

# EXECUTIVE SUMMARY

The Federal Aviation Administration (FAA or Agency) is considering Federal actions requested to support a proposal by the City of Chicago (City) to modernize Chicago O'Hare International Airport (O'Hare or Airport). The City seeks FAA approval to amend its Airport Layout Plan (ALP) and seeks Federal funding for improvements to address existing and future delay and capacity problems. The FAA has prepared this Environmental Impact Statement (EIS) to take a hard look at and disclose potential environmental impacts of the City's proposal and reasonable alternatives pursuant to the National Environmental Policy Act (NEPA) and other applicable Federal environmental laws.

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## I. BACKGROUND

The City's proposal, referred to as the O'Hare Modernization Program (OMP), provides for reconfiguration of the airfield as shown in **Exhibit 1**, along with associated terminal and support facilities, and related land acquisition. The FAA determined that the proposed action involves major Federal actions requiring preparation of an EIS. On July 17, 2002, the FAA issued a Notice of Intent to prepare an EIS and conduct the scoping, including public meetings. As a result, the FAA gained insight at the start of this process from other Federal agencies, as well as state and local jurisdictions, advocacy groups and the general public, as to issues of importance for consideration in this EIS.

A Draft EIS was issued for agency and public comment on January 21, 2005. In response to requests for an extension of the comment period, the FAA extended the deadline for comments to April 6, 2005, for a total of 75 days. All comments received on the Draft EIS have been reviewed and considered. The FAA's detailed responses are provided in the Final EIS in **Appendix U, Response to Comments**. In addition, the EIS has been revised to incorporate additional information and/or to expand or further clarify the analyses for a number of topics including, among others, alternatives, Section 4(f)/6(f), air quality, environmental justice, and mitigation. One specific addition to the Final EIS was the identification of Alternative C, the City's OMP, as the Agency's Preferred Alternative. A more detailed description of the changes between the Draft EIS and the Final EIS is included in **Section I.E.** of this Executive Summary. This Final EIS will serve as the basis for the FAA to issue its Record of Decision (ROD).

### A. Purpose of Preparing the EIS

The purpose of preparing an EIS is to investigate, analyze, and disclose the potential impacts of proposed Federal actions and their reasonable alternatives. The EIS serves to document and disclose to agency decision-makers as well as the public the environmental consequences of the proposed action and reasonable alternatives. The EIS aids the FAA in making informed decisions and taking actions that protect and may enhance the environment.

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## B. Proposed Federal Actions

The Federal actions associated with the proposed development are:

- Approval of an Airport Layout Plan (ALP) depicting the proposed project,
- Eligibility for Federal funding under the Airport Improvement Program (AIP) and to impose and expend passenger facility charges (PFCs),
- Establishment of air traffic control and airspace management procedures designed to affect the safe and efficient movement of air traffic to and from the proposed runways, as well as in the airspace surrounding the airport,
- Establishment of flight procedure modifications,
- Certifications as to the safety of instrumentation, procedures, and airfield operations, and
- Installation and/or relocation of navigational aids associated with the proposed new and relocated runways.

## C. Responsibility for Preparing the EIS

FAA is responsible for the preparation and content of this EIS. The FAA is also responsible for reviewing and verifying the accuracy of any environmental information provided by outside entities. The FAA selected a Third Party Contractor (TPC) to prepare this EIS. The FAA also utilized its TPC to independently evaluate environmental information submitted by the City (Airport Sponsor) or other entities that would become a part of the environmental analysis for this EIS.

## D. Agency Coordination and Public Involvement

The FAA has committed to public involvement and agency input throughout this EIS process. The FAA *Community Involvement Policy Statement*, dated April 17, 1995, clearly affirms:

The Federal Aviation Administration (FAA) is committed to complete, open, and effective participation in agency actions. The agency regards community involvement as an essential element in the development of programs and decisions that affect the public.

Additionally, *Chapter 2, Paragraph 208b. of FAA Order 1050.1E* states:

At the earliest appropriate stage of the action and early in the process of preparing NEPA documentation, the responsible FAA official, or when applicable, the project proponent, must provide pertinent information to the affected community and agencies and consider the affected communities' opinions (40 CFR 1501.2). The extent of early coordination will depend on the complexity, sensitivity, degree of Federal involvement, and anticipated environmental impacts of the proposed action.

In Chapter 7, paragraph 74 of *FAA Order 5050.4A*, as a part of public involvement, the lead agency is encouraged to invite Federal or state agencies that have "jurisdiction by law in areas that may be affected by airport development" to serve as cooperating agencies. These agencies may have expertise in a given area, or assure that the proper permits, licenses, or other requirements are met throughout the development of the EIS.

In an effort to meet and exceed this guidance, the FAA developed and implemented a comprehensive and proactive public involvement program. The facets of the program included:

- Public and Agency Scoping;
- Agency Coordination including initiatives with Cooperating Agencies;
- Public Outreach Program including extensive Environmental Justice Outreach;
- Public Hearings at three separate locations, over three days;
- Utilization of the World Wide Web including the development and implementation of two public websites updated throughout the EIS process: the O'Hare Modernization EIS Website at [www.ompeis.net](http://www.ompeis.net), as well as the O'Hare Modernization Program Document Library file sharing site at: [www.agl.faa.gov/OMP/](http://www.agl.faa.gov/OMP/). In order to provide early access to key information prior to release of the Draft EIS, the FAA began posting modeling data and other EIS-related documentation in July 2004. Through November 2004, FAA has posted over 7.5 millions pages related to O'Hare.

The FAA acknowledges and appreciates the significant role played by the following agencies in this EIS process by serving as cooperating agencies: United States Environmental Protection Agency (USEPA), Illinois Environmental Protection Agency (IEPA), United States Army Corps of Engineers (USACE), United States Fish and Wildlife Service (FWS), and Federal Highway Administration (FHWA). FAA also acknowledges and is thankful to the Illinois Department of Transportation (IDOT) and Illinois Department of Natural Resources (IDNR) for their participation in a cooperative fashion even though they did not accept "formal" cooperating agency status. In addition to formal cooperating agency contacts, FAA worked closely with numerous other Federal, state and local agencies throughout the EIS process, including Northeastern Illinois Planning Commission (NIPC), United States Department of Agriculture (USDA), Department of Interior (DOI), National Park Service (NPS), Advisory Council on Historic Preservation (ACHP), Illinois Historic Preservation Agency (IHPA), Illinois State Toll Highway Authority (ISTHA), Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), Regional Transportation Authority (RTA), and Chicago Area Transportation Study (CATS). These extensive contacts benefited the FAA by giving a substantial amount of information and perspective on the proposed development from the viewpoint of the other agencies. These meetings also were intended to enhance the ability of those entities to comment meaningfully, both during the development of the Draft EIS, in the formal comment period thereafter, and in the preparation of the Final EIS.

Simultaneously with preparation, distribution, and review of this EIS, the U.S Army Corps of Engineers (USACE) is reviewing and processing a Section 404 permit application and pre-discharge notification per the requirements of the Clean Water Act, as submitted by the City of Chicago Department of Aviation (DOA). Similarly, the Illinois Environmental Protection Agency (IEPA) is reviewing anti-degradation (Water Quality Standards) and Section 401 (Water Quality Certification) information pertaining to potential project-related wetland impacts. In furtherance of this goal, the public hearings that were conducted for the Draft EIS were hosted by FAA, the USACE, and the IEPA for purposes of meeting these agencies' requirements.

On February 22, 23, and 24, 2005, the FAA conducted three separate public hearings, at three different locations in the vicinity of O'Hare, to solicit comment on the Draft Environmental Impact Statement. The locations were selected based on their proximity to the impacted areas, their availability, and the ability of the facility to accommodate large numbers of individuals.

The FAA estimates that approximately 1,500 people attended the public hearings over the three-day period. Of the approximately 1,500 attending, nearly 400 individuals provided testimony during the three public hearing sessions. The Draft EIS comment period was originally scheduled for January 21, 2005 to March 23, 2005, providing a 60 day comment period. In response to requests for an extension of the comment period, the FAA extended the deadline for comments to April 6, 2005, for a total of 75 days. Public hearing testimony was transcribed and is included in **Appendix U, Response to Comments**.

In addition to public hearing testimony, the FAA received comments in the following formats: written, private testimony, email, and voice mail. Overall, the FAA received approximately 3000 pages of comments on the Draft EIS and related documentation (Draft General Conformity Determination and Draft Section 4(f)/6(f) Evaluation). The comment documents on the Draft EIS and the FAA's detailed responses appear in **Appendix U**. The comments and responses on the Draft General Conformity Determination are included in **Appendix J**, and the comments and responses on the Section 4(f)/6(f) Evaluation are included in **Appendix L**. Of the 3000 pages of comments, approximately one-third were submitted by the entities that represent the two communities (Bensenville and Elk Grove Village) and the Cemetery Associations that oppose the proposed action. Every comment has been considered and addressed in the Final EIS.

Most of the comments focused on Alternative C, the City's proposed OMP. The main themes from those supporting OMP (Alternative C) were economic growth and the benefits to the area's commerce, sustaining the region's prominence as a transportation hub, the employment opportunities of OMP (Alternative C), and that an improved O'Hare would generate improved efficiency/reduced delays. Those speaking in support were primarily business leaders, business associations, members of labor organizations, airline employees, others employed in the aviation industry, and local elected officials.

The main themes from those opposed to OMP (Alternative C) were concerns about how the project would be funded, relocation of the cemeteries, and support for use of other airports, congestion management, and/or building a south suburban airport rather than expanding O'Hare. Those in opposition included elected officials and local residents of affected suburbs.

In addition, there were comments related to environmental impacts including, among others, air quality, noise, Section 4(f)/6(f), and surface transportation.

## **E. Changes Between the Draft EIS and Final EIS**

The FAA has provided additional information and updated and/or refined analysis in the Final EIS in response to comments on the Draft EIS, Draft Section 4(f) and Section 6(f) Evaluation, and Draft General Conformity Determination. Additionally, the FAA expanded the text and added new graphics throughout the Final EIS to enhance the analysis in several important areas. More specifically, the Final EIS contains updated information in the following sections:

**Sections 3.6 and 3.7, of Chapter 3, Alternatives**

- Additional graphics and supporting text were added in Chapter 3 to the initial screening evaluation to further develop the FAA's analysis of regional airports.
- **Section 3.6** was added to **Chapter 3** to evaluate commenter-generated proposals, that upon review by the FAA were determine to be derivatives of alternatives in the Draft EIS. Additionally, **Section 3.6** provides an evaluation of derivatives to Alternative C developed by the FAA.
- **Section 3.7** was added to **Chapter 3** for the identification of the Preferred Alternative.

**Section 5.6, Air Quality, of Chapter 5, Environmental Consequences**

- This section was updated to provide additional airport operations' emissions inventory information and dispersion modeling for particulate matter 2.5 microns or less in size.
- Information has also been added to this section concerning the FAA's evaluation of general conformity requirements under the Clean Air Act, including a discussion of the Draft General Conformity Determination published on May 18, 2005 for public review and comment. The comments received and the Final General Conformity Determination has been issued with and attached to the Final EIS in **Appendix J**.

**Section 5.8, Section 4(f) and Section 6(f) Resources, of Chapter 5, Environmental Consequences**

- **Section 5.8** was updated to include information about the coordination under and in compliance with Department of Transportation Section 4(f) and Land Water Conservation Act Section 6(f). It discusses the Draft Evaluation issued for comment on May 20, 2005. Comments received and the Final Section 4(f) and Section 6(f) Evaluation has been issued with and attached to the Final EIS in **Appendix L**.

**Section 5.21, Environmental Justice, Subsections 5.21.4 through 5.21.11, of Chapter 5, Environmental Consequences**

- **Section 5.21.4** was updated to include the results of an analysis performed to determine if there was a statistically significant difference among the proportions of minority populations and low-income households in the "impact" areas when compared to the larger general study areas. This analysis was performed because the results for the comparison analyses for indirect noise impacts in the Draft EIS were so close (i.e., within 10 percent).
- The sections after **Section 5.21.4** were added to provide an analysis of indirect impacts on environmental justice communities for the following resource categories:
  - surface transportation
  - air quality
  - wetlands
  - Section 4(f) and Section 6(f) resources

**Section 5.22, Other Issues Relating to Cemetery Acquisition, of Chapter 5, Environmental Consequences**

- This section was added to **Chapter 5** to address commenter assertions that the FAA's approval of any proposal requiring relocation of these cemeteries would violate these commenters' First Amendment rights to free exercise of religion as well as rights deriving from the Religious Freedom Restoration Act.

**Section 5.23, Issues Relating to Due Process Claims and Formal Adjudicative Processes, of Chapter 5, Environmental Consequences**

- This section was added to **Chapter 5** to address commenter assertions that the FAA has violated these commenters' due process rights and that the FAA decisions related to any proposed O'Hare modernization require formal adjudication.

**Chapter 7, Mitigation**

- This chapter was revised to include further detailed information on alternative mitigation measures, including those for which the City of Chicago would have implementation responsibility if a Build Alternative would be selected in the ROD.

These changes are discussed in more detail in relevant sections of this Executive Summary.

**F. National Context**

The FAA fulfills its NEPA obligations in the context of a number of statutory, regulatory, and policy directives, including both the FAA's Operational Evolution Plan and Flight Plan. One of the goals of the Flight Plan is to "work with local government and airspace users to provide capacity in the United States airspace system that meets projected demand in an environmentally sound manner."

As stated by the Administrator of the FAA, Jane F. Garvey, before the Committee on Commerce, Science, and Transportation on June 15, 2001 regarding airport capacity in the Chicago area,

It is important to note the Federal Government's role in this endeavor. In a deregulated domestic aviation industry, the Federal government no longer controls where, how and when airlines provide their services. Nor are we the driving force in airport capacity development. What drives those considerations now is the market, and local and regional decision making, in partnership with the aviation industry, in response to that market demand. Certainly, we at the Federal level will provide any support and assistance that we can, and will do our part in continuing to modernize the air traffic control system and implementing ATC efficiencies wherever possible. However, the Federal government cannot and should not solve State and local planning challenges. In Chicago, past efforts to deal with airport capacity limitations in the region failed because of lack of consensus. That appears to be changing. It is a very positive development that the City and State appear to be coming together to reach consensus for both short and long-term measures to deal with the predicted growth in operations at the region's airports. We stand ready to assist in any way that we can.

**G. O'Hare Modernization Act**

Due to the importance of O'Hare to the State of Illinois, specific O'Hare Airport-related legislation was passed. The O'Hare Modernization Act (OMA), which related to the proposed

expansion of O'Hare, was adopted by the Illinois legislature and signed into law by the Governor on August 6, 2003.

The OMA states:

Section 5. Findings and purposes.

(a) The Illinois General Assembly finds and determines:

(1) The reliability and efficiency of the State and national air transportation systems significantly depend on the efficiency of the Chicago O'Hare International Airport. O'Hare has an essential role in air transportation for the State of Illinois. The reliability and efficiency of air transportation for residents and businesses in Illinois and other States depend on efficient air traffic operations at O'Hare.

(2) O'Hare cannot efficiently perform its role in the State and national air transportation systems unless it is reconfigured with multiple parallel runways.

(3) The O'Hare Modernization Program will enhance the economic welfare of the State of Illinois and its residents by creating thousands of jobs and business opportunities.

(4) O'Hare provides, and will continue to provide, unique air transportation functions that cannot be replaced by any other airport in Illinois...

(5) Public roadway access through the existing western boundary of O'Hare to passenger terminal and parking facilities located inside the boundary of O'Hare and reasonably accessible to that western access is an essential element of the O'Hare Modernization Program. That western access to O'Hare is needed to realize the full economic opportunities created by the O'Hare Modernization Program and to improve ground transportation in the O'Hare area. It is important to the State that the western access be constructed not later than the time existing runway 14R-32L is removed from service.

(6) For the reasons stated in paragraphs (1), (2), (3), (4), and (5), it is essential that the O'Hare Modernization Program be completed efficiently and without unnecessary delay.

(7) For the reasons stated in paragraphs (1), (2), (3), (4), and (5), it is essential that acquisition of property as required for the O'Hare Modernization Program be completed as expeditiously as practicable.

(8) The General Assembly recognizes that the planning, construction, and use of O'Hare and the planning, construction, and use of the O'Hare Modernization Program will be subject to intensive regulatory scrutiny by the United States and that no purpose would be served by duplicative or redundant regulation of the safety and impacts of the airport or the O'Hare Modernization Program...

(b) It is the intent of the General Assembly that all agencies of this State and its subdivisions shall facilitate the efficient and expeditious completion of the O'Hare Modernization Program to the extent not specifically prohibited by law, and that legal impediments to the completion of the project be eliminated.

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## II. O'HARE INTERNATIONAL AIRPORT

### A. Background

O'Hare International Airport is one of the most important airports in the National Airspace System (NAS). It provides vital origin and destination service to the nation's third largest metropolitan area, as well as serving as an important connecting hub for two of the world's largest airlines – American and United. Moreover, it provides substantial and growing international service. In 2002, O'Hare was the world's busiest airport as measured by total operations, the second busiest in terms of enplaned passengers, and the fourth busiest international gateway in the nation in terms of total international enplaned passengers. O'Hare also operates as a major cargo airport.

As of October 2004, 47 scheduled passenger airlines regularly served O'Hare - 10 U.S. flag air carriers, 27 foreign-flag air carriers, and 10 regional/commuter carriers. In addition, 23 carriers provided scheduled cargo service at O'Hare. O'Hare provides nonstop service to 127 domestic and 48 international destinations.

The current airfield layout along with the City's proposed airfield redesign is shown in **Exhibit 1**.

