CAC Noise Management
Concept Development

BOS/TAC
February 28, 2008
(Revised 3-12-08)
Concept Development Process

• Began with measures that had been identified in Phase 1 as potentially impactive and requiring an EIS

• Independent Consultant added numerous additional concepts and refinements of Phase 1 measures

• Individual members brought concepts to the table
CAC Meetings

Late October
• Began consideration with large group of approximately 50 different measures for ground, flight, and runway use
• Most of meeting was a discussion of how to evaluate measures within the process
• Took a long time to understand the intent of the concept development
• Adjourned without concepts but with better understanding of various community concerns
• Determined that runway use concepts were premature until flight and ground concepts were better understood and their preliminary feasibility and effects were known
Schematic Concept Reviews

Schematic Phase 2 Alternatives Screening Process

- Community Concepts
  - Phase 1 Carry-over Alternatives
  - FAA concepts

- CAC Review

- Identification and Description
  - Identity Intent
  - Narrative Description

- Preliminary Screening (Level 1)
  - Fatal Flaw Review for Safety and Operational Feasibility

  - Discarded Alternatives
    - Phase 2 Alternatives (procedures)
    - Phase 3 Alternatives (PRAS)

  - Secondary Screening (Level 2)
    - Operational Issues
    - Potential Noise Benefit

    - Discarded Alternatives
      - Phase 2 Alternatives (procedures)
      - Phase 3 Alternatives (PRAS)

  - Tertiary Screening (Level 3)
    - Operations Modeling (TAAM)
    - Noise Modeling (INM)

    - Discarded Alternatives
      - Phase 2 Selected Alternatives
      - Phase 3 Alternatives (PRAS)

Time Frames for each stage are not yet determined – See Project Plan, Version 3.0
CAC Meetings

Late November - Ground Noise Focus

• Changed approach to group brainstorming process to capture any and all ideas any member wanted to bring to the table

• Discussed merits and feasibility of each concept – dropped some, modified some, kept some as proposed

• Settled on a preliminary final list of ground noise abatement concepts
CAC Meetings

Late January (rescheduled from December)

• Began with adoption CAC ground concepts from November for initial screening

• Broke into interest groups by area (southwest, northwest, northeast and close-in, southeast) to consider various concepts from previous discussions for flight actions.
CAC Meetings

Late January – flight concepts

• Departure fanning from any runway over populated areas was immediately rejected by southwest and northwest groups
• Single corridors to higher altitudes were considered preferable by southwest and northeast groups
• Northeast group focused on refinements of Phase 1 actions and air traffic separation
• Southeast group focused on refinements of Drunk, Phase 1 RNAV refinements for special situations and on track location concepts for Runway 14/32
Criteria to Define Concepts

• Opinions of CAC members may differ and the CAC has not adopted an official position on the criteria for defining new concepts for noise abatement other than to reduce noise.

• In the Independent Consultant’s view, the criteria for defining concepts were:
  – Reduce cumulative time of exposure to ground noise through control of single event durations and their proximity to Chelsea, East Boston and Winthrop communities
  – Use single departure corridors over the most compatibly used land under paths leading from each runway and extend those paths until aircraft reach a higher altitude before turning
  – Avoid to the extent practicable the introduction of new overflights into populated areas at altitudes below approximately 6,000 MSL (and higher if feasible)
  – Use new technology to the extent practicable to continually seek ways to reduce takeoff, approach and ground noise event levels.
Let’s do dinner
CAC Noise Concepts
Proposed for Further Analysis

BOSTAC Meeting
February 28, 2008
Ground Concept G-A

• Tow aircraft to the runway ends before takeoff
Ground Concept G-B

- Single engine taxi on aircraft side away from nearest communities
  - Intended to reduce taxi noise levels by
    - Reducing number of engines in use
    - Using the aircraft body to shield the dispersion of noise between the aircraft and nearest communities
Ground Concept G-C

• Use Taxiway November for 22R takeoff traffic, use the Centerfield Taxiway for 22L traffic*

* This does not constitute endorsement by the CAC of the Centerfield Taxiway.
**Ground Concept G-D**

- Runway 4R arrivals taxi in on the Centerfield Taxiway*

* This does not constitute endorsement by the CAC of the Centerfield Taxiway.
Ground Concept G-E

