2023 - 2024
ANNUAL REPORT

National Institute for Advanced Transportation Technology
University of Idaho

MISSION

To develop engineering solutions (knowledge and technology) for transportation problems in the state of Idaho, the Pacific Northwest, and the United States while preparing our students to be leaders in the design, deployment, and operation of our nation's complex transportation systems.

VISION

To be one of the premier transportation research and education institutes in the United States with a focus on complex rural and urban transportation solutions that address the safe and sustainable movement of people and goods.

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DIRECTOR'S MESSAGE

NIATT has made great strides over the past year to continue serving and supporting our faculty at the University of Idaho, offer learning and growth opportunities for our graduate and undergraduate students, and conduct cutting-edge research that will benefit the people in the state of Idaho, the greater Pacific Northwest region, and beyond.

Two specific efforts were initiated and completed this year that focused on streamlining the very foundation of NIATT. First, the mission and vision statements were reviewed and updated. While the mission statement was determined to be on point and was retained, the vision statement was overhauled. The four-paragraph soliloquy has now been replaced with a targeted message emphasizing NIATT's specific plans moving forward. The updated mission and vision statements are found on the second page of this annual report.

Second, the NIATT advisory board was reshaped over the course of the last year, and the number of board members was reduced from 17 to 10. While it was difficult to part with long-standing practitioners and academicians who have contributed to and have been invaluable supporters for many years, NIATT recognized that a smaller board offers an opportunity to be more efficient in strategic matters. The introduction of a Board Chair and Vice Chair were also established, and those positions were filled after a nominating and voting process by the remaining board members.

In terms of research activities, NIATT continues to build on its decades-long partnership with consortium universities as part of the USDOT's University Transportation Centers Program. The past 12 months represented the first year of a new five year cycle, with researchers seeking to "develop human-centered and transformative multimodal mobility solutions for an equitable Pacific Northwest". The initial set of multi-institutional and single institution projects as part of this effort is listed in the Active Projects section of this report.

Your involvement with and interest in NIATT are valued. Thank you for your continued support.

With appreciation,

Kevin Chang, Ph.D., P.E.
Director, NIATT

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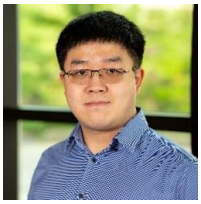

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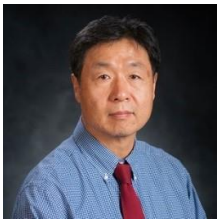

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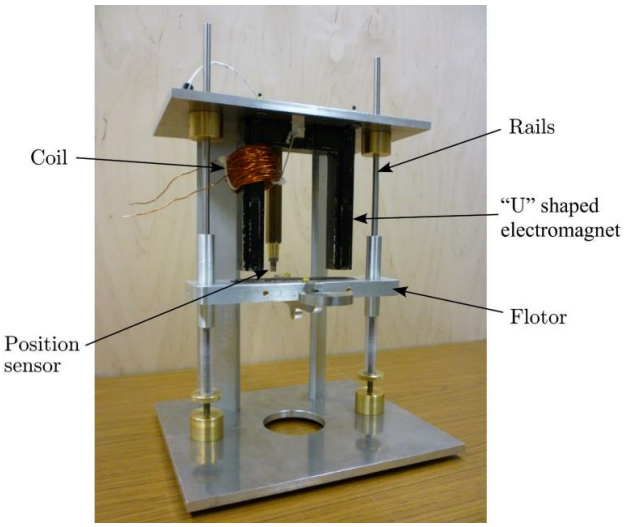
FEATURED RESEARCH

Advanced Energy Storage System for Electric Vehicle Charging Stations for Rural Communities in the Pacific Northwest

PI: Hess

Funding Source: PacTrans (USDOT)



SINGLE-AXIS ACTIVE-MAGNETIC-BEARING ACADEMIC TEST FIXTURE

As electric vehicles (EV) become more available, a pervasive and dependable charging network must be built. The electric power grid serves many remote places, but EV charging stations are not widespread and electric distribution is not always reliable in rural areas. This project builds on a previous NASA investigation that created the FRRM (field regulated reluctance machine) as an energy storage device on the surface of the moon. At NASA Technology Readiness Level (TRL) 2 (concept formulation, simulation of basic properties and algorithms, and elementary experimental investigation of underlying science), the data-driven solution appears promising. This FRRM forms the basis of exceptionally energy efficient storage in support of remote EV charging in an effective and reliable manner. The FRRM's rotor itself is the rotating energy-storing mass, making for a compact bidirectional machine. Using advanced power electronic converter technology, energy was stored and recovered using the FRRM's unique topology.

This research establishes the feasibility of the Active Magnetic Bearing control software and development of hardware for a Flywheel Energy Storage System (FESS) by addressing sensor and actuator subsystems, appropriate modeling, construction of the physical hardware, and reliability of storing energy in remote locations. To prove that the concept of an active magnetic bearing can be implemented, a single-axis active-magnetic-bearing academic test fixture was used to test the sensor and actuator subsystems. The appropriate modeling is proven effective, reliable, and fast enough to accomplish the physical hardware support for the selected machine topology. Construction of the physical hardware shows that the concept of a shaftless flywheel is feasible, even with an expansion to four axes, so six axes will be realized with a strong likelihood of success.

For more info, go to [depts.washington.edu/pactrans/research/].

Analysis of Asphalt Mixtures Using Alternate Aggregate in SMA and Superpave
PI: Kassem
Funding Source: Missouri DOT and Missouri S&T

