



**Alaska Railroad  
Corporation  
Seward Terminal Reserve**

**DOCK FACILITIES  
MASTER PLAN**

**Updated 2014**

## INTRODUCTION

The Alaska Railroad was constructed between 1917 and 1922 by the Federal government, and Seward has been the railroad's ocean terminus and a key supply center since initial construction. The Alaska Railroad Corporation (ARRC), a state-owned corporation, has owned and operated by the Alaska Railroad since 1985, when the railroad was purchased by the State of Alaska to serve Alaska business and communities as an engine of community development and economic growth.

Seward lies at the head of Resurrection Bay, a glacial fjord, on the east coast of the Kenai Peninsula, about 125 highway miles south of Anchorage. Founded in 1903 and incorporated as a city in 1912, Seward is the terminus of the Seward Highway and the Alaska Railroad, as well as a fishing, shipping and ferry port. Seward's ice-free port facilitates provided all-weather air, road, and rail access to the major population centers in south central and interior Alaska. Industrial activities in Seward are generally associated with shipping coal, petroleum product sales, gravel extraction, small scale timber manufacturing, fish processing, and ship repair. Secondary economic activity is associated with harbor moorage, boat storage and repair, and purchase of fuel, marine hardware, and other services. Recreation and tourism generate a significant part of Seward's economy, particularly in the summer.

The Alaska Railroad owns a land reserve in Seward that encompasses about 328 acres. Much of this land is used for train operations, including the rail yard where train maintenance and maneuvering occurs, as well as the passenger depot and terminal facilities. Operating lands also include the docks and adjacent uplands, which support intermodal operations. Railroad land not used to support railroad operations, or not set aside for future capital and expansion opportunities, is made available for lease or permitted use.

At its Seward dock facilities (approximately 75 acres), ARRC has made a number of improvements over the years. However, the demand for freight and passenger service continues to grow and evolve, and significant additional improvements in the dock area are required to support customers' need.

To support and encourage investment in the local community, the Alaska Railroad has updated this Master Land Use Plan in close coordination with the City of Seward. The purpose is to assess and guide future development of ARRC port facilities. The plan outlines areas available for current and future train operations, potential railroad business expansion, and for permitted use by marine / logistics enterprises and utilities. Given the nature of current concerns and projected growth, this Master Plan focuses on the Freight Dock and Passenger Docks and related support areas. It projects the full build-out condition, addressing future use of both land and water resources, and identifies specific areas for development to meet these needs. Finally, it includes a phased development plan that would be used to develop priorities for capital improvements. This plan would also be used to coordinate and involve resource and regulatory agencies, the Seward community, and user groups about ARRC's plans for its Seward dock facilities.





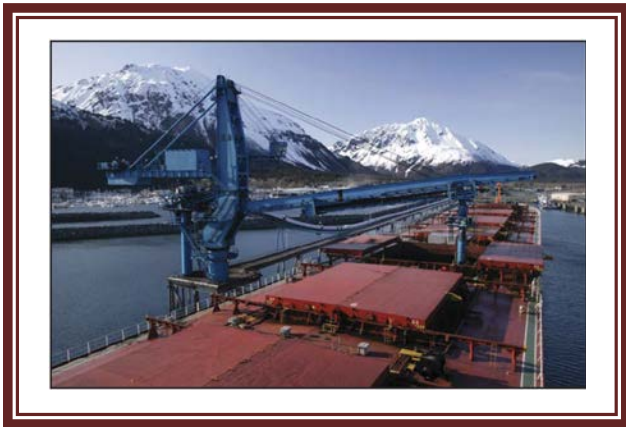
## DESCRIPTION OF ARRC'S EXISTING DOCK FACILITIES AND SUPPORT AREAS

A high percentage of Seward Port users make intermodal connections through the Alaska Railroad terminus on the Seward waterfront. Annually, more than 130,000 people and more than 2 million tons of cargo enter or exit Seward via the ARRC dock facilities. ARRC docks are directly connected to the state's rail system, which carries freight, resources and passengers to key hubs in Whittier, Anchorage, Wasilla, Palmer, Denali, Fairbanks/North Pole, and communities in between. Dock facilities and the railroad support freight routes around the state through connections to ports, rivers and roads in every region. ARRC's Seward Terminal Reserve is zoned for industrial use.

