Transportation Study

Alaska Railroad Corporation

Whittier Terminal Master Plan

Whittier, Alaska

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Executive Summary

The primary objectives of the Whittier Terminal Transportation Study (Study) are the identification, evaluation, and selection of replacement and new marine and supporting transportation alternatives. This data was assessed through the use of previous studies, current data points, and future scenarios based on known information about development in the region. This was completed in tandem with the development of phasing plans where applicable to best serve the transportation needs of the region during the construction of selected alternatives.

While the Terminal itself is needed for the safe and continuous rail and cargo operations of the Alaska Railroad Corporation (ARRC), it is equally important to ensure that the connections to the Terminal, be they rail or road, are considered to increase the efficiency of the critical barge-to-rail modal shift that occurs at Whittier.

These identified alternatives are expanded upon through preliminary design of primary elements or facilities related to transportation. This Study identifies and prioritizes issues, generates alternatives to address issues, identifies impacts to other terminal operations, addresses environmental considerations, and recommends preferred alternatives. It addresses potential improvements including terminal rail operations, reduced conflicts with road crossings, reduced conflicts between passenger and freight trains, and improved roadway and railway access and movement to and within the terminal. Critical to ensuring regional efficacy and support, this Study includes stakeholder engagement to ensure that the local communities concur with the findings, and that any suggested actions are beneficial to both Whittier Terminal and the local community.

The two primary alternatives considered are:

- Alternative 1: Westerly Relocation of Barge Berthing
- Alternative 2A: Reconstruct Existing Berthing Facilities in Place

This Study recommends Alternative 2A: Reconstruct Existing Berthing Facilities in Place. This document addresses the positive aspects of each option as well as the primary concerns.

The development of the Transportation Study secures continued and future partnerships with adjacent jurisdictions and regional, state, and federal agencies through a cooperative planning approach and the knowledge of how Whittier will be investing towards the future.

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1. Introduction

1.1. Purpose

The purpose of this Whittier Terminal Transportation Study (Study) is to identify gaps between the existing facilities and infrastructure and the future needs of the region. The Study produces options for how to fill those gaps and address other needs discovered during analysis of these facilities. Options produced were vetted to ensure that at least one is considered feasible for the overall planning effort.

This Study serves as a key component in modernizing the Whittier Terminal, an essential intermodal hub for Alaska's transportation network. This Study aims to assess the current state of the terminal's transportation infrastructure and develop a comprehensive plan to address both existing deficiencies and future demands. The Study prioritizes sustainability, resiliency, and operational efficiency, ensuring that Whittier remains a vital connection point for rail, marine, and ground transportation systems in Alaska. Alternatives developed in this Study feed into the Whittier Terminal Master Plan, guiding a holistic series of investments to the terminal and the region based on intermodality.

1.2. Objectives of the Transportation Study

This Study leverages the data collected and the direction provided by the Project Visioning process to assess the existing terminal transportation facilities and infrastructure in relation to current and future demands. This was performed by reviewing transportation connectivity and upland facilities with regard to both freight and passenger traffic. Where gaps were identified between existing facilities and infrastructure and future requirements, options were identified to address the needs. These options were vetted such that at least one, if not several, is considered feasible as part of the overall planning effort.

The work included but was not limited to the following activities:

- Evaluation Methodology
- Transportation Connectivity Study
- Feasibility Analysis of Facilities
- Report Workshop

This Study identifies and addresses the infrastructure needs of Whittier Terminal's intermodal facilities. It evaluates current conditions, forecasts future demands, and develops strategies to support the terminal's continued role in facilitating freight and passenger movements. The Study includes a detailed assessment of ARRC's marine terminal, upland track, and yard configurations and how they connect with the local roadways, pedestrian movements, and Anton Anderson Memorial Tunnel. The focus is placed on improving efficiency, reliability, and sustainability. It explores long-term expansion opportunities, including the installation of a roadway overpass, rail switching, and other potential improvements while minimizing impacts on

other stakeholders. Through this effort, the Whittier Terminal Master Plan creates a roadmap for future investments, setting the stage for sustainable growth and operational improvements.

1.3. Project Description

The Whittier Terminal Master Plan Project, funded under the U.S. Department of Transportation's Maritime Administration (MARAD) Fiscal Year 2021 Port Infrastructure Development Program (PIDP), is designed to assess and improve the operational capacity and infrastructure of the Whittier Terminal, which serves as a critical transportation hub for the Alaska Marine Highway and the sole connection between ARRC and the rest of the North American rail network. The project evaluates the terminal's current condition, focusing on safety, performance, efficiency, reliability, resiliency, and sustainability.