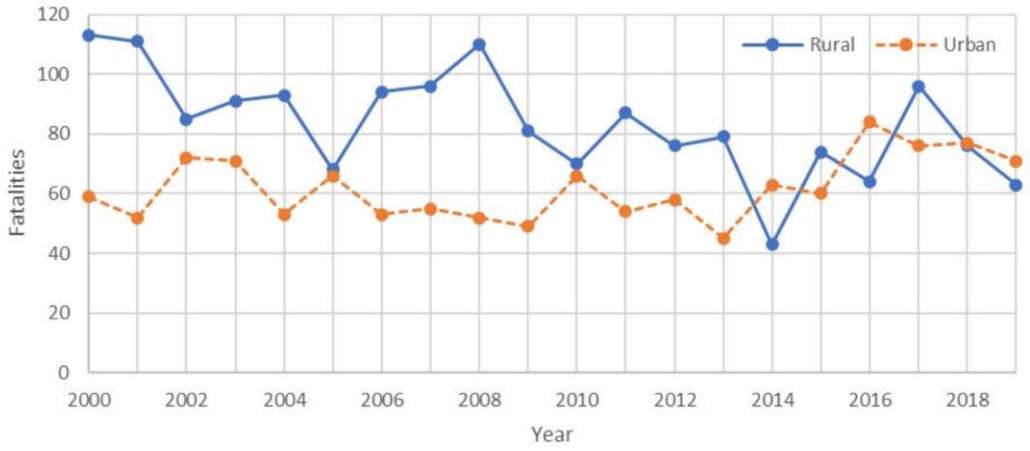
SAMPLED CANDIDATE AGGREGATES:
(a) TRAPROCK, (b) STEEL SLAG, (c) GRAVEL, (d) CHAT, (e) LIMESTONE, AND (f) DOLOMITE

The purpose of this research was to identify locally available, cost-effective, and durable crushed coarse aggregates for Stone Matrix Asphalt (SMA) and high-level Hot Mix Asphalt (HMA) mixes, and multiple well-distributed aggregates were evaluated in this study as candidate aggregates, including traprock (control), chat, gravels, steel slag, limestone, and dolomite. Aggregate screening and durability evaluations were conducted to eliminate unqualified candidates. Subsequently, SMA and HMA mixtures were designed with qualified candidate aggregates following AASHTO R 46 and R 35, respectively. Performance verification included Hamburg Wheel Tracker rutting test (HWTT) and IDEAL-CT cracking test to finalize the mix designs, and balanced mix design methods (BMD) were used to complete the designs if the volumetric optimum designs failed to meet the performance requirements.

The testing results showed that while the SMA and HMA mixes with traprock and gravel could satisfy both volumetric and performance thresholds. SMA and HMA mixes with blended aggregates (i.e., limestone and chat, and dolomite and chat) passed volumetric limits as well. For SMA and HMA mixtures with steel slag, the binder contents from the volumetric designs had to be increased to meet the cracking resistance requirements. Additional performance tests including fatigue and rutting on the Asphalt Mixture Performance Tester (AMPT), low-temperature Indirect Tensile (IDT) tests, and the Accelerated Friction Tests (AFT) were conducted to fully evaluate the mixtures' performance and durability. Analyses on both the material and pavement structural levels were performed, and cost-effective analysis for projects with mixtures using different aggregates were also used in this study. The results indicated that mixes with alternative aggregates performed comparably to those with control aggregates.

For more info, go to [rosap.ntl.bts.gov/view/dot/77703].

Assessing the Relative Risks of School Travel in Rural Communities
PI: Chang
Funding Source: CSET (USDOT)



ANNUAL NUMBER OF SCHOOL TRANSPORTATION-RELATED FATALITIES

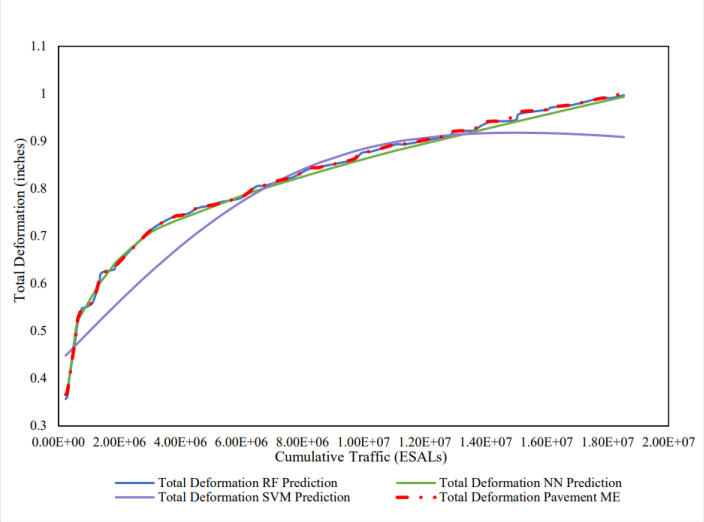
This study examined school travel safety and risk and explored the potential differences between conditions that are present today with those that existed nearly two decades ago, when the Transportation Research Board published its landmark study on school travel safety. For this study, thirty transportation professionals were interviewed and a twenty-year crash data set from the Fatality Analysis Reporting System (FARS) was analyzed.

The responses from the interviews were separated into ten common themes. The three most mentioned themes were education programs, concerns of roadway environments, and school bus safety. Based on the responses, concerns about the roadway environment, poor driver behavior, and the role of parents on mode choice have not changed in the last twenty years; however, safety education programs, vehicle centric travel, community planning, and pick up/drop off safety have evolved over time.

With regard to the FARS data set, which was used as a benchmark to assess school transportation safety, the overall trends indicate that the trip to and from school remains a relatively safe activity, particularly along rural facilities where positive results were identified across four key metrics. Along urban facilities, slightly increasing trends were observed in the annual number of fatalities and in the number of non-motorists involved in a fatal crash, suggesting that opportunities remain to enhance and to improve the travel environment for school children.

For more info, go to [cset.uaf.edu/research/].

Efficient and Data-Driven Pavement Management System Using Artificial Intelligence
PI: Kassem
Funding Source: PacTrans (USDOT)



