



## California North Coast Offshore Wind Studies

# Coastal Infrastructure Co-Benefits Linked to Offshore Wind Development



This report was prepared by Steve Hackett of the Humboldt State University's Economics Department. It is part of the *California North Coast Offshore Wind Studies* collection, edited by Mark Severy, Zachary Alva, Gregory Chapman, Maia Cheli, Tanya Garcia, Christina Ortega, Nicole Salas, Amin Younes, James Zoellick, & Arne Jacobson, and published by the Schatz Energy Research Center in September 2020.

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Schatz Energy Research Center  
Humboldt State University  
Arcata, CA 95521 | (707) 826-4345

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## **1. INTRODUCTION:**

The objective of this report is to describe the potential co-benefits linked to state and local actions and investments supporting offshore wind farm development based in Humboldt Bay. We begin by defining just what we mean by co-benefits, and providing an illustrative example. Next, we turn to specific actions, categorized into financing and development (including partnerships), and port planning. As state and local actions are precursors to investments, and investments generate co-benefits, a summary description of state and local investments, associated co-benefits, and recipients is provided after the description of actions.

### **1.1 What are Co-Benefits:**

*Co-benefits* refer to ‘the positive effects that a policy or measure aimed at one [target] objective might have on other objectives’ (IPCC, 2014, p. 14). Another term for co-benefits is ancillary benefits. In terms of the other objectives that are advanced in this context, identification of co-benefits may serve as a mechanism for garnering broader support from a coalition of interests that includes those who benefit from advancing both the target objective, as well as those who receive co-benefits. As such, co-benefits may accrue as a beneficial unpaid-for spillover (a positive externality), or they may be internalized. Internalization of co-benefits means that those who receive them contribute in some way, which increases demand for the action or investment generating the co-benefit.

The existence of co-benefits does not necessarily mean an equal division of benefits, and moreover, those who receive co-benefits may also experience other adverse impacts or costs linked to the generative action or investment.

### **1.2 Example of Co-Benefits Deriving from Local or State Actions and Investments Linked to Offshore Wind Farm Development:**

Regular and timely use of the Port of Humboldt Bay by vessels transporting wind farm components for in-port assembly, as well as for ongoing wind farm operations, maintenance, and repair, may depend upon maintaining design depths and widths for the bay entrance and federal channels, additional dredging for terminal access and anchoring sites, and repairing and maintaining the north and south entrance jetties. Such investments would generate co-benefits to other vessel operators utilizing the Port of Humboldt Bay, including commercial and recreational fishermen, charter operators, recreational boaters, transient vessels, cruise ship operators, freight-hauling vessels, and the Coast Guard. These co-benefits may take the form of safer entry, a lower frequency of entrance channel closure due to shoaling and hazardous sea states, and accommodation of deeper-draft vessels such as freighters and cruise ships over the bar and through transit channels within Humboldt Bay.

## **2. STATE AND LOCAL ACTIONS AND INVESTMENTS**

In this following sections of the report we describe a number of state and local actions and investments linked to Humboldt Bay channel and land-based improvements to support offshore wind farm development and operations, and that generate co-benefits. While the State of California is potentially an important player in this process, the Humboldt Bay Harbor, Recreation, and Conservation District, County of Humboldt, commercial fishing and other private industries are likely the most important facilitators of these port-related actions and associated investments.

For the purpose of this study, an *action* refers to the process of performing or carrying out a task with the purpose of achieving a particular end. In this section we will describe specific actions that state or local entities may engage in that would (i) support offshore wind development, and (ii) generate co-benefits for parties other than those in the offshore wind industry cluster. Note that an industry cluster is a group of similar and related firms in a defined geographic area that share common markets, technologies, worker skill needs, and which are often linked by buyer-seller relationships. The actions summarized below are

clustered around efforts to prepare the Port of Humboldt Bay to support offshore wind farm development, and operations and expanded channel and land-based facilities serving other industry clusters.