### B. Historical Delays at O'Hare

The physical and operational characteristics of O'Hare contribute to high levels of congestion and delay that are expected to become more severe over the forecast period. Working with the City and the air carriers, as members of the 1991 and 2001 O'Hare Delay Task Force, the FAA developed and implemented many of the Task Force recommendations to reduce delays. However, delays persisted. In 2003, O'Hare experienced more delays than any other airport in the country. Congestion and delay at O'Hare in turn affects the efficiency of the entire National Airspace System (NAS). As shown in **Table 1**, O'Hare had the greatest share of minutes of delay for the top delayed airports in the NAS, with 27.5 percent in 2002 and 31.4 percent in 2003. O'Hare operations were delayed a total of 2,875,328 minutes in 2002 and 3,840,493 minutes in 2003. In 2002, 53,156 operations at O'Hare were significantly delayed (i.e. more than 15 minutes); in 2003, 69,185 operations were significantly delayed.

**TABLE 1  
AIRPORT DELAYS AT THE TOP DELAYED AIRPORTS  
AS MEASURED IN TOTAL MINUTES OF DELAY**

2002					2003				
Facility	Total Operations	Total Delays	Total Delay Time (Min)	% of Delays of Top 5 Airports	Facility	Total Operations	Total Delays	Total Delay Time (Min)	% of Delays of Top 5 Airports
ORD	922,787	53,156	2,875,328	27.5%	ORD	931,422	69,185	3,840,493	31.4%
ATL	890,923	29,821	1,307,943	12.5%	ATL	911,788	37,520	1,542,601	12.6%
LGA	367,656	12,635	773,267	7.4%	EWR	410,661	24,649	1,443,001	11.8%
EWR	411,239	13,836	770,931	7.4%	LGA	379,369	17,898	952,656	7.8%
PHL	467,717	16,425	645,867	6.2%	PHL	445,974	13,627	603,221	4.9%

Source: FAA OPSNET, November 2004.

### C. FAA Orders Approving Limited Operations at O'Hare

Over the years, there has been some effort to address delay issues at O'Hare (and other airports of critical significance to the NAS) through the imposition of controls on operations during certain hours.

Beginning in 1969, the FAA adopted a High Density Rule (HDR) that established limits on the number of takeoffs and landings during certain hours at five airports, including O'Hare. In 1984, the FAA amended the HDR to increase the hours in which limitations at O'Hare would apply and to increase the number of takeoffs and landings permitted at that airport. In 2000, Congress adopted legislation intended to phase out the HDR while preserving the FAA's authority over safety and the movement of air traffic.

In January 2004, the FAA issued the first of three sequential orders addressing delays by limiting operations at O'Hare on a temporary basis. The following developments led to the issuance of the first order:

- In November and December of 2003, arriving passengers at O'Hare experienced a total of 1.7 million minutes (over 28,000 hours) of delay.
- During the same two months, 39 percent of the flights at O'Hare were delayed, with an average of 492 flights per day delayed an average of 57 minutes each.
- The percentage of on-time arrivals declined from 85 percent in October 2003, to 62 percent and 65 percent in November and December, respectively.

By mid-summer 2004, the delays became so critical that the U.S. Secretary of Transportation convened a meeting with the O'Hare carriers to discuss the need for additional flight reductions at O'Hare. The severe congestion and delays at O'Hare during peak periods coupled with airline over scheduling led the Federal government to issue a second order memorializing a voluntary agreement among the air carriers serving O'Hare to reduce service during certain hours.

An agreement was reached among all parties on August 18, 2004 which culminated in the issuance of a third Order on scheduled arrivals at O'Hare, limiting them to 88 per hour during most hours of the day and implementing the agreement among the carriers.

In adopting the most recent Order, the Agency said that its action was not intended to evaluate or to prescribe any particular long-term avenue for increasing capacity and reducing delays at O'Hare. The FAA reserves the authority to take further interim action, if necessary, when the present Order expires. Independently of the scheduling reduction Order, the FAA noted that it is preparing this EIS evaluating the City of Chicago's proposal and reasonable alternatives for reducing delays and thereby enhancing capacity.

Subsequent to the issuance of the Draft EIS, on March 25, 2005, the FAA issued a Notice of Proposed Rulemaking (NPRM) to extend the limitation of flight schedules:

The FAA is proposing this rule to address persistent flight delays related to over-scheduling at O'Hare International Airport (O'Hare). This proposed rule is intended as an interim measure, because the FAA anticipates that the rule would yield to longer term solutions to traffic congestion at the airport. Such solutions include an application by the City of Chicago that, if approved, would modernize the airport and reduce levels of delay, both in the medium term and long term. For this reason, the proposed rule includes provisions allowing for the limits it imposes to be gradually relaxed and in any event would sunset in 2008.

#### **D. O'Hare's Impact on the National Airspace System (NAS)**

The historic factors that have combined to make Chicago a key transportation hub in the nineteenth century, and the twentieth century aviation market forces that have consistently made O'Hare one of the world's busiest and most congested airports, are expected to continue. Both the current and forecast aviation demand in the Chicago market signal an urgent need for significant action to reduce congestion and delay.

It is important to note that the operational efficiency at O'Hare has a significant ripple effect on delays throughout the entire NAS, not just in Chicago. For example, aircraft traveling through a congested O'Hare environment that experience delays will then produce further delays elsewhere in the system as those aircraft reach other airports. In addition to missed connections, rescheduled flights, and cancelled flights due to such delays, O'Hare congestion also causes high altitude congestion as aircraft traveling on the same jet routes bound to and departing from O'Hare are slowed in response to delayed operations at O'Hare. Because of O'Hare's significant role in the NAS and because of Chicago's historic role as a transportation hub, reducing or minimizing present and projected future delays at O'Hare is essential to meeting the aeronautical needs of the Chicago region and thereby enhancing the capacity of the NAS.

In light of the projected aeronautical needs of the Chicago region and the additional adverse impact of further delays upon both the Chicago region and the NAS, a solution to O'Hare's present and future problems must be found. Moreover, any solution can only be realized within the limited powers of the FAA in the context of a deregulated airline environment.

### III. FORECASTS

Forecasts provide information for conducting technical analysis in the EIS, including noise modeling, air quality modeling, demand-capacity analysis, and socioeconomic analysis. This EIS utilizes the FAA's 2002 Terminal Area Forecast (TAF), the most recent demand forecast available when the technical analysis began. The TAF is prepared by FAA staff using industry-standard methodology—including statistical analysis of historical trends, review of recent trends in airline service, and assumptions regarding future airline developments. The FAA TAF represents the official FAA outlook for each major airport, and is the standard by which any independently-developed airport forecast is measured. The 2001 TAF was used by the City in formulating its Master Plan, and when the FAA commenced this EIS in 2002, it relied upon a more recent version of the TAF.

**Table 2** is a summary of the 2002 FAA TAF for O'Hare, for the period from 2002 to 2018. As shown, total enplaned passengers are forecast to increase from 31,710,512 in 2002 to 50,372,000 in 2018, at an average annual rate of 2.9 percent. Also as shown, total aircraft operations are forecast to increase from 922,787 in 2002 to 1,194,000 in 2018, at an average annual rate of 1.5 percent.

**TABLE 2  
2002 TAF FOR O'HARE – CALENDAR YEARS (CY)**

	<u>CY 2002</u>	<u>CY 2003</u>	<u>CY 2007</u>	<u>CY 2009</u>	<u>CY 2013</u>	<u>CY 2018</u>	<u>AAGR(a) 2003-2018</u>
Enplaned passengers	31,710,512	32,609,000	36,943,000	39,149,000	43,912,000	50,372,000	2.9%
Average annual change	n/a	2.8%	3.2%	2.9%	2.9%	2.8%	n/a
Aircraft Operations	922,787	960,500	1,026,300	1,057,200	1,120,600	1,194,000	1.5%
Average annual change	n/a	4.1%	1.7%	1.5%	1.5%	1.3%	n/a

Note: (a) AAGR – Average annual growth rate.

(b) n/a = not applicable.

Source: 2002 FAA Terminal Area Forecast, published in March 2003.

This forecast represents a reasonable representation of potential future activity levels for the purposes of this EIS. However, all forecasts are subject to uncertainty regarding future events, and it is possible that there will be future developments that would result in actual aviation activity somewhat different from that which was forecast.

Subsequent to the initiation of the Draft EIS, the FAA issued the 2003 and 2004 TAF. To address variations in forecasts and other unanticipated events, the FAA has developed **Appendix R, Alternate Considerations**. **Appendix R** identifies and considers a range of potential alternate outcomes with regard to aviation activity at O'Hare, and identifies the possible alternate environmental impacts that could occur under these conditions.

### IV. PURPOSE AND NEED

The regulations implementing NEPA indicate that environmental impact statements “shall briefly specify the underlying purpose and need to which the agency is responding in

proposing the alternatives including the proposed action." The O'Hare Modernization EIS defines the purpose and need for the proposed action as:

"To address the projected needs of the Chicago region by reducing delays at O'Hare, thereby enhancing capacity of the NAS, and ensuring that future terminal facilities and supporting infrastructure can efficiently accommodate airport users."

Continuing the role held by Midway Airport before Midway was eclipsed by the jet-age, O'Hare plays a vital role in the NAS by providing an extensive network of domestic and international air service to and from one of the nation's largest metropolitan areas, and also by serving as a central connecting point in the nation's air transportation network. O'Hare is uniquely suited to this role by virtue of its large local market, which is expected to increase in the future. This large local market, coupled with O'Hare's central location in the NAS, provides opportunities for connecting service to many destinations. Consequently, O'Hare has consistently ranked as one of the busiest airports in the United States. Under the current airport configuration, playing this role comes at the cost of high levels of aircraft delay. Continued growth in O'Hare traffic in the years ahead would have additional adverse impacts on the air transportation needs of the Chicago region and upon the efficiency of the NAS.

Delays at O'Hare have a direct impact on the entire NAS, in part because approximately 51 percent of the total passengers traveling through O'Hare currently connect to and from other airports. Additionally, O'Hare affects the NAS because the airfield lacks adequate runway capacity or gate availability to handle both the current and forecast levels of activity. O'Hare operations also directly affect the networks of 47 domestic and international passenger airlines providing service to 127 domestic and 48 international airports. In 2002, the City estimated that delays at O'Hare cost the airlines and other commercial operators nearly \$225 million in aircraft direct operating costs. Similarly in 2007, the City projects that delays are expected to cost O'Hare's aircraft operators over \$674 million in aircraft direct operating costs annually. Because delays at O'Hare result in delay throughout the NAS, other airports, airlines and passengers incur additional costs not reflected in the figures above.

For an airport such as O'Hare, where the historic percentage of connecting passengers has been 50 percent or more, delays at O'Hare result in delays throughout the NAS because of the high number of operations and passengers served by O'Hare, see discussion above in **Section II.D., O'Hare's Impact on the National Airspace System** of this **Executive Summary**.

To meet the needs of airlines, passengers, air cargo operators, and other Airport users, the capacity of terminal and support facilities should be in balance with the capacity of the airfield. Thus, this component of purpose and need simply reflects the FAA's recognition that any undertaking to enhance the airside capacity at an already congested location also needs additional non-airfield capacity, including terminals, gates, and associated infrastructure. The 21 gates and 5 hard stands in Terminal 5 today are the only nonexclusive gates at O'Hare. Consequently, new entrant carriers must either use these gates or sublease gates from an incumbent carrier. Gates at the other terminals (Terminals 1, 2, and 3) already average 7 to 11 turns per day, which is above the national industry average for gate utilization. It should be

noted that the FAA has not rejected the use of other airports, or any specific airport, as an alternative based on failure to provide adequate terminal facilities at O'Hare.

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## V. ALTERNATIVES ANALYSIS

### A. Range of Alternatives Considered

The FAA recognizes that the portion of the EIS dealing with alternatives is “the heart of the environmental impact statement” (Council on Environmental Quality (CEQ) Regulations). Accordingly, this EIS examines a wide range of alternatives from non-airfield development to several variations of airfield configuration. Because of the magnitude and complexity of the project and its national implications, the FAA conducted both initial and secondary screening to ensure that a reasonable range of alternatives would be studied in detail.

The initial screening assessed whether each potential alternative met the purpose and need as stated in the EIS. Thereafter, secondary screening examined the feasibility and prudence of alternatives that met the initial screening criteria. In total, 15 individual alternatives were considered prior to initial screening.

The types of alternatives considered in the EIS included the following:

- No Action (i.e. Alternative A),
- Other modes of travel or communication,
- Use of other airports, including regional airports and other mid-continent airports,
- Congestion management,
- Airspace improvements,
- New air traffic control and navigation technologies,
- Eight different O'Hare Development Alternatives, and
- A Blended Alternative combining component parts of other alternatives with limited airfield development (created after initial screening for consideration in secondary screening).

Non-Airfield Alternatives are identified in **Table 3**. O'Hare Development Alternatives are identified in **Table 4**.

### B. Initial Screening

In its initial screening of alternatives, the FAA evaluated the potential of each alternative to satisfy each component of the purpose and need of the proposed action. For example, the Agency carefully assessed the potential of other airports, including Rockford, Gary, Milwaukee, and the proposed South Suburban, as well as other mid-continent airports, to determine whether expanded use of those facilities was likely to alleviate present and future delay at O'Hare. In addition, expanded use of these airports was also considered in conjunction with certain non-airfield alternatives. At the conclusion of the initial screening process five O'Hare

Development Alternatives (Alternatives C, D, E, F and G) plus the No Action (Alternative A) remained. These alternatives were carried forward for secondary screening.

As a result of initial screening, several alternatives that did not involve construction at O'Hare were rejected for a variety of reasons. For example, FAA evaluated the Airspace-Only Improvement Alternative, (no airfield development combined with airspace modifications to enhance the flow of traffic to and from O'Hare). Implementing such improvements (e.g. new arrival routes) in the O'Hare airspace could reduce or eliminate the need for physical improvements to the airfield only if the capacity of the current runway system was greater than the capacity of the corresponding enhanced airspace. Today, the current runway system is the primary constraint on operations at O'Hare. In other words, improving the airspace at O'Hare without also making improvements in the runway capacity would be akin to adding new entrance ramps to an already congested highway without also adding new lanes. Therefore, the Airspace-Only Improvement Alternative would not, by itself, meet purpose and need.

Similarly, the FAA evaluated an alternative involving the use of other airports in the Chicago region. The conclusions of this evaluation were:

- It is possible that the capacity at other existing and potential regional airports could be used to satisfy some of the local origin-destination passenger demand forecast for O'Hare,
- It is not likely that any of the other regional airports would be used as a significant connecting hub or international gateway during the forecast period,
- The continued role of O'Hare as a major national connecting hub and international gateway is dependent on the airline service of local origin-destination traffic. Therefore, there is a limit to the amount of local traffic that could be diverted while still maintaining the roles of O'Hare as a hub and gateway,
- The practical limit of potential diversion of demand from O'Hare is estimated to be far less than the likely availability of capacity at other regional airports, and
- Any material diversion of demand from O'Hare would require airline strategic decisions which cannot be predicted or relied upon.

In view of these conclusions, coupled with the fact that neither the FAA nor the City has the power to prescribe where carriers may operate, it was determined that the use of other regional airports would not, by itself, be sufficient to satisfy purpose and need. The use of other regional airports was included as part of the Blended Alternative.

Although the use of other airports, by itself, would not meet the initial screening criteria, a Blended Alternative combining use of the non-airfield alternatives (including use of other airports, demand management, other modes of transportation, airspace improvements, and new technology) with less extensive development (Alternative B) at O'Hare was created. The FAA examined the possibility that this Blended Alternative might meet the purpose and need for the proposed action. The Blended Alternative was carried forward to secondary screening. Initial screening results are summarized in **Tables 3 and 4**.

**TABLE 3 INITIAL SCREENING - NON-AIRFIELD ALTERNATIVES**

Alternative	No Action	Other Modes of Travel or Communication	Use of Other Airports		Congestion Management	Airspace Improvements	New Air Traffic Control and Aircraft Navigation Technologies						
			Regional Airports	Mid-Continent Airports									
<b>1. Address the projected needs of the Chicago region by reducing delays at O'Hare, and thereby enhancing capacity of the NAS.</b>													
1a	Reduce delays, especially under adverse weather conditions												
1b	Efficiently accommodate existing and future aviation operating needs												
<b>2. Ensure that existing and future terminal facilities and supporting infrastructure can efficiently accommodate airport users.</b>													
2a	Provide adequate terminal, gate, and apron areas												
2b	Provide sufficient supporting infrastructure												
Conclusion - Ability to meet initial screening criteria as an individual alternative.		Retain as required by NEPA	Eliminate (a)	Eliminate	Eliminate (a)	Eliminate	Eliminate (a)						
Note: (a) This alternative will be evaluated further as part of the blended alternative discussed in the EIS.													
Legend: <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="background-color: #0000FF; width: 20px; height: 10px;"></td> <td>Alternative clearly has the potential to meet or exceed criterion.</td> </tr> <tr> <td style="background-color: #FFFF00; width: 20px; height: 10px;"></td> <td>Alternative may have the potential to partially meet criterion.</td> </tr> <tr> <td style="background-color: #FF0000; width: 20px; height: 10px;"></td> <td>Alternative clearly does not have the potential to meet criterion by itself.</td> </tr> </table>									Alternative clearly has the potential to meet or exceed criterion.		Alternative may have the potential to partially meet criterion.		Alternative clearly does not have the potential to meet criterion by itself.
	Alternative clearly has the potential to meet or exceed criterion.												
	Alternative may have the potential to partially meet criterion.												
	Alternative clearly does not have the potential to meet criterion by itself.												

