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**List of Acronyms**

APA	Administrative Procedure Act
ATCT	Airport Traffic Control Tower
BLANS	Boston Logan Airport Noise Study
BOS	Boston Logan International Airport
BOS/TAC	Boston Technical Advisory Committee
CAC	Logan Airport Community Advisory Committee
CFR	Code of Federal Regulations
CIP	Capital Investment Plan
DME	Distance Measuring Equipment
DOT	Department of Transportation
EIS	Environmental Impact Statement
ER	Elected Representative
FAA	Federal Aviation Administration
FAAST	Federal Aviation Administration Safety Team
FAR	Federal Aviation Regulation
G&O	Goals and Objectives
GRE	Ground Run-up Enclosure
IC	Independent Consultant
IFR	Instrument Flight Rules
ILS	Instrument Landing System
INM	Integrated Noise Model
LAHSO	Land and Hold Short Operation
LTA	Letter to Airmen

MSL	Mean Sea Level
NEPA	National Environmental Policy Act
NMI	Nautical Mile
PARTNER/ MIT	Partnership for AiR Transportation Noise and Emissions Reduction - Massachusetts Institute of Technology
PC	Project Consultant
RA	Resolution Advisory
RNAV	Area Navigation
ROD	Record of Decision
SEL	Single Event Noise Level
SET	Single Engine Taxi
SOP	Standard Operating Procedures
SOS	Scope of Services
SOW	Scope of Work
TCAS	Traffic Collision Avoidance System
TRACON	Terminal Radar Approach Control
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
VOR	VHF Omnidirectional Range

## **I. Level 2 Screening Purpose and Process**

This report provides information related to the Federal Aviation Administration (FAA) Evaluation Team's and Massachusetts Port Authority's (Massport) independent Level 2 screening evaluations of the Logan Airport Community Advisory Committee (CAC) and elected representative proposed aircraft noise abatement measures for the Boston Logan International Airport (the airport) that passed Level 1 screening analysis (refer to Level 1 Screening Analysis Report, October 5, 2009). In some cases, CAC evaluated selected measures to determine if the proposed measures met their established goals and objectives (G&O), which were developed after the measures were originally proposed. Those measures that were documented by CAC to be inconsistent with their G&O are also documented herein.

The FAA and Massport conducted separate and independent meetings to assess the measures based on Level 2 criteria that were deemed to be under their authority to implement. The evaluation by the FAA was conducted in accordance with the Level 2 operational screening criteria contained in the Boston Logan Airport Noise Study (BLANS) scope of services (SOS) dated October 28, 2009:

Operational Issues – Utilizing the refined definitions of the measures, FAA personnel will perform a detailed analysis of the measures and identify any that may significantly compromise their organizational goals and stated mission. This analysis will be coordinated with the IC and documented.<sup>1</sup>

### **1.1 FAA Screening Criteria**

The FAA defined the specific criteria by developing an Operational Screening/Evaluation Criteria Worksheet, which was reviewed by the Boston Technical Advisory Committee (BOS/TAC) and CAC. This FAA screening and evaluation worksheet is intended to be consistent with the FAA 2002 Logan International Airport Airside Improvements Planning Project, Record of Decision (ROD) dated August 2, 2002, and the BLANS SOS dated October 28, 2009, which states the following:

FAA 2002 Logan Airside Improvements ROD (pg. 27)

FAA, Massport, and the CAC (which includes South Shore Communities) will work jointly to develop the scope of a noise study that will include enhancing existing or developing new noise abatement measures applicable to aircraft overflights. The study will evaluate proposals on the basis of environmental benefit, operational impact, aviation safety and efficiency, and consistency with applicable legal requirements. Noise abatement proposals that FAA considers safe and efficient and that will not adversely affect other communities will be implemented. These proposals will be implemented to the extent feasible prior to completion of the noise abatement study.

BLANS SOS

Preamble (i)

the purpose of the Boston Logan Airport Noise Study is to identify and implement measures to reduce noise impacts to communities surrounding Boston Logan International Airport (BOS)

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<sup>1</sup> *Phase 2 Scope of Services*, October 28, 2009, page 41.

The FAA defined their organizational goals and stated mission as follows:

FAA Mission: <http://www.faa.gov/about/mission/>

- a. Our Mission: Our continuing mission is to provide the safest, most efficient aerospace system in the world.
- b. Our Vision: We continue to improve the safety and efficiency of flight. We are responsive to our customers and are accountable to the taxpayer and the flying public.
- c. Our Values:
  - i. Safety is our passion. We are the world leaders in aerospace safety.
  - ii. Quality is our trademark. We serve our country, our stakeholders, our customers, and each other.
  - iii. Integrity is our character. We do the right thing, even when no one is looking.
  - iv. People are our strength. We treat people as we want to be treated.

In addition, the FAA also considered information in the FAA National Airspace System Capital Investment Plan 2008-2012, which list Capital Investment Plan (CIP) project that have been aligned to the goals, objectives, and performance targets in the FAA Flight Plan 2007-2011 and the Department of Transportation's (DOT) strategic plan<sup>2</sup> The strategic goals are as follows:

1. Strategic Goal: Increased Safety

FAA Strategic Goal: To achieve the lowest possible accident rate and constantly improve safety.

2. Strategic Goal: Greater Capacity

FAA Strategic Goal: Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner.

3. Strategic Goal: International Leadership

FAA Strategic Goal: Increase the safety and capacity of the global civil aerospace system in an environmentally sound manner.

4. Strategic Goal: Environmental Stewardship

DOT Outcome: Reduce pollution and other adverse effects of transportation and transportation facilities.

5. Strategic Goal: Homeland and National Security

DOT Outcome: Balance homeland and national security transportation requirements with the mobility needs of the Nation for personal travel and commerce.

6. Strategic Goal: Organizational Excellence

FAA Strategic Goal: Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data.

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<sup>2</sup> [http://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/service\\_units/operations/sysengsaf/cip/files/FY08-12\\_CIP\\_Appendix\\_A.pdf](http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/operations/sysengsaf/cip/files/FY08-12_CIP_Appendix_A.pdf)

For purposes of the BLANS only, the FAA has adopted the following definitions of efficiency and capacity after consideration of FAA sources and the PC's and IC's recommendations.

**Efficiency** –For purposes of the BLANS, efficiency is how well aircraft are able to operate within the established useable space of the Logan area system based on air traffic control procedures, meteorological (wind and weather) conditions, and airport operating configurations, based on cost, time and pilot/air traffic controller workload.

**Capacity** – For the purposes of the BLANS, capacity is the maximum amount of activity (i.e. operations) that can be achieved within the physical useable space of the Logan system or element of the Logan system based on constructed facilities on the ground (e.g., runways, taxiways, nav aids) and the defined airspace and rules for aircraft operations (e.g., the established Class B airspace around the airport, navigational fixes, standard arrival and departure routes, air traffic control rules and regulations).

The FAA applied the following criteria to each BLANS measure to determine if it significantly compromises FAA goals and mission:

- Safety
- Controller Workload
- Delay, Efficiency and Flexibility Changes
- Capacity
- Other

For each of the criteria, a series of questions were formulated to assist the FAA in screening each measure. The questions are consistent for each measure and answers documented for each measure on the FAA's Operational Screening/Evaluation Criteria Worksheet. Final determinations were based on FAA's professional experience and judgment of the subject matter experts who work in the appropriate FAA facilities. Qualitative and/or quantitative information was used when available. One or more of the criteria below was used to make a final determination. These screening/evaluation criteria are unique and non-precedential in nature and are used for the BLANS only.

During the screening process, FAA kept in mind the overall purpose of the BLANS as stated in the SOS: "to identify and implement measures to reduce noise impacts to communities surrounding Boston Logan International Airport" (page i), and was open to opportunities to meet the original intent of a proposal without significantly compromising FAA's mission and goals.

## **1.2 Massport Screening Criteria**

If any measure required infrastructure changes on or around the airfield, Massport was tasked to evaluate the feasibility of such measure. In addition, measures that were deemed as "encouragement" or voluntary measures under Massport's authority were assigned to Massport for evaluation. Based on information provided by the PC, as needed, Massport determined if the measure could potentially be implemented without impacting current and future planned land uses on the airfield, cause new or worsen existing safety hazards on the airfield or degrade security around the airport. In addition, Massport also weighed the potential benefits qualitatively against potential costs. Massport shared the information they used to assess each measure and their conclusions with CAC and BOS/TAC.

## **1.3 CAC Screening Criteria**

When applicable, CAC applied their G&O to determine if a measure met CAC's intent. The CAC G&O were more clearly defined and documented after the measures were proposed. Based on the

CAC criteria, the IC reviewed measures as needed, and provided CAC their professional opinion as to measures ability to meet CAC's goal and objectives. Those measures that did not meet CAC criteria were eliminated from further study, and designated as "**inconsistent w/ CAC G&O.**"

The criteria listed below were used to determine if a measure met CAC goals:

Procedure Criteria

1. There shall be only a single initial departure (IC assumes jet) corridor for each runway.
2. Departing aircraft shall be routed over low population areas in the following priority: Bodies of water, marshes, wetlands and open space, industrial areas, parks and cemeteries, business areas and transportation corridors.
3. Departure corridors shall be kept as narrow as possible to reduce the number of residences affected.
4. Aircraft shall be kept within the departure corridor until climbing out of 4,000 to 5,000 ft.
5. Aircraft shall be kept within the departure corridor until reaching specific coordinates at least 7 miles from the departure fly over end of the runway.
6. Arrivals shall not descend below 3,000 ft Mean Sea Level (MSL) until within 11 miles of the runway and established on final approach.

Noise Criteria

1. Reduce the number of persons who are exposed to aircraft noise in excess of 60 decibels of DNL (60 Ldn).
2. Enact air traffic measures that will reduce or minimize increasing the noise level on people currently exposed to aircraft noise above 55 decibels of DNL (55 Ldn). An increase of more than 1 ½ DNL on people within the 55 DNL will be considered to be of substantial concern to the CAC.
3. Enact air traffic procedures that will minimize the introduction of aircraft noise above 55 decibels of DNL (55 Ldn) onto people not currently exposed to noise of that level, unless necessary to reduce noise on people exposed to 60 Ldn or more. Further, a change of 3 DNL or more within 50 Ldn will be considered to be of substantial concern to the CAC; a change of 5 DNL or more within 45 Ldn will be considered to be of substantial concern to the CAC.
4. Reduce, to the greatest extent practicable, the existing total number of persons exposed to cumulative daily aircraft noise in excess of 55 decibels of DNL (55 Ldn).
5. Reduce, at each grid assessment point, to the greatest extent practicable, the number of single-event flight operations with maximum noise levels in excess of 60 decibels (60 dBA Lmax), using the NEA60 metric.
6. Reduce, to the greatest extent practicable, the existing total number of persons exposed to cumulative daily aircraft noise in excess of nighttime exposure of more than 55 decibels of Leq(n).
7. Reduce, at each grid assessment point, to the greatest extent practicable, from the existing total daily duration, the amount of time (TA60 as modeled in minutes per average annual day) of aircraft in flight, and separately on taxiways, at the gate, at maintenance facilities, or elsewhere during a ground operation at BOS, above 60 decibels.

## 1.4 Early Implementation

A limited number of measures have already been or could be implemented without a need for additional noise analysis or formal Federal action that would require a NEPA analysis. In these cases, the measure was designated as “**implemented**” and eliminated from further evaluation. Some measures were already evaluated in the BOS Airside Environmental Impact Statement (EIS). In this case, those measures were designated as “**completed**.”

## 1.5 Runway Use Measures Status

Runway use advisory measures carried over from Phase 1 and potential new runway advisory concepts have not yet been evaluated. At the February 28, 2008, BOS/TAC meeting, CAC informed FAA that they are not yet prepared to suggest or review runway use concepts, and prefer to see the effects of the proposed noise abatement actions prior to defining runway use preferences.

## 1.6 Definition of Determinations

As mentioned above, the Level 2 determination options for each measure was as follows:

- **Passed to Level 3** – (1) the measure did not appear to significantly compromise the FAA’s ability to meet their mission and goals, diminish safety, and/or require the need for an external (non-TRACON designated) airspace redesign; (2) Massport did not deem the measure as unfeasible; and/or (3) appeared to meet CAC G&O related to the BLANS.
- **Passed to Level 3 with Conditions** – (1) the measure did not appear to significantly compromise the FAA’s ability to meet their mission and goals, diminish safety, and/or require the need for an external (non-TRACON designated) airspace redesign; (2) Massport did not deem the measure as unfeasible; and/or (3) appeared to meet CAC G&O but may be limited in use or require better definition of procedure in order to confirm determination.
- **Eliminated** – (1) the measure did significantly compromise the FAA’s ability to meet their mission and goals, diminish safety, and/or require the need for an external (non-TRACON designated) airspace redesign; (2) Massport did deem the measure as unfeasible; and/or (3) appeared to not meet CAC goals and objectives related to the BLANS.
- **Completed/Implement(ed)** – Infrastructure related to measure is already in place (completed); measure is documented and enacted; or measure is recommended (or in the process) for early implementation.

If eliminated from further consideration, the following decisions were identified for each measure:

- **Operational Feasibility** – the measure will provide limited benefit/effectiveness in relation to the BLANS or CAC G&O; could not be accomplished within a reasonable amount of time taking into account environmental, social, economic and technological factors; was deemed infeasible due to limited space on the airfield; or are inconsistent with applicable legal requirements as described in the 2002 Airside EIS Record of Decision (ROD).
- **Inconsistent w/ CAC G&O** – the measure did not meet CAC G&O based on IC assessment and CAC agreement on assessment.
- **Significant Compromise to FAA’s Ability to Meet Mission and Goals** - significant compromise to FAA’s ability to meet their mission and goals and/or requires an airspace redesign.

- **Safety** – the measure presents a strong potential for reducing safety and/or increases level of risk for existing hazards that are effectively mitigated.

**Figure 1** depicts a summary matrix for each measure and the determinations for each for Level 1 and Level 2 analysis. Refer to Section I of the BLANS Level 1 Screening Analysis Report (October 5, 2009) for Level 1 determination definitions.

