UGPTI Advisory Council Meeting

October 12th, 2023

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Tribal Transportation Program & Northern Tribal Technical Assistance Program

Ron Hall

Manager and Program Co-Director

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Northern Tribal Technical Assistance Program

- Co-Directed with Bryon Fuchs
- 5 year agreement with FHWA
- North Dakota, South Dakota, Nebraska, Wyoming, Montana
- 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.

Partnerships

- 28 Tribal Governments
- 5 State Local Technical Assistance Programs
- 2 Bureau of Indian Affairs Regional Transportation Programs
- 2 Federal Highway Administration Tribal Transportation Program Offices
- National LTAP/TTAP Association
- National Highway Institute
- Mountain Plains Consortium
- Transportation Learning Network

Research and Industry Partners

- Transportation Research Board
  - National Tribal Transportation Workforce Peer Exchange
  - EV charging infrastructure
- Intertribal Transportation Association
- American Public Works Association
- American Association of State Highway and Transportation Officials
- Associated General Contractors Association

Pursuing New Opportunities

- Training and Technical Assessment Needs Assessment
  - Tribal Programs require specialized training curriculum in addition to existing technical programs
- Technology Deployment Initiative
  - Digital video data collection and analysis for run off road crash and safety planning
- Equity Research
  - TRB Consensus Committee: Data, Meterics and Analytic Methods for Assessing Equity Impacts of Surface Transportation Funding Formulas

Questions / Comments?

Ron Hall
ronald.hall@ndsu.edu, 970-217-9076

Thank you!

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

ND Local Technical Assistance Program & Western Liaison

Bryon Fuchs

Program Director

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

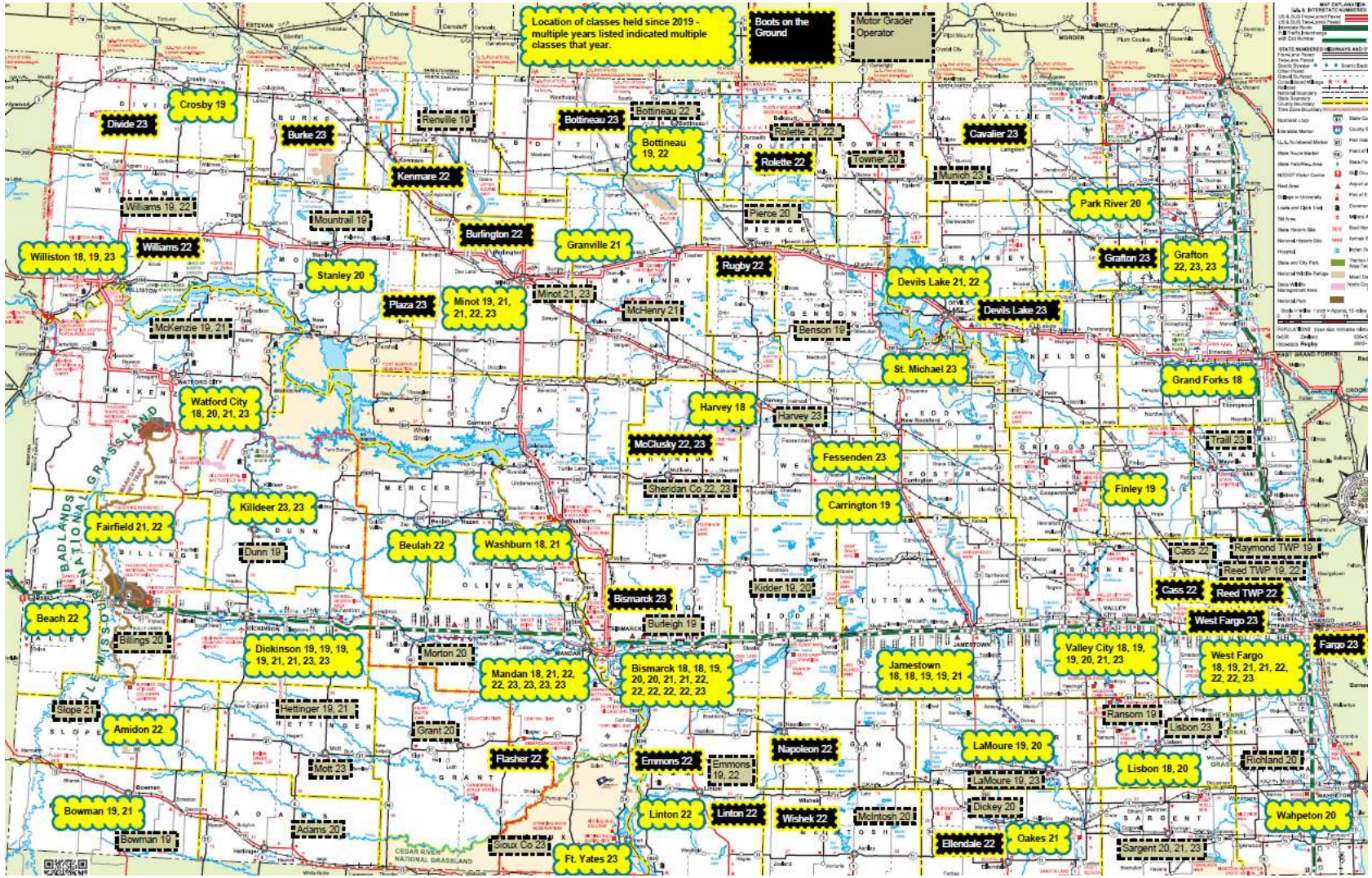
Who do we serve or who are our customers?

- 53 Counties
- Over 1,300 Organized Townships
- Almost 360 different Communities
- 4 Tribal Governments within the State
- NDDOT
- Consultant Engineers

Some of our core deliverables?

- Motor Grader Operator
- Boots on the Ground – Asphalt
- ND Asphalt Conference
- Local Road Conference (Partnership)
- Bridge Class
- Roadway Safety
- Gravel Quality
- Roadway Foundations
- Signing
- OSHA Classes

Where have we been?



How do we do this?

- Great Staff
- Advisory Board
- Partners

North Dakota Association of County Engineers

NDACo
NORTH DAKOTA ASSOCIATION OF COUNTIES

NDIRF NORTH DAKOTA INSURANCE RESERVE FUND
For North Dakota. For Local Government. For You.
www.ndirf.com

Northland Chapter Of ATSSA

NORTH Dakota | Transportation
Be Legendary.

NDTOA NORTH DAKOTA TOWNSHIP OFFICERS ASSOCIATION

WESTERN DAKOTA ENERGY ASSOCIATION

ND NORTH DAKOTA LEAGUE of CITIES

AMERICAN PUBLIC WORKS ASSOCIATION
APWA
North Dakota Chapter

U.S. Department of Transportation
Federal Highway Administration

What’s New?

- The Program Director

Where are we going?

- Striving for continuous improvement
  - Listen to our customers/partners
    - Needs assessment and surveys
  - Evaluate existing deliverables
  - Update/revise/add/remove deliverables
    - Roadway Safety
  - Focus on what provides value
  - And, we might not succeed at times
    - Allows for an opportunity to learn and grow

Western Liaison

- Started in 2020, 5-years (12-31-2024)
  - NDDOT Funded
  - Primary focus is the 4 major oil-producing County Region and MHA
    - Coordination, Collaboration, Planning Efforts, Information Exchange
  - Listen to our customers/partners
    - Continuation of program
  - Annual WDEA Roundtable

“good and bad ideas come from all levels”

-if we don’t recognize this, then we have already chosen poorly-

Questions / Comments?

Bryon Fuchs
bryon.fuchs@ndsu.edu, 701-328-9857

Thank you!

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

USACE – Upper Mississippi Induced Traffic

Dr. Alan Dybing

Advanced Research Fellow

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

USACE – Upper Mississippi

- Analysis of corn and soybean movements on the Upper Mississippi waterway
  - Modal characteristics/shares/costs
  - Ethanol production
- Scenario analysis:
  - Increased production
  - Changing ethanol demands
  - Railroad capacity issues
  - Changes in demand in Asia

Township Studies

Township Transportation Funding Program
North Dakota Road Safety Action Plan

Dr. Alan Dybing

Advanced Research Fellow

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Township Transportation Funding Program

- HB 1015: 2021 – Provided NDDOT with $10 million to match Federal Funds for Township road and bridge projects
  - Solicitation process resulted in roughly 2,500 townships, totaling over $200 million requested
  - Federal grant opportunities were assed and projects meeting the application requirement selected from the 2,500 for grouped applications
- HB 1012: 2023 – Township Assistance Program – application process for unused funds in HB 1015 for township projects
  - Application process announced early August, with initial September deadline extended to October 6
  - 187 applications as of October 2
  - Analysis of applications to filter applications meeting the funding criteria
  - Provide review committee with qualifying applications early December for selection process

North Dakota Road Safety Action Plan

- FHWA grant under the Safe Streets for All (SS4A) program
- Planning Grant: development of an action plan that identifies the most significant roadway safety concerns in a community and strategies to address them
- Scope: unpaved township roads

North Dakota Road Safety Action Plan

- Study Process
  - Analysis of crash data (Ongoing)
    - Identify crashes occurring on township roads or involving traffic from township roads
    - Crashes involving injuries and fatalities
    - Statistical modeling
  - Survey (February 2024)
    - Townships
    - Counties
    - Residents
  - Improvements and mitigation (Spring 2024)
    - Based on safety issues identified in the analysis and surveys develop strategies to improve safety conditions on township roads
  - Report Development (2025)

Infrastructure Needs:

County, Township and Tribal Roads and Bridges: 2024-2043

Dr. Alan Dybing

Advanced Research Fellow

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Study Objective

- Estimate the funding needs to maintain the existing road system over the next 20 years
- Update of previous studies

Study Components

- Traffic Model
  - Forecasts agricultural and oil related truck movements over the next 20 years
- Unpaved Roads Analysis
  - Cost and practices survey for counties and townships
  - In conjunction with traffic forecasts, estimate the funding needs

Study Components

- Pavement Analysis
  - Pavement data collection
  - GRIT data – project entry from counties
  - AASHTO-93 model – uses pavement structure, condition and traffic estimates to forecast deterioration and improvement timing
- Bridge Analysis
  - Utilizes National Bridge Inventory System (NBIS) data
  - Development of Bridge Needs Target (BNT) to evaluate bridge condition to estimate improvement and maintenance costs

Study Updates for 2023

- Jurisdiction
  - NDDOT roads_county jurisdictional information
  - Previous jurisdictional data was collected long ago
- Minor Structures
  - Structures below 20’ are not reported in NBIS
  - NDDOT inventory from 1985
  - Import to GRIT for county approval
  - Categorical costing
  - Bridge steering committee input and guidance

Timeline

- Data Collection
  - Pavement Data Collection – Summer 2023
  - Traffic Data Collection – Summer 2023
  - County and Township Survey – Initial mailing, November 1, 2023
  - Assumptions of Oil & Gas Development – October 2023
- Travel Demand Modeling – Ongoing, completion January 2024
- Gravel Modeling – Spring 2024
- Pavement Modeling – Spring 2024
- Bridge Modeling – Spring 2024, when NBIS becomes available
- Draft Report – June 2024
- County Outreach – July 2024
- Final Report – September 2024

Questions / Comments?

