

**RECORD OF DECISION
AND WRITTEN RE-EVALUATION
OF THE NEW YORK / NEW JERSEY /
PHILADELPHIA
METROPOLITAN AREA AIRSPACE REDESIGN
FINAL ENVIRONMENTAL IMPACT
STATEMENT**



July 31, 2008

U.S. Department of Transportation
Federal Aviation Administration

**WRITTEN RE-EVALUATION
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Appendix A: Effect of Schedule Limits on NY/NJ/PHL Airspace Redesign Environmental Impact Statement, the MITRE Corporation, June 2008.

1. Introduction

On September 5, 2007, the Federal Aviation Administration (FAA) issued its Record of Decision (ROD) on the New York/New Jersey/Philadelphia (NY/NJ/PHL) Airspace Redesign project.¹ After more than nine years of study and evaluation to address congestion and delays at some of the busiest airports in the U.S., the ROD established the agency's final decision to approve the project to redesign the airspace in the NY/NJ/PHL Metropolitan Area. The ROD relied on detailed analysis contained in a Draft Environmental Impact Statement (DEIS) (December 2005), a Final Environmental Impact Statement (FEIS) (July 2007) and supporting appendices.

The project is critical to enhancing the efficiency and reliability of the airspace structure and the Air Traffic Control (ATC) system. It is needed to accommodate current levels of traffic as well as future levels of growth. This will enhance safety and reduce both current and future delays in the NY/NJ/PHL Metropolitan Area. The Airspace Redesign Project not only modernizes the structure of the NY/NJ/PHL air traffic environment, but also serves as a critical foundation for achieving the Next Generation Air Transportation System in an environmentally responsible manner.

Shortly after the ROD for this project was signed, the U.S. Department of Transportation (DOT) and the FAA began a number of initiatives to address delays at the New York Metropolitan area airports. Most notably, the FAA convened scheduling reduction meetings with air carriers and issued Orders Limiting Scheduled Operations at John F. Kennedy International Airport (JFK) and Newark Liberty International Airport (EWR). The FAA also issued amendments to the 1996 Rates and Charges Policy.

In February and March 2008, the FAA received letters from attorneys for the Alliance for Sensible Airspace Planning and Mr. Michael Kroposki, Esq indicating that, among other items, these scheduling orders and the new rates and charges policy amendments constituted significant new information requiring preparation of a supplemental EIS for the Airspace Redesign project. The first request for a supplemental EIS was made in a letter dated February 8, 2008 from Mr. Steve F. Pflaum and Mr. Steven W. Kasten of the firm McDermott, Will & Emery on behalf of the Alliance for Sensible Airspace Planning. A separate request was made by Mr. Michael Kroposki, Esq in letters dated March 1, 2008, April 19, 2008 and June 28, 2008. The FAA provided initial responses to the letters dated February 8, 2008 and March 1, 2008. This ROD and Written Re-evaluation will be provided to the requesters.

In response to the above FAA actions, although not legally required, the FAA prepared a Written Re-evaluation, pursuant to FAA Order 1050.1E, Paragraphs 515-516, and 40 C.F.R. §1502.9(c)(1), to consider whether these Orders Limiting Scheduled Operations and the new rates and charges amendments, either affected the purpose and need for the Airspace Redesign project, or altered the reported environmental impacts. For more detail about why

¹ On September 28, 2007, the FAA issued a corrected ROD that addressed editing errors. Notice of the Corrected ROD was sent to all individuals on the project mailing list.

a Written Re-evaluation was not required, but deemed appropriate, see pages 7-8 below. The FAA also reviewed and documented the potential impacts of noise in an area outside of Philadelphia International Airport (PHL) that is subject to a short-term significant noise increase and addressed some late filed comments from the County of Rockland, NY on the FEIS.

After careful study and consideration, the FAA concluded that neither the limits on scheduled operations, nor the amendments to the 1996 Rates and Charges Policy negated the need for the Airspace Redesign project. The environmental impacts discussed in the EIS and ROD remain applicable, accurate, and valid. For the area outside of PHL that receives a short-term significant noise increase, the FAA reviewed and documented there are no schools subject to this increase. In this document, the FAA also provides a more detailed response to late filed comments by the County of Rockland, NY. As a result of this analysis, the FAA has concluded that there is no significant new information warranting preparation of a new or supplemental EIS for the Airspace Redesign project.

2. Background

A. Implementation of Airspace Redesign

The implementation of Airspace Redesign is taking place in four stages as described in the FAA's ROD. Implementation of each stage will take approximately 12 to 18 months. Full implementation is anticipated to be complete by late 2011. Development of a detailed implementation plan began after the ROD was signed.

Stage 1 implementation began shortly after signing the ROD, and on December 19, 2007 an important tool became available to Air Traffic control at Newark Liberty International Airport (EWR) and Philadelphia International Airport (PHL). The controllers could assign departure dispersal headings to aircraft waiting to depart Runway 22L/R at EWR and Runway 27L/R and Runway 9L/R at PHL.

The kickoff planning meeting for implementation of Stage 2 was held on April 2, 2008. Stage 2 focuses on the expansion of the westgate for the New York area departures. Enhancing the westgate not only provides for additional departure airways for the NY/NJ metropolitan airports, but also facilitates access to the westgate for departures from JFK International Airport, previously limited to a single departure fix over Robbinsville, New Jersey. Furthermore, Stage 2 provides for additional departure access to the western jet routes for PHL.

Stage 3, in turn, will be implemented after the aviation community has become acclimated to the airspace changes adopted in Stages 1 and 2, and Stage 4 will conclude the FAA action.

B. Congestion Management Initiatives

Until recently, the FAA managed congestion at JFK and LaGuardia Airport (LGA) through the High Density Rule (HDR) (commonly referred to as the slot program). The HDR expired on January 1, 2007 as a result of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21) of 2000. See FEIS page 1-18 for more discussion. Newark was one of the five airports initially managed under the HDR rule when it was promulgated in 1968; however, the FAA lifted those restrictions in 1970. None of the other 21 airports in the Airspace Redesign study area were covered by the HDR rule.

In the summer of 2007, airports in the greater New York area experienced record levels of congestion and delays. In response to this situation, the New York Aviation Rulemaking Committee (ARC) was chartered by Secretary Peters of the DOT on September 27, 2007. The ARC was formed to help the DOT and the FAA explore available options to manage the congestion at the New York metropolitan airports (LaGuardia, John F. Kennedy, and Newark Liberty).

The FAA has issued several Notices of Orders, Orders, Notice of Proposed Rulemakings and Amendments with this objective in mind. The following is a summary of the actions the DOT and the FAA have taken since September 2007 regarding airports in the NY/NJ/PHL study area:

1. John F. Kennedy International Airport (JFK)

As a result of a continued number of flights above capacity at JFK during the peak operating hours, the Acting Administrator of the FAA convened scheduling reduction meetings with the air carriers and issued an Order Limiting Scheduled Operations at JFK, 73 Federal Register 3510, January 18, 2008. This order became effective March 30, 2008 and terminates on October 24, 2009. Except as provided in the Appendix to the Order, scheduled U.S. air carrier and foreign air carrier arrivals and departures will not exceed 81 per hour during the hours of 6:00 am through 10:50 pm, Eastern Time.

On May 21, 2008, the FAA published a Notice of Proposed Rulemaking (NPRM) proposing a Congestion Management Rule for JFK and EWR (73 Federal Register 29626). The comment period for this NPRM closed on July 21, 2008. This proposal would replace the Orders imposing temporary operating limitations at JFK and establish a rule limiting unscheduled operations at this airport. Implemented as proposed, the rule would expire on March 30, 2019.

2. Newark Liberty International Airport (EWR)

EWR also experienced increasing delays during the summer of 2007 and the air carriers proposed summer 2008 schedules would have increased these delays further. In response to these delays and due to a concern that traffic from JFK may shift to EWR, on March 18, 2008, the FAA published a Notice of Proposed Order Limiting Scheduled Operations at EWR (73 Federal Register 14552). The comment period closed on April 1, 2008. The final

Order was published in the Federal Register on May 21, 2008, 73 Federal Register 29550. The schedule limits established in this Order became effective on June 1, 2008 and terminate on October 24, 2009. This order limits scheduled operations at Newark from 6:00 AM through 10:59 PM to 81 operations per hour as provided in the appendix to the Order.

On May 21, 2008, the FAA published a Notice of Proposed Rulemaking (NPRM) proposing a Congestion Management Rule for JFK and EWR (73 Federal Register 29626). The comment period for this NPRM closed July 21, 2008. This proposal would replace the Order imposing temporary operating limitations at EWR and establish a rule limiting unscheduled operations at this airport. Implemented as proposed, the rule would expire on March 30, 2019.

3. LaGuardia Airport (LGA)

LGA is a unique airport in its layout and in its demand profile. Because of the unique nature of this airport, it has been managed under the High Density Rule (HDR) since the late 1960's. The HDR expired by act of Congress on January 1, 2007. To prevent the anticipated increased congestion at LGA upon the expiration of the HDR, the FAA issued a Notice of Proposed Rulemaking capping operations at LGA. While this proposal was in the rulemaking process, in December 2006 the FAA also issued a temporary order limiting scheduled operations at LGA. This temporary Order remains in place until a final rule is adopted.

In response to comments on the NPRM and concerns raised by the Aviation Rulemaking Committee (ARC), the FAA supplemented the Notice of Proposed Rule Making (SNPRM) in April 2008, 73 Federal Register 20846 (April 17, 2008). This SNPRM withdraws FAA's upgaging proposal and its proposal to have Operating Authorizations that would have expired on a rolling ten-year cycle. It proposes to grandfather much of the existing operations. In addition, this SNPRM contains provisions for use or lose, unscheduled operations and withdrawal of operating authorization for operational need. The FAA further proposed to sunset the rule in ten years. The comment period for the SNPRM closed on June 16, 2008. The FAA has not yet finalized this Rule.

The modeling for Alternatives that were carried forward in the Airspace Redesign FEIS considered the schedule limits that were in place at LGA. Thus, the baseline in 2000 and the forecasts of traffic in 2006 and 2011 assumed that LGA traffic would remain constrained. The actions proposed to be taken by the FAA in the SNPRM do not change the number of operations at LGA, although one option could reduce operations by approximately one per hour. In general, it continues operation levels that have existed since 2001. Thus, the recent actions taken by the FAA to supplement the NPRM is not significant new information and does not change the assumptions or analysis in the Final EIS.

4. Other Study Airports

No schedule limits have been proposed at the remaining airports in the study area and Therefore, no change to the operational analysis or the corresponding environmental impacts is expected. The assumptions, analysis and conclusions set forth in the FEIS for all other airports remain adequate and current.

A Capacity Enhancement Program (CEP) is on-going at PHL. As noted in the ROD, the CEP has the potential for cumulative impacts with the Airspace Redesign. However at the time the ROD was signed, there was insufficient information about this evolving proposal to include it within the study of cumulative impacts in the Airspace Redesign EIS. The ROD for CEP is expected to be published in September 2009, and if approved, construction would not be completed until 2020, well beyond the 2011 full implementation date for the Airspace Redesign. CEP alternatives retain the current runway geometry, and the Airspace Redesign procedures are incorporated into the CEP analysis. Thus, potential cumulative impacts from the projects will be captured in the environmental analysis for that proposed project.