**Figure 1**

Level 2 Screening Determinations Matrix (Part 1 of 3)

SCREENING DETERMINATIONS		LEVEL 1			LEVEL 2		
		PASSED TO LEVEL 2	COMPLETED	ELIMINATED	PASSED TO LEVEL 3	COMPLETED	ELIMINATED
<i>Ground Concepts</i>							
G-A	Tow Aircraft To Runway End			X PE			
G-B	Mandate Single Engine Taxi Away From Community (previously known as G-N)			X SF			
G-Bv2	Encourage Single Engine Taxi Away from Community	✓			X IP		
G-C	Taxiway N for 22R/Centerfield for 22L			X PE			
G-D	Runway 4R Arrival on Centerfield	✓			X CP		
G-E	Add Fillets for Runway 4R Egress		X CP				
G-F	Encourage Limit Arrival Reverse Thrust	✓			X IP		
G-G	Noise Barrier on Community Side	✓					X GO
G-H	Floating Noise Barrier - Taxiway N			X SF			
G-I	Ground Run-Up Enclosure	✓					X OF
G-IV2	Preferred Location for Run Ups Away from Communities				✓		
G-J	Holding Area for Departures	✓					X SC
G-Jv2	Holding Area for Delayed Departures				✓		
G-K	Replace APU/GPU with Electric Power		X CP				
G-L	Change National On-Time Departure Rule			X PE			
G-M	Noise Barrier for Runway 15R Departures	✓					X GO
<i>Flight Procedure Concepts: Approach</i>							
F-A	Continuous Descent Approach	✓					X SC
F-B	Move DRUNK East over Water			X CB			
F-C	Raise Drunk Arrival Crossing Altitude			X CB			
F-D	Disperse Arrivals over Marshfield			X CB			
F-E	Move Jet Arrivals over Marshfield South			X CB			
F-F	Runway 32 over Water Approach			X SF			




	Passed to Next Level		Passed to Next Level with Conditions		Eliminated from Further Evaluation
SF	Safety	OF	Operational Feasibility	GO	Inconsistent with CAC Goal/Objectives
CP	Completed	DP	Duplicate	PE	Previously Evaluated
				CB	Combined
				SC	Significant Compromise
				UD	Under Development
				IP	Recommend to be Implemented

Figure 1 (continued)

Level 2 Screening Determinations Matrix (Part 2 of 3)

SCREENING DETERMINATIONS	LEVEL 1			LEVEL 2		
	PASSED TO LEVEL 2	COMPLETED	ELIMINATED	PASSED TO LEVEL 3	COMPLETED	ELIMINATED
<i>Flight Procedure Concepts: Approach (continued)</i>						
F-G	Runway 32/33L RNAV/Visual Approach North of Hull (Nighttime)	✔			✔	
F-H	Runway 32 Visual Approach (Similar to RNAV Approach)	✔			✔	
F-I	Maintain 3 Mile Separation for Arrivals	✔				✘ SC
F-J	Maintain Last Assigned Altitude on Visual Approach Until Glide Slope			✘ SF		
F-W (ER)	Raise Approach Altitude and CDA Over Marshfield			✘ DP		
F-X (ER)	Adopt CDA for Runway 32			✘ DP		
F-Y (ER)	Move F-F and F-G Outside Marshfield Boundary			✘ CB		
F-Z (ER)	Move Phase 1 Alt 6,7 and 11 Jet Arrivals over Marshfield Further South			✘ CB		
F-AA (ER)	Move the Entire Phase 1 Arrival Corridor South of Marshfield			✘ CB		
F-BB (ER)	Move DRUNK Intersection East over Water more than 2 Miles			✘ CB		
F-CC (ER)	Raise the Jet Arrival Altitude over DRUNK by more than 8,000 Feet			✘ SF		
F-GG	New Approach Crossing Point up to 2 Miles East and Several Miles South of DRUNK	✔				✘ SC
F-GG (v2)	Cross at DRUNK with Aircraft Crossing at 8,000 Feet MSL				✔	

*Flight Procedure Concepts: Departure*

F-K	Extend Runway 27 RNAV Departure Gates Further South	✔				✘ SC
F-K(v2)	Extend Runway 27 RNAV Departure Gate 1 nmi Southwest of Existing WYLLY Waypoint				✔	
F-L	Apply all Available Technology to Enhance Runway 27 RNAV Goals		✘ IP			
F-M	Runway 14 Departures Stay North of Hull and Raise Altitude Over Shoreline	✔			✔	
F-N	Runway 15R Late Night Departures Further North of Hull using RNAV	✔				✘ SC
F-N (v2)	Runway 15R Late Night Departures Further North of Hull using Phase 1 Conventional Departure Procedure during 33L Arrival and 15R Departure Runway Operating Configuration					✘ SC
F-O	Split Runway 22L/R Departures South and East			✘ GO		
F-P	Runway 33L Departure Follow Mystic River			✘ CB		
F-Q	Right Turn for Runway 9 Departures			✘ SF		
F-R	Runway 4R Departure - Shift Alternative 1 Waypoint East	✔			✔	

	Passed to Next Level		Passed to Next Level with Conditions		Eliminated from Further Evaluation						
SF	Safety	OF	Operational Feasibility	GO	Inconsistent with CAC Goal/Objectives	PE	Previously Evaluated	SC	Significant Compromise	IP	Recommend to be Implemented
CP	Completed	DP	Duplicate			CB	Combined	UD	Under Development		

Figure 1 (continued)

Level 2 Screening Determinations Matrix (Part 3 of 3)

SCREENING DETERMINATIONS	LEVEL 1			LEVEL 2		
	PASSED TO LEVEL 2	COMPLETED	ELIMINATED	PASSED TO LEVEL 3	COMPLETED	ELIMINATED
<i>Flight Procedure Concepts: Departure (continued)</i>						
F-S	Runway 4R, 9, 27 and 33L - Thrust/Climb Close-In vs. Distant Profiles					
F-DD (ER)	Move All Jet Departures over Marshfield Out over Water					
F-EE (ER)	Relocate Jet Departures West of Marshfield to Allow for Jet Arrival to be Raised					
F-FF (ER)	Extend Runway 33L Designated Heading until 7 DME					
F-HH	Runway 33L Departure Follow Mystic River up to 7 DME and 5,000 Feet Before Turn					
F-HH (v2)	Runway 33L Departures Follow Compatible Land Use to the Maximum Extent Practical up to 5 DME or 5,000 Feet before Turn					
F-HH (v3)	Runway 33L Departures Stay North of Admiral's Hill and Follows the Compatible Land Use to the Maximum Extent Practical up to 5 DME or 5,000 Feet Before Departure Fix Transition Turn					

*Flight Procedure Concepts: Local Traffic*

F-T	Establish Altitude Floor Over Downtown Area					
F-T (v2)	Issue Highest Altitude for Fixed Wing as Stated in BOS ATCT SOP via "at or below" Instruction; Issue Letter to Airmen Informing Noise Sensitivity Over Downtown; For Helicopters not Operating Over Recommend Routes, Issue Altitude at or below 1,000 Feet MSL					
F-U	Establish Required Helicopter Routes over Downtown Area					
F-U (v2)	Establish Recommended Helicopter Routes over Downtown and Outreach to Pilots					
F-V	Extend Propeller Departure Course Until Reaching 2,000 feet MSL					
F-V (v2)	Utilize 260 Course Heading from Runway 22R in lieu of 290 for Props/Turboprops Heading North, Northwest, or West until 2,000 Feet					

*Other Phase 1 Carry Over Measures*

M17	Runway 27/33L						
M21	All Runways - Fanned Headings						
M26	2nd Gate Fanning - Runway 27 WYLYY Departure						
M27	Offset Approach to Runway 4L/R						
M28	Right Turn - Runway 27 Departure						

**Totals**

	LEVEL 1 ANALYSIS				LEVEL 2 ANALYSIS			
	Passed to Level 2	Completed	Eliminated	Total	Passed to Level 3	Completed	Eliminated	Total
	22	3	28	53	10	5	17	32

	Passed to Next Level		Passed to Next Level with Conditions		Eliminated from Further Evaluation						
SF	Safety	OF	Operational Feasibility	GO	Inconsistent with CAC Goal/Objectives	PE	Previously Evaluated	SC	Significant Compromise	IP	Recommend to be Implemented
CP	Completed	DP	Duplicate	UD	Under Development	CB	Combined				

Source: FAA (FAA decisions); Massport (Massport decisions); CAC (CAC decisions), April 2011.  
Prepared by: Ricondo & Associates, April 2011.

Each of the measures, which has been retained as reasonable and feasible through the Level 2 screening analysis, was analyzed and refined to identify more specific operational procedure definitions required for implementation. As FAA and Massport evaluated the proposed measures, each considered primarily the intent of the proposed measures that satisfied the Level 2 criteria and the intent. In some cases, the information provided warranted elimination, but the FAA and/or Massport provided suggested modifications or versions that would deem the measure “Passed to Level 3” if CAC was willing to accept the modification. Those versions described herein were considered modifications by FAA or Massport which CAC agreed to evaluate in Level 2 in lieu of the original CAC-proposed measure.

Note: Those measures passed to Level 3 were based on limited and conceptual information at the time of the evaluation. As these measures are better defined for noise modeling in Level 3, issues related to safety and operational feasibility may lead to elimination.

## **II. Level 2 Determination Summary Matrix**

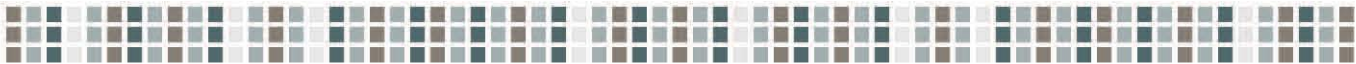
Figure 1 includes a matrix that summarizes the Level 2 determinations made by the FAA, Massport or CAC regarding each CAC and elected representative proposed measure. Figure 1 also illustrates all measures proposed since the beginning of Phase 2 and the associated status after Level 1 and Level 2 analysis.

## **III. Individual Measure Summary Sheet**

Summary sheets for each CAC and elected representative proposed measure that were approved for Level 2 analysis and were evaluated by the FAA, Massport, and/or CAC are included in this section. These sheets are intended as a summary of the detailed information provided by FAA, Massport and CAC. More specific information is provided in the FAA’s Operational Screening/Evaluation Criteria Worksheets and/or Attachments as referenced and is considered the official information related to each party’s determination.

Each of the summary sheets is organized by type of measure. The first set describes the aircraft ground noise abatement measures (those with a Measure Identification (ID) that start with ‘G’). The second set describes the flight - arrival procedure based measures. The third set describes the flight - departure procedure based measures. The last set describes the flight - local (non-BOS airport traffic) procedure based measures. The Measure ID for the second, third and fourth sets begin with ‘F’. Each measure identification code that was proposed by an elected representative contains the letters ‘ER’ in the Measure ID title (the number on the upper right hand corner of each sheet represents the identification number of the measure related to the entire noise study to include Phase 1 and Phase 2). Each sheet provides a brief description and the measures intent as presented by IC at the February 28, 2008 BOS/TAC meeting and the revised IC set of slides provided on March 12, 2008, and the elected representatives’ letters. Each sheet provides the FAA’s, Massport’s or CAC’s determination and reasons for the decision, where appropriate. In some cases, potential issues related to a measure that will effect definition and Level 2 determination are noted in italics.

Ground Concepts



**Measure ID:** G-B(v2) [previously labeled G-N]

**Measure Number:** 71

**Measure Description:** Massport should encourage air carriers and based or frequent general aviation users at BOS, subject to pilot discretion and the absence of conflicting traffic in Visual Meteorological Conditions (VMC) with clear and dry pavements, to: (1) voluntarily use single-engine taxi operations for ground operations, and (2) voluntarily give preference to the use of an engine on the aircraft side away from the nearest communities.

**Modified By:** CAC (May 28, 2009)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** Massport

**Intent:**

To reduce aircraft emissions and noise on the airport surface through the use of voluntary single engine taxiing to be conducted at the discretion of the pilot in command.



Source: Stock.xchg, www.sxc.hu, (accessed 2007).

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

Massport supports the goal of reducing emissions and noise on the airport surface. Massport reviewed a survey and case study regarding single engine taxiing (SET) and as a result sent letters to the Boston Logan Users Chief Pilots and the Boston Logan Airline Committee on the use of SET when safely appropriate. The letters targeted chief pilots with requests that they are shared with line pilots. Additionally the letter highlights the most prevalent and optimum uses of SET.

Massport has also sent a paper written by the Massachusetts Institute of Technology (MIT) surveying air carrier procedures and use of SET at the airport, a published article on the MIT survey, a recent press report from the Boston Globe, and a paper on research conducted by MIT at the airport on metering of taxiing aircraft. Lastly, Massport is supporting an ongoing research initiative being conducted at Boston Logan by the FAA's PARTNER/MIT initiative. The research involves optimizing taxiing strategies for the FAA Air Traffic Control Tower (ATCT) to reduce ground delays, which in effect can reduce emission and noise exposure levels.

Massport has stated no additional work is required regarding SET as it is used regularly at the airport and there is a strong economic incentive for airlines to continue use of SET whenever possible based on fuel savings and reduced engine wear benefits consistent with their safety practices. Massport has indicated to CAC they will seek further airline input to re-confirm their current understanding of airline procedures related to engine start-up/shut down and the use of SET as already shared with CAC. Massport will also conduct additional outreach to airline chief pilots to reconfirm the use of SET. See also the Level 1 Screening Analysis Report, October 5, 2009, for additional information on FAA input related to SET in general.

The CAC has requested that the use of SET be tracked through periodic surveying of airlines. CAC recommends the evaluation of the SET under Level 3 noise and operations modeling. In addition the CAC requests that

communication through surveys, posters, and directly with chief pilots be recurring. **Attachment I**, *Corresponding Information for Measure ID: G-B(v2)[previously labeled G-N]* contains all pertinent information related to this measure. For additional CAC recommendations see **Attachment Id**. **Attachment Ig** provides or documents in more detail Massport's commitment related to this measure.

CAC provided an update regarding ground noise measures on December 15, 2010, (reference **Attachment Id**) which indicated a request to noise model this measure. The PC did not model SET due to its voluntary nature, unpredictable use on an average daily basis, and limited capability in INM to model single-engine on either side of an aircraft.

In addition, Massport agreed with CAC's recommendation to form a noise abatement committee to continue information exchange related to ongoing noise issues at Boston-Logan (reference **Attachment Ih**). As a result, it is expected that further discussion will occur through that committee related to this ongoing implemented measure. A more formal and detailed response from Massport regarding ground noise measures is expected in the near future.