Al Dybing
alan.dybing@ndsu.edu, 701-231-5988

Thank you!

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Transportation Learning Network (TLN)

Chris Padilla

Program Director

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE


MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING


TLN PLANNING
COMMITTEE

TRANSPORTATION CURRICULUM COORDINATION COUNCIL

Commercial Vehicle Safety Center

nhi national highway institute
50TH ANNIVERSARY

ATSSA
SAFER ROADS SAVE LIVES

ARTBA American Road & Transportation Builders Association

CLEAR ROADS
research for winter highway maintenance

PARTNERS

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

EVENTS

MONTANA

DOT	LTAP	PRIVATE	TOTAL
517	57	56	630

NORTH DAKOTA

DOT	LTAP	PRIVATE	TOTAL
736	236	485	1457

SOUTH DAKOTA

DOT	LTAP	PRIVATE	TOTAL
533	95	54	682

WYOMING

DOT	LTAP	PRIVATE	TOTAL
313	20	10	343

ONLINE/SELF PACED MODULES

MONTANA	NORTH DAKOTA	SOUTH DAKOTA	WYOMING
46	389	829	46

4184

Participants


LMS ACCOUNTS

NORTHERN TRIBAL TECHINCAL ASSISTANCE PROGRAM

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Transportation Learning Network

About Us Resources Learning Opportunities Contact Us

Upcoming Presentations

Intro to Culvert Design & Basic Hydraulics - Part 1 of 3
- *Oct 26, 2023 – Virtual Learning*

Culvert Design Concepts & Computer Workshop - Part 2 of 3
- *Nov 2, 2023 – Virtual Learning*

Snow & Ice Webinar Part 1: Enviroproofing Your Operations with Liquids
- *Nov 3, 2023 – Virtual Learning*

View More

TLN LEARNING MANAGEMENT SYSTEM (LMS)

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Transportation Learning Network

Menu

Upcoming Presentations

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Questions / Comments?

Chris Padilla
chris.padilla@ndsu.edu, 701-202-5730

Thank you!

Don’t Forget to be Awesome!

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Small Urban and Rural Center on Mobility

Dr. Jill Hough

Program Director

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Team Members

- Jill Hough, Ph.D. – Program Director
- Ranjit Godavarthy, Ph.D. – Associate Professor
- Jeremy Mattson, Ph.D. - Associate Professor
- Dilip Mistry, Ph.D. - Data Scientist
- Dave Lee – Contractor / Training Faculty

Graduate Student Researchers

- Antonio Molina
- Bright Quayson

Partners

- University Transportation Centers
  - Wrapping up with Montana State University and Eastern Washington University
  - Texas A&M – new UTC partner
- North Dakota Department of Transportation
- Minnesota Department of Transportation
- National Rural Transit Assistance Program (NRTAP)
- Various State Transit Associations, DOTs, and Transit Agencies

Recently Completed SURCOM Projects

- Rural Transit Fact Book 2022
- Interest of Shared Mobility and Emerging Vehicle Technologies in Rural America
- Food Access and Food Delivery Services: An Exploratory Study for the Role of Public Transportation During the COVID-19 Pandemic in 2020-2021
- Comparing Public Transportation Service for Rural States (NDDOT)
- Editor/organizer/authors of TR News Special Issue on Mobility for Individuals in for 2023

Current SURCOM Projects

- Impacts of Transit on Health in Rural & Small Urban Areas
- Telehealth's Effect on Rural Veteran Healthcare and Mobility
- Designing an Electric Transit Bus Network
- Shared Use Mobility for Tribal Areas
- Improving Public Transportation in Rural Areas and Tribal Communities (NCHRP)
- **Impact of Transportation Service on Food Access for Native American Tribes in North Dakota (MPC)**
- Mapping Public Transportation Access to Food Stores in North Dakota

Questions / Comments?

Jill Hough
jill.hough@ndsu.edu, 720-793-1364

Thank you!

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Advanced Traffic Analysis Center Department of Transportation Support Center

Brad Wentz

Program Director

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Advanced Traffic Analysis Center
DOT Support Center

- Hire students to gain real world transportation experience providing the industry high tech services and potential future employees
  - Primarily funded by NDDOT
  - Also MPO's and Counties

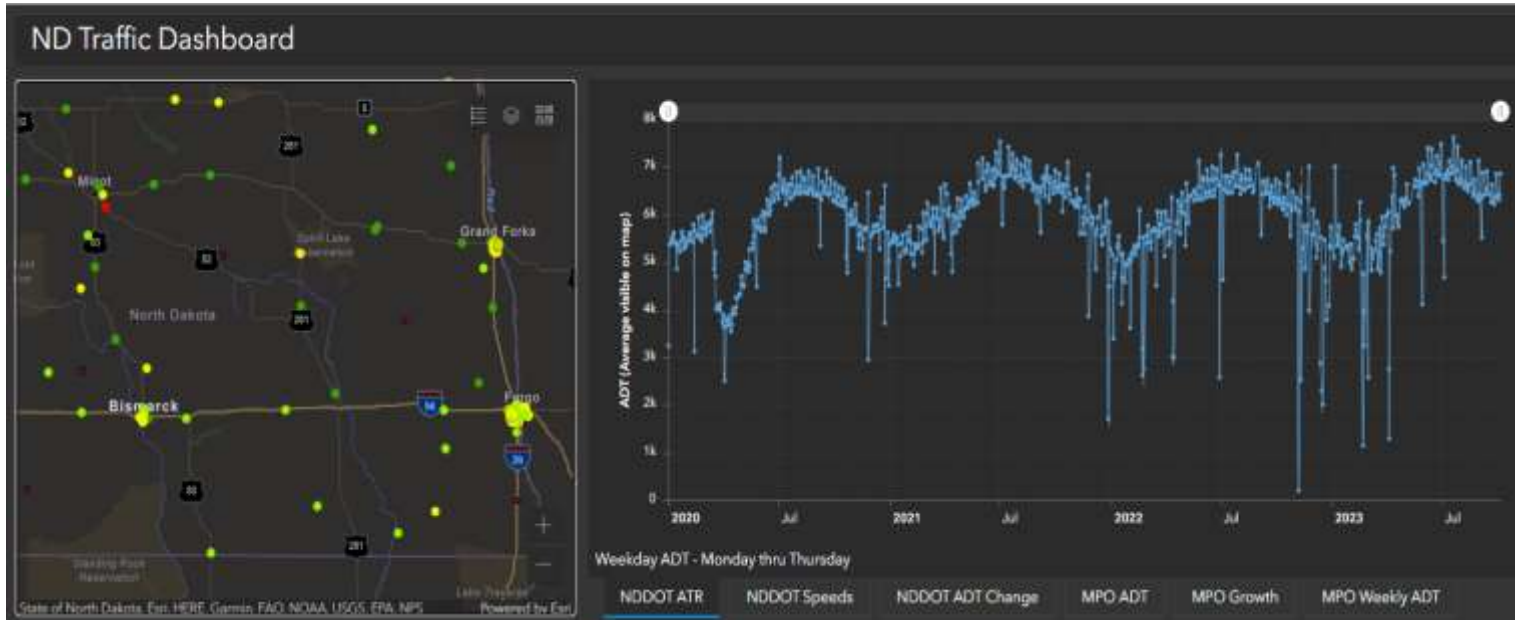
Mission: Promote Safe and Efficient Movement of People and Goods

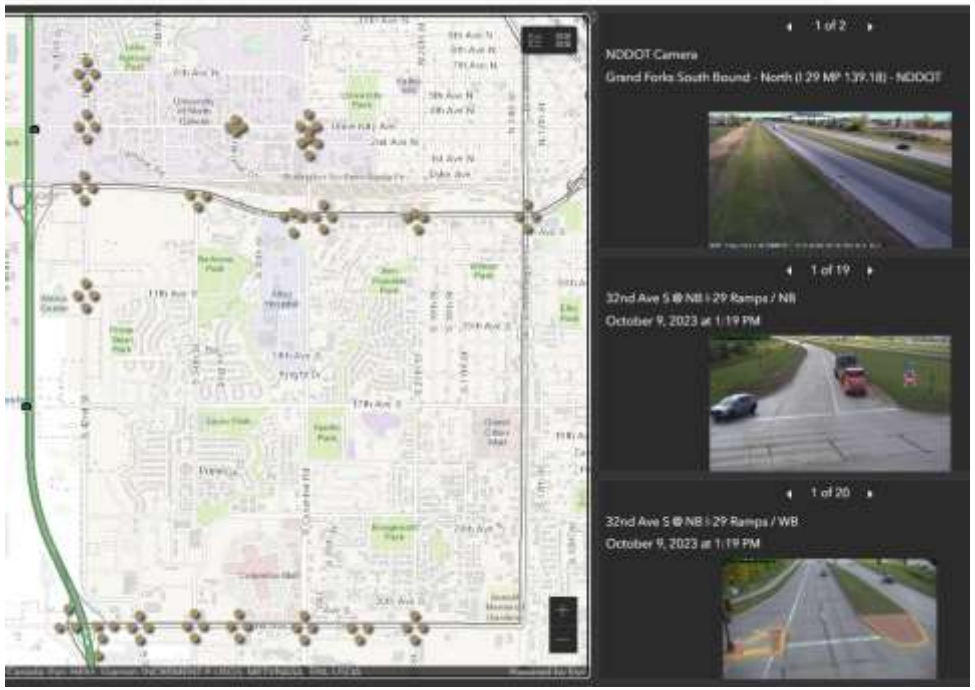
Advanced Traffic Analysis Center

- Focus Areas and Staff
  - Traffic Operations and Data Collection
    - Kshitij Sharma, M.S., EIT
  - Travel Demand Modeling
    - Diomo Motuba, Ph.D
  - Intelligent Transportation Systems
    - Sharijad Hasan, M.S., EIT
  - 3 to 6 students

