

## 1.0 PURPOSE OF AND NEED FOR ACTION

### 1.1 Introduction

In July 2004, the Federal Highway Administration (FHWA) and Alaska Department of Transportation and Public Facilities (DOT&PF) issued a Final Environmental Impact Statement (FEIS) for the Gravina Access Project, a proposed action to improve public access between Revillagigedo Island and Gravina Island in Ketchikan, Alaska. The preferred alternative identified in the FEIS was Alternative F1, which involved two bridges across the East and West channels of Tongass Narrows, with a roadway link on Pennock Island and a highway connection to Ketchikan International Airport on Gravina Island. Alternative F1 was the selected alternative in FHWA's Record of Decision, which was issued on September 15, 2004.

Following FHWA's Record of Decision and after securing permits for the project, the DOT&PF began the first phase of implementing Alternative F1: construction of the highway connection to Ketchikan International Airport. Construction of the highway, known as the Gravina Island Highway, was completed in 2008.

On September 21, 2007, due to rapidly escalating costs, then-Governor Sarah Palin directed the DOT&PF to identify the most fiscally responsible alternative for the Gravina Access Project rather than proceed with Alternative F1. This directive generated the need for FHWA to review its obligations under the National Environmental Policy Act (NEPA) with respect to the project.

According to the Council on Environmental Quality (CEQ) *Regulations for Implementing the National Environmental Policy Act* (40 [Code of Federal Regulations \[CFR\]](#) 1500-1508) and FHWA Technical Advisory T 6640.8A, agencies shall prepare supplements to either draft or final environmental impact statements (EISs) if:

- (i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or
- (ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

The following is noted in *Forty Most Asked Questions Concerning CEQ's NEPA Regulations* (46 FR 18026):

If an agency has made a substantial change in a proposed action that is relevant to environmental concerns, or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts, a supplemental EIS must be prepared for an old EIS so that the agency has the best possible information to make any necessary substantive changes in its decisions regarding the proposal.

Based on these regulations and guidance documents, FHWA and DOT&PF determined that a Supplemental EIS (SEIS) should be prepared for the Gravina Access Project. On July 2, 2008, FHWA issued a notice of intent to reexamine alternatives in an SEIS and identify and select a different preferred alternative. The purpose of and need for the project have not changed. The alternatives under consideration in this [Draft](#) SEIS include alternatives considered in the 2004 FEIS that have been updated to reduce costs and minimize environmental impacts. Changes in regulations, policies, and the existing environmental conditions of the project area since FHWA issued the 2004 FEIS are described in this document.

On June 21, 2013, FHWA and DOT&PF issued the Draft SEIS for the Gravina Access Project and gave the public and other interested parties (including government entities, regulatory agencies, and Native organizations) an opportunity to comment on its content during a 54-day comment period. The 2013 Draft SEIS did not identify a preferred alternative.

On October 22, 2015, DOT&PF announced its recommendation to FHWA that G4v be identified as the preferred alternative. On March 3, 2016, FHWA and DOT&PF issued a public notice identifying Alternative G4v as their preferred alternative. Alternative G4v provides improvements to the existing ferry system with new, replaced, and reconstructed shoreside facilities (i.e., without adding ferry vessels or changing ferry operations). This Final SEIS explains why Alternative G4v was identified as the preferred alternative; documents and responds to substantive comments on the 2013 Draft SEIS; describes findings, including any required for wetlands, floodplains, and cultural resources; and provides a list of commitments for mitigation measures for the preferred alternative. This Final SEIS also identifies any other findings to be made in compliance with all environmental laws, regulations, Executive Orders, and other related requirements with associated documentation of agency consultation. ~~FHWA and DOT&PF reviewed data from the 2004 FEIS and determined that, while some of the information contained therein remains current and useful, much of it needed to be updated with newly gathered information obtained through agency consultation, field investigation, updated model application, and other research.~~ The information contained in this document represents the best possible information available for the decision-makers. Sources are referenced throughout.

Pursuant to the provisions contained in Section 1319 of the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (Public Law 112-141; MAP-21), FHWA is issuing its Record of Decision for the Gravina Access Project concurrently with release of the Final SEIS. The Record of Decision identifies Alternative G4v as the selected alternative.

## **1.2 Description of the Project Area**

This general description of the project area is the same as what was described in the 2004 FEIS. The Gravina Access Project area is in the Ketchikan Gateway Borough (Borough) in Southeast Alaska, about 680 miles north of Seattle, Washington, and 235 miles south of Juneau, Alaska (see Figure 1.1 at the end of this chapter). The Borough contains two major islands, Gravina Island and Revillagigedo Island. The two islands are separated by Tongass Narrows, a 13-mile-long waterway that varies in width from ¼ to 1 mile. Most of the Borough's 13,000 residents live on Revillagigedo Island (on the eastern side of Tongass Narrows), whose major communities are Ketchikan and Saxman.

Gravina Island (on the western side of Tongass Narrows) is undeveloped except for the Ketchikan International Airport (on its eastern shore), a timber processing plant to the north of the airport, a few private homes in the northernmost portion of the island and on the southeastern shore along Clam Cove, and some access roads to private and public lands. The island includes large parcels of undeveloped land owned by the Borough, the Alaska Department of Natural Resources (DNR), the Alaska Mental Health Trust Authority, and the U.S. Forest Service (USFS).

At the southern end of Tongass Narrows, between Revillagigedo Island and Gravina Island, lies Pennock Island. Pennock Island is undeveloped except for some privately owned parcels with single-family homes along the northern shores of the island. As Tongass Narrows flows around Pennock Island, it is divided in two: East Channel to the east of Pennock Island and West Channel to the west.

The principal modes of transportation to islands within the Borough are by airplane (including seaplane) and ship. There is no "hard link" (surface) transportation between the islands. The primary public access to Gravina Island from Revillagigedo Island is an airport ferry that transports

vehicles, bicyclists, and pedestrians from a terminal on Revillagigedo Island approximately 2.6 miles north of downtown Ketchikan across Tongass Narrows directly to the airport terminal. Travelers may continue on the Airport Access Road to exit the airport property and travel south on the Gravina Island Highway or north on Lewis Reef Road.

Terrain constraints, ownership patterns, and access limitations restrict the availability of developable parcels to the waterfront areas along Tongass Narrows. Consequently, opportunities for development in these areas have become a major factor in land use planning and economic forecasting.

### **1.3 Proposed Action**

The following description of the proposed action is the same as what was described in the 2004 FEIS.

The DOT&PF, in cooperation with FHWA, has developed the Gravina Access Project to improve public access between Revillagigedo Island and Gravina Island. This project was one of 17 high-priority infrastructure projects in the State of Alaska to be federally funded under the federal Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21), enacted in 1998. The TEA-21 authorized approximately \$20 million for construction of a bridge joining Gravina Island to the community of Ketchikan on Revillagigedo Island.<sup>1</sup>

### **1.4 Purpose of and Need for the Proposed Action**

The purpose of and need for the Gravina Access Project, which have not changed since the 2004 FEIS was issued, are as follows:

**Purpose:** The purpose of the Gravina Access Project is to improve surface transportation between Revillagigedo Island and Gravina Island.

