Boston Overflight Noise Study

Phase 1

PROJECT CONSULTANT SCOPE OF SERVICES

AMENDMENT #1

FOR BOS/TAC REVIEW

September 30, 2005

Project Consultant
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INTRODUCTION

The Boston Overflight Noise Study is a two-phased study. Phase 1 will define potential airspace alternatives to improve the noise environs around Logan Airport. Airspace alternatives, which are eligible for Categorical Exclusion, will be initiated and implemented to the extent feasible in Phase 1.

Phase 2 will address the FAA environmental requirements to implement the recommended alternatives from Phase 1. The work elements of Phase 1 are more fully described in this scope of work. It is understood that the FAA in conducting the Phase 1 analysis is required to complete the Phase 2 environmental work to finalize the Environmental Impact Statement. The work elements of Phase 2 will be more fully described in the scope of work to be prepared as a task at the end of Phase 1.

The two tasks are in fulfillment of the requirements of the Record of Decision dated August 2, 2002 and the Massachusetts Superior Court Final Judgment of May 26, 2004.

This document presents the scope of services, also referred to as the work scope, for Phase 1 of the Boston Overflight Noise Study. The objectives of Phase 1 are to:

1. Define alternatives to be considered.
2. Establish the potential to implement alternatives that are carried forward to Phase 2.
3. Complete environmental requirements to implement noise improvements that are eligible for Categorical Exclusion per FAA of early implementation items (CatEx).
4. BOS/TAC and CAC agree on alternatives for early implementation.
5. Massport to submit to FAA request for early implementation alternatives to be implemented that are eligible for (CatEx).
6. Provide a scope of work, costs and schedule for Phase 2.

It is estimated that the Phase 1 effort may be completed in 12-15 months. A detailed project schedule will be developed at the start of this project.

This work scope defines the general tasks needed to achieve the Phase 1 objectives identified above. As the study progresses the consultant team will work closely with the FAA, Massport and the Logan Airport Community Advisory Committee, Inc. (CAC) to evaluate the study progress and determine what adjustments to the work scope are necessary to effectively achieve the objectives of the study.

The PC and IC will provide copies of all substantive work product developed during the study to the membership of the BOSTAC for their consideration in decision-making. All distributions of such material will be provided in a timely manner and in advance of critical BOSTAC discussions.

1 STUDY DESIGN

Study design covers the effort required to establish the study program for the Boston Overflight Noise Study. It entails the following actions:

- Project scoping meetings with BOS/TAC – a series of nine (9) project scoping meetings will be held with the consultant team and BOS/TAC.

- Development of project study framework – will include developing a problem statement, study objectives and decision process.

- Alternative Brainstorming Session – to identify a preliminary list of alternatives prior to the start of the program.

- Develop project work scope, budget and schedule for grant application.

- Revise project work scope, budget and schedule for consultant contracts.

- Meetings with client representatives to finalize work scope, budget and schedule.

- Notice to proceed will be issued after this task is complete.

PC Activities:

- Assist the BOS/TAC membership in understanding and articulating its goals and positions relative to the purpose, need and conduct of the study through the activities listed above.
- Prepare materials for scoping meetings with the BOS/TAC
- Attend eight (8) scoping meetings with the BOS/TAC committee.
- Attend and present the work scope to the CAC.
- Participate in the development of work scope, budget and schedule for the PC contract.
- Participate in brainstorming session regarding potential noise abatement procedures.
- Participate in teleconferences related to the study design effort.

2 PROJECT MANAGEMENT

This element addresses the overall project administration, management and coordination of the work effort. There are four tasks in this element as defined below. The FAA, Massport and the CAC will have overall responsibility for management of the PC. The CAC will have overall responsibility for management of the IC.

2.1 Project Administration and Coordination

This task covers the day-to-day project administration and coordination required by the PC and IC in coordination with the client group: FAA, Massport, and CAC.

PC Activities:

- Weekly conference calls – the PC will prepare a project action report, which will serve as the agenda for the weekly project status conference calls with the Project Administration Team (PAT). The PAT will be comprised of the FAA, Massport, CAC, PC and IC project managers, and others as may be deemed appropriate. The PC will coordinate with the IC for input on the project action report. This report will outline the current activities of the study. Following each conference call, which is anticipated to last 30-40 minutes, the PC will update the project status report and distribute the updated report to the BOS/TAC for informational purposes. Monthly project status reports – the PC will prepare a monthly status report to be distributed to the PAT. This report will also be submitted with the PC's monthly invoice.
- Monthly project schedule updates – accompanying the monthly status report will be a report of the project's progress against schedule. The PC will maintain a project schedule on a monthly basis.
- Coordination with the Independent Consultant – the PC will coordinate with the IC via conference call regarding project issues on a weekly or bi-weekly basis, outside of the other coordination as described above. This coordination is assumed to require one (1) hour per week.

2.2 CAC Coordination

This task covers the consultants' coordination and assistance to the CAC during Phase 1.

PC Activities:

- Up to twelve (12) periodic meetings and/or teleconferences with the CAC to discuss project issues or attend CAC meetings. For budgetary purposes, four (4) separate trips are assumed for this task over the course of Phase 1.

2.3 BOS/TAC Meetings

This task covers all primary meetings of the BOS/TAC. Sub-committee meetings (should they need to be held) will be covered under specific technical tasks described later in the work scope. It is anticipated that the BOS/TAC will meet at six (6) key milestone points during Phase 1. It is assumed that all meetings will be held at the Massport conference facilities.

PC Activities:

- The PC will prepare a draft agenda for review by the BOS/TAC for each meeting and incorporate comments as appropriate. Presentation or discussion material will be prepared as part of separate technical tasks for specific issues that will be discussed at each meeting.
- Following each meeting the PC will prepare and distribute draft meeting notes that capture the primary issues discussed and proposed follow-up actions. These notes are not intended to be minutes of every issue discussed or comments made by members of the BOS/TAC. The meeting notes will be distributed to the BOS/TAC for review and comments. The PC will incorporate comments and discuss the comments at the

subsequent PAT meeting if conflicting comments exist. The PC will distribute notes to the BOS/TAC via email.

2.4 Work Scope Re-Assessment

At four (4) points during Phase 1, the BOS/TAC will re-assess the work scope to determine if any changes are required to enhance the overall effectiveness of the study effort. The BOS/TAC will make the decision regarding contract changes. Work scope re-assessment will occur prior to the start of the following elements or tasks:

- 6.2 Conduct Initial Screening
- 7 Early Implementation Alternative Evaluation & Documentation
- 7.5 Provide Implementation Support
- 8 Preliminary Phase 2 Evaluation

PC Activities:

- Two to four weeks prior to the start of each of the above tasks, the BOS/TAC will discuss the Phase 1 Scope of Services. The PC will prepare and provide input/suggestions on possible work scope revisions.
- The BOS/TAC will direct the PC as to appropriate changes to the work plan. The PC will revise its work plan (scope, budget, and schedule) in coordination with the IC. The PC will distribute the revisions to the BOS/TAC for review and comment. The PC will incorporate changes, as agreed to by the BOS/TAC

FAA/Massport:

- Prior to changes to the consultant contracts, the FAA and Massport must approve the changes to the PC contract before they become effective.

