

To: Senator Kiehl
From: DOT&PF Deputy Commissioner Katherine Keith
Date: 3/7/2023
Subject: Southeast Alaska Port Electrification

Overview. There is \$4m in the SFY25 Governor Amended Capital Budget for “Southeast Alaska Port Electrification.” This allocation, if approved, would be funded through the Carbon Reduction Programⁱ (CRP). The Carbon Reduction Program is a formula-driven FHWA program, which provides funds for projects designed to reduce carbon dioxide (CO₂) emissions from on-road highway sources.

The CRP requires that DOT&PF, in consultation with all Municipal Planning Organizations (MPOⁱⁱs), develop a carbon reduction strategyⁱⁱⁱ not later than 2 years after enactment, which means the strategy deliverable is due to FHWA September 2023. Eligible CRP projects include replacing street lighting and traffic control devices with energy-efficient alternatives, deploying intelligent transportation systems (ITS) systems, reducing transportation emissions at port facilities (including through the advancement of port electrification), and others. DOT&PF proposed several CRP-eligible projects in the Governor’s Amended Capital budget for SFY24, including Light up the Highways, International Airport Charging Stations, Port of Alaska Tract-J Access Road, and funds for the Carbon Reduction Strategy planning document. Allocations also exist for FAST and AMATS.

Total Carbon Reduction funding from FY22 was \$15,700,000, and FY23 was \$15,700,000. 65% of funding is distributed to urbanized areas proportionally based on population, with a requirement to include populations of over \$50,000 sometime between FY22-26. 35% of funding can be used in any area of the state.

Strategic Investment Area: Sustainability. Given the prominent requirement in the “Bipartisan Infrastructure Law” (BIL) to reduce emissions from transportation infrastructure, DOT&PF formed a Sustainable Transportation and Energy Program (STEP) to help communities thrive through transportation investments that promote independence, efficiency, low-cost transportation, and a healthy environment. The Carbon Reduction funding falls under the Sustainability DOT&PF strategic investment area. Developing sustainable transportation infrastructure involves a multi-modal lifecycle approach that considers environmental quality, economic development, and social equity. In other words, for projects to be sustainable, they need to be viable, equitable, and bearable.

Maritime Regulations. A number of global and national policies, including International Maritime Organization (IMO) emissions regulations and the BIL guidance, have merged to create the need for increased vessel monitoring, data collection, and deployment of low-emission technologies in Alaska’s maritime sector. MARPOL is the main international agreement covering all types of pollution from ships. MARPOL was developed through the IMO, a United Nations agency that deals with maritime safety and security, as well as the prevention of marine pollution from ships which is specifically addressed in Annex VI of the MARPOL treaty, addressing air pollution from ocean-going ships. It was implemented in the US and established limits on nitrogen oxides (NO_x) emissions and requires the use of fuel with lower sulfur content.

MARPOL requires that the maritime industry track and report on greenhouse gas (GHG) related metrics such as the Carbon Intensity Indicator (CII) beginning January 1st, 2023. Some existing vessels in the Alaska Marine Highway System (AMHS) fleet are required to calculate an Energy Efficiency Existing Ship Index (EEXI) and seek improvements. New vessels also are required to reduce emissions where possible by establishing an Energy Efficiency Design Index (EEDI) and maintaining an annually updated Ship Energy Efficiency Management Plan (SEEMP). Simultaneously, the opportunity exists with BIL to offer a major investment, over \$1.25 billion, in our

national maritime transportation sector. The Federal Transit Administration (FTA) Ferry Fund program enables the modernization of AMHS, using an investment strategy that favors projects that (1) renew our transit systems, (2) reduce greenhouse gas emissions from public transportation, and (3) advance racial equity.

Port Electrification. Changing IMO regulations with hard-to-quantify impacts are the primary driver for the cruise industry, AMHS, local governments, and utilities to be the primary driver behind in evaluating the need and potential for port electrification in SE Alaska. Port electrification initially needed by cruise lines includes offering shoreside power to vessels for hotel loads and can also charge battery systems of low-no vessels.

Cruise Lines. Cruise Line International Association (CLIA) and associated cruise lines are pursuing options for port electrification to address hotel loads in Ketchikan, Juneau, Whittier, and others. According to the Port of Seattle, each ship that plugs in at a port can reduce diesel emissions by 80% and carbon dioxide emissions by 66%. Shore power is currently only available in Juneau. If unable to use shore power, cruise lines utilize other low-carbon technologies, such as governing speed, to meet their emission targets.

AMHS. In February 2023, AMHS received a \$46.4m award for a low-no emission ferry to serve short routes in Southeast Alaska as a shuttle ferry. Therefore, AMHS has been researching port electrification options combined with shoreside energy storage systems beginning in Ketchikan and Metlakatla, followed by Haines and Skagway. The Tustumena Replacement Vessel (TRV) is a diesel-hybrid propulsion system that will have a limited energy storage system aboard. Shore power will enable the TRV to reduce fuel.

Community Benefits. Port electrification infrastructure, especially those with energy storage systems, may offer significant ancillary benefits because it may offer power quality stabilization for local microgrids and supports the addition of renewable energy capacity. Such systems established at multiple ports increase the resiliency of Alaska's rural microgrids.

Partners. Port electrification is multi-modal, multi-jurisdictional, and interagency. Therefore, multiple partners will be required for successful implementation. This includes Southeast Conference (community and local entity coordination); CLIA (representing cruise line industry needs); AMHS (representing ferry needs); Juneau utilities, Ketchikan Public Utilities (KPU), Siemens (TRV propulsion system integrator); Southeast Alaska Power Agency (SEAPA); Southcoast Region DOT&PF (speaking to concurrent roadway projects in KTN); DEC; and others.

Efforts to Date. Efforts are underway to evaluate generation capacity in each AMHS port community, electrical grid in port communities, and port infrastructure needs for an interface between vessel and grid which may include batteries, specific electrical connection hook-ups, and other features. An Alaska DOT&PF FHWA-funded research project^{iv} concluded in January evaluating the feasibility of a low-no emission ferry for Alaska. This project also did a reconnaissance analysis of the requirements and capacity in Alaska for port electrification.

Next Steps. DOT&PF will begin the Carbon Reduction Strategy due September 23 while engaging in reconnaissance-level design for port electrification with all project partners. Once project locations are finalized, DOT&PF will coordinate with stakeholders on how best to proceed with construction.

ⁱ https://www.fhwa.dot.gov/bipartisan-infrastructure-law/crp_fact_sheet.cfm

ⁱⁱ Before obligating CRP funds for an eligible project in a rural area, a State shall consult with any regional transportation planning organization

ⁱⁱⁱ [§ 11403; 23 U.S.C. 175(d)(1)]

^{iv} Alaska DOT&PF Research, Development, and Technology Transfer Research, Development, & T2 Needs Statement