

**Project Consultant
Phase 1
Scope of Services
Adjustment
7/29/2005**

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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.

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 a Categorical Exclusion per FAA of fast track items (CatEx).
4. ~~Implement~~ Submit to FAA flight track changes to be implemented that are eligible for (CatEx).
5. 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 Community Advisory Committee (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.

Communications between the IC and the CAC’s BOS/TAC representatives will be channeled through one of three designated members of the CAC.

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 Fast-Track 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 ~~five~~ two (~~5~~2) locations for this event (~~north, south, southeast, west, and close in to the airport~~) 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 separate nights during a one-week period. One meeting during daylight hours may be scheduled to provide the opportunities for night workers to participate in the process.

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 Flight Management System (FMS) 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. ~~Results will be presented according to the selected metrics~~ as 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 ~~above 150,000 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.
- ~~Create Airfield Configuration Based INM Input Files using the air traffic data collected in Task 5.1, separate the activity by runway use configurations. Create a database of annual average day activity by configuration, runway and flight track assignment. Create separate INM input files for each configuration (4 configurations are assumed). Configuration files will be developed and accepted by the BOS/TAC prior to the computation of noise levels in either standard or supplemental metrics.~~
- Deliver to the IC all INM input files, output files and directories.
- Conduct noise modeling (Run INM) of expanded input files, ~~and produce a complete set of standard baseline metrics (tables/graphs of results).~~
- Compute supplemental noise metrics for the existing noise baseline condition ~~and produce tables/graphs, as appropriate.~~
- ~~In collaboration with the IC, prepare a draft Screening Baseline Noise Condition Working Paper. The PC will provide the draft working paper to the BOS/TAC. Following BOS/TAC review, the PC will incorporate BOS/TAC comments. The PC will also convert the working paper to PDF format for distribution on the project website.~~

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 can be fast tracked 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 is 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 fast-tracking.

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 alternative 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 fast tracking, 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 BOS/TAC and incorporate their comments.
- Provide support to IC during CAC coordination (response to comments).

7 EARLY IMPLEMENTATION FAST-TRACK ALTERNATIVE EVALUATION & DOCUMENTATION

~~Outlined below are the necessary tasks for evaluating the potential benefits and cost of implementing the alternatives that qualify for fast tracking as well as preparing the necessary Categorical Exclusion environmental documentation for each of these alternatives. Prior to the start of this task, the BOS/TAC along with the PC and IC will re-evaluate this scope for potential refinement. This refinement will be based on the nature of the specific procedures identified for~~

~~fast track evaluation as well as the specific noise conditions and supplemental metrics identified during the baseline analysis. For purposes of an initial budget estimate, it has been assumed that seven (7) alternatives will be evaluated (but that could change depending on the outcome of Task 6). Outlined below are the necessary tasks for evaluating the operational factors associated with implementing the alternatives that qualify for early implementation. This task also provides support for flight-testing selected early implementation alternatives. Support includes preparation of necessary Categorical Exclusion checklist documentation for a designated test period not to exceed 30-days and data collection before and during the test period(s). The intent of this task is to provide pertinent information to BOS/TAC members who will ultimately accept and recommend to Massport a set of alternatives for early implementation.~~

7.1 Develop Detailed Procedure Definition

~~For each of the fast track alternatives identified in Task 6, a detailed description of the procedure sufficient to assess the potential benefits and impacts, as well as potential effects on Airport and airspace operations will be developed.~~

PC Activities:

- ~~• Prepare draft procedure definitions for each of the fast track alternatives.~~
- ~~• Incorporate IC comments and distribute to the BOS/TAC for review and comment.~~
- ~~• Incorporate BOS/TAC comments.~~

~~The PC/IC/CAC met with the FAA on June 1, 2005 to review the results of the FAA's operational screening of the Early Implementation Alternatives. The FAA stated that the Alternative procedure definitions were sufficient for them to assess the potential benefits and impacts on airport and airspace operations~~

~~FAA comments were incorporated into the thirteen (13) Early Implementation alternatives that were presented to the BOS/TAC on June 21, 2005. At that meeting it was determined that several of the alternatives utilizing RNAV as a means of navigation required further definition prior to submittal to the FAA for appropriate processing and implementation.~~

