EXISTING AREA – SITE PLAN – AERIAL PHOTO

0' 600' 1200' 1800'
SCALE: 1" = 600'
(11x17 SCALE: 1" = 1200')

NORTH

FIGURE D-1

Vickerman • Zachary • Miller
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FILE:	J:\980730\V1\01\V10-D-1
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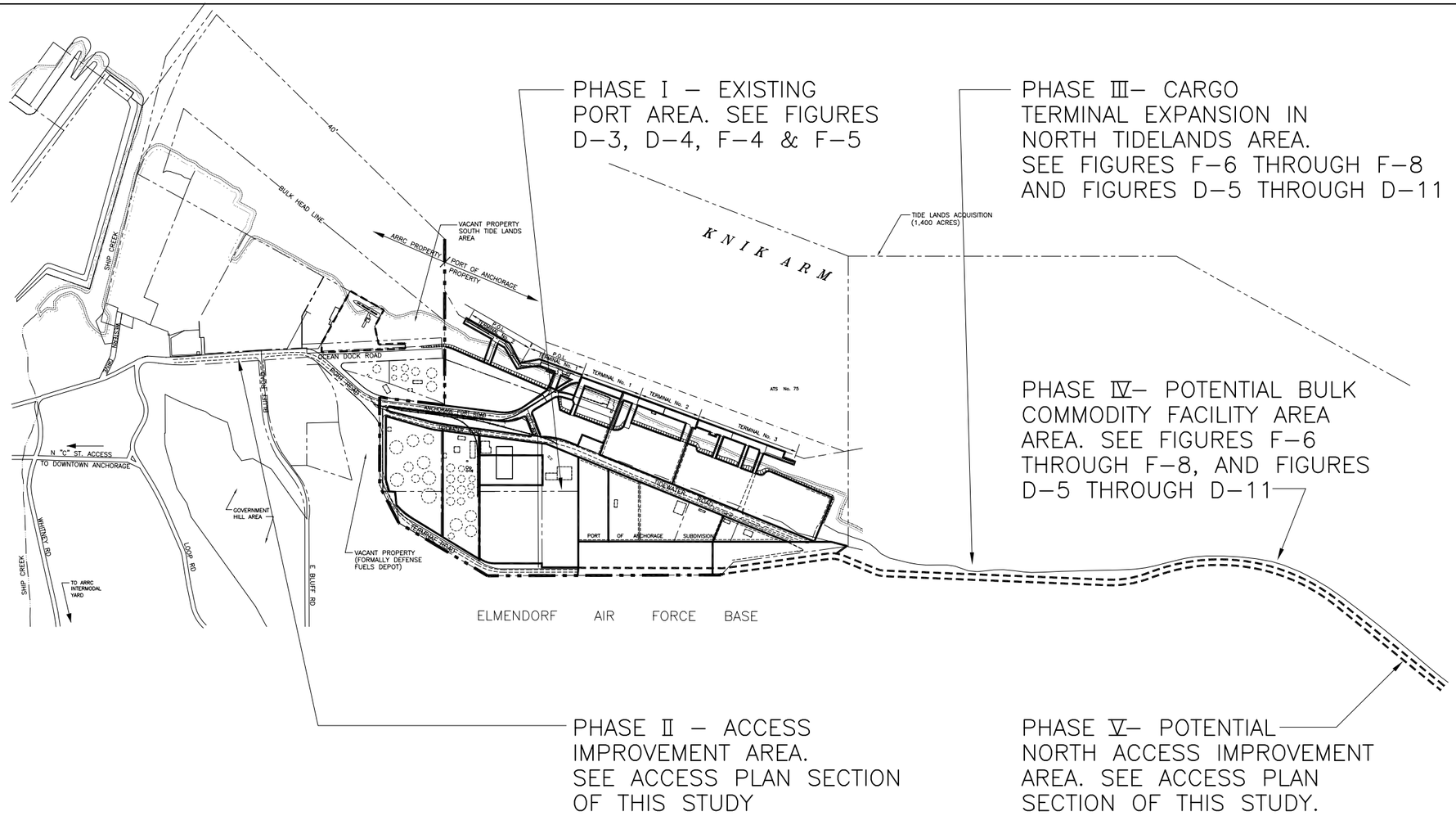

GRAPHIC SCALE

600 0 300 600 1200

(IN FEET)
SCALE: 1" = 600'
(11x17 SCALE: 1" = 1200')

NORTH

FIGURE D–2

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FILE:J:\980730\FINAL-AUG99\FIG-D-2	
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GRAPHIC SCALE
300 0 150 300 600
(IN FEET)
SCALE: 1" = 300'
(11x17 SCALE: 1" = 600')

40'
SUBMERGED LEASE AREAS
VACANT PROPERTY (FORMALLY CHUGACH ELECTRIC)
VACANT PROPERTY SOUTH TIDE LANDS AREA
BULK HEAD LINE
ARRC PROPERTY
PORT OF ANCHORAGE PROPERTY
K N I K A R M
POTENTIAL PASSENGER AND CARGO INTERMODAL RAIL ACCESS, SEE ACCESS PLAN
RENOVATE/EXPAND P.O.L. NO. 2 FOR LB/DB/PASSENGER/ GENERAL CARGO USE
COMBINATION CONTAINER/ PASSENGER/MISC. USE.
P.O.L. NO. 1 TO REMAIN
BREAK-BULK/MISC. TERMINAL
NEW TRESTLE
ABANDON ROAD
ATS No. 75
P.O.L. TERMINAL No. 2
P.O.L. TERMINAL No. 1
TERMINAL No. 1
TERMINAL No. 2
TERMINAL No. 3
SHIP CREEK
WESTERN DRIVE
OCEAN DOCK ROAD
PORT ROAD
BLUFF ROAD
CONSOLIDATE ROADS INTO ONE ACCESS
ANCHORAGE PORT ROAD
TIDEWATER ROAD
TERMINAL ROAD
NEW GATE (LOC. MAY VARY)
CONTAINER TERMINAL
CONTAINER TERMINAL
OPT. GATE
PORT OF ANCHORAGE SUBDIVISION
NEW GATE (LOC. MAY VARY)
FUTURE ROAD TO NORTH TIDELANDS EXPANSION OR NORTHERN ACCESS
N "C" ST. ACCESS
TO DOWNTOWN ANCHORAGE
GOVERNMENT HILL AREA
WHITNEY RD
LOOP RD
E BLUFF RD
SHIP CREEK
TO ARRC INTERMODAL YARD
VACANT PROPERTY (FORMALLY DEFENSE FUELS DEPOT)
LEASE LINE MAY VARY
SECTION LOT 3
E L M E N D O R F A I R F O R C E B A S E
NORTH

FIGURE D-3

PORT OF ANCHORAGE, ALASKA
PHASE IA - SITE PLAN

SHEET NO. D-3 REV. NO. △

IG-D-3.DWG User: hadorfmeier

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FILE: J:\980730\FINAL-AUG99\FIGD-3	
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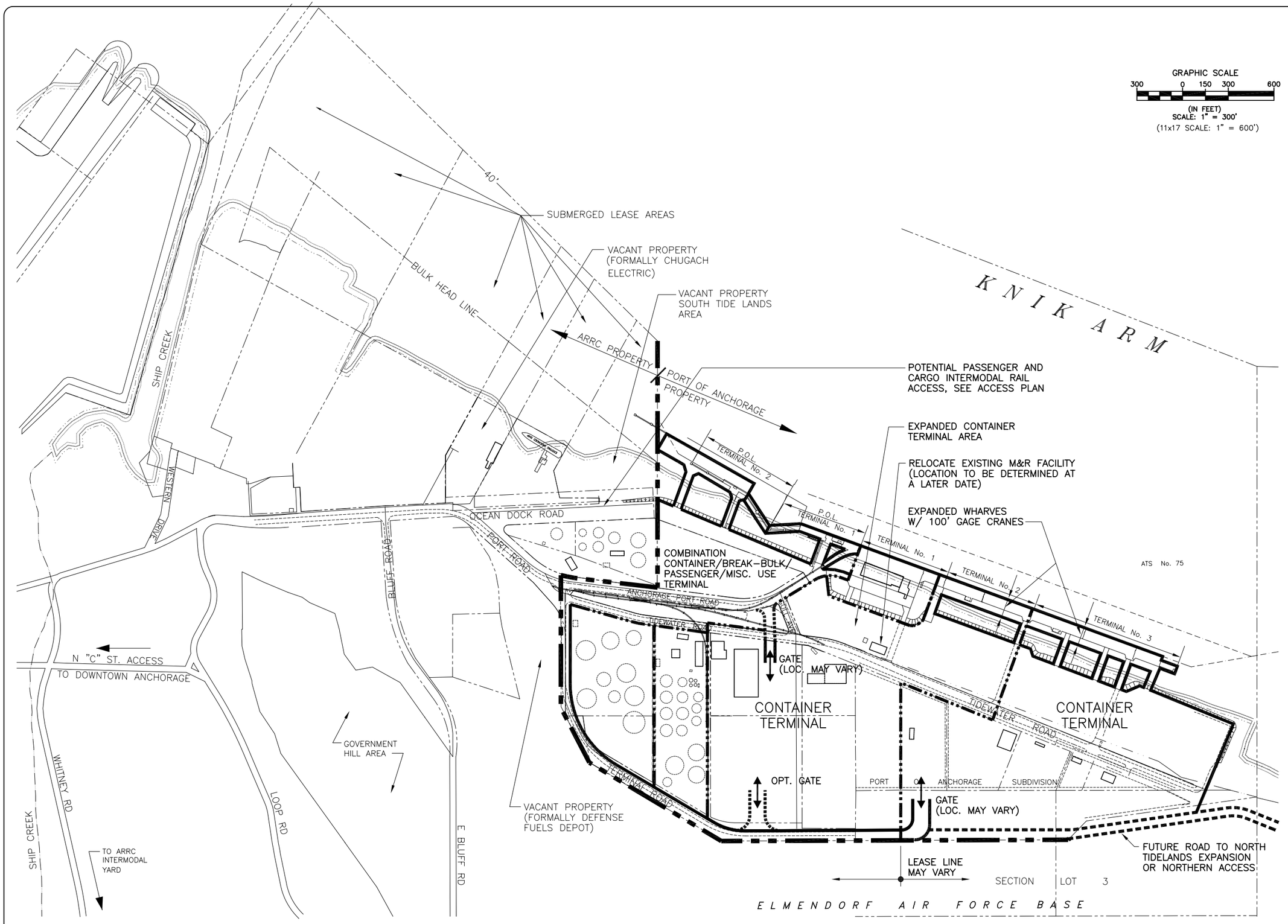

FIGURE D-4

PORT OF ANCHORAGE, ALASKA

PHASE IB – SITE PLAN

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FILE: J:\980730\FINAL-AUG99\FIG-D-4	
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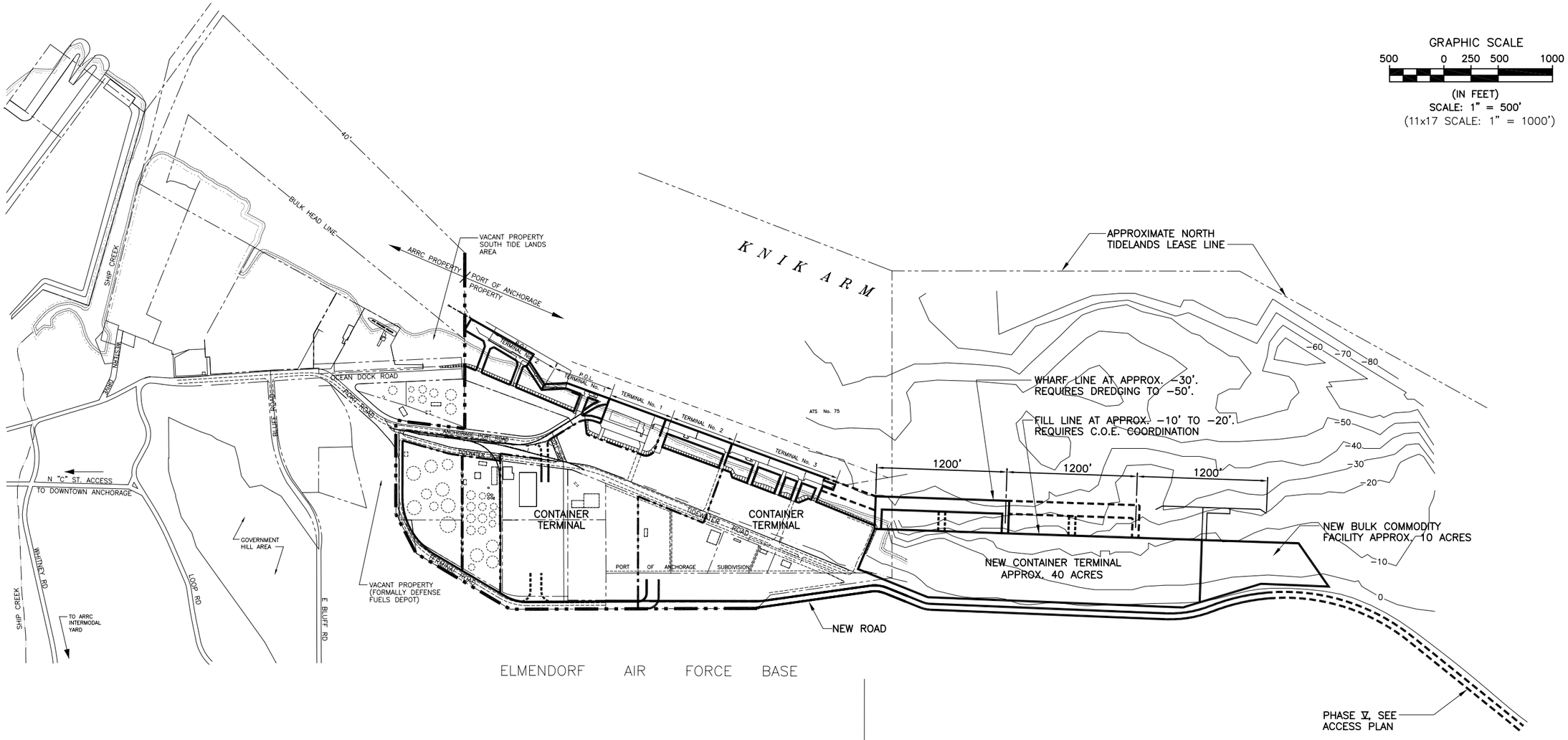
SHEET NO. D-4 REV. NO. △



ALTERNATIVE 1 – SITE PLAN

NOTE

BATHYMETRY IS APPROXIMATE AND BASED UPON INFORMATION PROVIDED BY PORT.

NORTH

FIGURE D-5

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FILE: J:\980730\FINAL-AUG99\FIG-D-5	
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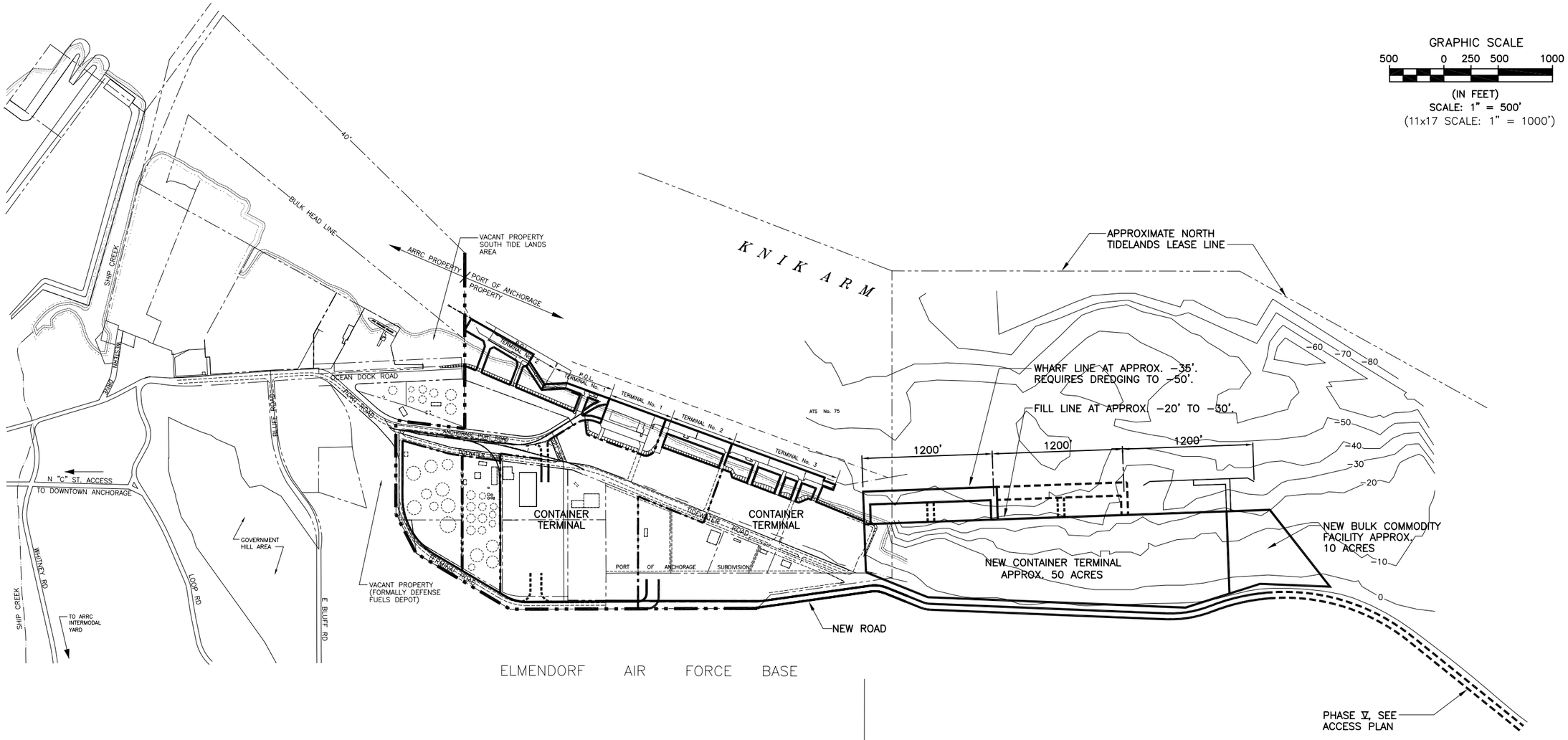

ALTERNATIVE 2 – SITE PLAN

NOTE

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FIGURE D-6

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FILE: J:\9980730\FINAL-AUG99\FIG-D-6	
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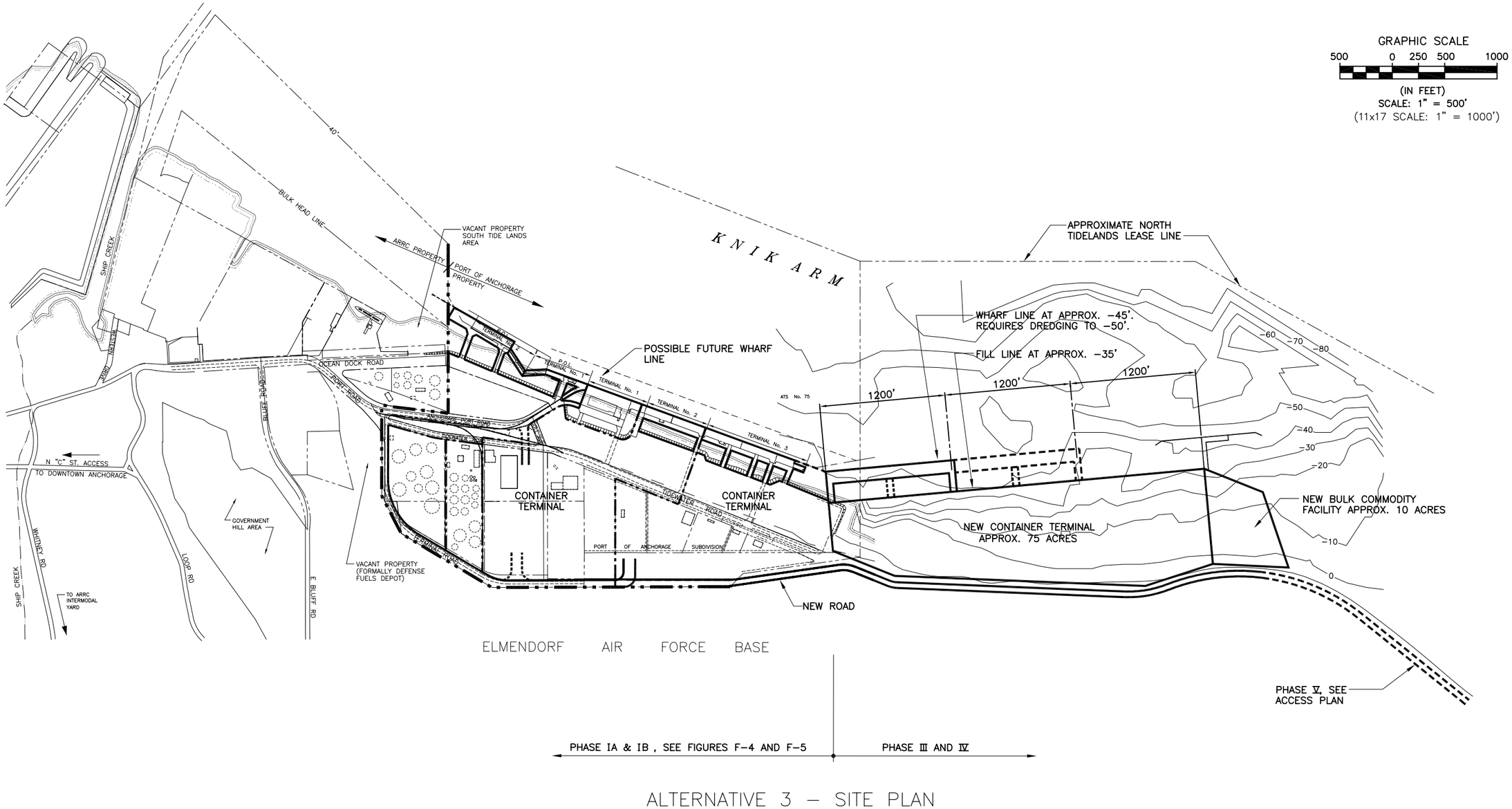

ALTERNATIVE 3 – SITE PLAN

NOTE

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FIGURE D-7

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FILE: z:\980730\FINAL-AUG99\FIG-D-7	
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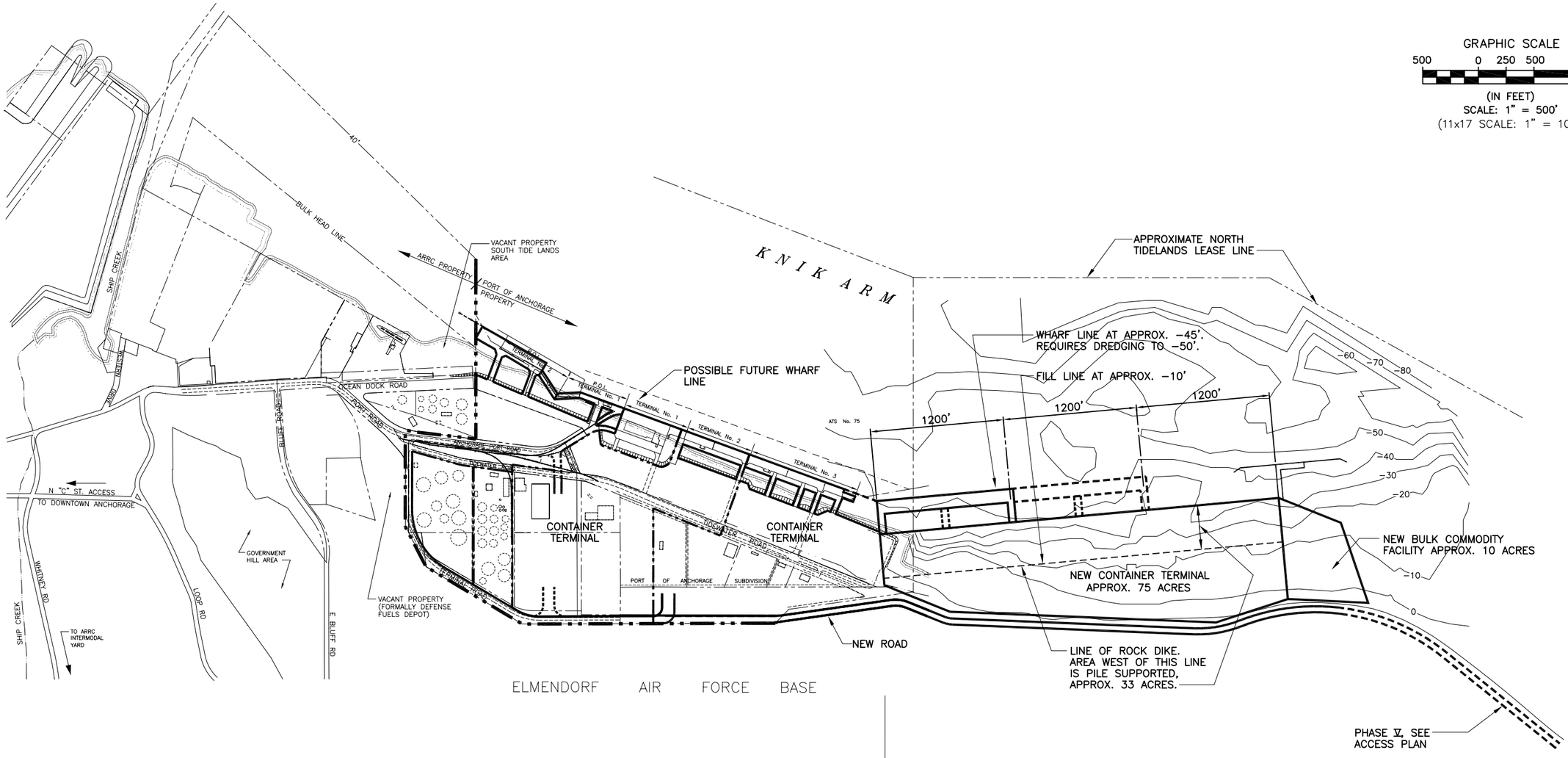

ALTERNATIVE 4 – SITE PLAN

NOTE

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NORTH

FIGURE D-8

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FILE: J:\980730\FINAL-AUG99\FIG-D-8	
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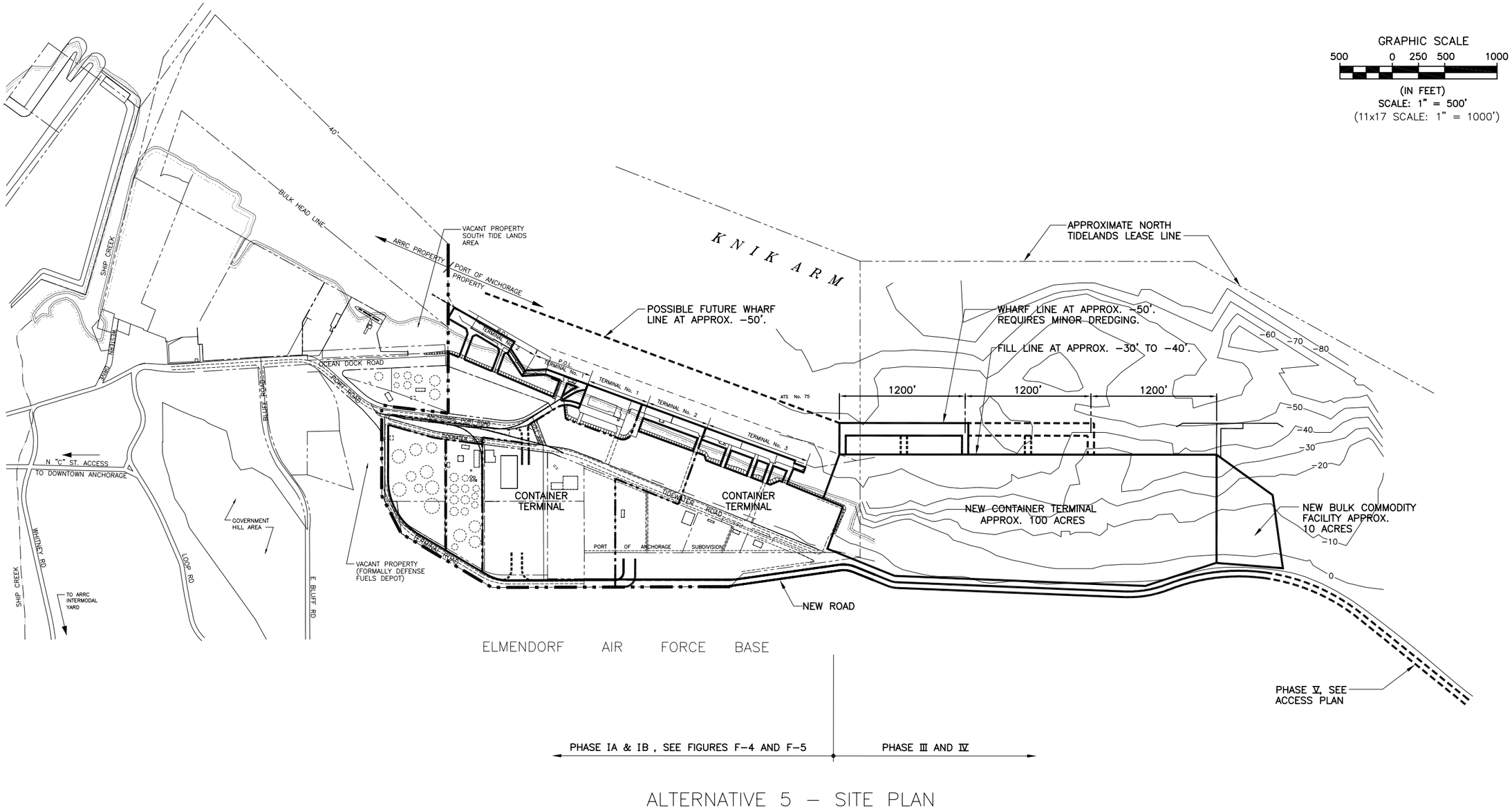

ALTERNATIVE 5 – SITE PLAN

NOTE

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FIGURE D-9

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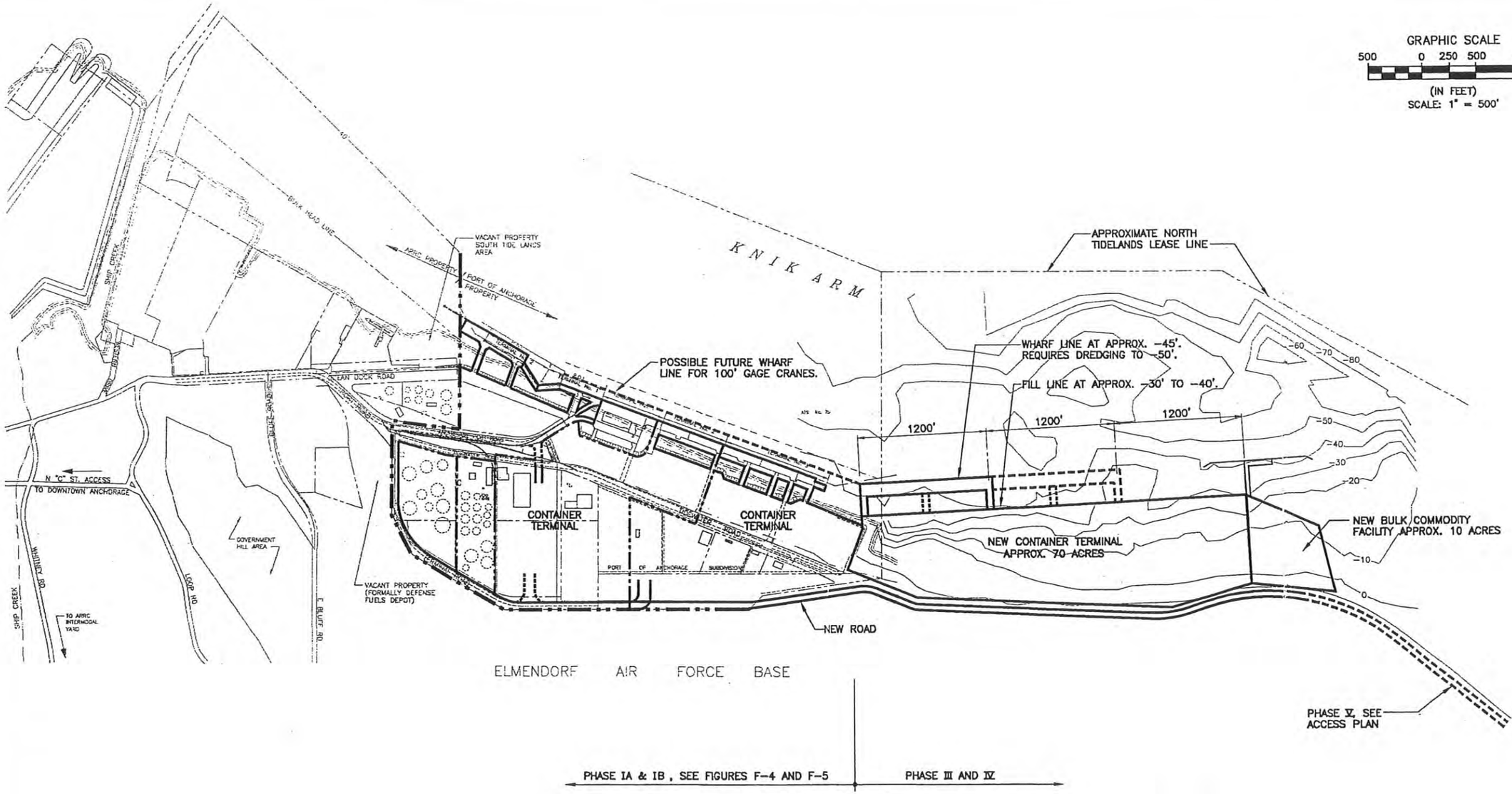

ALTERNATIVE 6 – SITE PLAN

NOTE

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FIGURE D-10

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FILE: J:\V980730\PMAL-AUG99\FIG-010

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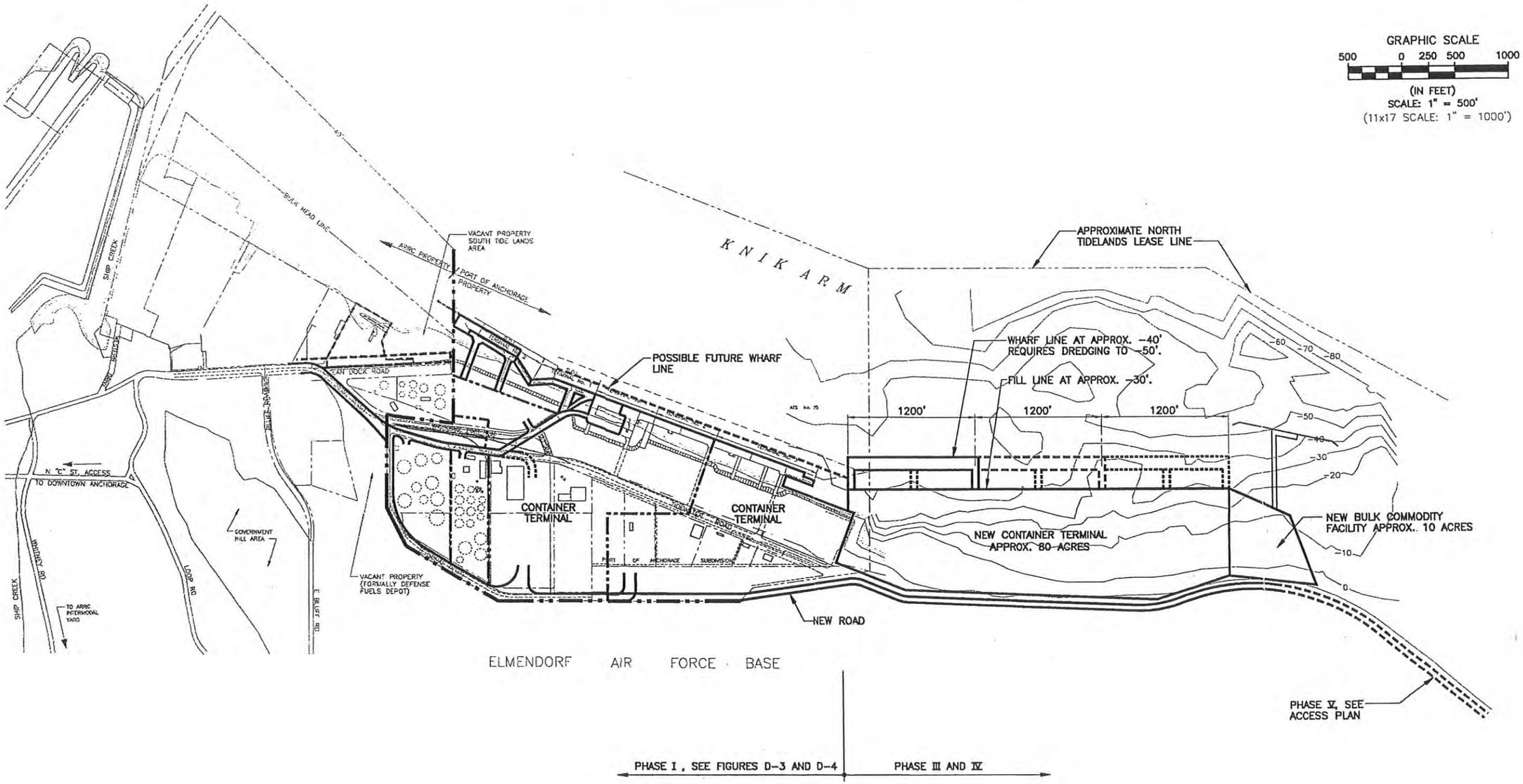

ALTERNATIVE 7– SITE PLAN

NOTE

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FIGURE D–11

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E. RECOMMENDED DEVELOPMENT PLAN

E.1 Evaluation of Alternatives

This section provides the methodology for the steps that led to the evaluation of the 12 Alternatives that were developed as part of the Draft Facilities Plan submittal. From the presentation of the Draft Facilities Plan and subsequent meetings with the consulting team and Port staff, it was determined that three Alternatives merited further review and refinement. The three Alternatives are:

- Alternative 1
- Alternative2
- Alternative 3

These Alternatives were considered to represent the best scenario for meeting the Port's needs for a market driven Master Plan well into the next century. It is important to recall that the consulting team and Port staff agreed to, and initiated this Master Plan project with the intent to meet the project goal.

The goal of this Master Plan is:

To provide a market driven Master Plan through the year 2020 for the Regional Port of Anchorage which will guide a pragmatic, environmentally sound program to stimulate and accommodate economic development, employment opportunities and an efficient transportation element serving Alaska.

In support of this goal, a number of project objectives have been identified. The Master Plan must also be:

- **Market driven** and responsive to competitive commercial and economic forces, opportunities and constraints.
- **Environmentally and aesthetically responsive** to the existing, planned and potential assets of the region.
- **Balanced** to accommodate growth in local, Alaskan and international trade.
- **Integrated** to optimize an efficient water, land and air transport network.
- **Cost effective and defensible**, with maximum utilization of existing assets, at reasonable world's best practice levels, prior to relying on expensive new developments.
- **Achievable and pragmatic** with realistic early phases which can grow to accommodate long-term success.
- **Flexible and expandable**, on both Master Plan and terminal levels to allow for future variations.

These three Alternatives were chosen because they best meet the challenges of the key project criteria and because of critical cost and environmental impacts considerations such as minimal encroachment into and fill of Knik Arm, minimal requirements for non-Port owned land, expandability and other key issues. The selection of the three Alternatives led the consulting team ultimately to the selection and refinement of one Alternative into the final Recommended Development Plan. **Alternative 3 has emerged as the clear winner in meeting the project goal and objectives.**

E.2 Selection and Refinement of Recommended Plan

Alternative 3 has been chosen to represent the Recommended Development Plan for the Regional Port of Anchorage's Master Plan because it can be built with a modest fill program while still meeting the needs of the Port's future throughput capacity requirements. In addition, Alternative 3 represents several optional development scenarios, or phasing options that allow for the ultimate flexibility and expandability of development options.

Alternative 3's flexibility and expandability are responsive to the 'market driven' approach that the consulting team has embraced throughout the course of the Master Plan. In essence, should the Port's throughput follow the medium forecast growth scenario, we have incorporated the ability for a 'medium-build' approach to the Northern Tidelands development. We anticipate that a modest 20-24 acre (Phase III-A) cargo terminal should be considered.

However, should the high forecast be realized, then a more robust development scenario could also be accomplished with some revisions to the plan. We have indicated this more aggressive development approach with Optional Phasing scenarios that consider larger land areas. In addition, additional berths may also be needed. We have performed a Berthing Analysis that indicates that at least 1-new berth will be needed as soon as 2002-2005. However, once again, should the high forecast be realized several caveats have been incorporated into the Phasing Plan that would provide for the development of additional land in order to accommodation the increased throughput.

As mentioned in the Analysis of Capacity and Demand:

- Approximately **56 acres (medium forecast) to 89 acres (high forecast)** will be needed for new containerized cargo facilities. Approximately **0 to 12 acres** will be needed for the remainder of other uses and cargo types. The 0 acres assumes that future non-container cargo needs (mostly auto storage) can be accommodated in the Defense Fuels area. The 12-acre need is for the commodities/coal terminal, which would be needed in the North Tidelands area to accommodate the high forecast.

And as mentioned in the Berth Occupancy Analysis: If new cargo facilities are constructed in the Northern Tidelands, it will be necessary to:

- Construct 1 new berth in the Northern Tidelands area in order to accommodate all of the future cargo capacity requirements sometime between the years 2005-2010 under the medium forecast.
- Also under the medium forecast, a second berth is not needed until after 2020.
- Using the high forecast, a new berth will be needed between 2000 and 2005.
- Also using the high forecast, a second new berth may be required around 2015. Then, like the medium forecast, an additional (or third) berth could be required after 2020.
- In addition, the provision for a possible third berth should always be considered during any subsequent planning or design phases for new terminal development. This could have implications as to the subsequent configuration and arrangement of the proposed commodities/coal terminal berth.

The Recommended Master Development Plan has been further refined and modified to reflect this requirement for additional land and berths to meet the Port's future needs. And we have indicated how an additional berth could be needed (shown dashed) should the Regional Port of Anchorage achieve the high forecast. Furthermore, we have indicated on the Plan, a slightly revised alignment of the Commodities/ Coal Terminal adjacent to Cairn Point (approximately 12 acres). However, the final design and configuration of the proposed Commodities/ Coal Terminal will likely require further review and refinement to determine it's optimum orientation and configuration. Because the products delivered to the wharf, for this type of terminal development can be conveyed by several means, the exact configuration of the berth(s) will require further scrutiny prior to preliminary design. We have located it in-line with the new container terminal berths for optimum berthing opportunities.