The Whittier Terminal Master Plan Project is essential in positioning the Whittier Terminal for future growth, ensuring that it continues to meet regional transportation needs and aligns with federal objectives for sustainable and resilient infrastructure.

1.4. Previous Studies and Available Data Review

1.4.1 Alaska State Rail Plan 2016

The Alaska Department of Transportation and Public Facilities (DOT&PF) developed the 2016 Alaska State Rail Plan (ASRP) to formulate a vision for rail in Alaska as well as guide the state’s rail freight and passenger transportation planning activities and project development plans over the next 20 years.

Alaska’s rail system plays an essential role in transporting goods to and from Alaska. Much of the food, consumer goods, and special or oversized equipment destined for Alaska is shipped from the mainland via container or trailer vessel and transported to destinations within the state by rail. Rail also provides a cost-effective and efficient way to transport heavy bulk commodities such as gravel and coal within the state. There is considerable potential for rail to support resource extraction in much of the state.

The Alaska Railroad provides passenger service, which is a needed transportation service to the state’s residents and supports the state’s tourism industry.

The 2016 ASRP provided the data and analysis to make decisions on the investments that would best support the state’s residents and visitors. The 2016 ASRP describes the state’s existing rail network, both passenger and freight, and their related impacts to the socio-economic fabric of the region. Most critically, the 2016 ASRP ensured that the Alaska state rail system is eligible to receive federal funding for rail projects.

1.4.2 Whitter Terminal Master Plan 2004

The 2004 Plan was commissioned to better understand the intermodal transportation development and needs of the region and assess the condition of the ARRC facilities. This

information was utilized to evaluate business opportunities and the best use of ARRC Whittier assets in meeting short- and long-term strategic objectives.

This 2004 Plan had predicted $17.6 million in revenue for Whittier by 2025, up from $6.5 million in 2004.

Many of the conclusions and proposed alternatives from the previous master plan are similar to those in the current master plan, as many of the same issues have continued to affect the region over the last 20 years. These were determined through similar fact-finding methodologies such as site visits, a review of existing information, and evaluation of facilities.

This effort highlights the criticality of ensuring that the currently suggested alternatives are completed to maintain safe operations well into the future.

More information on the conclusions and recommendations from the 2004 Master Plan can be found in Appendix G, Reference Documents.

1.4.3 Data Sources

Accurate data sources are critical to the development of transportation alternatives. The data utilized in developing the Whittier alternatives are listed here, highlighting their key points.

Seattle Barge Operations Data: Rail Car totals per quarter

See Appendix A, Figure 1 (Total cars shipped via barge).

Tunnel Traffic: Tolls and Hourly Traffic demand

- Since 2004, tunnel traffic has remained relatively consistent, averaging between 22,000 and 24,000 vehicles yearly.
- Of those totals, most crossings are made by Class A vehicles, with Class B vehicles making up most of the remainder, as seen in Table 1.

Table 1. All-Time Tunnel Crossings by Vehicle Class

Month	Class A	Class B1	Class B2	Class C	Class D	Class E	Class F	Class G	Class H	Total
Total	2,268,742	200,468	121,140	52,523	69,934	1,617	12,693	7,701	597	2,752,139
Ratio	82.44%	7.28%	4.40%	1.91%	2.54%	0.06%	0.46%	0.28%	0.02%	100%

Passenger Data: Passenger Platform Loading data

- Passenger trains operate between May and September.
- Alaska Railroad offers two daily round-trips to/from Whittier.
- Princess Cruise Lines meets each ship with two separate trains. Depending on vessel schedules, two to four round-trips are offered per week.

- The 800-foot-long passenger track accommodates most trains and is paved over to also allow passenger loading/unloading from the main track.
- If two trains are at the station simultaneously, one train may hold on the main track until the train on the passenger track has cleared.
- Only one train can be loaded/unloaded at a time.

2. Existing Conditions of Landside Terminal

See Appendix A, Figure 2 (Whittier Yard track map) and Figure 3 (Aerial image of Whittier).

