

PREAMBLE

The following scope of work outlines tasks to be performed during Phase 2 of the Boston Logan Airport Noise Study. Phase 1 was a collaborative process between the Logan Airport Community Advisory Committee (CAC), the Boston Technical Advisory Committee (BOS/TAC), the Federal Aviation Administration (FAA), and Massport, with support from the Project Consultant (PC) and the Independent Consultant (IC). The CAC represents 29 communities and towns within the Greater Boston area, each of which has appointed a representative to the organization. BOS/TAC contains representatives of FAA, CAC, Massport, the Air Line Pilots Association (ALPA), and airlines operating at Boston Logan Airport, and was the primary decision making body in Phase 1. Each of these parties played an important role in identifying potential alternatives to reduce noise impacts to communities surrounding Boston Logan International Airport (the Airport). Alternatives identified in Phase 1 that were determined to be feasible based on operational, safety, and technical criteria were retained for further consideration. Those alternatives that could be implemented without causing adverse environmental impacts were identified and may be implemented during the early stages of Phase 2 (Task 3).

Other alternatives identified in Phase 1 that were determined to be safe and operationally and technically feasible, but had the potential to cause adverse environmental impacts if implemented, were retained for further analysis in Phase 2. Those alternatives will be subjected to more detailed technical analyses to determine the significance of any environmental impacts, which will then be the subject of an Environmental Impact Statement (EIS) to be prepared by FAA. The National Environmental Policy Act (NEPA) requires federal agencies to consider the potential effects that their actions could have on the human environment. An EIS is a federal document and must be prepared when impacts of a proposed action, considering any associated mitigation, could have a significant adverse impact on the human environment. Specific to the consideration of alternatives being retained for further study in Phase 2 of the Boston Logan Airport Noise Study, FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, states that an EIS must be prepared when the proposed action “has a significant effect on noise levels of noise-sensitive areas”, or “when the degree to which the effects on the quality of the human environment are likely to be highly controversial.”

An EIS becomes a legal document when the lead federal agency issues a Record of Decision (ROD) on the proposed actions, alternatives, and associated impacts considered within the EIS. FAA, as the lead federal agency, has specific statutory requirements that it must fulfill in the preparation of an EIS before a ROD can be issued and the actions discussed in the EIS and identified in the ROD can be implemented. An EIS is prepared by the lead federal agency with the participation of and in consultation with federal, state, and local agencies that have jurisdictional authority over resources potentially affected by the proposed action. There are also specific minimum public involvement requirements to which the federal agency must adhere, including scoping prior to the preparation of the Draft EIS (DEIS) and a public hearing after release of the DEIS.

Because the purpose of the Boston Logan Airport Noise Study is to identify and implement alternatives to reduce noise impacts to communities surrounding Boston Logan International Airport, the active participation of representatives of communities most affected by noise from aircraft operating at the Airport is crucial to the success of the project. Thus, the FAA proposes to directly involve BOS/TAC and CAC, as well as the public at large, in a community dialogue process in completing three critical tasks in Phase 2:

- Task 4 – Study Area Definition,
- Task 5 – Develop Baseline Conditions and
- Task 6 – Alternatives -Identification and Evaluation

Additional resources, such as the FAA Evaluation Team that evaluated Phase 1 alternatives for safety and operational and technical feasibility, will be brought into the Phase 2 study process as needed.

The community dialogue process is outlined further in Task 2 – Public Coordination/Involvement. The purpose of this process is to ensure that BOS/TAC, CAC and the general public have the opportunity to provide input on the conduct of this noise study in the spirit of collaboration that existed in Phase 1. It will also serve to assist the CAC in reaching consensus at key decision points during Phase 2. At the appropriate point in the study, likely during Task 6 (Alternatives Identification and Evaluation), the FAA will initiate the formal EIS process, which will have a different communication protocol than the other portions of Phase 2 discussed above. The first EIS activity will be scoping meetings that will be open to the public and interested parties. All comments and suggestions received during scoping will be provided to the BOS/TAC and CAC for their information. BOS/TAC and CAC will be kept informed of the EIS activities through monthly progress reports and quarterly meetings. The PC, working with FAA, will develop preliminary drafts of sections of the DEIS. The preliminary documents will then be released, and sufficient time provided, to the CAC, Massport, and the IC to review and comment on the sections before they are included in the DEIS.

FAA will prepare and distribute a DEIS that describes the purpose and need for the proposed actions, summarizes the alternatives reviewed, and identifies the potential impacts associated with the proposed actions and alternatives carried forward for possible implementation. Public and agency comments on the DEIS will be received during the formal review period and during a public hearing that will be held on the DEIS. Under NEPA, the FAA is required to then review, consider, and respond to comments received on the DEIS, and to make any appropriate changes to the recommendations or findings of the DEIS. CAC will be kept informed of the response to comments and the preparation of the Final EIS (FEIS) through monthly progress reports and will be briefed on any potential issues that may alter any of the findings of the DEIS, prior to the release of the FEIS.

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PHASE 2 SCOPE OF SERVICES

INTRODUCTION

The Boston Logan Airport Noise Study is in fulfillment of the requirements of the FAA's Record of Decision dated August 2, 2002. The study is being completed in two phases.

During Phase 1, 55 airspace and operational alternatives to potentially improve the noise environs around Boston Logan International Airport were identified. Each alternative was subjected to a preliminary screening process that examined safety and operational feasibility. If an alternative was found to be technically feasible and met FAA safety criteria it was subjected to a secondary screening analysis. If an alternative was technically infeasible or did not meet FAA safety criteria, it was discarded from further consideration. Through this process, 18 of the 55 Phase 1 alternatives were ultimately discarded.

The remaining 37 alternatives considered in Phase 1 were examined in a secondary screening analysis to determine whether implementation would potentially cause an adverse environmental impact (as defined in FAA Orders 1050.1E¹ and 5050.4B²) that require disclosure and consideration in an Environmental Assessment (EA) or Environmental Impact Statement (EIS). Alternatives that would not cause an impact requiring disclosure and consideration in an EA or EIS, and were listed in and met the conditions of FAA Order 1050.1E to be considered as the type of action that would normally be categorically excluded, were identified as Early Implementation Alternatives. Of the Phase 1 alternatives considered, 23 were identified as Early Implementation Alternatives.

The remaining 14 alternatives deferred from Phase 1 (combined together into 12 alternatives) will be further evaluated in Phase 2 to determine potential impacts to communities and noise sensitive areas. The intent of these alternatives is to reduce noise impacts to communities surrounding Boston Logan International Airport. These 12 combined alternatives are:

- Alternative 4 – Runway 14 Departures: develop departure procedures to increase altitudes of aircraft over land. The intent of this alternative is to avoid overflights of Hull and increase altitude of aircraft at the point where their flight path crosses from the ocean to land. FAA-designed routing from Runway 14 was not available during Phase 1. Therefore, analysis for this alternative is to be addressed in Phase 2.
- Alternative 16 – Runway 32 Arrivals: develop approach procedure that maximizes flight over water. The intent of this alternative is to minimize noise impacts to South Shore communities. FAA-designed routing to Runway 32 is not complete and is currently under review by FAA National Flight Procedures Office. Therefore, analysis for this alternative is to be addressed in Phase 2.

¹ Federal Aviation Administration, Order 1050.1E, *Environmental Impacts: Policies and Procedures*, June 8, 2004.

² Federal Aviation Administration, Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, April 28, 2006.

- Alternative 17 – Runways 27 and 33L Departures: develop departure procedures for fanning. The intent of this alternative is to provide respite to close-in communities in departure areas of these runways.
- Alternative 18 – All Departure Runways: apply cockpit alternatives for thrust and climb management to benefit certain nearby communities through implementation of close-in noise abatement departure procedures. The intent of this alternative is to minimize noise impacts to close-in communities.
- Alternative 19 – Runway 27 Departures: establish balanced use of Runways 27 and 33L for departures. The intent of this alternative is to minimize noise to close-in communities. This alternative will be evaluated as a component of the Preferential Runway Advisory System (PRAS) evaluation.
- Alternative 20 – Runway 4L Departures and 22R Arrivals: remove noise emission restriction to achieve more utilization of this runway. The intent of this alternative is to develop a more equitable distribution of noise impacts. This alternative will be evaluated as a component of the PRAS evaluation.
- Alternative 21 – All Departure Runways: develop fanning procedures based on route of flight. The intent of this alternative is to disperse noise impacts in departure areas of runways.
- Alternative 22 – Runways 4R/L and 22R: develop runway use procedure to more reasonably distribute operations between these runways in meteorological conditions with small tailwind components. The intent of this alternative is to provide more equitable distribution of noise impacts from Runways 4R/L and 22R. This alternative will be evaluated as a component of the PRAS evaluation.
- Alternative 23 – Runway 27 Arrivals and Runway 15 Departures: arrive on Runway 27 and depart on Runway 15 during late night hours. The intent of this alternative is to minimize noise impacts on South Shore/Hull. This alternative will be evaluated as a component of the PRAS evaluation.
- Alternative 24 – Runway 15R Departures: implement a preferential runway use procedure during operational (FAA) nighttime hours (midnight to 6 a.m.) that places all departures on Runway 15R, unless tailwinds exceed 11 knots or departures exceed 60 per hour. The intent of this alternative is to reduce aircraft noise exposure during nighttime hours for communities in the departure area of Runway 27. This alternative will be evaluated as a component of the PRAS evaluation.
- Alternative 27 – Runways 4R/4L LDA Approaches: develop offset approaches from the east and west. The intent of this alternative is to minimize noise to communities under the existing approach to 4R/4L.
- Alternative 28 – Runway 27 Departures: modify Runway 27 departure procedure to an initial right turn in order to direct aircraft over the Charles River basin and away from heavily populated areas. The intent of this alternative is to reduce the aircraft noise exposure for the communities in the departure area of Runway 27.

Any alternative found desirable by the communities and acceptable to the FAA for implementation during Phase 1, but also found to generate significant noise effects or substantial public controversy, will be carried over for inclusion in the EIS process of Phase 2.³ For

³ In accordance with 40 CFR 1508.4, and FAA Orders 1050.1E and 5050.4B.

budgetary purposes, it is assumed that 3 of the Early Implementation Alternatives from Phase 1 will be carried over for inclusion in the EIS process of Phase 2.

In addition to these 12 alternatives, ground noise sources, such as taxiway use patterns, including the use of the centerfield taxiway, if approved by the FAA, will be analyzed in Phase 2 to identify potential alternatives that could minimize ground noise impacts on surrounding communities. This task will incorporate the analyses and findings of the FAA Centerfield study. If the centerfield taxiway is approved by FAA, it will be included as an existing condition for all future alternatives, including the future No Action alternative. In addition, assuming that the centerfield taxiway is approved, alternatives to the centerfield taxiway that were considered in the study conducted by FAA will not be re-examined in this study.

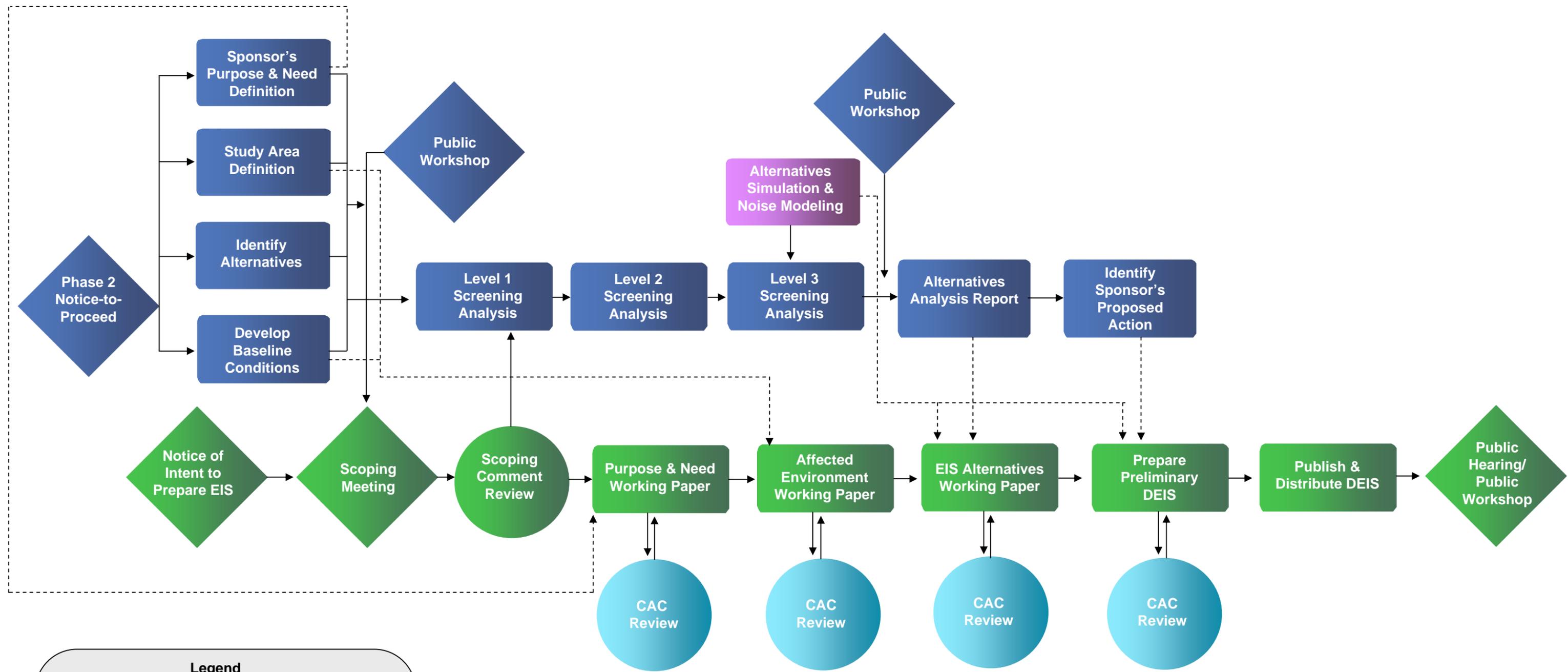
Massport's PRAS at Boston Logan International Airport will also be examined in Phase 2 to determine potential runway use alternatives that could minimize aircraft noise on near-by communities. The first step in the PRAS evaluation will be to confirm the purpose and goals of the PRAS program with CAC input. A cumulative impact assessment of all Phase 2 alternatives recommended for implementation will be required to determine if the intent and goal of the program, to reduce noise impacts on communities surrounding Boston Logan International Airport, would be realized. Different combinations of Phase 2 alternatives may need to be analyzed to determine the set of alternatives that best minimizes noise impacts.

This document presents the proposed scope of services, also referred to as the work plan, for Phase 2 of the Boston Logan Airport Noise Study. The objectives of Phase 2 are to:

1. Continue coordination between CAC, Massport, and FAA.
2. Continue the public coordination and involvement program through public workshops and the project web site.
3. Update the GIS database, develop baseline (existing conditions) air traffic simulation (as required to determine taxiway and runway use alternatives for noise modeling), and aircraft noise exposure baseline to use in the analysis of potential flight track, runway usage, and ground noise alternatives.
4. Develop Phase 2 alternatives evaluation screening criteria and process to identify reasonable and feasible alternatives that will improve the noise environment for the communities surrounding Boston Logan International Airport.
5. Develop an Environmental Impact Statement (EIS) for environmental analysis for those alternatives developed during Phase 2 and recommended for implementation if required to comply with pertinent FAA orders under NEPA.

A follow-on phase will address the implementation by Massport and FAA of the recommended alternatives approved in the FAA's Record of Decision (ROD).

The proposed process to be followed in Phase 2 is depicted in **Exhibit 1**.



Legend

- BOS/TAC Activities, including PC & IC
- FAA Activities, including PC
- CAC Activities, including Massport, IC & General Public
- FAA/PC Activity with IC and CAC Review

Exhibit 1
Boston Logan Airport Noise Study
Phase 2 Process
(Through DEIS Public Hearing)

1 PROJECT MANAGEMENT

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

CAC and BOS/TAC will continue to be involved in the development of the alternatives through the NEPA scoping phase. Once the final scoping document is issued it will be maintained by FAA and PC. Deliberative information will be maintained by FAA and released once public dissemination is appropriate. The CAC will be kept informed of key issues and work progress during the EIS process and will be provided opportunities to review information at appropriate points.

1.1 Project Administration and Coordination

This task covers the day-to-day project administration and coordination required by the PC and IC in coordination with FAA, Massport, BOS/TAC, and CAC. For purposes of scope and budget development, it is assumed that 3-years will be needed for project administration and coordination to complete all tasks through issuance of the Record of Decision (ROD). The 3-year timeframe is based on the following assumptions: eighteen (18) months to conduct baseline modeling, identify alternatives, conduct modeling of alternatives, and select preferred alternatives for implementation; and twelve (12) months after the alternatives selection process to complete the EIS process (issuance of the ROD). An additional six (6) months are assumed as a project contingency to mitigate scheduling risks.

PC Activities:

- Bi-Weekly conference calls – the PC will prepare a project activity report, which will serve as the agenda for the bi-weekly calls with FAA. This activity report will outline the current activities of the study and will be shared with the IC, for distribution to the CAC. Following each conference call, each of which is anticipated to last approximately an hour, meeting notes will be prepared and distributed by the PC within 3 days of each bi-weekly conference call. This coordination is assumed to require no more than two PC staff members to participate in weekly calls, and one administrative member to prepare meeting notes. Effort required for this coordination is assumed to be 3 hours per week.
- The PC will maintain a current project schedule on a monthly basis. The current schedule should be published on the BONS Forum website.
- Coordination with the IC – the PC will coordinate with the IC via conference call on a bi-weekly basis through the NEPA scoping phase, in addition to the other coordination as described above. This coordination is assumed to require four (4) hours per week to prepare for, conduct and prepare meeting notes as needed. The number of attendees will vary each week depending on the topics. Effort associated with additional meeting attendees is accounted for in the technical tasks described below. This task provides coordination and documentation support for each meeting.

- BOS/TAC Info-hub web site (www.bostac.com) – the PC will maintain and update the Info-hub web site throughout Phase 2. This site is an internal project site that stores key information and allows members to post and download files over the Internet. Reports and graphics will be developed as part of the technical tasks described in the following sections.
- BONS Forum web site will be updated and maintained on a regular basis. The PC will utilize the forum web site to post discussion topics and documents for review. Team members will be able to review documents and post comments, which will become part of the document record. The PC will be responsible for reviewing questions and coordinating responses to them within 5 business days. The site also contains a project schedule and allows team members to subscribe to different topic areas for automatic notification of new postings. The intention of this site is to enhance coordination between the PC and IC as well as with BOS/TAC members. Technical expertise required to respond to BOS/TAC member questions will be provided under separate technical tasks.
- The PC will prepare and submit monthly invoices and progress reports. This task is assumed to require two (2) hours per week for subconsultant coordination, reconciliation of invoices and budgets, and completion and preparation of invoices and status reports.
- The PC will maintain project files and records throughout Phase 2. This task does not include the establishment and maintenance of an Administrative Record for the EIS, which is discussed in Task 7.