The ultimate build-out of the Recommended Master Development Plan would provide for an approximately 66 to 72 acre containerized cargo terminal, depending on the position of the bulkhead line (and possibly 2-berth scenario). However, a provision has been included (Phase III-D) which considers an expansion to approximately 102 acres, which incorporates the expansion into the adjacent bluff.

The Recommended Master Development Plan is presented in Figure E-1.

F. IMPLEMENTATION

F.1 Overview

This section presents the recommended steps and methodology for phasing, approximate construction costs and sequential procedures for the implementation of the Recommended Master Development Plan. These steps occur over the course of approximately 20-years (in approximately 5-year increments), however, provisions should always be made for design and planning considerations for events beyond the year 2020. These include, but should not be limited to; changes in ship size and the effect this will have on all aspects of infrastructure, etc., potential increases for intermodal rail and transshipment cargo, Port access issues, and other factors.

In addition, because the Master Plan for the Regional Port of Anchorage is market driven, this Development Plan should be reviewed periodically to ensure that trends and other trade implications are consistent with how the development of new terminals and infrastructure is ultimately implemented. In other words, should the high trade forecasts be realized, new terminal development may be required sooner than indicated in our Development Plan Phasing, and the necessary steps should be taken to ensure that the necessary infrastructure would be in place when they are needed.

F.2 Development Plan Phasing

This sub-section conveys the preferred construction-phasing program, however, changes and/or modifications to this phasing plan are likely over the 20-year planning horizon. It is anticipated that the Development Plan will be market driven and therefore, responsive to competitive commercial and economic forces, opportunities and constraints. In addition, it must also be environmentally and aesthetically responsive to the existing, planned and potential assets of the region. We have also prepared this Development Plan Phasing so that it can be highly flexible and expandable, from both a Master Plan and individual terminal perspective, to allow for future variations.

The Recommended Master Development Plan has been divided into five major Phases. These five Phases have also been divided into two prominent categories, namely Near-Term Capital Improvements and New Facilities Expansion. Near-Term Capital Improvements involve improvements in and around the current Port boundaries as well as Port access improvements (see Access Improvements Section of this Study). The repairs and reconfiguration or re-use of areas identified have been under consideration by the Port for some time and are highly recommended to be carried out within the framework and time frame of this Master Plan.

The other category is for the new development, or expansion into the North Tidelands area. Several Phases have also been further broken down into corresponding sub-phases and an approximate associated time period that are described herein:

Near-Term Capital Improvements and Repairs (Existing Infrastructure):

- Phase I-A (1999-2005)
- Phase I-B (2005-2010)
- Phase II (See Access Plan Section of this Study)

New Facilities Expansion (North Tidelands Development):

- Phase III-A (2000-2005)
- Optional Phase III-A (2000-2005)
- Phase III-B (2010-2015)
- Phase III-C (2015-2020)
- Optional Phase III-D (2015-2020)
- Phase IV (2008-2020) Potential Bulk Commodity Terminal (See North Tidelands Coal Terminal Study, December, 1997)
- Phase V Potential North Access Improvement Area (See Northern Access Corridor Reconnaissance Study, May 1998)

Essentially Phase IA and Phase IB represent recommended repairs, realignments, and new construction that involve work on existing Port infrastructure. Phase II represents access improvements off of Port property, which will dramatically effect the movement of cargo throughout the Port. Phases IIIA through Phase IV, and their subsequent sub-phases, identify new terminal development requirements that are driven by the Future Facility Demand Analysis findings for both the medium and high trade forecasts. Phase V reflects the potential for a Northern Access route to the proposed new terminal development within the North Tidelands area.

The following narrative describes each Phase in greater detail.

F.2.1 Summary of Phasing Plans I-A and I-B

Two Phasing Plans were developed by the consulting team as a basis for defining re-use or reconfiguration of Port owned and non-Port owned properties in this Master Planning effort. These phasing plans coincide with the Port's own Phasing Plans that have been developed in earlier planning studies. The following is a description of each of the Phasing Plans.

Phase I-A (1999-2005)

Phase I-A considers the construction of a new concrete trestle structure for TOTE at Terminal 3. The exact location and configuration will require further study and review beyond the scope of this Master Plan. Another element of Phase I-A involves the realignment of the current configuration of the Port land use for both the existing Sea-land and TOTE container operations. This realignment would create more of a contiguous property configuration and also require some modifications to current lease boundaries. Note that the final location of the proposed lease line may vary. It should also be noted that this realignment will affect the abandonment of

Tidewater Road and could also affect existing utility power lines, fence lines and other structures that may require relocation or be put underground.

Under Phase I-A it is assumed that existing office buildings and other essential structures would remain within the current boundaries of each container operator, however, this will require a further evaluation and analysis that is not within the scope of this Master Plan.

Another consideration of Phase I-A is for a new access corridor that utilizes either Anchorage Port Road or Tidewater Road as the primary entrance and exit for both the Sea-Land and TOTE gate facilities. An optional gate configuration has also been identified for the southernmost container terminal.

Phase I-A also considers that the existing break-bulk terminal, an area of approximately 4.6 acres (see area B-1 of the Inventory of Maritime Facilities), would remain for break-bulk and miscellaneous uses. The existing transit shed and Port offices would also remain in their current configuration and use(s).

Phase I-A also envisions the renovation and/or expansion of P.O.L. 2 for liquid bulk, dry bulk and passenger/cruise, as well as general cargo uses. Essentially, this area would become available as a multi-use terminal. P.O.L. 1 would remain in its present configuration. The South Transit Area (see area B-2 of the Inventory of Maritime Facilities) would be enlarged, possibly by incorporating Anchorage Port Road (which would require closure) and could be made available as combination container/passenger/miscellaneous use area. Access to the new terminal would be along the new access corridor, whose exact configuration will require further review beyond the scope of this Master Plan.

As an option, Phase I-A also envisions a passenger and intermodal cargo access corridor parallel to Ocean Dock Road on ARRC property. This facility would provide much needed passenger access to the proposed Port cruise terminal in the South Transit Area. This option does not include an associated estimated cost item in the Construction Budget Estimate.

Refer to Figure F-4 for a descriptive drawing of Phase I-A.

Phase I-B (2005-2010)

Similar to Phase I-A, Phase I-B also considers the realignment of the current configuration of the Port land use for both the existing Sea-land and TOTE container operations. Like Phase I-A, this would create more much more contiguous property configuration and also require some modifications to current lease boundaries. Note that the final location of the proposed lease line may vary. It is also assumed that existing office buildings and other essential structures would remain within the current boundaries of each container operator. Like Phase I-A, a new access corridor would be needed that utilizes either Anchorage Port Road or Tidewater Road as the primary entrance and exit for both the Sea-Land and TOTE gate facilities. Optional gate configurations for the container terminals have also been identified on Phase I-B.

The major difference between Phase I-B and Phase I-A is the expansion of the existing wharves at Terminal 1 through Terminal 3 to accommodate 100-foot gage container cranes. This would also envision the purchase of new, or possibly used cranes. Phase I-B also requires the reconfiguration of the existing break-bulk terminal, an area of approximately 4.6 acres (see area B-1 of the Inventory of Maritime Facilities), for the expansion and use by the southernmost container terminal. However, the existing transit shed and Port offices would remain in their current configuration and use(s).

Phase I-B would also require the relocation of the existing maintenance building (currently located adjacent to Tidewater Road across from the Port of Anchorage's offices), or the construction of a new building, to an area near the new multi-use terminal. Maintenance operations would be enclosed within it's own boundary.

Also, as part of Phase I-B, the South Transit Area, (see area B-2 of the Inventory of Maritime Facilities) would be enlarged to incorporate what is now Anchorage Port Road (which would require closure) and will be made available as combination container/passenger/miscellaneous use area. Access to the new terminal will be along the reconfigured access corridor.

As an option, Phase I-B also envisions a passenger and intermodal cargo access corridor parallel to Ocean Dock Road, however, this concept would require the use of ARRC property. This facility would provide much needed passenger access to the proposed Port cruise terminal in the South Transit Area.

Refer to Figure F-5 for a descriptive drawing of Phase I-B.

Before moving on to the next Phases, it is necessary to mention that a separate Facilities Maintenance and Repair Analysis has been performed and a matrix has been developed that takes into consideration necessary facility maintenance and repairs of Port of Anchorage infrastructure that should not be overlooked. A matrix describing these maintenance and repair items, along with other important cost considerations are presented in Figure F-1. These estimated maintenance and repair costs are above and beyond the costs estimated for new facility expansion programs that are likely to occur as market demands dictate over the course of the next 20 years.

Figure F-1: Facilities Maintenance and Repair Matrix (in Millions of U.S Dollars)

Category	Project	Description	2005	2010	2020
Docks	Fenders	Repair and Recondition		$1,000	
	Surface Repair	Repair Spalling	$500	$500	$1,000
	Expansion Joints	Repair and Recondition	$500		
	Utilities	Repair and Recondition	$200	$200	$200
	Sea-Land Bus Bar	Repair and Recondition	$500		
	Piling	Repair and Replace	$500	$500	$2,000
	Bull Rail	Repair and Replace		$200	
	Lighting	Upgrade / Replace			$500
Trestles	Surface Repair	Repair Spalling	$200	$200	$400
	Approach Ways	Reconstruct	$400		
	Piling	Repair and Replace	$200	$200	$400
Transit Yards	Resurface	Repair Low Spots	$400	$200	$500
	Drainage	Repair and Replace	$700	$300	$1,000
	Lighting	Upgrade / Replace			$300
Roads	Renovate	Repair and Maintain	$500	$500	$1,000
Buildings	Maintenance	Flooring / Doors / R&R	$200	$200	$1,000
	Office	Heating / Roof / R&R	$400	$200	$200
	Transit Shed	Heating / Code / R&R	$500	$500	$1,000
	Stevedore Building	Flooring / Doors / R&R	$200	$200	$200
	POL1 Shed	Renovate	$100		
POL Equipment	Hose Tower	Upgrade	$500	$100	$100
	Valve Yard liner	Repair and Replace		$200	
Cathodic Protection	Dock CP System	Repair and Replace	$200	$1,000	$200
Emergency Mgmt.	Emergency Equipment	Repair and Replace	$200	$200	$400
Accessibility	ADA	Upgrade	$200	$200	$400
Machinery	Port Heavy Equipment	Repair and Replace	$200	$200	$400
Totals			**$7,300**	**$6,800**	**$11,200**

F.2.2 Summary of Phase II to Phase V Plans

Phase II (Refer to Access Plan Section of this Study)

Phase III-A (2000-2005)

Phase III-A envisions the construction and development of a new containerized cargo terminal of approximately 24 acres. A new 1,200 foot–long concrete, pile supported wharf structure would be constructed, with 3-concrete pile-supported access trestles of approximately 300 foot-long each. A new 2,000 foot-long rock dike would be constructed adjacent to the waterside edge of the facility. A new dredge depth, down to –50 feet is required. This results in approximately 228,700 cubic yards of hydraulically dredged material. We have assumed that approximately 50%, or about 114,000 cubic yards of this material is suitable for fill purposes.

Civil site work, including grading and paving, striping and signage and fencing would be included for the entire 24 acre site. Site electrical (i.e., sub-stations, lighting, reefer outlets, etc.) and site mechanical utilities (i.e., sanitary sewer, storm water, domestic water, firewater and gas, etc.) are assumed for the entire 24 acre site. Cathodic protection would also be required.

In addition, the new container cargo terminal would require approximately 14, 100-foot high-mast light standards situated on a modular grid system. A modest 3-acre gate facility is envisioned which would include a 10,000 square foot Administration Building, canopies, scales, booths and other gate accoutrements.

A 25,000 square foot Maintenance and Repair Building is incorporated for necessary equipment repairs, tune-ups, and possible roadability functions, etc.

Refer to Figure F-3 for a descriptive drawing of Phase III-A.

Optional Phase III-A (2000-2005)

Optional Phase III-A is very similar to Phase III-A with a few exceptions that include:

- The construction and development of a new containerized cargo terminal of approximately 20 acres.
- A new 1,200 foot-long rock dike would be constructed adjacent to the waterside edge of the facility.
- 3-concrete pile-supported access trestles of approximately 150 foot-long each.
- Approximately 689,700 cubic yards of fill is required.
- Civil site work, including grading and paving, striping and signage and fencing would be included for the entire 20 acre site. Site electrical (i.e., sub-stations, lighting, reefer outlets, etc.) and site mechanical utilities (i.e., sanitary sewer, storm water, domestic water, firewater and gas, etc.) are assumed for the entire 20 acre site. Cathodic protection would also be required.

Similar to Phase III-A, a new 1,200 foot–long concrete, pile supported wharf structure would be constructed, however, the 3-new trestles could be shorter. A new dredge depth, down to –50 feet

is also required. This results in approximately 228,700 cubic yards of hydraulically dredged material. We have assumed that approximately 50%, or about 114,000 cubic yards of this material is suitable for fill purposes.

In addition, the new container cargo terminal would require approximately 14, 100-foot high-mast light standards situated on a modular grid system. A modest 3-acre gate facility is envisioned which would include a 10,000 square foot Administration Building, canopies, scales, booths and other gate accoutrements.

A 25,000 square foot Maintenance and Repair Building is incorporated for necessary equipment repairs, tune-ups, and possible roadability functions, etc.

Refer to Figure F-6 for a descriptive drawing of Optional Phase III-A.

Phase III-B (2005-2010)

Phase III-B envisions the expansion and development of the Phase III-A containerized cargo terminal of an additional 23 acres (approximate) for a new cumulative total containerized cargo terminal of approximately 47 acres. Or, if the optional bulkhead line is extended out to the –40-foot line the area would be approximately 32 acres (or a new cumulative total containerized cargo terminal of approximately 56 acres).

A new 1,600 foot-long sheet piling system would be constructed adjacent to the waterside edge of the facility as containment. No new dredging is anticipated. Approximately 1,274,500 cubic yards of fill are anticipated.

Civil site work, including grading and paving, striping and signage and fencing would be included for the entire 23 acre site. Site electrical (i.e., sub-stations, lighting, reefer outlets, etc.) and site mechanical utilities (i.e., sanitary sewer, storm water, domestic water, firewater and gas, etc.) are assumed for the entire 23 acre site. Cathodic protection would also be required.

In addition, the new container cargo terminal would require approximately 12, 100-foot high-mast light standards situated on a modular grid system that coincides with the Phase III-A system.

Refer to Figure F-7 for a descriptive drawing of Phase III-B.

Phase III-C (2015-2020)

Phase III-C envisions the further expansion and development of the Phase III-A and Phase III-B containerized cargo terminal of an additional 28 acres (approximate), for a new cumulative total containerized cargo terminal of approximately 75 acres.

A new 2,400 foot-long sheet piling system would be constructed adjacent to the waterside edge of the facility as containment. No new dredging is anticipated, unless a new berth is needed in this location.

Civil site work, including grading and paving, striping and signage and fencing would be included for the entire 28 acre site. Site electrical (i.e., sub-stations, lighting, reefer outlets, etc.) and site mechanical utilities (i.e., sanitary sewer, storm water, domestic water, firewater and gas, etc.) are assumed for the entire 28 acre site. Cathodic protection would also be required.

In addition, the new container cargo terminal would require approximately 12, 100-foot high-mast light standards situated on a modular grid system that coincides with the Phase III-A and Phase III-B lighting systems.

Refer to Figure F-8 for a descriptive drawing of Phase III-C.

Optional Phase III-D (2015-2020)

Should the Port experience a robust high forecast growth, Phase III-C would provide for the further expansion and development of the earlier Phases of development of the containerized cargo terminal for an additional 36 acres (approximate), for a new cumulative total containerized cargo terminal of approximately 111 acres.

This Phase would effectively involve cutting into and grading the existing bluff adjacent to Elmendorf Air Force Base and the Port. This bluff is in excess of approximately 100 feet high above mean sea level in several locations. Availability of the land, land acquisition costs, and other acquisition and or mitigation implications costs must be considered, but have not been included in our budget estimates. In essence, a new expanded container yard would be cut out of the hillside to approximately +15 feet above mean low-low water (MLLW). The quantity and quality of material is extremely difficult to estimate, however a rough quantity of approximately 2,904,000 cubic yards of material has been used.

Civil site work, including grading and paving, striping and signage and fencing would be included for the additional 36 acres. Site electrical (i.e., sub-stations, lighting, reefer outlets, etc.) and site mechanical utilities (i.e., sanitary sewer, storm water, domestic water, firewater and gas, etc.) are assumed for the additional 36 acre site. Cathodic protection would also be required.

The new container cargo terminal expansion would require approximately 20, 100-foot high-mast light standards situated on a modular grid system that coincides with the Phase III-A, Phase III-B and Phase III-C lighting systems.

No drawing of Phase III-D is provided in this Master Plan document.

Phase IV (Refer to North Tidelands Coal Terminal Study, December, 1997)

Phase V (Refer to Access Plan Section of this Study and Northern Access Corridor

Reconnaissance Study, May, 1998)

F.3 Construction Budget Estimate

A preliminary conceptual construction budget estimate has been developed for all of the known Phases and other requirements of the Regional Port of Anchorage Recommended Master Development Plan, refer to Figure F-2. This preliminary conceptual construction budget estimate is provided for reference only and represents a professional opinion that is based on a "macro" cost evaluation and on available regional information. Actual construction costs may vary significantly from these preliminary figures, and other factors. **Therefore, this conceptual construction budget estimate is not a guaranteed maximum amount.**

This preliminary conceptual construction budget estimate does not take into account recommended improvements to existing facilities over the course of the next few years, except as noted. These quantitative amounts only provide an estimate of capital development costs for new expansion and development of new terminals and related infrastructure. Instead, a separate Facilities Maintenance and Repair Analysis has been performed and a matrix has been developed that takes into consideration necessary facility maintenance and repairs of Port infrastructure which cannot be overlooked. These maintenance and repair costs are above and beyond the costs for the new facilities expansion program that is likely to occur as market demands dictate over the course of the next 20 years. However, it should also be emphasized that any new infrastructure will also require the same consideration for maintenance and repairs that go hand-in hand with the everyday operations at the Port. These supplemental maintenance and repair cost can include:

- Wharf structures
- Fendering
- Cathodic protection
- Paving
- Other backland improvements, etc.

These anticipated maintenance costs have not been included in this conceptual construction budget estimate. Also, costs associated with possible mitigation, land acquisition, permitting, engineering and architectural design, and/or legal consultation costs, have not been included. The costs per acre were based on assumptions, which were made in the absence of specific development design plans. The following are a few of the key assumptions made for this preliminary construction budget estimate:

- The level of design completed, upon which this estimate is based, is conceptual.
- Some of the conceptual design information used in preparing this estimate is based on information obtained from the Regional Port of Anchorage and other Port documentation, regarding existing terminal lease boundaries as well as existing site conditions obtained from existing data. Some site data was also obtained from existing Port tenants.

Figure F-2: Order of Magnitude – Cost Estimate by Phase

Phase	**Order of Magnitude Cost Estimate – By Phase** (Based on Recommended Master Development Plan) **in Millions**
Phase I-A	$28 M
Phase I-B	$15 M
Phase II	See Access Plan
Phase III-A	$55 M
Phase III-A Optional	$45 M
Phase III-B	$13 M
Phase III-C	$24 M
Phase IV	$60M (See note 1)
Phase V	See Northern Access Corridor Reconnaissance Study, May, 1998

Notes :

1. See North Tidelands Coal Terminal Study, December, 1997

Complete spreadsheets for Phases I-A, I-B, III-A, III-B, III-C and III-D, which outline in greater details the estimated quantities, units costs and contingency factors have been included for reference in the Appendix.

Estimated dredging and fill costs have been used in this preliminary conceptual budget estimate and are considered very approximate. A conservative (more expensive) dredging cost of $9 per cubic yard has been used. In addition, $7 per cubic yard has been used for fill, depending on whether a percentage of the dredge material can be used and hydraulically manipulated for fill. The higher $9 has been used for imported material. Dredging costs are very difficult to estimate based only on conceptual planning stages because:

- Available data, e.g., current and exact soil conditions and hydrographic data, and the specific dredging and fill methodology, etc., were not available.
- The method of dredging is assumed to be hydraulic, therefore disposal could be done nearby. However, the nature of the dredged material is not known, therefore, quantities are very rough estimates.
- The possible presence of hazardous materials, etc., is not known, therefore costs could be significantly higher if proper disposal at an approved site is necessary.
- The potential for re-use of some dredged material was assumed to be approximately 50%. Higher or lower quantities for fill purposes can dramatically affect overall costs. The exact quantities and conditions of the re-used materials, etc., will require further analysis beyond scope of this Master Plan.

F.3.1 Additional Preliminary Conceptual Construction Budget Estimate Assumptions

- Contractors and owner's contingency is assumed to be 20%.
- This conceptual budget estimate is based on 1999 dollars.

- Owner's administrative costs during construction and costs associated with tenant move-in and start-up is **not** included.
- Tenant relocation costs are **not** included.
- Property/real estate acquisition costs and land lease costs are **not** included.
- Costs for off-site construction and utility hook-up or items are **not** included.
- Additional costs for environmental issues, especially mitigation, fees for preparation of traffic studies and EIR's or other government agency-related studies can be anticipated. However, these costs are **not** included.
- Hazardous material and asbestos abatement and disposal costs are not included.
- Maintenance fees and costs for owner's warranties and bonds are not included.
- **No** items are assumed to be owner-furnished/owner installed.
- **No** items are assumed to be owner-furnished/contractor installed.
- Owners insurance costs before, during and after construction are **not** included.
- Costs for cargo handling equipment, except where noted, is **not** included.
- Costs for all other cargo yard equipment, e.g., forklifts, hostlers, etc., are **not** included.
- Costs for optional mobile cranes are **not** included.
- All costs associated with tenant improvements are **not** included.

F.4 Implementation Schedule

The following Critical Path Method (CPM) schedule, see Figure F-3, presents a step-by-step documentation of the recommended projects that comprise the 20-year Regional Port of Anchorage Master Plan. Periodic review and adjustments to changing conditions should occur at approximately every two to five years.

Regional Port of Anchorage - Master Plan - Critical Path Schedule

ID	Task Name
1	**Phase I-A (1999-2005)**
2	I-A-1
3	I-A-2
4	I-A-3
5	I-A-4
6	I-A-5
7	I-A-6
8	**Phase I-B (2005-2010)**
9	I-B-1
10	I-B-2
11	I-B-3
12	I-B-4
13	**Phase II (2000-2010) Access Imprv'ts**
14	(See Access Plan Separate Sectio
15	**Phase III-A (2000-2005)**
16	III-A-1
17	III-A-2
18	III-A-3
19	**Phase III-B (2010-2015)**
20	III-B-1
21	III-B-2
22	III-B-3
23	**Phase III-C (2015-2020)**
24	III-C-1
25	III-C-2
26	III-C-3
27	**Optional Phase III-D (2015-2020)**
28	III-D-1
29	III-D-2
30	III-D-3
31	**Phase IV (2008-2020) Commodity/Coal**
32	IV-A-1
33	IV-A-2
34	IV-A-3
35	**Phase V (2008-2020) North Access Im**
36	(See Access Plan Separate Sectio

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Task | Progress | Summary | Rolled Up Split | Rolled Up Progress | Project Summary
Split | Milestone | Rolled Up Task | Rolled Up Milestone | External Tasks

FIGURE F-3

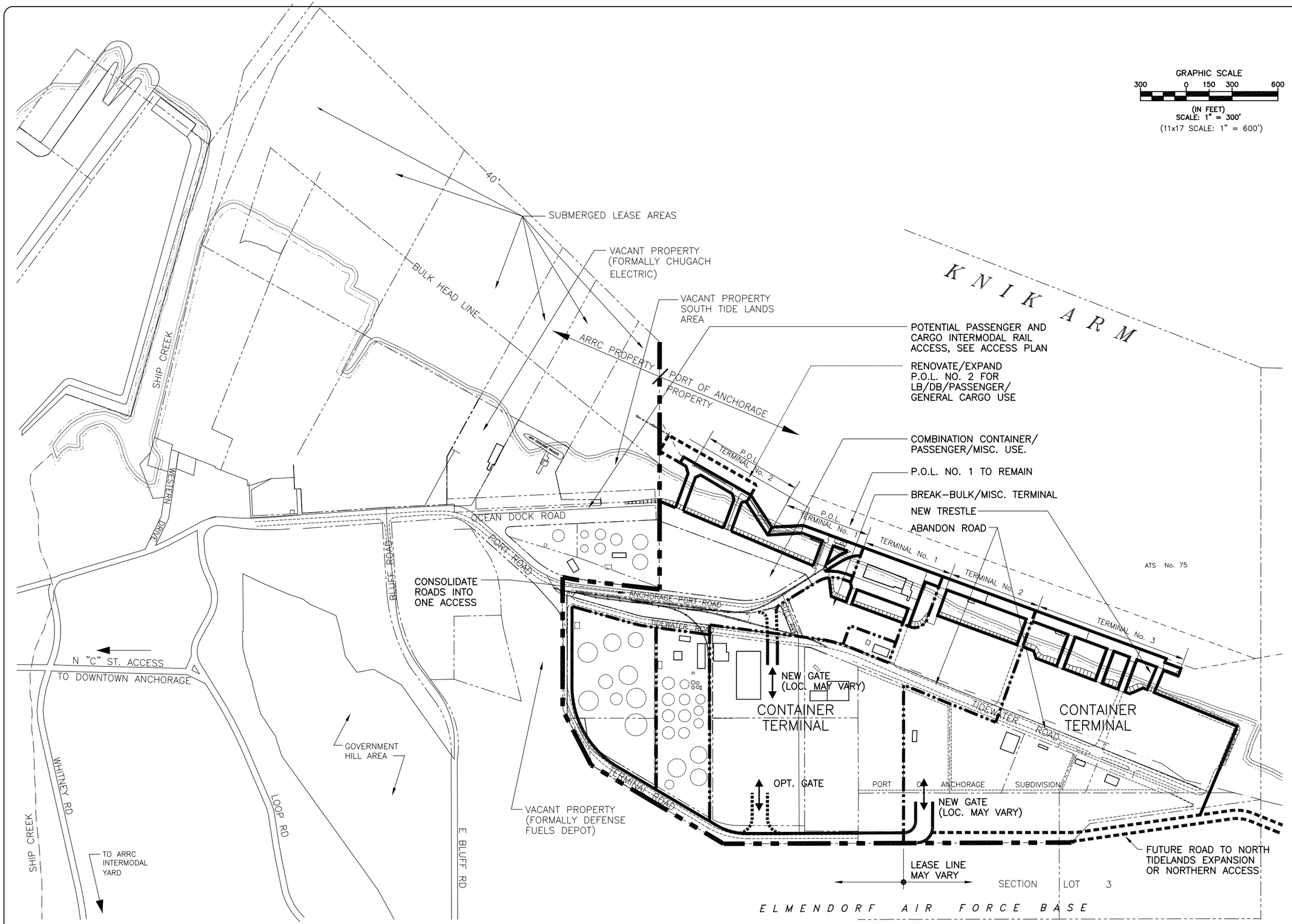

FIGURE F-4

PORT OF ANCHORAGE, ALASKA

PHASE IA – SITE PLAN

SHEET NO. F-4 REV. NO. △

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THE REGIONAL PORT OF ANCHORAGE

MASTER PLAN

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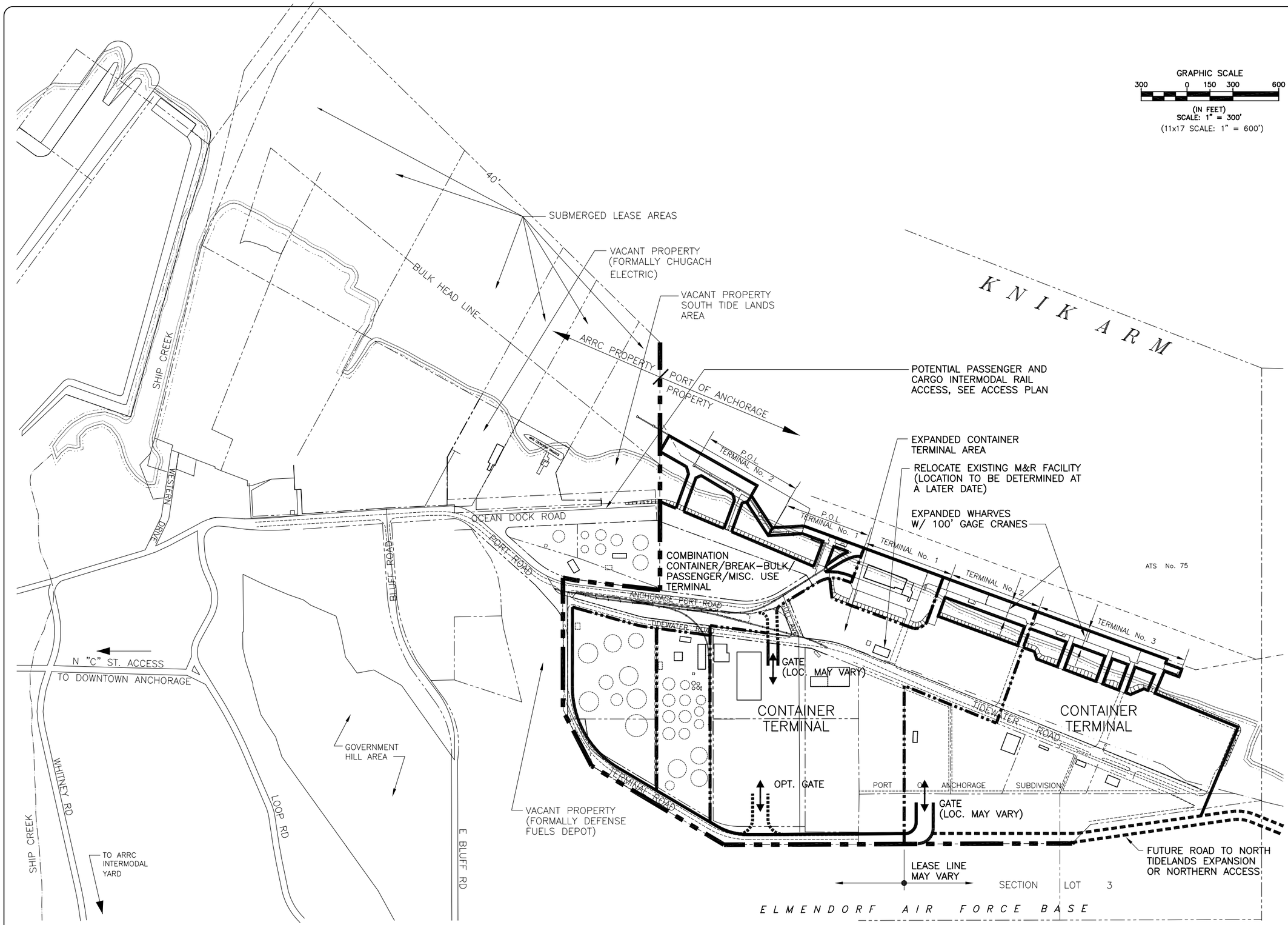

FIGURE F-5

PORT OF ANCHORAGE, ALASKA

PHASE IB – SITE PLAN

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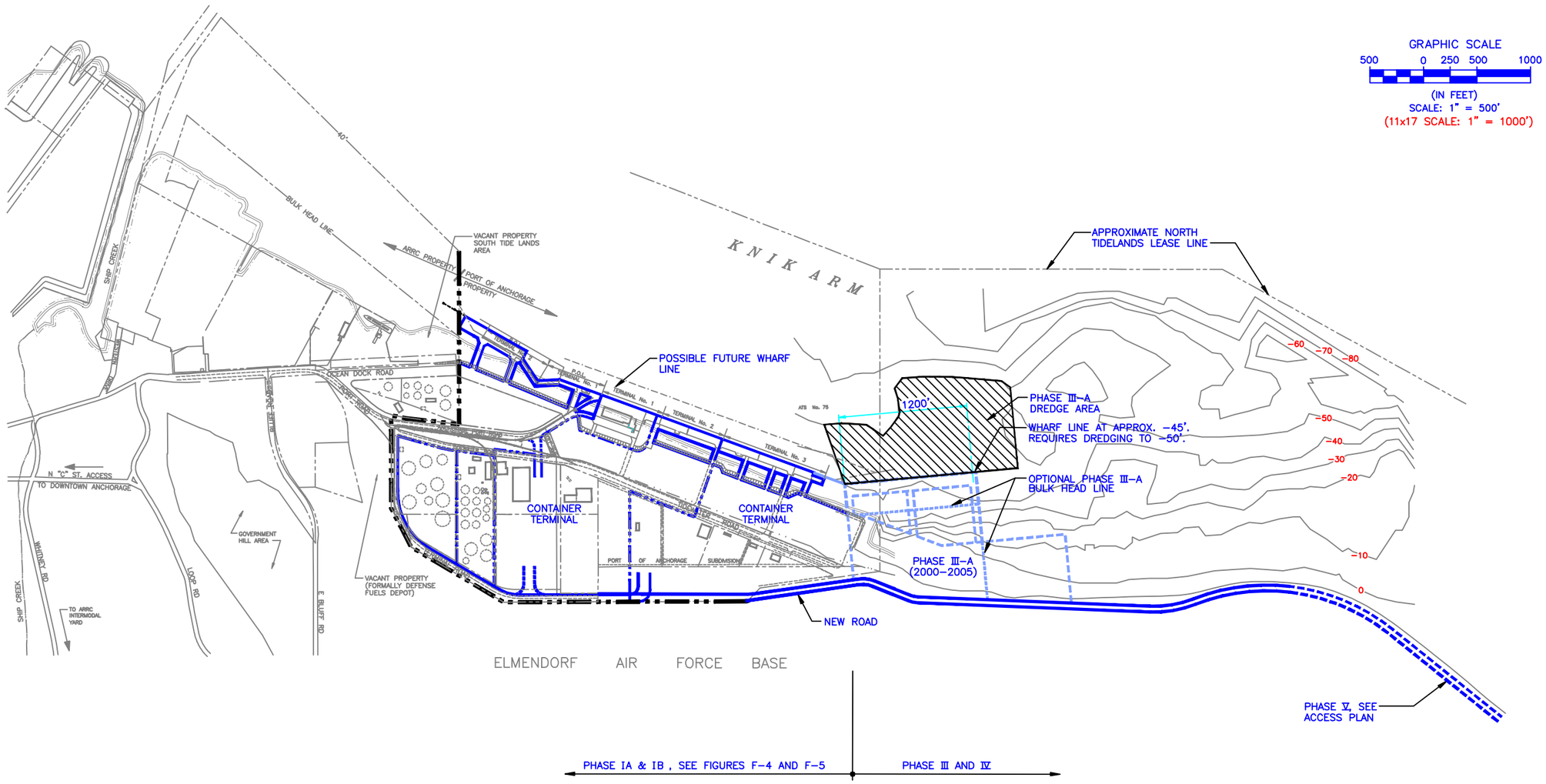

PHASE III-A SITE PLAN

NOTE

BATHYMETRY IS APPROXIMATE AND BASED UPON INFORMATION PROVIDED BY PORT.

NORTH

FIGURE F-6

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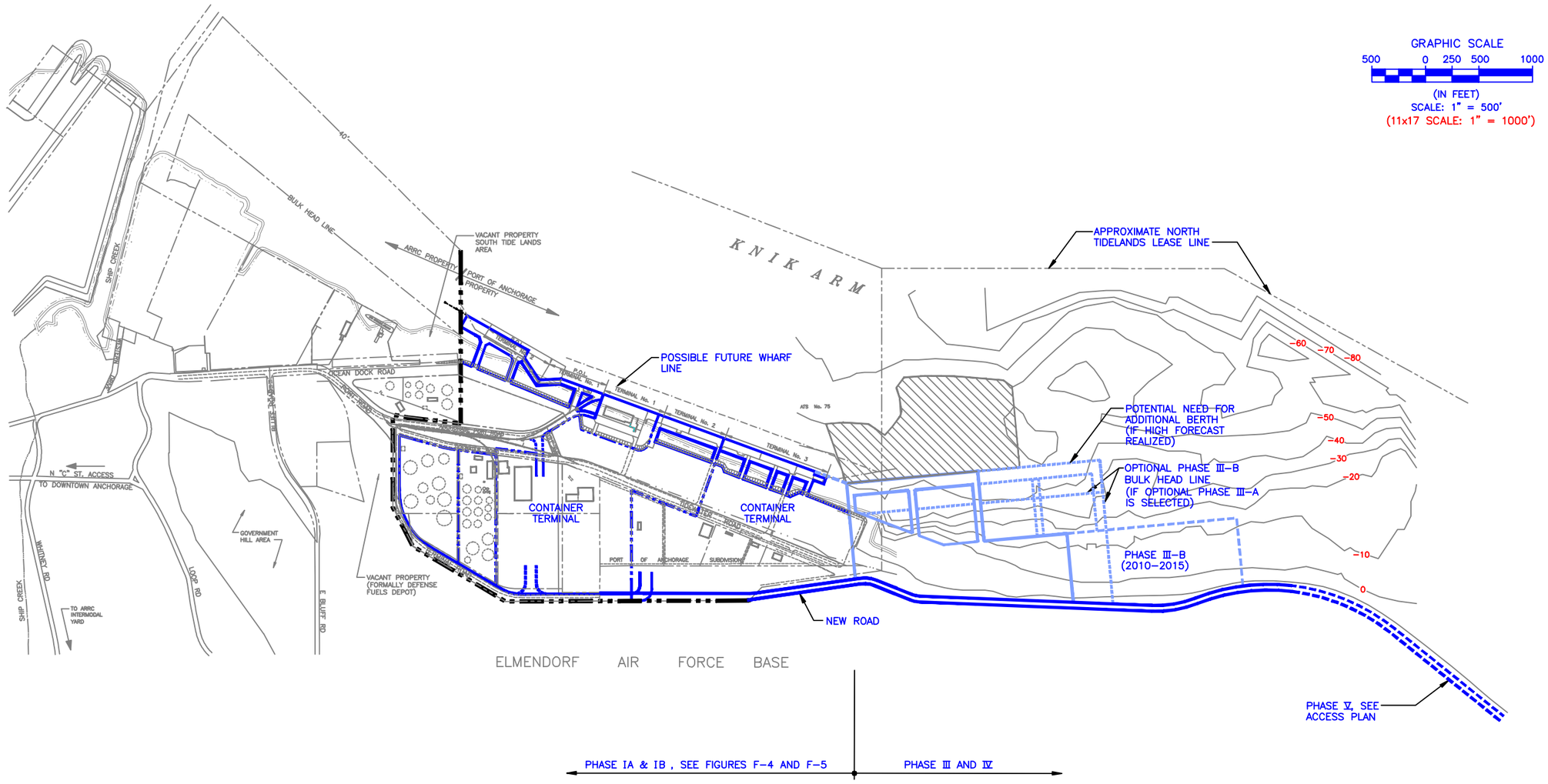

PHASE III–B SITE PLAN

NOTE

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FIGURE F–7

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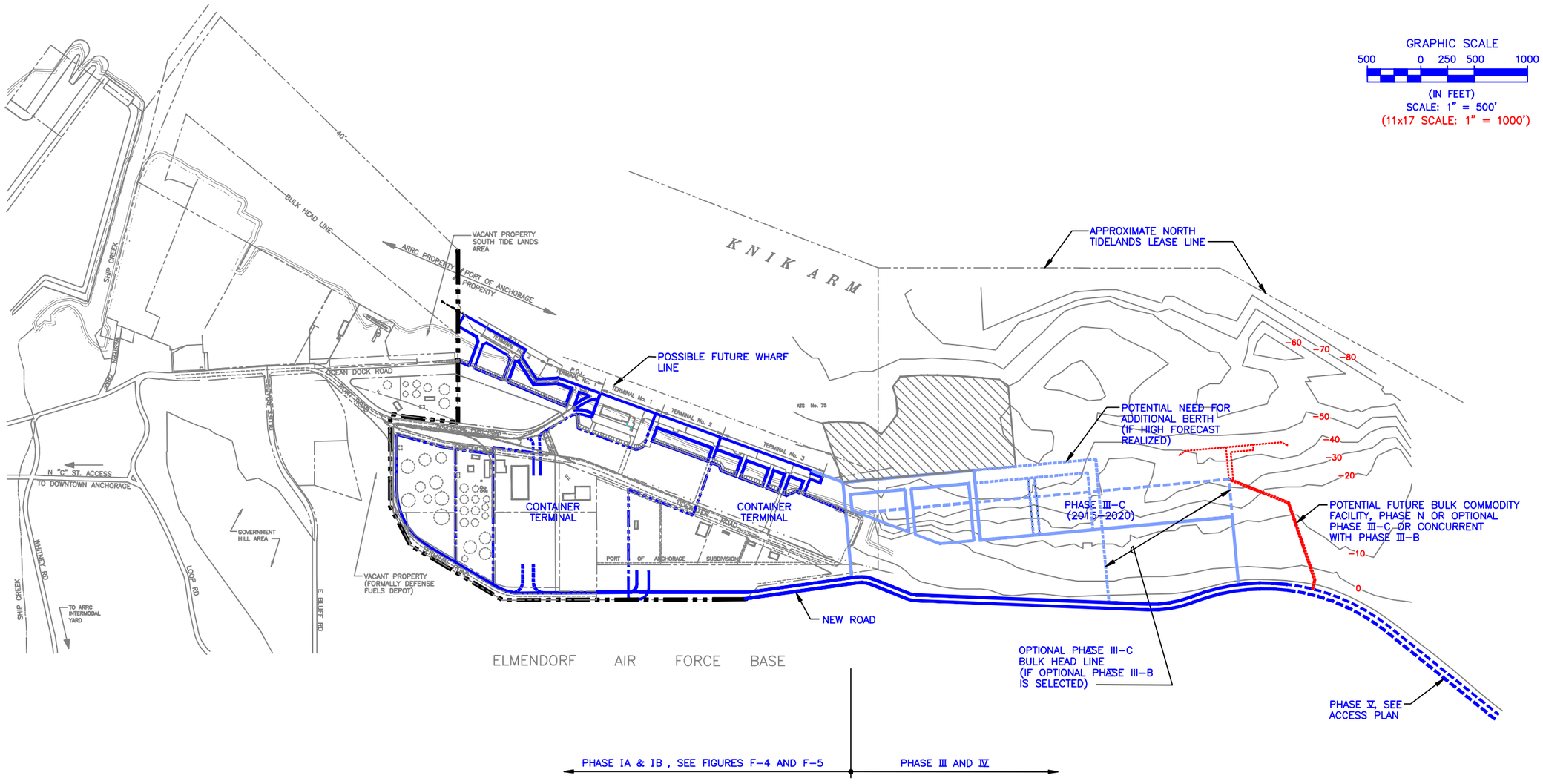

PHASE III-C SITE PLAN

NOTE

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NORTH

FIGURE F-8

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THE REGIONAL PORT OF ANCHORAGE

MASTER PLAN

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III. ACCESS PLAN

A. BACKGROUND

This study presents an access plan for the Port of Anchorage (POA), prepared as a component of the 1999 update of the POA Master Plan. This study considers the existing and future landside transportation facilities and the traffic that is expected to use them. Using conclusions drawn from the analysis of these facilities and traffic, recommendations are offered regarding long-term development strategies for landside access. This plan is primarily intended to provide input to the public transportation process and facilitate the integration of POA needs into a regional context.