Traffic Operations and Data Collection

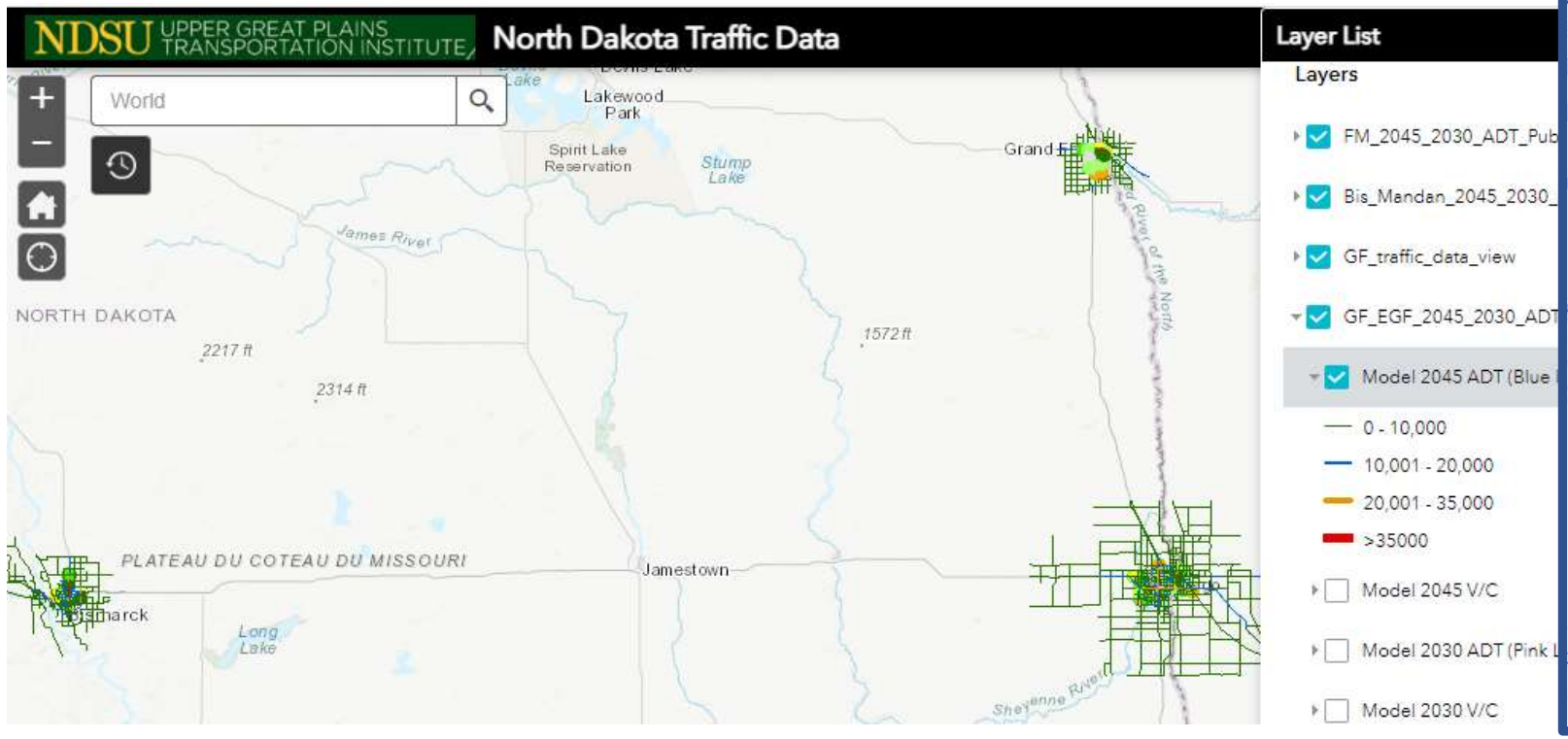
- Traffic Signal Data Collection and Performance Measures
  - NDDOT Signals, ATR's & RWIS Sites
  - All MPO's – approaching 100 intersections





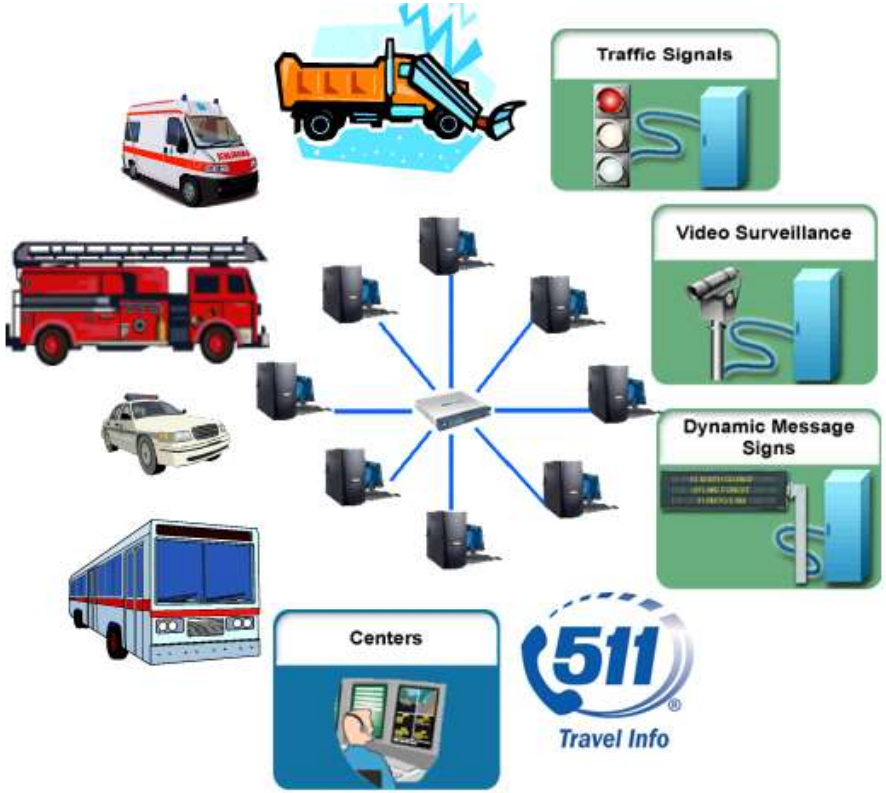
ND Travel Demand Modeling

- Forecasting Traffic Volumes 30 years into future
  - All three MPO Models updated
  - Working on new Central Dakota MPO Model



ND Intelligent Transportation Systems

- Regional & State ITS Architecture
  - Updated BisMan MPO & FMCOG Architecture
  - Working with NDDOT on ITS & TMC Plan