**TABLE 4 INITIAL SCREENING - O'HARE DEVELOPMENT ALTERNATIVES**

Runway Layout for Each Alternative	A	B	C	D	E	F	G	H	I
Alternative	(No Action)	B	(Sponsor's Proposal)	D	E	F	G	H	I
<b>1. Address the projected needs of the Chicago region by reducing delays at O'Hare, and thereby enhancing capacity of the NAS.</b>									
1a	Reduce delays, especially under adverse weather conditions								
1b	Efficiently accommodate existing and future aviation operating needs								
<b>2. Ensure that existing and future terminal facilities and supporting infrastructure can efficiently accommodate airport users.</b>									
2a	Provide adequate terminal, gate, and apron areas								
2b	Provide sufficient supporting infrastructure								
Conclusion - Ability to meet initial screening criteria as an individual alternative.	Retain as required by NEPA	Eliminate (a)	Retain for Secondary Screening	Eliminate	Eliminate				
<p>Note: (a) This alternative will be evaluated further as part of the blended alternative discussed in the EIS.</p> <p>Legend:</p> <ul style="list-style-type: none"> <li>Alternative clearly has the potential to meet or exceed criterion.</li> <li>Alternative may have the potential to partially meet criterion.</li> <li>Alternative clearly does not, by itself, have the potential to meet criterion.</li> </ul>									

### C. Secondary Screening

This section describes the criteria drawn from the applicable environmental statutes and regulations that are used in this section to evaluate the alternatives retained as a result of the initial screening process. For example, several criteria are found in FAA Order 5050.4A (Paragraph 83b). In pertinent part that Order provides:

[These acts] require a finding that “no feasible and prudent alternative” exists. The terms “feasible” and “prudent” are separate criteria and refer to sound engineering principles and sound judgment, respectively. A construction alternative, for example, may be feasible if, as a matter of sound engineering principles, it can be built. It may not be prudent, however, because of safety, policy, environmental, social, or economic consequences. As outlined in FAA Order 5050.4A, the environmental documentation must show that no feasible and prudent alternative exists when all factors (safety, national policy, efficiency, economic, social, and environmental) are considered.

The discussion of secondary screening was expanded to better describe how the FAA has applied the criteria used in conducting secondary screening for this particular airport improvement proposal.

- Pursuant to NEPA, the FAA must take a “hard look” at all “reasonable” alternatives, which involves a study of those alternatives “that are practical or feasible from the technical and economic standpoint and using common sense.”
- Because the proposed action involves the application for a permit from the U.S. Army Corps of Engineers to fill waters of the U.S., issuance of the 401 Water Quality Certification from the Illinois EPA, and required FAA findings regarding wetlands and floodplains, the FAA must also comply with the alternative analysis of the Clean Water Act, requiring a finding that no practicable alternative exists that would avoid or further minimize impacts to the resources at issue.
- Further, the proposed action implicates Section 4(f) of Department of Transportation Act and Section 6(f) of the Land and Water Conservation Act (See **Appendix L**) because there is proposed use of properties protected by those statutes.
- As a result, the FAA must conduct alternatives analyses as required by those statutes.

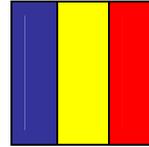
The Council on Environmental Quality (CEQ) and the FAA’s environmental policies and procedures require the EIS to serve as the platform for satisfying not only NEPA, but all these other environmental statutes as well. Because the concepts of reasonableness, practicability, and prudence are so similar, it would make little sense to conduct separate sets of analyses for these retained alternatives under each of the statutes identified above. Therefore, the FAA has integrated into the secondary screening a common-sense understanding of these similar concepts.

By definition, each of the retained alternatives appears feasible as a matter of sound engineering principles, is capable of being implemented, and could be operated safely. The examination of whether the retained alternatives are “reasonable” in the secondary screening analysis involves issues of practicality and prudence. Accordingly, the retained alternatives are evaluated relative to one another with respect to environmental, social, efficiency, economic, and national policy factors as shown in **Table 5**.

**TABLE 5  
SUMMARY OF SECONDARY SCREENING**

Alternative	C	D	E	F	G	Blended Alternative
Runway Layout for Each Alternative						
<b>1. ENVIRONMENTAL- Identify clearly superior and/or inferior alternatives with respect to environmental factors.</b>						
No alternative is clearly inferior or superior with respect to environmental factors. Therefore, no alternatives were eliminated on the basis of environmental factors.						
<b>2. OPERATIONAL EFFICIENCY - Identify clearly superior and/or inferior alternatives with respect to operational efficiency.</b>						
Delay Reduction						
<b>3. ECONOMIC - Identify clearly superior and/or inferior alternatives with respect to economic factors.</b>						
A. Delay Costs						
B. Local Tax Base						
C. Development Costs						
<b>4. NATIONAL POLICY - Identify clearly superior and/or inferior alternatives with respect to implementation factors.</b>						
Implementation Factors						
<b>5. CONCLUSION</b>						
Retain for Detailed Evaluation	YES	YES	NO	NO	YES	NO

Legend:



Alternative is better than other alternatives in the specific category.

Alternative is between other alternatives in the specific category.

Alternative is worse than other alternatives in the specific category.

## D. Evaluation of Commenter and FAA Developed Derivatives

In the course of reviewing comments on the Draft EIS, FAA was presented with suggestions and requests regarding the alternatives presented in the Draft EIS that could be considered for the purpose of avoiding or mitigating some of the impacts associated with proposed Build Alternatives.

Although in many cases these suggestions or requests have been described by commenters as "new alternatives", FAA has reviewed these proposals and believes that they are properly characterized as "variants" or "derivatives" to the alternatives that were presented in the Draft EIS. A document titled "The Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," in the Federal Register on March 23, 1981, Question 29b specifically deals with the issue of how an agency must respond to a comment raised on the Draft EIS concerning a specific alternative or alternative(s) not previously considered. Below are two scenarios discussed in this document which supports the agency's approach to the further evaluation of "variants" or "derivatives."

A second possibility is that an agency may receive a comment indicating that a particular alternative, while reasonable, should be modified somewhat, for example, to achieve certain mitigation benefits, or for other reasons. If the modification is reasonable, the agency should include a discussion of it in the final EIS....

A third slightly different possibility is that a comment on a draft EIS will raise an alternative which is a minor variation of one of the alternatives discussed in the draft EIS, but this variation was not given any consideration by the agency. In such a case, the agency should develop and evaluate the new alternative, if it is reasonable, in the final EIS. If it is qualitatively within the spectrum of alternatives that were discussed in the draft, a supplemental draft will not be needed....

The derivative alternatives can generally be categorized as follows: (1) commenter developed derivatives of the "No Build" or "Limited Build" alternatives, and (2) FAA developed derivatives of Alternative C (Preferred Alternative). For greater details on comments received as part of the formal EIS process, please see **Appendix U, Response to Comments**, of this FEIS.

**Section 3.6, Evaluation of Derivatives** of the Final EIS evaluates the commenter developed derivatives in relation to the FAA's screening criteria utilized in the EIS. FAA representatives evaluated these eight derivatives relative to the purpose and need. Based on its evaluation, FAA has determined that none of the commenter derivatives meet purpose and need. Therefore, these derivatives were not retained for secondary screening.

As a result of comments made on the Draft EIS, the Agency directed its staff to develop derivatives of Alternative C that would avoid or minimize potential impacts to the cemeteries (St. Johannes and Rest Haven). FAA representatives from within the Great Lakes Region (Airports, Air Traffic, CAMPO, TPC, and Runway Safety Officer) evaluated the FAA developed five derivatives in comparison to Alternative C. Based on its evaluation, FAA determined that none of the five FAA derivatives was a less restrictive alternative capable of performing as well as Alternative C. Similarly, none of the five derivatives would avoid or minimize impacts to the cemeteries while also performing as well as Alternative C. See **Chapter 3, Alternatives, Section 3.6** for greater detail.

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## VI. SIMULATION MODELING

As a foundation for the majority of analysis work to be accomplished under the EIS process, FAA employed state-of-the-art computer simulation modeling tools and methodology. Based on the forecast, computer simulation allows the FAA to evaluate multiple airspace, airfield, and operational scenarios in a variety of contexts and assess how each would perform. Based on forecast flight schedules, this model takes each aircraft traveling to and from O'Hare through its hypothetical trip in conjunction with all other aircraft in the region's airspace arriving at or departing from O'Hare and aircraft movement on the airfield. In other words, this model simulates flights using O'Hare from departure at another airport to when the engines are turned off at the gate at O'Hare. Then the model calculates the appropriate time between flights at that gate and provides a departure time based upon both ground traffic at O'Hare and other aircraft demanding the same airspace. This simulation modeling, utilizing the commercially-available Total Airspace and Airport Modeller (TAAM) software, provided insight into the operational capabilities of the airfield alternatives being studied, and provided a basis for assessment of environmental consequences associated with each alternative as well as the operational performance.

An unprecedented series of TAAM simulation analyses were conducted by the City of Chicago's Consultant Team (CCT) with direction, oversight, review and approval by the FAA and FAA's Third Party Contractor (TPC). TAAM simulation experiments were conducted for the No Action Alternative and Build Alternatives C, D, and G. The purpose of this effort was to provide insight as to how the various airfield alternatives performed when compared to one another. In addition, the model outputs provide input data to the noise and air quality assessment models.

The FAA and TPC participated in an intensive, nine month review process during this simulation effort. The objective of this process was to ensure that TAAM input assumptions, modeling methodologies, and output data conformed to industry best modeling practices and accurately reflected air traffic control rules and procedures. In total, the FAA invested over 2,000 hours reviewing assumptions, draft results, animations, and final results. The FAA review was conducted by an Air Traffic Work Group consisting of: FAA Management and National Air Traffic Controller Association (NATCA) representatives from O'Hare Tower, the Chicago Terminal Radar Approach Control Facility (TRACON), and the Chicago Center (ZAU); FAA Airports Division; and the FAA's TPC.

**Table 6** presents the average annual delay in minutes per operation that would be realized for the No Action Alternative and the Build Alternatives C, D, and G. Of the alternatives evaluated, Alternative C performs the best from a purely "delay and travel time" perspective. Alternative G performs second best followed by Alternative D. The No Action Alternative performs the worst in terms of average annual delays and is not able to accommodate the forecast passengers or operations.

Because the TAAM represents state of the art simulation, the FAA utilized it to model the various airfield alternatives and evaluated their resultant operational capabilities and delay characteristics, which are presented in **Table 6**. Under the constrained No Action alternative

where forecast operations are projected to be capped at 974,000 per year, the FAA nevertheless projects increases in annual enplanements because the Agency assumes that with such constraints carriers would use larger capacity aircraft. Importantly, even with operations constrained and larger aircraft, annual average delay is projected to be 17.1 minutes per operation in 2018 under the No Action Alternative.

**TABLE 6  
FORECAST AND TAAM SIMULATION SUMMARY**

Year	Forecast Annual Operations	Forecast Annual Enplanements	Forecast Peak Month Average Day Operations	No Action	Alternative C	Alternative D	Alternative G
				Alternative A Average Annual Delay (a)	Average Annual Delay (a)	Average Annual Delay (a)	Average Annual Delay (a)
<b>Unconstrained – With Project</b>							
2007	1,026,300	36,943,000	2,898	n/a	15.5	15.5	15.5
2009	1,057,200	39,149,000	2,987	n/a	10.3	10.3	10.3
2013	1,120,600	43,912,000	3,169	n/a	5.0	8.2	5.6
2018	1,194,000	50,372,000	3,374	n/a	5.8	10.5	6.9
<b>Constrained – No Action (Alternative A)</b>							
2007	974,000	36,219,500	2,750	16.2	n/a	n/a	n/a
2009	974,000	37,717,500	2,750	15.9	n/a	n/a	n/a
2013	974,000	40,908,500	2,750	17.2	n/a	n/a	n/a
2018	974,000	44,972,500	2,750	17.1	n/a	n/a	n/a
Note:	(a) Average annual delays are shown in minutes per operation. (b) n/a = not applicable.						
Source:	<b>Appendix D, Simulation Modeling.</b>						

## VII. ENVIRONMENTAL CONSEQUENCES

### A. Introduction

In this EIS, as in others prepared by the FAA, the document presents “the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision-maker and the public.” This section briefly discusses the environmental consequences for the four alternatives retained for detailed consideration, namely Alternative A (No Action), Alternative C (City’s Proposal), Alternative D, and Alternative G. The analyses of environmental impacts in this section primarily address material differences among the alternatives in certain key impact categories and are presented for the following conditions:

- Baseline – represents conditions in 2002
- Construction Phase I – First major construction phase complete (2007)
- Construction Phase II – Second major construction phase complete (2009)

- Build Out – Construction completed and operational (2013)
- Build Out + 5 – Five years beyond build out (2018)

For this executive summary, the potential environmental impacts under the Build Out + 5 phase are presented since this represents the Agency's best judgment of all reasonably foreseeable environmental impacts associated with the proposed Build Alternatives.

## **B. Noise and Compatible Land Use Assessment**

In the Aviation Safety and Noise Abatement Act of 1979 (ASNA), Congress mandated that the FAA develop a uniform methodology for measuring aviation noise and land use compatibility. The FAA incorporated the recommendations of the USEPA and Federal Interagency Committee on Urban Noise (FICUN), in promulgating the regulations of 14 CFR Part 150, where the FAA selected the yearly average day-night noise level (DNL) of 65 decibels (dB) as the level at which most land uses are compatible with aviation noise. DNL is a cumulative sound level that provides a measure of the total sound energy during a specified time period. DNL essentially averages the sound levels at a location over a 24-hour period, with a 10-decibel (dB) weighting penalty added to all sounds occurring during nighttime hours (between 10:00 PM and 6:59:59 AM). The 10 dB penalty represents the added intrusiveness of noise that occurs during sleeping hours because ambient sound levels during nighttime hours are typically about 10 dB lower than during daytime hours.

Estimates of noise effects resulting from aircraft operations can be interpreted in terms of the probable effect on human activities characteristic of specific land uses. Land uses are generally considered compatible with noise levels less than DNL 65, but only certain uses are compatible with noise levels at or above DNL 65. For purposes of NEPA, FAA has determined that a significant noise impact would occur if analysis shows that the proposed action will cause noise-sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same timeframe. Land uses considered sensitive to noise levels of DNL 65 and greater generally include residential housing, schools, places of worship, hospitals, and nursing homes. There is one eligible school, Socrates St. Sava Academy in Chicago, which would be within the 65 DNL Build Out + 5 noise contours for Alternatives C, D, and G that is currently eligible and has also requested sound insulation, but has not been completed. Funding has been approved and this school is scheduled to be sound insulated by the end of the summer 2005. For further information on places of worship, hospitals, and nursing homes see **Section 5.2** of the FEIS.

### **Alternative C**

**Exhibit 2** depicts the potential change in noise exposure associated with Alternative C compared to Alternative A (No Action Alternative) in the Build Out phase. There would be a total of 5,619 residences (16,218 people) newly exposed to the 65 DNL and greater noise contour area (but outside of the Build Out 65 DNL and greater noise contour for No Action – area noted on **Exhibit 2** in red), of which 1,102 have been sound insulated by the City of Chicago. There would be approximately 1,368 additional residences with a 1.5 DNL or greater increase within the 65 DNL and greater noise contour area, outside of the area defined above, of which 439

housing units have been sound insulated. The total number of currently non-insulated residences within the areas defined above is 5,446 residences (15,212 people).

#### **Alternative D**

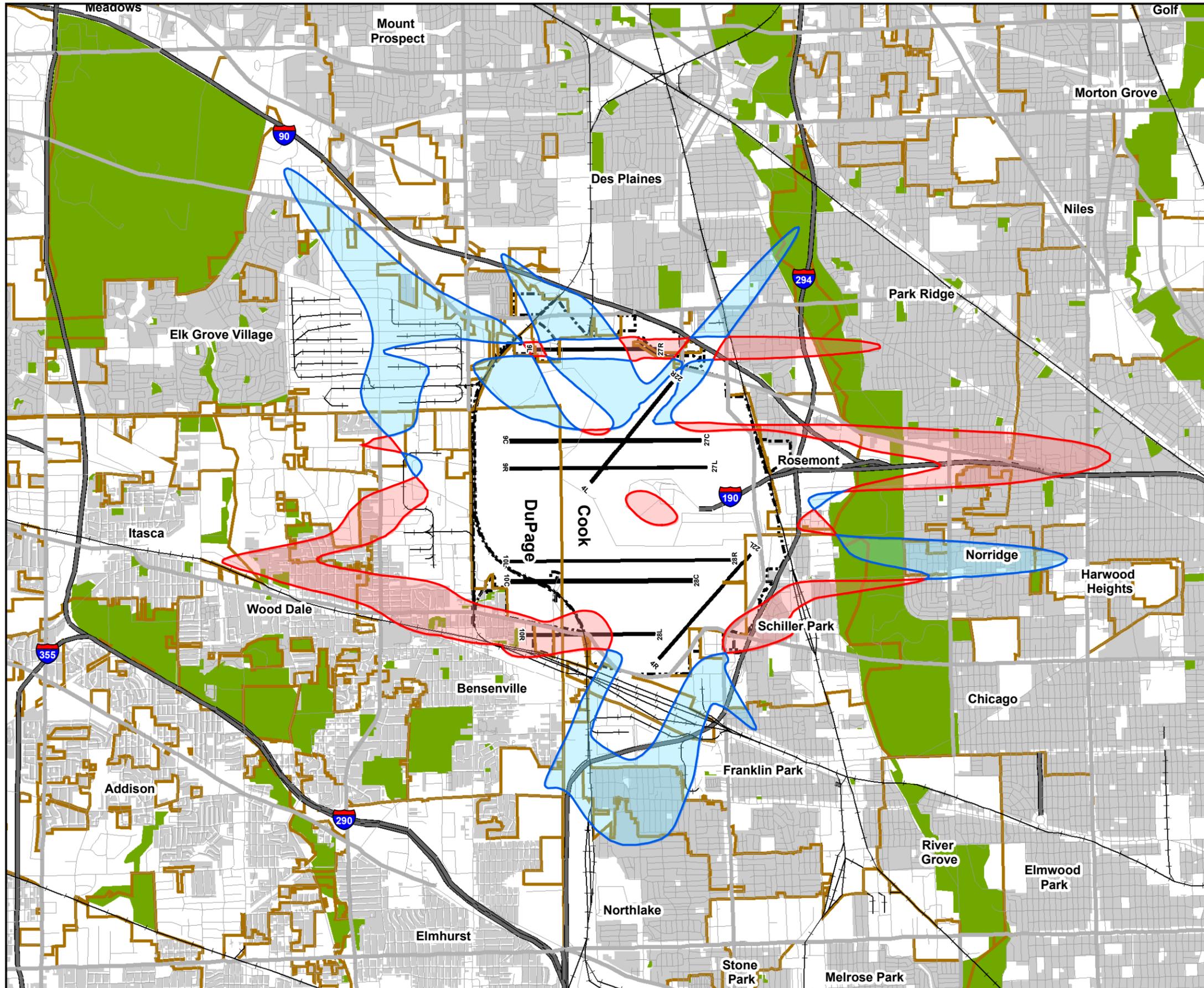
**Exhibit 3** depicts the potential change in noise exposure associated with Alternative D compared to Alternative A (No Action Alternative) in the Build Out phase. There would be a total of 5,766 residences (16,299 people) newly exposed to the 65 DNL and greater noise contour area (but outside of the Build Out 65 DNL and greater noise contour for No Action – area noted on **Exhibit 3** in red), of which 1,123 have been sound insulated by the City of Chicago. There are approximately 1,677 additional residences with a 1.5 DNL or greater increase within the 65 DNL and greater noise contour area, outside of the area defined in the sentence above, of which 496 housing units have been sound insulated. The total number of currently non-insulated residences within the areas defined above is 5,824 residences (16,074 people).