A.1. Access Objectives

As an intermodal facility, the POA's productivity is sensitive to the external surface transportation system that connects the marine-side facilities with its customers. The following objectives provide qualitative measures of the adequacy of the POA's landside access.

A.1.1 Access

POA must be fully accessible to its users, transportation providers, and ultimately the marketplace. The POA's landside gateway(s) must be accessible to all port-oriented traffic.

A.1.2 Mobility and Connectivity

In order to effectively compete and provide service, the POA's landside users and transportation providers must be able to travel between POA and their distribution centers and other destinations along a reasonably direct route and an acceptable level of service.

A.1.3 Safety and Integration

The surface transportation system serving the POA should be properly integrated with the character and functionality of the neighborhoods and districts through which it passes. POA-oriented traffic would be characterized as industrial. The POA users' goal of rapid deliveries and transfers is often at odds with local traffic in Ship Creek and the CBD. As discussed above, truck traffic between the Port and the CBD is a long-standing issue of concern to the trucking industry, downtown residents and merchants, the tourism industry, the ARRC, and visitors to the Ship Creek area. As the only roadway in and out of the Port, Ocean Dock Road must now carry 100% of the flatbed and van traffic coming from the transit yards and bound for warehouses, distribution centers, and other intermodal transfer areas. Ocean Dock Road's limited connectivity with the highway system further forces a substantial portion of these trucks to use CBD streets (such as 3rd, 5th, and 6th Avenues) to reach highway access points. The mix of these 48-foot-plus trucks with traffic (of all modes) has made "barriers" out of several streets (such as the A/C Couplet) and detracted from efforts to attract visitors to downtown Anchorage.

A.2 Agency Transportation Planning Objectives

This section briefly presents the key objectives established by these various bodies as they relate to the proposed corridor development.

A.2.1 Federal Planning Objectives

Immediately after President Bush signed ISTEA into law in 1991, the act was recognized as a significant departure from traditional surface transportation planning in the United States. ISTEA stressed that an efficient highway and intermodal transportation system for goods movement is critical if the United States is to be an effective competitor in the global economy. ISTEA envisioned an integrated highway system for the United States "which are essential for interstate and regional commerce." The act explicitly recognized ports as "intermodal interfaces", providing a strategic function in the delivery of commodities and freight. The planning components of the 1991 act (no longer in effect) required metropolitan planning organizations such as AMATS to develop transportation plans and strategies to promote efficient intermodal transport. A northern access route for the Port fits clearly within this vision of using federal resources to facilitate the movement of commodities and freight.

ISTEA was recently reauthorized through the Transportation Equity Act for the 21st Century (TEA 21). This act generally reiterated ISTEA's goals and objectives and- more importantly- provided a substantially-increased level funding for the federal-aid surface transportation program. Alaska was a major beneficiary of this new legislation, seeing its capital program doubled in size.

A.2.2 State Planning Objectives

Vision: 2020 Alaska Statewide Transportation Plan, ADOT&PF's most recent long-range strategic policy statement (published in 1995), articulated the Department's mission to manage its facilities to promote access, connection, and economic development. To quote from Chapter 3 of the plan:

> *The Department of Transportation and Public Facilities will develop and maintain access…to the extent practicable, to key destinations with Alaska such as population centers, ports and airports, recreation areas, and resource areas open to economic development and key destinations outside Alaska..*
>
> *The Department of Transportation will improve the economic well-being of the people of Alaska through these actions:*
>
> *Expand economic opportunity through targeted transportation developments, consistent with local government considerations, which generate or sustain economic activity;*
>
> *Identify intermediate and long-range needs of the commercial transportation industry;*
>
> *Develop a comprehensive, efficient, intermodal transportation system that supports productive competition among commercial carriers for Alaska.*

A.2.3 Municipal Planning Objectives

MOA has two key planning documents that provide guidance on transportation goals and objectives: the Comprehensive Plan (last updated in 1982) and its Long-Range Transportation Plan (last updated in 1991). Both plans are actively under revision and in both cases have developed plan elements that focus specifically on economic development in Anchorage. As part of the Comprehensive Plan update a city-wide study of commercial and industrial activity was performed. More significantly, the Long-Range Transportation Plan will include a freight mobility and goods movement study and include truck activity modeling in its Transportation Demand Model. Both of these plans have advanced far enough to articulate goals and objectives related to transportation and economic development. The recent draft goals and objectives offered the following:

Mobility and Access Objectives:

- Integrate transportation improvements and land use planning.
- Design air, port, rail, and road systems and their linkages for the efficient and safe receipt, transfer, and distribution of goods.
- Provide designated truck routes that minimize residential neighborhood and central business district disruption.

These goals and objectives should be reflected in future transportation programs in some emphasis in projects that support commodity and freight movements.

B. EXISTING ACCESS CONDITIONS

The Port of Anchorage (POA) currently serves as the northern terminus of an intermodal transportation network within Anchorage. A single railroad-road corridor connects the Port Area with the Anchorage central business district (CBD). From the CBD, road and railroad systems provide an extension of Port access to the Anchorage International Airport (AIA). In addition, the road system connects with Alaska's National Highway System (NHS) and the railroad system with the Alaska rail-belt.

The POA handles many types of cargo, including fuels, break-bulk and container freight. The handling of container cargo is the major activity. Container cargo ships arrive two times weekly throughout the year (Sundays and Tuesdays) with an additional ship arriving on Saturdays in the summer only. Containers are off-loaded by cranes and RO-RO transfer bridges. After off-loading, trucks transport containers to various transit areas for staging and subsequent road-haul. Petroleum products are mainly shipped as outbound cargo. An extensive tank farm adjacent to POA land stores liquid fuels that are transported by rail tankers generally originating from oil refineries near Fairbanks. A network of pipelines connects the storage facilities to the POA petroleum terminals.

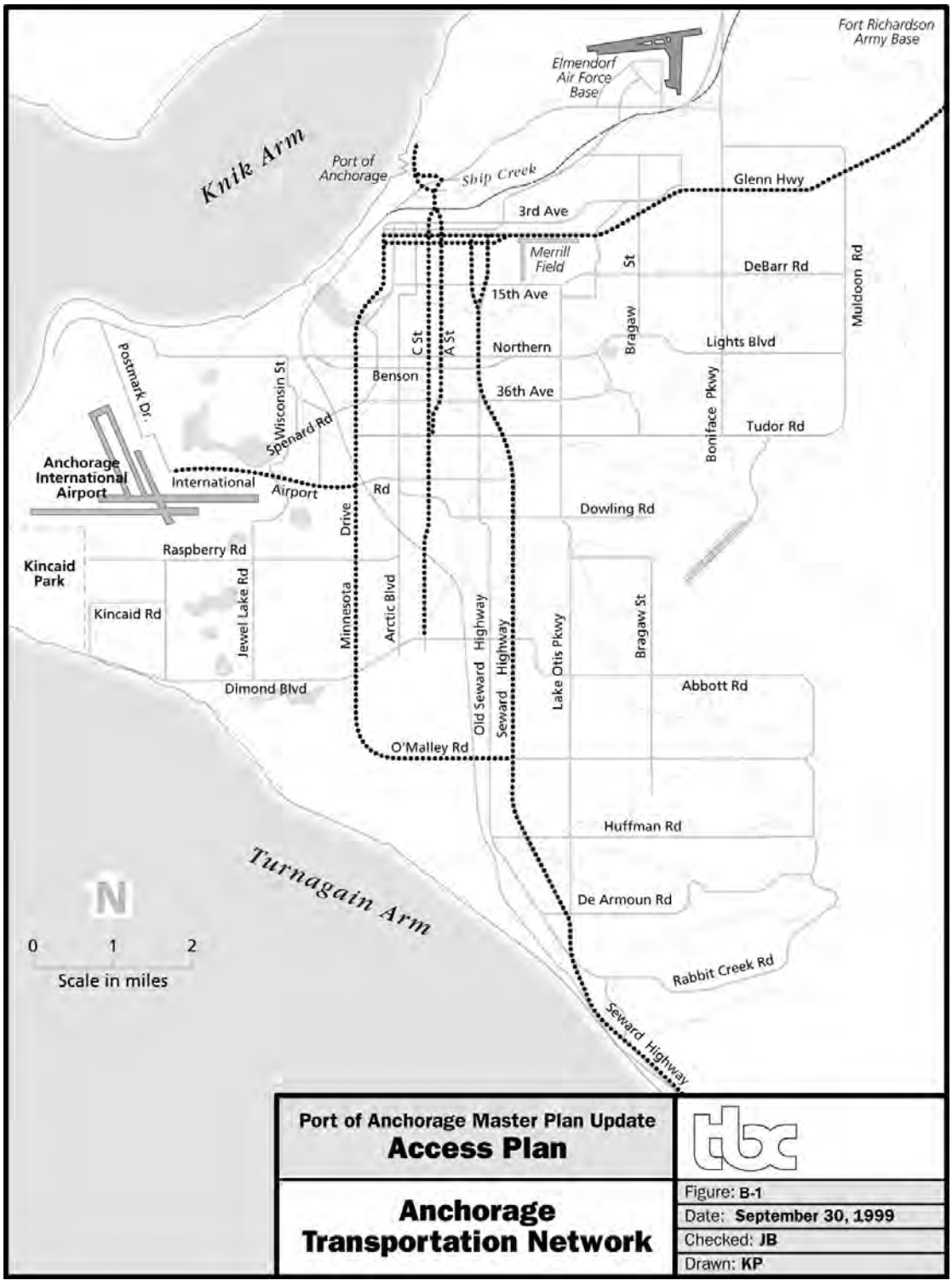
B.1 Street and Highway System

The Port of Anchorage is served by a single vehicular route, terminating in a virtual cul-de-sac in the Port Area. The Ocean Dock Road corridor provides this primary access into the Port Area. Secondary access is essentially non-existent in that two routes offering potential secondary access are either unsuitable or unavailable to the public. One is an unmaintained jeep trail running up a steep slope into a restricted area of Elmendorf AFB. The second is maintained but as a one-way jeep trail on steep grades into another restricted area. As a result, this sole access connects the Port of Anchorage to the local and statewide roadway transportation system.

B.1.1 Network Overview

A network of streets and highways links the Port Area with local, regional and statewide transportation destinations, as shown in the following figure. Within the Port Area, Ocean Dock enters as a minor arterial and splits to form the parallel roadways of Tidewater Road and Anchorage Port Road and a third leg, Terminal Road. According to the Municipality of Anchorage (MOA) *Official Streets and Highways Plan* (December 1996), Tidewater Road is considered the minor arterial extension of Ocean Dock Road to its northern terminus. The remaining two legs are not listed in the plan but provide access to local properties in the Port Area.

Figure B-1: Port of Anchorage Transportation Network



Exiting the Port of Anchorage, Ocean Dock Road connects locally to the nearby industrial area and the greater Anchorage area. Whitney Road serves as an industrial commercial collector linking the Port Area with the Ship Creek industrial area. Port Access Bridge, a major arterial, links Ocean Dock Road with the Anchorage CBD. South of 1st Avenue, Port Access Road splits to form the north-south route known as the A-C couplet. The A-C couplet currently provides access to midtown where A Street but C Street continues south to Dimond Boulevard. MOA plans would extend C Street further to tie in with the Minnesota Drive freeway in South Anchorage.

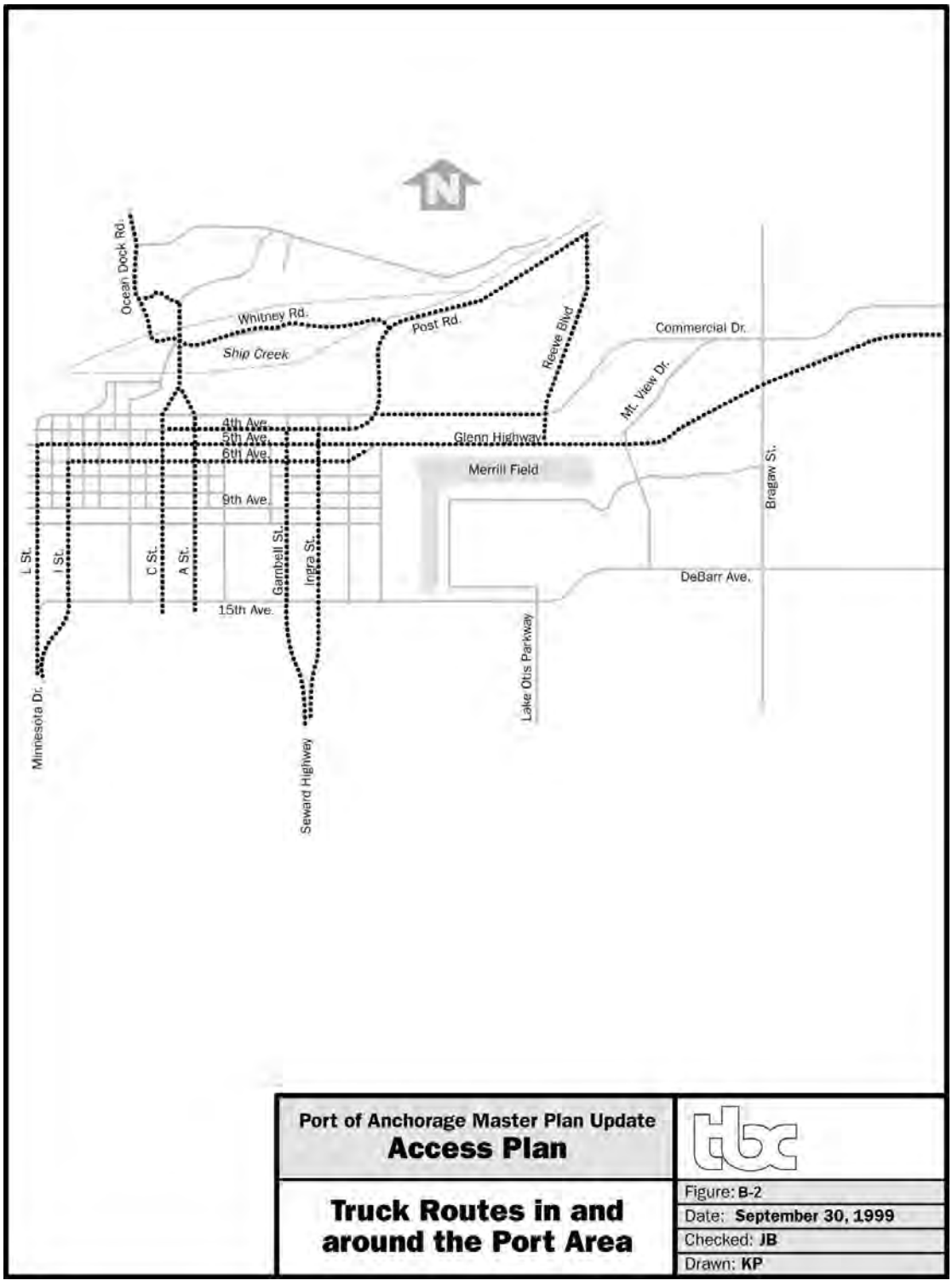
Additional roadway connections within the bowl of Anchorage use the 5^{th}-6^{th} Avenues couplet to reach the north-south route of Minnesota Drive in the western part of the CBD and to reach the north-south couplet of Gambell and Ingra Streets in the eastern part of the CBD. In both cases, access to midtown and further south within the Bowl is obtained. In addition, Minnesota Drive provides a connection with the AIA and its expanding cargo area. North of International Airport Road, Minnesota Drive functions as a major arterial. Gambell and Ingra Streets also function as major arterials until merging to form the New Seward Highway, a freeway.

Most of the routes described earlier additionally function to connect the Port of Anchorage to the National Highway System (NHS) serving Alaska. Ocean Dock Road is considered an element of Alaska's NHS as is Port Access Road. A northeastern extension of Port Access Road known locally as Loop Road is also an element of the NHS, leading to Elmendorf Air Force Base. The 5^{th}-6^{th} Avenues couplet and the routes to and including Minnesota Drive, New Seward Highway and Glenn Highway are additional NHS elements. New Seward Highway leads to points south, including the Kenai Peninsula. Glenn Highway extends east around Knik Arm and to a junction with the Parks Highway, both serving points generally north.

B.1.2 Truck Routes

According to a "Port Area Transportation Analysis" (Reid Middleton, February 1993), most general cargo and locally distributed petroleum products move out of the Port Area by truck. About 60% of the inbound freight is destined for Anchorage, with the remainder destined throughout the state. Nearly 9,000 truck trips occur in the Port Area each week with over 3,600 of these associated with container movements. Even though a majority of goods entering port remain in Anchorage, an estimated 80% of all goods are routed through warehouses before distribution. Whitney Road- Post Road is the major route for trucks hauling to warehouses from the Port. Port Access Road-C Street is the major route for the estimated 20% of goods hauled directly to customers. In both cases - warehouse intermediary or direct delivery - Ocean Dock Road provides the sole access to/from the Port Area. The following figure shows the truck routes in and around the Port Area.

Figure B-2: Truck Routes In and Around the Port Area



Truck movements of freight through warehouses reconnect with the road system depending on destination. Distribution to most Anchorage customers would generally occur using Post Road through the CBD to C Street. To the northeastern area of Anchorage, distribution would likely occur using Elmendorf Access Road/Reeve Boulevard to the Glenn Highway. Truck movements destined outside Anchorage to points south would probably use Post Road to Gambell Street and on to the New Seward Highway. Truck movements destined for points north of Anchorage would probably use Elmendorf Access Road/Reeve Boulevard to the Glenn Highway.

B.1.3 Public Transportation

Currently the MOA has no public transportation using the "People Mover" bus system in the Port Area. Once on a trail basis, one bus route swung from Christensen Drive, by the ARRC depot, and on to Government Hill. After about 6 months of complaints by users regarding the extra time in transit, the route was abandoned. MOA's public transportation planners indicate there are no immediate plans to provide service in the depot or Port Area. However, an ARRC intermodal plan involving a transportation link with the Matanuska Valley may revive service in the future.

B.1.4 Airport Connectivity

The Anchorage International Airport is the primary hub for handling both domestic and international air cargo in Alaska. One of its functions is to act as a redistribution center for inbound cargo arriving by air or ship that is to be transported to outlying communities by air. This airport function requires a connection with the Port of Anchorage in that cargo arriving by ship would come through the Port and be transferred to truck for transportation to the airport. The available transportation links include Port Access Road-C Street to International Airport Road and Port Access Road-5th Avenue-L Street/Minnesota Drive to International Airport Road. In both cases transport through the CBD is required.

B.2 Rail System

The Alaska Railroad Corporation (ARRC) operates the state's principal rail facility, providing service from the Ports of Seward and Whittier through Anchorage and north to Healy, Nenana, Fairbanks, and Eieleson Air Force Base. Anchorage serves as an operating hub for ARRC from the railroad industrial area located near the mouth and along Ship Creek. A single main line extends from the hub to the south with spurs into adjacent industrial properties throughout Anchorage, including an airport spur. A single spur leads from the ARRC operations center into the Port Area. Within the Port Area, the main spur splits into fourteen spurs plus an additional three lines for holding tracks essentially following the Port road system, serving users. Eight at-grade road-railroad crossings occur along the Ocean Dock Road route, resulting in considerable delays to truck and passenger vehicles accessing the Port Area. The State is finalizing plans to improve Ocean Dock Road and its road-railroad conflicts.

The ARRC rail system also includes an "intermodal yard" within the industrial area near the Port Area. Trucks from the Port accessing this yard *via* Whitney Road engage in transferring containers onto rail cars for shipments primarily to Fairbanks. As mentioned earlier, liquid petroleum products are shipped from the North Pole refinery in rail tankers. The fuels are stored

in an extensive tank farm adjacent to the Port. The rail traffic relies on a single main line from the Anchorage rail center to points north.

B.3 Pipeline

An extensive network of primarily underground pipelines serves the tank farms located in the Port Area. This network began with the storage of fuel during World War II. At that time a POL line was constructed to bring materials to military bases from the Port of Whittier. Now the POL line extending to Whittier is leased by Enstar to provide natural gas to Whittier. The current pipeline network includes lines from the storage facilities to petroleum terminals at the Port. In addition a new jet fuel supply pipeline was constructed in 1998 to provide fuels from the AFSC storage tanks near the Port to Anchorage International Airport. The route through the Port Area is underground, generally within the Ocean Dock Road or parallel ARRC right of ways.

C. PROGRAMMED ACCESS IMPROVEMENTS

The existing conditions in the Port Area and adjacent industrial and commercial districts indicated that impediments to traffic flow exist. The Anchorage Metropolitan Area Transportation Study (AMATS) provides ongoing planning and programming activities to address these and other transportation impediments in the Anchorage Area. AMATS also links the Municipality's Community Development and Planning group with the State's Central Region Planning group in compiling and evaluating local transportation needs. The resulting transportation program addresses mainly the Anchorage Street and Highway System; however, in some cases intermodal plans also result. Other Rail System improvements are planned through ARRC and the railroad's interaction with special task forces such as the Ship Creek planning group and neighboring communities such as Palmer and Wasilla in the Mat-Su Borough.

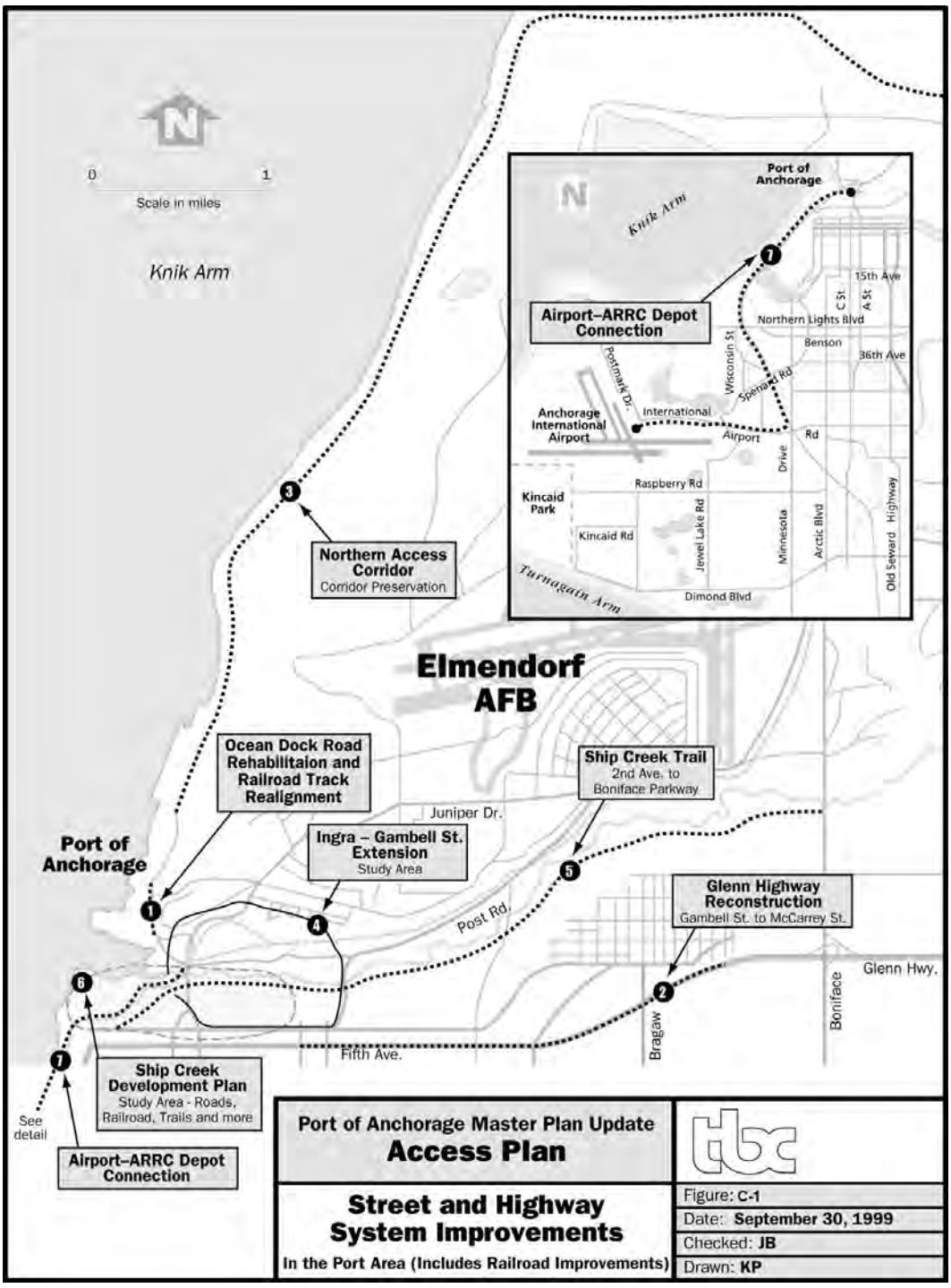
C.1 Street and Highway System

In recent times several improvements in the Port Area and for access to the Port have been proposed. These improvements include upgrades of existing roadways, the extension of existing roadways, and the construction of new access facilities. Proposals range from being in the early planning stages to being ready to construct. The following list identifies programmed access improvements that are also shown in Figure C-1.

C.1.1 Ocean Dock Road Rehabilitation

The POA and nearby area are served by one transportation corridor including both Ocean Dock Road and ARRC rail. After sixty years of service, Ocean Dock Road needs restoration. The heavily-weighted truck traffic using this route will greatly benefit from elimination of roadway/rail conflicts and by the addition of widened paved shoulders. Scheduled for construction in 1999, the one-season construction project will eliminate four at-grade railroad crossings and will provide six-foot paved shoulders on both sides of the driving surface. The railroad crossings will be eliminated by the removal of several spurs. A replacement spur will parallel the roadway on the west, providing access for petroleum deliveries to the MAPCO transfer facility. The level of service for the facility will be improved from "F" to "C" in design year 2010, meaning an elimination of traffic delays causing a waiting time of up to twenty minutes. In addition to the improvements mentioned, construction of a sidewalk and weigh-in-motion equipment is also programmed.

Figure C-1: Street and Highway System Improvements In the Port Area



C.1.2 Ingra-Gambell Street Extension

A large percentage of truck movements from the Port to the Anchorage road system and the State road system first route through the Whitney Road-Post Road industrial district. From that district only the Glenn Highway route toward the Mat-Su Valley and beyond is relatively accessible. This route takes advantage of Reeve Boulevard/Elmendorf Access Road. Other traffic heading to points south or even within Anchorage lack a ready connection to a designated truck route. The recognized lack of a second access point into the Ship Creek area, other than the C Street/Port Access Road connection, led to development of a High Priority Project for Anchorage to construct a new access route. A project programmed under this High Priority is the extension of the Ingra-Gambell Street couplet. Administered through the Municipality's Department of Public Works (DPW), this project is currently being evaluated in a feasibility study. Should the project continue as proposed in the 1998-2000 Statewide Transportation Improvement Program (January, 1999 draft), preliminary engineering and environmental assessment, then design, would occur beginning in fiscal year (FY) 1999. Right of Way funding would be available in FY 2000, and construction funding would be programmed in the future.

C.1.3 Glenn Highway Reconstruction

The Glenn Highway provides Anchorage with its only route to points north. ADOT&PF just selected a consultant to begin work on a programmed project to relieve traffic congestion from Gambell Street to McCarrey Street, the point where the Glenn Highway widens to six lanes. At this stage the project must undergo preliminary engineering and environmental analysis, in the form of an EIS. This phase of work is scheduled through January 2001. Final design of a preferred alternative would follow, with construction not likely before the 2003 construction season.

The proposed project would as a minimum eliminate a bottleneck on travel into Anchorage and could substantially reduce congestion by providing grade separations for the Airport Heights and Bragaw Street intersections. This is an area designated as an impediment to freight mobility in the earlier-referenced interviews with truckers. This project can also be considered in terms of an expansion of Fifth Avenue. This was one of the roadway options analyzed in the 1991 Anchorage Bowl Long-Range Transportation Plan to address problems in the Glenn Highway to Seward Highway area.

ADOT&PF expressed a desire for a full range of alternative solutions to be presented during the EIS phase of the Glenn Highway project, suggesting that solutions need not be confined to the $5^{th}/6^{th}$ Avenue couplet. In addition, the ADOT&PF recognizes that a new access route to the Ship Creek area has been designated a High Priority Project in Anchorage. The northern extension of the Ingra/Gambell Street couplet discussed in section (b) is a likely candidate for this new access that would affect traffic projections and intersection movements on the Glenn Highway project. The scope of services in the preliminary engineering and environmental work on the Glenn Highway will include a Major Investment Study to provide a more focused analysis of the corridor's transportation problems "while providing a broader perspective of the options available to solve these problems".

C.1.4 North Port Access

The concept of extending a transportation corridor north of the Port Area was first reported in studies addressing corridors for a proposed Knik Arm Crossing. Points of departure for the Anchorage end of the proposed crossing ranged from Point Woronzof to Eagle River, hence a discussion of an extended highway system north of the Port resulted. However, it was not until a Reid Middleton report in February 1993 addressing a "Port Area Transportation Analysis" that the idea of a northern connection to the Port itself was identified. In February 1996, VZM. In association with HDR Engineering, Inc., submitted the Traffic Flow Study – Final Report, which also suggested that a north access road development be pursued. This study also reviewed and considered improvements to increase Port area-wide traffic flow efficiency. Most recently a "Northern Access Corridor Reconnaissance Study" (draft report, November 1998) was issued by Tryck Nyman Hayes, Inc.

The Northern Access reconnaissance study evaluated potential alternatives for a multi-use transportation corridor, providing highway, rail and utility connections north from the Port Area to a tie-in with the Glenn Highway. All possible alignments require crossing Department of Defense lands on Elmendorf Air Force Base and Fort Richardson (Army Base). Because the feasibility of a public corridor through these lands is currently precluded due to exclusive military use, the reconnaissance study became focused on selecting a recommended route with respect to corridor preservation. In the event military lands are open for public use in the future, the recommended route could then be made available for a northern access to the Port. As of this writing the reconnaissance study is still in draft form. Chapters presenting project implementation and summary and recommendations are yet unwritten, awaiting completion of review comments on the draft report.

Although the future of a northern access to the Port is speculative at this time, benefits of such a corridor were documented in the reconnaissance study:

- Future coal handling could benefit from a northern access in that most current and potential sources are found to the north.
- The volume of container traffic destined for points north is growing faster than the container traffic destined for Anchorage.
- A northern access could provide a more direct linkage for vehicular traffic between the Anchorage CBD and Eagle River (and other points north).
- An alternative northern access route would divert over 2,000 trips daily form the Glenn Highway, resulting in improved capacity and level of service on the Glenn Highway.

C.1.5 Other Improvements

Other improvements in the general Port Area include a trail along Ship Creek from 2nd Avenue to the Glenn Highway at Boniface Parkway, including a connection to Government Hill. In addition to specific project improvements, additional study areas have also been programmed. Currently the AMATS staff is studying freight mobility in the Anchorage Bowl and, as revealed in earlier portions of this draft, have interviewed freight hauling companies to determine impediments to truck traffic flow. A large portion of freight movement originates in the Port Area. Results from

the study will likely determine the next round of recommended transportation improvements. Also, the Ship Creek area has been designated a special study sub-area by MOA transportation planners. A project to perform the Ship Creek Sub-Area Study is expected to begin in the next few months. Again, results from the study may be expected to contribute to future transportation improvement recommendations.

An overall Master Plan for the Ship Creek area is also underway. This major planning effort involves MOA planners, ARRC and several local engineering and planning firms. The group is viewing Ship Creek as a potential focus for renovation and promotion of tourism. Concepts include an aquarium, trail facilities, and fishing and viewing opportunities along the creek. Trail connections to Government Hill, Ship Creek Trail and the extension of the Coastal Trail are addressed. This study will be complemented with a Multi-Modal Transportation Study of the area, to be performed in 1999-2000.

The following table summarizes the major projects discussed above.

Figure C-2: Programmed Port-Related Streets and Highways Improvements

Project	Phase	Years	Budget
Ocean Dock Road Rehabilitation	Construction	2000-2001	$3,700,000
Glenn Highway – Gambell to McCarrey	Environmental/Design	1999-2001	$2,500,000
	ROW Acquisition	2002	10,000,000
	Construction	2003	$15,500,000
Ingra-Gambell Extension	Design Study	1999	$200,000
	Environmental/Design	2000-2003	2,000,000
	Construction	2004	9,000,000
Ship Creek Transportation Plan	Study	1999-2000	$250,000

C.2 Rail System

In some cases programmed improvements for the Alaska Railroad overlap with highway improvement projects; in other cases they are independent improvements. More focus on intermodal transportation over time promotes projects that improve railroad service in concert with roadway and other improvements.

C.2.1 Airport-ARRC Depot Connection

The State of Alaska has made redevelopment of Anchorage International Airport a high priority. Currently plans call for landside, airside and terminal improvements. The landside and terminal projects include accommodations for an elevated railroad and railroad terminal facility, promoting intermodal transportation at the airport. The other end of the proposed railroad connection is the main ARRC depot in Ship Creek. The Ship Creek -Airport connection would extend an existing railroad corridor now terminating east of the airport parking and traffic circulation area.

C.2.2 Ship Creek Master Plan

The ARRC contracted development of a Ship Creek Master Plan to lay out plans for long-range development and identify basic infrastructure needs. The plan locates potential lease lots and classifies appropriate uses for developable lots. The public and agency review draft report is being produced now, so is not yet available for widespread distribution. Elaboration of the plan can be incorporated in the next draft of this report.

C.2.3 Other Improvements

The ARRC is also in the midst of selecting a consultant to produce a Railroad Yard Study for the Ship Creek area. The study will be developed concurrently with the Municipality's Ship Creek Sub-Area Study and with the Port's Master Planning effort, so will cross-reference both. The main goal of the ARRC Yard Study and the Sub-Area Study is to identify transportation problems and recommend transportation improvements. One element that will be elaborated in the near-future studies is the possibility of relocating Whitney Road.

As one consideration in the Ship Creek Master Plan, the railroad is looking at an Intermodal Depot, to provide a connection between commuter trains and buses. Potentially, commuters from the Mat-Su Valley could use rail transportation to come and go from the Valley to Anchorage, and then use the People Mover bus system to travel to and from work or other destinations within Anchorage.

D. DEMAND AND CAPACITY ANALYSIS

The planning of the street and highway system for Anchorage is performed by the Municipality of Anchorage's Department of Community Planning and Development (Planning Department). At the time of this study, the Planning Department is performing an update of Anchorage's Comprehensive Plan, a key element of which is a Long-Range Transportation Plan for the city. Similarly, the Alaska Railroad Corporation is preparing comparable master plans for its facilities, including a special study of the Ship Creek area. Consequently, the analysis in this section will be limited to history and forecasts for port-oriented traffic. As appropriate, the data presented in this section should be incorporated into the Municipality's and ARRC's ongoing transportation planning efforts.

D.1 Historic Traffic Volumes

As an ADOT&PF facility, traffic counts are acquired on Ocean Dock Road on a regular basis. ADOT&PF performs seven-day, 24-hour hose counts at three locations. Figure D-1 presents the count locations.

Figure D-1: ADOT&PF Traffic Count Locations

Ocean Dock Road Mile Post (approx.)	Physical Location
0.00	At junction with C St.
0.25	At junction with Bluff Rd.
0.47	At junction with Terminal Rd.

One location is measured each year, meaning that each location receives a count every three years. The raw counts are then analyzed for vehicle classification, seasonal variation at the time of the count, relationship with historical trends for the site and other factors. A statistical analysis is then used to determine an Average Annual Daily Traffic (AADT), a value that is used in transportation planning and engineering. Figure D-2 presents the most recent five-year history of Ocean Dock Road's AADT's.

Figure D-2: Five Year History of Ocean Dock Road Average Annual Daily Traffic

Location (MP)	1993 AADT	1994 AADT	1995 AADT	1996 AADT	1997 AADT
0.00	4051	4000	4100	3600	3974
0.25	4618	3842	3999	3489	3275
0.47	1110	1110	1600	1600	1600

Of particular interest is the third count location, MP 0.47, Terminal Road. This segment would capture 100% of the port-oriented traffic and no other traffic. Thus the data collected at this site provides a relatively accurate summary of traffic at POA.

The period 1993-97 saw a gradual increase in POA traffic. With an annualized growth rate of 10%, traffic appears to have grown at rate that is substantially higher than the historical growth

rate for cargo volumes at the port. However, given the relatively small magnitude of these volumes, it is difficult to draw any meaningful conclusions regarding this relationship. It is also noted that these counts actually represent axle-crossings of the hoses set out for the counts and that an accurate distribution of vehicle types is necessary to develop a good estimate of volumes.

D.2 Components of Existing Traffic Volumes

Port-oriented traffic may be generally categorized as ***container*** and ***non-container*** traffic. Container traffic is the trucks and associated vehicles whose trips are generated as by container movements. Non-container traffic would include truck and other vehicles movements generated by break-bulk/neo-bulk, commodity, and automobile transfers. Figure D-3 presents a break-out of POA-oriented traffic by these two categories for the years 1995 and 1998. It is noted that these volumes were developed by the application of typical trip-generation rates for freight movements and not by physical hose or classification counts. Thus these estimates provide an independent validation of the results of the ADOT/PF field counts. Figure D-3 summarizes the results of this analysis. Appendix A presents the detailed analysis.

Figure D-3: 1998 Estimated Traffic Volumes for Port Related Only

		Truck	Auto	Total
Total Port	AADT	1,133	126	1,259
	Pk Day	1,822	126	1,948
	Pk Hr	284	42	327
Container	AADT	1,096	105	1,101
	Pk Day	1,710	105	1,815
	Pk Hr	256	37	293
Non-Container	AADT	37	21	58
	Pk Day	112	21	133
	Pk Hr	28	5	33

The estimated AADT by this approach yields a value that is approximately 80% of the volume developed through the field counts. Given the limitation in accuracy for the field counts because of variations in percentages of trucks within the traffic stream, the correlation between these two calculations is good.

D.3 POA Traffic Forecasts

The same technical approach used in estimating current port-oriented traffic volumes using freight volumes was applied to the forecast activity at POA to estimate a range of future traffic scenarios. Figure D-4 summarizes the results of this analysis. Appendix A presents the detailed analysis.

Figure D-4: Future Port of Anchorage Traffic Scenarios

	Year	2005			2010			2020		
Total Port		Truck	Auto	Total	Truck	Auto	Total	Truck	Auto	Total
	AADT	1246	139	1386	1317	149	1466	1448	165	1613
Low Growth	PK DAY	2,003	139	2,142	2,118	149	2,267	2,330	165	2,495
	DHV	313	46	359	331	49	380	364	54	419
	AADT	1443	164	1607	1712	203	1916	2264	270	2534
Medium Growth	PK DAY	2,356	164	2,520	2,851	203	3,054	3,771	270	4,041
	DHV	375	54	429	465	66	531	616	87	703
	AADT	1836	307	2143	2227	264	2491	3142	361	3503
High Growth	PK DAY	3,033	307	3,340	3,705	264	3,969	5,219	361	5,580
	DHV	490	103	593	604	86	690	849	118	967
Container	AADT	1206	115	1,321	1273	120	1,393	1398	130	1,528
Low Growth	PK DAY	1,881	115	1,996	1,986	120	2,106	2,181	130	2,311
	DHV	282	40	322	298	42	340	327	46	373
	AADT	1371	130	1,501	1587	150	1,737	2097	200	2,297
Medium Growth	PK DAY	2,138	130	2,268	2,476	150	2,626	3,271	200	3,471
	DHV	321	46	366	371	53	424	491	70	561
	AADT	1719	260	1,979	2067	200	2,267	2921	275	3,196
High Growth	PK DAY	2,681	260	2,941	3,224	200	3,424	4,557	275	4,832
	DHV	402	91	493	484	70	554	684	96	780
Non-Container	AADT	41	24	65	44	29	73	50	35	85
Low Growth	PK DAY	122	24	146	132	29	161	149	35	184
	DHV	30	6	37	33	7	40	37	9	46
	AADT	73	34	107	125	53	178	167	70	237
Medium Growth	PK DAY	218	34	252	375	53	428	500	70	570
	DHV	55	8	63	94	13	107	125	17	142
	AADT	117	47	165	160	64	224	221	86	307
High Growth	PK DAY	352	47	399	481	64	545	662	86	748
	DHV	88	12	100	120	16	136	166	22	187

D.4 Port Area Traffic Forecasts

Figure D-5 compares the combined POA-oriented traffic with traffic associated with the marine operators at the POA's periphery to present a long-term picture of future traffic in the Ocean Dock Road corridor.

Figure D-5:Estimated Future Traffic Area Volumes for Port Area

Year	2005			2010			2020		
	Truck	*Auto*	*Subtotal*	*Truck*	*Auto*	*Subtotal*	*Truck*	*Auto*	*Subtotal*
Low Growth									
Port of Anchorage									
AADT	1246	139	1386	1317	149	1466	1448	165	1613
Peak Day	2,003	139	2,142	2,118	149	2,267	2,330	165	2,495
DHV	313	46	359	331	49	380	364	54	419
Port Area									
AADT	1,101	1,101	2,202	1,157	1,157	2,314	1278	1278	2557
Peak Day	1,321	1,321	2,643	1,389	1,389	2,777	1534	1534	3068
DHV	132	132	264	139	139	278	153	153	307
Total Port Area									
AADT	2,347	1,240	3,588	2,474	1,306	3,780	2,726	1,443	4,169
Peak Day	3,324	1,460	4,784	3,506	1,538	5,044	3,864	1,699	5,563
DHV	445	178	623	470	188	658	518	208	725
Medium Growth									
Port of Anchorage									
AADT	1443	164	1607	1712	203	1916	2264	270	2534
VPD	2,356	164	2,520	2,851	203	3,054	3,771	270	4,041
VPH	375	54	429	465	66	531	616	87	703
Port Area									
AADT	1,140	1,140	2,280	1,228	1,228	2,456	1,425	1,425	2,850
Peak Day	1,368	1,368	2,735	1,473	1,473	2,947	1,710	1,710	3,420
DHV	137	137	274	147	147	295	171	171	342
Total Port Area									
AADT	2,583	1,304	3,887	2,940	1,431	4,371	3,689	1,695	5,384
Peak Day	3,724	1,532	5,256	4,324	1,677	6,001	5,481	1,980	7,461
DHV	512	191	703	612	213	826	787	258	1,045
High Growth									
Port of Anchorage									
AADT	1836	307	2143	2227	264	2491	3142	361	3503
Peak Day	3,033	307	3,340	3,705	264	3,969	5,219	361	5,580
DHV	490	103	593	604	86	690	849	118	967
Port Area									
AADT	1,221	1,221	2,442	1,381	1,381	2,762	1,768	1,768	3,536
Peak Day	1,465	1,465	2,930	1,657	1,657	3,315	2,122	2,122	4,243
DHV	146	146	293	166	166	331	212	212	424
Total Port Area									
AADT	3,057	1,528	4,585	3,608	1,645	5,253	4,910	2,129	7,039
Peak Day	4,498	1,772	6,270	5,362	1,922	7,284	7,341	2,483	9,824
DHV	637	249	886	770	252	1,021	1,061	330	1,391

Note:

ADT=Annual Average Daily Trips (total for both directions)

Peak Day = ADT with seasonal variation factor for peak operations applied

DHV=Vehicles per Peak Hour (total for both directions)

D.5 Street and Highway System User Issues

Transportation planners evaluated Ocean Dock Road by using an "Intermodal Connectors Condition & Investment Study, Field Inventory Data Checklist". Excerpts from the checklist summarize geometric and physical features, at-grade railroad crossings, traffic operations and safety, and other factors. Noted conditions are tabulated in Figure D-6.