IC Activities:

- Participate in bi weekly telecons with the PC (one hour bi-weekly).
- Review web site material prior to posting.
- Prepare web site postings representing CAC positions (assume 4 hrs weekly).
- Prepare monthly invoices and progress reports for delivery to the CAC management and Massport. This task is assumed to require two (2) hours monthly.
- Provide project files and records for Independent Consultant efforts for inclusion in the Administrative Record.

1.2 FAA EIS Coordination

The PC will hold regular coordination meetings with FAA during preparation of the EIS to review material, discuss work progress, and respond to FAA comments. It is anticipated that these coordination meetings will be held bi-weekly during preparation of the EIS. To the extent actions proposed require Massport involvement coordination with Massport will also be involved.

PC Activities:

- Up to 50 conference calls, as needed, will be held (up to two hours each) with FAA. Utilize Net meetings as directed by FAA with up to six (6) face to face meetings as needed.

IC Activities:

- As appropriate, the IC will participate in up to 20 conference calls held (up to two hours each) with FAA and PC for coordination of CAC interests in the preparation of the alternatives to be considered in the EIS. Participate in net meetings at the direction of the CAC; for budgetary purposes, three (3) separate trips to FAA offices are assumed.

1.3 Work Scope Re-Assessment

At four (4) points during Phase 2, the PC will re-assess the work scope and budget to determine if any changes are required to enhance the overall effectiveness of the study effort. Work scope re-assessment will occur at the following points:

1. After approval of Communications/Engagement Protocol (Task 2.1)
2. After approval of Noise Modeling and Measurement Protocols (Task 5.3.1)
3. After approval of PRAS Objectives and Evaluation Measures (Tasks 6.1.3.1 and 6.1.3.2)
4. Prior to Analysis of Phase 2 Alternatives (Level 3 Screening Analysis)

PC Activities:

- The PC will prepare and provide input/suggestions on possible work scope and budget revisions in coordination with FAA.
- The PC will revise its work plan (scope, budget, and schedule) in coordination with the IC. Duration to develop and review each re-assessment is assumed be no more than one month.

IC Activities:

- The IC will coordinate with the PC in the revision of the project work scope to accommodate unforeseen project requirements.
- The IC will subsequently revise its own work scope and budgetary allocations in accordance with the modifications made to the PC work scope and the needs of the CAC.

FAA/Massport:

- Prior to changes to the consultant contracts, the FAA in coordination with Massport must approve the changes.

2 PUBLIC COORDINATION/INVOLVEMENT

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

2.1 Develop Communications/Engagement Protocol

A communications/engagement protocol will be developed at the start of Phase 2 in conjunction with the CAC. It will outline the overall outreach strategy for Phase 2 and will address specific concerns raised by CAC and BOS/TAC members, including the decision making process, and when material will be shared with CAC and BOS/TAC depending on specific tasks. A scope re-assessment for this task may be necessary after the protocol is developed.

This process will be designed to accomplish several interconnected goals all of which will be necessary if the decisions of the CAC are to lead to real change in the noise impacts of Boston Logan Airport. Essential elements of this process that will be clearly defined in this task include:

- A clearly defined set of objectives: what does the CAC hope to accomplish at the end of Phase 2? What will success consist of?
- A schedule of particular tasks, desired outcomes and the specific meetings and other efforts needed to accomplish those outcomes.
- A means to get information prepared and distributed in a clear and comprehensible manner, accessible to CAC members at all levels of technical sophistication. The materials they receive must make clear the technical, political and community benefits and tradeoffs associated with the options presented.
- An on-line structure for communicating with each other and with technical consultants between scheduled meetings
- A process and meeting design that allows the CAC to work through the alternatives and their pros and cons and make decisions about which course of action to pursue.
- An integration of the CAC decision making in conjunction with the BOS/TAC.
- A process and materials with which to engage community stakeholders and members of the public, ranging from one-on-one meetings with stakeholders to on-line dialogue for hundreds of participants. These materials will be designed to help CAC members present alternatives and the associated pros and cons to non-technical people from the affected communities, and will provide a means for CAC members to gather useful feedback.

These elements together will allow the CAC , the FAA and Massport to engage in a purposeful, well-informed and highly structured process that will allow for and incorporate a wide range of perspectives, and ultimately will have the potential to make significant and widely supported changes to the noise impacts surrounding the Airport.

PC Activities:

- Prepare draft communications/outreach protocol for consideration by the FAA, Massport, and CAC.
- Facilitate a discussion among study participants regarding key outreach issues and concerns.
- Finalize communications/outreach protocol and update specific tasks as appropriate.

IC Activities:

- Cooperate with the PC in the preparation of the draft communications/outreach protocol
- Consult with CAC membership regarding optional approaches to key outreach issues and concerns.
- Peer review PC efforts in preparation of communications/outreach protocol and communicate results to CAC.

2.2 CAC Coordination

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

PC Activities:

- Up to eighteen (18) periodic meetings and/or teleconferences with the CAC to discuss project issues or attend CAC meetings. For budgetary purposes, eighteen (18) separate trips are assumed for this task over the course of Phase 2. This coordination is assumed to require forty (40) hours per meeting to prepare for, attend, conduct, and prepare meeting notes as needed. Number of attendees will vary depending on topic. Effort associated with additional meeting attendees is accounted for in the technical tasks described below.

IC Activities:

- Meet with the CAC on the evening prior to every BOS/TAC meeting in Boston to assist in their understanding of the materials under consideration. This coordination assumes 16 hours of meeting and preparation by three IC team members for each CAC meeting. For budgetary purposes assume 18 meetings.
- Gather quarterly in meetings or teleconferences with the general CAC membership to discuss project issues and status. This coordination assumes the participation of one to three members of the IC team at each meeting. The IC will be responsible for the location and rental of up to eight commercial meeting spaces during the course of the project. (Assume eight meetings and four teleconferences for budgetary purposes).
- Meet or teleconference up to 12 times during the course of the project, as directed by CAC, with small focus groups of the CAC membership and other public representatives to focus on specific areas of interest where greater understanding of the information is desired. For example, such focus groups of the CAC and other public representatives may include those members with intense interest in the noise modeling process, residents under the 27 departure path, residents in communities near the airport most interested in ground noise dispersion and mitigation, etc. For budgeting purposes, it is intended that any travel for these focus group meetings will

occur during any travel that occurs for quarterly CAC meetings. (Assume eight meetings and four teleconferences for budgetary purposes).

- Conduct periodic teleconference consultations with CAC to discuss project related issues. (assume one hour weekly by IC project manager)
- Notices/agendas should be sent electronically via e-mail distribution lists.

2.3 BOS/TAC Meetings

This task covers all primary meetings of the BOS/TAC. Sub-committee meetings (should they be held) will be covered under specific technical tasks described later in the work scope. It is anticipated that the BOS/TAC will meet up to 18 times over the anticipated 3-year timeframe for Phase 2. It is assumed that day meetings will be held at the Massport or Volpe conference facilities. Evening meetings will be held as needed (up to 6 meetings) and will be scheduled for no more than four hours. All evening meetings will be facilitated as directed by FAA. Project status meetings (if requested) will be conducted via web-conferencing.

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.
- The PC will provide meeting design and facilitation for an effective 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 specific comments made by members of the BOS/TAC. The meeting notes will be distributed to the BOS/TAC and IC for review and comment.

IC Activities:

- The IC will participate in each BOS/TAC meeting to assist the CAC in understanding the issues discussed and to provide peer review of technical presentations made by the PC during the meetings.
- IC will review PC meeting notes.

2.4 Public Workshops

Public workshops will be held at two points during the Phase 2 process. The first workshop will be held to present the findings of Phase 1, describe the intent and goals of Phase 2, and present the alternatives to be examined in Phase 2. Public input on Phase 2 alternatives and areas of concern will be solicited during this workshop, to be held in conjunction with the EIS public scoping meetings (discussed in greater detail in Task 7.3.4). The purpose of this workshop is to allow the public an opportunity to comment on the alternatives proposed to be analyzed and to identify any additional alternatives to be examined.

The second workshop would be held concurrent with the Public Hearing on the DEIS (see Task 7.5).

The public workshops will be held in four (4) locations, one each in north shore, south shore, Metro Boston and west communities as suggested by the CAC and approved by the FAA. Up to two (2) additional meetings may be added at the discretion of the FAA.

PC Activities:

- Coordinate with the CAC and 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, presentation boards, and a page for the public web site announcing the public workshop and topics to be presented.
- Assist FAA in the preparation of briefings to public officials at appropriate milestones in the EIS process.
- Assist FAA in preparing press releases (up to four) and publish in at least two major daily publications and ten local papers.
- Incorporate BOS/TAC comments.
- Provide up to seven professional staff for the meetings. Assume attendance by the project manager, technical lead, air traffic lead, RNAV lead, noise lead, and two consultants for sign-in table and meeting organization.
- Comments received during the public workshops associated with scoping and the DEIS public hearing will become part of the record for the EIS and are discussed in greater detail in Task 6. Comments received during the second workshop will be reviewed and cataloged. The PC will summarize the comments received and document disposition of the comments.

IC Activities:

- Review and comment on the behalf of CAC on materials prepared for BOS/TAC review for each workshop.
- Provide appropriate staff (up to two) to participate in workshops on behalf of the CAC. Assume attendance by the Project Manager and one technical lead. It is not anticipated that IC staff will provide manpower for workshop stations, but rather will circulate to understand public comment and provide peer review to PC material.
- Prepare and coordinate IC and CAC comments regarding presentations of material made at each workshop.

2.5 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 and CAC during the Study but will be tailored for the public website. There will be information updates throughout Phase 2. The web site will be reviewed monthly to determine if additional material should be posted. Results of Phase 1, appropriate public information, and other material deemed appropriate will be posted to the site. Notices will be sent to public libraries in the study area with instructions, so that the public can access the website on publicly available web-accessible computers.

PC Activities:

- Develop website materials, additional pages, necessary graphics and reports.
- Provide site production and progress reviews.
- Provide ongoing website updates.
- Coordinate with IC

IC Activities:

- Review and comment on website materials.
- Coordinate CAC comments.

2.6 Web Dialogues

This task will be used to provide the opportunity for dialogue among the BOS/TAC members, CAC, and/or general public on specific project issues during Phase 2. Each dialogue will be professionally facilitated and will focus on a specific issue and designed to maximize understanding among study participants and input into the process. The specific subjects and timing of these dialogues will be established as part of Task 2.1, Develop Communications/Outreach Protocol. For cost estimating purpose, it is assumed that quarterly dialogues will be held for two week durations.

PC Activities (for each dialogue):

- Develop dialogue design and materials.
- Facilitate online dialogues.
- Provide summary findings.

IC Activities:

- Participate in web-dialogue as appropriate.

2.7 Media Outreach

In addition to the outreach described above, the PC will prepare and disseminate material to the media and through other outreach mechanisms to maximize the overall public outreach for this program. Press releases will be prepared and sent to the various major and local media (print, radio and television) within the study area at the beginning of this study, and at up to six key milestones during Phase 2. These press releases will be concise and written in plain English, so that people can understand them. Similar material will be sent to state and federal elected officials in the study area. This task will be further defined as part of Task 2.1, Develop Communications Protocol.

PC Activities:

- Prepare mailing list of media and elected officials for distribution of project material.
- Develop materials for distribution.
- Distribute material
- Conduct periodic follow-up with five to ten recipients to ensure that the material is being delivered and to collect feedback.

IC Activities:

- Coordinate review with CAC membership familiar with specific issues covered in the press releases for public sensitivities.
- Peer review PC efforts on media distribution and follow up.

3 PHASE 1 IMPLEMENTATION

After conclusion of the Phase 1 alternatives analysis, the recommended early implementation alternatives (those that are categorically excluded from additional environmental evaluation) will be implemented. While the Phase 1 alternatives analysis predicted the impacts of the proposed alternatives, actual results will not be known until the alternatives proceed through the FAA process and are implemented. Under an adaptive management model, two additional steps will be conducted to ensure that the intended result(s) actually occur, as described below. For purposes of this scope, it is assumed that PC services for this task would be available for up to a 12-month period following the conclusion of Phase 1.

3.1 Implementation Monitoring Assistance

Prior to implementation of the early implementation alternatives, the PC and IC will assist the FAA during actual procedure development to ensure the intent of the alternative is not altered, particularly during the 18-step RNAV development process. In addition, the PC/IC will assist BOS/TAC in determining the monitoring metrics and reports required to determine if the early implementation alternatives are being implemented as planned, and assess actual data to determine if the intended results of the alternatives are being achieved. Massport has an aircraft operations and noise monitoring system in place that is currently being upgraded and enhanced. This system may be used to monitor implementation of the approved actions and may be supplemented with additional measurements to assess noise levels at locations beyond the area covered by Massport's monitoring system.

PC Activities:

- Assist BOS/TAC in determining the metrics and reports needed to monitor the implementation of the approved actions.
- Attend meetings as necessary during the implementation process, assume monthly meetings for up to 2 years.
- Assist in reviewing proposed adjustments, if any are proposed by FAA during procedure development.

IC Activities:

- Assist the BOS/TAC in determining the metrics and reports needed to monitor the implementation of approved actions.
- Attend meetings as appropriate during the implementation process.
- Coordinate with the PC to assist the FAA in reviewing proposed adjustments.
- Communicate proposed adjustments to the CAC and coordinate public comment regarding adjustments to procedures for which environmental approval has been provided.

3.2 Post-Implementation Assessment

After the early implementation alternatives have been implemented, the PC and IC will analyze the results of the monitoring and compliance reports generated by Massport and by supplemental monitoring, if any, to determine whether the intended results of the approved actions are being achieved. If the intended results are not being achieved, the PC and IC will analyze the

procedures and develop recommendations to BOS/TAC for possible adjustments to the procedures that would achieve the intended results.

PC Activities:

- Analyze results of monitoring to determine if intended results are being achieved.
- Recommend adjustments to procedures if intended results are not being achieved.

IC Activities:

- Coordinate with the PC to analyze the results of the monitoring from Massport and supplemental sources to determine if desired results are achieved.
- Coordinate with the PC to recommend adjustments to procedures if intended results are not being achieved.

4 STUDY AREA DEFINITION

A study area for the project will be defined and used in the development of baseline conditions and to determine potential impacts over a specified geographic area. Study areas will be defined for the noise analysis, environmental justice analysis, and the cumulative effects analysis. For purposes of this study, the study area will be defined as the area within a 25-mile lateral radius of the BOS TRACON radar. In order to be consistent with Phase 1 evaluations, the study area will incorporate BOS arrivals and departures up to 15,000 feet AGL. In accordance with guidance contained in FAA Order 1050.1E, noise impacts will be determined from the ground to 10,000 feet AGL for aircraft departures and from the ground to 7,000 feet AGL for aircraft arrivals.

PC Activities:

- Confirm study area definition with FAA.

IC Activities:

- Review study area definition.

5 DEVELOP BASELINE CONDITIONS

Baseline noise exposure and land use conditions at and around Boston Logan International Airport will be updated, documented, and modeled to provide a basis against which the noise abatement alternatives can be compared. The information gathered during Phase 1 of the study will need to be updated or verified to reflect a baseline year of 2005. This task also includes the development of a recent baseline for aircraft noise and air traffic/airfield operations. Baseline results will have to be reviewed and updated to include implementation of Phase 1 alternatives.

5.1 GIS Database

Existing data and map sources will be used to refine and supplement the GIS database developed during Phase 1 of the study. All GIS data will be obtained from the Massachusetts Geographic Information System (MassGIS). This scope of work does not include any field surveys.

5.1.1 Update/Verify Land Use Base Map

The land use base map developed and utilized in Phase 1 will be updated from MassGIS data. If recent aerial photography is available, a comparison of the GIS land use map with the aerial photography will be undertaken to verify land use. The land use map will be used to identify noise sensitive areas surrounding the airport.

PC Activities:

- Obtain land use data for the study area from MassGIS.
- Compare land use information with recent aerial photography if available, and update the project GIS database as necessary.

IC Activities:

- Review periodic modifications by PC to land use data for the study area from MassGIS.

5.1.2 Update/Verify Socioeconomic Data

Socioeconomic data for the study area will be reviewed to determine if more recent data is available from MassGIS. If updated socioeconomic data is available, it will be incorporated into the GIS database for the project. The socioeconomic data will be used to determine potential impacts to residents, minority populations, and low-income populations from the noise abatement alternatives.

PC Activities:

- Update project GIS database for the study area if more recent socioeconomic data from MassGIS is available.

IC Activities:

- Review updates to project GIS database for the study area prepared by PC.

5.1.3 Update/Verify Natural & Cultural Resources Data

Natural and cultural resources data for the study area will be reviewed to determine if more recent data is available from MassGIS. If updated data is available, it will be incorporated into the GIS database for the project. The natural and cultural resources data will be used to determine potential impacts to DOT Section 4(f)/303(c) and historic properties from the noise abatement alternatives. In addition, coordination with federal, state, and local resource agencies will be conducted to determine if other eligible DOT Section 4(f)/303(c) properties exist within the study area and determine existing and future uses of the DOT Section 4(f)/303(c) and historic properties.

PC Activities:

- Update project GIS database for the study area if more recent natural and cultural resources data from MassGIS is available.
- Coordinate with federal, state, and local resource agencies to determine existing and planned uses of DOT Section 4(f)/303(c) and historic properties.

IC Activities:

- Review updates of project GIS database for the study area prepared by PC.

5.2 Fast-time Air Traffic Simulation

Fast-time air traffic simulation will provide input data for noise modeling of ground movement, evaluation of the Preferential Runway Advisory System (PRAS), and determination of aircraft departure and arrival profiles. The air traffic information will also be used to determine baseline operational metrics associated with capacity and delay. The Total Airspace and Airport Modeler (TAAM) will be used to simulate air traffic at Boston Logan International Airport. TAAM has been effectively used in support of recent Final Environmental Impact Statements at Chicago O'Hare International Airport and Philadelphia International Airport and for the Draft Environmental Impact Statement on the New York, New Jersey, and Philadelphia Metropolitan Airspace Redesign Project.

Any existing TAAM and/or ground movement simulations of Boston Logan International Airport and data contained within those simulations will be utilized to the extent possible.

5.2.1 Model Verification

The purpose of model verification is to ensure that the simulation reasonably reflects the actual operation of the airfield/airspace system as characterized by key operating statistics. The verification involves an iterative process of (1) comparing model outputs to actual measured data, (2) visually verifying that the model is routing traffic appropriately, (3) making refinements to the model inputs, and (4) rerunning the model until the outputs approximate the measured data and operational characteristics. Inputs to the model would be coordinated with the noise modeling team and FAA ATC personnel. Results of the model calibration would be reviewed and approved by FAA before utilizing the model to analyze potential future alternatives.