2.1. Yard Tracks and Rail Operations within Terminal

The Whittier Terminal operation is ARRC's only rail connection with the rest of the North America rail network. Barge service is provided by Alaska Marine Lines (AML), utilizing one rail barge with eight 400-foot-long tracks and a capacity of 48 standard length railcars. The barge slip has three parallel tracks, meaning that the barge needs to be moved three times to unload and load railcars. The barge also has an upper rack structure that allows containers to be stacked above the rail tracks. Many of these containers are reloaded onto ARRC railcars for forwarding to AML's Anchorage terminal and ARRC's terminal in Fairbanks.

With the voyage between Whittier and Seattle taking nearly a week each way, and only three barges in service, harsh weather conditions in the Gulf of Alaska often delay the arrival of the barge at both Whittier and its southern terminus in Seattle, pushing back subsequent sailings. Also, the limited availability of barges that can carry railroad cars and are compliant with the Jones Act makes the augmentation of barge service very difficult to impossible. Seasonal fluctuations in freight traffic combined with weather delays often result in several hundred railcars waiting at Seattle for a berth on the barge. In recent years, BNSF Railway has placed periodic embargoes on railcars headed to Seattle and on the AML barge to limit the number of cars held on BNSF trackage in Seattle.

See Appendix A, Figure 4 (Inbound barge arriving at Whittier).

ARRC adjusts its rail service based upon the anticipated arrival of the barge. Sea conditions may delay the barge's arrival on short notice, so the railroad maintains some flexibility in calling train crews up until the last minute. There are two different trains called to meet the barge.

The first train is timed for arrival in Whittier close to the barge's estimated arrival time. The train is powered by three four-axle, GP-type locomotives and brings in containers destined for the top deck of the barge.

See Appendix A, Figure 5 (Inbound train preparing to enter the Anton Anderson Memorial Tunnel).

The two-man crew pulls the train up to the Whittier Street at-grade crossing, where the conductor drops off and instructs the engineer to pull the train ahead into yard tracks for unloading the containers. When the locomotives get close to the end of the track, the conductor

cuts the train, leaving the crossing clear, and is driven up to the locomotives, which he uncouples from the train. The conductor then rides the light engines back to the crossing where the power is coupled back on the train. The same procedure is followed until the entire train is safely parked in the yard. The crew then couples the power to what are called “idler” cars (the locomotives are too heavy to operate on the transfer span, so empty cars are used to couple to cars on the barge), moves the locomotives and idler cars to the barge lead, and waits for the barge to be docked.

See Appendix A, Figure 6 (Inbound train crew preparing to pull a cut of cars into the Rail Yard).

Once the barge is connected to the transfer span and the AML crew and conductor unsecure the railcars on the barge, the crew shoves the idler cars onto the span, then couples and pulls the first track off the barge and transfer span.

See Appendix A, Figure 7 (Inbound train shoving idler flats onto transfer span).

Once clear of the switch to the first track, the crew shoves the cars back and pulls the second track. The unloading starts from the portside track and then moves one track at a time across the barge, ending at the starboard track, with the AML crew constantly shifting the barge’s ballast to keep the deck level. After the first three tracks have been cleared, the AML crew shifts the barge so the middle two tracks can be unloaded. Once they are cleared, the barge is again shifted to allow the last three tracks to be unloaded.

See Appendix A, Figure 8 (The rail deck on the barge).

The train crew then pulls the cars in one group and shoves them in several yard tracks to await departure. During this switching process, the Whittier Street crossing is often blocked.

Upon completion, that crew ties up for rest. Once the train crew has pulled all the cars off the barge, AML uses container handlers to start unloading containers from the top racks. One container handler unloads from the transfer span on the stern while the other accesses the barge from the side ramp near the bow on the starboard side. After all containers have been unloaded, AML loads the outbound containers that came in by train, truck, or feeder barge.

See Appendix A, Figure 9 (AML container handlers unloading containers from the bow of the barge).

The second train, also with a two-man crew, is timed for arrival when it is estimated that AML will complete the container loading. The train is powered by four six-axle, SD-type locomotives and brings in railcars for loading on the barge. The crew yards the train in the same manner using whatever yard tracks are available. The crew then takes some loaded container cars and the freight cars from the inbound barge and departs for Anchorage with approximately 7,000 feet of train after about 3 hours of work. The yard during this time is at its most congested, with all inbound and outbound cars sharing the same limited number of yard tracks. The crew must often move groups of cars around several times to bring in the inbound cars and depart with the outbound ones. During most of this time, Whittier Street is blocked, and departure is sometimes delayed by train permission to use the tunnel.