Figure D-6: Noted Conditions of Geometric and Physical Features

Geometric and Physical Features	Noted Conditions
Pavement Condition	90%-Fair, 10%-Poor
Problems conditions	• Inadequate shoulder width - most of length • Lack of stabilized shoulders - most of length • Tight turning radii at intersections - short section • Slick active railroad crossings - short section (rubberized crossing materials are slippery when wet, cause trucks to reduce speed)
At-Grade Railroad Crossings (Problems)	Four crossings along Intermodal Connector
Delays at Railroad Crossings	Two crossings
Switching/Make-up Operations	Two crossings
Inadequate Sight Distance at Crossing	Four crossings (low angle crossings)
Rough Railroad Crossing Surface	Four crossings
Lack of Alternate Route	Three crossings (two lacked an alternate route for trucks)
Other: Slick Active Railroad Crossings	Four crossings
Traffic Operations and Safety	
Safety Problems or Delays, excluding railroad crossings?	Yes
• Heavy traffic/congested	During POA terminal peak
• Difficulty making left or right turns	During AM/PM peak and POA terminal peak
• High pedestrian traffic	During POA terminal peak (particularly when Ship Creek is open to salmon fishing)
Delay Problems at connector's junction with the mainline NHS route?	Yes
• Heavy traffic on Mainline NHS	During POA terminal peak
Other Factors	
Is destination signing adequate for truck drivers to find the freight terminal?	Yes

Figure D-6 shows shoulder deficiencies and railroad crossing conflicts as the primary concerns along Ocean Dock Road.

Additional information on truck route conditions in the Port Area was obtained in a Carrier Interview survey performed as part of MOA's Freight Mobility Study. A portion of the Carrier Interview, labeled "Goods Movement Issues" furnished insight into the impediments to efficient freight transportation in Anchorage, as perceived by carriers. Elements relevant to the Port Area can be gleaned from this survey data.

Responses concerning the most serious impediments to efficient transportation included the following:

- Traffic congestion, especially in summer
- Bus depot on Whitney Road causes delays along with trains (4-5 buses at railroad tracks adds 20-30 minutes of delay every day)
- Difficult truck routes
- Truck routes requiring heavy trucks (70,000 lb. GVW) to stop at the bottom of a hill, as occurs coming out of the Port Area, are undesirable - difficult in winter
- Lack of alternative access route to Port
- Need North Port access route
- Some intersections are difficult to negotiate; Whitney Road corner is "very tough"
- Summer construction causes congestion, delays
- Traffic delays result from number of signals and unsynchronized signals
- Road crossing movements between tank farm and terminals in the Port Area are difficult because of traffic volume
- Crossing movements between terminal and other yards also difficult because of through movements
- Excessive speeds on Post Road make it difficult for trucks to enter the roadway
- Better road construction standards desired to improve durability of road surface
- Congestion on Glenn Highway between 3-5 p.m. adds 15-20 minutes per trip
- Imposed load limits during breakup require more, lighter loads resulting in increased costs
- Trucks using double trailers cannot use the C Street bridge, must use Whitney Road
- Lack of direct route form Port to south side of town
- Train conflicts on ocean Dock Road cause delays of 30-45 minutes
- Public access to Tidewater Road causes conflicts

The impediments described in the freight movement survey fall into a few main categories:

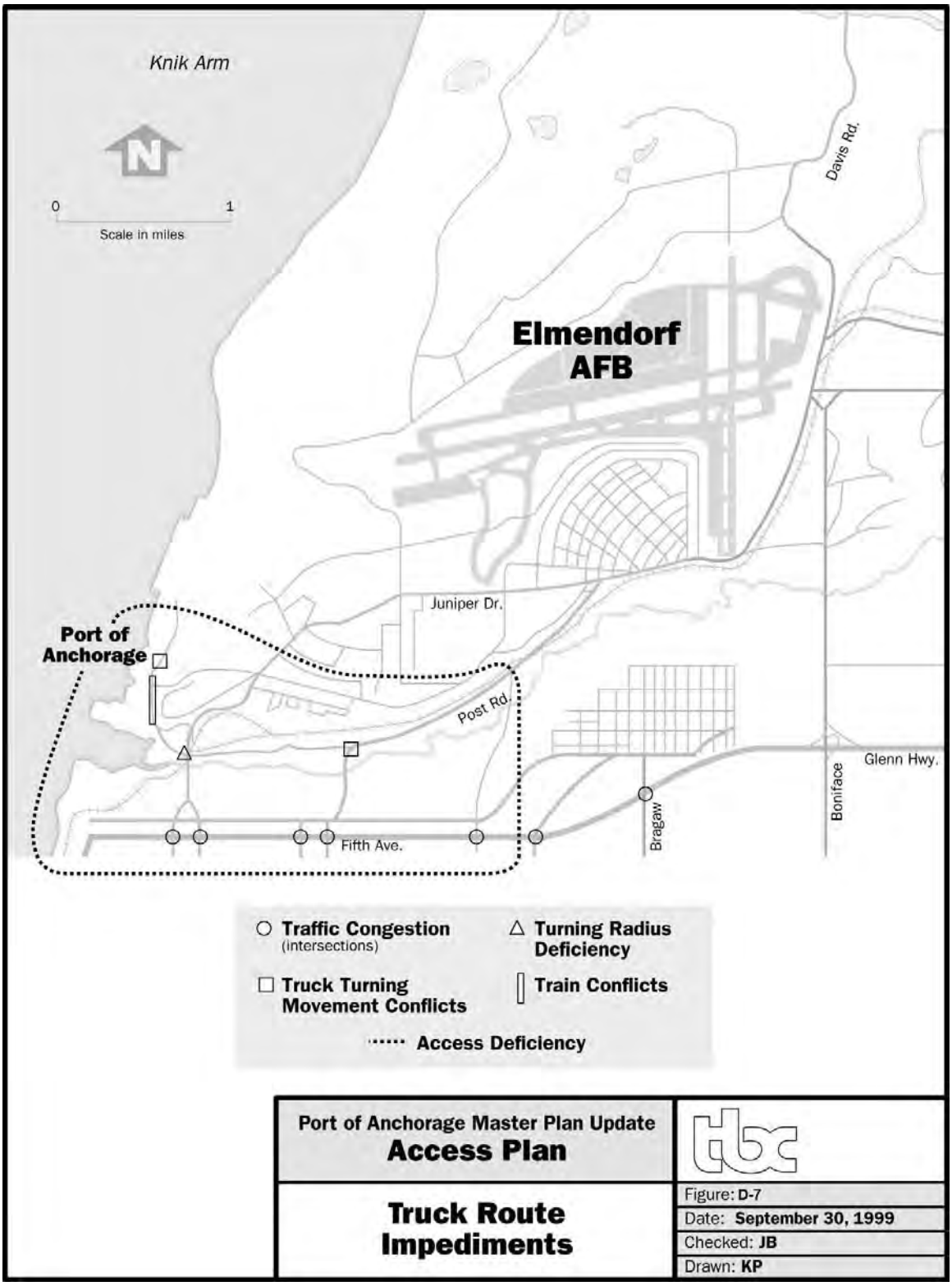
1. Traffic congestion in the overall truck route system
2. Turn movement conflicts because of truck volumes in the Port Area
3. Railroad crossing conflicts
4. Turning radius deficiencies
5. Access deficiencies on designated truck routes

The following Figure D-7 shows the Port Area with the immediate industrial and commercial districts and identifies problem spots identified as impediments.

D.5.1 Truck traffic and accidents

Information from the Ocean Dock Road improvement project Design Study Report (DSR) indicates that truck traffic accounts for 20 percent of the annual average daily traffic (AADT) south of Port Access Road and over 26 percent of AADT north of Port Access Road. Because truck activity in the Port Area is focused around ship days, the peak truck traffic in a given week occurs Sunday through Wednesday. The actual percentage of trucks on these days is arguably higher than the annualized average. The Ocean Dock Road DSR also provides accident data, showing that 20 accidents, including one fatality, occurred on Ocean Dock Road during the seven-year period from 1989 to 1995. Three accidents involved collisions between a vehicle and train, most accidents occurred near intersections. The estimated damages resulting from the twenty accidents exceed sixty-five thousand dollars.

Figure D-7: Truck Route Impediments in the Port Area



D.6 Conclusions and Recommendations

Key Access Plan findings and conclusions are as follows:

- There are capacity deficiencies on the primary roadways that convey Port-oriented traffic.
- Locations of concern include the Whitney/Ocean Dock Road intersection, the Central Business District and the A/C viaduct ramps.
- Extension of Ingra-Gambell to provide a direct connection to the Port would substantially improve levels of service on Port area roadways and facilitate the Municipality's Comp Plan objective of diverting truck traffic out of the Central Business District.
- Development of a North Port Access will also improve reserve capacity on Port area roadways and support key local and statewide economic development objectives. This Access would also provide an additional route between the Port and the National Highway System.

Key Access Plan recommendations are as follows:

- The Port should continue to vigorously support the public transportation process with the objective of elevating the priority of Port access improvements.
- Use the Ship Creek Transportation Study and the AMATS model to further refine future traffic volumes and identify roadway impacts in the Port Area.
- Provide planning and engineering assistance to the Ingra-Gambell Development effort.
- Provide planning and engineering assistance to the AMATS Long Range Transportation Plan and related program documents.
- Continue to pursue corridor preservation and environmental documentation for a North Port Access.

IV. IMPLEMENTATION PLAN

A. BACKGROUND

The first three elements of this Master Plan involved the detailed analysis and evaluation of various factors leading to a series of findings and recommendations for each element. This Implementation Plan is intended to condense those recommendations into a step-by-step listing of tasks to assist the Port staff in progressing towards the targeted opportunities. The Master Plan is essentially a market driven "road map" for future success. This implementation program highlights the most promising routes for execution of the Master Plan. However, like a road map, the Master Plan allows for fluctuations and shifts in the marketplace and for other changing conditions. The Master Plan elements define:

- The strategic marketing direction that the Port should follow.
- The required facility infrastructure to accommodate the opportunities.
- A program to assist in the development of efficient means to access the Port.

The following section, Implementation Recommendations, presents the steps for each element. It is also important that the Port staff initiate periodic reviews to ensure that the Master Plan is being followed, or, should shifts in the marketplace or other changes occur, that the Port revise the Master Plan appropriately. Because changes in trends and other trade fluctuations in the market are likely, these implications require careful evaluation. The Port should be proactive and prepared to respond to the potential need for new terminal development.

A.1 Purpose

The Implementation Plan provides the simplified rationale for the phased step-by-step execution of the Recommended Master Development Plan. Although these steps are intended to occur over the course of approximately 20 years (in approximately 5-year increments), it is important to understand that variations in conditions may accelerate or decelerate the need for specific actions. Because marketing actions should consist of immediate proactive patterns, and should not cease even if certain goals are achieved, the timing for the Strategic Marketing Plan recommendations has not been specifically defined. For the Facility Plan, timing related to the five year increments is associated with each action. For the Access Plan, which focuses on off-Port access improvements, the timing of improvements depends on the sum of both Port and non-Port impacts. Precise definition of non-Port access impacts is beyond the scope of this study and beyond the control of the Port. Therefore, the timing of Access Plan implementation steps has not been defined. We recommend that the Port continue to work closely with regional transportation planning processes to encourage that Port related access improvements are recognized for their high priority and value in the regional economy.

In addition to the key implementation recommendations, the Facilities Plan includes provisions for repairs and maintenance of existing facilities, as well as new infrastructure such access ramps

at the TOTE berths. The new structures and repair and maintenance procedures are defined in the Facilities Plan under Section F: Implementation. While these new structures, and repair and maintenance efforts are considered to be above and beyond the requirements for the new facilities expansion program, they are an essential means of providing existing and new tenants with necessary improvements over the 20-year span.

There are two other important Master Plan work scope components related to the Implementation Plan. The first involves an overview of the order-of-magnitude economic impacts of the Port of Anchorage. This component includes an assessment of the economic impact of the development recommended in the Master Plan and includes a consideration of the direct, indirect and induced economic impacts, and direct and indirect business and jobs impacts. This assessment is presented in Appendix A of this report, Economic Impact Overview.

Second, as part of the Implementation Plan, the consulting team performed a review of Port business and marketing documents. A Port tariff review was also initiated that considered the Port's tariff practices. Refer to Appendix B,: Port Documents Review for this complete evaluation process.

B. IMPLEMENTATION RECOMMENDATIONS

In this section, implementation steps are listed and described for the following:

- Strategic Marketing Implementation Recommendations
- Facilities Implementation Recommendations
- Access Implementation Recommendations

B.1 Strategic Marketing Implementation Recommendations

The strategic marketing strategy for the Regional Port of Anchorage will be dominated by the fact that Anchorage will likely continue to be the major distribution center for the State of Alaska well into the 21st Century. In the foreseeable future, the State, and Anchorage, will continue to rely on ocean carrier service from the ports of Northern Washington State. This condition is slightly different for the cruise industry, as some itineraries are also originating out of British Columbia. However, the industry is continually seeking new opportunities and approaches to passenger destinations. And, Anchorage could be the beneficiary of more exotic cruises, such as those to the Arctic Circle, etc.

Therefore, the following are the key strategic marketing steps that should be initiated as a means of improving and expanding the Port's role as the Regional Port for the State of Alaska. These are presented in a summary list, followed by a brief description of each item.

• **Foster Improvements for Existing Tenants**
• **Support In-State Distribution**
• **Pursue Asian Container Shipping**
• **Pursue Natural Resource Opportunities for Coal**
• **Pursue Natural Resource Opportunities for Timber**
• **Pursue Opportunities for Seafood Products**
• **Initiate Terminal Expansion Program**
• **Pursue Cruise Line Opportunities**
• **Negotiate with DOD for Additional Opportunities**
• **Seek Alternative Funding Sources**

Foster Improvements for Existing Tenants

Continue to improve and develop the Port's existing terminal facilities. Working with the existing tenants, initiate an improvement program of existing facilities.

Support In-State Distribution

Support in-State distribution efforts such as developing a plan of action to improve intermodal access and rail connectivity.

Pursue Asian Container Shipping

Actively work with the MOA and other organizations to develop direct container service from and to Asia. Begin process of developing marketing program to identify and approach Asian container shipping lines for new carrier service.

Pursue Natural Resource Opportunities for Coal

Develop marketing program to identify and approach new natural resource opportunities for coal.

Pursue Natural Resource Opportunities for Timber

Develop marketing program to identify and approach new natural resource opportunities for timber.

Pursue Opportunities for Seafood Products

Develop marketing program to identify and approach new opportunities for seafood products.

Initiate Terminal Expansion Program

Develop new cargo terminals for the new and larger generation of vessels that are likely to call on the Regional Port of Anchorage in the future. This requires deeper channels and deeper berthing capability. It also requires larger ship-to-shore cranes and other infrastructure.

Pursue Cruise Line Opportunities

Begin process of developing marketing program to identify and approach new cruise line itineraries and opportunities. The development of a state-of-the-art cruise terminal could enhance the Port's ability to accommodate and support additional cruise traffic and connectivity to the Downtown shopping area. Anchorage's high capacity International Airport is an excellent catalyst for smaller, adventure-oriented cruises to the Arctic Circle and the Aleutian Islands as well as other destinations not yet on the main tourist routes. These same adventure cruises are very popular in the Southern Hemisphere between the Antarctic Circle and Argentina.

Negotiate with DOD for Additional Opportunities

Begin process of negotiating with the DOD the necessary improvements to Port infrastructure for loading and offloading of munitions, heavy equipment and other military hardware.

Seek Alternative Funding Sources

Seek out and nurture alternative sources for capital funding of needed projects and infrastructure that will strengthen the Port's attractiveness to shipping lines and other potential cargo users that may consider Anchorage's unique environment and opportunity.

For all of the above strategic marketing steps, an ongoing effort is most appropriate. Therefore, the estimated start date for all would be 2000 and the estimated completion date would be 2020.

B.2 Facilities Implementation Recommendations

The Facilities Implementation Recommendations are directly linked to the findings of the Facilities Plan. That Plan identified a phased development process that will allow the Port to plan and construct new terminals and related infrastructure as the market dictates. However, permitting, planning and design and construction for a new terminal will take two to five years before a site can be occupied. It is important to note that the amount of time can vary quite dramatically for most new construction projects. Either way, depending on the complexity or simplicity of the project, the timing of new facilities must be carefully estimated in order to achieve the intended goal. This is especially critical if facilities are needed within a certain time frame. Therefore, an emphasis needs to be placed on careful planning and a periodic review of the market trends and the needs of existing tenants. We have developed a spreadsheet that identifies our estimate of these needs, based on the market medium forecast, for each of our recommended development Phases identified in the Facilities Plan. An approximate time frame in which to accomplish the various tasks identified for the Facilities Implementation Recommendations is presented in Figure B-1.

The following facility plan implementation steps are presented by in a summary list, followed by a brief narrative of each.

• **Phase I-A, Existing Facilities Improvement**
• **Phase I-A, Existing Facilities Improvement**
• **Phase III-A, Northern Tidelands Expansion**
• **Phase III-B, Northern Tidelands Expansion**
• **Phase III-C, Northern Tidelands Expansion**
• **Phase IV, Natural Resources Facility**
• **Phase V, North Access Improvements Program**
• **Maintenance**

Phase I-A

- Begin design process for new concrete trestle at TOTE terminal. Initiate construction upon funding, permitting and selection of contractor.
- Begin negotiations for the reconfiguration of existing Port of Anchorage property lines, especially for the Sea-Land and TOTE terminals. Initiate new property line designations, fence lines, gate entrances, etc.

- Begin design process for the realignment of Port access roads at same time as property reconfiguration. Initiate relocation of major utilities, reconfigure existing road and construct new.
- Begin design process for the renovation of POL 2 Terminal, possibly for new cruise terminal or for multi-use cargoes. Initiate construction.
- Perform necessary annual maintenance and repairs as described in the Facilities Plan: Facilities Maintenance and Repair Matrix for Phase I-A.

Phase I-B

- Begin design process for 100-foot gage crane expansion at Terminal 1 and 2. Initiate construction upon funding, permitting and selection of contractor.
- Begin permitting process with U.S. Army Corps of Engineers and design process for 45 foot dredge project of portion of Knik Arm for Terminals 2 and 3 as required.
- Begin design process for the relocation of the existing Maintenance and Repair building or the possible demolition of existing and construction of new M & R at location identified on Phase I-B drawing Figure F-2.
- Perform necessary annual maintenance and repairs as described in the Facilities Plan: Facilities Maintenance and Repair Matrix for Phase I-B.

Phase II

Begin the design process for necessary Programmed Access Improvements such as:

- Ocean Dock Road Rehabilitation
- Ingra-Gambell Street Extension.
- Glenn Highway Reconstruction.
- North Port Access.
- Other access Improvements

Refer to the Access Implementation Recommendations for a complete description of access issues that effect the Regional Port of Anchorage's ability to accommodate additional growth and expansion.

Phase III-A

- Begin design processes for new container terminal in Northern Tidelands area and begin permit process with U.S. Army Corps of Engineers, and other agencies for land fill of approximately 20 acres and dredging of approximately 6.2 million cubic yards. Initiate dredge and fill project.
- Begin design process for new concrete wharf and trestle system. Initiate construction.
- Perform necessary annual maintenance and repairs as described in the Facilities Plan.

Phase III-B

- Begin design processes for additional container terminal expansion in Northern Tidelands area and begin permit process with U.S. Army Corps of Engineers, and other agencies for

land fill of approximately 24 acres and dredging of approximately 11.6 million cubic yards. Initiate dredge and fill project.
- If high forecast realized, begin design process for new concrete wharf and trestle system. Initiate construction.
- Perform necessary annual maintenance and repairs as described in the Facilities Plan.

Phase III-C

- Begin design processes for additional container terminal expansion in Northern Tidelands area and begin permit process with U.S. Army Corps of Engineers, and other agencies for land fill of approximately 22 acres and dredging of approximately 34.4 million cubic yards. Initiate dredge and fill project.
- If high forecast realized, begin design process for new concrete wharf and trestle system. Initiate construction.
- Perform necessary annual maintenance and repairs as described in the Facilities Plan.

Phase IV

- Based on Strategic Marketing success, and high forecast, begin design processes for new natural resource facility in Northern Tidelands area and begin permit process U.S. Army Corps of Engineers, and other agencies for land fill of approximately 12 acres. Dredge quantities for new natural resource are described in greater detail in the Port of Anchorage – North Tidelands Coal Terminal Study, dated December 12, 1997.
- Perform necessary annual maintenance and repairs as described in the Facilities Plan: Facilities Maintenance and Repair Matrix for Phase IV.

Phase V

- See following Access Implementation Recommendations as well as separate North Access Corridor Reconnaissance Study, dated May 1998.

Maintenance

Figure B-1: Estimated Facilities Implementation Start and Finish Dates

Figure B-1: Estimated Facilities Implementation Start and Finish Dates

Task	Estimated Start Date	Estimated Finish Date
Phase I-A, Existing Facilities Improvement	2000	2005
Phase I-A, Existing Facilities Improvement	2005	2010
Phase III-A, Northern Tidelands Expansion	2000	2005
Phase III-B, Northern Tidelands Expansion	2010	2015
Phase III-C, Northern Tidelands Expansion	2015	2020
Phase IV, Natural Resources Facility	2010	2020
Phase V, North Access Improvements Program	2010	2020
Maintenance	2000	2020

B.3 Access Implementation Recommendations

In order for the Port to realized access improvements in and around the Port, the following steps need to be implemented. A summary list is followed by a brief narrative.

- **Pursue Internal Port Circulation Recommendations**
- **Support Public Transportation Planning Process**
- **Elevate Priority of Port Access Improvements**
- **Coordinate with Ship Creek Transportation Study**
- **Coordinate with Final Update of AMATS Model**
- **Assist in Planning Ingra-Gambell Improvements**
- **Pursue Corridor Preservation for North Access**

Pursue Internal Port Circulation Recommendations

Work with existing tenants to improve internal Port circulation. Review Facilities Implementations Recommendations for improvements to internal Port circulation suggested in Phase I-A. Also, review Phase II Facilities Implementations Recommendations for additional access considerations.

Support Public Transportation Planning Process

Actively support public transportation planning processes representing the unique and high value nature of Port traffic.

Elevate Priority of Port Access Improvements

Work with AMATS and appropriate transportation planning processes to assure high value of Port access is reflected in high priorities for Port related access projects.

Coordinate with Ship Creek Transportation Study

Use the Ship Creek Transportation Study and final update of the AMATS model to further refine traffic volumes and identify roadway impacts in the Port Area.

Coordinate with Final Update of AMATS Model

Work with AMATS to provide input for Port related traffic volumes and traffic patterns.

Assist in Planning Ingra-Gambell Improvements

Provide planning and engineering assistance to the Ingra-Gambell Design Study effort.

Pursue Corridor Preservation for North Access

Continue to pursue corridor preservation and environmental documentation for a North Port Access.

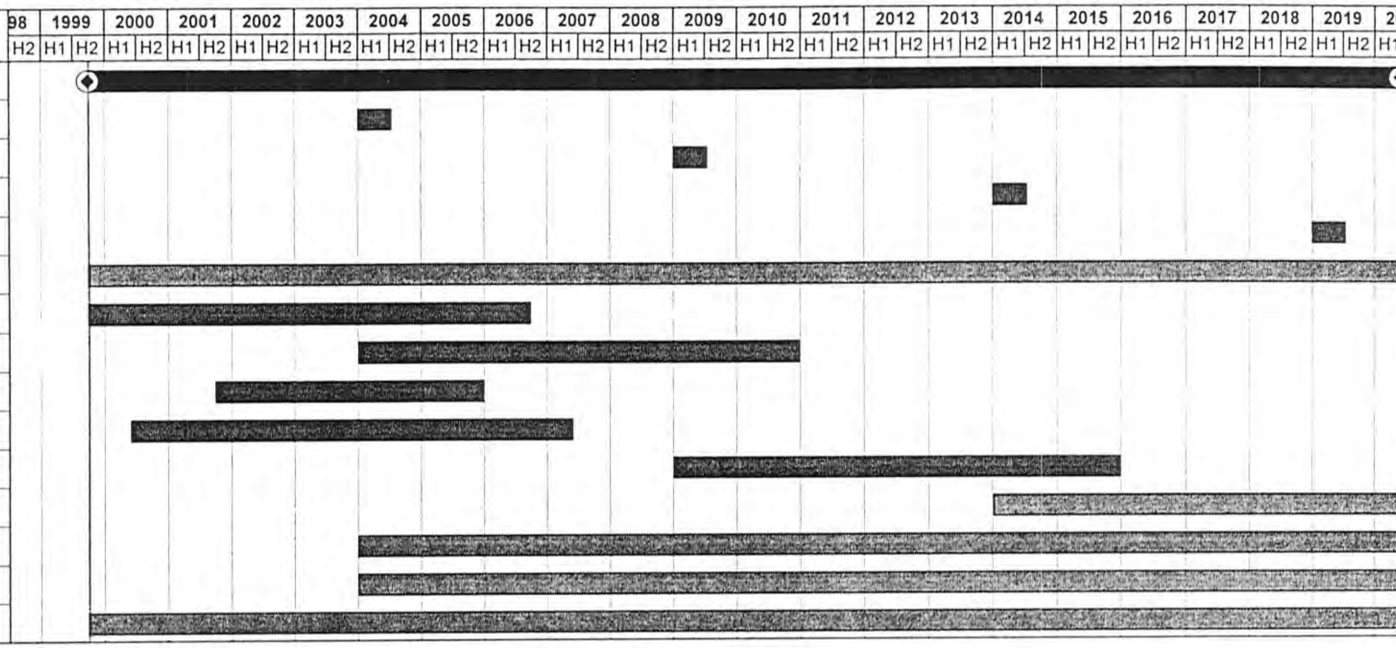
A time frame in which to accomplish the various tasks identified for the Access Implementation Recommendations is dependant on factors outside the Port's control. Therefore, a listing of start and completion dates is not included in this report. The Port should continue to work closely with the public transportation process to encourage and support a schedule consistent with the anticipated growth as outlined in the Access Plan of this report.

B.4 Implementation Schedule

A complete implementation schedule has been developed that represents an estimate for the implementation of the complete Master Plan. This schedule is based on the medium forecast defined in the Strategic Marketing Plan and is presented in Figure B-2. Note that periodic reviews at approximately 5-year intervals of the Master Plan by Port staff have been incorporated into the schedule

Port of Anchorage - Master Plan - Implementation Schedule

ID	Task Name
1	**Master Plan Implementation**
2	Perform Periodic Master Plan Review
3	Perform Periodic Master Plan Review
4	Perform Periodic Master Plan Review
5	Perform Periodic Master Plan Review
6	Strategic Marketing Program
7	Phase I-A Planning and Construction
8	Phase I-B Planning and Construction
9	Phase II Planning and Construction
10	Phase III-A Planning and Construction
11	Phase III-B Planning and Construction
12	Phase III-C Planning and Construction
13	Phase IV Planning and Construction
14	Phase V Planning and Construction
15	Maintenance



Project: Port of Anchorage
Date: Tue 9/28/99

Task		Milestone		Rolled Up Critical Task		Split	
Critical Task		Summary		Rolled Up Milestone		External Tasks	
Progress		Rolled Up Task		Rolled Up Progress		Project Summary	

VZM/TranSystems - Tryck Nyman Hayes, Inc. - Northern Economics - Leeper, Cambridge & Campbell, Inc. - The Boutet Company - Ogden Beeman Associates

FIGURE B-2

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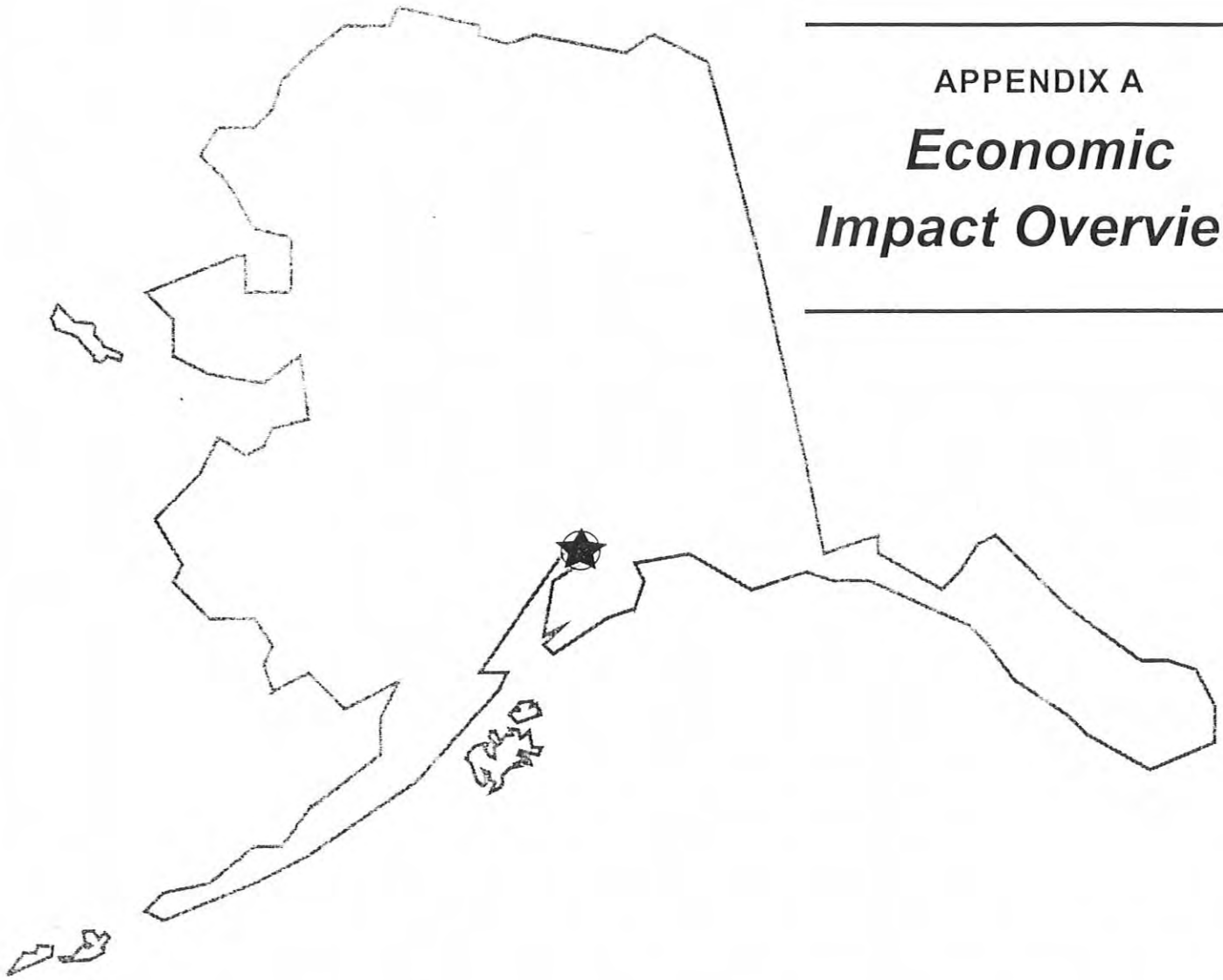
Regional Port of Anchorage
Master Plan



APPENDIX A

Economic Impact Overview

APPENDIX A: ECONOMIC IMPACT OF PORT ACTIVITIES

The purpose of this section is to provide an estimate of the economic impact of the Port of Anchorage (POA or the Port) in terms of business activity and jobs that may occur as a result of implementation of the Master Plan.

Ports play an important role in meeting the demand for water transportation service, which is driven by the producers and consumers of waterborne cargo both in foreign and domestic commerce. This demand for waterborne cargo initiates a chain of economic activity, which contributes to the overall economy.

The following subsections summarize the economic impact of the nation's public ports and certain individual ports that provide a range of values for the economic impacts of ports in general. The current and projected economic impacts of the POA are then presented. Due to limited resources and the scope of work, the discussion on the economic impact of POA is limited to the impacts from the port industry at the Port and the Port's capital expenditures.

A.1 Economic Impact of U.S. Public Ports

In 1996, the total waterborne commerce through U.S. public ports was 2,072 million metric tons (MT), with 1,074 million MT in foreign trade (665 million MT imported and 409 million MT exported) and 999 million MT in domestic trade. Figure 1 displays the commodities shipped through U.S. ports in 1996 as a percentage of total tonnage, foreign trade, and domestic trade.

Figure 1: U.S. Waterborne Trade Commodities, 1996

Commodities	Cargo Volume (Percent of Total Tonnage)		
	Total	**Foreign Trade**	**Domestic Trade**
Chemicals	6.7	6.1	7.3
Coal	14.4	8.3	20.9
Crude Materials	17.0	13.1	21.2
Food/Farm Products	12.5	15.8	8.9
Manufacturing Equipment	2.5	3.5	1.6
Manufacturing Goods	4.8	6.0	3.4
Petroleum	41.8	47.1	36.2
Other	0.3	0.1	0.5
Total	**100.0**	**100.0**	**100.0**

Source: U.S. Maritime Administration. *A Report to Congress on the Status of the Public Ports of the United States, 1996-1997*. Available online: http://www.marad.dot.gov/publications/Port_Report/index.htm. May 1999.

The economic impacts associated with the port industry, capital expenditures, and port users are measured as the direct, indirect, and induced impacts in terms of employment, personal income, and business sales, Gross Domestic Product (GDP),1 and taxes.

Direct impacts include the initial round of spending and employment generated by the port industry. Indirect impacts are the effects on other industrial and service sectors caused by the direct activity, for example, the purchase of supplies, services, labor, and other inputs. Induced impacts include household purchases of goods and services made possible because of wages generated by the direct and indirect effects.

The following subsections describe the economic impacts of the U.S. public port industry, capital expenditures, and port users.

A.1.1 Port Industry

The port industry is defined as any economic activity that is directly needed for the movement of waterborne cargo. The main categories include vessel services for pilotage and dockage; trade services for freight forwarders, customs brokers, and insurance; cargo handling and storage activities; and inland transportation.

The economic impacts of U.S. public ports shown in Figure 2 are based on the total domestic and foreign waterborne tonnage handled in 1996 by the nation's deep- and shallow-draft ports and do not include the economic benefits of the cruise industry.

Figure 2: Economic Impacts of the U.S. Port Industry, 1996

Item	Economic Impact			Multiplier
	Total	Direct	Indirect and Induced	
Employment	**1.4 million jobs**	0.4 million jobs	1.0 million jobs	2.50
Income	**$52.7 billion**	$16.8 billion	$35.9 billion	2.14
Sales	**$140.1 billion**	$44.1 billion	$96.0 billion	
Gross domestic product	**$74.8 billion**	$22.8 billion	$52.0 billion	
Federal taxes	**$14.7 billion**			
State and local taxes	**$5.5 billion**			

Source: U.S. Maritime Administration. *A Report to Congress on the Status of the Public Ports of the United States, 1996-1997*. Available online: http://www.marad.dot.gov/publications/Port_Report/index.htm. May 1999.

Multipliers are used to compute additional effects of the direct impacts on the economy–the indirect and induced impacts. At the national level, the port industry employment multiplier is 2.5 and the income multiplier is 2.14. The ratio of direct income to GDP generated by port activity for the national port industry is 0.74, and the ratio of indirect and induced income to GDP generated by port activity is 0.69.

[1] The GDP is the total market value of all goods and services produced in the nation in a given year—it is equal to the total of consumer spending, investment and government spending, plus the value of exports, minus the value of imports. This value is calculated by U.S. Treasury Department and was $8.1 trillion in 1997.

A.1.2 Capital Expenditure

The national economic impact derived from the public port industry's capital expenditure program for the construction and modernization of the terminal facilities and channel dredging is shown in Figure 3. The impacts reflect the short-term results produced by the initial capital expenditure but not the long-term benefits. For example, it includes the benefits derived from the construction of a new terminal facility, but not the economic gains that result from future terminal operations.

Figure 3: Economic Impacts of U.S. Public Port Capital Expenditures, 1996

	Economic Impact			
Item	**Total**	**Direct**	**Indirect and Induced**	**Multiplier**
Employment	**45,600 jobs**	15,400 jobs	30,200 jobs	1.96
Income	**$1.7 billion**	$688.7 million	$993.4 million	1.44
Sales	**$3.9 billion**	$1.2 billion	$2.7 billion	
Gross domestic product	**$2.3 billion**	$876.7 million	$1.4 billion	
Federal taxes	**$455.9 million**			
State and local taxes	**$172.9 million**			

Source: U.S. Maritime Administration. *A Report to Congress on the Status of the Public Ports of the United States, 1996-1997*. Available online: http://www.marad.dot.gov/publications/Port_Report/index.htm. May 1999.

At the national level, the employment multiplier for capital expenditures at public ports is 1.96 and the income multiplier is 1.44. The ratio of direct income to GDP generated by port activity for the national port industry is 0.79, and the ratio of indirect and induced income to GDP generated by port activity is 0.71.

A.1.3 Port Users

Port users are businesses that make significant use of the waterborne commerce for shipping or receiving goods. The economic impacts produced by U.S. public port users are shown in Figure 4.

Figure 4: Summary of Overall Economic Impacts of U.S. Public Ports, 1996

	Economic Impact			
Item	**Total**	**Direct**	**Indirect and Induced**	**Multiplier**
Employment	**11.7 million jobs**	2.1 million jobs	9.6 million jobs	4.57
Income	**$439.8 billion**	$105.7 billion	$334.1 billion	3.16
Sales	**$1,376.5 billion**	$442.8 billion	$933.7 billion	
Gross domestic product	**$665.8 billion**	$169.9 billion	$495.9 billion	
Federal taxes	**$131.2 billion**			
State and local taxes	**$47.4 billion**			

Source: U.S. Maritime Administration. *A Report to Congress on the Status of the Public Ports of the United States, 1996-1997*. Available online: http://www.marad.dot.gov/publications/Port_Report/index.htm. May 1999.

At the national level, the employment multiplier for port users is 4.57 and the income multiplier is 3.16. The ratio of direct income to GDP generated by port activity for the national port industry is 0.62, and the ratio of indirect and induced income to GDP generated by port activity is 0.67.

Figure 5 summarizes the total economic impacts of the U.S. port industry, capital expenditures and port users in 1996. A total of 13.1 million jobs nationwide and $494.2 billion in personal income were supported by public port activities in 1996. The majority of the jobs supported by public ports are in the service sector, represented by the 11.7 million jobs in the port user category.

Figure 5: Summary of U.S. Port Industry Economic Impacts, 1996

Item	Economic Impact			
	Total	**Port Industry**	**Capital Expenditure**	**Port User**
Employment	**13.1 million jobs**	1.4 million jobs	45,600 jobs	11.7 million jobs
Income	**$494.2 billion**	$52.7 billion	$1.7 billion	$439.8 billion
Sales	**$1,520.5 billion**	$140.1 billion	$3.9 billion	$1,376.5 billion
Gross domestic product	**$742.9 billion**	$74.8 billion	$2.3 billion	$665.8 billion
Federal taxes	**$146.4 billion**	$14.7 billion	$455.9 million	$131.2 billion
State and local taxes	**$53.1 billion**	$5.5 billion	$172.9 million	$47.4 billion

Source: U.S. Maritime Administration. *A Report to Congress on the Status of the Public Ports of the United States, 1996-1997*. Available online: http://www.marad.dot.gov/publications/Port_Report/index.htm. May 1999.

Figure 6 shows how the total impacts in Figure 5 are distributed within the national economy. Figure 6 specifically depicts which industrial sectors of the economy benefit from the movement of waterborne cargo in terms of employment, income, sales, and contribution to GDP. For example, 25.7 percent of the 13.1 million jobs supported by the U.S. public ports (3.4 million jobs) were in the manufacturing sector. The majority (6.6 million jobs) of the jobs supported by U.S. public ports in 1996 were in the manufacturing and the service sectors.

Figure 6: U.S. Port Impacts at the Industrial Sector Level, 1996

Industry Sector	Economic Impact (Percent of Total U.S. Port Impacts)			
	Employment	Income	Sales	GDP
Agriculture	0.5	2.2	3.1	2.7
Agricultural Services, Forestry, Fishing	1.0	0.7	0.5	0.6
Mining	1.5	2.9	4.7	5.9
Construction	2.3	2.5	1.0	1.7
Manufacturing	25.7	32.9	41.9	29.9
Transportation/Public Utilities	8.6	11.9	10.9	12.9
Wholesale	5.6	6.8	9.1	11.4
Retail Trade	16.6	9.7	6.4	7.8
Finance, Insurance, Real Estate	9.7	11.2	12.0	13.4
Services	24.8	17.3	9.6	12.6
Government	3.7	1.9	0.9	1.2
Total	**100.0**	**100.0**	**100.0**	**100.0**

Source: U.S. Maritime Administration. *A Report to Congress on the Status of the Public Ports of the United States, 1996-1997*. Available online: http://www.marad.dot.gov/publications/Port_Report/index.htm. May 1999.

A.2 Economic Impacts of Individual Ports

Numerous port impact studies for individual ports have been published in the last 10 years. These studies provide a range of economic impacts produced by individual ports that contribute to the total impact of U.S. public ports that was discussed in the previous section. Figure 7 summarizes several impact reports on individual reports. The Port of Portland is the only port that is a landlord port like POA, the other ports listed in the table are operators, and therefore show much higher direct employment.