Two conditions would be modeled and correlated. One would be the configuration most frequently used in Visual Meteorological Conditions (VMC). A date when this configuration

was operating will be identified; operational and schedule data from that date will be collected and then input into the model. Results will be compared with the actual operating statistics for that date and the model will be adjusted accordingly.

The other condition would be a configuration in Instrument Meteorological Conditions (IMC). A date when this configuration was operating will be identified; operational and schedule data from that date will be collected and then input into the model. Results will be compared with the actual operating statistics for that date and the model will be adjusted accordingly.

PC Activities:

- Develop VMC and IMC configurations for specific dates; test, compare, and calibrate model.
- Coordinate calibration results with IC.

IC Activities:

- Review TAAM model input and results of the calibration.
- Coordinate with CAC.

5.2.2 Development of Baseline Schedule

A baseline schedule will need to be developed for use in the modeling efforts. The PC will obtain the most recent operational data for the base year (2005). Using these and passenger airline schedules found within the Official Airline Guide (OAG), the PC will develop a baseline schedule representing an average day during the peak month (PMAD) of 2005. The schedule will include information on air service provider, flights (i.e. arrival, departure, or touch-and-go), fleet mix, operator type (i.e. air cargo carrier, passenger air carrier, general aviation, or military), origin-destination pair, and time of operation in adequate detail for use within the simulation and noise analysis.

To aid in the modeling effort, arriving and departing aircraft will be matched and assigned to specific gates.

PC Activities:

- Develop baseline schedule and match aircraft to specific gates.
- Coordinate schedule with IC.

IC Activities:

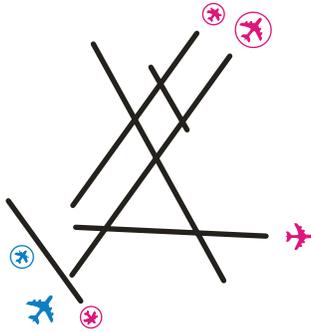
- Review baseline flight schedule.
- Coordinate with CAC.

5.2.3 Baseline Modeling

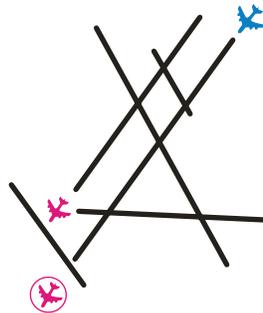
Representative Boston Logan International runway operating configurations are depicted in **Exhibit 5.1**. These representative configurations will be simulated using TAAM at three demand levels. These simulations will produce the following:

- Demand and delay curves to determine the current and future capacity of Boston Logan International Airport when operating under the various runway configurations.

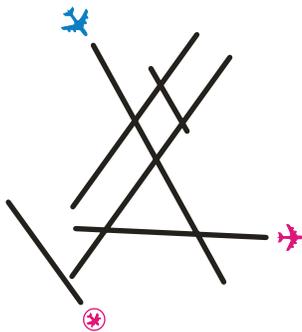
Runways 4/9/14



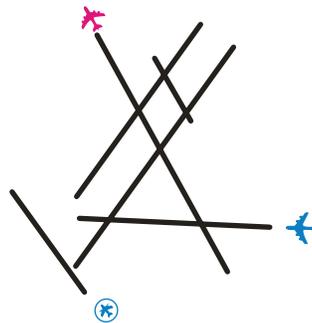
Runways 22/22



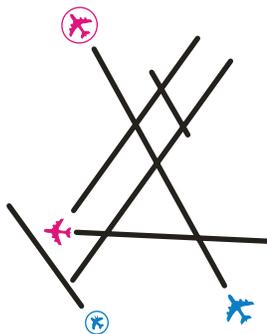
Runways 15R/9/14



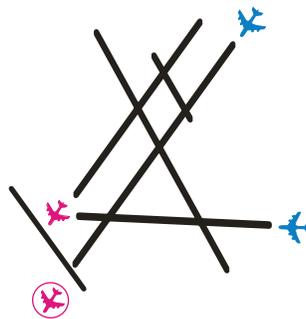
Runways 27/32/33L



Runways 33L/32/27



Runways 27/22



Source: Logan Air Traffic (2005)
Prepared by: Ricondo & Associates, Inc.

Exhibit 5-1

-  Primary Departure Runway
-  Primary Arrival Runway
-  Secondary Departure Runway
-  Prop Arrival
-  Prop Departure

Runway Operating Configurations

- Operational data produced from the schedules of aviation activity processed by the simulation. This data shall include but not be limited to, out-off/on-in (aircraft pushback from gate to departure from runway/aircraft touchdown on runway to arrival at gate) times at Boston Logan International Airport, departure or arrival airspace routes, aircraft type and arrival or departure runway assignment.
- Global Flight Data Record (GFDR) files that will provide data including but not limited to:
 - Airspeed
 - Heading
 - Altitude
 - Track across ground
- Data on taxiway utilization including, but not limited to, aircraft type, taxiway link (location) and total travel time on the taxiway link for use in ground noise modeling.

PC Activities:

- Model baseline conditions.
- Coordinate simulation results with IC.

IC Activities:

- Coordinate with PC on the development of simulation models.
- Review baseline simulation input and results.
- Coordinate with CAC.

5.3 Baseline Noise

Baseline noise modeling will be required to establish average annual day existing conditions at Boston Logan International Airport. A baseline year of 2005 will be developed and modeled, which will serve as the baseline for assessing potential noise abatement alternatives in Phase 2. Baseline results will have to be reviewed and updated to include implementation of Phase 1 alternatives.

The intent of this task is to develop a baseline noise study that describes the existing noise environment within the constraints of the latest-available industry research, data, and accepted noise and aircraft performance modeling tools available. The baseline will be developed with the goal of providing an analysis tool that captures the effects of real-world flight conditions (e.g., departure hold-downs and extended downwind approaches, among others) for an average annual condition at the Airport. The FAA's Integrated Noise Model (INM) 6.2 will be used to model all aircraft noise.

Development of the baseline noise model will require customizing certain INM input parameters to model both the horizontal and vertical components of the aircraft flows in and out of the Airport. The INM inputs will be developed to best simulate the average annual day three-dimensional flight trajectories and the performance characteristics of the aircraft experienced at the Airport. This will provide a comprehensive model of the average annual day existing noise environment, and will allow for a detailed analysis of the effects of each alternative.

5.3.1 Prepare Noise Modeling and Measurement Protocols

The PC will prepare a protocol for developing the baseline noise model for Boston Logan International Airport and for conducting the alternatives noise analysis. The protocol will be developed and submitted to FAA for review and any required approvals of software, input adjustments or models prior to conducting the noise modeling effort. The protocol will address:

- Collection and consolidation of radar data into representative backbone and dispersed flight tracks.
- Collection and consolidation of radar data into representative climb and descent profiles along primary departure and approach corridors.
- Dispersion of operations among backbone and dispersed flight tracks
- Noise modeling of flight and ground-based activity
- Supplemental/alternative noise metrics

The IC will develop a protocol for noise measurements, including metrics, site selection, durations of measurement and intended operational conditions to be measured. In addition, IC will conduct comparative measurements with a selection of Massport's permanent noise monitors in order to establish an acceptable error factor that will be factored in when comparing modeled levels.

The protocols will identify any proposed measures that may need approval from FAA AEE. Protocols for both efforts will discuss verification, validation and sensitivity assessments for application to modeling efforts. Quality assurance/quality control techniques, including statistical tests of the significance of input/results will be incorporated.

A draft working paper will be prepared for submission to the FAA's AEE to seek any approvals required if the use of previously-unproven models or proposed modifications to the INM noise modeling databases is proposed.

Opportunities for public involvement in the development of the protocols will be provided through two meetings (one meeting and one net meeting) with a focus group of the CAC and other interested parties. Upon completion of the draft protocol working paper, the results will be presented to the CAC for review and comment.

PC Activities:

- Develop overall noise modeling and measurement protocol with input from BOS/TAC, FAA, Massport, CAC, and IC.
- Identify noise modeling procedures that may require FAA AEE approval.
- Prepare documentation for submission to FAA AEE for approval of use of any noise models or unapproved input parameters.
- Review noise measurement protocols developed by PC.
- Coordinate protocols with BOS/TAC, FAA, and IC.
- Finalize noise modeling and measurement protocol document.
- Conduct scope re-assessment for noise analysis, if necessary.

IC Activities:

- Confer with the PC in the selection of appropriate approaches to modification of INM input files from standard input.
- Peer review any proposed usage of non-INM modeling and recommend appropriate modifications to protocol to assist the FAA AEE approval decision, if required.
- Peer review the PC's documentation for submission to the FAA AEE, if required for any and all approvals required prior to noise modeling.
- Prepare noise measurement protocols for side-by-side measurements at up to 12 of Massport's permanent noise monitoring stations for periods of several hours.
- Prepare noise measurement protocol for independent measurements with portable equipment at up to 6 sites located at distances beyond the coverage area of the Massport permanent noise monitoring system.
- Develop protocol to obtain and correlate radar data from FAA or Massport systems to measured noise events collected at permanent and independent portable measurement sites.
- Prepare a protocol document describing the noise measurement program selection of sites, measurement periods, desired operations for measurement, and intended utility for the PC in the validation of INM-modeled noise levels.

5.3.2 Noise Modeling Input and Methodology**5.3.2.1 Radar Data Analysis**

The PC will obtain a 12-month (CY 2005) radar data sample from Massport's airport noise monitoring system, which collects and archives the FAA BOS TRACON radar data. Within a 25-mile radius of the BOS TRACON radar, all radar data for aircraft operating in and out of the study area will be collected. The PC will analyze the data using Wyle's radar analysis software package, Noise Data and Display System (NDADS)⁴. NDADS is an interactive tool for creating flight tracks and flight profiles for further INM analysis. It reads a sample of air traffic control radar data and displays it in a manner that allows the operator to analyze the data statistically and mathematically create representative tracks and profiles. NDADS will also allow the PC to conduct statistical analyses of airport operations by aircraft type, operation type, runway assignment, and time of day. The IC will be provided an overview and working demonstration of the software during analysis of the radar data, either at the PC's offices in Arlington, Virginia, or via a web interface. Further details are given below which relate to the work effort for each main INM input element.

PC Activities:

- Obtain 12 months of radar data from Massport's airport noise monitoring system.
- Analyze radar data using NDADS.
- Coordinate results with IC.

⁴ The use of NDADS does not require approval from FAA AEE per discussions between FAA ATO and FAA AEE as long as standard INM datasets are being utilized. If NDADS is used to develop customized profiles, then FAA AEE approval will be sought.

IC Activities:

- Coordinate with PC to review evaluation software and radar data for later analysis.
- Conduct peer review on PC's analysis of radar data.

5.3.2.2 Aircraft Operations, Fleet Mix, and Runway Use

The PC will rely on the results of the radar data analysis to derive statistical operational distributions and daily operations by aircraft type, operation type, runway assignments, and time of day. All flight operations data collected from the noise monitoring system will be used in the baseline noise modeling. The PC will review aircraft type input errors and correct as necessary. The PC will verify runway use assignments as reported by Massport's airport noise monitoring system. If data records have no corresponding operations data, the PC will purge them from the database. Additional information will also be added for each recorded flight, if the database does not have all of the required information. This information includes:

- Aircraft category
- User category
- Aircraft origin and destination
- Runway configuration in use
- Arrival fix
- Departure fix

This information will be necessary in order for the PC to process and identify the appropriate radar tracks that will serve as the basis for INM flight track calculations.

PC Activities:

- Examine database and correct errors.
- Coordinate results with IC.

IC Activities:

- Review PC evaluations.

5.3.2.3 Analysis of Radar Flight Trajectories

The intent of this task is to sub-divide the composite set of radar trajectories into small operational bundles. A bundle refers to a grouping of radar flight trajectories that have the following common characteristics (listed in order of importance):

1. Arrival or departure
2. Runway use
3. Aircraft type
4. Flow direction
5. Similar aircraft climb and acceleration characteristics and descent profiles.

The PC will develop INM ground tracks to best capture the aircraft flows and dispersion characteristics for both arrival and departure streams. The PC will produce flight tracks for the

six BOS runway configurations and the annual average day configuration. The six common operating conditions will be developed by first sub-dividing the radar trajectories within the 365 days of radar data into the six common operating configurations. This will be accomplished by incorporating the configuration used for each hour as logged by the BOS Tower and collected by Massport. A configuration code will be assigned to each unique flight. Once sub-divided, each configuration subset will be further sub-divided into operational bundles, where the appropriate INM ground tracks and profiles will be developed for each operating configuration. Baseline noise will be calculated for each of the six operating configurations, as well as for the annual average day configuration, as described in the following sections.

The INM ground tracks and the associated operations assigned to the tracks will be determined statistically using the 12 months of radar data for 2005. The overall goal is to use NDADS to best simulate a representative horizontal dispersion of aircraft along each of the arrival and departure flows for BOS. This will involve bundling the operations according to various aircraft categories, which may include: Heavy Jet-Air Carrier, Large Jet-Air Carrier, Regional Jet-Air Carrier/Air Taxi, Business Jet-General Aviation, Propeller-Air Taxi, and Propeller-General Aviation. Each bundle will be created using a "gate" in NDADS; a gate is a representation of a window in space through which the aircraft flight tracks pass.

Within each aircraft category, radar tracks will be bundled according to runway. For each runway, the bundle will be further subdivided by visual inspection. Different components of each flow will be grouped, including variations near the runways (such as varying turn radii that result from air traffic decision-making in the sequencing of arriving and departing aircraft) and variations farther from the airfield (such as departures splitting off to different navigation fixes). This exercise will create more bundles of tracks, with each individual bundle representing a smaller number of radar trajectories.

For every bundle of radar tracks, representative average (backbone) flight tracks will be developed. In addition, the altitude and speed profiles will be plotted for each aircraft type, along with the standard INM profiles. Profiles for a given aircraft may vary between different runways, and may also vary on the same runway, depending on the ground track. For profiles requiring additional analyses, NDADS may be used to develop statistical vertical gate penetration information, such as altitude, speed, etc. This statistical profile data may be utilized and compared with criteria to determine the validity of the INM standard profiles. Where required, bundles will be sub-divided to account for vertical dispersion characteristics. Tracks for each bundle will be modeled using the ground track dispersion feature of INM.

PC Activities:

- Group radar tracks by aircraft category and runway, subdividing them into bundles.
- Coordinate results with IC.

IC Activities:

- Peer review PC's work in developing radar tracks assumptions and results/by aircraft category and runway, subdividing them into bundles, and developing representative average flight tracks for each bundle.
- Coordinate results with PC and CAC.

5.3.2.4 INM Flight Track Calculation

The PC will further utilize the NDADS software to create ground tracks from each bundle of radar tracks. Each saved bundle will be handled separately. The bundle will be loaded into NDADS, and a series of closely-spaced gates will be drawn across the bundle of tracks, beginning at the runways and ending at the end of the radar tracks. NDADS will be used to compute the mean and standard deviation of ground tracks developed for each bundle at each gate. The user will then interactively draw a series of straight and curved vector segments through the one-standard-deviation indicator at each gate. In this manner a statistically meaningful "nominal" ground track is created. NDADS will save the nominal ground track and all of the statistical data computed at each gate.

Each nominal ground track will be converted to a point track and loaded into INM as the backbone flight track. NDADS statistical data will be used to specify the sub-track spacing and distribution in INM. The INM dispersion modeling will include all operations within the bundle and across the full width of the gate.

PC Activities:

- For each bundle, create a nominal ground track and convert them to point tracks for INM.
- For each bundle, calculate the horizontal dispersion and model it within INM.
- Coordinate results with IC.

IC Activities:

- Review PC's backbone and dispersed flight track definitions for INM with NDADS by application of a comparable methodology for flight track definition used to prepare data for use in the FAA NIRS model. A random sampling of PC-developed tracks will be evaluated to determine the statistical validity of the proposed backbone and dispersed flight tracks.
- Coordinate results with PC and CAC.

5.3.2.5 INM Flight Profile Development

A flight profile defines the distance, altitude, speed, and thrust settings at many locations along a modeled flight path. The INM contains "standard" departure and approach profiles for every aircraft type in the INM database. The "standard" profiles have been developed to ensure valid three-dimensional flight trajectories that correlate well with actual speeds and thrust settings for each aircraft. In addition, the user may define "custom" flight profiles; however, the user must first determine the correct inputs for the INM, based on actual aircraft operations, and receive FAA Office of Environment & Energy (AEE) approval to use the customized data before applying them to INM modeling.

The first step in the process is to conduct an analysis of the radar flight trajectories (refer to Section 5.3.2.3) to determine – based on the effects of how aircraft are actually flown and how the air traffic flows in and out of the Airport are controlled – where it is appropriate to assign the standard INM profiles for departures and arrivals and where it is not. To accomplish this, the PC will compare a statistically-significant number of actual flight profiles with the standard INM

flight profiles. The comparison will include a calculation of both the average altitude and speed profiles for each aircraft type operating within each identified bundle. The average flight profiles will be based on the average values of all trajectories, specific to each aircraft type, that occur within each bundle. The PC has developed several utilities to help automate portions of this process.

The PC will develop evaluation criteria, with input and review by the IC, to determine the appropriateness of using standard profiles in the baseline model. Criteria may include multiple match points for special instances (pending AEE approval) (for example, where there are hold downs due to crossing traffic or where analysis of proposed alternatives will require profile modifications including level flight on approach and thrust on turns in downwind approaches). Wherever appropriate the standard INM profiles will be utilized. However, the PC anticipates that some operations cannot be suitably modeled using standard INM profiles and will require development of custom flight profiles.

If customized flight profiles are needed, the PC proposes to use the FAA's Noise Integrated Routing System (NIRS) Flight Segment Generator (FSG) model using existing INM procedure profile data. The FSG is an FAA-approved process that allows for the development of approved customized flight profiles. If the customized flight profiles generated by the NIRS FSG model prove inadequate, other techniques may be proposed that include the use of custom procedure steps in INM (procedure step data that is not available in INM), modifying standard profile points (by extending existing segments between profile points), or developing new profile points using various aircraft performance modeling techniques. The exact manner of techniques used will depend greatly on the availability of data needed to conduct the analysis. Wherever possible, procedure step data available in INM will be utilized. For INM aircraft that do not have procedure step data, the PC, with IC input, will determine if another INM aircraft can be used as a substitution that will provide similar acoustical results. If a substitution is not available, the PC will utilize readily available data to develop customized procedure step data. Another option, if data is available, is to develop customized profile point datasets. Any technique other than use of the NIRS FSG that is proposed to generate customized flight profiles must be pre-approved by FAA Office of Environment & Energy (AEE).

