



# Boston Overflight Noise Abatement Study

## Progress Update Report

April 20, 2006

The purpose of the this progress report is to inform the BOS/TAC and CAC of progress on Tasks 7, 8 and 9 of Phase 1 of the Boston Over Flight Noise Study. The report will provide the reader with an overview of technical activities conducted in the 1<sup>st</sup> quarter of 2006, and those planned for this quarter. The progress report serves as an interim update in an effort to keep all BOS/TAC and CAC members informed of the activities that the PC/IC teams are engaged in. All alternative corridor illustrations are available to BOS/TAC on the [www.bostac.com](http://www.bostac.com) file site. Please refer to the illustrations for additional information associated with alternative design. Periodic updates may occur. PC will alert members when updated information is available.

## Contents

<b>I. Early Implementation Alternative Summary .....</b>	<b>2</b>
Alternative 1/Alternative 14/Alternative 15: Procedure Summary .....	2
Alternative 2/Alternative 14/Alternative 15: Procedure Summary .....	3
Alternative 3/Alternative 14/Alternative 15: Procedure Summary .....	3
Alternative 5/Alternative 14/Alternative 15: Procedure Summary .....	4
Alternative 6: Procedure Summary .....	4
Alternative 7: Procedure Summary .....	5
Alternative 8: Procedure Summary .....	5
Alternative 9: Procedure Summary .....	5
Alternative 11: Procedure Summary .....	6
Alternative 12: Procedure Summary .....	6
Alternative 13: Procedure Summary .....	6
<b>2. Early Implementation Alternative Analysis.....</b>	<b>7</b>
<b>3. BOS/TAC Meeting(s) .....</b>	<b>9</b>
<b>4. CAC Meeting(s) .....</b>	<b>10</b>
<b>Attachment 1</b>	
<b>Attachment 2</b>	
<b>Attachment 3</b>	



## I. Early Implementation Alternative Summary

Serving as a reminder, the following summaries of each alternative are provided. The information pertains to the name, intent and brief descriptions of each alternative.

### ***Alternative 1/Alternative 14/Alternative 15: Procedure Summary***

<b>Type</b>	<b>Arrival:</b> <input type="checkbox"/>	<b>Departure:</b> <input checked="" type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	4R		
<b>Intent:</b>	This alternative is intended to increase the accuracy and narrow the track of departures over the Nahant causeway and reduce noise to North Shore communities (Alternative 1). The procedure is also intended to increase the altitude of shore crossings (Alternative 14). This procedure also includes an RNAV route to keep southbound departures east of Minot's Light prior to crossing the shoreline (Alternative 15)		
<b>Description:</b>	Establish a RNAV SID for all Runway 4R turbojet aircraft. Develop appropriate RNAV procedures/waypoints to route aircraft over the causeway north of Nahant and south of Swampscott, then east over water. For shoreline crossings (northwest, northeast, west and south departure flows), design an RNAV route that provides the maximum altitude possible when crossing the shoreline, provide dispersion where possible, and cross over non noise-sensitive areas if able.  Design a conventional procedure (vector-based) to approximate the published RNAV SID to accommodate non-RNAV aircraft.		



**Alternative 2/Alternative 14/Alternative 15: Procedure Summary**

<b>Type</b>	<b>Arrival:</b> <input type="checkbox"/>	<b>Departure:</b> <input checked="" type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	<b>09</b>		
<b>Intent:</b>	The intent of this alternative is to increase shoreline crossing altitudes over the South Shore and the North Shore when departing from Runway 09 (Alternative 2/Alternative 14 combined). This procedure also includes an RNAV route to keep southbound departures east of Minot's Light prior to crossing the shoreline (Alternative 15)		
<b>Description:</b>	Establish a RNAV SID for all Runway 09 turbojet aircraft. Develop appropriate RNAV procedures/waypoints to route aircraft over the shoreline (for northwest, northeast, west and south departure flows that provides the maximum altitude possible when crossing the shoreline, provide dispersion where possible, and cross over non noise-sensitive areas if able.  Design a conventional procedure (vector-based) to approximate the published RNAV SID to accommodate non-RNAV aircraft.		

**Alternative 3/Alternative 14/Alternative 15: Procedure Summary**

<b>Type</b>	<b>Arrival:</b> <input type="checkbox"/>	<b>Departure:</b> <input checked="" type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	<b>15R</b>		
<b>Intent:</b>	The intent of this alternative is to avoid overflights of the Hull peninsula (Alternative 3) and to increase shoreline crossing altitudes (Alternative 14). This procedure also includes an RNAV route to keep southbound departures east of Minot's Light prior to crossing the shoreline (Alternative 15).		
<b>Description:</b>	Establish a RNAV SID for all Runway 15R turbojet aircraft that keep traffic north of Hull. Develop appropriate RNAV procedures/waypoints to route aircraft over the shoreline (for northwest, northeast, west and south departure flows that provides the maximum altitude possible when crossing the shoreline, provide dispersion where possible, and cross over non noise-sensitive areas if able.  Design a conventional procedure (vector-based) to approximate the published RNAV SID to accommodate non-RNAV aircraft.		



### **Alternative 5/Alternative 14/Alternative 15: Procedure Summary**

<b>Type</b>	<b>Arrival:</b> <input type="checkbox"/>	<b>Departure:</b> <input checked="" type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	<b>22L/22R</b>		
<b>Intent:</b>	The intent of this alternative is to avoid overflights of the Hull peninsula (Alternative 5) and to increase shore-crossing altitudes. (Alternative 14). This procedure also includes an RNAV route to keep southbound departures east of Minot's Light prior to crossing the shoreline (Alternative 15).		
<b>Description:</b>	Establish a RNAV SID for all Runway 22L/22R turbojet aircraft that keep traffic north of Hull. Develop appropriate RNAV procedures/waypoints to route aircraft over the shoreline (for northwest, northeast, west and south departure flows that provides the maximum altitude possible when crossing the shoreline, provide dispersion where possible, and cross over non noise-sensitive areas if able.  Design a conventional procedure (vector-based) to approximate the published RNAV SID to accommodate non-RNAV aircraft.		

### **Alternative 6: Procedure Summary**

<b>Type</b>	<b>Arrival:</b> <input checked="" type="checkbox"/>	<b>Departure:</b> <input type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	<b>22L Arrivals from the South/Southwest (NORWICH arrivals)</b>		
<b>Intent:</b>	The intent of this alternative is to reduce noise for the communities under the downwind to Runway 22L south of the Airport.		
<b>Description:</b>	Modify existing standard arrival procedure (NORWICH STAR) by extending the STAR from the INNDY intersection to the DRUNK intersection (located about 25 nautical miles southeast of the Airport near the shoreline in Marshfield). Aircraft to cross the DRUNK intersection at or above 6,000 MSL and vectored towards the TONNI intersection (located about 17 nautical miles east of the Airport over the Atlantic). Pilots are to expect RADAR vectors after TONNI intersection to the final approach course.		



### **Alternative 7: Procedure Summary**

<b>Type</b>	<b>Arrival:</b> <input checked="" type="checkbox"/>	<b>Departure:</b> <input type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	<b>27 Arrivals from the South/Southwest (NORWICH arrivals)</b>		
<b>Intent:</b>	The intent of this alternative is to reduce noise for the South Shore communities.		
<b>Description:</b>	Modify existing standard arrival procedure (NORWICH STAR) by extending the STAR from the INNDY intersection to the DRUNK intersection (located about 25 nautical miles southeast of the Airport near the shoreline in Marshfield). Aircraft to cross the DRUNK intersection at or above 6,000 MSL and vectored to the final approach course.		

### **Alternative 8: Procedure Summary**

<b>Type</b>	<b>Arrival:</b> <input checked="" type="checkbox"/>	<b>Departure:</b> <input type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	<b>15R Left Downwind Arrivals</b>		
<b>Intent:</b>	The intent of this alternative is to narrow Runway 15R left downwind arrival dispersion between Winthrop and Nahant.		
<b>Description:</b>	This alternative will involve a RNAV procedure that will narrow flight track dispersion along the existing left downwind pattern for Runway 15R. The procedure will be an overlay of the existing traffic along the left downwind, but involves a fix between Winthrop and Nahant.		

### **Alternative 9: Procedure Summary**

<b>Type</b>	<b>Arrival:</b> <input checked="" type="checkbox"/>	<b>Departure:</b> <input type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	<b>04L/04R Left Downwind Arrivals</b>		
<b>Intent:</b>	The intent of this alternative is to provide more balance of left and right downwind traffic for Runways 4R and 4L to provide more equitable noise distribution.		
<b>Description:</b>	Provide access to both Large Jet Aircraft (above 75,000 lbs Maximum Takeoff Weight) and Non-Large Jet Aircraft (less than 75,000 lbs Maximum Takeoff Weight) to left downwind to 4R/L. It involves a modification to the existing SOP to allow any aircraft to use the left downwind approach and will follow a similar left downwind pattern utilized by regional jets for Runways 4L/4R.		



### **Alternative 11: Procedure Summary**

<b>Type</b>	<b>Arrival:</b> <input checked="" type="checkbox"/>	<b>Departure:</b> <input type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	<b>33L Charted Visual Approach</b>		
<b>Intent:</b>	The intent of this alternative is avoid/minimize noise to South Shore communities.		
<b>Description:</b>	This alternative is a charted visual approach to Runway 33L for aircraft using traditional navigation augmented by GPS waypoints, which may also be coded into an FMS database. Visual landmarks will be charted to assist pilots in navigating the procedure.		

### **Alternative 12: Procedure Summary**

<b>Type</b>	<b>Arrival:</b> <input checked="" type="checkbox"/>	<b>Departure:</b> <input type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	<b>Intercept Glide Slope at 4,000 ft MSL (Runway 04L/R, 22L/R and 33L)</b>		
<b>Intent:</b>	Reduce late night noise impacts to communities located near the Airport that are impacted turbojet arrivals turning from base leg to final approach to runways 4L/4R, 22L and 33L.		
<b>Description:</b>	Final descent altitude prior to intercepting the glide slope would be 4,000 ft. Intercept is approximately 12 NM from the runway for the purposes of this alternative.		