#### **Alternative G**

**Exhibit 4** depicts the potential change in noise exposure associated with Alternative G compared to Alternative A (No Action Alternative) in the Build Out phase. There would be a total of 5,240 residences (15,098 people) newly exposed to the 65 DNL and greater noise contour area (but outside of the Build Out 65 DNL and greater noise contour for No Action – area noted on **Exhibit 4** in red), of which 1,101 have been sound insulated by the City of Chicago. There are approximately 1,419 additional residences with a 1.5 DNL or greater increase within the 65 DNL and greater noise contour area, outside of the area defined in the sentence above, of which 438 housing units have been sound insulated. The total number of currently non-insulated residences within the areas defined in the paragraphs above is 5,120 residences (14,325 people).

#### **Comparison of 1982 Baseline 65 DNL Contour to 2002 Baseline 65 DNL Contour**

For comparison purposes, the FAA presents information from its O'Hare 1984 Final EIS regarding an earlier airport improvement project. The 1984 Final EIS identified 94,000 noise-affected homes in its 1982 Baseline 65 DNL contour. In contrast, the estimated number of homes exposed to the 2002 Baseline 65 DNL is less than 8,400 homes. What is more, even with an increase in operations at O'Hare from 591,807 in 1982 to 922,787 in 2002, the housing units within the 65 DNL contour during that same period diminished by over 90%. See **Exhibit 5** for a representation of the 2002 Baseline contour compared to the 1982 Baseline contour. Thus, even though this EIS projects, at most, a slight increase in affected residences (within the 65 DNL Build Alternative contours) when compared to the 2002 Baseline contour, this small overall increment should be viewed in the historic context of meaningful noise reduction in the communities surrounding O'Hare.



Source: StreetMapUSA, ESRI 2004. Land Use, DuPage Co. 2002, City of Park Ridge, 1996, Northeastern Illinois Planning Commission, 1992. Noise Contours: INM version 6.1, Leigh Fisher Associates, 2004.



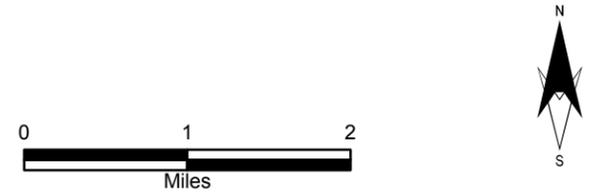
Chicago  
O'Hare  
International  
Airport

**O'Hare Modernization  
Environmental Impact Statement**

- +— Rail Roads
- Freeways
- Secondary Roads
- Local Streets
- ▭ Municipal Boundary
- ▭ Airport Property
- ▭ Noise Sensitive Land Use
- ▭ Parks and Forest Preserves
- ▭ Areas Newly Exposed to 65 DNL
- ▭ Areas No Longer Exposed to 65 DNL

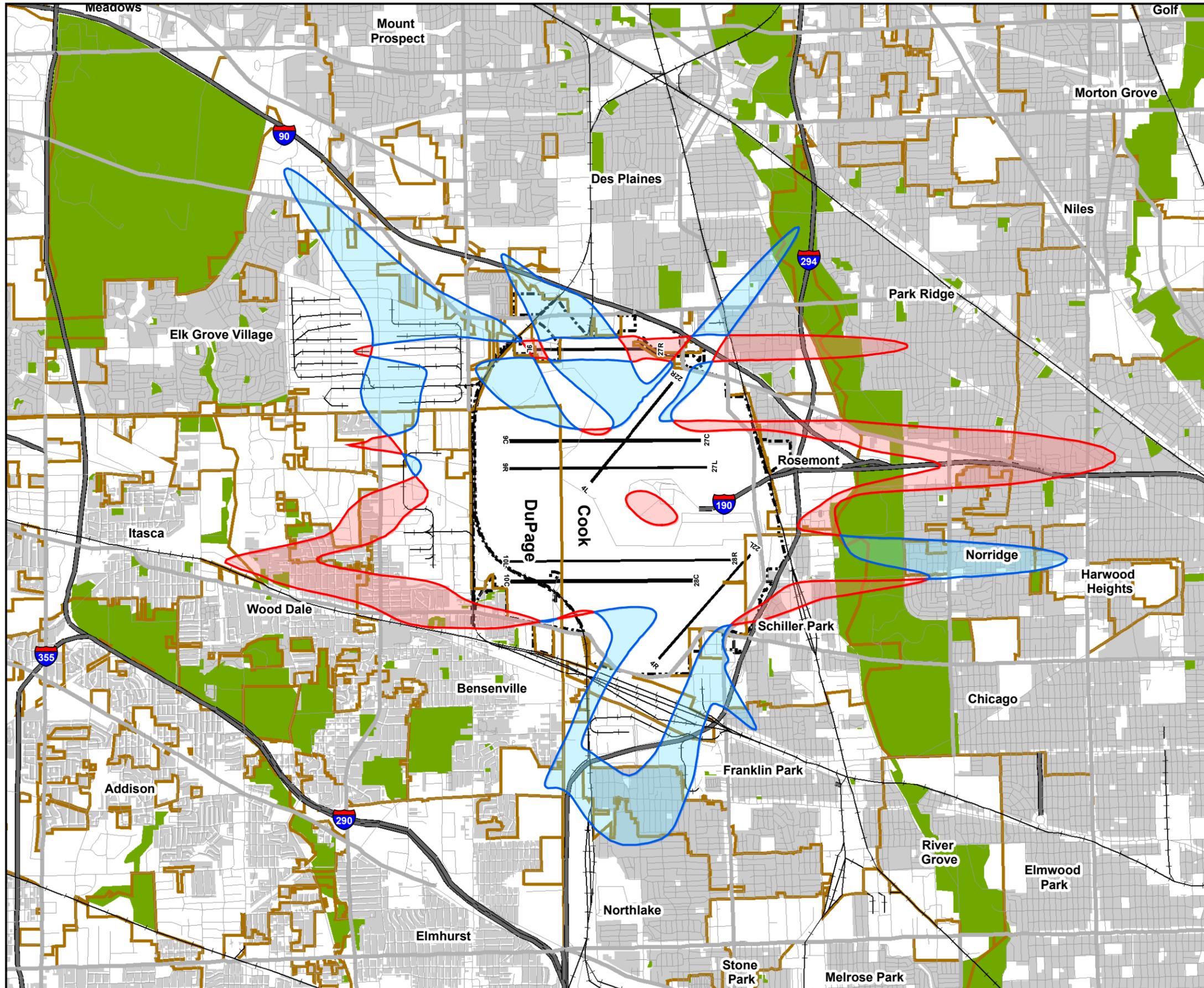
Note: Refer to Table 5.2-1 in section 5.2 of the FEIS for types of Noise Sensitive Land Uses.

Population	16,218	10,937
Housing Units	5,619	4,007



**Potential Change in Noise Exposure  
Alternative C Build Out  
Compared to Alternative A (No Action)**

► Exhibit 2



Source: StreetMapUSA, ESRI 2004. Land Use, DuPage Co. 2002, City of Park Ridge, 1996, Northeastern Illinois Planning Commission, 1992. Noise Contours: INM version 6.1, Leigh Fisher Associates, 2004.



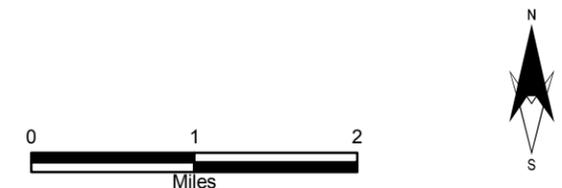
Chicago  
O'Hare  
International  
Airport

**O'Hare Modernization  
Environmental Impact Statement**

- +— Rail Roads
- Freeways
- Secondary Roads
- Local Streets
- ▭ Municipal Boundary
- ▭ Airport Property
- ▭ Noise Sensitive Land Use
- ▭ Parks and Forest Preserves
- ▭ Areas Newly Exposed to 65 DNL
- ▭ Areas No Longer Exposed to 65 DNL

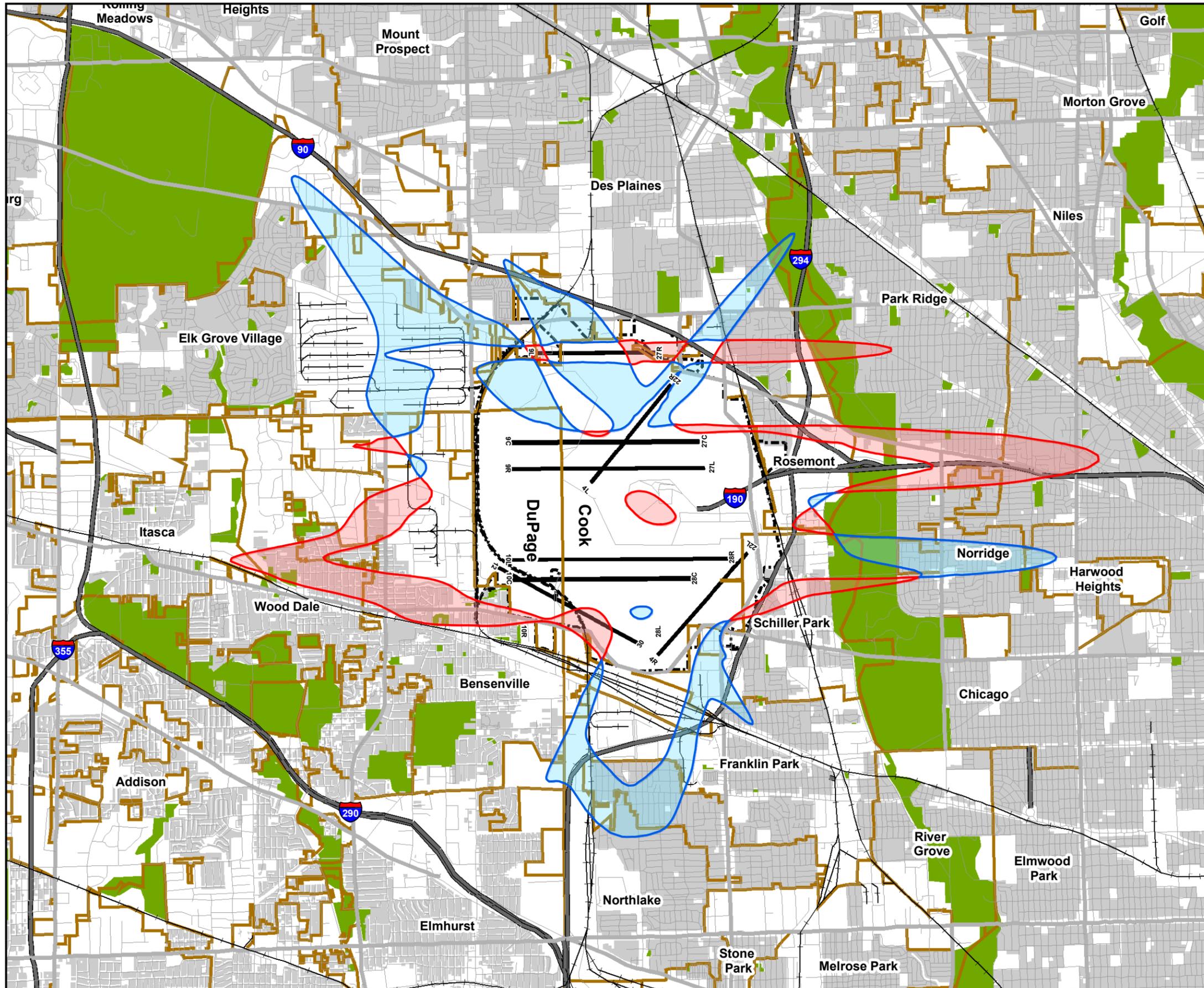
Note: Refer to Table 5.2-1 in section 5.2 of the FEIS for types of Noise Sensitive Land Uses.

Population	16,299	10,802
Housing Units	5,766	3,971



**Potential Change in Noise Exposure  
Alternative D Build Out  
Compared to Alternative A (No Action)**

► Exhibit 3



Source: StreetMapUSA, ESRI 2004. Land Use, DuPage Co. 2002, City of Park Ridge, 1996, Northeastern Illinois Planning Commission, 1992. Noise Contours: INM version 6.1, Leigh Fisher Associates, 2004.



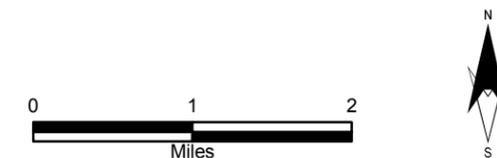
Chicago  
O'Hare  
International  
Airport

### O'Hare Modernization Environmental Impact Statement

- Rail Roads
- Freeways
- Secondary Roads
- Local Streets
- Municipal Boundary
- Airport Property
- Noise Sensitive Land Use
- Parks and Forest Preserves
- Areas Newly Exposed to 65 DNL
- Areas No Longer Exposed to 65 DNL

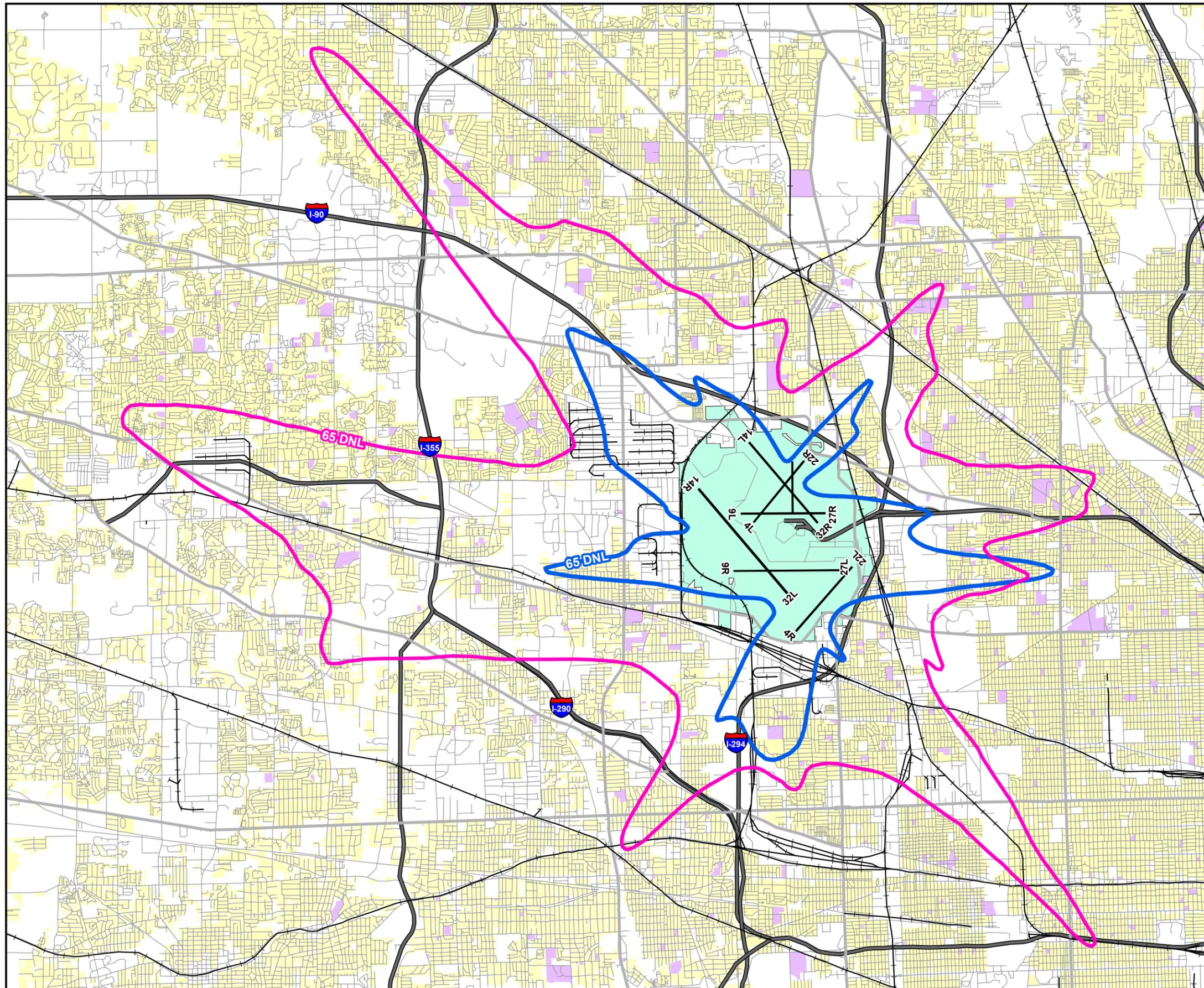
Note: Refer to Table 5.2-1 in section 5.2 of the FEIS for types of Noise Sensitive Land Uses.

Population	15,098	10,265
Housing Units	5,240	3,810



Potential Change in Noise Exposure  
Alternative G Build Out  
Compared to Alternative A (No Action)

► Exhibit 4



Chicago

O'Hare

International

Airport

**O'Hare Modernization  
Environmental Impact Statement**

-  1982 65 DNL \*
-  2002 65 DNL
-  Rail Roads
-  Freeways
-  Secondary Roads
-  Local Streets
-  Existing Airport Property
-  Compatible Land Use
-  Residential
-  Public, Hospitals, Institutional

\*Note: Contour from 1984 Final E.I.S.