PC Activities:

- Develop/identify INM flight profiles for each aircraft type on each identified flight trajectory bundle.
- Coordinate results with IC and BOS/TAC.

IC Activities:

- Cooperate with the PC in the development of an FAA/AEE approved methodology to generate user-defined profiles, if necessary, to accommodate BOS-specific variations from INM default climb and descent profiles.
- Peer review PC-developed INM flight profiles for each aircraft type on each INM flight track.
- Coordinate review findings with PC, CAC, and BOS/TAC.

5.3.2.6 INM Input File Development

Data will be formatted for input into version 6.2 of FAA's Integrated Noise Model (INM). A database will be compiled which includes the number of day and night operations for every combination of aircraft type, operation type, flight profile, stage length, runway, and track name, for each of the six air traffic configurations and the annual average operational condition. The database will be compiled based on the results of the radar analysis detailed above in Task 5.3.2.1.

Wyle's Dicerno™ software will be used to conduct supplemental metric analyses.⁵ Input for Dicerno™ will rely on the INM baseline conditions. The IC will be provided with INM database files. The CAC will be provided an overview and working demonstration of the software during analysis of the radar data, either at the PC's offices in Arlington, Virginia, or via a web interface. IC will be provided with input and output of interest that is identified after the demonstration for each scenario that is analyzed.

PC Activities:

- Create INM input files.
- Provide a full copy of all INM directories and cases and Dicerno™ output to the IC for review.
- Coordinate results with IC and BOS/TAC.

IC Activities:

- Peer review all aspects of the PC's INM input and output files.
- Coordinate review results with PC, CAC and BOS/TAC.

5.3.2.7 Noise Measurements

A supplemental noise measurement program to provide a comparison between modeled INM levels and those measured in the field will be conducted. This task includes both remote and side-by-side (with permanent monitors) monitoring. The remote measurements are intended to provide supplemental data to validate INM input developed in the INM modeling process. Where noise measurements significantly deviate from modeled noise levels, anomalies to the data will first be sought in the measurement data, and if not discovered, the operational and location input to the INM will be checked to assure that modeling assumptions and distributions are valid before proceeding to alternative modeling. The technical criteria and limitations associated with this analysis will be determined via the noise protocol developed in Task 5.3.1. The PC and IC, based upon the noise protocol, will jointly determine the appropriate course of action based upon comparative results. This will be reviewed during the noise protocol discussions with the FAA, Massport, and CAC.

Up to six supplemental field sites will be selected to ascertain aircraft noise levels at locations under current flight paths, but beyond the capture area of the current noise monitoring equipment. Noise measurement methodology and locations will be determined during the development of the noise protocol. At each site, measurements will be collected for five

⁵ The use of Dicerno™ does not require FAA AEE approval per discussions between FAA ATO and FAA AEE as long as standard INM datasets are being utilized.

consecutive 24-hour days. Each supplemental measurement site will be attended for five 8-hour daytime periods during which aircraft overflight events will be logged by an observer. Noise level data will be collected in A-weighted 1-second intervals.

Also, in order to assess differences between permanent monitor and INM values, side-by-side measurements will be conducted at no more than 12 existing permanent monitoring sites for periods of four hours each. Sites selected for this task will be distributed throughout the area and selected to represent both within and outside three (3) miles from the Airport. Locations will be determined during development of the noise protocol. This analysis will provide a comparison with the range of aircraft single event noise levels registered by the Airport's noise monitoring system. The information gathered from this assessment will provide a better understanding of modeled and measured differences associated with possible variance associated with measured data. The means in which the comparison will be conducted will be consistent with the protocol developed in Task 5.3.1. If measured level variance does not account for the differences between measured and modeled values, INM inputs that are candidates for adjustment as identified in the noise protocol will be reviewed.

Massport will provide noise measurement data collected at permanent monitoring sites for the same periods as supplemental and side-by-side measurements are conducted. In addition, all settings associated with the selected permanent monitors will be provided. Electronic time stamped radar data with flight numbers will be provided by Massport from its noise and operations monitoring system for the supplemental and side-by-side measurement period. Single events will be identified and comparisons between the noise levels of the same representative flight on INM flight tracks will be made. At each supplemental measurement site, data will be collected for five consecutive 24-hour days. Each supplemental site will be attended for five 8-hour daytime periods during which aircraft overflight events will be logged by an observer. Noise level data will be collected in A-weighted 1-second intervals.

Results will be documented for delivery to the CAC and PC.

PC Activities:

- Review proposed locations and protocol for supplemental and side-by-side noise measurement sites (see Task 5.3.1).
- Review preliminary noise measurement results.
- Coordinate findings regarding noise measurement results with IC and CAC.
- Review final noise measurement program documentation and results.
- Determine, in conjunction with the IC, if any adjustments to the baseline noise model input (flight track locations, operation distributions, profile assignments) are warranted.

IC Activities:

- Conduct supplemental noise measurement program in accordance with the protocol developed under Task 5.3.1.
- Conduct comparative analysis between radar data and measured noise levels to determine correlated aircraft noise source information.
- Determine confirmed potential anomalies associated with permanent sites.

- Develop draft measurement report and provide to CAC and PC for review.
- Document preliminary results and suggestions for delivery to PC for use in INM input file development, as appropriate.
- Upon completion of Task 5.3.2 and 5.3.3, compare measured noise levels with modeled noise level results.
- Coordinate review of final results with PC and CAC.

5.3.3 INM DNL 75, 70, 65, 60, and 55 dB Contours

Noise contours will be generated using Version 6.2 of INM at DNL values of 75, 70, and 65 dB, and overlaid on local vicinity maps. DNL values below 65 dB will use grid point analysis and Dicerno™, if approved for the purpose. The contour grid will be 50 nautical miles wide and 50 nautical miles high, centered on the airfield. This will ensure a large enough area to cover the entire radar coverage area and all surrounding communities. The grid spacing will be 500 feet.

PC Activities:

- Generate DNL 75, 70, 65, 60, and 55 dB noise contours.
- Provide all INM output files to the IC for review.
- Coordinate results with IC and BOS/TAC.

IC Activities:

- Review computed DNL 75, 70, 65, 60, and 55 dB noise contours for consistency with input assumptions and files.
- Coordinate findings with PC, CAC, and BOS/TAC.

5.3.4 Alternative Noise Metrics

The PC will run the INM and generate appropriate noise metrics, analyses, graphics, and maps, with input and oversight from the IC and BOS/TAC. The alternative noise metrics identified thus far in meetings held during Phase 1 include (the referenced metrics are defined below): (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) DL and NL analysis; (6) Lmax values at selected grid points; (7) SEL (and corresponding Sound Exposure, E) values at selected grid points; and (8) aircraft altitude at selected grid points. The use of supplemental noise metrics will be detailed in the noise protocol and will be used to more clearly identify the potential benefits and adverse impacts of each alternative evaluated in Phase 2.

Maximum A-Weighted Sound Level, Lmax

A common metric that is used to help in describing a single aircraft noise event is the Maximum Sound Level, or Lmax, which is measured in decibels (dB). For the purposes of describing community or environmental noise, A-weighting is assumed unless otherwise indicated. The Lmax metric is described technically as the highest A-weighted integrated sound level that is measured during a single event in which the sound level values vary with time (e.g., an aircraft over-flight). During an aircraft over-flight, the noise level starts at the ambient or background noise level, rises to the maximum level as the aircraft flies closest to the observer, and returns to the background level as the aircraft recedes into the distance. Lmax indicates the maximum

sound level occurring for a fraction of a second. In simplest terms, L_{max} is the highest sound level measured during a single noise event and describes the maximum level of a noise event, but does not take into account its duration. In other words, an event with a relatively low L_{max} but a longer duration can be just as intrusive as a short duration event with a higher L_{max} .

Sound Exposure Level, SEL

SEL is a composite metric that represents both the duration and magnitude (or amplitude) of a time-varying noise event. Two good examples are an aircraft over-flight and a passing truck. The sound levels of individual time-varying events have several main characteristics – the time when the sound level exceeds the lower threshold level, rising to a maximum noise level (L_{max}) during the aircraft flyover, then the time during which the sound level decreases to the lower threshold level.

SEL is a logarithmic measure of the total acoustic energy that occurs during the noise event. Mathematically, it is defined as the total acoustic energy of an event from background to background (typically computed from 10 to 20 dB from the event peak), but “normalized” to a one-second time period. The single value represents the level of a constant sound that, in one second, would generate the same acoustic energy as the actual time-varying noise event. In effect, the SEL metric “squeezes” the energy of the entire noise event into one second.

Sound Exposure, E

E (in linear units of $\text{Pa}^2\text{-s}$) is simply a measure of the total acoustic energy of the entire noise event.

Equivalent Sound Level, Leq

The equivalent sound level (Leq) is the most straightforward and flexible time-averaged metric used to describe aircraft noise. It is useful because it enables analysts and planners to evaluate the cumulative effects of a number of noise events on people. The time-averaged sound level is dominated by the louder levels that occur during the averaging period. As a simple example, consider a sound level which is 100 dB and lasts for 30 seconds, followed by a sound level of 50 dB which also lasts for 30 seconds. The time-average sound level over the total 60-second period is 97 dB, not 75 dB.

In essence, Leq represents the average sound level of all events occurring over a specified period of time. The time period is denoted in hours in parentheses. For example $Leq(1)$, $Leq(8)$, and $Leq(24)$ represent the average noise energy over a 1-hour, 8-hour, and 24-hour time period, respectively. For analysis of daytime noise impacts, $Leq(16)$ or Daytime Average Sound Level (DL or LD) is often used, while for analysis of nighttime noise exposure, $Leq(8)$ or Nighttime Average Sound Level (NL or LN), may be used. For analysis of noise impacts at schools, $Leq(7)$ might be used, corresponding to the typical 7-hour school day.

Time Above a Specified Level (TA)

Time-Above a specified level, usually described by the symbol $TAL(X)$, is a measure of the total time or percentage of time that the A-weighted aircraft noise level exceeds a defined sound level threshold (L) over the desired time period (X). TA values can be calculated for a full 24-hour annual average day, the 15-hour daytime and 9-hour nighttime periods, a school day, or any

other time period of interest, provided there is enough operational data to define that time period of interest. The time period (X) is usually defined in terms of minutes. As an example, TA65(60) calculated over a 24-hour day describes an area (or single point of interest) where an Lmax of 65 dB is exceeded for 60 minutes over a 24-hour annual average day. TA information will be developed and reported for a range of noise levels.

Number-of-Events Above a Specified Level (NA)

Number-of-Events Above, usually symbolized by NAL(X), is a noise metric that calculates the total number of aircraft events (X) that exceeds a certain sound level threshold (L) during a specified period of time. The sound level threshold can be defined using either the SEL or Lmax metric, and the period of time can be an average 24-hour day, daytime, nighttime, school day, etc., depending on the nature and application of the NA analysis. NA information will be developed and reported for a range of noise levels.

Slant Range distance can also be calculated for expected areas of interest. For budgetary purposes, it is assumed that Slant Range will be calculated at no more than 10 grid points.

The PC will use Wyle's Dicerno™ software to compute the Number-of-Events Above (NA) and other supplemental metrics for the defined cases.

PC Activities:

- Generate noise metrics, analyses, graphics, and maps in coordination with the IC and BOS/TAC.
- Provide all INM output files for supplemental metric evaluation to IC for review.
- Coordinate results with IC and BOS/TAC.

IC Activities:

- Review PC-developed supplemental noise metrics, analyses, graphics, and maps for consistency with INM input assumptions and files.
- Coordinate findings with PC, CAC, and BOS/TAC.

5.3.5 Identify Population and Noise Sensitive Area Impacts

The PC will identify the population and noise-sensitive area impacts, as defined by FAA Order 1050.1E Paragraph 11 (8), within the DNL 75, 70, 65, 60, and 55 dB noise contours. This task will quantify noise exposure in terms of population, households, and land use, as well as identifying minority and low-income populations, Section 4(f) properties, and historic sites. Tables will be developed to summarize the noise exposure estimates for the baseline noise model.

For examination of potential noise impacts due to changes in flight tracks, air traffic allocation, and other alternatives, grid point maps will be developed showing baseline noise exposure within the 25-mile radius area surrounding the radar located on the BOS airfield. The grid point maps will, at a minimum, identify political jurisdictional boundaries, existing water features, and shoreline.

PC Activities:

- Identify and document population, households, and noise sensitive land uses affected by aircraft noise within the defined study area.
- Coordinate results with IC and BOS/TAC.

IC Activities:

- Peer review the PC's evaluations of population, households, and noise sensitive land uses affected by aircraft noise within the defined study area.
- Coordinate results with PC, CAC, and BOS/TAC.

5.3.6 Ground/Taxiway Noise

Ground noise sources, such as taxiway use patterns, including the use of the centerfield taxiway, if approved by the FAA, will be analyzed in Phase 2 to identify potential alternatives that could minimize ground noise impacts on surrounding communities. Results from previously completed studies will be incorporated into the review. This task will incorporate and will utilize the same methodology and modeling to analyze any additional ground noise alternatives identified. As appropriate, that information will be incorporated into the No Action Alternative for future conditions. The FAA will consult with CAC in identifying key concerns related to ground noise at the Airport and to identify potential alternatives that were not previously examined by FAA. However, alternatives previously examined by the FAA in the centerfield taxiway study, will not be re-examined in this study. Any required engine run-up noise calculations will be modeled using INM.

For any additional ground noise alternatives, not previously examined by FAA, baseline noise information will be required. Information developed in support of the existing study will be used as input into the ground noise evaluation. For any new alternatives identified, appropriate taxiway routes used in the noise modeling will be provided via the baseline TAAM analysis, since there are no known sources of data that collect and archive historic taxiway movement data for the Airport. The only taxiway routes to be modeled will be those that are widely used for each of the six major air traffic configurations and those specific to any new alternatives not previously studied by FAA. TAAM output results will also be used to provide aircraft queuing (aircraft departures waiting to depart or arrivals waiting to cross active runways) time estimates for these alternatives.

PC Activities:

- Develop baseline ground/taxiway noise model using sources identified above.
- Coordinate results with IC and BOS/TAC.

IC Activities:

- Peer review baseline ground/taxiway noise modeling prepared by PC.
- Coordinate review findings with PC, CAC, and BOS/TAC.

6 ALTERNATIVES IDENTIFICATION & EVALUATION

Additional alternatives that have the potential to reduce noise impacts on noise sensitive areas and the communities surrounding Boston Logan International Airport, including those associated with ground noise and the implementation of the preferred Preferential Runway Advisory System (PRAS) (identified in Task 6.3.1) will be identified and evaluated in Phase 2, along with the 12 alternatives recommended for further evaluation in Phase 1, Phase 1 alternatives moved to Phase 2, and others that may be added during the NEPA process. These alternatives will be evaluated and subjected to a screening process to be used by BOS/TAC to ensure they meet they purpose and need of the project. 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 that will move forward in the EIS.

6.1 Identify Alternatives

The purpose of this task is to identify the alternatives to be evaluated and define them sufficiently such that they can be submitted through a Level 1 screening analysis described in Task 6.2.

6.1.1 Alternatives Recommended for Evaluation from Phase 1

Information about the 12 alternatives identified in Phase 1 to be further evaluated in Phase 2 will be reviewed in preparation for analysis. Information not available from FAA for proposed procedures in Phase 1, but needed for Phase 2 analysis will be obtained and reviewed. The alternatives deferred from Phase 1, which require further environmental review that will be evaluated in Phase 2 are identified in the introduction section of this document.

Those alternatives associated with runway use will be evaluated as part of the PRAS alternatives analysis (Alternatives 19, 20, 22, 23, and 24) stated in Task 6.3.1.

PC Activities:

- Collect, review, and document any additional operational information from FAA on alternatives from Phase 1 for evaluation during Phase 2. For budgetary purposes, it is assumed that 15 alternatives will be carried over from Phase 1 (12 identified as Phase 2 alternatives, plus 3 Phase 1 alternatives that need further environmental evaluation).
- Produce general concept illustrations that provide the general intent of each alternative (including flight tracks and altitude and velocity profiles, when applicable). Illustrations will depict generalized corridors and compatible land use. Illustration base maps will include community boundaries, shoreline location, and Airport runways at a minimum.
- Coordinate information with IC.

IC Activities:

- Coordinate with PC in the preparation of concept illustrations for each alternative.
- Review documentation on alternatives.
- Coordinate with CAC.

6.1.2 Ground Noise Alternatives

The PC will meet with BOS/TAC to discuss and identify additional ground noise alternatives that were not examined in the current FAA study⁶ and have the potential to reduce ground noise impacts. Criteria will be established to be used in developing alternatives, which may be similar to the criteria used in the FAA study. The data derived from the baseline simulation analysis on taxiway utilization and runway use will be used as one basis for identifying potential additional alternatives.

If the centerfield taxiway is approved for implementation, it will be included as an existing condition for the future No Action Alternative. Any alternatives examined in the centerfield taxiway study, but not implemented, will not be re-evaluated in this study.

PC Activities:

- Identify the primary contributors to ground noise impacts.⁷
- Identify taxiway use options that have the potential to reduce ground noise impacts.⁸
- Coordinate with IC on potential ground noise abatement alternatives. For budgetary purposes, it is assumed that up to 10 ground noise alternatives will be examined.
- Present the findings at a meeting with BOS/TAC and CAC for their consideration.

IC Activities:

- Coordinate with CAC on potential ground noise abatement needs.
- Coordinate with the PC to identify and evaluate potential ground noise abatement alternatives.
- Peer review all noise distribution results developed through use of FAA and non-FAA models.
- Participate in BOS/TAC meetings and presentations.

6.1.3 PRAS Alternatives

Massport has committed to work with the CAC to update PRAS as part of this study. This task includes the following steps to update the PRAS:

1. Assess and Refine PRAS Objectives.
2. Evaluation Measures: define metrics in line with specific objectives.
3. Data Collection: quantify metrics via existing and forecast conditions.
4. Develop a PRAS program definition and action plan.

The following sub-tasks describe the specific efforts that will be conducted. Discussions associated with this task are assumed to take place during BOS/TAC meetings. Efforts associated with presenting information at these meetings are provided in Task 2.1. In addition to those meetings, one meeting associated with Step 1 will be assumed for this task.

⁶ Harris Miller Miller and Hanson, Logan International Airport Additional Taxiway Evaluation Report, May 2006.

⁷ This scope assumes that taxi movement noise remains a major concern to surrounding communities based on information provided in the Logan Airside Final EIS.

⁸ Only alternatives not examined by FAA in their centerfield taxiway analysis at BOS will be evaluated.

