2. PHL Noise Mitigation Summary

PHL has been the subject of a number of environmental studies over the past decade that have addressed noise from aircraft activity and noise mitigation, and therefore have an impact on the range of alternatives under consideration in this Noise Compatibility Study. From 2000 through 2003, PHL embarked on its first FAR Part 150 study, which resulted in the formalization of a number of noise abatement recommendations. In 2009, Runway 17/35 was extended to address airfield delay. The Environmental Impact Statement (EIS) for this project evaluated noise impacts of existing conditions and various alternatives under consideration. The NY/NJ/PHL Metropolitan Area Airspace Redesign (ARD), while not specifically focused only on PHL or the immediately surrounding area, did evaluate the potential impacts of airspace changes around PHL, and was the subject of much legal and political discussion. This section briefly describes these studies and how each addressed the noise environment around PHL.

2.1 2003 FAR Part 150 Study

PHL’s blueprint of strategies to reduce noise exposure and prevent the development of future noise-sensitive land uses was formalized in the airport’s first Part 150 Study. The Noise Compatibility Program (NCP), completed in 2002 and approved by the FAA in 2003, outlined a series of measures that either continued the airport’s existing strategies or recommended new strategies to be implemented by the airport and surrounding jurisdictions. The FAA issued a Record of Approval on May 19th, 2003.

The NCP was developed following the completion of the forecast 2006 NEM, which identified significant impacts over noise-sensitive land uses in the Tinicum Township area. The elements of the NCP were developed through coordination with PHL ATCT, the Study Advisory Committee, and the general public. One notable constraint to the range of alternatives that was evaluated was the proposed changes to the regional airspace under consideration by the FAA as part of the ARD project. Many of the SAC, general public, and airport’s suggestions that typically have the potential to improve the noise environment around an airport were unable to be recommended or implemented because of the complexity of the changes under consideration in both the terminal and regional airspace. The ARD airspace study was anticipated to address some of these suggestions, although they could not be evaluated in the Part 150 study process.

The 2003 Part 150 study included seven noise abatement measures, five land use mitigation measures, and six program management measures. FAA’s approval of the measures indicated that each was suitable for implementation, but did not guarantee that the measures would be implemented, nor was it a guarantee of the availability of funding required to support its implementation. Each of the recommended noise abatement measures and a brief description and FAA action are listed below.

- **Noise Abatement Measure NA-1**: Aircraft weighing 12,500 pounds or more departing Runways 9L/9R/17/35/8 fly runway heading until reaching 2,000’ Above Ground Level. This measure was a continuation of an existing procedure, and was approved as voluntary by the FAA.

- **Noise Abatement Measure NA-2**: Aircraft weighing 12,500 pounds or more departing Runway 27L turn left to a 255 degree heading until reaching 3,000’ Above Ground Level. This measure was a continuation of an existing procedure, and was approved as voluntary by the FAA.
- **Noise Abatement Measure NA-3**: Aircraft weighing 12,500 pounds or more departing Runway 27R turn left to a 240 degree heading until reaching 3 DME, thence turn right to a 255 degree heading until reaching 3,000’ Above Ground Level. This measure was a continuation of an existing procedure, and was approved as voluntary by the FAA.

- **Noise Abatement Measure NA-4**: Continue existing nighttime runway use program from midnight to 6:00 a.m. This measure was a continuation of an existing procedure, and was approved as voluntary by the FAA.

- **Noise Abatement Measure NA-5**: Continue existing run-up procedures providing for location and orientation preferences with requirements for pre-approval and limitation to 20 minutes or less. This measure was a continuation of an existing procedure, and was approved as voluntary by the FAA.

- **Noise Abatement Measure NA-6**: Support creation of Area Navigation (RNAV) overlay procedures for selected existing and future flight procedures. The FAA neither approved nor disapproved this measure, but took no action, since RNAV procedures were under consideration as part of the ARD study.

- **Noise Abatement Measure NA-7**: Encourage noise attenuating standards in airport development. This measure addressed the placement of potential new facilities as identified in the Master Plan. The FAA approved the measure for the purposes of Part 150, but stipulated that other regulations and guidance must be met in order to determine final facility placement.