**Need:** The need for improving access is threefold:

- To provide the Borough and its residents more reliable, efficient, convenient, and cost-effective access for vehicles, bicycles, and pedestrians to Borough lands and other developable or recreation lands on Gravina Island in support of the Borough's adopted land use plans
- To improve the convenience and reliability of access to Ketchikan International Airport for passengers, airport tenants, emergency personnel and equipment, and shipment of freight
- To promote environmentally sound, planned long-term economic development on Gravina Island

The following Sections 1.4.1 through 1.4.3 explain these needs further. These sections are reprinted from the 2004 FEIS and updated where appropriate to reflect changes in the project area (e.g., the opening of the Gravina Island Highway in 2008 and new population data from the 2010 Census).

#### **1.4.1 Need for Improved Access to Developable Land**

***To provide the Ketchikan Gateway Borough and its residents more reliable, efficient, convenient, and cost-effective access for vehicles, bicycles, and pedestrians to Borough lands and other developable or recreation lands on Gravina Island in support of the Borough's adopted land use plans.***

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<sup>1</sup> Public Law 105-178, Subtitle F (High-Priority Projects), Section 1602 (Project Authorizations).

**Borough Land Grant.** Under Title 29 of the Alaska Statutes (AS 29.65), a general grant of land was made to the Borough to help the Borough meet “its legitimate needs for public or private settlement or development.” The lack of efficient, convenient vehicular access to Title 29 entitlement lands on Gravina Island combined with the geographic constraints of the region have limited the base of developable land to a narrow strip along Tongass Narrows on Revillagigedo Island. Within this narrow strip, the scarcity of suitable vacant land for expansion has caused several problems:

- High land costs (due to low supply and high demand)
- Loss of business opportunities
- Increased pressure to develop lands that are environmentally marginal in terms of development potential (e.g., wetlands and steep slopes), which is an unsound land management practice
- High land development costs (because developing the environmentally marginal lands is extremely costly)
- Development patterns that result in inappropriate or incompatible land use for some geographic locations (e.g., waterfront development that excludes water access dependent industries)

These are the very problems the Alaska State Legislature was trying to avoid when it enacted Title 29, which indicates that the purposes of the general grant of land have not been fulfilled. The land grant in itself is not enough because, without reasonable access to the land, the State cannot fulfill the purposes for which Title 29 was enacted—namely, to meet the legitimate needs of the Borough for settlement and development and to attain sound land management through rational ownership patterns (AS 29.65)

**Other Landowners.** The undeveloped properties of several other Gravina Island landholders, including the Alaska Mental Health Trust Authority, USFS, DOT&PF, DNR, and Alaska Native (Native) corporations, could also be used to meet the needs of the property owners and the community for settlement and development. Improved access to Gravina Island would enhance the opportunity for the landowners to use, sell, or lease these properties.

**Accessibility Issues.** The airport ferry provides the only public access for vehicles to Ketchikan International Airport and Gravina Island. From the airport ferry terminal on Gravina Island, vehicles can go directly to the airport or use the Airport Access Road to reach the Lewis Reef Road and the Gravina Island Highway, which provide access to other public and private properties on Gravina Island. Most of the year, the ferry leaves the terminal every half-hour, but during the summer (May/June through August/September, depending on need), a second ferry operates to handle the higher demand, and service increases to every 15 minutes. The airport ferry schedule is limited, essentially serving the airport during the airport’s hours of operation (opening at 6:00 a.m. year round, and closing at 8:00 p.m. during the winter season and at 10:00 p.m. during the summer season). Without improved access to its entitlement lands on Gravina Island, the Borough’s ability to make this land available to its residents is severely constrained.

The toll associated with the ferry crossing is applied directly to operations and maintenance costs of the airport ferry system. The current toll rates for one-way travel are \$6 for automobiles, light trucks, and vans; \$10 for commercial trucks and commercial passenger transportation; \$35 for vehicles over 35 feet; \$5 per adult (age 12 and over); and \$2 per child (age 6 to 11). Although same day return trips can be made at no additional charge, the cost of the ferry crossing may be a barrier to people interested in regular access to and development of Gravina Island.

**Suitable Use of Developable Lands.** Ketchikan is one of the most densely populated cities in Alaska, with a limited land base for development. Gravina Island has a suitable land base for

expansion. Because of easy waterfront access, development on Revillagigedo and Gravina Islands is focused along the water. Without improved access to expansion areas, development will continue to crowd the waterfronts. Improved access to non-waterfront property on Gravina Island would provide greater opportunities for non-water-dependent development to locate inland, at more economical sites, thereby freeing up waterfront land for water-related and water-dependent uses.

#### **1.4.2 Need for Improved Access to Airport**

##### ***To improve the convenience and reliability of access to Ketchikan International Airport for passengers, airport tenants, emergency personnel and equipment, and shipment of freight.***

Ketchikan International Airport is owned by the State of Alaska (State), but is operated and maintained by the Borough under a long-term lease with DOT&PF. The airport is the primary transportation link into and out of the Borough, accommodating the air traffic of commercial air carriers, air taxi and flightseeing (i.e., sightseeing by aircraft) operators, general aviation, cargo carriers, and the U.S. Coast Guard (USCG). Ketchikan, the largest city in the Borough and seventh largest city in Alaska, is the primary air and marine hub in the southern portion of Southeast Alaska. As such, the airport serves as the air-connecting point for all of the Borough's approximately 13,500<sup>2</sup> residents and for the 8,500 residents in neighboring communities, such as Metlakatla, Klawock, Craig, and other Prince of Wales Island communities.

The airport ferry provides the only access to the airport for passengers in vehicles and the primary means of access for passengers on foot. Passengers may also arrive at the airport by seaplane at the seaplane terminal, which is 600 feet north of the ferry terminal on Gravina Island, or by water taxi.

Ketchikan International Airport is a major intermodal facility with respect to the National Highway System (NHS) in Ketchikan, as are the Ketchikan Alaska Marine Highway System (AMHS) ferry terminal and the Ketchikan port area along the waterfront.<sup>3</sup> Tongass Avenue from Bawden Street to the airport ferry terminal is a designated NHS Intermodal Connector on Revillagigedo Island. The airport road from the ferry terminal to the airport terminal on Gravina Island is also a designated NHS Intermodal Connector. The airport ferry, however, is not part of the NHS; thus, there is no NHS connectivity between air travel and other modes in Ketchikan.

##### **1.4.2.1 Improved Convenience and Reliability of Access for Passengers**

Restricting air passengers to travel by ferry between the airport and community is inconvenient in many respects:

- Negotiating the ramps is particularly difficult for the elderly and physically challenged. During most of the tide cycles, the ramps do not comply with Americans with Disabilities Act (ADA) standards because of the steepness of the ramp. The steepness of the ramp and the distance between the airport terminal and ferry is arduous for the physically challenged.
- The average total travel time to the airport from the ferry terminal on Revillagigedo Island is 19 minutes, which includes waiting for, loading, and unloading the ferry.
- During heavy travel periods, embarking and disembarking from the ferry and the crossing travel time adds as much as 30 minutes to each end of a trip to/from Ketchikan.