### **Alternative 13: Procedure Summary**

<b>Type</b>	<b>Arrival:</b> <input type="checkbox"/>	<b>Departure:</b> <input checked="" type="checkbox"/>	<b>Other:</b> <input type="checkbox"/>
<b>Runway(s):</b>	<b>Late Night Propeller Departures from Runway 22L/R and 15R</b>		
<b>Intent:</b>	The intent of this alternative is to minimize noise to close-in communities.		
<b>Description:</b>	This alternative involves routing late night propeller departures along the same nighttime procedures for jet aircraft. This alternative involves a modification to the existing SOP to direct Runway 22L/R and 15R propeller departures along the late night jet departure headings within the Class B airspace. It will apply only to aircraft under radar control.		



## 2. Early Implementation Alternative Analysis

### Task 7 – Alternative Analysis

- The PC/IC continues to conduct a regularly scheduled weekly teleconference to review progress, identify and resolve problem areas.
  
- **Summary: The Early Implementation Alternative definitions, except for Alternative 11, are now complete and are now in noise analysis.**
  
- **Alternative 1, 2, 3, 5, 14 and 15:**
  - Procedural design completed for Runway 04R, Runway 09, and Runway 15R RNAV and Runway 04R, Runway 09, Runway 15R and Runway 22L/R Conventional departures (Alternative 1, 2, 3, 14 and 15). Procedure corridors were presented to BOS/TAC February 17<sup>th</sup>. BOS/TAC directed PC to proceed to noise analysis for these alternatives. A synopsis of all of the results, including noise, is expected to be available no later than May 31<sup>st</sup> for review.
  - Alternative corridors have been forwarded to Wyle for noise analysis.
  - Additional considerations:
    - Runway 22L/22R RNAV Departure (Alternative 5): PC conducted a final assessment of this RNAV alternative. The main issue addressed was the lateral separation requirement between the eastbound portion of the RNAV and Runway 27 final approach. A memorandum summarizing the final design was submitted to BOS/TAC for review March 20<sup>th</sup> (**see Attachment 1**). A BOS/TAC teleconference meeting was held March 30<sup>th</sup> to discuss the content and provide PC direction. BOS/TAC instructed PC to proceed with noise analysis. Teleconference meeting notes were developed (**see Attachment 2**). **Exhibit 1** illustrates the additional elements added to the RNAV procedure. The waypoint locations are identical to the procedure presented on February 17<sup>th</sup>. The altitude requirements stated for Runway 27 arrivals and Runway 22L/22R departures is an additional component to the final design.
    - Runway 22L/22R RNAV Northwest Departure (Alternative 5/14): Per BOS/TAC direction, PC has completed a design to split Runway 09 and Runway 22L/22R shoreline crossing locations along the northwest corridor. **Exhibit 2** shows a TARGETS (FAA's RNAV design tool) illustration of the updated northwest RNAV routes for Runways 04R, 09, 15R and 22L/22R. The purpose for this change was to disperse Runway 09 and Runway 22L/R departures when crossing over the shore towards the northwest. The Acrobat illustrations will be updated to reflect the change.



- PC began noise analysis on Runway 22L/22R RNAV design. A synopsis of all of the results, including noise, is expected to be available no later than May 31<sup>st</sup> for review.

➤ **Alternative 6, 7, 9 and 12:**

- Norwich Arrival to Runway 22L/R (Alternative 6) and Norwich Arrival Runway 27 (Alternative 7) designs and operational analysis are completed. BOS/TAC reviewed the designs and directed PC to continue with noise analysis. A synopsis of all of the results, including noise, is expected to be available no later than May 31<sup>st</sup> for review.
- Norwich RNAV Arrival to Runway 15R (left downwind only) (Alternative 8) design and operational impact analysis is complete. PC has proceeded to noise analysis. A synopsis of all of the results, including noise, is expected to be available no later than May 31<sup>st</sup> for review.
- Runway 04L/04R Left Downwind Arrival (Alternative 9) design is complete. PC re-assessed route and runway utilization according to further direction provided by the FAA at the February 17<sup>th</sup> BOS/TAC meeting. Utilization assumptions were updated and reviewed by the FAA. It will be used as part of the noise analysis. A synopsis of all of the results, including noise, is expected to be available no later than May 31<sup>st</sup> for review.
- Runway 04L/04R, Runway 22L and Runway 33L Approach intercept at 4,000 ft MSL (Alternative 11) designs and operations impact are completed. BOS/TAC directed PC to proceed to noise analysis. A synopsis of all of the results, including noise, is expected to be available no later than May 31<sup>st</sup> for review.

➤ **Alternative 11(Runway 33L Offset Visual Approach):**

- PC completed a visual survey for key landmarks that may be utilized by pilots.
- PC completed a prototype of the visual approach.
- PC requested Northwest Airlines, JetBlue, Continental Airlines and United Airlines to assess the procedure for flyability. All four airlines stated their willingness to assess the procedure and were provided a copy of the procedure. PC is awaiting their feedback.
- After airline feedback is received, PC will submit procedure to FAA for review. As soon as FAA review is complete, PC will assess operational impacts and quantify expected utilization of the procedure.
- Noise analysis is expected to begin no later than May 12<sup>th</sup>. A synopsis of all of the results, including noise, is expected to be available no later than May 31<sup>st</sup> for review.



- **Alternative 13 (Runway 15R and 22L/22R Late Night Propeller Departures):**
  - Design of Alternative 13 (Props on jet routes during late night hours) is complete.
  - FAA completed safety and operational review of Option 1 and 2 for Alternative 13. Option 1 presented no issues.
  - BOS/TAC directed PC to continue with noise analysis associated with Alternative 13 Option 1. A synopsis of all of the results, including noise, is expected to be available no later than May 31<sup>st</sup> for review.

### **Task 10 – Phase 2 Scope of Work Development**

- PC and IC completed a preliminary draft of Phase 2 Scope of Work.
- A full copy of the preliminary scope was sent to the FAA April 11<sup>th</sup>.
- A full copy of the preliminary scope was distributed to BOS/TAC by the FAA April 19<sup>th</sup> via email. FAA will also distribute a copy to CAC for review.
- Phase 2 SOW review and comment procedures are currently being developed and will be distributed to BOS/TAC and CAC members.

### **3. BOS/TAC Meeting(s)**

- A meeting was held February 17<sup>th</sup>, 2006. Meeting minutes are attached to this status report (**see Attachment 3**).
- A teleconference meeting was held March 30<sup>th</sup>, 2006. Meeting notes are attached to this status report.
- Two BOS/TAC meetings are scheduled for June 7<sup>th</sup> and June 8<sup>th</sup>.
  - June 7<sup>th</sup> Meeting:
    - Topic: Phase 1 Alternative Analysis Synopsis Review and Implementation Decision
    - Objective: for BOS/TAC to reach a decision on which alternatives should proceed to implementation. The meeting discussion will include any outstanding comments associated with each alternative and the results provided in each synopsis. All of which will be made available to BOS/TAC members no later than May 31<sup>st</sup>. PC assumes that BOS/TAC will receive synopsis as they become available. All synopses will be provided by May 31<sup>st</sup>. PC will be prepared to respond to any comments or concerns that arise before the June 7<sup>th</sup> meeting. PC also assumes that CAC and IC will discuss any concerns. Any items that need further clarification would be forwarded to PC either from IC or CAC BOS/TAC members.
  - June 8<sup>th</sup> Meeting:
    - Topic: Phase 2 Scope of Work Comment and Review
    - Objective: For BOS/TAC members to provide comments and concerns associated with the Phase 2 Scope of Work. BOS/TAC received a copy of the preliminary SOW April 19<sup>th</sup> for review and



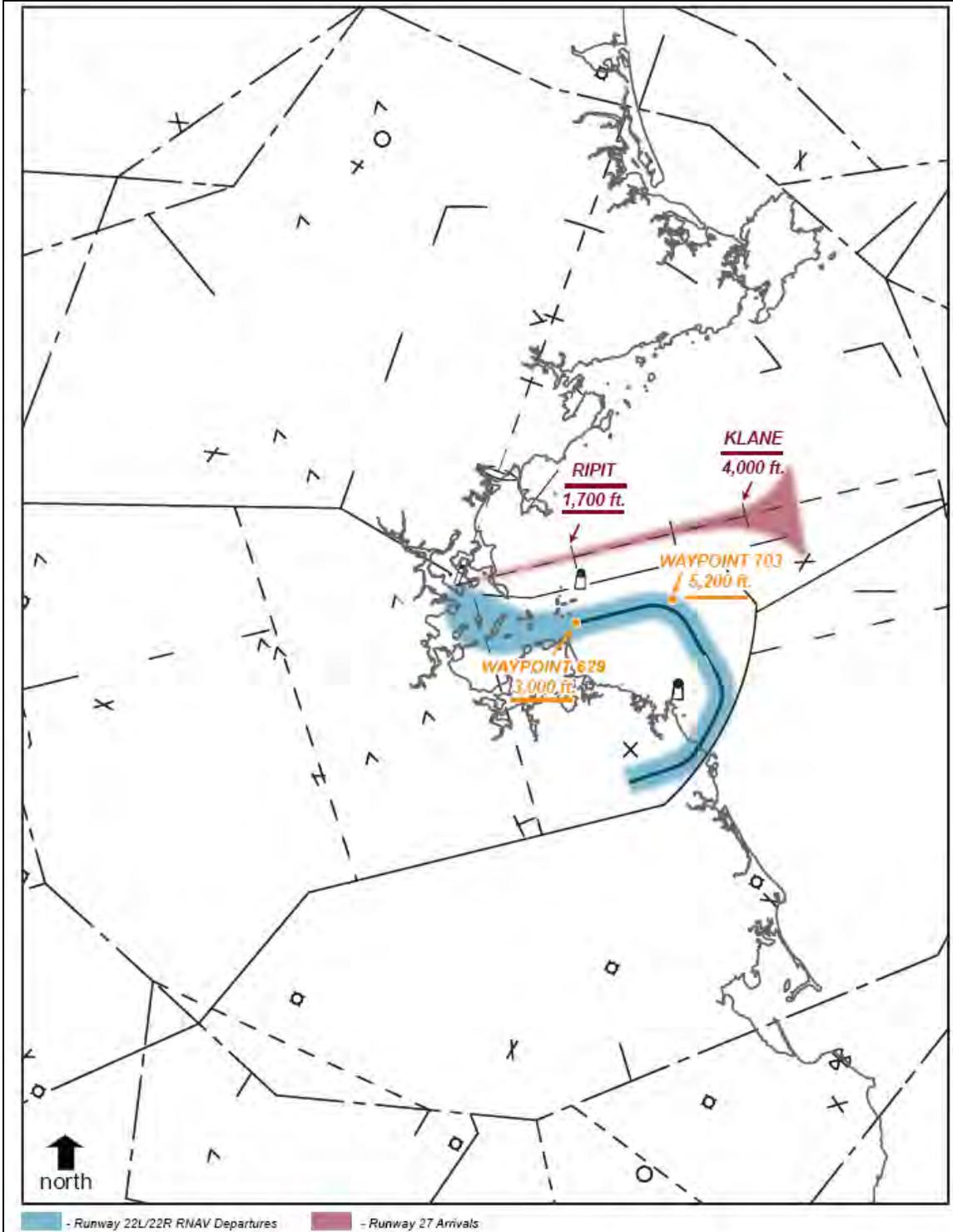
comment. CAC will also receive a copy as soon as FAA receives a CAC distribution list. Comments from BOS/TAC and CAC members will be accepted and appropriate responses in writing will be provided. The expectation is that most comments and/or concerns are addressed prior to the June 8<sup>th</sup> meeting. Any remaining comments and concerns will be addressed and resolved during the June 8<sup>th</sup> meeting.