6.1.3.1 Assess and Refine PRAS Objectives

The purpose of this task is to reach a consensus between Massport and CAC regarding PRAS objectives. Specifically, it will identify how success is defined. This task will be completed through a facilitated dialogue process that will primarily involve the BOS/TAC but may include participation of the full CAC. The specific engagement strategy for this task will be determined as part of Task 2.1 – Develop Communications/Engagement Protocol. If needed, a survey of other comparable airports will be conducted that specifically addresses preferential runway use programs, their goals and objectives, and measures used to assess successful implementation.

PC Activities:

- Attend meetings and assist FAA in facilitating discussions related to PRAS objectives.
- Document discussions and provide a summary matrix identifying goals and objectives for PRAS.

IC Activities:

- Conduct a survey of domestic and international airports to assess the use and utility of preferential runway use programs.
- Assist CAC membership in identifying and describing desirable PRAS objectives.
- Coordinate with CAC to further understanding of the tradeoffs of noise level, duration, exposure and among communities between potential objectives.
- Peer review PC efforts in definition of PRAS objectives.

6.1.3.2 Evaluate Measures

Based on the objectives developed in Step 1, metrics will be defined to measure existing conditions and forecast conditions, and quantify potential effects associated with the PRAS objectives. Up to four metrics will be defined (e.g., respite, persistence). Efforts for this step include the development of possible metrics, coordination among stakeholders and development of additional capabilities to calculate metrics (if not currently available).

PC Activities:

- Conduct a brainstorming session with IC and BOS/TAC to derive a series of metrics that can quantify and measure PRAS objectives.
- Develop the means to calculate chosen metrics (up to four) for the study area.
- Review methodology with IC.

IC Activities:

- Assist CAC membership in identifying and describing publicly desirable metrics and measures for successful PRAS implementation.
- Coordinate with CAC to further understand the probable formats for reporting success associated with potential evaluation metrics.
- Peer review PC efforts in definition of PRAS evaluation measures.

6.1.3.3 Data Collection

Utilizing modeled input developed in Tasks 5 and 6 (future No Action), the metrics identified in Step 2 will be calculated for existing and future no action conditions. Metric values will be provided for each of the six (6) major configurations and for an annual condition (existing condition and one future no action condition). The purpose of the results is to assist the stakeholders in reaching a better understanding of the current and future conditions associated with existing runway use via the metrics designed to measure the objectives identified in Step 1. The results may be used to further refine the PRAS objectives as well as to assist stakeholders in identifying thresholds associated with each metric that indicate if objectives have been met.

Alternatives will be identified based on up to two sets of thresholds for each metric, determined via stakeholder (CAC and Massport) consensus. The TAAM input developed in Task 6 will be used to identify up to five (5) operational alternatives that could assist in meeting the PRAS objectives. These alternatives will include the five runway use alternatives identified during Phase 1 for Phase 2 consideration. One or two of the five alternatives may be a derivative of the remaining four. The five alternatives may also be of a different nature that does not require operational analysis. If necessary, the four alternatives will be modeled in INM in order to calculate the metrics defined in Step 2. The task deliverable will be a selected alternative preferred by Massport and CAC.

PC Activities:

- An initial quantitative and qualitative analysis of PRAS will also be conducted using the baseline noise input developed in Task 5 by applying runway use changes that appear to be operationally viable to DicernoTM, which will provide a quick assessment of potential changes in aircraft noise levels.
- Calculate existing and future alternative metrics results identified in Task 6.1.3.2.
- Conduct TAAM analysis for each of the five potential alternatives to quantify operational variables and impacts.
- Conduct an alternative screening process that utilizes noise and operational results that will assist CAC and Massport to decide on a preferred alternative.
- Review results with IC.
- Provide decision matrix based on objectives set in Task 6.1.3.1 and results from this task.

IC Activities:

- Peer review PC efforts in definition of any modifications of TAAM input and output files for No Action conditions to evaluate PRAS metrics.
- Peer review PC efforts in definition of INM/DicernoTM input and output files for No Action conditions to evaluate PRAS metrics.
- Coordinate with CAC in further understanding the effectiveness of variable thresholds for reporting selected metrics.
- Assist CAC membership in understanding the complexities of noise metric results and identifying inherent tradeoffs between community impacts indicated by modeling results.
- Peer review PC efforts in evaluating PRAS alternatives.

6.1.3.4 PRAS Definition and Action Plan

Based on the information derived from the previous steps, the FAA will assist Massport and CAC via facilitation to select the preferred PRAS alternative. An action plan will be outlined that identifies the current gap between current conditions and the preferred alternative, identifies steps necessary to move from existing conditions to desired conditions, and develops performance targets and a mechanism to track the progress of each action item. A deliverable for this task is an overall top-level action plan that identifies goals, objectives and specific actions needed in order to achieve stated goals. When completed, Massport will submit the PRAS definition to FAA, who will incorporate the PRAS definition as part of the EIS cumulative impacts analysis.

A detailed implementation plan will be developed by Massport subsequent to the completion of Phase 2, as part of the implementation of the Phase 2 alternatives. The implementation plan is expected to provide flexibility when priorities change or variables such as aircraft performance capabilities warrant a change in the action plan and/or PRAS objectives. The implementation plan will also identify responsibilities for each action. This plan is not included in this scope of work.

PC Activities:

- Attend meetings, assist FAA in facilitation, and document discussions.
- Develop a draft high-level action plan and alternative definition that incorporates IC review.
- Develop final high-level action plan and alternative definition.

IC Activities:

- Assist CAC membership in understanding the details of potential implementation of the preferred PRAS alternative.
- Review and comment on PC's PRAS implementation plan efforts and documentation.

6.1.4 Other Alternatives

Additional alternatives may be identified during the public involvement process. If this occurs, the PC will develop sufficient information for each of them for evaluation and comparison with the other alternatives being considered. For budgetary purposes, evaluation of up to 10 additional alternatives is provided for in this EIS.

PC Activities:

- Develop information on the potential alternatives.
- Present findings at a meeting with BOS/TAC and the CAC for consideration.

IC Activities:

- Coordination with CAC on additional alternatives.
- Provide peer review of PC technical assessments.

6.2 Level 1 Screening Analysis

The evaluation of alternatives will focus on their ability to reduce noise impacts on noise sensitive areas and communities surrounding Boston Logan International Airport without negatively impacting the FAA's organizational goals and stated mission⁹, and can be successfully accomplished within a reasonable period of time, taking into account environmental, social, economic, and technological factors. Screening analysis assessments will include the preferred PRAS alternative plan determined in Task 6.1.3, and consider it as part of the future No Action alternative. Similar to the Phase 1 work, a three-level screening process will be conducted. The first level screening would eliminate alternatives that diminish safety or present substantial operational hurdles (e.g., technical feasibility, exceeds air traffic facility capabilities, requires airspace redesign¹⁰). The PC will hold two web-based meetings with BOS/TAC during the Level 1 screening analysis process to first discuss how the alternatives will be analyzed, and second, present preliminary findings of the analysis. The PC will coordinate with the IC and present the findings of the Level 1 screening analysis at a meeting with BOS/TAC.

PC Activities:

- In coordination with FAA, identify and define safety and operational criteria to be utilized.
- Conduct and document an alternatives evaluation analysis based on safety and operational criteria. For budgetary purposes, it is assumed that up to 40 alternatives will be evaluated.
- Identify and document alternatives eliminated from further consideration.
- Identify and document alternatives retained for further consideration.
- Coordinate analysis with IC.
- Present findings at a meeting with BOS/TAC and the IC for their consideration. The PC will recommend (based on the Level 1 screening analysis) and BOS/TAC will approve alternatives that should be retained for further consideration.

IC Activities:

- Coordinate with PC to define evaluative criteria.
- Peer review PC evaluations and documentation of results.
- Coordinate with CAC to provide feedback from web-based meetings to PC.
- Participate in BOS/TAC meetings and presentations.

⁹ FAA has defined organizational goals, which include increased safety and providing greater capacity in the airspace system to meet projected demand in an environmentally sound manner. FAA's stated mission is to provide the safest, most efficient aerospace system in the world (<http://www.faa.gov/about/mission/>).

¹⁰ The TRACON boundary includes the airspace within approximately 30 nautical miles of Boston Logan International Airport. Changes outside the TRACON airspace boundary are considered to be an airspace redesign element. While this Study will not consider airspace changes outside the TRACON airspace boundary, it may consider changes of air traffic control sector boundaries that lie within the TRACON airspace if such a change does not require a change to BOS Air Traffic Control Center sectors or boundaries.

6.3 Level 2 Screening Analysis

The purpose of the Level 2 screening analysis is to better define the Level 1 alternatives, determine which alternatives will meet operational criteria, and identify the alternatives that should be modeled for their noise reduction potential. Alternatives retained for consideration from the Level 1 screening analysis will be evaluated to assess the potential of each alternative to meet the objectives of the study, namely the ability to provide noticeable reductions in aircraft noise levels on noise sensitive areas and communities within the study area of evaluation.¹¹ Screening analysis assessments will include the preferred PRAS alternative plan determined in Task 6.1.3, and consider it as part of the future No Action alternative. Each alternative carried over from the Level 1 screening analysis will be refined to determine potential procedures, flight tracks, and viability. Criteria would be developed, defined and agreed upon in conjunction with BOS/TAC to determine the benefit or impact of each alternative on noise exposure upon noise-sensitive land uses.

6.3.1 Refine Alternatives

Each of the alternatives retained as reasonable and feasible through the Level 1 screening analysis will be analyzed and refined to identify more specific operational procedure definitions required for implementation. This information will be necessary in order to adequately assess the viability of each alternative.

PC Activities:

- Refine alternatives for Level 2 screening analysis. For budgetary purposes, it is assumed that up to 30 alternatives will be evaluated in the Level 2 screening analysis.
- Coordinate refinements with BOS/TAC and IC.

IC Activities:

- Coordinate with the PC in refining operational definitions of proposed procedures.
- Coordinate with CAC and BOS/TAC regarding procedure intent and detail.

6.3.2 Screening Analysis

The Level 2 screening process will focus on these criteria:

- **Operational Issues** – Utilizing the refined definitions of the alternatives, FAA personnel will perform a detailed analysis of the alternatives and identify any alternatives that may significantly compromise their organizational goals and stated mission. This analysis will be coordinated with the IC and documented.
- **Noise Reduction Potential** – Flight procedure alternatives will be qualitatively reviewed for the potential of providing a noticeable reduction¹² in aircraft noise

¹¹ “Noticeable” is defined as a level of change that addresses both the perspective of residents that experience aircraft overflights (through the measurement of overflight frequency) and/or a 3 dBA or greater reduction in aircraft single-event noise levels.

¹² “Noticeable” is defined as a level of change that addresses both the perspective of residents that experience aircraft overflights (through the measurement of overflight frequency) and/or a 3 dBA or greater reduction in aircraft single-event noise levels.

levels. In addition, the consultant team will review each alternative for potential adverse impacts to other communities. Using the refined air traffic alternative definitions, the PC will modify the targeted baseline route to look like the expected corridors and utilize DicernoTM to estimate the potential reductions and increases. Criteria to consider are the following:

- Introduction of noise from civil large jet airplanes (i.e. greater than 75,000 lbs.) that involve changes to departure routes or tracks within the defined study area.
- Introduction of civil large jet airplanes over residential areas that are not currently exposed to noise from civil large jet airplanes. Examine the lateral distance between existing routes or tracks and the proposed route or track at specific aircraft altitudes (if the procedure calls for a change in altitude profile) to determine the potential for reductions or increases in noise impacts.
- Changes in aircraft altitudes and/or numbers of daily operations of civil large jet airplanes on an existing route or track to determine the potential for reductions or increases in noise impacts if the alternative calls for a change in procedure altitude profiles.
- Change in number of departures and arrivals by civil large jet airplanes at specific aircraft altitudes over different types (Quiet Suburb, Normal Suburb, Urban, and Noisy Urban¹³) of residential communities to determine the potential for reductions or increases in noise impacts.
- Ground noise alternatives will be evaluated primarily based on changes in distance between the source and receivers (residences located nearest to the Airport). Via preliminary operational estimates, taxiway use frequency may also provide some indication of potential benefits. However, the PC recommends that ground noise alternatives that are operationally feasible should be subjected to the quantitative analysis performed during the Level 3 screening analysis unless the qualitative analysis clearly indicates no potential benefit. The degree of noise reduction potential for these alternatives will be difficult to assess with any certainty during the second tier analysis, especially when including all alternative elements cumulatively.
- Those alternatives that are determined to cause adverse impacts and involve no benefits or do not provide a noticeable reduction will be identified. This analysis will be coordinated with the IC and documented for review by the BOS/TAC. These analyses are informational. The information will be provided to BOS/TAC, who will assess the

¹³ Residential community classifications (Quiet Suburb, Normal Suburb, Urban, and Noisy Urban) were extracted from EPA Report No. 550/9-74-004, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. Ambient noise levels for these community types range from 50 dB for a Quiet Suburb, in 5 dB increments, to 65 dB for a Noisy Urban community. In the FAA's Air Traffic Noise Screening manual, the descriptions of the residential communities are intentionally brief and broad for the purpose of applying the screening procedure nationwide. Local knowledge of residential communities is very important in categorizing the affected communities. This may be established via the noise measurement task described in Task 4.

information and determine for each alternative whether to discard or retain it for the Level 3 screening analysis.

The PC will hold two web-based meetings with BOS/TAC during the Level 2 screening analysis process to discuss how the alternatives will be analyzed and present preliminary findings of the analysis. The PC will coordinate with the IC and present the final analytical findings of the Level 2 screening analysis at a meeting with BOS/TAC.

PC Activities:

- In coordination with FAA identify and define criteria to be utilized.
- Conduct and document an alternatives evaluation analysis based on criteria agreed upon by BOS/TAC. For budgetary purposes, it is assumed that up to 30 alternatives will be evaluated during the Level 2 screening analysis.
- Identify and document alternatives eliminated from further consideration.
- Identify and document alternatives retained for further consideration.
- Coordinate with the IC.
- Present preliminary findings at a meeting with BOS/TAC and the IC. The PC will solicit feedback from BOS/TAC and the IC on the preliminary findings.
- Present final findings at a meeting with BOS/TAC and the IC. The PC will recommend (based on the Level 2 screening analysis) and BOS/TAC will approve alternatives that should be retained for further consideration.
- At the direction of FAA provide documentation that includes details that describe methodology, results, and conclusions associated with each alternative.

IC Activities:

- Coordinate with PC to identify and define criteria.
- Coordinate with PC to review analytical results and documentation.
- Coordinate with CAC regarding advisability of keeping/discarding alternatives.
- Participate in BOS/TAC meetings and presentations.

6.4 Level 3 Screening Analysis

Alternatives retained for consideration from the Level 2 screening analysis will be evaluated in a Level 3 screening analysis that will quantitatively examine the ability of the alternatives to meet the objectives of the study, namely reduce noise impacts on noise sensitive facilities and residential areas within communities surrounding the Airport. Analyses will be conducted on each alternative retained from the Level 2 screening analysis, followed by a cumulative analysis or analyses of the alternatives that BOS/TAC identifies for potential implementation. Screening analysis assessments will include the preferred PRAS alternative plan determined in Task 6.1.3, and consider it as part of the future No Action alternative. For budgetary purposes, it is assumed that up to 13 alternatives will be evaluated during the Level 3 screening analysis.

The quantitative analysis will require a multi-step process, as described below.

6.4.1 Forecasting and Flight Schedule

A forecast and flight schedule for the future year (2010) will be developed as an input into the simulation modeling required for the Level 3 screening analysis, and eventually the EIS analysis. The PC will use the PMAD baseline schedule (developed in Task 5) and growth rates in operations as published within the FAA's most recent Terminal Area Forecast (TAF) for Boston Logan International Airport or other FAA-accepted forecasts for the Airport, to create schedules for 2010 and one future out-year. Air carrier operations provided within the TAF will be separated into operating type (i.e. passenger air carrier and air cargo) based on recent trends at the Airport. Fleet mix projections will be based on recent trends at the Airport and national projections provided by individual carriers and/or aircraft manufacturers. Future year peaking assumptions will be based on recent trends at the Airport.

To aid in the modeling effort, arriving and departing aircraft will be matched and assigned to specific gates based on their origins or destinations. The schedule-building process will be coordinated between the PC and the IC and documented for BOS/TAC review and acceptance.

PC Activities:

- Develop and document forecasts and flight schedule for 2010 and one intermediate year.
- Coordinate forecasts and flight schedule with the IC.
- Coordinate with BOS/TAC.

IC Activities:

- Peer review PC forecast and flight schedule analysis.
- Coordinate with CAC to describe/explain findings.

6.4.2 Operational Modeling

Fast-time air traffic simulation (TAAM) analysis would be conducted on all alternatives retained for consideration from the Level 2 screening analysis. The TAAM simulation will provide input data for noise modeling of ground movements and determination of aircraft departure and arrival profiles. Demand and delay results would be compared to the baseline results produced from Task 5.2.2 to assess the impact of the alternative on airfield capacity. Simulation data containing but not limited to out-off/on-in (aircraft pushback from gate to departure from runway / aircraft touchdown on runway to arrival at gate) times at Boston Logan International Airport, departure or arrival routes, aircraft type, and arrival or departure runway would be produced for input to the noise modeling. Global Flight Data Record (GFDR) files would be used as inputs to generate aircraft profile data that will indicate airspeed, heading, altitude, and track across the ground for each aircraft operation modeled. This data will be used for ground noise modeling to assess the effects of different taxiway utilizations, including but not limited to aircraft type, taxiway link (location), and total travel time on the taxiway link. Results and output of the TAAM modeling will be used as the basis for the INM modeling but will be supplemented and verified through the use of other source information including FAA air traffic control personnel input.

A future No Action Alternative, developed as part of Task 6.4.3.1.1 below, will be used for the purposes of comparing alternatives per FAA Order 1050.1E requirements when evaluating

impacts within the study area determined in Task 4. Results will be compared to the baseline simulation conducted in Task 5 and the future No Action Alternative to determine potential benefits or impacts of each alternative. The output metrics from this modeling will be used as inputs into the noise modeling. This analysis will be coordinated with the IC.

PC Activities:

- Conduct TAAM air traffic simulation analysis for each alternative.
- Assess and document the impact of each alternative on airfield capacity and delay.
- Coordinate results with BOS/TAC and IC.

IC Activities:

- Coordinate with PC on the development of simulation assumptions.
- Peer review simulation input, results, and documentation.

6.4.3 Noise Modeling

Noise modeling for the future No Action Alternative, which assumes the implementation of “early implementation” Phase 1 alternatives accepted for implementation, results of the centerfield taxiway study that have been adopted, and the preferred PRAS alternative identified in Task 6.1.3, will be provided. Noise modeling will also be conducted for each alternative that successfully meets Level 2 screening criteria, under No Action conditions. The future No Action and alternative scenarios would be compared to determine if an alternative would alleviate noise impacts or introduce noise impacts in other areas. Noise impact evaluations would consider INM, grid-point analysis, and alternative noise metrics identified in the noise protocol for use in the baseline noise modeling. This analysis will be coordinated with the IC.