3 PUBLIC COORDINATION/INVOLVEMENT

This task will focus on the dissemination and gathering of information from the general public and other organizations regarding the Boston Overflight Noise Study. This important aspect of the project will be conducted throughout the study process with increased activity associated with key milestones.

3.1 Initial BOS/TAC Outreach to Communities

As identified in the schedule, all communities within the general study area will be notified regarding the initiation of the study, the purpose of the study, how communities can participate in the decision making process (join CAC), how they can follow the progress of the study, and the estimated schedule of milestones/completion of the project.

PC Activities:

- The PC will prepare a project notification letter for review by the BOS/TAC. The FAA will reproduce and distribute the letters to the communities in the study area as defined in Task 4.2.

3.2 Web-Based Periodic Community Updates

This task will be used to provide the public with periodic updates regarding the study. Information will be similar to materials provided to the BOS/TAC during the Study but will be tailored for a website. There will be information updates throughout Phase 1.

PC Activities:

- Strategize and define key features and functions to be included in the website. Present website concept for review by the BOS/TAC. Incorporate comments, as necessary. For cost estimating purposes, it has been assumed that this website will be provided only in English.
- Develop website navigational architecture and site design.
- Develop website materials, review with BOS/TAC and incorporate comments.
- Develop feedback section for the public to provide comments.
- Provide site production and progress reviews.
- Beta test and launch website.
- Provide ongoing website updates.

3.3 Milestone Public Outreach

A formal public outreach effort will be conducted at a key milestone near the completion of Phase 1. There will be two (2) locations for this event as defined by the BOS/TAC). This public outreach will be in the form of a presentation and panel discussion with the opportunity for questions from the public. It is assumed that these meetings will occur on consecutive nights during a one-week period.

PC Activities:

- Coordinate with the BOS/TAC regarding the schedule and location for conducting the workshops.
- Provide logistical support for setting up the workshops, including reserving meeting space, equipment and supplies.
- Working from material prepared in the technical process, prepare a draft PowerPoint presentation and handout.
- Review material with the BOS/TAC
- Incorporate BOS/TAC comments
- Provide professional staff for the meetings (up to three).

4 INVENTORY

This task will focus on the collection and organization of all information necessary to initiate the technical analysis. Sources of information will generally include previous documents, interviews, and data collected for the study.

4.1 Airport Operating Characteristics

This task will include an inventory of pertinent operating characteristics and resulting noise data for Logan Airport using existing data, as well as new data collected for the study. Data collection meetings with the FAA Tower will be conducted in conjunction with the discussions and information compilation described in Task 5.1.

PC Activities:

- Collect existing data on the pertinent physical facilities of the airfield. The inventory will include major physical facilities including runways, taxiways and terminal facilities.
- Gather historic and current airport statistical data, including the following:
    - Aircraft Type/Engine Type
    - Airline
    - Runway
    - Operation Type (Arrival/Departure)
    - Date
    - Time of Day
    - Flight Tracks (in X, Y and Z dimensions)
    - Destination/Origin (determined through analysis if necessary)
    - Airspace Fix (determined through analysis if necessary)
    - Runway Configuration (determined through analysis if necessary)
    - Observations of activity from the FAA control tower
    - History of Noise Restrictions/Rules at Logan

Meetings

- Massport Noise Office
- FAA Tower

4.2 Land Use and Demographic Data

At the initiation of this task, the boundaries of the area for detailed noise analysis will be established by the BOS/TAC.

This task covers the activities necessary to develop a comprehensive Geographic Information System (GIS) map for this study. This GIS database will be compiled from existing sources through Massport or other agencies to the extent possible. Only limited field checking will be conducted to verify map data (additional field verification may be required in Phase 2).

PC Activities:

- The PC will work with the IC to propose a study area boundary for consideration by the BOS/TAC. After acceptance of the specific study area boundary by the BOS/TAC, the PC will begin the GIS data collection effort. The mapping will include at a minimum:
    - The jurisdictional boundaries of the communities within the study area
    - Assess available information (including the 2002 EDR, Airside EIS data)
    - The geographic distribution and demographic characteristics of residences and population, in sufficient detail for population and environmental justice analysis, based on 2000 Census data or other more accurate data where available
    - The geographic distribution of noise-sensitive facilities (schools, churches, libraries, hospitals, nursing homes)
    - Current sound insulation program boundaries
- The PC will compile the data into a single, comprehensive database for use in the study as a tool for analysis and to prepare mapping exhibits. Once developed, copies of the system files will be provided to the IC.

4.3 Additional Inventory Efforts

This task covers additional inventory efforts that will be conducted for this study.

PC Activities:

- The PC will review and provide comment on the survey effort prepared by the IC.

5 BASELINE CONDITIONS

The purpose of this task is to establish a screening level baseline of current and future air traffic conditions and of recent noise conditions in the Airport environs. Alternatives will be compared against the baseline conditions to determine the anticipated benefits and impacts of each alternative. The baseline conditions will be updated as needed in Phase 2 to accommodate changes that result from the Phase 1 analyses, as well as to reflect any changes in air traffic activity that may have occurred since the development of the screening baselines.

5.1 Air Traffic

The purpose of this task is to gain a thorough understanding of how Air Traffic Control (ATC) operates at Logan Airport and the factors that contribute to the current operation as well as the operation with the new runway.

PC Activities:

- During a site visit and interviews with ATC representatives, collect the following information:
    - Existing airspace structure and major airspace routes
    - Existing air traffic control procedures for approaches and departures
    - Current noise abatement procedures

  - Existing runway operating configurations for both visual flight rules (VFR) and instrument flight rules (IFR)
  - Future runway and airspace operating configurations (VFR/IFR) with Runway 14-32, including locations and altitudes of arrival/departure routes.
  - Wind, ceiling and visibility impact on operations
  - Existing runway assignment decision process for arrivals and departures
  - Anticipated effect of Runway 14-32 on runway assignment decision process
  - Standard separations on approach and takeoff
  - In-trail separation restrictions
  - Dependencies/coordination of operations on multiple runways
  - Aircraft performance
- Evaluate capabilities of current and projected fleet to use RNAV type and Global Positioning System (GPS) procedures and the degree of accuracy expected.
- Collect sample flight track radar data used to illustrate typical runway configuration patterns. Develop maps that depict the radar data for each configuration along with pertinent base map information.
- In collaboration with the IC, prepare a draft working paper summarizing the baseline air traffic conditions. Meet with ATC representatives during the preparation of the draft working paper to ensure accuracy. Follow-up with telephone contact as necessary.
- Submit draft working paper to the BOS/TAC for review. Incorporate comments.
- Convert working paper to PDF format for inclusion on the project website.