- **Land Use Measure LU-1**: Develop and implement a residential sound insulation program. This measure was approved, but stipulated that conditions of Chapter 8 of 5100.38B Airport Improvement Handbook (or subsequent versions thereof) must be met, including those governing Noise Compatibility Projects and Interior Noise Level Reduction (NLR), section 812.b.

- **Land Use Measure LU-2**: Develop and implement a purchase and resale program as a supplement to the residential sound insulation program. Under this program the Airport would purchase an eligible home at fair market value and attempt to resell the home to a new owner. The home may be sound insulated and/or upgraded prior to resale and would have an avigation easement attached to the property deed. Provides an option for eligible residents who may not qualify for the sound insulation program. This measure was approved, but stipulated that the conditions of Chapter 8 of 5100.38B Airport Improvement Handbook (or subsequent versions thereof) must be met to be eligible for Federal financial assistance.

- **Land Use Measure LU-3**: Develop and implement a land use controls program. Encourage local municipalities, such as Tinicum Township and the City of Philadelphia, to implement various Land Use Controls, such as re-zoning, and disclosure, for areas within and adjacent to the 2006 NCP/NEM DNL 65 dB noise contour. This measure was approved by the FAA.

- **Land Use Measure LU-4**: Develop and implement a land use development controls program. Encourage local municipalities, such as Tinicum Township and the City of Philadelphia, to amend their building codes to require any new construction and major alteration/addition within or adjacent to the DNL 65 dB NCP noise contour to meet an interior Noise Reduction Level (NRL) standard of 45 dB. This measure was disapproved for purposes of Part 150. New construction within the DNL 65 dB noise contour is
considered incompatible with normal airport operations and is inconsistent with the purposes of Part 150 to reduce or prevent incompatible land uses.

- **Land Use Measure LU-5:** Prepare a study to determine the feasibility of implementing noise mitigation measures at Fort Mifflin. The intent of this measure is to authorize and fund a detailed study to determine if potential noise mitigation measures, such as sound insulation, could be effective in reducing the interior noise levels at that location. Approved for study. Any recommendations to implement the results of the study would need to be included in an amendment to the Noise Compatibility Program.

- **Program Management Measure PM-1:** Establish a Noise Abatement Advisory Committee. The purpose of this committee would be to maintain regular communication and exchange of ideas between the Airport and surrounding communities, to enhance community understanding of the constraints on airport users and operators, and to serve as a vehicle for disseminating information to the community. The committee is intended to communicate the nature of land use compatibility to the community and to assist in describing the Airports Noise Compatibility Program. This measure was approved.

- **Program Management Measure PM-2:** Enhance the Airport’s Noise Monitoring System to better enable the Airport’s Marketing and Public Affairs Noise Office staff to be responsive to community inquiries. Approved with the stipulation that Criteria in FAA Order 5100.38B (or subsequent versions) Chapter 8 Noise Compatibility Projects, paragraph 813 Noise Monitoring Equipment/Systems, must be satisfied to be eligible for Federal financial assistance.

- **Program Management Measure PM-3:** Install additional noise monitors. Additional noise monitors would allow the Airport to have more and better data related to aircraft noise and flight paths that could be incorporated into planning studies. Additionally, long-term actual noise levels can then be shared with the communities that are affected by aircraft noise through the production of standard periodic reports. Approved with the stipulation that Criteria in FAA Order 5100.38B (or subsequent versions) Chapter 8 Noise Compatibility Projects, paragraph 813 Noise Monitoring Equipment/Systems, must be satisfied to be eligible for Federal financial assistance.

- **Program Management Measure PM-4:** Establish full time noise office with staff. The Noise Office is intended to provide a single point of contact for community involvement with Airport staff on noise related issues and to relieve senior Airport management of daily coordination functions related to aircraft noise. This measure was approved.

- **Program Management Measure PM-5:** Establish a pilot/community awareness program. A pilot and community awareness program would be designed to deliver information prepared by the Noise Office to both users and neighbors of the Airport. This measure was approved in concept. The FAA indicated that final approval of the specific language would be needed prior to publication or distribution.