5. 2008 Amendments to the 1996 Rates and Charges Policy

The FAA and DOT also adopted three amendments to the 1996 Rates and Charges Policy. 73 Federal Register 40430, July 14, 2008. These amendments provide airport operators greater flexibility to use landing fees as a means to address congestion. In order to use two of the three options identified in these amendments, an airport must be deemed “congested.” A congested airport is defined as an airport that accounted for 1 percent or more of all delayed aircraft operations in the U.S. in the most recent year for which data is available, and an airport listed on Table 1 of the FAA's Airport Capacity Benchmark Report 2004 (or the most recent version of this Report), or an airport listed in “Capacity Needs in the Airspace System 2007-2025: An Analysis of Airports and Metropolitan Area Demand and Operational Capacity in the Future” (FACT 2 Report).² The following airports in the NY/NJ/PHL Airspace Redesign study area meet this definition: (1) LGA; (2) JFK; (3) EWR; (4) PHL; (5) White Plains/Westchester County Airport (HPN); and (6) Teterboro (TEB). The third amendment to the rates and charges policy will allow all airports to use a two-part landing fee during periods of congestion (also referred to as “peak period”).

C. Environmental Determinations Completed in Conjunction with Recent FAA Actions on Congestion Management

In accordance with the National Environmental Policy Act (NEPA) requirements, an environmental determination was made as per Order 1050.1E “Environmental Impact: Policies and Procedures” for the FAA Rulemaking process associated with the congestion management rules for LGA, JFK and EWR and for the Order setting temporary schedule limits at EWR. These proposed rulemaking actions and the Order on EWR were determined to be categorical exclusions (CATEX) because they were determined to have no potentially significant environmental impacts and presented no extraordinary circumstances. Copies of the CATEXs for LGA and EWR/JFK are available on a public website,

² See Policy Regarding Airport Rates and Charges, 73 Federal Register at 40445 for a more detailed definition.

www.regulations.gov. The CATEX for the EWR Order is contained within the Notice of Order, 73 Federal Register 14552. For complete docket information, see the reference list at the end of this document

D. Congestion Management Programs in the NY/NJ/PHL Metropolitan Area Airspace Redesign Final Environmental Impact Statement (FEIS)

The FEIS for Airspace Redesign considered congestion management programs including administrative approaches (such as caps and slots), voluntary de-peaking and market based approaches as a category of alternatives in the initial screening of alternatives. These measures are discussed in further detail on pages 2-2 through 2-8 of the FEIS. This category of alternatives was eliminated from further study because it did not meet the purpose and need of the Airspace Redesign project.

The recent actions by the FAA to use schedule limits and the amendments to the 1996 Rates and Charges Policy (both congestion management programs) were not substantively considered in the analysis of FAA's Selected Project (also called the preferred alternative with mitigation) for Airspace Redesign for the NY/NJ/PHL metropolitan area because these actions were not initiated or formulated to an extent to which they could have been considered in the analysis until after the FEIS was completed and FAA's ROD issued. As a result, the FEIS for the NY/NJ/PHL Metropolitan Area Airspace Redesign did not contain operational or environmental analyses which considered congestion management as presented in the recent Orders, Notices of Proposed Rulemaking and Amendments.

3. Purpose of this Written Re-evaluation

The Council on Environmental Quality (CEQ) regulations address when it is appropriate for a federal agency to prepare a supplement to draft or final EISs. A supplement is required if there is remaining federal action and "the agency makes substantial changes in the proposed action that are relevant to environmental concerns or there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9(c)(1). FAA Order 1050.1E references this standard and defines significant information as "information that paints a dramatically different picture of impacts in the EIS." FAA Order 1050.1E, Paragraph 516. A Written Re-evaluation can be used to document whether a new or supplemental EIS is required. Paragraph 515. A Written Re-evaluation is not required in this instance because after the FAA issued the ROD in September 2007, there was no further remaining or ongoing discretionary federal action.

The ROD for Airspace Redesign has been issued, and now the FAA is fully engaged in implementing that determination. Thus, there is no pending "proposed federal action" with respect to airspace redesign for which any type of NEPA analysis would be appropriate. Nonetheless, the FAA has determined that it is appropriate, as a matter of policy for this important project that has garnered so much public attention, to document its analysis of new information that has arisen since the issuance of the ROD in September 2007.

The purpose of this Written Re-evaluation is to determine whether the data and analyses contained in the FEIS remains substantially valid when considering the temporary and proposed new schedule limits for EWR and JFK and the amendments to the rates and charges policy. This Written Re-evaluation presents the results of additional analysis conducted for the FAA by MITRE Corporation which demonstrates that schedule limits represent a very small change to operating conditions described in the FEIS. Indeed, the MITRE study further confirms the ongoing integrity of the environmental analysis in the draft and final EIS for airspace redesign. This latest analysis is contained in Appendix A of this Written Re-evaluation. The FAA independently evaluated MITRE's report, accepts it as an FAA document, and incorporates it by attachment. The forecasts of traffic for 2006 and 2011 as shown in the FEIS for Airspace Redesign included traffic patterns similar to those seen in the limited schedules proposed for summer 2008. Changes in modeling assumptions as a result of the congestion management initiatives impact the operational results of the Selected Project more than any of the other alternatives assessed in the Airspace Redesign EIS.

4. Analysis

The FAA recognizes that the caps on hourly flight operations at EWR and JFK are new information that could impact the purpose and need or change the operational and environmental impacts. Appendix A to this Written Re-evaluation/ROD contains an analysis of the limitations on scheduled flights as they relate to operational and environmental impacts. Section 4A1 of this document summarizes the operational impacts of schedule limits and Section 4B summarizes the environmental impacts.

A. How Congestion Management Impacts Airspace Redesign's Purpose & Need

1. Schedule Limits and Operational Benefits

The benefits of airspace redesign were calculated based on the forecast 90th percentile day³ of traffic in 2006 and 2011. The 90th percentile day is used because the impact of an airspace redesign is not as measurable when the traffic demand is low. The limited schedules were very similar to the forecast of the annual-average day (AAD) in 2011, which were simulated to provide input to the environmental-impact models. See Appendix A, Tables 3 and 4 for detailed information. Therefore, extracting operational metrics from the annual-average day simulation output for 2011 provided a good estimate of system performance if congestion management programs are in place.

The purpose of the Airspace Redesign, as repeatedly stated in the Final EIS and the ROD for that action, is to increase the efficiency and reliability of the airspace structure and ATC system, thereby accommodating growth while enhancing safety and reducing delays in air travel. There were eight evaluation criteria in the EIS associated with the purpose and need

³ The 90th percentile day is reflective of traffic levels that are greater than or equal to ninety percent of traffic days.

⁴ The annual-average day (AAD) is the annual IFR operations level divided by 365. Annual average day is used to determine the environmental impacts of an airspace project as required by FAA Order 1050.1E

for Airspace Redesign. These eight elements were: reduce complexity; reduce (pilot-controller) voice communications; reduce delay; balance controller workload; meet system demand and improve user access to the system; expedite arrivals and departures; increase flexibility in routing, and maintain airport throughput. These eight evaluation elements contained thirteen metrics designed to address various stakeholders' views of the system. The analysis conducted by MITRE contained in Appendix A of this ROD/Written Re-evaluation discusses each of these elements, the metric(s) used for each element, and why.

These same elements and metrics were then used to analyze how schedule limits would affect the metric and the reported benefits. The impact of schedule limits on the various purpose and need criteria are summarized in Table 1. This analysis shows that schedule limits meet only two of the eight criteria: reducing delay; and expedite arrivals and departures. It is important to note that schedule limits are counterproductive to two evaluation criteria of Airspace Redesign's purpose and need: meeting system demands and improving user access; and maintaining airport throughput. For the remaining four, there is no effect on the benefit. Therefore, while schedule limits share the purpose of Airspace Redesign to some extent, they are a complement, not a replacement, for Airspace Redesign.

Table 1. Effect of Schedule Limits on Benefits

System Improvement	Metric	Effect on Benefits
Reduce complexity	<i>Jet route delays + time below 18,000 ft (min)</i>	0
	<i>Arrival Distance below 18,000 ft (nmi)</i>	0
Reduce voice communications	<i>Max Inter-facility handoffs per hour</i>	0
Reduce delay	<i>Traffic-weighted Arrival Delay 2011</i>	Reduce
	<i>Traffic-weighted Departure Delay 2011</i>	Reduce
Balance controller workload	<i>Equity of westgate fix traffic counts</i>	0
Meet system demands & Improve user access to system*	<i>End of day's last arrival push</i>	Nullify
Expedite arrivals and departures	<i>Time below 18,000 ft (min)</i>	0
	<i>Change in Route Length per flight (nmi)</i>	0
	<i>Change in block time (minutes per flight)</i>	Reduce
Flexibility in routing	<i>Delay per flight on a severe-weather day (min)</i>	0

Maintain airport throughput	<i>Arrivals</i>	Nullify
<i>(total of maximum sustainable throughput)</i>	<i>Departures</i>	Nullify

*This metric is negated by schedule limits. (See Appendix A)

Much of the operational benefit resulting from airspace redesign was realized at EWR. The operational impact estimates in the EIS were based on the 90th percentile day. The delay benefits with limitations on scheduled operations would be different from the estimates in the EIS because delay is non-linear with respect to traffic, that is, short delays at less busy times at an airport can mushroom into long delays at busier times.

In evaluating the traffic associated with the limited schedules, the total traffic on the 2011 annual-average day (AAD)⁴ is very close to the traffic in the limited schedule. Operational simulations were done in the EIS for the average annual day in conducting a fuel-consumption analysis. Thus, there was no need to conduct a new simulation study for the limited schedule analysis. The delay output of the AAD simulations is directly applicable to the limited schedule analysis. At EWR, the overall delay reduction on the AAD is 2.7 minutes per flight and 7.2 minutes per flight on the 90th percentile day.

At JFK, the unconstrained forecast was compared to the limited schedule for August 2008. The number of flights with the limited schedule is higher than the number of flights for the forecasted 2011 AAD and lower than the 2011 90th percentile forecast. The operational impact estimates in the EIS were based on the 90th percentile day. The overall delay reduction is 2.4 minutes per flight on the AAD and close to the 2.3 minutes per flight on the 90th percentile day, so a delay benefit of about 2.3 minutes per flight can be expected under a congestion management program.

The Airspace Redesign project still provides operational benefits and meets the purpose and need. Based on the above discussion and MITRE's detailed analysis, the FAA concludes that the purpose and need for the Airspace Redesign continues to exist even with the schedule limits.