Meetings/On-Site Visits:

- On-site visits and observations at the Logan Airport Traffic Control Tower (ATCT) and Terminal Radar Approach Control (TRACON)
- Meetings/discussions with ATCT, TRACON and BOS Center controllers, as necessary
- Discussions with the Traffic Management Unit (TMU)
- Coordination with other airport facilities and the ARTCC

5.2 Noise

This task defines the baseline noise condition for purposes of the Phase 1 screening analysis. The following task will be completed.

5.2.1 Identify Noise Metrics to be Used

Select and define noise metrics that will be reported for the baseline, as well as alternative conditions, in response to the issues identified during Study Design.

PC Activities:

- Meet with the BOS/TAC to understand concerns and issues that should be considered in supplemental noise metrics. Present ideas on potential metrics. Define how each metric could be used to respond to issues identified in Study Design (related metrics to issues). Review and incorporate comments of the IC. Refine ideas and prepare

presentation for the BOS/TAC. Document BOS/TAC consensus on preferred noise metrics to be used.

- Determine the appropriate table/graphical formats for reporting each metric.

5.2.2 Baseline Noise Levels

Model the existing noise baseline condition and tabulate the results of the modeling. Metrics defined in Task 5.2.1 will be calculated. The noise conditions will include noise exposure from aircraft overflights as well as noise from ground operations while aircraft are on the runways at Logan Airport. Noise from ground operations while aircraft are taxiing between the runways and terminals will be addressed in Phase 2 of the Boston Overflight Noise Study. The INM model will be used as the basic tool for noise contour analysis and grid point analysis.

PC Activities:

- Obtain/Review most recent EDR INM Input Files and Supporting Data – The PC will collect from Massport all of the INM input files and supporting documentation (in electronic source files) developed for use in the preparation of the most recent Boston Logan's EDR. The PC will review the files in detail to develop a thorough understanding of their contents. In coordination with the IC, the PC will compile a list of questions and/or issues related to this data and submit to the BOS/TAC. These questions will then be transmitted to the preparers of the EDR for response. If necessary, the PC will participate in a conference call to discuss the issues with the preparers of the information.
- Expand EDR's INM Input Files to Capture Potential Study Area – the INM input files made available in the previous task will be expanded to cover any areas within the radar coverage area that are not accounted for by the EDR flight tracks. This effort may include lengthening flight tracks or increasing the altitudes of aircraft takeoff profiles that reach 15,000 feet. In addition, arrival profiles will be extended up to 12,000 feet. This scope and associated budget is based on the assumption that much of the EDR data will be adequate for screening analysis without modification.
- Deliver to the IC all INM input files, output files and directories.
- Conduct noise modeling (Run INM) of expanded input files.
- Compute supplemental noise metrics for the existing noise baseline condition.

Meetings:

- Present/review draft results with BOS/TAC
- Present/review final results with BOS/TAC

6 ALTERNATIVE DEFINITION & PRELIMINARY SCREENING

The purpose of this task will be to develop a comprehensive list of noise abatement procedures and determine which qualify for early implementation in Phase 1, which should be carried forward into Phase 2 and which alternatives should not be considered further.

6.1 Develop Preliminary List Of Alternatives

The consultants will begin with the initial list of concepts that were developed in the BOS/TAC brainstorming session in November 2003. The consultants will consider additional concepts and develop a list of possible actions that could be taken to reduce the noise impact to communities affected by over flight noise resulting from operations at Logan Airport. The only parameters for developing noise abatement alternatives to be considered in Phase 1 are that they should not include Airport use restrictions, runway use actions or procedures intended to address noise created by aircraft taxiing on the ground at the Airport. While taxi-related ground noise and PRAS are not addressed in Phase 1, they will be addressed in Phase 2 of this study. Ground noise generated by aircraft operations while on the runway (during takeoffs and landings including reverse thrust) will be considered in both Phase 1 and 2. Airport use restrictions, except for than those in the FAA Airside EIS ROD of August 2002, will not be considered in either Phase 1 or Phase 2 of this study.

PC Activities:

- Prepare ideas/concepts for consideration.
- Meet with IC and the BOS/TAC to review/refine concepts
- Document the initial list of alternatives; each alternative will include the following information:
    - Title – brief title of the procedure.
    - Purpose/Objective – to the extent possible, the intent of the procedure will be defined.
    - Description – a brief description and illustrations, as appropriate, of how the procedure is intended to work will be included.
- Incorporate IC comments on list of alternatives and distribute to BOS/TAC.

6.2 Conduct Initial Screening

The objective of this task is to eliminate from consideration all alternatives that do not meet the initial screening criteria ("show-stopper" technical issues only) and to identify alternatives that can be fast-tracked. The screening process will involve two steps: preliminary (safety) and secondary (operational and environmental factors). The BOS/TAC decision process will follow the following steps:

- Establish screening criteria
- Apply to alternatives
- Consider revised alternatives and re-apply screening criteria
- Apply FAA environmental criteria (FAA Order 1050.1D and 5050.4A) to determine if it can qualify for Categorical Exclusion.

- Reach consensus of alternatives that meet initial screening criteria and qualify for early implementation.

PC Activities:

- Develop recommended screening criteria/metrics for the initial screening (these will include show-stopper issues, such as: safety, technical feasibility, within scope of study).
- Meet with BOS/TAC to review recommendations of both PC and IC. Document BOS/TAC consensus on criteria.
- Assess each alterative against the screening criteria and document findings.
- Evaluate each alternative to determine if it may be eligible for Categorical Exclusion.
- Meet with BOS/TAC and FAA Air Traffic Evaluation Team to conduct preliminary screening.
- Work with the IC to evaluate each alternative that does not meet the screening criteria and modify, if possible, to meet the screening criteria while still achieving its intended objective.
- Present revised alternatives for consideration by the BOS/TAC.
- Meet with IC and FAA Air Traffic Evaluation Team to conduct secondary screening.
- Document BOS/TAC decision process and screening results. Review with BOS/TAC and revise as necessary.

6.3 Prepare Documentation

Document the evaluation process and results for each alternative, including the justification for early implementation, deferring to later study, or removing any alternative that does not meet the screening criteria. The FAA will provide documentation to justify any rejected alternatives. This documentation will provide source material for the discussion of alternatives in the EIS to be conducted in Phase 2.

PC Activities:

- Prepare draft-working paper documenting the evaluation process.
- Review with the IC and BOS/TAC -incorporate comments.
- Provide technical support to IC during CAC coordination (response to comments).

