

STATE OF ALASKA



**DEPARTMENT OF
TRANSPORTATION AND
PUBLIC FACILITIES
SOUTHEAST REGION**



RECONNAISSANCE ENGINEERING STUDY

KODIAK FERRY TERMINAL



**PROJECT NO. 68938
HPRL-0003(109)**

February 2007

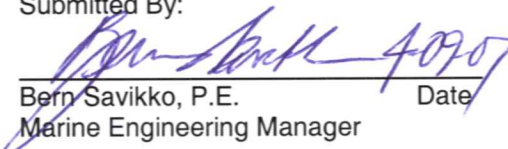
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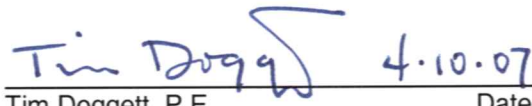
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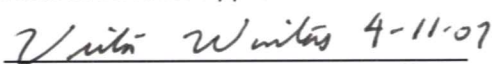
PROJECT NO. 68938 / HPRL-0003-(109) KODIAK FERRY TERMINAL

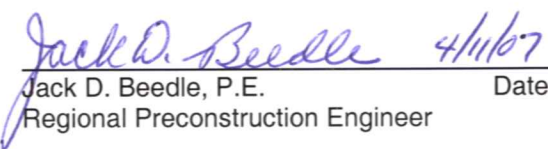
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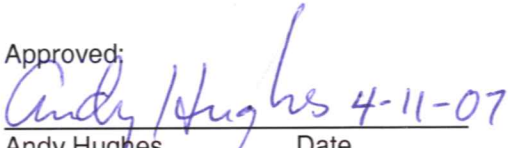

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Kodiak Ferry Terminal

NOTICE TO USERS

The Alaska Department of Transportation and Public Facilities (the Department) studied alternative sites for a new ferry terminal in Kodiak, Alaska. This Reconnaissance Engineering Study contains the results of the Department's preliminary engineering studies, identifies environmental issues, presents alternatives, and recommends a preferred engineering solution for development under Project No. HPRL-0003(109), 68938.

In addition to this report the reader is advised to consult the *Kodiak Marine Highway Terminal Study*, prepared for the Department in 1982 and the *Kodiak Ferry Terminal Environmental Assessment* prepared by the Department in 1986. The Terminal Study and the Environmental Assessment contain a substantial amount of additional information relevant to this project.

Changes occur frequently during the project development process. Persons relying on information contained in this study should contact the Department for the most current information. Additional information can be obtained from Bern Savikko, Marine Engineering Manager at 907-465-8945 or Tim Doggett, Marine Structural Engineer, at 907-465-2719.

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Introduction

The Alaska Department of Transportation and Public Facilities (Department) has studied alternatives to provide Kodiak with a dedicated Alaska Marine Highway System (AMHS) facility. This memo describes the Department's previous studies, presents current site alternatives, and recommends a preferred engineering solution for development under Project No. 68938 / HPRL-0003(109).

The City of Kodiak has been served for over 40 years by the AMHS M/V Tustumena, the principal mainline ferry operating in Southcentral Alaska and the Aleutian Chain. The M/V Tustumena principally runs between Kodiak, Seldovia, Port Lions, and Homer with summer excursions to the Eastern Aleutian communities. The ferry berths at Pier 1, a city owned facility in the Near Island Channel.

The search for a new ferry terminal began in 1980 when the Alaska State Legislature authorized the development of a new facility in Kodiak and in 1981 federal funds were approved for preliminary engineering. The *Kodiak Marine Highway Terminal Study*, prepared for the Department in 1982, examined nine potential sites for location of a marine highway terminal. The study eliminated those sites not worthy of further investigation and reduced the list to three candidates: Alternate A - Near Island, Alternate B - Pier 2 and 3, and Alternate C - No Build. The No Build alternative meant continued use of Pier 1, also known as the City Dock. The *Kodiak Ferry Terminal Environmental Assessment* considered the three alternatives in more detail in 1986 and selected Alternative A, a site on Near Island near the entrance to St. Herman Harbor, as the Department's preferred alternative.

At that time, neither the City of Kodiak nor the public were supportive of Alternative A. The existing facility at Pier 1 was perceived to be superior to development of the Near Island Site. The Department determined that Alternative B was unacceptable because geophysical hazards (landslides) identified in previous studies, threatened any development at the base of Pillar Mountain. With the elimination of Alternatives A and B, Alternative C -No Build alternative, was approved and the search for a new location ceased.

The M/V Tustumena continues to serve Kodiak and in 1998, the M/V Kennicott was added to the southwest route. The M/V Kennicott is 86 feet longer than the M/V Tustumena and unable to transit the Near Island Channel due to beam and height restrictions. The M/V Kennicott moors at Pier 2, on the northwest side of St. Paul Harbor, during its Kodiak calls. The M/V Tustumena is scheduled to provide an average of 13 departures per month and the M/V Kennicott is scheduled to provide an average of 8 departures per month for the 2007 summer season (April through September).