The rested crew then gets back on duty, uses the four-axle units and idler cars to backload the barge with cars from Anchorage, and departs with 4,000 to 6,000 feet of container cars remaining from the previous departure.

See Appendix A, Figure 10 (Outbound train preparing to depart Whittier).

Overall, AML and the railroad can turn the barge in approximately 26–36 hours, weather permitting.

2.2. Passenger Loading Facilities

The Whittier passenger platform area consists of one stub-ended track that can accommodate a passenger train up to 800 feet long. The track is paved over, allowing passenger trains to load and unload on the main track as an alternative. Passenger train operations in the summer months (May–September) can be extensive, dependent in part on cruise ship sailing schedules. As many as 30 passenger trains in each direction per week can operate through the tunnel.[1] As inbound barge arrivals can happen at any time of day and unloading/loading operations must start immediately upon arrival, passenger and freight operations often conflict with each other. When multiple passenger trains are at Whittier, they may need to lay over in the yard, which is severely constrained when the railroad is switching the barge.

2.3. Transfer Span

The transfer span is a small three-track bridge built for the transfer of railcars from barges to the Rail Yard. The existing span is approximately 50 years old. When not in use, its free span ends sit in a fixed upper position on blocks. The span is lowered with hydraulic pistons to sit on the barge's stern during loading/unloading, and it can be adjusted vertically to accommodate changing tides.

2.4. Tunnel Restrictions

The Anton Anderson Memorial Tunnel provides the only land access to Whittier and is shared by highway vehicles and trains. It is the longest highway tunnel in North America at 2.5 miles. Access is controlled by the Tunnel Control Center (TCC), which safely separates train and road vehicle access. Highway traffic enters the tunnel for 15-minute periods on the hour and half-hour, with vehicles taking approximately 7 minutes to clear the tunnel. The remaining 8 minutes are available for a train if it is ready to depart. Trains often have to pull up and wait on either side of the tunnel for this small window of time. The tunnel is closed to highway vehicles at night, which permits more flexible rail access to the tunnel. Communication between the railroad and the TCC is critical to avoid northbound trains waiting an extended amount of time for tunnel access while blocking Whittier Street.

[1] Port of Whittier Freight Study, May 2020, pg. 14.

2.4.1 Vehicle Size Limitations

Normal Operations

Under normal operations, the following are the maximum dimensions of vehicles allowed to use the tunnel:

- Maximum of 10.0 feet wide (excluding mirrors)
- Maximum of 14.0 feet high
- Maximum of 75.0 feet long

See Appendix A, Figure 11 (Normal tunnel operation vehicle guidelines).

Special Operations

Large vehicles will be allowed to use the tunnel during special openings scheduled three to four times a week. The hours of special operations are updated periodically and change seasonally to best serve the requirements of the traveling public. According to the regulations, the following are the dimensions of vehicles allowed to use the tunnel during special operations:

- Greater than 10.0 feet and not to exceed 11.0 feet wide (excluding mirrors)
- Greater than 14.0 feet and not to exceed 15.0 feet high
- Maximum of 75.0 feet long
- Overweight vehicles are not permitted; their cargo must be sent via railway

See Appendix A, Figure 12 (Special tunnel operation vehicle guidelines).

Hazardous Materials

Hazardous materials have the following limits:

- No more than a total of 12 gallons of gasoline in an Underwriters Laboratory (UL) listed portable container (no combination of containers added together can total more than 12 gallons).
- Propane must be stored in containers designed for the transport of propane and cannot exceed a total combined capacity of 100 pounds.
- Acetylene must be stored in a single container designed for the transport of acetylene with a maximum capacity of 400 cubic feet.
- Materials that, by federal law, do not require placarding in quantities less than 1,001 pounds are restricted to 400 pounds in the tunnel.

Alaska Railroad Clearances

Any carload exceeding the dimensions shown in the Appendix A, Figure 13 (Double Stack Clearance Diagram), requires a clearance from the railroad before it can be moved. This diagram is for single carloads moving without overhangs beyond end of car and is based on

cars with a length not exceeding 90 feet over end sills, with truck centers not exceeding 66 feet, and overhangs not exceeding 12 feet.