- **Program Management Measure PM-6:** Update the NEMs and NCP. The measure provides for continuing planning and care in assuring the greatest compatibility between the airport and its environs. This measure was approved.

All of these measures were reevaluated during the course of this Part 150 study.
2.2 Runway 17/35 Environmental Impact Statement

Proposed Project

In April 2005, a Record of Decision (ROD) was issued on the Philadelphia International Airport Runway 17/35 Extension Project. PHL began a Master Plan Update in 2000 to address the future facility needs and passenger forecasts of the airport. The study focused on the increasing delay at PHL, and as a result, identified a short-term and long-term assessment of future development. According to the FAA’s National Plan of Integrated Airport Systems, when average delay exceeds five minutes per operation, an airport is considered congested. A notable reason for current and projected aircraft delay at PHL was identified as the inability of the existing runway configuration to quickly accommodate forecast traffic levels during severe weather. An extension to Runway 17/35 was identified as a short-term solution that could reduce delays at PHL, and, in the longer planning horizon, a study, the Capacity Enhancement Program (CEP), was undertaken to identify ways to provide additional capacity and reduce delays.

Primarily, the justification to extend Runway 17/35 from its length of 5,459 feet was the continuing trend by airlines to utilize regional jet aircraft instead of turboprop aircraft. PHL’s primary runways (Runways 09R/27L and 09L/27R) are of sufficient length for the safe operation of regional jets. However, regional jets use of the primary runways contributes to delays at the airport, as larger jet aircraft are unable to use either Runway 17/35 or Runway 08/26.

Range of Alternatives

A number of alternatives were identified to address short-term delay reduction at PHL. Per National Environmental Policy Act (NEPA) guidelines, the FAA identified a Purpose and Need for the project, which was to reduce current and projected delays at PHL in the short term. NEPA guidelines also stipulate that a range of feasible alternatives be developed and evaluated, including a No Action alternative. Alternatives that were considered included off-site solutions and extensions to other runways, which ultimately did not meet the purpose and need of the project.

Detailed environmental evaluation was carried out on the No Action Alternative, Alternative 1, and Alternative 2, which are summarized as described in the ROD. The No-Action Alternative consists of periodic maintenance and minor enhancements needed to maintain safe operations at PHL. No changes to the airfield layout would occur. Alternative 1 would extend Runway 17/35 to the north by 640 feet and to the south by 400 feet, bringing the runway to a total length of 6,500 feet. This alternative would require occasionally suspending arrivals to Runway 35 over the Delaware River, while large ships that act as airspace obstructions pass. Alternative 2 would extend Runway 17/35 to the north and the south and would provide clearance over large vessels by displacing the Runway 35 landing threshold to the north by 1,444 feet. As compensation to avoid a loss of safe landing distance, a 500-foot runway safety area would be used on the north end. Thus, aircraft would have 7,000 feet of runway to depart and for landing, 6,500 feet to the south and 5,556 feet to the north. Further, arrivals to Runway 17 would include a displaced landing threshold due to I-95.

Noise Analysis

A detailed technical noise analyses was prepared for a series of conditions, including 2003 Existing Conditions, the No-Action Alternative in 2007 and 2015, and Alternative 1 and 2 for 2007 (the year the project had been anticipated to be complete) and 2015 (project design year). Forecasts of operations, runway utilization, projected fleet mix of aircraft, and other factors important in the determination of noise exposure were projected, and noise contours and noise levels at specific locations were identified.

1 http://www.phlrunway17-35eis.com/pdfs/Record%20of%20Decision.pdf
2 Since the CEP addresses forecast traffic levels beyond the FAR Part 150 five-year forecast horizon, it is not discussed in this report. The Draft Environmental Impact Statement for the CEP is available for review at www.phl-cep-eis.com.
The determination of significant impact associated with the proposed project is measured by a noise-sensitive location within the DNL 65 dB contour that experiences an increase of 1.5 dB or more as compared to the No Action Alternative. Under Alternative 1, when compared to the 2007 No Action alternative, no additional persons would be impacted by noise levels in excess of DNL 65 dB. However, under Alternative 2, in 2007, an additional 456 persons would be included in the DNL 65 dB noise contour, thus increasing the number of persons residing within noise levels in excess of DNL 65 dB. Alternative 1 became the FAA’s Preferred Alternative and was carried forth in the ROD.