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<sup>2</sup> U.S. Census Bureau 2010 estimate is 13,477.

<sup>3</sup> DOT&PF, 2006. *State of Alaska National Highway System Maps*. Prepared by DOT&F Division of Program Development in cooperation with FHWA. April 2006.

- Mechanical problems with the ferry or shoreside facilities (occurring about ten to twenty times per year) can add further delays to travel and result in missed plane flights.
- During peak season, when full planeloads of passengers are deplaning, the ferry fills up quickly. Many passengers must then wait for the next ferry, adding even more time to their trip.
- The airport ferry limits the potential transport of planeloads of passengers from chartered aircraft to and from cruise ships.
- Travel to the airport is tied completely to the ferry schedule; missing a ferry can mean missing a plane flight. Coordinating an air travel schedule with the ferry schedule adds inconvenience and stress to travel.
- Plane flights missed in Ketchikan because of the ferry travel time and unanticipated delays often have a domino effect of missed connections or appointments at the other end of the trip, which frustrates passengers and raises costs to airlines, businesses, and the public.
- The average waiting time for ferry passengers during the winter months (i.e., when the ferry departs from both terminals every 30 minutes) is 9 minutes for pedestrian passengers and 12 minutes for vehicle passengers.

Each of these factors contributes to a decrease in the quality of travel into and out of Ketchikan. Improved convenience and reliability of access would mean airport travelers would have fewer issues to confront and consider when moving between the airport and their point of origin or destination in Ketchikan.

#### **1.4.2.2 Improved Convenience and Reliability of Access for Airport Tenants**

In many cities, airports are generators of economic development in their own right. Air carriers, rental car operators, and other support services such as airplane repair, aircraft fuel distributors, charter operators, hotels, restaurants, couriers, and light manufacturers often want to locate their business next to an airport. Operating these services at Ketchikan International Airport, however, costs more than at other airports because of the inconvenience, additional handling of materials, and extra time to work around the ferry schedules. These costs and difficulties reduce the economic potential of the Ketchikan International Airport. There is a considerable disincentive to locating a business at the airport in terms of cost and inconvenience to both employees and customers. Because of the direct cost of access and the more difficult scheduling (to coordinate the timing of the trip with the ferry schedule), only essential services are located on airport property. This, in turn, reduces airport lease revenues, and increases the Borough's airport operation costs.

In addition to enhancing overall economic development of the Borough, improved access to Gravina Island is needed to help airport tenants conduct their business competitively and efficiently:

- Employers at the airport often need to move parts, supplies, and personnel between Ketchikan and the airport. The ferry trip adds up to an hour in lost productivity.
- The ferry service schedule prohibits after-hours access to the airport, which limits employers' ability to perform aircraft and building maintenance during off-peak hours.
- Deliveries of goods and services to the airport may be delayed as a result of ferry schedule or capacity, extreme tides that affect the ability of large vehicles to load onto and unload from the ferry, and mechanical problems. These delays lessen the ability of airport tenants to promptly and efficiently provide services to their customers.

- The ferry's schedule, capacity, and restrictions on the type and weight of transportable materials limit the services that airport tenants can provide.

#### **1.4.2.3 Improved Convenience and Reliability of Access for Emergency Personnel and Equipment**

Every year, Ketchikan's fire department and hospital personnel coordinate more than 160 medical evacuations (medevacs) using Ketchikan International Airport. The city's fire department is also responsible for responding to fires on Gravina Island that are not within the jurisdiction of the airport's Aircraft Rescue and Fire Fighting (ARFF) department.<sup>4</sup> Transporting emergency personnel and equipment between the airport and Ketchikan is inconvenient and limits the ability of emergency personnel to respond to emergencies quickly and efficiently. Emergency medical services staff must coordinate their activities with the airport manager to ensure timely transport of personnel and equipment, specifically:

- In a typical medevac situation during off hours (when the ferry is not operating), the fire department first informs the airport manager by telephone of the medevac operation. Then the airport manager alerts the ferry crew; the ferry crew then goes to the ferry, starts the engines, and waits some time for the engines to warm up. Finally the ferry transports the emergency personnel and equipment to the airport. In some cases when the emergency is critical enough not to wait for the ferry to become operational, a helicopter is used to expedite transport. Ferry maintenance activities, typically conducted during off-hours, can affect the ability of ferry operators to respond to emergencies.
- During the day when the ferry is operating, emergencies also require coordinating with the airport administrator, and the ferry schedule is interrupted to respond immediately.

Emergency fire equipment, such as a water and ladder truck, has difficulty accessing Gravina Island using the airport ferry. The ferry has both weight and length restrictions on vehicles, which would require the water truck to dump its load before getting on the ferry, adding delays to boarding and refilling once on Gravina Island. The ladder truck is restricted by its length, so another piece of equipment would have to be substituted or the truck would have to be transported by barge. The Ketchikan Fire Department responded to approximately 15 medical emergencies on Gravina Island in 2010.<sup>5</sup>

#### **1.4.2.4 Improved Convenience and Reliability of Access for Shipment of Freight**

Numerous companies on Revillagigedo Island rely on the airport ferry to ship cargo, fuel, and other products to and/or from the airport. The restrictions of the ferry schedule and its capacity, unexpected mechanical difficulties, and extreme tides can limit the abilities of shipping services to move freight expediently. The main problems of using the ferry to transport freight to and/or from the airport are as follows:

- Couriers and others picking up packages must work around the ferry schedule, which can increase their delivery times. This system is not only inefficient and inconvenient, but it also adds to the cost of doing business in Ketchikan.
- Delays caused by the ferry system (e.g., by capacity issues, schedule and travel time, and mechanical difficulties) can be detrimental to the shipment of seafood products (especially fresh) by air. To a large extent, seafood processors consider the ferry schedule when scheduling their packaging activities to ensure that the freshest possible product is delivered

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<sup>4</sup> Although ARFF can respond to fires on Gravina Island that are not related to the airport, such duties are beyond the ARFF's designated use.

<sup>5</sup> Personal communication with Jim Hill, Ketchikan Fire Chief, November 30, 2010, by Sandra Cook, HDR.

to the customers. If ferry delays cause a flight to be missed, the seafood products must be held in cold storage at the airport while waiting for the next available flight.

- The travel and waiting time associated with the ferry crossing reduces the amount of time a truck and driver can be actively making deliveries. A driver and truck can be tied up for an hour or more while waiting for the ferry, which adds to the cost of shipping.
- There is a limit on the amount of fuel that can be transported by ferry. Shippers transporting fuel to the airport must use small tanker trucks (or only partially fill larger trucks) and make deliveries more often, which is inefficient and costly.
- Because the ferry operates only during the daytime, shipping services cannot transport freight late at night or in the early morning, when traffic congestion would be at a minimum and they could operate more efficiently.