2. 2008 Amendments to the 1996 Rates and Charges Policy

As part of this Written Re-evaluation, the FAA determined that it was appropriate to consider if the amendments to the 1996 Rates and Charges Policy substantially changed the environmental impacts or called into question the underlying purpose and need of the Airspace Redesign project. The project increases efficiencies in the Air Traffic system which in turn decreases current and future congestion and delays. As part of the process to evaluate means to address solutions to the problem of current and future delays, the FAA considered congestion management techniques (including market based approaches and congestion based landing fees). DEIS at 2-4-2-5, FEIS at 2-5. This alternative was rejected from detailed study because it did not meet the purpose and need. Even with limited

demand, the airspace would remain too complex for maximum efficiency. We acknowledged that certain congestion management programs may reduce delays, but they would not accommodate growth in operations. DEIS at 2-3-2-5, FEIS at 2-5.

Even so, these measures can have value, for they can be additional tools that airport operators can use to address congestion. Two of these tools can only be used at congested airports. Put simply, these amendments “allow the airport operator to increase the cost of landing at a congested airport during periods of congestion.”⁵ (73 Federal Register at 40442). Thus, while the DOT/FAA has amended its policy on Airport Rates and Charges, this amendment does not obviate the purpose and need of this Airspace Redesign project. The FAA finds that the analysis and conclusion contained within the EIS remain valid today.

As to the potential environmental impacts of these amendments, the FAA acknowledges that use of these amendments could allow the Port Authority of New York and New Jersey to use landing fees to encourage aircraft operators to shift traffic to Stewart Airport (SWF), which is an uncongested airport. The Port Authority of New York and New Jersey is the airport operator for 4 of the 6 airports identified as congested (JFK, LGA, EWR and TEB). The other two airports are operated by the City of Philadelphia (PHL) and the County of Westchester (HPN). It is not presently known how, if at all, these airport operators will use the amendments. Thus, the amendments use is speculative and any potential environmental impact is not reasonably foreseeable.

B. Environmental Impact of Schedule Limits on Airspace Redesign

While all of the environmental impact categories were considered in the FEIS, this Written Re-evaluation focused on the environmental impact categories that could be affected by change in forecasts as a result of schedule limitations, specifically noise and air quality. We concentrated on noise and air quality because these are the impact categories that would be affected by changes in traffic operations.

To determine whether additional environmental analysis was required, comparisons were made between assumptions and the related analysis presented in the FEIS, and the recent schedule limits to determine if the changes would affect the analysis of the Selected Project as described in the ROD. If our present analysis of the schedule limitations determines that the potential environmental effects of airspace redesign are not significantly different from those disclosed earlier in the FEIS for Airspace Redesign, then the Selected Project for Airspace Redesign remains consistent with the approval given in the ROD and no further environmental analysis is required.

These environmental impacts were assessed on the basis of the average-annual day (AAD). The effects of schedule limits on the environmental analysis were reviewed individually for EWR and JFK because schedule limits affect one airport at a time.

⁵ The Department acknowledges that “airport development and expansion of airport capacity” continue to be the “most appropriate and the preferred long-term action to address airport congestion and delay.” 73 Federal Register at 40442. Redesigning the airspace to make more efficient use of it through new and improved air traffic procedures is another long-term means to address congestion and delays.

At EWR, the limited schedule for August 2008 is similar to the 2011 forecast AAD forecast. The total traffic considering the limited schedule is forecast to be 9% below the 2011 AAD forecast. The difference in noise between the AAD forecast and the limited schedule is a decrease of between 0.007 and .02 dB. Thus, there is no environmental impact as a result of the change.

At JFK, the August 2008 traffic under the schedule limitations is forecast to be higher than the 2011 forecast AAD. The total traffic under schedule limitations is forecast to be 3% above the AAD forecast. When taking into account the addition of night-time flights, the noise-effective traffic level is about 18% above the AAD forecast. Including this correction, these changes are likely to cause an increase in DNL of about 0.7 dB relative to the uncapped schedule in the FEIS, in both the Future No Action Alternative and the Selected Project. As noted in the ROD, the Selected Project's changes to procedures around JFK, to be implemented in future stages, were predicted to cause minimal noise impacts. The schedule limits cause no significant or reportable increases in noise impact.

Because the number of operations in the average-annual day is comparable to the number of operations under the limited schedule, the results of the fuel consumption analysis should not change. In the FEIS, the annual-average day was simulated for the fuel-consumption analysis. We recognize the delay benefits of airspace redesign may be reduced with a limited schedule; however, it is also true that fewer aircraft will be operating, also reducing fuel consumption. Based on these facts, and the fact that there are no significant impacts with the Airspace Redesign project, further fuel-consumption analysis is not needed.

C. Socioeconomic Impacts.

Pursuant to FAA Order 1051.1E, the FAA may use a Written Re-evaluation to determine if a new or supplemental EIS is required. As previously stated, a Written Re-evaluation is not legally required in this instance but the FAA has determined such a document is consistent with the purposes of NEPA. In this document, the FAA also determined it was appropriate to take a review the short-term noise impacts outside of PHL as they relate to schools and to further address some last minute comments on the FEIS. Absent the existence of FAA's subsequent actions regarding congestion management programs, such information on a standalone basis would not likely have been documented in a Written Re-evaluation.

1. Potential Impacts to Schools and Children Outside PHL

A. Schools

The requests for administrative and judicial stays raised an issue about children in schools. The FEIS and ROD addressed the long-term impact and short-term impacts of noise but did not provide detailed information on short-term noise impacts as they relate to children in schools. In this Written Re-evaluation, the FAA has determined that it is appropriate to review our noise analysis with respect to short-term impacts on children in schools. Schools are included in the list of land uses incompatible with noise levels greater than 65 dB DNL.

See Response to Comments on Noise Mitigation Report, FEIS, Appendix Q at 41. This documentation is done in an abundance of caution and because the FAA remains committed to addressing the concerns of citizens consistent with the intent of NEPA.

Only one geographic area receives a short-term noise increase. This occurs outside of PHL. Both the FEIS and the ROD noted that a small population (545 individuals) outside PHL receives a short-term significant noise increase during the initial stages of implementation. ROD at 26, FEIS, Appendix P at 60. This means noise in this area would increase by 1.5 DNL or more resulting in a noise exposure level of 65 dB DNL or higher in the short-term. Once the Airspace Redesign project is fully implemented, this significant noise increase is eliminated.⁶

The area that is subject to this short-term increase is identified as MIT-PINB-06PHL-A in Figure 5.17 of the FEIS and is discussed on page 5-31. This area includes 13 census blocks and is located about one and a half miles west of PHL and south of Industrial Highway in Tinicum Township, PA. In the EIS, the potential noise impacts to schools were evaluated as part of the consideration of compatible land use impacts. FEIS 5-37. This was accomplished by identifying whether there were any schools in the significantly noise impacted census blocks. The ESRI Geographic Names Information System (GNIS) database was used to make this determination. According to the GNIS database, there were no schools located in the significantly impacted census blocks.

B. *Other Impacts*

The potential impact to schools and to children can be related. Executive Order 13045: *Protection of Children from Environmental Health Risks and Safety Risks* states that, “Environmental health risks and safety risks” mean risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breath, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to).” The Airspace Redesign project does not create any significant short-term or long-term noise impacts to schools. The project reduces air pollutant emissions when compared to the Future No Action Alternative. FEIS at 5-133. The project conforms with the purpose of the State Implementation Plans (SIPs) to reach the National Ambient Air Quality (NAAQS). It is not anticipated to result in the potential to generate or disturb materials identified as a substance that has been determined to be capable of posing an unreasonable risk (i.e. hazardous) to health, safety, or property when transported in commerce. FEIS at 5-136. It is also not expected to impact water quality as it does not involve construction. FEIS at 5-135. Therefore, according to the

⁶ This occurs primarily because the noise modeling for 2006 and 2011 reflect different, albeit minor, assumptions. In 2006, the noise modelers assumed that ICC was not available, FEIS Appendix P at 13, thus “traffic loadings on the headings are slightly different as the variation without ICC uses different departure fixes.” Once the ICC is in use and the FAA has established an expanded westbound departure fix for PHL, the loading on the three departure dispersal headings for Runway 27 L/R is slightly different. This difference results in the elimination of significant noise impacts to the 545 individuals outside PHL.

analysis included in the FEIS, the airspace redesign would not result in a disproportionate effect on children's environmental health or safety.

2. *Rockland County*

On August 31, 2007, a month after the FEIS was issued and a few days before the FAA signed the ROD, the FAA received an additional comment package from Holland & Knight, LLP on behalf of their client the County of Rockland, New York.⁷ This package contained a cover letter addressed to the FAA Administrator, specific comments concerning the Final EIS, and three attached reports. Based on a preliminary review, we determined that the letter and reports raised issues that had already been addressed by the FAA during the public comment process. ROD at 54.

The FAA subsequently requested that an EIS consultant conduct a detailed review of the three attached reports. Of these three attachments, the Sanford Fidell report, dated August 31, 2007, and the Beckman Appraisals report, dated August 31, 2007, did not contain information that required an additional response. However, the Thomas/Lane Associates report, dated August 30, 2007, contained specific comments associated with the potential socio-economic impacts of the Proposed Action relative to Rockland County due to additional flights arriving to EWR. As we prepared this Written Re-evaluation, we determined it was appropriate and prudent to respond to these detailed and specific comments.

First, the commenter (Thomas/Lane report) indicates that noise is a marker for a range of socio-economic impacts (higher noise levels lead to a downward shift in land values causing changes in land use patterns, leading to adverse changes to local economic activity and the characteristic of the impacted resident population).

The area that the commenter addresses is projected to experience noise levels ranging between 31.5 and 41.1 DNL (noise tables attached to the comment) with increases in noise level between 6.5 and 7.9 dB DNL when comparing the 2011 Action (with mitigation) and No Action Alternatives. The issue of reduced property values due to aviation noise was addressed in response to comments from multiple sources in the Final EIS. The comparison that the commenter makes relative to the City of Mercer Island Washington is not particularly relevant due to the disparate distance from major airports. The City of Mercer Island is approximately 15 miles from Seattle Tacoma International Airport (SEA-TAC) whereas Rockland County is approximately 40 miles from EWR. Although FICAN reports have linked aviation noise to the potential for reduced learning these same reports indicate that more research is needed to draw conclusion(s) that can be used extensively. The school mentioned in the comment, ROD, Appendix D at D-75, is expected to experience 40.5 DNL in an outdoor setting; this noise level will be reduced further with typical building construction attenuation, and will likely be lower in the classroom setting.

⁷ As noted in our ROD, no federal agency is legally required to respond to comments on a FEIS. Nonetheless, the FAA undertook an effort in its Airspace Redesign ROD to evaluate if the comments on the FEIS did raise any new issues.

Second, the commenter indicates that the FEIS underestimates the actual impacts of the Proposed Action for two reasons: air transportation corridors experience feed back i.e. when additional capacity is added, additional traffic is attracted; and the forecast does not recognize the potential development of additional major regional airports once additional airspace capacity is added to the region.