**Measure ID:** G-D **Measure Number:** 32

**Measure Description:** Utilize Centerfield Taxiway for Runway 4R arrivals to the terminals in lieu of Taxiway November (N).

**Proposed By:** CAC(March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA/Massport

**Intent:**

Reduce aircraft ground noise levels for communities west of Taxiway N by increasing distance between the source (aircraft) and the receiver (residents west of the airport located within close proximity of line-of-site of Taxiway N).



Source: Google Earth Pro 2010; MassGIS, 2010; TerraMetrics 2010; Ricondo & Associates, Inc., April 2011.

**Level 2 Screening Findings:**

Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

The measure was identified in the Level 1 Screening Analysis Report, October 2009, as meeting the CAC goals and objectives and no safety issues or other impediments to implementation were found. Massport has implemented measure G-E (Add Fillets for 4R Egress) as illustrated in the above image which is compliant with FAA airport design standards, and allows aircraft to make unimpeded/expeditious turns onto the Centerfield Taxiway away from the north end of the airfield, which further favors the use of the Centerfield Taxiway when utilized. FAA determined this measure has been eliminated from Level 3 analysis as it was implemented as defined based on the description of use in the Final BOS Airside EIS (Table 3.9-1, pages 3-140 through 3-147). The CAC representatives at the May 20, 2010, meeting indicated no objections to the FAA's determination.

**Measure ID:** G-F **Measure Number:** 34

**Measure Description:** Limit use of reverse thrust during landing on all runways.

**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA/Massport

**Intent:**

The intent is to reduce landing noise levels on nearby communities. This measure would require longer landing roll distances.



Source: Angelo DeSantis, [www.flickr.com/photos/angeloangelo/](http://www.flickr.com/photos/angeloangelo/), January 1, 2010 (accessed May 2011).

**Level 2 Screening Determinations:**

Pass to Level 3  Eliminated  Completed/Implement(ed)

**Reason for Elimination:**

Safety  Inconsistent with CAC G&O  
 Operational Feasibility  Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

Based on the information collected by the PC during the literature review regarding idle reverse thrust, airports with a similar measure are voluntary, and encourage idle reverse thrust when able. When considering such a measure, the following were identified related to adopting an idle reverse thrust noise abatement encouragement measure at the airport.

- Airport Facilities (runways and runway exit locations)
- Mix of Air Carriers (aircraft type)
- Runway Occupancy Times (maintain current approach separations)

In addition, Massport and the FAA have expressed concern regarding safety and efficiency including:

- Reduced braking capability
- Limited use during adverse field conditions (e.g., during snow days)
- Conflict with Land and Hold Short Operations (LAHSO)
- Voluntary nature at the discretion of the Pilot in Command

See **Attachment 2**, *Corresponding Information for Measure ID: G-F* for additional information. Massport agreed to implement an effort to encourage and support the use of limited reverse thrust, subject to safety, air carrier procedures, and pilot discretion. The FAA does not have the authority to require or recommend airport users to limit reverse thrust, but emphasized importance to maintain safe operation, current runway occupancy times and the LAHSO program.

Under Level 3, CAC requests additional information regarding airline policies with regard to limited reverse thrust operations should be obtained. For additional CAC recommendations see **Attachment 1d**. CAC also requested to noise model this measure. The PC did not model SET for reasons explained in a PC memo drafted to the IC (see **Attachment 2c**).

Massport will continue to evaluate this measure as stated in their March 21, 2011, memo to the CAC (refer to **Attachment Ig**). Massport will explore including supporting language on reverse thrust (subject to safety consideration and pending results of level three analysis) in the annual letters sent to chief pilots on single engine taxiing and any final “fly friendly” poster for pilot lounges.

In addition, Massport agreed with CAC’s recommendation to form a noise abatement committee to continue information exchange related to ongoing noise issues at Boston-Logan. As a result, it is expected that further discussion will occur through that committee related to this measure. Refer to CAC December 15, 2010 memo (**Attachment Id**) regarding their request to form a noise abatement committee. Reference **Attachment Ig** for Massport’s response to CAC dated March 21, 2011. A more formal and detailed response from Massport regarding ground noise measures is expected in the fall of 2011.

Measure ID: G-G

Measure Number: 35

Measure Description: Erect noise barriers on the community side of the shoreline.

Proposed By: CAC (March 12, 2008)

Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency

Reviewer: CAC

Intent:

Reduce aircraft ground noise levels for residences that have direct line of site of Runways 15R/22L/22R/27. The number of residences targeted for reduction depends on the height of the proposed barriers.



Source: Google Earth Pro 2010; MassGIS, 2010; TerraMetrics 2010; Ricondo & Associates, Inc., April 2011.

Level 2 Screening Determinations:

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

Reason for Elimination:

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

Comments:

CAC requested IC to evaluate the viability of a noise barrier and its effectiveness in reducing ground noise. The IC evaluation was based upon a proposed barrier constructed of concrete panels to a height of 24 ft. The location as depicted above extended from the Wood Island T station to Point Shirley.

The IC determined there was limited noise level reduction. Based on the lack of large-scale noise level improvement, the adverse aesthetic impacts, the adverse probable effect on property values of shoreline residences, as well as the potential for environmental impact on coastlines and shore biotic communities, the CAC voted on October 23, 2010 to eliminate Measure G-G, based on supporting information as prepared by their Independent Consultant Landrum and Brown.

See Attachment 3, Corresponding Information for Measure ID: G-G, for additional information.

Measure ID: **G-I**

Measure Number: **37**

Measure Description: Build a dedicated hush house building for run-ups.

Proposed By: CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

Reviewer: Massport

**Intent:**

Reduce aircraft maintenance run-up noise by as much as 20 dBA.



Source: Chicago Department of Aviation, flychicago.com/Images/grepicture.jpg, (accessed January 2011).

**Level 2 Screening Determinations:**

Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

Massport determined that a ground run-up enclosure (GRE) was not operationally feasible due to severely constrained apron areas. Due to the physical limitations of the airfield, the proposed GRE would only accommodate a limited aircraft size and would require active runway crossings to and from these locations. Additionally, the efficiency and functionality of the GRE would be limited by variability in the wind and weather patterns affecting BOS.

Massport provided CAC information relating to the decision prior to the BOS/TAC meeting held on May 20, 2010, and no objections from the CAC was noted during the meeting. Massport proposed a modified version of the measure (G-I(v2)) to meet the intent: utilizing the turnaround pad at the end of Runway 32 as a preferred run-up location when Runway 14/32 is not in use. The CAC accepted G-I(v2) in lieu of Measure G-I. See **Attachment 4, Corresponding Information for Measure ID: G-I**, for additional information.

**Measure ID:** **G-I(v2)** (Recommended by Massport as enhancement of CAC Measure G-I)

**Measure Number:** **37**

**Measure Description:** Move run-up operations to less noise sensitive area of airport.

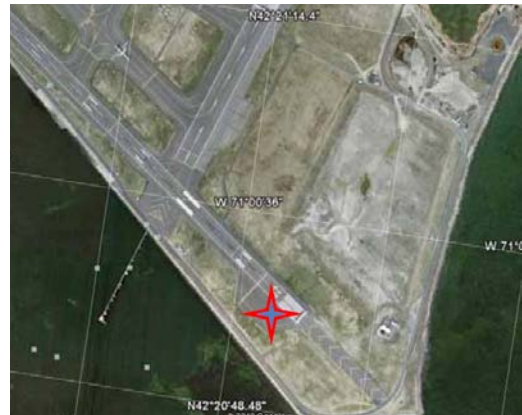
**Modified By:** Massport (October 28, 2010)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** Massport

**Intent:**

The intent of this measure was to move run-up operations from the north end to the south end of the airfield thereby reducing the noise associated with aircraft run-ups and taking advantage of the Shipping Channel and Conley Terminal/Industrial park as a buffer for communities to the south of the airport.



Source: Google Earth Pro 2010; MassGIS, 2010; TerraMetrics 2010; Ricondo & Associates, Inc., April 2011.

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

This measure, proposed by Massport in lieu of G-I, preserves the operational flexibility when Runway 14/32 is not in use, while minimizing crossings at the midfield of the airport. The measure appears to be consistent with the original intent of Measure G-I in regards to reducing engine run-up noise. CAC approved this measure for further review, subject to a more thorough analysis with regard to a Single Event Noise Level (SEL) perspective and engine blast area analysis in Level 3. The proposed location would be considered the preferred site for all run-ups. See **Attachment 5, Corresponding Information for Measure ID: G-I(v2)**, for additional information.

The CAC requested an evaluation of the relocated run-up area under Level 3 noise and operations modeling, enhanced run-up activity logs to include duration and thrust levels. In addition, the CAC would like a system of meaningful fines to be implemented if Massport’s current rules regarding nighttime run-up are not adhered to. For additional CAC recommendations see **Attachment 1d**.

Massport does not support either creating a new noise regulation or expanding the existing reporting requirements or a re-assessment of the current noise rule. Massport, however, proposes to report to the CAC, as part of the recommendation for ongoing CAC-Massport collaboration beyond the noise study, a review of noise complaints related to engine run-ups, including compliance with time of day and frequency. Massport will continue to evaluate this measure as stated in their response to CAC dated March, 21, 2011, See **Attachment 1g**.

**Measure ID:** G-J **Measure Number:** 38

**Measure Description:** Seek a location on the airport for a hold apron/penalty box to park aircraft as they await takeoff queuing onto Taxiway November and Taxiway D.

**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA/Massport

**Intent:**

The original intent was to reduce the duration of aircraft ground noise levels associated with taxiway movements and queuing (line of aircraft waiting to depart Runway 22L/22R).

The intent of this measure has been clarified to reduce the queue length for departures at the end Runways 22L/22R and 27, which are those runways closest to the northern communities. As such, the measure would be implemented when the departure queues reached a certain length, less than what currently occurs during peak periods. After the queue has reached the prescribed length the FAA would: (1) direct aircraft from the terminal to a hold pad located along Taxiway M, (2) assign a parking location in the pad based on order of release times and (3) direct a release from the hold pad to taxi to either Runway 22R/L or 27, where the aircraft would join the queue.



Source: Google Earth Pro 2010; TerraMetrics 2010; FAA BOS ATCT, 2010 (Taxi Routes); Massport 2010 (Holding Pads); Ricondo & Associates, Inc., April 2011.

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

Massport assessed potential holding area sites identified by the PC based on FAA Federal Aviation Regulation (FAR) Part 77 obstruction surfaces, Terminal Instrument Procedures (TERPS) airspace, and Airport Design surface standards. Based on this screening assessment, Massport requested the FAA Evaluation Team to consider two site locations along Taxiway M (Sites 1 and 4). Massport did not recommend pursuing Site 2, 3, and 5 as these options provide limited capability and capacity to park aircraft. Site 3 would also require extensive mitigation and runway crossings.

FAA evaluated the operation patterns associated with using either of the two hold pad sites to determine if using the pad(s) would cause a significant compromise on their ability to meet their mission and goals. FAA concluded that using any of the hold pads (Site 1 and 4) along Taxiway M to manage the departure queue for Runways 22R/L would significantly compromise safety. Aircraft would have to cross active Runway 22R to get to the hold pad, significantly increasing the likelihood of a known hazard (runway incursions) that has already been mitigated through measures identified in the past Safety Risk Management process. In addition, managing the coordination to and from the hold pad for Runway 22R/L departures when an active runway has to be crossed, would significantly increase controller workload. For more details related to FAA's determination, refer to the *FAA Operational Screening/Evaluation Criteria Worksheet G-J*.

FAA proposed a modified version (G-J(v2)) that proposes to hold delayed departures due to traffic management initiatives at Site 1. The CAC provided a memo dated December 15, 2010 (**Attachment 1d**) indicating acceptance of G-J(v2) in lieu of G-J. See **Attachment 6** for additional information related to hold pad preliminary siting analysis.

Measure ID: **G-J(v2)**

Measure Number: **38**

Measure Description: Preferred holding area, when operationally feasible, for departures assigned to Runways 22L/R and Runway 27 that are delayed due to traffic management initiatives.

Modified By: FAA (October 28, 2010)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

Reviewer: FAA

**Intent:**

When operationally feasible, reduce the number of delayed aircraft holding on Runway 15R due to traffic management initiatives as they wait to be cleared to the departure queue for Runways 22L/R and keep aircraft moving along Taxiway M.



Source: Google Earth Pro 2010; TerraMetrics 2010; FAA BOS ATCT, 2010 (Taxi Routes); Massport 2010 (Holding Pads); Ricondo & Associates, Inc., April 2011.

**Level 2 Screening Determinations:**

Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

The FAA's modified version of G-J (G-J(v2)) suggests that the proposed hold pad at Site I become the preferred holding location, when operationally feasible, for those departures that are held for traffic management initiatives, in lieu of using the existing hold locations, depicted in Exhibit GJ(v2).1 (of the *FAA Operational Screening/Evaluation Criteria Worksheet G-J(v2)*). This suggestion can reduce the number of aircraft holding on Runway 15R as they wait to be cleared to the departure queue for Runways 22L/R. This proposed modified measure will also ensure that traffic on the taxiway system continues to move. In some cases, aircraft assigned to holding areas near Taxiway M (the centerfield taxiway) may block other traffic, which may cause additional aircraft to hold or be rerouted.

The FAA determined this measure would not cause a significant compromise to their ability to meet their mission and goals and recommended passing the measure to Level 3.

CAC agreed to further evaluate this measure, but with some conditions associated with reporting the use of the hold pad. For CAC recommendations and conditions see **Attachment Id**. Massport stated support related to the intent of this measure in their response to CAC (see **Attachment Ih**). Specifically, Massport confirmed their continual support of the identification of specific areas to stage aircraft, including Taxiway M south of Runway 15L-33R and Runway 14-32 pavement areas (when Runway 14-32 is not in use), with the intent of keeping holding aircraft away from the north end of the airfield or near the Bayswater/Court Road neighborhoods.

Measure ID: **G-M**

Measure Number: **41**

Measure Description: Erect noise barrier for 15R departures – northwest end of 15R-33L along East Boston shoreline

Proposed By: CAC (March 12, 2008)

Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency

Reviewer: CAC

**Intent:**

The intention of this measure is to reduce aircraft ground movement, departure roll and arrival reverse thrust noise levels for residents located northwest of the airport within close proximity to the direct line of site of Runways 15R/22L/22R.



