050906_07

Exhibit A

QUALIFICATIONS

AND RESUMES

THE CAMPBELL-HILL AVIATION GROUP, INC.
Aviation and Economic Research Consultants

THE CAMPBELL-HILL AVIATION GROUP, INC.
Aviation and Economic Research Consultants

PROFESSIONAL SERVICES AND QUALIFICATIONS

SERVING:

Airports and Airport Authorities
International and Domestic Passenger Airlines
Integrated Express Carriers
Industry Trade Associations
Aircraft Manufacturers
Travel Companies
Legal Profession
Financial Institutions
Regulatory Agencies
Government Planning and Policy Agencies

700 North Fairfax Street • Suite 300
Alexandria, Virginia 22314
Tel: 703-836-1283 • Fax: 703-836-5607
e-mail: chag@air-econ.com

WHO WE ARE

The Campbell-Hill Aviation Group, Inc. (Campbell-Hill) is a privately-owned U.S. consulting firm providing a wide range of services to the aviation industry. Campbell-Hill's client base includes passenger airlines, all-cargo carriers, airports, industry associations, and city, state, and federal government agencies. Campbell-Hill is located in the Washington, D.C. area, which provides ready access to U.S. government agencies, law firms, leading transportation and public policy research centers.

The Campbell-Hill Aviation Group was formed by **Dr. Brian M. Campbell** in 1993, as the successor to the aviation practice of Leeper, Cambridge & Campbell, Inc. (LCC) of which Dr. Campbell was a co-founder and Chairman. Dr. Campbell has been engaged in aviation consulting continuously since 1982.

Dr. Campbell began his aviation consulting career in 1968 with Simat, Helliesen & Eichner, Inc. (SH&E) and is an expert in airline economics, planning and forecasting, and the measurement of the economic impacts of air services on local and regional economies. He was a co-founder of two start-up airlines and has consulted to many others. He also is an industry leader in the air cargo/air express sector and in the evaluation of the financial impacts of noise and emissions regulations on the owners and operators of commercial aircraft, as well as on national and regional economies. Dr. Campbell's broad background as an entrepreneur, airline executive, and respected advisor to the aviation industry is an invaluable resource for Campbell-Hill clients.

Mr. Dean B. Hill (President) brings 27 years of airline experience to the firm from Delta Air Lines, where he gained extensive operating expertise in all facets of airline planning, marketing, and analysis. Mr. Hill has particular skill in route and marketing strategy, hub development, acquisition evaluation, code-sharing and carrier alliances, and regulatory affairs. At his retirement from Delta, Mr. Hill was Director of International Route Development. Mr. Hill offers Campbell-Hill clients an important understanding of the aviation industry from an airline perspective.

Mr. Rex Edwards (Consulting Associate) brings more than 25 years of transportation research and consulting experience to Campbell-Hill projects. His strengths as an economist, statistician and transportation database expert benefit the firm's clients in both passenger and air cargo/express systems analysis and forecasting. Mr. Edwards manages the firm's aviation economic impact studies for airports and he has analyzed FAA flight operations and delay databases for a landmark study in 2001.

The firm has a highly qualified team including three other senior full-time experienced aviation economists.

Mr. Patrick M. Swift (Research Director) has a broad, hands-on background in the planning and operation of small and start-up airlines. Mr. Swift advises clients on a range of planning issues, including domestic and international slot procurement and management, CRS management, aircraft scheduling, and airline pricing. He is an expert in managing and analyzing large aviation and economic databases.

Mr. Kevin Schorr (Research Director) specializes in creating and delivering air service presentations for airport clients of all sizes. He also has experience with airport use and lease agreements, rates and charges methodologies, schedule analysis, and route planning. Before joining Campbell-Hill, Mr. Schorr spent 2½ years with PA Consulting Group, Inc. in Washington, DC and prior to that, he was Director – Domestic Strategies and Alliances for Trans World Airlines (TWA). His responsibilities at TWA included the implementation of the alliance with America West, international route planning, schedule planning, and other codeshare planning activities.

Mr. Todd Schroder (Research Director) has eight years of experience in aircraft marketing and fleet planning. He is an expert in market research, including fleet planning studies, regional airline industry forecasting, and strategic planning. Mr. Schroder's extensive technical abilities include database development and geographical, industrial, and demographic information systems.

Supporting the firm's research projects are three full-time economic analysts.

Azer Ibadov (Senior Research Analyst) Mr. Ibadov has a B.B.A in International Management from Pace University and an M.B.A. in International Finance from American University. Mr. Ibadov joined Campbell-Hill in 1999 and currently specializes in statistical and database analysis and research.

James Lundy (Research Analyst) Mr. Lundy has a B.B.A. in Finance from James Madison University. Joining the firm in 2003, Mr. Lundy specializes in statistical and database analysis and research.

The firm's computer systems employ state-of-the-art graphics software, communications packages, and modern database management and statistical packages that include traditional regression and other multivariate techniques. The firm has access to all U.S. Department of Transportation and Department of Commerce traffic and financial databases.

The Campbell-Hill Aviation Group maintains close working affiliations with a broad base of other aviation marketing, airport planning, and economic and financial service companies from which additional resources are readily available. In addition, Campbell-Hill has excellent working relationships with numerous regulatory attorneys, and transportation professors and researchers at several leading universities.

The firm is 100% employee owned and managed.

WHAT WE DO

The Campbell-Hill Aviation Group specializes in providing a wide range of consulting services to the aviation industry. Campbell-Hill's client base includes passenger airlines, integrated air express carriers, all-cargo carriers, airports, and financial institutions. Campbell-Hill's engagements are divided approximately equally between the private sector, and various levels of government and airport organizations.

A major portion of our engagements involves problem diagnosis, opportunity specification, forecasts and analyses of decision alternatives, strategic recommendations, and follow-up evaluations. Other significant aspects of our private sector practice include regulatory issues (e.g., international route development and regulatory cases, aircraft noise and emissions policy, and government aviation competition policy development), long-range planning (e.g., aircraft fleets), litigation support, and marketing strategy.

PRIMARY CONSULTING SERVICES

INTERNATIONAL AVIATION

Airline and Airport Advocacy and Representation
Carrier Alliances and Code-sharing Evaluation and Negotiation
Traffic Analysis and Forecasting • Environmental Policy Analysis
Financial and Economic Impact Studies
Government Regulatory Policy Analysis
Bilateral Representation and Strategy

AIR SERVICE DEVELOPMENT

Marketing Strategy • Service Opportunity Studies
Competitive Service Analysis • Marketing Programs for Airports
Air Service Plans and Presentations • Industry Monitoring Services
Traffic, Revenue, and Profit/Loss Forecasts
Multiple Airport Traffic Assignment Modeling

PRIMARY CONSULTING SERVICES

ECONOMIC AND FINANCIAL ANALYSIS

Feasibility Studies • Corporate Valuation Studies • Preparation of Business Plan
Litigation Support • Economic, Financial, and Traffic Forecasting • Arbitration Opinions
Impact Analysis of Environmental Initiatives • Due Diligence Evaluations

STRATEGIC PLANNING

Merger and Acquisition Analysis • Analysis of Industry Issues
Alliance Strategy Simulation Modeling • Route Strategy and Traffic Flow Analysis
Public Policy Analysis and Advocacy Papers

AIR CARGO STUDIES

Commodity Flow Analysis • Hub Location Analysis • Mode-Split Modeling
All - Cargo Service Studies • Economic Impact Studies • Carrier Presentations

REGULATORY SERVICES

Route Case Preparation/Presentation • Strategy Development
Expert Testimony • Aircraft Noise Policy Evaluation
Merger Case Analysis and Support (DOT, DOJ, FTC, Congress)
Regulatory Accounting and Reporting

RESOURCE PLANNING

Schedule Evaluation • Fleet Planning • Financial Forecasting
Airline Alliance Evaluation • Restructuring Studies • Airline Merger Evaluation
Aircraft Evaluation

SURVEY RESEARCH

Travel and Tourism • Airlines and Forwarders
Business Firms • Cargo Shippers

SELECTED CLIENTS

U.S. FEDERAL GOVERNMENT

Department of Transportation • Federal Aviation Administration

FOREIGN GOVERNMENTS

Government of Canada • Government of Taiwan

STATE AND LOCAL GOVERNMENTS

City of Calgary, Alberta • City of Edmonton, Alberta
City of Harlingen, Texas • City of Kansas City, Missouri
City of Memphis, Tennessee • City of San Jose, California
Commonwealth of Virginia • County of Milwaukee, Wisconsin
Province of Alberta • State of Connecticut • State of Hawaii
State of Maryland • State of New York • State of North Carolina
Province of Prince Edward Island

AUTHORITIES, REGIONAL COMMISSIONS, AND TASK FORCES

Austin - Bergstrom International Airport • BWI Airport
Berlin Brandenburg Flughafen • Bradley International Airport
Fresno Yosemite International Airport • General Mitchell International Airport
Greater Peoria Airport Authority • Lehigh - Valley International Airport
Metropolitan Washington Airport Authority • Munich Airport Authority
Pittsburgh International Airport • Port of Oakland • Port of Portland
Raleigh/Durham Airport Authority • Reno/Tahoe International Airport
Washington Airports Task Force • Washington Metropolitan Council of Governments

ASSOCIATIONS

Air Transport Association of America • Canadian Consumers' Association
Cargo Airline Association • Regional Airline Association

SELECTED CLIENTS

MANUFACTURERS

Boeing Corporation • Lockheed Aircraft Company • McDonnell Douglas Corporation

AIRLINES

Airborne Express • American Airlines • Atlantic Coast Airlines • BAX Global
Canada 3000 • Canadian Airlines • Continental Airlines • Delta Air Lines
DHL • Emery/CF Air Freight • Evergreen International Aviation
Federal Express Corporation • Gemini Air Cargo • Legend Airlines
Midway Airlines • Northwest Airlines • PeopleExpress • Polar Air Cargo
Royal Aviation, Ltd. • Royal Jordanian Airlines • Scandinavian Airlines System
Southern Air Transport • Southwest Airlines • United Airlines
United Parcel Service • Viacão Aerea Sao Paulo (VASP)

ENGINEERS

Howard Needles Tammen & Bergendoff • Kimley Horn

LAW FIRMS

Bagileo, Silverberg & Goldman • Ball, Janik • Condon & Forsyth • Crowell & Moring
Davis Polk & Wardwell • Hewes, Gelband, Lambert & Dann, PC
Hogan & Hartson • Hopkins & Sutter • Kirkland & Ellis
McGuire, Woods, Battle & Boothe • Morgan, Lewis & Bockius
Nobbs, Woods & Clark • O'Melveny & Myers • Preston, Gates, Ellis & Rouvelas Meads
Seamon, Wasko & Ozment • ShawPittman • Steptoe & Johnson
Sutherland, Asbill & Brennan • Tory, Tory, Deslauriers & Binnington
Ungarretti & Harris • Verner, Liipfert, Bernhard, McPherson & Hand
Winston & Strawn • Winthrop, Stimson, Putnam & Roberts
• Zuckert, Scoutt & Rasenberger

OTHER

GE Capital Aviation Service, Inc. • Hiller Investment Group
International Utilities • UNC Resources

TYPICAL ASSIGNMENTS

FOR AIRLINE CLIENTS

- Analyzed economic potential for expanded air services at hub cities
- Assessed government aviation initiatives and prepared advocacy papers
- Evaluated feasibility of hub locations for several new scheduled carriers
- Developed models to assess the economic and financial impacts of new noise and emissions stringencies
- Evaluated airline mergers and/or alliance potential for traffic, fleet, and labor efficiencies
- Analyzed carrier business plans and provided litigation support in bankruptcy case
- Evaluated competitors' marketing, pricing, and scheduling strategies
- Investigated numerous markets for passenger and cargo charter airlines
- Evaluated "down-sized" business plans for carrier operating in Chapter 11
- Assessed tour operator and charter market potentials for both scheduled and non-scheduled airlines, and for a major hotel corporation
- Assisted airline in the valuation of bankrupt carrier route authority
- Collected and evaluated data on the U.S. domestic business travel market
- Evaluated airlines under going concern, asset-based, and liquidation methods
- Raised venture capital for new start-ups and small takeover candidates
- Raised debt and lease financing for new entrant carriers
- Prepared applications and exhibits for Section 419 subsidy applications
- Prepared exhibits and testimony and appeared as expert witnesses in approximately 125 CAB/DOT adversarial cases
- Participated in attempted takeover of a U.S. domestic airline and advised on reorientation of airline operations, fleet, and marketing strategies
- Analyzed cargo and passenger traffic to support the establishment of a new overseas commuter airline
- Evaluated and negotiated alternative airport facilities leases on behalf of scheduled airlines
- Prepared performance review materials for contract cargo airlines
- Developed proposals and presentations on behalf of large contract carrier airlines for new route segments and whole systems of air express companies
- Prepared government pricing proposals for contract airlines
- Negotiated the sale of two commuter airlines
- Negotiated joint fare agreements for commuter air carriers
- Prepared country specific analysis for carrier use in bilateral negotiations
- Analyzed cargo and mail profitability under various methods of cost allocation and developed tactics for increasing profitability

TYPICAL ASSIGNMENTS

FOR AIRLINE CLIENTS

- Developed and implemented segment profit and loss models
- Designed carrier internal accounting and budgeting systems
- Developed new operating plan for refinancing proposals
- Installed interim transition management and new operating plans under four-month contract for scheduled helicopter turnaround situation
- Negotiated new and used aircraft purchase agreements, along with maintenance, spare parts, and training support services
- Forecast future aircraft values under alternative assumptions regarding fuel prices, interest rates, and traffic growth
- Evaluated economics of new generation aircraft under alternative assumptions regarding fleet size and mix of planes
- Assisted carriers with government bids and proposals (e.g., Military Airlift Command, Logair, and U.S. Postal Service procurement)

TYPICAL ASSIGNMENTS

FOR AIRPORT CLIENTS

- Prepared strategic marketing plans
- Prepared more than 100 airline service presentations. Supported the City of San Jose by preparing economic exhibits and testimony in DOT route case to obtain nonstop service to Tokyo
- Assisted BWI Airport in becoming the focal point of US Airways MetroJet low-fare operation
- Supported State of Connecticut in obtaining low-fare service from MetroJet, Southwest and America West at Bradley International Airport
- Supported seven cities in obtaining nonstop service to Toronto
- Assisted Portland, Oregon in obtaining authority to two additional points in Japan and becoming the first and only U.S. mainland gateway with authority to four cities in Japan
- Served as a major subcontractor for the North Carolina Air Cargo System Plan, and evaluated the potential for a global air cargo industrial complex ("Global TransPark")
- Helped Dulles to secure nonstop service to Zurich from Swissair
- Assisted Dulles in obtaining service from Delta Express
- Identified air freight development problems and opportunities at BWI Airport for Maryland Department of Transportation
- Served the Washington Dulles Parties by preparing economic exhibits and testimony (written and oral) in DOT route cases to obtain nonstop service to England, the former Soviet Union, and Italy
- Guided Raleigh/Durham Airport in securing nonstop service to London
- Forecast passenger and scheduled commercial flight distributions between the three Washington metropolitan area airports (BWI, IAD, and DCA) and performed similar studies in other multi-airport regions
- Prepared strategy analysis for airport client seeking to strengthen relations with hub carrier
- Assisted City of Harlingen in its successful efforts to obtain International Gateway status in the U.S.-Mexico All-Cargo Service Proceeding
- Prepared due diligence report for a city considering extending credit to important but financially weak tenant airline
- Analyzed scheduled passenger and cargo service deficiencies and prepared strategic plans for City of Calgary, Alberta, Canada

TYPICAL ASSIGNMENTS

FOR AIRPORT CLIENTS

- Worked with the Metropolitan New York Transportation Authority to develop a two-stage master plan forecast for Steward Airport
- Developed air cargo/express service improvement strategies and carrier presentations for Greater Peoria Airport Authority
- Guided Reno through service transitions resulting from the acquisition of its hub carrier by a major airline

TYPICAL ASSIGNMENTS

REGULATORY ACTIVITIES/POLICY ISSUES

- Analyzed opportunities and strategies for regulatory case participation
- Created economic exhibits and written and oral testimony in more than 125 aviation cases, including routes, rates, mergers, service evaluation, industry performance, and airline subsidy representing airlines, civic parties, federal government parties, and consumer associations
- Presented evaluation of the effects of major code-sharing alliances on U.S. markets and industry participants
- Prepared economic forecasts in support of international bilateral route negotiations on behalf of U.S. and foreign air carriers
- Represented cities and airlines in U.S. international bilateral route negotiations
- Evaluated economic benefits of the U.S. all-cargo industry in support of legislative proposals regarding the need for a uniform national aircraft noise policy, and a reasonable program to transition from Stage 2 to Stage 3 aircraft fleets
- Developed comprehensive study of the financial impacts on the world's airlines of new noise and emission standards proposed by ICAO
- Participated in Congressional hearings on transportation issues
- Presented written and oral testimony in Canadian Parliamentary hearings on aviation policy
- Prepared major analysis of proposed new airline industry competition rules
- Created regulatory and public relations material for a proposed major carrier alliance and for a major proposed airline merger
- Participated in numerous presentations to the DOT, DOJ and before European Community antitrust authorities regarding proposed immunized carrier alliances.

BRIAN M. CAMPBELL

CHAIRMAN

PROFESSIONAL EXPERIENCE

Dr. Campbell's thirty-seven year career has been heavily concentrated in the economic elements of commercial air transportation. After graduating from the Columbia University Graduate School of Business Administration in 1968, he was employed for seven years by Simat, Helliesen & Eichner, Inc., a transportation consulting firm. Prior to his resignation from that firm in 1975, he held the position of Vice President of the Washington office.

Between 1976 and 1982, Dr. Campbell was co-founder and senior executive of two new-entrant (post-U.S. deregulation) airlines, with primary responsibilities for planning and finance. The first of these new companies was Midway Airlines, Inc., where he held the position of Vice President of Finance and Administration from 1977 to 1980. After resigning from Midway, Dr. Campbell formed Air Chicago, Inc. and served as its Chairman and Chief Executive Officer through the planning and initial capitalization period.

Dr. Campbell returned to the consulting profession in 1982, and from 1987 until December 1993 he was a founding member of Leeper, Cambridge & Campbell, Inc. He held the position of President from 1991 to 1993. On January 1, 1994 he formed The Campbell-Hill Aviation Group, Inc.

Dr. Campbell's particular expertise is in the economic analysis of aviation issues and opportunities. This includes financial, marketing, planning, and operations aspects of airlines, airports, and equipment manufacturers. Dr. Campbell's experience is well developed from both the research and executive viewpoints. He has served numerous clients in problem diagnosis, specification and analysis of alternative courses of action, development of strategic action plans, and implementation procedures and controls.

Throughout his career, Dr. Campbell has developed various analytical models and procedures for a broad variety of clients in all major sectors of the industry. For instance, in his airport economic forecasting practice, he led the development of the only comprehensive airport activity and passenger forecasting model that realistically accounts

for inter-airport competition within a single region, such as New York/Newark, Washington/Baltimore, and San Francisco/Oakland. He also has developed and implemented detailed costing, budgeting, and financial forecasting models for airlines.

Dr Campbell's aviation expertise includes extensive consulting in air cargo and air express operations. He directed the firm's research and analysis for the Global Transpark (GTP) in North Carolina and he works closely with the creator of the GTP concept on opportunities for applying the system in other parts of the U.S. and elsewhere in the world. Currently he directs the firm's consulting services for Federal Express as well as for other air cargo and air express carriers.

Dr. Campbell has significant experience assisting airports in their air service development and marketing programs. The firm regularly serves eight U.S. airports in this fashion.

As a consultant, Dr. Campbell has appeared as an expert witness in more than 75 adversarial proceedings before regulatory boards or commissions, representing private as well as government and non-profit organizations. This cross section of cases includes routes, fares, mergers, initial certification, and industry performance evaluations. The majority of these case appearances were before the U.S. Civil Aeronautics Board and the U.S. Department of Transportation, and several occurred before the Canadian Transport Commission and the European Commission.

As a senior airline executive, Dr. Campbell raised millions of dollars of venture capital and several times that amount for lease and debt financing of used aircraft. He has managed an SEC registration for a public stock offering by a new-entrant airline; negotiated and successfully concluded purchase agreements for new and used flight equipment, spare parts inventories, training services, and airport and maintenance facilities; and managed the finance and accounting, purchase/stores, planning and administration department of new operating carriers.

AREAS OF SPECIALIZATION

- Route system development and market planning
- Litigation support and expert testimony
- Airport planning (economic forecasting and air service marketing issues)

- Financial and economic impact analysis of environmental regulations
- Aircraft evaluations and fleet planning
- Marketing, sales, promotion, advertising, and pricing strategies
- Demand forecasting (passenger, property, activity/operations)
- Proforma financial statements and measures of performance
- Corporate organization structure and planning
- Development and preparation of business plans for targeted purposes
- Presentations to financial institutions and boards of directors
- Financial services (equity and debt)
- Merger and acquisition analyses, recommendations, and integration plans
- Small community air service problems and plans for improvements
- Federal and local airport and airways policy issues
- Airport access, capacity, and noise regulation

EDUCATION

Bachelor of Commerce, McGill University

M.B.A., University of Western Ontario

Ph.D. Business Administration, Columbia University

DEAN B. HILL

PRESIDENT

PROFESSIONAL EXPERIENCE

Mr. Hill joined The Campbell-Hill Aviation Group in 1994 after 27 years of service at Delta Air Lines. He has made a successful transition from the airline sector to aviation consulting by offering his extensive airline experience to Campbell-Hill's clients. Mr. Hill designs and directs most of the firm's air service presentations for airport clients dealing with a wide range of airline targets and service objectives. For example, Mr. Hill prepared and delivered comprehensive route, scheduling, and marketing plans to several low-fare carriers that have led to the inauguration of daily low-fare flights at the client airport. He assisted another airport client in obtaining new international air service to Japan, and still another in obtaining new transatlantic service.

Mr. Hill is exceptionally qualified to deal with airline clients because he knows firsthand how they function and make route and scheduling decisions. He works easily with airport clients to fulfill their air service requirements because he is familiar with the airports' target markets, the airlines, and because he has years of experience in making route decisions at Delta. Using his legal background, Mr. Hill also works with the legal community, providing a bridge between the legal/regulatory world and the business side of airlines and airports.

Mr. Hill began his aviation career with Delta Air Lines in 1967. Between 1968 and 1981 he was part of Delta's Economic Research Department where his primary responsibilities included the planning, preparation, and sponsorship of Delta's route cases before the Civil Aeronautics Board. Mr. Hill appeared or participated, normally as Delta's chief economic witness, in every Delta route case from 1974 through 1994.

With the phase-out of airline regulation beginning in 1978, Mr. Hill was assigned the responsibility of planning the transition of Delta's route structure into the deregulated environment. His work led to the expansion of Delta's hubs at Atlanta, Dallas/Fort Worth, Cincinnati and, later, Salt Lake City. Early in the 1980's, Mr. Hill designed the comprehensive computer route model that would drive Delta's route planning for almost two decades.

As Delta's domestic hub structure matured, Mr. Hill was instrumental in extending Delta into the international arena, first from Atlanta and then from new gateways at Portland and Cincinnati. During this time Mr. Hill was heavily involved in Delta's acquisition of Western Airlines and Pan American Airways' European routes and the shuttle.

In early 1990's, Mr. Hill was again on the leading edge of route development as he led Delta's evolution into international airline alliances. He personally negotiated code-share agreements with nine airlines covering 34 routes between 1992 and 1994.

AREAS OF SPECIALIZATION

- Strategic planning for airports and airlines
- Airline alliance strategies
- Regulatory affairs (e.g. DOT, DOJ, European Commission)
- Route planning and analysis
- Air service presentation for airports
- Economic analysis of aviation issues
- Fleet planning
- Merger and acquisition analysis
- Analysis of industry issues
- Route strategies
- Code-sharing evaluation and negotiation
- Litigation support and expert testimony

EDUCATION

A.B. Political Science, Stanford University

J.D. Law, University of Kansas

Admitted to law practice in Kansas and Georgia

REX J. EDWARDS

CONSULTING ASSOCIATE

PROFESSIONAL EXPERIENCE

Mr. Edwards has worked extensively with Dr. Campbell since 1987. He assists the firm in the analysis and modeling of aviation systems. He has developed databases and analytical methods for estimating regional demand and supply patterns for several airport market studies. In addition, Mr. Edwards has developed economic impact methodologies for several FAA funding applications, and analyses of U.S. aviation competition issues. He also provided analysis of the potential impact of passenger carrier mergers on market competition. Mr. Edwards has worked extensively in analyzing new cargo airports in the U.S. and overseas, including feasibility and economic impact analysis.

He produces an annual database of current and forecast air trade flows by market, commodity type, and U.S. state of origin/destination, and supplies extracts of these data for airport market analysis, aviation bilateral negotiations, and DOT route case proceedings. In a recent analysis of Asian air policy, Mr. Edwards designed and applied a model for estimating air trade flows and the impact of air rights liberalization on economic development in China and Hong Kong. Mr. Edwards is a developer and programmer of software for transportation costing, systems modeling, and database management.

Mr. Edwards has 20 years of experience as a transportation and trade economist and researcher. Before joining Campbell-Hill as a consulting associate, Mr. Edwards was the vice president and a founding partner of Leeper, Cambridge & Campbell, Inc. Previously, he worked at several transportation and engineering firms, including Phillips Cartner & Co., Simat International, Exploration Services, and Simat, Helliesen & Eichner, Inc.

AREAS OF SPECIALIZATION

- Forecasting/modeling of transportation systems, facilities, technologies and services
- Software programming for transportation costing/database management
- Industrial level economic trade analysis
- International trade analysis by mode of transport, and by origin/destination
- Market feasibility studies
- Transportation demand forecasting

EDUCATION

B.A., Mathematics and Economics, College of William and Mary

JAMES LUNDY

SENIOR ANALYST

PROFESSIONAL EXPERIENCE

Mr. Lundy joined Campbell-Hill in June of 2003. During the course of his employment, he has worked on projects ranging from air service presentations to economic impact studies. He has provided research and analysis that has been used in expert witness testimony, including testimony in the DHL Citizenship Case before the United States Department of Transportation. Mr. Lundy's financial analysis was utilized in a presentation that played a vital role in the November 2004 repeal of the amendment to Florida's constitution that would have created a financially infeasible high-speed rail system. In addition, Mr. Lundy helped develop the statistical models that are currently used to determine intra Alaska bush mail rates for Part 121 carriers.

AREAS OF SPECIALIZATION

- Financial Research and Analysis
- Aviation Research
- Econometric Analysis
- Database and Statistical Analysis

EDUCATION

Mr. Lundy graduated Magna Cum Laude with a B.B.A. degree in Finance and a minor in Economics from James Madison University. He was awarded the Outstanding Student in Finance award for his graduating class with a 3.95 cumulative Finance grade point average and a 3.88 overall grade point average.

KEVIN SCHORR

RESEARCH DIRECTOR

PROFESSIONAL EXPERIENCE

Mr. Schorr joined Campbell-Hill in February of 2004. His work focuses on analytical interpretation of aviation issues including forecasting airport traffic and operations, and air service development.

Previously, Mr. Schorr has held several different positions which have exposed him to many aspects of the commercial aviation industry. He was a project engineer for Morse Diesel International on the Terminal One construction project at JFK International Airport. In addition to performing a variety of engineering tasks, Mr. Schorr was responsible for managing all construction drawings and samples for this multi-million dollar project.

For his Master's thesis, he developed a linear programming model that evaluated the assignment of regional jets to TWA's St. Louis hub operation. Mr. Schorr also held an internship with TWA's strategic alliances department where his responsibilities included financial and strategic evaluation of potential codeshare partners. After spending a year as a supply chain consultant with Ernst & Young LLP, Mr. Schorr became the Director – Domestic Strategies and Alliances for TWA. In this capacity, he played a key role in the implementation of the airline's alliance with America West Airlines, including negotiation of the codeshare agreement itself. Mr. Schorr's duties also included international route planning, schedule planning and analysis, and other strategic planning activities.

For the 2½ years prior to joining Campbell-Hill, Mr. Schorr was a consultant in the transport practice of PA Consulting Group, Inc. He participated in many different projects, including analysis of hub and spoke network economics, competitive scheduling analysis, airport traffic and operations forecasting, air service presentations, use and lease agreement negotiations, rates and charges methodologies, airport traffic forecasting, and airline route profitability systems.

AREAS OF SPECIALIZATION

- Demand forecasting (passenger, property, activity/operations)
- Economic analysis of airline hub and spoke networks
- Economic analysis of industry issues
- Route planning and analysis
- Airline alliance strategies
- Use and lease agreements (rates and charges methodologies)
- Air service presentations
- Airport marketing and incentive programs

EDUCATION

B.S. Civil Engineering, Washington University

M.S. Civil Engineering, Washington University

M.B.A., Washington University

PATRICK M. SWIFT

RESEARCH DIRECTOR

PROFESSIONAL EXPERIENCE

Mr. Swift joined Campbell-Hill in April of 1996. During his tenure with the firm, Mr. Swift has performed extensive traffic and revenue analysis for both passenger and cargo markets. He also has prepared airline schedule simulations for proposed markets and airline networks. Mr. Swift is an expert in large database management and manipulation, often dealing with U.S. passenger traffic and revenue data as well as global airline schedules. He has created several proprietary models that are in regular use by the firm.

Additionally, Mr. Swift has assisted Dr. Campbell and Mr. Fred Zusman, creators of the MADAM model, in enhancing the model to assist Metropolitan Washington Airports Authority in analyzing slot DCA perimeter rule changes during the McCain hearings. Those improvements are part of the MADAM model today.

Previously, Mr. Swift spent 10 years in the airline sector, where he developed many unique skills. He was co-founder of the second Midway Airlines and co-author of the company's business plan. In the planning of the start-up he dealt with schedules, route planning, strategy, fares and tariffs, slot management, and revenue forecasting and management. Previously, Mr. Swift was a co-founder, co-owner and Vice President of Aviation Fuels Services Company, where he specialized in the enhanced procurement and cost reduction of petroleum products. Mr. Swift acted as Director of Planning/Schedules/Stations at Jet Express, which later became Midway Airlines.

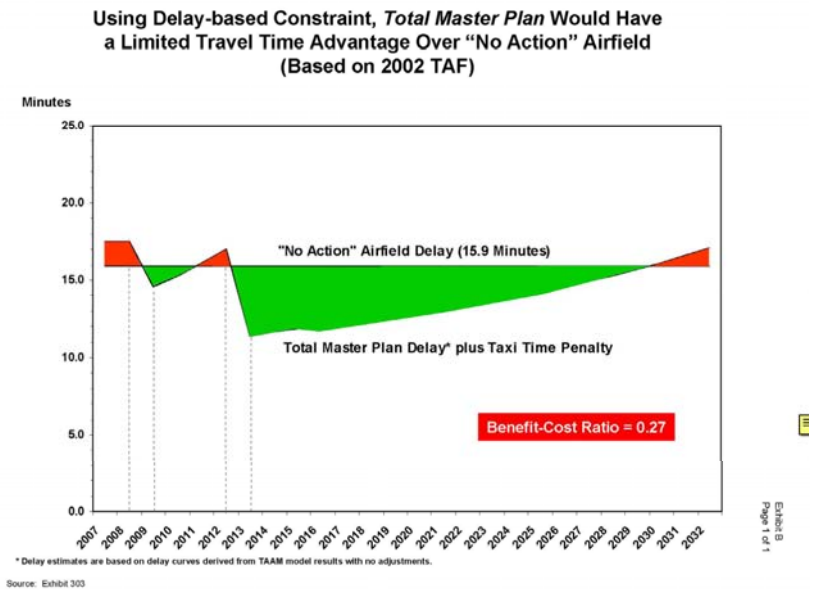
AREAS OF SPECIALIZATION

- Model Development and programming
- Computer reservations systems
- Yield management systems
- Planning
- Operations

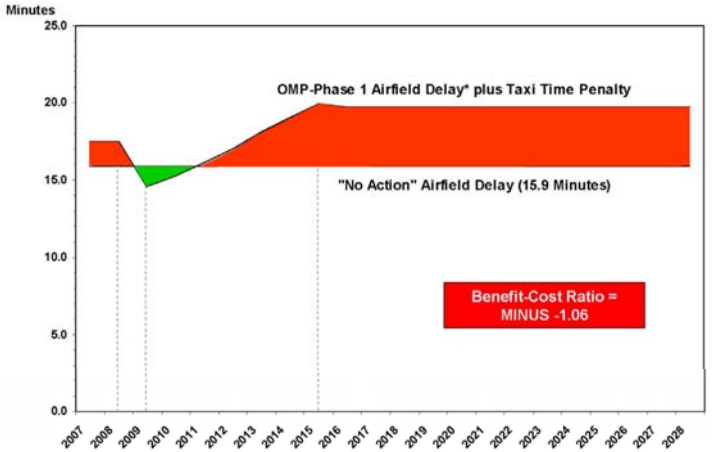
- Scheduling
- Pricing

EDUCATION

B.S. Aeronautical Studies, Embry-Riddle Aeronautical University



With Delay-based Constraint, *OMP-Phase 1 Airfield*
Would Have Significant Travel Time Disbenefits
(Based on 2002 TAF)



* Delay estimates are based on delay curves derived from TAAM model results with no adjustments.