#### **4. CAC Meeting(s)**

- Evening of June 8<sup>th</sup>: CAC Meeting
  - Topic: Approval of BOS/TAC Decision on Early Implementation Alternative Implementations
  - Objective: For CAC to approve (via a vote) the Early Implementation Alternatives that BOS/TAC decided to proceed with implementation. PC assumes that the full CAC will be provided material associated with each alternative and synopsis as they become available.

**Exhibit 1**

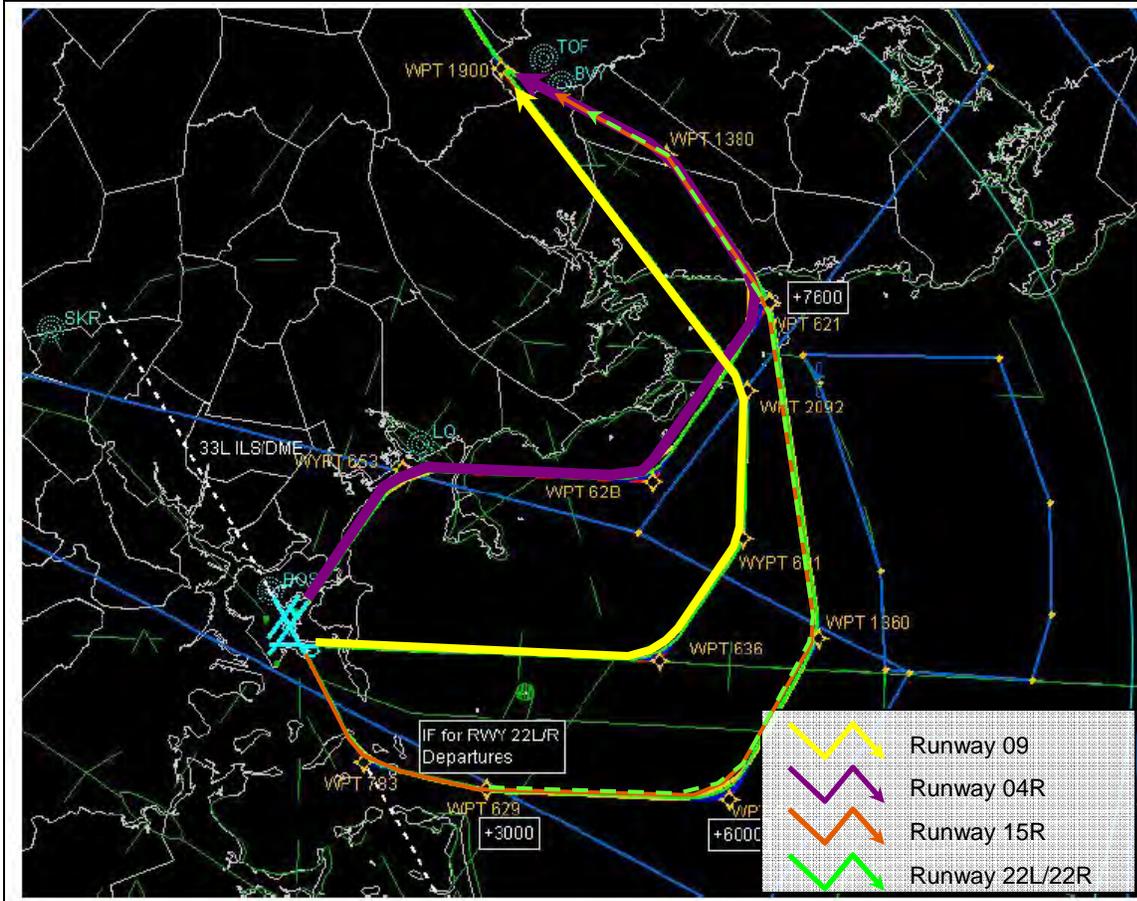
Alternative 5 RNAV Procedure Update (Depicts Westflow only)



Note: Altitude requirements are applicable to all Runway 22L/22R RNAV procedures.

**Exhibit 2**

TARGETS Illustration Northwest RNAV Design Update





## **Attachment 1**



MEMORANDUM

VIA E-MAIL

Date: March 20, 2006  
To: Boston Technical Advisory Committee (BOS/TAC)  
From: Project Consultant (PC) \_\_\_\_\_  
Subject: Alternative 5 – Runway 22R/L RNAV Departures

At the February 17, 2006 BOS/TAC meeting several issues were raised concerning the proposed Runway 22R/L RNAV Departure procedure as presented to the Committee. The BOS/TAC agreed that the PC would review the procedural design in an attempt to resolve these issues. The PC has completed this additional work in conjunction with the IC and with input from the FAA and the CAC representative from Hull. The revised procedure presented in this memo represents the best possible RNAV procedure to meet the intent of this alternative. The intent of this procedure is to avoid, to the extent practicable, overflights of the Hull peninsula (Alternative 5) and to increase shore-crossing altitudes (Alternative 14). This procedure also includes an RNAV route to keep southbound departures east of Minot's Light prior to crossing the shoreline (Alternative 15). The description of this alternative is an RNAV Standard Instrument Departure procedure for all Runway 22L/22R turbojet aircraft that keep traffic north of Hull, route aircraft over the shoreline (for northwest, northeast, west and south departure flows that provides the maximum altitude possible when crossing the shoreline, provide dispersion where possible over the shoreline, and cross over non noise-sensitive areas if able.

The PC is presenting this revised Alternative 5 and request BOS/TAC direction as to whether this alternative should be (1) advanced to noise analysis or (2) not to be advanced to noise analysis (in Phase 1). **We will be holding a web conference call at 10:00 a.m. Eastern Time on Thursday, March 30<sup>th</sup>, 2006 (see call-in instructions in email).** If you are unable to attend this conference call, you may submit your input (including recommendation) via email to Greg Wellman at [gwellman@ricondo.com](mailto:gwellman@ricondo.com) by end of day on Tuesday, March 28<sup>th</sup>, 2006, in order to have you input included in the conference call. The remainder of this memo provides a summary of the follow-up activity on this issue since the February BOS/TAC meeting and the PC recommended Alternative 5 definition.

\* \* \* \* \*

The following issues were raised at the February 17<sup>th</sup> BOS/TAC meeting:

- 1) The FAA stated that the procedure had been properly developed within the criteria established to meet the intent of this Alternative. However, the FAA pointed out that



MEMORANDUM  
BOS/TAC Members  
March 20, 2006  
Page 2

this procedure relies on pilot navigation to ensure separation from opposite direction arriving and departing aircraft. As such, two things may happen in the 18-step development process:

- The present lateral distance from the Runway 27 final approach course may be increased to account for dispersion to the north of the RNAV course.
  - The procedure may not pass the safety analysis that Air Traffic is required to conduct in accordance with the FAA Safety Management Systems (SMS) program because it deals with opposite direction traffic requiring precise pilot navigation to ensure separation.
- 2) The Community Advisory Committee (CAC) representative from Hull expressed concerns that the procedure may expose the northern Hull Peninsula to more noise impacts. This may occur due to the reduction in dispersion that will occur through the use of an RNAV procedure compared to existing dispersion north of Hull. In addition, he believed that the procedure would in fact be moved further south as a result of the required safety assessment, further exacerbating the potential noise impacts.

BOS/TAC agreed that the PC would review the procedural design in an attempt to meet the FAA's requirements and conduct a telephone conference on February 22, 2006 with the IC and the Town of Hull representative to discuss the results of the review. The following information was provided on this conference call:

- 1) The initial waypoint may be moved 0.2 Nautical Miles (NM) south and still meet the east end (shoreline crossing) criteria to remain inside the existing TRACON and Center boundaries. However, this will not resolve the Town of Hull's concerns and will trigger additional RNAV design issues, including a turn radius above the recommended 70 degrees, and a reduced average shoreline crossing altitude (by approximately 900 ft less than previously planned average which is at 13,000 ft Mean Sea Level or MSL).
- 2) The procedure cannot be re-designed to meet the FAA's stated lateral separation requirements of 4.12 NM between the Runway 27 final approach course and RNAV center line (3.5 NM from expected edge of the corridor), and remain within the agreed upon criteria to remain within the TRACON and Center boundaries. When aircraft turn back towards the west, they are directed to a specific BOS Center sector (west of the TRACON departure sector). This BOS Center sector is responsible for the safe and expeditious movement of westbound aircraft transitioning from the terminal area to enroute. The RNAV design criteria does not allow for a sharper turn to the west in order to transition into the responsible BOS Center sector, which would



MEMORANDUM  
BOS/TAC Members  
March 20, 2006  
Page 3

be needed if the procedure required a 4.12 NM lateral separation between Runway 27 final approach and the RNAV centerline. In addition, the RNAV route cannot be designed within the existing TRACON departure sector.