In contrast to actions, an *investment* in this context refers to an outlay of funds and other resources targeted at building or restoring a physical capital asset or improvement. As with actions, in this section we will describe specific investments that state or local entities may engage in that would (i) support offshore wind development and (ii) generate co-benefits for other industry clusters.

## **2.1 State and Local Actions:**

In this section of the report we summarize state and local actions that may generate co-benefits beyond those in the offshore wind industry cluster. In general, these actions fall into several broad categories: financing and development (including partnerships), and port planning. These actions serve as a precursor for investments in new or restored capital assets and Port of Humboldt Bay improvements, especially those of the Humboldt Bay Harbor Recreation and Conservation District (HBHRCD).

### **2.1.1 Financing and Development**

Grant programs: One important category of port development financing available to local or state government entities are grants, and therefore, applying for such grant funds serves as an important type of state or local action that could also generate co-benefits. There are a number of different sources of grant funds that could be used to support wind farm-related port development.

One example of these is the federal Maritime Administration (MARAD) port infrastructure development grant program. The following summarizes information provided on the MARAD port infrastructure development grant program website (US MARAD, 2019). In February 2019 Congress authorized \$292.73 million for Port Infrastructure Development Program grants to provide funds for a broad range of improvements within, or around, coastal seaports to improve safety, reliability, or efficiency. The \$292.73 million appropriated for the grant program remains available until expended. Of these funds, about \$93 million are earmarked for 15 US seaports with the most shipping volume as measured by total equivalent units (TEUs), while the remaining \$200 million is available for infrastructure improvements at all US coastal seaports.

Examples of seaport related-projects eligible for MARAD port infrastructure development grants include, but are not limited to, the following:

- Port gate improvements, including digital innovations to improve flow;
- Road improvements both within and connecting to the port;
- Rail improvements both within and connecting to the port;
- Berth improvements including docks, wharves, piers and dredging incidental to improvement project;
- Cargo moving equipment used shoreside (all equipment must be Buy American Act compliant);
- Facilities necessary to improve cargo transport including silos, elevators, conveyors, container terminals, Ro/Ro facilities including parking garages necessary for intermodal freight transfer, warehouses including refrigerated facilities, bunkering facilities for oil or gas products, lay-down areas, transit sheds, and other such facilities;
- Utilities necessary for safe operations including lighting, stormwater, and other such improvements that are incidental to a larger infrastructure project; and
- Port related intelligent transportation system hardware and software – all technologies used to promote efficient port movements including routing and communications for vessels, trucks, and rail cargo movements as well as flow through processing for import/export requirements, storage and tracking, and asset/equipment management.

It is important to note that maintenance dredging may not be considered competitive for MARAD port infrastructure grants, and navigation channel improvements such as widening or deepening are not

eligible for these grants. It is also important to note that MARAD port infrastructure grants fund up to 80% of project costs, and require a 20% (or larger) non-federal match. One possible source of local matching funds is the Headwaters Fund. The Headwaters Fund supports public and non-profit projects benefiting industry clusters in Humboldt County, with the goal of increasing the number of private sector jobs. The primary funding focus of the Headwaters Grant Fund is to support projects consistent with Humboldt County's economic development strategy (County of Humboldt, 2019).

Joint Powers Authority (JPA): The Joint Exercise of Powers Act, as codified in California Government Code section 6500, governs JPAs, and the following is drawn from that code section. A JPA is a legal entity allowing two or more public agencies to jointly exercise common powers. JPAs usually organize around a shared interest, and facilitate coordination among government entities in serving that shared interest. California law allows local agencies to form a JPA that may be used, among other purposes, to consolidate the financing of capital projects. JPAs may have the power to issue bonds or enter into other forms of indebtedness, and consolidation under a JPA umbrella may achieve lower overall borrowing costs. Public agencies use the JPA law and the related Marks-Roos Local Bond Pooling Act (California Government Code §6584-6599.1) to form bond pools to finance public works, working capital, insurance needs, and other public benefit projects. JPAs can issue one large Marks-Roos Act bond and then loan the capital to local agencies, thus creating a "bond pool." Bond pooling saves money on interest rates and finance charges.