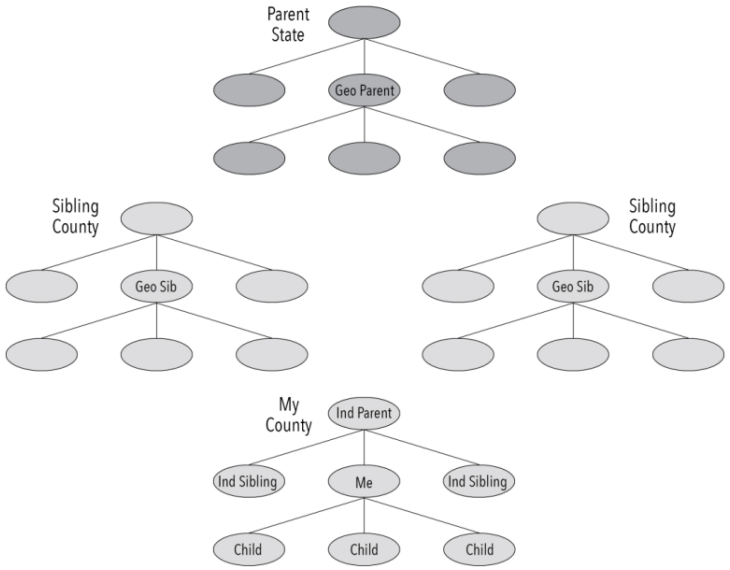
COMPARING TOTAL DEFORMATION PERFORMANCE DECAY CURVES USING VARIOUS AI METHODS

The performance of asphalt pavements decreases with time because of traffic loading and environmental conditions. Performance decay models are needed in pavement management systems to program pavement preservation and rehabilitation treatments to extend the service life and improve the performance of flexible pavements. Many factors affect pavement performance, including the material properties and thickness of each layer, applied traffic, and environmental conditions. Performance models, including those for rutting, cracking, roughness, are often developed and used to forecast the future conditions of pavements. To develop reliable performance models, numerous variables are needed in such models, and historical performance data are required. This study aimed to develop artificial intelligence models to predict pavement performance indicators using material properties, layer thickness, and traffic data.

Through investigating several artificial intelligence models, random forest regression models had the highest correlation between predicted and theoretical performance measures, and the predictions produced the most accurate performance decay curves out of all tested models. The proposed models can be used to forecast the future conditions of pavements at the network level. The models developed using the field dataset were able to achieve strong correlations between the predicted and measured performance indicators for some of the indicators. The models developed to predict IRI (international roughness index), total deformation (rutting), fatigue cracking, transverse cracking, non-wheel path longitudinal cracking, and wheel path longitudinal cracking had respective r-squared values of 0.81, 0.68, 0.58, 0.69, 0.54, and 0.48. Additional field pavement sections can be added to the dataset in order to increase the accuracy and further validate the models.

For more info, go to [depts.washington.edu/pactrans/research/].

Estimating County to County Transportation and Trade Flow
PI: Lowry
Funding Source: PacTrans (USDOT)



ENTITY RELATIONSHIP DIAGRAM FOR THE
NORTH AMERICAN INDUSTRIAL CLASSIFICATION SYSTEM (NAICS)

The goal of this research project was to develop a trade model to estimate foreign and domestic county-to-county and county-to-port commodity shipments and build on previous research conducted by the PIs which has estimated commodity supply and commodity demand for each county in the United States using numerous government datasets. This research used that framework to develop a doubly constrained gravity model that estimated both where the supply of each county's commodity output was consumed and where the place of origin for the commodities demanded in each county. Once the regionally specific input-output accounts were populated a trade model was applied to estimate the geographic source of those commodity inputs. Deriving multiregional social accounts required complete estimation of inter-regional foreign and domestic commodity shipments. It is important to understand the mobility of goods across counties and to ports to better understand how shocks to supply chains will disrupt regional economies. This research also enabled a better understanding of regional economic resilience in relation to supply chains and the movement of goods.

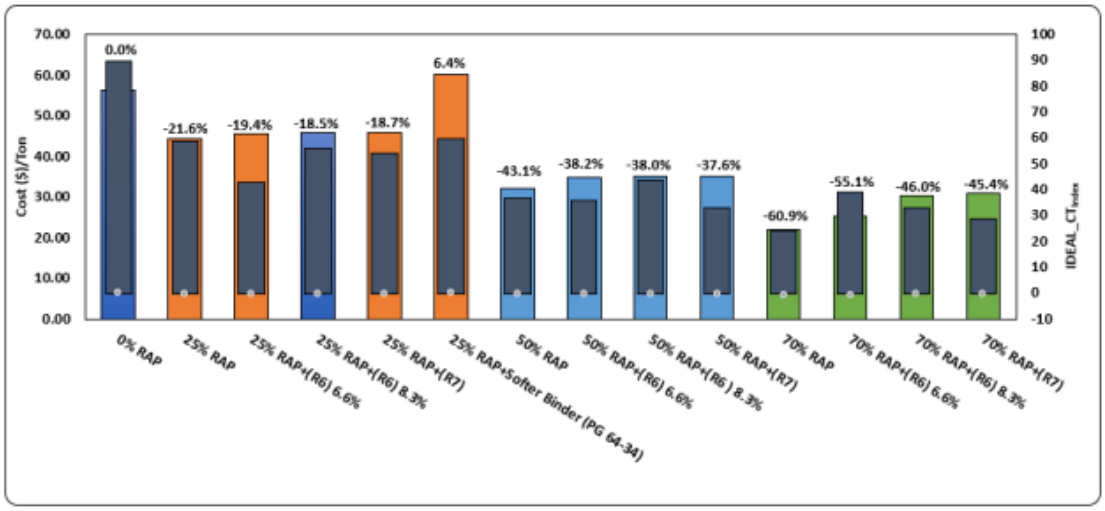
This project developed a gravity model which was made using Python code that runs on a University of Idaho network computer in 3.3 seconds per commodity per year. The model can successfully distribute commodities across the 3,142 counties of the United States. It was determined that creating algorithms is to overcome data suppression is likely the most effective solution within a federal data system that must maintain the confidentiality of employers' operational information.

For more info, go to [depts.washington.edu/pactrans/research/].

Implementation of Balanced Asphalt Mix Design of Asphalt Mixtures Prepared with Reclaimed Asphalt Pavements and Rejuvenators for Enhanced Performance