### **1.4.3 Need for Economic Development**

#### ***To promote environmentally sound, planned long-term economic development on Gravina Island.***

Historically, the economy of the Borough has been driven by natural resource development (fishing, mining, timber) and tourism, and has thus suffered over the years from instability and economic downturns. Ketchikan began with a salmon saltery and a cannery in the 1880s. In the mid-1890s the local mining industry took off, prior to the famed Klondike Gold Rush of 1898. By 1900, there were a thousand people in Ketchikan, which had become a hub for mining operations. It was during this time that Ketchikan incorporated. The fishing and mining industries continued until the 1920s when the mining industry went flat. A decade later, the fishing industry peaked and then declined for two decades. There was a short economic boost to the area during World War II with sailors and soldiers stationed in the area as part of Alaska's military defense. Then, with the decline of fishing and mining, timber became the dominant economic force.

Ketchikan's forest products industry began in 1951, with a 50-year timber sale contract between the Ketchikan Pulp Company (KPC, now owned by the Louisiana Pacific Corporation) and USFS. KPC built a \$52.5 million pulp mill, operated sawmills in Ketchikan and Metlakatla, and became the community's largest employer. However, in the late 1980s, timber harvests began to decline significantly. Between 1988 and 1998, the total value of the industry's international exports from Alaska declined by 56 percent (from \$475 million to \$208 million). These declines in the timber industry caused a correspondingly sharp decline in the industry's employment in Southeast Alaska. Consequently, the Ketchikan area created specialized forest products that appeal to many markets.<sup>6</sup>

**Economic Planning.** The Borough has aggressively planned for economic development as a way to stabilize its local economy. The 1998 Overall Economic Development Program<sup>7</sup> (OEDP 1998) identifies bridge access to Gravina Island as a priority for increased opportunities for development of additional ports, harbors, and industrial, commercial, and residential properties. According to its *Comprehensive Plan 2020*,<sup>8</sup> one goal for economic development is the creation of a development plan for Gravina Island that "provides for new economic opportunities to diversify and strengthen Ketchikan's economic health."

**Role of Transportation.** A key component of the project's purpose is to provide a transportation system that benefits the local economy. The lack of efficient, convenient access to developable

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<sup>6</sup> DOT&PF, Gravina Access Project, *Demographic and Socioeconomic Analysis*, April 2000.

<sup>7</sup> Ketchikan Gateway Borough Planning Department, *Ketchikan Gateway Borough Overall Economic Development Program: Major Program Revision 1998*, September 1998.

<sup>8</sup> Ketchikan Gateway Borough Planning Department, *Comprehensive Plan 2020*, 2009.



land on Gravina Island limits development of the economy in the Borough. Businesses that currently operate from Gravina Island or otherwise rely on transportation to Gravina Island are limited by the inconvenience of the current access options (i.e., airport ferry, plane, seaplane, boat, or barge). Transporting employees and products on the airport ferry is costly, inefficient, and limits productivity. Improved access would give businesses opportunities to raise productivity levels and expand operations, which would enhance the local economy. Improved access would also facilitate construction of needed infrastructure, such as power and other utilities, necessary to promote and sustain economic development.

**Recreational Use.** Tourism would continue to be a major component of the Borough's economy. Improving the transportation link between Ketchikan International Airport and Revillagigedo Island would create opportunities for independent travelers and for cruise and tour ships to use Ketchikan as a point of departure. Access to federal and state-owned lands on Gravina Island for recreational use and tourism would encourage the development of visitor facilities, which would broaden these sectors of the economy.

## 1.5 History and Background: Planning Studies

The history of land development and planning in the Borough provides a background on the need for improving access to Gravina Island. No new planning studies addressing Gravina Island access have been initiated since the 2004 FEIS was issued; therefore, the following descriptions of planning studies are the same as those presented in the 2004 FEIS.

For many years, the Borough has conducted several studies that characterize the availability and accessibility of developable land. A statement in the foreword to its Tongass Narrows Crossing Study<sup>9</sup> report (issued nearly 30 years ago) states that “[h]ard access to Gravina Island has been the desire of the Ketchikan community for a number of years.”

The study's statement of purpose also states that “[i]ntermittent access, such as provided by the existing shuttle ferry, is not considered adequate to spur development upon Gravina Island, nor does it provide convenient accessibility for traffic to and from the airport and other points on the island.”

The Tongass Narrows Crossing Study report cited previous studies of crossing locations, costs, and local impacts,<sup>10</sup> some of which also explored the possibility of including access to Pennock Island as part of the crossing.

Problems with land use and accessibility, as supported in the Borough's studies and plans, are summarized as follows:

- Lack of access to Borough lands on Gravina Island has made it difficult for the Borough to provide the land needed for the Borough's economy to grow and develop reasonably.
- The scarcity and high cost of land on Revillagigedo Island severely limit opportunities for the growth, development, and diversity of industrial, commercial, residential, and recreational pursuits.
- Airport access is inconvenient and inefficient for airport users and businesses. The airport ferry operates 16 hours per day with departures every 15 to 30 minutes, depending on the

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<sup>9</sup> Ketchikan Gateway Borough Planning Department, Tongass Narrows Crossing Study reports, prepared by EMPS-Sverdrup: *Phase I—Site Selection Study*, November 1981; *Phase II—Alternative Corridor Investigation*, December 1981; *Alternative Corridors and Summary of Findings*, May 1982.

<sup>10</sup> City of Ketchikan, *Ketchikan Comprehensive Plan Policies*, September 1976; Ketchikan Gateway Borough, *Waterfront Development/Management Study, Phase One*, prepared by Charles Pool & Associates, December 1980; and Reid, Middleton and Associates, *Ketchikan International Airport Master Plan*, March 1981.

season, which requires travelers to consider the ferry schedule when making plans to meet a flight at the airport.

Table 1-1 lists Borough-sanctioned or adopted studies and plans that discuss land availability and provide the Borough’s direction for addressing land availability issues. These documents assume and consistently express the Borough’s explicit, long-standing intentions to promote and facilitate land settlement and development on Gravina Island. The Borough’s principal motivation is to improve the economic health of the region by establishing residential, commercial, and industrial uses of its developable lands.

**Table 1-1: Planning Studies Addressing Access to Gravina Island**

STUDY	YEAR
Waterfront Development Management Study	1982
Land Use Inventory and Projections	1984
Pennock and Gravina Island Neighborhood Plan	1985
Ketchikan Gateway Borough Comprehensive Plan	1986, 1996, and 2009
Coastal Management Program	1984, 1989, and 2007
Land Use Inventory	1991
Ketchikan International Airport Industrial Development Plan	1993
Overall Economic Development Plan	1994 and 1998
Land Use Surveys	1995 and 1996
Lewis Reef Development	1997
Gravina Island Plan	2005

The descriptions provided in the following sections summarize the purpose, findings, and conclusions of these studies as they relate to the Gravina Access Project. For more detailed information, refer to the original documents, which are available from the Borough for public reference.