Since the purpose of the Selected Project to increase the efficiency and reliability of the airspace structure and ATC system, thereby accommodating growth while enhancing safety and reducing delays in air travel, capacity enhancement is not at issue. The forecast summarized in Section 1.3, Aviation Demand Forecasts, and Appendix B, Aviation Demand Forecast, of the FEIS considered 21 airports within the study area through 2011. Both Stewart and Teterboro were included within the detailed forecasting used for analysis within the EIS. The EIS did not speculate on additional airports in the metropolitan area and the addition of other airports would not be connected to the need for the Selected Project.

5. Findings

Implementation of Airspace Redesign and schedule limitations does not involve any physical changes on the ground through construction or land acquisition. Therefore, the FAA Order 1050.1E environmental impact categories most likely to have a potential impact from this type of action are Noise and Compatible Land Use. Also considered in the Written Re-evaluation were the impacts of local and national issues that have arisen since the ROD that affect assumptions used in the FEIS as they relate to aircraft noise exposure, compatible land use and air quality.

Based on the above review in our Written Re-evaluation and in conformity with FAA Order 1050.1E paragraph 515, the FAA has concluded that:

- a. The schedule limits at JFK and EWR do not change reportable environmental impacts. The Selected Project continues to conform to plans or projects for which a prior EIS had been filed and the schedule limits result in no substantial changes to the Selected Project that are relevant to environmental concerns.
- b. Data and analysis contained in the previously approved EIS remain substantially valid and there are no significant new circumstances or information relevant to environmental concerns and bearing on the Selected Project or its impacts;
- c. The Selected Project remains beneficial in both delay reduction and fuel savings, and thus air quality, with limited schedules and
- d. If schedule limits at JFK and EWR were extended beyond their current expiration date, they would not affect the conclusions of the FEIS for Airspace Redesign.

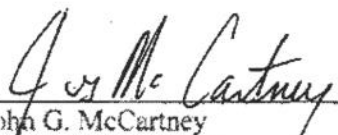
Additionally, implementation of schedule limits would not result in any additional significant adverse environmental impacts different than those disclosed and approved in the FEIS and ROD. The contents of the previous prepared EIS remain valid and no significant changes exist that require the preparation of a supplement or new EIS even if there still remained a pending proposal for major federal action significantly affecting the quality of the human environment with respect to airspace redesign.

Approval of this document completes FAA's review of the effect of schedule limitations at JFK and EWR on New York/ New Jersey/ Philadelphia Metropolitan Area Airspace Redesign.

6. Order

This document is prepared pursuant to Federal Aviation Administration Order 1050.1E, "Environmental Impacts: Policies and Procedures," Paragraphs 515 and 516.

After careful and thorough consideration of the facts contained in this Written Re-evaluation and Record of Decision, the undersigned finds that the schedule limits at JFK and EWR do not negate the purpose of and need for the Airspace Redesign Project. Additionally, the data and analysis contained in the Final Environmental Impact Statement for the New York/ New Jersey/ Philadelphia Airspace Redesign Project, published in July 2007, and the Record of Decision, published in September 2007 is not substantially affected by the schedule limits and remains applicable, accurate and valid. Accordingly, under the authority delegated to me by the Acting Administrator of the FAA, I conclude that there is no requirement to complete a new or supplemental EIS for the Airspace Redesign project. I direct that the Agency continue its implementation of the NY/NJ/PHL Airspace Redesign project as described in the ROD published in September 2007.



John G. McCartney
Terminal Director, Eastern Service Area
Air Traffic Organization
Federal Aviation Administration

Date: 7/31/08

Right of Appeal: This decision is taken pursuant to 49 U.S.C. §§40101 *et seq.*, and constitutes an order of the Administrator which is subject to review by the Courts of Appeal of the United States in accordance with the provisions of 49 U.S.C. §46110.

For further information contact the Airspace Program Office, Federal Aviation Administration via email at 9-AEA-NY-NJ-PHL-Airspace@faa.gov.

Reference List

1. New York/New Jersey/Philadelphia Metropolitan Area Airspace Redesign Final Environmental Impact Statement (FEIS), July 2007
2. Federal Aviation Administration Order 1050.1E, “Environmental Impacts: Policies and Procedures”
3. National Environmental Policy Act of 1969 (NEPA)
4. Record of Decision (ROD) for the New York/New Jersey/Philadelphia (NY/NJ/PHL) Airspace Redesign project, September 5, 2007
5. New York/New Jersey/Philadelphia Metropolitan Area Airspace Redesign Draft Environmental Impact Statement (DEIS), December 12, 2005
6. Corrected Record of Decision (ROD), September 28, 2007
7. Letter dated February 8, 2008 from Mr. Steve F. Pflaum and Mr. Steven W. Kasten of the firm McDermott, Will & Emery on behalf of the Alliance for Sensible Airspace Planning.
8. Letter dated March 1, 2008 by Mr. Michael Kroposki, Esq.
9. Letter dated April 19, 2008 by Mr. Michael Kroposki, Esq.
10. Letter dated June 28, 2008 by Mr. Michael Kroposki, Esq.
11. Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21) of 2000
12. Notice of Proposed Amendment to the 1996 Rates and Policy Statement, Docket No. FAA-2008-0036, 73 Fed. Reg. 3310, January 17, 2008
13. Notice of amendment to policy statement, Policy Regarding Airport Rates and Charges, Docket No. FAA-2008-0036, 73 Fed. Reg. 40430, July 14, 2008
14. Order Limiting Scheduled Operations at John F. Kennedy International Airport (JFK), Docket FAA-2007-29320, 73 Fed. Reg. 3510, January 18, 2008
15. Notice of Proposed Order Operating Limitations at Newark Liberty International Airport, Docket No. FAA-2008-0221, 73 Fed. Reg. 14552, March 18, 2008
16. Supplemental Notice of Proposed Rulemaking (SNPRM) establishing a Congestion Management Rule for LaGuardia, Docket No. FAA-2006-25709; Notice No. 08-04, 73 Fed. Reg. 20846, April 17, 2008
17. Categorical Exclusion for Supplemental Notice of Proposed Rulemaking for Congestion Management at LaGuardia Airport, New York, Docket Number 2006-25709-0097
18. Categorical Exclusion for Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, New York, Rulemaking Environmental Process, Docket Number 2008-0517, CATEX at 2008-0097-0004.1
19. Notice of Proposed Rulemaking (NPRM) establishing a Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, Docket No. FAA-2008-0517; Notice No. 08-05, 73 Fed. Reg. 29626, May 21, 2008
20. U.S.C. § 47175
21. “Capacity Needs in the Airspace System 2007-2025: An Analysis of Airports and Metropolitan Area Demand and Operational Capacity in the Future”(FACT 2 Report)
22. 1996 Rates and Charges Policy Statement
23. Executive Order 13045: *Protection of Children from Environmental Health Risks and Safety Risks*
24. Sanford Fidell report, dated August 31, 2007

25. Beckman Appraisals report, dated August 31, 2007
26. Thomas/Lane Associates report, dated August 30, 2007,

Appendix A

Effect of Schedule Limits on the NY/NJ/PHL Airspace Redesign Environmental Impact Statement

Jonathan H. Hoffman

June 2008

Fiscal Year: 2008
Dept. No.: F063

Contract No.: DTFA01-01-C-00001
Project No.: 0208FB06-N1

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Abstract

The New York/New Jersey/Philadelphia Airspace Redesign was undertaken with a goal of alleviating airspace complexity to meet the increased demand forecast for the area while providing increased safety and efficiency. Schedule limits share this goal to some extent, but they are a complement, not a replacement, for airspace redesign. This document shows that schedule limits are too small a change to operating conditions to impact the conclusions of the Environmental Impact Statement, and that schedule limits can be contrary to the purpose of the airspace redesign in two important respects: that schedule limits do not increase access to the system, and they are unlikely to maintain airport throughput.

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1 Introduction

The Federal Aviation Administration (FAA) has recently taken action¹ to limit scheduled traffic at John F. Kennedy International Airport (JFK) and Newark Liberty International Airport (EWR). The New York/New Jersey/Philadelphia Airspace Redesign was developed in response to forecasts of air traffic growth in the New York and Philadelphia metropolitan areas. FAA asked MITRE's Center for Advanced Aviation System Development to investigate the influence of limited schedules on the conclusions of the Airspace Redesign.

Schedule limits are intrinsically based on a single airport. The effect of airport based initiatives on airspace issues are indirect, except in places where one major airport dominates the airspace. In the area around New York and Philadelphia, such a situation does not exist. Airspace complexity arises from the presence of five airports among the fifty busiest in the United States, none of which is greatly busier than the others. The NY/NJ/PHL Airspace Redesign was undertaken with a goal of alleviating airspace complexity to provide increased safety and efficiency.² Schedule limits share this goal to some extent, but they are a complement, not a replacement, for airspace redesign.

1.1 Summary

The demonstration that schedule limits complement, but do not replace, an airspace redesign rests upon three premises. These premises are summarized here. Each is treated in more detail in a section to follow.

1.1.1 Schedule Limits are only a Temporary Solution

The recently-imposed schedule limits are a temporary measure, designed to moderate delays until a solution to the congestion problems in the New York City area can be implemented. Schedule limits are not a solution themselves. Section 3 addresses this point.

1.1.2 Schedule Limits are not a Viable Alternative

Table ES-1 of the Executive Summary of the NY/NJ/PHL Airspace Redesign Environmental Impact Statement lists eight evaluative criteria of the purpose and need for the redesign.³ Schedule limits meet only two of those elements: reducing delay and one part of expediting arrivals and departures. Schedule limits counteract two elements: meeting system demands and improving user access, and maintaining airport throughput. The remainder of the elements are not affected by schedule limits. The details of this assessment are in Section 4.

1.1.3 Airspace Redesign is Needed at Foreseeable Traffic Levels

Two levels of traffic demand were simulated for the operational analysis. Because the impact of good airspace design is not as measurable when the traffic demand is low, the 90th percentile day was simulated for the years 2006 and 2011. The 90th percentile day reflects traffic levels that are greater

¹ *Federal Register*, Dockets FAA-2007-29320 and FAA-2008-0221. Available at <http://www.regulations.gov>

² Federal Aviation Administration, *New York/New Jersey/Philadelphia Metropolitan Area Airspace Redesign Environmental Impact Statement*, July 2007. Available at http://www.faa.gov/nynjphl_airspace_redesign/

³ For simplicity, these evaluative criteria will be called "elements" for the remainder of this paper.

than or equal to ninety percent of the traffic days for the data set, typically a year. Annual-average days (AAD) for those years were simulated to support environmental modeling, but operational metrics were not calculated at those traffic levels.

Although the benefits of the airspace redesign were calculated on the forecast 90th percentile day of traffic in 2006 and 2011, the redesign provides benefits at any level of traffic comparable to or greater than current levels, including the limited schedule. An operational analysis of the annual-average day forecast in 2011, which closely resembles the limited schedules, is given in Section 5.

2 Background

There are two parts to the background of this study. First is a review of the Airspace Redesign itself, describing the alternatives and their effects on users of the airspace, air traffic controllers, and the populations around the airports. Second is the origin of the limited schedules.