Mitigation

Based on the analysis presented in the EIS, neither alternative would cause significant noise impacts in 2007 or 2015, as compared to the No Action scenario. PHL has stated in the EIS and in the ROD to being committed to update its Part 150 Study following any substantial changes in the airfield configuration, and would further evaluate expanding the existing sound insulation program into the newly impacted areas in the Eastwick neighborhood of Philadelphia.

Construction on the Runway 17/35 extension began in 2006 and the runway opened at its full length of 6,501 feet in 2009. Utilization of the runway at this length is reflected in both the 2008 and 2013 NEMs. As shown in the 2013 NEM, significant noise impacts do exist in the Eastwick neighborhood of the City of Philadelphia, and this NCP addresses those incompatible land uses.

2.3 NY/NJ/PHL Metropolitan Area Airspace Redesign Project

Study Background

The FAA is responsible for the safe and efficient movement of aircraft throughout the United States, and maintains the nation’s air traffic control system and airspace structure as a means to do so. Due to continuously increasing traffic levels, as well as a systematic increase in delay, the FAA has undertaken numerous efforts to safely accommodate air traffic, including redesigning airspace structure throughout the country. The northeastern United States is one of the busiest and most complex regions in the country, and also suffers from weather-related air traffic constraints.

In 1999 the New York/New Jersey/Philadelphia Metropolitan Area Airspace Project (ARD) study begun with a series of pre-scoping meetings. The ARD study area included John F. Kennedy International Airport, LaGuardia Airport, Newark Liberty International Airport, Teterboro Airport, Philadelphia International Airport and sixteen additional satellite airports throughout the region. Parts of Connecticut, New York, Delaware, Pennsylvania, and all of New Jersey were included in the study area. In early 2001, a Notice of Intent (NOI) was published in the Federal Register, indicated that the FAA intended to complete an EIS on the project. Over the next few years, various elements of the airspace structure were analyzed in order to determine a range of alternatives that would suitably meet the purpose and need of the project.

The stated purpose of the ARD is: “to increase the efficiency and reliability of the airspace structure and ATC system. The need is to accommodate growth in aircraft operations while maintaining safety, mitigating delays, and accommodating changes in the types of aircraft using the system.” The selected project, the Integrated Airspace Alternative with Integrated Control Complex with Mitigation, combines both high and low altitude airspace to create more efficient arrival and departure routes. It is worth noting that the ARD was not undertaken to increase or decrease noise levels at a specific airport, but rather to address airspace capacity over a much larger area. Noise reduction was not the reason for the study, nor

3 http://www.faa.gov/air_traffic/nas_redesign/regional_guidance/eastern_reg/nynjphl_redesign/
one of its main components. However, because of the range of potential changes and public concern, noise became a critical element of the FAA’s outreach and documentation.

Range of Alternatives

Four main alternatives were initially considered, including the Future No Action, Modifications to Existing Airspace, Ocean Routing Airspace, and Integrated Airspace Alternative. The FAA eventually selected a preferred alternative, which was then subject to mitigation measures designed to reduce its potential environmental impact. The initial range of alternatives is described below.

The Future No Action alternative would not change the structure of the existing airspace. Under the Modifications to Existing Airspace alternative, however, modifications to the airspace would occur, including fanned departure headings for westbound aircraft departures and two independent airways created from one congested westbound airway. This included new departure headings at LaGuardia, Liberty Newark, and Philadelphia. The implementation of this alternative would have served to increase the pace of aircraft departures, thus reducing the overall complexity of the airspace.

The Ocean Routing Airspace alternative, proposed by a citizen’s group, addressed noise impacts from departure operations from Newark Liberty International Airport by directing aircraft to fly over the Atlantic Ocean before turning on course. The FAA concluded that the alternative did not meet the purpose and need, as it did not address the total extent of the project area.