**1.5.1 Waterfront Development Management Study (1982)**

This study analyzed existing waterfront uses within the Borough and predicted a need for road-accessible commercial and industrial waterfront land by the year 2000. The study’s inventory of waterfront land uses showed that the available sites within the City of Ketchikan could meet the land needs of small commercial or industrial activities, but not those of larger enterprises. The study concluded that the Gravina Island airport area has the best short-term development potential because of its existing transportation links and utilities infrastructure. The eastern shoreline of Gravina Island was identified as one of the two best areas for long-term development, based on topography, existing land uses, and land availability.

**1.5.2 Land Use Inventory and Projections (1984)**

The Borough inventoried all private property and Borough land on the road system from Settlers Cove to Herring Cove (Revillagigedo Island) and projected land use needs to the year 2000. This inventory and projection became the baseline information for the 1986 update of the Borough’s *Comprehensive Plan* (see Section 1.5.4).

### **1.5.3 Pennock and Gravina Island Neighborhood Plan (1985)**

The *Pennock and Gravina Island Neighborhood Plan*, prepared in 1985, constructed a framework for the development of the lands on Gravina and Pennock Islands. One plan objective was to develop a transportation system that would provide access to interior land without compromising the qualities that attracted residents to the area. The plan clearly articulates a vision for future transportation access that would include a ferry. Regarding a bridge, the plan states: “Hard access by bridge or tunnel from Pennock to Gravina Island is not envisioned in the foreseeable future and, in light of the rural characteristics, should not be pursued. Hard access and its possible location is of concern to the community as a whole and should be determined by a borough-wide vote.” The *Pennock and Gravina Island Neighborhood Plan* was written at a time when considerable economic and population growth was anticipated in Ketchikan as a result of mineral development. That mineral development did not occur and the growth of Ketchikan was not consistent with the assumptions of the plan.

### **1.5.4 Ketchikan Gateway Borough Comprehensive Plan (1986, 1996, and 2009)**

In 1986, the Borough updated its *Comprehensive Plan*. The plan stated that the supply of residential, commercial, and industrial land was enough to generally meet short-term demand; however, the “Borough’s roaded system may not be able to supply large industrial tracts or tracts with suitable waterfront,” and that these land use needs “could require the opening up of new growth areas prior to residential expansion needs.”

The plan set two specific goals for Gravina Island access:

We shall provide for a broad and secure economic base and orderly growth while preserving the health, safety, beauty, and essential character of the community...Specific public projects with significant community wide economic benefits include...improved access to the airport [among others].

Air, water, and surface transportation systems within the borough that facilitate the development goals of the community will be provided... [including those to] improve access to Gravina and Pennock Islands.<sup>11</sup>

In the 1996 *Comprehensive Plan*, the Borough supported access to additional developable lands on Gravina Island as its economic development strategy to “expand and diversify the local economy” through “Gravina Island development.” The plan’s development strategies for Gravina Island included identification of ownership for lands needed for:

- Transportation (building roads north and south of the airport)
- Water-related uses on the waterfront
- Airport-related industrial uses
- Maintenance of recreation and subsistence uses
- Lewis Reef development
- Airport expansion
- Seafood industry facilities
- Residential development and large residential lots
- Public beaches
- Common waterfronts

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<sup>11</sup> Objective 4 of that goal

- Greenbelts
- Moorage for small boats and small planes
- Support of commerce and industry with utilities infrastructure (power, roads, sewer, and water)

According to the plan's Land Use Element, industrial needs were projected to use at least half of the available 1991 supply of vacant industrial land and at least 80 percent of the commercial land would be consumed over the next 10 years (presumably by 2006). The plan indicated that:

While the supply of vacant industrial and commercial lands can meet projected acreage needs, the supply is not sufficient for effective market competition. Type, location, and size of vacant land frequently lower their desirability. To optimize competition, it is generally recommended that a supply three times the amount of land needed should be available. Using this formula means demand would exceed supply of vacant commercial land [and] demand would equal 90 percent of the supply of vacant industrial land in the next ten years.

A Commercial and Industrial Land Committee was formed as part of the planning process. The committee preferred the development of Lewis Reef on Gravina Island, but concluded that development there might require hard-link access to the airport. The Comprehensive Plan's Transportation Element indicated that "a bridge spanning Tongass Narrows has been a planning topic ever since the airport was opened," but that high construction costs had deterred planning from going forward.

The plan further indicated that the Borough could take advantage of the airport's waterfront location by using it for an aviation-related industrial park. The plan recommended zoning the area against competing uses; this restriction has occurred to some extent, with industrial zoning being applied to portions of the Airport Reserve zone and private property north of the airport. The analysis indicated that, because of similar land use and the noise constraints to residential development, the areas around the airport are most suitable for industrial development. The plan continues, stating, "Industrially zoned land is in short supply, especially with saltwater access. Land on Gravina Island, both within the Airport Reserve (leased from the state), and elsewhere, is available for development but lacks access except by marine craft." The section concluded with a statement that expanding the community's land base to any extent depends on providing road access to it—in this case, a hard link.

In 2009, the Borough published its *Comprehensive Plan 2020*, which serves as a general guide to facilitate long-range growth and development through consistent application of Borough regulations. The Borough identifies development on Gravina Island as a goal within the plan's Economic Development section. Development potential on Gravina Island was encouraged to provide for "new economic opportunities to diversify and strengthen Ketchikan's economic health." The plan stated that the Borough may develop strategies that provide access to Gravina Island that "include, but are not limited to, a bridge, an enhanced ferry service, or other practical access solutions."

### **1.5.5 Coastal Management Program (1984, 1989, and 2007)**

This program inventoried commercial and industrial waterfront, and found that the downtown area was one of the few areas in Ketchikan where waterfront use was balanced between water-dependent, water-related, and non-water-dependent uses. The plan attributed this balance to the adjoining tracts of level land that allow efficient use. At the other end of the spectrum was the "west end" commercial area, where only 3 percent of the waterfront use was water-related. The plan concluded that the west end's commercial center is an example of how the scarcity of large,

level lots for commercial development impinged upon another scarce resource—prime waterfront property within city limits.

The inventory showed 32 miles of shoreline accessible from the road system, with approximately 2 miles of remaining shoreline considered to be available, suitable, and accessible for water-related commercial and industrial uses. To accommodate the need for more commercial and industrial waterfront property, the plan discussed a proposed hard link to Gravina Island. The plan noted that a bridge or a tunnel has been seriously considered for decades, and that the purposes of a hard link included airport development, access to commercial and industrial waterfront property, access to Borough land, and mutual aid for fire and police services.

This plan was revised in 2007 to provide a contemporary perspective on local development goals and objectives for coastal resources in the district and to establish policies that balance and manage the competition for these resources. The revised *2007 Ketchikan Coastal Management Plan* consisted of two volumes. Volume One described all enforceable policies and designated areas and includes local Best Management Practices and Administrative Policies. Volume Two provided background information and an inventory and analysis of coastal resources.

The plan identified the insufficient availability of suitable developable land in the Ketchikan region. As a result of the limiting physical constraints, all land use types are concentrated along a narrow strip of shoreline and frequently land use conflicts arise making community expansion difficult and expensive. Access to developable land on Gravina Island was identified as necessary to meet the future needs of the Ketchikan community. The construction of a bridge to Gravina Island from Revillagigedo Island was listed among the transportation needs.