2.1 The NY/NJ/PHL Airspace Redesign

In the NY/NJ/PHL area, airspace congestion was already identified as a problem in 1998. Since then, traffic has grown, so airspace redesign addresses a current concern. It is not merely a solution to a forecast future problem: The forecasts of traffic for 2006 and 2011 included traffic patterns similar to those seen in the limited schedules proposed for summer 2008. The 2011 annual-average day (AAD), in particular, has many features in common with the limited schedule. This section describes the benefits of the Selected Project (Integrated Airspace with Integrated Control Complex, Mitigated) under those conditions.

2.1.1 Alternatives in the Environmental Impact Statement

The Environmental Impact Statement (EIS) investigated the relative performance of four alternative airspace designs: Future No Action, which described the airspace if no changes were made and served as a standard of comparison; Ocean Routing, which was proposed by the New Jersey Citizens for Environmental Research as a noise-reduction measure; Modifications to Existing Airspace, which improved operations within the current air traffic control facility structure; and Integrated Airspace, which improves air traffic control operations by relaxing the constraints of the current air traffic control facility structure. The Integrated Airspace Alternative contained two variations: with and without an Integrated Control Complex. Without an Integrated Control Complex, airspace improvements center around the expansion of the west gate and additional departure headings. With an Integrated Control Complex, airspace would be fully integrated through a shared automation platform. The Record of Decision designates Integrated Airspace with Integrated Control Complex with Mitigation as the Selected Project.

2.1.2 Operational Impacts of the Alternatives

Modifications to Existing Airspace and Integrated Airspace Without Integrated Control Complex have very small impacts on delays. Under schedule limits, airport delay changes will be smaller; jet airway delays will not change very much. These two designs were not selected for implementation; they will not be considered further.

The salient operational feature of Ocean Routing is a huge increase in route miles, and a corresponding increase in departure delay⁴. This will be less severe in the presence of schedule limits, but the change is still for the worse, and therefore the alternative still does not meet the purpose and need of the redesign. Ocean Routing might even require lower schedule limits than the current proposal to account for its negative effect on airport efficiency. This design will not be considered further.

⁴ Federal Aviation Administration, *New York/New Jersey/Philadelphia Metropolitan Area Airspace Redesign Environmental Impact Statement*, July 2007, pg. 2-34. Available at http://www.faa.gov/nynjphl_airspace_redesign/

The Selected Project has operational impacts that are strong and positive. At full implementation, its environmental impacts are slight to moderate. That is, some of the population whose day-night average noise exposure (DNL) is in the 60-65 dB range will experience increases, though none significant. While there will be some increases in noise for people already exposed to 45-60 DNL, when the project is fully implemented, many of the people exposed to noise in that range will hear decreases⁵. Fuel consumption decreases. These benefits may depend on demand levels. The rest of this paper will concern itself with this project, and how demand levels affect it.

2.2 Limited Schedules

The limited schedules for JFK and EWR were obtained by FAA from the users of the airports, pursuant to a notice in the Federal Register⁶. The reduced and re-timed schedules were developed through a process of discussion with air carriers and FAA decisions regarding carrier schedules. At JFK a scheduling reduction meeting was conducted to discuss the proposed schedule with domestic carriers. At EWR and JFK, discussions and other communications with carriers took place in accordance with the International Air Transport Association Worldwide Scheduling Guidelines.

3 Schedule Limits are Temporary

The FAA Order for schedule reduction at JFK⁷ says, "This Order took effect at 6:00 a.m., Eastern Time, on March 30, 2008, and will expire at 11:59 p.m., Eastern Time, on October 24, 2009." The FAA Order for schedule reductions at EWR⁸ took effect in June 2008 and will expire the same day as the JFK order. A recent proposed rule for JFK and EWR would adopt similar limits for up to 10 years and introduce certain market-based aspects to partially address allocation and access issues. The FAA may increase the caps if additional traffic could be accommodated. Certain hours are below the caps and future operations may increase in those hours.

Demand for air travel is based on nationwide economics and demographics. Restricting schedules artificially does nothing to address the underlying demand. LGA is a valuable case study – demonstrating that historically, air carriers and other airspace users quickly return to a formerly-restricted airport as soon as restrictions are lifted. Absent scheduling limits, demand will return to something like the forecast levels.

In accordance with the High-Density Rule⁹, LGA has been schedule-limited since 1969, during which time it has frequently ranked among the five worst-delayed airports in the United States. In 2000, pursuant to the AIR-21 Act¹⁰, an experiment in relaxing slot restrictions was undertaken. The results

⁵ EIS, *op. cit.*, Appendix E: *Noise Mitigation Report*, pg. 60.

⁶ 72 *Federal Register*, 54317 (September 24, 2007).

⁷ www.regulations.gov; Docket FAA-2007-29320. See also http://www.faa.gov/news/updates/jfk_flight_reductions/

⁸ www.regulations.gov; Docket FAA-2008-0221

⁹ Federal Aviation Regulations, Part 93.

¹⁰ *Wendell H. Ford Aviation Investment and Reform Act for the 21st Century*, Public Law 106-181.

were unequivocal. At one point after the slot restrictions were relaxed,¹¹ 100 more operations had been added, and as a result, 25% of the delays in the entire US were attributed to LGA¹².

JFK was also schedule limited, until the same AIR-21 Act caused a sunset of the limits in January 2007 after which JFK likewise incurred large delays. Other airports in the region without schedule limits are also subject to delays and congestion due to current airspace limitations.

4 Schedule Limits and the Purpose of the Redesign

The air traffic control system provides a service to users of the national airspace system. Therefore, the performance of the system depends on the demand for its services. Section 4.1 describes the ways system performance metrics can behave in response to a change in traffic. Section 4.2 applies these general behaviors to the specific elements of the operational analysis of the airspace redesign.

4.1 Effects of Schedule Reduction on Metrics

A variety of metrics were computed in the EIS to encompass the range of stakeholder perspectives on performance of the air traffic management system. Some metrics will change by a large amount as traffic is added, some will change linearly, and some will change slowly or not at all.

4.1.1 Metrics that Grow Faster than Linearly with Traffic

Fewer flights mean lower delays in both No Action and the Selected Project. Since delay grows fastest when traffic is added to the busiest hours of the existing schedule (the “peaks”), the delay benefits of the redesign under schedule limits will be reduced as a percentage of their No Action values. Fuel consumption benefits depend on delay, so it is also possible for fuel consumption benefits to be smaller than they would be under unconstrained demand.

4.1.2 Metrics that Grow Linearly with Traffic

On balance, unimpeded flight routes are slightly longer under the Selected Project. Fuel and time cost of extra route miles might overtake delay benefits at sufficiently low traffic levels¹³. Air-ground communication workload metrics are linear in total traffic, but not dependent on the highest peak in the schedule (see section 4.1.4 below).

4.1.3 Metrics that Grow Slower than Linearly with Traffic

Noise exposure is logarithmic in traffic levels, so if traffic counts change by the same percentage before and after a redesign, DNL changes are not affected. Noise levels at population points can drop below one of the thresholds if forecast traffic is lower. If other things (mixture of types of aircraft, arrival/departure procedures, fraction of operations at night) are equal, a change in the number of

¹¹ Slots were relaxed for flights by new entrant carriers and for service to small hub and non-hub airports.

¹² Hoffman, J., *Demand Dependence of Throughput and Delay at New York LaGuardia Airport*, McLean, VA, MITRE Corporation, MP01 W078, April 2001.

¹³ EIS, *op. cit.*, Appendix C, pg. xxvi. Appendix R, Table 2, shows that the break-even traffic level is below the annual-average level for 2011.

flights will produce a change in DNL that depends on the logarithm of the change.¹⁴ For example, if the traffic decreases to 50% of its original value, the DNL will decrease by $10 \cdot \log_{10}(0.5) = 3$ dB.

Noise impacts in an EIS are expressed in terms of changes in DNL.¹⁵ A “significant impact” is one that (a) increases noise by 1.5 dB or more, and (b) results in a noise exposure above 65 dB DNL. There are two classes of “slight to moderate” impacts in the EIS: where the noise increases by 3 dB, resulting in a DNL between 60 and 65 dB; and where the noise increases by 5 dB, resulting in a DNL between 45 and 60 dB.

If traffic counts change by the same multiplier in baseline and alternative, all other things being equal, the baseline and alternative DNL will change by the same amount. In this case, the noise exposure change due to the alternative will be the same for both traffic counts. In the event of a schedule reduction, noise levels at population points can drop below one of the statutory thresholds if forecast traffic is lower. For example, consider a point at 64 dB DNL in the unlimited-schedule case, which sees a 2 dB increase due to the alternative. This hypothetical point sees a significant noise increase ($64+2 > 65$). If schedules are capped, so that the noise exposure drops to 62 dB in the baseline, then the 2 dB increase in DNL is no longer significant ($62+2 < 65$). In fact, this point is not even exposed to slight-to-moderate change, since noise changes of 3 dB are a slight-to-moderate change at this level.

It is possible that not all other things will be equal, when schedules are limited. Other changes may occur:

- Each flight shifted into night-time hours (10:00pm to 7:00am) effectively adds nine aircraft on existing tracks. The number of night-time flights is the same in the No Action Alternative and Selected Project, therefore impacts are constant. If the limited schedules push flights into the night-time hours, population points may move into higher-impact categories.
- If traffic is shifted within daytime hours, there is no impact.
- If traffic moves to alternate airports in the study area, noise increases are possible in that area.

4.1.4 Metrics that are Insensitive to Traffic Peaks

The metrics that are derived from airborne behavior alone will not be sensitive to peak traffic in the schedule. Airborne metrics, regardless of schedule, are derived from aircraft populations that have already been moderated by the effects of runway capacity. For example, a hypothetical airport could have a capacity of 60 departures per hour. If 100 departures were scheduled there in an hour, the airspace would see 60 aircraft in that hour, and 40 in the next hour. If the air carriers were then limited by regulation to 60 departures per hour, the schedule would have 60 departures that hour, and 40 some other hour. The airspace would see the same 60 flights per hour in either case, so schedule limits would not cause a change in airborne metrics.

¹⁴ EIS, *op. cit.*, Appendix E: *Noise and its Effect on People*, pg. 2.

¹⁵ FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, Section 14.4d.

Since the proposed schedule limits are based on the airports' runway capacities, their airborne metrics will be very similar to the values calculated from unconstrained schedules. The times of day at which these metrics accumulate may be different, but their systemwide value will not.

For example, jet airway delay occurs when airports are launching aircraft near their maximum rate. (The maximum rate is achieved when an airport operates at its capacity for a given configuration.) The number of hours scheduled near the maximum rate may change, if overall traffic is not reduced, but at the jet airways, the traffic will appear the same as if the scheduled peaks were still in place.

4.2 The Purpose of the Airspace Redesign

Table 2-6 of the EIS¹⁶ provides a summary of the evaluation of the purpose and need for the redesign using eight elements: reduce complexity; reduce (pilot-controller) voice communications; reduce delay; balance controller workload; meet system demands and improve user access to the system; expedite arrivals and departures; increase flexibility in routing; and maintain airport throughput. These eight evaluation elements, comprising thirteen metrics, are designed to address different views of the system held by different stakeholders.