PI: Kassem

Funding Source: ITD



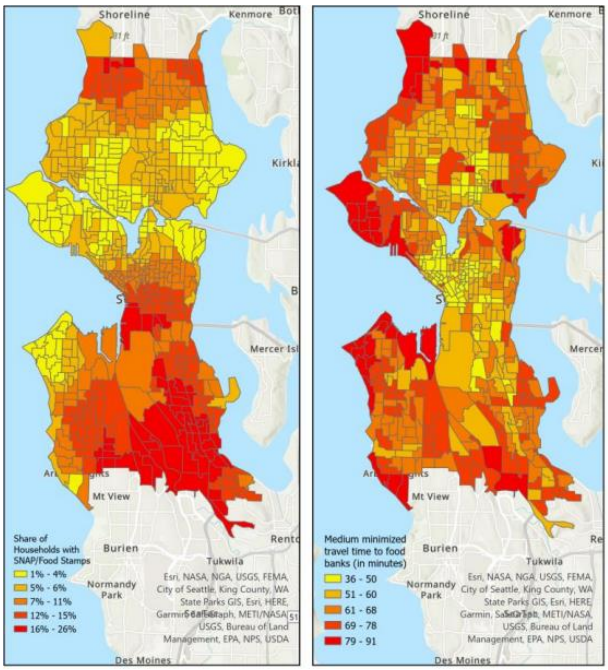
COST COMPARISON OF MIXTURES WITH RAP NO.4 AND REJUVENATORS

The use of Reclaimed Asphalt Pavement (RAP) promotes and integrates sustainable solutions into civil engineering practices; however, many transportation agencies limit the RAP content to a small percentage despite the environmental benefits and cost savings. Incorporating RAP into asphalt mixtures may result in stiffer mixtures, especially at a higher RAP content, that could be prone to premature cracking. Virgin binder grade adjusting is typically followed to account for the stiffening effect of RAP which may require the use of softer binders. This study examined the use of rejuvenators to improve the performance of asphalt mixtures, with different RAP contents, through a balanced mix design approach to ensure sufficient resistance to cracking and rutting. Seven different commercially available rejuvenators were acquired and included in the testing program of this study.

The results demonstrated that the use of rejuvenators in asphalt mixtures with RAP is beneficial and could offer environmental benefits and cost savings. However, it is more cost effective to incorporate rejuvenators in asphalt mixtures at high RAP content (e.g., 50 or 70 percent). The cracking performance of mixtures with certain rejuvenators and high RAP content could be comparable to that of the virgin mixture with additional cost savings. The use of tall oil and waste vegetable oil were found effective in improving the cracking resistance and providing cost savings compared to other rejuvenators. The results of this study clearly demonstrated the importance of implementing a balanced mix design approach to optimize the design of asphalt mixtures prepared with RAP and rejuvenators to provide adequate performance in terms of cracking and rutting resistance. The balanced mix design should be supplemented by conducting cost analysis to compare different alternatives that provide acceptable performance. Furthermore, this study evaluated the cracking and rutting performance of 23 different asphalt mixtures produced and used in Idaho. The results demonstrated that these mixtures are expected to exhibit good cracking and rutting performance.

For more info, go to [itd.idaho.gov/alt-programs/]

Integrating Foot Access with Public Transit Service where there are Food Deserts
PI: Liao
Funding Source: PacTrans (USDOT)



MAPS OF FOOD INSECURITY (LEFT) AND TRANSIT ACCESS TO FOOD BANKS (RIGHT)

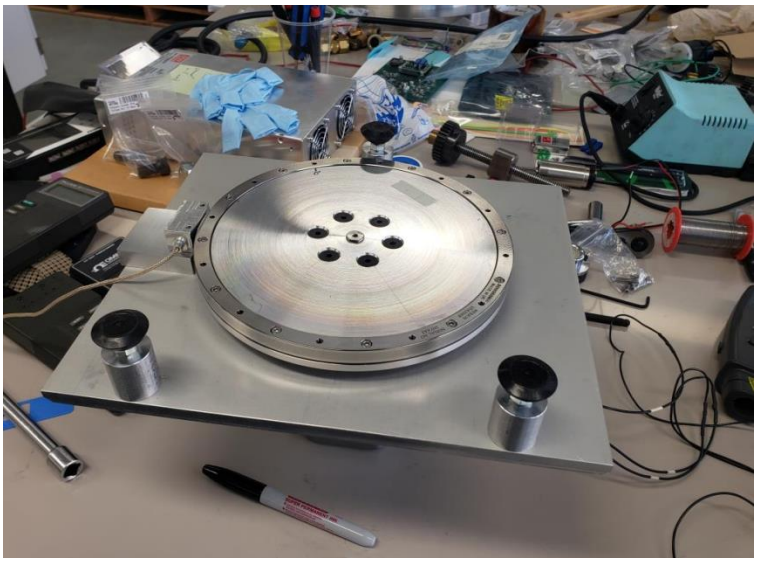
This study examined how public transportation can help improve access to emergency food resources and lower the risk of food insecurity in American cities, or food deserts, which are defined by the U.S. Department of Agriculture (USDA) as “urban neighborhoods and rural towns without ready access to fresh, healthy, and affordable food.”

For a case study of Seattle, Washington, the General Transit Feed Specification (GTFS) was used to measure the accessibility of food banks and food pantries at the census block group level. It was found that approximately 40 percent of neighborhoods in the city of Seattle were within walkable distances, or half a mile, of the nearest food bank or pantry. Transit access to the citywide food pantry network was unevenly distributed in that some neighborhoods associated with larger numbers of food insecure populations were simultaneously those with poor accessibility to emergency food resources. These neighborhoods were primarily located in South Seattle and near the city’s northern edge. The results of regression models further indicate that convenient access to food banks or food pantries remains important for vulnerable communities.

The proposed solution to decrease food insecure populations is to implement on-demand transit services or additional mobile food pantries to help bring free food to vulnerable communities, especially when regular public transit services are constrained by catastrophic circumstances such as the onset of the COVID-19 pandemic.

For more info, go to [depts.washington.edu/pactrans/research/].

Interfacing Major Subsistence for Resilient Electric Charging Facilities for Rural Areas
PI: Hess
Funding Source: PacTrans (USDOT)



FINAL ASSEMBLY OF ROTARY ENCODER TEST FIXTURE

Major subsystems for a standalone vehicle charging station for remote locations were developed. These address major elements of such a complex system including energy capture, energy storage, and energy dispensing. Photovoltaic panels capture the energy. A field regulated reluctance machine (FRRM) stores the energy and makes it available for a vehicle battery. A secure cyber physical control system arranges for dispensing the energy to an electric vehicle, providing billing and reliable, secure delivery. Each of these pieces is either complete or nearing successful development.

An interface based on power electronics to assemble the pieces into a functional vehicle battery charging unit for remote, off-grid locations typical of much of the rural Pacific Northwest is now necessary. In this project, the research team proposed to do this deceptively difficult task of interfacing this larger interconnected system. Beginning with working prototypes of each subsystem, the team built the interface electronics and software, coordinated communications and controls, and debugged the combined result.