In an attempt to meet the intent as much as practicable for this Alternative the PC proposes the following plan of action.

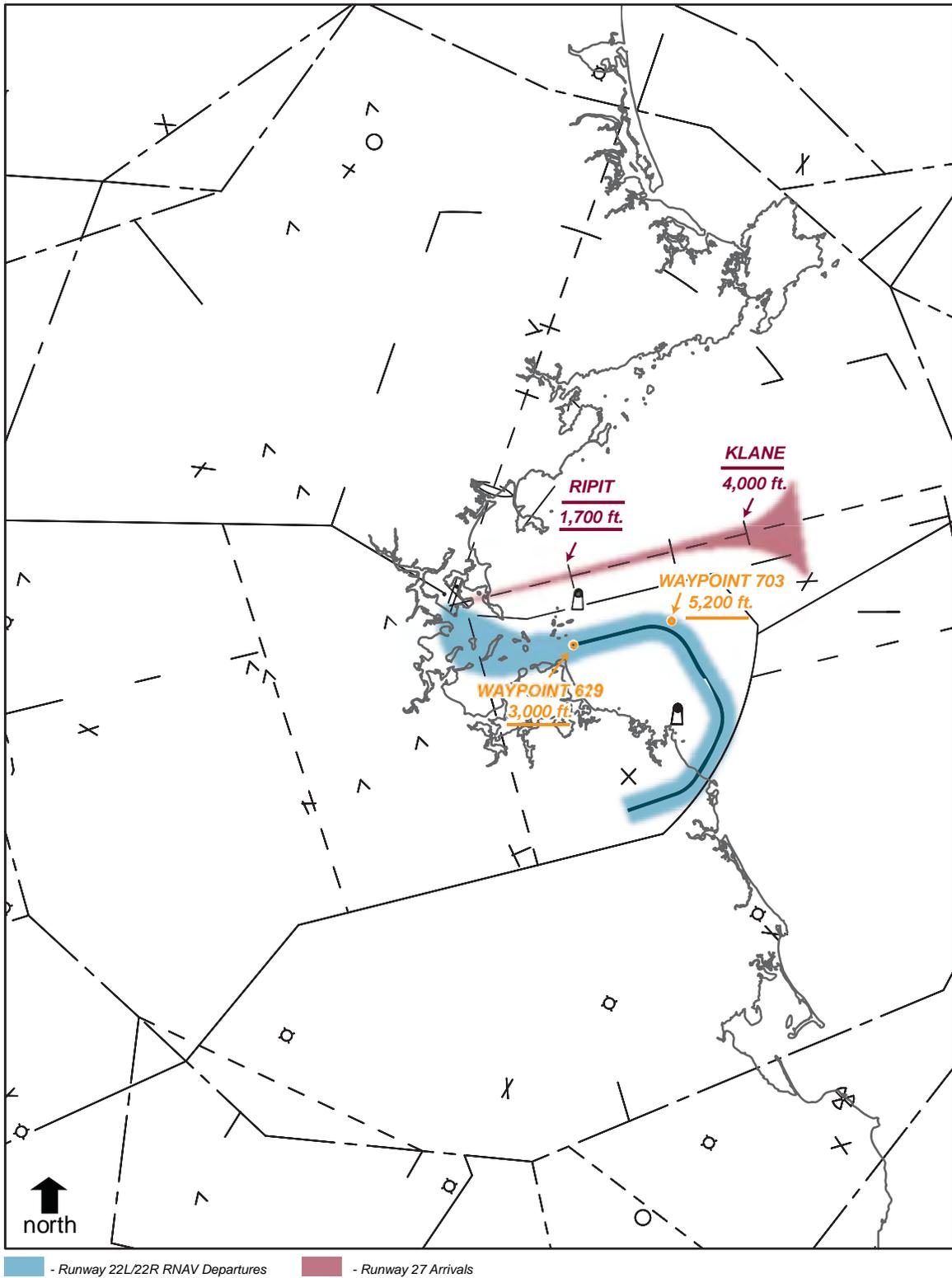
- 1) The PC will develop the original Alternative 5, as presented on February 17<sup>th</sup>, with required altitude crossings for departure aircraft. As shown in the attached exhibit, departure aircraft will cross Waypoint 629 (located 6.3 NM from the end of Runway 22L, approximately 7NM travel distance (latitude: 42° 19' 21.12"/longitude: 70° 52' 30.63")) at or above 3,000 ft. MSL, and Waypoint 703 (latitude: 42° 20' 31.05"/longitude: 70° 45' 53.99") at or above 5,200 ft. MSL. Arrival aircraft will normally be at or below 4,000 ft. MSL turning to the final approach course, and will be required to cross the RIPIT intersection at 1,700 ft. MSL on the approach to Runway 27. This will procedurally provide the required FAA altitude separation of 1,000 ft. MSL between the arrival and departure aircraft while using this procedure. Though there is no known FAA criteria to support the concept of including altitude separation for this procedure, we believe that the 3.4 NM lateral separation from the Runway 27 final approach course that our design provides, in conjunction with the altitude separation provided, would make this alternative design a better candidate to be evaluated in the FAA's 18-step process compared to the original presented February 17<sup>th</sup> at the BOS/TAC meeting.
- 2) The vector to a fix RNAV design that we propose is based on new criteria developed within the last year. It is subject to interpretation and change, based on discussions with Flight Standards (AFS 420) personnel. The variables that dictate dispersion along the vectored pattern are the same for existing conditions. Controllers will issue a heading to waypoint 629 when radar contact is established and separation is established. Due to weather conditions, piloting and the time when the controller issues the heading, the point at which the turn is conducted is expected to vary. Therefore, PC assumed that the southern dispersion in this first segment of the departure procedure will be similar to existing conditions, but the dispersion on the north side of the corridor will be reduced as the aircraft will be heading towards waypoint 629. The waypoint is a fly-by waypoint, which does not require the aircraft to fly directly over the waypoint. The PC is predicting that traffic will be within the RNAV corridor just after passing waypoint 629. Prior to waypoint 629, in the vector to a fix segment, the dispersion may be narrower than the PC has predicted, but there is no objective means to justify a narrower dispersion at this time for BOS traffic conditions. Therefore, PC has decided to use a wider dispersion to be more



MEMORANDUM  
BOS/TAC Members  
March 20, 2006  
Page 4

conservative noise analysis. The PC recommends this conservative estimate of dispersion, as the vector to RNAV criteria is new.

The proposed design refinements represent the best possible design based on the facts and professional opinion of the PC as well as input from the IC and FAA. We propose that the BOS/TAC review this design for Alternative 5 and decide whether it should be forwarded to the noise analysis. The difference between this design and the one proposed on February 17<sup>th</sup> is its interdependency on the proposed altitude requirements for both the Runway 22L/R departure and Runway 27 final approach procedures. If this design does not meet FAA's safety and risk assessment criteria (as part of the 18-step process) then we believe there are no further options available to meet the intent of this Alternative using RNAV procedures.



Prepared by: Ricondo & Associates, Inc.

Exhibit 1



## Alternative 5 RNAV Procedure with Required Altitude Crossings



## **Attachment 2**

**Boston Overflight Noise Study (BONS)  
BOS/TAC Meeting**

**MEETING SUMMARY**

March 30, 2006

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**Attendance:**

**BOS/TAC Members:**

Joseph Davies (FAA Air Traffic), Joseph Bellabona (FAA), Gail Lattrell (FAA Airports), Flavio Leo (Massport), Steve Kelley (FAA), Steve Lathrop (Hull), Maura Zlody (Boston Environmental Department), Sandra Kunz (Braintree), Bob D'Amico (City of Boston Mayor's Office), Jerry Falbo (Winthrop), Ron Fama (Weymouth)

**Project Consultant (PC) Team:**

Greg Wellman (Ricondo & Associates, Inc.), Dennis Burke (Ricondo & Associates, Inc.), Stephen Smith (Ricondo & Associates, Inc.), Robert Varani (ASRC Aerospace), Scott Hamwey (Planners Collaborative)

**Independent Consultant (IC) Team:**

Jon Woodward (Landrum & Brown, Inc.), Bud Riebel (Landrum & Brown, Inc.), Rob Adams (Landrum & Brown)

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**1. Introductions**

Greg Wellman started the conference call by taking a roll call and then introduced the format. He explained that there were two hours budgeted for the call and that the primary topic would be Alternative 5. At the February meeting, Alternative 5 had been set aside for further discussion, and a memo had been distributed on March 20 that presented the PC's, IC's and FAA's attempt at a revised design for the alternative. The purpose of this call is to review that revised design and determine if the BOSTAC wished to carry the alternative forward. G. Wellman added that if time allowed they could attempt to cover some outstanding issues surrounding Alternative 12.

**2. Alternative 5**

Steve Smith explained that at the February meeting, the PC presented what it believes was the best available design based on airspace and design, and one that met the intent of procedure. The issue that was raised at the meeting was the location of waypoint 629, and its viability in terms of separation from 27 arrivals and its relationship to northern tip of Hull. Steve Lathrop had inquired as to what waypoint 629's impact was given the 3.5 mile lateral separation with the approach to 27. Robb Varani's findings had been that the waypoint could only be moved 0.2 nautical miles to the south without impacting the remaining elements of the design. Anything more than 0.2 would put the waypoint outside the departure sector and impact TRACON to Center transition. The PC still had concerns that even moving the waypoint 0.2 miles would not meet the FAA's desired 3.5 nautical miles between the center of 22 RNAV and center of 27's approach.