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

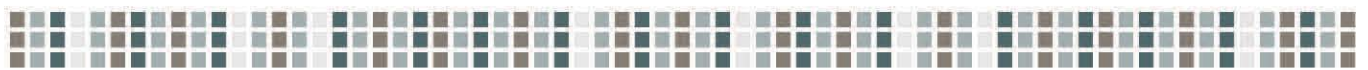
- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

As requested by CAC, IC evaluated the feasibility and extent of the potential noise reduction associated with this proposed noise barrier. For evaluation purposes, a barrier constructed of concrete panels to a height of 24 ft was assumed, with its location being along the high tide line of the bay extending from the Wood Island T Station to the west end of Constitution Beach.

Based on the lack of large-scale noise level improvement, the adverse aesthetic impacts, the adverse probable effect on property values of shoreline residences, as well as the potential for environmental impact on coastlines and shore biotic communities, the CAC voted on October 23, 2010 to eliminate this measure based on the supporting information as prepared by their Independent Consultant Landrum and Brown. See **Attachment 7, Corresponding Information for Measure ID: G-M**, for additional information.

## Flight Procedure Concepts: Approach



**Measure ID: F-A**

**Measure Number: 42**

**Measure Description:** Establish continuous descent approach to Runways 4R, 4L, 27, 33L, 32, 22R, 22L and 15R.

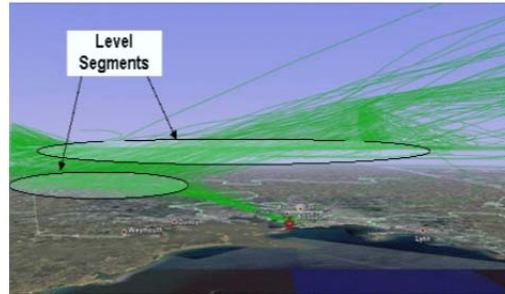
**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

Continuous Descent Approach procedures (CDAs) 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.



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

The assessment of Measure F-A had to wait until completion of the Boston Standard Terminal Arrival Routes (STARs) RNAV project, which didn't occur until May 2011. The Boston RNAV STARs project experienced some delays due to procedure modifications, noise modeling and a delay in contract approval at the FAA headquarters level.

FAA had advised CAC the BOS RNAV STARs project was being pursued as an independent project to meet FAA Flight Plan and NextGen goals and to provide operational benefits for air traffic control.

The BOS RNAV STARs designs overlay the existing arrivals into Boston-Logan. In addition, the designs take advantage of further opportunities for optimum profile descents (OPDs) from high altitude operations above 18,000 ft to runway transitions to intercept the initial approach fix and/or downwinds at Boston-Logan. Because the BOS RNAV designs are scheduled for implementation in December 2011, they serve as the new baseline condition or starting point for FAA's evaluation of CDAs as described in Measure F-A.

As documented in the Operational Screening/Evaluation Criteria Worksheet for Measure F-A, arrival aircraft on continuous descent profiles to Boston-Logan BOS would impact the safe separation of arrival and departure traffic, arrival aircraft with other arrival aircraft, and between arrival aircraft and internal and external airspace boundaries. FAA considers any impact on safety as significant.

A complete airspace and procedural redesign to accommodate a CDA without interruption would be required. Workload would be significantly increased as every arrival aircraft would need to be pointed out and coordinated with several sectors. Arrival aircraft on continuous descent profiles to BOS would require redesign of arrival and departure flows. It would also require an airspace and flow redesign with adjacent air traffic control facilities. An airspace redesign with adjacent air traffic control facilities is significant and is outside the scope of the BLANS.

In addition, FAA stated that any increases in lateral separation will have a direct effect in reducing the throughput

of the airport, increasing delays, reducing efficiency and decreasing capacity, which is a significant compromise to FAA goals and stated mission.

On August 16, 2011 CAC President, Sandra Kunz sent an email to FAA, advising that the CAC's IC, Jon Woodward, had rendered an opinion and agreed with the FAA's position with respect to Measure F-A or CDAs: that it is impossible to implement for various reasons, not the least of which is safety. Thus, Measure F-A will not move onto Level 3 for further evaluation. (refer to **Attachment 8**)

Ms. Kunz noted that the IC believes that the STARS approach will increase the altitude about 200-300 ft on approach and it appears that the increased altitude is the best the CAC can get at this point in the BLANS project. Ms. Kunz further acknowledges the IC's opinion that although an airspace redesign would be promising for the future, it does not, however, fall within the purview of this study.

In summary, the CAC does not object to the FAA's elimination of the measure for the reasons as described in the worksheet. See FAA's *Operational Screening/Evaluation Criteria Worksheet, Measure F-A* for additional information.

Measure ID: F-G

Measure Number: 47

**Measure Description:** 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.

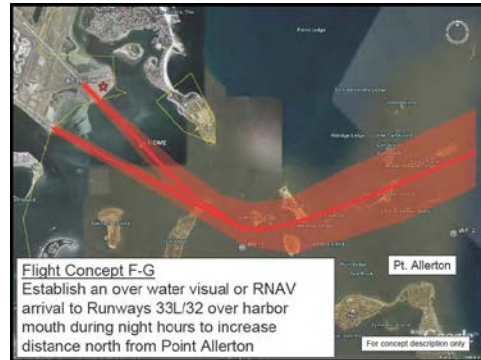
**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

Increase the distance between an aircraft (noise source) and receiver (resident located on Point Allerton), thereby reducing noise levels during more sensitive hours.



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

As shown in Exhibit F-G.I of the *FAA Operational Screening/Evaluation Criteria Worksheet F-G*, the proposed design uses the existing Light Visual Approach for Runway 33L. It would now be applicable to Runway 32 approaches, where aircraft would proceed along the same route to a specified waypoint at or near Fort Warren, then proceed to Runway 32. Further details would be defined in Level 3.

FAA provided CAC information relating to the decision prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC was noted during the meeting. See *FAA's Operational Screening/Evaluation Criteria Worksheet, Measure F-G* for additional information.

**Measure ID:** F-H

**Measure Number:** 48

**Measure Description:** When Runway 32 is used for arrivals 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 4,000 ft west of the Runway 33L approach course) when used in conjunction with Runway 33L arrivals.

**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

The intent of this measure is to maintain an offset approach to Runway 32 west of Hull at all times, instead of a straight in approach to Runway 32).

CAC provided FAA further clarification related to the intent of this measure: in conjunction with Runway 33L arrivals, leave Runway 32 arrivals where they are indicated in the BOS Airside EIS (or maintained as defined for the current Runway 32 RNAV approach).



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

During Level 1, FAA indicated that pilots are canceling the RNAV approach and conducting a visual approach to the runway. FAA cannot require that a pilot conduct the entire RNAV approach if the pilot has the runway in sight. Therefore, the proposed definition of this measure (depicted on Exhibit F-H.1 of the *FAA Operational Screening/Evaluation Criteria Worksheet F-H*) is to provide a visual approach with key landmarks on the ground that pilots can use that will overlay the RNAV approach line just prior to the BGDIG waypoint (west of Hull). Just prior to the BGDIG waypoint, the aircraft will be over the water and the pilot can then proceed to get in line with the Runway 32 centerline. The design also assumes that the TRACON will vector aircraft to join the proposed visual approach to Runway 32. The key assumption in the proposed design is that there are visible landmarks that pilots can see. Such landmarks have not yet been confirmed, and will need to be surveyed to determine if a visual approach overlay of the RNAV 32 approach is viable. If a charted visual approach along the described path cannot be developed due to a lack of visible landmarks, this measure will be eliminated. FAA also indicated its use will depend on operation conditions and pilot's acceptance of the procedure.

FAA provided CAC information relating to the decision prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting. See *FAA's Operational Screening/Evaluation Criteria Worksheet, Measure F-H* for additional information.

Measure ID: F-I

Measure Number: 49

**Measure Description:** Maintain 3 nautical mile separation between arriving aircraft on to Runway 22L – never allow for the 2.5 nautical mile separation rule to be applied.

**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

This measure is intended to reduce intensity of aircraft arrival noise events, even if it does not reduce the overall noise.

Trail Aircraft	In-trail Terminal Separations (nautical miles)				
	Lead Aircraft				
	Heavy	B757	Large	Small+	Small
Heavy	4.0	4.0	3.0	3.0	3.0
B757	5.0	4.0	3.0	3.0	3.0
Large	5.0	4.0	3.0	3.0	3.0
Small+	6.0	5.0	4.0	3.0	3.0
Small	6.0	5.0	4.0	3.0	3.0

Source: Ricondo & Associates, Inc. based on FAA Order JO7110.65T, February 11, 2010, Section 5-5-4, April 2011.

**Level 2 Screening Determinations:**

Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

**Exhibit F-I.1** of the *FAA Operational Screening/Evaluation Criteria Worksheet F-I* depicts the proposed change in the in-trail separation that comprises this measure. Utilizing criteria included in FAA Order JO 7210.3, Facility Operation and Administration (10-7-5, Calculating Airport Arrival Rates and Table 10-7-1, Maximum Runway Capacity), it has been shown that increasing the distance in the in-trail separation from 2.5 miles to 3 miles would reduce runway capacity by up to 17.3 percent (decreasing from 52 arrivals per hour to 43 arrivals per hour) for aircraft making a final approach to Runway 22L at 130 knots, or up to 17.8 percent (decreasing from 56 to 46 arrivals per hour) for aircraft making a final approach to Runway 22L at 140 knots.

Any reduction in capacity is considered a significant compromise to the FAA’s mission. As stated above, this measure would significantly reduce runway capacity.

FAA provided CAC information relating to the decision prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting. See *FAA’s Operational Screening/Evaluation Criteria Worksheet, Measure F-I*) for additional information.

**Measure ID: F-GG**

**Measure Number: 72**

**Measure Description:** Measure F-GG establishes a new approach crossing point at a location approximately two miles east and several miles south of the DRUNK intersection for arrivals from the PVD fix to Runways 22R/L, 27, 32, and 33L, and establishes a minimum crossing altitude of not less than 8,000 ft MSL.

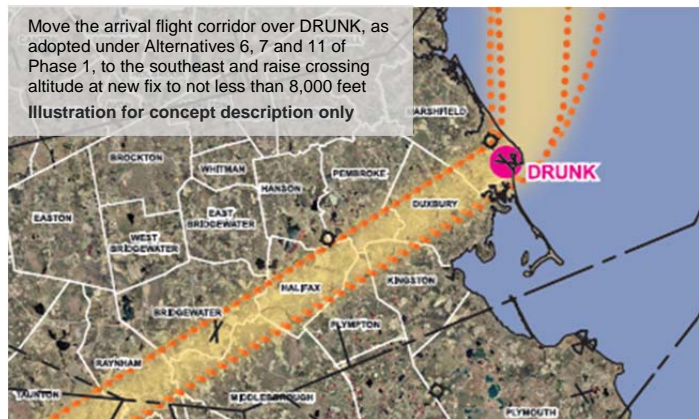
**Proposed By:** CAC (May 28, 2009)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

This measure was proposed by CAC as a consolidated measure related to the DRUNK Approach measures from the Southeast. The intent is to raise the altitude of arrivals to Runway 22L and Runway 27 over land while the aircraft are descending to the proposed fix, and relocate the arrivals to remove BOS Runway 27 and 22L jet arrival noise over Marshfield.



Source: MassGIS, June 2005 (aerial photo and town boundaries); FAA, Systems Operation Group, November 2009 (Video Map); Ricondo & Associates, Inc., November 2007.

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

For Runway 22L and 27, this measure significantly compromises safety by requiring that aircraft operate too close to the safety buffer for the TRACON/Cape Approach airspace boundary, increasing the likelihood of a potential reduction in separation between aircraft constituting an airspace conflict. In addition, due to the change in distance compared to Phase I and the cumulative increase in time and mileage that each aircraft would be required to fly under this measure compared to conditions prior to Phase I, efficiency would be significantly compromised. This measure will also eliminate the FAA's ability to direct aircraft to join the final approach for Runway 32 and 33L at multiple locations, which will affect the flexibility of the air traffic system and its ability to meet the acceptance rates of the runways. For more detail, refer to FAA's *Operational Screening/Evaluation Criteria Worksheet, Measure F-GG*.

This measure was refined to attempt to avoid impacts that resulted in a significant compromise to FAA goals and stated mission, which maintains the existing procedure, but crosses arrivals over DRUNK at 8,000 ft MSL (refer to Measure F-GG(v2)).

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting. The CAC has also accepted F-GG(v2) which has been proposed by Massport in lieu of Measure F-GG.

Measure ID: **F-GG(v2)**

Measure Number: **72**

**Measure Description:** Maintains the DRUNK intersection for arrivals from the PVD fix to Runways 22R/L and 27, but establishes a minimum crossing altitude of 8,000 ft MSL instead of 6,000 ft. This applies to conventional based procedures only.

**Modified By:** FAA (May 20, 2010)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

The intent is to raise the altitude of arrivals to Runway 22L and Runway 27 over land while the aircraft are descending to the proposed fix.



Source: Google Earth Pro 2010; TerraMetrics 2010; FAA, Systems Operation Group, November 2009 (Video Map); Ricondo & Associates, Inc. April, 2010.

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

FAA concluded that this measure would not cause a significant compromise in FAA’s ability to meet their mission and goals. BOS southbound departures could potentially conflict with the DRUNK flow if the altitude is raised to 8,000 ft and could increase the likelihood of a conflict, which the air traffic controller would have to resolve. Further evaluation will be conducted in Level 3, if necessary. See *FAA’s Operational Screening/Evaluation Criteria Worksheet, Measure F-GG(v2)* for additional information.

Note that this measure applies to conventional arrivals only. The BOS RNAV STARS independent project addressed altitudes in the vicinity of DRUNK as they cross the shoreline. As of this publication, the altitudes at DRUNK for Runway 22 and 27 RNAV arrivals will be 8,000 MSL after the BOS RNAV STARS are implemented.

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting. Written concurrence from CAC was received on October 27, 2010 (**Attachment 9**).

Flight Procedure Concept: Departure



Measure ID: F-K

Measure Number: 51

**Measure Description:** Extend Runway 27 departure gates for the south to I95/R128/ Dedham area before turning to enroute courses.