ARRC's existing dock facilities within the Seward Terminal Reserve are depicted on Figure 1. They include a Freight Dock (aka East Dock), Passenger Dock (aka the West Dock), and the Seward Loading Facility (SLF), as described below.

### ***Seward Loading Facility (SLF)***

The SLF was constructed in 1984 as an economic development project for the State of Alaska, providing a facility to transport bulk material from Seward, Alaska for shipment worldwide. The facility takes bulk material from railcars, conveys it to storage, and loads the material into bulk ships. ARRC acquired the facility in 2003, and has made a number of improvements since that time.



### **Seward Loading Facility**

**Uses:** Used to load bulk material onto ships

**Size:** Approximately 1700 feet long

**Docking:** One (1) side

- Stationary ship loader with a conveyor system

#### **Features:**

- Railcar dumper facility, with a pit and unloaders to discharge material from hopper cars
- Conveying systems to move material from the railcar dumper to ships or the stockpile and to move material from the stacker-reclaimer through a sampling station and onto ship loader
- Stacker-reclaimer distributes material from the conveyor to the stockpile and, in turn, reclaims the material from the stockpile for ship loading
- Stationary ship loader with a conveyor system for discharging material into the holds of oceangoing bulk carriers
- Two-story office/control building, a shop building, and a crew break room

#### **Improvements:**

- Dust control spray bars along the conveyor belts and the stacker/reclaimer
- Expanded SLF stockpile storage area
- Replaced the transfer chute on the ship loader to minimize shut downs and incidental spillage;
- Gangway for ship access
- Ship ladder hoist

## Passenger (West) Dock

The existing Passenger Dock was constructed in 1966 after the original dock was destroyed by an earthquake in 1964. The original dock served as a combined dock serving cargo ships, cruise ship passengers, and Alaska Marine Highway System (AMHS) passengers for many years.



In the early 2000s, to enhance passenger safety and efficiency, the multi-use pile-supported dock was rehabilitated for passenger use. Repairs/improvements included the following items: reinforce corroding piles and coat existing piles above mean tide elevation; re-weld submerged pile splices; replace timber fender piles, bullrail and fender camels; reconstruct the expansion joint between dock segments; conduct structural/seismic upgrades (steel frame bracing, dock piling repair, catwalk replacement/extension); replace cathodic protection system rectifiers and anodes, and add sacrificial sack anodes near shore; remove railroad

tracks; pave surface to eliminate tripping hazards and improve surface drainage; and replace exterior light towers. In addition, to resolve conflicts between freight and passenger operations, and due to weight restrictions on the Passenger Dock, a new dedicated Freight Dock was constructed to the east.

The Passenger Dock is only used occasionally for light freight and logistics. Each 736 foot dock face is equipped with ten (10) fenders and twelve (12) mooring bollards, and two (2) mooring dolphins 300 and 400 feet from the end of the dock. The west dock can moor two cruise ships at a time. Due to Homeland Security requirements, active loading and unloading at this dock is prohibited while a passenger ship is in port, making it difficult to use by any freight vessel during the May-September passenger season.

An assessment of the Passenger Dock conducted in November of 2013 included inspection of piling, concrete pile caps and deck, sheet pile abutment, fenders, whalers, and the electrical service/cathodic protection. Although the Passenger Dock is safe for passenger use, the facility is clearly reaching the end of its serviceable life. It must have significant and continuing capital maintenance investment, and will require major rehabilitation or replacement.

### West Dock Highlights:

**Uses:** Primarily for passenger/cruise ships

**Size:** 736 by 200 feet

**Docking:** Both sides

- Each side equipped with 10 fenders and 12 mooring bollards.
- 2 mooring dolphins: 300 and 400 feet from the end of the dock.