S. Lathrop said that he was confused. He said the memo stated that the procedure cannot be redesigned to meet FAA separation requirements, but then R. Varani had referred to the 3.5 mile separation. S. Smith replied that FAA was concerned about the center line. He explained that there is a 0.6 nautical mile width on either side of the center line. S. Lathrop asked if there was an expectation that the northern edge of the dispersion corridor would be 3.5 miles to the north if flights meet standards. S. Smith corrected his statement that the 3.5 mile separation starts from the northern edge of the RNAV procedure as discussed at the February 17<sup>th</sup> meeting. S. Lathrop suggested that there was agreement that this is a requirement. Dennis Burke replied that they were looking at it from the point of view of trying to get 3.5 miles of lateral separation. The refinement proposed by PC incorporates a vertical separation as well as staying 1.5 miles south of the departure sector line that separates Runway 27 arrivals from Runway 22 departures. The PC believes this is practical depending on how the procedure comes out of FAA's 18-step process. There was uncertainty due to the fact that this will be one of the first procedures of this kind to be reviewed. D. Burke suggested that, in the PC's opinion, this is on the only opportunity to put an RNAV procedure for runway 22 into the 18-step process with a chance to come out on the other side as an approved procedure. It can't be moved north because of 27 and it can't be moved south because it will go against the goal of reducing flight tracks over Hull. As a result, as per the March 20<sup>th</sup> memo, the PC is recommending that this procedure go into noise analysis.

Ron Fama stated that Weymouth has a serious problem with 140 degrees instead of 100. He said that 140 degree heading brings flights over Weymouth. He suggested that people were being protected from noise who were much further from the airport than Weymouth. R. Fama said that Weymouth is the most overflowed community in New England and requested that his dissent be noted as well as his citing of the federal court order and the record of decision. He also inquired as to whether Swampscott or Lynn receives any problems currently. Flavio Leo stated that both communities do get overflights, but discussions associated with these areas do not pertain the agenda item for this meeting. He did say that its highly unlikely that Massport would receive complaints on 22 departures from those communities. G. Wellman asked that the group restrict discussion to this alternative and procedure.

S. Lathrop asked when pilots would begin RNAV—at the first waypoint or earlier. D. Burke replied that the plane comes off on a 140 heading, and the controller will tell them to turn left to waypoint 629 ("cleared direct to the RNAV departure) and then the pilot would engage the RNAV portion of the procedure. S. Smith asked what the controller would need to know before releasing the pilot direct. D. Burke said that the controller needs to confirm radar contact. He added that weather information would also be a deciding factor. He estimated that this may occur somewhere between 2 to 2.5 miles from the end of the runway, but will vary from one operation to another. R. Varani added that pilot navigation begins at the end of the runway. S. Lathrop asked if pilot nav was the same as RNAV. Joe Bellabona said that they were different. Pilot navigation is a term for the pilot controlling aircraft movement by actively participating in rudder, aileron, elevator or thrust application(s).

S. Lathrop asked J. Bellabona about the point at which the pilot would engage RNAV. J. Bellabona replied that there had been no modeling done yet and that it would need to be simulated first. He said that all pilots will engage RNAV at different times. When they are told to go direct to fix, the pilot will engage their navigation system to go direct to fix. J. Bellabona explained that some are more aggressive than others. Up to that point, pilot nav is the same as you have today. When the flight management system is engaged, the pilot is no longer navigating the aircraft. The flight management system is. He said there would be pilot variances on making that turn. He added that the only thing guaranteed is that after waypoint 629 the aircraft will be on RNAV track.

S. Lathrop asked for clarification on pilot nav. J. Bellabona explained that the pilot is holding the wheel and flying the aircraft. Once the pilot engages lateral navigation and couples to the autopilot, then the autopilot is flying the aircraft. The pilot will engage LNAV when he is told to fly direct to that fix. J. Bellabona explained that this meant the pilot will engage it before that fix. He added that it would not be guaranteed that any track from end of the runway to waypoint 629 would avoid Hull.

S. Lathrop asked if it would be reasonable that the pilot nav would turn the plane away from 140 and towards to 629 at about the same point where this occurs presently. D. Burke replied that the answer is yes, PC expects that it will be close to the same. S. Lathrop asked if that meant that they could do an analysis on where those instructions are typically being issued now. S. Smith explained that such an analysis is not included in Phase I. The analysis involves collecting audio tapes of controller-pilot communication while simultaneously viewing radar data. Phase 1 budget does not include the level of analysis suggested here. S. Smith said that if there are any issues with this procedure, the 18-step process is designed to identify and assess them. What has been done already is sufficient to get into the 18-step process.

Bob D'Amico asked if the northbound turn would take place at waypoint 703. R. Varani replied that he thinks it will be a little farther east in order to get them above the 27 arrivals.

S. Lathrop said that the inability to know where the turn from course to 140 takes place introduces uncertainty. He pointed out that some of radar tracks don't seem to have flown a 140 heading for any length of time after takeoff, and suggested that factoring that into this analysis confuses the issue. J. Bellabona said that those tracks are normally used as a guide. He said that if you're looking at the data sent out, the line in the center is the one they are shooting for, and that once you are on that RNAV track, you will tend to be established on that track on the centerline. S. Smith said that they are depicting the situation as best as they can with the current available information.

S. Lathrop asked if the plane will be on the centerline after it hits 629. J. Bellabona replied that this was correct. S. Lathrop asked where the plane would be before that. J. Bellabona explained the switch to LNAV, saying that there is nothing that can be considered typical from the end of the runway to 629. S. Lathrop asked why there was a drawing, and if someone engages LNAV from the end of the runway whether the typical performance would change. J. Bellabona replied that they wouldn't know until it is modeled. He added that he is confident that nothing will change with this procedure on the northern tip of the Hull peninsula, but that he also doesn't think it will make anything worse. S. Smith stated that this conclusion should not be made until after noise modeling is completed.

G. Wellman interrupted the discussion and requested that conference call participants give each other an opportunity to speak. Before moving on he asked S. Lathrop for one final comment.

S. Lathrop said that the group is receiving professional opinion about what is going to happen, but that it is accompanied by descriptions of several factors that might affect the outcomes. He used the timing of LNAV engagement as an example, to which R. Varani clarified due to some misinterpretation. F. Leo said that he had always envisioned that once you use an RNAV on this procedure that you would get the same splay, just narrower. He asked if it was a realistic concern that, in addition to the narrower splay, that you could get a shifting of the splay as well. R. Varani replied that they do not know how the controllers are going to handle this, but that they can include a preferred vector.

J. Bellabona said that he never said the splay would shift further south. He said that there would be no difference from what you have today.

S. Lathrop asked if LNAV was software. J. Bellabona explained that it was a combination of hardware and software. S. Lathrop said that since there will be software in the equation, and the software will have something to say about how to fly that particular plane, then the outcomes will depend on discussions between FAA and software developers. He asked who would develop it. J. Bellabona replied that there are multiple developers. S. Lathrop suggested that it would be reasonable to assume that the developers would do as much as they can to match the FAA procedures. J. Bellabona said that they do it to a national safety standard. Procedures are not designed for noise abatement but for safety and efficiency. Then noise abatement is applied to the procedures.

Steve Kelley said that he didn't understand the thrust of the question, but that he thought J. Bellabona had done a great job of explaining how this works and what the potential benefits are. He agreed that there are a lot of variables and unknowns between takeoff and RNAV. S. Lathrop said that he knows there will be a lot of variables, and that he's asking if the software and procedural requirement are going to interact in a way such that airplanes are going to try to observe FAA's separation

requirements as close as possible. S. Kelley replied no, that the software does not know or care about FAA's separation requirements.

S. Lathrop asked if the software designer knows that there is a procedure that takes the plane into the separation zone, can it be rewritten so that it flies south of the centerline in order to increase safety. R. Varani replied that the software had already been written. When the procedure is developed, all that gets loaded is data on the procedure. The software is programmed to follow the procedure as designed. All elements that involve safety, such as separation, are accounted for during the procedure design.

R. Fama said that they could not look at safety and ignore the welfare of 60,000 people on the ground. He stated millions had been spent on noise abatement and yet the safety standards are rubber stamped. R. Fama suggested that this was backwards and a return to 1950s thinking. He said that he refuses to accept it and requested that the record reflect this.

S. Kelly said he understood the sensitivity, but that the bottom line is that the technical efforts involved in the design of this procedure meet the needs of this process. He said that it is not possible to give a guarantee and that they are up against a brick wall if the group can't go forward without one.

Sandra Kunz said that it is more perfectly clear today that we need the noise analysis to see what this procedure gets the group. She offered strong support for going forward with the noise analysis. Maura Zlody agreed.

S. Lathrop said it was not clear to him what would happen if this goes to noise analysis. G. Wellman reviewed the process—explaining how the PC and IC would move forward with a noise analysis and then come back to the BOS/TAC with the results. The BOS/TAC would be asked to make a decision for each alternative. The BOS/TAC would take the resulting package to the full CAC, which would then recommend procedures to Massport. Those involving RNAV would go into the 18-step process.

S. Lathrop asked if a procedure can be stopped once it is in the 18-step process. J. Bellabona said that once a procedure is in the process, you can stop it, but at that point you've spent a lot of money on it. He suggested that the decision be made before the 18-step process. S. Smith added that the 18-step process includes an environmental step and J. Bellabona said that they are now required to do a safety management system analysis. Gail Lattrell said that she would put the 18 steps up on their website.

G. Wellman reminded the group that the decision today was whether they should go forward with noise analysis for Alternative 5. If consensus reflects "yes," then the PC and IC will begin the noise analysis. S. Kelly said that the noise results on Alternative 5 will be reported back at the same time as the other alternatives.

S. Lathrop said he didn't understand why they would have to move to noise analysis prior to determining what the before/after conditions were. He said that this work had been done for all other procedures under consideration. G. Wellman replied that S. Lathrop was asking for the team to come back with one of the outputs provided by INM. He said the point of having the IC is to confirm that the PC has the inputs there that are necessary for the analysis. As soon as the inputs are verified, INM runs are conducted that will produce some of the output Mr. Lathrop is interested in. G. Wellman said that the work program is based on the needs of the BOS/TAC, and if they want the PC to come back with all of the inputs to be used in the noise analysis before it is run, then that can be done.

F. Leo suggested that the consultant team be allowed to do the work and then have the discussion after its done. His recommendation is for the PC to do the noise analysis.

S. Lathrop said to assume they get the noise analysis back and there are no impacts to Hull, and benefits for everyone else, so the procedure moves into the 18-step process. He asked if there were problems at that point in the 18-step would they be allowed to stop it. G. Lattrell said that if the procedure can't meet the intent of the alternative then it will not proceed. Moving the procedure south would not result in a benefit to Hull, so it would not be considered as a modification during the 18-step process.