Pier 1 no longer satisfies the needs of the AMHS. The dock is sandwiched between a marine fuel depot to the north and a seafood processor to the south. There is minimal room for the M/V Tustumena when other vessels moor to the adjacent facilities. The uplands are crowded as well. There is no secured staging area; vehicles must queue up along the public street and parking lot prior to loading. Other vessels use the facility to transfer fuel and general freight thus making it unsuitable as a homeport.

Commercial fishing vessels and their gear frequently occupy Pier 2, cruise ships use this dock in the summer, and the pier recently became the homeport of a National Oceanic & Atmospheric Administration (NOAA) research vessel. Cruise ship visits in the summer of 2006 conflicted with the ferry schedule and port calls by the M/V Kennicott often displace fishing vessels from the dock. The City will not grant unconditional priority use by AMHS during the busy summer season.

In 2006, Kodiak received an earmark for \$7.5 million in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The specific earmark wording is: "Kodiak, AK Construction of AMHW ferry terminal and approach". The construction funding for the project is itemized in the 2006-2009 Alaska Statewide Transportation Improvement Program (STIP) Draft Amendment #13 with \$5,106,200 in Federal Fiscal Year (FFY) 2008 (including 9.03% State match) and \$1,401,600 in FFY 09.

At present, two docks are required to serve both the M/V Kennicott and the M/V Tustumena. The M/V Kennicott is too large for Pier 1 and its moorage at Pier 2 interferes with the City's long-range plans for that facility. With increasing security requirements, operating out of two separate areas becomes more difficult and expensive. A new terminal is needed to efficiently accommodate both vessels in Kodiak.

Purpose and Need

Twenty years after the initial study, the Department again proposes to construct a new terminal in Kodiak. More than ever, there is a need for a dedicated facility to accommodate vehicle and passenger traffic from the two AMHS vessels currently serving Kodiak. This new facility may become a homeport, the port at which the ship re-supplies, changes crews, and lays up. A transfer bridge system, similar to that used in southeast Alaska, is desired to reduce use of the on board vehicle elevator and reduce the time required to transfer vehicles between the vessel and shore.

AMHS needs a single use facility for safe berthing of either vessel, which is free of schedule conflicts, that is suitable as a homeport, and that is designed for roll-on roll-off transfers. The Department has resumed its search for sites suitable for construction of a new ferry terminal.

Current Design Criteria

Preliminary layouts were based on the following facility requirements identified by AMHS planning:

- Single facility for use by both M/V Tustumena and M/V Kennicott
- Side berth with 142 foot long transfer bridge with intermediate ramp and apron. The intermediate ramp and apron system will be compatible with both AMHS vessels. The Kennicott will use a shore apron (similar to the systems in Southeast Alaska) and the Tustumena will use the ship's elevator and ship's transfer ramp to land onto the shore intermediate ramp. The transfer bridge will be supported at the seaward end with a float. The transfer system will be designed for an American Association of

- State Highway and Transportation Officials (AASHTO) HS20 vehicle loading and an intermediate semi trailer (WB40) design vehicle.
- Mooring/fendering structures with catwalks or pile supported docks. Mooring structures will be designed for vessel berthing energy of 70 ft-k and bollard load of 50 kips any direction.
 - Staging area (1,400 lane-ft), short & long term parking (50 spaces total). Staging area enclosed within security fencing, concrete barrier/guardrail at dock face. Staging and parking areas paved with curb, gutters, storm drains, conc. sidewalks, striping, and lighting.
 - Terminal building (3,000 sq ft) with ticketing, waiting, office, storage, and restroom areas.
 - Warehouse (720 sq ft)
 - Vessel water and sewer connections on bridge, no fueling facilities
 - Galvanized coating and/or cathodic protection on all submerged steel
 - Minimum dock elevation according to FEMA, Flood Hazard Maps and basin depth at -30 ft MLLW

Site Visits and Public Coordination

Bern Savikko and Tim Doggett, Southeast Region Engineers and Jim Potdevin Southeast Region/Marine Systems Planner visited potential sites on February 28 and March 2, 2006. They met with Howard Weston, Kodiak City Engineer and Mark Kozak, Kodiak Public Works Director, to discuss the various sites. Department staff also met with Capt. Barry Olver of the M/V Kennicott during a port call in Kodiak.

A survey was sent out to the masters on the Kennicott and the Tustumena for comments via email on March 22, 2006. Comments were received and incorporated into the various designs.

On April 19, 2006 DOT personnel met with the following Kodiak city staff:

Linda Freed, City Manager, Marty Owen, Harbormaster, Howard Weston, City Engineer, Capt. Scott Merrill, Tustumena Master, Lonnie White, Assistant Harbormaster.

The four preliminary sites were discussed and reviewed and comments were collected and incorporated into the draft reconnaissance report.