- Add fillets for 4R arrival egress - curve the fillet from the high speed exit taxiways Y and R onto the Centerfield Taxiway*

* This does not constitute endorsement by the CAC of the Centerfield Taxiway.
Ground Concept G-F

- Limit use of reverse thrust during landing on all runways
  - Intent is to reduce landing noise levels on nearby communities
  - Requires longer landing roll
Ground Concept G-G

- Erect noise barriers on the community side of the shoreline
Ground Concept G-H

- Place floating foam noise barriers in the water adjacent to November taxiway.
Ground Concept G-I

• Build a dedicated hush house building (ground run-up enclosure) for run-ups
Ground Concept G-J

• Seek a location on the airport for a hold apron/penalty box to park aircraft as they await takeoff queuing onto Taxiway N
  – Alternatively, institute gate hold measures to reduce the number of aircraft in the takeoff queue on Taxiway N
Ground Concept G-K

• Replace Ground Power Unit and Aircraft Auxiliary Power Units with electric power hook ups at all gates
Ground Concept G-L

• Change the national on-time departure rules so that can aircraft remain at the gate without penalizing the airline’s on time performance
  – intended to reduce taxiway queues on Taxiway N
Ground Concept G-M

- Erect noise barrier for 15R departures – northwest end of 15R/33L along East Boston shoreline
Flight Concept A
Establish Continuous Descent Approach to Runways 4R/L, 27, 33L, 32, 22R/L and 15R

- Continuous Descent Approach procedures allow for a gradual descent at low power settings all the way to the runway end. Generally results in lower noise in areas beyond the final approach, lower fuel consumption, and lower emissions.

- Level segments require higher thrust settings, more fuel burn and more noise.

Example: Runway 4L Arrivals

For concept description only
Move the DRUNK Intersection further east over the ocean, as opposed to remaining over land at Marshfield.
Flight Concept F-C

Raise the arrival crossing altitude at the DRUNK Intersection from 6,000 feet to 7,000 or 8,000 feet

Raise to 7000/8000 ft.

For concept description only
Flight Concept F-D

Spread out arrivals at the DRUNK Intersection by creating additional "way points"
Move the arrival flight corridor over DRUNK, as adopted under Alternatives 6, 7 and 11 of Phase 1, to the south and raise crossing altitude.
• Phase 1 Carry Over Measure 16 - Runway 32 Arrivals: develop approach procedure that maximizes flight over water

For concept description only
Flight Concept F-G
Establish an over water visual or RNAV arrival to Runways 33L/32 over harbor mouth during night hours to increase distance north from Point Allerton.
Flight Concept F-H

- When Runway 32 is used for arrival in conjunction with Runway 27 arrivals, (if an over harbor approach is not used per Concept F-F or F-G) leave Runway 32 arrivals where they are indicated by the Runway 14/32 EIS (approximately 4000 feet west of the Runway 33L approach course) when used in conjunction with Runway 33L arrivals.

For concept description only
Flight Concept F-I

• Arriving on Runway 22R/L, maintain three mile separation between all aircraft. Do not apply exemptions to allow 2 ½ mile separations between arrivals.
Flight Concept F-J

• Place a note on all approach plates: "When cleared for a visual approach to a runway, maintain last assigned altitude, until intercepting the ILS Glide Slope for that runway. For noise abatement fly at or above the glide path to the runway."
Flight Concept F-K
Extend Runway 27 jet takeoffs to new waypoint in I95/R128/Dedham area before turns

Proposed extension

2003 Large Jet Tracks
2003 Small Jet Tracks
Area of Current Jet Overflights
Area of reduced overflights with procedure
Waypoints
Current departure course
Proposed extension

For concept description only
Flight Concept F-L
Seek improvements to Runway 27 Departure compliance through use of all available technology

<table>
<thead>
<tr>
<th>Year</th>
<th>Monthly Average</th>
<th>60.4%</th>
<th>70.2%</th>
<th>64.4%</th>
<th>91.6%</th>
<th>87.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Deviation</td>
<td>2.4%</td>
<td>2.3%</td>
<td>2.4%</td>
<td>2.2%</td>
<td>2.8%</td>
</tr>
<tr>
<td>2005</td>
<td>Monthly Average</td>
<td>63.2%</td>
<td>72.5%</td>
<td>66.0%</td>
<td>92.7%</td>
<td>89.6%</td>
</tr>
<tr>
<td></td>
<td>Standard Deviation</td>
<td>1.8%</td>
<td>1.6%</td>
<td>1.7%</td>
<td>1.3%</td>
<td>1.9%</td>
</tr>
<tr>
<td></td>
<td>Change in Average Percentage</td>
<td>+2.0%</td>
<td>+2.3%</td>
<td>+1.2%</td>
<td>+1.1%</td>
<td>+2.1%</td>
</tr>
</tbody>
</table>