S. Kunz suggested that Alternative 5 should just be put into Phase II if BOS/TAC cannot come to a consensus on proceed to noise analysis. S. Lathrop said he couldn't have open discussions with consultants by himself, and that 1/3 of the time there isn't a 27 arrival to cope with; therefore does not understand why the Runway 22 departures cannot be moved further north of Hull. F. Leo said that this was not accurate and that the preponderance of those flights are Runway 22 departures while 27 arrivals are being conducted. S. Lathrop said he was not convinced of this statement.

G. Wellman asked the group if PC may go ahead with Alternative 5. S. Lathrop stated his position that it is apparent that there are no benefits from this RNAV. G. Wellman asked if there were any other comments.

Jerry Falbo asked if Jon Woodward could provide him with IC's comments on S. Lathrop's discounting of the RNAV benefits. J. Woodward stated that nearly all of the benefits can be achieved by utilizing the conventional procedure. He said that he feels the RNAV procedure may benefit Hull, and that is why he believes the group should move forward with the noise analysis.

R. Fama asked what the alternative does for Weymouth. J. Woodward stated there would be no impact. It would be the same for Weymouth as with the conventional alternative design.

G. Wellman asked if there were any concerns with proceeding with the analysis. S.

Lathrop said that given what J. Woodward had just said, he doesn't know why anyone would want to move forward with it. J. Woodward provided further clarification to S. Lathrop regarding IC's position. G. Wellman asked again for the group's consensus. Members except Ron Fama and Steve Lathrop agreed to proceed with noise analysis. Based on the general consensus, PC was instructed to proceed with noise analysis which will provide specific items S. Lathrop requested (slant range distance for two grid points for existing and alternative conditions).

### **3. Closing Remarks**

G. Wellman said that the PC will now start work on Alternative 5. He stated that work has begun on other alternatives, and PC will report back to the group on a date for a meeting to review the results.

S. Lathrop asked if closing remarks could be submitted in writing. G. Wellman said that they would absolutely be accepted.

No one offered any additional closing remarks. G. Wellman thanked everyone for their patience.

### **4. Submitted Remarks**

**Commenter: Mr. Steve Lathrop**

**Received: 4/14/06**

**Delivered to: Greg Wellman, Project Consultant**

**Format Received: email**

April 14, 2006

Greg,

This is a comment from the Town of Hull with regard to the proposed noise analysis of the departure route mitigations being considered for Phase 1 of the noise study.

There is one general comment, and a few specifics.

First, generally, the quality of the analytical process used to do a noise analysis for RNAV departures on Rwy 22 (left and right), and for Rwy 15, will depend on the creation of new objective information with regard to where airplanes navigating under RNAV procedures are expected to fly. Our telephone conference on this subject made it clear that that information does not now exist in sufficient detail to assess noise impacts in northern Hull.

The danger is that the analytical team, having begun with an assumed envelope of airspace for these flights, will simply particularize their assumption with more-or-less normally distributed flight paths, and analyze the result. If that happens, we will get a logically circular analysis, because the resulting noise data will be nothing more than an

alternative expression of the original untested assumptions. Those assumptions need to be objectively tested and confirmed, or there will be no real noise analysis.

In several hours of watching Rwy 22 departures using the Passur radar tracking facility on the internet, I have not seen any airplane, among more than one hundred Rwy 22 departures, fly a route consistent with the proposed RNAV procedure. By this I mean an airplane starting within the envelope of airspace defined by the proposal, passing within one half mile of the first waypoint, and then flying onward toward the general vicinity of the second waypoint.

Two observable modes have contributed to the above observation: (Mode 1) airplanes turn eastward from the 140 degree departure heading early (or seem not to use it at all), and then fly far to the north of the first waypoint, sometimes missing it by a mile or more; (Mode 2) airplanes fly close to the first waypoint, typically by first flying north of George's Island, and then angling southeastward toward the waypoint on a heading which also brings them close to Point Allerton. This course makes it impossible for these airplanes to approach the second waypoint at all, but easy for them to turn across the Hull peninsula as they proceed westward. Other variations were also seen, but none seemed to match the proposed procedure any better than these two, which were seen repeatedly.

These observations suggest that any assumption that the described RNAV procedure will be a simple overlay of existing practice could be misplaced. If few or no airplanes are now flying courses which match the proposed RNAV procedure, why should we assume that the effects which will occur when the RNAV is turned on will match the effects which occur now?

Looking at the same question from a different direction, why shouldn't we assume that the RNAV procedure will cause airplanes to fly differently than they do now, specifically by aligning the courses they follow north of Hull with the course they expect to fly as they transit between the first and second waypoints.

As noted above, many of the present operations could not logically (and maybe could not physically) fly the courses they now do north of Hull and then also fly the segment from the first waypoint to the second. If in the airspace directly north of Hull these airplanes moved their initial course segment farther south, closer to Hull, then they could fly the segment between the two waypoints as described by the procedure, because when they passed the first waypoint they would be heading for the second, instead of away from it as is now often the case. This is one of the principal reasons I am concerned that the proposed RNAV procedure will create adverse impacts in Hull.

A few more specifics:

1. The RNAV departure from Rwy 15 seems improvable. It apparently uses the same initial waypoint as Rwy 22 departures would. This is inappropriate because the Rwy 22 waypoint has been located as far south as possible to create lateral separation from presumed Rwy 27 arrivals. Most of the time when Rwy 15 departures occur, (at night)

Rwy 27 is not in use for arrivals. Hence, reliance on the Rwy 22 waypoint risks directing Rwy 15 departures closer to Hull than there is any reason to do. Any RNAV departure procedure from Rwy 15 needs its own initial waypoint, substantially north of the one used for Rwy 22 departures.

2. The convergence of compressed RNAV departure paths from Rwy 22, 15, and 9 in the vicinity of northern Scituate and southern Cohasset will obviously produce a situation in which some residents below will experience overflights from all of these departure streams as more-or-less straight overhead. They will be higher than before, but there will be a lot of them—maybe, because of the compression and multiple flight paths, more overflights than any location in the Boston area has ever experienced.

There needs to be an analysis which compares this situation to the one now prevailing along the shore to the north, to see if any net benefit can be had from these proposals. Because the current shore crossing pattern is one of broad dispersal, simple altitude analysis will not adequately quantify the comparative impacts. Analysis should use a series of grid points along the shore, from midway along the Hull peninsula southward to northern Scituate. Slant distances and operational numbers should be computed for each grid point.

To justify these proposed changes we ought to at least be able to show some gridpoints under the dispersed conventional flow which would be more heavily affected than the ones under this notable convergence. For an apples-to-apples comparison the analysis should take place under the assumption that the Minot's Light proposal and increased shore crossing altitudes are already in place at all grid points, both for the conventional case and for the proposal. If analysis does not show that grid points under the conventional flow are more heavily affected than those under the convergence of these flight paths, then these RNAV routings should be referred to Phase 2 of this project, or dropped altogether.

3. Similarly, the overall method of analysis needs to be incremental. If it is decided that some proposals are non-controversial, then analysis of the benefits available from others which are controversial needs to be undertaken with the assumption that the non-controversial ones are in place. Specifically, benefits, or disbenefits, from RNAV departures from Rwy 22 and Rwy 15 should be analyzed based on the assumption that the Minot's Light proposal and the higher altitude shore crossings are implemented, because these latter alternatives can clearly go forward independently, and command universal approval. Their assumed implementation will logically affect the analysis of other proposals for which benefits remain in doubt.

4. There needs to be an analysis of the benefits which could be derived from a modified conventional departure procedure from Rwy 22. Thorough description of such a procedure seems not to have occurred, but perhaps the same method could be used for this as is being used for the RNAV proposal—that is the particulars will be worked out as part of the noise analysis. For instance, Passur observation, as noted above, shows that many departures, even in the absence of any arrival traffic on Rwy 27, cut the corner very

closely at Point Allerton. With more airspace available to the east, it should be easy to create a real mitigation for Hull by correcting this flaw in the existing conventional procedure.

There are other obvious steps which could be taken, which I would be happy to discuss. The point is that it would be a mistake to compare environmental effects from an optimized RNAV procedure with those from the existing conventional procedure. That would load the dice. Logic requires that both kinds of procedure be optimized before the comparison is made.

Regards,  
Stephen Lathrop  
Representative from Hull to the CAC and BOS/TAC



## **Attachment 3**

**Boston Overflight Noise Study (BONS)  
BOS/TAC Meeting**

**MEETING SUMMARY**

February 17, 2006

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**Attendance:**

**BOS/TAC Members:**

John Silva (FAA Airports), Bettina Peronti (FAA Boston Tower), Barbara Wright (FAA Congressional), Jon Harris (FAA AT ANE), Steve Kelley (FAA ETSU), Joseph Davies (FAA TRACON), Brian Brunelle (FAA TRACON), Sandra Bogosian (FAA TRACON), Joseph Bellabona (FAA ETSU), Gail Lattrell (FAA Airports), Gary Hufnagle (FAA Boston Tower), (George Yardley (FAA BOS FPO), Flavio Leo (Massport), Frank Iacovino (Massport), Ron Fama (Weymouth), Steve Lathrop (Hull), Rod Hobson (Cohasset), Maura Zlody (Boston Environmental Department), Sandra Kunz (Braintree), John Stewart (South End), Bob Driscoll (Winthrop), Dick Morrison (Chelsea), Ralph Dormitzer (Cohasset), Jerry Falbo (Winthrop)

**Project Consultant (PC) Team:**

Greg Wellman (Ricondo & Associates, Inc.), Denis Burke (Ricondo & Associates, Inc.), Stephen Smith (Ricondo & Associates, Inc.), Robert Varani (ASRC Aerospace), Bruce Clark (ASRC Aerospace), Rylan Juran (ASRC Aerospace), Scott Hamwey (Planners Collaborative)

**Independent Consultant (IC) Team:**

Berta Fernandez (Landrum & Brown, Inc.), Bud Riebel (Landrum & Brown, Inc.), Rob Adams (Landrum & Brown)

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**1. Opening Remarks**

Greg Wellman opened the meeting and all attendees introduced themselves. He began by reviewing the agenda of the meeting, after which Gail Lattrell of FAA made some brief comments, emphasizing the importance of everyone remaining engaged throughout this process. Ralph Dormitzer reviewed the CAC's work and said that this meeting was particularly important. He suggested that this group has arrived at overflight proposals that, while not perfect, were good and met the objectives of Phase 1. He expected the group would implement some, adjust some and reject others.