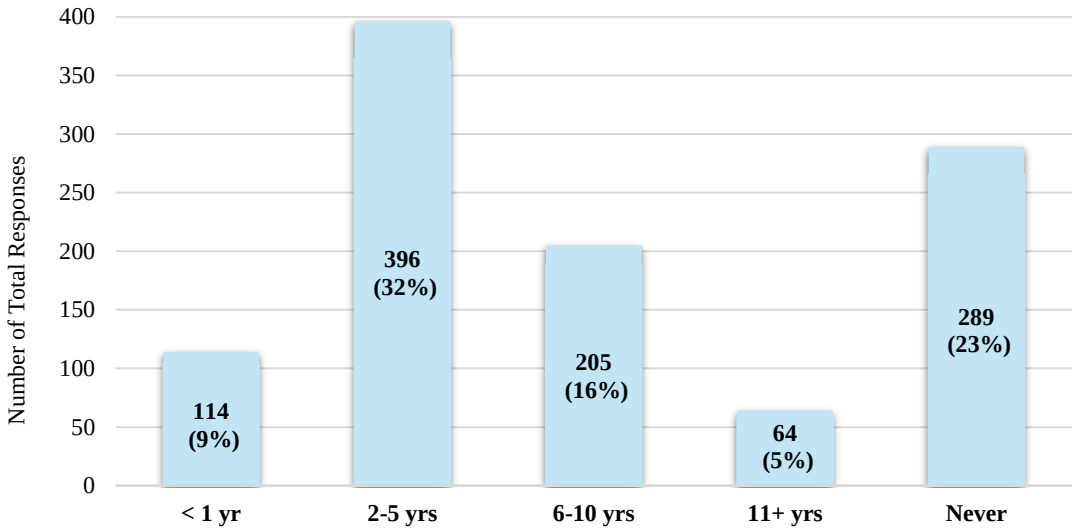
Solar panels facilitate capture of energy, and electronics were programmed to manage the energy as it moves from solar panels to a storage medium. Managing energy storage was the greatest advance in this project, and the research team succeeded in developing control programs to manage this energy safely and efficiently. Sensing for four of our machine's six axes was completed. The research team proved the sensor for position works to specification, and programming was developed within the Speedgoat architecture to control the machine's energy storage and its addition/distribution of energy. Our Speedgoat energy management framework was programmed to dispense energy on control. Simulations showed positive results. We can manage the in and out of energy on our system.

For more info, go to [depts.washington.edu/pactrans/research/].

Perception of Autonomous Driving in Rural Communities

PI: Chang

Funding Source: CSET (USDOT)



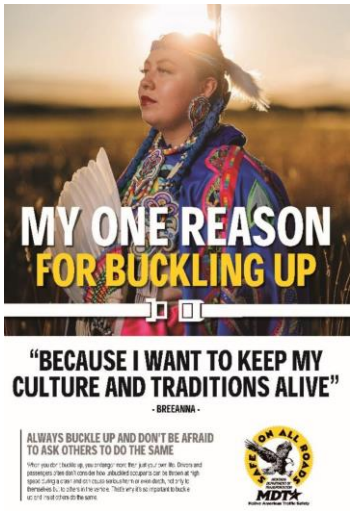
RESPONDENT TIMELINE TO PURCHASE AN AUTONOMOUS VEHICLE

Autonomous, or self-driving, vehicles have the capability to either fully or partially replace a human driver. To better understand how receptive society will be to these types of vehicles, this study focused on the perceived level of trust in autonomous vehicles (AVs) by domestic drivers. An online survey that examined the behavioral and value-based perspectives of drivers was developed and distributed to respondents across the United States, and a total of 1,247 valid responses were collected and analyzed.

Based on the results, rural (and non-rural) respondents had similar levels of trust when comparing self-driving vehicles with human-driven vehicles, though older people and those with less education tended to have less trust in self-driving vehicles. One outcome measured the general timeline of autonomous vehicle adoption. While 41% answered that they would adopt within five years, 16% identified an adoption window of between 6 and 10 years. Nearly 23% would never adopt, and another 14% were unsure. In terms of the trust placed by the public in self-driving vehicles, the percentages between rural and nonrural respondents were very similar. For example, 12% of respondents that identified as non-rural strongly agreed with the statement, whereas 13% of rural respondents strongly agreed. The outcomes from this study can be used to support targeted outreach efforts for those drivers who remain skeptical about the overall safety benefits of this evolving transportation technology area. Older drivers are a demographic that should be the focus of more educational outreach to increase comfort levels and outlook. Regarding the overall adoption of self-driving vehicles, rural driver wariness seemed to be comparable to that of non-rural drivers.

For more info, go to [cset.uaf.edu/research/].

Promoting Positive Traffic Safety Culture in RITI Communities through Active Engagement: Barriers and Opportunities
PI: Abdel-Rahim
Funding Source: CSET (USDOT)



SAFE ON ALL ROADS CAMPAIGN (MONTANA DOT)

Specific strategies to reduce motor vehicle crash-related injuries and deaths have been well-documented nationally. Safety-focused educational programs and general awareness campaigns with regard to increased use of occupant restraints, higher visibility traffic enforcement, and stronger laws to address impaired driving have all contributed to reduction in crashes in urban areas. However, in rural communities, where, on average, 30 percent of fatalities occurred due to speeding-related crashes, and 45 percent of all fatalities were related to either impairment and/or distraction and where it is common for children under the age of 16 to drive automobiles in addition to other non-traditional modes of transportation, much more work is still needed. It is incredibly important that RITI (rural, isolated, tribal, and indigenous) communities are provided the proper resources and methods to deliver the appropriate training and educational tools that promote and cause a significant positive change in the traffic safety culture in these communities. The primary goal of the work proposed in this project is to promote and strengthen a positive traffic safety culture among RITI communities in Idaho through active engagement activities. We aim to achieve the following two objectives: document lessons learned from previous active community engagement activities in tribal and rural communities that attempted to promote and positively impact the traffic safety culture in these communities, and develop guidelines for best practices to promote and positively impact the traffic safety culture in RITI communities highlighting both opportunities and barriers.