Source: Exhibit 303

Exhibit C
Page 1 of 1

Exhibit D
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Comparison of FAA Operations Forecasts for ORD
(2002, 2003 and 2004 TAF)

	2002 TAF calendar year ops	2003 TAF calendar year ops	2004 TAF calendar year ops
2002	922,787	907,172	907,172
2003	960,500	952,665	939,954
2004	976,544	1,054,344	985,490
2005	992,855	1,105,591	983,419
2006	1,009,439	1,135,178	1,015,934
2007	1,026,300	1,156,269	1,040,443
2008	1,041,635	1,173,853	1,061,529
2009	1,057,200	1,192,742	1,081,410
2010	1,072,706	1,211,991	1,099,749
2011	1,088,438	1,230,378	1,118,203
2012	1,104,402	1,249,390	1,137,062
2013	1,120,600	1,267,587	1,156,462
2014	1,134,910	1,286,484	1,176,499
2015	1,149,402	1,307,349	1,196,950
2016	1,164,080	1,329,521	1,219,352
2017	1,178,945	1,351,358	1,242,039
2018	1,194,000	1,373,356	1,264,569
2019	1,209,247	1,396,383	1,287,036
2020	1,224,689	1,419,795	1,309,902
2021	1,240,328	1,443,601	1,333,174
2022	1,256,167	1,467,805	1,356,859
2023	1,272,208	1,492,416	1,380,966
2024	1,288,454	1,517,439	1,405,501
2025	1,304,908	1,542,881	1,430,471
2026	1,321,571	1,568,750	1,455,885
2027	1,338,448	1,595,053	1,481,751
2028	1,355,539	1,621,797	1,508,076
2029	1,372,849	1,648,989	1,534,869
2030	1,390,381	1,676,638	1,562,138
2031	1,408,136	1,704,749	1,589,892
2032	1,426,117	1,733,333	1,618,138

Color Code

Yellow = 1.2 million ops = 5.8 min AAAW
Turquoise = 1.3 million ops -- Ricondo 2003 =10.9 min AAAW
Orange = 1.4 million which FAA in App R says = 13-16 minutes AAAW

Exhibit E
Page 1 of 3

UNMODIFIED TAFS
(In Fiscal Years)

Fiscal Years	Enplanements			Operations			Enplanements per Operation		
	2004 TAF	2003 TAF	2002 TAF	2004 TAF	2003 TAF	2002 TAF	2004 TAF	2003 TAF	2002 TAF
2002	30,943,392	31,036,583	31,026,878	901,703	901,703	901,703	34.3	34.4	34.4
2003	32,488,761	32,717,166	32,279,532	923,578	923,578	942,961	35.2	35.4	34.2
2004	35,283,104	36,299,801	33,355,660	989,082	1,039,927	956,478	35.7	34.9	34.9
2005	35,514,512	38,553,984	34,436,637	974,712	1,097,593	974,893	36.4	35.1	35.3
2006	36,560,681	40,016,916	35,482,484	1,009,541	1,129,584	990,853	36.2	35.4	35.8
2007	37,696,446	41,176,513	36,538,578	1,035,114	1,151,961	1,005,759	36.4	35.7	36.3
2008	38,760,211	42,365,388	37,616,027	1,056,429	1,169,193	1,020,212	36.7	36.2	36.9
2009	39,841,343	43,574,089	38,707,538	1,076,827	1,187,832	1,035,207	37.0	36.7	37.4
2010	40,880,131	44,809,921	39,838,460	1,095,160	1,207,471	1,050,072	37.3	37.1	37.9
2011	41,920,256	46,014,868	41,009,473	1,113,514	1,225,552	1,065,814	37.6	37.5	38.5
2012	43,004,093	47,302,742	42,193,590	1,132,271	1,244,857	1,081,429	38.0	38.0	39.0
2013	44,131,948	48,596,213	43,396,118	1,151,436	1,262,988	1,096,905	38.3	38.5	39.6
2014	45,304,159	49,932,756	44,595,908	1,171,540	1,281,384	1,111,865	38.7	39.0	40.1
2015	46,481,208	51,284,709	45,847,959	1,191,376	1,301,782	1,126,284	39.0	39.4	40.7
2016	47,696,802	52,701,547	47,128,724	1,213,672	1,324,051	1,141,590	39.3	39.8	41.3
2017	48,931,190	54,090,880	48,432,974	1,236,390	1,345,930	1,156,013	39.6	40.2	41.9
2018	50,196,123	55,503,487	49,759,252	1,258,984	1,367,640	1,170,635	39.9	40.6	42.5
2019	51,451,352	56,948,834	51,067,731	1,281,324	1,390,503	1,183,948	40.2	41.0	43.1
2020	52,722,217	58,395,018	52,404,871	1,304,171	1,414,021	1,198,192	40.4	41.3	43.7

Exhibit E
Page 2 of 3

TAFS EXTRAPOLATED
(In Fiscal Years)

Fiscal Years	Enplanements			Operations			Enplanements per Operation		
	2004 TAF	2003 TAF	2002 TAF	2004 TAF	2003 TAF	2002 TAF	2004 TAF	2003 TAF	2002 TAF
2002	30,943,392	31,036,583	31,026,878	901,703	901,703	901,703	34.3	34.4	34.4
2003	32,488,761	32,717,166	32,279,532	923,578	923,578	942,961	35.2	35.4	34.2
2004	35,283,104	36,299,801	33,355,660	989,082	1,039,927	956,478	35.7	34.9	34.9
2005	35,514,512	38,553,984	34,436,637	974,712	1,097,593	974,893	36.4	35.1	35.3
2006	36,560,681	40,016,916	35,482,484	1,009,541	1,129,584	990,853	36.2	35.4	35.8
2007	37,696,446	41,176,513	36,538,578	1,035,114	1,151,961	1,005,759	36.4	35.7	36.3
2008	38,760,211	42,365,388	37,616,027	1,056,429	1,169,193	1,020,212	36.7	36.2	36.9
2009	39,841,343	43,574,089	38,707,538	1,076,827	1,187,832	1,035,207	37.0	36.7	37.4
2010	40,880,131	44,809,921	39,838,460	1,095,160	1,207,471	1,050,072	37.3	37.1	37.9
2011	41,920,256	46,014,868	41,009,473	1,113,514	1,225,552	1,065,814	37.6	37.5	38.5
2012	43,004,093	47,302,742	42,193,590	1,132,271	1,244,857	1,081,429	38.0	38.0	39.0
2013	44,131,948	48,596,213	43,396,118	1,151,436	1,262,988	1,096,905	38.3	38.5	39.6
2014	45,304,159	49,932,756	44,595,908	1,171,540	1,281,384	1,111,865	38.7	39.0	40.1
2015	46,481,208	51,284,709	45,847,959	1,191,376	1,301,782	1,126,284	39.0	39.4	40.7
2016	47,696,802	52,701,547	47,128,724	1,213,672	1,324,051	1,141,590	39.3	39.8	41.3
2017	48,931,190	54,090,880	48,432,974	1,236,390	1,345,930	1,156,013	39.6	40.2	41.9
2018	50,196,123	55,503,487	49,759,252	1,258,984	1,367,640	1,170,635	39.9	40.6	42.5
2019	51,451,352	56,948,834	51,067,731	1,281,324	1,390,503	1,183,948	40.2	41.0	43.1
2020	52,722,217	58,395,018	52,404,871	1,304,171	1,414,021	1,198,192	40.4	41.3	43.7
2021	**54,024,473**	**59,877,927**	**53,777,022**	**1,327,425**	**1,437,937**	**1,212,607**	**40.7**	**41.6**	**44.3**
2022	**55,358,895**	**61,398,494**	**55,185,101**	**1,351,094**	**1,462,257**	**1,227,196**	**41.0**	**42.0**	**45.0**
2023	**56,726,277**	**62,957,674**	**56,630,049**	**1,375,185**	**1,486,989**	**1,241,960**	**41.2**	**42.3**	**45.6**
2024	**58,127,435**	**64,556,450**	**58,112,831**	**1,399,706**	**1,512,139**	**1,256,902**	**41.5**	**42.7**	**46.2**
2025	**59,563,201**	**66,195,825**	**59,634,438**	**1,424,664**	**1,537,714**	**1,272,024**	**41.8**	**43.0**	**46.9**
2026	**61,034,431**	**67,876,831**	**61,195,885**	**1,450,067**	**1,563,722**	**1,287,328**	**42.1**	**43.4**	**47.5**
2027	**62,542,001**	**69,600,525**	**62,798,217**	**1,475,923**	**1,590,169**	**1,302,816**	**42.4**	**43.8**	**48.2**
2028	**64,086,809**	**71,367,992**	**64,442,504**	**1,502,239**	**1,617,064**	**1,318,490**	**42.7**	**44.1**	**48.9**
2029	**65,669,774**	**73,180,342**	**66,129,845**	**1,529,026**	**1,644,414**	**1,334,352**	**42.9**	**44.5**	**49.6**
2030	**67,291,839**	**75,038,717**	**67,861,366**	**1,556,289**	**1,672,227**	**1,350,406**	**43.2**	**44.9**	**50.3**
2031	**68,953,969**	**76,944,283**	**69,638,225**	**1,584,039**	**1,700,510**	**1,366,652**	**43.5**	**45.2**	**51.0**
2032	**70,657,154**	**78,898,240**	**71,461,608**	**1,612,284**	**1,729,271**	**1,383,095**	**43.8**	**45.6**	**51.7**

Bold = Extrapolated by Campbell-Hill using the final year growth rate

Exhibit E
Page 3 of 3

TAFS EXTRAPOLATED
(In Calendar Years)

Fiscal Years	Enplanements			Operations			Enplanements per Operation		
	2004 TAF[1]	2003 TAF[1]	2002 TAF[2]	2004 TAF[1]	2003 TAF[1]	2002 TAF[3]	2004 TAF	2003 TAF	2002 TAF
2002	31,329,734	31,456,729	31,710,512	907,172	907,172	922,787	34.5	34.7	34.4
2003	33,187,347	33,612,825	32,609,000	939,954	952,665	960,500	35.3	35.3	34.0
2004	35,340,956	36,863,347	33,633,731	985,490	1,054,344	976,544	35.9	35.0	34.4
2005	35,776,054	38,919,717	34,696,477	983,419	1,105,591	992,855	36.4	35.2	34.9
2006	36,844,622	40,306,815	35,798,961	1,015,934	1,135,178	1,009,439	36.3	35.5	35.5
2007	37,962,387	41,473,732	36,943,000	1,040,443	1,156,269	1,026,300	36.5	35.9	36.0
2008	39,030,494	42,667,563	38,027,250	1,061,529	1,173,853	1,041,635	36.8	36.3	36.5
2009	40,101,040	43,883,047	39,149,000	1,081,410	1,192,742	1,057,200	37.1	36.8	37.0
2010	41,140,162	45,111,158	40,280,622	1,099,749	1,211,991	1,072,706	37.4	37.2	37.6
2011	42,191,215	46,336,837	41,450,618	1,118,203	1,230,378	1,088,438	37.7	37.7	38.1
2012	43,286,057	47,626,110	42,660,538	1,137,062	1,249,390	1,104,402	38.1	38.1	38.6
2013	44,425,001	48,930,349	43,912,000	1,156,462	1,267,587	1,120,600	38.4	38.6	39.2
2014	45,598,421	50,270,744	45,119,418	1,176,499	1,286,484	1,134,910	38.8	39.1	39.8
2015	46,785,107	51,638,919	46,367,492	1,196,950	1,307,349	1,149,402	39.1	39.5	40.3
2016	48,005,399	53,048,880	47,657,820	1,219,352	1,329,521	1,164,080	39.4	39.9	40.9
2017	49,247,423	54,444,032	48,992,074	1,242,039	1,351,358	1,178,945	39.7	40.3	41.6
2018	50,509,930	55,864,824	50,372,000	1,264,569	1,373,356	1,194,000	39.9	40.7	42.2
2019	51,769,068	57,310,380	51,050,000	1,287,036	1,396,383	**1,209,247**	40.2	41.0	**42.2**
2020	**53,059,595**	**58,793,341**	52,200,000	**1,309,902**	**1,419,795**	**1,224,689**	40.5	41.4	**42.6**
2021	**54,382,292**	**60,314,676**	53,400,000	**1,333,174**	**1,443,601**	**1,240,328**	**40.8**	**41.8**	**41.2**
2022	**55,737,962**	**61,875,376**	54,550,000	**1,356,859**	**1,467,805**	**1,256,167**	**41.1**	**42.2**	**41.6**
2023	**57,127,427**	**63,476,461**	55,750,000	**1,380,966**	**1,492,416**	**1,272,208**	**41.4**	**42.5**	**42.0**
2024	**58,551,530**	**65,118,976**	56,900,000	**1,405,501**	**1,517,439**	**1,288,454**	**41.7**	**42.9**	**42.3**
2025	**60,011,133**	**66,803,993**	58,050,000	**1,430,471**	**1,542,881**	**1,304,908**	**42.0**	**43.3**	**42.7**
2026	**61,507,122**	**68,532,610**	59,250,000	**1,455,885**	**1,568,750**	**1,321,571**	**42.2**	**43.7**	**43.1**
2027	**63,040,404**	**70,305,958**	60,400,000	**1,481,751**	**1,595,053**	**1,338,448**	**42.5**	**44.1**	**43.4**
2028	**64,611,908**	**72,125,192**	61,550,000	**1,508,076**	**1,621,797**	**1,355,539**	**42.8**	**44.5**	**43.7**
2029	**66,222,588**	**73,991,501**	62,750,000	**1,534,869**	**1,648,989**	**1,372,849**	**43.1**	**44.9**	**44.0**
2030	**67,873,419**	**75,906,103**	63,900,000	**1,562,138**	**1,676,638**	**1,390,381**	**43.4**	**45.3**	**44.3**
2031	**69,565,403**	**77,870,247**	65,050,000	**1,589,892**	**1,704,749**	**1,408,136**	**43.8**	**45.7**	**44.6**
2032	**71,299,566**	**79,885,214**	66,250,000	**1,618,138**	**1,733,333**	**1,426,117**	**44.1**	**46.1**	**44.8**

Bold = Extrapolated by Campbell-Hill using the final year growth rate

1/ Converted to calendar years by Campbell-Hill using Ricondo methodology of CY1=(0.75 x FY1)+ (0.25 x FY2)
2/ CY Unconstrained 2002 TAF prepared for the DEIS
3/ 2002-2018 from DEIS, 2019-2032 extrapolated by Campbell-Hill using the final year growth rate

Exhibit F
Page 1 of 7

THE FAA SHOULD NOT HAVE REDUCED PASSENGER PROJECTIONS IN THE 2004 TAF

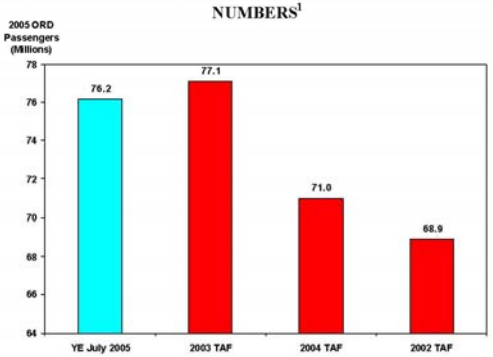
The significant decline in forecast ORD enplanements from the 2003 TAF to the 2004 TAF (forecast 2020 enplanements declined by 9.7%) defies all reason. It is abundantly clear that in the development of its 2004 TAF, the FAA ignored available data that showed, for the most recent history, increased passenger and economic activity. In fact, the 2003 TAF for 2005 is closer to **actual** 2005 passenger levels than either the 2004 or the 2002 TAF. The 2003 TAF fiscal year 2005 passenger number is 1.2% higher than actual ORD passengers for the year ended July 2005. The 2004 TAF forecast fiscal year 2005 passenger number is **6.8% lower** and the 2002 TAF number is **9.6% lower** than the current level (See Chart 1).[1] Further evidence that the FAA overlooked important data in developing the 2004 TAF is that all quarters in 2004 had extremely high quarter over quarter (prior year) passenger growth rates (Q1=6%, Q2=12%, Q3=11%, Q4=6%). Except for the first quarter, the quarter over quarter growth rates in 2003 were lower than in 2004 (Q1=9%, Q2= 5%, Q3=1%, Q4=3%) (See Chart 2). Using these data, the FAA erroneously predicted that passengers would only grow by 0.66% from fiscal year 2004 to fiscal year 2005. The passenger level for the year ended July 2005 is actually 4% higher than the passenger level for the year ended July 2004. So passenger growth at ORD accelerated during 2004 rather than decelerated as the FAA's TAF would have one believe.

[1] The actual passenger numbers are from the Chicago Department of Aviation. These passenger numbers are given in terms of total passengers, not enplanements. To compare the enplanements from the TAFs to the City's passenger numbers, Campbell-Hill multiplied TAF enplanements by two.

1

THE FAA SHOULD NOT HAVE REDUCED PASSENGER PROJECTIONS IN THE 2004 TAF

Chart 1
2003 TAF PASSENGER NUMBERS ARE CLOSER TO ACTUAL PASSENGERS NUMBERS[1]

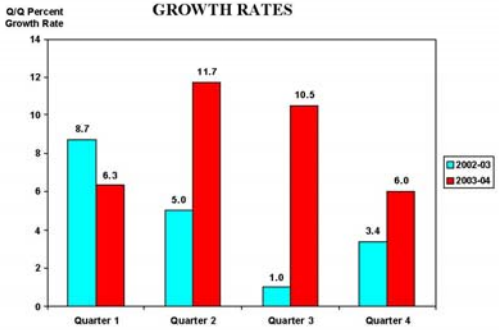


1/ TAF enplanements multiplied by two to get total passengers

Sources: Chicago Department of Aviation and FAA Terminal Area Forecasts

THE FAA SHOULD NOT HAVE REDUCED PASSENGER PROJECTIONS IN THE 2004 TAF

Chart 2
2004 PASSENGER GROWTH RATES WERE HIGHER THAN 2003 PASSENGER GROWTH RATES



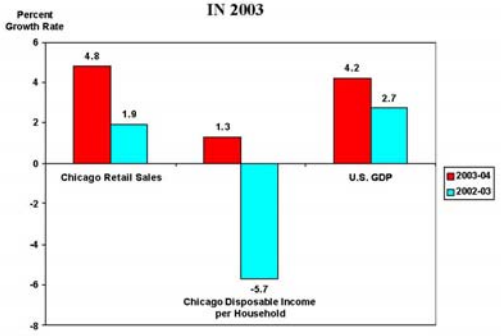
Source: Chicago Department of Aviation

According to FAA forecast methodology, it is also supposed to use both local and national economic variables in developing the annual TAFs. Once again, the FAA overlooked regional and national economic growth in developing its 2004 TAF. Total retail sales in the Chicago region were 4.8% higher in 2004 than they were in 2003. In contrast, total retail sales increased by only 1.9% from 2002 to 2003. Disposable income per household increased by 1.3% from 2003 to 2004, while it declined by 5.7% from 2002 to 2003.[2] The growth rate in the national economy, as measured by the real (adjusted for inflation) gross domestic product, was also higher from 2003 to 2004 than from 2002 to 2003 (4.2% vs. 2.7%).[3] In fact, the GDP growth from 2003 to 2004 was the highest one-year increase since 1998 to 1999. Any rational aviation economist would have increased forecast growth rates from the 2003 TAF to the 2004 TAF- not reduced them!

[2] The regional economic data are from Sales and Marketing Management, 2004 and 2003 Survey of Buying Power, September 2004 and September 2004.
[3] From the U.S. Department of Commerce

THE FAA SHOULD NOT HAVE REDUCED PASSENGER PROJECTIONS IN THE 2004 TAF

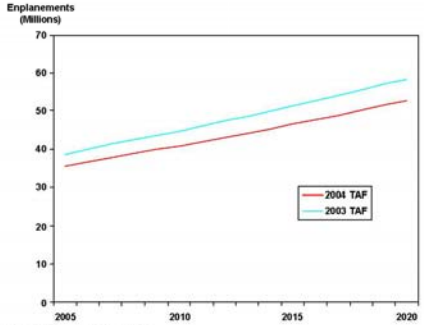
Chart 3
THE GROWTH IN ECONOMIC ACTIVITY WAS STRONGER IN 2004 THAN IT WAS IN 2003



Sources: Sales and Marketing Management, 2004 and 2003 Survey of Buying Power, September 2004 and September 2004; U.S. Department of Commerce.

THE FAA SHOULD NOT HAVE REDUCED PASSENGER PROJECTIONS IN THE 2004 TAF

Chart 4
DESPITE THE STRONGER GROWTH FROM 2003 TO 2004 THE FAA ILLOGICALLY REDUCED ITS 2004 FORECAST



Sources: FAA 2003 and 2004 TAFs

In the FAA's response to Campbell-Hill's April 6 comments, it states that the 2004 TAF "serves to validate the 2002 TAF that has been used for the EIS (Comment 55)." There is no reason why this should be the case. In contrast to the recent period preceding the 2004 TAF preparation, the aviation and economic activity preceding the development of the 2002 TAF was dismal. According the National Terminal Area Forecast, FY 2002 enplanements had decreased by 11% from FY 2000. During the same time period, ORD enplanements declined by 10%.[4] Further, the U.S. real GDP increased by only 1.2% annually from 2000 to 2002. These events should have produced a much lower forecast than the 2004 forecast that was preceded with such rapid growth. Instead, the 2020 ORD enplanements from the 2004 TAF are only 0.61% higher than the 2020 enplanements in the 2002 TAF. It seems clear that the FAA rigged the 2004 TAF to be similar to its 2002

[4] Enplanement numbers are from the TAF.

THE FAA SHOULD NOT HAVE REDUCED PASSENGER PROJECTIONS IN THE 2004 TAF

in order to salvage and justify (partially) its and the City's reliance upon the low-ball 2002 TAF.

If the most reasonable forecast of the three, the 2003 forecast, was used the FAA predicts that in 2018 with the OMP ORD would experience between 13 and 16 minutes of delay.[5] According to the FAA, at around 15 minutes "market forces will likely constrain aircraft operations."[6] This makes it clear why the FAA has had to justify its use of the 2002 TAF, even though the 2003 TAF was out for an entire year before the DEIS was released - ORD will be out of capacity just five years after the OMP opens.[7] And this conclusion destroys all economic viability and sensibility of the OMP, as demonstrated quantitatively in Campbell-Hill's comments on the City's Benefit/Cost Analysis (supplied June 6, 2005).

Corroborating Evidence from the FAA

The FAA released some files of spreadsheets and analysis that underlie the preparation of its ORD TAF's for 2002, 2003 and 2004. These files were supplied pursuant to the commenters' FOIA requests.[8]

These previously unreleased workpapers show clearly that the FAA's initial forecasting model results agree with Campbell-Hill's conclusion that forecasts prepared in 2003/04 should produce higher long term growth rates than forecasts developed a year earlier (2003/2002).

As shown in Table F-1 below, the FAA TAF model produced a 0.5% per year higher growth rate for air carrier operations in the 2004 TAF than it did for the 2003 TAF. This indicates that even the 2003 TAF forecasts are too low for purposes of evaluating the efficacy and performance of OMP (alternative C). If, as the FAA estimates, the 2003 TAF operations forecast for 2018 would produce an average delay of

[5] FAA, FEIS, page R-11.
[6] FAA, FEIS, page B-22.
[7] As displayed in Section 2.0 of Campbell-Hill's April 6 report, it is likely that the OMP will be out of capacity even prior to the five years forecast by the FAA.
[8] See letter from Joseph Kareganis to Barry Cooper at FAA dated August 8, 2005

THE FAA SHOULD NOT HAVE REDUCED PASSENGER PROJECTIONS IN THE 2004 TAF

13-16 minutes, it is reasonable to conclude that the adjusted 2004 TAF value[9] would produce delays well over 25 minutes in 2018. In fact, from the FAA's own data it is reasonable to conclude that ORD delay would reach 16 minutes when OMP opens in 2013 or 2014. This finding is confirmed by Campbell-Hill's independent analysis.

Finally, it must be noted that none of these delay estimates include the 6.5 minute additional taxi time occasioned by the OMP design. Inclusion of the added taxi time produces NEGATIVE BENEFITS for the OMP from DAY 1.

Table F-1
UNDERLYING FAA DOCUMENTS DISCLOSE THE FACT THAT ITS FORECASTING MODEL PRODUCED HIGHER FUTURE GROWTH RATES FOR THE 2004 TAF COMPARED TO THE 2003 TAF

ORD Annual Passenger Growth Rate

	2002/03-2020	2005-20
2004 TAF	3.3%	2.8%
2003 TAF	3.3%	2.7%
2004 TAF Higher than 2003 TAF	0.0%	0.1%

ORD Annual Departure Growth Rate

	2002/03-2020	2005-20
2004 TAF	2.4%	2.0%
2003 TAF	2.2%	1.5%
2004 TAF Higher than 2003 TAF	0.2%	0.5%

Sources: Files received from the FAA entitled ORD Forecast Methodology and ORD 04 Forecast Methodology.

[9] Adjusted by adding 0.5% per year to the 1.5% growth rate in the 2003 TAF (Table F-1).

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June 23, 2005

VIA FAX 202-493-5032 and By Certified Mail Return Receipt Requested

National Freedom of Information Act Staff
Federal Aviation Administration
ARC-40
800 Independence Ave., SW
Washington, DC 20591

VIA FAX 847-294-8490 and By Certified Mail Return Receipt Requested

Ms. Vickie Morris, FOIA Coordinator
FAA Great Lakes Region, AGL-4
2300 E. Devon Avenue
Des Plaines, IL 60018

VIA E-MAIL
Mr. Barry Cooper
Chicago Area Modernization Program Office
AGL-1CM
FAA Great Lakes Region
2300 E. Devon Avenue
Des Plaines, Illinois 60018

VIA E-MAIL
Mr. Perry A. Kupietz
Regional Counsel
Great Lakes Region
Federal Aviation Administration
2300 E. Devon Avenue
Des Plaines, IL 60018

Re: Freedom of Information Act Request relating to metropolitan Chicago and O'Hare Airport

Dear Gentlepersons:

This Freedom of Information Act request is intended to make certain that our pre-existing FOIA requests are not summarily terminated by FAA and that the categories of document requests we have made are clear. Our prior FOIA requests in this matter were made on November 19, 2003 by the Suburban O'Hare Commission and on February 26, 2004 by St. John's United Church of Christ, Helen Runge, Shirley Steele, the Rest Haven Cemetery Association, Robert Placek, Leroy Heinrich, and Roxanne Mitchell (copies enclosed).

Mr. Kupietz, Regional Counsel for the FAA Great Lakes region has stated in an e-mail to me that our prior FOIA requests terminated as of December 17, 2004 — an assertion as to which we disagree — and that FAA therefore had no obligation to produce documents generated after December 17, 2004.

Comment	Response
Attachment 5 to Karaganis-Cohn	The Karaganis White and Magel letters dated June 23, 2005, November 19, 2003, February 26, 2004, and June 22, 2005 were submitted in this order as an attachment to the September 6, 2005 comments filed by Karaganis and Cohn on the FEIS. In regard to these broad FOIA requests, the FAA refers the commenter to Section 8.1 of the ROD. As noted in Section 8.1, beginning in December 2003 the FAA began the process of providing and/or making available over 15,000 documents (comprising over 8 million pages) for a fee of $3,000. FAA has responded to the November 19, 2003 and the February 26, 2004 FOIA requests in a letter dated April 29, 2005. This FOIA response has been administratively appealed.

We believe that our prior requests are still active but — to the extent FAA disagrees with our position — this letter represents a new FOIA request for the same categories of documents. In addition, we have added sub-categories to our requests to more specifically identify document categories which we believe were included within our prior requests. Please produce for our inspection the following documents:

1. **All documents relating to the proposed project entitled "O'Hare Modernization Program" ("OMP") proposed by the City of Chicago.** This category includes, but is not limited to, all documents relating to the Airport Master Plan, the Environmental Impact Statement (EIS) and the Airport Layout Plan for the OMP, and includes all documents relating to the estimated costs of the OMP, cost/benefit analyses (whether included in or not included in the NEPA review), passenger/aircraft forecasts, the prospective financing of the OMP, the scheduling of the OMP, and the scheduling of the EIS, the Master Plan, and the FAA decision-making process. This category also includes all computer simulation programs, computer input and output, and CAD files relating to the OMP.

2. **All documents relating to the "World Gateway" project at O'Hare, including documents relating to its present and projected status and implementation.** This includes all documents relating to the World Gateway project as it relates to the OMP project.

3. **All documents relating to the National Plan for Integrated Airport System (NPIAS) and any state or regional plan as they are related to the State of Illinois and/or commercial air carrier airports in the six county Chicago metropolitan area.** This request focuses specifically on the statement in the Record of Decision (ROD) in the 1984 O'Hare EIS:

> "Development of another air carrier airport to serve the Chicago Metropolitan Area will be studied as part of a State System Plan to be prepared by the Illinois Department of Transportation under a series of grants to be funded by the FAA's Airport Improvement Program. The initial grant was issued in September 1984."
>
> 1984 FAA ROD at 4

This request seeks documents relating to that State System Plan and the relationship of that State System Plan to the current O'Hare Master Plan as well as any subsequent State System Plan that encompasses commercial airports in the metropolitan Chicago area.

4. **All documents that relate to the inclusion of development projects at O'Hare and Midway in the Illinois State System Plan, the formulation and development of the National Plan of Integrated Airport Systems (NPIA) and/or in the FAA's National Priority System and ACIP process.** This request includes all documents relating to the inclusion of Phase One of the "O'Hare Modernization Project" (OMP) in the 2005-2009 NPIAS (National Plan For Integrated Airport Systems) and, if the Phase One project is included in the National Priority System/ACIP process – all such documents.

5. **All documents relating to the preparation and development of scheduling orders or agreements implemented at O'Hare since 2002, including but not limited to the August 2004 FAA scheduling order and the March 25, 2005 Notice of Proposed Rulemaking (NPRM).**

6. **All documents relating to the preparation of the report entitled *Capacity Needs in the National Airspace System* (FAA/MITRE 2004).**

7. **All documents requested in the enclosed June 22, 2005 letter from Joseph Karaganis to Barry Cooper.**

8. **All documents relating to FAA consideration of the complaints and objections of the "Religious Objectors" as to the proposed destruction of St. Johannes Cemetery and Rest Haven Cemetery by the OMP and Phase One.**

9. **All documents relating to the deletion of the Lima Lima taxiway from Phase One of the OMP and the financing and other problems associated with Lima Lima.**

10. **All documents as to any problems with OMP or Phase One that are not related to Lima Lima – including any documents that relate to a Chicago Tribune story of June 20, 2003 describing other cost increases and anticipated construction delays with OMP.**

11. **All documents as to the cost estimates for Phase One and the full OMP.**

12. **All documents as to the financing of Phase One or the OMP.**

We believe that these documents are encompassed within our previous FOIA requests but were withheld from our examination due to Mr. Kupietz assertion (with which we disagree) that the cut-off date for production for our previous FOIA requests was December 17, 2004.

We are not asking FAA to copy these documents. We are simply asking to inspect and scan these documents where the documents are in paper format and ask that computer files be placed on CD-ROM or DVD disks where the documents are in electronic format. Please contact me to arrange a convenient time for us to examine the documents responsive to this request as soon as possible.

Sincerely yours,

Joseph Karaganis
Counsel for the Suburban O'Hare Commission, St. John's United Church of Christ, Helen Runge, Shirley Steele, the Rest Haven Cemetery Association, Robert Placek, Leroy Heinrich, and Roxanne Mitchell

Enclosures

cc: Robert Cohn

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November 19, 2003

VIA FAX (847)-294-7498

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VIA FAX 847-294-8490

Ms. Vickie Morris, FOIA Coordinator
FAA Great Lakes Region, AGL-4
2300 E. Devon Avenue
Des Plaines, IL 60018

Re: Freedom of Information Act Request reference prior Freedom of Information Act (FOIA) Request Document Request No. 2003—O02431GL

Dear Mr. Kupietz and Ms. Morris:

Pursuant to our discussions with Mr. Andrew Steinberg and Mr. Kupietz, the Suburban O'Hare Commission has agreed, subject to the conditions set forth below, to modify its prior FOIA request of January 3, 2003 and now requests access to examine and copy the following documents.

1. **All documents relating to the proposed project entitled "O'Hare Modernization Program" ("OMP") proposed by the City of Chicago.** This category includes, but is not limited to, all documents relating to the Airport Master Plan, the Environmental Impact Statement (EIS) and the Airport Layout Plan for the OMP, and includes all documents relating to the estimated costs of the OMP, cost/benefit analyses (whether included in or not included in the NEPA review), passenger/aircraft forecasts, the prospective financing of the OMP, the scheduling of the OMP, and the scheduling of the EIS, the Master Plan, and the FAA decisionmaking process. This category also includes all computer simulation programs, computer input and output, and CAD files relating to the OMP.

2. **All documents relating to the "World Gateway" project at O'Hare, including documents relating to its present and projected status and implementation.** This includes all documents relating to the World Gateway project as it relates to the OMP project.

3. **All documents relating to the National Plan for Integrated Airport System (NPIAS) and any state or regional plan as they are related to the State of Illinois and/or commercial air carrier airports in the six county Chicago metropolitan area.** This request focuses specifically on the statement in the Record of Decision (ROD) in the 1984 O'Hare EIS:

> "Development of another air carrier airport to serve the Chicago Metropolitan Area will be studied as part of a State System Plan to be prepared by the Illinois Department of Transportation under a series of grants to be funded by the FAA's Airport Improvement Program. The initial grant was issued in September 1984."
>
> 1984 FAA ROD at 4

This request seeks documents relating to that State System Plan and the relationship of that State System Plan to the current O'Hare Master Plan as well as any subsequent State System Plan that encompasses commercial airports in the metropolitan Chicago area.

This request also seeks all documents that relate to the inclusion of development projects at O'Hare and Midway in the Illinois State System Plan, the Field Formulation of the National Plan of Integrated Airport Systems and in the FAA's National Priority System.

4. **All documents relating to the post 2000 Delay Task Force at O'Hare.** With the exception of category 3, this request is limited to documents generated in the last 5 years.

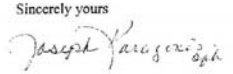
Our agreement to narrow our request is in response to the following understandings:

1. While we and the FAA continue to have a dispute about whether we have satisfied the requirements for either no charge for FAA searches or a waiver of those charges, Mr. Steinberg indicated that we could have access to the documents without resolving this dispute if we agreed to pay a "nominal" fee (which was in the range of 2-3 thousand dollars). We are prepared to pay this amount (but no more) to save the transactional costs which would be expended in resolving this dispute over FAA fees. By doing so, we in no way concede the merits of the FAA's assertion as to access charges.
2. Mr. Kupietz indicated that a large number of documents within the modified request related to technical "NAV-AID" matters. We agreed that if we could examine samples of the documents in their location, we may not need to examine these "NAV-AID" documents.

3. Mr. Kupietz asked if we wished to examine informal documents and communications such as e-mails. We do wish to examine such documents.
4. Our document request extends to computer programs and computer input and output material used by FAA or used by Chicago to assess Chicago's O'Hare expansion proposal. We wish to obtain these materials in electronic form as soon as possible so that our experts can evaluate these materials.

Please get back to me as soon as possible as to when we can have access to these materials.

Sincerely yours



Joseph Karaganis

Mr. Andrew B. Steinberg
Chief Counsel FAA

Mr. Robert Cohn

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February 26, 2004

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Ms. Vickie Morris, FOIA Coordinator
FAA Great Lakes Region, AGL-4
2300 E. Devon Avenue
Des Plaines, IL 60018

Re: Freedom of Information Act Request

Dear FOIA Coordinators:

Pursuant to the Freedom of Information Act (FOIA), on behalf of St. John's United Church of Christ, Helen Runge, Shirley Steele, the Rest Haven Cemetery Association, Robert Placek, Leroy Heinrich, and Roxanne Mitchell, I hereby request the following information described in this letter. The Suburban O'Hare Commission has previously made a FOIA request as a representative of these requestors, but I am making this request so that the record is absolutely clear that these specific requestors have made this FOIA request.

On behalf of these requestors, I request the opportunity to inspect and examine all documents in the possession of the Federal Aviation Administration national, regional and district offices relating to the following categories of information. By "documents" we mean to include electronic and computer files and programs, electronic graphics, computer data and e-mail, as well as paper material:

1. **All documents relating to the proposed project entitled "O'Hare Modernization Program" ("OMP") proposed by the City of Chicago.** This category includes, but is not limited to, all documents relating to the Airport Master Plan, the Environmental Impact Statement (EIS) and the Airport Layout Plan for the OMP, and includes all documents relating to the estimated costs of the OMP, cost/benefit analyses (whether included in or not included in the NEPA review), passenger/aircraft forecasts, the prospective financing of the OMP, the scheduling of the OMP, and the scheduling of the EIS, the Master Plan, and the

FAA decisionmaking process. This category also includes all computer simulation programs, computer input and output, and CAD files relating to the OMP.

2. **All documents relating to the "World Gateway" project at O'Hare, including documents relating to its present and projected status and implementation.** This includes all documents relating to the World Gateway project as it relates to the OMP project.

3. **All documents relating to the National Plan for Integrated Airport System (NPIAS) and any state or regional plan as they are related to the State of Illinois and/or commercial air carrier airports in the six county Chicago metropolitan area.** This request focuses specifically on the statement in the Record of Decision (ROD) in the 1984 O'Hare EIS:

> "Development of another air carrier airport to serve the Chicago Metropolitan Area will be studied as part of a State System Plan to be prepared by the Illinois Department of Transportation under a series of grants to be funded by the FAA's Airport Improvement Program. The initial grant was issued in September 1984."
>
> 1984 FAA ROD at 4.

This request seeks documents relating to that State System Plan and the relationship of that State System Plan to the current O'Hare Master Plan as well as any subsequent State System Plan that encompasses commercial airports in the metropolitan Chicago area.

This request also seeks all documents that relate to the inclusion of development projects at O'Hare and Midway in the Illinois State System Plan, the Field Formulation of the National Plan of Integrated Airport Systems and in the FAA's National Priority System.

4. **All documents relating to the post 2000 Delay Task Force at O'Hare.** With the exception of category 3, this request is limited to documents generated in the last 5 years.

5. **Paper and/or electronic file indices and electronic scanned images.** All file indexes or file databases relating to the organization of files and documents maintained by the FAA relating to the O'Hare Modernization Program, the World Gateway Program, or to the categories of information requested in this FOIA request. We are also requesting electronic copies of any scanned images of the

documents requested in this letter. It is our understanding that electronic computerized indices of some or all of the documents being requested in this letter are being maintained by FAA. Further, we understand that some or all of the documents being requested in this letter have been scanned by FAA or its contractor and are maintained in a scanned, electronic format.

We are *not* asking for copies of these documents at this time. We only wish to inspect them and we will scan at your offices any documents of which we want copies. As to electronic documents, we will arrange with you to have copies transferred to CD disks.

Further, we do not want to wait until all of the documents from all of the categories listed above are assembled. Nor do we wish to wait until each office within FAA is examined.

If the FAA proposes to withhold any documents requested in this letter on any basis, including any claimed exemption under the Freedom of Information Act, we request that the FAA prepare and provide us with an index of documents excluded from disclosure.

Please get back to me as to when documents within any of these categories of documents are available for inspection.

Please understand that the requestors here believe that they have independent rights (*i.e.*, independent of FOIA) to examine the documents requested in this letter as part of FAA's responsibilities to these requestors under the Due Process Clause and basic rules of administrative procedure. By making this FOIA request, the requestors are not waiving the assertion of these independent rights. These requestors are simply making certain that the record is clear that access to these documents to these requestors has been denied by the FAA. FAA has already effectively denied these requests by the Suburban O'Hare Commission by withholding these documents from inspection for more than one year.

Sincerely yours,

Joseph Karaganis

cc: Mr. Andrew B. Steinberg
Chief Counsel FAA
Mr. Robert Cohn

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June 22, 2005

VIA E-MAIL
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2300 E. Devon Avenue
Des Plaines, Illinois 60018

Re: ASV calculations and documents

Dear Barry:

This letter is in further correspondence as to documents that are encompassed within the scope of our existing FOIA requests but which have not been produced.

A. ASV Calculations:

On May 26, I sent you an e-mail (enclosed) asking for any documents and calculations and documents relating to "ASV" calculations for either the existing O'Hare and for any build options — as well as for the ASV calculations for other Chicago regional airports as described in Appendix C.

As I stated in my e-mail, we also know that ASV calculations were performed for both the existing O'Hare airport and the OMP option(s) in the FAA 2004 report *Capacity Needs in the National Airspace System* FAA/MITRE 2004)

Further, in the FAA's *Portfolio of Goals* the following statement is made under the Topic Heading "**Annual Service Volume**":

> Delay curves were developed for each of the 35 OEP airports for the existing airport layout and with new runways where proposed. Based on an acceptable level of delay, the number of operations that can reasonably be expected to occur at the airport were determined. A consistent calculation technique to estimate capacity was used for all airports.

Further, some sort of ASV calculation was used to calculate delay and capacity for the 2005-2009 NPIAS report which states that the AAAW delay at O'Hare is 7 minutes.

> The Annual Service Volume (ASV), at a particular level of delay, is used to measure airfield capacity at individual airports. Traditionally, a delay of four to six minutes per aircraft operation is used in ASV calculations. The relationship between aircraft operations and delay is non-linear, and often exponential. Experience shows that airfield delay increases gradually with rising levels of traffic until a certain level is reached. Thereafter, the delay rises more rapidly with increased traffic. For larger airports, it is our observation that the onset of the more rapid growth in delay often occurs when delay is between 4 and 6 minutes per aircraft operation.

NPIAS p. 12

The 2005-2009 NPIAS report (issued in September 2004) goes on the state that:

> "Table 4 lists the average minutes of delay per operation for 35 airports contained in the FAA's OEP"

NPIAS p. 14

In that Table the AAAW delay for O'Hare is listed as 7 minutes. We are seeking both the ASV and delay calculations for O'Hare and for the other OEP airports in Table 4 of the 2005-2005 NPIAS that were used in the 2005-2009 NPIAS. In particular — as to the other airports in Table 4 of the 2005-2005 NPIAS we wish to examine what delay levels (*e.g.*, minutes of AAAW) were used to calculate ASV for these airports.

We also believe that ASV calculations were made for O'Hare (both existing and at least Phase One of OMP) for the preparation of the NPIAS submission(s) that were developed at either the District and/or Great Lakes Region for inclusion in the 2005-2009 NPIAS. Presumably, these ASV and related delay and capacity analyses were used in developing the

Please make available the documents relating to ASV and related delay and capacity assessments for existing O'Hare and OMP, as well as the ASV's for the other airports in Appendix C of the DEIS and the OEP airports listed in Table 4 of the 2005-2009 NPIAS.