G. Wellman reviewed the process through which the proposed procedures would need to pass in order to be implemented—BOS/TAC consensus (the goal of today's meeting), CAC consensus, and finally Massport submission to FAA for implementation. R. Dormitzer asked how the group would proceed with the 33L arrivals procedure, given that it has yet to be completed. G. Wellman replied that it would be part of the next steps discussion at the end of the meeting. Steve Lathrop inquired as to when the group would know about 32 arrivals. Both G. Wellman and Steve Smith explained that there had been BOS/TAC agreement that the 32 arrivals would be deferred to the Phase 2 due it not being ready to move forward as of the group's October meeting. Joe Davies suggested that this information had been on the table since that time. George Yardley assured him that the procedure would be in line

with the record of decision. He added that the runway is scheduled for completion in November 2006, so given the 210-day procedure development process he expected that the procedure would not be available for public viewing until July or August. S. Lathrop said that the EIS and ROD had never shown a straight-in approach to 32, but always a dogleg.

## **2. Alternatives Analysis Review**

G. Wellman explained that the PC will present each of the alternatives, provide information on each and answer any questions in an effort to reach consensus on each alternative. Berta Fernandez said that at yesterday's meeting of the CAC, each alternative was reviewed and there were some technical issues with some that they would like to have resolved. She suggested that she could offer the CAC's summary opinion of each alternative after the PC presentation of each.

S. Smith reviewed the overall alternative design process for both non-RNAV and RNAV procedures and emphasized the goals of moving shoreline crossings out of the more noise sensitive areas when there was flexibility to do so. He outlined the three alternatives for the BOS/TAC after the review of each procedure—advance the alternative into the noise analysis, request additional refinements to the alternative, or to drop the alternative altogether. B. Fernandez underscored the need for this group to agree that they are ready to go to the CAC with an alternative.

R. Dormitzer suggested that not all of the accepted alternatives would require a noise analysis. J. Davies cautioned that the group could not arbitrarily shift noise from one community to another, even if there is an overall reduction in noise. This is a noise abatement study. In response to a question by Flavio Leo about the existence of triggers, J. Davies replied that there were, but that FAA's environmental staff would have to make that decision. He also cautioned the group from advancing procedures and having the PC do work on them if they were likely to be rejected by the FAA (due to shifting of noise to another community). He added that they could not CatEx a new procedure that adds noise to any community (going over 65 DNL or an increase of at least 1.5 DNL for those areas already above 65). R. Dormitzer countered that most of the changes the group is considering involve much lower DNL than that. G. Wellman reminded the group that a CatEx analysis is different than the noise analysis they are discussing. B. Fernandez said that the next step was the CAC, and that they could decide to go there without a noise analysis.

### *Runway 04R Departures-Alternative 1/14/15*

After S. Smith's brief overview, J. Davies said that he wanted to manage the group's expectations, saying that the RNAV does not create the level of precision that is depicted in the graphics. F. Leo asked about the wide swath of blue that followed the centerline of the departure graphic and seemed to cover portions of Winthrop and East Boston. S. Smith replied that the CAD program used shows a uniform .62 mile swath on either side. He said that he would go back into the program and attempt to taper the swath back closer to the airport runway to better reflect reality. He then

reviewed the resulting altitudes at the shoreline crossing for departures to the west, south, and northeast/northwest, comparing these altitudes with the existing conditions to generate a net improvement figure. B. Fernandez asked if the RNAV had been designed to mimic current procedures. Robb Varani explained that the goal of this procedure was to go through the middle of the Nahant causeway. R. Dormitzer passed along Bob D'Amico's comment that this was a 4.5 DME and not a 4 as depicted by the PC, since he was unable to attend today's meeting. R. Varani agreed to go back and check that number. Jon Harris said that the VOR/DME at Logan had been moved at Logan a decade ago, accounting for the differing DME figure suggested by B. D'Amico. In response to a question about the centerline of the departure graphic for the conventional procedure, S. Smith said that it is all vector and that the line is just an estimate.

R. Dormitzer emphasized that this was a low-usage departure, and asked if there were any adjustments after FAA gets to the implementation stage (after the 18-step process). G. Yardley replied that there may be operational issues. R. Dormitzer said that the purpose of this study was noise, not for efficiency. G. Wellman reminded the group that if BOS/TAC can't agree on an RNAV procedure for 4 departures, than FAA will implement their own pursuant to FAA OEP goals. G. Wellman said that the job of the PC and this group was noise, but that the role of FAA is to ensure safe operations. B. Fernandez underlined the goal of this procedure as being the need to hit the middle of the causeway every time. Robb Varani confirmed that the design was done with the intention of operating in the middle of the causeway.

G. Wellman asked for a consensus on the alternative design. B. Fernandez asked whether the CAC would need to see the results of a noise analysis in order to decide. G. Wellman said that there is an assumption that there would be a cumulative DNL at the end of Phase 1, but that the PC can also do a noise analysis for each one if they wish. D. Morrison suggested that they would need a noise analysis because of concerns that Winthrop would be impacted by planes having to climb higher and faster. S. Smith explained that noise analysis will provide DNL and some other supplemental metrics.

**There was consensus that this procedure would move forward contingent upon the results of a noise analysis.**

#### *Runway 09 Departures-Alternative 2/14/15*

After S. Smith reviewed this procedure, B. Fernandez said that the CAC would like to see a larger radar data sample, because there was a question regarding the time of year and the weather. Members of CAC feel that the data may not be representative of the overall conditions for this departure. Another CAC concern with this alternative had been the crossing of departures over Cohasset Harbor—she asked if it was possible to cross over the marsh area to the south and avoid the more populated areas. The final CAC concern shared by B. Fernandez had to do with the cumulative effects to the north.

In response to a question about how weather was accounted for by TARGETS, R. Varani explained how RNAV was used, and that low performing aircraft are responsible for failures in the TARGETS model. R. Varani also explained the extreme weather variables he used to test the flyability for each RNAV procedure. All designs presented passed extreme wind and temperature conditions in TARGETS.

The location of the shoreline crossing over Cohasset was addressed. S. Smith described the current location, which is passing over a more opened area. If moved further south, the dispersion between the Runway 22L/R route and Runway 09 would lessen; therefore impacting the ability to maintain some dispersion.

Discussion related to cumulative effects for the north shore was reserved for the Alternative 5 (Runway 22L/R) design discussion.

**Consensus on this procedure was withheld until after Runway 22L/22R discussion.**

*Runway 15R Departures-Alternative 3/14/15*

After review of the alternative, B. Fernandez voiced CAC concern about the cumulative impacts on the north shore. This issue was addressed during the Runway 22L/22R discussion.

**Consensus on this procedure was withheld until after Runway 22L/22R discussion.**

*22L/22R Departures*

After review of the alternative, B. Fernandez said that the intent of this procedure had been to reduce impacts, not overflights. She suggested that the biggest issue was for the north end of the Hull peninsula, and said that the CAC needs assurance that the radar sample is representative. She also inquired about the blue RNAV graphic showing dispersion north and south of RNAV centerline—would this really happen, or will flights end up on the south side of this line in order to remain the required distance from 27.

In response to the radar sample used, S. Smith reported that PC is confident that the sample represents a statistically significant sample for the purposes of which the data was used – to assist in capturing existing corridors and develop estimated parameters related to alternative designs. The radar data samples were not used to generate INM input. S. Lathrop stated that the days modeled did not capture the hottest days, and that the IC argues that the conditions that cause the most problems are not being accurately measured. G. Wellman replied that the problem is that the BOS/TAC agreed to use the EDR info in Phase 1. S. Lathrop said that this alternative should be evaluated in Phase 2. He added that he does not want to do that because there are a lot of good outcomes from this proposal, but he needs to be comfortable with what the impacts are on Hull before giving his consent.

He added that the procedure needs to go through the 18-step process in order for FAA to approve it. G. Wellman said that the PC would remove the black centerline from the RNAV graphic in future meetings. S. Lathrop said that his concern has been that FAA will get this procedure and change it unfavorably for Hull during the 18-step process, and at that point there will be nothing that he can do about it. Regarding the conventional design, J. Davies replied that it is not possible to do a better job vectoring through that corridor than they have done for the past 25 years. Sometimes they hit it just right, other times they don't. He said that 100 degrees is the direction aircraft take when turning east. Joe Davies also stated that he cannot guarantee that this RNAV procedure will happen as shown here. It is possible, but he suggested that there was a need to manage expectations. The 18-step process evaluates all aspects of an RNAV procedure, and new issues can arise during this process such as the need to maintain a larger lateral separation to guarantee pilot-nav separation. R. Dormitzer said that they wanted an RNAV procedure that works.

B. Fernandez said that the CAC understands the issues. She asked whether this procedure should be handled differently if it goes into the 18-step process. G. Wellman said that the decision before the BOS/TAC today was whether this alternative would be taken into noise analysis. S. Lathrop asked about the possibility of a separate session to discuss this. G. Wellman suggested the end of the day, but emphasized that it would need to be a process discussion and not a design discussion as there was no room to improve the design. J. Davies added that the procedure was the best that it can be. He stated that the FAA would have designed basically the same procedure. However, he wanted to make people aware of the risk that when it goes into the 18-step process it could be discarded. R. Dormitzer said that since RNAV will likely be required eventually, that the group should do this now while there is at least public input.

S. Lathrop said that because there needs to be a 3-mile separation between 27 arrivals and 22 departures, they should consider continuing the conventional vector to RNAV over the shoreline crossing.

B. Fernandez asked what the potential outcomes would be of this alternative going into the 18-step process. F. Leo said that it sounded as if S. Lathrop would be content with the status quo. G. Wellman said that he did not sense that the group was going to be able to reach consensus on this alternative and asked if the group thought it needed noise analysis or to be moved into Phase 2. B. Fernandez replied that the CAC did not have a bottom line position on this, and requested that the group caucus during lunch.