~~Further definition of the alternatives requires addressing issues and steps required to evolve the concept into an operationally feasible RNAV procedure compatible with BOS airspace. Those RNAV procedures that require a non-RNAV (or Classic) defined procedure will be identified below for each alternative. Efforts required for each alternative include: runway transition, common, and enroute segment, leg type, and FMS coding design, and aircraft performance and fly-ability, air traffic control, and TERPS assessments.~~

~~The procedure design and obstacle assessment for each alternative will be based on FAA Order 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, 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, and the Standard Operating Procedures (SOP) documents from the Boston Air Traffic Control Tower (ACTC) and Terminal Area Radar Control (TRACON).~~

The Boston Overflight Noise Study RNAV alternatives requiring additional definition or documentation include Alternatives 1–3, 5, 14 and 15. The following paragraphs detail the goals of each alternative and the efforts required for further definition.

7.1.1 Alternative Definitions

The following paragraphs outline specific issues and steps that will be addressed in defining these alternatives. A graphic illustration depicting the proposed procedure design along with key annotations will be developed for each of these alternatives. Information included on the base map illustration may include the appropriate TRACON video map, community boundaries, major geographic features and runway layout. The development of FAA procedure forms, while not included in this task, will need to be conducted when documents are submitted to the FAA for implementation.

- **Alternative 1 (Runway 4R RNAV Departures)** – this alternative is an overlay RNAV Standard Instrument Departure (Logan Two SID) for Runway 4R that will narrow flight track dispersion of the current procedures reducing impacts to Nahant and Lynn. Efforts required to further define this alternative include SID runway transition-common-enroute segment development, leg type designations, and FMS coding design. Other elements also include aircraft performance and fly-ability, air traffic control, and TERPS assessments. 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 entire route will assume at least 0.5 nautical miles (nm) from the main backbone route. Utilization of the RNAV procedure will be based on the RNAV user survey results and the specific components of the procedure (e.g., leg type). The non-RNAV companion of this alternative is the Logan Two SID.
- **Alternative 2 (Runway 09 RNAV Departures)** – this alternative is an overlay RNAV SID (Logan Two SID) for Runway 09 to minimize noise impacts to Nahant and parts of the Hull peninsula. Efforts required to further define this alternative include SID runway transition, common, and enroute segment, leg type, and FMS coding design, and aircraft performance and fly-ability, air traffic control, and TERPS assessments. 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 entire route will assume at least 0.5 nautical miles (nm) from the main backbone route. Utilization of the RNAV procedure will be based on the RNAV user survey results and the specific components of the procedure (e.g., leg type). The non-RNAV companion of this alternative is the Logan Two SID.
- **Alternative 3 (Runway 15R RNAV Departures)** – this alternative is an overlay SID (Logan Two SID) for Runway 15R which is intended to minimize noise impacts to Hull and other south shore communities. Efforts required to further define this alternative include SID runway transition, common, and enroute segment development, leg type designations, and FMS coding design. Other elements also include aircraft performance and fly-ability, air traffic control, and TERPS assessments. 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 entire route will assume at least 0.5 nautical miles (nm) from the main backbone route. Utilization of the RNAV procedure will be based on the RNAV user survey results and the specific components of the procedure (e.g., leg type). The non-RNAV companion of this alternative is the Logan Two SID.

- **Alternative 5 (Runway 22L/R RNAV Departures)** – this alternative is an overlay RNAV SID (Logan Two SID) for Runway 22R/L designed to reduce noise impacts to the Hull peninsula. Efforts required to further define this alternative include SID runway transition-common-enroute segment development, leg type designations, and FMS coding design. Other elements also include aircraft performance and fly-ability, air traffic control, and TERPS assessments. The design of this procedure must accommodate simultaneous arrivals on Runway 27 when BOS is in the Runway 27/22 configuration. BOS TRACON has indicated that radar contact may not always be achieved for aircraft departing Runway 22L/R; therefore, Runway 22L/R procedure design must account for possible non-radar separation from Runway 27 arrivals. Safe separation is maintained via initial course divergence until radar identification is confirmed. The PC will model the procedure in TARGETS to ensure that radar and non-radar separation will be maintained in the case of lost communications or lack of radar identification by ATC. The PC/IC will meet with the FAA Required Navigation Performance (RNP) office to discuss possible remedies to this situation by publishing “Lost Communications and Radar” instructions to pilots on the SID. Recently, FAA Flight Standards (AFS 420) has developed draft criteria to support Radar Diverse Vector Departures (RDVD). This new criteria will allow ATC to vector a departing aircraft from a runway end to an RNAV departure route and may be beneficial in solving separation issues. At the writing of this SOW, FAA AFS 420 indicated that this new criteria has been sent to FAA AFS 1 for approval and signature. It is anticipated that this new criteria will be available for use in approximately 30 days. The PC will obtain the new criteria as soon as it becomes available and incorporate it into the design of this procedure.