**Noise Contours,  
2002 Baseline 65 DNL  
Compared to 1982 65 DNL**

► Exhibit 5

## C. Surface Transportation

This section includes the following subsections:

- EIS Considerations
- Other Considerations

### EIS Considerations

Traffic congestion is already present within the surface transportation study area. This situation is expected to become worse with the No Action Alternative (Alternative A) for each of the four future years of analysis. When comparing the Build Alternatives to the No Action Alternative (Alternative A) for each of the construction phases analyzed, there is a pattern of increasing congestion at a number of intersections and directional roadway segments. Under the Build Alternatives for Construction Phase I and Phase II, when compared to the No Action Alternative (Alternative A), no intersections are expected to deteriorate such that they would exceed the threshold of significance, and only one directional roadway segment is expected to deteriorate such that it exceeds the threshold of significance. Under the Build Alternatives for the Build Out + 5 phase, when compared to the No Action Alternative, there are 10 intersections and 13 directional roadway segments that are expected to deteriorate such that they would exceed the threshold of significance.

### Other Considerations

During the development of this EIS, assumptions were made regarding surface transportation improvements that would be in place for each of the construction phase years, based on the Transportation Improvement Plan (TIP) for the Chicago metropolitan area. It is recognized that regional transportation planning is an ongoing and fluid process, and that implementation of any of the Build Alternatives would be expected to facilitate advancement of that planning. It is anticipated that a number of the adverse impacts that have been identified in this EIS could be reduced as a result of some of the surface transportation initiatives that are under consideration. However, impacts of the following projects will not be known unless and until sufficient plans and project information become available. Some of these projects that are known to be in the early stages of planning at this point are listed below:

- West O'Hare Bypass
- York Road / Irving Park Road / UPRR / CNRR – Grade Separation
- Elgin-O'Hare Expressway – East Extension
- Metra STAR Line
- CTA Blue Line – O'Hare Express
- DuPage County "J" Route Bus Rapid Transit

## **D. Air Quality**

This section includes the following subsections:

- Regional Air Quality Conditions
- Emission Inventories
- Dispersion Modeling
- Clean Air Act Conformity
- Supplemental Air Quality Analyses

### **Regional Air Quality Conditions**

O'Hare International Airport is located within Cook and DuPage counties. These counties are included in an area that is currently designated as "moderate" non-attainment for the eight-hour ozone National Ambient Air Quality Standard (NAAQS) and non-attainment for particulate matter 2.5 microns or less in size. Both counties are designated attainment for carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. Finally, O'Hare International Airport is located within an attainment area for particulate matter 10 microns or less in size.

Following requirements in the Clean Air Act, the mandated attainment date for the one-hour ozone NAAQS was November 15, 2007. However, recent rules regarding the eight-hour ozone NAAQS specify that the one-hour standard was revoked on June 15, 2005. The mandated attainment date for the eight-hour ozone NAAQS is June 15, 2010.

At the time the air quality analysis was performed for the Draft EIS, the USEPA had not yet designated this or any other area of the U.S. with respect to the status of attainment for the NAAQS for particulate matter 2.5 microns or less in size. Subsequent to the analysis, on December 17, 2004, the USEPA designated Cook and DuPage counties, along with four surrounding counties, and partial areas within two additional counties, as non-attainment for this pollutant. Based on the USEPA's scheduled timeline to have all areas of the country attain the standards for particulate matter 2.5 microns or less in size, States will submit their plans to the USEPA to attain the standard on or before April of 2008.

Because O'Hare is located within Illinois, the discussion and assessment of precursors to the air pollutant ozone has, for the most part, been limited to the Illinois portion of the eight-hour ozone non-attainment areas (referred to as the Chicago non-attainment area). Notably, representatives of the IEPA and representatives of the Indiana Department of Environmental Management (IDEM) serve together in the Lake Michigan Air Directors Consortium to assess air quality conditions within the eight-hour ozone non-attainment area.

### **Emission Inventories**

Before the scoping process, FAA met with USEPA and IEPA representatives to discuss their concerns and to develop a comprehensive scope of work reflected in the EIS methodologies for the air quality assessment. Thereafter, FAA developed, in conjunction with these agencies, specific air quality protocols to be used for air quality assessment purposes. FAA's protocols contained analytical methodologies which were subsequently modified based on further

coordination with USEPA and IEPA. In the Final EIS, FAA provides additional airport operations' emissions inventory information for particulate matter 2.5 microns or less in size.

### *Airport Operations*

Emission inventories provide an indication of increases and decreases in air pollutant or pollutant precursor emissions by providing an estimate of total emissions from sources with and without project implementation.

The emission inventories in the EIS air quality assessment were prepared using the FAA's Emissions and Dispersion Modeling System (EDMS Version 4.12). EDMS generates an emission inventory of carbon monoxide, volatile organic compounds, nitrogen oxides, sulfur oxides, and particulate matter with a diameter of 10 microns or less in size. The EDMS, and supplemental methodologies, were also used to prepare emissions inventories of particulate matter 2.5 microns or less in size.

The following main categories of sources were evaluated: aircraft, ground support equipment, auxiliary power units, motor vehicles on roadways (both on Airport and within a defined study area off Airport property) and at curbsides and parking facilities located on Airport property, fuel storage facilities, Airport-related fire training activities, and on Airport stationary sources (boilers, generators, etc.). The changes in emissions that would affect air quality are shown in **Table 7**. The analysis to determine the affect of the changes on local air quality conditions (in the vicinity of the Airport) are discussed in **Dispersion Modeling**.

### *Construction Operations*

Air quality impacts that would result from construction activities would be temporary (occurring over a period of ten years). When considering the total predicted air pollutant concentrations that were compared to the National Ambient Air Quality Standards (NAAQS), the level of dispersed air pollutants that would result from construction would be minimal when compared to the level of dispersed air pollutants from all other airport-related sources (aircraft, ground support equipment, passenger-related motor vehicles, etc.). Notably, the results of the dispersion analysis indicate that there would be no exceedances of the NAAQS with or without the proposed improvements.

**TABLE 7  
CHANGES IN AIRPORT-RELATED EMISSION INVENTORIES  
BUILD ALTERNATIVES RELATIVE TO ALTERNATIVE A – BUILD OUT + 5**

Alternative(a)	Source Category	Estimated Tons in Build Out + 5 (e,f)					
		Carbon Monoxide	Volatile Organic Compounds	Nitrogen Oxides	Sulfur Oxides	Particulate Matter 10 microns or less	Particulate Matter 2.5 microns or less
A	Total	21,844	1,055	6,210	438	112	94
C	Total	26,119	1,324	7,290	564	127	107
	Increase/Decrease(b)	+4,274	+268	+1,081	+125	+15	+13
D(c)	Total	26,605	1,367	7,408	589	128	109
	Increase/Decrease(b)	+4,761	+311	+1,199	+151	+17	+15
G(c)	Total	26,085	1,321	7,382	562	127	107
	Increase/Decrease(b)	+4,241	+265	+1,073	+124	+15	+13

## Notes:

- (a) Alternative A = No Action, Alternative C, D, and G are Build Alternatives.
- (b) When compared to Alternative A (No Action).
- (c) From an air quality/air pollutant perspective, the only difference in estimated emissions between Alternatives C, D or G would be those resulting from the operation of aircraft.
- (e) Numbers reflect numerical rounding.
- (f) Estimated emissions and changes in emissions with the Delayed Construction Schedule.

Source: Environmental Science Associates, Inc. [TPC] analysis, 2004/2005.

### Dispersion Modeling

Dispersion modeling provides predicted concentrations of ambient pollutant levels that can be compared directly to the NAAQS. For the purpose of the assessment, two “scales” of dispersion analyses were performed—macroscale (large) and microscale (very small). The macroscale analysis evaluates pollutant concentrations on and in the vicinity of the Airport and the microscale analysis evaluates pollutant concentrations immediately adjacent to intersections/interchanges within the study area. The macroscale and microscale dispersion modeling was performed for ground level emissions only. The dispersion analysis does not include emissions due to sequencing/vectoring delay because these emissions would occur above the atmospheric mixing height. Emissions above this height do not have a discernable effect on ground level concentrations of pollutants. In the Final EIS, FAA provides dispersion analysis for particulate matter 2.5 microns or less in size.

#### Macroscale Analysis

The macroscale analysis was used to evaluate the change in ambient pollutant concentrations at various locations on Airport property and in areas adjacent to the Airport. On Airport, the locations included terminal curbsides, the bus center, and parking areas. Off Airport, specific locations were selected either because they are considered sensitive to changes in ambient pollutant concentrations (i.e., residences) or because they were locations where the highest predicted concentrations of any of the air pollutants are expected to occur (intersections, near the end of runways).

The dispersion analysis was performed using the FAA's EDMS. The EDMS uses as its base, emission inventory data and site-specific meteorological data. EDMS provides dispersion analysis for the air pollutants nitrogen dioxide, carbon monoxide, particulate matter with a size diameter of 10 microns or less, and sulfur dioxide. The model is not designed to perform dispersion analysis for ozone or currently capable of performing dispersion analysis of particulate matter 2.5 microns or less in size. In addition to the sources within the defined study area, conservative background concentrations were "added" to computer predicted levels of each pollutant. These background levels were selected by the IEPA for the purpose of this EIS.

Based on the results of the analysis, ambient concentrations of nitrogen dioxide, carbon monoxide, particulate matter 10 microns or less in size, and sulfur dioxide would not exceed the NAAQS as shown in Table 8.

**TABLE 8  
MAXIMUM MACROSCALE DISPERSION MODELING RESULTS – BUILD OUT +5**

Alternative (b)	Maximum Predicted Pollutant Concentrations ( $\mu\text{g}/\text{m}^3$ )(a,d)									
	Nitrogen Dioxide	Carbon Monoxide		Particulate Matter 10 microns or less		Particulate Matter 2.5 microns or less		Sulfur Dioxide		
	Annual	1-Hour	8-Hour	24-Hour	Annual	24- Hour	Annual	3-Hour	24- Hour	Annual
	NAAQS Values (c)	100	40,000	10,000	150	50	65	15	1,300	365
A	84	34,687	8,237	64	31	39	14	303	96	13
C	84	28,767	8,338	64	31	39	14	290	99	13
D	84	29,517	8,265	64	31	39	14	291	99	13
G	83	29,352	8,302	64	31	39	14	290	99	13

Notes: (a) Includes Background concentrations.  
 (b) Alternative A = No Action, Alternative C, D, and G are Build Alternatives.  
 (c) NAAQS = National Ambient Air Quality Standards.  
 (d) Maximum results with the Delayed Construction Schedule.

Source: Environmental Science Associates, Inc. [TPC] analysis, 2004/2005.

### Microscale Analysis

EDMS does not include algorithms that consider both the free flow and congested motor vehicle operating conditions on levels of carbon monoxide. Therefore, a second type of dispersion analysis, a microscale analysis, was performed to evaluate the change in carbon monoxide emissions in the vicinity of the intersections and/or interchanges affected by the proposed improvements. The microscale analysis was performed using the USEPA's MOBILE6.2 motor vehicle emission rate model and CAL3QHC roadway/intersection dispersion model. The CAL3QHC (Version 2.0) model is currently the most accurate tool for identifying potential carbon monoxide concentrations due to mobile source emissions at congested locations.

The roadway intersection analysis evaluated effects of the alternatives at ten intersections in the vicinity of the Airport. The intersections included both existing intersections and proposed/improved intersections that would be constructed if the project is approved. The selection of

intersections was based on the analysis methodology described in the USEPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections*.

Based on the results of the analysis, ambient concentrations of carbon monoxide would not exceed the NAAQS in the vicinity of any of the evaluated intersections as shown in **Table 9**.

**TABLE 9**  
**MAXIMUM MICROSCALE DISPERSION MODELING RESULTS – BUILD OUT + 5**

Phase	Alternative	Intersection No.	Intersection	Carbon Monoxide Concentrations (ppm) (a,d)	
				One Hour(b)	Eight Hour(c)
Build Out+5	A (No Action)	10	Mannheim Road and Zemke Road	11.9	7.6
	C	20	Mannheim Road and Irving Park Road	10.9	7.0
	D	20	Mannheim Road and Irving Park Road	10.9	7.0
	G	20	Mannheim Road and Irving Park Road	10.9	7.0

Notes: (a) ppm= parts per million.

(b) Includes background concentration of 4.5 ppm.

(c) Includes background concentration of 2.9 ppm.

(d) Maximum results occur with the Original/Compressed Construction Schedules.

Source: Environmental Science Associates, Inc. [TPC] analysis, 2004.

### Clean Air Act Conformity

Under Section 176(c) of the Clean Air Act, 42 U.S.C. § 7506(c) (also known as Conformity), Federal agencies, such as the FAA, are prohibited from engaging in, supporting in any way, providing financial assistance for, licensing or permitting, or approving any activity in a non-attainment or maintenance area that does not conform to an approved State Implementation Plan (SIP).

To implement the provisions of Section 176(c) of the Clean Air Act, the USEPA has adopted guidance for demonstrating conformity. Within non-attainment areas, Federal actions related to transportation (highway) plans, programs, and projects that are developed, funded, or approved under U.S.C. Title 23 or the Federal Transit Act, must meet the procedures and criteria of 40 CFR Part 51, Subpart T. Non-highway related actions must also demonstrate conformity. These conformity demonstrations must meet the procedures and criteria of 40 CFR Part 51, Subpart W. The IEPA has adopted these "general conformity rules" (Title 35, IL Administrative Code, Part 255).

Under the general conformity rules (40 CFR Part 93 Subpart B), a project does not require a conformity determination if the project is exempt, presumed to conform, or if the increase in emissions due to a proposed Federal action is less than the *de minimis* thresholds outlined in Title 35 Illinois (IL) Administrative Code Part 255 and 40 CFR Part 93 Subpart B and if the action-related emissions are not regionally significant (if the action-related emissions are less than 10 percent of the emissions in the SIP).

USEPA's general conformity rule defines a "conforming" project as one that: 1) conforms to the SIP's overall objective of eliminating or reducing the severity and number of air quality violations in a state and achieving expeditious attainment of the NAAQS; 2) does not cause or contribute to new NAAQS violations in the area; 3) does not increase the frequency or severity

of existing NAAQS violations in the area; and 4) does not delay the state's timely attainment of the NAAQS or impede required progress toward attainment.

Based on the results of the general conformity evaluation, the total direct and indirect project-related emissions of volatile organic compounds and nitrogen oxides were determined to be either:

- Accounted for in the emission projections incorporated into the Chicago 1-hour ozone attainment demonstration SIP (the applicable SIP), or
- Could reasonably be accounted for in established emission totals and or excess regional emission estimates.

For these reasons, the FAA, in consultation with the IEPA, has determined that the emissions associated with the proposed O'Hare Modernization Program improvements conform to the applicable SIP, and thus to the Clean Air Act, regardless of construction schedule, construction scenario, or alternative.

The FAA published the Draft General Conformity Determination on May 18, 2005 for review/comment from the public and reviewing agencies. A total of nine comment letters were received on the Draft General Conformity Determination. The Final General Conformity Determination is incorporated by reference in the Final EIS, and is issued with the Final EIS in **Appendix J**.

### **Supplemental Air Quality Analyses**

In recent years, public and agency interest has increased regarding the contribution of airports to hazardous air pollutants (HAPs). HAPs are gaseous organic and inorganic chemicals and particulate matter that are either known or suspected to cause cancer (to be carcinogenic) or known or suspected to cause other serious health effects (non-carcinogenic).

The FAA developed the HAPs Protocol for this EIS in coordination with USEPA and IEPA. While the effects on human health from HAPs were raised in Scoping, the FAA, USEPA, and IEPA concur that at this time it is not appropriate to conduct a human health risk assessment for the HAPs discussed in **Appendix I**, and that the influence of the proposed airport development on the health of those living in the vicinity of O'Hare cannot currently be quantified in a meaningful way. Collectively, the agencies believe that, given the absence of HAP emissions data and the limitations of HAP speciation profiles for commercial jet aircraft engines, an accurate emissions inventory (the first step in a sound human health risk assessment) cannot be accomplished. A review of available regional emission estimates and the results of the evaluation indicate that, on a regional basis, the sources within the O'Hare study area emit from 1 to 3 percent of the regional emissions of the HAPs determined to be of most interest with respect to Airport-related activities. Because the sources included in the O'Hare evaluation include both motor vehicle traffic related to the Airport and background traffic, these estimates should be considered conservative. However, it should also be noted that, due to the uncertainties and limitations associated with airport-related HAP studies at the present time, the contribution of aircraft emissions is uncertain.

Given the lack of national ambient air quality standards for concentrations of HAPs and, also, given the uncertainties and limitation associated with airport-related data, information in this EIS regarding HAP emissions is provided in this EIS for disclosure purposes only.

## E. Social Impacts

This section evaluates potential social impacts, with a primary focus on impacts which would result from the potential relocation of homes and businesses. **Table 10** summarizes the social impacts associated with each alternative under consideration.