Figure 7: Selected Economic Impact Studies of Port Activities

Port	Study Year	Economic Impact						
		Employment			Personal Income ($Billions)			Revenue ($Billions)
		Total	Direct	Indirect	Total	Direct	Indirect	
Port Hueneme, CA	1994	2,553	NA	NA	0.06	NA	NA	0.28
Port of Portland, OR	1992	7,267	3,790	3,477	0.32	0.16	0.16	1.10
Port of Tacoma, WA	1993	67,167	33,413	33,754	1.74	0.85	0.89	6.47
Port of Charleston, SC	1997	83,085	37,100	45,900	2.60	1.50	1.10	10.70
Port of Houston, TX	1997	204,520	75,487	129,033	NA	NA	NA	7.70
Port of Seattle, WA	1994	275,000	90,000	185,000	NA	NA	NA	7.50

Sources:
LCC, Inc. *The Economic Impact of the Port of Hueneme on Ventura County for the Fiscal Year 1994*. October 1994;
Martin O'Connell Associates. *The Economic Impacts of the Port of Portland Executive Summary*. June 1992.
Port of Charleston. Economic Impact. Available online: http://www.port-of-charleston.com/economic.htm. April 1999;
Port of Houston. The Port's Economic Impact. Available online: http://www.portofhouston.com/overview/po.htm. April 1999;
Port of Seattle. Economic Impact. Available online: http://www.portseattle.org/gnrlinfo/economic.html. April 1999;
Port of Tacoma. Port of Tacoma's Economic Impact. Available online:
http://www.portoftacoma.com/tacoma/port/Economic../port_of_tacoma_economic_impact.html. April 1999;

NA = not available

Figure 8 contains the volume of cargo handled by different ports, the number of employees, the personal income generated, and the number of employees per million ST of cargo. These statistics were computed for port industry workers only. For the Port of Hueneme the number of employees per million ST is relatively higher than for the other ports listed because it is an agricultural port in which the break-bulk commodities are palletized. Data for the POA that are similar to those shown in Figures 7 and 8 are presented in Section B.3.1.1.

Figure 8: Port Industry Employment and Earnings for Various Ports

Port	Volume of Cargo[a] (Million Short Tons)	Employment (No. of Jobs)	Personal Income ($Millions)	Employees per Million Short Tons
Port of Hueneme, CA	0.9	864	22.7	960
Port of Portland, OR	15.2	5,250	178.9	345
Port of Tacoma, WA	21.5	5,068	168.9	236
Port of Charleston, SC	11.1	5,300	177.7	477

Source: Computed by Northern Economics, June 1999.
[a] Data from U.S. Army Corps of Engineers.

A.3 Economic Impacts of the Port of Anchorage

The Port of Anchorage is very important to the Alaska economy because the majority of goods coming into the state move through the Port. The Port supports more than just its direct employees. The businesses that operate on Port property and the companies that ship goods through the Port benefit from the existence of the Port as well.

The number of jobs, personal income earned, and the number of jobs and personal income generated by other businesses at the Port are measures of the impact of the port industry at POA on the Alaskan economy.

Capital expenditures at the Port also affect the Alaskan economy. The number of construction workers and the income they earn in connection with capital projects add to the impact POA has on the economy.

It is difficult to quantify the impacts of port users without an extensive research and survey effort. Extensive research is beyond the scope for work for this study. Therefore, the impact of the port industry capital expenditures at the POA are the only impacts quantified in this analysis.

A.3.1 Current Economic Impacts of the Port of Anchorage

The 1998 economic impacts quantified in this analysis consist of two components, the port industry and the capital expenditures. The total impact of each of these components is the sum of direct, indirect, and induced impacts. The direct impacts were established through discussions with personnel at the Port and other businesses that operate on Port property. The indirect and induced impacts and the amount of Alaska Gross State Product (GSP)2 generated by Port activities were estimated by applying the national average multipliers discussed in Sections B.1.1 and B.1.2.

Port Industry

The Port employs 21 Alaskans—12 maintenance personnel, 4 office personnel, 4 managers and 1 port director. In 1998, these 21 Port employees earned $1.4 million in salary and wages, overtime, and other benefits. In 1998, the Port handled 2.9 million ST of cargo, which equates with 7.12 Port employees per million ST of cargo.

There are 12 businesses that hold Terminal Use Permits at the Port. These businesses are very dependent on the Port for their livelihood. They employ laborers, operators, clerical staff, administrative managers, drivers, customer service representatives, bookkeepers, warehouse workers, and others. The number of people employed by these businesses ranges from 3 to 166 people. Combined, these 12 businesses employ at least 358 Alaskan residents who earn an estimated total of $14.2 million annually. There are about 121 employees of terminal use permit holders for every 1 million ST of cargo moving through the Port.

Figure 9 summarizes the employment and earnings directly related to the Port. The direct impact of port industry employment at the Port of Anchorage is 379 Alaskan residents, earning a total of $15.6 million in personal income annually.

[2] The total Alaska GSP in 1996 was $24.2 billion.

Figure 9: Port of Anchorage Employment and Earnings, 1998

Employer	Number of Jobs	Total Income ($Millions)	Employees per Million Short Tons
Port	21	1.4	7
Terminal Use Permit Business	358	14.2	121
Total Port Industry	**379**	**15.6**	**128**

Source: Computed by Northern Economics, June 1999

The number of port industry employees per million ST at POA is much lower than the numbers presented in Figure 8. However, a direct comparison is not appropriate because each of these ports is unique and handles very different commodities and cargo volumes.

The national employment and income multipliers presented in Section B.1.1 were used to compute the indirect and induced impacts resulting from direct employment and direct personal income generated by the port industry at POA. The total employment (1,327 jobs), total personal income ($48.9 million), and the portion of the Alaska GSP ($69.5 million) generated as the result of POA's 1998 capital expenditures are shown in Figure 10.

Figure 10: Economic Impacts of the Port Industry at the Port of Anchorage, 1998

	Economic Impact		
Item	**Total**	**Direct**	**Indirect and Induced**
Employment	**1,327 jobs**	379 jobs	948 jobs
Income	**$48.9 million**	$15.6 million	$33.3 million
Gross state product	**$69.5 million**	$21.2 million	$48.3 million

Source: Computed by Northern Economics, June 1999.

Capital Expenditures

In 1998, the Port spent $4.14 million on maintenance and repair including additions to the plant, renovations, equipment purchases, and land development. These expenditures resulted in additional employment and earnings. Since data are not available to estimate employment and earnings for POA expenditures, the construction industry is used as a surrogate in the following analysis.

According to a study completed by the University of Alaska Institute of Economic and Social Research in 1997, the construction industry contributed $1,248 million to the state gross product in 1996. The Alaska Department of Labor reported that there were 12,600 construction workers in 1996. The amount of gross state product per construction worker for 1996 is estimated at $99,048. This number implies that 1 construction worker is supported for approximately every $100,000 spent on construction projects.

Employing these data suggests that nearly 42 workers were supported by the Ports capital expenditures. At the average construction workers' hourly wage rate of $15.52, these workers earned $1.4 million in 1998.

The national employment and income multipliers presented in Section B.1.2 were used to compute the indirect and induced impacts of capital expenditures at the Port in 1998. The total employment (124 jobs), total personal income ($3.3 million) and the portion of the Alaska GSP ($5.7 million) generated as the result of POA's 1998 capital expenditures are shown in Figure 11.

Figure 11: Economic Impacts of Capital Expenditures at the Port of Anchorage, 1998

	Economic Impact		
	Total	**Direct**	**Indirect and Induced**
Employment	**124 jobs**	42 jobs	82 jobs
Income	**$3.3 million**	$1.4 million	$1.9 million
Gross state product	**$5.7 million**	$1.7 million	$4.0 million

Source: Computed by Northern Economics, June 1999.

Port Users

As stated earlier, the economic impacts of the Port on port users are difficult to quantify without an extensive research effort. In order to present a more complete picture of the total economic impacts of the Port, the GSP generated by port users was approximated by applying the ratio of the GSP generated by the POA for the port industry and their capital expenditures to the national GDP generated by the U.S. public port industry and their capital expenditures (0.10 percent). Using this methodology, the GSP due to POA port users is estimated to be $650 million. This estimate may in fact be higher because the entire state's population is highly dependent on the Port for the goods delivered.

Figure 12 summarizes the total economic impact of POA's port industry, capital expenditures and port users on Alaska GSP. An estimated total of $725.2 million of Alaska GSP is generated by the Port.

Figure 12: Summary of the Port of Anchorage's Impact on Alaska GSP

Item	**Economic Impact ($Millions)**			
	Total	**Port Industry**	**Capital Expenditure**	**Port User**
Gross state product	**725.2**	69.5	5.7	650.0

Source: Computed by Northern Economics, June 1999.

A.3.2 Future Economic Impacts of the Port of Anchorage

The impact of the Port on Alaska GSP is expected to continue to increase over the next 20 years at a rate similar to the population growth rate. The total impact may exceed $1 billion by the year 2020.

Acronyms

Port, POA	Port of Anchorage
MT	metric ton
GDP	gross domestic product
GSP	gross state product

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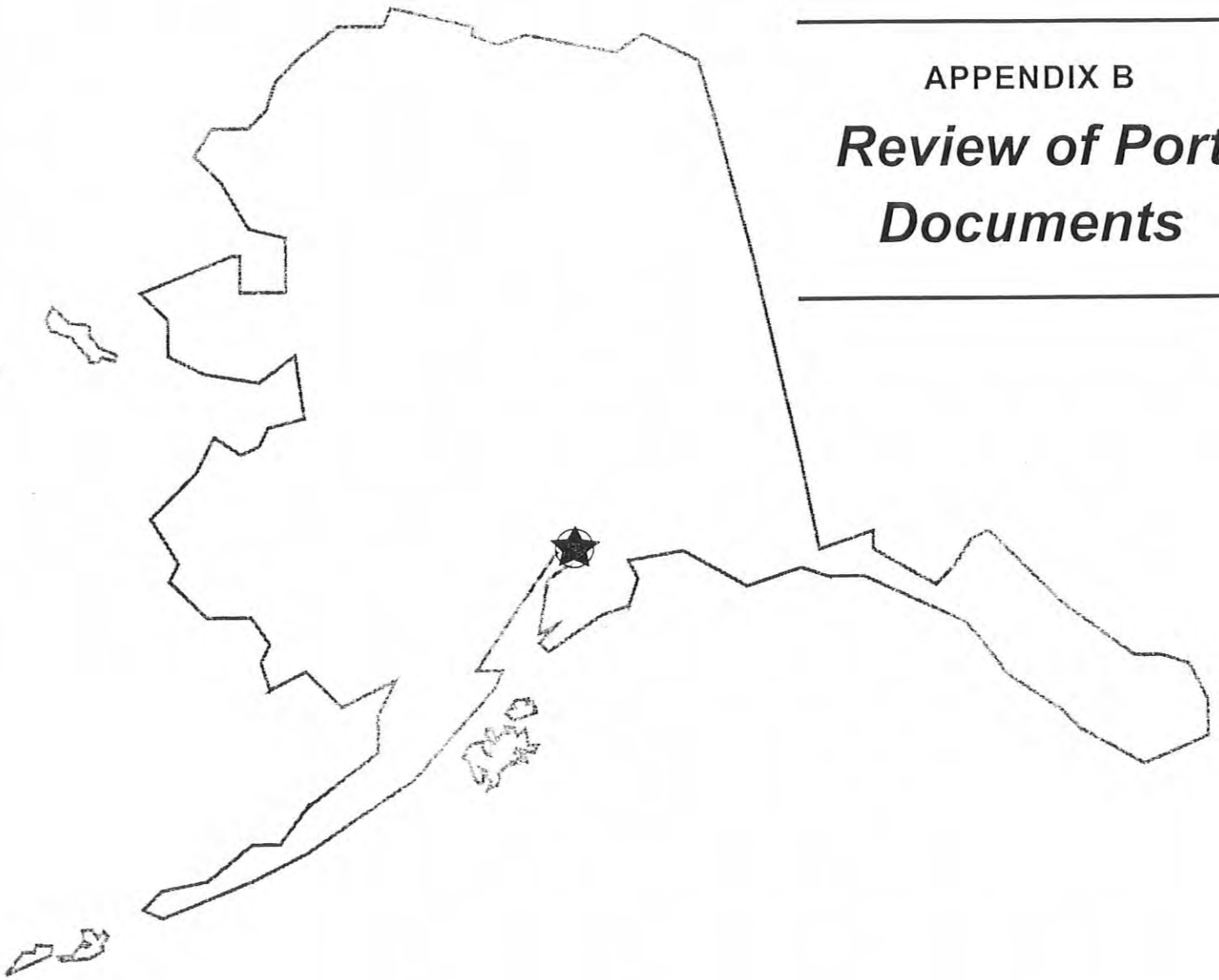

APPENDIX B

Review of Port Documents

APPENDIX B: REVIEW OF PORT DOCUMENTS

The documents produced by the Port can be broken down into two categories:

- Documents either required by law or by business practice to provide the Port, the Municipality and port users information required to plan for the use of the port facilities. These include port tariffs and agreements and the Port Business Plan.
- Documents and information provided by the Port as part of its marketing program for use by present or prospective users of the port. These include facilities information, including maps of the Port showing location of various facilities at the Port.

The purpose of this section is to generally describe the major documents and provide the consultant's observations on changes or updates which may be appropriate for the Port to consider as part of the master planning work.

These two categories of documents are further discussed below.

B.1 Required Documents

The Federal Maritime Commission (FMC) has historically required ports to submit their tariffs (schedule of rates and charges) to the FMC for public access. In recent years this practice has become less formal. The practice today simply requires the Port to have a tariff and post it on a web site for public consumption. Most ports will continue to publish a hard copy version of the tariff including rules, regulations and charges for the convenience of port users.

The Port of Anchorage is presently operated under Terminal Tariff No. 4 effective February 1, 1994. Tariff provision 100 (d) provides that "right is reserved by the Port of Anchorage to enter into agreement with carriers, shippers, consignees and/or their agents concerning rates and services, providing such agreements are consistent with existing local, state and national law governing the civil and business relations of all parties concerned".

Included in such agreements are preferential user agreements (PUAs) between the Port of Anchorage and certain carriers which may grant special privileges or responsibilities. The most common feature of such a PUA is the granting of "preferential" berthing which guarantees the ship or ships covered by the PUA the right to a berth assuming the ship follows the steps called for in the PUA.

The Port of Anchorage Tariff #4 is presently under review by the Port in an attempt to update the rates from 1994 and previous rates which are contained therein. Assuming this work proceeds as scheduled, a revised tariff will be available by the end of the year. At that time, the tariff can be reissued. Under present practice, that will consist of a web site plus publication in hard copy for the convenience of users. The basic structure of the existing tariff and the charges therein we established in approximately 1984 and have been modified several times since. Liner container

ships are covered under Preferential User agreements PUAs which provide for special rates and conditions for PUA holders.

There are two major preferential user agreements (PUAs) in effect at the Port of Anchorage. They are with Sea-Land and TOTE and provide for preferential berthing and other features. The PUA agreements run until 2010 and 2015, respectively, with provision for price adjustments at five year intervals next applicable in the year 2000. There are other agreements between the Port and users which are public documents. Normal port commercial practices would allow inspection of such documents but would not include publication for general usage.

B.2 Optional Documents

The optional documents dispensed by the Port will generally serve informational and marketing purposes. The documents fitting these categories which have been identified are the following:

- "Alaska's Regional Port". Undated, published by the Port of Anchorage. This is a foldout six page colored brochure with marketing type information and a map and description of Port Facilities. It has some information about services.
- "Port of Anchorage Master Plan" (1999), under preparation.
- "Port of Anchorage" Business Plan. (199x)

B.3 Discussion and Recommendations

The adoption of a new Port Master Plan and proposed publication of a new Tariff provides a timely opportunity for the Port to tie together its publications and documents. The Port industry is being forced by the FMC to publish tariff information on the web while competitive port practices are resulting in Port's using the web for marketing and other purposes.

It is recommended that the Port of Anchorage use this opportunity to accomplish several things through use of the web.

- As a minimum, use the web for publication of the revised tariff. This could be tentatively scheduled for sometime after Jan.1, 2000. Most of the changes in the tariff are contained in Ogden Beeman & Associates, Inc. report presently being prepared for adoption by the Port. Port Commission and Municipal approval will be required prior to publication.
- It is suggested that the existing web page for Port information be edited and expanded to contain information presently included in various port publications. This will included as a minimum the port information contained in the existing six page colored brochure. and the existing web site.
- It is suggested that the web page(s) include important findings from the master plan.
- It is suggested that the web pages include a provision for news or updates about the Port and its plans.

These suggestions are made after reviewing the web pages of several other Ports. The advantage of the above approach is that required information (e.g. tariff) can be presented and the same

format be used to add other information useful to the reader. Outlining and drafting of a new web site is beyond the scope of this work but should not be a complex task given the number of samples from other ports and the fact that the Port is completing work on its master plan, tariff and other information.

Web sites from several West Coast ports are available via the web. For example:

- The Port of Anchorage site apparently is accessed through the Municipality directory and contains information about the Port staff, facilities and commodity tonnages.
- The Port of Tacoma has a comprehensive presentation including facilities, services and 2010 capital improvements.
- The Port of Portland site covers all aspects of the port activities which includes aviation and industrial development in addition to marine. The index to the marine portion of the site is included.

These samples provide the reader of this report with a sense of how the web site concept can be used to integrate the various communications obligations of the Port. Once this integration takes place, rules, practices and responsibilities for changing and updating the web site can be adopted.

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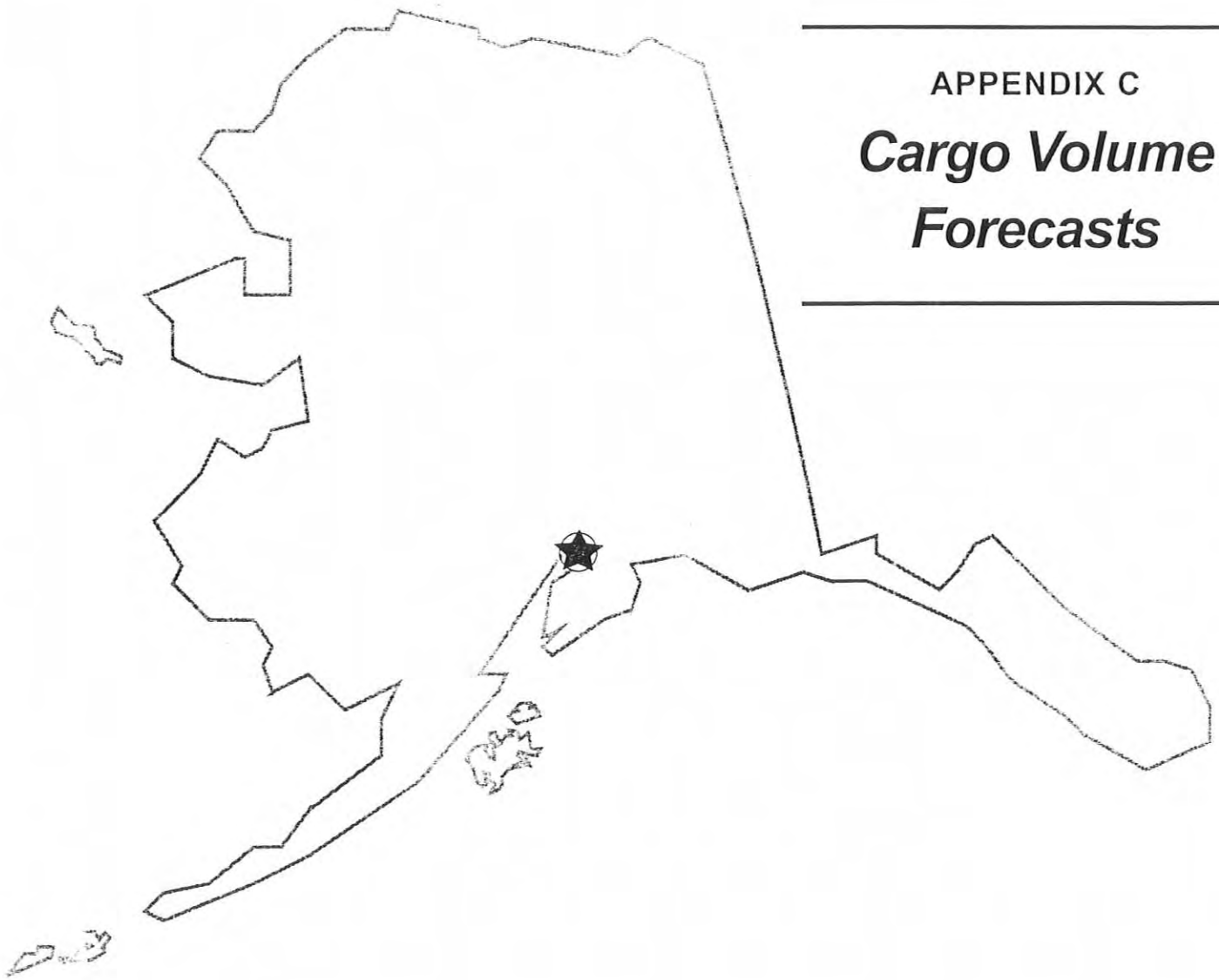


APPENDIX C

Cargo Volume Forecasts

APPENDIX C: CARGO VOLUME FORECASTS

The forecasts presented in this document offer supplementary detail for the cargo and passenger forecasts presented in Section E of the Strategic Marketing Plan of the 1999 *Port of Anchorage Master Plan*. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

Figures 1 through 9 present low-, medium-, and high-volume cargo forecasts and passenger forecasts for the years 2005, 2010, and 2020. Figures 10 through 15 depict low, medium, and high cargo forecasts by commodity and passenger forecasts from historical levels through 2020.

Figure 1: Low Scenario, Port of Anchorage Cargo and Passenger Forecast for 2005

	Cargo and Passenger Volume (Thousands)				
Type of Cargo	**Inbound Domestic**	**Inbound Foreign**	**Outbound Domestic**	**Outbound Foreign**	**Total**
Passengers	-	-	-	-	**2**
Vans, flats, and containers[a]					
ST	1,463	0	210	0	**1,674**
TEUs	345	0	50	0	395
Break-bulk/neo-bulk (freight NOS)[b]					
ST	0	0	0	0	**0**
Automobiles/vehicles					
Units	23	0	16	0	39
Liquid bulk (petroleum) [c]					
ST	144	213	450	170	**977**
Barrels[d]	946	1,403	2,961	1,118	6,428
Dry bulk (cement)[e]					
ST	35	65	0	0	**99**
Total					
ST	**1,642**	**278**	**660**	**170**	**2,750**

Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 *Port of Anchorage Master Plan*. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

NOS = not otherwise specified.

ST = short tons.

TEUs = 20-foot equivalent units.

[a] 0.5 percent growth rate includes all vehicles in containers and RO/RO vehicles at 2 per TEU.

[b] No freight NOS.

[c] 50 percent decrease from 1998 levels for inbound; no change from 1998 levels for outbound.

[d] 6.58 barrels per ST.

[e] 0.5 percent growth rate based on population for inbound; no outbound cement.

Figure 2: Medium Scenario, Port of Anchorage Cargo and Passenger Forecast for 2005

	Cargo and Passenger Volume (Thousands)				
Type of Cargo	**Inbound Domestic**	**Inbound Foreign**	**Outbound Domestic**	**Outbound Foreign**	**Total**
Passengers	-	-	-	-	4
Vans, flats, and containers[a]					
ST	1,673	0	233	0	**1,906**
TEUs	394	0	55	0	449
Break-bulk/neo-bulk (freight NOS)[b]					
ST	0	0	0	15	**15**
Automobiles/vehicles					
Units	26	0	18	0	44
Liquid bulk (petroleum)[c]					
ST	201	298	450	170	**1,120**
Barrels[d]	1,324	1,964	2,961	1,118	7,367
Dry bulk (cement)[e]					
ST	37	69	0	0	**106**
Total					
ST	**1,911**	**368**	**683**	**185**	**3,147**

Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 *Port of Anchorage Master Plan*. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

[a] 2.4 percent growth rate includes all vehicles in containers and RO/RO vehicles at 2 per TEU.

[b] No freight NOS inbound; assume 1 shipload of scrap or forest products.

[c] 30 percent decrease from 1998 levels for inbound; no change from 1998 levels for outbound.

[d] 6.58 barrels per ST.

[e] 1.4 percent growth rate based on population for inbound; no outbound cement.

Figure 3: High Scenario, Port of Anchorage Cargo and Passenger Forecast for 2005

	Cargo and Passenger Volume (Thousands)				
Type of Cargo	**Inbound Domestic**	**Inbound Foreign**	**Outbound Domestic**	**Outbound Foreign**	**Total**
Passengers	-	-	-	-	12
Vans, flats, and containers[a]					
ST	2,141	0	246	0	**2,387**
TEUs	505	0	58	0	563
Break-bulk/neo-bulk (freight NOS)[b]					
ST	20	20	15	15	**70**
Automobiles/vehicles					
Units	28	0	19	0	47
Liquid bulk (petroleum)[c]					
ST	288	426	450	170	**1,334**
Barrels[d]	1,891	2,806	2,961	1,118	8,776
Dry bulk (cement)[e]					
ST	39	74	0	0	**113**
Total					
ST	**2,488**	**520**	**711**	**185**	**3,904**

Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 *Port of Anchorage Master Plan*. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

[a] 3.4 percent growth rate plus inbound capital project of 300,000 ST.

[b] Inbound capital project 40,000 ST; Assume 2 shiploads.

[c] No change from 1998 levels for inbound or outbound.

[d] 6.58 barrels per ST.

[e] 2.4 percent growth rate based on population for inbound; no outbound cement.

Figure 4: Low Scenario, Port of Anchorage Cargo and Passenger Forecast for 2010

	Cargo and Passenger Volume (Thousands)				
Type of Cargo	**Inbound Domestic**	**Inbound Foreign**	**Outbound Domestic**	**Outbound Foreign**	**Total**
Passengers	-	-	-	-	2
Vans, flats, and containers[a]					
ST	1,500	0	214	0	**1,715**
TEUs	365	0	52	0	417
Break-bulk/neo-bulk (freight NOS)[b]					
ST	0	0	0	0	**0**
Automobiles/vehicles					
Units	23	0	16	0	39
Liquid bulk (petroleum)[c]					
ST	144	213	450	170	**977**
Barrels[d]	946	1,403	2,961	1,118	6,428
Dry bulk (cement)[e]					
ST	35	67	0	0	**102**
Total					
ST	**1,679**	**280**	**664**	**170**	**2,793**

Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 *Port of Anchorage Master Plan*. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

[a] 0.5 percent growth rate includes all vehicles in containers and roll-on/roll-off vehicles at 2 per TEU.

[b] No freight NOS.

[c] No change from 2005 levels for inbound; no change from 1998 levels for outbound.

[d] 6.58 barrels per ST.

[e] 0.5 percent growth rate based on population for inbound; no outbound cement.

Figure 5: Medium Scenario Port of Anchorage Cargo and Passenger Forecast for 2010

	Cargo and Passenger Volume (Thousands)				
Type of Cargo	**Inbound Domestic**	**Inbound Foreign**	**Outbound Domestic**	**Outbound Foreign**	**Total**
Passengers	-	-	-	-	14
Vans, flats, and containers[a]					
ST	1,883	0	256	0	**2,139**
TEUs	458	0	62	0	520
Break-bulk/neo-bulk (freight NOS)[b]					
ST	0	0	0	30	**30**
Automobiles/vehicles					
Units	29	0	20	0	49
Liquid bulk (petroleum)[c]					
ST	386	483	450	170	**1,489**
Barrels[d]	2,540	3,180	2,961	1,118	9,799
Dry bulk (cement)[e]					
ST	39	74	0	0	**113**
Total					
ST	**2,309**	**557**	**706**	**200**	**3,772**

Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 *Port of Anchorage Master Plan*. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

[a] 2.4 percent growth rate includes all vehicles in containers and roll-on/roll-off vehicles at 2 per TEU.

[b] No freight NOS inbound; assume 2 shiploads of scrap or forest products.

[c] Historical logarithmic growth rate for inbound; no change from 1998 levels for outbound.

[d] 6.58 barrels per ST.

[e] 1.4 percent growth rate based on population for inbound; no outbound cement.

Figure 6: High Scenario, Port of Anchorage Cargo and Passenger Forecast for 2010

	Cargo and Passenger Volume (Thousands)				
Type of Cargo	**Inbound Domestic**	**Inbound Foreign**	**Outbound Domestic**	**Outbound Foreign**	**Total**
Passengers	-	-	-	-	23
Vans, flats, and containers [a]					
ST	2,501	0	342	0	**2,843**
TEUs	607	0	70	0	677
Break-bulk/neo-bulk (freight NOS) [b]					
ST	20	20	15	15	**70**
Automobiles/vehicles					
Units	33	0	22	0	55
Liquid bulk (petroleum) [c]					
ST	493	1,044	450	170	**2,157**
Barrels [d]	3,246	6,867	2,961	1,118	14,192
Dry bulk (cement) [e]					
ST	44	83	0	0	**128**
Total					
ST	**3,059**	**1,147**	**752**	**185**	**5,198**

Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 Port of Anchorage Master Plan. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

[a] 3.4 percent growth rate plus inbound capital project of 300,000 ST; direct foreign liner service 5,000 TEU.

[b] Inbound capital project 40,000 ST; assume 2 shiploads.

[c] Historical logarithmic growth rate for inbound; no change from 1998 levels for outbound.

[d] 6.58 barrels per ST.

[e] 2.4 percent growth rate based on population for inbound; no outbound cement.

Figure 7: Low Scenario, Port of Anchorage Cargo and Passenger Forecast for 2020

	Cargo and Passenger Volume (Thousands)				
Type of Cargo	**Inbound Domestic**	**Inbound Foreign**	**Outbound Domestic**	**Outbound Foreign**	**Total**
Passengers	-	-	-	-	3
Vans, flats, and containers[a]					
ST	1,577	0	223	0	**1,800**
TEUs	401	0	57	0	458
Break-bulk/neo-bulk (freight NOS)[b]					
ST	0	0	0	0	**0**
Automobiles/vehicles					
Units	25	0	17	0	42
Liquid bulk (petroleum)[c]					
ST	144	213	450	170	**977**
Barrels[d]	945	1,402	2,961	1,118	6,426
Dry bulk (cement [e]					
ST	37	70	0	0	**107**
Total					
ST	**1,758**	**283**	**673**	**170**	**2,884**

Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 *Port of Anchorage Master Plan*. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

[a] 0.5 percent growth rate includes all vehicles in containers and roll-on/roll-off vehicles at 2 per TEU.

[b] No freight NOS.

[c] No change from 2005 levels for inbound; no change from 1998 levels for outbound.

[d] 6.58 barrels per ST.

[e] 0.5 percent growth rate based on population for inbound; no outbound cement.

Figure 8: Medium Scenario, Port of Anchorage Cargo and Passenger Forecast for 2020

	Cargo and Passenger Volume (Thousands)				
Type of Cargo	**Inbound Domestic**	**Inbound Foreign**	**Outbound Domestic**	**Outbound Foreign**	**Total**
Passengers	-	-	-	-	27
Vans, flats, and containers[a]					
ST	2,386	0	311	0	**2,697**
TEUs	608	0	79	0	687
Break-bulk/neo-bulk (freight NOS)[b]					
ST	0	0	0	45	**45**
Automobiles/vehicles					
Units	37	0	25	0	62
Liquid bulk (petroleum)[c]					
ST	512	610	450	170	**1,742**
Barrels[d]	3,371	4,011	2,961	1,118	11,461
Dry bulk (cement)[e]					
ST	45	85	0	0	**130**
Total					
ST	**2,944**	**695**	**761**	**215**	**4,614**

Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 *Port of Anchorage Master Plan*. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

[a] 2.4 percent growth rate includes all vehicles in containers and roll-on/roll-off vehicles at 2 per TEU.
[b] No freight NOS inbound; Assume 3 shiploads of scrap or forest products.
[c] Historical logarithmic growth rate for inbound; no change from 1998 levels for outbound.
[d] 6.58 barrels per ST.
[e] 1.4 percent growth rate based on population for inbound; no outbound cement.

Figure 9: High Scenario, Port of Anchorage Cargo and Passenger Forecast for 2020

	Cargo and Passenger Volume (Thousands)				
Type of Cargo	**Inbound Domestic**	**Inbound Foreign**	**Outbound Domestic**	**Outbound Foreign**	**Total**
Passengers	-	-	-	-	41
Vans, flats, and containers[a]					
ST	3,374	0	438	0	**3,813**
TEUs	859	0	98	0	957
Break-bulk/neo-bulk (freight NOS)[b]					
ST	20	20	30	30	**100**
Automobiles/vehicles					
Units	46	0	31	0	77
Liquid bulk (petroleum)[c]					
ST	606	1,382	450	170	**2,608**
Barrels[d]	3,987	9,091	2,961	1,118	17,157
Dry bulk (cement)[e]					
ST	56	106	0	0	**162**
Total					
ST	**4,056**	**1,507**	**863**	**200**	**6,683**

Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 *Port of Anchorage Master Plan*. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

[a] 3.4 percent growth rate; inbound capital project of 300,000 ST; direct foreign liner service 10,000 TEU; Return of project cargo containers.

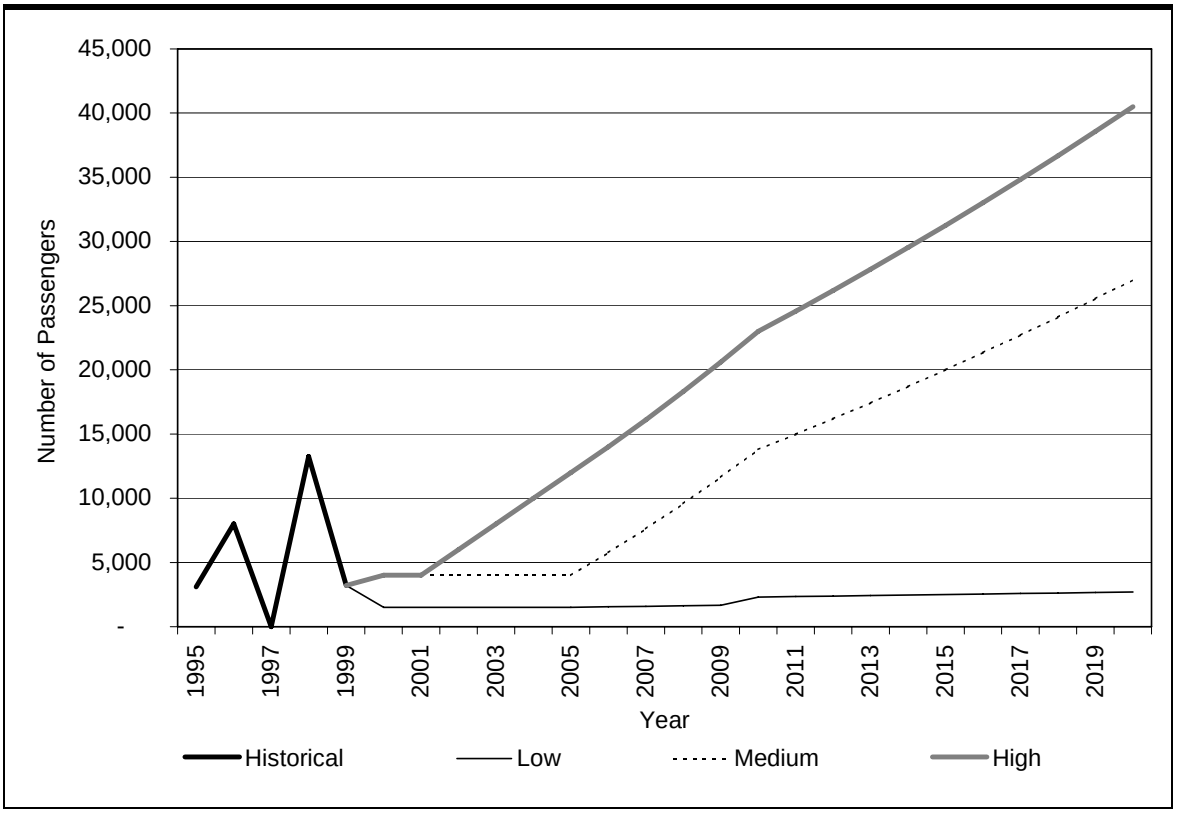
[b] Inbound capital project 40,000 ST; assume 4 shiploads.

[c] Historical logarithmic growth rate for inbound; no change from 1998 levels for outbound.

[d] 6.58 barrels per ST.

[e] 2.4 percent growth rate based on population for inbound; no outbound cement.

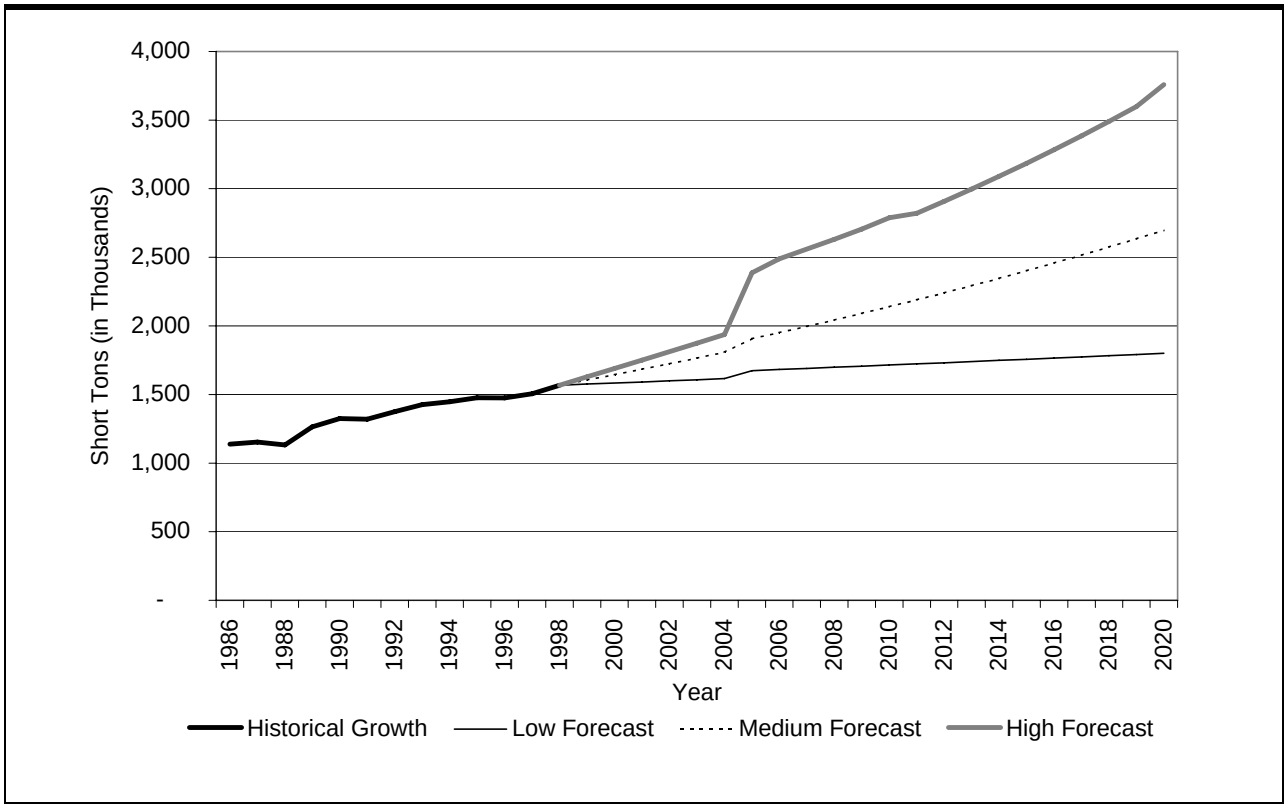
Figure 10: Historical Growth and Low, Medium, and High Forecast for Passengers Through the Port of Anchorage,1995-2020



Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 Port of Anchorage Master Plan. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

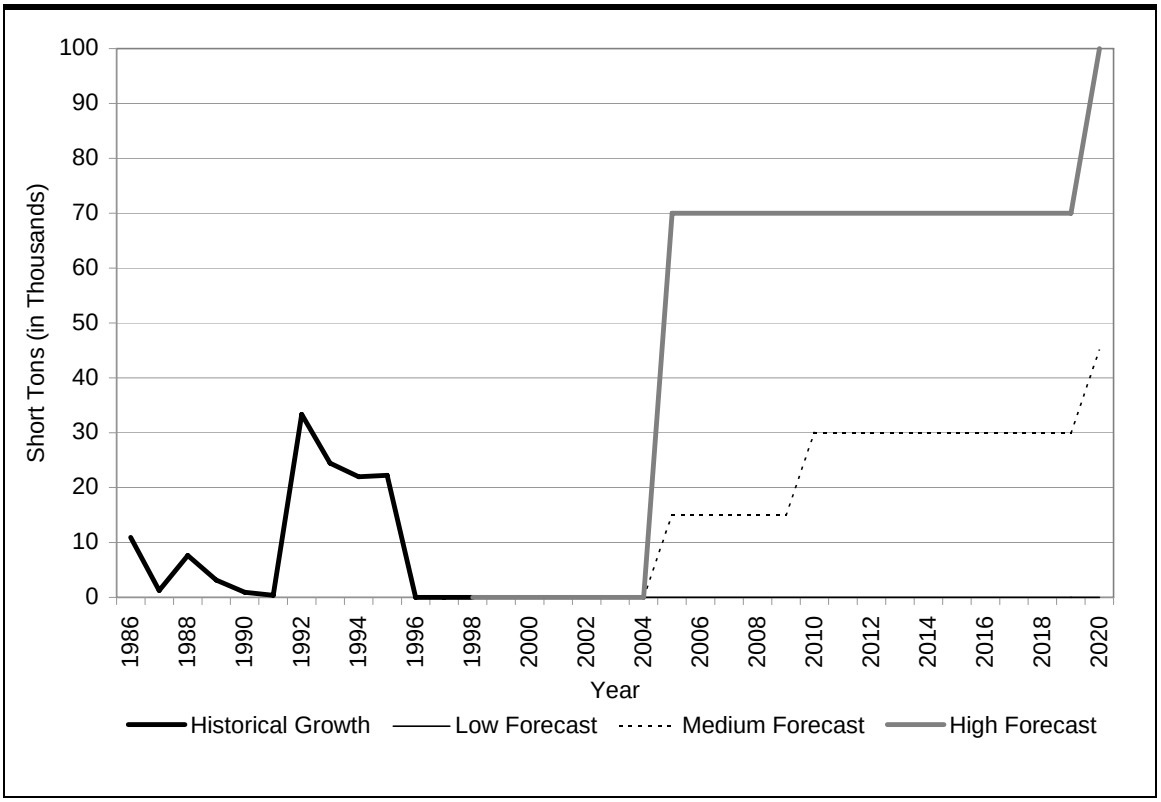
Figure 11: Historical Growth and Low, Medium, and High Forecast for Vans, Flats, and Containers Through the Port of Anchorage, 1986-2020



Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 Port of Anchorage Master Plan. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

Figure 12: Historical Growth and Low, Medium, and High Forecast for Break-bulk/Neo-bulk Cargo Through the Port of Anchorage, 1986-2020

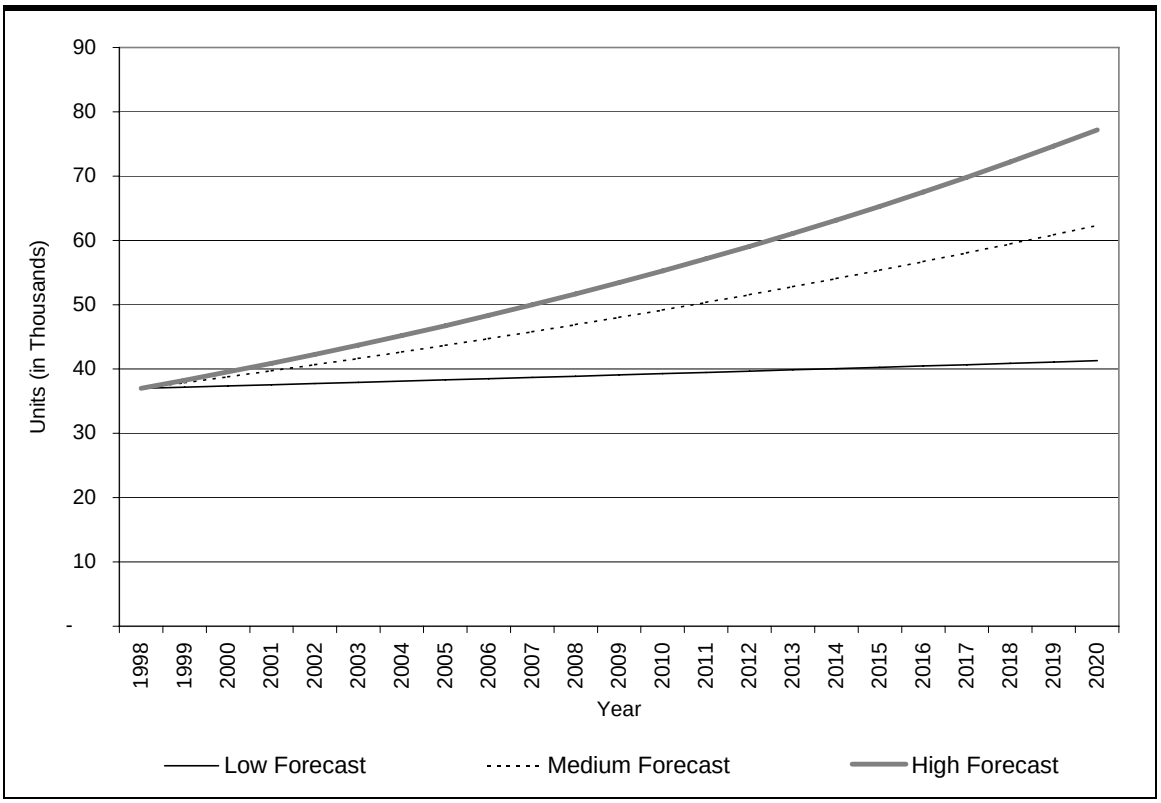


Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 Port of Anchorage Master Plan. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

The low forecast of zero tons is not identifiable from the zero short tons grid line.