On June 6, 2006 Tim Doggett and Bern Savikko from the Department presented the alternatives at a joint meeting with the Kodiak City Council and Harbor Advisory Board. The council supported the preferred site selection and unanimously passed a resolution to proceed with the project at the Near Island site.

Identification of Candidate Sites

Since the recommendation of "No Build" in the 1986 Environmental Assessment, several changes have occurred in the Kodiak area and in the AMHS fleet. Over the ensuing years, there has been development of a small boat harbor in Dog Bay, linking of Near Island and the city by

bridge and addition of the M/V Kennicott to the southwest route. These changes modify the previous site selection criteria. Previous studies examined sites inside Near Island Channel, such as the city transient float, the former seaplane terminal, and a bight on the west side of Near Island Channel. AMHS Operations will not permit the M/V Kennicott to transit the channel; therefore, the sites inside Near Island Channel are no longer viable.

The current reconnaissance effort examined four sites in St. Paul Harbor and Womens Bay that may satisfy AMHS needs; refer to Figure 1. The potential sites are Near Island, Pier 2, St. Paul Harbor breakwater, and Lash Dock. Attached are sketches of each site depicting a preliminary dock configuration. Listed below are the comparative construction cost estimates and attributes of each site:

Near Island (Preferred Engineering Alternative)

This city owned property is located near the north entrance to St. Herman Harbor; refer to Figure 2. Configuration shown is a port-to layout, however other options are under evaluation by AMHS vessel operators. Estimated construction cost is \$7,700,000 plus right-of-way (ROW) acquisition.

Pros:

- Fair vessel accessibility, good if shoal removed
- Generally well protected from prevailing winds and ocean swells
- Water, sewer, and electrical utilities nearby
- Unconstrained vehicle traffic flow
- Undeveloped site that may be customized to meet AMHS needs
- ROW belongs to the City and could be donated to reduce overall project costs
- Existing area suitable for development with minimal environmental impacts
- No dredging will be required
- Supported by City resolution
- Excellent foundation substrate

Cons:

- Awkward vessel approach
- Frequent small boat traffic from harbor and channel
- Requires commercial development of pedestrian transportation to city center
- Prone to sudden violent westerly winds in winter (infrequent)
- M/V Kennicott may not be able to moor at Near Island under severe weather conditions and require use of Pier 2 as an alternate berth.
- City wants to continue use of adjacent barge landing
- May require removal of shoals

Pier 2

This is a city owned platform dock located on the northwest side of St Paul Harbor; refer to Figure 3. Estimated construction cost is \$4,900,000 plus ROW acquisition.

Pros:

- Excellent vessel accessibility
- Existing dock and mooring structures
- Existing water and sewer utilities
- Port and starboard side vessel mooring possible
- Reuse existing structures requiring minimum environmental impacts

Cons:

- City unwilling to grant AMHS exclusive or preferred use of facility
- Dedication of Pier 2 for AMHS use would limit future dock expansion proposed by the City
- ROW acquisition complicated. City not a willing seller
- Displace current users, i.e.- commercial vessels, cruise ships
- Limited uplands; future access road expansion conflicts with development
- Inefficient use of dock
- Possible conflicts with NOAA research vessel
- Major modification to dock required for transfer bridge
- Subject to ocean swell, not suitable for homeport
- Prone to sudden violent winds (williwaws) in winter
- Require demolition of existing warehouse building
- Transfer bridge lift system required
- Pier 2 is used frequently by other vessels

St. Paul Harbor Breakwater

This site is located at the southeast end of the St. Paul Harbor breakwater; refer to Figure 4. Estimated construction cost is \$13,500,000 plus ROW acquisition.

Pros:

- Fair vessel accessibility, good if shoal removed
- Generally well protected
- Easy access to city center

Cons:

- Requires extensive modification to existing Corps of Engineers (COE) breakwater
- Road improvements required for ferry traffic access via Shelikof Street, which is presently a low-volume city street
- Procurement and demolition of a privately owned existing dock required
- 1,250 ft water and sewer extension required
- Frequent small boat traffic
- ROW acquisition is complicated--COE owns the breakwater
- Development of a large fill area in a sub-tidal area has significant environmental impacts
- Prone to sudden violent winds (williwaws) in winter

Lash Dock

This privately owned sheet pile dock lies on the west side of Womens Bay; refer to Figure 5. Estimated construction cost is \$5,500,000 plus ROW acquisition.