**Surface Features:**

- Asphalt surface; single track extends to end of dock, flush with surface (no longer in service due to weight restrictions)
- Top-of dock elevation: 24 feet MLLW

**Terminal:**

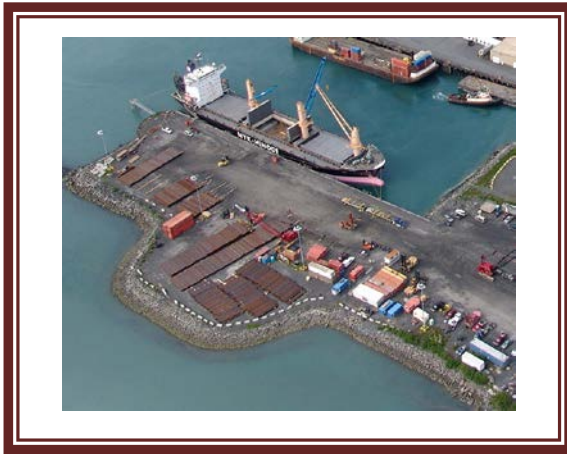
- 240-by-100-foot Intermodal facility on north(shore) side of pier
- Intermodal connection for cruise passengers.

**Uplands:**

- Partially paved and fully lit parking area
- Circular driveway for bus, shuttle and private vehicle pick-up/drop-off
- Pathway connects pedestrians to downtown walking corridors
- Paved rail passenger platform offers a safe train-boarding area

## Freight (East) Dock

Completed nearly a dozen years ago, the Freight Dock handles a wide variety of commodities. It has a length of 550 feet and a width of between 200 and 320 feet. The dock is supported with rail operations, track at the dock face and uplands support areas. In 2007, to better accommodate freight customer needs, ARRC obtained permits for widening the dock to 320 feet, and conducted initial fill activities to widen a portion of the dock to the east.



The dock is supported by a sheet pile bulkhead on the west side, a riprap & armor rock fill slope on the east side, and a combination of the two on the south side. It has a series of fenders on the west side where ships dock. A catwalk and mooring dolphin were installed at the end of the dock to aide in berthing of vessels, and the basin adjacent to the new dock was dredged.

The west facing ship berth is equipped with seven (7) fenders and nine (9) mooring bollards and one (1) mooring dolphin with a single bollard 71.5 feet from the end of the dock connected to the dock by a catwalk. An

approximately 1,100 foot long rubble mound sediment groin extends south off the southern end of the Freight Dock protecting the dredged basin from further siltation from the nearby Resurrection River.

In 2010, ARRC dredged the basin at the West Dock and the East docks ship berths to accommodate deep draft ships.

### East Dock Highlights:

**Uses:** Preferred for freight, but also available for passenger vessels.

**Size:** Originally 550 by 200 feet. In 2007, a portion of the east face of the dock was widened to 320 feet to provide more room for trucks and other equipment to maneuver.

**Docking:** One (1) side

- West side equipped with 7 fenders and 9 mooring bollards.
- One mooring dolphin with a single bollard: 71.5 feet from the end of the dock (accessible by a catwalk)

### Surface Features:

- Compact gravel surface
- Double track extends to the end of the dock, flush with surface
- Top-of dock elevation: 20 feet MLLW

### Uplands:

- Limited Space for temporary cargo lay-down and storage
- Fenced Perimeter
- Vacant unimproved acreage on the shore

## PROBLEMS AND CONCERNS WITH EXISTING FACILITIES

### Freight Dock

Vessel traffic in Seward has outgrown the available dock space, and the demand for berthing at the Freight Dock exceeds current availability. The Freight Dock has numerous limitations that affect its overall utility, as well as its safety and efficiency and ability to accommodate existing and projected future vessel traffic. Specific problems are as follows.

- Limited berthing space. The length of the Freight Dock (550 feet) only accommodates berthing of up to two small or medium sized vessels or one large vessel. When a vessel larger than 400 feet or a long barge berths at the Freight Dock, no other vessel is able to berth. Lack of berthing space has resulted in dock and port congestion, with vessels often idling in open water areas waiting for a berth to become available.
- Capacity to service larger ships. The Freight Dock has limited flexibility for loading and unloading freight from larger vessels due to the width and generally small dock area. As an example, Totem Ocean Trailer Express, Inc. (TOTE) vessel class (Orca Class) that currently delivers freight to Alaska has identified the Seward dock area as its contingency berth in the event of an emergency where docking in Anchorage is not feasible. However, TOTE cannot use the Freight Dock. The dock width does not provide adequate space required for roll-on/roll-off ramps for larger vessels.
- Limited area for safe and efficient cargo handling/storage/staging. The current dock area severely restricts storage and staging of cargo in a secured area. This challenge, which affects most (if not all) Freight Dock customers, compromises the safe and efficient use of the dock and has resulted in loss of freight customers. Because of the limited berthing space at the Freight Dock, many vessels that could dock long-term in Seward now travel to Seattle (5-7 days sailing time) for the winter or for longer-term services. This not only reduces long-term service delivery in Seward, but also increases fuel and pollution due to added transport time without goods transfer, and negatively affects shipping company schedules and bottom lines.
- Limited area to service barges in the barge basin. The exiting barge basin has been significantly impacted by siltation introduced by the recent shift of one of the braided channels of the Resurrection River. The barge basin needs to be dredged to restore its serviceability, but the continual supply of silt being delivered by the Resurrection River makes such efforts futile. ARRC has had no choice but to move the majority of its barge service to the ship berth, exacerbating the traffic congestion at the dock.