Figure 13: Low, Medium, and High Forecast for Vehicles as Port of Anchorage Cargo, 1998–2020

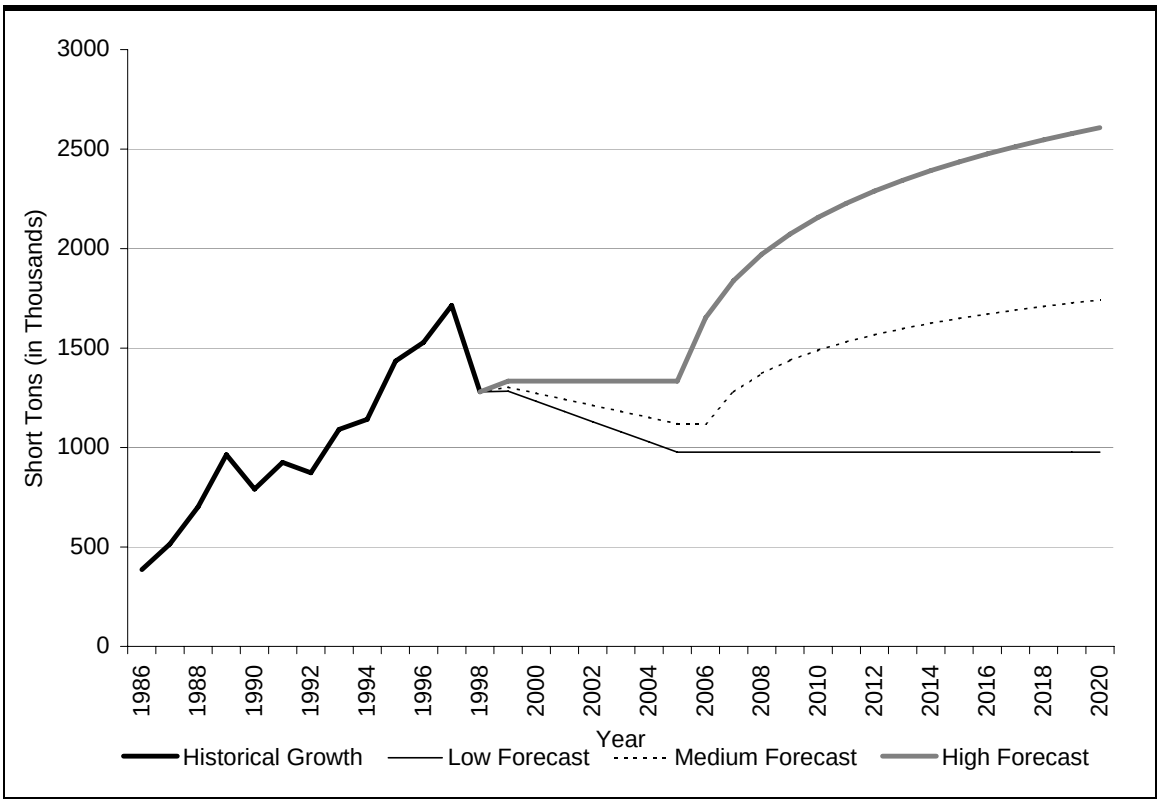


Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 Port of Anchorage Master Plan. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

POA statistics in previous years counted vehicles that moved off of vessels under their own power and did not count vehicles that were moved in containers. The forecast presented in this figure includes all vehicles moving across the POA dock and is based on information obtained from ocean carriers.

Figure 14: Historical Growth and Low, Medium, and High Forecast for Liquid Bulk Cargo Through the Port of Anchorage, 1986-2020

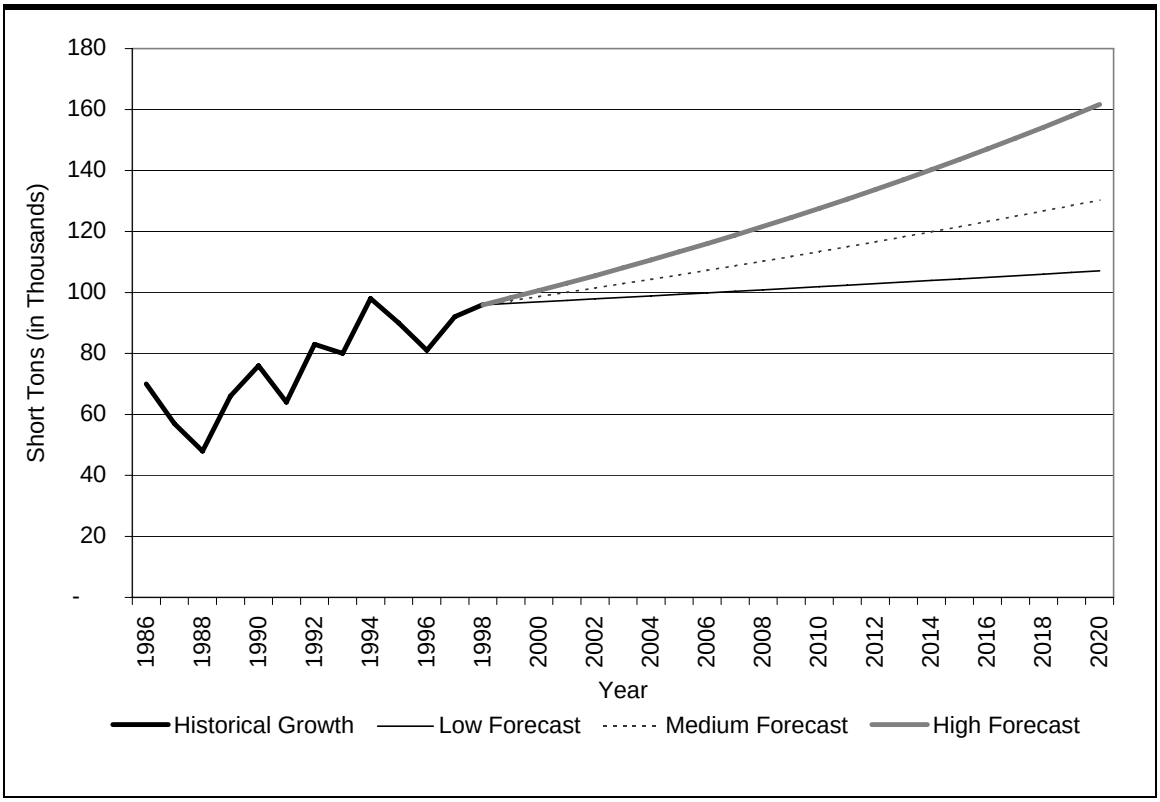


Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 *Port of Anchorage Master Plan*. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

The medium and high forecasts are constrained in later years to reflect anticipated difficulties in expanding or creating new tank farms in the POA area.

Figure 15: Historical Growth and Low, Medium, and High Forecast for Dry Bulk Cargo Through the Port of Anchorage, 1986-2020



Notes:

The forecast presented in this figure offers supplementary detail for the forecasts presented in the Strategic Marketing Plan of the 1999 Port of Anchorage Master Plan. The forecasts were developed by Northern Economics, Inc., and Leeper, Cambridge and Campbell in February 1999.

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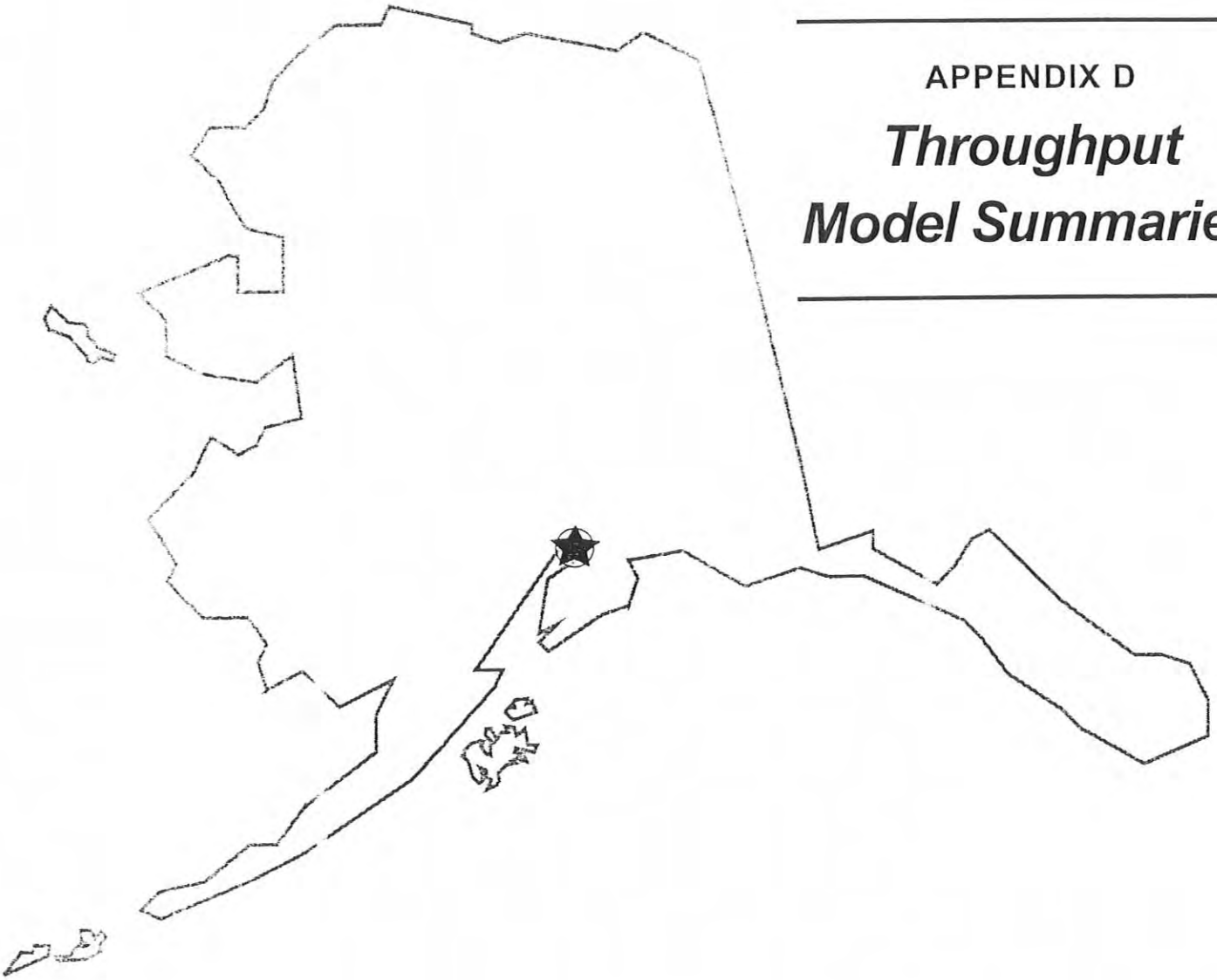
Master Plan

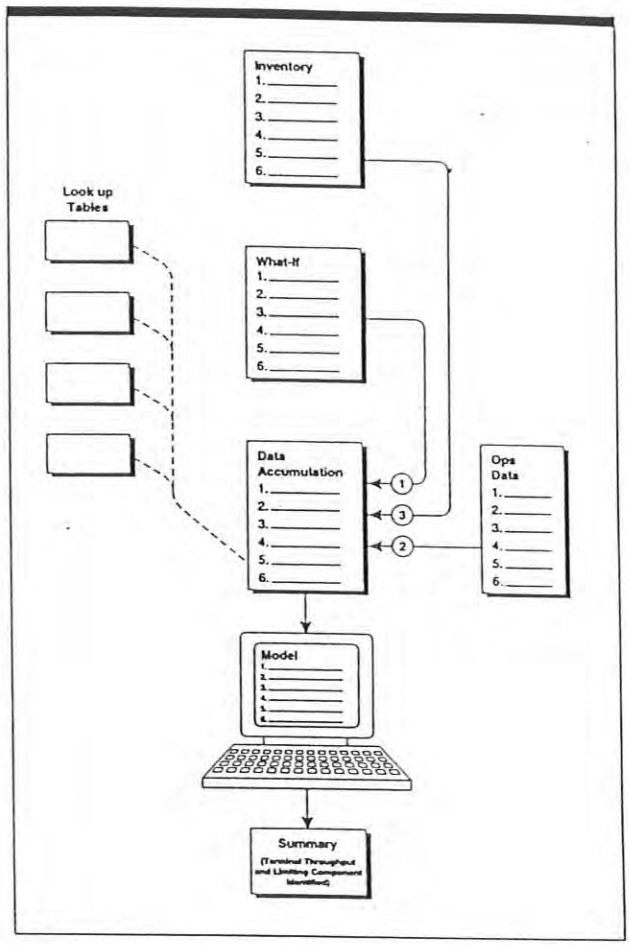


APPENDIX D

Throughput Model Summaries

Throughput Model Architecture

VZM's throughput capacity analysis uses a model architecture with a component evaluation technique similar to a system developed by the U.S. Maritime Administration in 1979 and updated in 1986. The model evaluates six terminal throughput components. These are: berth/apron activities, ship-to-apron transfer, apron-to-storage transfer, storage, inland transfer and gate processing.



Each of the six throughput components is represented in five sections within the model:

1. Inventory File

Typical terminal features are transferred to this section from a separate computerized base.

2. What-if File

Data in this section will supersede data from the inventory file. If left blank, the model looks in the inventory file. If the inventory is blank, the model looks in the operations data file.

3. Operations Data File

This section contains default data based on typical terminal operations.

4. Data Accumulation File

This section accumulates data for use in the model. The data is retrieved from other files in the following priority:

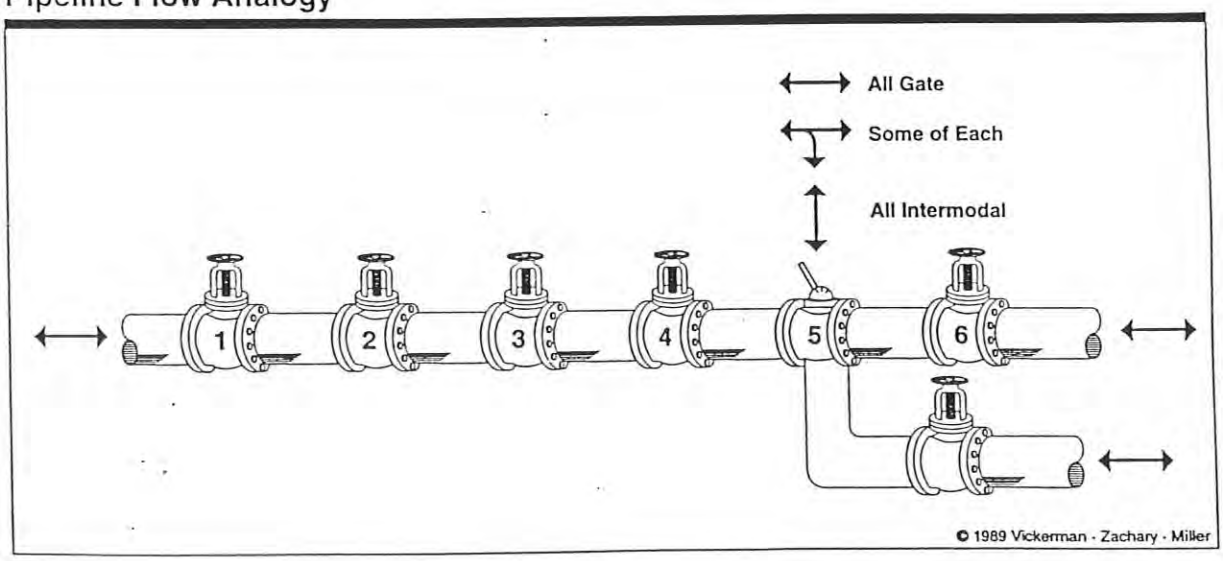
- What if
- Inventory
- Operations Data

5. Computer Model

This section calculates the maximum practical throughput capacity of the terminal for each of the six components. The results are summarized and the limiting component identified.

It may be helpful to conceptualize the six model components as valves in a pipeline, where each component is capable of constricting the flow (of cargo) within the pipeline. Obviously, if one valve constricts the pipeline, the entire system is affected. For example, if gate processing is shown to be the most constricting element, gate operations will be evaluated and improvements made so that the gate is properly sized with respect to the rest of the system.

Pipeline Flow Analogy



Pipeline Flow Analogy

The following components were those analyzed in this study.

1. Vessel and Berth Activities

    1.1 Estimates vessel size in tons (based on input, berth length or ship length).
    1.2 Determines average cargo transfer per ship call (percent of transfer).
    1.3 Determines maximum practical annual berth occupancy hours.
    1.4 Determines average berth time per vessel (per ship call).
    1.5 Determines number of vessel calls per year and associated throughput.

2. Ship-to-Apron Transfer

    2.1 Estimates crane productivity.
    2.2 Determines tons/hour (TPH).
    2.3 Determines maximum annual crane operating hours.
    2.4 Determines maximum practical throughput for crane activities.

3. Apron-to-Storage Transfer

    3.1 Estimates productivity of conveyors.
    3.2 Determines annual operating hours for conveyors.
    3.3 Determines maximum practical throughput for conveyor activities.

4. Container Yard Storage

    4.1 Determines total storage static capacity
    4.2 Determines factored capacity based on open and covered storage utilization.
    4.3 Determines number of turnovers per year based on dwell time and peaking characteristics and identifies throughput.

5. Inland Transfer

    5.1 Determines throughput based on loaders, tracks, storage characteristics and throughput peaking characteristics. Selects governing throughput for this component.

6. Gate Processing

    6.1 Determines average processing rate per lane, total gate processing rate per year and associated throughput.

Throughput Model Summary Sheets

Regional Port of Anchorage
Master Plan
VZM/TranSystems
Containerized Cargo Throughput Capacity Model - Summary Sheet
Revised 11/6/96

21-Apr-99

SUMMARY CAPABILITY ESTIMATES

Containerized Cargo Model Throughput Capability By Terminal Component (TEU per Year)	Sea-Land Terminal 2	TOTE Terminal 3	Misc. Use Areas C3,C4,C5&C6
Component 1: Berth and Apron Activities	268,894	256,090	##########
Component 2: Ship To Apron Transfer	606,528	539,136	##########
Component 3: Apron To Storage Transfer	748,051	350,270	381,888
Component 4: Storage	177,612	220,369	87,189
Component 5: Intermodal Transfer	##########	##########	##########
Component 6: Gate Processing	224,078	238,083	126,978
Maximum Practical Throughput Capacity Estimate	**177,612**	**220,369**	**87,189**

Component Summary Table of Limiting Factors	Terminal 2	Terminal 3	Areas C3,C4,C5&C6
Component 1: Berth and Apron Activities	.....	.....	.....
Component 2: Ship To Apron Transfer	.....	.....	.....
Component 3: Apron To Storage Transfer	.....	.....	.....
Component 4: Storage	Limiting	Limiting	Limiting
Component 5: Intermodal Transfer	.....	.....	.....
Component 6: Gate Processing	.....	.....	.....

Terminal Acres	29.2	29.1	24.4
Throughput Capability per Terminal Acre	6,083	7,573	3,573
Terminal Storage Acres	25.0	23.0	18.2
Throughput Capability per Storage Acre	7,104	9,581	4,791

Total Port's Capability Based on Limiting Component	**485,170**
Total Port's Capability Based on Berth Component 1	**524,984**
Limiting Total Port's Throughput Capability	**485,170**
Total Port's Throughput Capability (TEU's)	**485,170**
Total Port's Throughput Capability (Short Tons)	**2,125,043**
Total Terminal Acres	**82.7**
Throughput Capability per Terminal Acre	**5,867**
Total Storage Acres	**66.2**
Throughput Capability per Storage Acre	**7,329**
Number of Terminals	**2**
Average Storage Acres per Terminal	**33**
Average Throughput per Average terminal	**242,585**

Regional Port of Anchorage
Master Plan
VZM/TranSystems
Break-Bulk / Neo Bulk Throughput Capacity Model - Summary Sheet
Revised 5/08/95

19-Mar-99

SUMMARY CAPABILITY ESTIMATES

	Break-Bulk Berth Name :	Terminal 1	Terminal 1
	Break-Bulk Terminal Location :	Transit Area A - (B1)	South Transit Area - (B2)
	Break-Bulk User Name :	Common User	Common User
Throughput Capability By Terminal Component (Metric Tons/Yr)			
Component 1: Berth and Apron Activities		34,040	34,040
Component 2: Ship To Apron Transfer		93,366	93,366
Component 3: Apron To Storage Transfer		60,021	60,021
Component 4: Storage		112,348	196,608
Component 5: Inland Transfer		##########	##########
Component 6: Gate Processing		249,600	249,600
Maximum Practical Throughput Capacity Estimate		**34,040**	**34,040**
Component Summary Table of Limiting Factors			
Component 1: Berth and Apron Activities		Limiting Component	Limiting Component
Component 2: Ship To Apron Transfer		.....	.....
Component 3: Apron To Storage Transfer		.....	.....
Component 4: Storage		.....	.....
Component 5: Inland Transfer		.....	.....
Component 6: Gate Processing		.....	.....
Total Terminal Acres		4.6	7.5
Throughput Capability per Terminal Acre		7,400	4,539
Total Storage Acres		4.0	7.0
Throughput Capability per Storage Acre		8,510	4,863

Break-Bulk / Neo Bulk Summary

Total Port's Throughput Capability (Short Tons)	**68,079**
Total Terminal Acres	**12.1**
Total Storage Acres	**11.0**
Throughput Capability per Total Terminal Acres	**5,626**
Throughput Capability per Storage Acre	**6,189**

Regional Port of Anchorage
Master Plan

VZM/TranSystems

Automobile Throughput Capacity Model - Summary Sheet

Revised 9/08/95

19-Mar-99

SUMMARY CAPABILITY ESTIMATES

Automobile Throughput Model

Automobile Terminal Name:	Terminal 2	Terminal 1
Automobile Terminal Operator:	Sea-Land	TOTE
Throughput Capability (Number of Autos/Year)		
Component 1: Berth and Apron Activities	24,068	44,090
Component 2: Ship To 1st Pt of Rest Transfer	48,135	88,179
Component 3: Vehicle Processing Activities	87,360	##########
Component 4: Storage	49,391	11,642
Component 5: Inland Transfer	74,880	62,402
Component 6: Gate Processing	95,680	72,802
Maximum Practical Throughput Capacity Estimate	**24,068**	**11,642**

Automobile Throughput Model	Terminal 2	Terminal 1
Throughput Capability (Short Tons/Year)	Sea-Land	TOTE
Component 1: Berth and Apron Activities	26,474	48,498
Component 2: Ship To 1st Pt of Rest Transfer	52,949	96,997
Component 3: Vehicle Processing Activities	96,096	##########
Component 4: Storage	54,330	12,806
Component 5: Inland Transfer	82,368	68,643
Component 6: Gate Processing	105,248	80,083
Maximum Practical Throughput Capacity Estimate	**26,474**	**12,806**

Component Summary Table of Limiting Factors	Terminal 2	Terminal 1
Component 1: Berth and Apron Activities	Limiting Component	.....
Component 2: Ship To 1st Pt of Rest Transfer	.....	.....
Component 3: Vehicle Processing Activities	.....	.....
Component 4: Storage	.....	Limiting Component
Component 5: Inland Transfer	.....	.....
Component 6: Gate Processing	.....	.....
Total Terminal Acres	4.0	1.0
Throughput Capability per Terminal Acre	6,017	11,642
Total Storage Acres	4	2
Throughput Capability per Storage Acres	5,870	5,652

Total Ports' Throughput Capability (Short Tons/Year)	39,281
Total Terminal Acres	5.0
Throughput Capability per Terminal Acre (Short Tons/Year)	7,856
Number of Terminals	2
Total Terminal Storage Acres	6.2
Average Storage Acres per Terminal	2.5
Average Throughput per Average Terminal (Short Tons/Year)	19,640

Regional Port of Anchorage
Master Plan

VZM/TranSystems

Liquid Bulk (Hazardous & Non Hazardous) Throughput Capacity Model - Summary Sheet

Revised 8/24/95

19-Mar-99

SUMMARY CAPABILITY ESTIMATES

Liquid Bulk Berth Name :	POL 1 & 2	POL 1 & 2	POL 1 & 2	POL 1 & 2
Liquid Bulk Terminal Name :	South Terminal	South Terminal	South Terminal	South Terminal
Liquid Bulk User Name :	EQUILON	AFSC Signature	MAPCO	Chevron
Liquid Bulk Model				
Throughput Capability By Terminal Componant (Barrels/Yr)				
Component 1: Vessel and Berth Activities	4,382,632	4,382,632	4,382,632	4,382,632
Component 2: Ship To Apron Transfer	4,050,000	4,050,000	4,050,000	4,050,000
Component 3: Apron To Storage Transfer	3,900,000	3,900,000	3,900,000	3,900,000
Component 4: Storage	6,046,875	5,373,750	##########	##########
Component 5: Pipeline Inland Transfer	##########	##########	##########	##########
Component 6: Rail/Truck to Inland Transfer	7,054,320	7,054,320	##########	##########
Maximum Practical Throughput Capacity Estimate	**3,900,000**	**3,900,000**	**3,900,000**	**3,900,000**
Throughput Capability By Terminal Componant (Tons/Yr)	EQUILON	AFSC	MAPCO	Chevron
Component 1: Vessel and Berth Activities	553,198	614,664	614,664	614,664
Component 2: Ship To Apron Transfer	511,211	568,013	568,013	568,013
Component 3: Apron To Storage Transfer	492,278	546,975	546,975	546,975
Component 4: Storage	763,267	753,668	##########	##########
Component 5: Pipeline Inland Transfer	##########	##########	##########	##########
Component 6: Rail/Truck to Inland Transfer	890,432	989,368	##########	##########
Maximum Practical Throughput Capacity Estimate (ST)	**492,278**	**546,975**	**546,975**	**546,975**
Component Summary Table of Limiting Factors	EQUILON	AFSC	MAPCO	Chevron
Component 1: Vessel and Berth Activities	.....	.....	.....	.....
Component 2: Ship To Apron Transfer	.....	.....	.....	.....
Component 3: Apron To Storage Transfer	Limiting	Limiting	Limiting	Limiting
Component 4: Storage	.....	.....	.....	.....
Component 5: Pipeline Inland Transfer	.....	.....	.....	.....
Component 6: Rail/Truck to Inland Transfer	.....	.....	.....	.....
Average Density of this Product (lb/bbl)	252.45	280.50	280.50	280.50
Total Storage Acres Available	5.6	20.8	42.0	10.2
Throughput Capability per Storage Acre	696,429	187,500	92,857	382,353
Total Terminal Acre Available	8.7	11.2	27.2	17.3
Throughput Capability per Terminal Acre	448,276	348,214	143,382	225,434
Total Ports's Throughput Capability (Short Tons)	**2,133,203**			
Total Port of Anchorage Terminal Acres	**19.9**			
Total Non-Port of Anchorage Terminal Acres	**44.5**			
Throughput Capability per Terminal Acre	**107,196**			
Number of Terminals	4			
Total Terminal Storage Acres	78.6			
Average Storage Acres per Terminal	19.7			
Average Throughput per Average Terminal (Short Tons)	533,301			

Regional Port of Anchorage
Master Plan

VZM/TranSystems

Dry Bulk Throughput Capacity Model

Revised 4/25/94
19-Mar-99

SUMMARY CAPABILITY ESTIMATES

Throughput Capability By Terminal Componant (Tons/Yr)

Dry Bulk Terminal Name : / Dry Bulk Terminal Operator :	POL 1 ABI
Component 1: Vessel and Berth Activities	107,817
Component 2: Ship To Apron Transfer	108,799
Component 3: Apron To Storage Transfer	108,799
Component 4: Storage	147,512
Component 5: Inland Transfer	121,992
Component 6: Gate Processing	156,000
Maximum Practical Throughput Capacity Estimate	**107,817**

Component Summary Table of Limiting Factors

Dry Bulk Terminal Name : / Dry Bulk Terminal Operator :	POL 1 ABI
Component 1: Vessel and Berth Activities	Limiting
Component 2: Ship To Apron Transfer	.....
Component 3: Apron To Storage Transfer	.....
Component 4: Storage	.....
Component 5: Inland Transfer	.....
Component 6: Gate Processing	.....
Total Storage Acres Available	1.2
Throughput Capability per Storage Acre	89,848
Total Terminal Acres Available	3.18
Throughput Capability per Terminal Acre	33,905
Total Port's Throughput Capability	**107,817**
Total Storage Acres	**0.5**
Throughput Capability per Storage Acre	**222,018**
Number of Terminals	**1**
Average Storage Acres per Terminal	**0.5**
Acerage Throughput per Average Terminal	**107,817**

Regional Port of Anchorage
Master Plan

VZM/TranSystems

Passenger Terminal Model - Summary Sheet

Version of 6/1/95

18-Jan-99
Passenger / Cruise Model
Throughput Capability By Terminal Componant (revenue passengers/year)

Passenger Terminal Name:	Terminal 3
Passenger Terminal Operator/s:	Misc
Component 1: Vessel and Berth Activities	21,730
Component 2: Ship To Terminal Transfer	17,354
Component 3: Hotelling and Luggage Transfer	65,664
Component 4: Passenger Lounge & Luggage Claim	18,453
Component 5: Passenger Check-in & Customs	24,912
Component 6: Passenger Arrival & Departure	30,280
Maximum Practical Throughput Capacity Estimate	**17,354**

Component Summary Table of Limiting Factors	Terminal 3
Component 1: Vessel and Berth Activities	.....
Component 2: Ship To Terminal Transfer	Limiting
Component 3: Hotelling and Luggage Transfer	.....
Component 4: Passenger Lounge & Luggage Claim	.....
Component 5: Passenger Check-in & Customs	.....
Component 6: Passenger Arrival & Departure	.....
Total Vessel Calls	8
DomecticPassenger Maximum Practical Capacity	4,338
International Passenger Maximum Practical Capacity	13,015
TOTAL PORT MAXIMUM PRACTICAL CAPACITY:	**17,354**

Regional Port of Anchorage
Master Plan

APPENDIX E

Terminal Planning Modules

CONTAINER

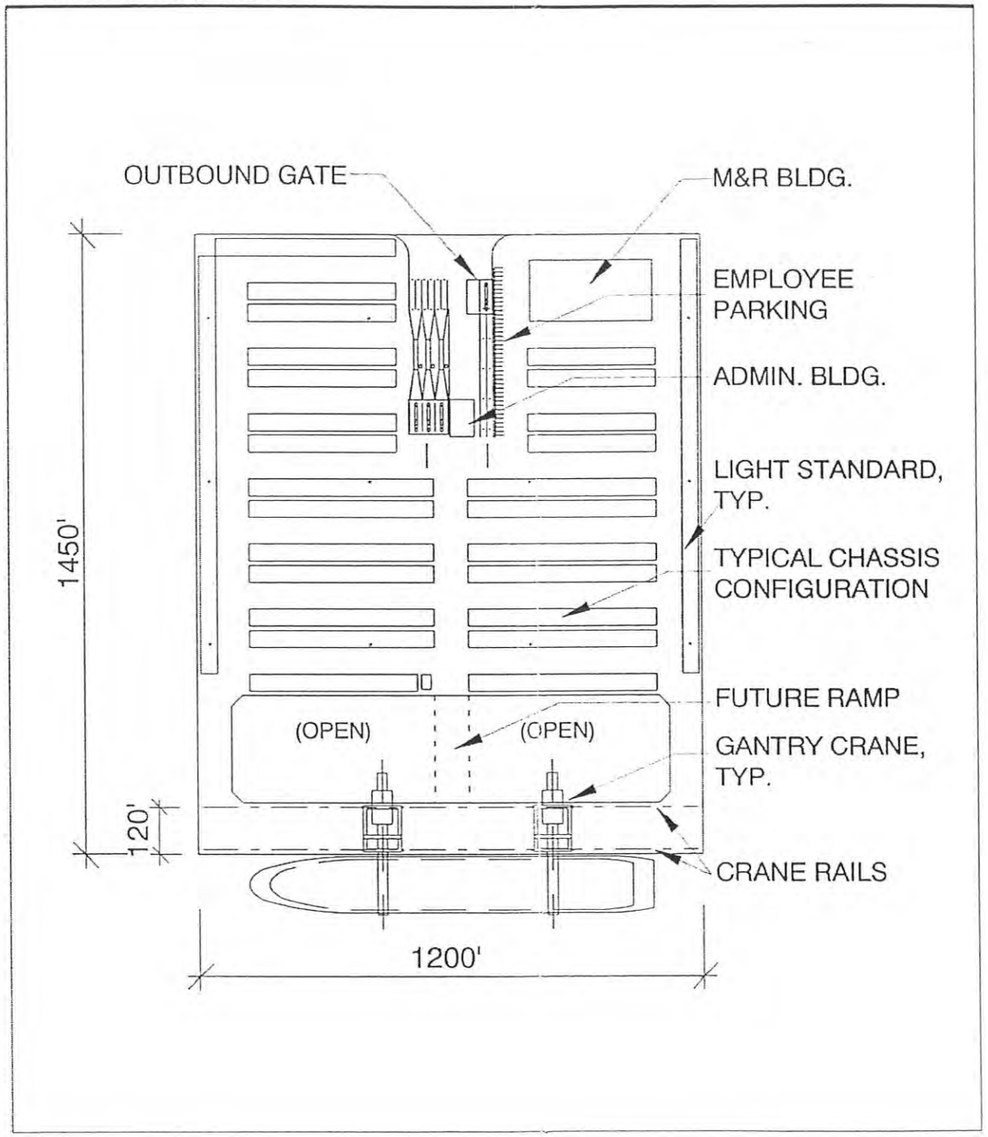
Container Terminal Facility Data

Gross Terminal Area	40 Acres
Storage Capacity Area:	32 Acres
Throughput Capacity	TEU/Year: 150,000 – 200,000
Wharf Apron Configuration	Length: 1,200', Width: 120'
Channel Criteria	Depth: 38' (Min.) 45' – 50' (Preferred), Width 300' – 400' one way, 500' – 700' two way
Basin Geometry Depth	Depth: 38' (Min.) 45' – 50' (Preferred)
Storage Area/ Storage Requirements	Chassis: 32 Acre 1400 TEU
Surge Capacity	Off-Site Storage
Tank Requirements	N/A
Crane Configuration/ Crane Capacity	Gantry Crane 40-50 Tons
Transfer Equipment	Chassis/Yard Tractor
Building Areas	Gate Building: 2,000 s.f.
M & R Building:	CFS: N/A
Gate Geometry	2-4 Inbound, 2-3 Outbound, Expandable
Road and Rail Requirements	Access to Rail Facility
Special Requirements	N/A
Hazardous Cargo Areas	As required in storage area
Safety Criteria	Fire Hydrant Layout

Container Terminal Infrastructure Requirements

Vehicular Traffic per Day (Round Trip Counts as Two)	300-500
% of Traffic That is Truck	89%
Number of Unit Trains per Day (Round Trip Counts as Two)	N/A
Parking Spaces Required	50
Electrical Power	4,000 KVA
[Crane 1,000 KVA x 2]	[1,000 KVA - Future Possibility Only]
Reefers	1,000 KVA
Lighting	1,000 KVA
Buildings	1,000 KVA
Misc.	1,000 KVA
Potable Water	260 GPM
Fire Water	8-12 Hydrants, 2,500 GPM
Telephone/Communications	Six Lines
Sanitary Sewer	10" Line
Storm Sewer	Two 48" Outfalls
Special Utilities	Paging and Computer
Special Right-of-Way	Rail Access

Container Terminal Module



BREAK-BULK/NEO BULK

Break-Bulk Terminals Facility Data

Gross Terminal Area:	10 Acres
Storage Capacity Area:	6 Acres Open and 4 Acres Transit Shed Storage
Throughput Capacity	Short Tons/Year: 150,000-200,000
Wharf Apron Configuration	650' Marginal Wharf; 60' Min. Setback Structures
Channel Criteria	Depth: 40' – 42' Width: 500' min.; 700' preferred
Basin Geometry Depth	Depth: 35' – 42' min.; 45' preferred
Storage Area/	Open Storage: 8.0 Acres
Storage Requirements	Covered Storage/Warehouse 90,000 s.f.
Surge Capacity	Included in Storage Area; 1 Acre Open Storage
Tank Requirements	Also Available
Crane Configuration/	Ship's gear plus one 50-ton Mobile Crane
Crane Capacity	
Transfer Equipment	Forklifts
Building Areas	Maintenance and Administration Space Included
Inside Covered Storage/Warehouse	
Gate Geometry	Two Inbound, two Outbound
Road and Rail Requirements	Road Access Plus On-Dock Rail Access
Special Requirements	N/A
Hazardous Cargo Areas	Standard
Safety Criteria	Standard
Right-of-Way Requirements	N/A

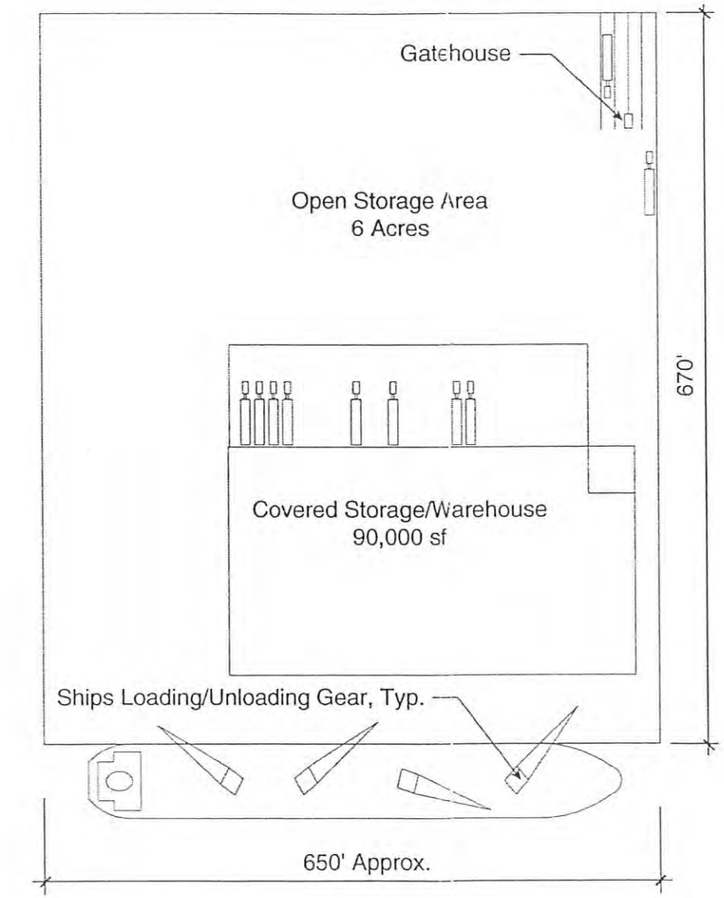
Break-Bulk Terminal Infrastructure Requirements

Vehicular Traffic per Day (round trip counts as two)	15-20
% of Traffic That is Truck	87%
Parking Spaces Required	20
Electrical Power	1,000 – 2,000 KVA
Reefers	1,000 KVA
Lighting	1,000 KVA
Buildings	1,00 KVA
Misc.	1,000 KVA
Natural Gas	4" Line
Potable Water	6" Line
Fire Water	8" Line
Telephone/Communications	Four Lines
Sanitary Sewer	8" Line
Storm Sewer	One 36" Outfall
Special Untilities	Paging System