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 entire route will assume at least 0.5 nautical miles (nm) from the main backbone route. Utilization of the RNAV procedure will be based on the RNAV user survey results and the specific components of the procedure (e.g., leg type). The non-RNAV companion of this alternative is the Logan Two SID along with a change in the FAA’s Standard Operating Procedures (SOP) to raise shoreline crossing altitude to 7,000 feet MSL.

- **Alternative 6 (22L/R NORWICH Arrivals)** – this alternative needs no further definition. It involves a modification to the existing SOP 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/R over the ocean.
- **Alternative 7 (Runway 27 RNAV NORWICH Arrivals)** – this alternative needs no further definition. It involves a modification to the existing SOP 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 15 RNAV NORWICH Arrivals)** – the intent of Alternative 8 is to narrow flight track dispersion along the existing left downwind pattern for Runway 15R in order to minimize impacts over Nahant. The procedure will be an overlay of the existing traffic along the left downwind, but involves a fix just east of Nahant that ensures that traffic stays east of 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 04R/L Downwind Arrivals) – this alternative needs no further definition. It involves a modification to the existing SOP for arrivals to Runway 04R/L to permit a left downwind. The alternative definition will mirror the existing left downwind pattern utilized by regional jets for Runways 04R/L.
- Alternative 11 (Runway 33L Charted Visual Approach) – this alternative is a visual approach to Runway 33L for aircraft using traditional navigation, which can also be coded into an FMS database for use by RNAV aircraft in order to reduce noise impacts to the shoreline communities. Efforts required to further define this approach include the development of all segments of the approach, identification of landmarks to be used in the visual approach, and determination of approach minimums. In addition, a lead carrier will be identified to support the simulation of the approach and confirm aircraft performance “fly-ability.” The PC will design the approach for daytime and nighttime use. Additional lighting may be required for nighttime authorization of this approach. The PC will identify additional infrastructure that will be required for the approval of the approach. 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 have been sent for signature. It is anticipated that the criteria will be available mid-August 2005. 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). - this alternative needs no further definition. It involves a modification to the existing SOP to direct Runway 22L/R and 15R propeller departures along Logan Two departure headings within the Class B airspace during nighttime hours.
- Alternative 14 (Shoreline Crossing – Runway 04L/R, 09, 15R and 22L/22R) – this alternative will be incorporated into the RNAV departure procedures outlined in Alternatives 1,2,3,5 and 15. The definition of RNAV procedures for these alternatives will extend through TRACON airspace and include the segment of flight crossing over the shoreline. The location and altitude of shoreline crossings will be included in the procedure definition. Anticipated dispersion identified for Alternative 1,2,3 and 5 will be utilized. General dispersion along the entire route will assume at least 0.5 nautical miles (nm) from the main backbone route up to a point where radar vectoring may begin. Utilization of the RNAV procedure will be based on the RNAV user survey results and the specific components of the procedure (e.g., leg type). The non-RNAV companion of this alternative is the Logan Two SID along with a change to air traffic SOP designating 7,000 ft MSL as a required shoreline crossing altitude.
- Alternative 15 (Minot’s Light South Flow Departure - Runway 04L/R, 09, 15R and 22R/L) – this alternative is a change to the SOP in order to reduce south flow departure noise for communities west of Minot’s Light and cross the shoreline at a higher altitude. The definition of this alternative will include the location of the proposed route, altitude, 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

~~Operational analysis will be conducted on the fast track alternatives. This analysis will be prepared by the PC in collaboration with the IC. The consultants will also coordinate with the ATC representatives of the BOS/TAC. The following operational factors will be considered:~~