B. Materials from 2004 report *Capacity Needs in the National Airspace System* FAA/MITRE 2004)

We agreed in our discussion last Friday that the documents generated and used in the 2004 report *Capacity Needs in the National Airspace System* FAA/MITRE 2004) (hereafter the "MITRE Report") contained significant amounts of information relating to O'Hare and OMP. Among the areas of the MITRE Report that are encompassed within our previous FOIA request are:

1. Documents from the so-called Future Airport Capacity Task Force (FACT) that relate to any assessments of O'Hare and Midway (*i.e.*, either O'Hare individually or as a part of a system with Midway) to meet metropolitan demand. MITRE Report at p. 1
2. The calculation of ASV for O'Hare (both existing and various phases of OMP) and for Midway. Of particular interest are the average delay values that were used in calculating ASV for each of the OEP airports and the level of delay used for ASV for Midway and O'Hare (both existing and various phases of OMP) See p 26 of the MITRE Report.
3. The documents and data that are the basis for the statement at p. 10 of the MITRE Report that:

> Aggressive assumptions for the airfield reconfigurations at ORD and PHL were used in the 2020 analysis. Using these assumptions the airports are expected to have sufficient capacity to meet demand growth.
>
> ***
>
> The reconfiguration of ORD and the construction of a new runway at PBI will add sufficient capacity to satisfy expected demand levels in the Chicago and South Florida metropolitan areas.

MITRE Report at p. 10

4. The statement is made at p. 21 of the MITRE Report that the FACT analysis team updated the FAA's *Airport Capacity Benchmark Report* ("as part of the FACT analysis") MITRE further states at p. 22: "To produce the capacity estimates necessary for the FACT analysis the team utilized the Enhanced Airfield Capacity Model (E-ACM). The E-ACM is a MITRE-developed update of the widely used FAA Airfield Capacity Model." We wish to examine all documents that relate to the development of the "updated benchmark report" that was developed by the FACT team. Of particular interest are documents relating to the level of delay (if any) that was used as a variable or factor in determining the capacity values used in the updated *Airport Capacity Benchmark Report*.
5. The MITRE Report at p. 13 states that MITRE modeled both existing O'Hare and various versions of OMP by means of an NAS-wide simulation model. We wish to examine documents relating to this modeling effort as it related to O'Hare.
6. The MITRE Report at p. 14 states that MITRE performed calculations as to the capacity of both existing O'Hare and various versions of OMP by means of "extrapolation of historical data" We wish to examine documents relating to this analytical effort as it related to O'Hare.
7. The MITRE Report at p. 14 states that MITRE performed "socio-economic demand modeling" for the Chicago metropolitan area, including O'Hare and

Midway. (See also MITRE Report at 24) We wish to examine documents relating to this modeling effort.

8. The MITRE Report at pp. 26-27 says that an NAS-Wide Simulation of Airport Delay was used to calculate delays at existing O'Hare as well as delays at various OMP stages. We wish to examine all documents relating to this modeling effort and its results.

9. The MITRE Report at p. 27 states that "capacity-related delay estimates" were made comparing existing O'Hare and future iterations of OMP. We wish to examine all documents relating to this analytical effort.

C. Documents relating to the preparation of the submission By the Chicago District, Great Lakes Region, and FAA Headquarters relating to the inclusion of OMP elements in the 2005-2009 NPIAS and related National Priority System

It is clear from the 2005-2009 NPIAS that FAA has made a determination that Phase One of the OMP meets the requirements of 49 U.S.C. §47103:

> "The [NPIAS] plan shall include the kind and estimated cost of eligible airport development the Secretary of Transportation considers necessary to provide a safe, efficient, and integrated system of public-use airports adequate to anticipate and meet the needs of civil aeronautics"
>
> 49 U.S.C. §47103 (emphasis added)

FAA has included the purported $2.9 billion cost of Phase One in the 2005-2009 NPIAS as "eligible airport development the Secretary of Transportation considers necessary to provide a safe, efficient, and integrated system of public-use airports adequate to anticipate and meet the needs of civil aeronautics."

There must have been documents generated at the Chicago District office, the Great Lakes Region, and FAA Headquarters relating to the reasons why FAA determined that OMP Phase One met the requirements of §47103. Similarly, there must be documents that relate to possible inclusion of Phase One in the related National Priority System and NPIAS-ACIP database.

We have specifically asked for these documents in our prior FOIA requests:

> "This request also seeks all documents that relate to the inclusion of development projects at O'Hare and Midway in the Illinois State System Plan, the Field Formulation of the National Plan of Integrated Airport Systems and in the FAA's National Priority System."

None of the documents provided thus far include the documents relating to the inclusion of Phase One in the NPIAS and the inclusion of Phase One in the National Priority System-ACIP process.

Please get back to me as soon as possible as to when these documents will be available. To the extent these documents are in electronic format, I ask that these documents be transmitted to me immediately.

Sincerely yours,

Joseph Karaganis

cc: Mr. Robert Cohn
Mr. Joseph Del Balzo

050805_02

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August 5, 2005

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VIA E-MAIL
Mr. Perry A. Kupietz
Regional Counsel
Great Lakes Region
Federal Aviation Administration
2300 E. Devon Avenue
Des Plaines, IL 60018

Dear Gentlepersons:

On June 23, 2005 I sent FAA a detailed supplemental FOIA request, asking for documents that had been requested in earlier FOIA requests on November 19, 2003 by the Suburban O'Hare Commission and on February 26, 2004 by St. John's United Church of Christ, Helen Runge, Shirley Steele, the Rest Haven Cemetery Association, Robert Placek, Leroy Heinrich, and Roxanne Mitchell.

The documents we requested in our FOIA request are highly relevant to the claims made by FAA in its Draft and Final Environmental Impact Statements and in various related claims made by FAA— including but limited to claims made by FAA to the DOT Inspector General relating to both Phase One and the full build OMP-Master Plan.

Unfortunately, FAA has not yet made the requested documents available and that failure has severely hampered the ability of my clients to prepare responsive and intelligible comments on the Final EIS and related FAA decisions concerning Phase One and the full build OMP-Master Plan.

Comment	Response
Attachment 6 to Karaganis-Cohn	The Karaganis White and Magel letter dated August 5, 2005 was submitted as an attachment to the September 6, 2005 comments filed by Karaganis and Cohn on the FEIS. In regard to these broad FOIA requests, the FAA refers the commenter to Section 8.1 of the ROD.

I am asking FAA to immediately make the requested documents available. In an attempt to expedite delivery of these documents and our utilization of these documents in preparation of our response, I am highlighting various sub-categories of documents as I read through portions of the FEIS. I will send FAA individualized requests for these subcategories as I find them in the review of the FEIS.

I do not consider these new FOIA requests but believe these sub-categories are clearly encompassed within earlier FOIA requests. My individual identification of these sub-categories is simply to identify significant sub-categories of relevant documents and highlight the fact that these documents have not been produced to date. Moreover, FAA's continued failure to produce these documents in a timely manner shall serve as one of the bases of my clients' challenge to any FAA decision that is based in part on any claims made by FAA to which the missing documents are relevant.

The initial sub-categories of documents (in addition to the detailed categorization I provided in earlier FOIA correspondence) are:

1. All documents relating to the preparation of the 2002, 2003, and 2004 TAFs for O'Hare. The FAA makes the following statement (emphasis added) at page U.4-540 of the FEIS:

> "FAA disagrees with the comment that the decrease in activity from the 2003 TAF to the 2004 TAF is unjustified. FAA conducts a comprehensive review of recent airline activity and future outlook for each annual TAF. This review is coordinated with a review of national aviation trends used in developing the forecast of aviation activity for the nation as a whole. In preparing the 2004 TAF, FAA determined that the long-term outlook for ORD was different from that reported in the 2003 TAF, and this is reflected in the results of the 2004 TAF. The FAA finds the commenter data for a few recent historical years unpersuasive on this issue. The assumptions regarding the future growth at ORD are based on the judgments of the FAA's forecast experts.

FAA surely did not pull the 2004 TAF out of thin air. The assumptions and data on which the FAA based the 2004 TAF and, *inter alia*, the reasons for the dramatic reduction in forecast enplanements between the 2003 and 2004 TAF, must have been memorialized in appropriate documentation. As the United States Court of Appeals for the District of Columbia Circuit emphasized in *Village of Bensenville v. Federal Aviation Administration*, 376 F. 3d 1114 (D.C. Circuit 2004), the FAA cannot rely on bald, unsupported claims of "expertise". FAA's claims of expert judgments must be supported by data and logic in the record. The FAA claims at p. U.4-538 that the 2004 TAF "validates" the FAA's continued use of the 2002 TAF. However, absent disclosure and production of the underlying documentation relating to the differences between the 2003 and 2004 TAF, there is a legitimate suspicion

that the 2004 TAF was deliberately reduced to fit FAA's pre-determined support for approval of the OMP proposal.

2. All documents used and referenced in preparation of the Final EIS. FAA has previously stated that it has provided all reference documents used in preparation of the draft EIS. To the extent that additional documents were used in preparation of the Final EIS, or to the extent that documents relating to either the Draft EIS or Final EIS have not been previously produced, please produce those documents.
3. All documents relating to communications between the FAA and the DOT Inspector General relating to the OMP.
4. All documents relating to modeling performed by MITRE relating to the OMP. The Final EIS makes reference to modeling studies performed by MITRE relating to OMP but to my knowledge — despite our prior requests— no documents relating to such MITRE studies have been produced.

Again, these itemized sub-categories are already included within our long standing and still unsatisfied FOIA requests to the FAA. Please produce these documents immediately so that we can use these documents in preparing our responses to the FEIS. Again, by itemizing these sub-categories, we are not waiving our overall concern and objections that FAA is withholding thousands of relevant documents from our inspection — documents which are relevant to the FAA decisions at issue as to Phase One and the OMP. Please produce the documents identified in our June 23, 2005 supplemental FOIA request as well.

Sincerely yours,

Joseph Karaganis

cc: Mr. Robert Cohn

Comment	Response
Attachment 7 to Karaganis-Cohn	The Karaganis White and Magel letter dated August 26, 2005 was submitted as an attachment to the September 6, 2005 comments filed by Karaganis and Cohn on the FEIS. To the extent that the commenter presents new issues, these matters are addressed in the Record of Decision.

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August 26, 2005

VIA E-MAIL
Mr. Barry Cooper
Chicago Area Modernization Program Office
AGL-1CM
FAA Great Lakes Region
2300 E. Devon Avenue
Des Plaines, Illinois 60018

Dear Mr. Cooper:

I am in receipt of your letter of August 26, 2005 received this afternoon denying our request for an extension of time in which to respond to the FEIS and FAA's proposed resolution of the issues of the religious cemeteries. For the record, it is important to set forth our strong disagreement with the assertions and reasons given by FAA for denying this request. Let me address each of the assertions:

- **"8 million pages" of documents.** FAA persists in a mantra that it has made available massive numbers of pages of documents (7.5 million quoted in the EIS) now 8 million. Put bluntly, FAA has been putting forward a massive and largely irrelevant "haystack" (the so-called 7.5 million pages) while hiding several thousand important and relevant "needles" — *i.e.,* thousands of pages of relevant documents which we have been asking for the past several years and which are relevant to the FAA's claims made in the FEIS and elsewhere regarding the OMP.

  For example, as you know the "demand" (*i.e.,* the forecast) used by FAA is critical to the analysis of impacts and alternatives. FAA makes the claim repeatedly in the FEIS that the FAA is free to use the 2002 Terminal Area Forecast (TAF) because the 2004 TAF "validates" the 2002 TAF. We have been asking for all the documents relating to OMP and O'Hare for many months; and the technical and evidentiary support for the 2002, 2003 and 2004 TAFs are a central evidentiary element of any objective analysis of the FEIS. The demand side of the analysis clearly drives the entire EIS and other analytical process — both as to impacts and to alternatives. Yet despite our repeated requests for this critical TAF information and documents, FAA did not send us this information until today, August 26, 2005; and even this late arriving material appears to be incomplete. Yet FAA now wants us to analyze and comment on this late

arrived (August 26) and incomplete material by September 6, 2005, less than two weeks away.

Similarly, FAA continues to refuse to provide us with underlying documents and data as to delay calculations and capacity analyses — information which apparently contradicts claims made in the FEIS. For example, FAA finally today (after refusing to produce this information for many months) purported to provide us with the data supporting the claim in the 2005-2009 NPIAS that says that the annual delay for 2002 at O'Hare was seven minutes. This seven minute delay tends to rebut FAA's claim that delays at O'Hare today are over 15 minutes because traffic levels today and reported delays similar to levels reported in 2002. Yet despite our requests for the detailed evidence and backup for the NPIAS reported values, FAA sent us today only a single sheet reporting the same values set forth in the NPIAS without providing any of the backup documentation. It appears as if the FAA is deliberately trying to hide relevant information.

The breadth of FAA's withholding of documents — documents needed to effectively prepare our response to the FEIS— goes even further. We have been asking for the ASV (annual service volume) calculations for O'Hare and for OMP as well as the calculation of ASV for the so-called 35 OEP airports. We believe that this data and information will show that FAA has misled the public on the claims of capacity for OMP. Understating demand (erroneous TAF) and overstating supply (overstating acceptable delay) has enabled FAA to dramatically skew the impacts and alternatives analysis of the EIS.

These are but a few of the examples of major categories of documents which are highly relevant to the FEIS and FAA decisionmaking on OMP but which the FAA continues to hide from our clients. Rather than being in the public domain, FAA has kept these critical documents hidden somewhere in the bowels of the agency — afraid to expose them to public scrutiny.

- **FAA's claim that the material to be reviewed is only 319 pages.** Contrary to FAA's assertion that the FEIS review only requires us to analyze 319 pages, Appendix U alone covers approximately 1,000 pages involving complex and detailed cross-checking to follow FAA's labyrinthine cross-references. Similarly there have been modifications to the other volumes of the FEIS that require examination to address the limited chapter sections to which the FAA has solicited comments.
- **FAA's proposed action on Religious Rights.** FAA ignored our repeated requests for information regarding our clients' religious rights for several years prior to the issuance of the FEIS. FAA deliberately ignored the subject in the earlier DEIS. Yet now FAA asks us to examine the entire FEIS within the framework of the federal Religious Freedom Restoration Act — a position the FAA announced for the first time at the end of July. As you know, the federal Religious Freedom Restoration Act sets entirely different and far more rigorous standards than NEPA and some of the other federal statutes involved here. FAA is clearly attempting to sweep FAA's patent violation of the federal Religious Freedom Restoration Act under the rug by foreclosing the Religious Objectors from conducting a thorough review of the FEIS

and related evidence (see discussion of missing documents below) before being forced to comment on FAA's proposed destruction of St. Johannes Cemetery.

- **The FOIA Requests are not separate from the FAA's decision-making process.** Your letter contains the self-serving declaration that — despite the fact that the documents FAA is withholding or has failed to deliver under FOIA are highly relevant to the FAA's decisions on the OMP— the FOIA and FAA NEPA processes are "separate and apart". Based on this *ipse dixit* declaration you announce that FAA will proceed to decision without producing the requested documents and without giving our clients an opportunity to prepare our comments on the FEIS after first having had an opportunity to review these documents. We believe that FAA's action is hypocritical and a deliberate attempt to deprive our clients rights under the Constitution and federal statutes.

In conclusion, FAA's denial of our request is but one more example of FAA's apparent zeal to rubber stamp a deeply flawed O'Hare expansion proposal and of FAA's apparent willingness to join with Chicago in callous and knowing disregard of our rights (and FAA's responsibilities) under the Constitution and laws of the United States.

Sincerely yours,

Joseph Karaganis

cc: Congressman Henry Hyde
Mr. Robert Cohn

Comment	Response
Attachment 8 to Karaganis-Cohn	Filed as attachment to Karaganis-Cohn's September 6, 2005 comments on FEIS.

CHICAGO'S O'HARE MODERNIZATION PROGRAM

Federal Aviation Administration

Report Number: AV-2005-067

Date Issued: July 21, 2005

Memorandum

U.S. Department of Transportation
Office of the Secretary of Transportation
Office of Inspector General

Subject: ACTION: Report on Chicago's O'Hare Modernization Program
Federal Aviation Administration
AV-2005-067

Date: July 21, 2005

From: Kenneth M. Mead
Inspector General

Reply to Attn. of: JA-10

To: Federal Aviation Administrator

In response to a request from Representative Henry J. Hyde and former Senator Peter G. Fitzgerald, we examined the Federal Aviation Administration's (FAA) process for reviewing and approving the City of Chicago's (City) O'Hare Modernization Program (OMP). This report presents the results of our review of FAA's involvement in the City's OMP.

Specifically, we focused our review on FAA's (1) process for reviewing the financial viability of the OMP, and (2) actions to redesign the airspace to accommodate the OMP. We did not assess FAA's Environmental Impact Statement (EIS) of the OMP during this review, since there is a well-established Federal environmental review process governed by the National Environmental Policy Act and other applicable environmental laws. This review process involves the participation of several Federal agencies, state and local authorities, and the general public. Moreover, the Federal courts are available for those with legal standing (see the scope and methodology in Exhibit A).

We periodically met with FAA officials and provided the Agency a draft copy of this report for its review. Where appropriate, we have revised the report to reflect FAA's comments. FAA generally agreed with the report's recommendations.

INTRODUCTION

Delays and congestion have plagued O'Hare for more than 30 years, in spite of regulatory intervention. Controls on landing slots and schedules have temporarily brought some relief, but they do not accommodate demand and can stifle competition.

In 2001, the City developed the OMP—a proposal to build one new runway, relocate three existing runways, extend two others, and complete other infrastructure improvements designed to increase the efficiency and capacity of O'Hare. The OMP is estimated at $6.6 billion[1] in 2001 dollars. In addition to the OMP, the O'Hare 20-year Master Plan also includes the Capital Improvement Program (ongoing maintenance projects such as resurfacing a runway at an estimated cost of $4.1 billion) and the World Gateway Program (additional gates and terminals on the east side of O'Hare at an estimated cost of $2.6 billion). The total estimated cost of the O'Hare 20-year Master Plan is $13.3 billion. Exhibit B contains further information on O'Hare's 20-year Master Plan.

The City plans to implement the OMP in two phases over an 8-year period. Phase 1 and Phase 2 are scheduled to be completed by 2009 and 2013, respectively. The City is planning on receiving a sizable Federal investment for the OMP, with approximately $2 billion coming from FAA-approved Passenger Facility Charges (PFCs, $1.45 billion) and Airport Improvement Program grants (AIP, $594 million). Exhibit C provides further information on the OMP funding streams and approval process. The City's and FAA's models have projected that the OMP will provide significant benefits in reducing delays and increasing capacity at O'Hare. According to these models, delays will be reduced from an average of 19.2 minutes per flight in 2004 to an average of 5.0 minutes per flight in 2013, while expanding airfield capacity from an average of 2,712 flights per day in 2004 to an average of 3,169 flights per day (peak month average daily flights[2]) in 2013.

RESULTS IN BRIEF

There is no question that capacity constraints exist at O'Hare and that these constraints affect the efficiency of the entire National Airspace System. The OMP is designed to address O'Hare's capacity constraints. But the complexity and magnitude of the OMP cannot be overstated, as it is one of the largest and most costly reconfigurations of an airport in the United States. In terms of national

[1] The $6.6 billion cost estimate for the OMP includes the cost of all airfield projects (design and construction), land acquisition, noise mitigation, and other ancillary costs associated with the OMP.
[2] In modeling the OMP, FAA used the "peak month average daily flights." This number is the average daily flights during the peak month of the year (the month with the most flights).

infrastructure projects, the OMP may be second only to Boston's Central Artery/Ted Williams Tunnel project (the "Big Dig"), which is estimated to cost $14.6 billion when completed. We identified two areas where FAA will need to focus greater attention: (1) verifying that the OMP's costs, schedule, and sources of funding are realistic, reasonable, and credible and that any known or reasonably anticipated risks that could affect the Phase 1 and Phase 2 project milestones are fully disclosed and considered; and (2) redesigning airspace necessary to realize the benefits of OMP airfield improvements in reducing flight delays and increasing capacity.

We are making a series of recommendations to FAA regarding the performance of its due diligence when reviewing the OMP financial plan prior to approving any PFC or AIP grants and with respect to the airspace redesign changes that are key to realizing the benefits represented in the OMP. One of these recommendations pertains to the appointment of one senior FAA official with overall responsibility for airspace redesign to direct the planning, resources, budget, schedule, and implementation of airspace changes necessary to support the OMP.

- ***OMP Costs, Schedule, and Sources of Funding Must Be Verified as Realistic, Reasonable, and Credible.*** The City has submitted to FAA a Request for a Letter of Intent (LOI) to provide multi-year funding ($30 million each year for 10 years) of AIP discretionary grants for OMP Phase 1 projects. As part of the LOI, the City submitted a summary of the estimated capital costs for the entire OMP, including more specific costs for Phase 1 projects, a preliminary implementation schedule for all OMP airfield projects, and a financial plan identifying the sources of funds and expected cash flows needed to complete the Phase 1 projects.

  FAA's policy requires a review of the financial plan for Phase 1 before approving PFC or AIP funds. As part of its review, FAA should consider not only the stability of the financial plan for Phase 1, but also the reasonableness of the overall OMP financial plan, which includes Phase 2. This is critical because most of the benefits of the OMP are contingent upon completing both Phase 1 and Phase 2. The airlines' approval of Phase 1 is conditional on the City receiving the $300 million in Federal funds, and the airlines have yet to approve Phase 2. FAA must also ensure that the benefits and costs represented for both Phase 1 and Phase 2 are fully disclosed and considered.

  Since the announcement of the OMP in 2001, the City has advertised the OMP as a two-phased, multi-year program with an estimated price tag of $6.6 billion in 2001 dollars. Projections made in 2001 dollars are not likely to be the actual cost of the OMP. We have seen cost estimates prepared by the City ranging from $7.1 billion to $8 billion. FAA, in its review of the LOI, must ensure that the statement of costs is credible and includes escalations for any anticipated

schedule delays and rising labor or materials costs. For example, the cost of iron and steel has increased nearly 48 percent between 2001 and June 2005.

The City estimated that Phase 2 will cost $2.5 billion, but detailed project specifications and cost estimates will not be completed until after 2006, when the City completes the final design of Phase 2. FAA will need to evaluate the risk to cost estimates due to changes in project scope, final engineering changes, labor and material cost increases, and other factors and then will need to disclose their potential effect on the cost of the OMP. FAA must ensure the financial plan and the accompanying schedule are realistic and take into account any risks to cost due to potential schedule slippage (e.g., a delay in FAA's approval of the OMP or winter weather delaying construction). This is apart from ongoing lawsuits and the threat of other legal action to delay or prevent the OMP from being completed.

In its OMP financial plan, the City is making assumptions about the amount of money it will receive from two major funding sources that require congressional or other Federal approval, which the City has not yet received.

- First, the City is requesting an unprecedented amount of AIP discretionary funds for Phase 1—$300 million or $30 million each year for 10 years. It is not known at this time whether FAA or Congress will approve this level of AIP discretionary funding given that FAA's budget request of $3 billion in AIP funding for fiscal year (FY) 2006 is $472 million less than in FY 2005. Furthermore, there will be competing interests for AIP discretionary grants in the near future as other airports begin planning large modernization programs. For example, in February 2005, as part of its $3 billion expansion program, Washington-Dulles International Airport requested $208 million in discretionary AIP grant funds to build a fourth runway.[3] The Los Angeles International Airport is planning an approximately $11 billion modernization plan, for which we understand the Airport may request a significant AIP discretionary grant.

- Second, the City is assuming Congress will authorize an increase in the PFC maximum charge from $4.50 to $6.00 by 2011. If the increase is not authorized, the City will be overstating its PFC collections by nearly $241 million for the 4-year period from 2011 through 2014.

FAA needs to ensure the City has adequately disclosed how it plans to cover any funding shortfall from AIP discretionary grants or PFCs, including who will pay what amounts and when. Additional OMP costs or reductions in AIP

[3] The total cost of the fourth runway is estimated at $356 million. Of that, Dulles Airport is requesting $207.8 million in AIP discretionary funds (58 percent of the total project costs), along with $34.3 million in PFCs (9.6 percent of the total cost).

discretionary grants or PFCs will require the City to issue additional bonds to address the funding gap. For example, if the City's request for the entire $300 million in AIP discretionary grants for Phase 1 is not approved, the City plans to issue additional bonds to cover the shortfall. According to the City, an additional $300 million bond issuance would require estimated debt service payments of approximately $24 million annually. These payments would ultimately be passed on to the airlines through increases in aircraft landing and terminal use fees. The airlines would in turn attempt to pass on these costs to the consumer. FAA will need to consider the impact of any funding shortfall from AIP discretionary grants or PFCs and the corresponding effect of fee increases on the airlines' cost per enplaned passenger before making the appropriate disclosures.

The Majority-In-Interest airlines[4] have agreed to Phase 1, but their approval is contingent upon the City receiving $300 million in AIP discretionary grants for the Phase 1 airfield projects. The Majority-In-Interest airlines are still negotiating with the City for approval of Phase 2, including the funding sources. FAA must exercise due diligence when reviewing the City's request for an LOI to ensure that the sources of funding are sufficient to handle the costs of Phase 1 and Phase 2 projects and that the funds are not otherwise committed or encumbered for other programs in O'Hare's Master Plan. We are making this point because FAA has legal obligations to assure that the project costs not paid for with AIP grants or PFC revenue will in fact be covered by non-Federal funds (such as airport-issued bonds) before approving the LOI for Phase 1.

FAA needs to fully and thoroughly carry out its legal obligation for approving and authorizing PFC and AIP grants. Under the PFC statute, FAA is required to make several findings before approving a PFC, including one that the proposed PFC will result in no more revenue than is necessary for financing the specific project. In July 2004, the United States Court of Appeals for the District of Columbia Circuit reversed FAA's approval of the City of Chicago's $221 million PFC application for the preparation of the EIS at O'Hare, concluding that FAA had not fulfilled its legal obligation to analyze the cost.

The Court stated that, "FAA cannot simply declare its 'expertise' [in estimating costs]; it must exercise that expertise and demonstrate sufficiently that it has done so." Given that there could be future legal challenges to FAA's decisions on the O'Hare modernization project, it is important for FAA to

[4] Majority-In-Interest is defined in the O'Hare Airport Use Agreement. During a fiscal year, the Majority-In-Interest is either (a) any five or more airline parties that together paid 60 percent or more of the preceding fiscal year's airport fees and charges or (b) any majority of airline parties that together paid 50 percent or more of the preceding fiscal year's airport fees and charges.

exercise due diligence in reviewing the City's request for an LOI, including the OMP financial plan, and any PFC applications the City submits to fund the OMP's design and construction projects. The Court's decision underscores the need for FAA to take corrective action and exercise due diligence in reviewing the financial plan.

In our opinion, now is the time for FAA to raise its level of review for projects the size and scope of the OMP. The City has provided the necessary information to allow the FAA to carefully scrutinize all aspects of and assumptions made in the OMP financial plan. Now, it is the responsibility of the FAA, like any prudent investor, to analyze the validity and reasonableness of the City's plan.

- ***Airspace Changes Must Be Implemented To Achieve and Sustain the Benefits of the OMP, but FAA Has Had Problems Making the Transition From Planning to Implementation.*** The planned benefits (reduction in delays and increase in operations) of the OMP airfield changes and other infrastructure changes are contingent upon FAA completing substantial changes to the airspace. In other words, for the public investment to yield the benefits as advertised, airspace changes must be implemented with the OMP airfield changes or else FAA may have to re-implement administrative controls to manage congestion at O'Hare.

  By implementing *both* the OMP and the required airspace changes as opposed to doing nothing (not implementing the OMP and not making changes to airspace):

  – In 2009 after the completion of Phase 1, the average daily delay per flight is forecasted to decrease from 15.9 minutes to 10.3 minutes and then to 5.0 minutes after the completion of Phase 2 in 2013.

  – In 2009, the forecasted number of daily flight operations (arrivals and departures) increases from 2,750 to 2,987 and then to 3,169 in 2013.

  Airspace changes are needed not only within a 40-mile radius of O'Hare but in other parts of the Great Lakes region: over 300 miles east to Cleveland, Ohio, and 400 miles northwest to Minneapolis, Minnesota.

  Airspace changes required to support the OMP include designing new air traffic control sectors and routes, acquiring new radio frequencies, and purchasing and deploying radar and communication equipment. FAA needs to synchronize airspace changes with airfield improvements, sequence them in an order that maximizes the benefits from the airfield projects, and commit the necessary funding levels to support the airspace changes. The key now is

moving from planning to implementation, with implementation being the vulnerable point in FAA's past efforts to redesign airspace.

Our prior work[5] has demonstrated that FAA has substantial difficulty moving from the planning stages of airspace redesign to execution due to (1) unreliable cost and schedules for the vast majority of airspace projects because FAA does not clearly identify what is needed to shift from project design to project implementation, (2) delays of 3 years or more in projects due in part to changes in project scope, and (3) lack of coordination between the designers of the airspace and the implementers of the changes. The problem in the case of O'Hare is that if FAA's airspace changes are not implemented in synchrony with the OMP airfield changes, the benefits of investing in the OMP will be greatly overstated.

With respect to the airspace redesign necessary for the OMP, FAA has established the Chicago Area Modernization Program Office to coordinate Agency efforts. This is an important step, but airspace changes not under the Program Office's jurisdiction, *outside of Chicago airspace* (east to Cleveland and northwest to Minneapolis), also need to be made to sustain expected downstream capacity increases and reductions in delays. These changes are critical and need to be in place by 2013.

The current cap on flight arrivals at O'Hare is set to expire in October 2005. FAA has proposed extending the cap on flight arrivals until 2008. According to FAA, the proposed extension to the cap on flight arrivals at O'Hare will gradually be relaxed as Phase 1 projects are completed and will be lifted entirely in 2008. However, if required airspace changes are not fully implemented, then O'Hare will not receive the long-term benefits of reducing delays and increasing capacity (or the benefits represented in the OMP Draft EIS) from an average of 19.2 minutes per flight in 2004 to an average of 5.0 minutes per flight in 2013, while expanding airfield capacity from an average of 2,712 flights per day in 2004 to 3,169 flights per day (peak month average) in 2013. If this is not achieved, FAA may have to continue to implement administrative controls to manage congestion at O'Hare. Our work has identified specific actions that FAA should take to ensure the planned airspace changes for the OMP are implemented.

AGENCY COMMENTS

On April 29, 2005, we provided FAA with a draft of this report. FAA provided us with a written response, and on May 26, 2005, the Deputy Associate

[5] OIG Report Number AV-2005-059, "Airspace Redesign Efforts Are Critical To Enhance Capacity but Need Major Improvements," May 13, 2005. OIG reports can be found on our website: www.oig.dot.gov.

Administrator for Airports and other Agency officials met with us to discuss FAA's comments and our recommendations. After this meeting, FAA provided us with additional comments clarifying its actions taken or planned to address our recommendations.

FAA disagreed with some conclusions in the report. As stated in its comments, FAA does not agree with the implication that the OMP proposal (and FAA's role in regard to the proposal) is analogous to the "Big Dig." Our reference to the Big Dig is to illustrate that the OMP, like the Big Dig, is a large transportation project that requires an increased level of oversight of project costs and schedule. FAA also disagreed with the report's characterization of the City's AIP funding request of $300 million for the OMP as "unprecedented." Only Denver has received over $300 million in AIP discretionary funding, and this was to build the new Denver airport. FAA provided $340 million in discretionary AIP funding for the construction of multiple runways at a new airport in Denver. However, the $340 million was not a single LOI. The $340 million consisted of a $250 million LOI in discretionary funding and about $90 million in pre-LOI AIP discretionary funds. Thus, we are not aware of, nor did FAA provide support for, any other single airport sponsor's LOI request or planned LOI request for a single grant of $300 million in AIP discretionary funds for an existing airport.

In addition, in its comments, FAA disagrees with the implication that it is not exercising due diligence in analyzing the reasonableness and credibility of project costs and sources of funding for airport development projects. In our draft report, we identified the need for increased oversight of the OMP given the size and scope of the project and the potential for cost or schedule overruns. In its comments, FAA stated that in the past it has hired financial experts from the private sector to review requests for Federal funding for large and complex airport development projects in Seattle and St. Louis. Also, FAA stated it will hire an airport financing consultant to help analyze the benefits and costs, schedule, and proposed financing for both phases of the OMP. This analysis will include four tasks: (1) establishing the current financial situation at O'Hare, (2) analyzing financial impacts under the proposed OMP Phase 1, (3) analyzing financial impacts under the full OMP, and (4) reviewing the benefit-cost analysis. The analysis of financial impacts will include a sensitivity analysis examining the impact of delays in construction schedules, cost increases, and deviations from the City's requested LOI amount or payment schedule.

We would like to point out the importance of doing this review in terms of FAA's due diligence to ensure the OMP's costs, schedule, and sources of funding are realistic, reasonable, and credible. The City's estimate of $6.6 billion (2001 dollars) is not likely to be the final cost of the OMP due to increases in construction costs since 2001, potential schedule changes, and less precision in

Phase 2 costs compared to Phase 1 costs. Also, FAA has been admonished by a Federal court for its financial review in the past. In 2004, the United States Court of Appeals for the District of Columbia Circuit reversed FAA's approval of the City of Chicago's $221 million PFC application for O'Hare, concluding that FAA had not fulfilled its legal obligation to analyze the cost.

FAA generally agreed with our recommendations. As stated previously, FAA intends to hire a financial consultant to help in its review of the OMP's benefits and costs, schedule, and financing. Also, FAA stated that it will appoint a senior official to serve as a focal point within FAA's Air Traffic Organization to coordinate the execution and timing of planned airspace changes associated with the OMP implementation. To fully meet the intent of our recommendation, we believe FAA needs to appoint an official to oversee the airspace redesign with the proper responsibility and authority to decide what needs to be done and when it needs to be done and then direct FAA units to do it. We recognize that this may require someone that can cut across bureaucratic lines, has authority over the entire project, and can speak directly to the Administrator or Deputy Administrator of FAA.

In light of the importance of the actions FAA must take to ensure the success of the OMP, we intend to review FAA's and its consultant's actions from time to time. FAA's full response can be found in the Appendix.

BACKGROUND

Severe capacity constraints at O'Hare affect the efficiency of the entire National Airspace System. In the past 3 years, the percentage of delayed flight arrivals at O'Hare increased from 19 percent in 2002 to 27.9 percent in 2004, and the percentage of delayed flight departures increased from 18.4 percent in 2002 to 28.2 percent in 2004. Aviation delays and congestion have been a significant problem at O'Hare for more than 30 years. In 1985, FAA established allocation procedures for slots at O'Hare, including use-or-lose provisions and permission to buy and sell slots in a secondary market. In 2000, Congress relaxed the slot rules and phased them out entirely in 2002.

Since that time, recurring delays and congestion have caused FAA to intervene with an array of administrative actions to mitigate O'Hare congestion and prevent disruptions from cascading throughout the aviation system. FAA intervened three times in 2004 to get the airlines to reduce flight schedules. Administrative responses are not a desirable long-term solution to capacity constraints at O'Hare because prolonged regulatory intervention can restrict demand and inhibit competition.

There have been alternative proposals to solving capacity constraints at O'Hare and relieving congestion at both O'Hare and Chicago's Midway Airport, such as building a new airport or expanding smaller nearby airports. Plans to build a third airport have been on the drawing board since the 1980s. At one time, the Lake Calumet area on the southeast side of Chicago was considered as a location for a third airport. It was demonstrated in a study to be the most expensive and environmentally damaging of the sites evaluated. Subsequently, the Illinois Legislature failed to support development of an airport at the site.

Since 1991, the most likely site for a third airport has been near Peotone, Illinois, about 35 miles from downtown Chicago. FAA so far has provided $8 million in funding for the Master Plan and EIS of what would be called the South Suburban Airport. The need or location of a third airport is not within the scope of this review. However, the financial plan and airspace redesign for the OMP will have some impact on how much Federal funding is available for other airport projects in the Chicago area and whether FAA can make additional airspace changes to accommodate a third Chicago area airport.

The OMP will be implemented in two phases over an 8-year period. In Phase 1, scheduled to be completed by 2009 at a cost of $4.1 billion (62 percent of the OMP costs), the City plans to construct one new runway, relocate one runway, extend an existing runway, and mitigate noise (at a cost of $2.6 billion); it will also construct radar facilities, an automated people mover, and a west satellite concourse (at a cost of $1.5 billion). Over 90 percent of the design for the new runway has been completed, and over 50 percent of the design has been completed for the runway relocation and extension. In Phase 2, scheduled to be completed by 2013, the City plans to relocate two runways, extend one runway, and construct a new western terminal building at a cost of $2.5 billion (38 percent of the OMP costs). Planning-level cost estimates (which by definition are less precise than final design estimates) for Phase 2 have been completed, with the final design scheduled to begin in 2006 and be completed in 2011.

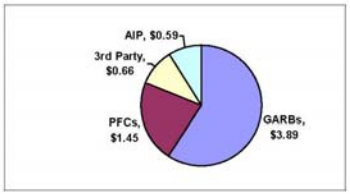
The Majority-In-Interest airlines—United Airlines, American Airlines, and 13 other airlines—are on the record as supporting the OMP and its phased implementation. They have agreed to Phase 1, but this approval is contingent upon the City receiving $300 million in AIP discretionary grants for the Phase 1 airfield projects, which FAA must approve and Congress must appropriate.

The City is currently negotiating with the Majority-In-Interest airlines for approval of the OMP Phase 2, and it is not known at this time when or under what conditions the City will receive that approval. Phase 2 approval from the Majority-In-Interest airlines is contingent on the support of either United or American, the dominant carriers at O'Hare. Together, United (46 percent) and

American (32 percent) paid approximately 78 percent of O'Hare's airport fees and charges in FY 2003.