Although the Anton Anderson Memorial Tunnel can accommodate double-stack railcars, there is another railroad tunnel (the “Portage” tunnel) immediately north of the Anton Anderson Memorial Tunnel whose clearance prevents the use of these cars between Whittier and Anchorage.

2.5. Snow Maintenance

The often-inclement weather in Whittier has a large impact on terminal operations. Whittier receives an average of 196 inches of precipitation annually, much of which comes in the form of snow that can total 20 feet in a season. The primary issue is where to put that snow after the tracks and yard are cleared. By regulation, the snow cannot be shoved into the harbor, so both ARRC and AML have developed tactics to place or sometimes move the snow to locations that allow operations to proceed. Keeping switches and frogs from ice buildup is also a persistent problem, as ice can derail a train if not constantly monitored. Redevelopment of the yard and terminal facility must take winter operations and snow removal into consideration.

3. Whittier City Facilities

The Whittier Boat Harbor is outside of the scope of this project but is generally used for personal pleasure craft and private fishing vessels. There is a not a sizeable commercial fishing industry operating from the Whittier Boat Harbor. The DeLong Dock, owned and operated by the City of Whittier, is the primary base of operation for commercial fishing cargo transportation.

4. Ferry Terminal

The Whittier Ferry Terminal is part of the Alaska Marine Highway System, which stretches 3,500 miles along the Alaska and Pacific Northwest coastline from Bellingham, Washington, to Dutch Harbor, Alaska. The ferry route between Washington and Whittier is the most popular route choice, as Whittier is the closest ferry terminal to Anchorage. Most communities in Southeast Alaska receive year-round service, but ferries are sometimes delayed due to ice and weather conditions. As these ferries have both vehicular and pedestrian traffic, the connection between the ferry terminal and the rest of the Whittier transportation network is critical for the safe movement of ferry passengers.

See Appendix A, Figure 14 (Alaska Marine Highway System).

4.1. Cruise Dock

The Whittier Cruise Ship Terminal serves the following cruise lines: Princess Cruises, Holland America Line (HAL), Norwegian Cruise Line (NCL), Oceania Cruises, UnCruise Adventures,

and Seabourn Cruises. Cruise passengers are connected to inland points, such as the Ted Stevens Anchorage International Airport, via buses or special trains.

There are two cruise ship terminals in Whittier, the “Carnival/Princess” Dock adjacent to the Terminal Reserve Land, and the “Huna Totem” Dock at the Head of Resurrection Bay, both which are destination “turnaround” ports. The larger cruise ships can carry more than 5,000 passengers and cause traffic congestion when ships call on Whittier. There are nearly 100 cruise ship visits scheduled to call at Whittier for the 2025 May–September season.

4.2. Railcar Fleet and Yard Equipment

ARRC currently has 296 flat cars on its roster, which comprises 45 percent of ARRC’s total fleet of 682 railcars. ARRC plans to purchase 20 new 65-foot flat cars to improve the reliability, efficiency, and capacity of ARRC’s freight rail services.

The new cars, with wood-decked surfaces, will be used to provide intermodal (container-on-flatcar and trailer-on-flatcar) service and manifest freight service (i.e., hauling pipe, machinery, lumber, and other products) along the ARRC corridors from Seward and Whittier, through Anchorage, and north to Fairbanks and North Pole. The equipment will replace aging 53-foot flat cars, built in 1976, that are nearing the end of their maximum 50-year revenue service life.

In contrast to current intermodal operations within the Lower 48 states, ARRC does not currently operate railcars capable of double stacking containers. The current vertical clearance limitation of the Portage tunnel does not permit the operations of double-stacked containers, but elimination of that physical impairment would allow for the double stacking of containers between Whittier and Anchorage. The operational efficiencies of double stacking are well documented, as the density of containers moved per foot of train is nearly doubled. Within a space-restricted terminal like Whittier, the reduction in train length made possible via double stacking would reduce the number of tracks required and reduce switching and movements of the railcars within the terminal for each train arrival and departure event. This in turn reduces the time and manpower required to handle the same number of containers, reduces the opportunities for blockage of the at-grade crossing, and potentially allows for additional traffic to be moved through the terminal.

The full fleet breakdown is shown in Table 2.