#### **1.5.6 Land Use Inventory (1991)**

In 1991, the Borough Department of Planning and Community Development inventoried the developed and vacant land in the urbanized portion of the Borough and reported that approximately 85 percent of the vacant (i.e., undeveloped) land was zoned for residential use. Half of the remaining acreage was designated for industrial use, one-quarter for commercial use, and one-quarter for public use. Of the 901 acres zoned for industrial use, only 256 acres were vacant in and around Ketchikan. The inventory reported that most of the vacant industrial land (157 acres) was held by DNR and Louisiana Pacific Corporation (i.e., KPC).

#### **1.5.7 Ketchikan International Airport Industrial Development Plan (1993)**

In this report, the Borough estimated how long the remaining supply of industrial land would last, based upon the 1991 inventory. From 1980 to 1990, an average of 18 acres of commercial/industrial land had been used each year. Based on the absorption rates and the 1991 supply (i.e., 256 acres), the report estimated 10 to 20 years of supply but supposed that, depending on the rate of consumption, it could be as few as 5 years or as many as 30 years of supply. The report did not take into account the developability of the remaining 256 acres of land zoned for industrial use.

According to the analysis, there may “eventually be a shortage of developable land in Ketchikan.” The analysis noted that Ketchikan is surrounded by vacant land that is “severely limited by land ownership and mandated uses;” and that without changes to ownership of state and federal lands, the land “shortage is at least true in the short run.” The market analysis concluded that the amount of land available for uses that would most likely locate at or near an airport was limited, and that land for future economic development was limited unless more land could be added to the inventory of developable or developed land.

The plan considered six sites for industrial development on Revillagigedo Island plus Pennock Island, but found none of them suitable. The study recommended that the Borough pursue strategies for developing industrial land adjacent to the airport on Gravina Island. According to the study, the one negative aspect of airport industrial development was that “access to the Ketchikan airport is problematic, requiring improvements in the auto and passenger ferry service and capacity or significant capital costs of bridges.”

### **1.5.8 Overall Economic Development Plan (1994 and 1998)**

The 1994 *Overall Economic Development Plan* (OEDP 1994) identified economic issues and developed strategies for addressing them. One of the main issues was “a shortage of industrial sites with infrastructure, roaded access, appropriate locations, and adequate size.”

Although other areas were investigated as potential industrial sites, an industrial sites task force proposed that the Borough identify sites along the Tongass waterfront, from the northern end of the airport to the northern end of Gravina Island, that would be suitable for wood products manufacturing and seafood processing. The task force also proposed that the Borough assist potential developers in applying for the permits necessary to develop the lands. The task force reported that there were only seven undeveloped industrial sites (totaling 19 acres) in Ketchikan that had water, sewer, and power.

The Borough issued a major revision of this plan in 1998. It identified bridge access to Gravina Island among its top three priorities. The OEDP 1998 states:

The Ralph M. Bartholomew Veterans Memorial Bridge addresses the need for roaded transport of goods and services between Revillagigedo Island and Gravina Island. This bridge will provide access to the Ketchikan International Airport and support regional air cargo growth for the region’s emerging industries. This bridge is expected to significantly increase opportunities for development of additional ports, harbors, and industrial/commercial, and residential properties. Ketchikan has identified this project as a priority in its OEDP efforts since 1976.

### **1.5.9 Land Use Surveys (1995 and 1996)**

A fall 1995 survey of the road system from Settler’s Cove on the North Tongass Highway to Herring Cove on the South Tongass Highway found approximately 1,250 vacant parcels of land. The Borough’s 1996 *Comprehensive Plan* indicated that “topographical constraints might physically rule out development on many of these sites, or make them prohibitively expensive to develop.” There appeared to be “sufficient land base to satisfy the community’s short-term future needs for residentially zoned property.” Commercial and industrial properties, particularly those with waterfront access, however, were “perceived to be in short supply.”<sup>12</sup>

In the winter of 1996, the Borough surveyed the Tongass Highway corridor from Beaver Falls to Settlers Cove to determine actual land use. With few exceptions, commercial and industrial development occurred adjacent to the highway corridor, interspersed with residential development either immediately adjacent to it or directly opposite across the highway. The analysis concluded that, “[i]n part, because of the scarcity of developable land for commercial and industrial purposes, adjacent conflicting land uses are prevalent in the Borough.”<sup>13</sup>

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<sup>12</sup> Ketchikan Gateway Borough Planning Department, *Comprehensive Plan*, 1996.

<sup>13</sup> Ketchikan Gateway Borough Planning Department, *Comprehensive Plan*, 1996.

### **1.5.10 Lewis Reef Development: Purpose, Needs, and Alternatives (1997)**

Based on its past planning studies, and to implement its comprehensive plan goals, the Borough pursued a marine industrial park for marine-related commerce and industry operations north of the airport at Lewis Reef. The purpose was to “meet the fundamental need in the area of supporting industrial development that requires immediate access to both marine and air transportation support. It [was also to] meet a need for additional areas to locate industrial facilities to resolve land use conflicts.” Of the seven sites explored, only a site on Gravina Island (at Lewis Reef) was deemed to have the characteristics needed to support the industrial park; no suitable land on Revillagigedo Island was identified.

Development of a timber processing facility has since occurred near Lewis Reef. The Borough received a provisional permit from the U.S. Army Corps of Engineers (USACE) to construct a new road around the west side of the airport to the Lewis Reef development area. When DOT&PF developed the Gravina Island Highway as part of the first phase of implementing Alternative F1 (see Section 1.3), it included development of Lewis Reef Road from the Airport Access Road north to the Airport Creek crossing. The Borough took ownership of the access road to the Lewis Reef development area.

### **1.5.11 Gravina Island Plan (2005)**

In 2005, the Borough published the *Gravina Island Plan* to define and organize development goals, policies, and strategies for Gravina Island. The plan was intended to ensure orderly change through devising separate but integrated plans for five geographic areas. Each area plan identified road and trail corridors, streamlined improvements by resolving conflicts, organizes economic development initiatives, provided direction for land management, and protected the values important to citizens.

The plan was intended for use as a framework to make local planning decisions and enact a new zoning ordinance. As outlined in the Borough’s *Gravina Island Plan Citizen’s Guide to Public and Private Decision-making* (April 2005)<sup>14</sup>, the key issues facing planners are improving access from Ketchikan, building a new road system, promoting commerce and industry, accommodating tourism and recreational users, developing residential areas, providing services and infrastructure, supporting commercial resource harvesting, and sustaining subsistence uses.

Central to the Borough’s planning perspective is that the relatively untouched landscape of Gravina Island demands and deserves careful management, and that protecting the natural setting that attracts tourists is the best long-term economic strategy. Four major types of development are already slated for the near term: timber harvesting, airport expansion, road construction, and industrial construction.

