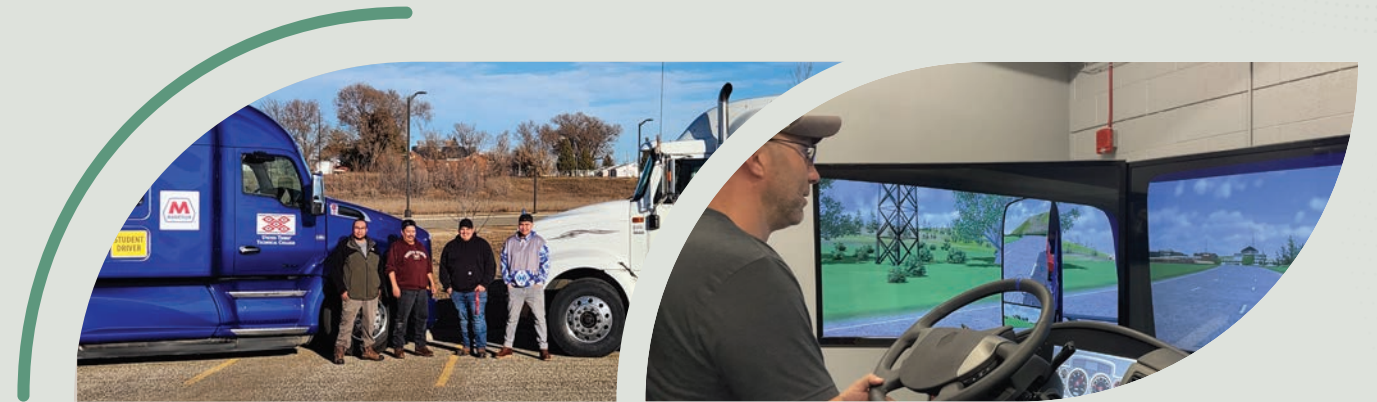CTE AND WIOA COORDINATOR:
Shelby Martell
smartell@uttc.edu

UTTC, located near Bismarck, ND, provides education and training opportunities for Native Americans, fostering personal growth and community development. UTTC has maintained continuous accreditation through the Higher Learning Commission since 1982 and is the first Tribal college in the nation authorized to offer fully online degree programs. The college is a 1994 Tribal Land-Grant Institution.

RESEARCH FOCUS AREAS:
- **Tribal governance and leadership.** Research related to enhancing Tribal governance and leadership includes studying traditional governance structures, modern Tribal administration, and the integration of indigenous knowledge systems in leadership practices to empower Native American communities.
- **Sustainable environmental practices.** Research focuses on sustainable environmental practices and development and promotion of techniques and policies that protect and preserve natural resources, emphasizing traditional ecological knowledge and its application in environmental stewardship.

RESEARCH EXPERTISE:
- **Indigenous knowledge systems.** Research and integration of traditional knowledge in modern contexts.
- **Community health initiatives.** Developing programs and policies to improve health outcomes in Native American communities.
- **Environmental sustainability.** Research on sustainable practices and their application to preserve natural resources.

WORKFORCE DEVELOPMENT FOCUS AREAS:
- **Healthcare training and education.** Comprehensive training and education including programs for nursing, public health, and healthcare administration.
- **Information technology and cybersecurity.** Workforce development programs equip students to excel in network administration, cybersecurity, software development, and other IT roles.
- **Construction technology and trades.** Prepares students for careers in construction management, carpentry, and related fields. The curriculum's hands-on training and certification programs ensure job readiness.

SPECIALIZED LABS OR FACILITIES:
- Health Sciences Laboratory. Tools and resources for healthcare education.
- Information Technology Center. State-of-the-art facilities for IT and cybersecurity training, including computer labs and network simulation environments.
- Construction Trades Workshop. Hands-on training facility, equipped with modern tools and materials.

University of Colorado Denver

Globally connected and locally invested, UC Denver partners with more than 15,000 learners to design accessible, relevant, and transformative educational experiences. Its proximity to downtown Denver and the city's business, political, and arts corridor offers opportunities to enhance lives, careers, and professional networks.