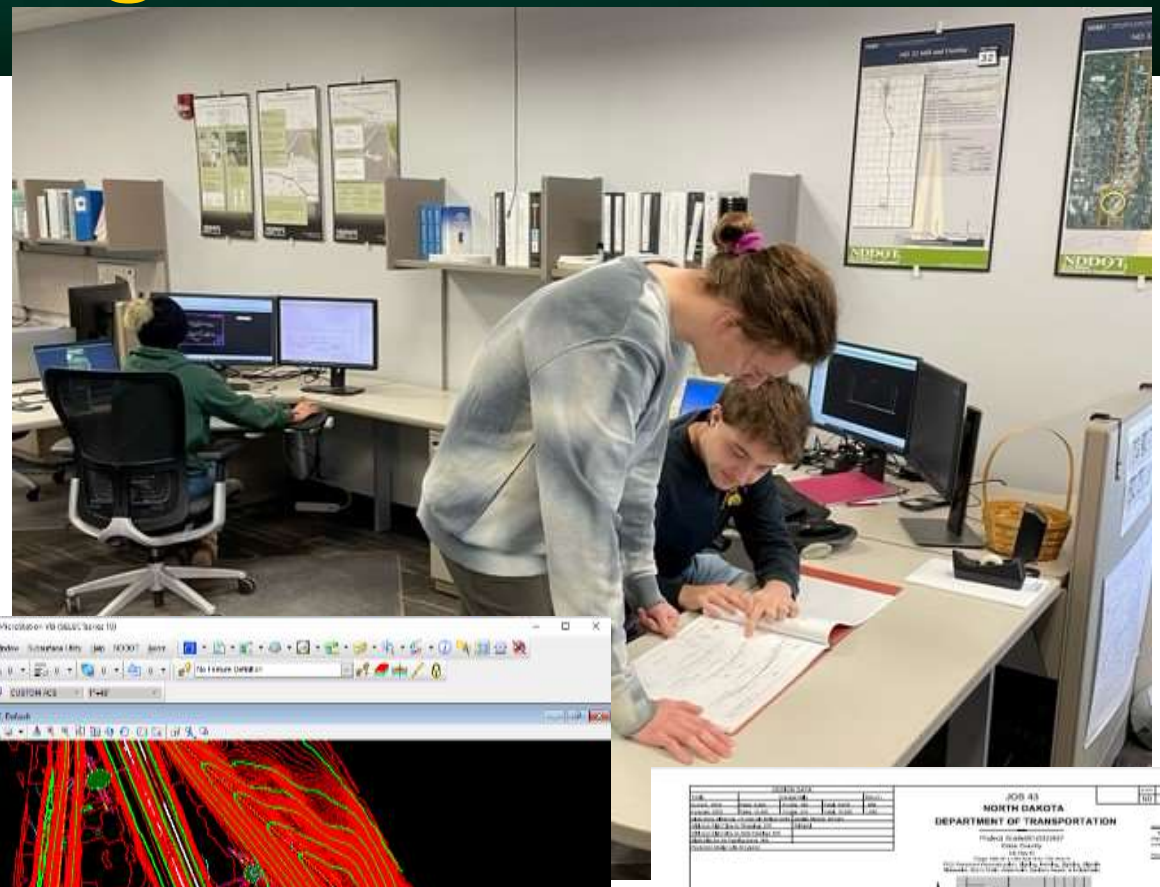


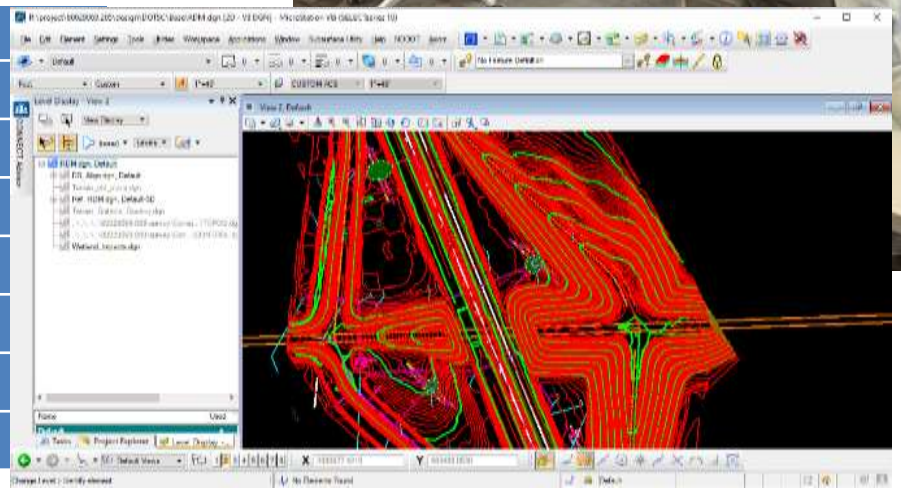
DOT Support Center - DOTSC

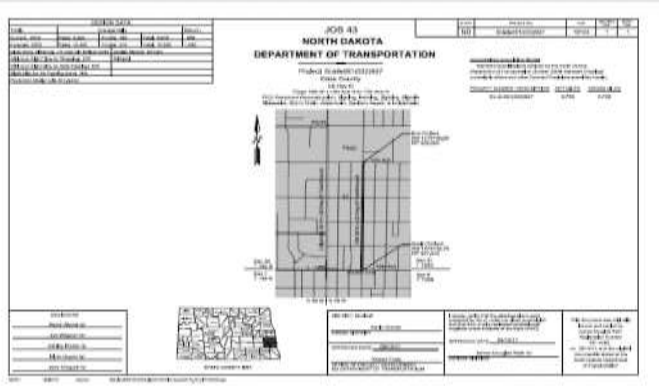
- Focus Areas and Staff
  - Design Section
    - Brady Haussler, P.E. NDDOT
    - Jennifer Kern, P.E. NDDOT
    - 10 – 12 Engineering students
  - IT Section
    - Sowmya Gudise, M.S.
    - 3 to 6 Computer Science students
  - Engineering Support
    - Special projects with engineers at UGPTI

DOTSC Design Section

- High Mast Lighting at Exits 59 & 61 on I-94 (Dickinson)
- Fort Yates Roundabout
- I-29 & 40th Ave N Interchange Technical Support (Fargo)
- Work Zone Traffic Control - Memorial Bridge (Bismarck)
- US 2 Reduced Conflict Intersections & Turn Lanes
- New South Interchange Technical Support (Grand Forks)
- I-94 Eastbound Reconstruct from RP 11 to Little Missouri
- 13th Ave S & I-29 Ramp - Median Modifications (Fargo)
- Lynchburg Interchange Structure Replacement
- ND 27 Improvements in Lisbon Technical Support
- Woodworth Wetland Bank / Mitigation Project
- I-94 from I-29 to 25th St Auxiliary Lane (Fargo)
- US 52 Passing Lanes
- US 2 Mill & Overlay from Montana line to ND 1804
- Railroad Coordination
- ND 22 Ditch Grading & Erosion Repairs (Dickinson)





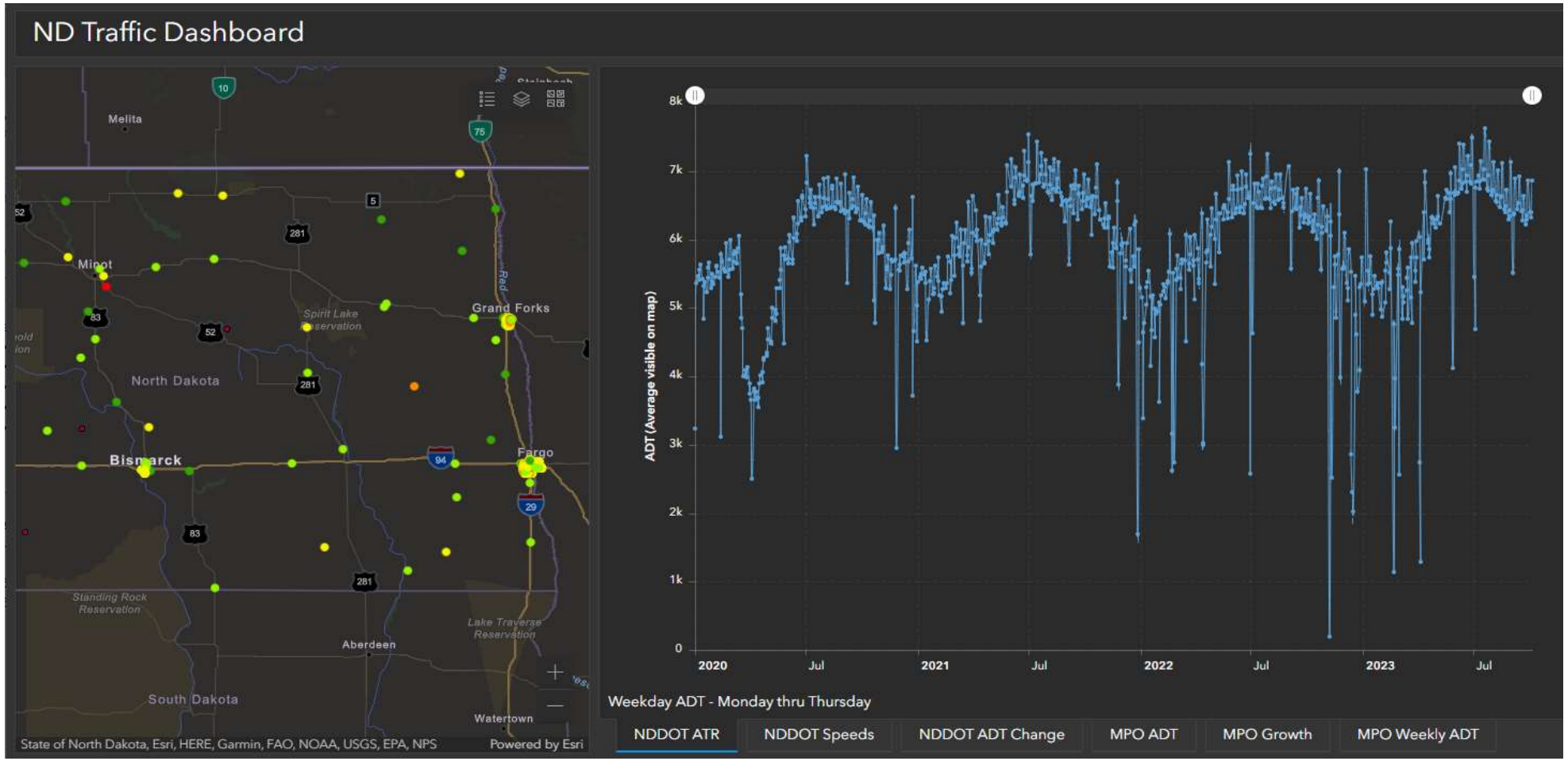


DOTSC IT Section

- Application Development, Maintenance & Support
  - NDDOT Certification and Materials Testing Reporting
  - ★ Traffic Analysis – Added all NDDOT ATR's and Dashboard
  - ★ Maintenance Cost & Performance Measure Dashboards - NDDOT
  - Local Government Asset Management – GRIT
    - Pavement Performance Forecasting - Dashboards
    - Active Load Restrictions
    - Sign Inventory
  - Surface Selection Tool – Proposal to integrate with GRIT
  - Truck Weight Calculator – Updates to 129,900
  - ★ Artificial Intelligence and Machine Learning

ND DOT Support Center (DOTSC)

- Traffic Analysis – Includes all ATR and signalized intersections



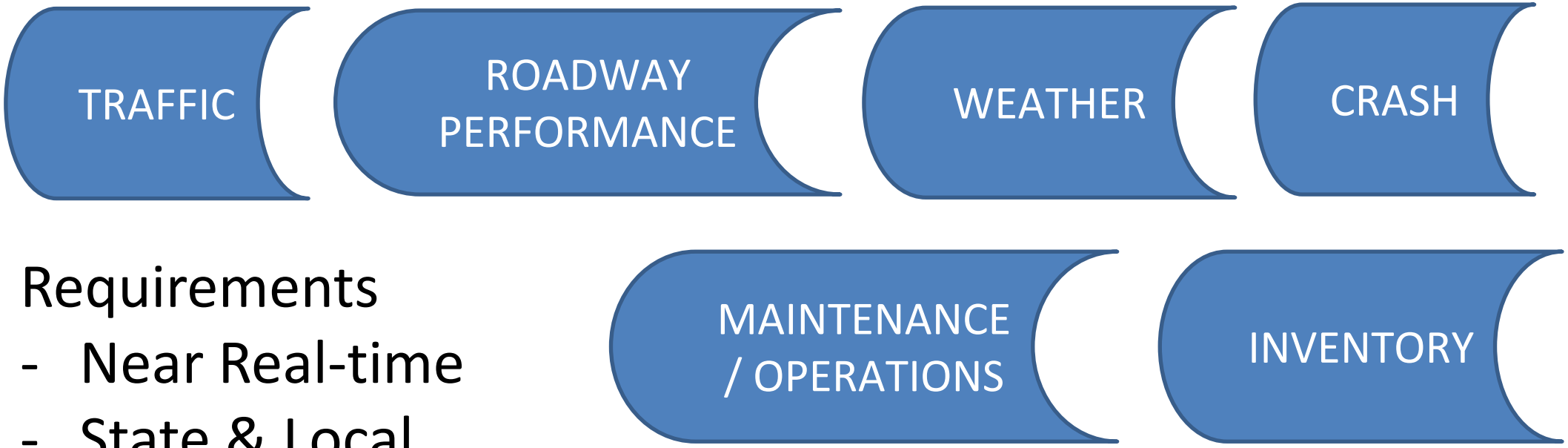
ND DOT Support Center (DOTSC)

- NDDOT Maintenance – Speed Recovery

Artificial Intelligence / Machine Learning

*AI **** Data -> Processing -> Information**** AI*

Transportation Data Intelligence Lab



Requirements

- Near Real-time
- State & Local
- Project level density or sight distance density
- Geographic and Time related