Table 2. Fleet Breakdown

Fleet	Description	Fleet (cars)
Flat Car	Moves trailers and containers, pipe, lumber, and heavy equipment.	296
Air Dump	Side-dumping railcars used primarily to transport ballast and other rock material for track maintenance.	31
Open Top Hopper	Moves bulk solids, primarily coal and gravel, and unloads from the bottom.	326
Covered Hopper	Moves dry bulk, including grain, fertilizer, and cement.	29

Fleet	Description	Fleet (cars)
Tank Car	Moves liquid bulk cargo, including jet fuel, gasoline, asphalt, vegetable oils, aircraft deicer, and various other chemicals.	209 privately leased/owned[a]

Source: Alaska Railroad, Business Facts, May 5, 2023, "Freight Services Business." https://www.alaskarailroad.com/sites/default/files/Communications/FACT-SHEET_2023_ARRC_Freight_Business_or.pdf.

[a] ARRC also hauls cargo with cars owned or leased by customers, who contract ARRC to perform operating maintenance only.

4.3. Public Transportation in Whittier

4.3.1 Residential Vehicles

The City of Whittier has a year-round population of around 200 residents. Most of the residents live within a condominium community in the city center area, on the mountain side of the Whittier Terminal tracks. The only road access to and from the city center is via the Whittier Street at-grade crossing of the ARRC mainline tracks. This at-grade crossing is the only way public vehicles can leave the city center to access the Whittier Tunnel, the Cruise Ship Terminals, or the Whittier Boat Harbor waterfront. These facilities are critical to the everyday lives of the town population, whether for work or recreation.

There are sometimes delays for vehicles, as trains can block the at-grade crossing for stretches of time. Delays can cause vehicles to miss the hourly tunnel openings. This issue is notable, as much of the parking for the waterfront is on the mountain side of the tracks. This creates an issue for drivers to find usable parking when there is a train on the tracks at the crossing.

4.3.2 Pedestrian Traffic

Residents and visitors may walk to and from the city center across the at-grade crossing or through the pedestrian tunnel underneath the tracks, which is located approximately 1,600 feet east of the at-grade crossing. The primary concern here is that the pedestrian tunnel option is not used to its fullest extent due to location, lighting, signage, and winter maintenance frequency. Although more convenient, using the at-grade crossing poses safety concerns by creating pedestrian-rail conflicts.

4.3.3 Commercial

Most of the commercial vehicle movements within Whittier occur between the tunnel and the terminal, as the majority of the inbound and outbound freight is ultimately moved via the barge to the U.S. mainland. Limited local deliveries within the town also occur, as do movements of petroleum products from the distributor that imports petroleum products by railcar for local distribution.

4.3.4 Tourism

Tourism is a critical economic driver in Whittier, but it is very seasonally based. During the summer months, the Whittier Boat Harbor is utilized as a launching point for the region's recreational boat fleet. Prince William Sound is considered one of the more naturally beautiful regions in this part of the country, and many visitors make a day trip to Whittier for sightseeing. Otter Creek Tours is based in Whittier and has a fleet of three boats. In addition to daily sightseeing trips, the boats are used as water taxis for long-term campers in the region. The cruise ship terminal also drives significant seasonal traffic, as discussed previously in this Study.

4.3.5 Conflict Points

The primary conflict point for the region is the Anton Anderson Memorial Tunnel. It is a one-way tunnel that serves motor vehicles and trains. Directional access through the tunnel for motor vehicles occurs every 30 minutes, requiring scheduling to ensure that it meets the opening windows. Directional access through the tunnel is limited to 5-minute windows during freezing temperatures and winter openings. Additional motor vehicle delays may occur when unscheduled trains require access. There are restrictions on what kind of goods can be moved through the tunnel.

The tunnel is a major point of conflict for passengers and cargo, contributing to the massive amount of backup from tourist traffic throughout the summer months.

The other primary conflict point is the Whittier Street at-grade railroad crossing. This is the only road connection between the two sides of Whittier and is often blocked by freight trains when the barge is being switched. The major parking area for recreational vehicles and boat trailers is across the tracks from the Whittier Boat Harbor. Significant vehicular delays occur when the railroad is switching a barge during daylight hours.

See Appendix A, Figure 15 (Whittier Street at-grade crossing conflict point).

4.3.6 Future Development

Construction of a 2.0-mile segment of Shotgun Cove Road has been completed heading east of the city center. The Shotgun Cove Road extension will continue to be developed with the addition of 2.5 miles to Trinity Point, which will provide access to recreational areas and City land for commercial and residential development. Shotgun Cove Road is accessed by the public through the railroad at-grade crossing if travelling from the city center. An increase in traffic on the road will increase the number of vehicle delays at the at-grade crossing if it is not grade separated.