- ~~• Airspace/Airfield Considerations, including potential effects on other routes and airfield capacity.~~
- ~~• FAA and aircraft equipment/facility requirements.~~
- ~~• Human factor analysis—addressing controller to controller and controller to pilot interactions and issues.~~
- ~~• Aircraft performance analysis—will compile a current fleet mix at BOS and identify key aircraft performance characteristics and differences in on board avionics, pilot training and air carrier operating procedures that may affect aircraft ability to fly a proposed procedure. This work will include a review of any near term (up to 5 years) air carrier plans to change, upgrade or replace these aircraft or change air carrier specific operating procedures.~~
- ~~• TERPS analysis—will analyze procedures for obstruction clearance.~~
- ~~• Other operational considerations—additional operational issues may need to be addressed in this study, depending on the scope of the alternatives and evaluation criteria identified.~~
- ~~• In the case where flight simulation may be required, the consultants would coordinate with specific airline(s) regarding flight simulation experiments of selected proposed noise abatement procedures.~~
- ~~• Nothing in the foregoing analysis will preclude modification of alternatives or consideration of entirely new alternatives to achieve the same or similar noise benefit.~~

PC Activities:

- ~~• Develop proposed methodology and review with the IC and BOS/TAC representatives.~~
- ~~• Finalize methodology based on input of the IC and BOS/TAC.~~
- ~~• Conduct analysis in collaboration with the IC.~~
- ~~• Present findings, in a discussion outline format, along with the findings of Task 7.3 to the BOS/TAC.~~
- ~~• Incorporate comments and revise documentation, as appropriate.~~

~~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 varying 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.

- **Alternative 1 (Runway 4R RNAV Departures)** – As defined there are no operational issues to be assessed. This will be an RNAV overlay of the existing Logan Two Departure. Analysis associated with shoreline crossing is incorporated in the Alternative 14 description below.
- **Alternative 2 (Runway 09 RNAV Departures)** – As defined there are no operational issues to be assessed. This will be an RNAV overlay of the existing Logan Two Departure. Analysis associated with shoreline crossing is incorporated in the Alternative 14 description below.
- **Alternative 3 (Runway 15R RNAV Departures)** – As defined there are no operational issues to be assessed. This will be an RNAV overlay of the existing Logan Two Departure. Analysis associated with shoreline crossing is incorporated in the Alternative 14 description below.
- **Alternative 5 (Runway 22L/R RNAV Departures)** – The FAA’s concerns related to non-radar separation will be addressed in the procedure definition (Task 7.1). There are no other operational issues to be assessed. This will be an RNAV overlay of the existing Logan Two Departure. Analysis associated with shoreline crossing is incorporated in the Alternative 14 description below.
- **Alternative 6 (22L/R RNAV NORWICH Arrivals)** – Two operational issues need to be considered with this alternative:
 - Changes time/distance flown by arrival aircraft.
 - Eliminates to climb restrictions.

Three analytical techniques will be used to address these issues:

- Distance from common arrival fix to the runway for both the baseline and alternative procedure.
- Flight time from common arrival fix to the runway for both the baseline and alternative procedure to determine impact to users.
- Departure flight time from runway 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 and cost 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 issue related to this alternative is the potential impact on aircraft travel time/distance. To address this concern, the PC will measure the distance from common arrival fix to the runway for both the baseline and alternative procedure. The PC will also calculate the potential cost to the users for this change.

- Alternative 8 (Runway 15 NORWICH Arrivals) – Because this alternative does not involve changes to the existing arrival route along the NORWICH STAR and runway transition to Runway 15R, there are expected to be no operational factors associated with it. Therefore, further analysis is not needed.
- Alternative 9 (Runway 04R/L Arrivals) – This alternative will be flight-tested for 30 days in order to assist in determining the operational and noise issues associated with this procedure. Operational factors that will be evaluated as part of the flight testing will include:
 - Quantify the number of traffic crossings/interactions and flight tracks via SDAT and radar data before and during flight-test period to determine how it affects traffic conflicts between GARDNER and SCUPP arrivals and subsequent vectoring north and northeast of Boston to determine benefit of reduced flight tracks over north shore communities.
 - Assess the utilization of the west downwind – track locations, fleet, time of day, altitudes, etc. An assessment of the profile of the aircraft using the downwind may be helpful to describe and discuss any interactions and potential conflicts between aircraft using the procedure and aircraft using the satellite airfields in the west suburbs.
 - Quantify change in runway utilization and acceptance rates.
 - Quantify change in flight time/distance from common arrival fix to the runway for both the baseline and alternative procedure to determine benefit to users.
- Alternative 11 (Runway 33L Charted Visual Approach) – Two operational issues will need to be addressed with this alternative.
 - FAA Facility Requirements – this alternative may require lead-in lighting for nighttime use. The PC/IC will work with FAA to determine locations, equipment requirements, estimated cost and feasibility of installing lead-in lights. Possible light locations will be based on findings made in Task 7.1. This information will be documented for benefit cost analysis in conjunction with noise benefits identified in 7.3.
 - Arrival Throughput – this alternative may require increased spacing on final approach, increased controller workload and have an overall effect on efficiency. Assumptions for spacing on final approach will be provided by the FAA Air Traffic Evaluation Team. The PC will identify potential utilization of this procedure based on final design, FAA and user 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 arrival acceptance rate will be calculated by ACM for each separation scenario provided by the FAA. An estimated average delay will be determined through qualitative analysis.
- Alternative 12 (Raised Glide Slope Intercept Altitude to 4,000 ft. MSL – Runway 04L/R, 22L/R and 27) – The FAA has determined that this alternative can only be considered for use during nocturnal hours. 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) – 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 04L/R, 09, 15R and 22L/22R) – This alternative has been incorporated into each of the proposed RNAV departure procedures (Alternatives 1,2,3,5 and 15). The following operational issues associated with achieving the shoreline crossing will include:

- Effect on controller/pilot communications to assess benefit to ATC.
- Effect on controller workload (i.e. it may increase controller workload if radar monitoring requirements increase based on aircraft/pilot performance) to assess impact to ATC.
- Effect on Aircraft travel time/distance to assess impact to users

These benefits/impacts must be assessed through qualitative use of controller knowledge and experience. If the PC is requested to provide quantitative analysis the procedure may be modeled in the FAA training Lab, otherwise operational flight testing will be required to meet assess the impacts/benefits.

- Alternative 15 (Runway 04L/R, 09, 15R and 22R/L South Flow Departures) – This alternative is recommended for immediate flight testing (30 days). The results of the flight testing will be evaluated to determine potential operational issues (cost/benefits) that may be related to this alternative.

7.3 Assess Potential Noise Benefits/Impacts

~~The noise analysis of fast track alternative procedures will be assessed and tabulated for the fast track alternatives. Results will be presented according to the selected metrics using the same methods as in the existing baseline noise analysis.~~

~~PC Activities:~~

- ~~Develop activity assumptions and INM Input files and review with the IC.~~
- ~~Conduct noise modeling according to established approach with the oversight of the IC.~~
- ~~Produce tables/graphs of results, as appropriate.~~
- ~~Prepare discussion outline material.~~
- ~~Review with and incorporate comments of the IC and BOS/TAC.~~

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), 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).

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.

The Phase 2 EIS portion of the BONS will re-evaluate the requirement for a high-fidelity, custom profile analysis to more accurately model the alternatives that will require a more rigorous environmental analysis, i.e. alternatives not eligible for CatEx documentation under the NEPA process and FAA directives.

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, visual approaches, raising ILS arrival intercept altitudes, changes to Logan Two to reflect the RNAV courses, etc. RNAV 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 [TBD]) 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. 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 04R RNAV Departures), Alternative 2 (Runway 09 RNAV Departures), and Alternative 3 (Runway 15R RNAV Departures) [RNAV and classic portion]

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 existing Logan Two Departure will be used to model non-RNAV-equipped aircraft. INM flight track locations after the outer RNAV waypoint (at which point ATC vectoring of aircraft takes over) will reflect similar tracks and dispersion used in current configuration, just pushed further out over water. 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) [RNAV and classic portion]

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. North and south-bound INM flight tracks after the final RNAV waypoint (at which point ATC vectoring of aircraft takes over) will be developed, pushing the procedure further out over water. Note that this alternative is linked to the shoreline crossing altitude analysis.

Alternative 6 (22L/R RNAV 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 RNAV waypoint (at which point ATC vectoring of aircraft takes over) will be developed.

Alternative 7 (Runway 27 RNAV 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 RNAV waypoint (at which point ATC vectoring of aircraft takes over) will be developed.

Alternative 9 (Runway 04R/L 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 of the tradeoffs between

operational impacts and potential noise benefits. Second, information from the tradeoff analysis and operational analysis in Task 7.2 will be used to determine a “goal” utilization of the left downwind. Note that the operational benefits/impacts (refer to Section 7.2) of this procedure are linked to the potential noise benefits/impacts. This procedure is also linked to Alternative 12.