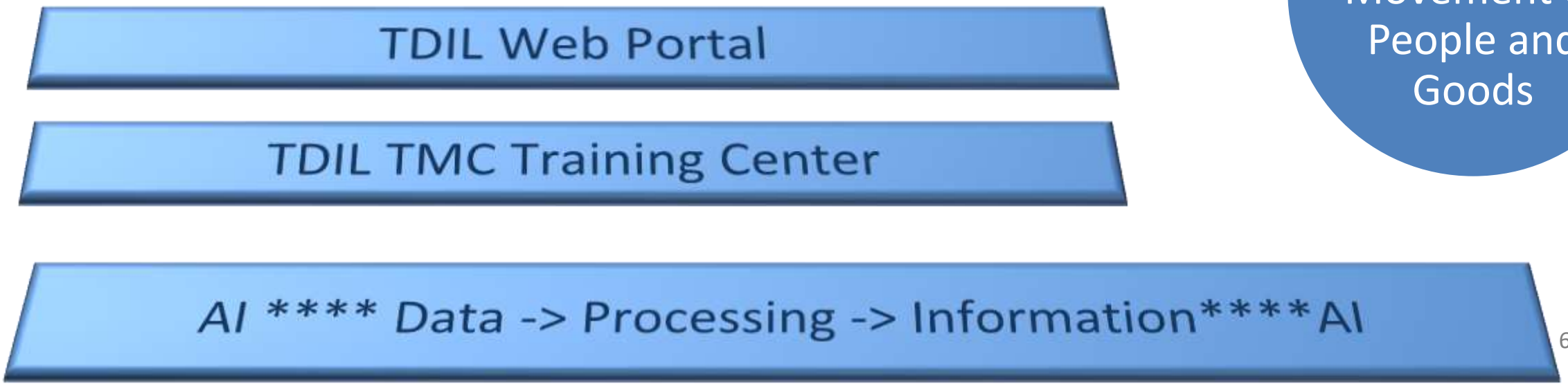
*AI **** Data -> Processing -> Information**** AI*

Transportation Data Intelligence Lab

Artificial Intelligence / Machine Learning

- Data Collection – Develop new low cost IOT devices
- Data Processing
- Digital Twin – Accurate Forecasting
- Information Sharing – Agencies to Public

Vision – Safe and Efficient Movement of People and Goods



Questions / Comments?

Brad Wentz
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Thank you!

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Mountain Plains Consortium (MPC) Research Updates/Activities

Pan Lu

Associate Research Fellow

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Intelligent Infrastructure and Transportation Management Team

Research Focus:

- **Transportation Infrastructure**
- **Safety**
- **Mobility, Accessibility, and Traffic**

Key People

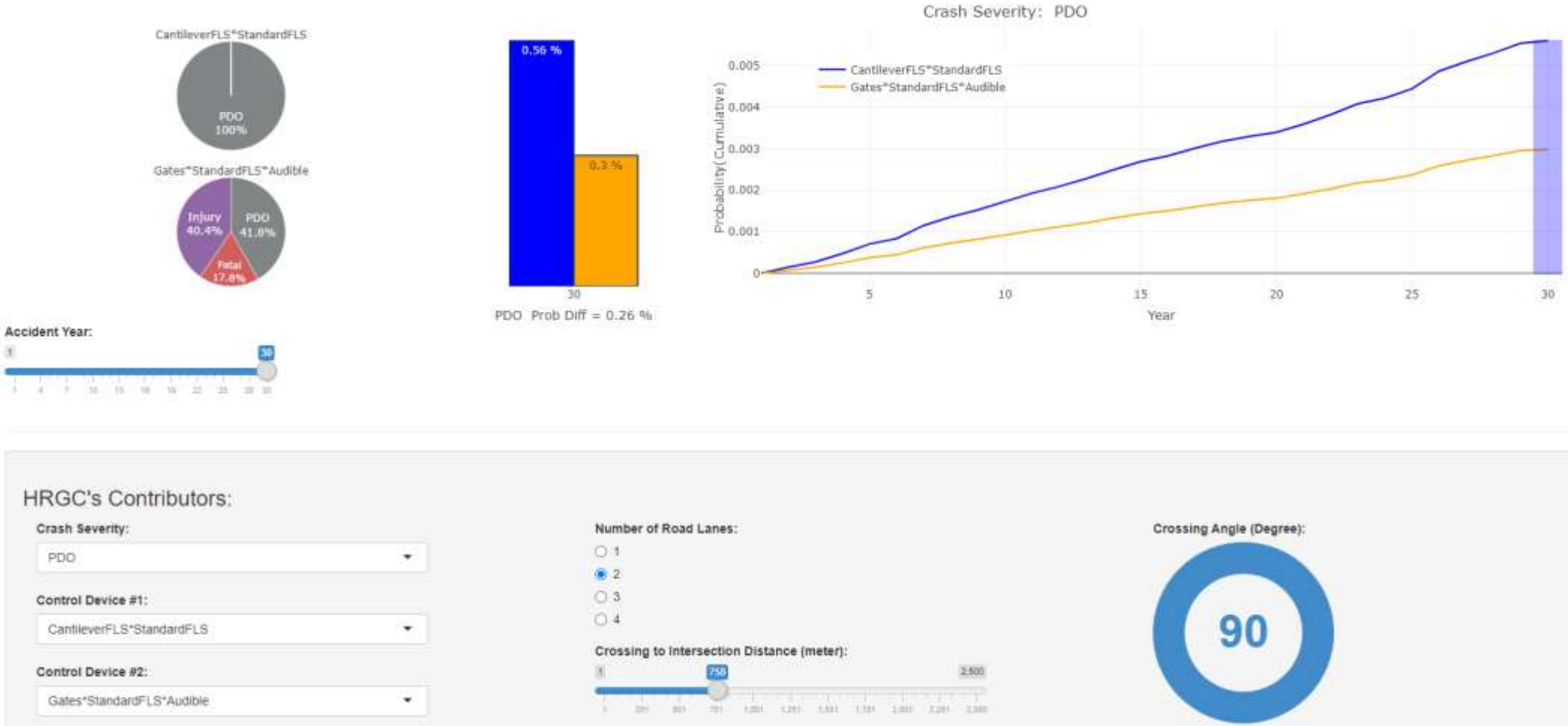
Name	Role	Expertise Area	Photo
Pan Lu	PhD Associate Professor Senior Researcher	• Infrastructure Management System • Highway Rail Grade Crossing Safety • Multi-Modal Freight Transportation • Equitable Mobility • Artificial Intelligent	
Yihao Ren	PhD Candidate Senior Research Assistant	• LiDAR Sensor • Point Cloud Data Analysis • Smartphone Application in Transportation • Unsupervised Learning/Deep Learning	
Xinyi Yang	PhD Candidate Senior Research Assistant	• Weight-in-Motion Data Quality • Strain Sensor such as Optical Fiber Sensor • Machine Vision technology • Reinforcement Learning	
Heshani Wickramage	PhD Candidate Senior Research Assistant	• HazMat Transportation • Risk Assessment • Chemical and Physical Characteristic Analysis • Spatial Clustering Analysis	
Ryan Jones	PhD Candidate Junior Research Assistant	• Commercial Truck Operations • Autonomous Truck Marketing Potential Analysis • Regulations in Trucking Industry	

List of Current Projects

1. **MPC 601**: Sensitivity and Accuracy Assessment of Vehicle Weight-in-Motion System Measurement Errors using In-Pavement Strain-Based Sensors (*August, 2024*)
2. **MPC 657**: Knowledge-Based Machine Learning for Freeway COVID-19 Traffic Impact Analysis and Traffic Incident Management (*Sep., 2023*)
3. **MPC 673**: Multimodal, Multistate Corridor Modeling for Long-Distance Movements of Food and Containerized Goods (*August, 2024*)
    1. Risk Assessment of Hazardous Materials Transported by Rail
4. **MPC 685**: MPC Regional Emergency Evacuation Analysis in Traffic with Connected and Autonomous Vehicles (*Dec., 2023*)
5. **NCHRP 17-99**: Assessing Safety Effectiveness of Treatments and Technologies at Highway-Rail Grade Crossings (*March, 2025*)
6. **CMMM** (Center for Multi-Modal Mobility) 0009: Analysis of Traffic Safety and Mobility for Tribal Communities under Severe Weather Conditions (*Oct. 15, 2023 – Oct. 14, 2024*)
7. **CMMM 0010**: Mobility and Safety Analysis of Mixed Traffic with Connected and Autonomous Vehicles in Rural and Small Urban Area under Severe Weather Conditions (*Oct. 15, 2023 – Oct. 14, 2024*)
8. **FHWA/NDDOT**: All-in-One Data Collection Station for Real-Time Traffic and Pavement Bottom-up Cracking Monitoring (*Sep. 11, 2023 --- September 11, 2025*)

Some Research Results

- https://kmtgis.shinyapps.io/ak_plot/



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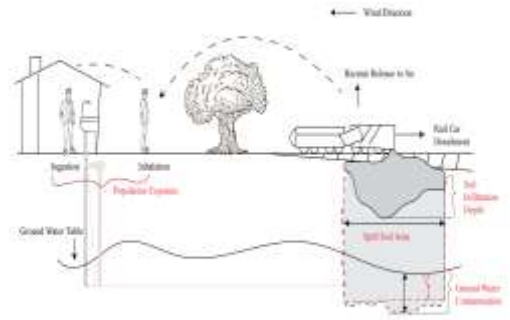