## **1.6 History and Background: Engineering and Environmental Studies**

With the exception of studies completed in support of this SEIS, no new engineering or environmental studies addressing Gravina Island access have been initiated since the 2004 FEIS was issued; therefore, the following descriptions of previous engineering and environmental studies are the same as those presented in the 2004 FEIS. A summary of the 2004 FEIS is provided in Section 1.6.5.

Since the early 1970s, numerous engineering and environmental studies have addressed various alternatives for providing access via a hard link (bridge or tunnel) across Tongass Narrows (see Table 1-2). These studies demonstrate a long-term commitment by the community and

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<sup>14</sup> Ketchikan Gateway Borough, *Gravina Island Plan Citizen’s Guide to Public and Private Decision-making*, April 2002.

governmental entities to improve access to Gravina Island, beginning in 1973 with the opening of the Ketchikan International Airport and the start of the airport ferry service across Tongass Narrows. The State of Alaska responded that year by examining five proposed bridge crossings. Since then, several other engineering studies of bridges and tunnels have been conducted.

**Table 1-2: Engineering and Environmental Studies Addressing Access to Gravina Island**

Study	Year	Prepared For
Gravina Island Crossing Reconnaissance Report	1973	Alaska Department of Highways Southeastern District Reconnaissance Section
Tongass Narrows Crossing Study	1981-1982	Borough Planning Department
Tongass Narrows Crossing Benefit/Cost Study	1985	Borough Planning Department
Gravina Road Corridor/Airport—Hard Link	1989	Borough Planning Department
Tongass Narrows Crossing Preliminary Scoping Study	1992	James M. Montgomery Consulting Engineers
Preliminary Draft Environmental Impact Statement	1994	DOT&PF
Final Environmental Impact Statement	2004	DOT&PF

In 1981, the Borough examined eight bridges and three underwater tube crossings of Tongass Narrows. In 1985, Tippetts-Abbett-McCarthy-Stratton analyzed the costs of proposed bridge, tube, and ferry crossings on behalf of the Borough.

In 1988, the Borough passed Resolution 794 supporting a hard-link crossing and the preparation of an [Environmental Impact Statement \(EIS\)](#). In 1989, the Borough studied road routes on Pennock and Gravina Islands to the airport.

In 1991, the Alaska Legislature authorized funding for the Ketchikan hard-link EIS. In 1994, the DOT&PF prepared a Draft EIS of three crossing options, as discussed in Section 1.6.4. Most recently, in 1998, TEA-21 allocated \$20.4 million specifically for this project. Additional funding will be required to begin construction of a selected access alternative.

The reports of these studies are briefly described in this section (Section 1.6). The reports are available to the public at the Ketchikan Public Library at 629 Dock Street.

### **1.6.1 Gravina Island Crossing Reconnaissance Report (1973)**

The *Gravina Island Crossing Reconnaissance Report* study,<sup>15</sup> which was completed during the construction of the Ketchikan International Airport, evaluated five potential bridge routes across the Tongass Narrows:

- A – From Mile 4.6 on North Tongass Highway (just south of Peninsula Point) to Lewis Point
- B – From Mile 4 on North Tongass Highway to the northern end of the airfield
- C – From Charcoal Point to the southern end of the airfield
- D-North – From Mile 1.1 on South Tongass Highway (just south of the USCG Station) to just south of Clam Cove, via Pennock Island
- D-South – From Mile 3 on South Tongass Highway (just south of Saxman) to just south of Clam Cove

<sup>15</sup> Alaska Department of Highways Southeastern District Reconnaissance Section, *Gravina Island Crossing Reconnaissance Report*, Project S-0922(1), April 1973.



All five alternatives were proposed with horizontal navigational clearances of 500 feet and vertical clearances of 130 feet, and two alternatives included less costly variations with vertical clearances of 50 or 75 feet. These lower clearances would prevent passage of larger vessels, such as state ferries, cruise ships, and oil tankers. Alternative C included a moveable (vertical lift) bridge as one variation.

The report recommended deferring bridge site selection and design until the effects of the new airport operations on development and traffic trends were more fully established.

### **1.6.2 Tongass Narrows Crossing Study (1981–1982)**

In 1981 and 1982, the Borough undertook an extensive *Tongass Narrows Crossing Study*<sup>16</sup> regarding a hard-link route from Ketchikan to Gravina Island. The study as originally conceived had three phases: I—Site Selection; II—Investigation of Alternatives; and III—Feasibility (tube versus bridge).

#### **1.6.2.1 Phase I—Site Selection**

The study established institutional and physical crossing constraints, investigated 11 crossing corridors (eight bridges and three tunnels), and recommended corridors for further investigation in later phases of the study. Each of the eight bridge alternatives, two of which crossed Pennock Island, was proposed with horizontal navigational clearances of 500 feet and vertical clearances of 145 feet. For the Pennock Island alternatives, the West Channel bridges were proposed with horizontal and vertical navigational clearances of 500 feet and 145 feet, respectively, whereas the East Channel bridges were proposed with horizontal navigational clearances of 300 feet and vertical navigational clearances of 55 feet. For corridor assessment, investigators used a full range of evaluation factors: traffic congestion, travel distance, marine navigation, airport activity, environmental effects, community development, right-of-way displacement, costs, geologic and soils concerns, air navigation risks, and geometric design.

The resulting assessment narrowed the focus of the next study phase to three bridge corridors and one tunnel corridor. These four corridors were judged the most favorable crossing locations because of their convenient connections; minimal impacts on development, environmental resources, and traffic modes; excellent foundation potentials; and shorter crossing lengths.

#### **1.6.2.2 Phase II—Investigation of Alternatives**

This report identifies the general considerations and constraints applicable to the four crossing corridors recommended in Phase I, as well as one new corridor, added by the Borough after its review of the report. The new crossing corridor was a tube tunnel from the intersection of Tongass Highway and Shoreline Drive either to the Lewis Reef area or near the medium-intensity approach lighting system of the airport runway.

The Phase II investigation reflected the constraints developed in Phase I, as well as information gathered from the public and government agencies, bathymetric data, and more-detailed engineering analysis. For one of the bridge corridors (Corridor 7), the additional possibility was raised of constructing a causeway instead of a bridge, which would require thorough investigation of the effects on tidal movements. The report recommended two corridors for further feasibility evaluation in Phase III: Corridors 3 (bridge) and 11 (tube tunnel).

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<sup>16</sup> Ketchikan Gateway Borough Planning Department, *Tongass Narrows*, November 1981; *Phase II—Alternative Corridor Investigation*, December 1981; *Alternative Corridors and Summary of Findings*, May 1982.

### 1.6.2.3 Phase III—Additional Studies

In the original project scope, Phase III was to be a feasibility study that would compare the most favorable bridge and tunnel options and recommend a preferred crossing type. However, in light of comments received at a public hearing in February 1982, the Phase III scope was redirected to address the specific concerns of the public and, consequently, was enlarged to investigate five corridors rather than just the two corridors designated as most favorable in Phase II. The Phase III additional studies developed additional background information and details for both bridge and tube crossings, and provided additional studies of crossing alternatives for Corridors 3 and 7 (including a partial causeway). The Corridor 2 bridge crossing and the Corridor 12 tube crossings were included in the detailed studies.

