



To: LOGAN COMMUNITY ADVISORY COMMITTEE MEMBERSHIP  
From: Jon Woodward, Independent Consultant Project Manager

Date: January 20, 2009

Re: Review of FAA's RNAV Designs for Implementation of Phase 1 Measures

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The FAA has recently completed the design of the RNAV measures that will implement three of the four recommended RNAV departure procedures resulting from evaluations conducted under Phase 1 of the project. You will recall that the intent of Phase 1 was to 1) identify measures that could be implemented for noise abatement without the requirement of a complex Environmental Impact Statement, and 2) would raise the crossing altitudes of aircraft as they returned over the shoreline from the Massachusetts Bay.

Four RNAV procedures (SOXXS, HYLND, LBSTA and PATTS) were designed by FAA technicians to replicate the desired flight courses laid out in the Phase 1 recommendations. These designs address departures from Runways 4R, 9, and 15L only. The FAA has not yet finalized a design for departures from Runways 22R/L. During the development process, the FAA also developed two additional RNAV procedures which they believe will further abate noise effects. These were designated the CELTK and BRUWN RNAVs).

This memorandum provides the Independent Consultant's review of these FAA designs in light of the intent set forth by the originally recommended Phase 1 RNAV measures.

### **SOXXS RNAV – departures to the south over the South Shore**

This RNAV design appears to meet the intent of the original recommendation that southbound departures cross the shoreline above the marshlands between Scituate and Marshfield at an altitude averaging more than 13,000 to 15,000 feet, depending upon departure runway. The RNAV course does not adhere strictly to the original design over the water, but this deviation does not pose meaningful adjustments to the resulting noise levels or altitudes determined during the original

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evaluations conducted prior to the recommendation that Alternatives 1, 2, and 3 be adopted to improve departure noise conditions from Runways 4R, 9 and 15L respectively.

The Independent Consultant concurs with the FAA assertion that the SOXXS RNAV procedure meets the intent of the Phase 1 RNAV recommendations for southbound departures from Runways 4R, 9 and 15L.

#### **HYLND RNAV – departures to the northwest and west over the North Shore**

This RNAV design appears to meet the intent of the original recommendation that northwest bound departures cross the shoreline above Beverley at an altitude averaging more than 9,000 to 13,000 feet, depending upon departure runway. The RNAV course does not adhere strictly to the original design over the water, but this deviation does not pose meaningful adjustments to the resulting crossing locations, noise levels or altitudes determined during the original evaluations conducted prior to the recommendation that Alternatives 1, 2, and 3 be adopted to improve departure noise conditions from Runways 4R, 9 and 15L respectively.

The Independent Consultant concurs with the FAA assertion that the HYLND RNAV procedure meets the intent of the Phase 1 RNAV recommendations for northwest bound departures from Runways 4R, 9 and 15L.

#### **LBSTA RNAV – departures to the northeast over Gloucester**

This RNAV design appears to meet the intent of the original recommendation that northeast bound departures cross the shoreline above Gloucester at an altitude averaging more than 10,000 to 13,000 feet, depending upon departure runway. The RNAV course does not adhere strictly to the original design over the water, but this deviation does not pose meaningful adjustments to the resulting crossing locations, noise levels or altitudes determined during the original evaluations conducted prior to the recommendation that Alternatives 1, 2, and 3 be adopted to improve departure noise conditions from Runways 4R, 9 and 15L respectively.

The Independent Consultant concurs with the FAA assertion that the LBSTA RNAV procedure meets the intent of the Phase 1 RNAV recommendations for northeast bound departures from Runways 4R, 9 and 15L.

#### **PATTS RNAV – departures to the west over the South Shore**

Until reaching the South Shore shoreline crossings, this RNAV design appears to meet the intent of the original recommendation that west bound departures cross the shoreline above Cohasset and Scituate at an altitude averaging more than 11,000 to 13,000 feet, depending upon departure runway. The RNAV course does not adhere strictly to the original design over the water, nor does the crossing location for departures from Runway 15 replicate the center courses of the recommended course as originally recommended – it is offset by approximately

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one-half mile to the north. While this deviation poses an adjustment to the crossing location, the associated noise levels for aircraft at the anticipated crossing altitudes should be imperceptible to the human ear. The horizontal difference in course location adds or subtracts less than 400 feet to the approximately 13,000-foot slant-range distance between an aircraft in the air and the shoreline crossing points of the two departure courses.

The Independent Consultant concurs with the FAA assertion that the PATTS RNAV procedure substantially meets the intent of the Phase 1 RNAV recommendations for westbound departures over the South Shore from Runways 4R, 9 and 15L.

#### **CELTK RNAV – departures to the Mediterranean**

The CELTK RNAV is a variation of the SOXXS RNAV recommended for implementation by the FAA. It is intended for use by those aircraft bound to destinations around the Mediterranean Sea. Approximately five aircraft per day that are destined to that area would previously have been assigned the SOXXS RNAV and been routed over the shoreline between Scituate and Marshfield. Under the CELTK RNAV procedures departures to that area from Runways 4R, 9 or 15L would continue to fly to the east direct to their destinations.

The Independent Consultant concurs with the FAA assertion that the CELTK RNAV procedure will improve the intent of the Phase 1 RNAV recommendations for southbound departures over the South Shore from Runways 4R, 9 and 15L.

#### **BRUWN RNAV – departures to the Caribbean or Miami**

The BRUWN RNAV is another variation of the SOXXS RNAV recommended for implementation by the FAA. It is intended for use by those aircraft bound to Miami or in the Caribbean. Approximately 15 aircraft per day that are bound to that area would previously have been assigned the SOXXS RNAV and been routed over the shoreline between Scituate and Marshfield. Under the BRUWN RNAV procedures departures to those destinations from Runways 4R, 9 or 15L would fly a southeasterly course to cross the shoreline over Barnstable at altitudes estimated to be in excess of 24,000 feet.

The Independent Consultant concurs with the FAA assertion that the BRUWN RNAV procedure will improve the intent of the Phase 1 RNAV recommendations for southbound departures over the South Shore from Runways 4R, 9 and 15L.

#### **Departures from Runways 22R/L**

Upon receipt of proposed RNAV procedures related to Runways 22R/L, the Independent Consultant will provide a supplementary review of how well they comply with the original intent of the Phase 1 RNAV recommendations.

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