7 EARLY IMPLEMENTATION ALTERNATIVE EVALUATION & DOCUMENTATION

Outlined below are the necessary tasks for evaluating the noise benefits and operational impacts of implementing the early implementation alternatives. The intent of this task is to provide pertinent information to BOS/TAC and CAC members who will ultimately accept and recommend to Massport a set of alternatives for early implementation. While this analysis will provide the BOS/TAC with information for decision-making purposes, the Project Consultant will not provide any tradeoff analysis as part of this work scope.

In addition, this task will also provide supporting documentation for flight-testing of selected early implementation alternatives. Support includes preparation of necessary Categorical Exclusion checklist documentation for a designated test period not to exceed 180-days[1] and data collection before and during the test period(s).

7.1 Develop Detailed Procedure Definition

On June 21, 2005 the BOS/TAC accepted 13 alternatives for early implementation subject to additional definition as described in this section. For purposes of this work scope, the PC assumes that each alternative may include some or all of the following considerations: runway transition, common, and enroute segment, leg type, waypoints (GPS, DME/DME, etc.), FMS coding design, aircraft performance, fly-ability, air traffic control, and TERPS assessments. Conventional procedures will overlay the RNAV designs. The RNAV alternatives requiring additional definition include Alternatives 1, 2, 3, 5, 14 and 15.

The BOS/TAC agreed to create Alternative 14, shoreline crossing, in order to separately evaluate the shoreline crossing from the close-in departure procedure under consideration. However, the departure procedures can be best evaluated by first addressing the shoreline crossing issue. For purposes of this task, the PC/IC will evaluate each of the departure procedures in conjunction with the shoreline-crossing component. Consequently, Alternative 14 will first be evaluated and the resultant shoreline crossing altitude and track dispersion findings will be incorporated into Alternatives 1, 2, 3, 5, and 15.

The procedure design and obstacle assessment for each alternative will be based on FAA Orders 8260.3B United States Standards for Terminal Instrument Procedures (TERPS), 8260.19 Airspace and Procedures, 8260.44A Civil Utilization of Area Navigation (RNAV) Departure Procedures, 8260.53 Standard Instrument Departures that Use Radar Vectors to Join RNAV Routes, and other pertinent guidance documents. RNAV route leg type, FMS coding, aircraft performance and fly-ability assessment will be conducted using the Terminal Area Route Generation Evaluation and Traffic Simulation (TARGETS) software. Assessment of Air Traffic control compatibility will be conducted based on FAA Order 7110.65P Air Traffic Control, the Standard Operating Procedures (SOP) documents from the Boston Air Traffic Control Tower (ATCT) and Terminal Radar Approach Control (TRACON).

[1] 180 days is the maximum allowable flight test period. The actual duration of the flight test will depend on the particular procedure. The intent is for the test period to be only as long as necessary to determine the operational issues associated with the procedures and the potential noise impacts.

A graphic illustration depicting the proposed procedure design along with key annotations will be developed for each alternative. Information included on the base map illustration may include the appropriate TRACON video map, community boundaries, major geographic features and runway layout. The following paragraphs detail the intent of each alternative and the efforts required for further definition.

- **Alternative 14 (Shoreline Crossing – Runway 4R, 9, 15R and 22L/22R)** – The intent of this alternative is to increase shoreline-crossing altitudes. As stated above, Alternative 14 has been incorporated into the definition of Alternatives 1, 2, 3, 5 and 15. The segment of route crossing back over the shoreline at a higher altitude will be defined using the tools and methods described under Alternatives 1, 2, 3, 5 and 15. Alternative 5 will be used as the starting point for defining Alternative 14 because of its complexities (Alternative 1 may be more critical to north shore crossing altitudes owing to climb restrictions currently imposed on takeoffs from that runway). The non-RNAV companion of Alternative 14 is the Logan Two SID[2] (Standard Instrument Departure) modified to overlay the RNAV procedure, which will also be incorporated in Alternatives 1, 2, 3, 5 and 15. The result of this definition process (in conjunction with the definitions of Alternatives 1, 2, 3, 5 and 15) will be:
  - The specific "at or exceed" altitude (highest possible) requirement that can be achieved on the basis of safety, aircraft performance and flyability (TARGETS factors) within the existing TRACON airspace boundaries.[3] To the extent that an altitude less than 12,000 feet MSL is the maximum achievable, the limiting factors will be identified (i.e. safety, climb performance, equipage, airspace structure, etc.).
  - The location(s) where aircraft will cross the shoreline (west/south/north/northwest bound) and the anticipated dispersion around the crossing point. To the extent that different crossing points for each alternative are viable (or needed), these will be identified. The factors limiting the location of alternate crossing points and/or more/less dispersion will be identified. The relationships between altitude changes and flight track concentration changes will be evaluated by the PC/IC in the definition of the shoreline crossing altitude and location components described in the two paragraphs above.
- **Alternative 1/Alternative 14 (Runway 4R RNAV Departures with Shoreline Crossing)** – This alternative is intended to increase the accuracy and narrow the track of departures over the Nahant causeway, reduce noise to North Shore communities and increase the altitude of shore crossings. Efforts required to further define this alternative are common-enroute segment development, leg type designations, aircraft performance and fly-ability assessment using the TARGETS software. Anticipated dispersion around the initial turns for design aircraft categories (Heavy, Medium and Small turbojets) will be based on TARGETS fly-ability output. The definition of RNAV procedures for these alternatives will extend through TRACON airspace and include the segment of flight crossing over the shoreline as developed during the definition of Alternative 14. The location and altitude of shoreline crossings will be included in the procedure definition. General dispersion along the route will be developed in consultation with IC and the results of the assessment of Alternative 14. The non-RNAV

[2] Logan Two SID (Standard Instrument Departure) is the standard departure procedure that aircraft are issued by air traffic.

[3] The TRACON boundary includes the airspace within approximately 30 nautical miles of Boston Logan Airport. While this study will not consider changes outside the TRACON airspace boundary, it may entail sector boundaries within the TRACON airspace.

companion of this alternative is the Logan Two SID, modified to overlay the new RNAV procedure. The non-RNAV procedure will likely be less precise due to the technology limitations of a non-RNAV procedure.