Source: Runway 27 Analysis - Percentage of Departures Inside and Outside of Corridor, March 19, 2007 (Massport 2007)
Prepared by: Wyle Laboratories, 2007

For concept description only
Flight Concept F-M
Develop Runway 14 jet departure procedures to increase altitudes over the shoreline by routing traffic north of Hull when Runway 27 is used for arrivals
Flight Concept F-N
Establish a departure waypoint from Runway 15R for use at night to move departures further north of Hull than established by Phase 1 Alt 3.
Flight Concept F-O
If Phase 1 22L/R RNAV departure waypoint does not keep departures from flying over Hull, then change departure headings to route 50% of the departures southward over Quincy Bay or replace the RNAV route with a conventional route that routes all jet departures north of Hull.
Flight Concept F-P
Extend Runway 33L jet takeoffs to new point near Wellington Station (approx 5 DME and 5000 MSL) before turning.
Flight Concept F-Q
Runway 9 Departures turn at or before the runway end to the right (approx BOS R-120) to pass over Deer Island sewage treatment plant, then resume 093 departure course of Alternative.
Flight Concept F-R
Shift Runway 4R Phase 1 Alternative 1 RNAV initial waypoint to east to pass more over water away from Revere Beach
Flight Concept F-S

- Phase 1 Carry Over Measure 18 - Departure Runways 27, 33L, 4R, 9: pilots apply thrust and climb management to benefit certain nearby communities through implementation of “close-in” or “distant” noise abatement departure procedures.
  - Evaluate each measure for noise reduction effects off the end of each runway.
  - Effects may vary from Runways 27, 33L and 4R, while Runway 9 is expected to achieve greater benefit from a close-in (special) departure procedure.
Flight Concept F-T
Establish altitude floor for local VFR traffic under Tower control not on approach or initial climb to BOS to increase altitudes over downtown
Flight Concept F-U

• Establish required helicopter routings within downtown area airspace for all users, including hospitals, businesses and media
Flight Concept F-V

Extend initial departure course for turboprop aircraft to 2,000 MSL before initiating turns over populated areas

Current

For concept description only

Proposed
Measures Rejected By CAC

Runway 27 Departures

- Phase 1 Carry Over Measures 17/21 - develop departure procedures for fanning. The intent of this measure is to provide respite to close-in communities in departure areas of these runways.

- Phase 1 Carry Over Measure 28 - modify Runway 27 departure procedure to an initial right turn in order to direct aircraft over the Charles River basin and away from heavily populated areas. The intent of this measure is to reduce the aircraft noise exposure for the communities in the departure area of Runway 27.

Both measures rejected because they run counter to CAC goal to not spread significant noise into new communities.
Measures Rejected By CAC

Runway 4R Departures

• Phase 1 Carry Over Measures 17/21 - develop departure procedures for fanning. The intent of this measure is to provide respite to close-in communities in departure areas of these runways.

Runway 33L Departures

• Phase 1 Carry Over Measures 17/21 - develop departure procedures for fanning. The intent of this measure is to provide respite to close-in communities in departure areas of these runways.

Both measures rejected because they run counter to CAC goal to not spread significant noise into new communities.
Measures Rejected By CAC

Runway 4R/4L LDA Approaches
  • Phase 1 Carry Over Measure 27 - develop offset approaches from the east and west. The intent of this measure is to reduce noise to communities under the existing approach to 4R/4L. Measure rejected because it runs counter to CAC goal to not spread significant noise into new communities.
Runway Use Measures

• The CAC believes the effectiveness of flight and ground noise measures may be initially evaluated independently of runway use measures, but

• Agrees that runway use measures are an important consideration in the entire noise management program that should be considered in conjunction with the best of the flight and ground measures.

• Therefore, the CAC is not prepared to suggest runway use concepts at this time.