Pros:

- Fair vessel accessibility, good sea conditions, no surge, well protected
- Existing dock and building
- Deep overburden, lower cost pile driving
- Inexpensive mooring structures
- Unconstrained vehicle traffic flow
- Reuse existing structures which provides minimum environmental impacts

Cons:

- Facility is outside the city fire and police districts
- Increases M/V Tustumena transit time by 3 hrs, Womens Bay entered via dredged channel (does not require additional dredging)
- Retained fill and cells have settled, quality of fill and repair unknown
- Large amount of uncoated submerged steel
- Insufficient distance between end of transfer bridge and property line
- No city sewer, water provided by USCG
- Eleven miles from city center, no public transportation
- Transfer bridge and dock ROW has separate land owners, tidelands ownership is disputed
- Significant ROW acquisition cost
- Winter ice concerns for Womens Bay
- Prone to sudden violent winds (williwaws) in winter

Preferred Engineering Alternative

Analysis to date indicates the preferred engineering alternative is the Near Island site. Though not ideal, the site has fair vessel access from St. Paul Harbor and the approach may be improved with removal of adjacent shoals. The uplands are readily accessed via Dog Bay Road and utilities are nearby. Construction of a ferry terminal is compatible with allowable land uses on Near Island as described in the City of Kodiak's *Near Island Development Plan* (1987). The site is undeveloped and can be configured to meet AMHS needs with minimum right of way issues. The existing parking area is readily converted to a staging area, the basin depth is adequate, and adjacent rock outcrops provide an excellent foundation substrata; overall constructability is very good.

On rare occasions, during strong westerly winds, the M/V Kennicott may be unable to safely approach the Near Island site. On those occasions, the M/V Kennicott will bypass the new terminal and moor at Pier 2.

The next stage of project development is for the Department to request Federal Highway Administration (FHWA) approval to develop the Environmental Document. Additional

preliminary engineering, surveying, and preconstruction studies will be conducted if the Environmental Document supports selection of the Near Island site. Current Statewide Transportation Improvement Plan (STIP) shows construction funding available in federal fiscal year 2008.

References

- Kodiak Marine Highway Terminal Study*, SP Group Northwest Consultants, January 1982.
Kodiak Ferry Terminal Environmental Assessment, Alaska Department of Transportation, 1986.
Near Island Development Plan, Near Island Task Force, Walter E. Johnson, Chairman, March, 1987.
Port of Kodiak Development Plan, Peratrovich & Nottingham, Inc., Kramer, Chin & Mayo, Inc., Williams-Kuebelbeck & Associates, Inc., Roy Ecklund, 1982.