The Integrated Airspace Alternative proposed a consolidation of the airspace under control of the New York Terminal Radar Approach Control (New York TRACON) with the surrounding Air Route Traffic Control Centers. The combination of the multiple airspace units would allow for a more expeditiously and efficient flow of air traffic, and eventually became the preferred alternative.

The FAA evaluated the environmental impacts of the range of alternatives and published a Draft EIS in 2005. Following the publication of the Draft EIS and an extensive public comment period, the FAA identified the Integrated Airspace Alternative with ICC as the preferred alternative, and shortly thereafter, issued a Noise Mitigation Report, which evaluated measures to alleviate, to the extent possible, the noise impacts associated with the preferred alternative based on public comments. The study identified several mitigation measures for analysis—some of which were later incorporated into the preferred alternative based on their feasibility. Specifically at PHL, this included comments pertaining to the use of continuous descent arrival (CDA) and RNAV procedures, an increase in the use of the river approach to Runway 09R, and reducing the number of fanned departure headings. The mitigation report identified the following needs: that a minimum of 3 departure headings were necessary to maintain operational efficiency; the current single heading departure procedure could be used during the nighttime hours given the forecast traffic levels; the river approach to Runway 09R could be used more to reduce noise; and that CDA procedures could be used for some arrival routes during the nighttime hours given the forecast traffic levels.

The following alternatives were retained for a more detailed noise screening:

- Use CDA procedures for nighttime arrivals from the north, northwest, and southwest;
- Increase use of the visual approach to Runway 9R;
- Use of four departure headings of 081, 096, 112, and 127 during daytime hours, and one departure heading of 085 (existing condition) during nighttime hours;
- Use of three departure headings of 230, 245, and 268 during daytime hours, and one departure heading of 255 (existing condition) during nighttime hours.

The results of the detailed noise analysis indicated that there were potential noise reduction benefits associated with the mitigation measures, and were thus included in the mitigated version of the preferred alternative. Implementation of this alternative would reduce the number of persons who would be significantly impacted by noise to 545 people near PHL in 2006 (the original initial year of
implementation). By 2011, no significant impacts would exist with the implementation of the preferred alternative.

Phases of Implementation

The implementation of the preferred alternative, with mitigation, was anticipated to take up to five years, and is broken down into multiple phases, each of which are anticipated to take 12 to 18 months. As the FAA made clear in its documentation and continued public outreach, many of the details of the implementation are continuously refined and developed as new information becomes available. Elements of the implementation of the ARD at PHL are briefly summarized below.

The first phase (Stage 1) did not require structural or operational changes to the airspace. This stage consisted of the introduction of limited fanned departure headings during specific periods of time and a continuation of the traditional Noise Abatement Procedure for Runway 27R and Runway 27L jet departures during the overnight hours. The introduction of the fanned departure headings occurred in late 2007.

The second phase (Stage 2B) introduces the use of the 230°, 112° and 127° headings for jet departures. At the time of submittal of this NCP Update (and in the 2008 Noise Exposure Maps) Stage 2B has not yet been implemented due to airspace changes required to accommodate the headings. It is anticipated that these additional headings will be in place by 2013, which is reflected in the 2013 NEM modeling and contours.

The third phase (Stage 3) will include the shifting of airspace boundaries and adding additional airways (high altitude aircraft routes, as opposed to departure headings), and an additional increase in size in the PHL TRACON. Lastly, Stage 4 includes the integrated changes at all air traffic facilities and would represent the completion of the implementation of the proposed project.

As noted in Noise Abatement Measure NA-6, PHL supports additional use of Area Navigation (RNAV) and Require Navigation Performance (RNP) procedures when possible and encourages aircraft operators and Air Traffic Control to further develop and utilize them when possible.

Each of the studies described in the preceding sections impact the range of alternatives that historically are evaluated in a Part 150 study. Noise abatement procedures that are typically considered in a Part 150 study have, in some cases, been identified and evaluated in previous studies, such as RNAV procedures and CDAs. Comments from the Study Advisory Committee, the general public, and elected officials throughout this study have reflected these ongoing concerns.