As shown in Figure 1, the City plans to fund the OMP through four sources: AIP funds, Federally authorized PFCs, General Airport Revenue Bonds (GARBs), and third-party financing.

Figure 1. Total OMP Funding Streams
($ in Billions)



Before the City can break ground on any of the OMP's runway projects, FAA must, by law, complete a review of the environmental impacts of the OMP. For the environmental review, FAA will produce two documents, an EIS and a Record of Decision. The EIS discloses and evaluates both the positive and negative effects, such as those on noise and air quality, of a project with potentially significant effects on the environment. A Record of Decision is FAA's official decision to provide environmental approval for a project to go forward, taking into consideration its environmental effects and any alternatives. FAA released its draft EIS in January 2005, held public hearings on it in February 2005, and plans to release a final EIS in July 2005, which will be followed by the release of its Record of Decision in September 2005.

FINDINGS AND RECOMMENDATIONS

The OMP, with a 2001 estimated price tag of $6.6 billion, is one of the largest aviation infrastructure projects ever undertaken in the United States. It may be the most costly transportation project in the United States to date next to Boston's Central Artery/Ted Williams Tunnel project (the "Big Dig," which is estimated to cost $14.6 billion when completed but was first estimated at $2.6 billion). The City is projecting that approximately one-third of the OMP will be funded with FAA-approved PFCs and FAA-issued AIP grant funds. FAA will need to verify that the OMP's costs, schedule, and sources of funding are realistic, reasonable, and credible and that any known risks that could affect the cost and schedule of

the OMP are fully disclosed and considered. FAA must also implement the necessary airspace changes around O'Hare and outside the Chicago area to realize the capacity benefits (reduced delays and increased operations) of the airfield changes.

To Protect the Public's Investment in O'Hare, FAA Must Ensure That the OMP Financial Plan as Advertised Is Realistic, Reasonable, Credible, and Executable

Given the amount of taxpayer dollars at stake in the OMP, it is essential that FAA fulfill its statutory mandate to ensure, among other things, that the use of the PFC revenues is adequately justified. The Department has a statutory mandate to ensure that sufficient funding exists to complete a project before committing AIP discretionary funds to that project. Fulfilling these mandates will require FAA to proactively and aggressively analyze the reasonableness and validity of the OMP financial plan. We are making this point because FAA has the legal obligation to assure that the project costs not paid for with AIP grants or PFC revenue will in fact be covered by non-Federal funds (such as airport-issued bonds) before approving the LOI for Phase 1.

FAA needs to fully and thoroughly carry out its legal obligation for approving and authorizing PFC and AIP grants. Under the PFC statute, FAA is required to make several determinations before approving a PFC, including one that the proposed PFC will result in no more revenue than is necessary for financing the specific project.

In February 2003, FAA approved the City's application to use PFCs to fund a study on the environmental impacts of the OMP. At that time, FAA rendered a Final Agency Decision and approved a $4.50 PFC to be used only for the portion of the Runway Formulation Project application involving work leading to the completion of the EIS. In total, FAA approved more than $221 million in PFCs, half to be used for the environmental study and half for associated financing and interest costs. In July 2004, the United States Court of Appeals for the District of Columbia Circuit reversed FAA's approval of the City of Chicago's $221 million PFC application for the preparation of the EIS at O'Hare, concluding that FAA had not fulfilled its legal obligation to analyze the cost.

The Court stated that, "FAA cannot simply declare its 'expertise' [in estimating costs]; it must exercise that expertise and demonstrate sufficiently that it has done so." Given that there could be future legal challenges to FAA's decisions on the O'Hare modernization project, it is important for FAA to exercise due diligence in reviewing the City's request for an LOI, including the OMP financial plan, and any PFC applications the City submits to fund the OMP's design and construction

projects. The Court's decision underscores the need for FAA to take corrective action and exercise due diligence in reviewing the financial plan.

Our review has highlighted a number of areas FAA must pay particular attention to so it can carry out its legal responsibilities for reviewing the OMP financial plan. Some of these are straightforward and common to the analysis of financial plans on any large infrastructure project. Other items have implications specific to the OMP. FAA will need to identify the interrelationships between cost, schedule, and funding and to assess the potential cascading effects of changes in any single component. The FAA should consider not only the stability of the financial plan for Phase 1, but also the reasonableness of the overall OMP financial plan because the full benefits of the project are reached only upon completing both phases of the OMP.

Current OMP Costs Estimates Are a Baseline, Which Will Need To Be Adjusted Upward. The City's estimate of $6.6 billion for the entire OMP is in 2001 dollars. We have recently seen estimates for the OMP prepared by the City ranging from $7.1 billion to $8.0 billion when costs are stated in escalated dollars, (this excludes O'Hare's Capital Improvement Program estimated at $4.1 billion and the World Gateway Program estimated at $2.6 billion). Projections made in 2001 dollars are not likely to reflect the actual cost of the OMP, as the costs of labor and materials have increased since 2001, especially in the construction industry. For example, the cost of iron and steel has increased nearly 48 percent between 2001 and June 2005. These increases in cost are not reflected in the $6.6 billion estimate. This is a matter FAA should review, and the Agency should ensure the costs of the OMP are stated in escalated dollars and reflect any known or reasonably expected increases in construction costs.

Cost Estimates for Phase 2 Are Less Precise and More at Risk for Increases. In 2001, the City estimated that Phase 2 projects would cost $2.5 billion. The City does not plan to start final design for Phase 2 until 2006, with construction planned to begin in 2009. Planning-level cost estimates (which by definition are less precise than final design estimates) for Phase 2 have been completed, with the final design scheduled to begin in 2006 and be completed in 2011. Given that the estimate of $2.5 billion is in 2001 dollars and final design has not been completed, the final cost of Phase 2 will likely be higher. FAA will need to evaluate the risk to cost estimates due to changes in project scope, final engineering changes, labor and material cost increases, and other factors and then disclose their potential effect on the cost of the OMP.

OMP Phase 1 Schedule Delays Could Increase the Cost of the OMP. The City planned that FAA would approve the OMP by mid-2004 so that construction could begin on Phase 1 projects. The City had also planned for the first new runway under Phase 1 to be operational by the start of 2007, with all of Phase 1 completed

by the start of 2009. Although these plans have been delayed by more than a year (until at least September 2005, when FAA is expected to issue its Record of Decision), the City still expects to meet the original milestone schedule. We believe that the Phase 1 schedule, while aggressive, can still be met assuming that FAA issues the Record of Decision in September 2005 and that construction begins immediately thereafter. We based this on our analysis of recent runway projects at other airports and on the assumption that construction is not further delayed by lawsuits or injunctions.

Further delays in the OMP construction schedule could occur as a result of a court order or injunction from ongoing and possible future lawsuits filed by groups opposed to the OMP. For example, there are two cemeteries that the City plans to relocate to complete the OMP, and the owners are suing the City to prevent the removal of these cemeteries. Under court order, the City in July 2003 agreed not to acquire the cemeteries unless and until FAA issues its Record of Decision. The FAA anticipates additional lawsuits as the environmental review progresses. As such, FAA must ensure that the schedule is realistic and takes into account any known risks that could affect the Phase 1 and Phase 2 project milestones.

A Substantial Part of the OMP Funding Must Be Approved by Congress or FAA. The City is planning on receiving a sizable Federal investment for the OMP, with approximately $2 billion coming from FAA-approved PFCs ($1.45 billion), AIP entitlement funds ($66 million), and AIP discretionary grants ($528 million). The City is assuming that Congress will raise the PFC maximum charge from $4.50 per enplaned passenger to $6.00 by 2011. If the increase is not authorized, the City will be overstating its PFC collections by nearly $241 million for the 4-year period from 2011 through 2014.

The City is planning to receive an unprecedented $528 million in AIP discretionary grants to complete the OMP ($300 million for Phase 1 and $228 million for Phase 2). In addition, the City plans to request another $248 million in AIP discretionary grants to finance its Capital Improvement Program over the next 20 years. If all of the City's requests are granted, the AIP discretionary grants it receives for currently planned projects over the next 20 years would total $776 million.

According to FAA, $300 million is an unusually large request for AIP discretionary grants. As of September 2004, FAA had 30 LOIs with total payments of $917 million in discretionary grants spread over the next 11 years. By law, FAA can only use 50 percent of AIP discretionary funds for LOIs. This issue is particularly important given that FAA's budget request of $3 billion in AIP funding for FY 2006 is $472 million (15.7 percent) less than in FY 2005. Therefore, it is unlikely the City can receive $30 million each year for 10 years.

Furthermore, there will be competing interests for AIP discretionary grants in the near future as other airports begin planning large modernization programs. For example, as part of its $3 billion expansion program, Washington-Dulles International Airport requested $208 million in AIP discretionary grants for a new runway project in February 2005. In addition, the Los Angeles International Airport recently announced an $11 billion modernization plan, for which we understand the airport may request a significant AIP discretionary grant.

FAA Needs To Ensure the City Has Adequately Disclosed How It Plans To Cover Any Funding Shortfalls and That the Funds Are Not Otherwise Encumbered. If any shortfalls in funding or increases in project costs materialize, the City has indicated it plans to make up the funding/cost difference by issuing additional bonds. For example, if the City's request for the entire $300 million in AIP discretionary grants for Phase 1 is not approved, the City plans to issue additional bonds to cover the shortfall but only after approval by the Majority-In-Interest airlines. According to the City, an additional $300 million bond issuance would require debt service payments of approximately $24 million annually, payments that would ultimately be passed on to the airlines through increases in aircraft landing and terminal use fees. The airlines would in turn attempt to pass on these costs to the consumer.

FAA will need to consider the impact of any funding shortfall from AIP discretionary grants or PFCs and the corresponding effect of fee increases on the airlines' cost per enplaned passenger before making the appropriate disclosures. FAA must also ensure that the sources of funding are enough to handle the expected cash flow needed to pay for Phase 1 and Phase 2 projects and that the funds are not otherwise committed or encumbered currently or in the future for other programs in O'Hare's Master Plan.

Both Phase 1 and Phase 2 Must Be Completed To Get the Full Benefit of the OMP. The Majority-In-Interest airlines have agreed to the Phase 1 business plan. However, their final approval is contingent on the City receiving $300 million in AIP discretionary grants for the OMP. If the AIP funds are not granted, the City will have to renegotiate approval of Phase 1 with the airlines.

The Majority-In-Interest airlines are still in negotiations with the City for approval of Phase 2, including the funding sources. Majority-In-Interest rights allow dominant carriers to delay—or cancel—Phase 2 projects. Given the uncertain economic outlook of the airline industry, there is no guarantee that all of the projects planned for Phase 2 will be approved. If Phase 2 is not completed as planned, the full benefit of the OMP in reducing the average time of delay (down to an average of 5 minutes per flight by 2013) and increasing capacity (an average daily increase of 419 departures and arrivals combined) will not be realized.

The current cap on flight arrivals at O'Hare is set to expire in October 2005. FAA has proposed extending the cap on flight arrivals until 2008. According to FAA, the proposed extension to the cap on flight arrivals at O'Hare will gradually be relaxed as Phase 1 projects are completed and will be lifted entirely in 2008. However, if Phase 2 is not completed as planned, the lifting of the cap on flight arrivals may be short-lived because Phase 1 infrastructure improvements alone will not provide the necessary airfield capacity to handle the estimated 1.5 percent increase each year in flight operations forecasted by FAA. Accordingly, if Phase 2 is not completed, FAA may have to re-implement administrative controls that could again limit demand and inhibit competition at O'Hare.

Airspace Changes Must Be Implemented To Achieve and Sustain the Benefits of the OMP, but FAA Has Had Difficulty Making the Transition From Planning to Implementation

FAA and Mitre[6] analyses show that building new runways by themselves will have minimal impact on the congestion and delay problems at O'Hare. Airspace changes in and around the Chicago area are critical to relieving congestion at O'Hare and realizing the full benefits of the OMP, although the analysis has not been completed to finalize the costs and resource requirements in making these airspace changes.

Reductions in Delays and Increases in Capacity at O'Hare Depend on Both the OMP Airfield Changes and Airspace Redesign. FAA and the City used simulation modeling to assess operational delay and travel times associated with implementing all the necessary redesign plans. Figure 2 and Figure 3 show the difference between implementing the OMP and required airspace changes and doing nothing.

[6] The Mitre Corporation functions as FAA's Federally funded research and development center.

Figure 2. Average Minutes of Delay per Flight: With and Without OMP

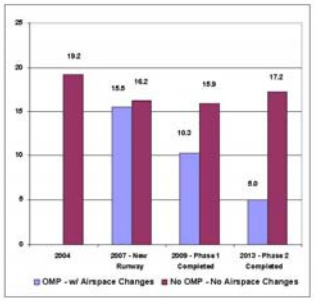
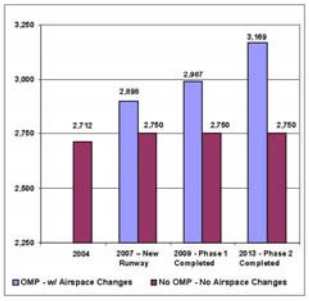


Figure 3. Average Daily Flight Operations: With and Without OMP



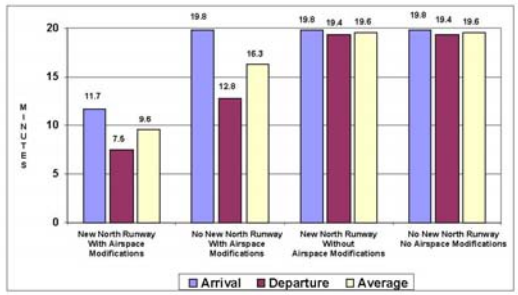
Source: Total Airspace and Airport Modeler for 2007 – 2013 data. FAA's Aviation System Performance Metrics and Air Traffic Activity Data System for 2004 data.
Note: 2004 figures include the effect of flight caps effective as of November 1, 2004.

- The average forecasted delay per flight decreases from 15.9 minutes to 10.3 minutes at the completion of Phase 1 in 2009 and to 5.0 minutes at the completion of Phase 2 in 2013.
- The forecasted daily flight operations (arrivals and departures) increase from 2,750 to 2,987 in 2009 and to 3,169 in 2013 (peak month average daily flights).

To further demonstrate the need for both airfield and airspace changes, Mitre conducted a study that showed how increasing capacity and reducing delays at O'Hare depend on both the OMP airfield changes and airspace redesign in and around the airport. Mitre concluded that without the proposed first new runway, arrival delays will continue to be excessive; and without the proposed airspace changes, the benefits of the proposed first new runway will be very limited.

As shown in Figure 4, in 2007 the greatest reduction in delays occurs with the Phase 1 new north runway operational and the associated airspace redesign completed.

Figure 4. Average Minutes of Delay: New North Runway Versus No Action Option With and Without Airspace Changes, 2007



Source: FAA's presentation of data from the Mitre Corporation

- A combination of airfield and airspace changes provides for more than a 50 percent reduction in the average minutes of delay per flight from 19.6 to 9.6 minutes.[7]
- Airspace changes alone provide little relief in the average minutes of delay per flight—16.3 minutes—when compared to "do nothing" at an average delay of 19.6 minutes per flight.
- Runway changes alone provide no relief in the average minutes of delay per flight—19.6 minutes—when compared to "do nothing," also at an average delay of 19.6 minutes per flight.

FAA has completed the majority of planning for the airspace redesign necessary to accommodate Phase 1. FAA has identified the airspace changes needed in the Chicago Air Route Traffic Control Center and the Chicago Terminal Radar Approach Control facility airspace from 10 to 200 miles out from O'Hare. FAA plans to add four new sectors,[8] four new routes, and the accompanying air traffic control procedures. FAA has also identified the equipment and resources needed to support these airspace changes—the key now is moving from planning to

[7] Mitre's delay minutes are slightly different from FAA's delay minutes in Figure 2 because Mitre used more limited operational conditions in its model. Mitre's calculations of delay are based on: (1) flights occurring in good weather conditions with only two to three heavily used runway operating configurations versus the five primary runway configurations used by FAA, and (2) daytime-only flight schedules versus full-day flight schedules used by FAA.

[8] FAA divides airspace into sections called "sectors." Air traffic controllers are assigned certain sectors of airspace in which to monitor planes.

implementation, with implementation being the vulnerable point in FAA's efforts to redesign airspace. To achieve maximum operational benefits, airspace changes are needed in other en route facilities in other cities, specifically Cleveland, Indianapolis, and Minneapolis. These efforts are being pursued under a separate initiative known as National Airspace Redesign. FAA has not yet finalized the cost and resource requirements for making these airspace changes.

FAA's Airspace Redesign Efforts Often Face Significant Delays When Making the Transition From Planning to Implementation. A strong, direct, and unambiguous link connects the benefits of the airfield investments to the redesign of airspace at O'Hare and surrounding areas. Our work on FAA's National Airspace Redesign efforts shows FAA has significant problems in making the transition from planning to implementation. It is important that these problems do not recur at O'Hare. If FAA's airspace changes are not implemented in synchrony with the OMP airfield changes, the benefits of investing in the OMP will be greatly overstated. Specifically, our work found that:

- Cost and schedules for the vast majority of airspace projects are not reliable because they do not clearly identify what is needed to shift a project from the design phase to implementation. FAA could not—nor could we—determine the cost in FY 2004 of implementing 42 active projects we reviewed.

- Projects have been delayed 3 years or more because of changes in scope, environmental issues, or problems in developing new procedures for more precise arrival and departure routes. For example, the San Francisco Bay to Los Angeles Basin Redesign project (focused on high-altitude routes in the region and navigating airspace managed jointly by FAA and the Department of Defense) slipped from a 2003 target date to 2008 due to problems developing new procedures, problems acquiring equipment, and changes to project scope.

- Project efforts are not effectively coordinated among FAA stakeholders or linked to FAA's budget process. Coordination is ineffective between the designers of the airspace and the implementers of the changes. For example, 19 of the 42 approved projects in FY 2004 had unresolved resource or equipment issues.

The establishment of the Chicago Area Modernization Program Office to coordinate Agency efforts is an important step. However, airspace changes also need to be made *outside of Chicago airspace* (over 300 miles east and over 400 miles northwest) to sustain expected downstream capacity increases and reductions in delays. These changes are critical and need to be in place by 2013.

Implementing the Airspace Changes To Accommodate the OMP Is a Complex Effort That Has Significant, Yet Not Fully Defined, Resource Implications for FAA. To get the benefits of Phase 1 and reduce the average minutes of delays per flight by almost 50 percent, FAA *must modify* the airspace in the Great Lakes region, including airspace around Chicago; South Bend, Indiana; and Milwaukee, Wisconsin. To do so, FAA needs to add four new sectors and four new departure routes, acquire additional radio frequencies, purchase and deploy radar and communication equipment, and train air traffic controllers assigned to the new sectors. Although FAA has identified the necessary costs and resources for the airspace changes needed to accommodate Phase 1, the key now is moving from planning to implementation.

Also, to implement the Phase 1 airspace redesign, the Chicago Air Route Traffic Control Center will divest some current airspace to Terminal Radar Approach Control facilities in South Bend and Milwaukee. According to FAA, additional internal adjustments of the Chicago Air Route Traffic Control Center's airspace are also required. Although such airspace exchanges are relatively straightforward from a conceptual perspective, FAA has had difficulty managing them in the past.

To ensure that proposed airspace changes move forward, the Chicago Area Modernization Program office needs to finalize and submit to FAA's Air Traffic Organization its proposal for approval and funding the airspace changes needed to support the Phase 1 projects. In turn, the Air Traffic Organization needs to approve the proposal and commit to the necessary funding levels for the Phase 1 airspace redesign changes. Once approved, airspace design activities need to be prioritized and key milestones and target completions dates established so that they coincide with the OMP runway project milestones and target completion dates.

To get all the associated benefits from the OMP as currently envisioned, FAA also needs to complete the OMP airspace redesign for the Chicago area by *adding sectors* to O'Hare airspace. As many as five additional sectors need to be established to the west and north of O'Hare by 2013. Maximizing the full benefits of the OMP will reduce arrival and departure delays to an average of 5 minutes per flight, while at the same time increasing daily arrivals and departures by an average of 15 percent (or an average daily total of 419 arrivals and departures combined).

The exact extent of the airspace redesign may ultimately change from the current plan of five new sectors due to advancements in technology or other factors affecting management of airspace. The work to date on this effort is still in the conceptual stage, and FAA needs to conduct technical analyses to determine the feasibility of implementing this airspace redesign in terms of the availability of frequencies, staff, and equipment.

We note that a number of airspace changes need to be made outside of Chicago airspace that are important to sustain the expected benefits of the OMP. When new departure routes are added to O'Hare, the airspace around Cleveland and Indianapolis will have to be modified to allow these Air Route Traffic Control Centers to accept increased departures from O'Hare. These efforts are outside the scope of the Chicago Area Modernization Program Office. According to Mitre, proposed sector and routing changes in the Cleveland and Indianapolis Centers will sustain the benefits of the Chicago area redesign projects. FAA plans to add two new sectors to the Cleveland Center and three new sectors to the Indianapolis Center.

FAA has not yet finalized the costs and resource requirements for making these airspace changes. FAA needs to identify the resources that will support the airspace changes (i.e., additional radio frequencies, communication equipment, and staffing levels).

RECOMMENDATIONS

Prior to approving the City's request for $640 million in PFCs and $300 million in AIP discretionary grants for Phase 1 or any PFC or AIP grants for Phase 2, the Federal Aviation Administrator needs to ensure that the public's investment in the project is protected by reviewing the OMP financial plan and determining that:

1. The benefits and costs represented in OMP Phase 1 and Phase 2 are fully disclosed and considered and that the costs are realistic, reasonable, credible, executable, and stated in escalated dollars reflecting any projected increase in the cost of labor and materials.

2. The schedule is realistic and takes into account any known risks that could affect Phase 1 and Phase 2 project costs and milestones.

3. Funding sources—AIP, PFC, third-party financing, and bonds—are fully disclosed, can handle the expected cash flow needed to pay for Phase 1 and Phase 2 projects, and are not otherwise committed or encumbered for the O'Hare Capital Improvement Program or World Gateway Program.

FAA also needs to develop an overall airspace redesign implementation plan, with incremental phasing of the proposed changes that is carefully synchronized with the proposed OMP airfield changes. Specifically, the Federal Aviation Administrator needs to:

4. Appoint one senior official with overall responsibility for airspace redesign who can direct the planning, resources, budget, schedule, and implementation of airspace changes necessary to support the OMP.

5. Develop a schedule that synchronizes implementation of airspace changes with airfield changes and send to Congress a budget linked to this schedule that identifies the timing and cost of all the necessary equipment and other resources needed to complete the OMP airspace changes, including the airspace changes outside the Chicago area that further enhance the OMP.

6. Prioritize its airspace changes with the OMP airfield improvements and sequence them in an order that maximizes the benefits from the airfield projects.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We sent a draft copy of this report to FAA on April 29, 2005. On May 20, 2005, FAA provided us with its formal written response. On May 26, 2005, we met with the Deputy Associate Administrator for Airports and other Agency officials to discuss FAA's comments and response to our recommendations. After this meeting, FAA provided us with additional comments clarifying its actions taken or planned to address our recommendations.

While FAA disagreed with some conclusions in the report, the Agency agreed with our recommendations and if FAA conducts its planned actions in the manner it has stated in its written comments, its actions will be responsive to our recommendations. In light of the importance of the actions FAA must take to ensure the success of the OMP, we intend to review FAA's and its consultant's actions from time to time. FAA's full response can be found in the Appendix. FAA's response to the draft report recommendations is summarized below.

Recommendations 1, 2, and 3. In order to accomplish the recommended analysis, FAA will hire an airport financing consultant to help analyze the benefits and costs, schedule, and proposed financing for both phases of the OMP. This analysis will include four tasks: (1) establishing the current financial situation at O'Hare, (2) analyzing financial impacts under the proposed OMP Phase 1, (3) analyzing financial impacts under the full OMP, and (4) reviewing the benefit-cost analysis. The analysis of financial impacts will include a sensitivity analysis examining the impact of delays in construction schedules, cost increases, and deviations from the City's requested LOI amount or payment schedule. Should the OMP ultimately be approved by the FAA in its Record of Decision, FAA expects to reach a decision on the LOI for OMP Phase 1 shortly after completion of the Record of Decision planned for September 2005. FAA stated that it plans to document its findings about the recommendations at that time.

We would like to point out the importance of doing this review in terms of FAA's due diligence to ensure the OMP's costs, schedule, and sources of funding are realistic, reasonable, and credible. The City's estimate of $6.6 billion (2001 dollars) is not likely to be the final cost of the OMP due to increases in construction costs since 2001, potential schedule changes, and less precision in Phase 2 costs compared to Phase 1 costs. Also, FAA has been admonished by a Federal court for its financial review in the past. In 2004, the United States Court of Appeals for the District of Columbia Circuit reversed FAA's approval of the City of Chicago's $221 million PFC application for O'Hare, concluding that FAA had not fulfilled its legal obligation to analyze the cost.

Recommendations 4, 5, and 6. FAA stated that development of an airspace redesign implementation plan to address the recommendation is underway. Also, FAA stated it will designate a focal point within the FAA Air Traffic Organization to coordinate the execution and timing of planned airspace changes associated with OMP implementation. To fully meet the intent of our recommendation, we believe FAA needs to appoint an official to oversee the airspace redesign with the proper responsibility and authority to decide what needs to be done and when it needs to be done and then direct FAA units to do it. We recognize that this may require someone who can cut across bureaucratic lines, has authority over the entire project, and can speak directly to the Administrator or Deputy Administrator of FAA.

FAA provided additional responses to our recommendations in a document that was attached to its May 20, 2005 written comments containing its suggested text changes to the draft report. Due to the length of the document, it is not included in this report. We did incorporate FAA's text changes as deemed necessary. In the document, FAA stated that it is currently developing a detailed schedule to ensure that airspace redesign efforts are timed, budgeted, and funded in synchrony with the City's OMP construction schedule. Also, FAA stated that costs associated with airspace changes beyond Chicago are being developed in concert with the OMP requirements. In addition, FAA stated that the necessary airspace changes have been prioritized to provide the most benefit to the phased OMP airfield construction.

While these actions are responsive to our recommendations, we are requesting that FAA provide us with: (1) an estimated target date for developing an airspace redesign implementation plan, (2) an estimated target for when an official will be appointed to oversee airspace redesign implementation for the OMP and what level of authority and responsibility the official will be given in the organization, (3) an estimated target date for when the airspace changes schedule and associated budget will be finalized, and (4) support that the airspace changes have been prioritized to provide the most benefit to the phased OMP airfield construction.

In addition to its response on our report recommendations, FAA also made general comments about its view of our report conclusions. FAA stated it disagreed with the (1) comparative reference of the OMP proposal to the Big Dig; (2) characterization of the City's AIP funding request for the OMP as "unprecedented"; and (3) assertion that FAA does not have an adequate process for assessment of cost, schedule, and sources of funding for airport development projects.

- Comparative Reference of the OMP Proposal to the Big Dig. As FAA stated in its comments, "FAA does not agree with the implication that the OMP proposal (and FAA's role in regard to the proposal) is analogous to the 'Big Dig' " and further requested that the reference to the Big Dig be deleted from the report. Our reference to the Big Dig is to illustrate that the OMP, like the Big Dig, is a large transportation infrastructure project that will have a substantial public investment that FAA must protect through an increased level of oversight of project costs and schedule. We also point out that the OMP is one of the first projects of its kind for an existing airport in terms of cost, magnitude, and complexity and that the $6.6 billion price tag that is being advertised today is not likely to be the actual cost of the OMP. Therefore, FAA's role in regards to the OMP should be to provide a higher level of scrutiny over the project's costs, schedule, and sources of funding.

- Characterization of the City's AIP Funding Request for the OMP Is "unprecedented." In our report, we stated that the City is requesting an unprecedented amount of AIP discretionary funds for Phase 1—$300 million or $30 million each year for 10 years. The City is requesting this $300 million from FAA through a single LOI. In its comments, FAA indicated that while $300 million in discretionary funds is large, it is not out of line with AIP funding commitments made to other large airport development projects (e.g., Detroit, Denver, and St. Louis). Only Denver has received over $300 million in AIP discretionary funding, and this was to build the new Denver airport. FAA provided $340 million in discretionary AIP funding for the construction of multiple runways at a new airport in Denver. However, the $340 million was not a single LOI. The $340 million consisted of a $250 million LOI in discretionary funding and about $90 million in pre-LOI AIP discretionary funds. Thus, we are not aware of, nor did FAA provide support for (see Attachment 2 to FAA's June 15, 2005 written comments in the Appendix in this report), any other single airport sponsor's LOI request or planned LOI request for a single grant of $300 million in AIP discretionary funds for an existing airport. We are also not aware of any single airport sponsor's multiple LOI requests for more than $528 million in AIP discretionary funds, which represents the City's total planned LOI requests for AIP discretionary funds for

Phase 1 and Phase 2. Therefore, we continue to believe the City's LOI request is unprecedented.

- Assertion That FAA Does Not Have an Adequate Process for Assessment of Cost, Schedule, and Sources of Funding for Airport Development Projects. In its comments, FAA disagrees with the implication that it is not exercising due diligence in analysis of the reasonableness and credibility of project costs and sources of funding. In our draft report, we identified the need for increased oversight of the OMP given the size and scope of the project and the potential for cost or schedule overruns. In its comments to our draft report, FAA provided us with additional information on this issue, including its use of private sector financial consultants to review large and complex airport development projects in the past and its plan to use a financial consultant to review the benefits and costs of the OMP. FAA's plan to conduct a financial review of the OMP with a financial consultant appears to be adequate if the reviews are conducted as stated in its written comments.

ACTIONS REQUIRED

In accordance with Department of Transportation Order 8000.1C, we would appreciate receiving target dates for planned actions to be taken for Recommendations 4 and 5 and evidence of actions taken for Recommendation 6 within 30 calendar days. You may provide alternative courses of action that you believe would resolve the issues presented in this report.

We appreciate the courtesies and cooperation of FAA representatives during this review. If you have any questions concerning this report, please call me at (202) 366-1959 or David A. Dobbs, Assistant Inspector General for Aviation and Special Program Audits, at (202) 366-0500.

#

cc: The Secretary
Deputy Secretary
Chief of Staff
FAA Deputy Administrator
FAA Chief of Staff
Anthony Williams, ABU-100
Martin Gertel, M-1

EXHIBIT A. SCOPE AND METHODOLOGY

The audit was conducted from March 2004 to April 2005. We conducted our review in accordance with Generally Accepted Government Auditing Standards prescribed by the Comptroller General of the United States.

We initiated our review in response to the request from Representative Henry J. Hyde and former Senator Peter G. Fitzgerald to examine FAA's process for reviewing and approving the City's OMP. In their request, Representative Hyde and Senator Fitzgerald expressed concerns about (a) whether FAA's process for reviewing the OMP was fair, open, and transparent to all interested parties; (b) the financial viability of the OMP; (c) technical issues involving the airspace around O'Hare; and (d) whether specific guidelines were being met for system and master planning at O'Hare.

On June 16, 2004, we met with Senator Fitzgerald and his staff and agreed to focus our review on the status of FAA's work on the OMP EIS; FAA's process for verifying the reasonableness and credibility of the OMP costs, schedule and sources of funding; and FAA's actions taken and needed for completing substantial changes to the airspace to accommodate the OMP.

We did not assess the EIS process during this review, since there is a well-established Federal environmental review process that involves the collaboration and coordination of several Federal agencies, state and local authorities, and public-interest groups representing communities surrounding O'Hare.

To obtain information on all aspects of FAA's involvement with the system and master planning at O'Hare, we held extensive discussions with officials at FAA's Chicago Area Modernization Program Office, the office responsible for overseeing FAA's role in the O'Hare Modernization Program. Over the course of our review, we met on several occasions with FAA's staff responsible for (1) conducting the environmental review of the OMP, (2) reviewing O'Hare's Master Plan and Airport Layout Plan, (3) overseeing the work on the Total Airport and Airspace Modeler (TAAM) computer model, and (4) budgeting and managing airspace redesign for O'Hare. We also reviewed the City's Airport Layout Plan, Master Plan, and airspace redesign budget and plans and viewed computer simulation modeling of the TAAM for the OMP. We also met with the FAA Great Lakes Regional Administrator and officials from the region's Airports Division and Flight Procedures Office. We toured the airport to view where proposed OMP development would take place. We also visited the surrounding neighborhoods to view the land the City plans to acquire to support the OMP.

In reviewing the financial viability of the OMP, we held extensive discussions with City officials, including the Executive Director and key staff of the O'Hare Modernization Program and the City's OMP consultant. We reviewed O'Hare's Master Plan, financial statements for the years ended December 31, 2002 and 2003, the OMP Financial Plan as submitted in the City's Request for a LOI for AIP discretionary funds, supplemental documentation provided by the City in support of the LOI, and GARB prospectuses. We also met with the staff from FAA's Airports Financial Assistance Division and the Financial Analysis and Passenger Facility Charge Branch. We reviewed relevant laws and regulations related to PFC and AIP funding for airport development.

To understand the technical issues involving airspace changes in and around O'Hare, we met with officials in the Air Traffic Organization, including the Vice President of Transition, the Director of System Operations and Safety, the Director of Spectrum Management, and key staff. We also met with FAA officials in the Chicago Air Traffic Route Control Center, the Chicago Terminal Radar Approach Control facility, and the O'Hare Control Tower. We reviewed FAA's airspace redesign plans, including the *FAA Flight Plan*, the *Operational Evolution Plan*, and the *Great Lakes Region National Airspace Redesign Integrated Design Plan*. We also reviewed the results of the TAAM computer model for the OMP and additional documentation provided by Mitre regarding airspace changes necessary to support the OMP. We did not assess the validity of the information in the City's, FAA's, and Mitre's computer modeling for the airspace redesign, including the TAAM.

We also met with the mayors of surrounding communities, groups opposed to the OMP, law firms representing persons opposed to the OMP, and representatives of businesses in favor of the OMP.

Exhibit A. Scope and Methodology

EXHIBIT B. PROGRAM COMPONENTS OF O'HARE'S MASTER PLAN

O'Hare's Master Plan outlines projects and funding sources over the next 20 years that will allow the airport to meet future demand. The Plan represents all that *could* be built at O'Hare and not what *must* be built. The Plan gives the airport and the airlines flexibility to determine which projects move forward and when, based on market demand and the approval of the airlines servicing O'Hare.

The Airport Capital Improvement Programs funds are essentially repair and replacement programs, usually consisting of short-term (5-year) maintenance improvements and long-term maintenance improvements. Resurfacing an existing runway is an example of a maintenance improvement under the Capital Improvement Program. O'Hare's Capital Improvement Program, estimated to cost more than $4 billon projected over 20 years, will be implemented with or without the World Gateway Program and the O'Hare Modernization Program or any other future airport development project. O'Hare's annual operation and maintenance expenditures, such as snow removal and regularly scheduled escalator and elevator maintenance, are not part of O'Hare's Capital Improvement Program.

The World Gateway Program, estimated to cost more than $2.6 billion in 1999 dollars, would allow the airport to build additional gate capacity through construction of two new terminals—Terminal 6 and Terminal 4. To accommodate traffic at the new terminals, Concourse K will be extended, new taxiways will be constructed, and existing taxiways will be reconfigured. Terminal 6 will have space for 18 aircraft, and Terminal 4 for 13. In December 2000, the City began work on the development of the Program, but work was suspended in September 2002 because of changes in the industry and economy. Market demand will guide the World Gateway Program's future development.

Exhibit B. Program Components of O'Hare's Master Plan

EXHIBIT C. OMP FUNDING STREAMS AND APPROVAL PROCESS

The City plans to fund the OMP through five sources as are shown here:

General Airport Revenue Bonds (59 percent)	Passenger Facility Charges (22 percent)	Third-Party Financing (10 percent)	AIP Discretionary Funds (8 percent)	AIP Entitlement Funds (1 percent)
$3.894 Billion	$1.452 Billion	$660 Million	$528 Million	$66 Million

Financing includes GARBs, PFCs, third-party financing, and AIP entitlement and discretionary funds.

- GARBs are bonds backed by the revenues generated by the airport, such as airline rates and charges. The City must get approval from O'Hare's Majority-In-Interest airlines to issue GARBs.

- PFCs are imposed on air travelers to help finance eligible airport-related projects, such as new runways. An airport sponsor can collect a PFC of up to $4.50 per passenger flight segment with an $18 limit on a round-trip ticket.

  The City must consult with the airlines servicing O'Hare when requesting a PFC and must get approval and authorization from FAA to collect and use PFCs. Only Congress can authorize an increase in PFCs above the current $4.50 per passenger flight segment.

- Under third-party financing, the debt service on bonds issued to pay for the western terminal facility proposed in the OMP would be paid by revenues generated by the terminal. The City must get approval from O'Hare's Majority-In-Interest airlines to seek third-party financing for the western terminal facility if it affects the airlines' rates and charges.

- AIP entitlement funds are allocated to primary airports, cargo service airports, and states based on statutory provisions and are calculated using specific formulas. AIP discretionary funds are the funds that remain after entitlements are allocated. FAA approves and authorizes the use of AIP discretionary funds.

U.S. Department of Transportation
Federal Aviation Administration

Memorandum

Subject: INFORMATION: FAA's Response to the Office of Inspector General's Draft Report: Chicago's O'Hare Modernization

Date: MAY 20 2005

From: Assistant Administrator for Financial Services and Chief Financial Officer

Reply to Attn. of

To: Assistant Inspector General for Aviation and Special Programs Audits

This memorandum is provided in response to the subject report. The FAA has reviewed the draft OIG document. The paragraphs below contain an overview of some substantive issues addressed in our comments, as well as a synopsis of our response specifically regarding the recommendations contained in the draft report. Additionally, we have attached an edited copy of the draft report that conveys, in detail, all FAA comments and suggested changes to the text of the report.