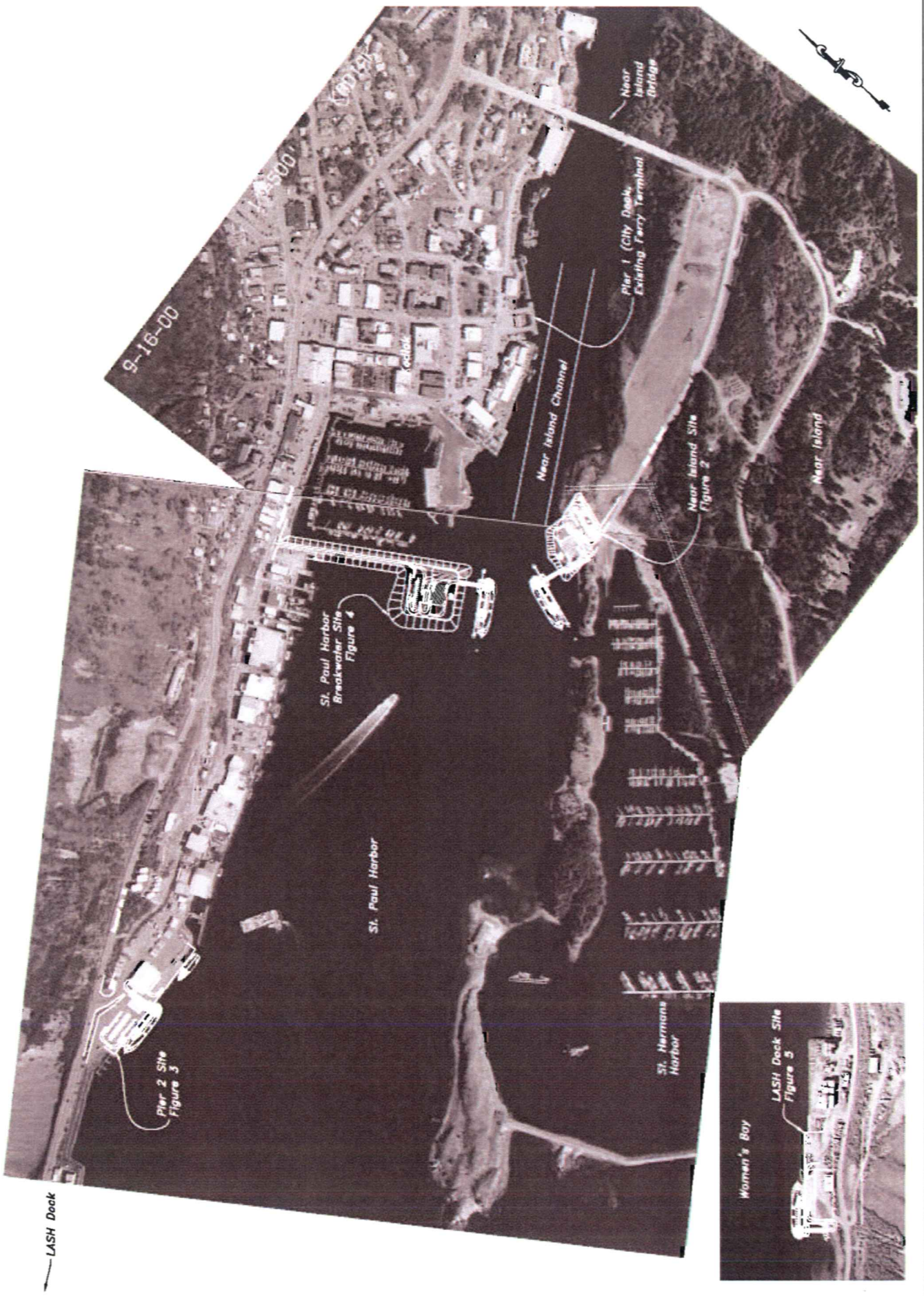
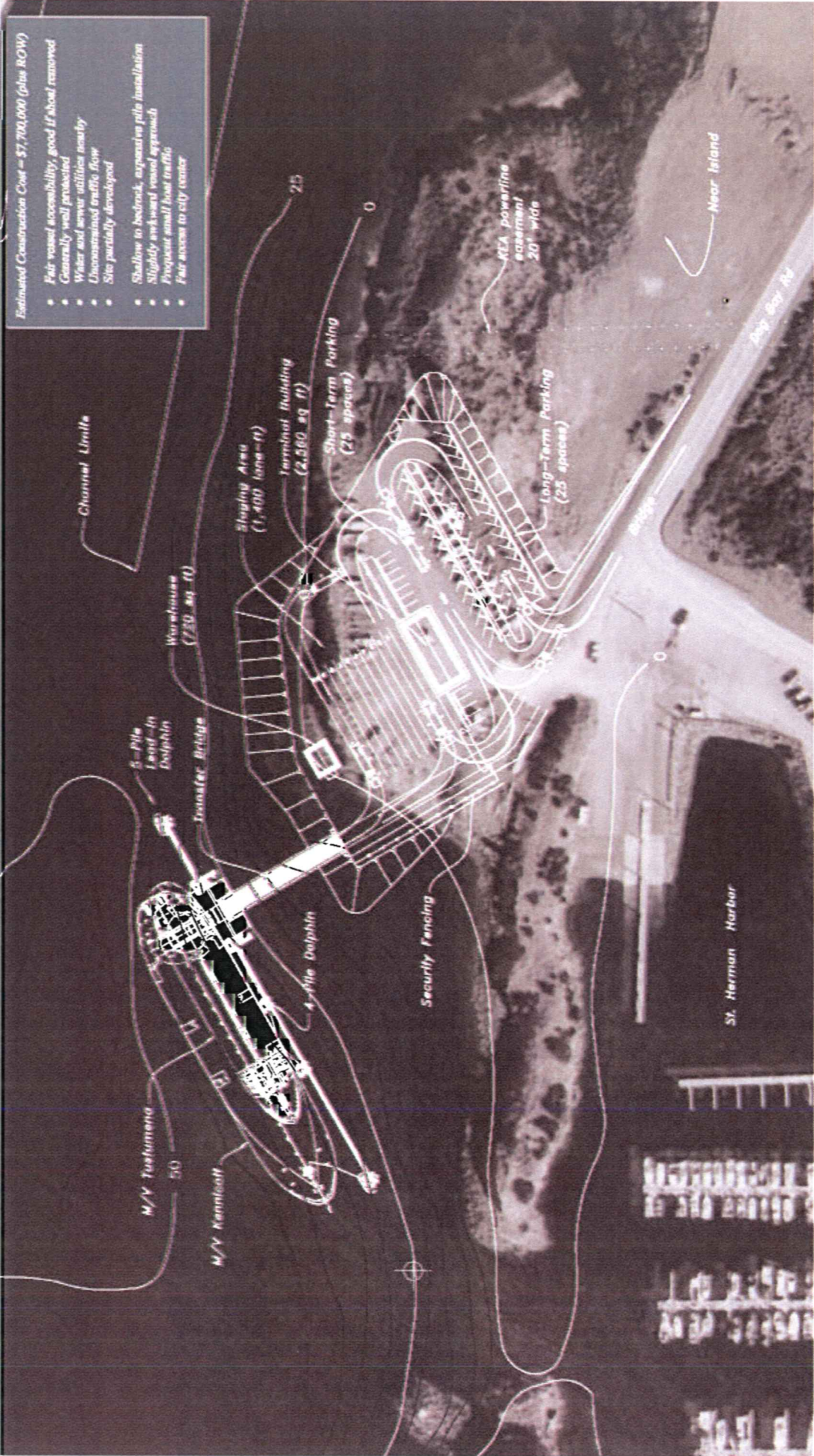