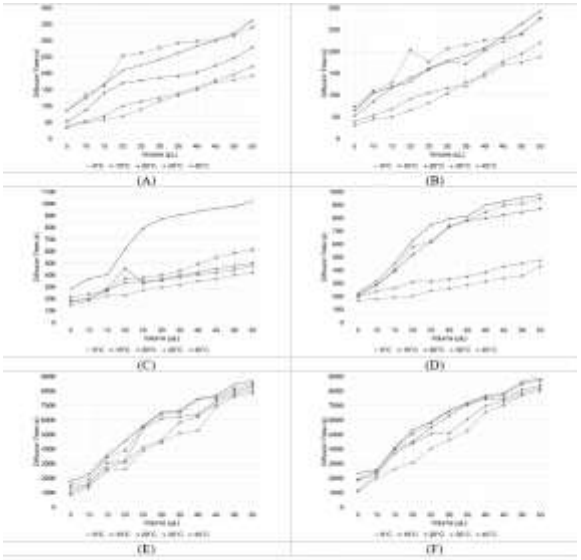
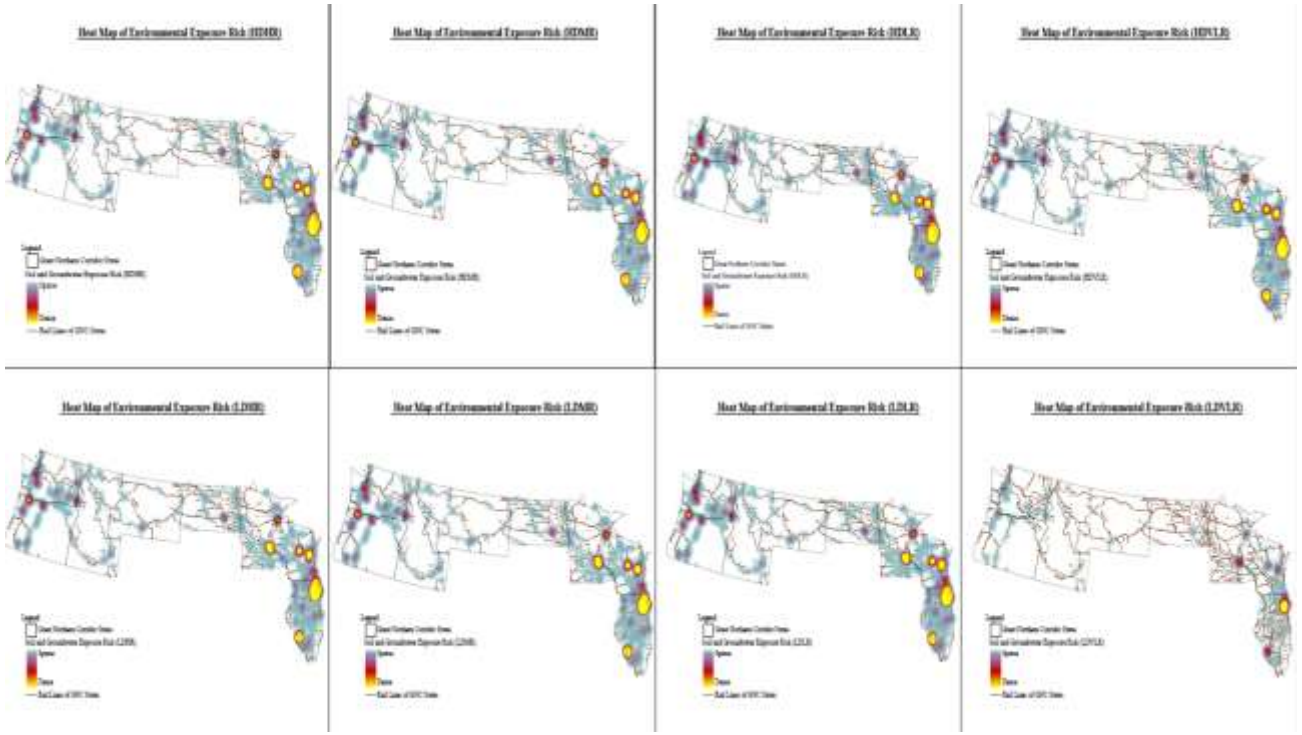


Figure 2. Diffusion Time Distribution for (A) Methanol, (B) Ethanol, (C) HCL, (D) NaOH, (E) Bakken, and (F) Niobrara



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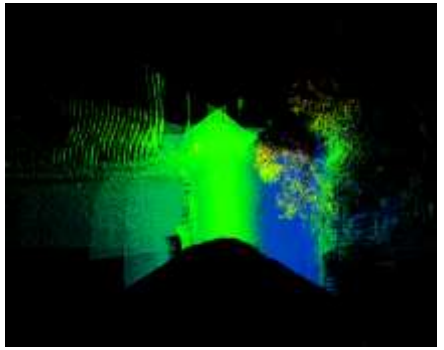
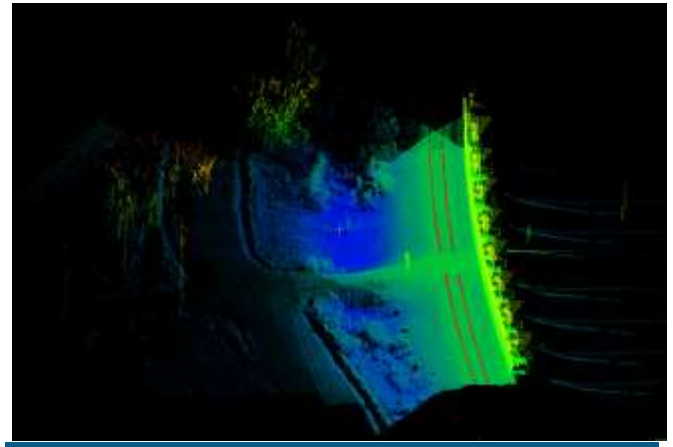
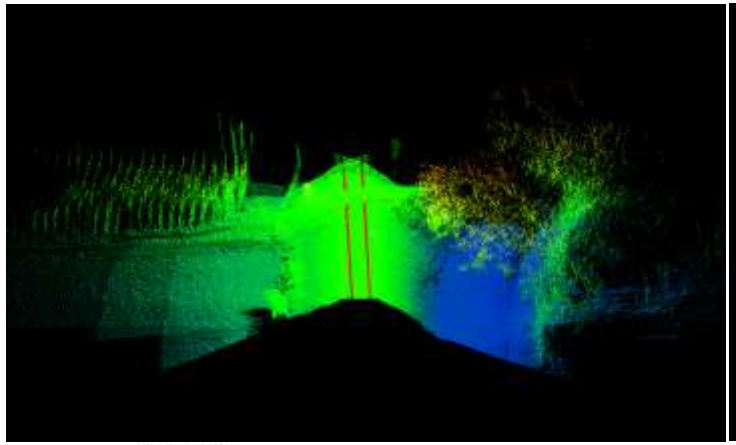
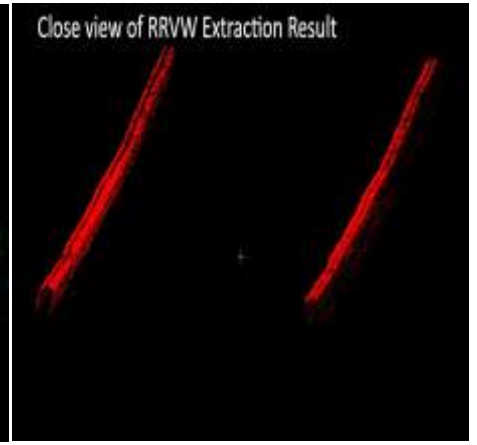
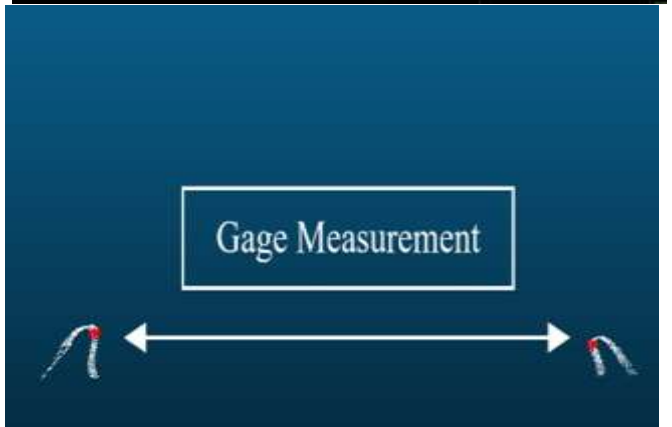
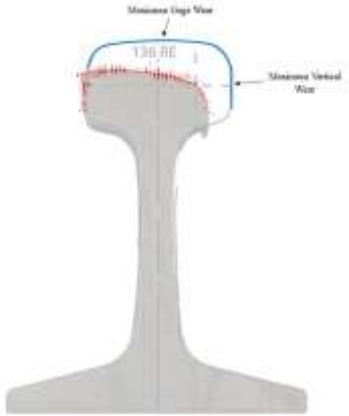


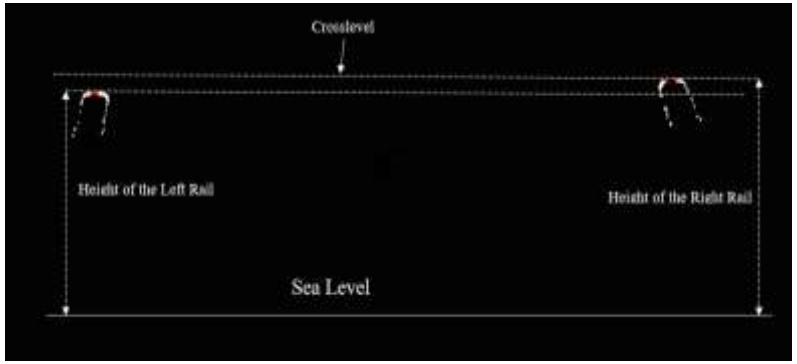








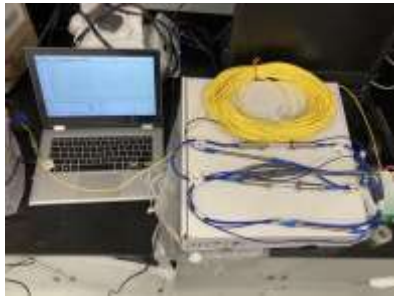


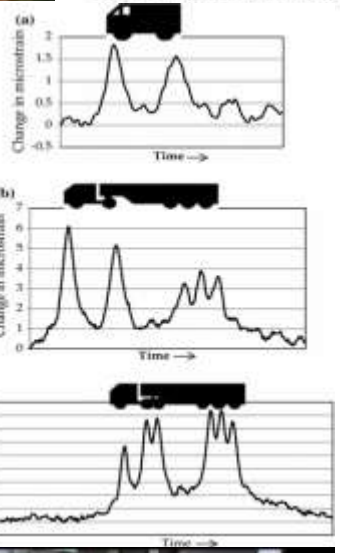


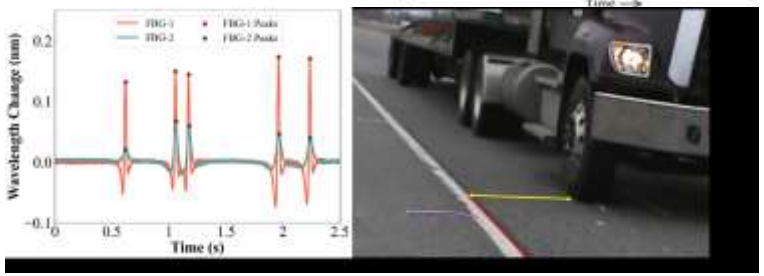
Some Research Results

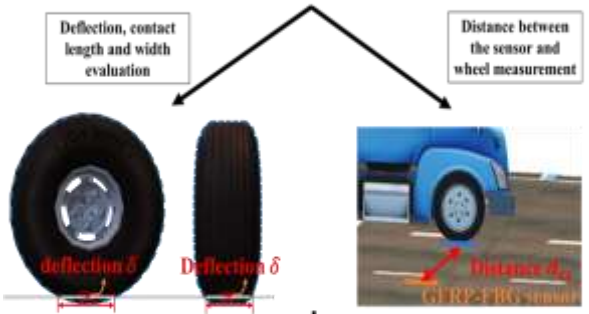
(a) (b) (c)

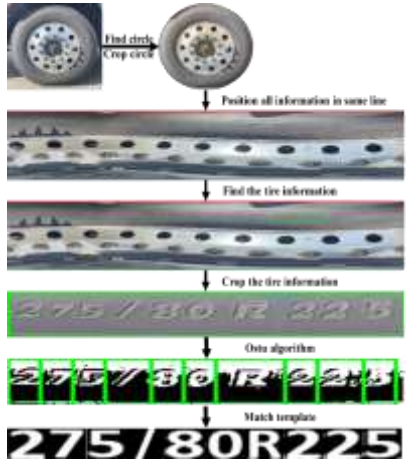
Figure 3. Experiment field with (a) multiple strain sensors above the wheel path; (b) strain sensor used in this study; and (c) paving HMA above the sensors.