A JPA can issue tax-exempt revenue bonds to finance projects that provide a public benefit and are located within the geographic boundaries of its member agencies. State law requires local approval of the construction, acquisition, and financing of public benefit projects. The local agency with approval power must be the city, county, or city and county within whose boundaries the public benefit project is to be located; the law also specifies that the local agency with approval power must have land use jurisdiction over the project.

HBHRC is considering entering into a JPA with the County of Humboldt, Humboldt Bay Municipal Water District and Peninsula Community Services District (formation pending) with shared interests in financing Port improvements and adjacent Samoa Peninsula upland-area development. (*Note joint infrastructure financing on District Dec 12 Agenda*)

California Maritime Infrastructure Bank and Authority: The California Maritime Infrastructure Bank and California Maritime Infrastructure Authority seek to ensure a flourishing maritime/marine industry in California, by providing port and harbor agencies with timely access to capital markets. The following is summarized from the California Maritime Infrastructure Bank and Authority website ([Californiamaritimeinfrastructureauthority.org](http://Californiamaritimeinfrastructureauthority.org)). The Bank was formed at the request of the California Marine Affairs and Navigation Conference (CMANC) and codified as Sections 6516.5 and 6571 of the Government Code and Part 1 (commencing with Section 1690) of Division 6 of the Harbors and Navigation Code of the State of California.

The Bank may also function as a Public Agency, under Code Section 1700, with its authority to establish one or more joint powers under State Law for the purpose of establishing an infrastructure fund for pooled financing of port or harbor infrastructure. This power enabled the Bank to form the California Maritime Infrastructure Authority. The Authority is a joint exercise of powers authority formed under and pursuant to Article 1 of Chapter 5 of Division 7 of Title 1 of the Government Code of the State of California and a joint exercise of powers agreement among the Authority's member Districts. The Authority can issue debt, establish and administer infrastructure funds, receive or administer public and private grants, and expend tax revenues, appropriated funds, and other financings on behalf of its member Districts.

HBHRC (or a JPA of which they are a member) could take the action of partnering with the California Maritime Infrastructure Bank and Authority for the purpose of securing port improvement financing. The services provided by the California Maritime Infrastructure Bank and Authority provides the following services:

- Revising business plans;
- Assessing and developing strategies to finance facility construction and improvements;
- Advising on financial planning to enhance credit standing;
- Assisting with tenant financing; and
- Executing long-term and short-term debt transactions.

The California Maritime Infrastructure Bank and Authority provides lease financing for a variety of personal and real property used by ports and their tenants, allowing the port to match payments with the benefits received from the equipment.

Public-private port-development partnerships: Public-private partnerships are designed to bring together government and private-sector entities for the purpose of facilitating development projects. Government entities, for example, have the ability to apply for grant funds that may not be available to businesses in the private sector. Grant funds may in turn help leverage private venture capital funds that could be used to initiate pilot-scale development. Once a project is demonstrated as being capable of generating an adequate revenue stream, conventional private banks may be willing to extend loans that would enable completion of appropriately scaled development projects. HBHRCD (or a JPA of which they are a member) could take the action of entering into a public-private partnership for the purpose of securing phased project financing.

Phased port development: Financing large-scale development of the Port of Humboldt Bay will likely require a sustained multi-year effort by public and private entities. Certain tasks such as maintaining entrance, channel, and turning basin depths, initial marine terminal upgrades, and a functional level of upland warehouse, storage, and staging facilities must be in place for initial wind farm development, in order to support platform and turbine assembly and initial deployment to lease areas.

Development of a utility-scale offshore wind farm (up to approximately 1.8 gigawatts, entailing 150 or more 12-MW turbines) is anticipated to be a multi-year process. It is therefore reasonable to anticipate phased port development as a necessary condition for supporting an offshore wind farm. Phased port development will involve initial public and private investments that would support both new offshore wind farm development as well as expanding existing industrial and commercial uses such as aquaculture, cruise ship calls, pellet and other wood products shipments, and possibly terrestrial wind farm development.