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), with new flight tracks and expected dispersion added to the 2003 EDR INM. Operations along 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 stakeholder understanding of operational impacts and potential noise benefits.

Alternative 12 (Raised Glide Slope Intercept Altitude to 4,000 ft. MSL – Runway 04L/R, 22L/R and 27)

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/L, 22L, and 27 both higher and further out along the arrival corridors. Analyses will enhance stakeholder understanding of the balance between potential noise benefits/impacts and expected operational impacts along the entire route. Utilization of this alternative will be based on information provided by the FAA in Task 6 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 will be developed to model the effects of re-locating prop flight tracks to follow the Logan Two departure tracks within the Class B airspace during nighttime 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 04L/R, 09, 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. Modeled utilization of the procedure will depend on the final results of the BOS RNAV Equipage Survey. The existing Logan Two Departure will be used to model non-RNAV-equipped aircraft, just re-located to follow the RNAV tracks. As previously noted, the evaluation of this alternative is dependent on several other departure alternatives.

Alternative 15 (Minot’s Light South Flow Departure - Runway 04L/R, 09, 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 22 R/L east of Minot’s Lighthouse, then vectoring on course. The operational split between north- 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. The existing Logan Two Departure will be used to model non-RNAV-equipped aircraft, just re-located to follow the RNAV tracks.

7.4 Prepare and Conduct Operational Flight Testing-Prepare Documented Categorical Exclusion for Flight Testing

The results of Task 7.2 and 7.3 will be reviewed to determine which of the alternatives should be flight tested prior to implementation. For each of these alternatives, a separate documentation to support a Categorical Exclusion for flight testing will be prepared. This documentation will incorporate the analysis completed in previous tasks and will follow a format consistent with the FAA New England region procedures. The documentation will be coordinated with FAA Air Traffic Division Environmental Specialist.

PC Activities:

- ~~As part of the BOS/TAC's review of findings from Tasks 7.2 and 7.3, identify which alternatives should be flight tested prior to implementation~~
- ~~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.~~
- ~~In accordance with the documentation requirements established above, prepare draft documents for BOS/TAC review, including the following elements:~~
 - ~~— Project/Procedure Description — Description of the proposed action in text and use of exhibits/illustrations as prepared initially in Tasks 6.3, 7.1 and portions of Task 7.2.~~
 - ~~— Purpose and Need of Proposed Action — Describe purpose and need of the proposed action, including the assessment of potential air traffic operational benefits determined in Task 7.2.~~
 - ~~— Affected Environment — Description of the area potentially affected/benefited by the proposed change as may be applicable; otherwise, description of general airport environment. Utilize Tasks 5.1 and 7.1 and 7.2.~~
 - ~~— Environmental Consequences — Document findings of Tasks 5.2 and 6.2. Describe potential impacts/benefits to all impact categories as outlined by FAA Order 5050.4A, including discussions of Thresholds of Significance. It is anticipated that the assessment of impacts will focus on the evaluation of noise, compatible land use, social impacts, and air quality.~~
 - ~~— Other Considerations and Cumulative Impacts — Describe potential for controversy or other considerations. Describe potential for cumulative impacts when considering the proposed action together with other past, present, and reasonably foreseeable future development projects/actions.~~
 - ~~— Public Involvement — Describe public and agency coordination efforts. Summarize and document all public coordination efforts, including public notification requirements associated with flight testing (if applicable) and implementation as may be proposed.~~
 - ~~— Summary/ Conclusion — Summarize overall impacts / benefits and finding.~~
- ~~Review with IC and submit to FAA for review and comment.~~
- ~~Prepare final documents to incorporate FAA comments.~~

Flight-testing as part of Phase 1 is limited to alternatives that can be implemented through a SOP change. Phase 1 alternatives that require RNAV procedure development will not be ready for flight testing until after the completion of Phase 1 due to FAA's required 18-step RNAV

development process (FAA Order 8260.43A). RNAV procedure testing and/or simulation is typically part of the 18 step evaluation process, and requires a lead carrier and an FAA approved RNAV procedure for testing. Up to four alternatives will be flight-tested (Alternatives 6,7,9 and 15). For each of these alternatives, a separate documentation to support a CatEx for flight-testing will be prepared. This documentation will incorporate the analysis completed in previous tasks and will follow a format consistent with the FAA New England region procedures. The documentation will be coordinated with FAA Air Traffic Division Environmental Specialist. Results from the test will be utilized to support analysis for Task 7.2 and 7.3 where appropriate. PC will complete the following steps:

- 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 ARTS and operational 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. The data will be processed and analyzed in Task 7.2 above.
- Prepare documentation of all operational analysis conducted during the flight test. This will be conducted in conjunction with Task 7.2.
- Coordinate with IC regarding field measurement protocol and comparative assessments.
- Review field-testing conducted by the IC during flight-testing and resulting findings.