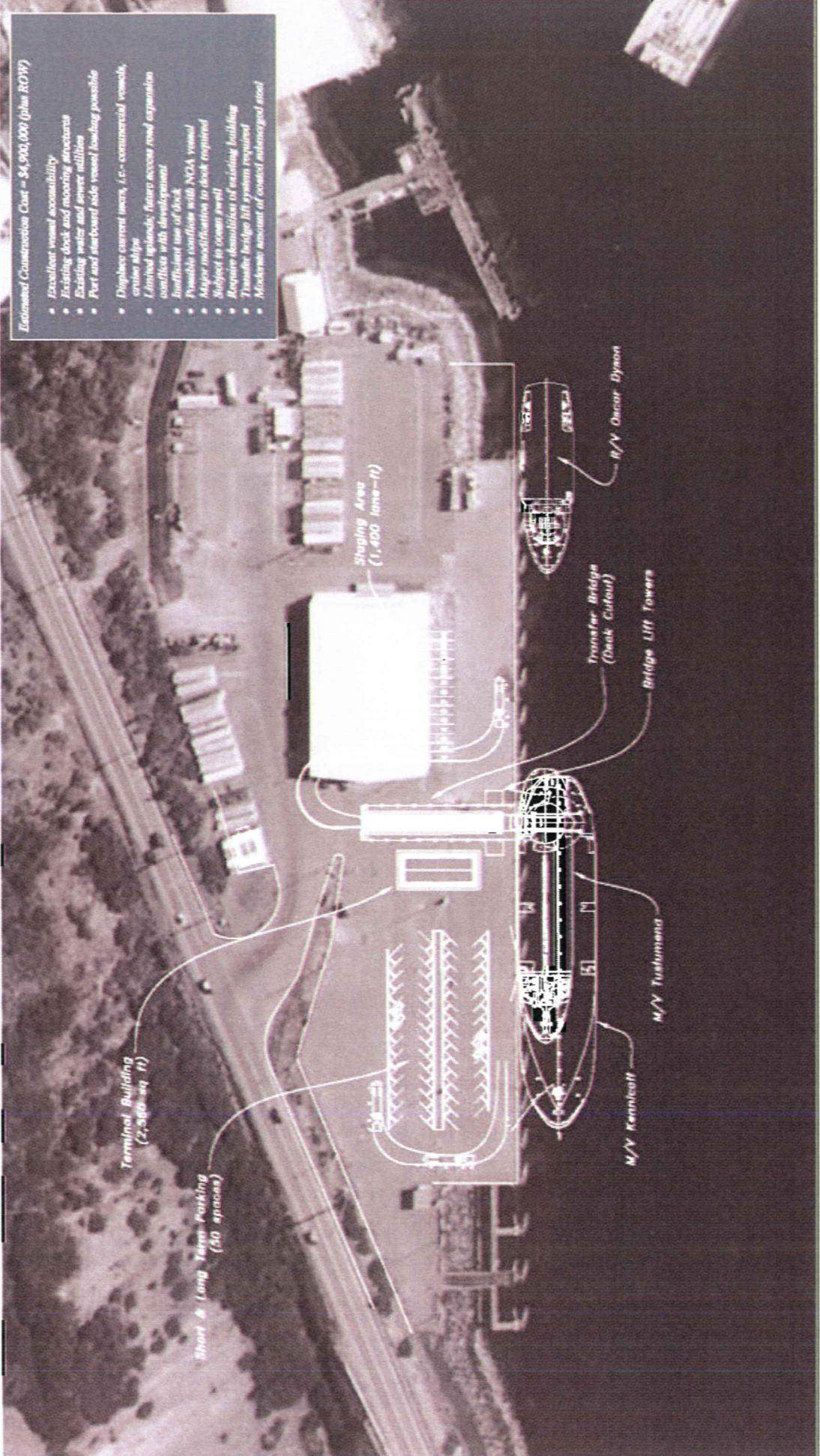
FIGURE 1-PROPOSED SITES

Kodiak Ferry Terminal
 ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
 PROPOSED KODIAK FERRY TERMINAL
 KODIAK, ALASKA



- Estimated Construction Cost = \$7,700,000 (plus ROW)
- Fair vessel accessibility, good if shoal removed
 - Generally well protected
 - Water and sewer utilities nearby
 - Unconstrained traffic flow
 - Site partially developed
 - Shallow to bedrock, expensive pile installation
 - Slightly eastward vessel approach
 - Proprietary small boat traffic
 - Fair access to city center