### **2.1.2 Port Planning:**

Planning generates a number of advantages for managing complex projects such as offshore wind farms and improvements to associated port infrastructure. By carefully considering key process steps and desired outcomes in advance, planning effectively guides coordinated action. For multifaceted projects such as phased port development that involve a large number of agencies, stakeholders, and funders. Planning facilitates co-ordination and defines roles, resources and responsibilities for completing each step of the process. Consequently, a number of existing plans related to Port of Humboldt Bay development and improvement are briefly summarized in the material that follows. The maps provided in Figure 1 and Figure 2 show the locations for each of the plan sites described below.

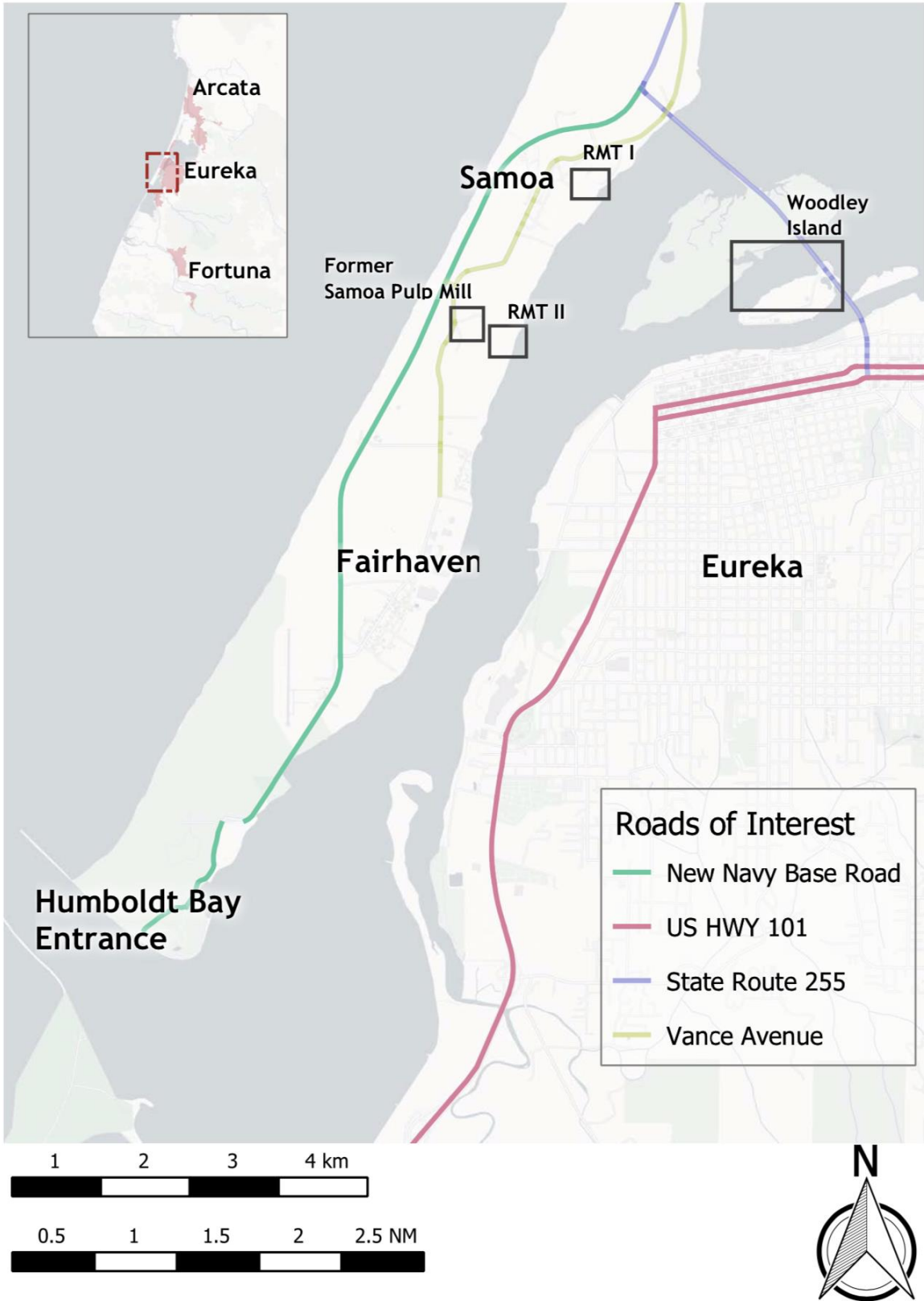


Figure 1. Map of Samoa Peninsula and areas of interest.