General Cargo – Break-Bulk/Neo Bulk Module

Approximate Area: 10 Acres

Approximate Throughput Capacity: 150,000 ShortTons/Year



AUTO/VEHICLE

Automobile Terminal · Facility Data

Gross Terminal Area:	10 Acres		
Storage Capacity Area:	8 Acres		
Throughput Capacity	Units/Year: 50,000		
Wharf Apron Configuration	Length: 875', Width: 100'		
Channel Criteria	Depth: 42'	Width: 500' min.; 700' preferred	
Basin Geometry Depth	Depth: 42' min.; 45' preferred		
Storage Area/	First Point of Rest: 2 Acres		Autos
Storage Requirements	Open Storage: 4 Acres	1,500	Autos
	VPC Storage: 1 Acre		Autos
	Truck Away: 1 Acre		Autos
	POV/Customs: 1 Acre		Autos
	Buildings: 1 Acre		
Surge Capacity	Off-Site Storage		
Tank Requirements	N/A		
Crane Configuration/ Crane Capacity	N/A		
Transfer Equipment	Ro/Ro		
Building Areas	Gate Building:	1,000	s.f.
	VPC and Wash Area:	5,000	s.f.
	Administration:	6,000	s.f.
Gate Geometry	Three Inbound, Three Outbound		
Road Requirements	N/A		
Special Requirements	N/A		
Hazardous Cargo Areas	N/A		
Safety Criteria	Transportation corridors clearly identified with district traffic patterns		
Right-of-Way Requirements	N/A		

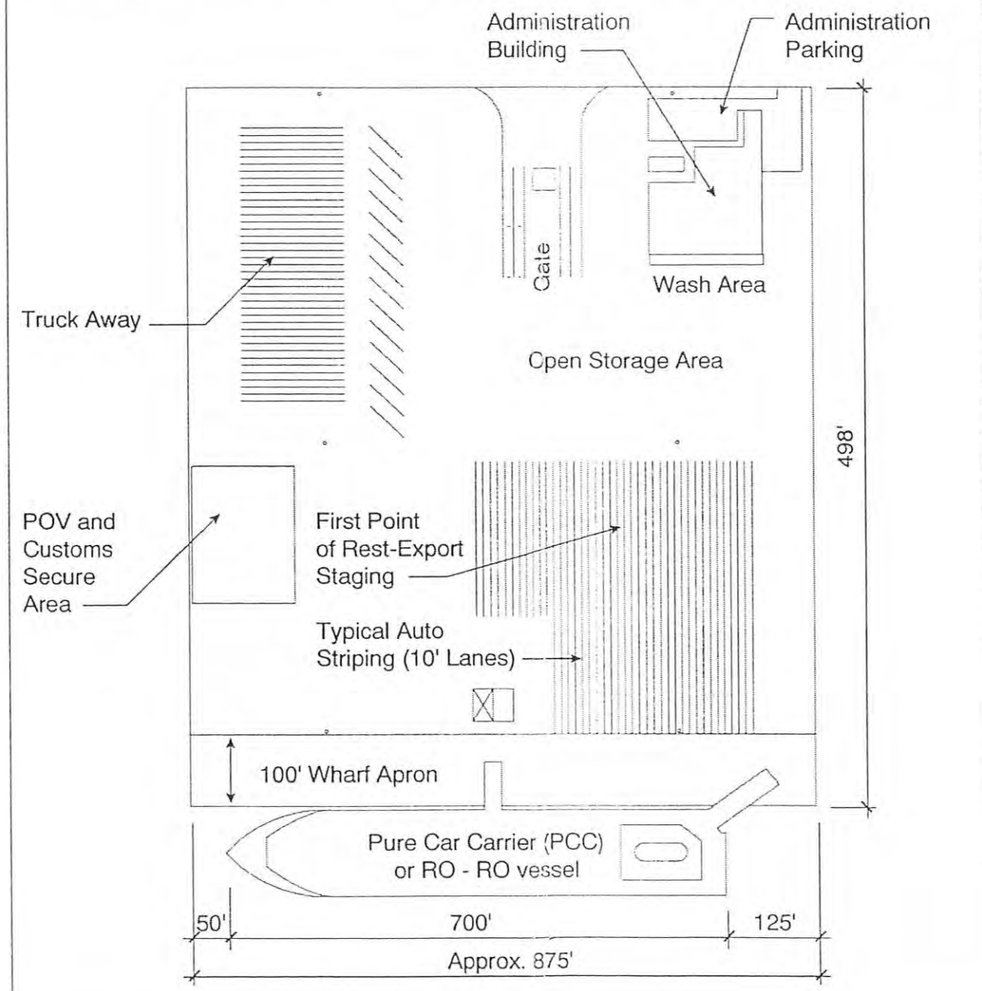
Automobile Terminal · Infrastructure Requirements

Vehicular Traffic per day (round trip counts as two)	40-45
% of Traffic That is Truck	25%
Parking Spaces Required	10-15 (Admin/VPC/Maintenance/Etc.)
Electrical Power	3,000 – 4,000 KVA
Lighting	2,000 KVA
Buildings	4,000 KVA
Misc.	1,000 KVA
Natural Gas	2,500 CFH
Potable Water	200 GPM
Fire Water	3 Hydrants, 2,500 GPM
Telephone/Communications	Six Lines
Sanitary Sewer	10" Linez
Storm Swere	Two 48" Outfalls
Special Utilities	Paging System
Special Right-of-Way	N/A

Automobile Module

Approximate Area: 10 Acres

Approximate Throughput Capacity: 50,000 Short Tons/Year

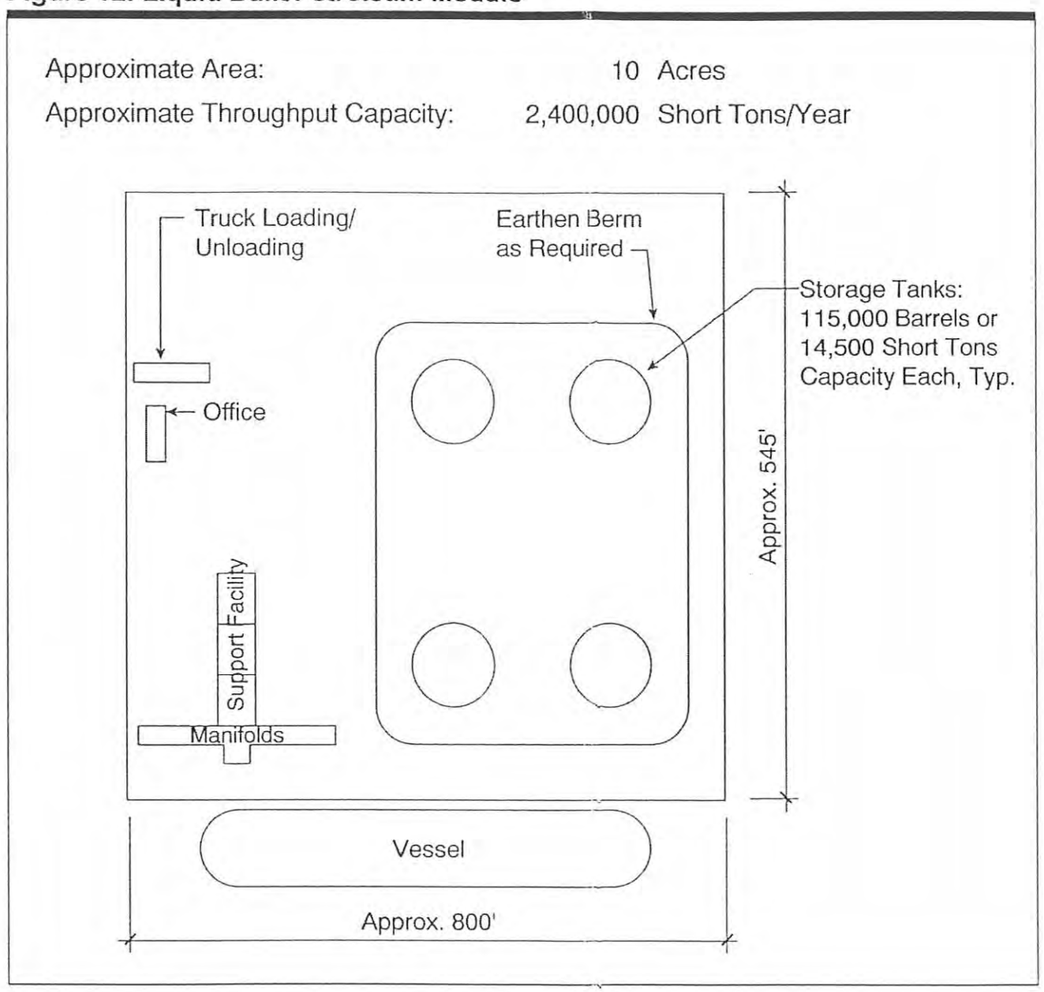


LIQUID BULK

Liquid Bulk · Petroleum Infrastructure Requirements

Gross Terminal Area:	10 Acres
Storage Capacity Area:	Varies
Throughput Capacity	Short Tons/Year: 2,400,000
Wharf Apron Configuration	Length: 800', width: 100'
Channel Criteria	Depth: 45', Width: 500' min.; 700' preferred
Basin Geometry Depth	Depth: 45' min.; 48' preferred
Storage Area/Tank Capacity	Tanks - 115,000 Barrels or 14,500 Short Tons
Surge Capacity/Tank Requirements	Varies
Crane Configuration/Crane Capacity	N/A
Transfer Equipment	Product manifolds, recessed risers, or articulated hoses.
Building Areas	N/A
Gate Geometry	N/A
Road Requirements	Tank Truck
Special Requirements	N/A
Hazardous Cargo Areas	All
Safety Criteria	OSHA, NFPA, LAFD, API620, 650, 0IA
Right-of-Way Requirements	N/A

Figure 12: Liquid Bulk/Petroleum Module



DRY BULK

Dry Bulk Terminal · Facility Data

Vehicular Traffic per Day	20 - 30
(Round Trip Counts as Two)	
% of Traffic That is Truck	0% – 100%
Parking Spaces Required	50
Electrical Power	7,000 KVA
Equipment	4,000 KVA
Lighting	1,000 KVA
Buildings	1,000 KVA
Misc.	1,000 KVA
Natural Gas	6" Line
Potable Water	8" Line
Fire Water	4 Hydrants
	2,500 GPM
Telephone/Communications	6 Lines
Sanitary Sewer	10" Line
Storm Sewer	One to three 48" Outfalls
Special Utilities	Paging and Computer
Special Right-of-Way	N/A

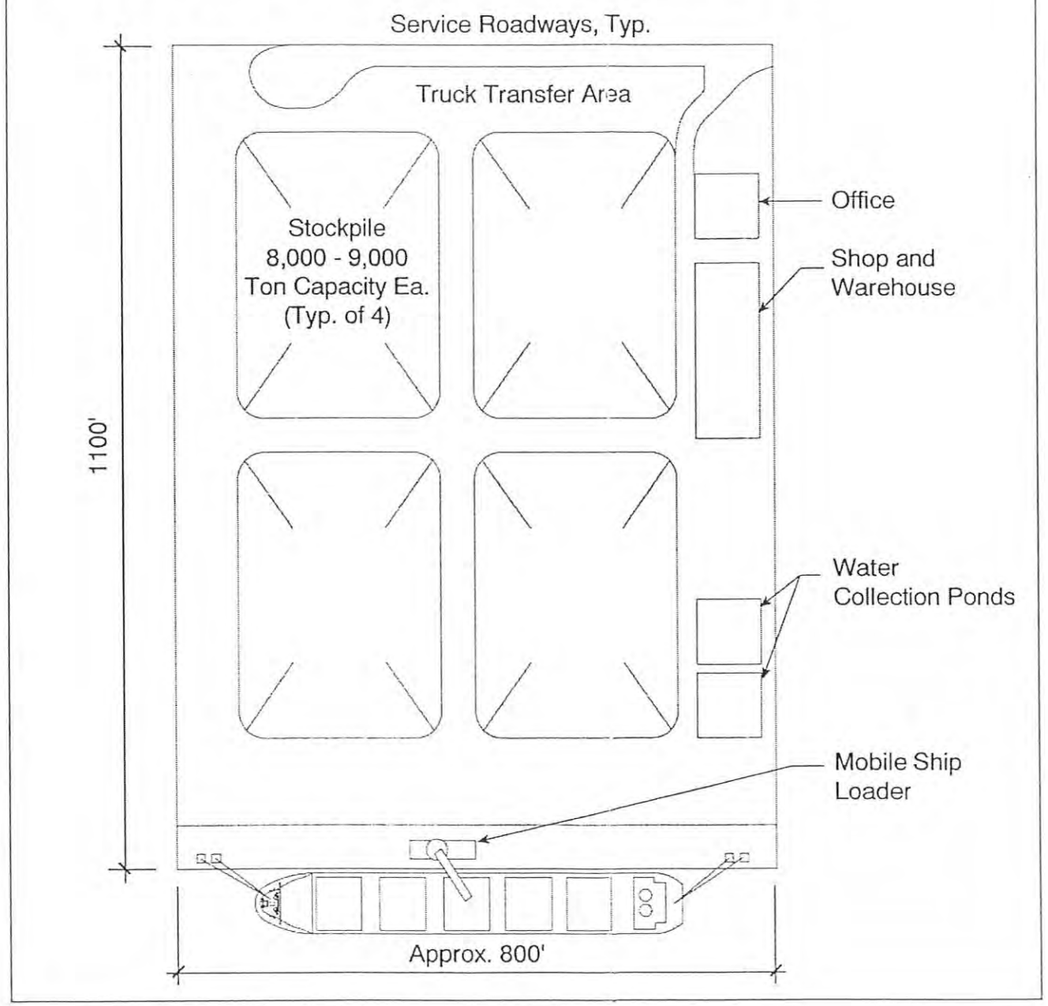
Dry Bulk Terminal · Infrastructure Requirements

Gross Terminal Area/ Storage Capacity Area	20 acres, 15 acres open storage
Throughput Capacity	1,000,000 Short Tons/Year
Wharf Apron Configuration dolphins	800-foot berth with mooring and breasting
Channel Criteria	Depth: 40' – 60'
Basin Geometry	Depth: 40' – 60'
Storage Area/ Storage Requirements	15 acres/four 8,000-9,000 ton capacity open piles
Surge Capacity/Tank Requirements	Included in storage acres
Crane Configuration/ Crane Capacity	1 linear shiploader with 5,000 - 6,000 TPH rated capacity each.
Transfer Equipment	Two stacker reclaimer units (one per conveyer system) with 5,000 MTPH capacity each.
Building Areas	Maintenance Sheds: 6,000 s.f. Administration and Parking: 5,000 s.f.
Gate Geometry	Guardhouse with two gate lanes— one inbound and one outbound.
Road Requirements	Minimal roadway on terminal.
Special Requirements	Dust and storm water control and treatment.
Hazardous Cargo Areas	N/A
Safety Criteria	Standard.
Right-of-Way requirements	N/A

Dry Bulk Module – Open Storage

Approximate Area: 20 Acres

Approximate Throughput Capacity: 1,000,000 Short Tons/Year

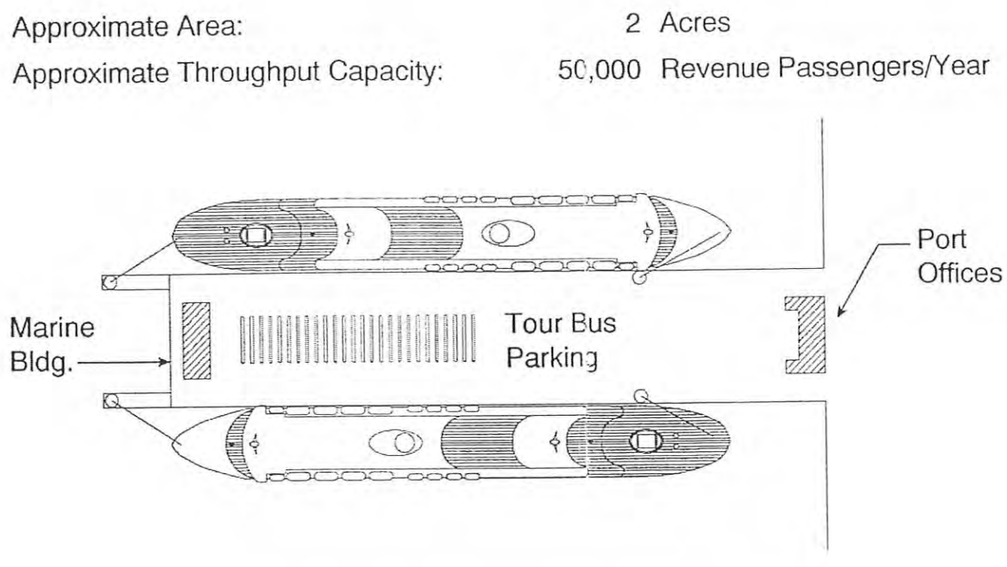


PASSENGER

Port-of-Call Cruise Terminal · Infrastructure Requirements

Total Gross Area	2 acres
Throughput Capacity	50,000 Revenue Passengers/year
Wharf Area Configuration	1,100' Marginal Wharf - 850' min 50' Minimum Setback - Structures
Terminal Building	15,000 Square Feet (Marine Building and Port Office)
Storage Area (Covered Storage)	1,000 Square Feet (Included in Marine Building)
Transfer Equipment	Forklifts: 4 @ 2.5 Tons Each
Special Requirements	• ADA Requirements • Vessel Sewage Discharge Infrastructure Allowance • Minimize Passenger Walking Distances • Visitor Information Kiosk • Covered Parking for Five 55' Tour busses @ Terminal • Band
Safety Criteria	Highest Standard
Hazardous Cargo Areas	Foreign Flag Vessels – Garbage Dumpster
Road Requirements	Road Access
Channel Criteria	Depth: 33' (Min.) 35' (Preferred) Width: 300' (Min.) 400' (Preferred)*
Basin Geometry Depth	33' (Min.) 35' (Preferred)
Building Areas	Office, Toilets, Lounge, Waiting Areas, Phones and Customs included in Terminal Building Area.

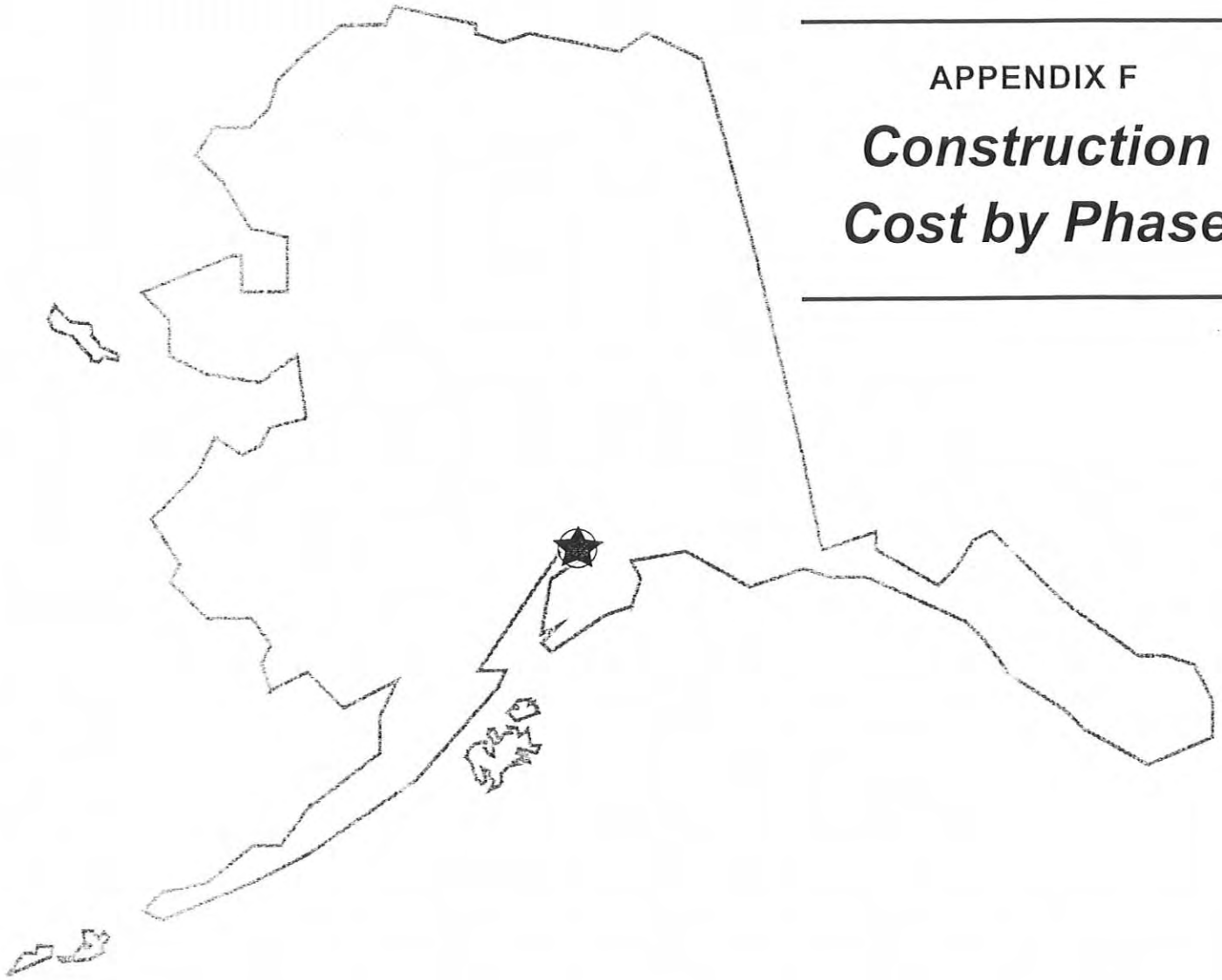
Figure 4-32: Passenger/Cruise Terminal (Port-of-Call)



Port-of-Call Cruise Terminal · Facility Data

Electrical Power	3,000 KVA
Lighting	1,000 KVA
Buildings	1,000 KVA
Misc.	1,000 KVA
Natural Gas	N/A
Potable Water	6" Line
Fire Water	8" Line (5 Hydrants; 2,500 GPM)
Telephone/Communications	12 Lines
Sanitary Sewer	8" Line
Storm Sewer	24" Outfall
Special Utilities	Paging System
Parking Spaces Required	Five Full Size Tour Busses Under Cover @ Terminal Remote Queue for an Additional Five Tour Busses 80 Minimum – Passenger Vehicles
Special Right-of-Way Requirements	Public Coastal Access

Regional Port of Anchorage
Master Plan



APPENDIX F

Construction Cost by Phase

Regional Port of Anchorage
Recommended Development Plan
PHASE I-A

DATE: April 22, 1999

PROPOSED DEVELOPMENT PLAN CONSTRUCTION COSTS

Task No.	Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Approximate Itemized Costs - Phase I-A Improvements						
	1	New Trestle at Terminal 3	1	LS	$2,000,000	$2,000,000	Expand Existing Docks for 100' gage cranes, purchase new cranes
	2	Consolidate and Realign Tidewater and Port Roads	1	LS	$1,000,000	$1,000,000	Consolidate roads and realign for new access corridor
	3	Reconfigure Container Terminals, redo utilities along Tidewater Road	1	LS	$ 500,000	$500,000	Includes fencing and gate improvements, signage, realign'mt of utilities along Tidewater Road
	4	Upgrade POL 2	1	LS	$ 20,000,000	$20,000,000	Assumes upgrade of existing Terminal for multiple uses
SUB-TOTAL ALL TASKS						$23,500,000	
INCLUDE CONTINGENCY OF					20%	$4,700,000	
TOTAL CONSTRUCTION COST						$28,200,000	
TOTAL BUDGET ESTIMATE FOR PHASE I-A (Rounded)						**$28,000,000**	

Notes:
1. Assumes budget estimate is based on a conceptual level of design only.
2. Costs have also been adjusted to reflect estimated Anchorage, Alaska regional costs based on 1999 U.S. Dollars.
3. Gate improvements do not include computers, software, cameras, intercoms, and other necessary related equipment.

Regional Port of Anchorage
Recommended Development Plan
PHASE I-B

DATE: April 22, 1999

PROPOSED DEVELOPMENT PLAN CONSTRUCTION COSTS

Task No.	Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Approximate Itemized Costs - Phase I-B Improvements						
	1	Expand Existing Wharves and Upgrade Cranes	1	LS	$30,000,000	$30,000,000	Expand Existing Docks for 100' gage cranes, purchase new cranes
	2	Increase Draft to -45 feet	1	LS	$ 5,000,000	$5,000,000	Dredgingto -45 feet & sheet piling as required
	3	Construct or relocate New Maintenance Bldg.	1	LS	$2,000,000	$2,000,000	New or relocated Maintenance Buillding.
	4	Demolish or relocate Maintenance Building, reconfigure site for Container use	1	LS	$ 200,000	$200,000	Demolish old M&R Bldg, provide new fencing, signage, etc
SUB-TOTAL ALL TASKS						$37,200,000	
INCLUDE CONTINGENCY OF					20%	$7,440,000	
TOTAL CONSTRUCTION COST						$44,640,000	
TOTAL BUDGET ESTIMATE FOR PHASE I-B (Rounded)						$45,000,000	

Notes:

1. Assumes budget estimate is based on a conceptual level of design only.
2. Costs have also been adjusted to reflect estimated Anchorage, Alaska regional costs based on 1999 U.S. Dollars.
3. Gate improvements do not include computers, software, cameras, intercoms, and other necessary related equipment.
4. Existing Maintenance Building can either be relocated or rebuilt on new site, cost is approx. for either.

Regional Port of Anchorage
Recommended Development Plan
PHASE III-A

DATE: April 22, 1999

PROPOSED DEVELOPMENT PLAN CONSTRUCTION COSTS

Task No.	Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Approximate Itemized Costs - Phase III-A New Container Terminal Module						
	1	Clear and Grub	1	LS	$330,000	$330,000	
	2	Civil Site Work	20 871,200	AC SF	$2	$1,742,400	Including grading,paving, striping,fencing,signage, etc.
	3	Dredging	6,175,000 228,704	SF CY	$9	$2,058,333	To -50 feet Assumes Hydraulic Dredging
	4	Fill	21,780,000 806,667	SF CY	$7	$5,646,667	To +15 feet Assumes that 50% of Fill is Imported Mat'l, 50% from Dredge
	5	Rock Dike	2,000	LF	$3,000	$6,000,000	Construct new rock dike & rip-rap as required
	6	Bulkheading	550	LF	$2,000	$1,100,000	Construct new bulkheading & rip-rap as required
	7	New Concrete Wharf and Trestle Construction	2,300	LF	$10,000	$23,000,000	Construct New Concrete Wharf and Trestle Structures Crane Rails, etc.
	8	Site Electrical	20	AC	$35,000	$700,000	Lighting, Electrical Sub-Stations, etc.
	9	Cathodic Protection	1	LS	$100,000	$100,000	Typical Cathodic Protection
	10	Site Mechanical	20	AC	$30,000	$600,000	Includes SD/FW/DW/SS.
	11	Yard Light Standards	14	EA	$50,000	$700,000	Assume 100' light poles
	12	Gate Site Work	3 130,680	AC SF	$10	$1,306,800	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
	13	Gate Facility	10,000	SF	$75	$750,000	Canopies and/or Other Structures
	14	Administration Building	10,000	SF	$110	$1,100,000	Administrative Building As Required
	15	Maintenance & Repair Building	25,000	SF	$75	$1,875,000	M & R Building
SUB-TOTAL ALL TASKS						**$47,009,200**	
INCLUDE CONTINGENCY OF					20%	$9,401,840	
TOTAL CONSTRUCTION COST						$56,411,040	
TOTAL BUDGET ESTIMATE FOR NEW CONTAINER TERMINAL (Rounded) PHASE III-A						**$56,000,000**	

Notes:

1. Assumes budget estimate is based on a conceptual level of design only.
2. Costs have also been adjusted to reflect estimated Anchorage, Alaska regional costs based on 1999 U.S. Dollars.
3. Gate improvements do not include computers, software, cameras, intercoms, and other necessary related equipment.

Regional Port of Anchorage
Recommended Development Plan
OPTIONAL PHASE III-A

DATE: April 22, 1999

PROPOSED DEVELOPMENT PLAN CONSTRUCTION COSTS

Task No.	Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Approximate Itemized Costs - Optional Phase III-A New Container Terminal Module						
	1	Clear and Grub	1	LS	$330,000	$330,000	
	2	Civil Site Work	20 871,200	AC SF	$2	$1,742,400	Including grading,paving, striping,fencing,signage, etc.
	3	Dredging	6,175,000 228,704	SF CY	$9	$2,058,333	To -50 feet Assumes Hydraulic Dredging
	4	Fill	18,621,900 689,700	SF CY	$7	$4,827,900	To +15 feet Assumes that 50% of Fill is Imported Mat'l, 50% from Dredge
	5	Rock Dike	1,200	LF	$3,000	$3,600,000	Construct new rock dike & rip-rap as required
	6	Bulkheading	550	LF	$2,000	$1,100,000	Construct new bulkheading & rip-rap as required
	7	New Concrete Wharf and Trestle Construction	1,650	LF	$10,000	$16,500,000	Construct New Concrete Wharf and Trestle Structures Crane Rails, etc.
	8	Site Electrical	20	AC	$35,000	$700,000	Lighting, Electrical Sub-Stations, etc.
	9	Cathodic Protection	1	LS	$100,000	$100,000	Typical Cathodic Protection
	10	Site Mechanical	20	AC	$30,000	$600,000	Includes SD/FW/DW/SS.
	11	Yard Light Standards	14	EA	$50,000	$700,000	Assume 100' light poles
	12	Gate Site Work	3 130,680	AC SF	$10	$1,306,800	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
	13	Gate Facility	10,000	SF	$75	$750,000	Canopies and/or Other Structures
	14	Administration Building	10,000	SF	$110	$1,100,000	Administrative Building As Required
	15	Maintenance & Repair Building	25,000	SF	$75	$1,875,000	M & R Building
SUB-TOTAL ALL TASKS						$37,290,433	
INCLUDE CONTINGENCY OF					20%	$7,458,087	
TOTAL CONSTRUCTION COST						$44,748,520	
TOTAL BUDGET ESTIMATE FOR NEW CONTAINER TERMINAL (Rounded) OPTIONAL PHASE III-A						**$45,000,000**	

Notes:

1. Assumes budget estimate is based on a conceptual level of design only.
2. Costs have also been adjusted to reflect estimated Anchorage, Alaska regional costs based on 1999 U.S. Dollars.
3. Gate improvements do not include computers, software, cameras, intercoms, and other necessary related equipment.

Regional Port of Anchorage
Recommended Development Plan
PHASE III-B

DATE: April 22, 1999

PROPOSED DEVELOPMENT PLAN CONSTRUCTION COSTS

Task No.	Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Approximate Itemized Costs - Phase III-B - Expansion of Container Terminal						
	1	Clear and Grub	1	LS	$330,000	$330,000	
	2	Civil Site Work	24 1,045,440	AC SF	$2	$2,090,880	Including grading,paving, striping,fencing,signage, etc.
	3	Dredging	0 0	SF CY	$9	$0	To -50 feet Assumes Hydraulic Dredging
	4	Fill	11,616,000 430,222	SF CY	$8	$3,441,778	To +15 feet Assumes that 50% of Fill is Imported Mat'l, 50% from Dredge
	5	Sheetpiling	1,600	LF	$1,000	$1,600,000	Construct new sheetpiling & back fill as required
	6	Bulkheading	650	LF	$2,000	$1,300,000	Construct new bulkheading & rip-rap as required
	7	New Concrete Wharf and Trestle Construction	0	LF	$10,000	$0	Construct New Concrete Wharf and Trestle Structures Crane Rails, etc.
	8	Site Electrical	24	AC	$35,000	$840,000	Lighting, Electrical Sub-Stations, etc.
	9	Cathodic Protection	1	LS	$100,000	$100,000	Typical Cathodic Protection
	10	Site Mechanical	24	AC	$30,000	$720,000	Includes SD/FW/DW/SS.
	11	Yard Light Standards	12	EA	$50,000	$600,000	Assume 100' light poles
	12	Gate Site Work	0 0	AC SF	$10	$0	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
	13	Gate Facility	0	SF	$75	$0	Canopies and/or Other Structures
	14	Administration Building	0	SF	$110	$0	Administrative Building As Required
	15	Maintenance & Repair Building	0	SF	$75	$0	M & R Building
SUB-TOTAL ALL TASKS						$11,022,658	
INCLUDE CONTINGENCY OF					20%	$2,204,532	
TOTAL CONSTRUCTION COST						$13,227,189	
TOTAL BUDGET ESTIMATE FOR NEW CONTAINER TERMINAL (Rounded) PHASE III-B						**$13,000,000**	

Notes:

1. Assumes budget estimate is based on a conceptual level of design only.
2. Costs have also been adjusted to reflect estimated Anchorage, Alaska regional costs based on 1999 U.S. Dollars.
3. Gate improvements do not include computers, software, cameras, intercoms, and other necessary related equipment.

Regional Port of Anchorage
Recommended Development Plan
PHASE III-C

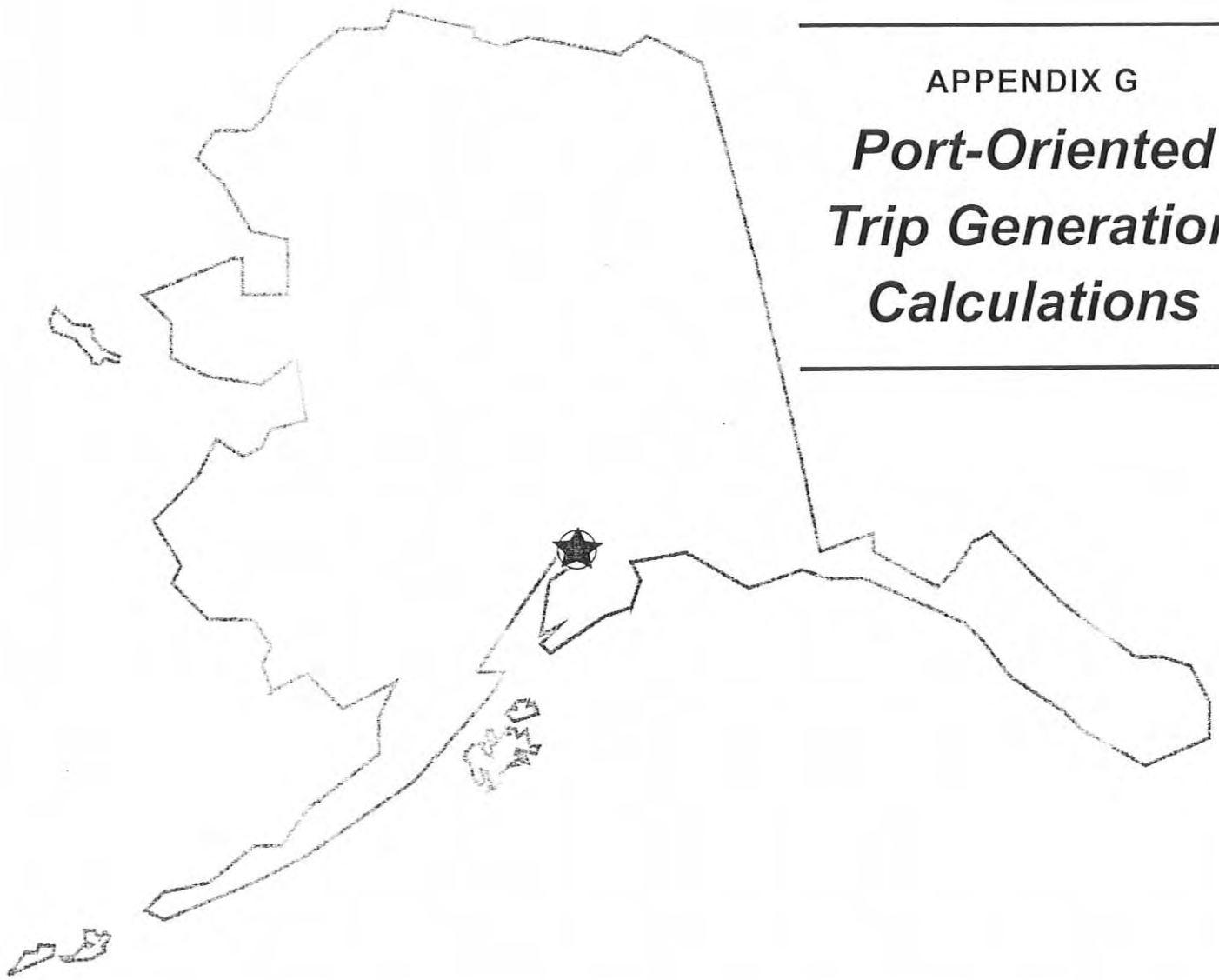
DATE: August 3, 1999

PROPOSED DEVELOPMENT PLAN CONSTRUCTION COSTS

Task No.	Item No.	Item	Quantity	Unit	Unit Cost	Item Cost	Remarks
1	Approximate Itemized Costs - Phase III-C - Expansion of Container Terminal						
	1	Clear and Grub	0	LS	$330,000	$0	
	2	Civil Site Work	28 1,219,680	AC SF	$2	$2,439,360	Including grading,paving, striping,fencing,signage, etc.
	3	Dredging	0 0	SF CY	$9	$0	To -50 feet Assumes Hydraulic Dredging
	4	Fill	35,800,000 1,325,926	SF CY	$8	$10,607,407	To +15 feet Assumes that 50% of Fill is Imported Mat'l, 50% from Dredge
	5	Sheetpiling	2,400	LF	$1,000	$2,400,000	Construct new sheetpiling & back fill as required
	6	Bulkheading	1,050	LF	$2,000	$2,100,000	Construct new bulkheading & rip-rap as required
	7	New Concrete Wharf and Trestle Construction	0	LF	$10,000	$0	Construct New Concrete Wharf and Trestle Structures Crane Rails, etc.
	8	Site Electrical	28	AC	$35,000	$980,000	Lighting, Electrical Sub-Stations, etc.
	9	Cathodic Protection	1	LS	$100,000	$100,000	Typical Cathodic Protection
	10	Site Mechanical	28	AC	$30,000	$840,000	Includes SD/FW/DW/SS.
	11	Yard Light Standards	12	EA	$50,000	$600,000	Assume 100' light poles
	12	Gate Site Work	0 0	AC SF	$10	$0	Includes Scales, Pre-Check Booths, Conc. Curbs & Other Utilities, etc.
	13	Gate Facility	0	SF	$75	$0	Canopies and/or Other Structures
	14	Administration Building	0	SF	$110	$0	Administrative Building As Required
	15	Maintenance & Repair Building	0	SF	$75	$0	M & R Building
SUB-TOTAL ALL TASKS						$20,066,767	
INCLUDE CONTINGENCY OF					20%	$4,013,353	
TOTAL CONSTRUCTION COST						$24,080,121	
TOTAL BUDGET ESTIMATE FOR NEW CONTAINER TERMINAL (Rounded) PHASE III-C						$24,000,000	

Notes:
1. Assumes budget estimate is based on a conceptual level of design only.
2. Costs have also been adjusted to reflect estimated Anchorage, Alaska regional costs based on 1999 U.S. Dollars.
3. Gate improvements do not include computers, software, cameras, intercoms, and other necessary related equipment.

Regional Port of Anchorage
Master Plan



APPENDIX G

Port-Oriented Trip Generation Calculations

Port of Anchorage Master Plan
VZM/TranSystems Port Terminal Traffic Generation Model
7/7/99

Estimated Traffic Volumes for Port Related Only

(Traffic from areas off of Port property must be added to use for road design.)