- **Alternative 2/Alternative 14 (Runway 9 RNAV Departures with Shoreline Crossing)** – The intent of this alternative is to increase shore crossing altitudes over the South Shore and the North Shore. Efforts required to further define this alternative are common-enroute segment development, leg type designations, aircraft performance and fly-ability assessment using the TARGETS software. The definition of RNAV procedures for these alternatives will extend through TRACON airspace and include the segment of flight crossing over the shoreline as developed during the definition of Alternative 14. The location and altitude of shoreline crossings will be included in the procedure definition. Anticipated dispersion around the initial turns for design aircraft categories (Heavy, Medium and Small turbojets) will be based on TARGETS fly-ability output. General dispersion along the route will be developed in consultation with IC and the results of the assessment of Alternative 14. The non-RNAV companion of this alternative is the Logan Two SID, modified to overlay the new RNAV procedure. The non-RNAV procedure will likely be less precise due to the technology limitations of a non-RNAV procedure.
- **Alternative 3/Alternative 14 (Runway 15R RNAV Departures with Shoreline Crossing)** The intent of this alternative is to avoid overflights of the Hull peninsula and to increase shoreline crossing altitudes. Efforts required to further define this alternative are common-enroute segment development, leg type designations, aircraft performance and fly-ability assessment using the TARGETS software. The definition of RNAV procedures for these alternatives will extend through TRACON airspace and include the segment of flight crossing over the shoreline as developed during the definition of Alternative 14. The location and altitude of shoreline crossings will be included in the procedure definition. Anticipated dispersion around the initial turns for design aircraft categories (Heavy, Medium and Small turbojets) will be based on TARGETS fly-ability output. General dispersion along the route will be developed in consultation with IC and the results of the assessment of Alternative 14. The non-RNAV companion of this alternative is the Logan Two SID, modified to overlay the new RNAV procedure. The non-RNAV procedure will likely be less precise due to the technology limitations of a non-RNAV procedure.
- **Alternative 5 (Runway 22L/R RNAV Departures)** – The intent of this alternative is to avoid overflights of the Hull peninsula and to increase shore-crossing altitudes. Efforts required to further define this alternative are common-enroute segment development, leg type designations, aircraft performance and fly-ability assessment using the TARGETS software. The PC will model the procedure in TARGETS to ensure that separation will be maintained in the case of lost communications. The definition of RNAV procedures for these alternatives will extend through TRACON airspace and include the segment of flight crossing over the shoreline as developed during the definition of Alternative 14. The location and altitude of shoreline crossings will be included in the procedure definition. Anticipated dispersion around the initial turns for design aircraft categories (Heavy, Medium and Small turbojets) will be based on TARGETS fly-ability output. General dispersion along the route will be developed in consultation with IC and the results of the assessment of Alternative 14. The non-RNAV companion of this alternative is the Logan Two SID, modified to overlay the new RNAV procedure. The non-RNAV procedure will likely be less precise due to the technology limitations of a non-RNAV procedure.

- **Alternative 6 (22L NORWICH Arrivals) –** The intent of this alternative is to reduce noise for the communities under the downwind to Runway 22L south of the airport. This alternative needs no further definition. It involves a modification to the existing STAR for arrivals to Runway 22L over NORWICH by adjusting the radar vector segment to direct traffic over the DRUNK intersection, thence transition to Runways 22L.
- **Alternative 7 (Runway 27 NORWICH Arrivals)** – The intent of this alternative is to reduce noise for the South Shore communities. This alternative needs no further definition. It involves a modification to the existing STAR for arrivals to Runway 27 over NORWICH by adjusting the radar vector segment to direct traffic over the DRUNK intersection, thence transition to Runway 27 over the ocean.
- **Alternative 8 (Runway 15R RNAV NORWICH Arrivals)** – The intent of this alternative is to narrow dispersion between Winthrop and Nahant. This alternative will narrow flight track dispersion along the existing left downwind pattern for Runway 15R. The procedure will be an overlay of the existing traffic along the left downwind, but involves a fix between Winthrop and Nahant. A preferred alignment will be plotted in order to conduct operational/noise analysis. If BOS/TAC determines to proceed with this alternative based on the results of the analysis, the RNAV procedure definition will take place during the FAA's 18-step process.
- **Alternative 9 (Runway 4R/L Downwind Arrivals)** – The intent of this alternative is to provide more balance of left and right downwind traffic for Runways 4R and 4L to provide more equitable noise distribution. This alternative needs no further definition. This alternative involves a modification to the existing SOP to allow any aircraft to use the left downwind approach and will follow the existing left downwind pattern utilized by regional jets for Runways 4R.
- **Alternative 11 (Runway 33L Charted Visual Approach)** – The intent of this alternative is avoid/minimize noise to South Shore communities. This alternative is a charted visual approach to Runway 33L for aircraft using traditional navigation augmented by RNAV waypoints, which may also be coded into an FMS database. Efforts required to further define this alternative are common-enroute segment development, leg type designations, and aircraft performance using the TARGETS software. Flight simulator availability through a lead carrier will need to be identified to support the simulation of the approach and confirm aircraft performance "fly-ability." General dispersion along the route will be developed in consultation with IC. In addition, identification of visual landmarks and approach minimums need determination or assessment.

  The PC will design the approach for daytime and nighttime use. New stand-alone (RNAV) transition criteria are currently being developed supporting the development of RNAV visual approaches. At the writing of this document, these criteria are pending final FAA approval. The PC will acquire the new criteria and incorporate them into the design of the procedure.
- **Alternative 13 (Runway 22L/R and 15R Propeller Departures)**. The intent of this alternative is to minimize noise to close-in communities. Original definition involves routing nighttime propeller departures along the same nighttime procedures for jet aircraft. Further definition is required for both route(s) and altitude. This alternative involves a modification to the existing SOP to direct Runway 22L/R and 15R propeller departures along the modified Logan Two departure headings within the Class B airspace during nighttime hours. It will apply only to aircraft under radar control, so VFR traffic will not be included in this procedure.

- **Alternative 15 (Minot's Light South Flow Departure - Runway 04R, 09, 15R and 22R/L)** – The intent of this alternative is to reduce noise for South Shore communities. This alternative involves a change to the SOP in order to route south flow traffic east of Minot's Light. The definition of this alternative will include the location of the proposed route, shoreline crossing altitude as developed during the definition of alternative 14, and the anticipated fleet and destinations that will be assigned to the new route. The RNAV version of this alternative will be incorporated in Alternatives 1,2,3, and 5.

7.2 Assess Potential Air Traffic Operational Benefits/Impacts

The PC/IC/CAC met with the FAA Air Traffic Evaluation Team (including TRACON and TOWER management and union personnel) on June 1, 2005 to present the results of the FAA's operational review of the Early Implementation Alternatives identified in Task 6. FAA comments were incorporated into the thirteen (13) Early Implementation Alternatives that were presented to the BOS/TAC on June 21, 2005. Operational factors identified by the FAA in Task 6 for each alternative will be quantified based on the scope of each alternative. Evaluation methodology used in this process was determined for each alternative based on:

- Operational factors identified by the FAA in Task 6; and
- Appropriate metric(s) to quantify the level of potential operational impact associated with each factor.

This analysis will be coordinated with the IC and documented for review and approval of the BOS/TAC. These analyses are informational and will not be used by the consultants to make tradeoff judgments on a per case basis.