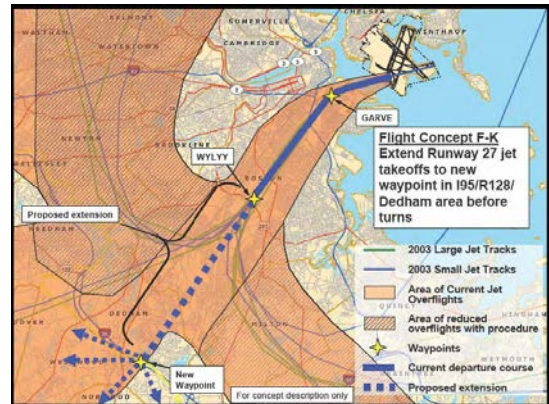
**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

Reduce frequency of overflight noise events.



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

FAA indicated safety concerns with the procedure included in this measure as described by CAC and IC. To summarize, safety concerns include infringement on safety buffer areas with Boston Center (Providence and Gardner Sectors) and A90 (Plymouth Sector) airspace, conflicts with both inbound traffic on V431 (Boston VOR radial path) from Gardner and with Providence arrivals, and increased controller workload and complexity. This measure would increase the span of control (amount of time and distance the aircraft remains within the sector), the number of required controller radio transmissions, radio frequency congestion, and level-offs. The capacity and efficiency of the air traffic control system would be negatively impacted as aircraft are required to fly for additional periods of time and distance to comply with this procedure. For additional information see FAA's *Operational Screening/Evaluation Criteria Worksheet, Measure F-K*.

FAA proposed a modified version of this measure to avoid impacts that resulted in a significant compromise to FAA goals and stated mission, which extends the start of transition to departure fix about 1 nautical mile southwest of the WYLYY waypoint (refer to Measure F-K(v2)).

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting. The CAC has also accepted F-K(v2) which has been proposed by the FAA in lieu of Measure F-K.

**Measure ID: F-K(v2)**

**Measure Number: 51**

**Measure Description:** Extend Runway 27 jet departure tracks farther south along the same course of the existing track to the maximum extent practicable to avoid significant compromises to FAA organizational goals and stated mission.

**Modified By:** FAA (May 20, 2010)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

The intent of the design is to get all jet departures assigned to the RNAV departure procedure to initiate the turn to assigned transition at about one (1) nautical mile southwest of WYLYY.



Source: MassGIS, USGS, 2008 (Ortho Imagery); FAA, System Operations Group, FAA Offload Archive Flight Track Data, 9/7/09, 9/18/09, 9/24/09, 10/8/09 (Flight Track Data and Video Map); FAA System Operations, Performance Based Navigation RNAV/RNP Group, September 2010 (Procedures, Flyability Models); Ricondo and Associates, Inc. 2010 (Corridors)

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

The proposed design is for RNAV navigation only. All departures from Runway 27 would be subject to increased travel time and mileage flown, but not considered to be significant to FAA.

Proposed RNAV procedures will be subject to a more detailed review and design process (such as the current 18-step process) prior to implementation. This process advances a draft procedure to ensure all technical and safety criteria meet FAA requirements within all FAA lines of business, as well as ensure coordination efforts with the affected airline users. The proposed RNAV design after the WYLYYA waypoint may change to align with procedures in use at the time of RNAV development.

FAA cannot commit to precise routes to be flown after the proposed turning point. Instead, the FAA has provided a three mile wide “swath” (each side of the centerline track) that begins after the anticipated turning points. The “swath” will be modeled for noise analysis in Level 3 screening with the understanding that it is subject to change. It is expected that the RNAV development process will not begin until after the NEPA phase has been completed. FAA will continue to seek CAC input on the development of the locations of the procedures. For additional information see FAA’s *Operational Screening/Evaluation Criteria Worksheet, Measure F-K(v2)*.

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting. Written concurrence from CAC was received on October 27, 2010 (**Attachment 9**).

**Measure ID:** F-M (Runway 14 Departures Stay North of Hull and Raise Altitude Over Shoreline) **Measure Number:** 4

**Measure Description:** Phase I Carry Over Measure 4 - Runway 14 Departures: develop departure procedures to increase altitudes of aircraft over land by establishing course guidance to route traffic north of Hull, when used in conjunction with Runway 27 arrivals.

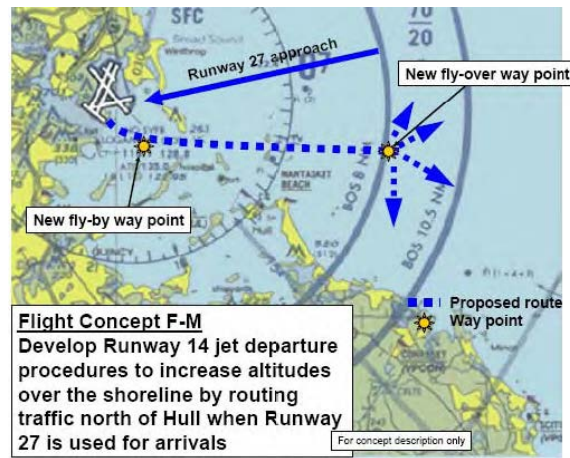
**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

Increase distance between an aircraft (noise source) and residents (receiver) on the ground by staying north of Hull and increase altitude when crossing back over the shoreline. By increasing distance, noise levels detected on the ground could be reduced.



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

This measure proposes a departure procedure from Runway 14 that keeps traffic north of Hull and raises altitude over the shorelines. The proposed definition uses the Phase I Runway 15R RNAV as implemented, and adds a transition leg from Runway 14 to the first waypoint. This procedure would be the standard RNAV departure procedure for jets departing Runway 14. The conventional procedure would be similar to the conventional procedure designed for Runway 15R when the traffic proceeds to the northwest, northeast, south and west.

This measure is passed to Level 3 analysis as there are no known effects to implementation at this time.

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting. For additional information see FAA's *Operational Screening/Evaluation Criteria Worksheet, Measure F-M*.

**Measure ID: F-N**

**Measure Number: 53**

**Measure Description:** Establish a departure waypoint from Runway 15R for use at night to move departures farther north of Hull than established by Phase I Alternative

**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

Increase the distance between an aircraft (noise source) and receiver (resident located on Point Allerton), thereby reducing noise levels during more sensitive hours.



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

This measure proposed an additional RNAV departure procedure for Runway 15R late night (12a.m. to 6 a.m.) to move departures further north of Hull compared to the existing RNAV SID for Runway 15R. This would involve a different RNAV Standard Instrument Departure Procedure (SID) for Runway 15R compared to the Phase I RNAV SID accepted by CAC and currently implemented by the FAA for all hours of a day when the runway is being used. In order for this measure to be considered, it cannot be applied when Runway 27 arrivals are occurring based on the same limitations recorded in Phase I related to maintaining safe separation.

FAA concluded that two different RNAV SID procedures for one runway (i.e. day vs. late night (12am – 6am) is not feasible, as this would introduce a safety hazard related to aircraft assignment to an appropriate SID. Introducing different RNAV SID procedures for the same runway based on different traffic levels introduces a new hazard into the system, by reducing consistency/predictability, potentially causing pilot/controller confusion and increasing workload/coordination requirements. Incorporating a new hazard into the system is a significant compromise of FAA’s mission and goals. For additional information see *FAA’s Operational Screening/Evaluation Criteria Worksheet, Measure F-N*.

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting. The CAC has also accepted F-N(v2) which has been proposed by the FAA in lieu of Measure F-N.

**Measure ID: F-N(v2)**

**Measure Number: 53**

**Measure Description:** Use the LOGAN 6 conventional departure procedure from Runway 15R during late night hours (12 a.m. – 6 a.m.) to move departures farther north of Hull than established by Phase I Alternative

**Modified By:** FAA (May 6, 2011)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

Increase the distance between an aircraft (noise source) and receiver (resident located on Point Allerton), thereby reducing noise levels during more sensitive hours.



Google Earth Pro 2010; TerraMetrics 2010; Ricondo & Associates, Inc., April 2011.

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

Two default procedures for RNAV equipped aircraft for one runway (i.e. day vs. late night (12am – 6am) is not feasible, as this would introduce a safety hazard related to aircraft assignment to an appropriate SID. Introducing assignment of either the RNAV SID or the conventional LOGAN 6 SID for the same runway based on different traffic levels introduces a new hazard into the system, by reducing consistency/predictability and potentially causing pilot/controller confusion. Incorporating a new hazard into the system is a significant compromise of FAA’s mission and goals.

Reverting to conventional vectors as a default procedure is a step backwards. Conventional procedures are not part of NextGen and will eventually be phased out. See FAA’s *Operational Screening/Evaluation Criteria Worksheet, Measure F-N(v2)* for additional information.

**Measure ID: F-R**

**Measure Number: 57**

**Measure Description:** Shift Runway 4R Phase I Alternative 1 RNAV initial fix to east to move the course away from Revere Beach, while avoiding noise increases to Nahant.

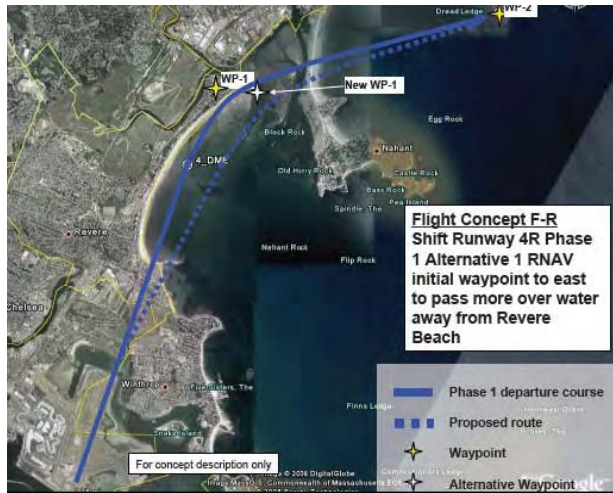
**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

The intent is to increase the distance between an aircraft (noise source) and receiver (resident located along Revere), thereby reducing noise levels. Measure F-R is intended to assure that any modification of the course of the Phase I RNAV departure course from Runway 4R does not result in increased noise impacts in the Nahant area. It is understood that the final definition of the RNAV course may already accomplish the desired objective for the Runway 4R departure course.



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

The proposed design moves the initial waypoint as far east as possible without causing the routes to overfly residential areas south of the Nahant causeway. The conventional procedure will remain as defined from Phase I. This change in the RNAV design would not affect the conventional procedure. For additional information see FAA's *Operational Screening/Evaluation Criteria Worksheet, Measure F-R*.

This measure is passed to Level 3 analysis as there are no known effects to implementation at this time.

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting

Measure ID: F-S

Measure Number: 18

**Measure Description:** Phase I Carry Over Measure 18 - Departure Runways 4R, 9, 27, and 33L: apply cockpit alternatives for thrust and climb management to benefit certain nearby communities through implementation of close-in or distant noise abatement departure procedures.

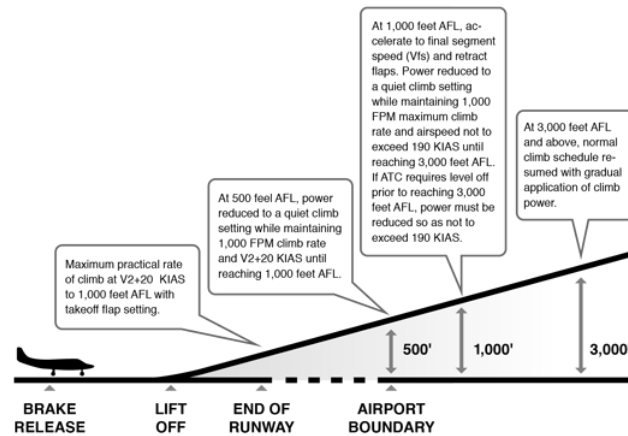
**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** CAC

**Intent:**

Evaluate each measure for noise reduction effects off the end of each runway. Effects from either a close-in or distant noise abatement departure procedure may vary among Runways 4R, 27, and 33L, while Runway 9 is expected to achieve greater benefit from a close-in departure procedure.



Source: www.nbaa.org, (accessed November 2011).

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

PC conducted a noise screening analysis to determine if either a close-in or distant noise abatement departure profile would reduce the number of people exposed to noise levels that are consistent with CAC's goals and objectives. PC concluded that both noise abatement departure profiles do not reduce population exposed to notable noise levels, and are expected to increase the number of people exposed to higher single-event levels. As of March 28, 2011, the IC reviewed PC's analysis of Measure F-S and found that the results of the screening indicate that the procedure produced neither a consistent nor general benefit as it pertains to the population exposed to noise. Given these results, the IC recommended that Measure F-S be dropped from further evaluation. The information was provided to CAC by IC for consideration to determine if the measure meets the CAC's goals and objectives. Refer to **Attachment 10, Corresponding Information for Measure ID: F-S.**

On July 21, 2011, the President of the CAC (Ms. Sandra Kunz), notified the BLANS Project Management Team (PMT) representatives via email, that the CAC had voted to eliminate Measure F-S from further consideration based on the IC's findings that the procedure produced neither a consistent nor general benefit as it pertains to the population exposed to noise (refer to **Attachment 10c**). As a result, no FAA criteria worksheet was required for this measure.

Measure ID: F-DD [ER]

Measure Number: 68

Measure Description: Move all the departures over Marshfield, including for Runways 4, 9, 14, 15, 22L and 22R out over the water. This includes both conventional and RNAV procedures.

Proposed By: Frank M. Hynes, State Representative, Marshfield and Scituate (July 1, 2008)

Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency

Reviewer: FAA

Intent:

Reduce noise levels by having the traffic stay over the water as it heads south towards Cape Cod and Providence, rather than coming over Marshfield at North Marshfield and then heading south over Marshfield.



Source: MassGIS, USGS, 2008 (Ortho Imagery); Federal Aviation Administration, System Operations Group, November 2009 (Video Map: Land 4L/R Configuration); Ricondo & Associates, Inc., 2010 (Proposed Phase 2 Dispersion Corridor, Proposed Phase 2 RNAV Centerline).

Level 2 Screening Determinations:

- Pass to Level 3       Eliminated       Completed/Implement(ed)

Reason for Elimination:

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

Comments:

Implementation of this measure would result in an increase in the total distance traveled per operation of about: (1) two and a half nautical miles compared to the Phase I southbound RNAV and conventional procedure distance and (2) approximately six nautical miles farther and approximately one minute longer, than under conditions prior to this study. See Exhibit F-DD.2 (FAA's Operational Screening/Evaluation Criteria Worksheet, Measure F-DD(ER)).