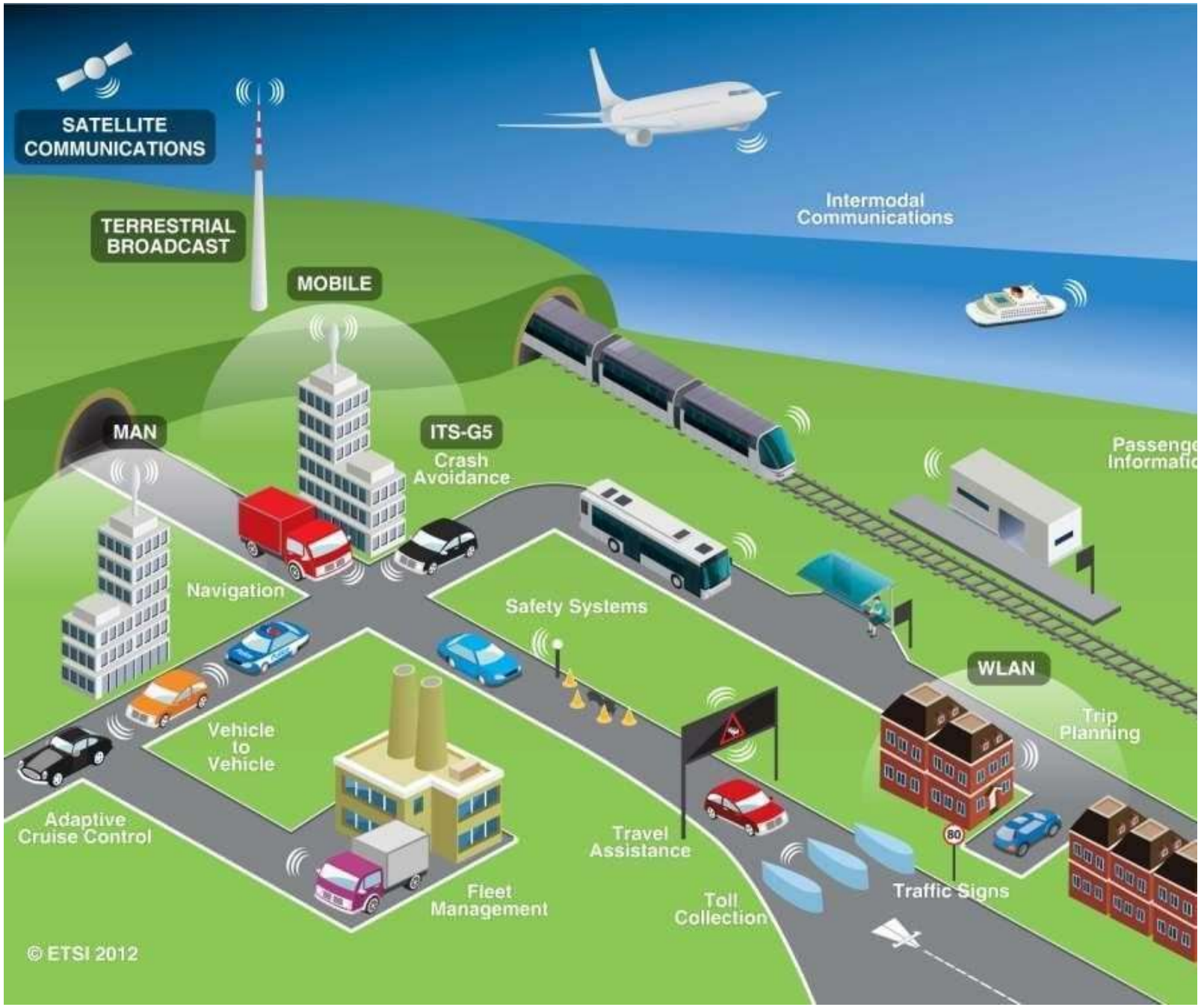
275/25R28

Tire width | Tire height ratio | Rim diameter

Impacts

Past 1 year (Summer 2022 to Summer 2023)

- 16 peer-reviewed journal publications
- 6 journal papers under-review/under-construction
- 12 MS/PhD/undergraduate/Post-doc mentored
- 2 refereed technical report publications
- More than 25 conference presentations and conference proceeding publications
- More than 30 times field/lab visits to collect data


SATELLITE COMMUNICATIONS
TERRESTRIAL BROADCAST
MOBILE
Intermodal Communications
MAN
ITS-G5
Crash Avoidance
Navigation
Safety Systems
WLAN
Trip Planning
Vehicle to Vehicle
Adaptive Cruise Control
Travel Assistance
Fleet Management
Toll Collection
Traffic Signs
80
© ETSI 2012

Thank you!

Questions / Comments?

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Thank you!

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Transport Technology Research

Surface Mobility Applications and Real-Time Simulation Environments (SMARTSe)

Raj Bridgelall

Co-PI: Denver Tolliver

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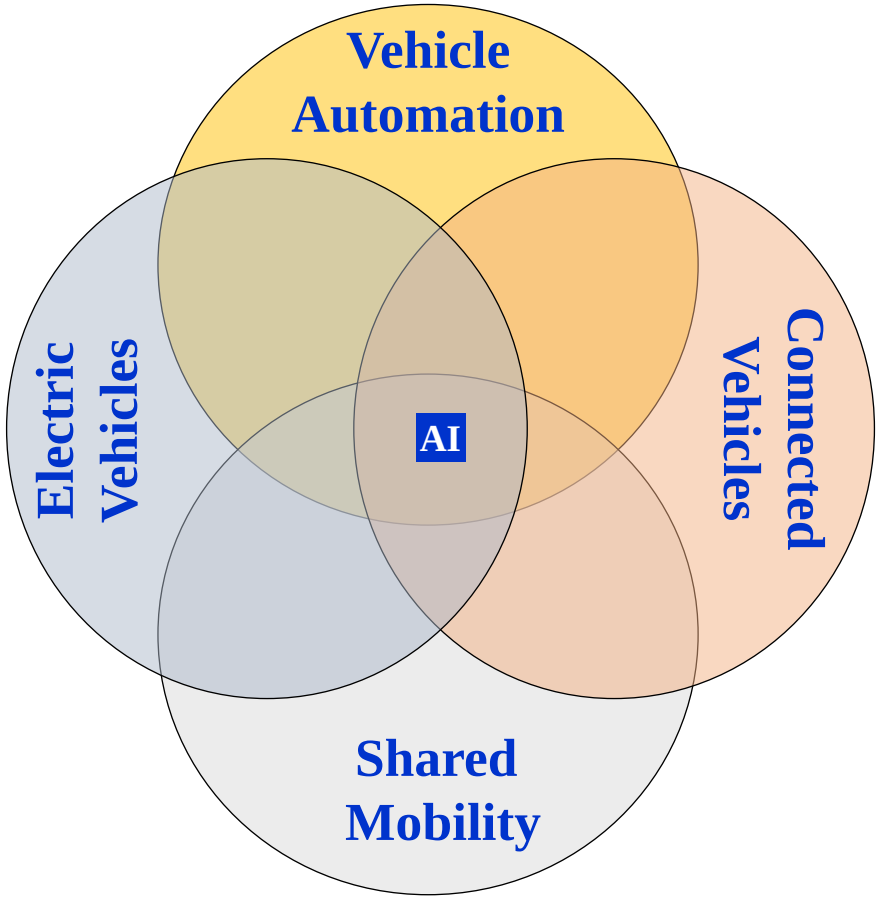
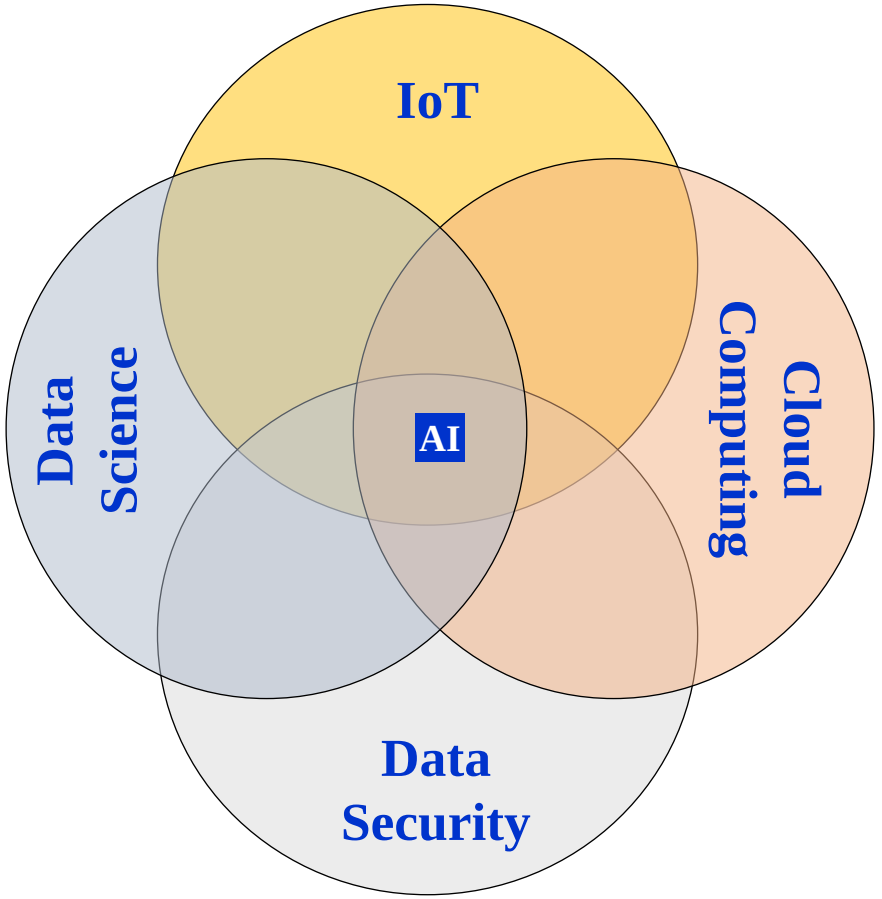
Innovations in Transportation and Supply Chain