- **Alternative 1 (Runway 4R RNAV Departures)** –This will be a modification of the existing Logan Two Departure with the optimum shoreline crossing altitude determined in Task 7.1. Operational impact analysis associated with shoreline crossing component is incorporated in the Alternative 14 description below.
- **Alternative 2 (Runway 9 RNAV Departures)** – This will be a modification of the existing Logan Two Departure with the optimum shoreline crossing altitude determined in Task 7.1. Operational impact analysis associated with shoreline crossing component is incorporated in the Alternative 14 description below.
- **Alternative 3 (Runway 15R RNAV Departures)** – This will be a modification of the existing Logan Two Departure with the optimum shoreline crossing altitude determined in Task 7.1. Operational impact analysis associated with shoreline crossing component is incorporated in the Alternative 14 description below.
- **Alternative 5 (Runway 22L/R RNAV Departures)** – This will be a modification of the existing Logan Two Departure with the optimum shoreline crossing altitude determined in Task 7.1. Operational impact analysis associated with shoreline crossing component is incorporated in the Alternative 14 description below.
- **Alternative 6 (22L NORWICH Arrivals)** – Two operational impacts will be quantified with this alternative:
    - Changes to time/distance flown by arrival aircraft.

- Effect on climb restrictions.

Two analytical techniques will be used to address these impacts:

- Time/distance from common arrival fix to the runway for both the baseline and alternative procedure.
- Departure flight time from Runway 22R to 10,000 ft MSL (cruise climb transition) to determine benefit to users.

These metrics will be calculated using GIS to determine distances along flight routes and spreadsheet calculations to estimate flight time factors. The analysis will show the relative change of implementing this procedure. Climb time and distance will be measured using TARGETS.

- **Alternative 7 (Runway 27 NORWICH Arrivals)** – The operational impacts related to this alternative is the potential change to aircraft travel time/distance. To address this impact, the PC will measure the time/distance from common arrival fix to the runway for both the baseline and alternative procedure.
- **Alternative 8 (Runway 15R NORWICH Arrivals)** – This alternative does not involve changes to the existing arrival route along the NORWICH STAR and runway transition to Runway 15R. Therefore, no operational factors associated with this alternative are expected. Further operational analysis is not needed.
- **Alternative 9 (Runway 4R Arrivals)** – This alternative is recommended for flight-testing. However, in order to determine the operational and noise issues associated with this procedure for BOS/TAC decision making prior to flight testing, the PC will work with the IC to develop a likely operational scenario for the use of this alternative. This operational scenario will be evaluated with the following operational factors:
    - Quantify the potential number of traffic crossings/interactions and flight tracks to determine benefits of reduced flight tracks over Braintree, Weymouth, Hingham, and north shore communities.
    - Assess the potential utilization of the west downwind – track locations, fleet, time of day, altitudes, etc. Assess the likely aircraft profiles using the downwind to identify any potential interactions and conflicts between aircraft using the BOS arrival procedure and aircraft using the satellite airfields in the west suburbs.
    - Quantify potential change in runway utilization and acceptance rates.
    - Time/distance from common arrival fix to the runway for both the baseline and alternative procedure.

    All of these factors will be re-evaluated after the flight testing period in order to verify and update, as necessary, the findings from this effort.
- **Alternative 11 (Runway 33L Charted Visual Approach)** – Two operational issues will need to be addressed with this alternative.
    - FAA Facility Requirements – this alternative will require visual reference points. The PC/IC will work with FAA to determine potential visual reference points for daytime and nighttime. The PC will consider similar procedures at other airports. To the extent that any new facilities or equipment is required, the PC/IC will work with the FAA in assessing the locations, equipment requirements, and estimated cost.

- Arrival Throughput – this alternative will consider effect on airport efficiency. The following assumptions will be used:
    - Spacing on final for the visual approach will be based on existing FAA procedures at Boston Tower/TRACON
    - The Boston TRACON published Airport Acceptance Rate (AAR) of 36 arrivals for Runway 33L will be used for the baseline ILS operation.
    - The Representative Day Schedule contained in the Air Traffic Base Condition document will be used to select moderate to low arrival demand hours when the procedure would most likely be used based on demand, mix of airlines/aircraft, and flight origin.
    - The Boston TRACON will provide space on the "visual final" for aircraft requesting the 33L ILS. Required spacing to accommodate the ILS approach will be established by the TRACON based on published FAA requirements.

  The PC will identify potential utilization of this procedure based on the points above, similar procedures at other airports and IC/FAA input. The PC may utilize the FAA Airfield Capacity Model (ACM) to determine arrival acceptance rate based on FAA defined arrival spacing for both baseline and alternative scenario. The overall AAR will be calculated by ACM for each separation scenario provided by the FAA. An estimated average delay will be determined through quantitative analysis.

- **Alternative 12 (Raised Glide Slope Intercept Altitude to 4,000 ft. MSL – Runway 4R, 22L and 33L)** – The FAA has determined that this alternative can only be considered for use during late night and light traffic conditions. This alternative will be evaluated to determine its potential utilization and its effect on aircraft arrival distance/time
- **Alternative 13 (Turboprop/prop Departures 15/22R/L)** – The PC will evaluate the operational impacts in terms of additional travel distance/time to the users and a qualitative review of overall effect on operational efficiency (if any) through GIS and spread sheet analysis
- **Alternative 14 (Shoreline Crossing – Runway 4R, 9, 15R and 22L/22R)** – This alternative has been incorporated into each of the proposed RNAV departure procedures (Alternatives 1, 2, 3, 5 and 15). An analysis, independent of FAA Air Traffic, of operational issues associated with achieving the shoreline crossing will include (assumptions are that RNAV procedures are used throughout TRACON airspace):
    - Effect on airport performance (e.g., arrival acceptance rate and departure rate).
    - Effect on controller workload to assess impact to ATC.
    - Effect on aircraft travel time/distance to assess impact to users.

  Additional quantitative analysis/information may be gained during TARGETS modeling, flight simulation, and operational flight-testing of the RNAV procedure during the 18 step process.

- **Alternative 15 (Runway 4R, 9, 15R and 22R/L (Minot's Light South Flow Departures**– There are no known issues with this alternative. It is recommended for immediate flight-

testing (up to 180 days). If and when this alternative is flight tested, the results will be evaluated to determine potential operational issues that may be related to this alternative.

7.3 Assess Potential Noise Benefits/Impacts

The noise analysis of the Phase 1 Early Implementation Alternatives will serve two purposes; (1) provide the BOS/TAC with adequate information to quantify the noise benefit and/or the potential noise impact resulting from the shift in aircraft flight tracks from one community to another and, (2) support the Categorical Exclusion (CatEx) documentation. The results will be presented using noise metrics, analyses, graphics, tables and maps – selected with input from the IC and the BOS/TAC membership – to explain and evaluate the change (i.e., beneficial and/or adverse impact) from the existing baseline noise conditions (2003 Environmental Data Report (EDR) INM Study

7.3.1 Develop INM Input

The 2003 EDR INM deck will serve as the primary data source for the BONS for the express purpose of providing a comparative noise analysis (i.e., the relative "delta" between the existing noise environment and the noise environment resulting from the early implementation alternatives). The comparative analysis will be required for both the CatEx documentation and additional supplemental analysis to help identify areas of potential net benefit/impact. This assumes that the early implementation alternatives under Phase 1 will model only flight track changes (x,y plane coordinates – known as the two dimensional coordinates or latitude/longitude on the surface), with no changes to the 2003 EDR INM arrival and departure altitude profiles (INM's definition of the x, y, z location of aircraft along a flight path – 'z' location denotes the altitude of each unique location that adds the three-dimensional element to each flight track).