Due to the cumulative increase in time and mileage (additional six nautical miles) that each aircraft would be required to fly under this measure compared to conditions prior to Phase I, efficiency would be significantly compromised. For additional information see FAA's Operational Screening/Evaluation Criteria Worksheet, Measure F-DD [ER].

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting.

Measure ID: F-HH

Measure Number: 73

**Measure Description:** Jet aircraft departing Runway 33L would be assigned a course that would route the aircraft over the Wellington Station until reaching a point seven (7) nautical miles beyond the fly over end of the runway or to an altitude of 5,000 MSL before turning to enroute or intermediate courses.

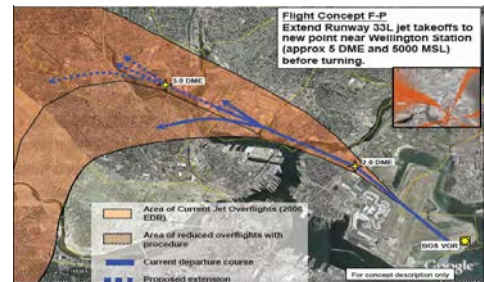
**Proposed By:** CAC (August 31, 2009)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

This measure consolidates Measures F-P and F-FF to describe a proposed departure procedure for jet aircraft using Runway 33L. Reduce frequency of overflight noise events over noise-sensitive areas by increasing overflights over less sensitive areas (e.g., industrial, commercial).



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

This measure results in significant safety concerns resulting from all Runway 33L departure traffic climbing to 6,000 ft and leveling for longer periods to ensure separation from arrival traffic on V431 at 7,000 ft. Departures would be in close proximity to arrival traffic more frequently and for longer periods of time. This measure would increase the likelihood of additional Traffic Collision Avoidance System Resolution Advisories (TCAS RAs).

This measure would also increase the amount of traffic involved in such potential conflicts by adding all westbound and southbound traffic, in addition to lengthening the period of time the existing north bound traffic remains under the V431 arrival flow. In addition, potential conflicts with traffic on the Bedford Airport (KBED) Instrument Landing System (ILS) and in the KBED Class D airspace (designated airspace around KBED) would also increase.

Controller/pilot workload would increase due to additional traffic advisories and radar vectoring required to keep departures within appropriate departure corridors and clear of associated safety buffers, lengthening time span of control and increasing the number of radio transmissions on frequency per aircraft before transfer of control to Boston Center or A90 internal sectors can be accomplished.

These factors, in combination with increases in time, mileage and level-off time for departure aircraft, render this measure a significant compromise to FAA goals and stated mission. For additional information see FAA's *Operational Screening/Evaluation Criteria Worksheet, Measure F-HH*.

FAA proposed a modified measure to attempt to avoid impacts that resulted in a significant compromise to FAA goals and stated mission (refer to Measure F-HH(v2)).

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010, and no objections from CAC were noted during the meeting. The CAC concurred with evaluating F-HH(v2) proposed by the FAA in lieu of Measure F-HH, subject to the CAC subcommittee meeting which was identified in the October 27, 2010, the CAC memorandum (**Attachment 9**).

**Measure ID:** F-HH(v2)

**Measure Number:** 73

**Measure Description:** Establish both a conventional and RNAV departure route from Runway 33L that follows compatible land use to the maximum extent practical (e.g. Mystic River and industrial area toward Wellington Station) up to the BOS VOR 5 DME or at 5,000 ft.

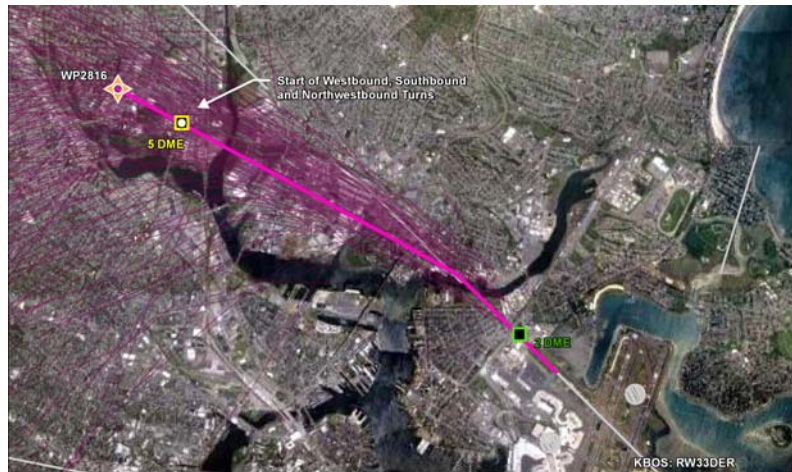
**Modified By:** FAA (May 20, 2010)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

This measure consolidates Measures F-P and F-FF to describe a proposed departure procedure for jet aircraft using Runway 33L. Reduce frequency of overflight noise events over noise-sensitive areas by increasing overflights over less sensitive areas (e.g., industrial, commercial).



Source: Google Earth Pro 2010, USGS, Terrametrics 2011; FAA, System Operations Group, FAA Offload Archive Flight Track Data, 9/7/09, 9/18/09, 9/24/09, 10/8/09 Flight Track Data and Video Map); FAA, System Operations, Performance Based Navigation RNAV/RNP Group, September 2010 (Procedures, Flyability Models); Ricondo and Associates, Inc., 2010 (Corridors)

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

Initially, the FAA Evaluation Team determined that F-HH(v2) was a feasible procedure. As a result the CAC recommended that it proceed to Level 3 subject to a subcommittee meeting (see **Attachment 9**). During the subcommittee meeting, FAA and CAC discovered a climb gradient issue related to F-HH(v2).

FAA confirmed it would require a steeper or non-standard climb gradient. An increased climb gradient that is 76% greater than the current climb gradient is considered a significant compromise to the FAA's ability to meet their mission and goals.

Due to a steeper climb gradient, the direct effect would be the need for additional takeoff length beyond what is available at the airport for the same type of operations that use Runway 33L presently. Therefore, aircraft may be required to implement weight reduction measures or utilize Runway 4R-22L causing substantial delay for heavier aircraft. In addition, the queue for Runway 33L may increase due to holding requirements based on increased Runway 4R-22L departures.

If a pilot requests Runway 4R in lieu of Runway 33L for more runway length, aircraft taxiing to Runways 33L and 4R would be in the same taxi flow potentially causing ground movement conflicts and increasing taxi times.

Airlines continue to utilize larger aircraft, as such; any effect on the available runway length for departures that results in a reduction is considered a significant compromise on the FAA's ability to meet their mission and goals.

CAC was provided with information related to the climb gradient for this measure during a CAC sub-committee meeting held on January 26, 2011. The end result of the CAC sub-committee meeting was the development of an additional modification known as Measure F-HH(v3). For additional information see *FAA's Operational Screening/Evaluation Criteria Worksheet, Measure F-HH(v2)*.

Measure ID: F-HH(v3)

Measure Number: 73

**Measure Description:** Establish an RNAV standard instrument departure procedure from Runway 33L that turns to the northwest at a location that avoids Admirals' Hill then follows compatible land use as traffic proceeds northwest from Admiral's Hill, and follows compatible land use to the maximum extent practical up to the BOS VOR 5 DME or at 5,000 ft.

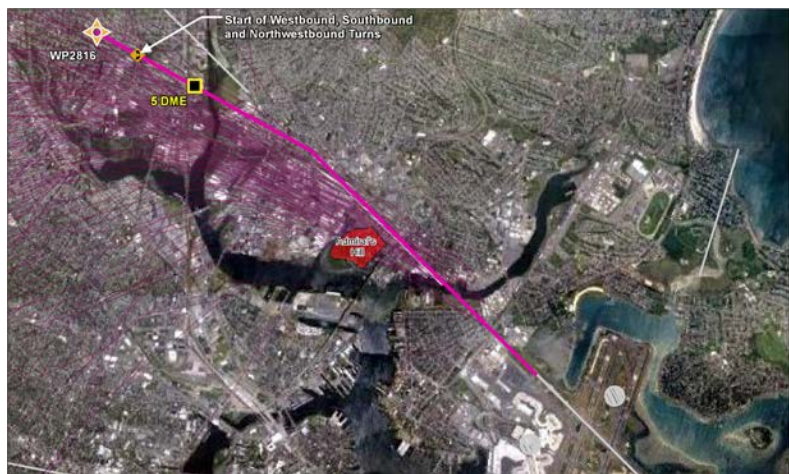
**Modified By:** CAC/FAA (January 26, 2011)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

This measure consolidates Measures F-P and F-FF to describe a proposed departure procedure for jet aircraft using Runway 33L. Reduce frequency of overflight noise events over noise-sensitive areas, including Admiral's Hill by increasing overflights over less sensitive areas (e.g., industrial, commercial).



Source: MassGIS, USGS, 2008 (Ortho Imagery); FAA, System Operations Group, FAA Offload Archive Flight Track Data, 9/7/09, 9/18/09, 9/24/09, 10/8/09 (Flight Track Data and Video Map); FAA System Operations, Performance Based Navigation RNAV/RNP Group, September 2010 (Procedures, Flyability Models); Ricondo and Associates, Inc. 2010 (Corridors)

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

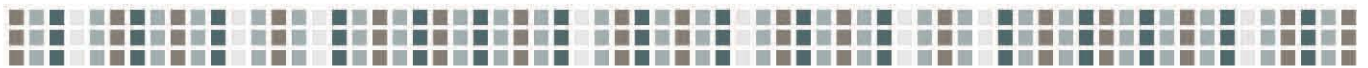
For the RNAV design, all aircraft heading to the northwest, west and south will begin the turn between the 5.0 and 5.5 DME. Although the original F-HH(v3) measure description states 5.0 DME, recent collaboration between members of a Boston TRACON workgroup confirmed that the turn-point could be extended up to ½ mile further, consistent with the intent of earlier CAC proposals for Measure F-HH.

Previous RNAV designs based on F-HH(v2) were used and adjusted to initiate the turn to the northwest towards the 5 DME waypoint in a manner that provides a climb gradient close to the existing climb, and avoids as much as possible Admiral's Hill yet continues along non-noise sensitive land use (e.g., commercial and industrial). The same heading parameters from 33L that were applied for F-HH(v2) were also applied to F-HH(v3) as well as the general location/distance where the transition to departure fix turns must take place.

The proposed design is for RNAV navigation only and represents the most the FAA can do to extend the departure route without significantly compromising FAA goals and stated mission. CAC reviewed the proposed RNAV design during a CAC sub-committee meeting held January 26, 2011, and agreed it still meets the spirit of the original intent, and requested the FAA evaluate the design. The design involves a climb gradient of 280 ft per nautical mile. Compared to the 224 ft that exists today, FAA concluded the 280 ft per nautical mile was acceptable.

FAA cannot commit to precise routes to be flown after the 5.5 DME proposed turning point. Instead, the FAA will provide a three mile wide "swath" (each side of the centerline track) that begins after the anticipated turning points. The "swath" will be modeled for noise analysis in Level 3 screening with the understanding that it is subject to change. As stated in the worksheet for Measure F-HH(v3), proposed RNAV procedures will be subject to a more detailed review and design process (such as the current 18-step process) prior to implementation. FAA will continue to seek CAC input on the development of the locations of the procedures.

## Flight Procedure Concepts: Local Traffic



Measure ID: F-T

Measure Number: 58

Measure Description: Establish altitude floor to increase altitudes over downtown area for local VFR traffic under BOS Tower control that are not on approach or initial climb.

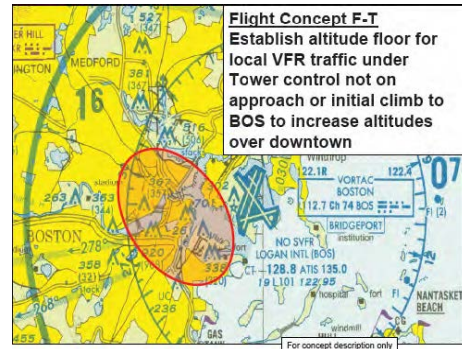
Proposed By: CAC (March 12, 2008)

Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency

Reviewer: FAA

Intent:

The noise abatement intent is to increase the distance between an aircraft (noise source) and receiver (resident located in the downtown area), thereby potentially reducing noise levels. The CAC reaffirmed its intent of this measure at an August 13, 2009 CAC meeting to: decrease noise from small planes and helicopters over the inner cities. This language can be found in Attachment 16 of the Level 1 Screening Analysis report, dated October 5, 2009.



Source: Landrum & Brown, Inc., February 2008.

Level 2 Screening Determinations:

- Pass to Level 3
- Eliminated
- Completed

Reason for Elimination:

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

Comments:

The CAC August 13, 2009 addendum in the Level 1 Screening report recommended that FAA reasonably maximize minimum altitudes over residential and commercial areas to reduce noise from small planes (i.e. VFR fixed-wing) and helicopters. Recommended altitudes included fixed wing at 1,600 ft for downtown and 1,900 ft for Back Bay Boston and helicopters generally at 500 to 1,000 ft. CAC also recommended that FAA ensure compliance with Minimum Safe Altitudes (MSAs) and any other noise abatement agreed to altitudes by developing materials and programs to monitor and enforce these.

The FAA decision on F-T is not related to efficiency or capacity issues, therefore, the worksheet criteria did not apply. As a result, the FAA decision is documented in a determination sheet, *FAA Determination, Measure F-T*.

The establishment of mandatory minimum or maximum altitudes requires general rulemaking, at the FAA Headquarters level, which follows a separate public process with an uncertain outcome. This is beyond the scope of the BLANS; therefore, the FAA will not be establishing mandatory altitudes as described in measure F-T, but have advised CAC that it may pursue rulemaking outside of the BLANS.

The FAA Airport Traffic Control Tower (ATCT) determined that some altitude assignments by air traffic controllers were not ideal to encourage pilots to comply (as already required) with 14 CFR §91.119. Accordingly, for aircraft transitioning the Class B airspace, the ATCT took an independent action and updated their Standard Operating Procedures (SOP) Order to: (1) issue at or below altitudes for VFR fixed-wing aircraft of 2,000 ft MSL over the downtown area and 1,500 ft MSL over other land areas, and (2) at or below altitudes for VFR helicopters of 1,000 ft MSL over all land areas except for established recommended helicopter routes. Note that these altitudes are in fact maximum altitudes to provide prescribed separation from BOS arrival/departure traffic overhead.

