

Mapping the Impact of Climate Change, Social, and Economic Factors on Transportation Mobility in Rural Alaskan Communities

Recipient/Grant (Contract) Number: 69A3552348310

Center Name: Pacific Northwest Transportation Consortium (PacTrans)

Research Priority: Improving the Mobility of People and Goods

Principal Investigator(s): Osama Abaza (UAA), Matthew Calhoun (UAA)

Project Partners: NA

Research Project Funding: \$30,000 federal; \$30,000 non-federal match

Project Start and End Date: 8/16/2023 – 8/15/2025

Project Description: The unique and delicate ecosystems of Arctic and sub-Arctic regions, particularly rural Alaska, face unprecedented challenges driven by the impacts of climate change. As the effects of global warming intensify, rural Alaskan communities are experiencing rapidly shifting weather patterns, melting permafrost, coastal erosion, and increasingly severe weather events. These environmental transformations are directly influencing the region's transportation infrastructure, accessibility, and mobility, thereby posing significant threats to the well-being and sustainability of these remote settlements.

Transportation is a lifeline for rural Alaskan communities, providing essential connections to critical services, economic activities, and social interactions. However, the mounting challenges posed by climate change, social dynamics, and economic factors necessitate a comprehensive and data-driven approach to understanding their interconnected impacts on transportation mobility.

US DOT Priorities: This project aligns closely with the strategic priorities of the United States Department of Transportation (USDOT) and advances its Research, Development, and Technology (RD&T) strategic goals by addressing key challenges in transportation mobility while fostering breakthrough, advanced, and transformative research.

By comprehensively mapping the impact of climate change, social dynamics, and economic factors on transportation mobility in rural Alaskan communities, our project directly supports USDOT's priority of enhancing transportation resilience and sustainability. Through interdisciplinary research, we aim to understand the complex interactions between environmental shifts, social influences, and economic conditions, ultimately informing policy recommendations and sustainable solutions that bolster community resilience and promote a prosperous future.

Furthermore, our project engages in breakthrough, advanced, and transformative research by integrating cutting-edge methodologies, such as data-driven analysis, interdisciplinary collaboration, and community engagement. By leveraging innovative approaches, including surveys, interviews, workshops, and observational studies, we seek to uncover novel insights and develop inclusive strategies that address the unique challenges faced by rural Alaskan communities.

Mapping the Impact of Climate Change, Social, and Economic Factors on Transportation Mobility in Rural Alaskan Communities

In essence, our project not only contributes to achieving USDOT's priorities of enhancing transportation resilience and sustainability but also embodies a commitment to advancing breakthrough research methodologies and transformative solutions that have the potential to drive positive change in transportation systems nationwide.

Outputs: This research project will produce significant outputs contributing to advancements in transportation mobility and fostering new partnerships beyond the UTC consortium with the native rural community in Alaska. Through innovative methodologies and interdisciplinary collaboration, we anticipate generating new research insights into the impact of climate change, social dynamics, and economic factors on rural Alaskan communities' transportation mobility. These insights will inform the development of targeted strategies for resilience and sustainability. Additionally, valuable datasets, policy recommendations, and partnerships with stakeholders including local communities, governmental agencies, and academic institutions will be established, facilitating knowledge exchange and implementation of research findings to enhance transportation infrastructure development and climate adaptation efforts."

Outcomes/Impacts The outcomes and impacts of this research project will be far-reaching, with direct applications to the transportation system and its regulatory, legislative, and policy frameworks. By leveraging the outputs generated, including new research insights, innovative methodologies, valuable datasets, and policy recommendations, we anticipate significant changes to transportation infrastructure planning, resilience strategies, and policy development. These outputs will inform evidence-based decision-making processes, leading to improved safety, reliability, and durability of transportation systems in rural Alaskan communities. Additionally, the implementation of our research findings is expected to result in cost savings through more efficient resource allocation and reduced vulnerability to climate-induced disruptions. Furthermore, the establishment of partnerships with stakeholders will foster collaboration and knowledge exchange, enhancing the overall effectiveness and sustainability of transportation initiatives. Ultimately, our research output will positively impact the transportation system by promoting resilience, sustainability, and prosperity in remote Arctic settlements, setting a precedent for addressing similar challenges in other regions.

Final Research Report: *will be provided upon completion of the project*