**TABLE 10**  
**SUMMARY OF PROPOSED LAND ACQUISITION RELATED IMPACTS**  
**BUILD OUT+5 (2018)**

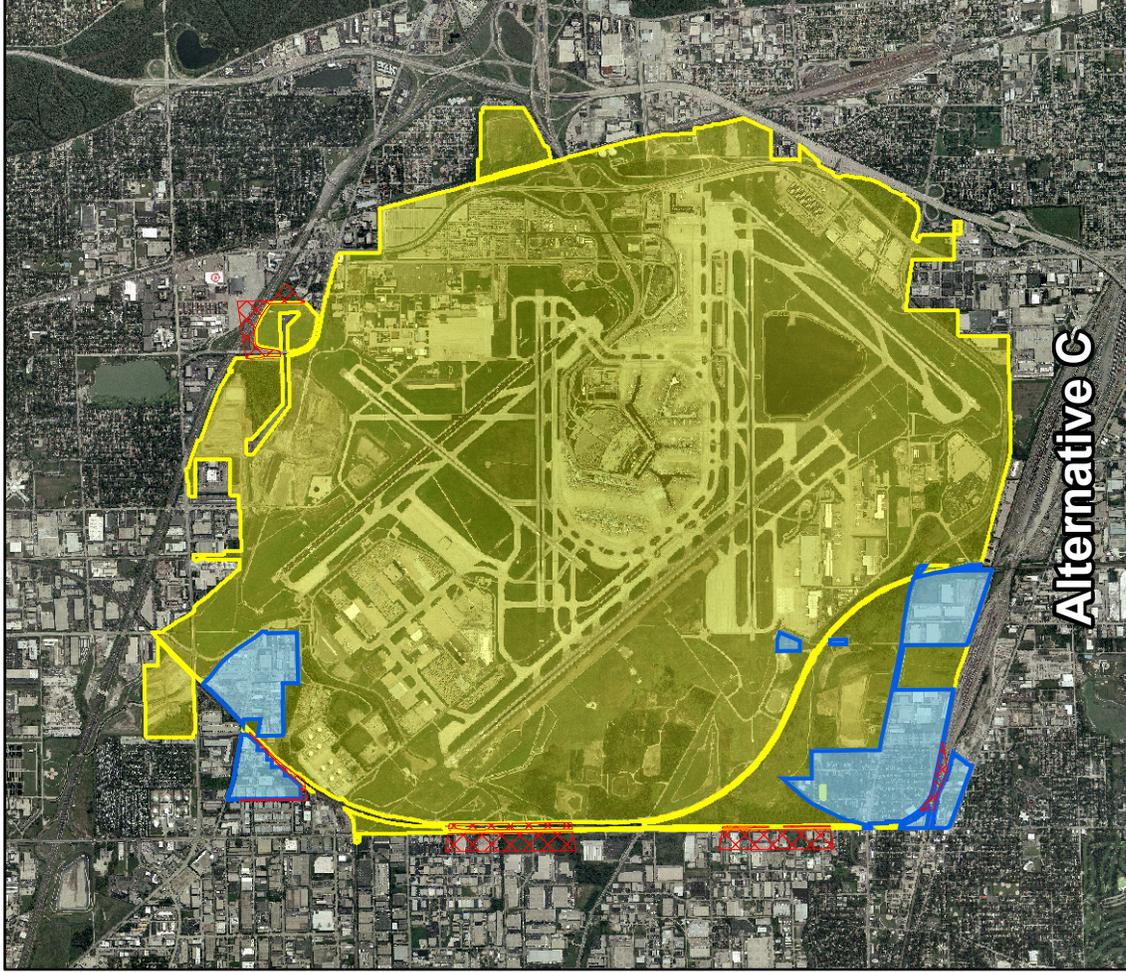
<b>Impacts</b>	<b>Alternative A</b>	<b>Alternative C</b>	<b>Alternatives D or G</b>
Housing Units (Residential)	0	539	522
Businesses (Non-Residential)	0	197	164
Total Estimated Acres Acquisition Area	0	440	413
Population in Acquisition Areas	0	2,631	2,553
Minority Population in the Acquisition Area (by race)	0	1,575	1,479
Minority Population in the Acquisition Area (by ethnicity) (b)	0	1,599	1,524
Estimated Tax Loss - School Districts and Colleges	0	\$3,152,694	\$3,020,632
Estimated Tax Loss - Other Taxing Bodies	0	\$2,511,076	\$2,275,305
Total Estimated Tax Loss (1 year only) (a)	0	\$5,663,770	\$5,295,937

Note: (a) Estimated Tax Loss based on 2002 Cook and DuPage Counties Tax Bills;  
(b) Minority population by ethnicity only includes persons of Hispanic ethnicity.

Source: TPC Analysis.

The analysis of social impacts focused primarily on proposed land acquisition and relocation associated with the Build Alternatives C, D, and G. Up to 539 homes and 197 businesses would be acquired if any of the Build Alternatives were to be implemented. The direct impacts of relocation require mitigation in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act). Owners, tenants, and businesses in the proposed acquisition areas would be relocated pursuant to the Uniform Act and FAA's Advisory Circular AC150/5100-17 *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects*. The Uniform Act will be followed by the City of Chicago with compliance assured by FAA. In addition, although not specifically required under the Uniform Act, the City of Chicago has committed to providing advisory services to those immediately adjacent to the acquisition area. The proposed land acquisition areas for Alternatives C, D and G are depicted on **Exhibit 6**.

The employment forecast for the Build Alternatives (in 2018) indicates that there would be approximately 49,000 more permanent jobs related to O'Hare than there are in Alternative A.

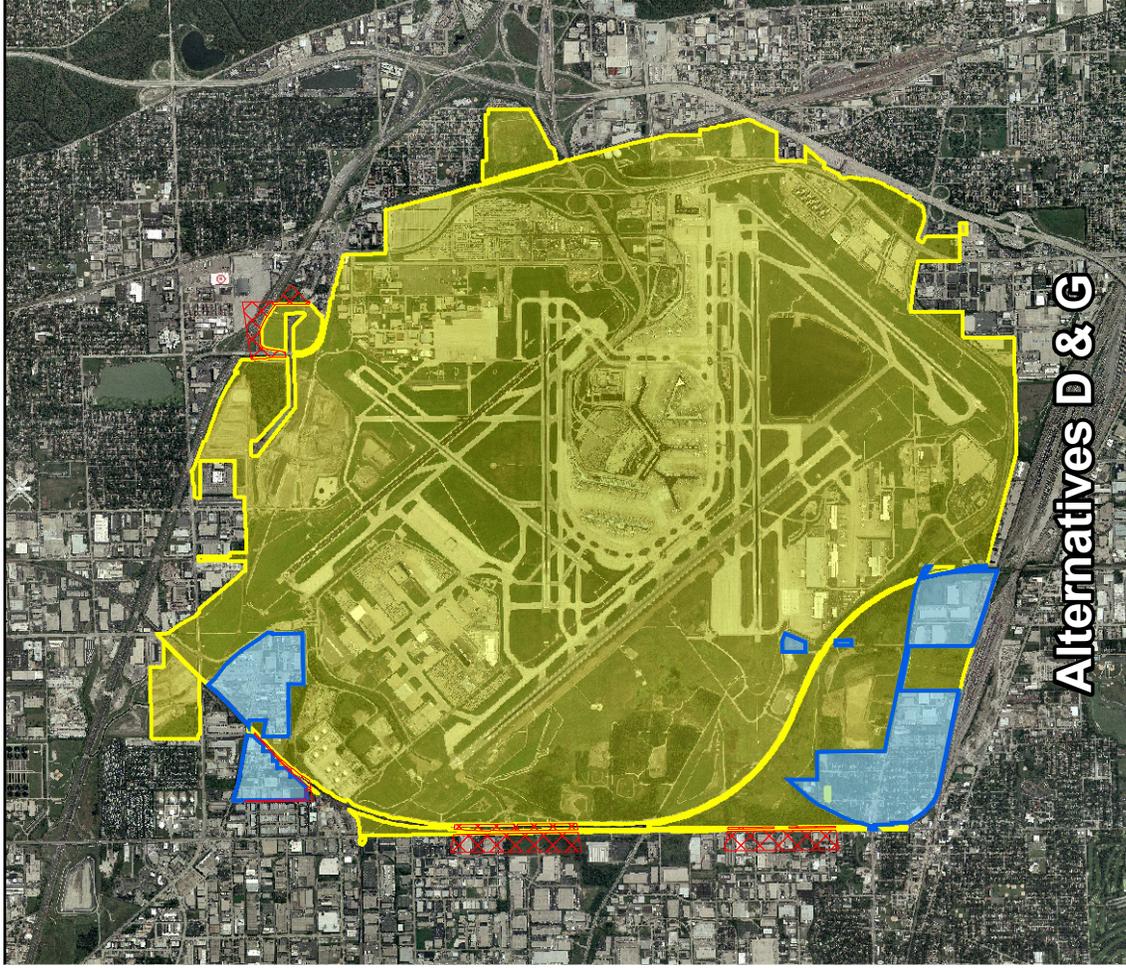


Proposed Acquisition Areas

Existing Airport Property

Proposed Avigation Easement

**Alternative G**



**Alternatives D & G**

Chicago O'Hare International Airport

**Proposed Land Acquisition**



**O'Hare Modernization  
Environmental Impact Statement**

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## **F. Environmental Justice**

EPA guidance states it is important to “encourage and facilitate more active participation by low-income communities and minority communities in its NEPA process.” In response, the FAA committed to a particularized, highly focused outreach program designed to ensure that this affected population received the full measure of all possible information about the proposed project and their rights related to potential acquisition/relocation. This goal was accomplished through careful identification of target audiences and aggressive community outreach beyond the traditional forums. The environmental justice outreach process for this EIS provided information to the affected population and afforded significant opportunity for interaction with Federal officials. On May 23, 2004, the FAA held its first environmental justice public meeting. A second environmental justice outreach meeting was held on August 29, 2004 at St. Alexis Church in Bensenville, and the third environmental justice outreach meeting was held on March 6, 2005, also at St. Alexis Church. In addition, over 30 small-group meetings were held at various businesses and residences located in the acquisition area.

FAA considered direct and indirect impacts for environmental resource categories where there were potentially significant impacts under NEPA: acquisition, noise, surface transportation, air quality (as requested by commenters, including USEPA), wetlands, and Section 4(f) and Section 6(f) impacts.

### **Direct Impacts**

As noted in the EIS, within the population to be acquired under the Build Alternatives, there are a disproportionate number of minority (by race and ethnicity) populations. In addition, businesses could be negatively impacted by the loss of minority residents. Other than the residents and the businesses previously mentioned, there may also be some environmental justice impacts to certain community resources that would remain following acquisition. For instance, schools or other social service agencies may conduct programs which teach English as a second language because of the large minority population present in the acquisition area. If this large minority population moves beyond the limits of the present school district boundary, programs may be affected. Class size and demographics could be affected which could cause a reduction in staff.

### **Indirect Impacts for Noise**

The total number and percentage of minority populations and low-income households within the 65 DNL and higher noise contours for each Build Alternative were compared to the total number and percentage of these groups within this contour under the No Action Alternative. The minority population and low-income households affected within the 65 DNL and higher noise contours for each Build Alternative in Build Out + 5 were also compared to the 2000 U.S. Census baseline minority population and low-income households of the Comparison (Comp.) Areas for 65+ DNL to determine if the minority population and low-income households affected by each of the Build Alternatives was “meaningfully greater” than that in the Comp. Areas for 65+ DNL. Where a greater number or higher percentage of the minority or low-income population would experience 65 DNL and higher noise levels under any of the Build

Alternatives than under the No Action Alternative (Alternative A), there could be a disproportionately high and adverse impact. Additionally, if a meaningfully greater percentage of minority or low-income populations would experience 65 DNL and higher noise levels under any of the Build Alternatives as compared to the 2000 U.S. Census baseline minority and low-income population of the Comp. Areas for 65+ DNL, there could be a disproportionately high and adverse impact.

The minority populations and low-income households in areas that would newly experience DNL 1.5 db or greater increases in noise at or above 65 DNL noise levels for each Build Alternative were examined to determine whether significant noise impacts would be predominately borne by minority population and low-income households in any area. Additionally, the minority population and low-income households in areas that would newly experience DNL 1.5 dB or greater increases in noise at or above 65 DNL noise levels for each Build Alternative was examined, and was compared to the 2000 U.S. Census baseline minority and low-income population of the respective Comp. Area for DNL 1.5 dB for each Build Alternative to determine if there was a "meaningfully greater" percentage of minority or low-income populations that would experience a significant noise increase.

Because the results of the comparison analyses presented in the Draft EIS were so close (i.e., within ten percent), and in the absence of specific CEQ guidance related to the definition of "meaningfully greater," FAA decided to conduct a statistical analysis. A statistical analysis was performed to determine if there was a statistically significant difference among the proportions of minority populations and low-income households in the "impact" areas when compared to the larger general study areas described previously. For the purposes of this EIS, FAA is treating differences in proportions of populations that are statistically significant as "meaningfully greater" differences.

The analyses of potential noise impacts for the Build Alternatives led to the preliminary conclusions that there are disproportionately high and adverse noise impacts on minority (by race and ethnicity) populations and low-income households. In making determinations regarding disproportionately high and adverse effects on minority and low-income populations, mitigation and enhancement measures to the affected minority and low-income populations may be taken into account. This final determination will be made in the FAA's ROD.

### **Indirect Impacts for Surface Transportation**

The analyses for the Build Alternatives led to the preliminary conclusions that there are disproportionately high and adverse noise impacts on minority (by ethnicity) populations and low-income households. Within environmental justice areas, there are a total of two deficient intersections (Bessie Coleman Drive & Higgins Road and York Road & Irving Park Road Ramp) with any of the Build Alternatives when compared to the No Action Alternative (Alternative A) in Build Out and Build Out + 5. In making determinations regarding disproportionately high and adverse effects on minority and low-income populations, mitigation and enhancement measures to the affected minority and low-income populations may be taken into account. This final determination will be made in the FAA's ROD.

## Indirect Impacts for Other Environmental Resources

The FAA has reviewed additional impact categories, including; air quality, wetlands, Section 4(f) and Section 6(f) resources. There are no disproportionate impacts to minority and/or low-income communities associated with these environmental resources. The FAA also reviewed the other impact categories as contained in **Chapter 5, Environmental Consequences** of the Final EIS and has not found any additional environmental justice impacts.

### G. Water Quality

Under the No Action Alternative (Alternative A) and each of the Build Alternatives, the FAA concludes that no significant impacts related to water quality would occur. Compared to the No Action Alternative (Alternative A), the potential for water quality impacts under Alternatives C, D, or G would be greater due to the increase in impervious surface area, additional airside areas using deicing chemicals, and substantial construction activity. However, the increase in potential water quality impacts would not be significant because, in addition to the efforts to reduce contamination to surface water from deicing chemicals, adequate stormwater facilities, designed to manage, contain, and convey the calculated increases in stormwater, would be designed and constructed as part of each of the Build Alternatives.

### H. Historic, DOT Section 4(f), and Section 6(f) Properties

There are a total of four historic properties under Alternatives C, D and G that are proposed for acquisition and/or removal or relocation. These include St. Johannes Cemetery, Rest Haven Cemetery, Schwerdtfeger Farmstead, and Gas Service Station. One of the four properties, Rest Haven Cemetery, may not need to be relocated, but may still be acquired. An additional historic property, the Green Street School, at present, is shown for acquisition in order to conservatively assess the impacts. However, this property would not be demolished.

Historic properties of national, state, or local significance are protected under Section 4(f) of the U.S. Department of Transportation Act of 1966. Section 4(f) lands include public parks, recreation areas, or wildlife and waterfowl refuges of national, state, or local significance and land from an historic site of national, state, or local significance. Land and Water Conservation (LAWCON) Section 6(f) refers to lands that are purchased with LAWCON funds for public recreation purposes. The proposed Build Alternatives would all adversely affect Section 4(f) and Section 6(f) properties.

A total of three parks (part of *Silver Creek/DuPage County Forest Preserve*, *Schuster Park*, and *Bretman Park*) would be acquired under all of the Build Alternatives. *Schuster Park* is the only 6(f) property located within the project area and is proposed for acquisition under all of the Build Alternatives.

Local municipalities in the area of potential effect were also provided an opportunity to provide information concerning formally identified local landmarks. Sources identified 134 sites of local historical importance within the project area that could be affected by the proposed Build Alternatives. Based on the analysis conducted for the Section 4(f) and 6(f) Evaluation, none of these sites would be directly affected by the Build Alternatives, but were considered relative to

indirect/potential constructive use impacts. A review was conducted of the indirect impacts of the alternatives on these lands, and noise was identified as the only potential indirect impact. **Appendix L** identified locally important historic sites that would exceed the FAA's noise compatibility guidelines with the proposed Build Alternatives. These incompatible noise levels are not anticipated to substantially impair the use of these properties. Sound insulation would occur as the noise level would not be compatible with residential uses. Sound insulation would not be needed due to the property having local historic importance. With any Build Alternative, if selected, sound insulation following the Secretary of Interior's *Standards for the Treatment of Historic Buildings* (U.S. Department of Interior, National Park Service, 1995) and FAA guidelines would avoid adverse impacts to these sites.

A Draft Section 4(f) and 6(f) Evaluation (Evaluation) was submitted for public and agency review on May 20, 2005. A 45-day comment period was provided on the Draft Evaluation, which ended on July 5, 2005. A total of 13 comment letters were submitted on the Draft Section 4(f) and 6(f) Evaluation which are incorporated into the Final Evaluation and responded to by FAA. The Final Section 4(f) and 6(f) Evaluation is included in the Final EIS as **Appendix L**.

### **I. Biotic Communities/Threatened and Endangered Species**

The Illinois Department of Natural Resources (IDNR) and the U.S. Fish and Wildlife Service (FWS) were consulted regarding the presence of biotic communities at the Airport and reviewed and concurred with the protocols and findings of the related surveys conducted for this project. The FWS and the IDNR concur with the determination that no threatened or endangered species currently exist in the construction impact area.

The Build Alternatives include similar proposed land acquisition and would result in the potential disturbance of all biotic communities within the construction impact area. However, given that these biotic communities are not exceptional, and are fragmented, the FAA concludes that no significant impacts would occur. In addition, these biotic communities contain common, highly adaptive urban species that will continue to exist in the vicinity of the Airport. The impacts of each Build Alternative would be similar.