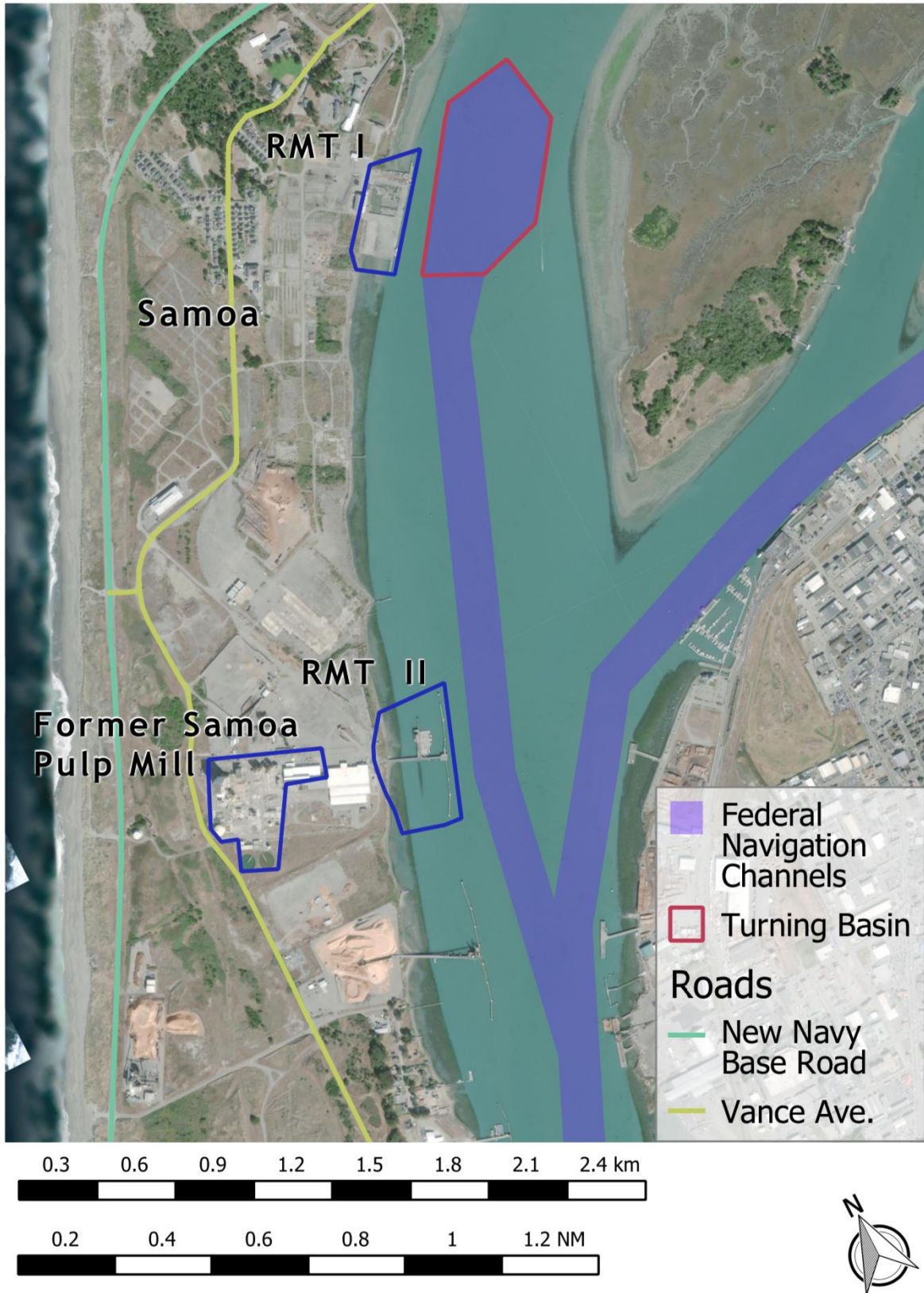


Figure 2. Map showing Redwood Marine Terminals and navigation channel on Samoa peninsula.

Redwood Marine Terminal Business Plan: The Redwood Marine Terminal Business Plan (2008) was funded by a Headwaters Community Investment Fund Grant, following the District's acquisition of berth 1 in 2004-06. The plan selected by the District was for a single multi-purpose berth integrated with long-term expansion. The multi-purpose berth would accommodate a variety of ship types, including multi-purpose cargo ships, cruise ships, and barges, and would be designed to facilitate integration into larger terminal development. The plan called for permitting and other needs for aquaculture and related uses on property designated for non-cargo uses.

The plan called for entering into negotiations with the Samoa Pacific Group to ensure their adjacent property is available for medium- to long-term terminal development as future opportunities arise. The long-term component included a future marketing plan for major terminal development, including consideration of extending the turning basin and dredging at the berth to accommodate deeper-draft vessels. The District would act as a landlord port authority that provides long-term leases for terminal infrastructure development (including multipurpose berth, warehouse facilities, and utility upgrades) and a number of terminal support services such as security and pilotage. The District would enter into an agreement for the lease, design, construction, and operation of the Redwood Marine Terminal. The operator would take over management and operations of the terminal.

RMT I Business Plan Update: As of December 2019, HBHRCD is preparing an update of the 2008 Redwood Marine Terminal Business Plan. The 2008 business plan was aimed at two objectives: (1) multipurpose berth development and (2) long term expansion (Note that the terminology used by HBHRCD changed somewhat between 2008 and 2019 – the two berths are now known as RMT I and II). RMT I was formerly the Town of Samoa Wharf and Dock, where locally harvested redwood logs were transported for milling, and the resulting lumber was shipped as an important regional export product. The business plan update will focus on renewable energy port development on the Samoa Peninsula, and will guide HBHRCD and partners through RMT I's transition to a renewable energy marine terminal. The business plan update will include the following:

- Assessment Phase: Evaluate existing RMT I facilities and adjacent upland areas for renewable energy site capability. Determine future infrastructure and facility requirements;
- Market Demand: Market opportunities analysis of current and potential dock and upland use as a renewable energy port;
- Evaluation Phase: Describe future RMT I improvements to meet market demand; and
- Recommendations: Prioritize recommendations for terminal development opportunities, based on the results of above.

HBHRCD is anticipated to pursue a phased, multi-year terminal development effort, as coordinated financing and terminal development is expected take several years for full buildout. Humboldt Bay holds much potential for offshore wind development. Samoa peninsula has industrially zoned lands that were formerly dependent on forest product industries and are available for redevelopment. In addition, the federally navigable and maintained channels in Humboldt Bay make convenient and necessary port access.

Request For Proposals For Operator of RMT I: In 2019 HBHRCD issued a request for proposals (RFP) for an operator of RMT I. HBHRCD's RMT I goals, as articulated in the RFP (HBHRCD, 2019) are as follows:

- Develop a new multipurpose terminal and associated facilities to support the offshore floating wind industry and other maritime uses;
- Increase maritime commerce and utilization of RMT I;

- Maximize the indirect economic benefit from Port operations to the surrounding local community and region;
- Secure business that supports, enhances, or diversifies current maritime operations, and is compatible with the Port's maritime operation;
- Maintain and enhance environmental protection and the regions quality of life;
- Maximize revenues from the use and operation of the site;
- Relocate the existing aquaculture and commercial fishing storage areas to better facilities; and
- Comply with and support the Port's policies.