Following the break for lunch and CAC caucus, R. Dormitzer described the results of that meeting. He said that there was concern that Hull would get more noise. He did suggest that the majority of the group was willing to move forward with the alternative, but that they were asking for help from the PC to show with more certainty what the current tracks and noise are and what the future tracks and noise

will be. He also asked if the conventional tracks are farther south and more noisy than what was being proposed. S. Lathrop added that there is a conflict between the INM data and other respected experts' opinions on the noise. He asked that knowledgeable people be brought together to discuss these issues.

G. Wellman asked if any of these outstanding issues were design issues. S. Lathrop asked if it could be designed to be better for Hull. Denis Burke said that they could look at it one last time and work with FAA. He suggested that S. Lathrop and Rod Hobson participate in a conference call with PC and IC next week. PC will schedule a call for next week. PC will also look at the current RNAV design to address the lateral separation requirements to see how far south the design can be moved to ensure 3 or more mile separation from Runway 27 arrivals. The results will be discussed during the call scheduled next week with Steve Lathrop.

In response to B. Fernandez' earlier question regarding the impacts on north shore communities, R. Varani explained the rationale for the Beverly Harbor crossing point. R. Dormitzer said that the problem was that these communities do not get anything now, so it's a huge differential. He said that 22 and 9 should be separated so that these communities can get some relief. J. Davies said that we could do that if there was agreement that there was no longer a requirement to avoid Marblehead. F. Leo suggested that they try to reach out to other impacted communities on the north shore. R. Varani said that they based it on a 500-feet/mile climb rate. Several options were discussed and it was concluded that placing the Runway 22L/22R route over the Runway 04L/04R route may be the best option. PC will make the adjustment in the RNAV design.

**There was consensus that this procedure would move forward after an additional look to see how additional dispersion can be generated, and with several concerns noted. Consensus on Runway 09 and Runway 15R designs are also dependent upon the northwest flow dispersion adjustment.**

*Runway 22L Arrivals from Providence STAR - Alternative 6*

S. Smith reviewed the procedure, noting that it was not RNAV, just point to point. B. Fernandez said that there needs to be assurance that there will not be any additional noise in Nahant. There was a concern related to the close-in base turn to final. S. Smith reported that this element was added based on IC input. The thought is with coming from the TONNI intersection, there may be a limited opportunity for aircraft to conduct an early base turn. S. Smith reported that this element was assumed to be used infrequently, but will be modeled for conservative reasons. J. Davies concurred with the limited possibility of this element occurring. J. Davies suggested that the band illustrated over the ocean should be more west than possible. PC will make the adjustment.

**There was consensus that this procedure would move forward with noise analysis with a refinement to the west boundary.**

*Runway 27 Arrivals from Providence STAR – Alternative 7*

No major issues were identified. After a brief discussion, **there was consensus that this procedure would move forward with noise analysis.**

*Runway 15R Arrivals from Providence Star – Alternative 8*

S. Smith reviewed the proposal design and intent. Jerry Falbo said that they hadn't discussed this proposal at the CAC meeting. S. Smith noted that B. D'Amico requested that this alternative be evaluated (B. D'Amico was not present). J. Davies said that FAA does not feel that it is worth the effort, given that this represents only 1.5% of usage, but that if the committee agreed to, they would proceed.

**There was consensus that this procedure would move forward with noise analysis, but emphasized priority of work based on available funds.**

*Runway 4L/4R Left Downwind Arrivals – Alternative 9*

S. Smith reviewed the proposal, noting that there would be new overflights in the Norwood area. B. Fernandez asked that they change the RJ stream color from the northeast to show that it is an existing condition. Ron Fama suggested that the western suburbs had been receiving a free ride and that they should be asked to shoulder more of the burden. F. Leo asked what the net change was; saying that if it was big that communities under the left downwind corridor would have to be notified. FAA staff said there is a bias towards 4R over 4L because of taxiway crossing traffic, and the Runway 04L runway use assumptions should be reviewed.

**There was consensus on the design, but further review of Runway 04L runway use assumptions is needed prior to conducting noise analysis.**

*Runway 33L Visual Offset Arrival – Alternative 11*

R. Varani described this proposal. He said that he had flown the course the day before this meeting, and identified some visual cues for the procedure. He said there is nothing but water on your right and the shoreline on your left. He is also concerned with siting the airport, but acknowledged that a professional pilot who operates at the Airport frequently may be able to pick out the Airport easily. He also said that he would need to work with a lead carrier to see if they can make the turn on to final approach. The key issues are the need for additional cues, especially for nighttime operations, and working together with an airline to confirm flyability. R. Varani said that this involves a 60-degree turn to 3.5 mile final and he's not sure if an airline would be willing to do this. J. Davies said that on a charted visual the NATCA union has a large say and there is an additional process it must go through. J. Davies requested that they develop a prototype chart that is doable given certain circumstances. Two things are required—an airline willing to do it and a check with FAA to see if it is viable within the management of the airspace. S. Smith said it would take three weeks to finish the prototype plate design and additional time after that to work with an airline and the FAA to finalize the procedure. G. Wellman added that it is on the critical path and is the PC's highest priority for design work.

**There was no need for consensus on this proposal as it is still in design.**

*Runway 04R, 22L and 33L Late Night Arrival Intercept Glide Slope at 4,000 ft – Alternative 12*

After a review of the 4R proposal, R. Fama said that this did not appear to be an improvement. B. Fernandez said that the CAC views this as an improvement for Weymouth, Randolph and Braintree. R. Fama added that the current situation is untenable. S. Smith emphasized the very low utilization of late night arrivals to Runway 04R. R. Dormitzer said that this was only a poor weather condition procedure.

G. Yardley offered that there was concern with the glide slope, saying that the day-to-day approach would have to be attuned. He said that glide slopes are good out to ten nautical miles. He suggested that the better answer might be to get better use of the current published procedure. J. Davies noted that controllers would vector aircraft to join the localizer at 4,000 feet even though the glide slope signal is guaranteed only out to 10 miles. The area where aircraft would join the localizer is approximately 12 miles from the end of each runway.

For Runway 33L, B. Fernandez said that the CAC prefers the visual approach procedure for late night hours (Alternative 11). If for any reason the visual is not available, Alternative 12 design for Runway 33L should be used. A discussion ensued about the definition of “late night.” J. Davies described several different ranges used to describe “late night” depending on the usage, but that in this case the term meant midnight to 6am.

**There was consensus that this procedure would move forward with noise analysis.**

*Runway 15R/22L Late Night Propeller Departure – Alternative 13*

R. Fama suggested that the proposed procedure was not acceptable. R. Dormitzer said that it went against the CAC goals of not simply shifting noise from one community to another. John Stewart, who supports the procedure, said that he would like to have the noise analysis done and then let the CAC decide. He said he could live with the alternative being discarded if the CAC was able to use the results of a noise analysis in making their decision. R. Dormitzer cited the term “adverse noise impacts” from the ROD to suggest that this procedure should be rejected out of hand. J. Davies said that the impacts may or may not be “adverse” for this procedure as that term is narrowly defined in environmental law. J. Silva said that FAA defines “significant” not “adverse.” G. Wellman said the PC could assist in establishing priorities for the group. R. Hobson asked the group to consider the pilot of a small propeller plane being forced to fly several miles out over the ocean at night. B. Fernandez agreed that this proposal should be treated like the others and put through a noise analysis. Sandra Kunz said that the group needed numbers of flights and altitudes. J. Stewart said that the communities he represents that live under 27 have requested this.

**There was consensus that this proposal would undergo a noise analysis and the CAC would decide the outcome based on that.**

### **3. Phase 2 Work Plan**

G. Wellman reviewed the status, milestones and major elements of Phase 2. He explained that the same process would be used as in Phase 1 (BOS/TAC approval – CAC approval – Massport – FAA implementation). The difference is that at the end of Phase 2 there is an EIS conducted by FAA.

#### *Ground Noise*

B. Driscoll requested that ground noise (taxiways, runway operations) be included in Phase 2. G. Wellman pointed out that this element is part of the Phase 2 evaluation. J. Falbo said that ground noise from the centerline taxiway needs to be addressed. F. Leo said that assessing the centerline taxiway will be part of the baseline if the FAA accepts the measure. B. Driscoll suggested that the committee should meet with the centerline taxiway committee. D. Morrison asked if there was any data they can share. J. Silva added that the taxiway does not have any public participation requirement (public workshops). J. Davies said that FAA has conducted a center taxiway in the EIS, and the group will know the impacts by the time a baseline is developed for this project.

#### *EIS Process*

J. Silva said that once the EIS begins, other federal agency involvement will be triggered. He said that EPA's Region I office gets pretty involved and that MEPA may or may not be triggered. Sometimes they will say that they would like an EIR for informational purposes. J. Silva warned that the group would not be able to easily discard alternatives once this process begins. Region I of EPA may challenge CAC ownership of the alternatives. He suggested a pre-meeting with EPA. He also mentioned that they might want to know why air quality is not being considered as part of this study.

G. Wellman reviewed the three types of Phase 2 alternatives—those deferred from Phase 1, ground noise, and PRAS. S. Lathrop suggested that they should also include new ideas that may arise. B. Driscoll said that ground noise was agreed to at the first meeting three years ago. G. Wellman said there were three categories of baseline conditions—update GIS, air traffic simulations, and baseline noise; the latter two of which are more rigorous than the EDR used in Phase 1. EDR was used in Phase 1 in order to be able to compare apples to apples. F. Leo said that of the numerous metrics available, three or four will be selected that best tell the story. S. Lathrop asked if the baseline noise input would be Massport figures or developed from scratch. He requested a root and branch noise study. S. Smith replied that while the details were still being worked out, an independent baseline noise evaluation will be conducted by PC along with IC review. The PC will develop its own INM based on

12 months of radar data with IC input. F. Leo said he was not opposed, but asked if the cost was justifiable. He suggested that PC develop a scope of work and let the group see how it looks. R. Dormitzer emphasized the need to make sure the process continues and offered support of B. Driscoll and J. Falbo's requests to study the centerline taxiway noise.

#### **4. Closing Remarks**

G. Wellman closed the meeting with a request for any final comments. J. Bellabona said that FAA will need to get a sense for when they will receive procedures recommendations, so that they can schedule the review process. R. Dormitzer said that he believed the overall work of BOS/TAC was moving in the right direction.