Connected & Autonomous Ground & Air



Deep Learning, Cybersecurity, & Blockchains

Student Research Collaborations (Current)

Taraneh Askarzadeh
Urban and Regional Planner
Drones/Sensors
Multimodal Infrastructure Inspections

Baishali Rahman
Director of a Central Bank
Drones
Vertiport Location Optimization

Faisal Habib
Traffic Analysis
Safety
Spatial Analysis

Wesam Helmi
Independent Studies
Sensors & AI
Multimodal Infrastructure Inspections

Seguy Tchakounte-Wakem
Commander (Army Reserve)
Drones/Logistics
Battery Technology Impacts

Ryan Jones
National LTL Carrier
Autonomous Trucking
Deployment Opportunities

Shawn White
Freight Airline Pilot (B747)
Drones
Practical Deployment Planning

Dr. Sattar Dorafshan &
Eberechi Ichi (Student)
University of North Dakota
Railroad Hyperspectral Inspections

Research Products (Sample for Past Two Years)

Transportation Technology & Planning

- Introducing an Efficiency Index to Evaluate eVTOL Designs. *Technology Forecasting and Social Change.*
- Predicting Advanced Air Mobility Adoption by Machine Learning. *Standards*.
- Characterizing Ride Quality with a Composite Roughness Index. *IEEE Transactions on Intelligent Transp. Systems*.
- Budgeting the Adoption of Sensors on Connected Trains. *Transportation Planning and Technology*.
- Forecasting the Effects of Autonomous Vehicles on Land Use. *Technological Forecasting and Social Change*.
- Model Contrast of Autonomous Vehicle Impacts on Traffic. *Journal of Advanced Transportation*.
- Exploratory Spatial Data Analysis of Traffic Forecasting: A Case Study. *Sustainability*.

Transportation Security

- Factors Associated with Terrorist Attack Locations by Data Mining and Machine Learning. *Intl. Soc. Sci. Journal*
- Perspectives on Securing the Multimodal Transportation System. *Vehicles*
- An Application of Natural Language Processing to Classify what Terrorists Say They Want. *Social Sciences*.
- Using Artificial Intelligence to Derive a Public Transit Risk Index. *Journal of Public Transportation*.
- Applying Artificial Intelligence to Identify Factors Associated with Terrorist Attack Locations. *Security Journal*.
- Applying Unsupervised Machine Learning to Counterterrorism. *Journal of Computational Social Science*.
- Attack Risk Modelling for the San Diego Maritime Facilities. *Marine Policy*.

Transportation Safety

- A Systematic Literature Review of Drone Utility in Railway Condition Monitoring. *J. Transportation Engineering*
- Railroad Reliability Engineering by Natural Language Processing. *Reliability Engineering & System Safety.*
- Reducing Risks by Transporting Dangerous Cargo in Drones. *Sustainability*
- Railroad Accident Analysis Using Extreme Gradient Boosting. *Accident Analysis and Prevention*.
- Detecting Pavement Anomalies by Ensemble Connected Vehicle Signals. *Intl. Journal of Pavement Engineering*.
- Signal Feature Extraction and Combination to Enhance the Detection of Railroad Track Irregularities. *IEEE Sensors*.
- Calibration of Smartphone Sensors to Evaluate the Ride Quality Paved and Unpaved Roads. *Intl. J. Pavement Engineering*.

Questions / Comments?

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Thank you!

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Rural Transportation Safety and Security Center (RTSSC)

Highlights

Dr. Kimberly Vachal

Program Director

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RTSSC Scope

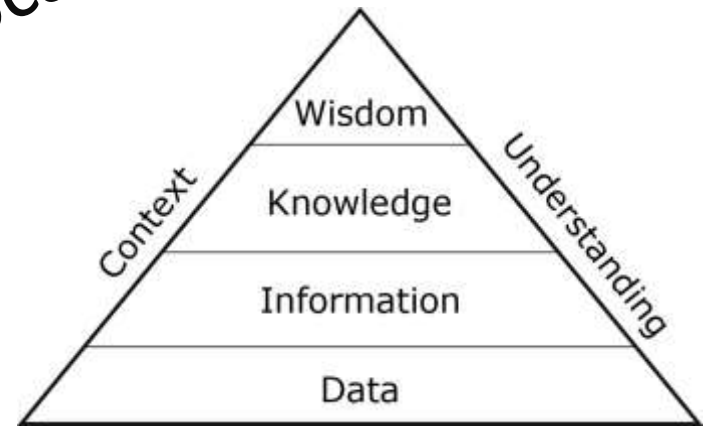
- Research and Outreach
  - Program evaluation
  - Data quantity/quality and decision-maker support
  - Exploratory analysis, POC/pilot, risk modeling
- Human behavior with engineering/environmental features
- Evidence-based and innovative strategies
- Leverage support/funding to conduct research

RTSSC Emphasis Areas

- Road Departure
- Speed
- Alcohol and/or Drug Related
- Unbelted Vehicle Occupants
- Speeding/Aggressive Driving
- Young/Aging Drivers
- Tribal Nation Traffic Safety Support

VISION ZERO
Zero fatalities. Zero excuses.

...Local Roads!



RTSSC Team & Projects

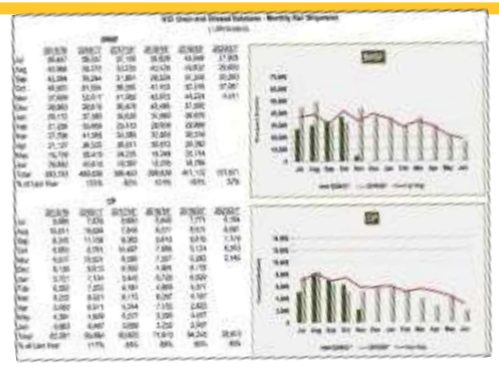
- Assessment
  - Observed & Self-Reported Surveys
  - Impaired Driving Investigations
  - High-Risk Driver Groups
- Research
  - Novice Drivers, Recidivism Risk, Lane/Road Departure
  - Empirical Studies, Systemic Safety Analysis, Local/Rural Road Safety
- Education/Outreach
  - VZ Partner Conference/Coordinators
  - ATSIP, TRB, Lifesavers

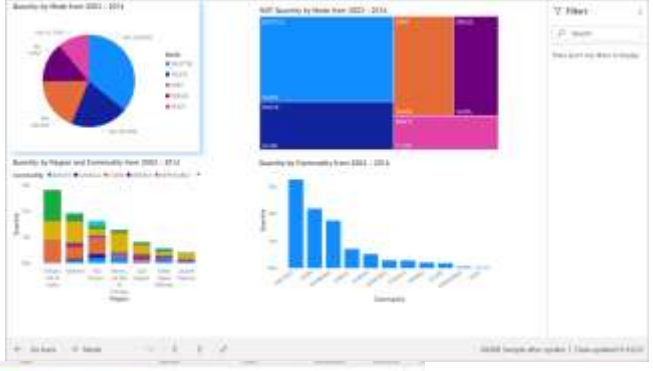
Photo Facebook, Traffic Safety

Questions/Comments

Agricultural Activities

- ND Ag Producer Support in Transport/Logistics
  - ND Grain Movement Database
  - Annual Elevator Transportation Survey
  - Rail Service/Market Information
  - Ag Market Developments and Trends
  - Traditional Publications & Beta Dashboard
- USDA (AI/Del)
  - Basis Map
  - Rail grain activity and premiums
  - Containerized Grain Investigation
  - Quarterly grain truck market survey





ND Freight Transportation Information Center

- North Dakota's Current Transportation Supply and Expectations for the Future Demand: Competitiveness, Agility, Responsiveness
- Subject Matter Expert Panel Formation/Periodic Discussions
- Current Freight Transportation Information Inventory
- Key National Freight Information Source Portfolio
- Freight Transport Knowledge Gaps
- Industry Freight Transport Information Priorities

Questions / Comments?

Kimberly Vachal
Kimberly.vachal@ndsu.edu, 701-231-6425

Thank you!

Commercial Vehicle Safety Center Highlights and Activities

Brenda Lantz

Program Director

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Commercial Vehicle Safety Center

- Established fall 2017 through a Federal Motor Carrier Safety Administration (FMCSA) grant
- The 2017-2019 grant - **Commercial Driver's License** (CDL) focus
- The 2019-2021 grant - **data quality** focus
- The 2021-2023 grant - focus on **work zone safety & distracted driving**
- Current grant - focus on **technologies and tools** to promote safe driving behaviors and to identify high-risk corridors

Commercial Vehicle Safety Center

- Goal is to improve CMV Safety and CDL Compliance through University Partnerships
  - www.ugpti.org/outreach/cvsc/
  - Commercial Vehicle Safety Summits and technical assistance
- Point of contact for universities, law enforcement, and driver licensing agencies to establish partnerships
- Provide resources and host webinars
  - The What and Why of Distracted Driving – June 2023
  - NTSB Commercial Vehicle Crash Investigations: Findings and Recommendations – August 2023
  - The Mountain Rules: Colorado's Safety Communication Efforts with the Trucking Industry – September 2023

Research Projects – Recently Completed

- Investigating the Safety of CMV Operation by Deaf and Hard of Hearing Drivers
  - With toXcel, ATRI, and SMEs in ASL linguistics and audiology
- Automated CMV Inspection Demonstrations and Evaluations
  - With toXcel, eScience Technology & Solutions, JFL Solutions, QS-2, ATRI, and PrePass Safety Alliance

Research Projects – In Progress

- Effectiveness of Third-Party Testing and Minimum Standards for CDL Knowledge and Skills Tests
  - With toXcel and eScience Technology & Solutions (eSTS)
- National CDL Program Assessment
  - With UC, UCLA, and eSTS
- CMV Driving with Limb Loss or Impairment
  - With toXcel, ATRI, and the Association for Driver Rehabilitation Specialists
- CDL Specific Training for Clerks of Courts
  - With UC, eSTS, and the National Center for State Courts (NCSC)

Questions / Comments?

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Thank you!

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