In general, we concur with the recommendations outlined in the draft report (see below). However, we believe that there are some substantive issues that must be highlighted and resolved in order to ensure the information contained in the report is accurate and to clarify the scope of the report's recommendations. The following paragraphs summarize some of the key issues that the FAA believes warrant further discussion.

Comparative reference of the O'Hare Modernization Program (OMP) proposal to Boston's Central Artery/Ted Williams Tunnel project (also known as the "Big Dig" project): The OIG draws a comparison in its draft report between the OMP proposal and the "Big Dig." The FAA does not agree with the implication that the OMP proposal (and FAA's role in regard to the proposal) is analogous to the "Big Dig." First, the FAA's share of Phase 1 of the overall OMP would be less than percent of the projected Phase 1 project cost, with the vast majority of the project cost and risk to be borne by the local airport sponsor and private investors (via general airport revenue bonds). The Federal share of the "Big Dig" project was significantly higher. Secondly, the OMP proposes a phased project implementation, with each phase producing independent benefits. The "Big Dig" could not be separated into discrete phases with associated independent benefits. Lastly, as complex as the OMP proposal may be, it still represents essentially a surface paving and reconfiguration project. As such, it is far simpler and less uncertain than the "Big Dig," which involved tunneling underwater and constructing bridge structures in water. The FAA suggests that the comparative reference of the OMP proposal to the "Big Dig" project be taken out of the draft OIG report.

Characterization of the City of Chicago's Airport Improvement Program (AIP) funding request for the OMP as "unprecedented": The FAA considers this representation to be inaccurate for the following reasons. First, while the AIP Letter of Intent (LOI) request from the airport sponsor for $300 million in discretionary funds is large, it is not out of line with AIP funding commitments made toward other large airport development projects (Detroit, Denver, and St. Louis being examples). Secondly, when considered on a "per runway" basis, the OMP Phase 1 proposal, and the $300 million LOI request, is on a par with the FAA's normal planning target of $100 million discretionary dollars per runway for LOIs at large hub airports. Specifically, on a per runway basis, the OMP proposal and associated LOI request ranks below such locations as Seattle, St. Louis, and Atlanta. Third, on a percentage basis, the requested FAA participation in funding the OMP proposal (approximately 10 percent of the project cost) is among the lowest of any LOI request for runways at large hub airports.

Assertion that FAA does not have an adequate process for assessment of cost, schedule, and sources of funding for airport development projects: The FAA disagrees with the implication in the OIG report that the Agency is not exercising due diligence in analysis of the reasonableness and credibility of project costs, funding sources, etc. The LOI process includes a requirement for airport sponsors to submit a project financing template and analysis of alternate payment streams. These submissions are reviewed by FAA staff and determinations are made by the Agency concerning reasonableness of project costs and financial feasibility. Additionally, for larger, more complex projects and LOI requests, the FAA obtains assistance in its analysis from outside (private sector) airport finance experts. The OIG report suggests that it is time for the FAA to "raise the standard" regarding its review of LOI requests for large airport development proposals. In fact, the FAA believes it has done just that on relatively recent large projects such as Seattle and St. Louis. The FAA agrees that the OMP deserves additional scrutiny and is applying that higher level of diligence to the OMP proposal and its associated LOI request. In summary, the FAA believes that the level of scrutiny applied to analysis of project cost and funding plans by FAA staff (and, when warranted, outside experts supporting FAA's work) is adequate to assure appropriate LOI program management, proper utilization of AIP discretionary dollars, and compliance with all statutory requirements applicable to the FAA's management of allocated AIP funds.

Differentiation between FAA's statutory responsibilities regarding assessment of costs and benefits for OMP Phase 1 vs. OMP Phase 2: The AIP funding statute governing LOIs requires the FAA to assess the benefits and costs of the project proposed for LOI funding and to evaluate the system impacts of the project proposed for LOI funding (49 USC 47110(e)(2)(C); 49 USC 47115(d)(1).(2)). In addition, the statutory requirement for a determination that the sponsor has sufficient funds to finance the non-Federal share of a project is limited to the specific project for which funding is sought (49 USC 47106(a)(3)). Since the City of Chicago is seeking AIP funding at this time for only Phase 1 in its pending LOI application submitted to FAA, the law requires that FAA make the benefit-cost evaluation and system capacity determinations for Phase 1 on a stand-alone basis. In addition, the costs and benefits of OMP Phase 2 are, at this time, less defined than the costs and benefits associated with Phase 1. For these reasons, the FAA does not intend to evaluate the benefits or costs of Phase 2 to the same

level of detail as will be done for Phase 1. The analysis of Phase 2 benefits, costs, and financial feasibility in the level of detail required by the AIP funding statute, to support a commitment of AIP funds, will be made by FAA when the City of Chicago makes application for LOI funding for Phase 2.

As stated above, a complete and detailed presentation of the FAA's comments and suggested changes regarding the draft OIG report is contained in the attached copy of the draft report.

Concerning the specific recommendations contained in the draft OIG report, the FAA offers the following:

Recommendation concerning the need for FAA to ensure that the public's investment in the project is protected by reviewing the OMP financial plan and determining that:

1. ***The benefits and costs for OMP Phase 1 and Phase 2 are fully disclosed, considered, and determined to be reasonable.***
2. ***The schedule is realistic and considers known risks.***
3. ***Funding sources are fully disclosed and can be expected to pay for OMP Phase 1 and Phase 2.***

FAA Response: The FAA agrees with this recommendation for OMP Phase 1 and, to the extent that benefits, cost, schedule, and financing can be analyzed at this point in time for Phase 2, the FAA will assess Phase 2 within the context of a sensitivity analysis covering a range of reasonable assumptions.

Recommendation that FAA needs to develop an overall airspace redesign implementation plan that is synchronized with the proposed OMP airfield changes, specifically including:

4. ***Appointment of one senior official with overall responsibility for management of airspace redesign.***
5. ***Development of an implementation schedule that synchronizes airspace changes with anticipated airfield changes.***
6. ***Prioritization of airspace changes to maximize operational benefits as the OMP is implemented.***

FAA Response: The FAA agrees with this recommendation. Development of an implementation plan to address the recommendation is well underway, and designation of a focal point within FAA's Air Traffic Organization, to coordinate the execution and timing of planned airspace changes associated with OMP implementation, will be undertaken.

The FAA appreciates the opportunity to comment on the OIG's draft report before a final report is developed. FAA representatives are available to discuss the comments and

suggested changes to the draft report that are contained in this memorandum and its attachment. Should you have comments or need additional information, please contact Mr. Barry Cooper, Manager, Chicago Area Modernization Program Office, at 847-294-7812.

Ramesh K. Punwani

Attachment

U.S. Department of Transportation
Federal Aviation Administration

Memorandum

Subject: **INFORMATION:** Additional Information form FAA in Regard to the OIG's Draft Report: Chicago's O' Hare Modernization Program

Date: JUN 15 2005

From: Assistant Administrator for Financial Services and Chief Financial Officer

Reply to Attn. of:

To: Assistant Inspector General for Aviation and Special Programs Audits

On May 20, the FAA submitted to your office its comments on the subject draft report. Following your office's review of those comments, further discussions between FAA and the OIG took place during the week of May 23. On June 2, as a result of those further discussions, FAA forwarded to you, via e-mail, additional information including some suggested revised wording for various paragraphs contained in the draft report. A representative of the OIG subsequently contacted FAA on June 8, requesting that the information submitted to you by FAA via e-mail on June 2, be formally transmitted to you in memorandum form. The purpose of this memorandum is to formally retransmit FAA's June 2 comments regarding the draft OIG report.

Accordingly, please find attached FAA's additional input on the draft OIG report. Attachment 1 contains suggested verbiage for inclusion in the final report. Attachments 2 and 3 contain spreadsheets that provide information concerning Federal funding commitments to other recent new runway projects.

Should you have questions concerning the attached information, please contact Mr. Anthony Williams, Budget Policy Division, at 202-267-9000.

Ramesh K. Punwani

Attachments

June 10, 2005

ATTACHMENT 1

FAA RESPONSES TO SPECIFIC COMPONENTS OF DRAFT OIG REPORT, "CHICAGO'S O'HARE MODERNIZATION PROGRAM" PROJECT NO. 04B3006B000

Page 5 of draft OIG report, second paragraph (middle of page), regarding the Federal court remand of FAA's PFC decision. FAA offers the following alternative verbiage:

FAA needs to fulfill its legal obligation for approving and authorizing PFC and AIP grants. The PFC statute requires the FAA to make several findings before approving a PFC, including a finding that the proposed PFC will result in revenue that is not more than is necessary for financing the specific project. The AIP statute has similar requirements, including one that project costs be reasonable in amount in order for them to be allowable. In a 2004 ruling, the United States Court of Appeals for the District of Columbia Circuit[9] reviewed a prior PFC decision to fund the O'Hare OMP EIS, and concluded that the administrative record did not demonstrate that the FAA had fulfilled its legal obligation to analyze the costs proposed to be financed with PFCs. Considering the controversy surrounding this project and the likelihood of further litigation, it is essential for the FAA to exercise due diligence in reviewing the City's LOI, including the OMP financial plan, and any PFC applications the City submits to fund the OMP's design and construction projects, and to assure that the City provides sufficient documentation to support any statutory required findings by FAA.

Pages 18 and 19 of draft OIG report, in response to Recommendations 1, 2, and 3, FAA offers the following verbiage:

The FAA agrees with these recommendations for Phase 1 and to a limited extent for Phase 2. Since the City is seeking AIP funding for only Phase 1 in the pending LOI application, the law requires that we make the BCA evaluations and system capacity determinations for Phase 1 on a stand-alone basis. The AIP funding statute governing LOIs requires the FAA to assess the benefits and costs of the project proposed for LOI funding and to evaluate the system impacts of the project proposed for LOI funding (49 USC 47110(e)(2)(C); 47115(d)(1),(2)). In addition the statutory requirement for a determination that the sponsor has sufficient funds to finance the non-Federal share of a project is limited to the specific project for which funding is sought (49 USC 47106(a)(3)). , As discussed in our comments on other portions of the draft, timing, costs and benefits of phase 2 are more uncertain at this time. For these reasons, FAA does not plan on evaluating the benefits or costs of Phase 2 in the same level of detail as we use for Phase 1. The analysis of Phase 2 benefits, costs and financial feasibility in the level

[9] *Village of Bensensville v. FAA*, 376 F.3d 1114 (D.C. Cir. 2004).

of detail required by the AIP funding statute to support a commitment of AIP funds will be made when and if the City applies for LOI funding for Phase 2.
In order to accomplish the recommended analysis, the FAA will hire an airport financing consultant to help analyze the benefits and costs, schedule, and proposed financing for both phases of the OMP. This analysis will include four tasks including: establishing the current financial situation at O'Hare; analyzing financial impacts under the proposed OMP – Phase 1; analyzing financial impacts under the full OMP; and a review of the benefit cost analysis. The analysis of financial impacts will include a sensitivity analysis examining the impact of the following: delays in construction schedules; cost increases; and deviations from the City's requested LOI amount or payment schedule. In this context, should the OMP ultimately be approved by the FAA via an Environmental Impact Statement Record of Decision (EIS ROD), FAA expects to reach a decision on the LOI for the Phase 1 OMP shortly after completion of the EIS ROD. The FAA expects to document its findings in regard to the recommendations at that time.

ATTACHMENT 2
AIP Participation for Large Runway Projects

Year	Length (yrs)	Location	State	Hub	Description	Disc ($M)	Ent ($M)	**Total Federal ($M)**	Total Project Cost ($M) [OEP Reporting]	Fed Rate (all AIP funds)	Fed Rate (disc. Only)
LOIs for Single Runway Programs											
2002	3	Denver *	CO	Large	New Runway	99	33	**132**	180	73%	55%
2004	8	Boston	MA	Large	New Runway	58	33	**91**	138	66%	42%
2000	10	Houston	TX	Large	New Runway	100	93	**193**	298	65%	34%
2001	10	Cincinnati	KY	Large	New Runway	100	32	**132**	233	57%	43%
1999	11	Miami	FL	Large	New Runway	69	35	**101**	215	47%	32%
1999	10	Orlando	FL	Large	New Runway	36	38	**74**	203	36%	18%
2000	14	Cleveland	OH	Med	New Runway	100	48	**148**	458	32%	22%
2001	13	Seattle (w/ 2 amendments)*	WA	Large	New Runway	181	94	**301**	1,054	29%	17%
2003	10	St Louis (w/ amendment)*	MO	Med	New Runway	170	46	**216**	1,100	20%	15%
1999	12	Minneapolis	MN	Large	New Runway	95	0	**95**	563	17%	17%
1997	10	Atlanta (2 LOIs)	GA	Large	New Runway	179	0	**179**	1,350	13%	13%
		Total (11 locations)				1,187		**1,662**			
		Average LOI approval				108		151			
LOIs for Multiple Runway Programs											
1990	10	Denver (with Pre-LOI grants)*	CO	Large	New Airport (5 runways)	340	104	**444**	4,269	10%	8%
1990	18	Detroit	MI	Large	2 New Runways	204	96	**300**	?		
2005	10	Chicago O'Hare (proposed)*	IL	Large	2 Runways & runway extension	305	56	360	2,660	13%	11%

* Includes AIP funding outside the LOI

Prepared by the Federal Aviation Administration 5/31/05

Appendix. Agency Comments

ATTACHMENT 3
Total AIP funding at locations receiving LOIs

	Total AIP (2001-2004)			LOI payments (2001-2004)			AIP less LOI payments (2001-2004)		
Location	Ent ($M)	Disc ($M)	**Total Federal ($M)**	Ent($M)	Disc ($M)	**Total Federal ($M)**	Ent ($M)	Disc ($M)	**Total Federal ($M)**
Houston	90	81	**170**	36	42	**78**	54	39	**92**
Miami	58	37	**95**	28	18	**46**	30	20	**50**
Orlando	38	94	**132**	6	25	**30**	32	70	**102**
Cleveland	15	78	**93**	10	46	**56**	5	33	**37**
Seattle	30	156	**186**	26	58	**84**	5	98	**102**
St Louis	28	151	**180**	18	68	**86**	11	83	**93**
Minneapolis	27	123	**150**	0	42	**42**	27	81	**108**
Atlanta	39	179	**218**	0	61	**61**	39	118	**157**
Detroit	32	84	**116**	21	49	**70**	11	35	**47**

Notes:
All locations received LOI payments each of the 4 years (FY 01 - FY 04)
FY 01- FY 04 represent increased AIP levels due to AIR-21 legislation

Prepared by the Federal Aviation Administration 5/31/05

Appendix. Agency Comments

FROM (TUE) 9. 6'05 8:54/ST. 8:53/NO. 4860698503 P 3

050906_03

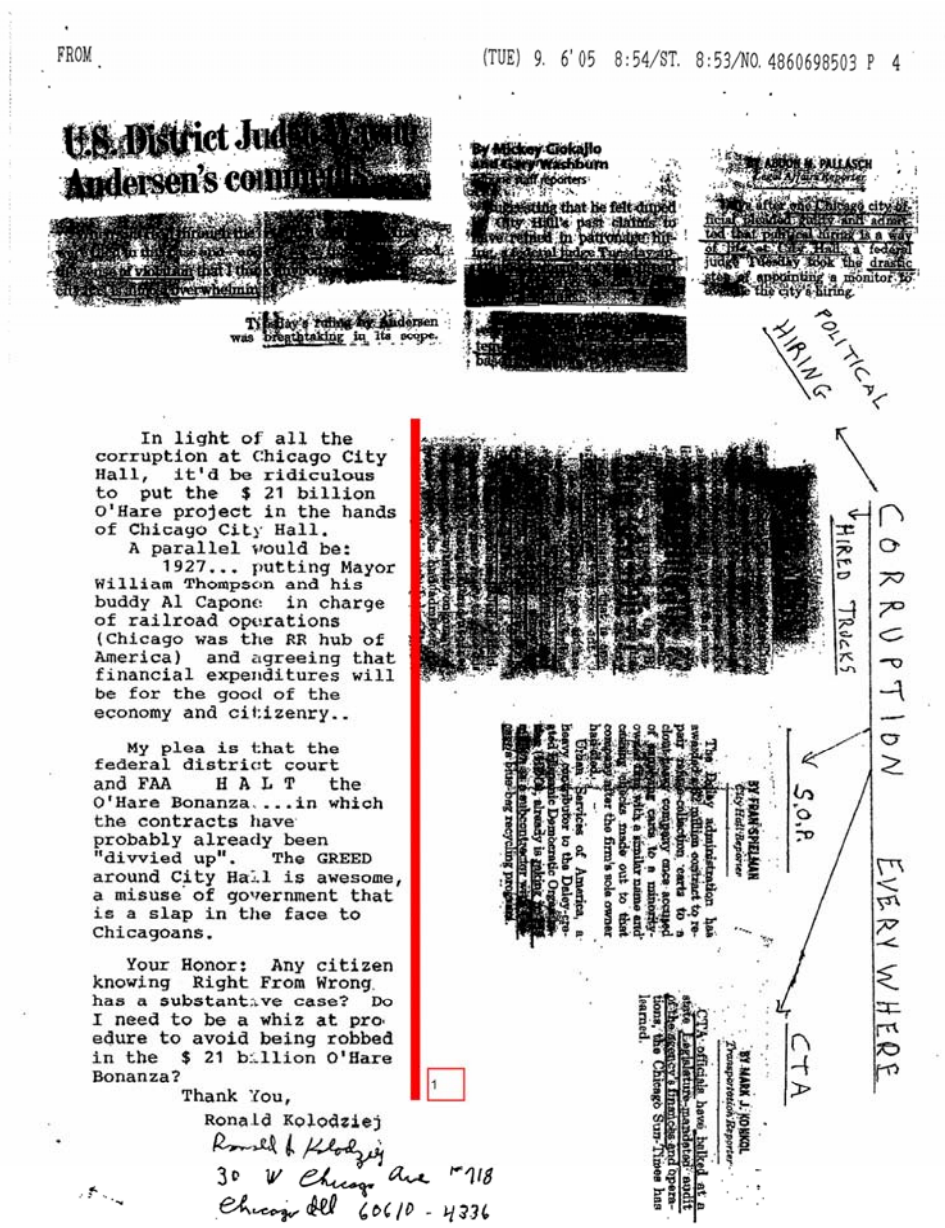
ARP-5

FAA AND DEPT OF TRANSPORTATION

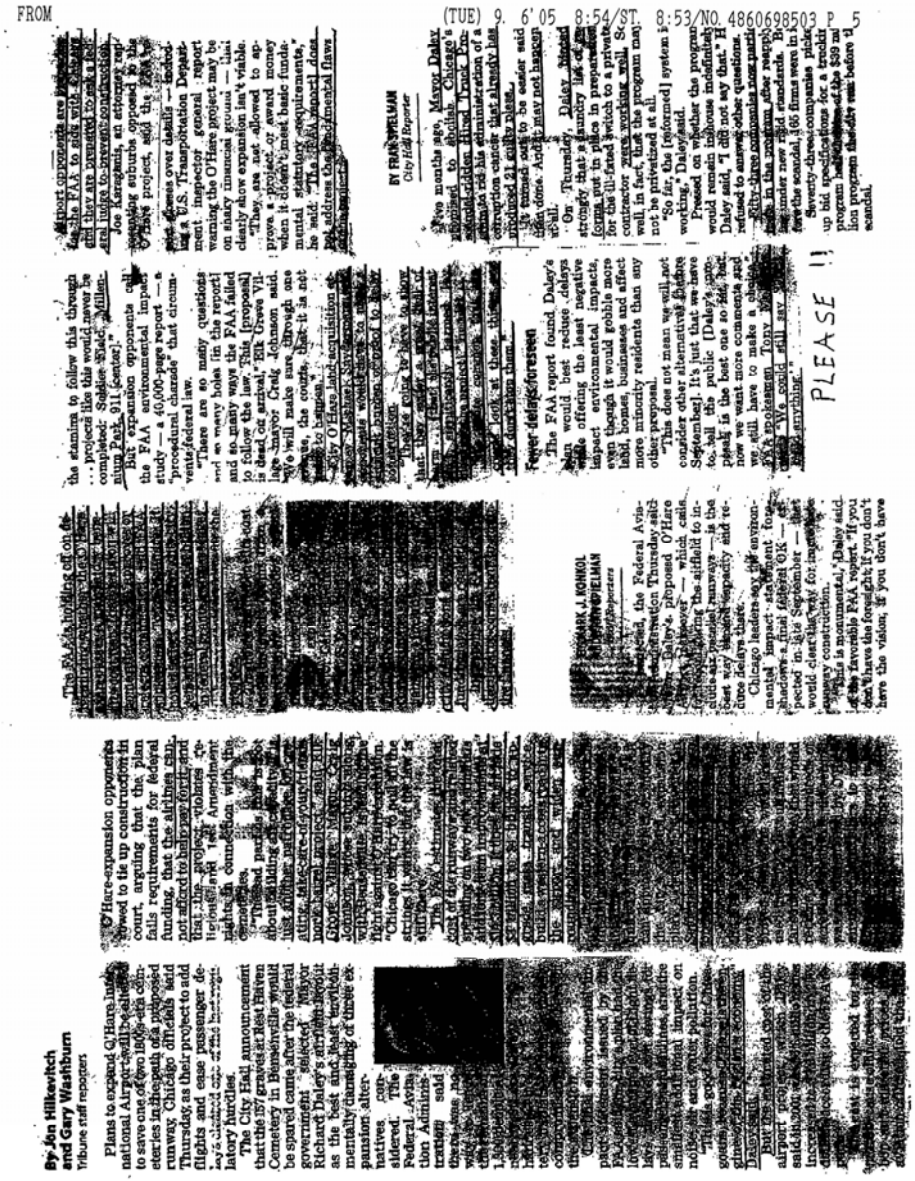
HOW CAN ANYONE PUT $ 21 BILLION DOLLARS (THE O'HARE BONANZA) INTO THE HANDS OF CHICAGO CITY HALL, ALREADY PROVEN CORRUPT

In 1976 the City Hall of a suburb of Chicago wanted to blow $ 24 million (million, not BILLION) on sewers. They REFUSED to COMP ROMISE. (pause) A$ REFERENDUM we voters said NO by a vote of 4800-1100 .....Calumet City Ill is a city of 36,000 people.

Sooo, 2005, Chicago. In the one party oligarchy called Chicago City Hall, please give the people of Chicago a chance for Common Sense....there are many better ways to improve the Infrastructure and local econo my. Its senseless to have people deprived of health care and life necessities because of a dang airport ...how many of Chicago's 2,900,000 people fly? For less thar $21 BILLION we can have an infrastructure second to none and a health system worthy of A merica's great constitutional rights.....a government of the people, by the people, FOR the people, not for the greedos aborting government.



Comment	Response
1	The FAA notes the opinions of the commenter with regard to the City of Chicago. The FAA notes that a summary of the cost of the proposed project is contained in Section 1.7 of the Final Environmental Impact Statement (EIS) including the cost breakdown of the approximately $14.2 billion project.



FROM (TUE) 9. 6'05 8:54/ST. 8:53/NO. 4860698503 P 5

PLEASE !!

FROM (TUE) 9. 6'05 8:55/ST. 8:53/NO. 4860698503 P 6

Defendant : City of Chicago

How plaintiff is harmed:

Violation of the U S Constitution. Government was not intended to be an oligarchy uncontrolled by the courts.

City jobs are passed out by favoritism, these people are rewarded via "campaign contributions (graft)" with City Hall acting as FOREMAN. Chief Foreman Dale y thumb his nose at the Shakman Decree..... so city hall is free to award contracts and contract amounts in a way that is a heist on taxpayers, in luding me. I cannot absorb being a turkey paying for ther hatchet, I am entitled to Equal Protecti0on of the laws. Do I have to wait until being ax d and have the oligarchy 's "corporate counsels " slide away with the legalized thievery? No. Based on the fact of actual convictions, I have a right to seek "preventative constitutionality via this case.

Jurisdiction: It'd be a farce to take this case to the Circuit Court of Crook County in which the judges are anointed by the DEFENDANT in this case.

Relief requested: $ 0.00 in money damages.

I want injunction Estoppel of the unnecessary O'Hare bonanza..... stimulation of the economy can be accom plished in moire economical ways. We can't "open the vault" to a City Hall with a list of convictions on its rap sheet.

FROM (TUE) 9. 6'05 8:55/ST. 8:53/NO. 4860698503 P 7

COMPLAINT

KOLODZIEJ vs CHICAGO CITY HALL

To stop the city's misuse of Eminent Domain and waste of $ 15 billion for two runways and revisions at O'Hare Airport. The estoppal is explained with a definition of Eminent Domain:

, a Taking , at a just compensation , for a public purpose , when that public purpose cannot be achieved in other reasonable ways..

I yield that the airport can be called a public purpose. But the O'Hare bonanza is not the only or best solution for the progress of the economy. City Hall refuses to consider other alternatives, thirsts for the $ 15 billion expenditure, and has no concern for the taxpayers struggling in a difficult economy.

The alternative to the $15 billion bonanza is to limit flights to those over 700 miles, the shorter flights being Replaced by a faster and safer infrastructure of RAIL on the median of interstate highways; such a deal would decrease the traffic congestion around O'Hare; the $ 15 billion bonanza would INCREASE the congestion which already affects the entire population adversely.

Supposedly the airport is for the Common Good. How can that be , when the common people are deprived of money for medical bills (life) by having to pay for the airport bonanza? City Hall doesn't care about the health damage to kids from airport noise pollution. Plaintiff seeks a RULE OF REASON / COMMON SENSE. $ 15 billion divided by about 3 million Chicagoans is a heist of about $ 5,000. on every man , woman and child. Such money should be spent on health/life. Thats astounding, the promoters of the O'hare Bonanza should be impeached,

FROM (TUE) 9. 6'05 8:55/ST. 8:53/NO. 4860698503 P 8

If Eminent Domain was for a needed hospital in the center of a populated city instead of on prarie on the outskirts of the city, YES, let City Hall Bulldozer Daley bulldoze the way he bulllldozed a RUNWAY (at Meigs Field). But a mere 2 runway extension by a corrupt City Hall which has alternate options should be immediately estopped/injunctioned by a federal district court.

The existence and expansion of Midway Airport and presence of several airfields near O'Hare proves that a city airport system need not be centrally located with all flights jammed into one airport. So why is City Hall so obsessed with O'Hare ? Answer: B O N A N Z A, which, based on City Hall's current indictments, will result in many many federal cases.

FROM (TUE) 9. 6'05 8:55/ST. 8:53/NO. 4860698503 P 9

I made a mistake. The O'Hare expansion is not a $15 billion bonanza. According to the FAA estimater , its a $ 21 billion bonanza.....and will skyrocket by 2013 due to inflation and additional graft/

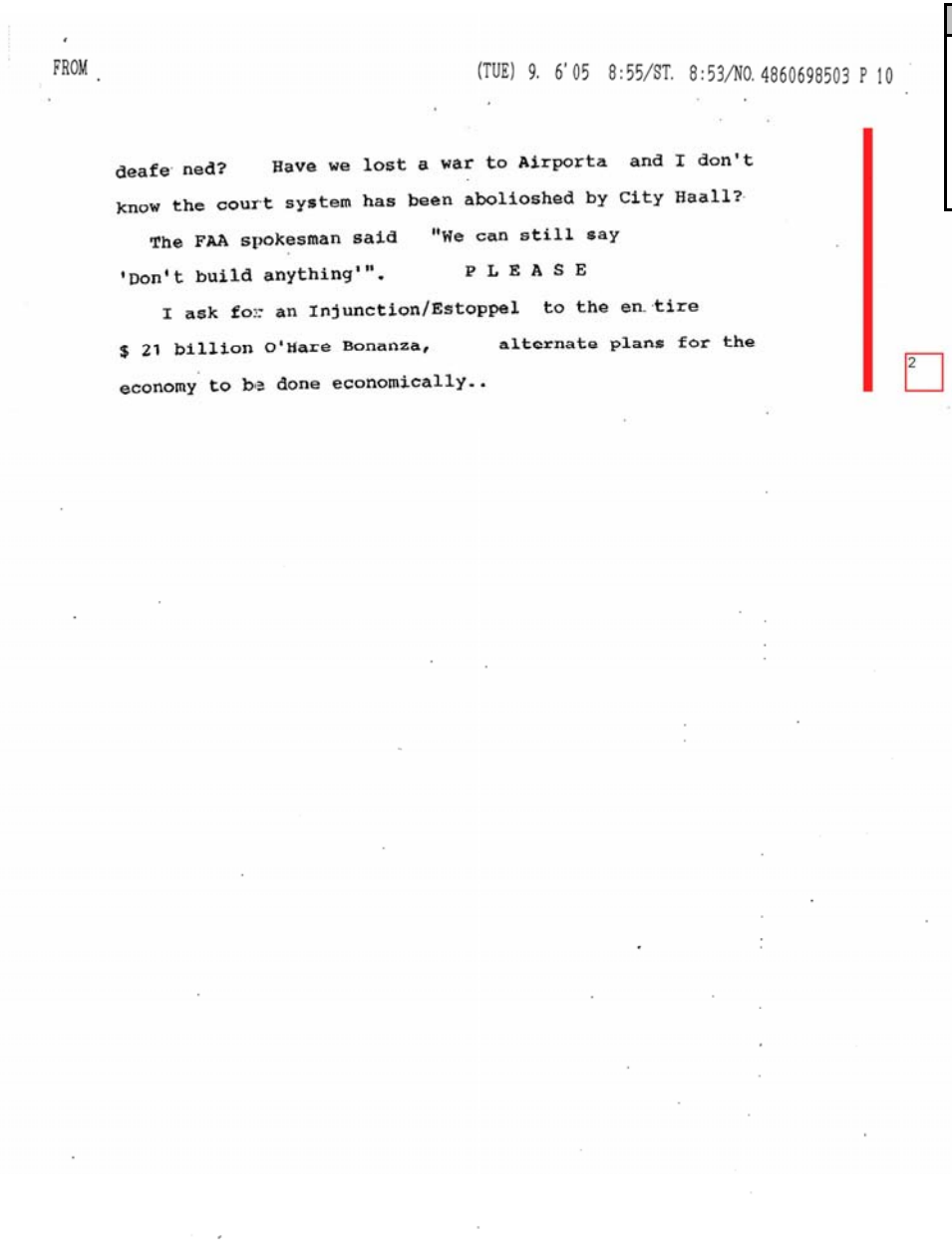
Thats an average of $ 7,000 from every man, woman, and child in Chicago, a city in which tho usands ar e homeless, hundreds of thousands are worried about making ends meet.. ....and the nonfeasant mayor brags about providing the Milleneum Park Bonanza.. How can the federal govenmenmt allow such a travesty on constitutional principles in an airport deal partially funded thru the federal governmenmt/?????

Look at the way they systematically avoid the Shakman Act/Decree. This is not a political matter, its a court order.

These guys never stop. Look at the Hired Trucks scandal. 21 guys pleaded G UILTY. But City Hall is sweeping it under the rug and has 53 companies ready to feast on the O'Hare Bonanza.

Note the quote from City Hall Attorney Michael Snyderman: "They (plaintiffs) are going to have to show that they suffer a great deal of harm...its quite common that the courts look at these things and they don't stop them"..

Who does this guy think he is? He thinks airport NOISE is Ok if his mayor furnishes soundproofing? Will he have to be living under the noise and putting on earmuffs to go out on his lawn. Do the affected citizens have to prove they not only received hearing loss but were actually



FROM (TUE) 9. 6'05 8:55/ST. 8:53/NO. 4860698503 P 10

deafe ned? Have we lost a war to Airporta and I don't know the court system has been abolioshed by City Haall?

The FAA spokesman said "We can still say 'Don't build anything'". P L E A S E

I ask for an Injunction/Estoppel to the en tire $ 21 billion O'Hare Bonanza, alternate plans for the economy to be done economically..

2

Comment	Response
2	The commenter's opinion is noted. The FAA notes the commenter's inclusion of a legal complaint (and other filing documents) against the City of Chicago. FAA has refrained from commenting on this complaint as the FAA is not a named party, and FAA is not aware of the filing status of the complaint.

FROM (TUE) 9. 6' 05 8:56/ST. 8:53/NO. 4860698503 P 11

JS 44 (Rev. 3/99)

CIVIL COVER SHEET

The JS-44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM.)

(a) PLAINTIFFS

Ronald J Kolodziej

(b) County of Residence of First Listed Cook, Il
(EXCEPT IN U.S. PLAINTIFF CASES)

DEFENDANTS

City of Chicago

County of Residence of First Listed Cook, Il
(IN U.S. PLAINTIFF CASES ONLY)
NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE LAND INVOLVED.

(c) Attorney's (Firm Name, Address, and Telephone Number)

Ronald J Kolodziej
30 W Chicago Ave # 718
Chicago, Ill. 60610

Attorneys (If Known)

II. BASIS OF JURISDICTION (Place an "X" in One Box Only)

- ☐ 1 U.S. Government Plaintiff
- ☒ 3 Federal Question (U.S. Government Not a Party)
- ☐ 2 U.S. Government Defendant
- ☐ 4 Diversity (Indicate Citizenship of Parties in Item III)

III. CITIZENSHIP OF PRINCIPAL PARTIES (Place an "X" in One Box for Plaintiff and One Box for Defendant)
(For Diversity Cases Only)

	PTF	DEF		PTF	DEF
Citizen of This State	☐ 1	☐ 1	Incorporated *or* Principal Place of Business In This State	☐ 4	☐ 4
Citizen of Another State	☐ 2	☐ 2	Incorporated *and* Principal of Business In Another State	☐ 5	☐ 5
Citizen or Subject of a Foreign Country	☐ 3	☐ 3	Foreign Nation	☐ 6	☐ 6

IV. NATURE OF SUIT (Place an "X" in One Box Only)

CONTRACT	TORTS		FORFEITURE/PENALTY	BANKRUPTCY	OTHER STATUTES
☐ 110 Insurance	PERSONAL INJURY	PERSONAL INJURY	☐ 610 Agriculture	☐ 422 Appeal 28 USC 158	☐ 400 State Reapportionment
☐ 120 Marine	☐ 310 Airplane	☐ 362 Personal Injury—Med. Malpractice	☐ 620 Other Food & Drug	☐ 423 Withdrawal 28 USC 157	☐ 410 Antitrust
☐ 130 Miller Act	☐ 315 Airplane Product Liability	☐ 365 Personal Injury—Product Liability	☐ 625 Drug Related Seizure of Property 21 USC	PROPERTY RIGHTS	☐ 430 Banks and Banking
☐ 140 Negotiable Instrument	☐ 320 Assault, Libel & Slander	☐ 368 Asbestos Personal Injury Product Liability	☐ 630 Liquor Laws	☐ 820 Copyrights	☐ 450 Commerce/ICC Rates/etc.
☐ 150 Recovery of Overpayment & Enforcement of Judgment	☐ 330 Federal Employers' Liability	PERSONAL PROPERTY	☐ 640 R.R. & Truck	☐ 830 Patent	☐ 460 Deportation
☐ 151 Medicare Act	☐ 340 Marine	☐ 370 Other Fraud	☐ 650 Airline Regs	☐ 840 Trademark	☐ 470 Racketeer Influenced and Corrupt Organizations
☐ 152 Recovery of Defaulted Student Loans (Excl. Veterans)	☐ 345 Marine Product Liability	☐ 371 Truth in Lending	☐ 660 Occupational Safety/Health	SOCIAL SECURITY	☐ 810 Selective Service
☐ 153 Recovery of Overpayment of Veteran's Benefits	☐ 350 Motor Vehicle	☐ 380 Other Personal Property Damage	☐ 690 Other	☐ 861 HIA (1395ff)	☒ 850 Securities/Commodities/ Exchange
☐ 160 Stockholders' Suits	☐ 355 Motor Vehicle Product Liability	☐ 385 Property Damage Product Liability	LABOR	☐ 862 Black Lung (923)	☐ 875 Customer Challenge 12 USC 3410
☐ 190 Other Contract	☐ 360 Other Personal Inj.		☐ 710 Fair Labor Standards Act	☐ 863 DIWC/DIWW (405(g))	☐ 891 Agricultural Acts
☐ 195 Contract Product Liability			☐ 720 Labor/Mgmt. Relations	☐ 864 SSID Title XVI	☐ 892 Economic Stabilization Act
			☐ 730 Labor/Mgmt. Reporting & Disclosure Act	☐ 865 RSI (405(g))	☐ 893 Environmental Matters
REAL PROPERTY	CIVIL RIGHTS	PRISONER PETITIONS	☐ 740 Railway Labor Act	FEDERAL TAX SUITS	☐ 894 Energy Allocation Act
☐ 210 Land Condemnation	☐ 441 Voting	☐ 510 Motions to Vacate Sentence	☐ 790 Other Labor Litigation	☐ 870 Taxes (U.S. Plaintiff or Defendant)	☐ 895 Freedom of Information Act
☐ 220 Foreclosure	☐ 442 Employment	Habeas Corpus:	☐ 791 Empl. Ret. Inc. Security Act	☐ 871 IRS—Third Party 26 USC 7609	☐ 900 Appeal of Fee Determination Under Equal Access to Justice
☐ 230 Rent Lease & Ejectment	☐ 443 Housing/ Accommodations	☐ 530 General			☐ 950 Constitutionality of State Statutes
☐ 240 Torts to Land	☐ 444 Welfare	☐ 535 Death Penalty			☐ 890 Other Statutory Actions
☐ 245 Tort Product Liability	☒ 440 Other Civil Rights	☐ 540 Mandamus & Other			
☐ 290 All Other Real Property		☐ 550 Civil Rights			
		☐ 555 Prison Condition			

V. ORIGIN (PLACE AN "X" IN ONE BOX ONLY)

☒ 1 Original Proceeding ☐ 2 Removed from State Court ☐ 3 Remanded from Appellate Court ☐ 4 Reinstated or Reopened ☐ 5 Transferred from another district (specify) ☐ 6 Multidistrict Litigation ☐ 7 Appeal to District Judge from Magistrate Judgment

VI. CAUSE OF ACTION (Cite the U.S. Civil Statute under which you are filing and write brief statement of cause. Do not cite jurisdictional statutes unless diversity.)