7.5 Documentation Provide Implementation Support

Following completion of the documented Categorical Exclusion for flight-testing, the consultants may be required to provide technical support to the implementation of the proposed fast track alternatives. This technical support will be determined for each alternative (such as noise measurements):

PC Activities:

- Collect ARTS and operational 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. The data will be processed to show the effectiveness of the measures in terms of flight tracks and altitude, as appropriate to the specific objectives of the measure.
- Prepare documentation of all operational analysis conducted during the flight test. Present to the BOS/TAC.
- Oversee and review field testing conducted by the IC during flight testing.

This task includes the documentation of assumptions, analyses and findings of Task 7. The intent of the document is to provide BOS/TAC 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.

7.6—Prepare Documented Categorical Exclusion for Implementation

~~Following successful flight testing (or completion of Task 7.2 and 7.3 for alternatives that may not require flight testing) a documented Categorical Exclusion will be prepared for implementing each of the alternatives, as appropriate. This documentation will incorporate the analysis completed in previous tasks and will follow a format consistent with the FAA New England region procedures.~~

PC Activities:

- ~~In accordance with the documentation requirements established above, prepare draft documents for FAA review, including the following elements:~~
 - ~~Project/Procedure Description—Description of the proposed action in text and use of exhibits/illustrations as prepared initially in Tasks 6.3, 7.1 and portions of Task 7.2.~~
 - ~~Purpose and Need of Proposed Action—Describe purpose and need of the proposed action, including the assessment of potential air traffic operational benefits determined in Task 7.2.~~
 - ~~Affected Environment—Description of the area potentially affected/benefited by the proposed change as may be applicable; otherwise, description of general airport environment. Utilize Tasks 5.1 and 7.1 and 7.2.~~
 - ~~Environmental Consequences—Document findings of Tasks 5.2 and 6.2. Describe potential impacts/benefits to all impact categories as outlined by FAA Order 5050.4A, including discussions of Thresholds of Significance. It is anticipated that the assessment of impacts will focus on the evaluation of noise, compatible land use, and social impacts.~~
 - ~~Other Considerations and Cumulative Impacts—Describe potential for controversy or other considerations. Describe potential for cumulative impacts when considering the proposed action together with other past, present, and reasonably foreseeable future development projects/actions.~~
 - ~~Public Involvement—Describe public and agency coordination efforts. Summarize and document all public coordination efforts, including public notification requirements associated with flight testing (if applicable) and implementation as may be proposed.~~
 - ~~Summary/ Conclusion—Summarize overall impacts / benefits and finding.~~
- ~~Review with IC and submit to BOS/TAC for review and comment.~~
- ~~Prepare final documents to incorporate BOS/TAC comments.~~

~~8—DOCUMENTATION~~

~~This task includes the documentation of assumptions, analyses and findings of the study. Documentation will be distributed in electronic and printed form. Documents will be reviewed with the BOS/TAC and other established technical committees. Comments will be incorporated into final versions of the documentation. Documentation will include the following:~~

- ~~• Appendix Technical working papers documenting key elements of the study.~~
- ~~• Final Technical Reports summarizing Phase 1.~~
- ~~• Executive Summary highlighting the findings of Phase 1.~~
- ~~• Appendix public process.~~

~~PC Activities:~~

- ~~• Prepare reports as outlined above for BOS/TAC review.~~
- ~~• Prepare final reports.~~
- ~~• Prepare reports for inclusion on the website.~~

~~9—PRELIMINARY PHASE 2 EVALUATION~~

~~For each of the alternatives identified in Task 6 that may not be eligible to be Categorically Excluded from formal NEPA processing, alternative analysis and refinement will be conducted. This task will be re-assessed prior to being initiated. The following activities assumes that this task will be a limited effort that will primary determine the likelihood that each of the alternatives being considered for Phase 2 can be implemented in a reasonable timeframe (next 5 years) based on available technology.~~

