

Gravina Access Project

Appendix G

FAA Determination of Hazard to Air Navigation

This page intentionally left blank.



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
2601 Meacham Boulevard
Fort Worth, TX 76193

Aeronautical Study No.
2013-AAL-328-OE
Prior Study No.
2009-AAL-147-OE

Issued Date: 08/15/2014

Jim Lowell, PE
Alaska Dept of Transportation and Public Facilities
6860 Glacier Highway
Juneau, AK 99801

**** DETERMINATION OF HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Bridge Alternative C3-4
Location:	Ketchikan, AK
Latitude:	55-21-36.89N NAD 83
Longitude:	131-43-03.21W
Heights:	17 feet site elevation (SE) 142 feet above ground level (AGL) 159 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure as described above would have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft and/or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would be a hazard to air navigation.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before September 14, 2014. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager, Airspace Regulations & ATC Procedures Group, Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on September 24, 2014 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and enroute procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed

structures. The study disclosed that the described structure would have a substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Robert van Haastert, at (907) 271-5863. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2013-AAL-328-OE.

Signature Control No: 199882985-227159542

(DOH)

John Page

Manager, Obstruction Evaluation Group

Attachment(s)

Additional Information

Map(s)

Additional information for ASN 2013-AAL-328-OE

AERONAUTICAL STUDY NO. 2013-AAL-328-329-330-OE

Abbreviations

AGL - above ground level
MSL - mean sea level
RWY - runway
IFR - instrument flight rules
VFR - visual flight rules
nm - nautical mile
Part 77 - Title 14 CFR Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

1. LOCATION OF PROPOSED CONSTRUCTION

The FAA reviewed the proposed Ketchikan bridge proposal involving these three (3) points east of RWY 11 threshold at Ketchikan International (KTN) Airport, AK. KTN elevation is 92 MSL. These points are Alternative C 3-4.

Aeronautical Study	Heights	Distance to KTN RWY 11 threshold
2014-AAL-328-OE	142 AGL / 159 MSL	3,515 feet
2014-AAL-329-OE	265 AGL / 265 MSL	2,195 feet
2014-AAL-330-OE	1 AGL / 284 MSL	1,371 feet

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed structures are identified as obstructions under these Part 77 standards:

- a. Section 77.19(a) -- The surface of a takeoff and landing area of an airport or any imaginary surface. 2014-AAL-329-OE would exceed the VFR maneuvering areas for Category A and Category B aircraft (horizontal surface) at KTN by 26 feet. 2014-AAL-330-OE would exceed the VFR maneuvering areas for Category A and Category B aircraft (horizontal surface) at KTN by 45 feet.
- b. Section 77.19 (e) -- The transitional surface area designated to prevent tall structures from being located at the edge of the primary and approach surfaces of an airport. 2014-AAL-328-OE would exceed the KTN RWY 11/29 transition area (abeam the runway) by 55 feet.

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR follows: KTN RWY 11 is designated Right Traffic keeping aircraft on the west side of the RWY 11/29. Two points, 2014-AAL-329 and 2014-AAL-330-OE would exceed the KTN VFR Traffic Pattern, however, are located east of RWY 11/29.

Alaska Region Flight Standards Division identified the following seaplane bases: Murphy's Pullout (8K9), Peninsula Point Pullout (9CO), and Ketchikan Harbor (5KE), which have a combined total flight operations in excess of 13,000 annually would be adversely impacted by requiring VFR operations to change its regular flight course or altitude. 8K9 and 9CO are north of this proposed bridge and 5KE is south of this bridge. The VFR flyway en route to/from these seaplane bases is through the Tongass Narrows waterway avoiding mountainous terrain, overflight of the city of Ketchikan, and KTN. This bridge will require aircraft to climb above the bridge with 500 feet of obstacle clearance. This climb may not be possible during inclement weather where aircraft will have to climb over the bridge and may encounter IFR conditions.