U S Constitution, Equal Protection of the law as applicable to the states

VII. REQUESTED IN COMPLAINT: ☐ CHECK IF THIS IS A CLASS ACTION UNDER F.R.C.P. 23 DEMAND $ 0.00 CHECK YES only if demanded in complaint: JURY DEMAND: ☐ Yes ☒ No

VIII. This case
☒ is not a refiling of a previously dismissed action.
☐ is a refiling of case _____, previously dismissed by Judge _____

DATE SIGNATURE OF ATTORNEY OF RECORD

Ronald J Kolodziej

FROM (TUE) 9. 6' 05 8:56/ST. 8:53/NO. 4860698503 P 12

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS

In the Matter of

Kolodziej
vs
City of Chicago

Case Number:

APPEARANCES ARE HEREBY FILED BY THE UNDERSIGNED AS ATTORNEY(S) FOR:

(A)	(B)
SIGNATURE Ronald Kolodziej	SIGNATURE
NAME Ronald J Kolodziej	NAME
FIRM PRO SE	FIRM
STREET ADDRESS 30 W Chicago Ave. # 718	STREET ADDRESS
CITY/STATE/ZIP Chicago, Ill. 60610	CITY/STATE/ZIP
TELEPHONE NUMBER / FAX NUMBER	TELEPHONE NUMBER / FAX NUMBER
E-MAIL ADDRESS	E-MAIL ADDRESS
IDENTIFICATION NUMBER (SEE ITEM 4 ON REVERSE)	IDENTIFICATION NUMBER (SEE ITEM 4 ON REVERSE)
MEMBER OF TRIAL BAR? YES ☐ NO ☒	MEMBER OF TRIAL BAR? YES ☐ NO ☐
TRIAL ATTORNEY? YES ☐ NO ☒	TRIAL ATTORNEY? YES ☐ NO ☐
	DESIGNATED AS LOCAL COUNSEL? YES ☐ NO ☐
(C)	**(D)**
SIGNATURE	SIGNATURE
NAME	NAME
FIRM	FIRM
STREET ADDRESS	STREET ADDRESS
CITY/STATE/ZIP	CITY/STATE/ZIP
TELEPHONE NUMBER / FAX NUMBER	TELEPHONE NUMBER / FAX NUMBER
E-MAIL ADDRESS	E-MAIL ADDRESS
IDENTIFICATION NUMBER (SEE ITEM 4 ON REVERSE)	IDENTIFICATION NUMBER (SEE ITEM 4 ON REVERSE)
MEMBER OF TRIAL BAR? YES ☐ NO ☐	MEMBER OF TRIAL BAR? YES ☐ NO ☐
TRIAL ATTORNEY? YES ☐ NO ☐	TRIAL ATTORNEY? YES ☐ NO ☐
DESIGNATED AS LOCAL COUNSEL? YES ☐ NO ☐	DESIGNATED AS LOCAL COUNSEL? YES ☐ NO ☐

FROM (TUE) 9. 6'05 8:56/ST. 8:53/NO. 4860698503 P 13

AO 440 (Rev. 05/00) Summons in a Civil Action

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS

SUMMONS IN A CIVIL CASE

Plaintiff

Ronald J Kolodziej

V.

City of Chicago

CASE NUMBER:

ASSIGNED JUDGE:

DESIGNATED MAGISTRATE JUDGE:

TO: (Name and address of Defendant)

City of Chicago
c/o Mayor Richard Da ley
5th Floor, City Hall
121 N LaSalle
Chicago, Ill. 60602

YOU ARE HEREBY SUMMONED and required to serve upon PLAINTIFF'S ATTORNEY (name and address)

Ronald J Kolodziej
30 W Chicago Ave, # 718
Chicago, Ill. 60610

an answer to the complaint which is herewith served upon you within 20 days after service of this summons upon you, exclusive of the day of service. If you fail to do so, judgment by default will be taken against you for the relief demanded in the complaint. You must also file your answer with the Clerk of this Court within a reasonable period of time after service.

MICHAEL W. DOBBINS, CLERK

(By) DEPUTY CLERK DATE

FROM (TUE) 9. 6'05 8:56/ST. 8:53/NO. 4860698503 P 14

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Plaintiff(s)

Ronald J Kolodziej

v.

Defendant(s)

City of Chicago

Case No.

Judge:

COMPLAINT

ALLIANCE OF RESIDENTS CONCERNING O'HARE, Inc. "a grass roots organization"

P.O. Box 1702 ❍ Arlington Heights, IL 60006-1702 ❍ Fax: 847/506-0202 ❍ Tel: 847/506-0670 ❍ www.areco.org

050906_08

September 6, 2005

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Federal Aviation Administration
Chicago Airports District Office
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Des Plaines, IL 60018
Fax (847) 294-7046 ompeis@faa.gov

The Honorable Richard Durbin
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Washington, DC 20510

The Honorable Barack Obama
United States Senate
713 Hart Senate Office Building
Washington, D.C. 20510

The Honorable Henry J. Hyde
U.S. Congressman
2110 Rayburn Building, HOB
Washington, DC 20515-1306

The Honorable J. Dennis Hastert
Speaker of the House
235 Cannon House Office Building
Washington, DC 20515

The Honorable Henry Hyde
U.S. Congressman
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Addison, IL 60101

The Honorable Mark Kirk
U.S. Congressman
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Honorable Mayor John Geils
Village of Bensenville
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Ms. Ellen Athas
Council on Environmental Quality
722 Jackson Place, NW
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The Honorable Rod Blagojevich
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The Honorable Wendell Jones
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General Accounting Office
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The Honorable Dave Sullivan
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The Honorable Suzanne Bassi
State Representative
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Alliance of Residents Concerning O'Hare and Mothers Against Airport Pollution O'Hare Flight Expansion "OMP" FEIS Comments

FILED IN PROTEST: FAA NOT RESPONSIVE, PROCESS TO FAST FOR AMOUNT OF DOCUMENTATION, ETC.

Overall and total non-responsiveness to appendices.

The FAA has, in their responses to AReCO's DEIS Comments, demonstrated that they are really not interested in honest, detailed criticism of their environmental analyses of the probable impacts from the planned, massive O'Hare expansion, of which the FAA appears to be fully supportive. This is crystallized in FEIS response 18 (p. U.4-300): "The FAA's mission is to provide the safest most efficient airspace system in the world." This mission statement is notably devoid of components related to the environment and public health, and the FAA's prosecution of the O'Hare OMP EIS, especially the FEIS, clearly shows that these factors are of minimal priority.

It is not enough for the FAA, with degrees of complicity from "cooperating agencies", to produce thousands of pages of documentation to create "form", without properly addressing "substance". And AReCO's extensive substance has been largely dismissed, minimized and discounted with statements such as "The FAA reviewed AReCO Appendix D in responding to the comments contained in the main text of this [AReCO DEIS Comments] letter regarding the same issues." This is not just disingenuous but is instead a blatant statement that "we do not intend to address such extensive issues". Even a cursory review shows that, in fact, the FAA indeed did not even attempt to address most of the issues "…in responding to the comments contained in the main text…".

AReCO made it abundantly clear in our DEIS Comments that the Comments appendices were to be considered an integral part of the Comments, not just a compendium of information for the FAA's reference. This is set forth, for example, in the line following the topic of Air Quality Dispersion Modeling (DEIS Comments, p.11), where it is stated: "Reference Appendices D, D1 and E for all AReCO comments in this category." Thus, a mere "reviewing" of these Comments is a dismissal of those extensive and detailed comments and issues.

AReCO is forced by these FAA actions to resubmit here our unanswered DEIS Appendices D, D1, E, F, H and I. See below. We demand specific responses to the specific issues and questions presented in these appendices, not just dismissals, along with appropriate actions and resolutions, not just platitudes. 1

Mitigation recommendations by the FAA acknowledge problems for which proposed solutions are woefully inadequate to protect public health, quality of life, our living environment, etc. We have not seen a full accounting of the projected costs of mitigation in the EIS, along with funds allocations plans; obviously, funds must be identified and allotted. 2

ARECO-MAAP FEIS Comments
3

Comment	Response
1	In fact, the FAA did consider and review the AReCO appendices in concert with the generation of the response to the comments contained in the main text of AReCO's April 6,2005 letter of comments on the Draft EIS. As AReCO notes, the main text of that letter did reference some of the appendices that were attached, however, the majority of the appendices submitted to that letter appeared to be backup material for the comments contained in the text of the letter. As stated in the AReCO quotation from their April 6 letter, "Reference Appendices D, D1, and E for all comments in this category," the FAA understood that comments made by AReCO used the text within said appendices as reference material. When the subject matter of the appendices did, in fact, differ from comments within the letter, the FAA responded to them in the Final EIS. Nonetheless, the FAA has responded to these resubmitted appendices herein.
2	For detailed information regarding the mitigation commitments, including the cost associated with mitigation, where it can be known at this time, see Section 9 of this Record of Decision.

The FAA's scope and purpose is too narrow to allow any reasonable or better alternatives; thus, defeating the heart and soul of NEPA. By clever design, the only FAA alternative of the damaging affects of aviation is more aviation. 3

The FAA also tries to wash its hands of its liability and responsibility being of being the key federal authority, with general disclaimers; in fact, as the federal agency that is responsible for approving this massive "almost new" airport expansion, it strongly shares liability with the city of Chicago and others. 4

Comments relative to FAA's responses to specific other AReCO DEIS issues/questions.

[Lack of comment here regarding any of FAA's responses to AReCO's DEIS comments does not necessarily imply agreement with the FAA.]

In reference to FAA comments #:

7) The FAA's key informational web site remains inaccessible, as tested by at least four different computer systems and knowledgeable individuals. It is NOT "publicly accessible". Requests to the FAA to test (in)accessibility by their staff from their homes and not office network, went unanswered. In fact, by not holding hearings in at least the affected neigborhoods in the city of Chicago proper, we believe it was an intended purpose to exclude the large majority of Chicagoands that are affected and strongly opposed to the airports expansion. Furthermore, the FAA only supplied one copy of the EIS documents to the Harold Washington Library downtown and none to other area libraries. 5

10) The FAA's answer, "The EIS addresses the entire O'Hare environment, including locations where employees work." is wrong. There were no dispersion analyses "receptors" (analysis points) located at key employee working areas, for instance the outdoor gate areas, de-icing stations, etc. The nearest receptors were placed in the public roadway "curbside" areas, e.g. R1, R2, etc. This is one of the reasons why AReCO stated that OSHA should have been one of the "cooperating agencies" (and still believes that). Thus we continue to disagree with the FAA's continuing position to exclude OSHA. 6

11) AReCO had expressed in detailed fashion significant concerns that the EIS analyses of air quality excluded any consideration or quantifications for on-board aircraft passengers while the plane was "buttoned up" and still on the ground (e.g. taxiing, being de-iced, etc.), knowing that outside polluted air is ingested into the aircraft through its on-board ventilation system. The FAA states, "The EIS addresses the entire O'Hare environment, including locations utilized by passengers." This is blatantly false in this regard. 7

17) The FAA states, "FAA has not predicted the future price of oil in developing the forecast used in the EIS. In fact, the FAA annually forecasts the future price of jet fuel (which is the obviously implied issue) in their *FAA Aerospace Forecasts*, looking out at least 10 years. If we are to interpret FAA's comment that that is true but that the FAA does not consider fuel costs in forecasting future flight activity, then the forecasts are inherently wrong.

Comment	Response
3	The FAA disagrees with the commenter' opinion with regard to the alternatives analysis. The FAA provided a substantial analysis of non-aviation alternatives, such as the use of other modes of travel and communication, however, those alternatives were found to not meet the purpose and need.
4	The FAA disagrees with the commenter's assertion.
5	The FAA respectfully disagrees with the commenter's assertion that the FAA's website cannot be accessed and that help was not provided by the FAA to those individuals that requested it. The FAA responded to all requests for assistance for access to the website from homes and businesses. The FAA cannot control if an entity chooses not to modify its internet settings to allow automatic detection of settings and allow active FTP access. FAA staff has verified website access from libraries, FedEx/Kinko's locations, and their own homes. The FAA also provided AReCO with electronic media of the air quality data posted to the FAA's website on May 24, 2005. The FAA respectfully disagrees with the commenter's assertion that "it was an intended purpose to exclude the large majority of Chicagoands [sic]…" The FAA held hearings at three locations surrounding the airport. The nearest location to Chicago was held at the White Eagle Banquets & Restaurant that is located at 6839 North Milwaukee Avenue in Niles, Illinois, less than one mile north of the border of Chicago. The notice for the public hearings was also published in the following papers with Chicago distribution: Chicago Tribune, Chicago Sun Times, and Daily Southtown. The FAA respectfully disagrees with the commenter's assertion that the "FAA only supplied one copy of the EIS documents to the Harold Washington Library downtown and none to other area libraries." The FAA sent a copy to the Harold Washington Library as it is the repository for all government publications for the Chicago Public Library System. The FAA also sent copies of the EIS to 32 other suburban libraries where no suburban library card is needed by a Chicago resident to view the documents. FAA did provide AReCO with an electronic copy of the Final EIS.
6	The EIS addresses the entire O'Hare environment, including locations employees work (such as terminal curb fronts and parking lots). The FAA does not agree that "OHSA must be brought in" as a cooperating agency.
7	The EIS addresses the entire O'Hare environment, including locations utilized by passengers (such as terminal curb fronts and parking lots). FAA is authorized to protect the health and safety of passengers. The regulations by which the FAA protects the health and safety of passengers are contained in 49 USC 40101D and 49 USC 44701A. FAA also promulgated specifications for air quality in commercial aircraft. Continued on the following page.

To that extent, we have petitioned the FAA to immediately produce a mid-year correction to their Aerospace Forecast, and to reflect the unacknowledged high fuel costs in revised O'Hare EIS forecasts. The to-date unanswered petition is attached here for reference [Appendix X]. 8

22) The FAA's assertion that, "The FAA does not believe that the OMP's success is dependent upon theseElgin-O'Hare Expressway [EOH] and/or Western O'Hare Bypass [WOB] projects" flies fully in the face of their own DEIS data, indicating substantial traffic "gridlock" if these (and other "massive infrastructure programs", as AReCO stated) are not concurrently implemented. If the FAA is basing their whole OMP justification ("purpose and need") on several minutes of reduced passenger aircraft delays, while simultaneously disregarding many minutes of increased passenger airport-access delays, the entire project justification is a sham.

AReCO continues to maintain that the FAA cannot claim the benefits of passenger (and freight) delay reductions as project justification without reducing those delay reductions by inclusion of delay increases due to increased congestion and increasing costs to include any expenditures needed to achieve assumed airport access delay reductions. The fact that additional airport access infrastructure funds are not supplied by the FAA or the airlines is irrelevant. 9

37) The FAA's clarification that, "Multi-family dwellings are eligible for FAA funding as part of an overall mitigation plan" implies that Chicago's existing mitigation program, as administered by ONCC, is exclusionary by choice. Any OMP ROD should clearly state that multi-family dwellings shall be included in any mitigation program by Chicago/ONCC, on equal footing with single-family dwellings. 10

39) The FAA's statement that, "In addition, the capping of operations is contrary to the purpose and need of this EIS" is absolutely false. The regulatory purpose and need of this EIS is to protect the public, under NEPA and other auspices, from unexpected or unauthorized emissions dangerous to the public health, our living environment and general well-being. The FAA and EPA are delinquent in their duties if emissions impacts are not analyzed on the basis of maximum limits. The FAA's statement that, "[it] believes that the range presented constitutes a reasonable estimate of potential range of alternative levels within the planning horizon" is unacceptable as a regulatory public protection mechanism.

We restate that expanded O'Hare operations must be either capped at the FAA's analyses level or the analyses, (i.e. emissions inventories and dispersion analyses) must be re-run at the expanded OMP maximum capacity (as determined by annual flight delay's equal to those experienced in the 2002 "baseline" assumptions). 11

40, 41) AReCO's previous requests for detailed summaries of aircraft emissions, by mode, in order to validate the FAA's assertions that "The inventories include emissions from aircraft arriving and departing O'Hare up to an altitude of 2,510 feet (approximately 0.5 miles in altitude)" remain unanswered. The facts that, (a) these summaries should be easily created by EDMS data/report outputting capabilities, (b) there are potential differences between full emissions inventories and the portion used for dispersion analyses within EDMS, (c) that a substantial difference exists between prior IEPA and DEIS inventories, and (d) the DEIS and FEIS state that, "The macroscale and microscale dispersion modeling was performed for ground

ARECO-MAAP FEIS Comments
5

Comment	Response
7 continued	These specifications are detailed in Federal Aviation Regulations (FARs): 14 CFR 21, 14 CFR 25, 14 CFR 121, and 14 CFR 125). The regulations address ozone, carbon monoxide, carbon dioxide, ventilation, and cabin pressure. The regulations in 14 CFR 25 are airworthiness standards for commercial aircraft and are intended as design specifications for aircraft that are subject to certification under 14 CFR 21. By contrast, 14 CFR 121 is intended as an operational standard and applies to domestic, foreign, and supplemental air carriers. Regulations similar to the U.S. regulations established by FAA are applied to European aircraft by the European Joint Airworthiness Authority (JAA) and are termed Joint Aviation Regulations.
8	Please see the response to AReCO Appendix X.
9	The FAA disagrees with the commenter's assertions concerning surface transportation impacts. FAA's EIS describes surface transportation impacts in Section 5.3 of the EIS, and appropriate mitigation for project related impacts is described in Section 9.2 of the ROD. In addition, the FAA disagrees with the commenter's statements regarding the "project justification." The FAA directs the commenter to Chapter 2 of the EIS where FAA outlines the project justification that extends beyond aircraft delay.
10	FAA respectfully disagrees with the commenter's implication that multi-family dwellings will not receive noise mitigation. In point of fact, Section 9.1 of the ROD indicates that newly impacted multi-family dwellings will receive sound insulation.
11	The FAA disagrees with the commenter's assertions regarding the manner in which the air quality assessment is to be conducted. In point of fact, FAA's no action scenario did utilize an operations capped at present levels as a part of the air quality assessment. The FAA evaluated future air quality impacts out to Build Out +5 consistent with its determination that this time horizon represented the reasonable foreseeable future for this EIS. The FAA is required to do impact out to the reasonably foreseeable future.
12	The FAA has responded to all of AReCO's previous requests. As AReCO was informed, the FAA has been proactive in making available to the public through various means; including posting documents on a publicly accessible website and placing copies of key documents in local public libraries. As stated in our letters to Mr. Jack Saporito, the Executive Director of AReCO (April 25, 2005 and May 24, 2005), the information requested has been available through these means. Additionally, with transmittal of the FAA's May 24, 2005 letter to AReCO were enclosed electronic media (a full set of DVDs), including EDMS input files. These EDMS input files, the files that specify the aircraft altitude used to assess the OMP improvements, have Continued on the following page.

level emissions only" [p. ES-32], maintains and increases suspicions that the FAA's statement is untrue.

The FAA must publicly validate their position by publishing a summary of emissions factors used, time-in-mode and emissions totals by aircraft type and mode (approach, taxiing, takeoff, climbout), for all of the various emissions analyzed.

12

42, 43, 44) The FAA's comments, "…limited available data with respect to particulate matter emissions from aircraft engines prevents a more accurate quantification…than that presented in this EIS" implies that the "First Order Approximation" (FOA) method used (based on smoke number correlations) used to calculate non-volatile PM2.5 emissions, and the assumed 3:1 ratio of volatile to non-volatile PM emissions are in fact at least reasonably accurate.

AReCO has disagreed with this in the past, both in DEIS comments and in communiqués with EPA, and restates that the non-volatile PM2.5 calculation method (FOA) is seriously flawed and significantly underestimates the actual probable non-volatile PM emissions. We include here [Appendix Y] a research study that fully validates our position. This study, "Flawed FAA Aircraft PM2.5 Emissions Estimation Method…Archaic "Smoke Number" Use Behind Failure", has also been forwarded to the FAA's EIS cooperating advisory agency, the EPA, which we have asked to declare this method unacceptable for use.

Additionally, the 3:1 ratio of volatile to non-volatile PM has not been scientifically documented in the public eye and is therefore highly questionable. AReCO attempted to procure such documentary support, such as measurement results from the APEX program (18 months ago), from both the FAA and the EPA, without success.

Even if the volatile ratio assumption was reasonable, this means that the FAA's calculations of total PM2.5 (non-volatile plus volatile) emissions are under-calculated to the same significant degree of error as are the basis calculations of the (FOA) non-volatile portions, which the research paper suggests could be too low by factors of 2-10:1.

AReCO strongly notes again that the IEPA has stated that these EIS PM2.5 results will be incorporated in their in-process PM2.5 SIP as the most current and accurate figures available to them. Thus, these results will impact Illinois state programs, which the USEPA will have to approve. That is, the FAA's results will be reflected to a much wider scope than this EIS. Furthermore, since the FAA has chosen to rush these PM calculation methods into EDMS incorporation, these methods and assumptions have nation-wide impact for all airport PM2.5 calculations, thereby similarly being adopted into the PM2.5 SIP's of ALL of the states and committing the USEPA to a de-facto approval of these (seriously flawed) methods and results for these SIPs.

For all of these reasons, the FAA must rectify these serious errors and recalculate PM2.5 (and PM10) emissions based on good, publicly documented, scientific evidence (measurements and engine operating parameter associations), then recalculate related dispersion analyses results, before issuing any final OMP EIS conclusions and ROD.

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Comment	Response
12 continued	also been and are available on FAA's website. As further stated in our April 25, 2005 letter to Mr. Saporito, the EDMS model has been and remains commercially available at the following website: http://www.aee.faa.gov/emissions/edms/edmshome.htm. Comments regarding differences between the IEPA and DEIS inventories were addressed in a letter from FAA to AReCO dated April 25, 2005; this letter can be found response to comments in the Final EIS, see page U.4-825. Finally, FAA's inventories and macroscale dispersion analysis include contributions from all ground level sources and from airborne aircraft arriving and departing O'Hare up to an altitude of 2,510 feet. Aircraft-related emissions above this altitude would have no discernible impact on ground level pollutant levels (see Section 5.6.1.6 of the Final EIS). Aircraft emissions from all four operating modes: idling, approach, takeoff, and climbout, were accounted for in the emissions inventory and dispersion modeling analysis. Additionally, numerous other "above-ground" emission sources, such as stationary sources, were accounted for in the emissions inventory and dispersion modeling analysis. Thus, the dispersion modeling was performed for ground level and above-ground level emissions from aircraft and other airport-related sources.
13	With regard to the FAA's FOA, the FAA has responded to AReCO's comments on the FOA in a detailed response to AReCO's Appendix Y of this letter. While the total concentration of particulate matter 2.5 microns or less in size (PM2.5) is 90 percent or more of the NAAQS, it is important to note that 1) the air pollutant PM2.5 was not part of the original protocol, 2) all reported levels are overwhelmingly dominated by the background concentration that was provided by the IEPA), and 3) the year 1990, the year used in the analysis, has been previously shown to be the worst-case met data year for all other pollutants and all other averaging periods. In other words, the OMP-related contribution to the total concentration of PM2.5 is so small that OMP-related emissions would have to increased tremendously (which they don't) to affect any change in the reported concentrations. With respect to the worst-case meteorological data: USEPA in its Final EIS comment letter raised no objection to FAA's approach. Rather, USEPA's letter said: "Information was presented in the Final EIS to support the choice of 1990 as the worst case meteorological year for criteria pollutant dispersion modeling. Based on the information included in the Final EIS together with Illinois Environmental Protection Agency's (IEPA) involvement on this issue, we concur with your use of 1990 as the worst-case meteorological conditions for the five year period under consideration for this project."

Additionally, after calculating the improved (yet still too low) PM2.5 dispersion analyses results, the FAA has failed in the FEIS to follow the dispersion analysis protocol established in the EIS for PM2.5. In this regard, AReCO has previously posed the very serious issue that the "worst year" (1990) choice by the FAA/IEPA was in fact not the best choice for "worst year", thereby minimizing probable future expected meteorological conditions that would result in worse NAAQS dispersion results than calculated in the EIS. In order to mute this kind of impact, the official protocols for analysis state that, "Should any of the predicted concentrations be close to (within 10%) an applicable standard, additional years of meteorological data will be simulated…". In fact, PM2.5 Annual dispersion results exceed this criteria, (i.e. 13.5 ug/cu.m.) for ALL program alternatives and schedules, yet no such additional simulations were performed. The FAA must perform these simulations, even without considerations of the probable severe under calculations discussed above. 13

47, 48) The FAA is wrong in it's conclusion that mercury emissions from O'Hare aircraft (and GSE) are insignificant. The FAA also errs in it's implication that there are no aircraft mercury emissions, based on the Shumway report. In fact, the detection limit in that study was 1 ppb, thus, it must be assumed from that study that the amount of mercury could be as high as 1 ppb. More importantly, other sources tend to contradict Shumway's low results.

The USEPA states in their emission factors document AP-42 that the mercury factor is 1.2E-6 lb/MMBtu (1.67E-4 lb/1000gals., 26 ppb) for gas turbines burning number 2 distillate fuel oil, which is similar to aircraft fuel (kerosene).

AReCO calculates [ref. Appendix Z] that mercury emissions form aircraft LTO operations alone, as expanded, will be between 1-24 lbs/year, using these two limits. Addition of mercury emissions from GSE and on-airport. Natural gas combustion increases this range to 72-96 lbs/year. Since it is noted that the EPA and many of the states around Lake Michigan set source reporting requirements at 10 lbs/year, O'Hare mercury emissions certainly would be considered "significant", requiring at minimum that the FAA and EPA impose such reporting requirements (including other sources such as vehicular traffic and construction vehicles) on any O'Hare expansions and directing that those emissions be included in the Lake Michigan states mercury reduction program partnership's data base. 14

49) Regarding air pollution from de-icing fluids, the FAA's difficult to understand conclusions are totally wrong and in violation of basic physics: "…vaporization during aircraft treatment is appropriate to consider…the ambient temperature is low…At low temperatures these fluids do not evaporate."

We are at a loss to understand this circuitous logic. First, the de-icing fluids are heated to a high temperature (180 degrees F) when applying (spraying), guaranteeing evaporation, independent of the ambient temperature. Secondly, ethylene glycol gases are lighter than air and will thus not sink to the ground. Glycols combined with water molecules will act much the same as "steam" in the winter, dispersing their contents downwind. Finally, the FAA cannot make such statements for de-icing and anti-icing fluids without a clear understanding of the hazardous additives therein (in addition to glycols), of which AReCO continues to ask for full disclosure of said additives, with no response from the FAA or EPA.

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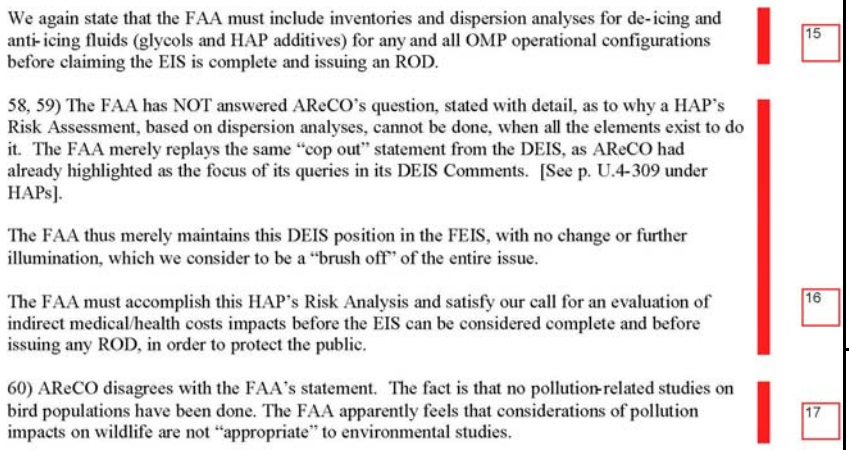
Comment	Response
13	See the previous page for the response to this comment.
14	First, mercury emissions from aircraft were assumed to be insignificant in the EIS, because measured mercury levels in jet fuel, as reported by Shumway, are below the detection limit of 1 ppb. Second, the commenter simply uses the wrong assumption when estimating mercury emissions from aircraft. The commenter erroneously relies on a USEPA mercury emission factor reported for stationary turbines which burn number 2 distillate fuel oil instead of jet fuel. Number 2 distillate fuel oil is a heavier fraction of petroleum than is jet fuel, and measured mercury levels in fuel oil are as high as 26 to 31 ppb. Thus mercury emissions from aircraft that burn jet fuel would have to be lower than the emissions from stationary turbines that burn number 2 distillate oil. Of note, mercury emissions from GSE, motor vehicles, and stationary sources such as the heating and refrigeration plant were included in the analysis based on available published emission factors and documented within the EIS and its supporting documentation. Of the 188 air pollutants identified by the USEPA as being hazardous, 65 were identified in the EIS as having the potential to be emitted by sources operating at and in the vicinity of O'Hare (including mercury emissions).
15	The FAA disagrees with the comment because the comment does not adequately consider the physical properties of propylene glycol, the component of de-icing fluid that is toxic. When compared to water, the other component of de-icing fluid, propylene glycol has a much lower tendency to evaporate. Its boiling point is 370 degrees Fahrenheit as compared to 212 degrees for water. In addition, the vapor pressure of propylene glycol is much lower than water, where at 25 degrees centigrade the vapor pressure of propylene glycol is about 0.1 mm Hg, and for water the vapor pressure is 24 mm Hg. Consequently the rate of evaporation of propylene glycol would be extremely small as compared to water. Although the de-icing liquid may be heated before applying it to aircraft, the maximum temperature would be well below the boiling point of propylene glycol. In addition, the temperature of the de-icing liquid would rapidly drop as it is applied to aircraft surfaces that are near or below freezing. Consequently, there would be little or no evaporation of propylene glycol from de-icing operations. Continued on the following page.



We again state that the FAA must include inventories and dispersion analyses for de-icing and anti-icing fluids (glycols and HAP additives) for any and all OMP operational configurations before claiming the EIS is complete and issuing an ROD. 15

58, 59) The FAA has NOT answered AReCO's question, stated with detail, as to why a HAP's Risk Assessment, based on dispersion analyses, cannot be done, when all the elements exist to do it. The FAA merely replays the same "cop out" statement from the DEIS, as AReCO had already highlighted as the focus of its queries in its DEIS Comments. [See p. U.4-309 under HAPs].

The FAA thus merely maintains this DEIS position in the FEIS, with no change or further illumination, which we consider to be a "brush off" of the entire issue.

The FAA must accomplish this HAP's Risk Analysis and satisfy our call for an evaluation of indirect medical/health costs impacts before the EIS can be considered complete and before issuing any ROD, in order to protect the public. 16

60) AReCO disagrees with the FAA's statement. The fact is that no pollution-related studies on bird populations have been done. The FAA apparently feels that considerations of pollution impacts on wildlife are not "appropriate" to environmental studies. 17

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Comment	Response
15 continued	The Material Safety Data Sheet (MSDS) for de-icing fluid, which is required to identify the hazardous components, does not report other toxic contaminants in the fluid. If any are present they would be at trace levels. Consequently evaporative emissions of other contaminants would be extremely small. Lastly, the air quality analysis that was performed to assess the OM was performed in close coordination and was reviewed by both the USEPA and the IEPA. The methodologies used to perform the analysis were discussed extensively with both agencies, and an agreed upon air quality analysis protocol was thereafter developed (see Appendix J.1 Air Quality Analysis Protocol – Criteria Air Pollutants of the Final EIS). This protocol includes detailed information of receptor placement, meteorological data to be used, and emission sources to be included in the analysis. In this regard, de-icing was considered an insignificant emission source with the O'Hare Title V Operating Permit, and thus, not included in the OM EIS analysis.
16	The FAA considered this issue throughout the EIS process and fully responded to this same comment on the DEIS (see page U.4-310 of the Final EIS). The FAA developed the HAPs Protocol for the 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 of the Final EIS, 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 the use of existing human health risk assessment protocols would not be scientifically sound nor defensible given the limitations of the existing modeling tools and critical input data. Specifically, the computer models typically used in human health risk assessment protocols are unable to accurately represent chemical reactivity during transport of airborne pollutants, and the assumptions prescribed for HAPs exposure from stationary sources are not directly transferable to mobile sources. Furthermore, critical data concerning the absence of HAP emissions data and the limitations of HAP speciation profiles for all types of aircraft engines (i.e., commercial jets, military, general aviation, and air taxi) do not exist.
17	The FAA responded to this same comment on the DEIS (see page U.4-311 of the Final EIS). Based on consultation with Federal and State wildlife officials, the FAA concludes that all appropriate project-related impacts on birds and other wildlife within the project study area have been adequately presented within the EIS.

Comment	Response
D1	The FAA disagrees with the commenter's assertion concerning "flaws and deficiencies" in the air quality evaluation of the OM. Further, the results of the analysis, predicted in areas where the public and others could conceivably be exposed to elevated levels of air pollutants at the corresponding averaging periods, indicate that the airport improvements would not cause or contribute to any new violations of any of the National Ambient Air Quality Standards, nor would improvements at O'Hare cause any delays in attainment of the air quality goals set forth in the applicable SIP.

Appendix D: Flawed/Missing Criteria Pollutant Dispersion Analysis

There are numerous flaws and deficiencies associated with the FAA's attempt to achieve the overall objective of characterizing and predicting atmospheric pollution content, resulting from airport emissions, in areas where people might be exposed to unacceptable levels of these pollutants that can create potential health and welfare dangers.

D1

BASICS

The purpose of this "tutorial" section is to provide reader context in order to better assess and judge the following DEIS criticisms/comments.

The primary objective of dispersion analysis is to translate emissions into atmospheric concentrations at various geographical locations, at some distance from the emissions source(s), under meteorological and other influences, such as emission and "receptor" altitudes, emission rise (due to elevated temperature), etc. Such analyses are in reality models and methods that largely attempt to simulate the meteorological transport mechanisms that influence emissions movement toward and dispersion during transport from source to receptor (a geographical point in the atmosphere, most often defined to be points where people are or may be present).

There are at least three categories of "people" that need to be included in such analysis: (1) exposure to the public beyond the airport boundary, (2) exposure to the public within airport boundaries, (3) exposure to airport workers (employees and non-employees) within the airport boundaries. In the latter case, airport/airline employees, contract workers, public safety, etc. workers operating within the active aircraft areas are of particular concern (e.g., fuelers, de-icers, baggage handlers, etc.) due to their close proximity and long term exposure working conditions.

Thus models need to be able to accurately (reasonably) simulate conditions over short (10's to hundreds of meters), medium (hundreds to few thousand meters) and longer distances (up to about 15,000 meters). This might result in the need for various models and various sets of historical meteorological data.

Such simulations also assume that the weather in the future, here perhaps 15 years from now, can be adequately characterized as being "the same as" a period from the past. This is of course open to speculation. Nonetheless, the analyst must choose some set of acceptable past data to apply to the model as the assumed future. Sometimes this selection is made on the basis of an attempt to characterize the data as "worst case" (i.e., such that its use has been demonstrated to

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result in worse case concentration predictions). Historical weather databases are generally obtained from the National Weather Service (NWS). D2

Emission sources are inventoried as to amount (e.g., grams/second, tons/year, etc.), horizontal and vertical locations and other parameters (e.g., plume rise parameters). Decisions are made as to how to characterize the sources in order to present them to the model, with key types being point, line, and area and volume sources. Since traditional dispersion models cannot deal with dynamic situations, sources are generally averaged over an hour's time. For example, emissions from planes using a given runway will be summed over each hour, then averaged to an emission rate of, say, X grams per second by dividing the sum by 60. D3

In the case of planes (and roadways), the normal approach would be to model them as line-sources by then taking the emission rate and spreading it uniformly over the planes travel paths, including airborne (both horizontal and vertical parameters), runways and taxiways locations. Where the resulting lines are actually curved (such as a takeoff path), line segments might be implemented to approximate the curve.

Parking lots and the like are often modeled as area or volume sources. Stationary sources are usually modeled as point sources, though a fixed location volume characterization might be useful in some cases as well. Stationary sources with elevated chimney outputs (e.g., heating plants, manufacturing facilities, etc.) generally need additional characterizations related to pollutant plume rise due to buoyant forces (high temperature) and exhaust output velocity. These chimney structures are generally designed to discharge the pollutants high in the air, such that they travel over nearby people locations and are reduced in concentration before reaching people locations on the ground or other places. D4

All of the input data is then supplied to the dispersion model "core" for analysis. Most of these cores use a Gauissian dispersion approach. (A visual helps here; e.g., consider a chimney with a visible plume of pollutants streaming out in a horizontal direction, as set by the horizontal wind, which has been blowing in the same direction for an extended period of time. If there were no vertical up and down winds, and no crosswinds, the plume would be seen as a constant thickness pencil line across the sky [much like upper atmosphere plane contrails]). But within the "mixing layer" close to earth (generally less than 1000 meters thick), there are considerable circulating up/down/cross winds induced by thermal heating of the earth's surface. These numerous, random circulations, characterized as atmospheric "instability", will cause the plume to widen with distance, becoming non-uniform in cross-sectional concentration, with the non-uniformity characterized as a Gauissian distribution…thus the "Gauissian" model. The degree of instability used in the analysis is normally determined for each hour by the pre-processor, or sometimes set at a fixed value (e.g., "neutral").