The CAC notes the MSA requirement for 1,000 ft higher than within 2,000 ft still leaves relatively little airspace

around Back Bay and downtown towers and questioned why the 1,500 ft minimum at or below cannot be higher than the 2,000 ft closer to Logan around the towers.

FAA responded that MSA requires in congested areas 1,000 ft higher than within 2,000 ft; and the 1,500 ft is consistent, to allow compliance with MSA. It is necessary to assign VFR altitudes to provide separation from arrival/departure traffic, traffic transitioning Class B airspace and other VFR aircraft. The altitude assignments are conveyed to aircraft in both VFR depending on the aforementioned and by traffic and runway configuration. The independent SOP change enacted by ATCT has procedurally increased the quantity of higher altitudes assignments flown by Class B VFR aircraft. The SOP change accounts for safe separation from arrivals and departures at the airport as long as the VFR traffic does not exceed 2,000 ft.

Regarding MSA § 91.119 compliance, FAA investigated specific past operations, the details of which were provided by CAC members. The FAA found those helicopter and fixed-wing aircraft were in compliance with the regulation.

In addition, FAA stated their position that evaluating compliance to the regulation is outside the scope of the noise study, but understands CAC's efforts to try and raise altitudes to reduce noise. FAA does not agree with a CAC member's interpretation of § 91.119 regarding helicopter MSAs who states that the exemption for helicopters to fly lower than normal minimums should only be available if the operation is conducted "without hazard" to persons or property on the surface which is more stringent than "without undue hazard". CAC requested that the FAA consider changing § 91.119. FAA advised that this again is outside the scope of the BLANS. FAA addressed this request in an email to Ms. Sandra Kunz, CAC President, dated December 3, 2009 (refer to **Attachment 11a**).

The CAC addendum also included a recommendation that the security Notice to Airmen (NOTAM) prohibiting aircraft from within 3 miles and 3,000 ft of a stadium having a seating capacity of 30,000 from before until after major sporting events be applied to music events in the same stadium and to any open-air assembly of the same size. FAA advised that expanding the NOTAM for noise abatement purposes was outside the scope of the BLANS. FAA has interpreted Congress' intent as precluding the FAA from altering the restrictions imposed by that NOTAM in any way, whether the effect of any alteration is to increase or decrease the number of events covered by the NOTAM. FAA noted in the determination sheet, however, that there are two different processes on how Temporary Flight Restrictions can be obtained, depending on if there are safety or security concerns by either event organizers national security or intelligence.

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010. In an effort to meet the intent of the measure, FAA proposed an alternative Measure F-T(v2) (refer to FAA Determination, Measure F-T(v2)) that includes conducting pilot outreach to remind pilots of their responsibility to adhere to the §91.119 MSA requirements when operating in Boston Class B Airspace and to fly neighborly with the intention of reducing community noise impacts . The CAC agreed to proceed with F-T(v2) in Level 2.

Measure ID: F-T(v2)

Measure Number: 58

**Measure Description:** Conduct initial pilot outreach to remind pilots of their responsibility to adhere to the 14 CFR §91.119 Minimum Safe Altitude (MSA) requirements when operating in Boston Class B Airspace and to “fly neighborly” with the intention of reducing community noise impacts.

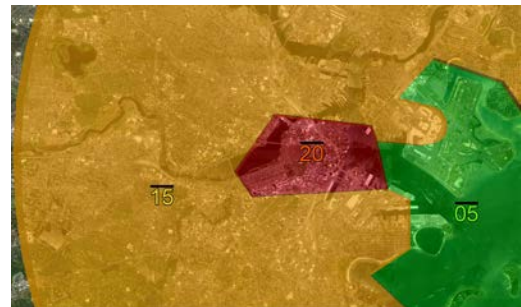
**Modified By:** FAA (May 20, 2010)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

The noise abatement intent is to increase the distance between an aircraft (noise source) and receiver (resident located in the downtown area), thereby potentially reducing noise levels.



Source: MassGIS, USGS, 2008 (Ortho Imagery); Federal Aviation Administration, Boston ATCT, March 2010 (Boston Area Reference Altitudes within ATCT airspace); Federal Aviation Administration, 2010 (At or Below Altitudes and Areas).

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

On October 27, 2010, CAC stated their position CAC to advance the measure to Level 2 subject to Project Team acceptance of the goal to decrease noise to Downtown Boston and the Inner-city communities from VFR, non-Logan operations aircraft. See **Attachment 9** for full description.

The FAA decision on F-T (v2) is not related to efficiency or capacity issues, therefore, the worksheet criteria did not apply. As a result, the FAA decision is documented in a determination sheet, *FAA Determination, Measure F-T(v2)*.

The FAA agreed to conduct pilot outreach to remind pilots of their responsibility to adhere to §91.119 MSA requirements when operating in Boston Class B Airspace and to “fly neighborly” with the intention of reducing community noise impacts.

FAA advised CAC that the public outreach, education and monitoring efforts are considered advisory in nature under FAA Order 1050.1E, paragraph 301 and are not subject to the National Environmental Policy Act (NEPA). In addition, because these voluntary efforts are not subject to a NEPA review or noise modeling, are considered safe and efficient, and will not adversely affect other communities, they can be implemented prior to the completion of the noise abatement study consistent with the 2002 Record of Decision (Section VIII Mitigation

Measures, Number 6).<sup>3</sup> As stated in the F-T (v2) determination sheet, this measure is already in the process of implementation.

The FAA Airport Traffic Control Tower (ATCT) has already issued a Letter to Airmen (LTA) to remind pilots operating in the Class B airspace of the continuing requirements of regulatory MSAs and to encourage them to fly as high as possible (refer to **Attachment I Ib**)

Flight Standards has agreed:

- conduct awareness training,
- pursue distribution of an existing banner towing operator's (voluntary) Code of Conduct,
- issue an informational letter, targeting banner towing and sightseeing operators, blimps, and professional helicopter associations, and
- review potential low-flying aircraft incident data forwarded by Massport from their noise compliant system for potential MSA violations.

CAC had requested to see reports on some or all of the above items, but FAA responded that they generally do not create reports in order to answer specific requests, whether those requests are made under the Freedom of Information Act (FOIA) or otherwise.

The Flight Standard's outreach efforts and coordination with Massport on potential low-flying aircraft incidents have either already happened or are scheduled to happen by the end of 2011. As stated in the determination sheet, FAA will reconsider the need for further outreach at the time the LTA expires two years from the date of issuance (or September 2012).

As requested by CAC, Flight Standards also sent a written request to the FAA National Charting Office in April 2010 to graphically depict the MSAs within the Class B airspace and to include a note that reminds pilots that the acceptance of an ATC clearance or instruction does not relieve them of their duty to adhere MSAs. Due to charting office policies, they verbally declined Flight Standards request.

CAC recommended passing Measure F-T(v2) to Level 3 subject to the Project Team's acceptance of the goal to decrease noise to downtown Boston and Inner-city communities from VFR, non-Logan operations aircraft – including monitoring, reporting, and enforcement of the FAA MSAs (§ 91.119), particularly 1,000 ft above and within 2,000 ft of the Back Bay, Downtown Boston, and other urban towers (refer to **Attachment 9**). FAA stated that because the measure is already in the process of implementation, is advisory in nature and does not require noise modeling, it will not pass to Level 3, but will be considered as already implemented or in the process of implementation. In addition, FAA has explained in detail in F-T(v1) why enforcement of the MSAs are outside the scope of the BLANS. For additional information, see *Determination Sheet for F-T (v1 & 2)*

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<sup>3</sup> Department of Transportation, Federal Aviation Administration, Record of Decision; Airside Improvements Planning Project. August 2, 2002, p. 28

**Measure ID: F-U**

**Measure Number: 59**

**Measure Description:** Establish helicopter routings within the downtown area airspace for all users, including hospitals, businesses and media. On August 13, 2009, the CAC reaffirmed its description of this measure to also include routes for small planes over the inner cities.

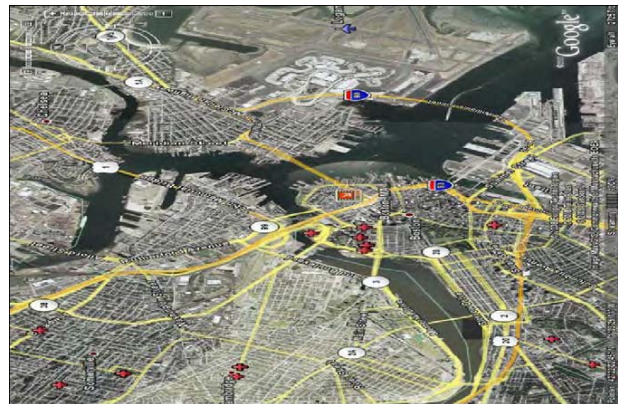
**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

To locate all helicopter operations over less noise-sensitive areas such as highways. The CAC reaffirmed its intent of this measure at an August 13, 2009 CAC meeting to: decrease noise from helicopters and small planes over the inner cities. This language can be found in Attachment 16 of the Level 1 Screening Analysis report, dated October 5, 2009.



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

The FAA decision on F-U is not related to efficiency or capacity issues, therefore, the worksheet criteria did not apply. As a result, the FAA decision is documented in a determination sheet, *FAA Determination, Measure F-U(v1)*.

As described in the Level 1 Screening Analysis Report dated October 5, 2009, the FAA-recommended voluntary helicopter routes for noise abatement are already in place. The recommended routes were selected based on similar criteria recommended by the FAA in the FAA Report to Congress: Nonmilitary Helicopter Urban Noise Study published December 2004 (see reference 12 depicted in **Attachment 14**). FAA described to CAC the process in which the routes were selected were based on the same objectives CAC requested in their reaffirmed intent: routing over more compatible areas such as water bodies, undeveloped open spaces, transportation ways and corridors, industrial, commercial and agricultural/green spaces. Therefore, FAA decided a review was not necessary due to the previous efforts conducted by the FAA to establish the existing routes.

The establishment of mandatory VFR routes in the Class B airspace requires general rulemaking at the FAA Headquarters level, which follows a separate public process with an uncertain outcome. The general procedures are outlined in the Federal Aviation Regulations 14 CFR Part 11, General Rulemaking Procedures. FAA cannot agree to impose mandatory routes in the context of this noise study, but have advised the CAC it may pursue rulemaking outside of the study. Since general rulemaking is beyond the scope of the BLANS, the FAA will not, as part of the BLANS, be establishing mandatory routes.

In an effort to decrease noise, CAC recommended FAA consider changes to the existing recommended helicopter

routes over the Charles River and the SPOND Route. The PC reviewed moving the Charles River route over the Prudential Tower as requested by the CAC, but found that its existing location over the Charles River is more beneficial for noise abatement purposes and is consistent with CAC's land use priorities. FAA clarified that the SPOND Route was designed to allow for a north south transition through the Class B airspace (not to get helicopters to the downtown area) and needed to be maintained as charted.

FAA also clarified that emergency operations (such as air ambulances and law enforcement) are an exception related to the use of recommended routes. CAC noted FAA Aeronautical Information Manual (AIM), Chapter 4, Section 4-2-4, paragraph (b), which states that air ambulances with a mission of an urgent medical nature that requires expeditious handling should be noted in the remarks section of the flight plan as "LIFEGUARD." During radio communications, LIFEGUARD followed by the aircraft number should be stated. CAC requested FAA to ensure this occurs, which can be used when needed to easily identify and exclude such operations when assessing use of the routes. The AIM is not regulatory in the sense that all flights that may qualify to use the LIFEGUARD call sign must do so. The FAA, therefore, cannot require pilots to use that call sign in the context of this noise study.

CAC has requested that the FAA acknowledge and summarize the FAA Report to Congress: Nonmilitary Helicopter Urban Noise Study, December 2004 and its conclusions and recommendations (page [1-2]-[1-4]), relative to the BLANS. FAA acknowledges that members of the FAA Evaluation Team have read the report and the consensus was that the report didn't offer any additional information that the FAA wasn't already aware of in terms of reducing noise from helicopters. The report suggests that "...further operational alternatives that mitigate noise should be explored..." The report concluded the following category types related to operational alternatives to reduce noise and maintain safe and efficient air flow:

1. Noise reduction benefits can be achieved with higher altitude flight.
2. Optimal helicopter route planning to avoid noise sensitive areas will require comprehensive evaluation for each specific region of concern.
3. The promotion of noise abatement procedures should be pursued on two fronts – with helicopter pilots and air traffic control personnel.
4. The use of advanced technologies, such as GPS, aids in helicopter approach and departure procedures do show to be beneficial for noise abatement operations.

At CAC's request, FAA addressed each of the four points from the report. Refer to *Measure F-U Determination* for more details.

CAC requested FAA to consider the FAA's current proposed rulemaking to implement operational procedures for helicopter air ambulances and commercial helicopter operations. Because the rule is not yet implemented and has no direct connection to required routes and altitudes that can be applied now, the FAA did not further consider it for purposes of BLANS.

CAC was provided with information related to this measure prior to the BOS/TAC meeting held on May 20, 2010. In an effort to meet the intent of the measure, FAA has proposed an alternative Measure F-U(v2) (refer to *FAA Determination, Measure F-U(v2)*), which recommends a pilot outreach effort to encourage pilots to the voluntary helicopter routes. The CAC agreed to proceed with F-U(v2) in Level 2, which was proposed by the FAA in lieu of Measure F-U. For additional information see *FAA Determination, Measure F-U (v1)*.

Measure ID: F-U(v2)

Measure Number: 59

**Measure Description:** The FAA will conduct pilot outreach to encourage pilots to use the existing recommended voluntary helicopter routes that were already established over low population areas in the Class B airspace.