Samoa Industrial Waterfront Preliminary Transportation Access Plan (SIWPTAP): HBHRCD's Samoa Industrial Waterfront Preliminary Transportation Access Plan (HBHRCD, 2013) was funded by the Federal Highway Administration through a grant administered by the California Department of Transportation. It is a site reconnaissance, land utilization, access alternatives development and outreach plan that identified a preferred alternative access route to support enhanced commercial and industrial transportation on the Samoa Peninsula. The route provides connectivity between waterfront properties Samoa Peninsula infrastructure, and state and interstate highways connecting to major metropolitan areas of California and beyond. These waterfront properties are owned by HBHRCD and private parties.

At the time SIWPTAP was development, the HBHRCD's vision of an enhanced transportation network on the Samoa Peninsula involves the establishment of an American Association of State Highway and Transportation Officials (AASHTO)-standard roadway system along a preferred alternative route. There was also a separate study prepared concurrently to assess feasibility of a north-south or east-west rail system that would accommodate freight traffic to and from existing and future terminals on Humboldt Bay. It should be noted that since the rail feasibility study was developed in 2013, the prospects for either of these rail development projects has diminished. In the SIWPTAP, the District anticipated a "major collector" functional classification designation for all seven road segments, and inclusion of the entire preferred alternative route in the National Highway System (NHS). This NHS designation would extend to State Route 255 between New Navy Base Road and U.S. Highway 101, as any road proposed for NHS designation must be contiguous to existing NHS roadways. The transportation plan included key process steps. The plan notes that future implementation may involve the following tasks:

- Procurement of permanent access easements or fee title acquisition of roadways;
- Construction of new road "spurs" from existing roads to waterfront parcels;
- Widening and resurfacing of existing roads, such as Vance Avenue;
- Improvement and installation of safety features at key intersections;
- Installation of security features to protect private property and sensitive port facilities; and
- Relocation of above-ground utilities to underground facilities.

Infrastructure Needs and Reuse on the Samoa Peninsula: Redwood Marine Terminal II: The RMT II infrastructure re-use evaluation plan (HBHRCD, 2016) was developed following HBHRCD's acquisition of the site in 2013. RMT II is a 72-acre parcel and site of the Former Louisiana Pacific pulp mill located at 1 TCF Drive in the Town of Samoa. The report notes that reuse of the existing infrastructure at RMT II could benefit communities on the Samoa Peninsula and Humboldt Bay through economic development (aquaculture and a cost-effective method for processing dredge spoils), and enhanced environmental health (disposal of treated effluent through the ocean outfall limits impacts to groundwater from existing on-site disposal activities). The report evaluated several key RMT II site assets for reuse or repurposing:

- An industrial water filtration system with a 30-million gallon per day (MGD) capacity, including two 1.5 million-gallon (MG) clarifier ponds, fourteen 17,000-gallon water filters, four 150-horsepower (hp) pumps, a MicroFloc water filter system, and a 1,000-kilovolt amperes (kVA) electrical substation;
- A 48" raw water pipe with supply from Humboldt Bay Municipal Water District;

- An ocean outfall that is 1.5 miles in length, with a 48-inch diameter steel pipe and anchoring system with a 32-inch diameter high density polyethylene (HDPE) sleeve with an 800-foot long diffuser system at the ocean floor; and
- A large domestic wastewater treatment system that includes a collection system, septic tank, and associated leach field.

The study also evaluated several possible future uses of RMT II, and presented planning-level cost estimates for the following reuse options:

- Use of the existing water treatment facility and ocean outfall pipe for treatment and discharge of water used for aquaculture operations;
- Use of the existing ocean outfall pipe for discharge of wastewater collected from nearby areas, including the Samoa Peninsula and possibly the City of Eureka; and
- Use of the existing MicroFloc industrial water treatment facility for the dewatering and discharge of dredge slurry from a projected 30,000 to 50,000 cubic yards of dredge materials generated annually from HBHRCD dredging operations and piped to the site from the bay channel.