It is important to understand that such a Gauissian model first converts the point source into a horizontal line source with the line's emission rate over its length being inversely proportional to the assumed wind speed. For instance, a point source emission of 100 pounds per hour would, with a wind speed of 10mph, be converted into an infinitely thin line source of 10 pounds per hour per mile. Then the atmospheric instabilities would be applied to the line to cause it to

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Comment	Response
D2	The air quality analysis that was performed to assess the OM was performed in close coordination and was reviewed by both the USEPA and the IEPA. The methodologies used to perform the analysis were discussed with both agencies and an agreed upon air quality analysis protocol was developed (see Appendix J.1 Air Quality Analysis Protocol – Criteria Air Pollutants of the Final EIS). This protocol includes detailed information of receptor placement and meteorological data to be used in the analysis.
D3	The OM-related emission inventories and dispersion analysis were prepared/performed using the EDMS (use of the model was discussed with the USEPA and IEPA). EDMS contains algorithms that simulate point, line, and area (volume) sources of air pollutants. AReCO's comment erroneously states that "…emissions from planes using a given runway will be summed over each hour, then averaged to an emission rate of, say X grams per second by dividing the sum by 60." In point of fact, EDMS sums (for emission inventory purposes) and simulates (for dispersion purposes) aircraft-related emissions for each individual hour of each day of a simulated year.
D4	The following describes how EDMS assigns and models the various sources. Aircraft emissions occur on the taxiways, at the end of the active runways, and on the runways themselves, as a set of point sources along the line representing the taxiway and runway. These aircraft emissions also include airborne emissions within the approach, takeoff, and climbout operation modes. GSE emissions were simulated as a set of stationary point sources at each terminal apron area next to aircraft gate locations. Emissions from motor vehicles on the on- and off-Airport roadways were modeled as individual line sources. The motor vehicle emissions from terminal curbsides were modeled as line sources located next to the on-Airport roadways immediately in front of the various terminals. All parking lots, including the Passenger Parking Lots and the Employee Parking Lots in the service areas were modeled as area sources. Each level of parking garages was modeled individually as an elevated area source. The Heating and Refrigeration Plant stacks and training fires were modeled as point sources. The emission inventories and dispersion modeling analysis in the EIS air quality assessment were prepared using the FAA's Emissions and Dispersion Modeling System (EDMS-Version 4.12). Use of the EDMS is required by the FAA when evaluating airport-related emissions at civilian airports. The modeling methodologies, including the dispersion model to be used, were approved, as part of the air quality protocol, by IEPA and USEPA. The EDMS incorporates approved methodologies for characterizing the emissions and dispersion of air pollutants from point (stationary), area (parking lots), and line sources.

spread (disperse) with distance, and how much of this spread reaches the ground (or 6' above it) would be calculated along its length i.e. distance from the original point source.

Instability factor assessment within the simulator (the under-pinning mathematics) has advanced over the decades, but still is associated with restrictions on ranges of applicability. For example, if one plans on doing a dispersion analysis over a distance of ten miles, one must necessarily assume that the atmospheric stabilities determined at a single point, (e.g., O'Hare airport weather station), are unchanged over that entire distance. Alternately, the hourly instabilities could be actually characterized over that distance (area) through use of more extensive atmospheric data sets and/or use of expanded capability simulation models.

On the other hand, for very short distances, in complex physical environments, such as an airport, validity of the use of stability factors, perhaps determined for 10 meters and above, becomes questionable at best when dealing with near-ground sources and receptors (potential people locations). Conditions in a layer immediately above the earth might be even more unstable than higher up in the summer, due to ground heating (e.g., tarmac, and more stable in winter due to frigid and/or snow covered ground) [creating a low altitude inversion layer (i.e., gets warmer as altitude increases)]. The impact of these situations may not be too significant for long-term averages, such as a year, but could be very significant for short-term conditions (e.g., 1-24 hours).

It is clear that lower wind speeds increase the line source's "center line" concentration and that more stable atmospheric conditions will spread it less at a given distance. It is also clear that for any given point source above the ground (think chimney again), that ground level pollutant concentration will be near zero at the base of the chimney, will increase to a peak level at some distance from the chimney, then decrease farther on (all this assumes the simplistic case of a constant wind and stability condition over the distance being considered). Thus, it is incorrect to state that pollutant concentrations always decrease with distance.

Finally, the model core outputs all the hourly calculation data to a post-processor module that converts the numbers into averages over time, creates maps and documentation, etc. The post-processor may be a data base system (e.g., Microsoft Access or a spreadsheet program [e.g., Microsoft Excel, or combinations]). The key requirement here is accuracy of the information retrieval process. That is, one has to be confidant that the value returned for "maximum hourly carbon monoxide level" is indeed the maximum, etc.

The FAA's EDMS analysis system uses a Gauissian modeler core (AERMOD), as do many others, modernized to use a (vertical) probability density function for unstable conditions. It includes a meteorological pre-processor (AERMET), along with various databases and processing capabilities (e.g., handling of line sources via CALINE and mapping). EDMS/AERMOD also includes the capability to model building downwash (plume downwash effects downwind behind a source building) via PRIME.

More advanced modelers exist and are approved for use by the EPA, such as "puff" models like CALPUFF or specialized modelers like the Offshore and Coastal Dispersion Model (OCD). CALPUFF is often particularly useful. To quote the EPA (APPENDIX W TO PART 51—GUIDELINE ON

AIR QUALITY MODELS):

CALPUFF is a multi-layer, multi-species non-steady-state puff dispersion modeling system that simulates the effects of time- and space-varying meteorological conditions on pollutant transport, transformation, and removal. CALPUFF is intended for use on scales from tens of meters from a source to hundreds of kilometers. It includes algorithms for near-field effects such as building downwash, transitional buoyant and momentum plume rise, partial plume penetration, subgrid scale terrain and coastal interactions effects, and terrain impingement as well as longer range effects such as pollutant removal due to wet scavenging and dry deposition, chemical transformation, vertical wind shear, overwater transport, plume fumigation, and visibility effects of particulate matter concentrations.

(2) CALPUFF may also be used on a case-by- case basis if it can be demonstrated using the criteria in Section 3.2 that the model is more appropriate for the specific application. The purpose of choosing a modeling system like CALPUFF is to fully treat stagnation, wind reversals, and time and space variations of meteorology effects on transport and dispersion, as discussed in paragraph 8.2.8(a). D5

DEIS DISPERSION ANALYSIS FAILURES and DEFICIENCIES

** Failure to adequately characterize emission source quantities.
The emissions inventories shortfalls enumerated in Appendices B and C and other places, will cause inaccuracies in outputs, generally translating into understatements of any calculated pollutant concentrations (i.e., errors). D6

** Failure to analyze beyond airport "fence line".
Failure to promulgate the dispersion analysis beyond the airport boundaries (fence line) is just unacceptable. The analysis must go out to a minimum of at least a 5-mile radius around the airport boundaries (10 miles is preferred).
Justification that the fence line represents the "maximum" pollutant concentrations, without any supporting simulation evidence is unwarranted and unacceptable. In fact, pollutant concentrations can be higher at more distant points, especially if the emission sources are substantially elevated and/or close to the fence line (e.g., the north runway under light south winds).

**Failure to properly place receptors around the airport.
Receptors were apparently purposely placed on the airport "fence line" in most cases. Since major roads border the airport, this "conveniently" decreases maximum receptor values for some (many) conditions where roadway emissions are removed from receptor impact by wind directions (or where one chemical's concentration is diminished by another's).

For example, with a south wind, airport receptors along the north periphery would include effects from aircraft activity on the north runway, but would not include any effects from roadway traffic on the I-90 expressway. Those living in Des Plaines, just north of I-90 would be fooled into believing that the calculated receptor values approximately represented the levels of pollutant concentrations they would be exposed to. If the receptors were instead placed just north of I-90 (maybe a shift of only several hundred feet), they would now register much higher

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Comment	Response
D5	The emission inventories and dispersion modeling analysis in the EIS air quality assessment were prepared using the FAA's Emissions and Dispersion Modeling System (EDMS-Version 4.12). Use of this model is required by the FAA when evaluating airport-related emissions at civilian airports. The modeling methodologies, including the dispersion model to be used, were approved, as part of the air quality protocol, by IEPA and USEPA. The dispersion modeling analysis was supplemented by a post-processing methodology (a Microsoft Access database) that is consistent with industry practice. This methodology was used to identify the concentrations for each pollutant, for each pollutant's respective averaging time(s), at each of the receptors, for a source category (such as aircraft, motor vehicle, and construction) and the total Airport. In short, the post-processing takes the modeling output and adds the concentrations from each individual source category modeled. The concentrations at each receptor in the modeling network are needed to present a complete spatial picture of air quality impacts at each modeled location.
D6	The FAA disagrees that the air quality analysis fails to adequately characterize any of the O'Hare-related emission sources or emission source quantities. Further, because the analysis was performed using various assumptions that would produce conservatively high results, the FAA disagrees that the emission source quantities are understated. All significant airport-related sources were included in the OM evaluation. Finally, because the study area extended beyond the airport property line, non-airport-related sources were also evaluated. Finally, the emission sources included in the analysis were approved, as part of the air quality protocol, by IEPA and USEPA.

calculated values (southerly winds) due to the combined effects of the north runway (and all other airport activities south of there) and the I-90 traffic and the general prevailing winds for the summer months.

This appears to be a planned deception, since, supposedly, the emissions from roadway traffic are taken into consideration when calculating receptor values via dispersion analysis. ["The emission inventories include contributions from vehicles on major arterials in the vicinity of the airport." P. J-111]

Even more, the magnitude of the deception is not small, as exhibited by the fact that motor vehicles are stated to make major contributions to the total emissions inventories, for instance 15,589 tons per year of CO out of a total of 28,838 tons per year, for 2002 "base" conditions. [Table J.2-71, p. J-142]

Receptor placement in the near-airport area must be revised to be placed on both sides of the "major arterials" from the airport, and analyses rerun.

D7

**Failure to consider situations where pollutants are drawn into building ventilation systems. The "convenience" of terminating the dispersion analysis at the airport fence line obviates the need to consider situations where the pollutants are drawn into rooftop building ventilation systems, thereby exposing all of the occupants to potentially dangerous conditions. These buildings are of particular concern as they are usually multi-story and vulnerable to pollutants lofted into the air from the airport operations, such as from elevated chimney structures or airborne aircraft.

Office workers, etc. spend great parts of their time at their place of work (8-12 hours per day, everyday) and expect the building owner and their business management to provide a safe environment. The DEIS analysis does not validate such expectations.

Tourists and visitors staying in expensive hotels, such as the O'Hare Hilton on the airport property or in nearby Rosemont, and employees, expect a safe environment and therefore need to be assured that airport emissions entry will not compromise that safety. The DEIS analysis does not provide such assurance.

Multi-story apartment residents nearby, such as along River Road. in Schiller Park or just northeast of O'Hare, do not expect a hazardous atmosphere for their family (including young children, pregnant mothers, the elderly and other "sensitive" groups) when opening their windows for summertime ventilation. Yet the DEIS does not even address those expectations, let alone assuring safety.

The dispersion analyses must be re-run with additional receptors located coincident (horizontally and vertically) with key surrounding building ventilation intakes, including:

All airport terminals, airport located office buildings (e.g., U.S. P.S., etc.), O'Hare Hilton, Rosemont Hotels, the office building at Lawrence and Mannheim, and any other office building or hotel located within 5 miles of the airport perimeter.

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Comment	Response
D7	The pollutant concentrations presented in the Draft EIS and Final EIS are representative of the greatest estimated levels of pollutant concentrations (levels would decrease farther away from the airport property line). The results of the analysis indicated that at the property line, pollutant levels would be below the National Ambient Air Quality Standards. As such, pollutant concentrations attributable to the Airport and beyond the property line would also be below the standards. Notably, the results of the analysis can be considered conservative because they are based on conservative assumptions including background concentrations that are representative of the highest measured levels in the Chicago area (levels are likely lower in the vicinity of the O'Hare). The methodologies used to perform the analysis were discussed with both agencies and an agreed upon air quality analysis protocol was developed (see Appendix J.1 Air Quality Analysis Protocol – Criteria Air Pollutants of the Final EIS). This protocol includes detailed information on receptor placement and meteorological data to be used in the analysis.
D8	See the following page for the response to this comment.

Additionally, receptors must be located coincident with any multi-story apartment building within 5 miles of the airport perimeter. Each location must have receptors located vertically at the second floor height, as well as the top floor and building vertical mid-point (as one does not know, apriori, which height will experience the highest pollutant concentration level). D8

**Failure to analyze HAPs at all.
Limited Hazardous Air Pollutants (HAPs) are considered, documented and inventoried in endless pages (J-1 to J161) of the DEIS. Yet in the end, no dispersion analysis at all is done, even to the airport's fence line (which would seem, at minimum, of value to protect airport employees, especially those working outside on airport property). D9

**Questionable decision on "worst case" weather year.
The DEIS uses 1990 as the "worst-case" weather year, "…for the five-year period (1986-1990)…based on discussions with IEPA…" [p. J-155, Teleconference with IEPA, 11/22/02]. The DEIS does not clarify why or how 1990 was chosen as worst, though there is an implication that some dispersion analyses were run for those years in order to choose "worst". The DEIS also does not clarify why the period of 1986-1990 was chosen for examination as contrasted to, say 1986-2000.

Much of this DEIS is "borrowed" from the (now reincarnated as part of OMP) World Gateway project proposal, which was also under IEPA guidance. There, 1994-1999 was examined and 1995 was picked as the worst year, based on dispersion run screens. [WGP p. I-14] So is 1990 a "worst" year, or perhaps 1995, or maybe some other year, say 1993… D10

To complicate matters further, in order to run screening dispersion analyses to pick a worst year to use as the model for future characterizations, one logically must input the meteorological data for each year within the chosen range into the model. EDMS, being used for FAA analyses here, uses a weather pre-processor (AERMET) to ensure quality in the data finally submitted to the dispersion analyzer (AERMOD). Any deficiencies noted by the pre-processor are flagged to the analyst for correction. Human intervention here, though warranted, leaves open the possibility that a truly "bad" year for dispersion might be converted to a not-so-bad year for entering into the model. The DEIS must document any changes that were made to the (NWS) meteorological databases before entering into the dispersion model for analysis. [See also "Calms", below.]

**Failure to characterize "calms" meteorology (wind speed) situations and residual pollutant effects, which combined are usually the "worst-case" pollution scenarios, instead just disregarding them because of EDMS in capabilities. [See Appendix D1] A more capable modeler must be applied, such as CALPUFF.

**Probable mis-measurement determination of true "calms" conditions by the O'Hare weather station due to local wind disturbances from nearby landing/takeoff aircraft (i.e., makes it appear officially windier than it actually is in the airport area. D11

**Failure to consider building downwash and other structure effects; failure to adequately define the terminal roadways (curbsides) areas models.

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Comment	Response
D8	The mechanical ventilation systems in buildings re-circulate most (approximately 90 percent) of the indoor air with the balance (approximately 10 percent) coming from outdoors. This fact, in combination with the series of particulate traps, filters and moisture condensers that make up a ventilation system, results in levels of indoor air contaminants that are typically reduced over outdoor levels of the same pollutants. Buildings such as offices and hotels are also typically kept under a slight positive pressure so that outdoor air does not drift in through open doors, windows and other appurtenances. The methodologies used to perform the analysis were discussed with both USEPA and IEPA and an agreed upon air quality analysis protocol was developed (see Appendix J.1 Air Quality Analysis Protocol – Criteria Air Pollutants of the Final EIS). This protocol includes detailed information of receptor placement and meteorological data to be used in the analysis.
D9	The FAA disagrees that limited hazardous air pollutants were considered, documented, and inventoried. Of the 188 air pollutants identified by the USEPA as being hazardous, 65 were identified in the EIS as having the potential to be emitted by sources operating at and in the vicinity of O'Hare. One additional pollutant, diesel particulate matter, was also considered, documented, and inventoried. With respect to dispersion analysis of these pollutants, the FAA, USEPA, and IEPA collectively agree that given the absence of HAP emissions data and the limitation of HAP speciation profiles for commercial jet aircraft engines, an accurate emissions inventory (the first step in what would constitute a sound human health risk assessment) cannot be accomplished. In addition, substantial material on HAPs is provided in Appendix I.
D10	USEPA, in their Final EIS comment letter said, "Information was presented in the Final EIS to support the choice of 1990 as the worst case meteorological year for criteria pollutant dispersion modeling. Based on the information included in the Final EIS together with Illinois Environmental Protection Agency's (IEPA) involvement on this issue, we concur with your use of 1990 as the worst-case meteorological conditions for the five year period under consideration for this project."
D11	The emission inventories and dispersion modeling analysis in the EIS air quality assessment were prepared using the FAA's Emissions and Dispersion Modeling System (EDMS-Version 4.12). Use of this model is required by the FAA when evaluating airport-related emissions at civilian airports. The modeling methodologies and the dispersion model to be used (including EDMS's calm processing algorithms), were approved, as part of the air quality protocol, by IEPA and USEPA. No changes were made to the NWS meteorological databases (upper air and surface files) before entering the data into the dispersion model for analysis.
D12	The version of the EDMS (Version 4.12) that was available at the time the analysis for performed and used to perform the OM air quality analysis does not have the capability to incorporate consideration of building downwash.

The DEIS dispersion results today tend to show high(est) pollutant concentrations in the terminal curbside areas. These areas are located next to building structures, often in semi-enclosed environments. At a minimum, the DEIS must document exactly how these complex areas were physically modeled, along with any associated assumptions, either in the DEIS body or in reference EPA agreed-upon "protocols." This documentation must include whether or not EDMS building downwash modeling (PRIME) was implemented for any sources and which. D12

Additionally, the assumptions used to model the terminal area roadways (curbsides) are incomplete and suspect. The only information provided is that they "…were modeled as line sources located next to the on-Airport roadways immediately in front of the various terminals." "Next to" does not define how distant from the roadway centerline a line source was placed nor on which side of the centerline it was placed, both of which can make substantial differences in the calculated results (from vehicle emissions). Nor is it clarified as to exactly where the modeled receptors (R1-R8, 15 total) were placed.

Line source placement should be instead on the road centerlines for both upper and lower curbsides. The lower levels must be modeled, where physically appropriate, as two adjacent roadways, with a center island between them. Receptors must be placed on the pickup/dropoff areas adjacent to and, in the case of the lower levels, on the island between the two roadways. D13

Even given these modeling improvements, it is a matter of debate as to how accurate the EDMS dispersion analysis portrays the complex nature of these areas. There must be documentation included in the DEIS that clarifies the methods used. D14

**Failure to treat numerous, location shifting airport sources with statistical methods in order to properly assess risks. D15

Mobile airport emission sources are just that…mobile (i.e., they are in a constant state of moving around). The technically correct way to model this situation is to use a statistical approach, not the EDMS approach of trying to "average" everything. [See Appendix F] D16

**Failure to characterize airborne aircraft as airborne line sources.
The DEIS appears to not characterize airborne aircraft emissions, or if it does (which is a serious question here), does not place the emissions on a line-source trajectory, in order to then include as a source in the dispersion analysis, even if the trajectories are assumed "nominal" vs. real world spreads (note that most important trajectories, closer to airport, are reasonably well defined).

**Failure to document exactly how the aircraft airborne emissions were characterized as sources. Sometimes analysts take shortcuts and calculate aircraft airborne emissions but artificially place them in the model as point sources at the end of the runways (takeoff or landing ends). This can introduce errors in pollutant concentration results and should not be done except for special cases, and then well documented. D17

**Failure to distribute aircraft on runways/taxiways as line sources.

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Comment	Response
D12	See the previous page for the response to this comment.
D13	The FAA disagrees that the assumptions used to model the terminal area roadways (or any other sources in the study) are incomplete or suspect. In addition to all of the documentation provided in Appendix J (Air Quality) of the EIS, all of the EDMS input and output files have been available for review and comment. As AReCO was informed previously, the FAA has been proactive in making information available to the public through various means, including positing documents on a publicly accessible website and placing copies of key documents in local public libraries. Further, as stated in our letters to Mr. Jack Saporito, the Executive Director of AReCO (April 25, 2005 and May 24, 2005), all information that AReCO has requested has been available through these means. Additionally, with transmittal of the FAA's May 24, 2005 letter to AReCO were enclosed electronic media (a full set of DVDs), including the EDMS input files. These EDMS input files, the files that specify the location of and method of modeling the terminal area roadways, have also been and are available on FAA's website. As discussed in Appendix J (Air Quality, Sections J.1 (Air Quality Analysis Protocol - Criteria Air Pollutants) and J.2 (Technical Memorandum)) EDMS simulates aircraft emissions on taxiways, at the end of the active runways, and on the runways themselves, as a set of point sources along the line representing the taxiway and runway. These aircraft emissions also include airborne emissions within the approach, takeoff, and climbout operation modes. GSE emissions were simulated as a set of stationary point sources at each terminal apron area next to aircraft gate locations. Emissions from motor vehicles on the on- and off-Airport roadways are modeled as individual line sources. The motor vehicle emissions from terminal curbsides were modeled as line sources located next to the on-Airport roadways immediately in front of the various terminals. All parking lots, including the passenger parking lots and the employee parking lots in the service areas were modeled as area sources. Each level of each parking garage was modeled individually as an elevated area source (except for the ground level of each garage). The heating and refrigeration plant stacks and training fires were modeled as point sources.
D14	The EIS, the supplemental information provided by the FAA at publicly available locations, and publicly available information regarding the EDMS contain more than sufficient documentation to determine 1) the accuracy of the EDMS and 2) the methodologies/assumptions used in the analysis. The emission inventories and dispersion modeling analysis in the EIS air quality assessment were prepared using the FAA's Emissions and Dispersion Modeling System (EDMS-Version 4.12). Use of this model is required by the FAA when evaluating airport-related emissions at civilian airports.
D15	The FAA disagrees that the air quality analysis failed to evaluate the difference in location of any of the airport-related sources with the OM improvements.
D16, D17	See the following page for the response to these comments.

The DEIS indicates that:

"Aircraft emissions occur on the taxiways, at the end of the active runways, and on the runways themselves. These emissions were simulated as a set of stationary point sources at each terminal apron area next to aircraft gate locations." [p. J-151]

Though this may have provided simplification for the analyst, or was done as an artifice to allow "worst-case" analysis of the aircraft emissions on terminal areas, it is basically wrong. D18

This act will result in a reduction of modeled emissions concentrations in some areas (i.e., in proximity to where the emissions actually occurred). For example, artificially moving all of the proposed north runway emissions to the center of the airport (apron areas) will substantially reduce the calculated effects in Des Plaines under south wind conditions (i.e., the runway source is now [artificially] much farther away). Another example might be locations where planes actually taxi by or queue up in a takeoff waiting line now have (artificially again) these sources moved to more distant locations. D19

Furthermore, consolidating more distant aircraft line sources much closer to receptors (e.g., terminal curbsides) can actually cause a reduction in the calculated receptor concentrations. Consider a simple example: a distant, say 1600 meters, point source is directly upwind from a receptor, but offset 100 meters. A substantial amount of the source pollutants will arrive at the receptor due to horizontal dispersion as the pollutants move towards it. Now place the same source, say, and 200 meters directly upwind from the receptor and again 100 meters offset. Very little of the pollutant will reach the receptor as the source "plume" has little horizontal spread at the receptor's location.

This simplifying approach should not have been taken. If run as a separate "worst-case" analysis, great care must be taken as to artificial source consolidation locations and wind directions. [Ideally, several artificial source location alternatives should be test-runned, with variable direction winds to determine "worst-case".] D20

**Failure to publish methods used to determine annual averages of simulated results, from which the "highest" was picked.
It is not clear whether EDMS automation or analyst manual methods of determining 3 hour, 8 hour, 24 hour and yearly averages are done in exactly the proper fashion proscribed by the EPA in setting the various pollutant concentration regulatory limits.

For example, one of the CO limits is an 8-hour average. Was that determined in EDMS for 3 discrete 8-hour periods in the days, or several overlapping 8-hour periods, or by some form of moving average? And how does that method compare to EPA methods requirements? D21

This must be well documented.

**Failure to do second level analyses that clarify and state what the major source was behind any high receptor values, even if not, by current calculations, in exceedance of limits.

Such analysis is required in order to (a) assess what are actually the "drivers" of the high numbers, (b) to allow judgment of viability and sensitivity and, (c) to allow consideration of possible mitigation methods, including airport design changes. It is critical to situational

Comment	Response
D16	See responses to AReCO's Appendix F comments.
D17	EDMS simulates aircraft emissions on taxiways, at the end of the active runways, and on the runways themselves, as a set of point sources along the line representing the taxiway and runway. These aircraft emissions also include airborne emissions within the approach, takeoff, and climbout operation modes. The emission inventories and dispersion modeling analysis in the EIS air quality assessment were prepared using the FAA's Emissions and Dispersion Modeling System (EDMS-Version 4.12). Use of this model is required by the FAA when evaluating airport-related emissions at civilian airports.
D18	EDMS simulates aircraft emissions on taxiways, at the end of the active runways, and on the runways themselves, as a set of point sources along the line representing the taxiway and runway. These aircraft emissions also include airborne emissions within the approach, takeoff, and climbout operation modes.
D19	The air pollutant sources were not "moved artificially". Each source (including runways and taxiways) was input into the model appropriately and each source is in the appropriate location within each evaluated scenario. EDMS simulates aircraft emissions on taxiways, at the end of the active runways, and on the runways themselves, as a set of point sources along the line representing the taxiway and runway. These aircraft emissions also include airborne emissions within the approach, takeoff, and climbout operation modes.
D20	The air pollutant sources were modeled appropriately and each source was modeled in its appropriate location within each evaluated scenario. EDMS simulates aircraft emissions on taxiways, at the end of the active runways, and on the runways themselves, as a set of point sources along the line representing the taxiway and runway. These aircraft emissions also include airborne emissions within the approach, takeoff, and climbout operation modes.
D21	The dispersion modeling analysis was supplemented by a post-processing methodology (a Microsoft Access database), consistent with industry practice. This methodology was used to identify the concentrations for each pollutant, for each pollutant's respective averaging time(s), at each of the receptors, for a source category (such as aircraft, motor vehicle, and construction) and the total Airport. In short, the post-processing simply takes the modeling output and adds the concentrations from each individual source category modeled. The modeling output, as determined by EDMS and its automated methods for determining concentration at all averaging periods were used. The emission inventories and dispersion modeling analysis in the EIS air quality assessment were prepared using the FAA's Emissions and Dispersion Modeling System (EDMS-Version 4.12). Use of this model is required by the FAA when evaluating airport-related emissions at civilian airports.

understanding to be able to quantify the relative source contributions to any receptor location for the various pollution sources in the analysis. Without this characterization, one is totally unable to understand, for example, what the major CO contributor to curbside conditions is. Is it primarily vehicles, or aircraft/GSE, or a nearby heating/refrigeration plant, or ?

D22

Comment	Response
D22	A second level of analysis is not necessary to determine what source contributes the most to any of the reported values nor is it relevant to the analysis because the purpose of the analysis was not to identify specific sources, it was to evaluate whether or not air pollutant levels would exceed the National Ambient Air Quality Standards and whether or not emission totals of volatile organic compounds and nitrogen oxides were accounted for in the IEPA's SIP. There was no need to evaluate mitigation methods as such, because the modeling indicates that no National Ambient Air Quality Standards would be exceeded.

Appendix D1: Slight Of Hand…How the potentially highest predicted pollutant concentrations "disappear"!

CALMS

Question: When is pollution really bad? When the weather is "calm". This generally means, as most who live in major urban areas know, when the wind speed goes to zero, or close to it, especially if it stays that way for hours (or days). So one would of course expect that a dispersion modeler, such as EDMS, would indeed predict the highest levels of pollutant concentrations to occur during hours of the year that are defined as "calm." You would be sorely disappointed!

The reason is that all hours of the year that are defined as "calm"…get discarded!

Yes, it's true. The dispersion analysis core modeler (AERMOD) in EDMS, like most "Gauissian" models, is incapable of doing its job when the wind speed is defined as "calm", so when it encounters a "calm" wind speed in the meteorological file sent to it, it marks the calculated pollutant concentration as zero and sets a flag in the output file to let the analyst know.

The "calm" definition comes to AERMOD from the EDMS meteorological preprocessor (AERMET), which gets its input from a historical National Weather Service (NWS) file. Now it gets a little worse.

The NWS measures wind speed with an instrument that has a threshold speed measurement capability, usually in the range of range of 0.5-1.0 m/s. But the NWS theoretically never reports lower than 0.5 m/s, so even if a file shows a speed of, say, 0.3 m/s, it is set to 0.5 by AERMET. [This is believed to be the case…older modelers (e.g., ISC set the speed to 1.0 m/s).]

> …This condition is not likely to occur since the minimum wind speed reported by NWS is 1 knot (about 0.5 m/s), excluding calm winds. … [Ref. AERMET Users Guide]

What happens if the NWS reports that the wind was "calm" for 8 hours in a row? That's correct, it all gets marked as "zero"/flagged!

Now, if a few hours of what would have been high readings get set to zero concentration and some 8760 hours (a year) of concentration calculations are being averaged to calculate a yearly average number, not a big impact. But what about averages over 24 hours (PM2.5, PM10, SO2) or 8 hours (ozone, CO) or 3 hours (SO2) or… 1 hour (i.e., "that hour" [ozone, CO])? Then it makes a big potential difference!

How this is handled is explained in the "calms-processing routine", demonstrated in these references:

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APPENDIX W TO PART 51—GUIDELINE ON AIR QUALITY MODELS
9.3.4 Treatment of Near-calms and Calms
9.3.4.1 Discussion
a. Treatment of calm or light and variable wind poses a special
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D1-1

Comment	Response
D1-1	The emission inventories and dispersion modeling analysis in the EIS air quality assessment were prepared using the FAA's Emissions and Dispersion Modeling System (EDMS-Version 4.12). Use of the EDMS is required by the FAA when evaluating airport-related emissions at civilian airports. The modeling methodologies, including the dispersion model, were approved, as part of the air quality protocol, by IEPA and USEPA. EDMS does incorporate a Gaussian plume model. The commenter's position related to calms is noted, however, FAA understands both the potentials and limitations of the model and believes that it is the best available tool for this purpose. In point of fact, as stated in *Appendix W to Part 51, the Guideline on Air Quality Models* (and cited by the commenter) "concentrations [using a Gaussian model] may become unrealistically large when wind speeds less than 1 m/s [meter per second] are input…". *The Guideline on Air Quality Models* further states "[h]ourly concentrations calculated with steady-state Gaussian plume models using calms must not be considered valid; the wind and concentration estimates for these hours must be disregarded and considered to be missing". These guidelines cited by the commenter regarding the methods used to provide average concentrations demonstrate that the air quality analysis was performed following approved procedures. Furthermore, contrary to the commenter's supposition, the 1990 (the year of the 5 years evaluated resulting in the highest predicted pollutant concentrations) meteorological data shows that calm periods prevailed only approximately 2% of the time.

problem in model applications since steady-state Gauissian plume models assume that concentration is inversely proportional to wind speed. Furthermore, concentrations may become unrealistically large when wind speeds less than 1 m/s are input to the model. Procedures have been developed to prevent the occurrence of overly conservative concentration estimates during periods of calms. These procedures acknowledge that a steady-state Gauissian plume model does not apply during calm conditions, and that our knowledge of wind patterns and plume behavior during these conditions does not, at present, permit the development of a better technique. Therefore, the procedures disregard hours which are identified as calm. The hour is treated as missing and a convention for handling missing hours is recommended.

9.3.4.2 Recommendations

a. Hourly concentrations calculated with steady-state Gaussian plume models using calms must not be considered valid; the wind and concentration estimates for these hours must be disregarded and considered to be missing. Critical concentrations for 3- , 8- , and 24-hour averages must be calculated by dividing the sum of the hourly concentrations for the period by the number of valid or non-missing hours. If the total number of valid hours is less than 18 for 24- hour averages, less than 6 for 8-hour averages or less than 3 for 3-hour averages, the total concentration must be divided by 18 for the 24-hour average, 6 for the 8-hour average and 3 for the 3-hour average. For annual averages, the sum of all valid hourly concentrations is divided by the number of noncalm hours during the year. For models listed in Appendix A, a post-processor computer program, CALMPRO114 has been prepared, is available on the SCRAM Internet Web site (subsection 2.3), and must be used. b. Stagnant conditions that include extended periods of calms often produce high concentrations over wide areas for relatively long averaging periods. The standard steadystate Gaussian plume models are often not applicable to such situations. When stagnation conditions are of concern, other modeling techniques should be considered on a case-by-case basis (see also subsection 8.2.8). c. When used in steady-state Gaussian plume models, measured site specific wind speeds of less than 1 m/s but higher than the response threshold of the instrument should be input as 1 m/s; the corresponding wind direction must also be input. Wind observations below the response threshold of the instrument be set to zero, with the input file in ASCII format. In all cases involving steady-state Gaussian plume models, calm hours must be treated as missing, and concentrations must be calculated as in paragraph (a) of this subsection. [40 CFR Ch. I (7-1-03 Edition) Pt. 51, App. W] {Emphasis added…Ed]

"When calm wind conditions are encountered, AERMET does not perform any computations and inserts missing data indicators into the output files for the boundary layer parameters... [Ref. AERMET Users Guide]

The AERMOD model uses the same routines for processing calm hours as ISCST3, namely, hourly concentrations are not considered valid and are treated as missing, and concentrations for 3-, 8-, and 24-hour averages are calculated by dividing the sum of the hourly concentrations for the period by the number of valid (non-calm) hours. If the total number of valid hours is less than 18 for 24-hour averages, less than 6 for 8-hour averages or less than 3 for 3-hour averages, then the total concentration is divided by 18 for the 24-hour average, 6 for the 8-hour average and 3 for the 3-hour average. For annual averages, the sum of all valid hourly concentrations is divided by the number of non-calm hours during the year. However, the NOCALM option available in ISCST3, which models the calm hour by setting the wind speed to 1.0 m/s, is not available in AERMOD, since AERMOD uses a full profile of wind speeds, and is considered valid for cases when the wind speed is below 1.0 m/s but above the instrument threshold. A calm hour in AERMOD is identified by a reference wind speed of 0.0 m/s in the surface meteorological data file generated by AERMET. [Ref. http://home.pes.com/aerfaqs.htm]

…This condition is not likely to occur since the minimum wind speed reported by NWS is 1 knot (about 0.5 m/s), excluding calm winds. … [Ref. AERMET Users Guide]

It is notable that no mention of "1-hour average" is made here, as there is no such thing (i.e., the minimum period is one hour).[1] Thus, in say a 24 hour period, where there was perhaps 8 calm hours, there is now 16 hours of valid data and 8 hours of invalid (to be not counted). Similarly, if a given year (8760 hours) is picked as the "worst case" for use in predicting the highest levels of CO, the perhaps 760 "calm" hours of concentrated pollution would be discarded and the only the highest calculated value from the remaining 8000 hours would be reported! Think about that when considering the CO limit requirement which is, "not to be exceeded more than once each year"! The top 760 probables were just tossed.

D1-1

RESIDUALS

Another "quirk" of modelers such as EDMS is that they inherently assume that no residual pollutant concentrations from emission sources exist from hour to hour. That is, each hour of analysis assumes that the location being considered (a grid point) was pure, clean air that then is polluted by the calculated emission source(s) impact. ["Background" concentrations are added in later.]

This is a reasonable approximation as long as the wind speed is not small/zero and doesn't reverse direction, as any pollutants that move into an area (say a cubic meter around your head) are offset by removal of pollutants due to the same wind that brought in the new ones. But what

[1] Though vector addition of winds might be done within the hour in order to calculate the 1-hour number.

if happens in a relatively "calm" condition where wind speed is near zero and the direction meanders back and forth under the influence of local conditions (e.g., thermals, passing vehicles, etc?). The pollutants from the first hour are still there in the second hour…and perhaps the third, fourth, etc.

These residuals, combined with the calm conditions, cause a gradual buildup of pollutant concentrations not characterized at all by EDMS (since it doesn't handle "calms" in the first place). Residual effects can also be realized in an area even for non-zero speed wind reversals or meanders. These situations are typical of conditions of "stagnation" that can occur in all seasons, typically due to the influence of relatively non-moving high pressure centers that park themselves over an area for an extended period, and the typical dispersion modeler does not work for these conditions, which indeed are usually the "worst case" scenarios (where people sicken and die).

D1-2

Comment	Response
D1-2	The background concentrations used in the OM air quality analysis were obtained from the IEPA and represent actual measured (recorded) levels of each air pollutant. As such, the background concentrations include "residual" emissions. Secondly, adding the background (maximum measured values) provides a further conservative estimate of the total concentration, because the actual background concentration is typically less than the maximum measured value.

Appendix E: Missing HAPs Dispersion Analysis

AReCO first expresses fundamental disagreements with the implied "what HAPs problems?" conclusions related to the DEIS section 1.2.1 [p. I-126] "IEPA's Chicago O'Hare Airport Air Toxic Monitoring Program". These disagreements and comments are captured in a requested critique of that report* and have been in the public eye (www.areco.org) for more than 2 years and the FAA is derelict in not providing that critique document in the DEIS.

{*TECHNICAL NOTE Date: Tue, 04 Jun 2002 [Revised 9/21/02]
Comments on IEPA "Final Report, Chicago O'Hare Airport Air Toxic Monitoring Program"}

The critique in entirety is included here as Appendix K and should be addressed by the FAA/EPA.

Inexplicably, there were no HAPs dispersion analyses done for the DEIS. This is even more mind-boggling since the DEIS quotes the recent past Oakland Airport (OAK) as a key reference (see appendix I, p.I-41), and OAK in-fact ran HAPs dispersion analyses! (The question again arises; is someone trying to cover-up?)

Nothing more can be said than it needs to be done and it needs to be modeled out to a distance that is sufficient to guarantee no problems in populated or public-use areas. A 10-mile distance from the airport boundary is recommended.

As with Criteria pollutants, there are at least three areas that need to be included in the analysis: (1) exposure to the public beyond the airport boundary, (2) exposure to the public within airport boundaries, (3) exposure to airport workers (employees and non-employees) within the airport boundaries. In the latter case, airport/airline employees, contract workers, public safety, etc. workers operating within the active aircraft areas are of particular concern (e.g., fuelers, de-icers, baggage handlers, etc.) due to their close proximity and long term exposure working conditions.