6.4.3.1 INM Input Development

The modeling effort that will be required to determine the potential impact of the future 2010 No Action Alternative and the selected alternatives will be dependent on the complexity of the alternatives. This alternative may have to be adjusted based on implemented Phase 1 alternatives that may alter the baseline. For example, the modeling must predict the acoustic impact of moving flight tracks from one geographic location to another, moving operations from one runway to another, or changing flight approach and/or departure profiles, and, in some cases, a combination of the above. In order to discern the acoustic impact of these alternatives on the surrounding communities, the level of analysis must be commensurate with the level of detail in the alternatives. The noise impact in a given community is dependent on the quantity and location of the aircraft operations as well as the aircraft altitude, speed, and thrust setting. Greater detail associated with the proposed work efforts will be provided after a scope re-assessment is conducted, as described in Task 1.3. The work efforts described below are general in nature and provide the expected methodologies and framework to be utilized.

6.4.3.1.1 2010 No Action Alternative

The first step will be to develop the INM inputs for the 2010 No Action Alternative. The PC will re-assess the existing baseline noise model (developed in detail under Task 5) and determine the changes needed to update that case to model the airport operations projected for 2010. Changes made to the baseline noise model will include:

- Increased number of operations as determined by the forecasting completed in Task 6.4.1.
- Different aircraft fleet mix as determined by the flight schedule completed in Task 6.4.1.
- Incorporation of Phase 1 alternatives that are or will be implemented between current and 2010 time frames.
- Addition of Runway 14-32 in accordance with the Record of Decision.¹⁴
- Incorporation of the center field taxiway (if approved by the FAA).
- Incorporation of the preferred PRAS alternative as defined by efforts conducted in Task 6.1.3.

Outputs from the TAAM simulations will be used as inputs into the INM future scenarios. Because TAAM uses a peak month average day (PMAD) schedule and FAA requires that an annual average day (AAD) schedule be used for INM, the PMAD schedule from TAAM will need to be modified to reflect an AAD schedule. Operational data and aircraft fleet mix will be derived from the 2010 No Action Alternative simulation model results. The TAAM outputs will be normalized from peak month average day to annual average day for use in INM. Most of these changes will be carried out by editing the INM input database files except for the profile data needed for the alternatives implemented after Phase 1.

The 2010 No Action Alternative will represent the existing conditions, updated to reflect future 2010 operating levels and fleet mix, including the addition of Runway 14-32, addition of the centerfield taxiway (if approved), preferred PRAS alternative, and the Phase 1 alternatives that will be implemented. The following components of the existing baseline noise model developed under Task 5 will be included:

- Physical location of flight tracks.
- Approach and departure profiles.
- Percentage distribution of categories of aircraft (i.e., air carrier, regional jet, and propeller) among the defined runways, tracks, and profiles (assumes flight destination/origin will remain the same as existing conditions).
- Percentage of nighttime operations unless TAAM evaluations of Task 6.4.2 indicate a shift to nighttime shoulder hours.
- Runway layout and usage, with the addition of new Runway 14-32.
- Taxiway use with the addition of access to new Runway 14-32.

The 2010 No Action Alternative inputs and outputs will be compared to the existing baseline noise model to identify any potential data anomalies and identify that differences are accurately depicted. The No Action Alternative inputs will be coordinated with the IC. Next, the 2010 No Action Alternative noise model will be used to compare the impacts of the alternatives.

PC Activities:

- Develop INM inputs for the 2010 No Action Alternative.

¹⁴ *Record of Decision, Airside Improvements Planning Project, Logan International Airport, Boston, Massachusetts, FAA, August 2, 2002.*

- Compare 2010 INM inputs and outputs with Baseline noise model; make corrections to 2010 INM inputs, if needed.
- Coordinate results with BOS/TAC and IC.

IC Activities:

- Peer review PC's INM input and output assumptions and input files for the 2010 No Action Alternative.
- Coordinate results with CAC.

6.4.3.1.2 Alternatives

As described in Task 6.4.2, TAAM air traffic simulation analysis will be completed for each alternative. The output data from the TAAM will be used as the primary source to generate the necessary INM inputs along with 2010 No Action INM input variables. The TAAM outputs will be normalized from peak month average day to annual average day for use in INM, as discussed in Task 6.4.3.1.1.

There are several types of noise abatement procedures outlined in the recommended alternatives from Phase 1, with varying levels of noise-modeling complexity. The types of procedures include:

- Creating new flight tracks and profiles and shifting operations from existing tracks to the new tracks.
- Moving and editing an existing flight track.
- Creating additional departure flight tracks to model "fanning" of operations over an area, and distributing operations among these fanned tracks.
- Changing the amount of operations on a given runway.
- Shifting operations to different runways.
- Relocating nighttime operations to different runways.

Additional alternatives identified during the Phase 2 process, including ground noise alternatives will also be modeled. These procedures require varying levels of effort to model in INM. All of these procedures will first be simulated using TAAM. The PC will take the output from TAAM and convert this information into INM input data format, making any necessary computations. This information will be compared to the No Action input. Any variables that are shared between the No Action Alternative and other alternatives will be incorporated in the alternative INM data set. New assumptions will be supported by the TAAM simulation output and FAA air traffic control input. Key data variables and assumptions will be coordinated with the IC. This method will be applied for each alternative that has been retained from the Level 2 screening process.

Changing the distribution of operations among runways and existing tracks will involve a certain level of complexity. However, these alternatives would work within the confines of the existing airport configuration. Therefore the only changes needed to the No Action Alternative would be recalculating the numbers of operations and then editing the INM database files.

Alternatives that include changes to the airport configuration, such as moving and creating flight tracks and profiles, will introduce more complexity to the analysis. The physical tracks (GFDR output from TAAM will provide the flight track backbone) would need to be created in the INM. Next, the appropriate operations would be placed on these tracks. In addition, the expected climb and descent performance flight profiles for these tracks will be output from TAAM and reviewed with FAA air traffic control personnel, before being modeled in INM. These profiles may be different than the profiles modeled in the No Action and Baseline INM cases, and would therefore need to be analyzed. Any differences from the No Action and Baseline profiles would be clearly described and explained.

PC Activities:

- Normalize TAAM outputs from peak month average day to annual average day.
- Modify TAAM outputs to provide acceptable INM inputs for each alternative, to include data such as flight profiles (unless addressed in Task 6.4.3.1.3) and flight tracks, as required.
- Compare 2010 INM inputs for each alternative modeled with No Action Alternative inputs; make corrections to 2010 alternative INM inputs, if needed.
- Coordinate results with BOS/TAC and IC.

IC Activities:

- Peer review PC modifications of TAAM output data to INM input standards.
- Coordinate results with CAC.

6.4.3.1.3 Flight Profiles for Alternatives

Some alternatives may require editing of the No Action Alternative approach and departure profiles. Profiles used in either the Baseline or No Action Alternative will include some standard INM profiles and some custom-defined profiles (as described in Section 5.3.2.5). Both standard and custom profiles may have to be edited in any or all of the alternatives in order to adequately determine the average annual acoustic impacts for each alternative. For example, a departure profile modeled in the No Action Alternative may have a hold down segment included due to traffic located above the specific flight track. An alternative case may have a replacement flight track that does not pass under the same traffic, and therefore the hold down segment may potentially be shortened, changed to a different altitude, or eliminated. These changes would depend on aircraft type, and the runway and track utilized.

As described in Section 6.4.2, the TAAM operational modeling will utilize the Global Flight Data Record (GFDR) files that supply aircraft track and profile data including airspeed, heading, altitude, and ground track location. The radar data used to construct the Baseline (inherited in the No Action Alternative) flight tracks and profiles will be used as a basis to determine the appropriate distribution of profiles defined by TAAM. This step is necessary to verify that TAAM profiles reflect realistic expectations and identify key differences that will support later analyses.

Whenever possible, INM procedure steps will be used to model the flight profile. For certain INM-provided aircraft, procedure step profiles may not be available. If an appropriate INM aircraft substitution is available, it will be used. If not, a customized profile dataset will be

developed. For those operations where detailed profile performance analyses are required, as detailed in Section 5.3.2.5, the output will be a new series of procedure steps or a series of profile points (including velocity and thrust setting) for INM. Flight profile development will follow the same procedures and methodology as described in Task 5.3.2.5, including receiving FAA AEE approval to use any customized data before applying it in INM. Both types of profile definitions will be added to the INM input deck for the appropriate operations. The PC will utilize available information to take into account the performance of the aircraft when modeling customized flight profiles to ensure that the proper noise source characteristics are used to model the noise environment. If necessary data is not readily available, the PC will coordinate with the IC to determine if there is a reasonable substitution using an available customized aircraft dataset.

PC Activities:

- Obtain FAA AEE approval of profiles or profiling process, if necessary, before developing user-designed profiles to reflect local reality.
- Modify approach and departure flight profiles for alternatives, if/as needed.
- Coordinate results with BOS/TAC and IC.

IC Activities:

- Peer review the PC's work in the modification of approach and departure flight profiles for alternatives, if needed.
- Coordinate results with the CAC.

6.4.3.2 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 during Phase 1, which to the extent practicable, will be held consistent for Phase 2 analyses). Toolsets and metrics applied for each alternative will be detailed in the noise protocol. 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) Case SEL (and corresponding Sound Exposure, E) values at selected grid points; and (8) distributed range of aircraft altitudes at selected grid points (location of interest - point of closest approach analysis). Appropriate metrics for each alternative will be determined. Grid points and analysis tools will be selected to allow BOS/TAC members a better understanding of the benefits and adverse impacts of the alternative. As necessary, supplemental metrics that require post-processing of INM data or the generation of additional data will be completed. Preliminary results will be discussed with the IC. Population and housing counts will be completed within the DNL contours as well as any other demographic analysis required for environmental justice review. In addition, indications of potential environmental justice impacts or constructive use of DOT Section 4(f)/303(c) properties or historic properties will be identified.

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 of going forward with an individual procedure. BOS/TAC will assess the information and determine for each alternative whether to discard or retain for further analysis. Alternative-specific considerations will be identified during the scope re-assessment, which occurs prior to Level 3 screening. In addition, to properly assess the combined effect of the individual alternatives, a cumulative analysis of all alternatives in a single noise analysis will be conducted (refer to Task 6.4.4 below).

PC Activities:

- Coordinate with IC on the development of assumptions and results.
- Conduct noise modeling for each alternative using the latest available version of the INM.
- Assess and document potential impact of each alternative in terms of noise exposure to population and sensitive land uses.
- Identify potential environmental justice issues.
- Identify potential impacts to DOT Section 4(f)/303(c) properties or historic properties.
- Coordinate results with BOS/TAC.

IC Activities:

- Coordinate with PC on the development of assumptions and results.
- Peer review all noise model input and output files prepared by the PC for every case evaluated.
- Coordinate with CAC to describe input and output results.
- Participate in BOS/TAC meetings and presentations.

6.4.4 Cumulative Effects Screening Analysis

Criteria will be developed, defined, and agreed upon in conjunction with BOS/TAC to determine the benefit or impact of the alternatives when considered individually, as a whole, or in subsets/groupings. Simulation modeling will be conducted to calculate metrics associated with operational and user impact, which will be made available to BOS/TAC members for their use in identifying the alternatives. Noise modeling will be conducted and compared to the baseline and future No Action noise results to determine the effect of combining the alternatives retained through all of the previous screening analyses together, or the effect of combining some of the alternatives into subsets or groups. This analysis is required to determine if implementation of all of the recommended alternatives together would effectively alleviate noise impacts or introduce new noise impacts in other areas. This evaluation will also include Phase 1 alternatives that were implemented. For purposes of scope development, it is assumed that three (3) cumulative alternative scenarios will be modeled.

A comparative analysis of the alternatives indicating both positive and negative impacts on airport operations, noise conditions, population, sensitive land uses, environmental justice issues, DOT Section 4(f)/303(c) properties, and historic properties will be developed, both for the individual alternatives and for the combined or cumulative alternative scenarios. This information will be presented in both tabular and graphic format for review by BOS/TAC and the IC.

The PC will hold two web-based meetings with BOS/TAC during the Level 3 screening analysis process to discuss how the alternatives will be analyzed and present preliminary findings of the analysis. The PC will present the final findings of the Level 3 screening analysis to BOS/TAC. BOS/TAC will assess the information and recommend a package of alternatives as the Proposed Action for implementation.

PC Activities:

- Identify and define criteria to be utilized.
- Coordinate with IC on the analysis of alternatives.
- Conduct and document an alternatives evaluation analysis based on criteria agreed upon by BOS/TAC.
- Conduct simulation modeling of cumulative alternatives.
- Conduct noise modeling of cumulative alternatives.
- Conduct air quality emissions inventory of cumulative alternatives.
- Conduct an environmental justice analysis of cumulative alternatives.
- Conduct a DOT Section 4(f)/303(c) impact analysis of cumulative alternatives.
- Conduct a historic properties impact analysis of cumulative alternatives.
- Identify and document alternatives eliminated from further consideration.
- Identify and document alternatives retained for further consideration.
- Hold 2 web-based meetings with BOS/TAC to discuss process and present preliminary findings.
- Present final findings to BOS/TAC for recommendation to Massport.

IC Activities:

- Coordinate with PC on the selection of alternatives for inclusion within cumulative scenarios.
- Peer review the PC's analysis and documentation of cumulative alternative scenarios.
- Coordinate with CAC.
- Participate in BOS/TAC meetings and presentations.

7 ENVIRONMENTAL IMPACT STATEMENT

This task outlines the work to be performed for the preparation of an Environmental Impact Statement (EIS) for the alternatives recommended for implementation in Task 6. The EIS will be prepared to discuss the potential impacts of federal actions related to implementing the reasonable noise abatement procedure alternatives identified during the alternatives evaluation process (Task 6).

The EIS shall conform to, and be processed in a manner consistent with applicable federal, State of Massachusetts, regional, and local statutes, regulations, and guidelines. The final product shall conform to the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.), Council on Environmental Quality (CEQ) regulations (40 C.F.R. Parts 1500-1508), applicable Department of Transportation (DOT) Orders, the Massachusetts Environmental Policy Act (MEPA), and FAA Orders 1050.1E and 5050.4B. Personnel assigned to this project will possess a thorough working knowledge of these documents.

The following sections provide descriptions of the various tasks to be performed. During preparation of the EIS issues may arise that would necessitate modification of this scope of work and the associated budget. In the event that such changes are required, as directed by the FAA, changes to this scope of work will be coordinated and approved by the FAA and Sponsor. While this scope of work identifies all work items believed necessary for completion of the EIS, additional work items may arise from comments submitted during agency and public review periods associated with scoping and the Draft EIS.

7.1 Review Existing Documentation

The purpose of this task is to determine any information or data needs for development and documentation of the EIS.

PC Activities:

- The documents, data and information gathered during Phase 1 of the Study will be reviewed to determine if additional or more updated information required for development of the EIS is needed.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.2 Assemble and Maintain Administrative Record and Index

A document record will be developed that will form the basis for the FAA's Administrative Record for the EIS. A copy of each record/document/information relating to the project that is used by the FAA in its decision making process will be kept. A database index of this material will also be developed.

7.2.1 Administrative Record Database

The database will include at least the following information for the documents included in the record:

- (1) Volume in which the document is located
- (2) Type of document (letter, memorandum, map, working paper, etc.)
- (3) Originator of the document
- (4) Date of the document
- (5) Subject of the document
- (6) Inclusive pages of the document within the appropriate Administrative Record volume.

The database will be maintained using an FAA-approved computer database application. The database index and, to the extent possible, document record contents will be delivered to the FAA on CD-ROM. The Administrative Record will include materials from Phase 1 pertinent to decisions made in the EIS.

PC Activities:

- Develop an Administrative Record database and document system.

7.2.2 Documents

All documents related to production of the EIS will be maintained chronologically, in volumes by category. Four (4) copies of all documents in the record and four (4) copies of the CD-ROM(s) that contain the database and documents shall be provided to the FAA. If the FAA or others need additional copies of documents or CD ROM(s), copies will be provided on a unit cost basis, as established by the PC and agreed upon by the FAA.

PC Activities:

- Maintain a document record and index of all materials used or referenced in the EIS.
- Provide four paper and four electronic copies of the administrative record at the conclusion of the EIS process.

7.2.3 Electronic Files

All drawings and maps in the EIS that can be incorporated into a Geographic Information System (GIS) will be transferred to Massport in a format that is compatible with MassGIS standards. The PC assumes that a majority of the inventory data to be used in the environmental analyses will use data obtained from MassGIS.

A procedure for maintaining all electronic files used for the analyses and graphic presentations to be included in the DEIS and the FEIS will be established. These files, in addition to the GIS files described above, will include input and output files for analytical tools such as the Integrated Noise Model (INM) and the Emissions and Dispersion Modeling System (EDMS). The PC will ensure that the FAA is provided with complete sets of data files for each of the

analyses as presented in the DEIS and FEIS. The data sets will be maintained throughout the course of the development of the DEIS and the FEIS and only the final sets that reflect the results presented in the documents will be provided to FAA.

PC Activities:

- Maintain a record and index of all electronic data and files used or referenced in the EIS.
- Provide electronic copies of the data sets and files at the conclusion of the EIS process.

7.3 EIS Scoping

As required by NEPA, scoping will be held to gather comments on the scope of the EIS from federal, state and local agencies, tribal governments, public interest groups, CAC, residents within the affected area and the general public.

7.3.1 Notice of Intent and Early Coordination

The PC will draft a Notice of Intent (NOI) to be published in the *Federal Register* by FAA and in area newspapers announcing that an EIS will be prepared, the preliminary purpose and need of the project, range of alternatives that will be considered, and the date and location of scoping meetings to be held. The draft Notice of Intent will be submitted to BOS/TAC for their review and comment. Once all revisions have been made, FAA will submit the NOI for publication in the *Federal Register* and the PC will submit the NOI for publication in area newspapers. In addition, at FAA's direction, the PC will schedule and prepare materials for meetings with federal, state and local agencies to brief them on the project. Particular attention will be made to brief agencies that may be invited to become cooperating agencies on the EIS, such as the U.S. Environmental Protection Agency, Massachusetts Department of Environmental Protection, and the Massachusetts Executive Office of Environmental Affairs.