In order to account for the extended BONS study area, the INM profiles used in the 2003 EDR INM have been extended to allow INM to calculate the noise levels further out. The standard arrival profiles have been extended to a maximum altitude of 12,000 ft MSL. The standard departure profiles have been raised to a maximum altitude of 15,000 ft. MSL.

7.3.2 Flight track modifications, track utilization, distribution, and operations

The 2003 EDR INM tracks will be modified to model the intended effect of each individual procedure type – precision navigation (RNAV/FMS/GPS) procedures, conventional procedures, visual approaches, raising ILS arrival intercept altitudes, modification to Logan Two to reflect the RNAV courses, etc. RNAV and associated conventional departure and arrival procedures will be designed in FAA's TARGETS RNAV design tool as identified in Task 7.1, with INM tracks reflecting narrow dispersion and flight track locations, which are aircraft dependent. Operations on INM tracks will be distributed based on information collected in Task 6, refined assumptions used in Task 7.2, and the BOS RNAV survey results. Noise analyses will enhance stakeholder understanding of both noise benefits and potential adverse impacts along the entire route.

7.3.3 INM Analysis

The PC will run the INM and generate the appropriate noise metrics, analyses, graphics, and maps, with input and oversight from the IC and BOS/TAC (an initial set of analysis tools was

presented to the BOS/TAC under Task 5), for the early implementation alternatives. Toolsets and metrics applied for each alternative will be coordinated with BOS/TAC and IC. Examples include: (1) Number of Events Above (NA) and Time Above (TA) analyses above a series of thresholds (To be determined) and presented in tabular format; (2) DNL color gradient maps; (3) NA and TA maps for selected grid points and thresholds; (4) flight corridor maps overlaying radar data on INM flight tracks for various aircraft groupings (e.g. heavy jets and RJs); (5) Daytime Level (DL) and Nighttime Level (NL) analysis; (6) Lmax values at selected grid points; (7) SEL (and corresponding Sound Exposure, E) values at selected grid points; (8) aircraft altitude at selected grid points. Appropriate metrics for each alternative will be determined. Grid points and analysis tools will be selected to allow BOS/TAC to better understand the benefits and adverse impacts of the alternative. Where supplemental metrics require post-processing of INM data or the generation of additional data, these will be completed. Preliminary results will be discussed with the IC. Population and housing counts will be completed as well as any other demographic analysis required for environmental justice review.

The analysis will be conducted on a dual-track basis. The environmental effects of each alternative will first be presented on an individual basis, allowing the BOS/TAC to better understand the implications in going forward with an individual procedure. In addition, FAA and NEPA regulations will require a full, cumulative analysis of all alternatives in a single noise analysis.

Alternative-Specific Considerations -- Specific INM output analyses for each alternative that will enable evaluation of the procedure by the reviewer will be determined via coordination with IC and BOS/TAC.

- **Alternative 1 (Runway 4R RNAV Departures), Alternative 2 (Runway 9 RNAV Departures), and Alternative 3 (Runway 15R RNAV Departures)**

  The development of INM flight tracks and associated dispersion will rely on results provided by Task 7.1. Modeled utilization of the procedure will depend on the final results of the BOS RNAV Equipage Survey. The modified Logan Two Departure reflecting RNAV locations will be used to model non-RNAV-equipped aircraft. Note that these three alternatives are interwoven with and will be dependent on the evaluation of the departure shoreline crossing altitude.

- **Alternative 5 (Runway 22L/R RNAV Departures)**

  The INM flight tracks and dispersion used to model the RNAV portion of the alternative will rely on design results provided by Task 7.1. Modeled utilization of the procedure is aircraft-specific. New flight tracks (and associated dispersion) will be developed to model non-RNAV equipped aircraft in order to approximate the RNAV route. Note that this alternative is linked to the shoreline crossing altitude analysis.

- **Alternative 6 (22L NORWICH Arrivals)**

  The INM flight tracks and dispersion used to model alternative route will rely on existing dispersion characteristics along the existing route. INM flight tracks after DRUNK intersection will also be developed.

- **Alternative 7 (Runway 27 NORWICH Arrivals)**

  The INM flight tracks and dispersion used to model alternative route will rely on existing dispersion characteristics along the existing route. INM flight tracks after DRUNK intersection will also be developed.

- **Alternative 8 (Runway 15R RNAV Arrival)**

  The existing arrival procedure (2003 EDR INM track) from NORWICH will be modified to reflect narrower dispersion along the route. The conventional procedure (non-RNAV version) will reflect the existing route and dispersion. Utilization of this route reflected in the 2003 EDR INM study will be maintained.

- **Alternative 9 (Runway 4R Downwind Arrivals)**

  New INM flight tracks and expected dispersion (most likely mirroring the existing large jet tracks on right downwind arrival and regional jet tracks along the left downwind) will be developed. Modeled utilization of the right and left downwind may be presented at various utilization percentages to provide a more comprehensive understanding operational impacts and potential noise benefits. Second, information from the operational analysis in Task 7.2 will be used to determine an approximate utilization of the left downwind.

- **Alternative 11 (Runway 33L Charted Visual Approach)**

  The visual approach procedure on 33L will be designed within available means of navigation (e.g., DME, VOR and stand-alone (RNAV) transition criteria), with new flight tracks and expected dispersion added to the 2003 EDR INM. Operations along the visual approach track will be distributed based on expected utilization rates (range of utilization rates identified from Task 7.2) between ILS and visual approach, allowing BOS/TAC understanding of operational impacts and potential noise benefits.

- **Alternative 12 (Raised Glide Slope Intercept Altitude to 4,000 ft. MSL – Runway 4R, 22L, 27 and 33L)**

  This alternative, which proposes raising ILS intercept altitude to 4,000 ft. MSL during nighttime hours, will require relocation of tracks further out along approach. New INM tracks will be developed to push traffic on arrivals to 4R, 22L, 27 and 33L both higher and further out along the arrival corridors. Utilization of this alternative will be based on information provided by the FAA in Task 6, examples of utilization at other airports and refined assumptions used in Task 7.2.

- **Alternative 13 (Runway 15R and 22L/R Nighttime Propeller Routing)**

  New INM tracks (and expected dispersion) for propeller-driven aircraft under radar control will be developed to model the effects of directing prop departure tracks to follow modified jet departure tracks within the Class B airspace during late night hours only. Analyses will enhance stakeholder understanding of the potential noise benefits (and potential impacts on communities with new overflights) and expected operational impacts along the entire route.