- Siltation problems associated with the existing sediment groin. A 250 foot long rubble mound sediment groin, constructed in 1966 to reduce sediment deposits, was extended to approximately 1,500 feet in 1996. A portion of the groin was removed for construction of the Freight Dock in 2000, and it is now approximately 1,100 feet long. The current groin effectively prevents bed load and heavy/large suspected particle deposition, but does allow finer suspended particles to settle in the ship basins. This results in the need for periodic dredging of the ship berths to be able to maintain adequate drafts for existing traffic, but frequent dredging of the barge basin is required if it is to remain serviceable.



### **Passenger Dock**

A condition assessment of the dock conducted in 2013 found areas of significant corrosion and deterioration in the support structure, and confirmed that the dock is near the end of its intended design/service life. The assessment included inspection of the piles supporting the dock, including an underwater inspection by divers. It also included inspection of the concrete pile caps and deck, sheet pile abutment, fenders, wales, and electrical service/cathode protection system. Although the concrete deck and caps are in fair to satisfactory condition, the H-piles, sheet pile abutment, pipe piles, and timber wales are in poor condition. Corrosion of the steel near the splash zone is the main concern, with loss of up to 50% of wall thickness documented in some areas. As such, it has reduced load capacity and previously imposed weight restrictions are appropriate. The entire wale system requires replacement, as the wood is deteriorating.

While the dock can still be safely used for passenger services with ongoing repairs and frequent inspections, expensive capital maintenance upgrades are needed now and in the future to keep this aging facility up to minimum standards. The dock was originally designed for much higher loads that it can no longer accommodate, although it has been adequate for use as a passenger facility. Due to the age and corrosion rates on the piles of this dock, the dock should be planned for major rehabilitation or replacement. Replacement with a modern facility that meets current and anticipated future needs would be more desirable and cost-effective for the long term.

In planning and designing a new dock, key considerations are as follows:

- Traffic/Market Demand Analysis. A traffic and market demand analysis could be conducted to confirm the types of cargo opportunities that are realistic for Seward and the facilities required to meet those opportunities. This analysis could provide justifications for facility sizes, phasing priorities, and optimization for current and future usage. This analysis could also evaluate the current need and projected future demand for additional berthing at Freight Dock to help ARRC plan for when this extension should be completed. The Freight Dock extension may be a higher priority as an option to minimize disruption to cruise ship operations while the Passenger Dock replacement is under construction. A firm that specializes in economic and financial evaluations of port and transportation with expertise in the Pacific Northwest and Alaska maritime industry would be retained for this effort.
- Multi-modal Operations. The current passenger dock was originally designed for much higher loads and accommodated multimodal operations. As cruise ships use the dock only during a limited season (mid-May through mid-September) and for



a limited number of days during that season, a multi-modal dock would allow flexibility for future growth and use for other purposes when not in use by cruise ships. Therefore, planning and design for the replacement dock should address the opportunity for a multi-use dock that complements the Freight Dock and ensures ARRC's port facilities accommodate the needs of various users. This would require consideration of:

- Dock Length and Height. In its current condition, the dock has been adequate for use as a passenger facility, but it is only 750 feet long and it is not ideally suited for mooring the larger cruise ships (up to 1000-ft long) that are now utilizing this facility. A longer dock is needed, as these cruise ships overextend the length of the dock by a considerable amount. Also, the fixed dock height is incompatible for use by many vessels.
- Dock Capacity. The dock capacity should be increased for crane loads, which would allow increased operations for fuel and freight barges as well as off-season long-term berthing for larger fishing vessels (i.e., tenders) that can't otherwise be accommodated in the City of Seward small boat harbor.