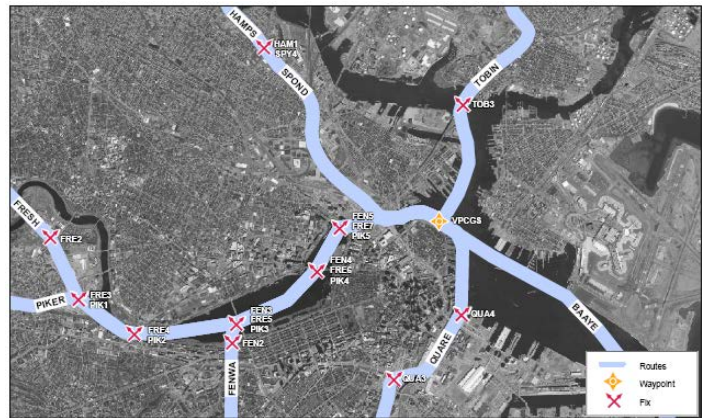
**Modified By:** FAA (May 20, 2010)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

To increase pilot use of the existing recommended voluntary helicopter routes depicted on the Boston Helicopter Chart through pilot awareness outreach.



Source: MassGIS, USGS, 2008 (Ortho Imagery); FAA, Boston Helicopter Chart, December 2007 (Helicopter Routes).

**Level 2 Screening Determinations:**

- Pass to Level 3
- Eliminated
- Completed/Implement(ed)

**Reason for Elimination:**

- Safety
- Inconsistent with CAC G&O
- Operational Feasibility
- Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

On October 27, 2010, CAC stated their position to advance the measure to Level 2 subject to Project Team acceptance of the goal to decrease noise to Downtown Boston and the Inner-city communities. See **Attachment 9** for full description.

The FAA decision on F-U(v2) is not related to efficiency or capacity issues, therefore, the worksheet criteria does not apply. As a result, the FAA decision is documented in a determination sheet, *FAA Determination, Measure F-U(v2)*.

In summary, the FAA agreed to conduct pilot outreach to encourage pilots to use the existing recommended helicopter routes that were already established over low population areas in the Class B airspace, and to fly as high as possible, for example, using the maximum altitudes assigned by the BOS Air Traffic Control Tower (ATCT). This will be conducted through seminars conducted by the FAA Safety Team (FAAST) at the same time the training is conducted for the MSAs (refer to FAA Determination for Measure F-T(v2)). Letters to Airmen and other FAA informational letters, as described in Measure F-T(v2), will include distribution to the Eastern and New England Helicopter Councils.

As stated in Measure F-T(v2) the public outreach, education and monitoring efforts are considered advisory in nature under FAA Order 1050.1E, paragraph 301 and are not subject to the National Environmental Policy Act

(NEPA).

In addition, because these voluntary efforts are not subject to a NEPA review or noise modeling, are considered safe and efficient, and will not adversely affect other communities, they can be implemented prior to the completion of the noise abatement study consistent with the 2002 Record of Decision (Section VIII Mitigation Measures, Number 6).<sup>4</sup> This measure is already in the process of implementation.

Consistent with the recommendations in the helicopter report to Congress (see *FAA Determination, Measure F-U (v1)*) the CAC also recommended that FAA pursue the promotion of noise abatement procedures on two fronts – with helicopter pilots and air traffic control personnel. FAA maintains that they already do this and will continue to do so. CAC also contends that voluntary programs don't work. FAA disagrees with this conclusion. The FAA believes that voluntary programs for noise mitigation do work, but notes that the results of those efforts have not been to the satisfaction of the CAC. If CAC wishes to conclude that this modified proposal does not meet their goal and objectives, the CAC can choose to not recommend it for early implementation.

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<sup>4</sup> Department of Transportation, Federal Aviation Administration, Record of Decision; Airside Improvements Planning Project. August 2, 2002, p. 28

**Measure ID: F-V**

**Measure Number: 60**

**Measure Description:** Extend initial departure course for turboprop aircraft to 2,000 MSL before initiating turns over populated areas.

**Proposed By:** CAC (March 12, 2008)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

To reduce the frequency of low altitude propeller departures and associated noise levels (below 2,000 ft MSL) over populated areas. The CAC reaffirmed its intent of this measure at an August 13, 2009, CAC meeting to: “decrease noise from short takeoff planes over downtown Boston.” This language can be found in Attachment 16 of the Level 1 Screening Analysis report, dated October 5, 2009.



Source: Landrum & Brown, Inc., February 2008.

**Level 2 Screening Determinations:**

Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

For purposes of evaluation, “short takeoff planes” were considered to be propeller and turboprop aircraft departures. The FAA considered multiple propeller/turboprop headings from all runway ends, which were proposed by the PC and reviewed by the IC. The proposed routes addressed both the original intent and CAC-clarified intent of this measure.

FAA determined this measure causes significant safety issues when aircraft with substantially different performance characteristics (jet versus propeller) are required to fly the same route, when departure aircraft are integrated with arrival aircraft, and when pilot or controller workload is increased. These are major factors involved with this measure, resulting in unacceptable increases in pilot and controller workload, as well as increases in delay and decreases in capacity. The measure would introduce a loss of separation, increase wake turbulence encounters, and produce other unacceptable safety risks that represent a significant compromise to FAA ability to meet mission goals and objectives and therefore the measure has been eliminated.

CAC requested FAA to also consider the feasibility of the other following scenarios:

- Avoid the current short takeoffs with hard turns climbing from low over downtown Boston;
- Compliance with minimum safe altitudes (MSA) which begin “except when necessary for takeoff or landing. (FAA to define “takeoff” for the record);
- The London Heathrow Airport minimum 1,000 ft (before turning) Rule;
- Extend turboprops to 2,000 ft MSL before initiating turns over populated areas during off- peak hours, such as nights, weekends and holidays; and
- Separate turboprops and jets on separate runways during periods when multiple runways are in use.

FAA considered the above scenarios and concluded that mixing conventional procedures for different traffic levels would introduce a new risk into the system, which FAA views as a reduction of the overall safety of the system.

In response to CAC's request for a definition of takeoff in the context of MSA compliance, the FAA clarified that in the context of 14 CFR 91.119, the term takeoff covers all aircraft maneuvering from the ground to the aircraft's planned enroute altitude. Therefore, while section 91.119 applies to every aircraft departing the airport, until the aircraft completes its climb out (and is in the enroute phase of flight) the route and altitude flow is considered "necessary for takeoff." Accordingly, there is no violation of the section 91.119 when an aircraft turns after takeoff before the end of the runway and overflies downtown Boston while proceeding to its enroute altitude.

The London Heathrow Airport 1,000 ft rule (refer to **Attachment 13**) is a noise abatement departure profile procedure in which aircraft reduce thrust once they reach 1,000 ft within approximately three and one half nautical miles from the airport. Refer to Measure F-S that describes why CAC eliminated this procedure from further consideration based on CAC goals and objectives. In addition, FAA determined that keeping propeller aircraft on jet routes to 1,000 ft before turning had the same safety impacts as keeping them on the same route to 2,000 ft.

For additional information see FAA's *Operational Screening/Evaluation Criteria Worksheet, Measure F-V*.

CAC was provided with information related FAA's determination of this measure prior to the BOS/TAC meeting held on May 20, 2010. In an effort to meet the intent of the measure, FAA proposed an alternative Measure F-V(v2), to route turboprop/propeller departures from Runway 22R heading north, northwest and west along a course between 260 degrees and 290 degrees until reaching 2,000 ft, thence turning to the assigned departure fix. CAC chose a 260 degree course. This proposal meets the intent of raising propeller departure altitudes over the downtown area, and is assigned as the standard departure course for all activity levels when Runway 22R is in use. The CAC accepted F-V(v2) for further evaluation, which is in lieu of Measure F-V.

**Measure ID:** F-V(v2)

**Measure Number:** 60

**Measure Description:** Proposes an initial Runway 22L/R departure track heading of 260 degrees for turboprop and propeller aircraft heading northwest or west to 2,000 ft or 4.5 DME (whichever occurs first), before initiating turns over populated areas.

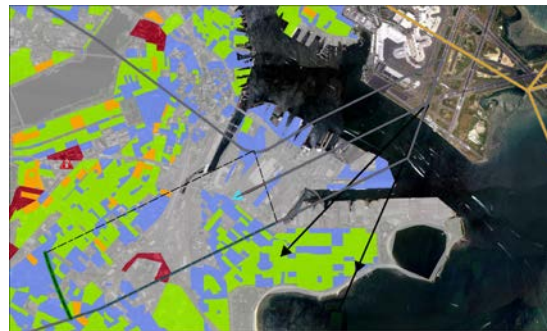
**Modified By:** FAA (May 20, 2010)

**Level 2 Review for Significant Compromise to FAA Ability to Meet Agency Mission and goals, Safety, Operation, Feasibility and/or CAC G&O Consistency**

**Reviewer:** FAA

**Intent:**

To reduce the frequency of low altitude propeller departures and associated noise levels (below 2,000 ft Mean Sea Level) over populated areas.



Sources: Google Earth Pro, 2011; TerraMetrics 2010; Federal Aviation Administration, System Operations Group, November 2009 (FAA Offload Archive Flight Track Data, Rwy 22: 10/01/09, 10/03/09, 10/07/09 and Video Map); US Census Bureau, 2000 (Census Blocks); Wyle Laboratories, 2007 (Noise Contours); Ricondo & Associates, 2011 (Route, Corridors, Safety Buffers).

**Level 2 Screening Determinations:**

- Pass to Level 3       Eliminated       Completed/Implement(ed)

**Reason for Elimination:**

- Safety       Inconsistent with CAC G&O  
 Operational Feasibility       Significant Compromise to FAA Ability to Meet Mission and Goals

**Comments:**

On October 27, 2010, CAC stated their position CAC to advance the measure to Level 3 for noise level evaluations, subject to the goal to decrease noise to Downtown Boston and the Inner-city communities from propeller and turboprop departures. See **Attachment 9** for full description.

The proposed vector procedure seeks to re-direct Runway 22R turboprops/props departures that make immediate turns to the west and northwest to first head 260 degrees over more compatible areas (e.g., water, commercial use). This meets the intent of the original F-V measure to reduce propeller/turboprop overflights over populated areas. The Runway 22R propeller departure procedure to the west and northwest was the only one FAA determined could be modified to meet the intent without causing a significant compromise on their ability to meet their mission and goals.

The only known effect at this time is in relation to northbound props and turboprops which would be subject to increased travel time and mileage flown, but not considered to be significant by the FAA at this time. FAA met with the CAC sub-committee on January 27, 2011, regarding F-V(v2) to confirm if the 260 heading was appropriate. Based on the population and general land use data shared with CAC members, the sub-committee group concurred the 260 heading was appropriate and could potentially meet the intent, but would require additional noise analysis in Level 3.

For additional information see FAA's *Operational Screening/Evaluation Criteria Worksheet, Measure F-V(v2)*.

#### **IV. Next Steps**

As stated in the Phase 2 SOW, Level 3 involves an assessment to determine potential noise benefit afforded by each measure and a combination of those requested by CAC to Massport for implementation. Some of the measures retained for consideration from the Level 2 screening analysis will be evaluated quantitatively with regard to the measures ability to meet the objectives of the study, namely, reducing noise impacts on noise sensitive facilities and residential areas within communities surrounding the airport without adversely impacting other communities and that are considered safe and efficient. Other measures may intrinsically provide some benefit, but it is not feasible to model quantitative noise levels for comparison purposes. Such measures include ground measures that may be implemented as voluntary or encouragement based actions. The analysis will be conducted on individual measures retained from the Level 2 analysis, followed by a cumulative analysis of the measures CAC identifies for potential implementation.

The Level 3 analysis will be a multi-step process including the following activities:

1. Noise modeling each individual measure, as appropriate, and change analysis against the future year baseline;
2. CAC determination on which measures to include as a cumulative alternative;
3. Noise modeling the cumulative alternative and change analysis against the future year baseline (No Action and No Project)<sup>5</sup>; and
4. CAC determination to request Massport to implement the alternative.

After Step 4, Phase 2 efforts are considered to be completed.

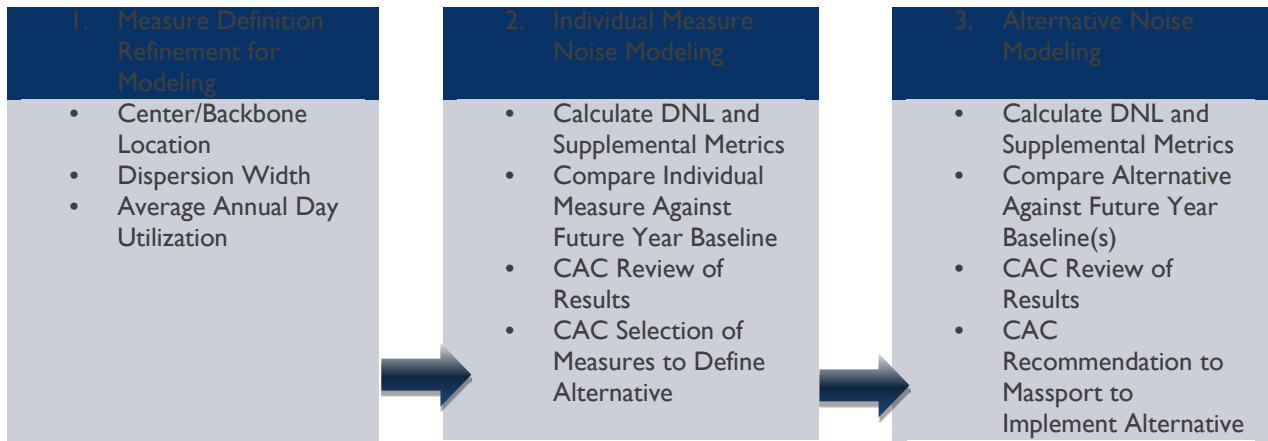
**Figure 2** illustrates the process for Level 3. **Figure 3** depicts the current schedule for the Level 3 efforts.

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<sup>5</sup> DNL Analysis only for No Project.

**Figure 2**

Level 3 Process Flow Chart



Source: Ricondo & Associates, Inc., July 2011.  
 Prepared by: Ricondo & Associates, Inc., July 2011.

**Figure 3**

Schedule for Level 3 Efforts as of November 2011

	2011												2012		
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Measure Definition Refinement for Modeling	█	█	█	█	█	█	█	█							
Individual Measure Noise Modeling					█	█	█	█	█	█					
CAC Alternative Recommendation										█	█	█			
Alternative Noise Modeling													█	█	
CAC Recommendation														█	█

Note: Does not include PRAS/Phase 3 Scope of Work tasks.

Source: Ricondo & Associates, Inc., November 10, 2011.  
 Prepared by: Ricondo & Associates, Inc., November 2011.