4.2.1 Reduce Complexity

There is no consensus on how to measure complexity of airspace directly. Therefore, the EIS used the impact of complexity on users as its measure. Departing aircraft can be delayed as they are spaced properly for their jet airway, and they may be held to lower altitudes to maintain separation from aircraft above them. Departure complexity is therefore the sum of the jet airway delay and the time below 18,000 ft (above sea level). Arriving aircraft see complexity in the form of extra vectoring for the arrival runway. Therefore, the average distance flown by arrivals below 18,000 ft is the measure of arrival complexity.

Departure complexity, as has been mentioned above, occurs after runway capacity limits on the ground have already moderated the traffic entering the airspace. That is, large numbers of aircraft scheduled to depart in the heaviest periods of demand at the airport are never realized in the airspace due to the airport limitations. Consequently, departure complexity is a purely-airborne metric, insensitive to schedule limits.

Arrival complexity can be expected to decrease by a small amount, as the job of sequencing the aircraft is potentially simpler. However, the majority of arrival delay in an unlimited schedule is due to enforcement of airport arrival rates by the Traffic Flow Management Units of the various facilities, before the aircraft descend below 18,000 ft. The total amount of vectoring will be linear with traffic peaks, but the average metric will be affected less than linearly.

4.2.2 Reduce Voice Communications

As was described in Appendix C of the EIS, calculating the absolute number of voice communications involved in any particular airspace design would be a formidable task. Fortunately, only the reduction in voice communications needs to be calculated. Any voice communications that will be constant across all alternatives do not need to be calculated here. For most communications, the timing of the communication changes, but the number does not.

¹⁶ This table is also in the Executive Summary as Table ES-1.

The communication loads that will change systematically due to the airspace redesign are those due to handoffs of aircraft across facility boundaries. This is related to the number of aircraft crossing a facility boundary in each hour. The maximum hourly count of aircraft crossing a boundary over the simulated period was the metric.

The total number of aircraft crossing a boundary per day is reduced by schedule limits, but the maximum is not. This metric is insensitive to changes in schedule peaks.

4.2.3 Reduce Delay

Schedule limits reduce delay, as long as delay is measured with respect to published schedules (as the Bureau of Transportation Statistics measures it) or with respect to unimpeded transit times (as FAA's OPSNET¹⁷ system measures it). This metric grows faster than linearly as traffic peaks grow, so when schedule limits are in place, the benefits of delay will decrease compared to the 90th percentile day that was used for the EIS.

Section 5 of this paper will address the delay question in detail.

4.2.4 Balance Controller Workload

The changes in controller workload balance came primarily from changes to New York Metro departures. The distribution of traffic over departure fixes and departure routes is the major difference among the alternatives. For this metric, the difference between the share of New York Metro traffic allocated to each fix in a gate was measured with a metric¹⁸ that is zero when all fixes have the same traffic and one when one fix has all the traffic.

As with other purely-airborne metrics, such as the departure complexity described above in section 4.2.1, the balance of controller workload is insensitive to schedule peaks. The metric will be unaffected by schedule limits.

4.2.5 Meet System Demand and Improve User Access to System

The operational analysis report stated¹⁹

Ideally, user access would be defined as a number of aircraft per day, computed via a feedback process in which traffic that can not be accommodated by the system drops out of the demand files. Unfortunately, changing traffic in this manner would make it impossible to compare delay and throughput metrics among plans (as well as introducing assumptions about user priorities that would complicate the design process).

¹⁷ Operations Network (OPSNET) is the FAA's vehicle for the collection of delay and traffic count data. See FAA Order JO 7210.55D.

¹⁸ This metric is called the "Gini index". See Appendix C of the EIS, Section 9.1.4, and references therein.

¹⁹ EIS, *op. cit.*, Appendix C, section 9.1.5

Instead, as is usual in ATM simulations, this analysis maintained the demand as the fixed, independent quantity. The simulated airport keeps running to meet the demand, even if that requires operations very late into the night. The metric for user access in this case is the time at which the last arrival push of the evening finally is completed. (In New York, the last scheduled operations of the day are typically arrivals.)

Schedule limits are a way of imposing from a change in traffic from outside the system, specifically to prevent the imbalance between capacity and demand that this metric measures. Consequently, the rationale for measuring user access with this metric no longer applies.

In the face of this change in operating assumptions, a new way of measuring this element of the purpose and need must be found. Figures 1 and 2 show the difference between unconstrained and limited schedules.

Schedule limits directly impede user access to the system. Schedule limits, by construction, do not meet system demand. On the annual average day, four to seven hours show access that will be denied at the two airports. On the higher-traffic days, as many as 11 hours of system demand will not be met at the capped level. Of course, access to the airport has not been denied (see the total traffic counts in Section 5 below), but access at desired times is not available. Especially for international carriers, who frequently connect to airports with curfews (e.g., Tokyo Narita) or specifically-timed slots (e.g., London Heathrow), only the desired time meets their business requirements.

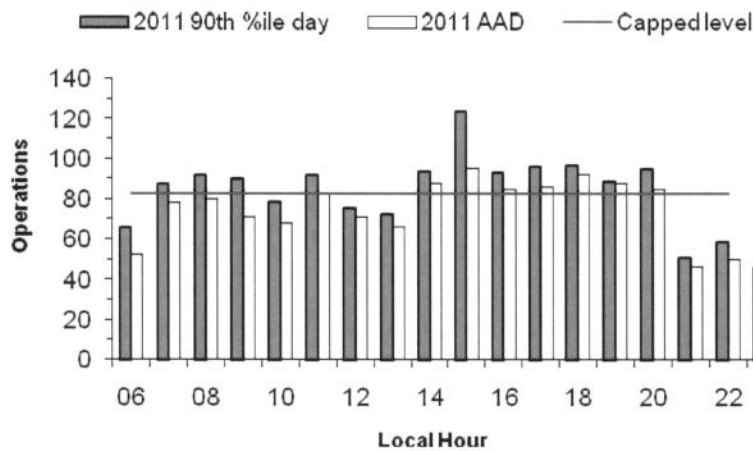


Figure 1. Forecast and Limited Schedules at EWR

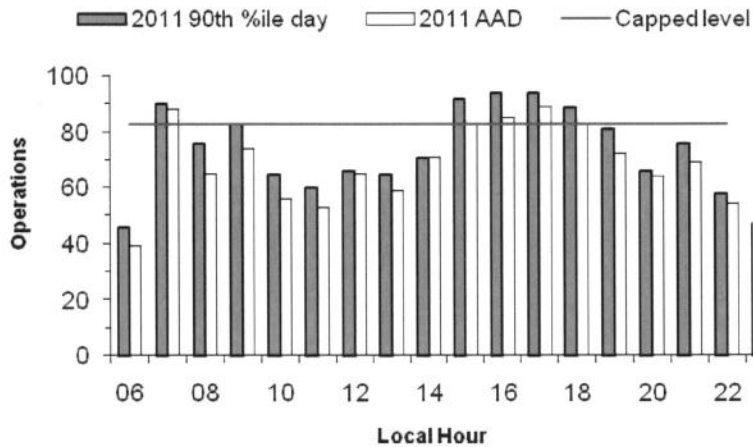


Figure 2. Forecast and Limited Schedules at JFK

4.2.6 Expedite Arrivals and Departures

Three things can get in the way of expeditious arrivals and departures at a large terminal like the ones in New York and Philadelphia. First, there are delays in the airspace due to volume. Second, there is excess routing distance due to procedural separation of flows. Third, altitude restrictions can keep aircraft at low altitudes where speeds are limited. In the (current) terminal area, these three effects are combined by calculating the time spent below 18,000 feet. The three causes are combined because any decrease in the time, regardless of which of the causes has been ameliorated, is an equivalent benefit to users.

Delays in the airspace due to volume are experienced by flights whose departure times have already been moderated by runway capacity, as described in 4.1.4 above. They are measured by a purely-airborne metric that is insensitive to schedule limits. Excess routing distance and altitude restrictions are fixed parts of the airspace design, so they are insensitive to demand in general, as well as to schedule limits.

4.2.7 Flexibility in Routing

Flexibility in routing matters most on days of severe weather, when the system operations are disrupted. These tend not to be the days of highest traffic, as airlines cancel flights that will be unable to depart in a reasonable time. For this reason, routing flexibility was simulated on the annual-average day, not the 90th percentile day. Since the metric was calculated on a day equivalent to the limited-schedule day, there will be no change to the metric.

4.2.8 Maintain Airport Throughput

Airport throughput is the number of flights that an airport can launch or land in an hour. When the airspace is efficient, airport throughput can be as high as the runway capacity. Schedule limits can maintain airport throughput only if they are set to the airport's highest-capacity configuration. If this is done, whenever that configuration is unavailable, delays will result. Therefore, schedule limits are typically set to a somewhat-lower value. If the schedule is limited to a lower value, during times when the highest-capacity configuration is in use, airport throughput cannot be maintained. Table 1 shows the lower values used in limiting the schedules.

Table 1. Maximum Throughputs and Schedule Limits

	Maximum Throughput (flights per hour, Future No Action)			Limited Schedule	Difference
	Arrival	Departure	Total	Maximum	
EWR	44	55	99	81	-18
JFK	44	50	94	83	-11

As was stated in the operational analysis²⁰,

Airports are frequently observed to handle more arrivals and departures than their declared capacity would permit, for a short time. TAAM simulations show the same effect. For this metric, the sustained throughput was used. Sustained throughput must continue for at least two consecutive hours.

This situation, where the airport handles traffic above its declared capacity, generally occurs when air traffic controllers can find opportunities to sequence flights in a highly-efficient way that can not be assumed when capacity is calculated. It is a response to high demand, and is the last resort in avoiding delays. Schedule limits make this situation very rare. Schedule limits, therefore, impede the ability of the system to maintain airport throughput.

4.2.9 Summary

The impacts on the various purpose and need elements are summarized in Table 2. The column "Effect of Schedule Limit on Metric" describes how the schedule limits will change the value of the metric for any single alternative. The column "Effect of Schedule Limit on Benefit" describes how the difference between Future No Action and the Selected Project will change. For example, if the metric is affected the same way in both alternatives, the effect on the benefit will be zero.

If a single Alternative under unconstrained demand is compared to its performance under schedule limits, limiting schedules would improve six of the metrics. A limited schedule could possibly have a small positive change to two others. It would not affect five metrics. For six of the metrics used to evaluate the Purpose and Need, the benefits of the Selected Project would be reduced by limiting schedules. The other seven benefit measures would be unaffected.

²⁰ *ibid.*, Section 9.1.8

One of the metrics, Meet System Demand and Improve User Access to System, was developed under conditions that are invalidated by schedule limits. The purpose and need element measured by this metric would in fact be harmed by schedule limits.

Because reducing delay is not the sole purpose of the airspace redesign, schedule limits are not a viable solution to the congestion problems in the NY/NJ/PHL area.

