

Research Project Name: Autonomous Electric Ferries (Autoferry) - Low Carbon Connectors
Recipient/Grant (Contract) Number: Florida A&M University; University of Washington Tacoma
Center Name: Rural Safe Efficient Advanced Transportation (R-SEAT) Center
Research Priority: Improving Mobility of People and Goods
Principal Investigator(s): Heather Dillon, Panick Kalambay, Mike McCourt, Jeffrey Walters, Angela Kitali
Project Partners: WAV-C - Washington Autonomous Vehicle Cluster, Maritime focus; Numurus - Company focused on Autonomous Hardware and Software https://numurus.com/ ; Future Marine Inc.
Research Project Funding: \$98,258.19 (Federal request); \$49130 (Non-Federal cost share)
Project Start and End Date: 7/1/2024 to 6/31/2025
Project Description: Island and peninsula communities in the Puget Sound are often isolated from regional cities like Seattle and Tacoma due to large transit time by road. Regional ferry systems are large and expensive to operate, limiting the number of service times and access points. Most of the ferries only operate between larger regional towns and major cities, isolating smaller communities that often lack bus services as well. Autonomous electric ferries offer a unique low-carbon option to better connect rural communities in the region. In recent years, the Washington state ferry system has struggled with staffing and maintenance of older diesel ferry systems. For example, the residents of Anderson Island and Ketron Island in the south Puget Sound region are served by one ferry that connects them to the mainland. For Ketron Island, the ferry runs only 4 times per day and was out of service completely for several days recently while the ferry was being repaired. This project will focus on addressing key technical objectives with the autonomous ferries, including (1) autonomous docking procedures, (2) optimization of possible routes for weather and tidal events, and (3) building deeper partnerships with commercialization partners. Our methods will include literature review, weather and tidal data collection, design and prototyping, and testing.
US DOT Priorities: The Autonomous Electric Ferries project, focusing on low-carbon connectors, aligns with the USDOT's RD&T goals in climate sustainability, economic strength and global competitiveness. The project will address economic strength through system reliability (travel time reliability) and connectivity, emphasizing the need to empower rural communities and expand access. It contributes to climate and sustainability goals by proposing autonomous electric foot ferries to connect isolated islands and rural communities, especially around Seattle-Tacoma, alleviating mobility constraints for people and goods.
Outputs: The overall objective of this project is to support the development of small, electric, low-carbon ferries that connect underserved communities in the Salish Sea. Supporting the development of an autonomous ferry network creates access for rural communities in the region. This year, our project team will focus on three objectives: (1) extend our analysis of possible ferry routes and docking locations to include weather and tidal data. This will build on work to map existing possible docks, (2) develop prototypes and docking procedures for autonomous operation of the ferries. Our project partners report this is a key area of need from

the research community, and (3) build deeper partnerships with regional groups and stakeholders that support the development of the autonomous ferry network.

Outcomes/Impacts: The successful implementation of this project is expected to yield the following outcomes: (1) research experiences for undergraduate research students that build skills and knowledge about transportation careers, (2) improved connectivity and accessibility for pedestrians and cyclists in low-income satellite communities on islands and peninsulas, (3) reduced transportation-related costs and improved economic opportunities for low-income residents, and (4) promotion of more sustainable transportation systems within the region.

Final Research Report: In progress