The report concluded that a bridge crossing was the most feasible hard link across Tongass Narrows, and the most favorable crossing locations were Corridor 7 (south of the airport) and Corridor 2 (north of the airport). The final recommendation was for further studies of Corridors 2, 7, and 11 to obtain additional field data, prepare an environmental assessment, develop more technical information as a basis for preliminary design plans, and determine the most favorable crossing corridor.

### 1.6.3 *Other Tongass Narrows Crossing Studies (1985-1992)*

***Tongass Narrows Crossing Benefit/Cost Study.*** This 1985 study for the Borough<sup>17</sup> emphasized the importance of access to Gravina Island with this statement: “One central fact underscored all of the discussions and meetings held to examine this topic: the citizens and leaders of Ketchikan unanimously support improved access between the islands and view [such access] as essential to the growth of the community.”

Nine access alternatives were compared, based on quantifiable benefits and costs. The hard-link alternatives assessed were the three corridors favored by the Tongass Narrows Crossing Study conducted in 1981 and 1982: Corridor 2 (bridge), Corridor 7 (bridges via Pennock Island), and Corridor 11 (tube tunnel). In addition, the study assessed a low-level bridge or causeway to Pennock Island, three ferry systems to access Gravina Island (existing service, remodeled ferries, and larger vehicular ferries), and two ferry systems to access Pennock Island (passenger and vehicular ferries).

***Gravina Road Corridor/Airport—Hard Link.*** This 1989 study<sup>18</sup> defined an alignment for a two-lane access road to the Ketchikan International Airport, with 0.6 mile of roadway on Pennock Island and 3.4 miles on Gravina Island. The study considered topography, soils, property ownership, future development, and drainage. The roadway system was designed to serve the West Channel bridge crossing that was part of Corridor 7 recommended in the Tongass Narrows Crossing Study in 1982.

***Tongass Narrows Crossing Preliminary Scoping Study.*** This scoping study<sup>19</sup> summarized previous crossing reports and briefly compared three crossing corridors from the Tongass Narrows Crossing Study in 1992 (i.e., Corridors 2, 7, and 11) and one new crossing, referred to as “PN&D 72/92” after the study preparers: Peratrovich, Nottingham & Drage, Inc. The scoping study included the following 1992 cost estimates:

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<sup>17</sup> Ketchikan Gateway Borough Planning Department *Tongass Narrows Crossing Benefit/Cost Study*, prepared by TAMS Engineers (Tippetts-Abbett-McCarthy-Stratton, a Professional Corporation), (apparently published in 1985).

<sup>18</sup> Ketchikan Gateway Borough Planning Department, *Gravina Road Corridor/Airport—Hard Link*, prepared by PEI Consultants, 1989.

<sup>19</sup> James M. Montgomery Consulting Engineers, *Tongass Narrows Crossing Preliminary Scoping Study*, prepared by Peratrovich, Nottingham & Drage, Inc., April 15, 1992.

Corridor 2 (bridge):	\$100 million
Corridor 7/7A (two bridges or a bridge/causeway):	\$100 million
Corridor 11 (tube tunnel):	\$180 million
PN&D 72/92 (bridge):	approximately \$ 60 million

These cost estimates were based on a vertical navigational clearance of 160 feet for the bridges, and introduced a new and costly element to project requirements—protection of bridge piers from ship collisions. The report also noted that, from 1962 to 1990, bridge costs in Alaska had escalated an average of 3.5 percent per year.

The study concluded that only Corridor 7/7A and the PN&D 72/92 crossing (all bridge alternatives) had merit, and recommended that they undergo future environmental studies and comparison with the existing airport ferry access system.

#### **1.6.4 Preliminary Draft Environmental Impact Statement (1994)**

In 1994, the DOT&PF evaluated the potential environmental impacts of three alternatives for a Tongass Narrows crossing and a No Action Alternative in an EIS.<sup>20</sup> The proposed action was developed to address future limitations on the capacity of the existing ferry service and to provide a more reliable direct link between the City of Ketchikan and the airport on Gravina Island. Scoping for this study evaluated five bridge alternatives, an underwater crossing, and a drawbridge.

The three “action” alternatives selected as reasonable alternatives for evaluation in the Preliminary Draft EIS were:

- 1 – A two-lane bridge from north of downtown Ketchikan on Revillagigedo Island to the north end of the airport on Gravina Island and 1.5 miles of access road (\$61 million to construct). This alternative included a horizontal navigational clearance of 500 feet and a vertical navigational clearance of 160 feet.
- 2 – A two-lane bridge from south of downtown Ketchikan (near the USCG Station) to Pennock Island, a second bridge from Pennock Island to south of Clam Cove on Gravina Island, and 4 miles of access road (\$74 million to construct). Navigational clearances for the West Channel bridge were proposed at 500 feet horizontal and 160 feet vertical. The East Channel bridge navigational clearances were proposed at 300 feet horizontal and 60 feet vertical.
- 3 – Improvements to the existing ferry system (\$9 million to \$10 million), including replacement of the existing ferry vessel with a much larger (120-foot) vessel having capacity for 12 to 15 additional vehicles and 20 to 30 additional passengers, and redesign and replacement of the transfer bridge at the ferry terminal on Gravina Island.

Alternative 1 included a rock breakwater that might have impeded nearshore salmon migrations, but would have been mitigated by a 100-foot opening in the breakwater. The bridge pier supports (rock islands) would cover about 2.8 acres of marine habitat, but it was anticipated that these rock islands would create equally productive habitat for marine species. Alternative 2 would have taken 80 acres of wetlands, and would have the same impacts from rock islands as Alternative 1. Most residents of Pennock Island opposed Alternative 2. Alternative 3 would not have had any new major environmental impacts.

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<sup>20</sup> DOT&PF, *Ketchikan, Alaska, Tongass Narrows Crossing Preliminary Draft Environmental Impact Statement*, prepared by Montgomery Watson, October 1994.

This Preliminary Draft EIS was prepared for internal DOT&PF review only and did not recommend a preferred alternative. The State of Alaska chose not to pursue the project due to lack of funding.

#### **1.6.5 Environmental Impact Statement (2004)**

As mentioned in Section 1.3, FHWA and DOT&PF issued the Gravina Access Project FEIS in July 2004. The 2004 FEIS examined nine reasonable action alternatives: two high bridges near the airport with navigational clearances adequate to accommodate large cruise ships (Alternatives C3a and C4); two lower bridges near the airport with navigational clearances adequate to accommodate ships as large as the largest AMHS ferries (Alternatives C3[b] and D1); two bridge alternatives that cross Pennock Island (Alternatives F1 and F3); and three ferry alternatives with locations north of the airport, south of the airport, and at the airport (Alternatives G2, G3, and G4, respectively).

The 2004 FEIS identified Alternative F1 as FHWA's and DOT&PF's preferred alternative. Alternative F1 was the selected alternative in FHWA's Record of Decision, which was issued on September 15, 2004.