Table 2. Summary of Purpose and Need Elements

System Improvement	Metric	Effect on Metric	Effect on Benefits
Reduce complexity	<i>Jet route delays + time below 18,000 ft (min)</i>	0	0
	<i>Arrival Distance below 18,000 ft (nmi)</i>	small	0
Reduce voice communications	<i>Max Inter-facility handoffs per hour</i>	0	0
Reduce delay	<i>Traffic-weighted Arrival Delay 2011</i>	reduce	reduce
	<i>Traffic-weighted Departure Delay 2011</i>	reduce	reduce
Balance controller workload	<i>Equity of westgate fix traffic counts</i>	0	0
Meet system demands & Improve user access to system*	<i>End of day's last arrival push</i>	earlier	nullify
Expedite arrivals and departures	<i>Time below 18,000 ft (min)</i>	0	0
	<i>Change in Route Length per flight (nmi)</i>	small	0
	<i>Change in block time (minutes per flight)</i>	reduce	reduce
Flexibility in routing	<i>Delay per flight on a severe-weather day (min)</i>	0	0
Maintain airport throughput <i>(total of maximum sustainable throughput)</i>	<i>Arrivals</i>	reduce	nullify
	<i>Departures</i>	reduce	nullify

*The premise of this metric is invalidated by schedule limits.

5 Airspace Redesign Benefits at Limited Traffic Levels

This section shows the effect of schedule limits on the input and output of the operational simulations in the EIS. First, the difference in input demand between the limited schedules and the forecast schedules used in the EIS was investigated. Four levels of traffic were simulated in the process of developing the EIS: The 90th percentile traffic days in 2006 and 2011 for the operational analysis, and the annual-average day in 2006 and 2011 for the environmental analysis. The limited schedules were found to be very similar to the forecast of the annual-average day in 2011. Therefore, a good estimate of system performance can be obtained by extracting operational metrics from the output of these simulations. The result was a set of metrics comparable to the entries in the EIS metrics tables for the Future No Action Alternative and the Selected Project.

This section is written airport by airport, since schedule limits affect one airport at a time. There are also interaction effects between flows to the various airports, but as demonstrated above, these are purely-airborne effects and are not much affected by schedule limits.

5.1 EWR

EWR is the location of much of the operational benefit of the preferred alternative, as well as many of the environmental impacts. Figures 3 and 4 compare the four forecast levels of traffic from the EIS with the limited schedules for August 2008.

5.1.1 Changes to Traffic

The total traffic on the 2011 annual-average day is very close to the traffic in the limited schedule. Table 3 gives the exact numbers, including 2 general-aviation operations per hour, which may or may not occur. The limited schedule for August 2008 is similar in hourly pattern to the forecast 2011 AAD. The total traffic is 9% below forecast. The peak traffic loads are similar. The off-peak traffic is lower from 0800 to 1059 (local time). Traffic is also higher from 1100 to 1259 and 2100 to 2159. There does not appear to be a shift from day to night operations (after 2200 local time).

Compared to the 90th percentile day, the limited traffic schedule is missing the large arrival peaks between 1500-1659 and 1800-1959 local time. The morning departure peak, a common feature of all New York airports, is present, though one hour later than the forecast. The afternoon departure peak around 1600 is greatly reduced. Otherwise the traffic patterns are similar.

Table 3. EWR traffic levels simulated in the EIS

Schedule	Operations 6:00 AM - 10:00 PM		Difference from 2008 limited schedule		
	Departures	Arrivals	Departures	Arrivals	Total
2008 Limited	673	636	-	-	
2006 Average Day	656	597	-3%	-6%	-4%
2006 90th percentile	733	681	9%	7%	8%
2011 Average Day	673	611	0%	-4%	-2%
2011 90th percentile	751	703	12%	11%	11%

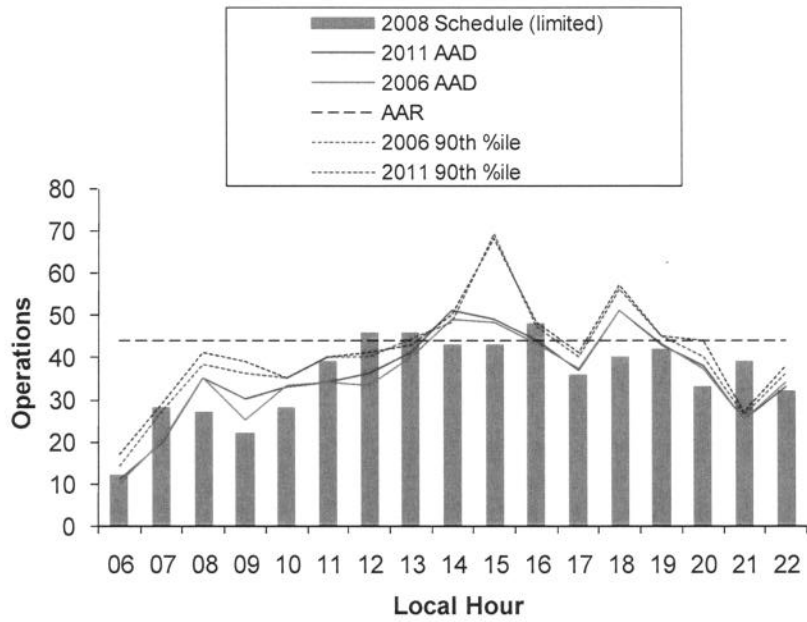


Figure 3. EWR Arrival Demand, Forecast and Limited Schedule

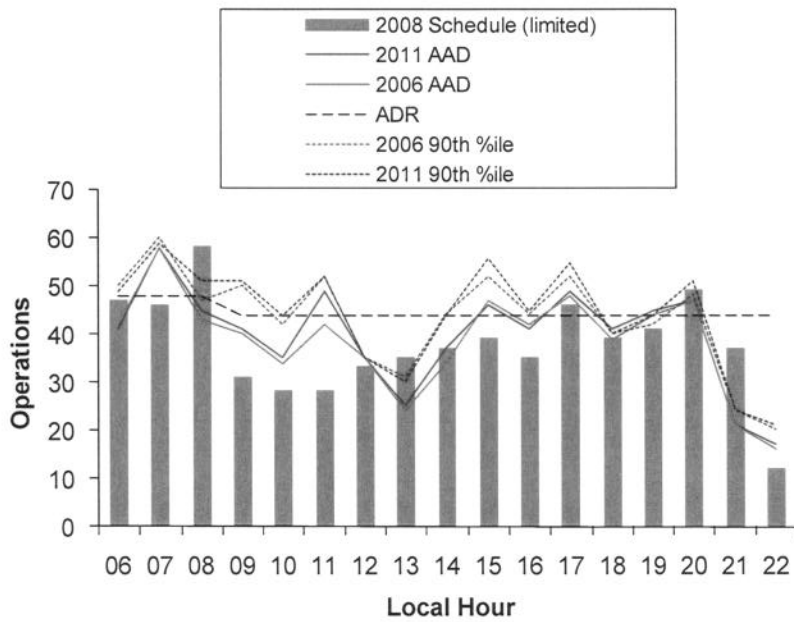


Figure 4 EWR Departure Demand, Forecast and Limited Schedule

5.1.2 Environmental Impact

Environmental impact was assessed on the basis of the annual-average day, as required by Federal Aviation Regulation Part 150.²¹ The annual-average day at EWR is very close to the limited -schedule in total operations during the day.

Schedule limits do not apply at night, so night-time flights must be added to the limited schedule to create a schedule appropriate for estimating the noise impact. Figures 3 and 4 show that the forecast traffic and the limited schedule are not very different toward the end of the schedule limit period, so there is no reason to suppose that schedule limits will change the number of night-time flights at EWR. If we apply the night-time traffic pattern from the 2011 annual-average day to the limited schedule, the resulting total number of flights is:

$(673 \text{ departure} + 636 \text{ arrival day-time}) + (54 \text{ departure} + 98 \text{ arrival night-time}) = 1461 \text{ operations.}$

The traffic modeled in the EIS is 1433 operations, which is within 2% this level. It should be noted that the annual-average traffic forecast shows that the full allowance of general-aviation flights is not likely to be used, so the traffic under schedule limits might be as much as 32 fewer than 1461, which would mean that the limited schedule is within 0.5% of the forecast.

The difference in noise between the annual-average day forecast and the limited schedule is technically a decrease, but it is a decrease between 0.007 and 0.02 dB, far below the ability of the ear to hear or models to detect. Therefore, the environmental impact of the change in schedule is zero.

5.1.3 Operational Impact

The operational impact estimates in the EIS were based on the 90th percentile day. Since delay is non-linear with respect to traffic, the delay benefits with a limited schedule would be different from the estimates in the EIS. However, as noted above, the annual-average day is comparable to the limited schedule. In the EIS, the annual-average day was also simulated for the fuel-consumption analysis. The delay output of those simulations is directly applicable here, and no new simulation studies need be undertaken. The results are shown in Figure 5. The overall delay reduction on the annual-average day is 2.7 minutes per flight, as compared to 7.2 minutes per flight on the 90th percentile day.²²

Arrival delay dominates EWR delays at the 90th percentile traffic level. EWR is geographically small, and arrivals must be delayed to avoid overwhelming the gates and taxiways. At annual-average levels of traffic, there is less need to limit arrivals. Arrival delays diminish below departure levels.

²¹ EIS, *op. cit.*, Appendix E: *Noise Modeling Technical Report*, pg. E-1.

²² EIS, *op. cit.*, Appendix C, Figures 9-10 and 9-11.

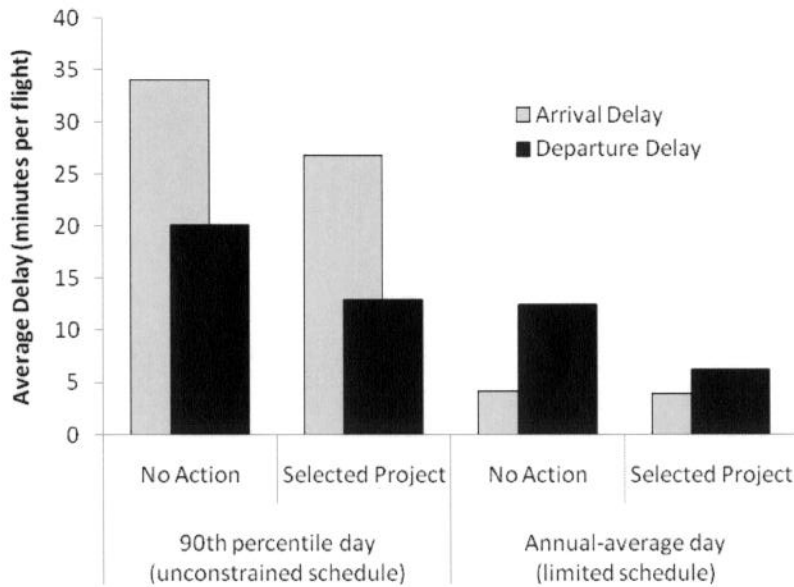


Figure 5. Airport Delays at EWR, Unconstrained and Limited Schedules

5.2 JFK

Figures 6 and 7 show the unconstrained forecasts and the limited schedule for August 2008.