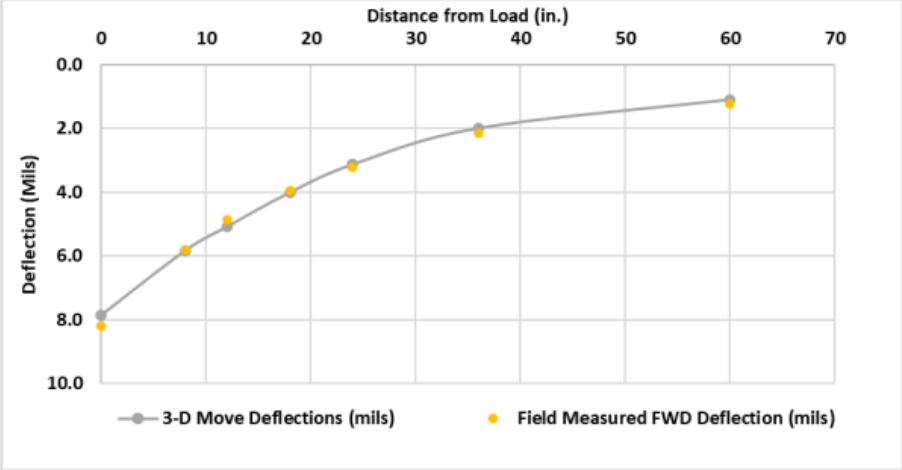
Through reviewed literature and interviews with tribal community stakeholders, this research team came to understand that tribal youth are most impacted and engaged when educational material is made culturally relevant. We then developed an implementation guide to be used by tribes to create, develop, and enact a sustained educational program with the mission to positively impact traffic safety culture among youth in tribal and rural communities.

For more info, go to [cset.uaf.edu/research/].

Simplified Analysis Methods of Traffic Speed Deflectometer (TSD) and Falling Weight Deflector (FWD) Data for Effective Pavement Preservation Programs

PI: Kassem

Funding Source: ITD



COMPARISON BETWEEN PREDICTED AND MEASURED DEFLECTION BASIN: SECTION D-3 SH-55 2020

Pavement evaluation is critical for determining proper and cost-effective surface treatments and allocation of limited funds and resources to maintain, rehabilitate and reconstruct flexible pavements. This study examined two nondestructive testing devices that are used to evaluate the structural capacity and integrity of highway pavements including the Falling Weight Deflectometer (FWD) and Traffic Speed deflectometer (TSD). The researchers conducted a theoretical parametric study to simulate the FWD and TSD loading and predict pavement performance. In addition, they examined and analyzed FWD and TSD deflection data from various test sections in Idaho. Furthermore, they explored the use of Artificial Intelligence (AI) to predict pavement performance and layers' moduli using the FWD and TSD deflection measurements.

The results demonstrated that there was a good correlation between pavement mechanical responses (e.g., vertical compressive strain at top of subgrade and tensile strain at the bottom of asphalt layer) and FWD and TSD deflection parameters. Furthermore, the predicted pavement distresses had a good correlation with the deflection basin parameters. The analysis of FWD and TSD field deflection data demonstrated a strong correlation between FWD and TSD field deflections and effective structural number for the field sections. There was a good agreement between the assessment of pavement conditions using FWD and TSD for most of field sections. The AI was found to be a powerful technique to model pavement performance and response.

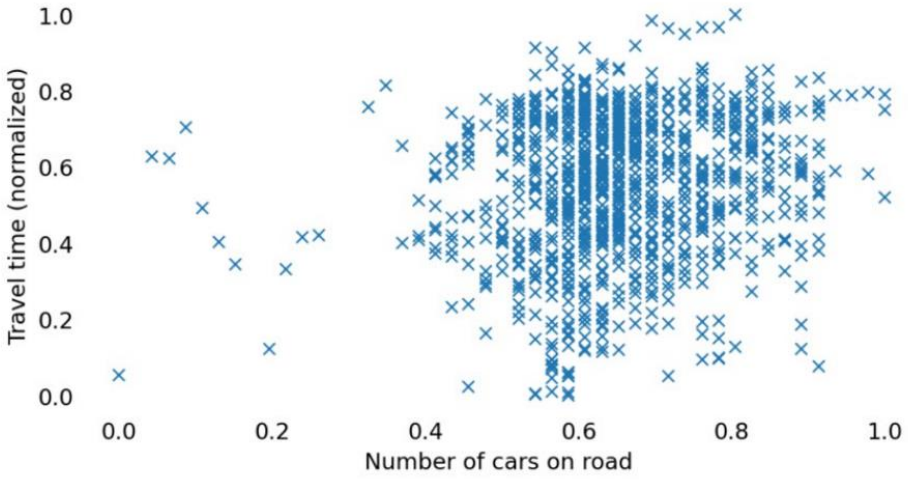
Based on the comprehensive analysis conducted in this study, the TSD can be effectively used at the network level to identify hot spots or sections with potential structural deficiency for further FWD analysis at the project level. This can optimize the time and resources of employing the FWD crew and reduce traffic interruption and improve the safety of FWD crew and motorists.

For more info, go to [itd.idaho.gov/alt-programs/]

Using Machine Learning to Customize Traffic Prediction for High Performance Traffic Analysis and Optimization

PI: Heckendorn

Funding Source: PacTrans (USDOT)



NORMALIZED TRAVEL TIME VERSUS NUMBER OF CARS ON THE ROAD

Traffic signal control of the future will adapt in real time to traffic, driving, and environmental conditions. The adaptations will require real-time optimization based on traffic monitoring. However, for optimization to work, it must be able to predict what traffic will do in response to changes in signal timing. Furthermore, it must do this prediction very efficiently, in a short time horizon, so that the optimization process can evaluate many alternative signal timing parameters. Instead of using a "one size fits all" legacy function for prediction of traffic flow, this project took steps to pioneer the use of machine learning techniques to learn how traffic behaves on particular segments of streets in response to traffic and driving conditions and used that learning to build a high-speed simulator to predict the arrival times of cars at intersections.

This project proposed a mesoscopic simulator which is used as a predictor for each road segment. The predictor of a road segment predicts the travel time distribution for the particular traffic conditions. The mesoscopic simulator selects a random sample of the predicted distribution as travel time. We compared the performance of our simulator with VISSIM which stands in for real time traffic data. The distributions showed that the travel time predicted by the simulator is similar to that of the VISSIM and the simulator runs 10.02 to 21.45 times faster than VISSIM, proving that the developed model should provide system operators with reliable and effective mesoscopic simulation model showing the operations of complex transportation networks with mixed use traffic allowing them to assess the expected benefits of alternative network control.

For more info, go to [depts.washington.edu/pactrans/research/].

WORTH SHARING

6th Annual Michael Kyte Distinguished Lecture
October 2023

Dr. Karl Smith, Emeritus Cooperative Learning Professor, Purdue University, and Emeritus Professor, University of Minnesota, was selected as the 6th Annual Michael Kyte Distinguished Lecture Series speaker. His presentation was titled, “The Meaning of Engineering Education.”