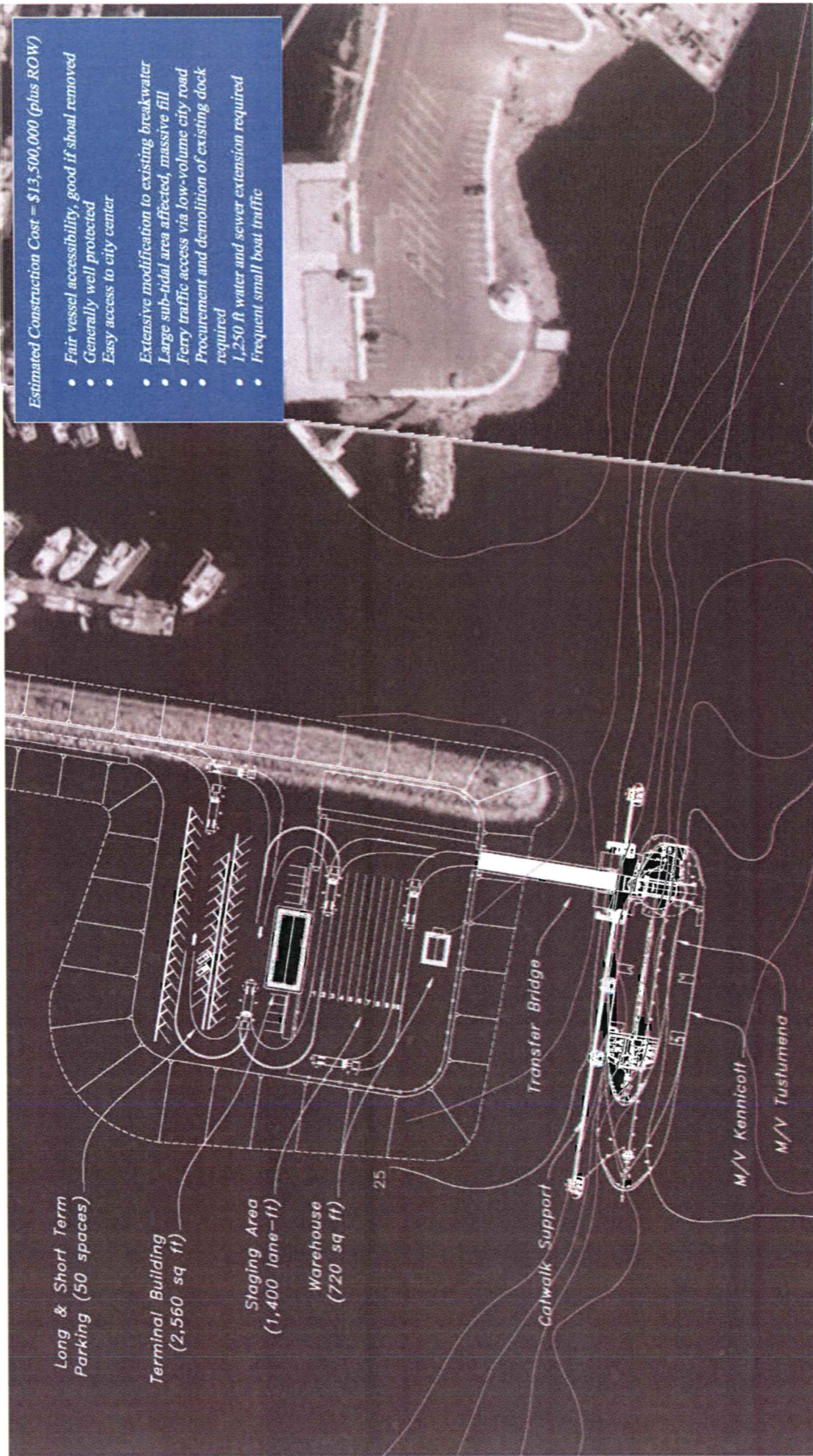
FIGURE 2 - NEAR ISLAND SITE
Kodiak Ferry Terminal
 ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
 PROPOSED KODIAK FERRY TERMINAL
 KODIAK, ALASKA



- Estimated Construction Cost = \$4,500,000 (plus ROW)**
- Excellent vessel accessibility
 - Existing dock and mooring structures
 - Existing water and sewer utilities
 - Port and starboard side vessel loading possible
 - Displace current users, i.e. - commercial vessels, cruise ships
 - Limited expansion; future access road expansion conflicts with development
 - Inefficient use of dock
 - Possible coordination with NOAA vessel
 - Major modification to dock required
 - Subject to ocean swell
 - Requires demolition of existing building
 - Transfer bridge lift system required
 - Moderate amount of coastal retrofitted road

FIGURE 3 - Pier 2 Site
Kodiak Ferry Terminal
 ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
 PROPOSED KODIAK FERRY TERMINAL
 KODIAK, ALASKA