5.2.1 Changes to Traffic

The number of flights in the August 2008 limited schedule is higher than the number in the 2011 forecast AAD, and lower than the 2011 90th percentile forecast. Table 4 gives the exact numbers, with slots for unscheduled operations included.

Table 4. JFK traffic levels simulated in the EIS

Schedule	Operations 6:00 AM - 11:00 PM		Difference from 2008 limited schedule		
	Departures	Arrivals	Departures	Arrivals	Total
2008 Limited	651	633	-	-	
2006 Average Day	548	563	-16%	-11%	-13%
2006 90th percentile	607	608	-7%	-4%	-5%
2011 Average Day	602	614	-8%	-3%	-5%
2011 90th percentile	654	665	0%	5%	+3%

The hourly demand patterns are very similar. The peak traffic in the forecast is just below the peak in the capped schedule. Off-peak traffic in the forecast can be as many as 10 operations below capped schedule (e.g., arrivals between 2000 and 2059), or 10 operations above (e.g., departures between 1600 and 1659). Total traffic is 4% above the forecast.

The 90th percentile traffic exceeds the limited schedule in the afternoon. Forecast departures are higher in the 1700-1859 hours. Forecast arrivals are higher than schedule limits from 1600-1659 and from 2200 to 2259.

5.2.2 Environmental Impact

Environmental impact was assessed on the basis of the annual-average day. The limited-schedule total demand is 3% above this level during the day. As was the case at EWR, night-time flights from the annual-average day can be added to the day-time limited schedule to estimate the effects on noise exposure.

$(641 \text{ departure} + 633 \text{ arrival day-time}) + (32 \text{ departure} + 36 \text{ arrival night-time}) = 1342 \text{ operations.}$

There is one additional complication, however. Since the limited arrival schedule between 2200-2259 is 20 operations above the forecast, the fraction of night-time operations will not be the same. The additional night-time flights, because they have the potential to disrupt sleep, count ten times as much to the day-night average noise level as flights during the day. So adding an additional 9 operations for each flight moved past 2200 local time gives:

$$1342 + 9 * 20 = 1522 \text{ effective operations.}$$

The noise-effective traffic level is therefore about 18% above the AAD forecast. Including this correction, these changes are likely to cause an increase in DNL, relative to the uncapped schedule in the EIS, of about 0.7 dB. This increase applies both to No Action and the Selected Project.

Since this is a noise increase, it is possible that a population point could move into one of the reportable categories of noise as a result of the schedule limits. A population point that was calculated in the EIS to have a noise exposure (under the Selected Project) between 64.3 and 65 dB DNL, and a noise increase of 1.5 dB, would experience a significant increase in noise due to the selected project with schedule limits. No such point exists in the noise modeling done for the EIS in the vicinity of JFK. A population point calculated to have a noise exposure between 59.3 and 60 dB DNL, and a noise increase of 3 dB, could experience a slight-to-moderate increase in noise as a result of the Selected Project with schedule limits. The same situation applies for a population point between 44.3 and 45 dB DNL that experiences an increase of 5 dB. No point meeting either of these descriptions is found in the noise modeling results, either. This is consistent with the findings of the categorical exclusion of the schedule limits from environmental impact analysis.

The Selected Project's changes to procedures around JFK caused very few noise impacts. There are no reportable differences between the noise exposures caused by schedule limits. No change is expected to the conclusions of the EIS.

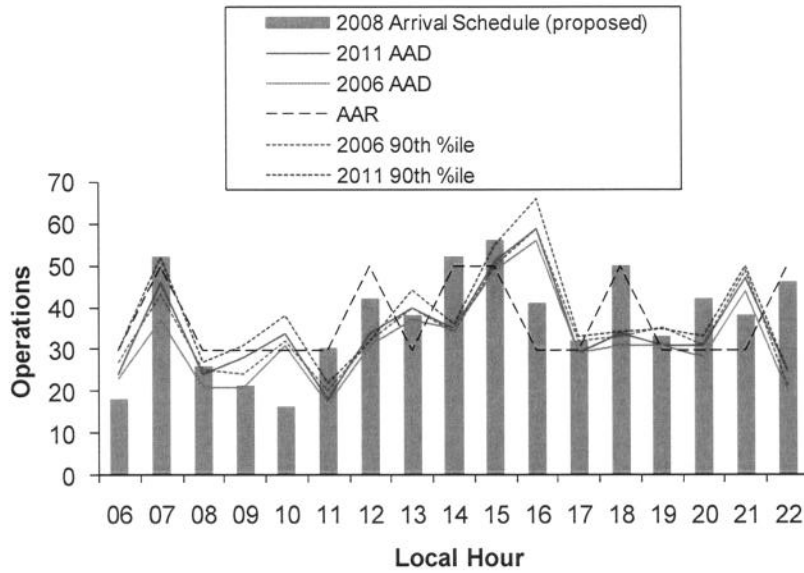


Figure 6. JFK Arrival Demand, Forecast and Limited

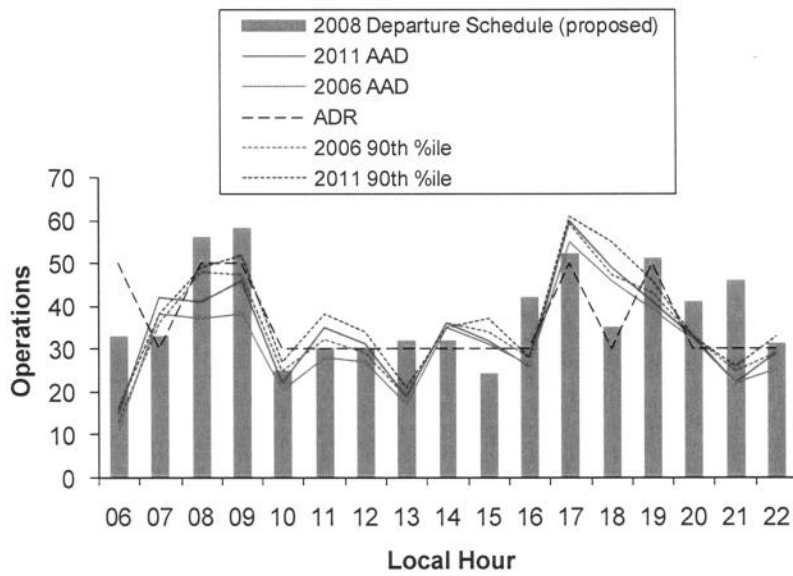


Figure 7. JFK Departure Demand, Forecast and Limited

5.2.3 Operational Impact

The operational impact estimates in the EIS were based on the 90th percentile day. As shown in Table 4, the limited schedule lies between the 90th percentile day and the AAD. Delay results for both are given in Figure 8. The overall delay reduction is 2.4 minutes per flight on the AAD, close to the 2.3 minutes per flight on the 90th percentile day.²³

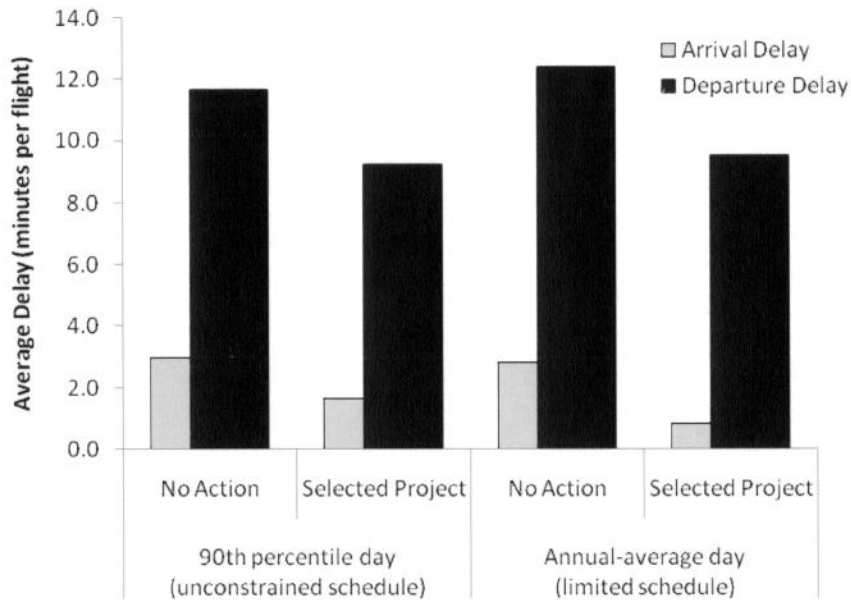


Figure 8. Airport Delay at JFK, Unconstrained and Limited Schedules

Departure delays dominate JFK at both the 90th percentile and annual-average traffic levels.²⁴ There is little difference between the delays at the two traffic levels because this metric is purely airport delay, and the unconstrained schedule does not put as much strain on the runways as is the case at EWR. Since the two simulated cases have similar delay performance, and the limited-traffic schedule lies between the two presented here, the effect of the Selected Project on JFK delays will look very similar. No change to the conclusions of the EIS will result.

²³ EIS, *op. cit.*, Appendix C, Figures 9-6 and 9-7.

²⁴ The departure delay is actually slightly less in the unconstrained-schedule case than in the limited-schedule case. This is because JFK operates most efficiently when the airport can be configured to favor arrivals over departures, or vice versa. The limited schedule has lower peaks, so the demand spreads out into more hours, making it more likely that the demand will be an equal mixture of arrivals and departures.

5.3 LGA

Demand at LGA has been limited since 1969. Schedule limits were kept in place in the analysis of all Alternatives. No changes to the environmental or operational metrics are likely. No change to the results of the operational analysis in the EIS is expected.

5.4 PHL

No limits on demand at PHL are currently contemplated. No change to the results of the operational analysis in the EIS is expected.

6 Recommendations

This paper has presented an expansion of the results of the operational analysis supporting the NY/NJ/PHL Airspace Redesign Environmental Impact Statement. Based on these operational simulations, it has been shown that the conclusions of the operational analysis hold under widely-varying levels of assumed input demand for air traffic control services.

The findings of this analysis are:

- Schedule limits do not solve problems of airspace congestion. They postpone them, at best.
- The schedule limits at JFK and EWR neither increase nor reduce reportable environmental impacts.
- The Selected Project remains beneficial in both time and fuel, with limited schedules as with unconstrained forecasts.
- Even if schedule limits at JFK and EWR were to be extended beyond their current expiration date, they would not affect the conclusions of the airspace redesign EIS.

As a result, it is recommended, if the only change to operating conditions is a limit to the assumed scheduled demand at EWR and JFK, that no re-evaluation of the Record of Decision is necessary.

Appendix A List of Acronyms

AAD	Annual-average Day
ATM	Air Traffic Management
dB	Decibel
DNL	Day-Night Average Sound Level
EIS	Environmental Impact Statement
EWR	Newark Liberty International Airport
FAA	Federal Aviation Administration
JFK	John F. Kennedy International Airport
LGA	New York LaGuardia Airport
NJ	New Jersey
NY	New York
PHL	Philadelphia International Airport
TRACON	Terminal Radar Approach Control Facility