### **Seward Loading Facility (SLF)**

This dock meets existing needs and will accommodate anticipated growth. Other than routine maintenance, no transportation-related problems or needs have been identified. This dock is not able to alleviate the problems and needs associated with the Freight and Passenger Docks. Historically, larger freight vessels have sometimes docked at SLF, but they are unable to load or unload freight at that facility. Located approximately 1,500 feet from shore, and connected only by a cat walk and conveyor belt, the location of the SLF is such that there is no practical means to provide adequate loading or unloading of freight, nor any reasonable means to connect it with the existing rail and truck loading facilities within ARRC's Terminal Reserve. The SLF is not suited for any purpose other than loading of bulk commodities (e.g., coal or gravel) onto ships.

### **Support Areas**

Many customers have expressed the desire to lease land near the Freight and Passenger Docks to support their operations, particularly once their operations grow. ARRC's Seward Terminal Reserve has some undeveloped land, and ARRC is planning to develop this small area to provide value added services and railroad infrastructure to support customers. With the anticipated expansion of the dock facilities, these needs are anticipated to grow. All available land near the dock facilities are needed for logistical support of operations.



## ARRC SEWARD DOCK AREA MASTER PLAN

ARRC's overall goal is to provide a high level of service to the public, improve the state's transportation infrastructure, and otherwise foster and promote economic development (as envisioned by our governing statutes).

Based on the previous section documenting the problems and concerns in the Seward dock area, no major capital improvements are needed at the SLF. This dock is a fully developed facility that meets existing needs, and is anticipated to handle traffic projects well into the future. Planned future investments in the SLF are limited to maintenance and repair of the infrastructure, as needs develop. These needs are not addressed further in the Master Plan.

However, significant improvements are warranted at the Freight Dock and Passenger Dock, and in the underutilized and unimproved upland areas to address documented current and future needs. This Master Plan as depicted on the following figures focuses on these needs.

Our goals, relative to the ARRC Seward dock facilities, are to:

- improve the safety and efficiency of freight and passenger operations
- preserve the intermodal operations of our commercial freight and passenger customers
- accommodate demonstrated and projected increases in traffic volumes and types
- enhance the long term utility of the docks and surrounding areas

These goals would be met by widening and lengthening the Freight Dock; rehabilitating support tracks, and extending tracks and utility service to the expanded dock. The planning for multi-modal operations would ensure traffic and market analysis be conducted to identify passenger and freight handling needs. It is anticipated that the development plan may include replacing the Passenger Dock with a multi-use structure. This could provide additional short- and long-term berthing space, capacity for simultaneous and varied vessel type berthing secure cargo storage and staging/transfer area, roll-on/roll off compatibility, and capacity to service more and larger ships. The existing sediment groin could be replaced with a relocated jetty, and dredging and fill could be accomplished to establish berthing capability along the jetty and Freight Dock east face. Improvements should also consider passenger access requirements, with modification of facilities as necessary to facilitate amenities.

Underutilized efficient rail, vehicle, and pedestrian land areas adjacent within the Seward Terminal Reserve should be improved for future leasing to accommodate customer uplands operations/support needs. Finally, to improve vehicular transportation flow, Port Avenue could be extended to connect with Airport Avenue. Combined, these improvements would relieve the steadily increasing dock and port congestion, increase intermodal cargo transfer and storage efficiencies, reduce idle time for vessels waiting to berth and load or unload, and meet anticipated future needs.

Funding constraints prevent immediate implementation of all elements of the Master Plan. Therefore, construction of the various elements would be phased. These phases would be implemented over the next 5 to 10 years, as funding permits.