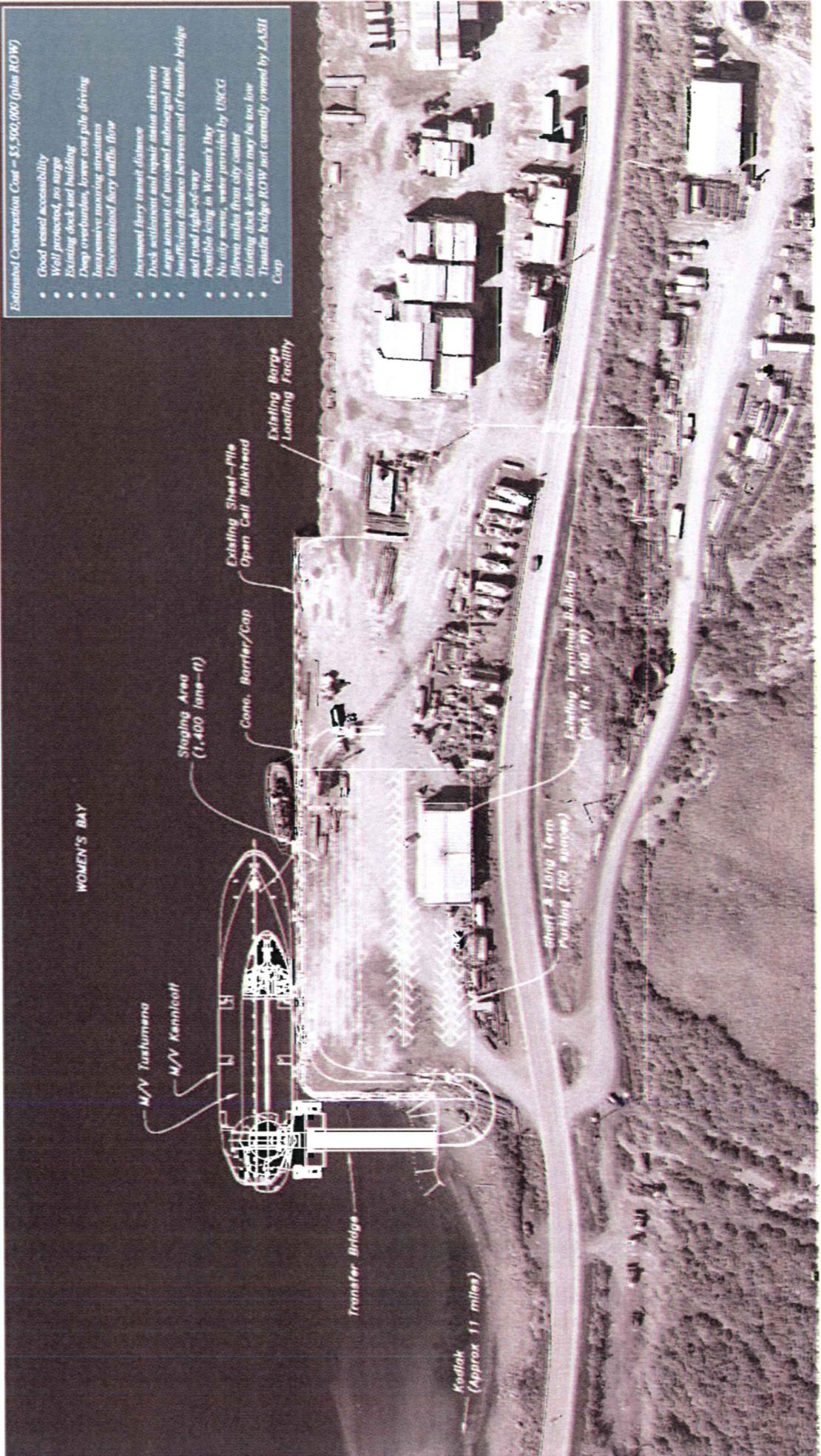




Estimated Construction Cost = \$13,500,000 (plus ROW)

- Fair vessel accessibility, good if shoal removed
- Generally well protected
- Easy access to city center
- Extensive modification to existing breakwater
- Large sub-tidal area affected, massive fill
- Ferry traffic access via low-volume city road
- Procurement and demolition of existing dock required
- 1,250 ft water and sewer extension required
- Frequent small boat traffic

FIGURE 4 - St Paul Harbor Breakwater Site
Kodiak Ferry Terminal
 ALASKA DEPARTMENT OF TRANSPORTATION
 PUBLIC FACILITIES
 IMPROVED KODIAK FERRY TERMINAL
 KODIAK, ALASKA



Estimated Construction Cost = \$5,500,000 (plus ROW)

- Good vessel accessibility
- Well protected, no surge
- Existing dock and building
- Deep overburden, lower cost pile driving
- Inexpensive mooring structures
- Chosen/standard ferry traffic flow
- Increased ferry transit distance
- Deck settlement and repair status unknown
- Large amount of insulated submerged steel
- Insufficient distance between end of transfer bridge and road right-of-way
- Possible icing in Women's Bay
- No city sewer, water provided by USCG
- Eleven miles from city center
- Loading dock elevation may be too low
- Transfer bridge ROW not currently owned by LASH Corp

FIGURE 5 - LASH Dock Site
Kodiak Ferry Terminal
 ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
 PROPOSED KODIAK FERRY TERMINAL
 KODIAK, ALASKA