PROGRAM COORDINATOR:
Wesley Marshall, PhD, PE
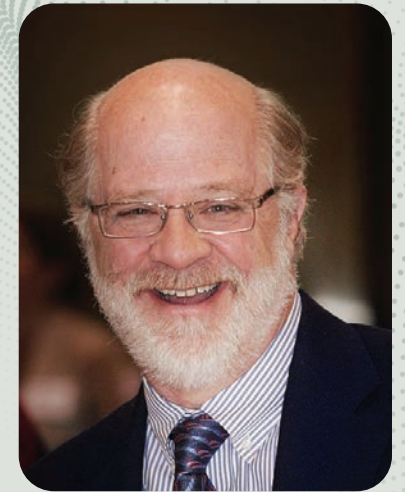wesley.marshall@ucdenver.edu
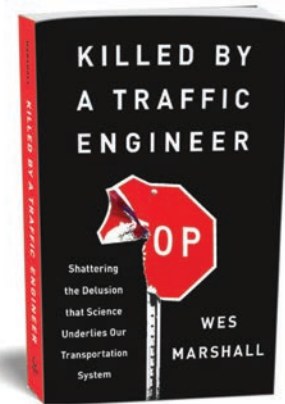
RESEARCH FOCUS AREAS:
- **Promoting safety and improving the mobility of people and goods.** Research focuses on transforming traditional transportation with human-centered approaches. UC Denver aims to foster a vibrant community of transportation professionals committed to societal impact. Core areas include exploring transportation's effects on public health, resilience, and sustainability; promoting physical activity; and reducing pollution. Additional research addresses road safety disparities using a safe systems approach to create accessible and safe transportation for all. Additionally, we integrate smart technologies and data analytics to enhance health, safety, and sustainability in transportation systems.

RESEARCH EXPERTISE:
- Equitable road safety
- Smart sustainable mobility
- Healthy active communities

SPECIALIZED LABS:
- Trimble Technology Lab. Includes a TX8 3D laser scanner, Trimble SiteVision AR system, R12 GNSS systems, Juno 5D handheld scanner, Geo 7x mobile GNSS data collectors, and field tablets as well as advanced software solutions, including RealWorks scanning software and SketchUp Pro.
- Big Data Management and Mining Lab. Facilitates access to data mining and management applications for data-intensive research.

UNIVERSITY OF DENVER

DU offers a 4D experience, which includes advancing intellectual growth, pursuing careers and lives of purpose, promoting well-being, and exploring character. More than 13,000 students attend DU's campus in the city of Denver, CO, and its mountain campus nestled in the Colorado Rockies.

PROGRAM COORDINATOR:
Patrick Sherry
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RESEARCH FOCUS AREAS:
- **Driver fatigue.** DU researchers investigated the effectiveness of a handheld mobile application designed to detect and predict driver fatigue. Using a mobile administered visual tracking and reaction time measure, significant correlations between hours awake and cognitive fatigue were found.
- **Safety culture.** DU researchers have been developing tools to measure the presence of an effective safety culture over the last 15 years. Our studies have shown significant correlations between measures of positive safety culture and fewer reported accidents and incidents in the workplace.

RESEARCH EXPERTISE:
- Safety culture assessment
- Identifying driver fatigue
- Preventing railroad trespass fatalities

WORKFORCE DEVELOPMENT FOCUS AREAS:
- **Safety habits of transportation workers.** Research has focused particularly on the response to trespassers and driver fatigue. Training with frontline railroad personnel improves their skill and effectiveness at intervening with trespassers entering the railroad right of way.
- **Leadership development training**
- **Frontline trespasser safety training**
- **Fatigue management training**

SPECIALIZED LABS:
- National Center for Intermodal Transportation
- Transportation and Supply Chain Institute
- Unmanned Systems Research Institute

UNIVERSITY OF NORTH DAKOTA
COLLEGE OF ENGINEERING & MINES

Located in Grand Forks, ND, and with more than 14,000 students, UND is North Dakota's oldest university. UND has a proven record of developing leaders and has earned national recognition for its academic programs. It serves the largest number of exclusively online students among all nonprofit flagship universities in the eight-state region.

PROGRAM COORDINATOR:
Sattar Dorafshan
sattar.dorafshan@und.edu

RESEARCH FOCUS AREAS:
- **Infrastructure preservation through autonomous inspection and AI.** Researchers will automate aspects of infrastructure preservation for faster, safer, and less biased periodic inspections. This includes increasing technical capabilities in autonomous path planning in GPS denied environments, real-time data processing, and decision making using advanced deep and machine learning algorithms.
- **Assessment of current UAS and AI technologies for infrastructure preservation.** Researchers are investigating existing UAS for condition assessment and monitoring of transportation infrastructure.
- **New technologies in transportation, such as advanced spectral sensing and cutting-edge computing methods in infrastructure preservation**. The impacts of emerging technologies with regional importance are investigated. The adaptation of connected autonomous vehicles at different levels and its impact on state and regional transportation infrastructure is also being studied.