~~PC Activities:~~

- ~~• Refine scope based on available funds and the scope of the alternatives to be carried into Phase 2.~~
- ~~• Define screening criteria (primarily implementation focus)~~
- ~~• Evaluate each alternative based on above criteria. The evaluation is qualitative only. This analysis will be used to further refine the alternatives prior to Phase 2.~~
- ~~• Refine alternatives, as necessary and re-test against criteria.~~
- ~~• Report findings to BOS/TAC.~~

10 SCOPE OF SERVICES – PHASE 2

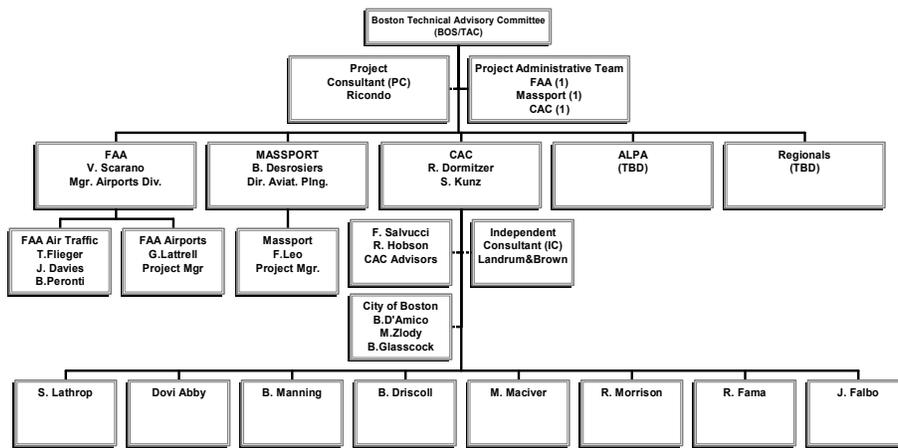
Based on study findings, prepare a draft scope of services for Phase 2. Phase 2 will assess the noise abatement procedures carried forward from Phase 1 as well as runway use patterns and taxiway noise levels

PC Activities:

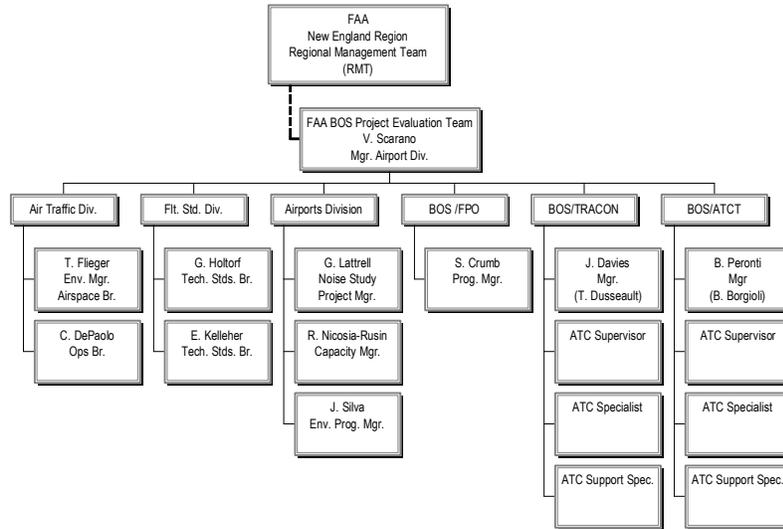
- Meet with the BOS/TAC to establish framework for scoping Phase 2.
- Participate in scoping meeting with the BOS/TAC.
- Prepare draft scope, budget and schedule for Phase 2 in collaboration with the IC.
- Meet with the BOS/TAC to review the proposed Phase 2 work plan.

- Revise work plan, as necessary.
- Provide additional assistance to the FAA in preparing the FAA grant application.

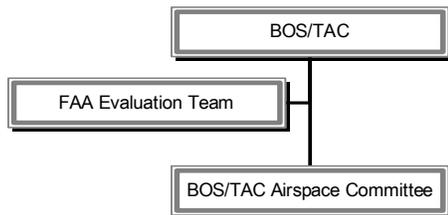
BOS/TAC ORGANIZATION CHART



FAA EVALUATION TEAM



FAA EVALUATION TEAM RELATIONSHIP TO BOS/TAC



Boston Overflight Noise Study

Phase 1

PROJECT CONSULTANT
SCOPE OF SERVICES

March 8, 2004