In addition to the plans described above that are directly linked to industrial uses such as supporting wind farm development and operations, there are several other related plans briefly summarized below.

Samoa Town Master Plan: In addition to the site adjacent to RMT I that is zoned as Coastal Dependent Industrial, the Samoa Town Master Plan (County of Humboldt, 2005) includes a number of other planned improvements that could enhance RMT I as a wind farm support facility:

- New workforce housing (80 units now under construction);
- Additional single-family housing in addition to existing housing;
- An emergency services vehicle storage building;
- A tsunami evacuation site; and
- A business park and town square.

These planned improvements are supported by new water tanks, wastewater treatment facility, roadway and trail infrastructure.

Eureka Fishing Community Sustainability Plan: Funded by the Saltonstall-Kennedy program, the Eureka Fishing Community Sustainability Plan (2019) aimed to identify and prioritize initiatives needed to ensure greater resilience for the fishing industry; to communicate economic, social, and environmental benefits and the vision of the fishing industry to the broader community; the position the industry to implement projects and activities; and to provide a resource for the fishing industry to promote and support their industry. A number of key critical needs identified in the plan overlap with those of other Port of Humboldt Bay industrial uses. These include:

- Dredging;
- Dock and marina maintenance; and
- Protecting marine-dependent uses relating to waterfront infrastructure.

The Eureka Fishing Community Sustainability Plan contains a number of recommendations, including several involving coordination between the commercial fishing community and HBHRCD. In response to this plan, as of December 2019, HBHRCD is planning dock extensions and upland improvements at Woodley Island to provide more work areas and infrastructure for commercial fishing operations (HBHRCD Planner, 2019).

## 2.2 State and Local Investments

In this section of the report we summarize state and local investments that may generate co-benefits that extend beyond the offshore wind industry cluster. As actions lead to investments, and investments lead to co-benefits generation, this section includes a description of the various categories of co-benefit recipients associated with each of the state and local investments listed below. Note that a more complete and detailed description of investments necessary for the Port of Humboldt Bay to serve as a staging, fabrication/assembly, operations, maintenance, and repair site for different scales of wind farm development is described elsewhere in this report.

<b>State and Local Investments</b>	<b>Co-Benefits</b>	<b>Co-Benefit Recipients</b>	<b>Specific Examples of Co-Beneficiaries</b>
Enhanced harbor entrance and channel maintenance; terminal access and anchorage improvements; jetty and levee repair	Fewer delays for all vessels due to harbor entrance channel closures from shoaling; Improved freight vessel terminal access	Other vessel operators and stakeholders; other freight shippers	Commercial fishermen; recreational fishermen; pleasure boaters; freight shippers; Coast Guard; transient vessels; bar pilots; tug operators; forest products and aquaculture industries
Improvements to Redwood Marine Terminals 1 and 2	Enhanced functionality and productivity of marine terminals for all industrial shippers	Other freight shippers; Harbor District	Forest products industry; aquaculture industry;
Increase in vessel maintenance and repair facilities	Reduced transit costs to other ports for vessel maintenance and repair	Other vessel operators and stakeholders; Harbor District	Commercial fishermen; recreational fishermen; pleasure boaters; freight shippers; Coast Guard; transient vessels; bar pilots and tug operators
Increase in port-related upland warehouse and storage space	Improved functionality of port for all industrial shippers	Other freight shippers; Harbor District;	Forest products industry; aquaculture industry; other
Increase in labor force skilled in fabrication, vessel and heavy equipment maintenance and repair	Improved access to skilled, work-ready labor force for all commercial and industrial port users	Other vessel operators and stakeholders; other coastal dependent industries	Commercial fishermen; recreational and pleasure boaters; other freight vessels; Coast Guard; transient vessels; tug operators
Other port improvements (upland sites, transportation, other infrastructure)	Improved functionality of port for all commercial and industrial shippers	Other vessel operators and stakeholders; other coastal dependent industries	Commercial fishing industry; forest products industry; aquaculture industry; other

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