This annual event honors University of Idaho Emeritus Professor of Civil Engineering Michael Kyte by acknowledging his professional accomplishments in the field of transportation engineering and his almost three decades of service as a highly respected and popular faculty member.

Idaho Asphalt Conference
October 2023

The 63th Idaho Asphalt Conference was held in October under the leadership of Associate Professor Emad Kassem. This event is supported by the University of Idaho, the Idaho Transportation Department, and the Asphalt Institute. The conference addresses issues related to asphalt pavements that are of concern to local and state governments as well as consulting engineering firms.

Logan Prescott Named CSET Student of the Year
January 2024

Logan Prescott, an MSCE student, was recognized by the Center for Safety Equity in Transportation (CSET) as its Outstanding Student of the Year. CSET is a Tier 1 University Transportation Center (UTC), and outstanding students from participating UTCs are honored by the USDOT each year for their achievements and promise for future contributions to the transportation field at the annual Council of University Transportation Centers (CUTC) awards banquet in Washington, DC.

Logan began his professional career with Kimley-Horn as a Civil Analyst in September 2024.

University of Idaho Clean Snowmobile Team
February 2024

The University of Idaho's Clean Snowmobile Challenge Team took fourth place overall at the 2024 Society of Automotive Engineers (SAE) Clean Snowmobile Challenge. The interdisciplinary team competed against teams from across the U.S. and Canada in the weeklong challenge to produce innovative solutions to make a cleaner, quieter, and more efficient snowmobile practical for manufacturers and enthusiasts alike.

UI has been participating in this event since 2001, and NIATT has been proud to support this team and its effort for many years. The faculty advisor for the Clean Snowmobile Team is Professor Kamal Kumar.

Kassem Receives Mid-Career Faculty Award
May 2024

Associate Professor Emad Kassem received the UI College of Engineering's Mid-Career Faculty Award which recognized his outstanding teaching, research, and service by the College of Engineering. Kassem joined the faculty in August 2015, and his area of research is materials and pavements engineering and focuses on characterization of pavement materials, tire-pavement interaction, microstructure analysis of composite materials, non-destructive evaluation of pavements, multifunctional materials, and analytical and computational modeling of infrastructure materials.

University of Idaho Featured at NATMEC
June 2024

The biennial National Travel Monitoring Exposition and Conference (NaTMEC) provides travel monitoring professionals and transportation data users with opportunities to network, exchange ideas, and learn about the very latest in policy, technology and equipment.

The 2024 conference was held in Boise, ID, and the University of Idaho sent a large faculty and student delegation to the event to present their research and to participate in conference events.

Chang Receives ITE Mountain District Outstanding Educator Award
June 2024

NIATT Director and Associate Professor Kevin Chang received the Institute of Transportation Engineer's Mountain District Outstanding Educator Award in 2024. This award recognizes an educator who has shown great creativity in teaching, taken exceptional measures to spark student interest in the transportation profession, provided unwavering encouragement for student endeavors, or shown unequaled service to ITE in the past year.

Chang teaches a number of undergraduate and graduate transportation courses, along with the College of Engineering's First Year Engineering course. This is the second time that he has received a district-level Outstanding Educator Award from ITE.

ITE Student Chapter Competes in ITE Mountain District Traffic Bowl
June 2024

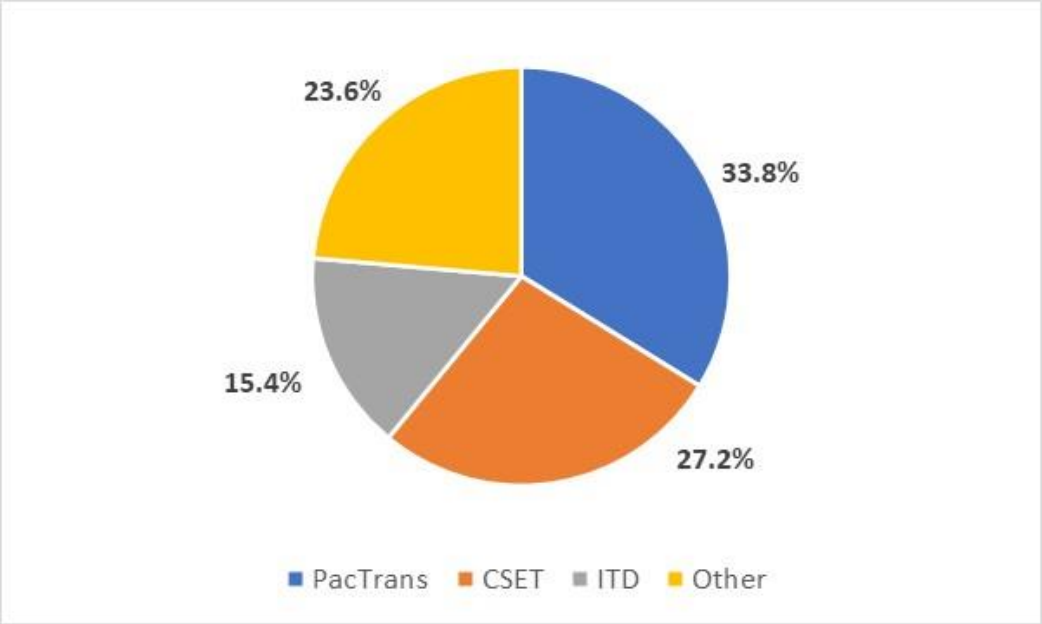
The ITE Student Chapter team participated in the Mountain District Traffic Bowl competition in Big Sky, MT this summer. The University of Idaho was represented by an all-undergraduate team comprised of Shrawan Basnet, Arturo Beighler, and Saujan Jamkatel.

The Traffic Bowl competition is like Jeopardy, but all of the questions are transportation-related.

NIATT and the ITE Idaho Section are proud supporters of ITE student activities. Professor Kevin Chang serves as their faculty advisor.

FINANCIAL SUMMARY

The FY23 budget, as of June 30, 2024, totaled $1,224,585. A percentage breakdown, by source, is shown below.



NIATT has historically relied on funding from the USDOT's University Transportation Centers (UTC) program. This trend continues in the present day.

Specifically, PacTrans is the UTC's Region 10 Center and is led by the University of Washington. CSET (Center for Safety Equity in Transportation) is a Tier 1 UTC led by the University of Alaska-Fairbanks, and that center will sunset in 2024.