- **Alternative 14 (Shoreline Crossing – Runway 4R, 9, 15R and 22L/22R)**

  The development of INM flight tracks and associated dispersion will rely on the development of the procedure provided from Task 7.1 and incorporated into alternatives 1, 2, 3, 5, and 15. Modeled utilization of the procedure will depend on the final results of the BOS RNAV Equipage Survey. A modified Logan Two Departure approximating each RNAV procedure will be used to model non-RNAV-equipped aircraft operations.

- **Alternative 15 (Minot's Light South Flow Departure - Runway 4R, 9, 15R and 22R/L)**

  New INM flight tracks will be developed to predict the probable ATC vector corridors that will place departures off 4R, 9, 15, and 22L east of Minot's Lighthouse, followed by vectoring on course. The operational split between west- and southbound departures are not expected to change from the 2003 EDR INM values. Note that this procedure is linked to the RNAV departure procedure for the previously mentioned runways. RNAV utilization will be based on the BOS RNAV Equipage Survey and RNAV design criteria from Task 7.1. A modified Logan Two Departure approximating the RNAV procedure will be used to model non-RNAV-equipped aircraft operations.

7.4 Conduct Operational Flight Testing

The BOS/TAC will determine which alternatives will be flight-tested as part of Phase 1. Alternatives that can be implemented through a SOP change will be flight tested as early as practical. Alternatives that require RNAV procedure development will not be ready for flight-testing until after the procedures have been submitted to FAA for implementation due to FAA's required 18-step RNAV development process (FAA Order 8260.43A). For each alternative to be flight tested, separate documentation to support a CatEx for flight-testing will be prepared consistent with the FAA New England region procedures. The documentation will be coordinated with FAA Air Traffic Division Environmental Specialist.

PC will complete the following steps for all alternatives that are flight tested (both RNAV and non RNAV procedures):

- Coordinate with FAA to establish documentation requirements and procedures for this flight-testing. For purposes of this work scope, it is assumed that the process established in the FAA New England Region Preliminary Environmental Review Checklist and Categorical Exclusion Declaration (revised 1998) will apply.
- Develop proposed testing protocol and review with IC and BOS/TAC representatives.
- Collect STARS, operational data and complaint data from Massport to evaluate the operational conditions prior to the test period and during the test period in order to assess the effectiveness of the measures and public perception of noise change.
- Prepare documentation of all operational analysis conducted during the flight test.
- Coordinate with IC regarding field noise measurement protocol and comparative assessments conducted for pretest and during test conditions.
- Review field noise measurements conducted by the IC during flight-testing and resulting findings.

7.5 Documentation

This task includes the documentation of assumptions, analyses and findings of Task 7. The intent of the document is to provide BOS/TAC and CAC members the appropriate level of information needed to decide which alternatives should be implemented. Documentation will be distributed in electronic and printed form. Documents will be reviewed with the BOS/TAC. Comments will be incorporated into final versions of the documentation. PC will coordinate with IC and BOS/TAC regarding document content. The PC will complete the following steps:

- Prepare reports as outlined above for BOS/TAC review.
- Prepare final reports.
- Prepare reports for inclusion on the website.
- Support BOS/TAC as needed during decision process.
- Prepare maps that depict route changes along appropriate jurisdictions.

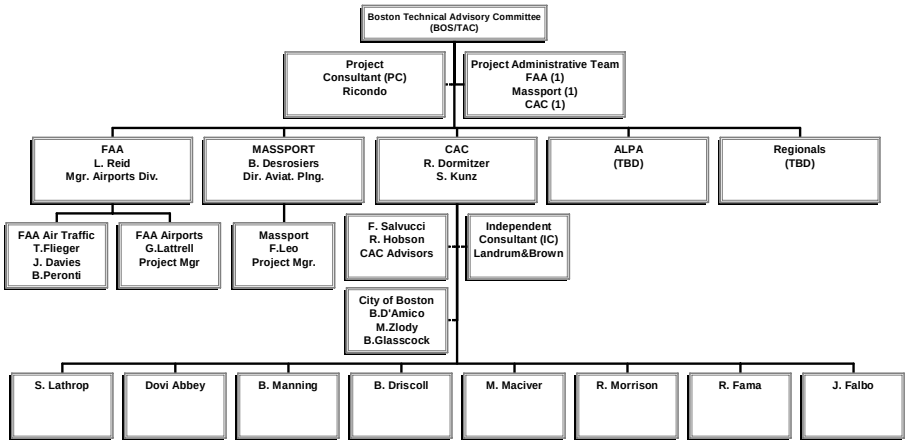
8 SCOPE OF SERVICES – PHASE 2

Based on study findings, prepare a draft scope of services for Phase 2. Phase 2 will assess the noise abatement procedures carried forward from Phase 1 as well as runway use patterns and taxiway noise levels

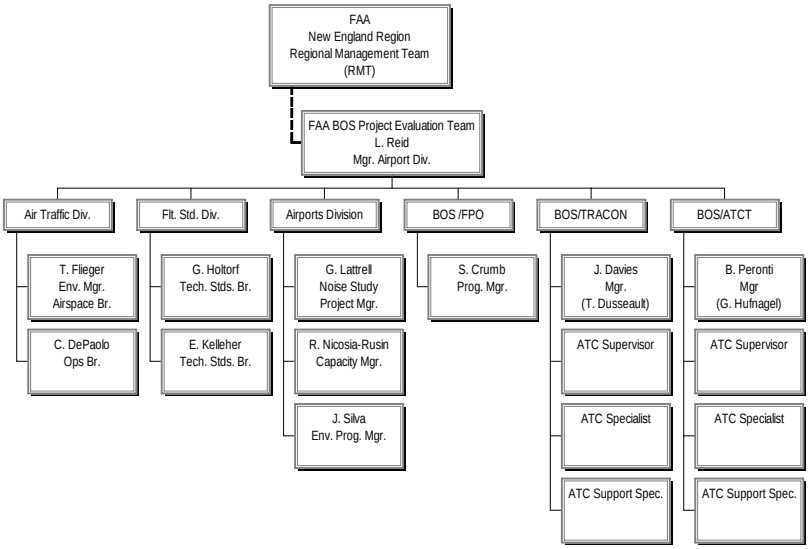
PC Activities:

- Meet with the BOS/TAC to establish framework for scoping Phase 2.
- Participate in scoping meeting with the BOS/TAC.
- Prepare draft scope, budget and schedule for Phase 2 in collaboration with the IC.
- Meet with the BOS/TAC to review the proposed Phase 2 work plan.
- Revise work plan, as necessary.
- Provide additional assistance to the Massport in preparing the FAA grant application.

BOS/TAC ORGANIZATION CHART



FAA EVALUATION TEAM



FAA EVALUATION TEAM RELATIONSHIP TO BOS/TAC