The KTN Airport Master Record can be viewed at <http://www.gcr1.com/5010web/airport.cfm?Site=KTN>. It states that there are three (3) single-engine aircraft, one (1) multi-engine, and one (1) jet aircraft based at KTN. For the 12 months ending 1 January 2013 (latest information) there were 15,959 reported operations.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR follows: The IFR instrument approach and departure procedures would not require raising minimums. However, the Alaska Region Technical Operations Division identified that the LOCALIZER air navigation facility would be adversely impacted by the proposed bridge.

The proposed bridge from Ketchikan to the airport crossing the Tongass Narrows will intersect Gravina Island approximately 500 feet laterally from KTN RWY 11, a runway serviced by a full Instrument Landing System (ILS) approach. Technical Operations evaluated possible signal interference and ILS/LOCALIZER performance in terms of both height and location relative to the runway. The LOCALIZER is a key component of the ILS system that provides lateral guidance for instrument-equipped aircraft on approach to land at Ketchikan RWY 11. Modelling study was conducted by the FAA Technical Center in Atlantic City, to ascertain the impact of the proposed bridge on the ILS performance. Given the early stages of bridge design, many assumptions on the design were made and utilized, and like all early assumptions, are subject to revision. The conclusion in the study states that "the proposed bridge will [adversely] impact the performance of the KTN RWY 11 LOC." Based on the current model, the impact foreseen is expected to be approximately 60% of maximum allowable signal tolerance for navigational accuracy. Furthermore, the study states: "If the finalized plan has the bridge taking a different route or the [support] piers are larger [more numerous, or differently spaced] than what was [evaluated], the model [must be amended and] run again to confirm that the new conditions will not create an out of tolerance condition." The adverse impact to ILS performance is significant as a result of the bridge. In addition, the close proximity of the elevated portion of the bridge structure to the runway creates an additional hazard to air navigation. Technical Operations strongly urges utilizing that portion of the Gravina Island highway approximately 2-3/4 miles southeast of the airport as an island point of access instead of the Ketchikan Airport next to RWY 11. Using the southeast dead-end of the Gravina Island highway should minimize adverse impact to the on-airport navigational aids servicing landing air traffic.

c. The impact on all future, plan-on-file public-use airports and aeronautical facilities follow: None.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures follows: The cumulative effect of the proposed bridge, as currently proposed, would adversely impact the KTN RWY 11 LOCALIZER facility. Additionally, VFR aircraft were separated geographically after a 1987 mid-air collision. Helicopter traffic remains north of the City of Ketchikan/Tongass Narrows and fly near and parallel to the mountains, the KTN VFR arrivals/departures remain south of the Tongass Narrows, and float plane traffic remains over the Tongass Narrows. This proposed bridge will bisect the Tongass Narrows and adversely impact the VFR flyways in the Tongass Narrows area.

4. CIRCULATION AND COMMENTS RECEIVED

The proposal was circularized for public comment on 7 July 2014 and five (5) letters were received from Island Wings Air Service, Alaska Airlines, Alaska Air Carriers Association (AACA), Aircraft Owners and Pilots Association (AOPA), and Mountain Air Service objecting to the proposal before the comment period closed on 13 August 2014.

The letters identified the following:

There are twelve floatplane air taxi services, one runway air taxi service and two helicopter services operating out of Ketchikan on a daily basis. Additionally Alaska Airlines, Guardian Air, and a variety of other jet

and private aircraft operate from the runway and harbor areas. Air traffic congestion is busy year round and especially congested during peak summer months.