### **J. Wetlands**

Simultaneously with preparation, distribution, and review of this EIS, the U.S. Army Corps of Engineers (USACE) is reviewing and processing a Section 404 permit application and pre-discharge notification per the requirements of the Clean Water Act, as submitted by the City of Chicago Department of Aviation (DOA). Similarly, the Illinois Environmental Protection Agency (IEPA) is reviewing anti-degradation (Water Quality Standards) and Section 401 (Water Quality Certification) information pertaining to potential project-related wetland impacts. In accordance with a Memorandum of Agreement (MOA) signed by FAA, the USACE, and the IEPA, all three of these decision-making agencies will use the information developed during this EIS process to reach decisions on project alternatives and related matters as nearly simultaneously as possible. In furtherance of this goal, the public hearings conducted for this EIS were hosted by FAA, the USACE, and the IEPA for purposes of meeting these agencies' decision-making requirements.

Approximately 154 acres of wetlands (both jurisdictional and non-jurisdictional) and other non-wetland Waters of the United States (WUS) would be impacted by any of the Build Alternatives. The wetlands at the Airport include many small, individual sites providing relatively few beneficial wetlands functions and values. These wetlands and WUS have been adversely affected by past human activities, including clearing, grading, and other developmental actions. The impacts of past disturbances range from modification of plant communities, to creation of new wetland areas, primarily caused by man-made grading changes that blocked original drainage ways or which created isolated depressions.

The guidelines associated with the Section 404 permit process indicate that satisfactory mitigation must be provided if jurisdictional wetlands impacts could occur as a result of project implementation. The City's proposed Conceptual Wetlands Mitigation Plan, which has been refined in response to comments from the Interagency Mitigation Review Team (MRT) during the Section 404 application review process, is intended to provide compensatory mitigation for wetlands and non-wetland WUS removed from O'Hare. The MRT consists of the USACE, USEPA, IEPA, and the USFWS. The overall intent is to provide compensatory mitigation, which greatly improves the quality of the provided resources with respect to wildlife utilization, while also offering additional value to interested publics by providing access that is not possible at the Airport. A total of 447.4 acres of compensatory mitigation is proposed as outlined in Table 11.

**TABLE 11  
PROPOSED WETLAND AND NON-WETLAND WUS MITIGATION CREDITS**

<b>Water Resource Type</b>	<b>Classification</b>	<b>Impact (acres)</b>	<b>Mitigation Ratio</b>	<b>Mitigation Credits</b>	<b>Mitigation Category(a)</b>
USACE Jurisdictional Wetlands (DuPage County)	Jurisdictional	11.3	1.5 : 1.0	17.0	I
USACE Jurisdictional Wetlands (Cook County)	Jurisdictional	15.4	1.5 : 1.0	23.1	II
WUS - Creeks/Ditches (Cook County) (b)(c)	WUS	23.0	5.0 : 1.0	115.0	IV
WUS - Creeks/Ditches (Cook County) (c)	WUS	3.0	1.5 : 1.0	4.5	IV
Isolated Wetlands (DuPage County)	Isolated	24.9	1.5 : 1.0	37.4	I
Isolated Wetlands (Cook County)	Isolated	14.5	1.0 : 1.0 (d)	14.5	III
Isolated – Critical Classification (DuPage County)	Isolated	10.7	3.0 : 1.0	32.1	I
In-Channel Wetlands (SW120 and SW121) (e)	Jurisdictional	24.8	5.0 : 1.0	124.0	IV
USEPA – Forested (DuPage County) (f)	Jurisdictional	22.2	3.0 : 1.0	66.6	I
USFWS – Forested (Cook County) (g)	Jurisdictional	4.4	3.0 : 1.0	13.2	II
<b>Total</b>		<b>154.2</b>	<b>N/A</b>	<b>447.4 (h)</b>	<b>N/A</b>

- Notes:
- (a) Refer to **Section 5.12.4.3, Mitigation Categories**, for a description of the proposed approaches to meet mitigation requirements.
  - (b) Includes 1.0 acre of WUS in the potential southwest acquisition area.
  - (c) Mitigation ratios for specific creeks and ditched were reviewed by USACE.
  - (d) FAA concurrence from Michael MacMullen (FAA) to Carol Wilinski (DOA), dated January 16, 2002, for the 1.0: 1.0 mitigation ratio for the non-jurisdictional (isolated) wetlands associated with the O'Hare Express North Project.
  - (e) The USACE has indicated that mitigated Wetland SW120 and Wetland SW121 should be treated as WUS, as these wetlands provide conveyance for WUS (i.e., Bensenville Ditch).
  - (f) In comments provided by USEPA on the DRAFT EIS, USEPA indicated that wetlands NW28 and SW15 should be mitigated at a higher ratio of 3:1.
  - (g) In comments provided by USFWS on the DRAFT EIS, wetlands SE63, NE01, NE05, NE10, NE58, NW37B, NE08, SE64, and SW25 should be mitigated at a higher ratio of 3:1.
  - (h) 447.4 acres of credit are proposed.

Source: City of Chicago Department of Aviation Individual Permit Application to U.S. Army Corps of Engineers, November 2004 (Revised June 23, 2005).

**K. Floodplains**

Under the No Action Alternative (Alternative A) and each Build Alternative, the FAA concludes that no significant encroachment on floodplains would occur as defined in EO 11988. Each Build Alternative includes similar increases in impervious surfaces and runoff and would result in an encroachment. The FAA has considered whether there are practicable alternatives to this encroachment. The proposed detention basins would reduce the size of the floodplains on the Airport and would ensure that no significant encroachment impacts to the existing floodplains would occur. The increase in runoff from the Airport would be accommodated without having an adverse effect on floodplains, on stream habitat, or on streambank erosion.

**L. Wild and Scenic Rivers**

Each Build Alternative includes similar increases in impervious surfaces and runoff. Because Alternatives C, D, or G would include the expansion of detention basins at the Airport, these alternatives would not affect the free flowing condition of the Des Plaines River and, given the use of best management practices in operating the airport, would not affect any of the natural, cultural, or recreational values of the river. Therefore, no impacts to wild and scenic rivers or rivers on the NRI would occur under these alternatives.

**M. Energy Supply and Natural Resources**

Energy demands are expected to increase in the future regardless of whether or not proposed Build Alternatives would be implemented. Energy demands associated with airport facilities would only increase if additional airport facilities are undertaken, but increases in aircraft fuel consumption would increase as activity increases and/or delay levels increase. Contacts with local energy and natural resource suppliers have indicated the ability to meet the projected demands with the Build Alternatives.

**N. Light Emissions**

Light emission impacts are localized based on the existing or potential location of individual facilities. However, because the lighting would be directed upward, or would be buffered from surrounding residential areas by existing industrial, commercial, and transportation sources, the FAA concludes that no significant project-related light emission impacts would be expected.

**O. Solid and Hazardous Waste**

The FAA concludes that no significant impacts related to solid and hazardous waste would occur under the Build Alternatives since no problems are anticipated with respect to meeting the applicable local, state, Tribal, or Federal laws and regulations. Each Build Alternative maintains the same amount of enplaned passengers. Therefore, since the amount of generated solid waste is directly related to the number of enplaned passengers, the amount of solid waste generated for each Build Alternative would be the same. In general, with the exception of construction, demolition and land clearing waste, it is anticipated that there would be an increase in the level of solid waste generated by the Airport with the Build Alternatives when compared to the No Action Alternative. Though the handling of hazardous waste is forecast to increase proportionately with the growth of enplaned passengers, best management practices

regarding handling and transporting hazardous materials would be utilized to ensure environmental safety.

## **P. Construction Impacts**

The preparation of any EIS requires that certain assumptions (e.g. forecast, construction schedule, development plan) must be made early in the process to provide a framework for the environmental analysis. In this case, those assumptions were established in late summer/early fall of 2002. These assumptions helped to form the basis for identifying and selecting the various alternatives to be considered. These assumptions further enabled computer simulation models to be formatted and run to analyze the potential impacts of the alternatives on numerous environmental categories required for consideration under NEPA. As stated above, the analyses of environmental impacts in this EIS are presented for the following conditions:

- Baseline – represents conditions in 2002
- Construction Phase I – First major construction phase complete (2007)
- Construction Phase II – Second major construction phase complete (2009)
- Build Out – Construction completed and operational (2013)
- Build Out + 5 – Five years beyond Build Out (2018)

Throughout 2002 and most of 2003, the expectation of the FAA was that the entire NEPA process could be completed, and a ROD could be issued, sometime in the middle of 2004 (consistent with the City's original EIS schedule). As a result, initially the EIS analyses were prepared using specific "years of analysis," (i.e. 2007, 2009, 2013 and 2018). This assignment of years of analysis was necessary to allow technical experts to begin the work (e.g. running models) of disclosing potential impacts in compliance with NEPA. However, by early 2004, it became clear to the Agency that the City's proposed EIS/ROD schedule was incompatible with the time required to achieve the quality of work the Agency has always devoted to such projects. Accordingly, the years of analysis were revised to reflect major phases (i.e. Construction Phase I, Construction Phase II, Build Out, and Build Out + 5), rather than specific years. In addition, and in an effort to assist the FAA with adequate disclosure of the best estimate of the revised construction timetable, the City of Chicago submitted a letter in December 2004 confirming revised construction timetables.

The changes in presentation (i.e., major phases, construction schedules) described below were made to allow flexibility given the uncertainties that abound regarding construction implementation, and to acknowledge that commencing construction in 2004 was not feasible. There are other uncertainties that can also affect construction, including, for example, weather conditions, length of construction season, etc.

Therefore, in an effort to provide this flexibility and bound the potential timeframe under which construction could commence or be completed, the following potential construction schedule scenarios were considered:

- **Original Schedule** – The original construction schedule submitted to the FAA by the City called for construction to begin in mid-2004. For reasons already identified, it is now evident that this schedule was unduly optimistic.
- **Compressed Schedule** – This construction schedule would compress the construction that was to occur in the Original Schedule between July 2004 (Year 1 of the Original Schedule) and September 2007 (Year 4 of the Original schedule), into the time period of September 2005 (Year 1 of the Compressed Schedule) to September 2007 (Year 3 of the Compressed Schedule). Unlike the Original Schedule, the City's proposed Runway 9R/27L would be fully operational in October 2007 (Year 3 of the Compressed Schedule) instead of January 2007 (Year 4 of the Original Schedule). All other future years of analysis would remain the same as those assessed in the original schedule.
- **Delayed Schedule** – This construction schedule is the same as the original construction schedule, but delayed by 14 months. Instead of construction beginning in July 2004 (Year 1 of the Original Schedule), it would begin in September 2005 (Year 1 of the Delayed Schedule). For all other future years of analysis, there would be a one-year delay (i.e. 2008, 2010, 2014, and 2019 are analyzed instead of 2007, 2009, 2013, and 2018). However, reference will continue to be made to the construction start year for each potential construction schedule (i.e. Year 1, Year 2, or Construction Phase I, Construction phase II, Build Out, and Build Out +5.)

The analysis using these above schedules provides disclosure of the maximum potential impacts. The years of analysis from the Original Schedule (i.e. 2007, 2009, 2013, and 2018) form the basis of all presentation comparisons relative to the appropriate impact categories. Representative years beyond those originally considered will also be analyzed to determine the potential impacts that could be realized. The focus of this effort will be primarily on surface transportation, noise, and air quality impact assessments. Changes in gating assignments or the fleet mix of aircraft as a result of the potential construction schedules listed above are expected to be minimal. Therefore, the assumptions used for the original construction schedule were retained.

#### **Q. Cumulative Impacts**

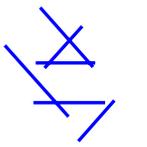
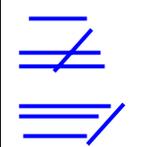
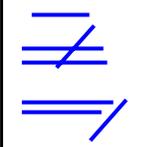
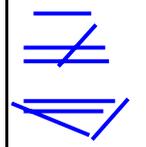
A review of past, present, and reasonably foreseeable conditions indicates that O'Hare exerts both positive and negative impacts on the local environs, which have changed over time. Over time, these impacts have decreased relative to environmental conditions such as aircraft noise, emissions of carbon monoxide, volatile organic compounds, and particulate matter. Impacts from surface transportation levels and congestion, natural resource consumption, air emissions of nitrogen oxides and sulfur oxides, and solid waste/hazardous waste generation have increased as activity levels have increased. For example, in its study of cumulative noise effects, the FAA has studied aircraft noise, construction noise, highway noise and railroad noise in the O'Hare area. No significant cumulative noise increases were found. With respect to air quality, the agency reviewed emissions reasonably foreseeable from the various Build Alternatives, as well as emissions from construction, and vehicular emissions at O'Hare including surrounding surface roads. Again, no significant cumulative increases were identified.

A number of past, and present non-airport projects have occurred in the area, and others are expected to occur in the future. It is anticipated that changes will continue in the Airport vicinity due to continued increases in population and economic activity in the airport environs and in the Chicago region, the third largest metropolitan area in the U.S. Much of the Airport environs are already surrounded by intensive transportation, residential, and commercial uses. There will be other forms of development, the dimension of which would not be known until plans are approved, which can not be measured at this point in time. Given the existing extent of development in the region generally, the incremental effect of the Build Alternatives is minor, at best, as reflected in this EIS. Some intensification of development would be expected in the areas, resulting in additional pressures on the social fabric and natural resources of the area. Such effects are dependent on ultimate design, land use plans, and other considerations. However, until specific project plans are known, it is not possible to quantify the specific cumulative effects from the proposed Build Alternatives and these other regional projects.

#### **R. Summary Comparison of Alternatives**

**Table 12** on the following page compares Alternatives A (No Action), C, D and G (Build Alternatives) in terms of environmental impacts, operational efficiency, economic factors, and national policy. The City of Chicago's proposal is Alternative C.

**TABLE 12  
SUMMARY COMPARISON OF RETAINED ALTERNATIVES**

Runway Layout for Each Alternative					
Alternatives		A	C	D	G
<b>1. Environmental Impacts</b>					
Wetland impacts	Jurisdictional & non-jurisdictional, including non-wetland Waters of the United States (acres)	23.5	154.2	154.2	154.2
Floodplain impacts	Increase in impervious surfaces area (acres)	0	1,000	823	1,126
DOT Section 4(f)/6(f) Parkland impacts	Parkland properties to be acquired	0	3	3	3
Section 106 impacts	Properties to be acquired and removed	0	4	4	4
Acquisition and relocation impacts	Area of proposed land acquisition (acres)	0	440	413	413
	Population of proposed land acquisition area	0	2,631	2,553	2,553
	Housing Units	0	539	522	522
	Businesses	0	197	164	164
65+ DNL noise impacts (Build Out)	Area (acres)	12,427	11,263	11,187	11,216
	Housing Units	5,199	6,754	7,392	6,572
	Population	14,512	19,577	21,154	19,135
Environmental justice impacts	Minority residents in proposed acquisition area by race	0	1,575	1,479	1,479
	Minority residents in proposed acquisition area by ethnicity	0	1,599	1,524	1,524
Air Quality Impacts	Compliance with NAAQS	Exceedance of CO at 1 location	No exceedances	No exceedances	No exceedances
<b>2. Operational Efficiency Factors</b>					
2018 average annual delay	(minutes per operation)	17.1	5.8	10.5	6.9
2018 annual operations served	(operations)	974,000	1,194,000	1,194,000	1,194,000
<b>3. Economic Impact Factors</b>					
Delay cost	Delay cost to the airlines in 2018 (millions) based on \$25 per minute of delay	\$416.4	\$173.1	\$313.4	\$206.0
Local tax base	Tax base loss of parcels acquired (millions)	\$0	\$5.7	\$5.3	\$5.3
Relative development costs	Relative construction cost	Less than C, D or G	More than A, D, less than G	More than A, less than C, G	More than A, C and D
<b>4. National Policy Factors</b>					
Implementation factors	Regulatory – Does authority exist to implement?	Yes	Yes	Yes	Yes
	Sponsor – Is there a sponsor able to fund?	Yes	Yes	Yes	Yes
	Service Provider – Will adequate service be initiated?	Yes	Yes	Yes	Yes

Notes: Surface transportation effects are included in Sections VII-C, Surface Transportation of this Executive Summary.  
n/a = not applicable

Source: TPC Analysis, Chapter 5, Environmental Consequences.

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## VIII. MITIGATION SUMMARY

**Chapter 7, Mitigation Summary**, of the Final EIS presents a summary of the proposed mitigation measures, or other impact reduction measures, that could be implemented by the City of Chicago, with oversight by the FAA, to avoid or minimize the potential environmental impacts associated with the Build Alternatives, including Alternative C, the Preferred Alternative. The Preferred Alternative was identified in **Chapter 3, Alternatives**, of the Final EIS and is summarized in **Section XI** of this **Executive Summary**. The proposed mitigation measures for the Build Alternatives were developed based on detailed analyses of the impacts identified in **Chapter 5, Environmental Consequences**, and comments received from the public and agencies on the Draft EIS.

The following is a list, by environmental resource category, of the types of proposed mitigation and other reduction measures that are identified in **Chapter 5** of the Final EIS.

- Noise and Compatible Land Use
  - Sound insulation for eligible residences and schools
- Surface Transportation
  - Intersection capacity improvements (i.e., additional lanes)
  - Establishment of escrow accounts to contribute to mitigation costs
  - Cooperative planning with all jurisdictional agencies
  - Availability of adjacent Airport-owned right-of-way to facilitate future improvements
- Social Impacts
  - O'Hare Land Acquisition Relocation Plan
  - Uniform Relocation Assistance and Real Property Acquisition Policies Act
  - Advisory Services
- Air Quality
  - Use Best Management Practices
  - Use OMP Sustainable Design procedures
  - Airport vehicle, construction equipment, and aircraft emission reduction measures
- DOT Section 4(f)/6(f) Lands
  - Acquisition at fair market value
  - MOA or Agreement outlining proposed mitigation
- Historical, Architectural, Archaeological, and Cultural Resources
  - MOA or Agreement outlining proposed mitigation

- Wetlands
  - USACE Section 404 Individual Permit when issued
  - IEPA Section 401 Water Quality Certification
- Construction Impacts
  - Use Best Management Practices
  - Use OMP Sustainable Design procedures
  - Construction Outreach Program for O'Hare Modernization
  - Erosion and Sedimentation Control Plan
- Environmental Justice
  - O'Hare Land Acquisition Relocation Plan
  - Uniform Relocation Assistance and Real Property Acquisition Policies Act
  - Sound insulation for eligible residences
  - Public Outreach Activities

If a Build Alternative is selected in the Record of Decision, the FAA will identify those mitigation measures that the City would be required to implement as a condition of project approval.