4.4. Stakeholder Engagement

The City of Whittier's community and economy are inexorably tied to the Alaska Railroad. Over the last 60 years, the City has grown around the ARRC's Terminal facilities, and both the City and local businesses hold long-term leases for waterfront and upland property. Because of the close association between the ARRC and the City, input from key stakeholders was critical to

identifying opportunities and issues to be considered in the Whittier Terminal Master Plan's development. Internal and external stakeholders were engaged early in the process to identify a vision for the Plan's development, and provide their perspective on land use, the transportation network, opportunities for development, and infrastructure needs.

See Appendix E, Stakeholder Engagement Report, for combined documentation from stakeholder activities for the plan.

4.4.1 Challenges

Primary concerns raised by external stakeholders included the relationship between ARRC's rail operations and DOT&PF's tunnel operations and emergency response. Tunnel openings are established by DOT&PF, and delays in tunnel operations can result in railcars blocking access between the waterfront and upland areas. This is of particular concern in case of tsunami or other natural disaster that requires rapid access to higher ground.

Access to waterfront property is another point of concern, especially for local businesses. Current beach access is via land leased from ARRC. External stakeholders expressed a strong desire for continued waterfront access for business and public recreational use.

The ARRC Marine Terminal bisects the City, which creates a variety of land use and access issues:

- Impeded access to the ferry terminal for vehicles and pedestrians.
- Impeded access to parking for the small boat harbor.
- Inconvenient and unsafe pedestrian/road crossing between the City's residential and long-term parking areas to the waterfront.
- Difficulty in direction-finding for visitors and tourists, which is a safety issue if people end up on railroad property by mistake.
- Difficult access to commercial sites on the City side of the tracks.

Tourism will continue to grow in Whittier, and the biggest question is how to move motorcoaches, private vehicles, freight, and trains effectively and lessen negative impacts in the Whittier core.

4.4.2 Growth Needs

The main conflict between the City and rail operations is land use. While Whittier desires increased population growth, the City cannot grow economically or otherwise without more access to developable land, including land for necessary public works infrastructure.

5. Proposed Alternatives for Landside Terminal

In response to the ongoing operational challenges and structural concerns at the Whittier Terminal, an alternatives analysis was performed to address the reconstruction of the waterfront

facilities. Details of the analysis and a final recommendation on the preferred alternative are documented in Appendix D, the Waterfront Reconstruction Study.

The aim of all alternatives was to improve the overall functionality, safety, and longevity of the terminal's infrastructure while maintaining efficient operations. Each alternative presents distinct approaches for the relocation or reconstruction of critical waterfront elements, including the waterfront. The following sections present benefits and challenges of a number of landside terminal alternatives, focusing on operational efficiency, construction feasibility, and cost considerations based on the preferred waterfront reconstruction alternative, reconstructing existing facilities in-place, leveraging the current location's known environmental conditions, and infrastructure advantages.

5.1. South Terminal Track Realignments

Need/Challenge: Existing track alignments within the terminal are not optimized, resulting in insufficient and unusable track length for loading and unloading trains and storing cargo. Maintain truck traffic and lift equipment routes within the terminal to allow side handling of containers.

Proposed Solution: Realignment and installation of additional working tracks within the terminal.

There are three options (A, B, and C) presented to realign terminal tracks:

- Option A:
    - Add a pair of dock tracks to the railroad east (geographic north) of the barge slip.
    - Realign the slip lead and add working tracks on either side.
    - Relocate the ramp track to provide for circus loading of vehicles to flat cars.
    - Add a full length of additional Lower 3 track (1,680 feet).
    - Extend the Oil Track an additional 500 feet.
    - Net gain of 3,720 feet in intermodal working track length.
- Option B:
    - Add a pair of dock tracks to the railroad east (geographic north) of the barge slip.
    - Add a pair of mid-tracks to the railroad east (geographic north) between the existing slip lead and proposed dock tracks.
    - Relocate the ramp track between the slip lead and lower tracks. Add side ramp loading capability.
    - Add a partial length of additional Lower 3 track (685 feet).
    - Extend the Oil Track an additional 500 feet.
    - Net gain of 2,670 feet in intermodal working track length.
- Option C:
    - Add a pair of dock tracks to the railroad east (geographic north) of the barge slip.