The cumulative impacts are of concern to all of the objectors and are listed below:

- 1) The VFR traffic is through the Tongass Narrows. This proposed bridge will cross the narrows requiring aircraft to climb above the bridge with 500 feet of obstacle clearance. VFR seaplane traffic would be impacted during inclement weather when aircraft climb over the bridge and encounter IFR conditions. The 2007 Ketchikan Coastal Management plan states on p.72 that the Ketchikan Harbor Seaplane Base (5KE) alone exceeded 85,000 take-offs and landings annually.
- 2) At any given moment there can be 20 aircraft operating in the vicinity of the airport and the Ketchikan harbor. This area is narrow and restricts aircraft operations into a very confined area. All traffic, which includes IFR and VFR traffic going to and from the runway, the airport seaplane base, the harbor seaplane base, and the helicopter base are all within a 1.5 nm radius. Adding a bridge in any area of the current traffic patterns would further restrict an already densely congested air traffic area.
- 3) Alaska Airlines is concerned over the possible impact to the LOCALIZER and to their Special RNAV (RNP) M RWY 11 approach and to the ILS or LOC DME Z RWY 11 approaches. During low weather, Alaska Airlines has the option to use either their Special RNAV (RNP) M RWY 11 approach or the ILS or LOC DME Z RWY 11 approach. The ILS provides the best option for a successful approach and landing on a low weather day because it provides lower minimums 1800 RVR and 200 DH as opposed to the RNAV RNP with 3500 RVR and 364 DH. In poor weather, more flights would be forced to divert. In addition, Alaska Airlines flights that utilize Ketchikan as a weather alternate could also be impacted. Higher minimums increase the chance that Ketchikan would not be legal as a weather alternate, and Alaska Airlines would be forced to carry more fuel to plan for a more distant alternate.

The LOCALIZER is a key component of the ILS system at Ketchikan RWY 11. Based on the current model this project is expected to reduce the maximum allowable signal tolerance for the localizer accuracy by up to 60%. An operational impact of 60% to the ILS/localizer would significantly impact IFR operations at Ketchikan International Airport and would limit the future airport's use.

- 4) The specific and separate traffic routes for floatplanes, helicopters, and runway traffic, that are in use today were put into place after the 1987 mid-air collision that happened between a helicopter and a floatplane near the end of the runway. Currently, helicopters transition north of Ketchikan along the mountains. KTN VFR traffic pattern restricts aircraft west of the runway where VFR entry points are southwest of the Tongass Narrows, and float planes are restricted to remain over the Tongass Narrows waterway. The associated NTSB accident report number is SEA87FA162A, which included the following phrase: 'FAA DATA INDCD HVY TRAFFIC AT KTN FM MAY TO SEP.'

The FAA concurs with the VFR flyway adverse impacts and adverse effect on the KTN LOCALIZER.

5. DETERMINATION - HAZARD TO AIR NAVIGATION

It is determined that the proposed construction would have a substantial adverse effect on the safe and efficient use of navigable airspace by aircraft.

6. BASIS FOR DECISION

This proposed Ketchikan bridge project, Alternative C 3-4, would exceed the KTN Part 77 horizontal surface by 26 and 45 feet and would exceed the Part 77 transitional surfaces (abeam the runway) by 55 feet. Two

points of his proposed bridge project would exceed the KTN VFR traffic pattern airspace for RWY 11/29, however, RWY 11 is designated Right Traffic keeping VFR aircraft southwest of the airport and away from the proposed bridge. The FAA has identified this Alternative C 3-4 bridge proposal will adversely impact the LOCALIZER navigational signal. FAA Joint Order 7400.2, Handling Airspace Matters, identifies in 6-3-3, Determining Adverse Effect, that a structure is considered to have an adverse aeronautical effect if it first exceeds the obstruction standards of Part 77, and/or is found to have physical or electromagnetic radiation effect on the operation of air navigational facilities. Additionally, 6-3-3 identifies that proposed structure, if not amended, altered, or removed, has an adverse effect if it would require a VFR operation, to change its regular flight course or altitude. This bridge will bisect an established VFR flyway and require VFR operations to change their regular flight courses or altitudes. The KTN Airport Master Record verifies that a significant volume of VFR operations exist. Therefore, the aeronautical study concludes that there are substantial adverse effects and a Determination of Hazard is warranted.