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## IX. OTHER ISSUES

As submitted by the City of Chicago, the proposed Airport Layout Plan for the OMP called for the use of two cemeteries, St. Johannes and Rest Haven. At the time of this submission, the City intended to use its land acquisition authority to obtain title to these properties and to relocate the bodies of those buried in the cemeteries to another nearby existing cemetery if the FAA approved the OMP. These acquisitions would be necessary to construct Runway 10C/28C and establish an international air cargo facility in the southwestern quadrant of O'Hare.

Those who oppose the relocation of graves from St. Johannes and Rest Haven Cemeteries have asserted that the FAA's approval of any proposal that would require relocation of these cemeteries would violate their First Amendment right to free exercise of religion as well as the Religious Freedom Restoration Act. FAA has carefully studied these claims in the Final EIS and has identified a proposed resolution to these legal issues. In doing so, the FAA proposes to find that Rest Haven Cemetery, unlike St. Johannes, may not need to be relocated. A final decision on these legal issues will be made in the ROD after opportunity for comment. For further information see **Section 5.22, Other Issues Relating to Cemetery Acquisition**.

In addition, the Cemetery Associations, the Village of Bensenville, and Elk Grove Village have asserted that their due process rights have been violated and that FAA decisions related to any proposed O'Hare modernization require formal adjudication. FAA has carefully studied these claims and proposes to find that these claims have no merit. A final decision on these legal

issues will be made in the ROD after opportunity for comment. For further information see Section 5.23, Issues Relating to Due Process Claims and Formal Adjudicative Processes.

## X. MASTER PLAN

The O'Hare International Airport Master Plan (Master Plan) prepared by the City of Chicago Department of Aviation provides the backdrop and foundation for its request that the FAA approve what has become Alternative C in this EIS. It is not the function of this EIS to provide in-depth review of the Master Plan. However, reference to that document is helpful to address implementation schedules, cost estimates, and preliminary funding, to the extent required under NEPA.

### A. Master Plan Implementation Schedule

In February 2004, the City submitted the Master Plan. This submittal to the FAA included a three-volume set of documents that set forth the detailed project components for the implementation of the O'Hare Modernization Program and a proposed Airport Layout Plan (ALP) set of drawings. In Volume 2 of the Master Plan, the City specifically provided information on the anticipated project timing, estimated cost, and financial feasibility of the projects described therein.

In response to comments, the FAA has broadened the discussion in this Final EIS of the financial feasibility, which includes an analysis of the City's estimated costs for this proposal. This analysis is not intended to prejudge the outcome of any separate process involving the City on other matters, for example the Letter of Intent application or requests for PFC authorization. Table 13 outlines the major components of the Alternative C and their proposed first full year of operation.

**TABLE 13  
MASTER PLAN PRELIMINARY IMPLEMENTATION SCHEDULE**

Master Plan Project Component	First Full Year of Operation
<b>O'Hare Modernization Program (OMP) Runway Components</b>	
Construction of Future Runway 9L/27R	2007
Extension of Existing Runway 9R/27L (Future Runway 10L/28R)	2009
Construction of Future Runway 10C/28C	2009
Extension of Existing Runway 9L/27R (Future Runway 9R/27L)	2013
Construction of Future Runway 9C/27C	2013
Construction of Future Runway 10R/28L	2013
<b>World Gateway Program (WGP) Terminal Components</b>	
Concourse K	2009
Terminal 4	2013
Terminal 6	2013
<b>West Terminal Complex Components</b>	
Satellite Concourse	2009
Terminal Building/Concourse	2013
West Terminal Ground Access	2013

Source: O'Hare International Airport Master Plan, City of Chicago, February 2004.

## B. Master Plan Cost Estimate

Listed in **Table 14** is a summary of the project costs estimated by the City associated with the City's O'Hare Modernization Program as presented in Volume 2 of the Master Plan. The total costs in **Table 14** are in billions of dollars, rounded to the nearest million and escalated to 2004 dollars from the original costs presented in the City's Master Plan. The Draft EIS cost estimate was based upon a uniform cost escalator of 2.4%. For the Final EIS, the FAA has utilized escalation indicators which are appropriate for the specific types of construction work. These industry specific escalators were utilized based on whether the construction was Heavy Construction or Building Square Foot Cost for historical cost indexes for the City of Chicago. In addition, the Capital Improvement Projects (CIP) costs associated with the Subsequent Years (2008-2022) were also adjusted to 2004 dollars to make the entire **Table 14** reflective of 2004. The Master Plan indicated that the proposed costs are consistent when compared to costs of other airport improvement programs. See **Appendix A, Background, Attachment A-1**.

**TABLE 14**  
**ESTIMATED COSTS IN BILLIONS OF DOLLARS (f)**

Project Description	Original Cost Estimate(a)	Estimate Year(b)	Type of Work(c)	Escalation Multiplier(d)	Estimated Cost in 2004 Dollars
<b>O'Hare Modernization Program (OMP)</b>					
Program Wide Requirements	0.909	2001	BSF	1.1324	1.029
Other Program Costs	0.321	2001	BSF	1.1324	0.364
Airfield	3.211	2001	HC	1.1446	3.675
West Terminal	1.727	2001	BSF	1.1324	1.956
On-Airport Circulation	0.432	2001	HC	1.1446	0.495
Subtotal	6.600				7.519
<b>Capital Improvement Projects (CIP)</b>					
Five-Year (2003-2007)	1.386	2003-2007	HC	1.0000	1.386
Subsequent Years (2008-2022)	2.742	2008-2022	HC	0.8012(e)	2.197
Subtotal	4.128				3.583
<b>World Gateway Program (WGP)</b>					
Airport-wide, Airfield and Airside	0.244	1999	HC	1.2319	0.301
Terminal 2 FIS Facilities	0.079	1999	BSF	1.2028	0.095
Terminal 4	0.968	1999	BSF	1.2028	1.164
Terminal 6	1.353	1999	BSF	1.2028	1.628
Subtotal	2.644	1999			3.188
<b>Total Costs</b>					<b>\$14.290</b>
Notes:	(a) Total costs are in billions of dollars, rounded to the nearest million.				
	(b) Estimates were prepared/published by the City of Chicago and are based on construction costs for the year listed.				
	(c) HC = Heavy Construction Cost Index ; BSF = Building Square Foot Cost Index				
	(d) Escalation multipliers were developed using RS Means Square Foot Costs from 1999, 2001, 2004, and Heavy Construction Cost Data from 1999, 2001, 2004 for historical cost indexes for the City of Chicago.				
	(e) The O'Hare International Airport Master Plan (page VII-24) notes that this amount is in escalated dollar values for subsequent years (2008-2022). A 2 percent construction escalation factor was used to determine this multiplier.				
	(f) The FAA conservatively assumed a 2 percent escalation factor for the subsequent years (2008-2022) in the CIP which would equate to 15 years of projects at approximately \$146 million per year. The resulting 15 year total for the CIP would be \$2.197 billion in 2004 dollars. The difference between the CIP costs presented in the City's Master Plan and the dollars presented for this same line item on Table 1-11 is approximately \$545 million. If a 4 percent escalation factor had been applied as the City used in WGP, the resulting value for CIP (2008-2022) in 2004 dollars would have been approximately \$1.756 billion. FAA has chosen a more conservative approach.				
Source:	Original Cost Estimate: O'Hare International Airport Master Plan, City of Chicago, February 2004.				
	Escalation Multipliers: R.S. Means Square Foot Costs, 1999, 2001, 2004, and Heavy Construction Cost Data, 1999, 2001, 2004, except as noted in footnote (e).				

### C. Master Plan Funding Detail

The City of Chicago has developed a financial plan for OMP that includes consideration of investments required for OMP and anticipated for other capital improvements. In particular, the City has considered the required funding and sources of funding for (1) O'Hare Modernization Program, (2) World Gateway Program, and (3) other Capital Improvement Program projects.

The amount of funding required for the combined OMP, WGP, and CIP projects at O'Hare is large—a total of about \$14.29 billion in escalated dollars, as presented above in **Table 14**. However, O'Hare is one of the largest airports in the United States, and one of the major connecting hubs for the national transportation system. Therefore, it is not considered unusual or unreasonable that required investments would be significant in order to accommodate future growth in activity.

### D. Sources of Funding

The City has identified four funding sources to carry out the projects set forth in the O'Hare International Airport Master Plan. These funding sources are listed below:

- Federal grants-in-aid under the Airport Improvement Program (AIP)
- Passenger facility charges (PFCs)
- General airport revenue bonds (GARBs)
- Third-party financing

In presenting these funding sources, the City's Master Plan indicated that,

The actual amount of funding available from certain [...] sources will depend primarily on future levels of aviation activity at the Airport, future federal reauthorizations, and future airline approvals.

**Table 15** shows the best estimate of funding by source.

**TABLE 15**  
**ESTIMATED SOURCES OF FUNDS**

Program	Sources of Funds (Percentages)						
	FAA AIP Grants		Passenger Facility Charge		Airport Revenue Bonds	Third-Party Financing (b)	Total (c)
	Entitlement	Discretionary (a)	Pay-As-You-Go	Bond Funds			
OMP	1%	8%	2%	20%	59%	10%	100%
CIP	0%	6%	11%	30%	54%	0%	100%
WGP	0%	0%	0%	0%	78%	22%	100%

Notes: (a) Includes discretionary LOI funds, discretionary noise funds, and assumed funding for safety and security projects.

(b) Assumes that 33.3 percent of terminal project costs are eligible for third-party financing resulting in 10 percent of OMP total project cost and 22 percent of WGP total project cost.

(c) Totals may not add due to rounding.

Source: O'Hare International Airport Master Plan, Section VII, February 2004.

The City's financing plan for OMP and related capital investments includes a significant amount of borrowing in the form of airport revenue bonds, as is typical for large hub airports. Thus, an important consideration in evaluating the financing plan is the anticipated "reaction" or "acceptance" of the financial community; e.g., the ability to obtain an investment-grade bond rating and attract investors in bonds and insurers of bonds.

The City of Chicago has initiated planning and design work associated with the \$2.9 Billion Phase 1 of the OMP. Significant projects associated with Phase 1 include:

- New Runway 9L/27R
- New Runway 10C/28C
- Runway 10L Extension
- South Detention Basin Relocation
- Union Pacific Railroad Relocation

As noted above, the City has to-date only issued bonds for preliminary phases of OMP. It is typical that large, long-term capital programs are implemented and financed in phases. It is not necessary, and not financially prudent, to borrow money significantly in advance of the need for such money for construction — to do so would result in undue interest costs. Thus, the City has developed a financial plan that assumes issuance of bonds in phases consistent with the need to have funds available to finance construction. The financial community will evaluate each proposed new series of bonds at the time these bonds are required to be issued, and in the context of the then-current set of circumstances.

On the basis of the information presented herein, the review of the City's financial plan, and an understanding of airport financing in general, FAA has no reason to believe that the City's financial plan cannot be implemented as generally presented in the Master Plan. Further, FAA has no reason to believe that the resulting costs to airport users (most significantly, major airlines serving O'Hare) will significantly adversely affect the ability to finance the capital projects and realize the projected aviation demand, particularly in the context of future investments that will be required at other large hub airports in the United States. All projections and forecasts are subject to uncertainty, and future events may result in changes or adjustments to the FAA conclusions.

In response to comments on the Draft EIS, FAA has reviewed additional cost-related information applicable to the project. For purposes of this review under NEPA, the FAA has concluded that the estimated costs of the project are reasonable. FAA has also concluded that it is reasonable to assume that, based upon the impact O'Hare has on the Chicago region, as well as the NAS, and the benefits to the regional economy, there will be sufficient funds to complete the proposal, if approved. In addition, FAA believes that with a project of this magnitude and importance, the availability of projected funding sources is sufficiently reasonable and capable of being obtained. Accordingly, the FAA has decided it is both appropriate and necessary under NEPA to subject the Sponsor's full build proposal and alternatives thereto to this environmental analysis because the entirety of the proposed action is reasonably foreseeable.

This determination is made without prejudice to evaluation of the City's pending Letter of Intent request, which is a separate process from this environmental analysis.

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## XI. SELECTION OF A PREFERRED ALTERNATIVE

The Final EIS by regulation is required to identify a "preferred alternative". The FAA in its consideration of alternatives, in addition to the relevant environmental statutes, has been mindful of its statutory charter to encourage the development of civil aeronautics and safety of air commerce in the United States (49 U.S.C. §40104). FAA has also considered the congressional policy declaration that airport construction and improvement projects that increase the capacity of facilities to accommodate passenger and cargo traffic be undertaken to the maximum feasible extent so that safety and efficiency increase and delays decrease [49 U.S.C. §47101(a) (7)]. As defined in CEQ's 40 Questions and Answers about the NEPA Regulations, "The 'agency's preferred alternative' is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors." In identifying a preferred alternative, the FAA has examined financial feasibility and has conducted concurrent with this EIS, an examination of religious liberty claims concerning the proposed relocation of cemeteries.

### A. Environmental Consequences

Three build alternatives, in addition to the No Action Alternative, were retained for detailed study in the EIS. **Table 12** (on page 47 of this Executive Summary) presents a side-by-side comparison of the alternatives in terms of environmental, economic, and operational impacts. A review of **Table 12** shows that Alternatives C, D, and G have the same impacts in four categories (wetlands, DOT Section 4(f)/6(f), historic properties, and air quality). **Table 12** also shows that Alternative C has environmental impacts that are slightly greater in several other impact categories than Alternatives D and G. For example the population impacted by the 65+ DNL noise contour in 2018 for Alternative C is 24,103 persons, which is 566 persons greater than for Alternative D, and 796 persons greater than for Alternative G. Alternative G has fewer noise impacts but greater floodplain impacts than the other build alternatives. With regard to land acquisition, Alternative C would require the relocation of approximately 539 housing units and 197 businesses, while Alternatives D and G would require the relocation of approximately 522 housing units and 164 businesses.

### B. Delay Reduction

Alternative C is more effective and efficient than the other Build Alternatives in meeting the purpose and need identified in this EIS. Alternative C provides the greatest reduction in average annual delay. Adoption of Alternative C would provide the greatest benefits, not only to the Chicago region, but also to the NAS. All of the Build Alternatives fully satisfy the purpose and need of ensuring that existing and future terminal facilities and supporting infrastructure (access, landside, and related ancillary facilities) can efficiently accommodate airport users.

As discussed in the EIS, O'Hare affects the NAS because the airfield lacks adequate runway capacity and gate availability to handle both current and forecast levels of activity for O'Hare. In addition, delays at O'Hare have a direct impact on the NAS, in part because approximately 51% of the total passengers traveling through O'Hare currently connect to and from other airports.

The three Build Alternatives C, D, and G provide for 1,194,000 annual operations served in 2018. The resulting average annual delay in 2018 is 5.8 minutes per operation for Alternative C, (City's OMP), 10.5 minutes per operation for Alternative D, and 6.9 minutes per operation for Alternative G. Notably, when comparing Alternative C to Alternative D, there is an 81 percent increase in the average annual delay with Alternative D. When comparing Alternative C to Alternative G, there is a 19 percent increase in the average annual delay with Alternative G.

In contrast with the Build Alternatives, the No Action Alternative is projected to serve 974,000 annual operations (constrained) in 2018 at an average annual delay 17.1 minutes per operation. This is approximately 200,000 less operations at a significantly higher level of delay than any of the Build Alternatives and does not meet the purpose and need.

### **C. Public Involvement**

The FAA did not identify a preferred alternative in the Draft EIS, believing that this decision could best be made after consideration of all comments and subsequent analysis that post-dated the Draft EIS. **Section I-D** of the Executive Summary identifies the extensive outreach conducted by the FAA to maximize public involvement in the Agency's evaluation of O'Hare modernization. Further, the Agency's careful scrutiny of the comments received on the Draft EIS, and the responses crafted to those comments (see **Appendix U**) provided additional insight into the identification of the preferred alternative.

### **D. Identification of Preferred Alternative**

In consideration of the substantial similarity between the environmental impacts for Build Alternatives C, D, and G, the FAA has identified the alternative that best fulfills its statutory mission and responsibilities as the "Preferred Alternative." Given the clear superiority of Alternative C in terms of the average annual delay reduction, the FAA has identified Alternative C, the Sponsor's proposed O'Hare Modernization Program, as the Preferred Alternative. This identification of Alternative C as the Preferred Alternative fully satisfies all of the FAA's environmental obligations associated with consideration of the proposed OMP.

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## **XII. NEXT STEPS IN THE EIS PROCESS**

The FAA has not yet reached a decision on the implementation of any alternative, including the Preferred Alternative. However, the FAA expects to publish a Record of Decision (ROD) in September 2005. The ROD provides the FAA decision-maker's basis for the decision and the mitigation requirements to implement the project. The agency uses information in the Final EIS to prepare the ROD.

Specific sections of the Final EIS have been updated and/or refined for purposes of the Final EIS, in part, because of response to comments on the Draft EIS, Draft Section 4(f) and Section 6(f) Evaluation, and Draft General Conformity Determination.

The FAA will accept comments on the updated and/or refined information of the Final EIS in the sections identified below until 5:00 p.m. Central Standard Time, Tuesday, September 6, 2005:

- Sections 3.6 and 3.7, of Chapter 3, Alternatives
- Section 5.6, Air Quality, of Chapter 5, Environmental Consequences
- Subsections 5.21.4 through 5.21.11, of Section 5.21, Environmental Justice, of Chapter 5, Environmental Consequences
- Section 5.8, Section 4(f) and Section 6(f) Resources, of Chapter 5, Environmental Consequences
- Section 5.22, Other Issues Relating to Cemetery Acquisition, of Chapter 5, Environmental Consequences
- Section 5.23, Issues Relating to Due Process Claims and Formal Adjudicative Processes, of Chapter 5, Environmental Consequences
- Chapter 7, Mitigation

Please send your written comments to:

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