WORKFORCE DEVELOPMENT FOCUS AREAS:
- **Development of multidisciplinary courses in applications of AI in civil engineering.** Courses are offered as technical electives for undergraduate and graduate students.
- **Attracting undergraduate students to transportation careers.** Students from civil engineering and other disciplines can participate in DOT job shadowing and training program (UAS inspector/pilot).

RESEARCH EXPERTISE:
- Condition assessment of infrastructure
- Autonomous construction and inspection
- Artificial intelligence and robotics
- Connected autonomous vehicles

SPECIALIZED LABS:
- Benchtop Hyperspectral Imagery
- Uncrewed Aerial Systems
- Additive Construction and 3D Printing

THE UNIVERSITY OF UTAH

With more than 35,000 students, the University of Utah is increasingly diverse, seeing a 72% increase in diverse students since 2009. Located in Salt Lake City, the university is rated the number one university in the West and one of the top 10 public universities in the U.S. by the Wall Street Journal. The University of Utah is recognized as an R1 institution for very high research activity.

PROGRAM COORDINATOR:
Chris P. Pantelides
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RESEARCH FOCUS AREAS:
- **Infrastructure preservation through autonomous inspection and AI.** The goals are to identify infrastructure preservation needs that can be met with UAS technology and AI using mobile phone data and LiDAR, and determine the potential extent of UAS usage for monitoring and assessing transportation infrastructure using machine learning.
- **Infrastructure preservation through resiliency and improved materials.** The goals are to develop new materials and technologies to maximize the effectiveness and durability of pavement, develop low-crack bridge decks, and develop advanced materials such as ultra-high-performance concrete and fiber reinforced polymer composites for rapid recovery of existing infrastructure under natural and man-made disasters.

RESEARCH EXPERTISE:
- Intelligent transportation systems
- Pavement and bridge infrastructure, including geotechnical and structural materials
- Pavement and bridge construction and maintenance

WORKFORCE DEVELOPMENT FOCUS AREAS:
- **Transportation Electrification Certificate Program.** Ensures a supply of professionals capable of leading the transformation toward sustainable and electrified transportation infrastructure.
- **Comprehensive cross-disciplinary geotechnical training for engineers.** By merging the fields of computational geomechanics, data science, machine learning, and geophysics, projects encourage engineers to develop new methods and technologies to address enduring challenges.
- **Infrastructure sensing and experimental mechanics laboratory.** Students work with local agencies, passenger and freight railways, and local and global engineering consulting firms to enable unprecedented sensing capabilities for track structures and improve the safety of rail or transit workers.
- **Infrastructure structures projects.** Students address challenges for retrofitting and repairing of existing bridges and improving seismic performance of new bridges.

SPECIALIZED LABS:
- Utah Traffic Lab
- Civil and Environmental Engineering Structures Lab
- Civil and Environmental Engineering Materials Lab

UNIVERSITY OF WYOMING

UW is a nationally recognized land-grant research and teaching institute located in Laramie, WY. It is also Wyoming's only public university and has an enrollment exceeding 10,000 students and more than $139 million in research expenditures.

PROGRAM COORDINATOR:
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Wyoming Technology Transfer Center
WY T²
LTAP/TTAP
Local Technical Assistance Program
Tribal Technical Assistance Program

WYT2/LTAP/TTAP, located at the University of Wyoming, helps local Wyoming agencies and individuals gain technical transportation knowledge by communicating new and developing technology, responding to direct requests, providing reference materials, and conducting workshops throughout the state.

LTAP/TTAP DIRECTOR:
Khaled Ksaibati
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RESEARCH FOCUS AREAS:
- **Performance and maintenance of gravel roads.** Multiple studies explored the use of recycled asphalt pavement in gravel roads, gravel road management, speed limit and gravel road safety, and other studies related to gravel road dust mitigation.
- **Management of paved roads.** Researchers study ways to optimize resources when managing paved roads. The research is conducted on the state highway system as well as local roads.