ACTIVE PROJECTS

The following list identifies all of the active NIATT projects, as of June 30, 2024.

The list is presented in alphabetical order based on project title, and includes the principal investigator(s) and funding source.

Alkali-Silica Reaction Mitigation Strategies with Specific Admixtures
Kassem
ITD

Assessment and Repair of Prestressed Bridge Girders Subjected to Over-Height Truck Impacts
Ibrahim
FHWA Pooled, Mo. S&T

Characterization of Underserved Population Perceptions and Mobility Needs in Connected-Vehicle and Smarter City Environments
Abdel-Rahim
PacTrans (USDOT)

Computer Vision for Pedestrian Traffic Monitoring
Lowry
PacTrans (USDOT)

Data Needs Analysis for Resilient Multimodal Rural Freight Corridors
Ibrahim
PacTrans (USDOT)

Developing Value-Added Additives from Pacific Northwest Agro and Forestry Residues for Climate-Smart Winter Mobility
McDonald
PacTrans (USDOT)

Development of PacTrans Workforce Development Institute
Chang
PacTrans (USDOT)

Geotechnical Asset Management for Rock Slopes and Rockfall Risk Assessment
Kassem
ITD

Impact of Falling Debris in Structural Collapse Progression
Ibrahim
NSF

Impact of the COVID-19 Pandemic on Fatal Crash Rates for RITI Communities in Idaho
Abdel-Rahim
CSET (USDOT)

Optimization of Electrified Propulsion Systems for School Bus Fleets using Scheduled (Daily) Routes Data
Abdel-Rahim
PacTrans (USDOT)

Pedestrian Safety Analysis Using Computer Vision Sensors
Lowry
CSET (USDOT)

Promoting Positive Traffic Safety Culture in RITI Communities through Active Engagement: Implementation Guide and Outreach Activities
Abdel-Rahim
CSET (USDOT)

Research and Coordination Network of CAV Testbeds for Human-Center Technologies and Equitable Mobility in the Pacific Northwest
Abdel-Rahim
PacTrans (USDOT)

School Travel Behaviors in Rural Communities
Chang
CSET (USDOT)

Understanding Human-Centered AI through Data Integration and Analytics
Abdel-Rahim
PacTrans (USDOT)

Using Computer Vision to Evaluate Bicycle and Pedestrian Improvements
Lowry
PacTrans (USDOT)

Working Towards Operationalizing Transportation Equity into the Research Process
Chang
PacTrans (USDOT)

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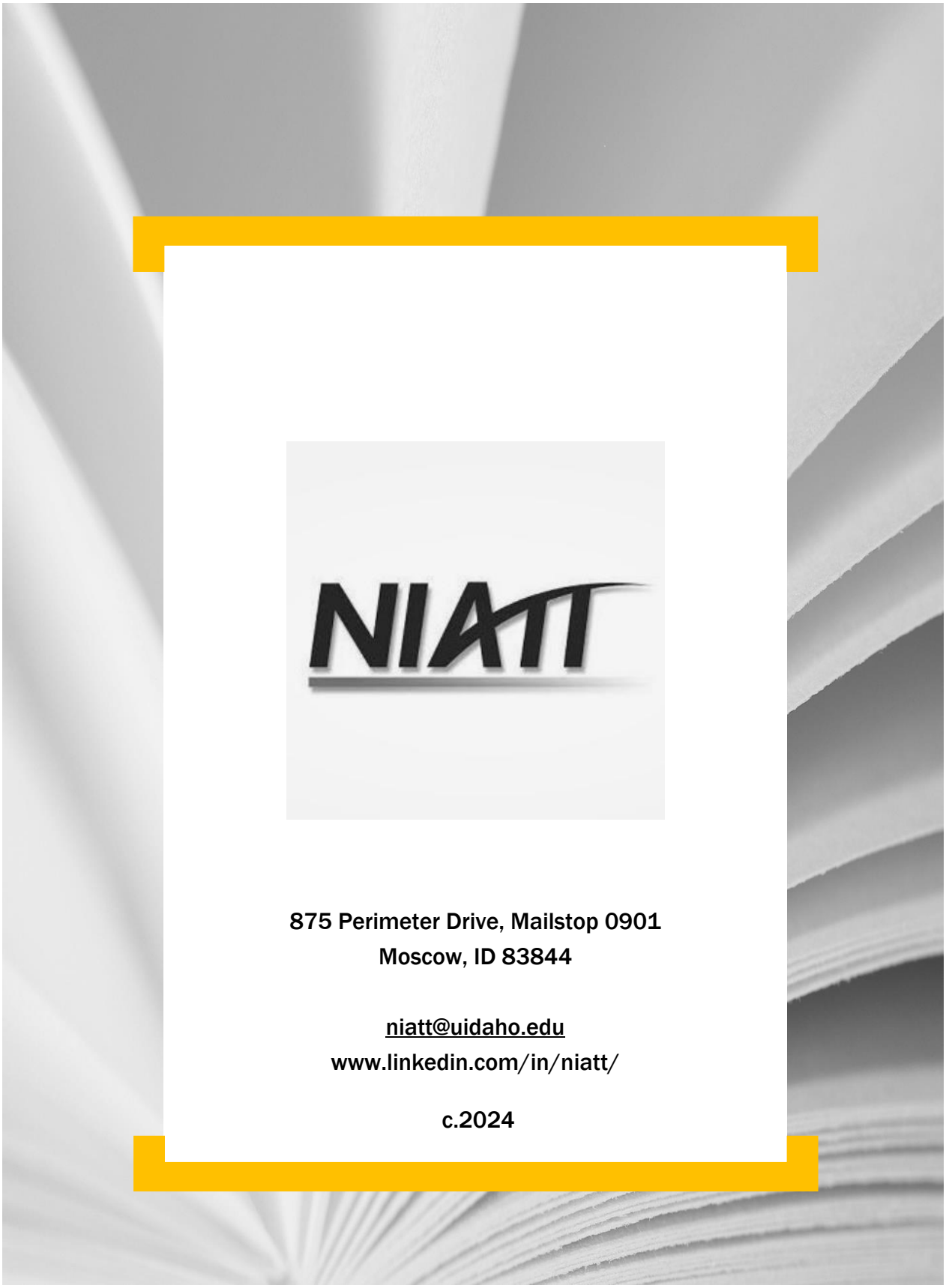

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