PC Activities:

- Prepare Draft NOI, revise and produce Final NOI for publication.
- Identify and arrange for publication of the NOI in local newspapers.
- Schedule and prepare materials for briefings of the project to agencies identified by FAA as potential cooperating agencies.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.3.2 Pre-Scoping Document

A pre-scoping document will be prepared by the PC. The document will provide background on the proposed project, explain the purpose of scoping and EIS process, identify the preliminary purpose and need for the project, and alternatives that have been identified for consideration. This document will be mailed to the federal, state, and local agencies, tribal governments, interested parties, public interest groups and other individuals that FAA identifies, along with a

copy of the NOI, inviting them to participate in the scoping process and attend the scoping meetings. A database of contact names and addresses will be developed and maintained by the PC for use in sending out scoping materials and future mailings of the Draft and Final EIS.

PC Activities:

- Prepare pre-scoping document for distribution to federal, state, and local agencies, interested parties, public interest groups, etc.
- Develop and maintain a database of contacts to be used throughout the EIS process.
- Distribute pre-scoping document, NOI, and a cover letter inviting participation in the scoping process to agencies and individuals contained in the contact database.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.3.3 Environmental Notification Form (ENF)

If required by MEPA, an ENF will be filled out by the PC and submitted to the Executive Office of Environmental Affairs (EOEA) for review. The ENF will provide sufficient information about the project and potential impacts for a determination by the EOEA on whether an Environmental Impact Report (EIR) or other environmental documentation to meet the requirements of MEPA will be required. To the extent any actions (or set of actions) are proposed that involve Massport as a state agency that triggers MEPA, then the environmental document would be processed as a joint EIS/EIR.

PC Activities:

- Prepare and submit ENF to EOEA.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.3.4 Scoping Meetings

Separate scoping meetings are proposed to be held for agencies and the public. Two agency meetings will be held during business hours in order to facilitate participation from as many agencies with jurisdictional and review requirements as possible. While the meetings will be primarily conducted for agency personnel, they will also be open to the public. The PC will determine potential location sites; coordinate room setup and facilities; arrange for a court reporter to record all proceedings at both locations; provide sign-in sheets, comment sheets, and handout materials; and develop scripts and presentations for the FAA that explains the purpose of the scoping meeting and proposed project. The PC will also provide sufficient staff for the sign-in tables, meeting set-up, presentation assistance, and to answer questions about the project.

In addition to the agency scoping meetings, the PC will also arrange for up to four public scoping meetings and informational workshops to be held in the early evening. The PC will identify potential locations in the affected areas for these meetings; coordinate room setup and facilities;

arrange for a court reporter to record all oral testimony at both locations; arrange for translators if attendance by non-English speaking residents is anticipated; provide sign-in sheets, speaker cards, comment sheets and handout materials; and develop scripts and presentations for the FAA that explains the purpose of the scoping meeting and proposed project. In addition, presentation boards explaining the Phase 1 results and status of the Study, the scoping process, and proposed projects will be produced and displayed as part of the information workshop. The PC will provide sufficient staff for the sign-in tables, meeting set-up, presentation assistance, and to answer questions from the public during the workshop.

PC Activities:

- Facilitate scheduling of scoping meetings, room setup, and logistics.
- Produce handout materials including comment sheets, speaker cards, sign-in sheets, etc.
- Produce presentation boards and directional signs.
- Attend and staff scoping meetings.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.
- Attend and participate in scoping meetings on behalf of the CAC, making such presentations as are desirable to the CAC membership.

7.3.5 Scoping Document

The PC will produce a scoping document after close of the comment period. The scoping document will include copies of the NOI, proof of publication in the *Federal Register* and area newspapers, scoping materials sent out to federal, state and local agencies, a list of names and addresses to whom the scoping notice was sent, materials handed out at the scoping meeting, sign-in sheets, transcripts, and written comments submitted during the scoping comment period. The PC will develop a comment database and catalog all the comments received. The comments will be reviewed and discussed with FAA and BOS/TAC to refine the scope of work for the EIS. If an EIR is required, the EOEPA will determine the scope of the EIR. Scoping comments will be responded to in the Draft EIS.

PC Activities:

- Produce and distribute scoping document.
- Develop comment database for the EIS.
- Refine EIS/EIR scope of work.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4 Preparation of Draft Environmental Impact Statement (DEIS/DEIR)

The PC will be responsible for preparing all sections of the DEIS under the direction of FAA. A preliminary DEIS will be prepared and submitted to FAA and will include sections on project background, purpose and need, alternatives, affected environment, environmental consequences, and summary of impacts and mitigation. If an EIR is required, the DEIS will be prepared so that it also meets MEPA requirements and a joint Draft EIS/EIR (DEIS/DEIR) will be prepared and submitted to the EOEPA for review (assumed for this scope of work).

7.4.1 Project Background

This task will document background information on the project, area airports, air traffic control in the Boston Region, and the current airspace structure and air traffic control procedures.

PC Activities:

- Produce and document project background.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.2 Purpose and Need

The purpose and need for the project will be described and defined in this section of the EIS. The impacts associated with overflights of aircraft departing and arriving at Boston Logan will be described, along with the mitigation measures requiring this study that are detailed in the Record of Decision (ROD) from the 2002 *Airside Improvements Planning Project, Logan International Airport*, and will form the basis for the need for the project. The purpose(s) of the proposed project will be clearly and succinctly defined by the FAA. Other information covered in this section will include identifying other projects occurring at Boston Logan and whether they are independent or dependent actions, defining the requested federal action, and outlining a general project timeframe.

The PC will produce a preliminary working paper that includes the Project Background and Purpose and Need sections and submit it for FAA review. The PC will compile all comments on the preliminary working paper and discuss the comments with FAA during a meeting or teleconference. The PC will respond to comments and make necessary revisions to the working paper and produce a second preliminary draft. Once FAA has concurred with the revised preliminary draft working paper, a draft working paper will be released to BOS/TAC and any cooperating agencies identified by FAA for review and comment. The PC will compile all comments, and prepare responses to comments for FAA review. The PC will attend one meeting to discuss the comments received with FAA and the reviewing agencies/parties. After concurrence by FAA on responses to the comments, the PC will revise the draft working paper for inclusion in the preliminary DEIS.

PC Activities:

- Produce and distribute Project Background and Purpose and Need Working Paper to FAA.
- Compile and respond to comments and revise working paper.
- Produce and distribute working paper to BOS/TAC and other cooperating agencies.
- Compile comments and attend meeting to discuss comments.
- Respond to comments and revise working paper.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.3 Alternatives

The alternatives section of the DEIS will need to document all of the alternatives considered during Phases 1 and 2 of the Study and analyze alternatives considered in Phase 2. Besides the noise abatement alternatives identified, additional alternatives will need to be included to fulfill FAA's NEPA requirements. These alternatives include the No Action Alternative and alternatives that do not involve noise abatement procedures (e.g., expanding use of regional alternatives, other transportation modes, and demand management strategies).

The bulk of the alternatives section will rely on the alternatives evaluation process conducted and completed in Task 6, which identified the alternative or group of alternatives recommended for implementation. The PC will produce a preliminary working paper documenting the identification and consideration of alternatives and submit it for FAA review. The PC will compile all comments on the preliminary working paper and discuss the comments with FAA during a meeting or teleconference. The PC will respond to comments and make necessary revisions to the working paper and produce a second preliminary draft. Once FAA has concurred with the revised preliminary draft working paper, a draft working paper will be released to BOS/TAC and any cooperating agencies identified by FAA for review and comment. The PC will compile all comments, and prepare responses to comments for FAA review. The PC will attend one meeting to discuss the comments received with FAA and the reviewing agencies/parties. After concurrence by FAA on responses to the comments, the PC will revise the draft working paper for inclusion in the preliminary DEIS.

PC Activities:

- Identify the alternatives to be evaluated in the EIS process.
- Document the alternatives evaluation analysis completed in Phases 1 and 2.
- Document alternatives eliminated from further consideration.
- Document alternatives retained for further consideration.
- Identify preferred alternative or group of alternatives.
- Produce and distribute Alternatives Working Paper to FAA.
- Compile and respond to comments and revise working paper.
- Produce and distribute working paper to BOS/TAC and other cooperating agencies.
- Compile comments and attend meeting to discuss comments.

- Respond to comments and revise working paper.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.4 Affected Environment

The affected environment section of the EIS will include a description of the project area and provide baseline information on existing conditions. The study area will be discussed and agreed upon with FAA prior to initiation of this task. To the extent possible, existing information will be gathered and utilized in the development of this section. This section will be broken down into the following sub-sections, which will include appropriate text and graphics depicting the affected project area.

- Description and Identification of Study Area
- Airport Facilities
- Airspace and Air Traffic Control
- Affected Jurisdictions
- Existing Land Use and Zoning
- Demographics and Socioeconomic Profile
- Biological and Natural Resources
- Public Lands
- Historical, Archaeological, Architectural, and Cultural Resources
- Past, Present, and Reasonably Foreseeable Future Actions

The PC will produce a preliminary working paper documenting the affected environment and submit it for FAA review. The PC will compile all comments on the preliminary working paper and discuss the comments with FAA during a meeting or teleconference. The PC will respond to comments and make necessary revisions to the working paper and produce a second preliminary draft. Once FAA has concurred with the revised preliminary draft working paper, a draft working paper will be released to BOS/TAC and any other cooperating agencies identified by FAA for review and comment. The PC will compile all comments, and prepare responses to comments for FAA review. The PC will attend one meeting to discuss the comments received with FAA and the reviewing agencies/parties. After concurrence by FAA on responses to the comments, the PC will revise the draft working paper for inclusion in the preliminary DEIS.

PC Activities:

- Identify project area to be considered in the EIS.
- Gather and document existing conditions of the project area.
- Produce and distribute Affected Environment Working Paper to FAA.
- Compile and respond to comments and revise working paper.
- Produce and distribute working paper to BOS/TAC and other cooperating agencies.
- Compile comments and attend meeting to discuss comments.
- Respond to comments and revise working paper.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5 Environmental Consequences

The environmental consequences section of the EIS will include a detailed evaluation of the potential environmental impacts of the reasonable alternatives retained for consideration, identified in task 6.4.3. The PC assumes that the base year (existing conditions) will be 2005 and will conduct environmental impact analysis for a future year of 2010. A future year beyond 2010 will also be examined to determine potential significant impacts after implementation of the alternatives considered; the future year will be determined in consultation with FAA. It is assumed that Runway 14-32 would be operational in 2010 and that the FAA's Terminal Area Forecast (TAF) for Boston Logan International Airport will be used to determine the future year level of operations and enplanements. The following environmental impact categories will be analyzed.

7.4.5.1 Noise

Baseline and future noise contours and conditions will be documented and potential significant impacts identified, based on the noise modeling and alternatives evaluation conducted by the PC in Tasks 5 and 6. Potential noise impacts of the alternatives considered in this section of the EIS will be analyzed to the same level as the alternatives analyzed in Task 6.

PC Activities:

- Document baseline noise conditions; develop graphics and tables.
- Document alternatives noise impact analysis, develop graphics and tables depicting impacts.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.2 Compatible Land Use

This task will document the FAA's Compatible Land Use Guidelines, identify land uses that are exposed to significant noise levels (existing conditions) as defined by FAA's Compatible Land Use Guidelines, identify population and households that are exposed to significant noise levels (existing conditions) as defined by FAA's Compatible Land Use Guidelines and determine land uses, populations, and households that would be exposed to significant noise levels in the future (2010) as defined by FAA's Compatible Land Use Guidelines. In addition, the PC would determine and document whether significant noise impacts over noise sensitive areas would occur. FAA defines significance as an increase of 1.5 dB within areas exposed to DNL 65 and higher or introducing significant noise (DNL 65 or higher) over noise-sensitive areas that were not previously exposed to significant noise. In the event that an increase of 1.5 dB within areas

exposed to DNL 65 or higher are identified on noise sensitive land uses, increases of 3 dB or more within the area exposed to DNL 60 to 65 are also reported and documented. Additional information concerning changes in noise exposure identified in Task 6 will also be considered.

PC Activities:

- Identify land uses, population, and households exposed to significant noise levels as defined by FAA’s Compatible Land Use Guidelines for the base year (2005).
- Identify land uses, population, and households exposed to significant noise levels as defined by FAA’s Compatible Land Use Guidelines for the future year (2010) and additional out-year.
- Identify significant noise impacts over noise sensitive areas (1.5 dB increase within DNL 65) and document 3.0 dB increase within DNL 60 to 65 (if an increase of 1.5 dB within DNL 65 would occur).
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC’s work effort and communicate results to the CAC.

7.4.5.3 Socioeconomic Impacts, Environmental Justice, and Children’s Environmental Health and Safety Risk

The PC will evaluate each of the viable alternatives to determine potential socioeconomic impacts. Of primary importance will be the consideration of the potential for disproportionate adverse effects associated with changes in aircraft noise on minority and low-income populations, as described in Executive Order 12898 and DOT Order 5610.2. The PC will conduct a demographic analysis quantifying the proportion of minority and low-income populations affected by the project. U.S. Census Bureau data from the 2000 Census (obtained from MassGIS) will be used to determine demographic make-up of the affected areas.

The PC will also assess the potential for environmental health or safety risks that may disproportionately affect children, pursuant to Executive Order 13045, “Protection of Children from Environmental Health Risks and Safety Risks”. These environmental health risks and safety risks are risks that are attributable to products or substances that a child is likely to come into contact with or ingest. Given the range of alternatives to be evaluated in the EIS and their potential effects on air quality, the potential for disproportionate air quality impacts to children will be evaluated.

It is assumed that the alternatives to be evaluated do not involve the acquisition and relocation of real property or other community disruption to transportation, planned development, or employment. Thus, a detailed socioeconomic impacts analysis would not be performed.

PC Activities:

- Identify minority and low-income populations within the affected area.
- Identify potential impacts of the reasonable alternatives to minority and low-income populations within the affected area.

- Identify potential health and safety risks of the reasonable alternatives to children within the affected area.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.4 Secondary (Induced) Impacts

The PC will assess and document induced socioeconomic impacts to the extent that they are influenced by the operation of the Airport, and in particular as they would be affected (positively or negatively) by the proposed project(s) or any of the reasonable alternatives. Secondary or induced impacts include shifts in patterns of population movement and growth, public service demands, and changes in business and economic activity to the extent influenced by airport operations.

It is assumed that the range of alternatives evaluated, including the No Action Alternative, would not involve changes in levels of enplanements, changes in levels of aircraft operations, land acquisition or relocation, or reconfiguration of area roadways. The alternatives would not result in secondary or induced impacts, so a detailed secondary (induced) impacts analysis would not be performed.

PC Activities:

- Identify induced socioeconomic impacts of the reasonable alternatives.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.5 Air Quality

Air quality modeling, performed with the current version of FAA's Emissions and Dispersion Modeling System (EDMS), will be conducted for taxiway and runway use alternatives to determine if changes in operations would cause air quality impacts. This analysis will be completed as part of the EIS, not prior to. If an alternative causes a significant impact, it will be discarded unless there are mitigation measures which can be included in the EIS (FAA Order 1050.1E, paragraph 506h). An existing baseline and future baseline will need to be established to determine the potential impact or benefit of each alternative. Emission levels of each alternative will be compared with the future baseline and then relative to the currently approved State Implementation Plan (SIP) to determine each alternative's potential for exceeding *de minimis* levels. To determine if any of the taxiway or runway use alternatives would cause potentially significant air quality impacts, modeling will be conducted to determine changes in aircraft emissions.

It is assumed that the range of alternatives evaluated, including the No Action Alternative, would not involve changes in levels of enplanements, changes in levels of aircraft operations, or reconfiguration of area roadways. Thus, no area wide dispersion analysis, roadway dispersion analysis, or air toxics analysis would be conducted, but an aircraft emissions inventory would be conducted and documented. Because Logan is located in that portion of the Metropolitan Boston-Lawrence-Worcester Air Quality Control Region that is currently designated a moderate nonattainment area for the 8-hour ozone National Ambient Air Quality Standard (NAAQS), the PC would also conduct a general conformity evaluation for the preferred alternative(s).

Annual aircraft operational emissions inventories will be developed using EDMS. Aircraft landing and takeoff cycle (LTO) information will be derived from the noise modeling and used in EDMS as inputs. Data from the TAAM simulations will be used to determine an average taxi time for each aircraft type under each alternative modeled, which will then be used as input into EDMS.

The PC will use EDMS to calculate emissions of carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NO_x), sulfur oxides (SO_x), and particulate matter, both fine and coarse particles (PM_{2.5} and PM₁₀) for each aircraft in the inventory. The current approved version of EDMS is 4.3, which is capable of modeling PM emissions for some, but not all, aircraft engines. FAA AEE recommends the use of AP-42 emission factors for estimating PM emissions for turboprop and piston aircraft. When using AP-42 emission factors, PM_{2.5} emissions are assumed equal to PM₁₀ emissions in accordance with FAA AEE guidance. This output will be examined for each alternative to determine if changes in taxiway usage and/or changes in aircraft delay resulting from runway use changes would result in changes in emission levels that would exceed applicable *de minimis* levels.

PC Activities:

- Document Regulatory Setting.
- Document Existing Conditions.
- Document emissions inventory (EDR report).
- Develop annual aircraft operational emissions inventories for each alternative, including the No Action Alternative.
- Assess and document potential air quality impact of each alternative.
- Determine potential exceedances of *de minimis* levels of criteria pollutants.
- Conduct General Conformity analysis.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.6 Water Quality

The PC will assess and document the potential effects of the alternatives upon water quality and quantity associated with the proposed project(s) and reasonable alternatives as well as the No Action Alternative. It is assumed that none of the alternatives will involve changes in drainage

patterns, surface water runoff or water usage. If changes in runway usage or taxi patterns or ground noise abatement alternatives would require the movement of de-icing facilities or change runoff patterns, an assessment of water quality impacts would be required and would need to be added to this scope of work.

PC Activities:

- Document that none of the alternatives would impact water quality or usage.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.7 DOT Section 4(f) Lands

The PC will complete an analysis of the potential effects on Section 4(f) properties (parks or recreational areas) as well as Section 6(f) (Land and Water Conservation Fund Lands) for the proposed project(s) and reasonable alternatives. Relevant properties will be identified from MassGIS data for the affected area, described, and potential impacts to the properties will be evaluated as outlined in FAA Orders 1050.1E and 5050.4B. Consideration will be given to all potential uses of Section 4(f) and 6(f) lands including direct use (such as through acquisition) and constructive use (such as increased noise levels). Direct uses of Section 4(f) lands are not anticipated but constructive use due to increased noise impacts are possible. The assessments of the potential effects of noise, as defined by FAA guidance, will consider the type of facility and its use. If DOT Section 4(f) lands would be impacted, the scope of work would need to be revised to include an analysis of impacts and permitting requirements.