RESEARCH EXPERTISE:
- Pavement preservation
- Gravel road management
- Use recycled asphalt in gravel roads
- Speed limits and safety
- Dust mitigation
- Paved road management
- Traffic operation
- Construction management

WORKFORCE DEVELOPMENT FOCUS AREAS:
- Work zone safety
- Aggregate, asphalt, and concrete certification for construction workers

SPECIALIZED LABS:
- **Traffic simulator lab.** Used in conducting studies on trucks and passenger vehicles.
- **Pavement research lab.** Used for conducting various pavement studies and performing testing for the certification materials workshop.
- **Structural lab.** Used for conducting bridge-related studies.

LTAP FOCUS AREAS:
- Safety
- Infrastructure

LTAP EXPERTISE AREAS:
- Pavement management systems
- Speed limits
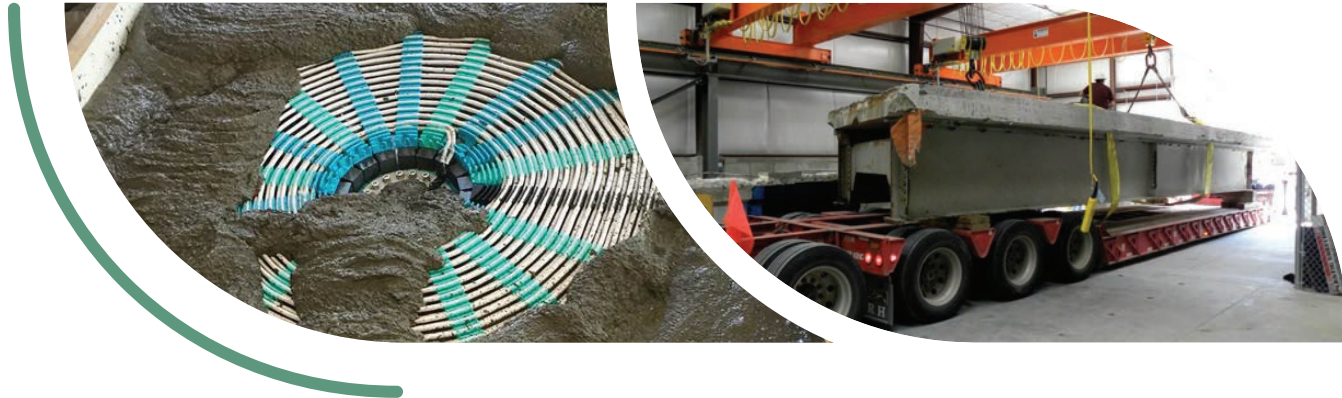- Asset Management
- Safety studies
- Traffic studies

College of Engineering
UtahStateUniversity

Utah State University, located in Logan, UT, is one of the nation's premier student-centered land-grant and space-grant universities. With an enrollment of more than 27,000 students, USU focuses on delivering an exceptional learning experience, driving impactful research and creative excellence, building prosperous local and global communities, and cultivating the USU community and culture.

PROGRAM COORDINATOR:
Marv Halling
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UTAH LTAP

Located at Utah State University, the UTAP LTAP Center is committed to serving local agencies, UDOT, FHWA, and the transportation industry through technology transfer, technical assistance, training and workforce development, information services, and assisting with transportation needs.

LTAP DIRECTOR:
Randy Wahlen
randy.wahlen@usu.edu

RESEARCH FOCUS AREAS:

- **Bridge management.** To preserve existing bridges, researchers will explore the use of advanced and emerging materials, including, but not limited to, high-performance and ultra-high-performance concrete, engineered cementitious composite, and fiber reinforced polymer.
- **Climate change and sustainability.** Electrification of the transportation sector in the United States and around the world is an essential step toward reducing dependence on fossil fuels and associated greenhouse gas emissions. Adoption rates for some transportation modes are increasing, but some transportation segments have significant barriers to overcome. Plug-in charging solutions for large trucks are problematic and impeding adoption of electrification. Wireless charging and dynamic wireless charging of EVs is an important next step in their adoption.

RESEARCH EXPERTISE:

- Bridge management and reliability
- Electrified transportation
- Travel behavior modeling

SPECIALIZED LABS:

- TIMELab
- Systems, Materials, and Structural Health (SMASH) Lab
- Electric Vehicle and Roadway Research Facility and Test Track
- Power Electronics Lab
- Utah Earthquake Engineering Center and Laboratory

LTAP FOCUS AREAS AND EXPERTISE:

- Heavy Equipment Training
- Pavement Management
- Traffic Safety for Local Government
- Asset Management
- Workforce Development
- Work Zone Safety
- Stormwater Quality – Design and Inspection