### Seward Master Plan Phases

#### PHASE 1

- Widen existing freight dock to 320 feet, from the shore to the end of the existing dock
- Extend existing freight dock by 400 feet
- Rehabilitate support tracks, and extend tracks and utility service to the expanded dock

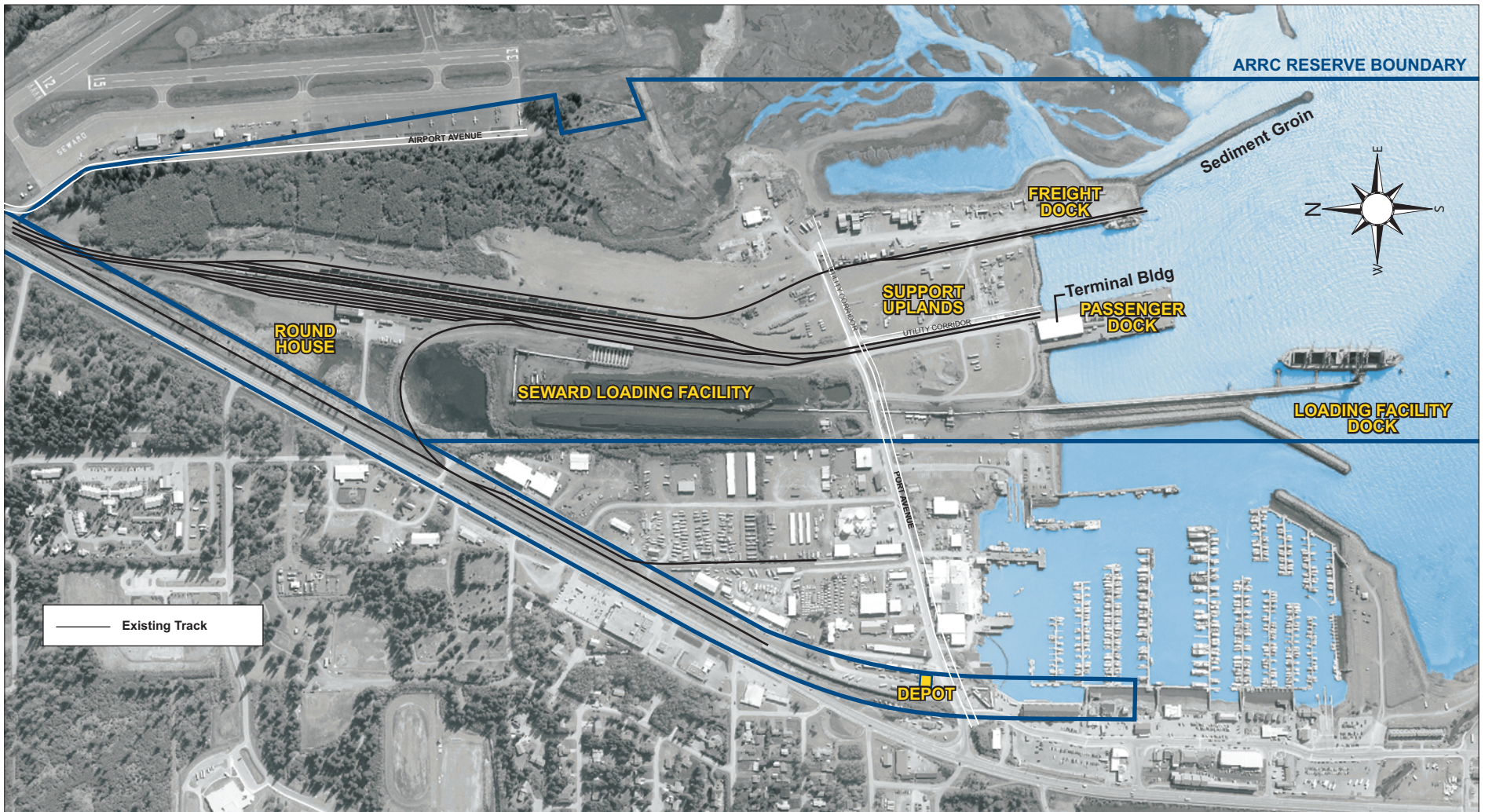
#### PHASE 2

- Construct/relocate jetty and remove existing sediment groin
- Dredge east side of the freight dock basin
- Remove existing passenger dock and construct new multiuse dock
- Grade uplands areas to accommodate freight customer uplands operations/support needs
- Address passenger intermodal needs