ADT=Average Daily Trips (total for both directions)
Peak Day=Vehicles per Peak Day (total for both directions)
DHV=Design Hour Volume (total for both directions)

Total Port (no Off-Port)	Year:	1998 Truck	1998 Auto	1998 Subtotal	2005 Truck	2005 Auto	2005 Subtotal	2015 Truck	2015 Auto	2015 Subtotal	2020 Truck	2020 Auto	2020 Subtotal
Low Growth	Pk Day	1,822	126	1,948	2,003	139	2,142	2,118	149	2,267	2,330	165	2,495
	DHV	284	42	327	313	46	359	331	49	380	364	54	419
Medium Growth	Pk Day	1,822	126	1,948	2,356	164	2,520	2,851	203	3,054	3,771	270	4,041
	DHV	284	42	327	375	54	429	465	66	531	616	87	703
High Growth	Pk Day	1,822	126	1,948	3,033	307	3,340	3,705	264	3,969	5,219	361	5,580
	DHV	284	42	327	490	103	593	604	86	690	849	118	967

Container	Year:	1998 Truck	1998 Auto	1998 Subtotal	2005 Truck	2005 Auto	2005 Subtotal	2015 Truck	2015 Auto	2015 Subtotal	2020 Truck	2020 Auto	2020 Subtotal
Low Growth	Pk Day	1,710	105	1,815	1,881	115	1,996	1,986	120	2,106	2,181	130	2,311
	DHV	256	37	293	282	40	322	298	42	340	327	46	373
Medium Growth	Pk Day	1,710	105	1,815	2,138	130	2,268	2,476	150	2,626	3,271	200	3,471
	DHV	256	37	293	321	46	366	371	53	424	491	70	561
High Growth	Pk Day	1,710	105	1,815	2,681	260	2,941	3,224	200	3,424	4,557	275	4,832
	DHV	256	37	293	402	91	493	484	70	554	684	96	780

Est. Non-Container	Year:	1998 Truck	1998 Auto	1998 Subtotal	2005 Truck	2005 Auto	2005 Subtotal	2015 Truck	2015 Auto	2015 Subtotal	2020 Truck	2020 Auto	2020 Subtotal
Low Growth	Pk Day	112	21	133	122	24	146	132	29	161	149	35	184
	DHV	28	5	33	30	6	37	33	7	40	37	9	46
Medium Growth	Pk Day	112	21	133	218	34	252	375	53	428	500	70	570
	DHV	28	5	33	55	8	63	94	13	107	125	17	142
High Growth	Pk Day	112	21	133	352	47	399	481	64	545	662	86	748
	DHV	28	5	33	88	12	100	120	16	136	166	22	187

Port of Anchorage Master Plan
VZM/TranSystems Port Terminal Traffic Generation Model
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Low Growth Scenario

ADT=Average Daily Trips (total for both directions)
Peak Day=Vehicles per Peak Day (total for both directions)
DHV=Design Hour Volume (total for both directions)

		1.041	1.145	1.209	1.328
Input:	**All Container**				
Terminal Name or Scenario	**1995**	**1998**	**2005**	**2010**	**2020**
Throughput in TEU	345,000	359,000	395,000	417,000	458,000
TEU per Unit	1.80	1.80	1.80	1.80	1.80
Percent by Truck (not intermodal or trans)	100%	100%	100%	100%	100%
Gate Days per Week	6	6	6	6	6
Effective Gate Hours per Day	10	10	10	10	10
Peak Month(s) to Avg. Month Ratio	1.2	1.2	1.2	1.2	1.2
Peak Day(s) of Wk to Avg. Day Ratio	1.3	1.3	1.3	1.3	1.3
Truck Peak Hour(s) to Avg. Hour Ratio	1.5	1.5	1.5	1.5	1.5
Auto Peak Hour(s) to Avg. Hour Ratio	3.5	3.5	3.5	3.5	3.5
Percent Trucks with In Plus Out Loads	70%	70%	70%	70%	70%
Percent of Extra (non thr'put) Trucks	20%	20%	20%	20%	20%
Estimated POVs per Peak Day	100	105	115	120	130
Output:					
TEU per Year	345,000	359,000	395,000	417,000	458,000
Units per Year	191,667	199,444	219,444	231,667	254,444
Percent by Truck	100%	100%	100%	100%	100%
Units Through Gate	191,667	199,444	219,444	231,667	254,444
Days per year	312	312	312	312	312
Units per Avg. Day	614	639	703	743	816
Percent of Trucks with Units Both Ways	70%	70%	70%	70%	70%
1-way Thr'put Truck Trips per Avg. Day	878	913	1,005	1,061	1,165
Percent of Extra Truck Moves	20%	20%	20%	20%	20%
Total Truck Trips per Avg. Day	1,053	1,096	1,206	1,273	1,398
Peak Month Factor	1.2	1.2	1.2	1.2	1.2
Peak Day Factor	1.3	1.3	1.3	1.3	1.3
Combined Peak Day per Year Factor	1.56	1.56	1.56	1.56	1.56
1-way Truck Pk Day Trips per Peak Day	1,643	1,710	1,881	1,986	2,181
Total Pk Day, (Trucks plus POVs)	1,743	1,815	1,996	2,106	2,311
Truck Vehicle Trips per Avg. Hour	164	171	188	199	218
Truck Peak Hour Factor	1.5	1.5	1.5	1.5	1.5
Truck DHV, Vehicle Trips per Peak Hour	246	256	282	298	327
Auto Vehicle Trips per Avg. Hour	10	11	12	12	13
Auto Peak Hour Factor	3.5	3.5	3.5	3.5	3.5
Auto DHV, Vehicle Trips per Peak Hour	35	37	40	42	46
Total DHV Trucks + Autos (container related only)	281	293	322	340	373
Container Summary:					
Total Truck Container Pk Day	1,643	1,710	1,881	1,986	2,181
Total Truck Container DHV	246	256	282	298	327
Total POV-Auto Container Pk Day	100	105	115	120	130
Total POV-Auto Container DHV	35	37	40	42	46

Port of Anchorage Master Plan
VZM/TranSystems Port Terminal Traffic Generation Model
7/7/99

Low Growth Scenario

Estimated Non-Container Port Site Traffic Input:	1995	1998	2005	2010	2020
Auto Throughput Units	37,000	37,000	39,000	39,000	42,000
Avg. Autos per Truck	7	7	7	7	7
Typical Auto Transfer Days per Week	3.5	3.5	3.5	3.5	3.5
Auto Peak Month Factor	3	3	3	3	3
Auto Peak Hour Factor	2	2	2	2	2
BB/NB Throughput Short Tons	0	0	0	0	0
Typical BB/NB Transfer Days per Week	5	5	5	5	5
Est ST per Truck	5,000	5,000	5,000	5,000	5,000
BB/NB Peak Month Factor	3	3	3	3	3
BB/NB Peak Hour Factor	2	2	2	2	2
Est Commodity Bulk Trucks Pk Day	0	0	0	0	0
Commodity Peak Hour Factor	2	2	2	2	2
Est percent add'l for Bulk related POV	10%	10%	10%	10%	10%
Est Misc Truck (Texaco, BB, Passg'r etc.) Pk Da	25	25	30	40	50
Misc Peak Hour Factor	2	2	2	2	2
Est percent add'l for Bulk related POV	50%	50%	50%	50%	50%
Output:					
Auto Truck Avg. Trips per Day	29	29	31	31	33
Auto Truck Peak Trips per Day	87	87	92	92	99
Auto Truck Peak Trips per Hour	22	22	23	23	25
BB/NB Trucks per year	-	-	-	-	-
BB/NB Truck Avg. Trips per Day	0	0	0	0	0
BB/NB Truck Peak Trips per Day	0	0	0	0	0
BB/NB Truck Peak Trips per Hour	0	0	0	0	0
Est Commodity Bulk Trucks Pk Day	0	0	0	0	0
Est Commodity Bulk Trucks DHV	0	0	0	0	0
Total Pk Day Trucks for Auto, BB, Commodity	87	87	92	92	99
Total Pk Day POV for Auto, BB, Commodity	9	9	9	9	10
Total DHV Trucks for Auto, BB, Commodity	22	22	23	23	25
Total DHV POV for Auto, BB, Commodity	2	2	2	2	2
Misc Truck Pk Day	25	25	30	40	50
Misc POV Pk Day	13	13	15	20	25
Misc Truck DHV	6	6	8	10	13
Misc POV DHV	3	3	4	5	6
Non-Container Summary:					
Total Truck Non-Container Pk Day	112	112	122	132	149
Total Truck Non-Container DHV	28	28	30	33	37
Total POV-Auto Non-Container Pk Day	21	21	24	29	35
Total POV-Auto Non-Container DHV	5	5	6	7	9
Total Container Plus Non-Container:					
Total Truck Pk Day	1,755	1,822	2,003	2,118	2,330
Total Truck DHV	274	284	313	331	364
Total POV-Auto Pk Day	121	126	139	149	165
Total POV-Auto DHV	40	42	46	49	54
Total Port Area Generated Truck Pk Day	1,876	1,948	2,142	2,267	2,495
Total Port Area Generated Truck DHV	315	327	359	380	419

Port of Anchorage Master Plan
VZM/TranSystems Port Terminal Traffic Generation Model
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Medium Growth Scenario

ADT=Average Daily Trips (total for both directions)
Peak Day=Vehicles per Peak Day (total for both directions)
DHV=Design Hour Volume (total for both directions)

		1.041	1.301	1.507	1.991
Input:	**All Container**				
Terminal Name or Scenario	**1995**	**1998**	**2005**	**2010**	**2020**
Throughput in TEU	345,000	359,000	449,000	520,000	687,000
TEU per Unit	1.80	1.80	1.80	1.80	1.80
Percent by Truck (not intermodal or trans)	100%	100%	100%	100%	100%
Gate Days per Week	6	6	6	6	6
Effective Gate Hours per Day	10	10	10	10	10
Peak Month(s) to Avg. Month Ratio	1.2	1.2	1.2	1.2	1.2
Peak Day(s) of Wk to Avg. Day Ratio	1.3	1.3	1.3	1.3	1.3
Truck Peak Hour(s) to Avg. Hour Ratio	1.5	1.5	1.5	1.5	1.5
Auto Peak Hour(s) to Avg. Hour Ratio	3.5	3.5	3.5	3.5	3.5
Percent Trucks with In Plus Out Loads	70%	70%	70%	70%	70%
Percent of Extra (non thr'put) Trucks	20%	20%	20%	20%	20%
Estimated POVs per Peak Day	100	105	130	150	200
Output:					
TEU per Year	345,000	359,000	449,000	520,000	687,000
Units per Year	191,667	199,444	249,444	288,889	381,667
Percent by Truck	100%	100%	100%	100%	100%
Units Through Gate	191,667	199,444	249,444	288,889	381,667
Days per year	312	312	312	312	312
Units per Avg. Day	614	639	800	926	1,223
Percent of Trucks with Units Both Ways	70%	70%	70%	70%	70%
1-way Thr'put Truck Trips per Avg. Day	878	913	1,142	1,323	1,748
Percent of Extra Truck Moves	20%	20%	20%	20%	20%
Total Truck Trips per Avg. Day	1,053	1,096	1,371	1,587	2,097
Peak Month Factor	1.2	1.2	1.2	1.2	1.2
Peak Day Factor	1.3	1.3	1.3	1.3	1.3
Combined Peak Day per Year Factor	1.56	1.56	1.56	1.56	1.56
1-way Truck Pk Day Trips per Peak Day	1,643	1,710	2,138	2,476	3,271
Total Pk Day, (Trucks plus POVs)	1,743	1,815	2,268	2,626	3,471
Truck Vehicle Trips per Avg. Hour	164	171	214	248	327
Truck Peak Hour Factor	1.5	1.5	1.5	1.5	1.5
Truck DHV, Vehicle Trips per Peak Hour	246	256	321	371	491
Auto Vehicle Trips per Avg. Hour	10	11	13	15	20
Auto Peak Hour Factor	3.5	3.5	3.5	3.5	3.5
Auto DHV, Vehicle Trips per Peak Hour	35	37	46	53	70
Total DHV Trucks + Autos (container related only)	281	293	366	424	561
Container Summary:					
Total Truck Container Pk Day	1,643	1,710	2,138	2,476	3,271
Total Truck Container DHV	246	256	321	371	491
Total POV-Auto Container Pk Day	100	105	130	150	200
Total POV-Auto Container DHV	35	37	46	53	70

Port of Anchorage Master Plan
VZM/TranSystems Port Terminal Traffic Generation Model
7/7/99

Medium Growth Scenario

Estimated Non-Container Port Site Traffic Input:	1995	1998	2005	2010	2020
Auto Throughput Units	37,000	37,000	44,000	49,000	62,000
Avg. Autos per Truck	7	7	7	7	7
Typical Auto Transfer Days per Week	3.5	3.5	3.5	3.5	3.5
Auto Peak Month Factor	3	3	3	3	3
Auto Peak Hour Factor	2	2	2	2	2
BB/NB Throughput Short Tons	0	0	15,000	30,000	45,000
Typical BB/NB Transfer Days per Week	5	5	5	5	5
Est ST per Truck	5,000	5,000	5,000	5,000	5,000
BB/NB Peak Month Factor	3	3	3	3	3
BB/NB Peak Hour Factor	2	2	2	2	2
Est Commodity Bulk Trucks Pk Day	0	0	50	150	200
Commodity Peak Hour Factor	2	2	2	2	2
Est percent add'l for Bulk related POV	10%	10%	10%	10%	10%
Est Misc Truck (Texaco, BB, Passg'r etc.) Pk Da	25	25	30	40	50
Misc Peak Hour Factor	2	2	2	2	2
Est percent add'l for Bulk related POV	50%	50%	50%	50%	50%
Output:					
Auto Truck Avg. Trips per Day	29	29	35	38	49
Auto Truck Peak Trips per Day	87	87	104	115	146
Auto Truck Peak Trips per Hour	22	22	26	29	36
BB/NB Trucks per year	-	-	3,000	6,000	9,000
BB/NB Truck Avg. Trips per Day	0	0	12	23	35
BB/NB Truck Peak Trips per Day	0	0	35	69	104
BB/NB Truck Peak Trips per Hour	0	0	9	17	26
Est Commodity Bulk Trucks Pk Day	0	0	50	150	200
Est Commodity Bulk Trucks DHV	0	0	13	38	50
Total Pk Day Trucks for Auto, BB, Commodity	87	87	188	335	450
Total Pk Day POV for Auto, BB, Commodity	9	9	19	33	45
Total DHV Trucks for Auto, BB, Commodity	22	22	47	84	112
Total DHV POV for Auto, BB, Commodity	2	2	5	8	11
Misc Truck Pk Day	25	25	30	40	50
Misc POV Pk Day	13	13	15	20	25
Misc Truck DHV	6	6	8	10	13
Misc POV DHV	3	3	4	5	6
Non-Container Summary:					
Total Truck Non-Container Pk Day	112	112	218	375	500
Total Truck Non-Container DHV	28	28	55	94	125
Total POV-Auto Non-Container Pk Day	21	21	34	53	70
Total POV-Auto Non-Container DHV	5	5	8	13	17
Total Container Plus Non-Container:					
Total Truck Pk Day	1,755	1,822	2,356	2,851	3,771
Total Truck DHV	274	284	375	465	616
Total POV-Auto Pk Day	121	126	164	203	270
Total POV-Auto DHV	40	42	54	66	87
Total Port Area Generated Truck Pk Day	1,876	1,948	2,520	3,054	4,041
Total Port Area Generated Truck DHV	315	327	429	531	703

Port of Anchorage Master Plan
VZM/TranSystems Port Terminal Traffic Generation Model
7/7/99

High Growth Scenario

ADT=Average Daily Trips (total for both directions)
Peak Day=Vehicles per Peak Day (total for both directions)
DHV=Design Hour Volume (total for both directions)

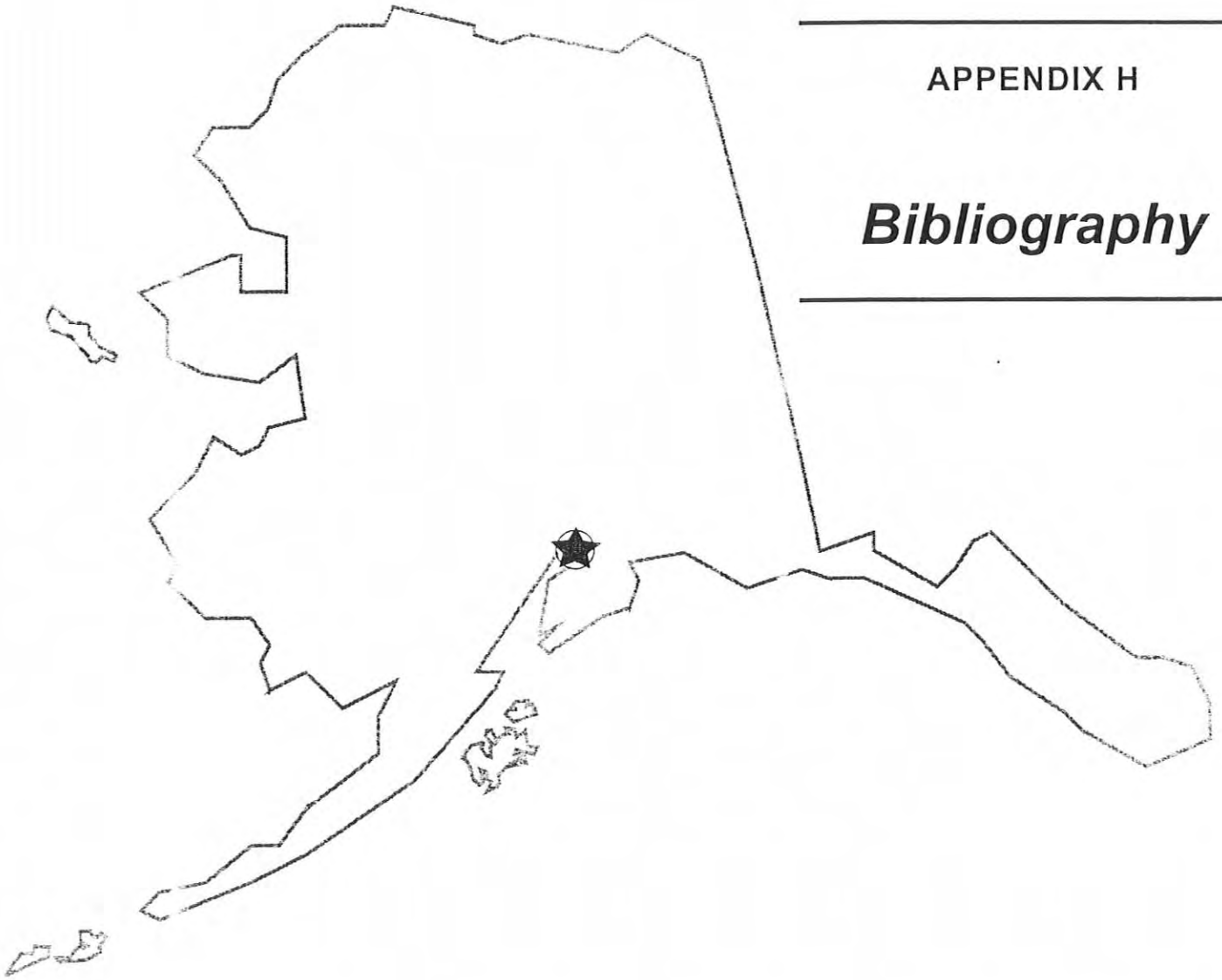
		1.041	1.632	1.962	2.774
Input:	**All Container**				
Terminal Name or Scenario	**1995**	**1998**	**2005**	**2010**	**2020**
Throughput in TEU	345,000	359,000	563,000	677,000	957,000
TEU per Unit	1.80	1.80	1.80	1.80	1.80
Percent by Truck (not intermodal or trans)	100%	100%	100%	100%	100%
Gate Days per Week	6	6	6	6	6
Effective Gate Hours per Day	10	10	10	10	10
Peak Month(s) to Avg. Month Ratio	1.2	1.2	1.2	1.2	1.2
Peak Day(s) of Wk to Avg. Day Ratio	1.3	1.3	1.3	1.3	1.3
Truck Peak Hour(s) to Avg. Hour Ratio	1.5	1.5	1.5	1.5	1.5
Auto Peak Hour(s) to Avg. Hour Ratio	3.5	3.5	3.5	3.5	3.5
Percent Trucks with In Plus Out Loads	70%	70%	70%	70%	70%
Percent of Extra (non thr'put) Trucks	20%	20%	20%	20%	20%
Estimated POVs per Peak Day	100	105	260	200	275
Output:					
TEU per Year	345,000	359,000	563,000	677,000	957,000
Units per Year	191,667	199,444	312,778	376,111	531,667
Percent by Truck	100%	100%	100%	100%	100%
Units Through Gate	191,667	199,444	312,778	376,111	531,667
Days per year	312	312	312	312	312
Units per Avg. Day	614	639	1,002	1,205	1,704
Percent of Trucks with Units Both Ways	70%	70%	70%	70%	70%
1-way Thr'put Truck Trips per Avg. Day	878	913	1,432	1,722	2,434
Percent of Extra Truck Moves	20%	20%	20%	20%	20%
Total Truck Trips per Avg. Day	1,053	1,096	1,719	2,067	2,921
Peak Month Factor	1.2	1.2	1.2	1.2	1.2
Peak Day Factor	1.3	1.3	1.3	1.3	1.3
Combined Peak Day per Year Factor	1.56	1.56	1.56	1.56	1.56
1-way Truck Pk Day Trips per Peak Day	1,643	1,710	2,681	3,224	4,557
Total Pk Day, (Trucks plus POVs)	1,743	1,815	2,941	3,424	4,832
Truck Vehicle Trips per Avg. Hour	164	171	268	322	456
Truck Peak Hour Factor	1.5	1.5	1.5	1.5	1.5
Truck DHV, Vehicle Trips per Peak Hour	246	256	402	484	684
Auto Vehicle Trips per Avg. Hour	10	11	26	20	28
Auto Peak Hour Factor	3.5	3.5	3.5	3.5	3.5
Auto DHV, Vehicle Trips per Peak Hour	35	37	91	70	96
Total DHV Trucks + Autos (container related only)	281	293	493	554	780
Container Summary:					
Total Truck Container Pk Day	1,643	1,710	2,681	3,224	4,557
Total Truck Container DHV	246	256	402	484	684
Total POV-Auto Container Pk Day	100	105	260	200	275
Total POV-Auto Container DHV	35	37	91	70	96

Port of Anchorage Master Plan
VZM/TranSystems Port Terminal Traffic Generation Model
7/7/99

High Growth Scenario

Estimated Non-Container Port Site Traffic Input:	1995	1998	2005	2010	2020
Auto Throughput Units	37,000	37,000	47,000	55,000	77,000
Avg. Autos per Truck	7	7	7	7	7
Typical Auto Transfer Days per Week	3.5	3.5	3.5	3.5	3.5
Auto Peak Month Factor	3	3	3	3	3
Auto Peak Hour Factor	2	2	2	2	2
BB/NB Throughput Short Tons	0	0	70,000	70,000	100,000
Typical BB/NB Transfer Days per Week	5	5	5	5	5
Est ST per Truck	5,000	5,000	5,000	5,000	5,000
BB/NB Peak Month Factor	3	3	3	3	3
BB/NB Peak Hour Factor	2	2	2	2	2
Est Commodity Bulk Trucks Pk Day	0	0	50	150	200
Commodity Peak Hour Factor	2	2	2	2	2
Est percent add'l for Bulk related POV	10%	10%	10%	10%	10%
Est Misc Truck (Texaco, BB, Passg'r etc.) Pk Da	25	25	30	40	50
Misc Peak Hour Factor	2	2	2	2	2
Est percent add'l for Bulk related POV	50%	50%	50%	50%	50%
Output:					
Auto Truck Avg. Trips per Day	29	29	37	43	60
Auto Truck Peak Trips per Day	87	87	111	130	181
Auto Truck Peak Trips per Hour	22	22	28	32	45
BB/NB Trucks per year	-	-	14,000	14,000	20,000
BB/NB Truck Avg. Trips per Day	0	0	54	54	77
BB/NB Truck Peak Trips per Day	0	0	162	162	231
BB/NB Truck Peak Trips per Hour	0	0	40	40	58
Est Commodity Bulk Trucks Pk Day	0	0	50	150	200
Est Commodity Bulk Trucks DHV	0	0	13	38	50
Total Pk Day Trucks for Auto, BB, Commodity	87	87	322	441	612
Total Pk Day POV for Auto, BB, Commodity	9	9	32	44	61
Total DHV Trucks for Auto, BB, Commodity	22	22	81	110	153
Total DHV POV for Auto, BB, Commodity	2	2	8	11	15
Misc Truck Pk Day	25	25	30	40	50
Misc POV Pk Day	13	13	15	20	25
Misc Truck DHV	6	6	8	10	13
Misc POV DHV	3	3	4	5	6
Non-Container Summary:					
Total Truck Non-Container Pk Day	112	112	352	481	662
Total Truck Non-Container DHV	28	28	88	120	166
Total POV-Auto Non-Container Pk Day	21	21	47	64	86
Total POV-Auto Non-Container DHV	5	5	12	16	22
Total Container Plus Non-Container:					
Total Truck Pk Day	1,755	1,822	3,033	3,705	5,219
Total Truck DHV	274	284	490	604	849
Total POV-Auto Pk Day	121	126	307	264	361
Total POV-Auto DHV	40	42	103	86	118
Total Port Area Generated Truck Pk Day	1,876	1,948	3,340	3,969	5,580
Total Port Area Generated Truck DHV	315	327	593	690	967

Regional Port of Anchorage
Master Plan



APPENDIX H

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APPENDIX H: BIBLIOGRAPHY

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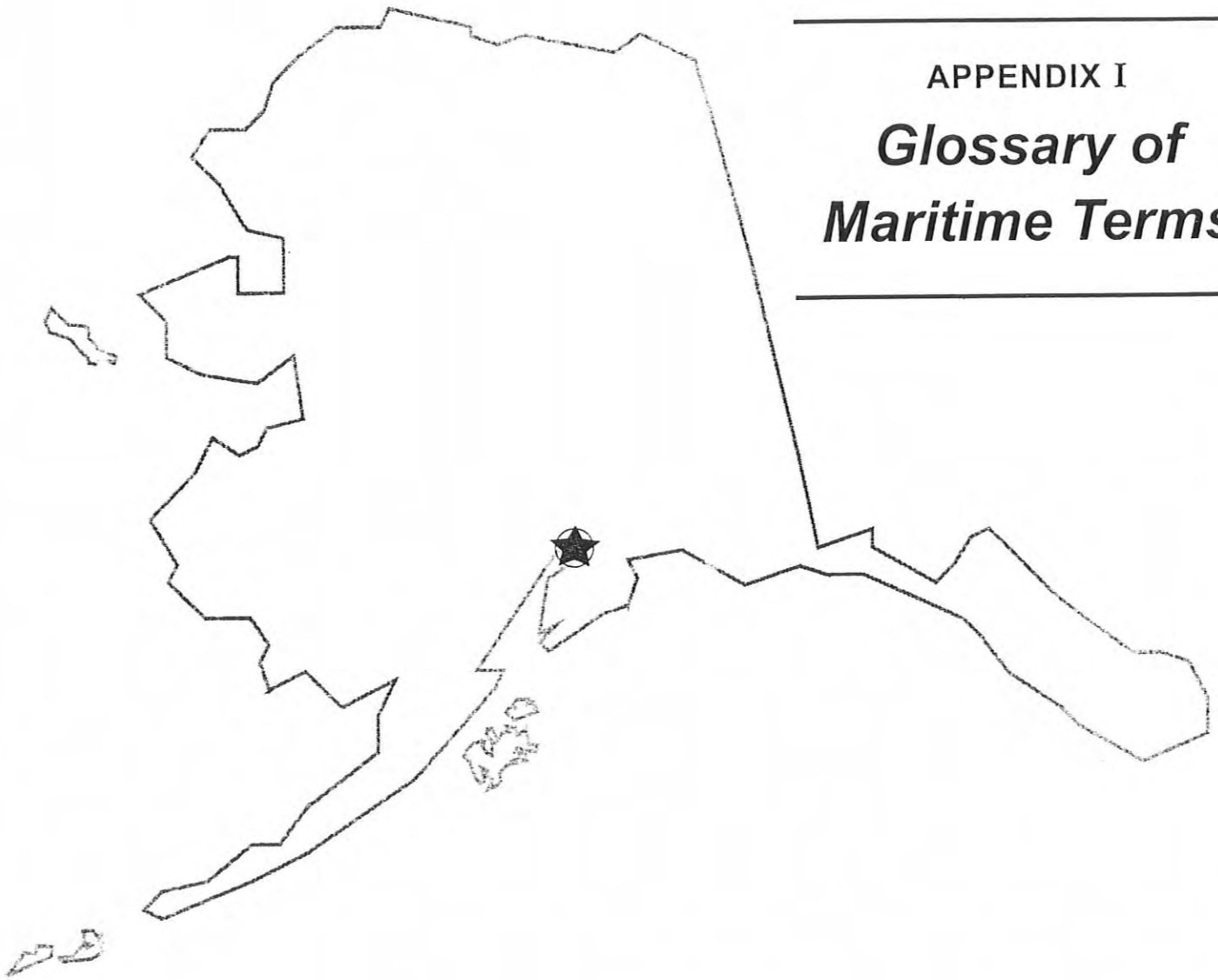
Master Plan



APPENDIX I

Glossary of Maritime Terms

Glossary of Intermodal and Maritime Terms

3GCV

4GCV

3GCV Third-Generation Container Vessel. A vessel placed in service circa 1975-85, with typical capacities of 2,500 to 3,500 TEU's (twenty-foot equivalent unit containers).

4GCV Fourth-Generation Container Vessel. A vessel placed in service circa late 1980's-early 1990's, with typical capacities of 3,500 to 5,000 TEU's.

AAPA American Association of Port Authorities.

ACI Automated Container Identification System.

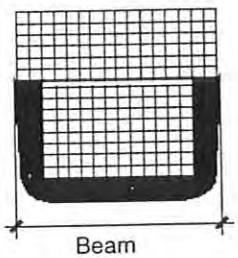
AEI Automated Equipment Identification System.

Apron That portion of a wharf or pier lying between the waterfront edge and the storage areas or transit shed. Typically, the area above the wharf structural system.

Back Haul A marine transportation carrier's return movement of cargo, usually opposite from the direction of its primary cargo distribution.

Backlands Storage area of a marine terminal that is distant from the wharf area.

Bad Order Equipment (trains, trucks, containers) in need of repair.



Beam

Bathymetric Measurement of water depth.

Beam The width of a vessels hull at its widest part.

Berth The water area, at the waterfront edge of a wharf, reserved for a vessel. The term is sometimes used to refer to the dock or wharf structure.

Beyond-Panamax Refers to vessels too large to navigate (Post-Panamax) the Panama Canal.

Bill of Lading Receipt of goods shipped signed by the person (or agent) who contracts to carry them, that states the terms under which the goods are carried.

Bollard

Blade Conventional fork lift truck (as opposed to "Top Pick").

Body Track One of several parallel tracks in a railroad yard for rail car storage or classification.

Bollard A line-securing device on a wharf around which mooring and berthing lines are fastened.

Glossary of Intermodal and Maritime Terms

Devanning Removal of contents from a container (sometimes called stripping or discharging).

Dolphin An isolated cluster of piles used as a support for mooring devices or marker lights.

Domestic Container A container for transporting containerized cargo with both points of origin and destination within the contiguous United States. Specially constructed domestic containers do not meet the ISO requirements for international shipment and are therefore not normally handled in a marine CY.

Double Stack

Double Stack A special articulated railcar to haul containers one on top of another. The typical car consists of five articulated rail "platforms," each capable of holding two forty-foot containers.

Draft, Vessel The depth of a vessel below the waterline, measured to the lowest point of the hull, the bottom of the propeller or another reference point.

Drill Track A rail track connecting with a lead or ladder track, over which locomotives and cars move back and forth in switching.

EDI Electronic Data Interchange. A system of electronic data processing standards.

EIR Equipment Interchange Report. See TIR.

Escape Track Also known as a Runaround Track. Used to allow road engines (locomotives) which pull trains to disconnect and "escape" from the rail yard or terminal.

FCL Full Container Load. Used to indicated that the load carried in a container equals one of the two operating maxima—weight or volume.

FEU Forty-Foot Equivalent Unit. A term used in indicating container vessel or terminal capacity. Two 20-foot containers (TEU's) equal one FEU.

FLT Forklift, i.e., a vehicle used for lifting and handling containers and other cargo.

FMC Federal Maritime Commission.

Fender A device or framed system placed against the edge of a dock to take the impact from vessel berthing.

Freight Forwarder A firm engaged by a shipper to handle all or most aspects of export shipments.

Glossary of Intermodal and Maritime Terms

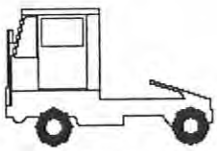
Gantry Crane A crane or hoisting machine mounted on a frame or structure spanning an intervening space and designed to hoist containers into or out of a ship. Also see "Container Crane."

Gatehouse A building, usually with associated check-in/check-out booths, for processing entering and exiting trucks with their loads.

Gauge The distance between the rails of a railroad track. Also, the measurement of a gantry crane's rail width, i.e., 34-foot gauge, 100-foot gauge, etc.

General Cargo A variety of consumer goods, mostly manufactured or processed, and usually shipped on liner cargo or air freight services.

High Cube Any container that exceeds 8'6" (102") in height. Usually refers to a container which is 9'6" in height.



Hostler/Hustler

Hostler/Hustler A tractor, usually unlicensed, for moving containers within a yard. An employee who drives a tractor for the purpose of moving cargo within a container yard.

Hydrodynamic A measurement of the velocity of the flow of water.

Hydrographic The configuration of the bottom of a body of water.

ICTF Intermodal Container Transfer Facility. See ITF.

ILA International Longshoremen's Association (East Coast).

ILWU International Longshoremen's and Warehousemen's Union (West Coast).

IMO International Maritime Organization.

ISO International Standards Organization. Worldwide organization formed to promote development of standards to facilitate the international carriage and exchange of goods and services. Governs construction specifications for ISO containers.

ITF (ICTF) Intermodal Transfer Facility. A facility used for the transfer of cargo from ship to truck to rail in any order.

Industrial Lead A railroad track serving an industrial area, with numerous branch tracks.

Inter-Box Connector (IBC) A manual or automatic device for connecting stacked containers on board ship or on double-stacked trains. Also called stacking cone, stacking shoe or twist-lock.

Glossary of Intermodal and Maritime Terms

Interlocking An arrangement of signals and special track work where rail routes meet, including turnouts and crossovers (as the case may be), and connected such that movements from one track to another can only be made safely and in the proper sequence, preventing opposing or conflicting train movements. Interlockings occur at the crossing of two railroads, at junctions or upon entering or leaving terminals or yards.

Intermodal Carriage by more than a single mode. In some segments of the freight transportation industry, "intermodal" is defined as the transfer of containers from ship to rail. In this report, its definition includes transfers between all freight modes involved in general cargo transportation (ship, rail and truck), taken as a system for moving freight from origin to destination by its most efficient means. In the ISTEA, the meaning includes passenger trips involving more than one mode.

Kip Kilopound (1,000 lbs. of force).

LCL Less-Than-Container Load. A shipment moving at other than the rate for a full container load. Sometimes used to denote a shipment consisting of cargo for more than one consignee.

Ladder Track A track with numerous turnouts leading to parallel yard or body tracks. Often, a yard will have ladder tracks at both ends for improved access.

Landbridge The provision of a cargo movement overland between two separate voyages by sea (a sea/land/sea movement). May also refer to a land/sea/land movement.

Lighter A barge or other small floating craft used in transferring cargo from ship to shore or vice versa.

Liner Service That type of service offered by regular line operators of vessels. The itineraries and sailing schedules are predetermined and fixed. Most of the cargo is containerized general cargo.

Live Load A nonpermanent vertical load to which a structure is subjected, such as movable equipment or stored materials.

Load Center Railroad and marine transportation term for concentrating cargo in one location for distribution to other locations. Similar to airline "hubs."

Lo-Lo Lift-On/Lift-Off. A type of vessel that allows cargo to be loaded or unloaded by either ship or shore cranes.

M&R Maintenance and Repair. Facility used to maintain container yard equipment and containers.

MARAD The U.S. Maritime Administration.

Glossary of Intermodal and Maritime Terms

MLLW Mean Lower Low Water. The average height of the lower of the daily low tide over a 19-year period.

MT Metric Ton (1,000 kilos or 2,204.6 pounds).

Material-Handling Equipment Forklift trucks, platform tracks, warehousing industrial cranes, straddle carriers, pallet trucks, platform trucks, warehouse trailers, conveyer systems and other equipment used in storage and handling operations.

Micro-Landbridge A through movement in which cargo moves between an inland U.S. point and a port via rail or truck, connecting with a ship for movement to or from a foreign port. (The ocean carrier accepts full responsibility for the entire movement on a single through bill of lading.)

Mini-Landbridge A through movement of cargo between Europe and the Pacific Coast of the U.S. or between the Far East and the Atlantic or Gulf Coast of the U.S. Also, a unit train movement across the U.S. that substitutes for the all-water route through the Panama Canal. (The ocean carrier accepts full responsibility for the entire movement on a single through bill of lading.)

Mooring Dolphin An isolated cluster of piles used as a support for mooring devices.

Mule East coast designation for hostler or yard tractor.

NVOCC Nonvessel Operating Common Carrier. A carrier defined by maritime law, offering an international cargo transport service through the use of underlying carriers and under one's own rate structure, in accordance with tariffs filed with the Federal Maritime Commission.

Near-Dock Refers to operations taking place within a reasonable drayage distance from the wharf.

Neo-Bulk Used to refer to processed or manufactured goods that move by ship-lot lots, such as automobiles or lumber.

OCP Overland Common Point. A term used on the U.S. West Coast for destinations east of the Rockies, i.e., the states of Montana, Wyoming, Utah and Arizona.

Off-Dock Refers to operations taking place at a distance from the wharf area.

On-Dock Refers to operations taking place at or adjacent to the wharf area.

Over-the-Road A term used, principally in the U.S., for the road freight carrier or vehicle's over-the-road operation. Describes equipment meeting safety and operational requirements for utilization of public access roads, which is specifically licensed to do so.

Glossary of Intermodal and Maritime Terms

PCC Pure Car Carrier. A type of vessel configured to carry only automobiles.

PIANC Permanent International Association of Navigational Congresses.

POV Privately Owned Vehicle.

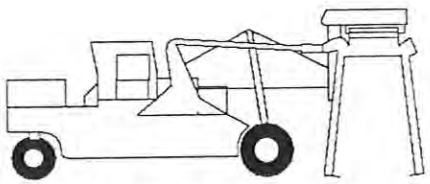
Panamax Refers to the maximum dimensions of a vessel in order to transit the Panama Canal.

Pier The location in a seaport at which cargo arrives or departs. A dock for loading or unloading ships or vessels. A type of wharf, running at an angle with the shoreline of a body of water.

Piggyback The hauling of road vehicles and trailers and containers on wheels on railroad flatcars.

Piggy Packer Trade name for a Raygo-Wagner front-end top-pick forklift vehicle that is used to lift containers and trailers on or off rail flatcars.

Planametrics A measurement of a flat or level surface by means of an instrument that measures the area by tracing its boundary line.



Portpacker/Top Pick

Portpacker/Top Pick Trade name for a front-end forklift made by Raygo-Wagner Corporation that lifts a container by securing the lift mechanism on the top of the container.

Portainer The registered trade name for low-profile container gantry cranes manufactured by Pacific Coast Engineering Company (PACECO).

Port Side To Refers to a vessel docked with its left side adjacent to the wharf.

Pre-Blocked Run-Through Train A through train made up of blocks or cuts of cars which are not separated until reaching a destination yard, where the blocks may be sent off on separate branch lines or to individual consignees.

Pre-Check A system of collecting portions of check-in data from a vehicle prior to its reaching the gatehouse, using remote cameras, scales, intercoms, etc.

Pre-Trip Preparation and cleaning of a reefer or container prior to a trip.

Queue A waiting line at the entrance to a terminal or other operation for vehicles picking up or delivering cargo.

RF Tag Radio Frequency Tag. Used to identify a container through automated container identification.

RITF Regional Intermodal Transfer Facility. An intermodal facility serving several marine terminals within a given region. See ITF.

Glossary of Intermodal and Maritime Terms

RTG Rubber-Tired Gantry Crane. See "Gantry Crane" and "Transtainer."

Railhead End of the railroad line or point in the area of operations at which cargo is loaded and unloaded.

Railyard A rail terminal at which occur traditional railroad activities for sorting and redistribution of railcars and cargo.

Reefer Slang for refrigerated containers.

Rip Rap A layer, facing or protective mound of stones placed to prevent erosion, scour or sloughing of a structure or embankment; also, the stone so used.

Ro-Ro Roll-On/Roll-Off. A vessel constructed in such a way as to permit cargo to be driven on and off the vessel.

Road Engine A locomotive used by the railroads to haul cargo long distances over the main line trackage.

Road Switcher A locomotive used for through or main line movements, often in multiple with other similar units. Road switchers may also be used to do work along branch lines.

Roadability Canopy Canopy over the area where vehicles are inspected for road-worthiness.

Roadrailer A specialized road chassis that has retractable rail wheels which allow it to operate directly on a rail system.

Runaround Track A running track kept clear to allow the movement of equipment from one end of a railyard or ITF to the other.

Seawall A structure that is built along and parallel to a shoreline for the purpose of protecting and stabilizing the shore against erosion resulting from wave action.

Shiploading Container Gantry Crane See Container Crane, Gantry Crane.

Siding An auxiliary to the main railroad track to allow the meeting or passing of trains.

Sidepick A lift truck with forks situated in such a manner as to lift the container from the side by inserting the forks under the container; also called a "Side-Loader."

Signage Refers to the total of all signs with writing and symbols denoting directions and destinations within a container terminal or ITF.

Glossary of Intermodal and Maritime Terms

Simulation A terminal management assistance tool which makes use of a computer model that mimics, in real time, the operations of a terminal. Simulation is used to predict cargo throughput and areas of conflict under differing operating scenarios.

Solid Train A train transporting a single commodity from one source to one destination, in which the integrity of the loaded train is maintained; however, unlike unit trains, the empty cars may then be deadheaded separately back to the original or to other sources. Also see Unit Train.

Spine Car A lightweight, low-cut, multi-platform articulated railcar designed for efficient transfer of intermodal container cargo.

Spotting The placement of a railroad car where required, so that it is accessible for loading/unloading.

Spur A section of track connected only at one end to a main track, i.e., a stub-ended siding.

Spreader A device used for handling (lifting) containers by their corner castings, which usually can be adjusted to handle various sizes of containers.

Starboard Side To Refers to a vessel docked with its right side adjacent to the wharf.

Stevedore Individual or firm employing longshoremen (or other labor) for the purpose of loading and unloading a vessel.

Storage Track A track on which railroad cars are placed when not in service.

Straddle Carrier/Strad A self-propelled, steerable vehicle on wheels, open in the middle, that can straddle a container or container-on-chassis, then lift and move it from one place to another in a container yard. Capable of straddling a single row of containers, stacked two to five containers high. Derived from the method used by old lumber carriers in moving lumber and timber around a lumber yard.

TEU Twenty-foot-equivalent unit. A means of expressing containers of various sizes, such as 40- or 48-foot, in equivalent units.

TIR (EIR) Trailer Inspection (or Interchange) Report. Same as an Equipment Interchange Report, used to document damage and condition of containers and chassis.

Trailer-on-Flatcar

TOFC Trailer-on-Flatcar. "Piggybacking" highway trailers on specially equipped rail flatcars.

Tail Track A stub-end track, usually at the end of a yard, kept clear of standing cars to allow space for rail equipment to switch or to exit from a ladder or body track.

Glossary of Intermodal and Maritime Terms

Tanker Ship for moving dry or liquid bulk commodities. In US Census Bureau international commerce data, it only refers to liquid bulk.

Throughput The amount of cargo that reasonably can be expected to be processed, given the physical facilities available, the operating conditions present and the business conditions characteristic of the trade in which the terminal is engaged.

Tons Expressed in maritime trade as "long," "short" or "metric." A long ton equals 1,016 kg or 2,240 lb. A short ton equals 2,000 lb. A metric ton equals 100 kg or 2,205 lb.

Toplift A type of forklift with a spreader device for lifting containers from the top.

Topographic Graphic delineation of man-made and natural features of a site, showing relative location and elevation on a map or chart.

Tramp Irregular service afforded by vessels, other than tankers, that are chartered or otherwise hired for the carriage of goods on special voyages. Service is not predetermined or fixed. Most of the cargo is dry bulk, but also includes general cargo moved in ship-load lots.

Transit Shed Building or other structure located on or adjacent to a wharf, designed for the short-term storage of merchandise in transit. Usually associated with break-bulk cargo.

Transtainer The registered trade name of a yard gantry or bridge crane manufactured by Pacific Coast Engineering Company (PACECO). Also see "Portainer."

Turnout A switch and accompanying section of track allowing the diversion of rolling stock from one track to another.

UTR Parking An area for parking utility tractors (yard hostlers) which are not in use in the container yard.

Unit Train A train transporting a single commodity or type of cargo from one source (shipper) to one destination (consignee). For coal and other bulk cargos, usually the integrity of unit trains is maintained after unloading at the destination, and the empties (still coupled in the same order) are returned for subsequent loading.

VPC Vehicle Processing Center where automobile accessories are added, damage is repaired, etc.

Wash-Down Areas Areas of a container yard specifically designed with apparatus to wash and clean containers and equipment.

Waybill Document prepared by a transportation line, which shows point of origin, destination, route, consignee, description, etc., of a shipment. Also called a Bill of Lading.

Glossary of Intermodal and Maritime Terms

Wharf A berthing place for vessels to facilitate direct loading and discharge of cargo.

Working Track In an ITF, track used for loading or unloading containers from rail cars.

Wye Track configuration in shape of capital letter "Y," used to "turn around" a complete consist.

Yard Air Air compressors and distribution system installed in a yard so rail car air brake systems can be charged prior to arrival of motive power. Reduces time required for brake tests and departure of outbound trains.