- Realign the slip lead and add working track along the south side.
- Relocate the ramp track to the end of the work track, near the stern ramp of the barge. Add side ramp loading capability.
- Extend the Bay track (1,020 feet) for intermodal transfer.
- Extend the working length of the Mountain track (1,325 feet) for intermodal transfer.
- Reconfigure the railroad west end of the freight tracks and provide a Bay escape track.
- Extend the Oil Track an additional 500 feet.
- Net gain of 1,815 feet in intermodal working track length.

5.2. Second Main Track from Whittier Creek to Tunnel Entrance

Need/Challenge: Switching operations within the terminal are limited by the single main track from the Whittier Creek crossing to the Whittier Tunnel entrance. This creates a bottleneck where freight operations are hindered during days of heavy passenger traffic and vice versa. Increasing track capacity by double tracking from the tunnel entrance to the north end of the terminal will improve capacity and provide for more flexible freight and passenger operations within Whittier. Further, the installation of a new track will provide an opportunity to build a level passenger boarding platform to allow for a safer and more convenient passenger boarding experience.

Proposed Solution: Construct a second main track from Whittier Creek to the tunnel entrance. Include a level passenger boarding platform to improve the experience for passengers.

5.3. Grade Separation of Camp Road and Whittier Street

Need/Challenge: The existing at-grade crossing at Whittier Street is a safety concern and operations choke point for rail operations within the terminal. During barge loading and unloading, the crossing is frequently blocked, cutting off Whittier proper (including boat harbor/boat trailer parking) from the waterfront and tunnel access.

Proposed Solution: Construct a grade-separated crossing at Whittier Street:

- Utilize the existing hillside above the current passenger loading area to the west of Whittier Creek for a new roadway (Whittier Street).
- Move the crossing to the west end of the passenger loading area and grade raise Camp Road.
- Construct the elevated portions of Camp Road on piers to allow for snow removal on the railroad tracks under and through the elevated structure.
- Construct a new pedestrian “salmon walk” along Whittier Creek to facilitate foot traffic from the parking area to the boat harbor, waterfront, etc.
- Construct an alternative bus parking area on the waterfront side of Camp Road with pedestrian access directly from buses to the train passenger loading area to increase accessibility and safety.

5.4. New Gates and Security Fencing

Need/Challenge: ARRC is required to maintain a secure perimeter around the terminal. Changes to the proposed track alignments and truck routing will require moving some gates and installing new fencing in certain areas.

Proposed Solution: install new gates and fencing in strategic locations:

- Relocate the existing security gate and fencing geographic west towards the ferry terminal to allow for the new ramp track construction location.
- Construct a new primary truck entrance to the terminal off Whittier Street to improve traffic flow and circulation of both terminal and non-terminal traffic.

Add new fencing as needed throughout different phases of terminal construction to maintain a secure perimeter at all times.

5.5. Other Reconstruction Considerations

Snow removal and storage is a known issue in Whittier. Grade separation will be column-supported to allow snow removal from tracks underneath the raised road. Removal of the fish-packing facilities (no longer in service) will provide for additional snow removal area within ARRC right-of-way. Consideration(s) will be made in the Whittier Terminal Master Plan to maintain DOT&PF and City of Whittier snow relocation and maintenance operations.

6. Summary and Recommendations

Alternative 2A - Reconstruct Existing Berthing Facilities in Place was determined to be the preferred alternative as documented in the corresponding Waterfront Reconstruction Study (Appendix D). This alternative provides multiple improvement opportunities that can be implemented as funding becomes available. Due to the variety of projects, it is preferable that the funding plan takes a holistic approach based on applicable funding sources. All alternatives in the Waterfront Reconstruction Study include a version of the south terminal track realignments, second main track extension, grade separation, and reconfiguration of security gates and fencing. Of the three options presented for the south terminal track realignments, Option C is the recommended option as it provides for the best truck traffic flow while also providing the longest lengths of working track for the Mountain and Bay tracks.

To incorporate these recommendations and findings into the Whittier Terminal Master Plan, this Study will be presented to the public and the terminal and rail partners for their input. After their input is received, it will be incorporated into the Study, and any changes implemented will be analyzed and corrected for potential recommendations. That finalized Study will then be implemented into the Whittier Terminal Master Plan with an action plan for the investments to guide their achievement. A funding and action plan will be written to lay out the process and potential funding sources for Alternative 2A.