#### PHASE 3

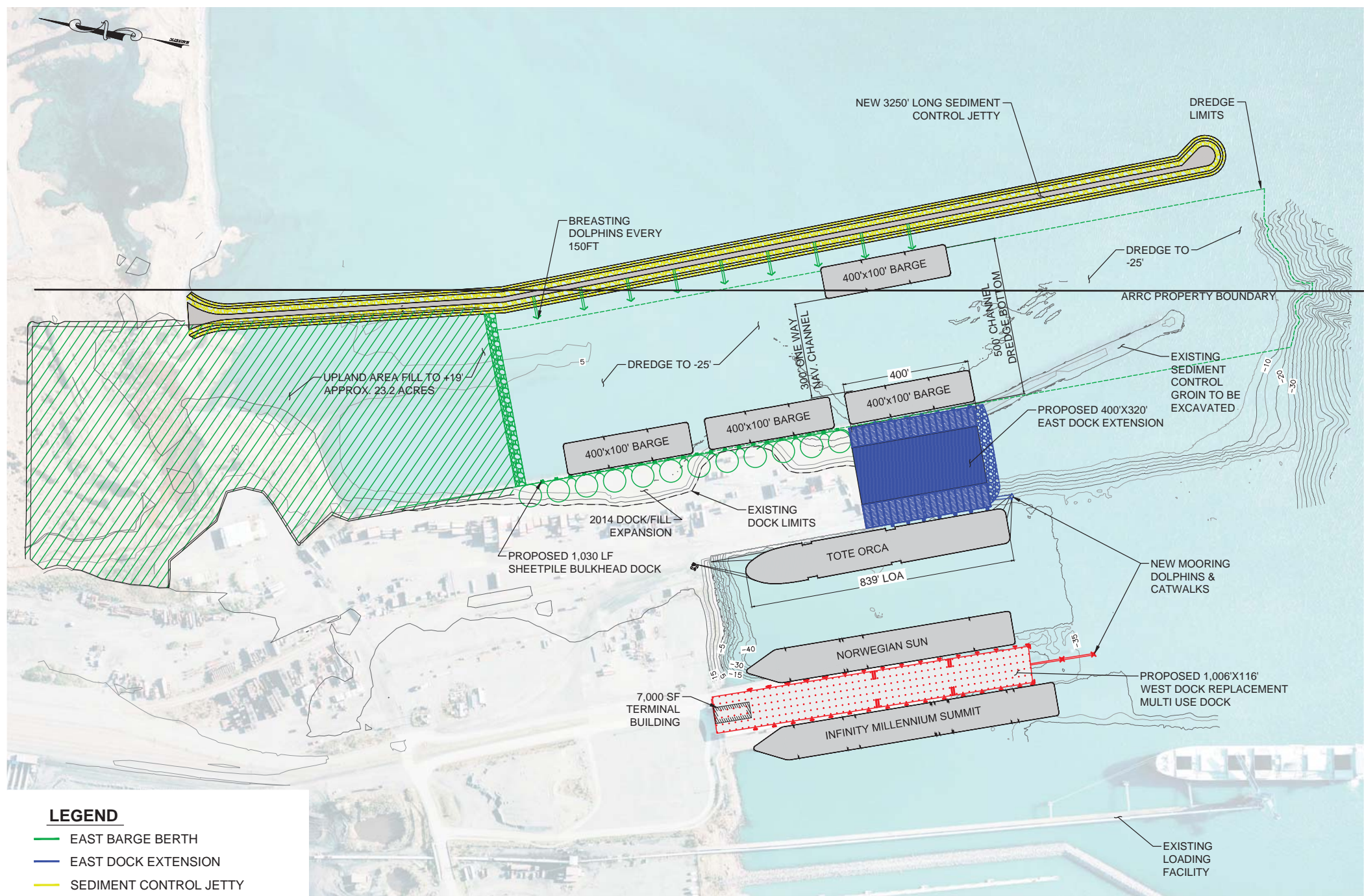
- Extend Port Avenue to connect with Airport Avenue (including utilities, security measures, etc.)
- Lease and develop upland parcels to accommodate customer operation and support needs
- Improve Intermodal operating areas

# ARRC Seward Terminal Reserve: Existing Facilities



- Seward Reserve 328 acres
- Seward Loading Facility (coal and gravel)
- Passenger Dock, Terminal and Supporting Uplands
- Freight Dock and Supporting Uplands
- Seward Yard and Operating Tracks





**LEGEND**

- EAST BARGE BERTH
- EAST DOCK EXTENSION
- SEDIMENT CONTROL JETTY
- WEST DOCK REPLACEMENT

**1 CONCEPT PLAN**  
Scale: NTS



# ARRC Seward Master Plan: Future Development