PC Activities:

- Identify potential impacts to Section 4(f) and Section 6(f) Lands.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.8 Historical, Architectural, Archaeological, and Cultural Resources

The PC will identify historic properties listed on the National Register of Historic Places or eligible for listing on the National Register of Historic Places through consultation with the State Historic Preservation Officer (SHPO) and from MassGIS data. The PC will assist FAA in the determination of the Area of Potential Effect (APE) in consultation with the SHPO. The noise analysis (Subtask 7.4.5.1) shall include a determination of the potential for noise impacts on historic properties, as defined by FAA guidance. The noise analysis will identify projected noise levels at specific historic properties using the DNL metrics associated with each of the alternatives. The results of this analysis will be presented in the DEIS.

In terms of architectural and archaeological resources, it is assumed that the range of alternatives to be considered in the EIS will not involve physical impacts, thus detailed archaeological or architectural analyses would not be performed.

The PC will initiate National Historic Preservation Act (NHPA) Section 106 coordination with the SHPO and the Tribal Historic Preservation Officer (THPO). In accordance with FAA Order 1050.1E paragraph 11.2P, completion of the NEPA process will also satisfy completion of the Section 106 process.

PC Activities:

- Conduct consultation with the SHPO to identify historical, architectural, archaeological, and cultural resources and determine potential significant impacts.
- Identify potential impacts to historical, architectural, archaeological, and cultural resources.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.9 Fish, Wildlife, and Plants

The Endangered Species Act, Section 7 as amended (FAA Order 1050.1E, Appendix A, Section 8) requires the initiation of coordination with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS), as appropriate, to determine potential impacts on federally listed endangered, threatened, and candidate species or designated critical habitat. The Fish and Wildlife Coordination Act requires the initiation of coordination with federal, state, and local agencies having administration over fish, wildlife, and plant resources.

Although the proposed projects and alternatives are assumed to not involve physical impacts to fish, wildlife, or plant habitats, the potential impact of aircraft noise on these communities will be evaluated to determine if the projects or alternatives would result in a constructive use of sensitive biological habitats, as defined by FAA guidance. Consultation with FWS, NMFS and relevant state agencies will be conducted to determine if any sensitive biological habitats may be impacted by any of the reasonable alternatives.

PC Activities:

- Conduct consultation with FWS, NMFS and relevant state agencies to identify sensitive biological habitats or resources.
- Identify potential impacts to sensitive biological resources.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.10 Wetlands

Executive Order 11990, DOT Order 5669.1A, the Rivers and Harbors Act of 1899, and the Clean Water Act address activities in wetlands. Federal agencies must minimize the destruction, loss, or degradation of wetlands. It is assumed that the proposed projects and alternatives do not involve physical impacts to wetlands; thus, a detailed wetland delineation and subsequent coordination with federal, state, and local agencies is not included in this scope of work. If changes in runway usage or taxi patterns would require the movement of de-icing facilities, an analysis would need to be conducted to ensure that no wetlands would be impacted. If wetlands would be impacted, the scope of work would need to be revised to include an analysis of impacts and permitting requirements.

PC Activities:

- Document that none of the alternatives would impact wetlands.

7.4.5.11 Floodplains

Executive Order 11998 and DOT Order 5560.2 address activities in floodplains. Federal agencies must minimize floodplain encroachment. It is assumed that the proposed projects and alternatives do not involve physical impacts to floodplains, as defined in the Federal Emergency Management Administration (FEMA) Flood Insurance Rate Maps (FIRM). Therefore, a detailed floodplain assessment is not included in this scope of work. If changes in runway usage or taxi patterns would require the movement of de-icing facilities, an analysis would need to be conducted to ensure that no floodplains would be impacted. If floodplains would be impacted, the scope of work would need to be revised to include an analysis of impacts and permitting requirements.

PC Activities:

- Document that none of the alternatives would impact floodplains.

7.4.5.12 Coastal Resources

The Coastal Barriers Resources Act (CBRA) prohibits federal financial assistance for development within the Coastal Barrier Resources System that contains undeveloped coastal barriers along the Atlantic and Gulf coasts and the Great Lakes. The Coastal Zone Management Act (CZMA) provides procedures for ensuring that proposed actions are consistent with approved coastal zone management programs, and Executive Order 13089 requires that federal actions do not degrade the conditions of coral reef ecosystems.

It is assumed that the proposed projects and alternatives will not result in physical impacts to coastal resources therefore a detailed coastal resource impact assessment is not included in this scope of work.

PC Activities:

- Document that none of the alternatives would impact coastal resources.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.13 Wild and Scenic Rivers

The Wild and Scenic Rivers Act describes those rivers or river segments designated or eligible for inclusion in the Wild and Scenic Rivers system. FAA is responsible for determining potential impacts of projects under their jurisdiction on rivers listed on the National Rivers Inventory (NRI) or otherwise eligible for listing and coordinating with the appropriate agency with jurisdiction over the affected river segments.

It is assumed that the proposed projects and alternatives will not result in physical impacts to any river segment covered under the Wild and Scenic Rivers Act, therefore a detailed impact assessment is not included in this scope of work.

PC Activities:

- Document that none of the alternatives would impact river segments protected by the Wild and Scenic Rivers Act.

7.4.5.14 Farmlands

The evaluation of the effect of the proposed project(s) and alternatives on land under the jurisdiction of the Farmland Protection Act is required. However, as it is assumed that the proposed projects and alternatives would not result in physical impacts to farmlands, a detailed farmland analysis is not included in this scope of work.

PC Activities:

- Document that none of the alternatives would impact farmlands.

7.4.5.15 Natural Resources and Energy Supply

The PC will evaluate and document the potential effects of the proposed project(s) and the alternatives on energy supplies and natural resources. This would include the consideration of changes in fuel usage given anticipated changes in taxiing patterns and flight patterns with the implementation of the proposed projects and alternatives.

PC Activities:

- Document potential effects of the reasonable alternatives on energy supplies and natural resources.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.16 Light Emissions and Visual Impacts

The PC will evaluate and document the potential for the intrusion of additional light emissions in sensitive areas associated with the proposed project(s) and the alternatives. The analysis will consider the effects of new and or relocated airport lighting systems, if any, and light emissions from aircraft, particularly with respect to alternatives that change flight track locations or runway usage. Potential visual impacts from changes in flight tracks will also be evaluated.

PC Activities:

- Document potential light emissions and visual impacts of the reasonable alternatives.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.17 Hazardous Waste, Pollution Prevention, and Solid Waste

Several federal laws regulate the production, transport, and disposal of hazardous waste, including the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). None of the alternatives considered are expected to impact existing hazardous waste sites or produce hazardous waste, thus a detailed hazardous waste analysis is not included in this scope of work.

FAA also examines quantities of solid waste generated by proposed projects and potential impacts to area landfills. None of the alternatives considered are expected to produce significant quantities of solid waste, thus a detailed solid waste analysis is not included in this scope of work.

PC Activities:

- Document potential hazardous waste and solid waste impacts.

7.4.5.18 Construction Impacts

A general description of the types and extent of construction activities from the alternatives considered as well as measures to minimize their impacts will be developed. However, since none of the alternatives considered are expected to involve construction activities a detailed construction analysis is not included in this scope of work.

PC Activities:

- Document potential construction impacts.

7.4.5.19 Cumulative Impacts

NEPA requires that consideration of the impacts of the proposed project along with impacts from other past, present, or reasonably foreseeable projects within the affected project area need to be considered. This includes other projects occurring at the airport that have already been

approved, and projects taking place within the project area not under the jurisdiction of FAA that may also impact the resources potentially impacted by the alternatives considered. The PC will identify other projects that should be considered, including the Early Implementation Items from the Phase 1 Study, and the timeframe and geographic area to be utilized in the cumulative impacts analysis. A brief discussion of potential cumulative impacts from these projects will be developed.

PC Activities:

- Identify other projects within the affected area to consider in the cumulative impacts analysis.
- Develop preliminary draft text and exhibits.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.5.20 Other Considerations

The PC will document other environmental considerations that may arise during the EIS process that should be considered by FAA in their decision-making process. These items would include short-term uses and long-term productivity of the environment, irreversible and irretrievable commitment of resources, and potential for controversy. It is assumed that the work effort for this task would be minimal.

PC Activities:

- Develop preliminary draft text.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.6 Summary of Impacts and Mitigation Measures

The PC will summarize the impacts of the proposed action and reasonable alternatives, as well as detail any mitigation measures that the Sponsor commits to alleviate any potential impacts associated with the proposed action.

PC Activities:

- Develop preliminary draft text.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.7 Preliminary DEIS/DEIR

The PC will produce a preliminary DEIS/DEIR for FAA review (assuming a DEIR is required). The PC will compile all comments on the preliminary DEIS/DEIR and discuss the comments with FAA during a meeting or teleconference. The PC will respond to comments and make necessary revisions to the preliminary DEIS/DEIR and produce a second preliminary draft. Once FAA has concurred with the revised preliminary DEIS/DEIR, it will be released to BOS/TAC and any cooperating agencies identified by FAA for review and comment. The PC will compile all comments, and prepare responses to comments for FAA review. The PC will attend one meeting to discuss the comments received with FAA and the reviewing agencies/parties. After concurrence by FAA on responses to the comments, the PC will revise the preliminary draft and produce the DEIS/DEIR.

PC Activities:

- Prepare Preliminary DEIS/DEIR.
- Respond to comments and produce Revised Preliminary DEIS/DEIR.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.4.8 DEIS/DEIR Printing and Distribution

The PC will produce 200 printed copies of the DEIS/DEIR and 400 CD copies of the DEIS/DEIR for distribution. The DEIS/DEIR will be mailed to agencies, elected officials, public interest groups, and individuals contained in the project contact database established at scoping, as directed by FAA. The DEIS/DEIR will also be sent to local libraries for access by the public; an electronic version in PDF format will be posted on the public project web site. The PC will prepare a Draft Notice of Availability (NOA) along with a Notice of Public Hearing, for FAA review and comment. The Notice of Availability and Notice of Public Hearing will be published in the *Federal Register* (EPA) and in local public newspapers (PC). The DEIS/DEIR will be filed with the US Environmental Protection Agency (EPA) and the DEIS/DEIR will also be submitted to the EOE (if a DEIR is required) for review.

PC Activities:

- Prepare Draft NOA, revise and produce Final NOA for publication.
- Identify and arrange for publication of the NOA in local newspapers.
- File DEIS with EPA.
- File DEIS/DEIR with EOE, if required.
- Produce and distribute DEIS/DEIR.
- Post to FAA website and project website and link to Massport website.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.5 Public Hearing

The PC will assist the FAA in the organization and conduct of a public hearing on the DEIS/DEIR conducted concurrently with a public information workshop. The public hearing will allow interested agencies, groups, and individuals additional opportunity to review and comment on the DEIS/DEIR.

PC Activities:

- Facilitate scheduling of public hearing, room setup, and logistics.
- Arrange for court reporter and translators (if required)
- Produce handout materials including comment sheets, speaker cards, sign-in sheets, etc.
- Produce presentation boards and directional signs.
- Attend and staff public hearing.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.
- Attend and participate in the Public Hearing, as directed by the FAA.

7.6 DEIS/DEIR Comments Review

7.6.1 Catalog Comments

The PC will catalog all oral (obtained from transcripts recorded at the Public Hearing) and written comments in the comment database established under Task 7.3.5.

PC Activities:

- Catalog comments.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.6.2 Respond to Comments

The PC will draft responses to comments received during the scoping meetings (Task 7.3), Public Hearing(s), and the public review period. Draft responses to comments will be submitted to FAA for their review and comment. The PC will meet with FAA in person or via teleconference to discuss the response to comments. A revised response to comments and draft public involvement appendix will be assembled and submitted to BOS/TAC for their review and comment at the direction of FAA. The PC will meet with BOS/TAC once to discuss any comments on the draft public hearing appendix.

PC Activities:

- Draft responses to comments received during scoping, public hearings, and public review period.

- Revise responses to comments based on FAA review.
- Prepare and complete draft public involvement appendix and submit to FAA for review.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.7 Prepare Final Environmental Impact Statement (FEIS)/Final Environmental Impact Report (FEIR)

7.7.1 Preliminary FEIS/FEIR

The PC will meet with FAA to discuss necessary revisions to the DEIS/DEIR based on comments received during the DEIS public comment period. If additional analysis is required, an amendment to the scope of work may be required. The PC will produce a preliminary FEIS/FEIR for FAA review. The PC will compile all comments on the preliminary FEIS/FEIR and discuss the comments with FAA during a meeting or teleconference. The PC will respond to comments and make necessary revisions to the preliminary FEIS/FEIR and produce a second preliminary final document. Once FAA has concurred with the revised preliminary FEIS/FEIR, it will be released to BOS/TAC for review and comment. The PC will compile all comments, and prepare responses to comments for FAA review. The PC will attend one meeting to discuss the comments received with FAA and BOS/TAC. After concurrence by FAA on responses to the comments, the PC will revise the preliminary final for inclusion in the FEIS/FEIR.

PC Activities:

- Prepare Preliminary FEIS/FEIR.
- Respond to comments and produce Revised Preliminary FEIS/FEIR.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.7.2 FEIS/FEIR Printing and Distribution

The PC will produce 200 printed copies of the FEIS/FEIR and 400 CD copies of the FEIS/FEIR for distribution. The FEIS/FEIR will be mailed to agencies, elected officials, public interest groups, and individuals contained in the project contact database established at scoping and revised during the Public Hearing process, as directed by FAA. The FEIS/FEIR will also be sent to local libraries for access by the public; an electronic version in PDF format will be posted on the public project web site. The PC will prepare a Draft Notice of Availability (NOA), for FAA review and comment. The Notice of Availability will be published in the *Federal Register* (EPA). The FEIS will be filed with the US Environmental Protection Agency (EPA) and the FEIS/FEIR will also be submitted to the EOE (if an FEIR is required) for review.

PC Activities:

- Prepare Draft NOA, revise and produce Final NOA for publication.
- File FEIS with EPA.
- File FEIS/FEIR with EOE, if required.
- Produce and distribute FEIS/FEIR.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.8 FEIS/FEIR Comments Review

7.8.1 Catalog Comments

The PC will catalog all written comments FAA receives on the FEIS/FEIR in the comment database established under Task 7.3.5.

PC Activities:

- Catalog comments.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.8.2 Respond to Comments

The PC will draft responses to comments received after release of the FEIS/FEIR. Draft responses to comments will be submitted to FAA for their review and comment. The PC will meet with FAA in person or via teleconference to discuss the response to comments. At the direction of FAA, the PC will meet with BOS/TAC once to discuss any comments on the FEIS/FEIR.

PC Activities:

- Draft responses to comments received after release of the FEIS/FEIR.
- Revise responses to comments based on FAA review.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.9 Record of Decision

The PC will assist the FAA in the production and development of a draft Record of Decision (ROD) on the FEIS, as directed. The PC will review and comment on the draft ROD, compile comments on the draft ROD, and revise the draft ROD, as directed by the FAA. The PC will produce and distribute 200 printed copies and 400 electronic copies of the Final ROD, as

directed by FAA. The PC will also prepare a draft Notice of the ROD for publication in the *Federal Register* by the FAA.

PC Activities:

- Assist in production of draft ROD at direction of FAA.
- Produce and distribute Final ROD.
- Prepare draft Notice of ROD for publication in the *Federal Register*.

IC Activities:

- Coordinate with the PC to provide peer review of the PC's work effort and communicate results to the CAC.

7.10 Freedom of Information Act (FOIA) Requests

The PC will assist the FAA in responding to FOIA requests during the EIS process. Upon the receipt of a FOIA request on the project, the FAA will forward the request, stating the specific information requested along with any applicable information or direction. The PC will be responsible for the compilation, copying, preparation of the transmittal letter, and distribution of the releasable information. Before distribution is made, the FAA will review the information to ensure that the information is consistent with the FAA's FOIA requirements. The FAA will determine what materials are to be denied and if the denied material is to be identified. For each FOIA request, the PC will prepare a complete list of the documents provided and those denied. The document lists will contain sufficient information to identify each document such as the type document, date, originator, receiver, subject matter, etc. The document lists shall be contained in the response to the FOIA request. A copy of the FOIA transmittal letter along with the document list shall be provided to the FAA. For cost estimating purposes, this Scope of Services anticipates the Contractor responding to up to twenty-five (25) individual FOIA requests.

PC Activities:

- Compile, copy, document, and distribute releasable information for each FOIA request (up to 25).

IC Activities:

- No activity

List of Abbreviations

AAD	Annual Average Day
AEE	FAA Office of Environment & Energy
AGL	Above-Ground Level
APE	Area of Potential Effect
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower
BONS	Boston Overflight Noise Study
BOS	Boston Logan International Airport
BOS/TAC	Boston Technical Advisory Committee
CAC	Logan Airport Community Advisory Committee
CBRA	Coastal Barriers Resource Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	Code of Federal Regulations
CO	Carbon Monoxide
CY	Calendar Year
CZMA	Coastal Zone Management Act
dB	Decibel
DEIR	Draft Environmental Impact Report
DEIS	Draft Environmental Impact Statement
DL	Daytime Average Sound Level
DNL	Day-Night Level
DOT	Department of Transportation
E	Sound Exposure
EA	Environmental Assessment
EDMS	Emissions and Dispersion Modeling System
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ENF	Environmental Notification Form
EOEA	Executive Office of Environmental Affairs
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FEIR	Final Environmental Impact Report
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FMS	Flight Management System
FOIA	Freedom of Information Act

FSG	Flight Segment Generator
FWS	U.S. Fish & Wildlife Service
GFDR	Global Flight Data Record
GIS	Geographic Information Systems
HC	Hydrocarbons
IC	Independent Consultant
IMC	Instrument Meteorological Conditions
INM	Integrated Noise Model
LDA	Localizer Directional Aid
Leq	Equivalent Sound Level
LTO	Landing and Takeoff
Lmax	Maximum Sound Level
MassGIS	Massachusetts Geographic Information Systems
MEPA	Massachusetts Environmental Policy Act
NA	Number of Events Above
NAAQS	National Ambient Air Quality Standards
NDADS	Noise Data and Display System
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NIRS	Noise Integrated Routing System
NL	Nighttime Average Sound Level
NMFS	National Marine Fisheries Service
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NO _x	Nitrogen Oxides
NOI	Notice of Intent
NRI	National Rivers Inventory
OAG	Official Airline Guide
PC	Project Consultant
PM	Particulate Matter
PMAD	Peak Month Average Day
PMT	Project Management Team
PRAS	Preferential Runway Advisory System
RCRA	Resource Conservation and Recovery Act
RJ	Regional Jet
RNAV	Area Navigation
ROD	Record of Decision

SEL	Sound Exposure Level
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO _x	Sulfur Oxides
TA	Time Above
TAAM	Total Airspace and Airport Modeler
TAF	Terminal Area Forecast
THPO	Tribal Historic Preservation Officer
TRACON	Terminal Radar Approach Control Facility
U.S.C.	United States Code
VMC	Visual Meteorological Conditions