In addition to analyzing the impact of the specific HAPs emissions discussed in Appendix I (but not, again inexplicably, in the main body (e.g., associated with Air Quality), critical attention must be paid to personnel and public exposures to vaporized ethylene/propylene glycols from de-icing/anti-icing fluids and, importantly, to the HAPs contained therein, as the many "additives" included in these solutions. While normal temperature evaporation of these fluids is minimal, the de-icing and anti-icing processes heat the fluids to relatively high temperatures (180 degrees F) and vaporization is significant. Further, ethylene glycol gas is lighter than air, increasing its ability to maintain itself within the local atmospheric environment.

The FAA may defend a position of not addressing these HAPs by claims that the additive chemicals are manufacturer's "company secrets". This "don't know, can't tell" position is ridiculous, particularly given that the FAA's main charter is "safety" for the air transportation system and passengers (we assume that includes airport workers as well). [AReCO has sued the airports on this issue in the past and many of the chemicals we exposed under discovery are now public knowledge; the FAA and EPA are fully aware of said chemicals, as they were our co-plaintiffs in one of our lawsuits.]

The glycols and additives must be defined, both in content and in source emission rates, as part of the overall HAPs emission inventory, then analyzed for impact along with the rest by

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E1

E2

Comment	Response
E1	The FAA disagrees that it is derelict in not including AReCO's critique of the IEPA's report entitled "Chicago O'Hare Airport Air Toxic Monitoring Program in the EIS. The FAA notes the commenter's reference to an AReCO critique of the IEPA study, and FAA believes that any response should come from IEPA. The FAA assumes that Appendix K referred to by the commenter is Appendix K of their April 6, 2005 comments on the Draft EIS which was not resubmitted as a comment on the Final EIS.
E2	Please see response to comment 16. Additionally, while a human health risk assessment was provided in the LAX EIS, the assessment was provided because of State requirements mandating such coverage. It should also be noted that air quality criteria for a variety of HAPs exist in California, but not in Illinois.
E3	See the following page for the response to this comment.

Comment	Response
E3	Please see response to comment 15.

dispersion analyses. Also, dispersion to the atmosphere due to runoff from aircraft leaving the ground must be included in the analyses.

E4

Appendix F: Proper statistical analysis methods for airport related dispersion analyses conclusions.

Mobile airport emission sources are just that…mobile (i.e., they are in a constant state of moving around. The technically correct way to model this situation is to use a statistical approach instead of the typical (EDMS) approach of trying to "average" everything. The source types are "averaged", their emission rates are "averaged", their locations are fixed at "average" choices, meteorological conditions are "averaged", etc. Past a certain point it becomes doubtful what the end result of subsequent dispersion analysis means, other than some kind of ill-defined "average". The problem here is that even a calculated "highest concentration value" of a pollutant at a given receptor is, in fact, then not the highest!

That is, all "averages" must be accompanied by some distribution description, such as a "sigma" associated with the average/mean. For instance, assume a calculated "highest value" of 1.0 was associated with a "normal" distribution, with a sigma 0.2.

Then it could be said that the "highest value" would be exceeded approximately 50% of the time or, alternately, that one is only 50% confident that the "highest value" is indeed the highest value. Consulting standard statistical tables, one could also state that one is 84% confident that the highest value is less than (mean + one sigma) 1.2, 95% confident that it's less than (mean + 1.65 sigma) 1.33 and 98% confident that it's less than (mean + 2.05 sigma) 1.41.

Since the EPA and others would consider a 98-percentile conclusion to be acceptable, the real "highest value" must be stated as 1.41, with 98% confidence.

The average of the average of the average…approach to analysis was often taken in decades past because of computational limitations, since the statistical approach requires making numerous simulation runs, each time changing the parameters in random fashions (with some range for each source here). EDMS was itself originally designed for "IBM PC's" running DOS, which in comparison to today's affordable PC's (e.g., 2GHz Pentium) would be equivalent to still flying on post-WWII prop planes. Thus, any rationalization that proper statistical analysis approaches cannot be accomplished today is totally without merit.

Appendix H: FAA "Mandated" EDMS Modeler Not Validated

"Validation" in the strictest sense means that sufficient testing of observed versus predicted values has been done in order to determine that the subject simulator, or "modeler", "does what it is supposed to do, under the conditions and within the limits it is designed for, and does it accurately".

Determining the degree of accuracy is always a main validation objective. From a scientific perspective, +/-10% would be considered reasonably accurate in this category of prediction. However, when it comes to the regulatory aspect of protecting human health and welfare, "accurately" means that the predicted values of pollutant concentrations should always be greater than what will be actually observed. That is, +/-10% is unacceptable but +10-20% error is acceptable. [Obviously +100-125% still protects the public, but it is excessive in error and might be considered "inaccurate".]

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Comment	Response
Appendix F/H	As noted in previous responses, the emission inventories and dispersion modeling analysis in the EIS air quality assessment were prepared using the FAA's Emissions and Dispersion Modeling System (EDMS-Version 4.12). Use of this model is required by the FAA when evaluating airport-related emissions at civilian airports and military air bases. The model was developed by the FAA in cooperation with the United States Air Force. The modeling methodologies, including the dispersion model to be used, were approved, as part of the air quality protocol, by IEPA and USEPA.

A modeler that is inaccurate in the regulatory sense might have its fundamental codes modified, or have additional limits placed on its use, or have procedural changes made, all to increase its accuracy to an acceptable degree. This is not a simple task when dealing with complex application environments, as it is necessary to determine exactly why the inaccuracy exists in order to fix it with confidence.

The FAA's current version of its "mandated" EDMS airport pollution simulator has never been validated as to operational predictability and accuracy for the relatively short distances, complex infrastructure, and complex emission sources, such as aircraft, associated with today's airports. This is obviously necessary before any conclusions of airport dispersion analyses could be considered…valid.

A program to do just this was initiated at the United States Department of Transportation/Volpe Center in 2001, using CO measurements/observations to compare to the predictions of EDMS (v. 4.1). Unfortunately, though the gathering of all data was accomplished in January 2002, only an interim report was published in 4/03 (modified 6/03), said report containing no results of comparisons of measured/observed vs. predicted. [See paper extracts below.]

AReCO believes the now three-year wait for results publishing means that, in fact, good correlation and thus validation was not demonstrated. If we are wrong, the DEIS must be re-issued with a copy of a final results version published to demonstrate that.

Another, but similar reason for not publishing (lack of?) validation results, is that these possibly negative results may have been fed back to the EDMS scientists in order to modify EDMS to move it toward improved accuracy. For example, EDMS v.4.1, used for this analysis, was released on Oct. 2002, according to the FAA's web site. Subsequently, v.4.1.2 was released in Oct. 2003, carrying significant GSE emissions changes and aircraft engine default changes. Then v.4.2 was released in Sept. 2004, with PM2.5 capabilities added (but not for aircraft), improved modeling for multi-level parking lots and allowing identification and locations of each airport building (affecting point-source plume modeling (e.g., "downwash"). Of course, this scenario leaves us still with the fact that no published validation exists for EDMS v.4.1.2, which was used for DEIS analyses.

Validation of FAA's Emissions and Dispersion Modeling System (EDMS): Carbon Monoxide Study Paper # 69607 {Published 4/2003, Emphasis added….Ed.}

ABSTRACT

Air quality at airports has received substantial attention in recent years. In a 2000 report by the U.S. General Accounting Office (GAO), air quality was cited as the number two environmental concern (after noise) by the 50 busiest airports in the United States.[1] Accurate air quality models are needed to properly analyze air pollution in the vicinity of airports, develop appropriate mitigation and policies, and to plan for increased growth. The FAA's Office of Environment and Energy (FAA/AEE) and the Environmental Measurement and Modeling Division at the United States Department of Transportation's John A. Volpe National Transportation Systems Center (Volpe Center) are engaged in a multi-year validation effort of FAA/AEE's Emissions and Dispersion Modeling System (EDMS). EDMS is the FAA required tool for assessing aviation emissions and concentrations near airports. A systematic validation effort is needed to assess the

accuracy of the model and identify any needed refinements.

This study involved the measurement of carbon monoxide (CO) concentrations at 25 locations at a major U.S. international airport. In addition to the CO measurements, a detailed accounting of all related airside and landside activity was also done. This additional data included aircraft types and runways, ground support equipment activity, auxiliary power unit activity, roadway and parking lot traffic activities, stationary sources, and meteorological data.

The airside and landside data are currently being input to EDMS. EDMS-predicted concentration levels will then be compared with measured concentrations, and a detailed statistical assessment of the AERMOD dispersion algorithm within the model will be conducted. As such the information contained in this report is interim, with more detailed results to follow.

Excerpt-------

As background information, EDMS was developed in the mid-1980s as a complex source microcomputer model (i.e., multiple air pollution sources at an airport) to assess the air quality impacts of proposed airport development projects. EDMS is designed to assess the air quality impacts of aircraft, auxiliary power units, ground support equipment, stationary sources, fueling operations, motor vehicles, and training fires. The model uses the latest aircraft engine emission factors from the International Civil Aviation Organization (ICAO) Engine Exhaust Emissions Data Bank[2], vehicle emission factors from the Environmental Protection Agency's (EPA) MOBILE5a[3], and stationary source/fueling emission factors from AP-42.[4] Since 1993, EDMS has been an EPA "Preferred Guideline" model for use in civil airports and military air bases. In 1998, the FAA revised its policy on air quality modeling procedures to identify EDMS as the required model to perform air quality analyses for aviation sources. This revised policy ensures the consistency and quality of aviation analyses performed for the FAA.

In response to the need for increased accuracy and flexibility by the air quality analysis community, the FAA, in cooperation with the United States Air Force (USAF), reengineered and enhanced EDMS in 1997 and released Version 3.0.[5] The FAA has continued to improve EDMS. To take advantage of new data and algorithm developments, the FAA released Version 4.0 in May 2001. EDMS 4.0 was developed under the guidance of a government/industry advisory board composed of experts from the scientific, environmental policy, and analysis fields.

A primary enhancement of the Version 4.0 release of EDMS was the incorporation of the EPA's next-generation dispersion model, AERMOD[6,7]. The manner in which AERMOD is used in EDMS is based on guidance from the American Meteorological Society/EPA Regulatory Model Improvement Committee (AERMIC), which is responsible for developing AERMOD and introducing state-of-the-art modeling concepts into the EPA's local-scale air quality models. In theory, the incorporation of AERMOD should result in substantial improvements in EDMS accuracy, but validation using appropriate field measured data is desirable to substantiate this assumption and refine the manner in which airport emission sources are characterized using AERMOD. Although AERMOD has been validated for stationary sources, the dispersion algorithms of AERMOD have not been validated with regard to the many and varied sources found at an airport, particularly aircraft. Complete sets of data, including measured concentrations and

associated operational data are lacking.
Because AERMOD, the emission calculation procedures, and the emission factors used in EDMS are well established and EPA developed and/or recommended, the purpose of this study is not to evaluate these parts of the analysis process. Rather, the manner in which AERMOD is being used to characterize dispersion from airport sources is being evaluated and quantified so that FAA can refine how AERMOD is applied in EDMS to model airport sources. This evaluation is needed because there is no official EPA guidance on how AERMOD should be used to model airport sources, (e.g., should aircraft be modeled as an area or a volume source). EPA has given FAA guidance on applying AERMOD in EDMS, but in an effort to maximize model accuracy FAA is evaluating EPA's guidance and will refine the source characterization where possible.

CONCLUSIONS
A substantial database has been assembled. It includes CO concentrations for eighteen, one-hour periods from January 8th to January 10th, 2003. The database also includes a detailed quantification of both airside and landside activity at the airport during the entire measurement period. Over the coming months, **[three years ago…Ed.]** these data will be utilized to assess the performance of the AERMOD dispersion algorithm recently incorporated into FAA's EDMS. As deemed necessary, enhancement to AERMOD and/or recommendations on its use within the context of EDMS will be documented in a final comprehensive report, which will be made available to the modeling community. Final results of the study will be available on the FAA website at www.faa.gov.

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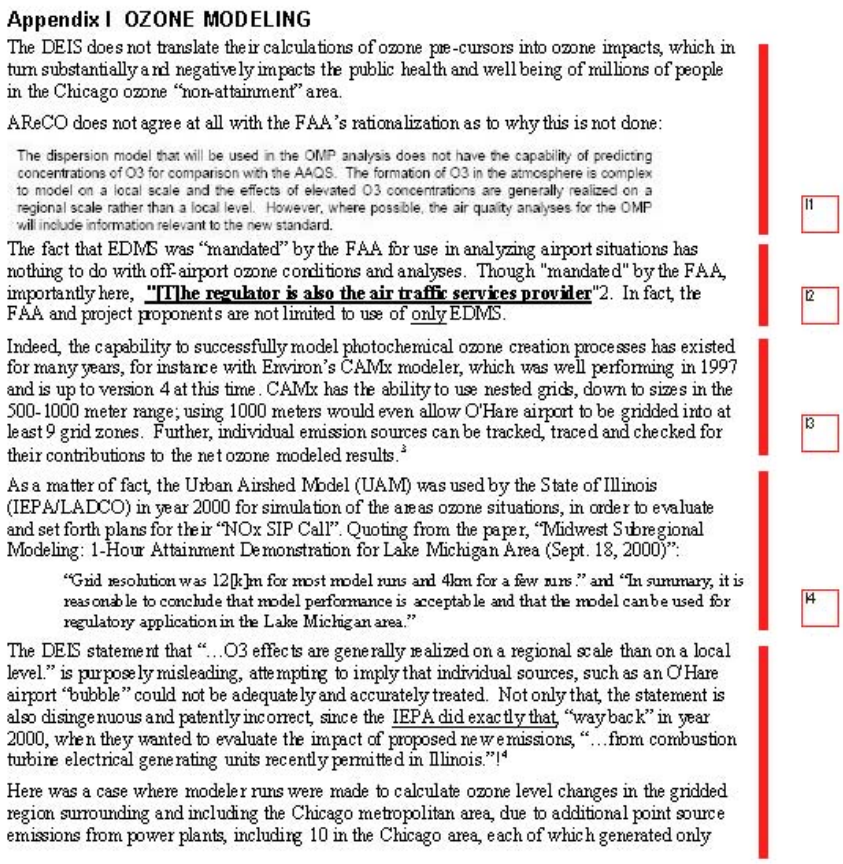

Appendix I OZONE MODELING

The DEIS does not translate their calculations of ozone pre-cursors into ozone impacts, which in turn substantially and negatively impacts the public health and well being of millions of people in the Chicago ozone "non-attainment" area.

AReCO does not agree at all with the FAA's rationalization as to why this is not done:

> The dispersion model that will be used in the OMP analysis does not have the capability of predicting concentrations of O3 for comparison with the AAQS. The formation of O3 in the atmosphere is complex to model on a local scale and the effects of elevated O3 concentrations are generally realized on a regional scale rather than a local level. However, where possible, the air quality analyses for the OMP will include information relevant to the new standard.

The fact that EDMS was "mandated" by the FAA for use in analyzing airport situations has nothing to do with off-airport ozone conditions and analyses. Though "mandated" by the FAA, importantly here, **"[T]he regulator is also the air traffic services provider**"[2]. In fact, the FAA and project proponents are not limited to use of only EDMS.

Indeed, the capability to successfully model photochemical ozone creation processes has existed for many years, for instance with Environ's CAMx modeler, which was well performing in 1997 and is up to version 4 at this time. CAMx has the ability to use nested grids, down to sizes in the 500-1000 meter range; using 1000 meters would even allow O'Hare airport to be gridded into at least 9 grid zones. Further, individual emission sources can be tracked, traced and checked for their contributions to the net ozone modeled results.[3]

As a matter of fact, the Urban Airshed Model (UAM) was used by the State of Illinois (IEPA/LADCO) in year 2000 for simulation of the areas ozone situations, in order to evaluate and set forth plans for their "NOx SIP Call". Quoting from the paper, "Midwest Subregional Modeling: 1-Hour Attainment Demonstration for Lake Michigan Area (Sept. 18, 2000)":

> "Grid resolution was 12[k]m for most model runs and 4km for a few runs." and "In summary, it is reasonable to conclude that model performance is acceptable and that the model can be used for regulatory application in the Lake Michigan area."

The DEIS statement that "…O3 effects are generally realized on a regional scale than on a local level." is purposely misleading, attempting to imply that individual sources, such as an O'Hare airport "bubble" could not be adequately and accurately treated. Not only that, the statement is also disingenuous and patently incorrect, since the IEPA did exactly that, "way back" in year 2000, when they wanted to evaluate the impact of proposed new emissions, "…from combustion turbine electrical generating units recently permitted in Illinois."![4]

Here was a case where modeler runs were made to calculate ozone level changes in the gridded region surrounding and including the Chicago metropolitan area, due to additional point source emissions from power plants, including 10 in the Chicago area, each of which generated only

[2] The International Herald Tribune, "Emissions by airliners leave Europe and U.S. split," Mar. 19, 2005. Comments by Carl Burleson, director of the FAA Office of Environment and Energy.
[3] Published CAMx results of analyses demonstrates that, typically, around 50% of ozone concentrations are caused by nearby sources of less than about 25km. (15.5 miles) distance.
[4] "Ozone Attainment Demonstration for the Chicago Nonattainment Area (December 21, 2000)", Chapter I

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Comment	Response
I1	FAA respectfully disagrees with the comment. Consistent with professional practice, the FAA believes it is not practical to perform ozone-related computer modeling for an individual project such as the improvements at O'Hare. Specifically, models used to perform ozone analysis (e.g., USEPA's Urban Airshed Model) are not structured to evaluate localized impacts from individual projects.
I2	The FAA requires the use of EDMS when performing air quality analysis for aviation sources. The USEPA also recommends EDMS for air quality assessments of primary pollutant impacts at airports.
I3	The user's guide for the Comprehensive Air Quality Model with extensions (CAMx) states that the model provides an assessment of gaseous air pollutant over many scales (http://www.camx.com/files/CAMx.User.Guide.v4.10.August2004.pdf). The user's guide further recommends that the smallest of the scales modeled should be urban. When discussing the concept of scales with respect to air pollutants, "scale" refers to the physical dimension of an air parcel. Urban scales represent an overall, citywide air parcel (Title 40, Chapter I, Part 58 – Ambient Air Quality Surveillance). The USEPA believes that photochemical grid models are not sufficient to assess incremental changes in area wide ozone concentrations from emission changes at a single or group of small sources. O'Hare-related emissions of volatile organic compounds and nitrogen oxides would be considered a small source because the total airport-related emissions represent less than 1 and 4 percent, respectively, of the total emissions within the Chicago non-attainment area. Notably, these percentages reflect the total predicted emissions due to the operation of O'Hare (not project-related emissions). When considering just the predicted change in emissions due to the OM (the project-related emissions), the emissions would represent approximately 0.03 and 0.05 percent of the total emissions within the Chicago non-attainment area. Notably, emission changes must amount to some significant fraction of an area's emissions (which the project-related emissions do not) before modeling results can be interpreted with sufficient confidence that the results are not lost in the "noise" of the model and/or the input data (http://envinfo.com/caain/nonattainment/sec182f.html).
I4	The IEPA used the Urban Airshed Model (UAM) to simulate conditions (all emissions from all sources) on an urban scale (for the entire Chicago non-attainment area). As noted in response to comment I1 above, it is not practical to perform ozone-related computer modeling for an individual project such as the improvements at O'Hare. Models used to perform ozone analysis (e.g., USEPA's UAM) are not structured to evaluate localized impacts from individual projects.

about 10% of the total NOx generated by O'Hare (not even counting associated "roadways" emissions). Modeled results were able to detect and show ozone concentration changes of only 1-3ppb out of average levels of >100ppb. I5

Finally, it is not at all clear that if the limits for pre-cursors were just met in the area (including O'Hare NOx and VOC contributions), that this would imply a good ozone situation (i.e., ozone levels always below EPA NAAQS limits), since the pre-cursor limits are based on their own human health hazards, not ozone hazards. Additionally, O'Hare airport NOx and VOC emissions are deposited in the atmosphere in a spectrum of altitudes, from ground level to miles, which would generally result in considerably different ozone formation impacts than near ground level emissions (and where airport analyses receptors are placed i.e., "human environment"). Even if constrained to those deposited in the "mixing layer", deposition altitudes extend to about 1000 meters.

In summary, AReCO believes that the DEIS short-cutted this important issue and that O'Hare related emissions indeed have a significant ozone effect in the area and that such effect could and must be calculated via simulation. I6

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Comment	Response
I5	The USEPA believes that photochemical grid models are not sufficient to assess incremental changes in area wide ozone concentrations from emission changes at a single or group of small sources. A review of the USEPA's proposed rule (Federal Register: July 11, 2001 (Volume 66, Number 133) to approve the Illinois SIP that included the additional point source emissions from power plants (the new permitted combustion turbine generators) indicates that the generators would emit an additional 18.499 tons per day of nitrogen oxides and 0.924 tons per day of volatile organic compounds. As shown in Table 5-19 of the Final General Conformity Determination (Appendix J – Attachment J-2, Page 96 of the EIS), OM-related emissions of nitrogen oxides and volatile organic compounds are projected to be 0.30 and 0.18 tons per day, respectively, in the year 2007 (the mandated attainment year for the one-hour ozone standard and for the applicable SIP). Notably, the OM-related emission totals are much less than those that were proposed for the generators (approximately 2 and 19 percent of the generator-related emissions). If the modeled results for the generators indicated that ozone levels would "change" from 1 to 3 parts-per-billion (ppb) with the additional emissions, then the results of any ozone modeling to assess the OM (if it were performed) would be far less (a maximum change of 0.6 ppb (assuming the maximum change for the generators of 3 ppb and the maximum percent of OM-related emissions to the generator emissions (19 percent)).
I6	FAA disagrees that O'Hare-related emissions would have a significant effect on ozone in the area and that the effect of the OM-related emissions could be modeled in a meaningful way. First, the IEPA is charged with protecting air quality conditions within the Chicago non-attainment area. To assess the OM with respect to air quality, the FAA worked closely with the IEPA (and the USEPA) to 1) prepare an air quality assessment protocol and 2) to prepare a General Conformity Determination (the purpose of which is to assess the impact of a proposed project on the pollutants for which an area is designated non-attainment). Based on the evaluation performed for the Final General Conformity Determination, the FAA has determined that O'Hare-related and OM-related emissions of nitrogen oxides and volatile organic compounds can be reasonably be accounted for in the IEPA's established emission totals. As such, O'Hare-related emissions would not have a significant effect on ozone levels within the airshed. Second, the FAA concurs with the USEPA that photochemical grid models are not sufficient to assess incremental changes in area wide ozone concentrations from emission changes at a single or group of small sources.

Comment	Response
Appendix X	The FAA formally responded to this letter from Mr. Saporito on September 2, 2005. As the FAA letter noted, "[t]he impact of fuel prices is just one factor that affects forecast of aviation demand. In the case of Chicago, [FAA] analysis indicates that the major factor affecting aviation demand is the growth of the local Chicago economy."

Appendix X

July 18, 2005

VIA FACSIMILE and regular mail

To:
Marion Blakey, Administrator
Federal Aviation Administration
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(202) 267-5047

Barry D. Cooper
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From: Jack Saporito
President, American Working Group for National Policy
Executive Director, Alliance of Residents Concerning O'Hare

Subject: Grossly Erroneous Oil/Fuel Price Forecasts Used For U.S. Air Transportation Demand Projections Drive Excessive Air Transportation Demand Forecasts.

The American Working Group for National Policy, Inc. (AWGNP) and The Alliance of Residents Concerning O'Hare, Inc. (AReCO) hereby petition the Federal Aviation Administration (FAA) to produce a mid-year correction to your "FAA Aviation Forecast 2004", released in February 2005. This petition is based on what we believe to be gross errors in the forecast for aircraft fuel prices for the next decade. The impact of fuel prices is already, and will continue to be, much higher than forecasted and will substantially raise air transport operational costs and force much higher passenger ticket and freight prices, reducing demand below that which is forecasted.

The importance of a fast response in creating this mid-year correction is heightened by the fact that numerous, very expensive, United States airport expansion programs are in various stages of approval by the FAA and that these approvals will be based on the existing airport capacity projections, as derived from the demands developed in this "FAA Aviation Forecast 2004". Thus, the justifications for many of

these airport expansion plans are seriously flawed and the FAA cannot go forward with any such approvals until this serious error is corrected.

AWGNP and AReCO therefore also petition the FAA to cease and desist any approvals of U.S. airport expansion programs until such mid-year forecast is completed and any affected airport expansion programs are appropriately adjusted for the expected substantial changes in demands.

Specifics:
It is clear that the FAA's fuel price forecasts (below) represent a total denial of reality in the issue of world oil supply and demand in the foreseeable future. The forecast is only six months old and is already totally out of sync with the actual current pricing situation.

Jet fuel price (daily gulf coast prices, per gallon) began 2004 at about $0.75 and ended the year at about $1.25, with a brief excursion to around $1.60 (due primarily to 2004 hurricane impacts on gulf supplies). But the upward trend could already be seen as early as the beginning of 2002 when the price was near $0.50/gal. [Note: These prices are, of course, much lower than the costs for passenger vehicles and trucks, due to their on-going exemption from numerous taxes.] Fuel prices bounced back up to $1.68 on April 5, 2005, returning to their apparent (3 year) trend line of about +44% year, which, of course, may not continue at that rate; however, this trend is so much greater than the FAA forecast, as to make their forecast useless.

It is understood that the FAA refers to the Office of Management and Budget (OMB), Congressional Budget Office (CBO) and others for base information. Yet the more knowledgeable agency, the Department of Energy, fully supports a position of on-going higher petroleum prices, as is seen in their most current forecast (see Attachment).

It appears ridiculous to assume that the air transportation industry will experience the forecasted $0.759/gal price average that is currently forecasted for 2005. Even if pricing stabilizes at current levels, the average will be above $1.50/gal, essentially twice as high as forecasted. And it is highly probable that it will instead experience a continuing rise, perhaps to as much as $2.25/gal by years end.

The continuing irrationally optimistic view by some that oil and fuel pricing will eventually return to even close to the currently projected levels must be rejected in the face of:
* Tremendous oil demand growth by the Chinese and other developing countries,
* Little to no expectations of future world oil supply growth from present levels, which are already only a percent or so above demand,
* Global warming impacts (now in consensus), further increasing fuel demands (e.g., for electricity, etc.) while negatively impacting supply (e.g., many more gulf coast oil source hurricane disruptions),
* Existing and future shortages of fuel refining capacities,
* The falling dollar (foreign oil producers will raise prices in inverse proportion),
* Out-of-control U.S. debt and trade imbalances, especially with the Chinese,
* The resulting probable purchase of U.S. (and/or foreign owned) major oil companies (witness the current Chinese bid for Unocal), in order to capture oil holdings as well as technologies,
* The failure of the "western world" to solve the Islamic terrorism issues.

Any forecast that expects the price of oil and fuel derivatives to be only 6% higher than 2004 -- 11 years from now, and actually cheaper than 2004 when discounted (0.67/gal vs. 0.80.9/gal, in 2003 dollars), must be discarded and immediately redone.

From the "FAA Aviation Forecast 2004":
"OMB projects that energy prices (as measured by the oil and gas deflator) will increase by 0.7 percent in 2004, decline by 10.0 percent in 2005, and then increase at an annual rate of 1.8 percent over the remainder of the forecast period. Over the entire 12-year period, the OMB forecast assumes that nominal energy prices will increase by only 0.7 percent annually. In real terms, OMB expects energy prices to decline at an annual rate of 1.5 percent over the 12-year period. CBO forecasts a 1.5 percent annual increase in nominal fuel prices and an annual decline of 0.9 percent in real prices. Global Insight projects nominal fuel prices to increase by 1.8 percent a year—a decline of 0.5 percent annually in real terms."

TABLE 16
U.S. LARGE AIR CARRIER FORECAST ASSUMPTIONS
JET FUEL PRICES

FISCAL YEAR	DOMESTIC CURRENT $ (Cents)	FY 2003 $ (Cents)
Forecast		
2004	82.1	80.9
2005	75.9	73.7
2006	75.7	72.3
2007	76.6	71.6
2008	77.7	71.1
2009	79.0	70.5
2010	80.3	69.8
2011	81.6	69.3
2012	82.9	68.7
2013	84.3	68.1
2014	85.7	67.5
2015	87.1	67.0

ATTACHMENT

****

U.S. Department of Energy

July 12th, 2005 Release (Next Update: August 9th, 2005)

2005 Summer Motor Fuels Outlook Update (Figure 1)

Retail regular-grade gasoline prices moved up from about $2.12 per gallon at the beginning of June to $2.33 on July11. Gasoline pump prices for the summer (April-September) are now projected to average $2.25 per gallon, 8 cents per gallon higher than last month's projection and about 35 cents per gallon above the year-ago level. Crude oil prices are expected to remain high enough to keep quarterly average gasoline prices above $2.20 per gallon through 2006. The projected average for retail diesel this summer is $2.33 per gallon, up about 56 cents per gallon from last summer. Nationally, annual average diesel fuel prices are expected to remain above regular gasoline prices through 2006. Currently, this pattern is evident in all major regions of the country.

Crude Oil and Petroleum Products (Figures 2 to 8)

The WTI crude oil price averaged over $56 per barrel in June and is now expected to average $59 per barrel for the third quarter of 2005, approximately $6 per barrel higher than projected in the previous Outlook and $15 per barrel above the year-ago level. Monthly average WTI prices are projected to remain above $55 per barrel for the rest of 2005 and 2006. Oil prices remain sensitive to any incremental oil market tightness. Imbalances (real or perceived) in light product markets could cause light crude oil prices to average above $60 per barrel.

Several factors are contributing to the expectation of continued high crude oil prices. First, worldwide petroleum demand growth is projected to remain robust during 2005 and 2006, although not as strong as in 2004. Worldwide oil demand is projected to grow at an annual average of about 2.1 million barrels per day in 2005 and 2006, representing a 2.5-percent annual average growth rate compared with 3.4 percent growth in 2004. Chinese demand growth, which averaged about 1 million barrels per day in 2004, is projected to be slower but still robust at an annual average of 600,000 barrels per day in 2005 and 2006. In addition, total projected oil demand for countries outside the Organization of Economic Cooperation and Development (OECD) is higher than in previous Outlooks because EIA has increased its estimate of historical (2003-2004) demand in the non-OECD countries by 200,000 barrels per day.

Second, production growth in countries outside of the Organization of Petroleum Exporting Countries (OPEC) is not expected to accommodate incremental worldwide demand growth. Non-OPEC supply is projected to grow by an annual average of 0.8 million barrels per day during 2005 and 2006, below the annual average growth rate seen in the 2002 through 2004 period. Third, worldwide spare production capacity has recently diminished; in practice, only Saudi Arabia has any spare crude oil production capacity available, and the Saudis would need to steeply discount their heavy oil in order to market it effectively. Despite projected capacity additions in Saudi Arabia and other Persian Gulf countries in 2005 and 2006, world spare capacity could decline from 2004 levels over the next 2 years if world oil demand grows more rapidly than expected. Fourth, downstream sectors, such as refining and shipping, are expected to remain tight. Finally, geo-political risks, such as the continued insurgency in Iraq and

possible problems in Nigeria and Venezuela, are expected to keep the level of uncertainty in world oil markets high.

Another factor that could influence the U.S. oil market over the next few months is the severity and location of hurricanes. The end of summer and the beginning of fall are the prime months for hurricane activity that can affect oil and natural gas production and refinery operations in the Gulf of Mexico region. With limited spare global crude oil production capacity and U.S. refinery utilization rates in the upper 90-percent range for much of the summer, oil prices are likely to react strongly to any disruption of or damage to petroleum infrastructure. While Hurricane Dennis was the immediate concern at the beginning of July, there are also likely to be other hurricanes that will threaten Gulf of Mexico oil facilities and increase the potential for temporary price spikes. How long prices remain elevated due to a particular storm, however, will ultimately be determined by the severity of damage to petroleum facilities.

High levels of production from OPEC members contributed to inventory builds in the OECD countries in the first half of this year, with these stocks moving towards the upper end of the 5-year historical range. However, OECD stocks have not grown in terms of days supply (the number of days that inventories would satisfy demand) because demand has grown rapidly as well. EIA's forecast includes little additional growth in OECD commercial oil inventories over the next 2 years. U.S. crude oil inventories, now above the historical range, are much improved compared to this time last year. However, some of this improvement is expected to dissipate over the forecast period.

U.S. petroleum demand growth during the 2-year period is projected to average about 1.3 percent per year, down from the much stronger 3.5-percent increase seen in 2004. Motor gasoline demand growth is projected to average 130,000 barrels per day during the 2-year period, or 1.5 percent, per year, below the 1.9-percent growth in 2004.

Jet fuel demand is expected to rise by an average 2.9 percent per year, slightly below 2004's 3.3-percent growth. Distillate demand is projected to climb steadily by an average of 1.9 percent per year, well below the 3.3-percent growth recorded for 2004. Residual fuel oil demand, having increased by 12 percent last year, is projected to register an overall decline in deliveries during the forecast interval.

Appendix Y

Flawed FAA Aircraft PM2.5 Emissions Estimation Method
Archaic "Smoke Number" Use Behind Failure

R. E. Ruthenberg 9/01/05

Abstract

The FAA has officially put forth its estimate method for jet aircraft PM2.5 particulate matter emissions, mandated for use in all U.S. environmental impact statements (EIS), based on a "first order approximation" correlation to historically measured "smoke numbers", which measurement system was put in place in the early '70's and has not changed since.

We describe here that the ICAO[5] smoke number measuring system is incapable of adequately measuring any particles of diameter less than about 0.5 microns. Though this was not a serious problem in the early years of commercial jet aviation as the smoke, for which the test was intended, was comprised of relatively large particles, e.g. 1-10 microns in diameter, it is a very serious problem when attempting to correlate smoke numbers to engine (non-volatile) particulate mass emissions, targeted at placing such mass calculations in a PM2.5 context, when the predominant portions of such emitted particles fall into the ultra fine category emitted by modern aircraft, with diameters in the 0.01-0.05 micron diameter range.

As such, these correlations, the results of which have now been officially incorporated into the FAA's EDMS emissions tool, are seriously flawed and the actual emission masses are substantially under calculated, perhaps by factors of as much as 10:1. Since the FAA has also recently put forth the conclusion that volatile engine exhaust particulates are estimated to be three times the non-volatile component, the total calculated (volatile + non-volatile) particulate mass emissions, also now encapsulated into EDMS, are in error as well, in the same proportion. Any airport-related environmental (e.g. EIS) conclusions on particulate matter inventories and dispersion analyses are therefore seriously compromised.

Background

The FAA has been under heavy pressure to provide quality information and guidance on particulate matter (PM) emissions from commercial jet aircraft in order to provide accurate calculations of ground-level and low altitude PM emissions inventories for use in airport environmental impact statements (EIS), as well as for high altitude global climate change impact studies. This has been problematical, to say the least, as the FAA and EPA have not adequately pursued actual aircraft engine measurements and characterizations in the past. Nor has the international United Nations organization, ICAO, been strongly motivated to do so.

This shortage of information led to the development of a "first order approximation" (FOA) of particulate matter emissions from aircraft[6], which the FAA has embraced as their "best estimate" of (non-volatile) PM emissions from jet aircraft, incorporating it already into their EDMS simulator ("mandated" by the FAA for use in airport EIS analyses).

This FOA takes the approach of using aircraft certification "smoke numbers" to correlate to PM

[5] International Civil Aviation Organization.
[6] "Derivation of A First Order Approximation of Particulate Matter From Aircraft", Wayson, Fleming, Kim and Draper, 4/15/03.

Comment	Response
Appendix Y	FAA disagrees with the commenter's assertions. Specifically, FAA's First Order Approximation (FOA) methodology is the only accepted tool in existence today that enables estimation of PM emissions from commercial jet aircraft engines. The FOA is a conservative approximation methodology (i.e., over predicts PM emissions) that serves an interim purpose until such time that sufficient measured data are available for representative aircraft engines. In addition, FAA is working to further improve the accuracy and reliability of the FOA methodology in the near-term, and the FAA is committed to actively pursuing and sponsoring PM measurement campaigns using existing modern aircraft engines. Along with partners such as NASA and the universities of Missouri Rolla and Central Florida, the FAA has several PM measurement campaigns underway this year, with plans to add more in the future, as opportunities arise and funding permits. Each initiative is resource-intensive, and will take time to assemble a fully verified data set of PM emission indices for enough aircraft engines to represent the current fleet. FAA's FOA has been scrutinized by over 70 reviewers from academia, industry, and government, including the Environmental Protection Agency (EPA). In fact, the EPA stated in a letter to the FAA dated 21 July 2005 that "We believe it is an important step in the right direction." Furthermore, the FOA has been evaluated and accepted by the Working Group 3 of the International Civil Aviation Organization (ICAO) Committee on Aviation Environmental Protection as an interim method to estimate aircraft particulate matter (PM) emissions. Continued on the following page.

mass emissions, for each aircraft (engine) type. The "smoke number" (SN) is a very old[7] method originally used to determine how "smoky" an aircraft's exhaust would be and to set standards to drive "smokiness" downward in order to reduce public complaints of air pollution around airports. To that extent, it was effective in that (1) the measurement process that resulted in a given aircraft engine SN characterization was fairly well adapted to engine exhaust characteristics of the period (70's) and (2) engine manufacturers had a specific test and standard to design/redesign engines to (as well as the consideration of other factors, e.g. fuel constituents, operational parameters, etc.).

The prime smoke culprits at the time were relatively large diameter particles, often due to unburnt fuel or "rich" fuel-to-air ratios in these engines. Non-volatile particles at the time were generally characterized as "soot", with mean mass particle diameters generally greater than 0.5 microns, and probably mainly in the range of 1-10 microns. Since visible light wavelengths fall in the 0.4-0.7 micron range, clouds of these particles (smoke) would be quite visible in the atmosphere (i.e. size greater than light wavelengths).

The smoke numbers for an engine were determined for varying degrees of engine thrust, generally corresponding to taxiing (7%), approach (30%), takeoff (100%) and climb out (65%) modes. A predetermined, fixed quantity of exhaust[8] was drawn from near the point of engine exhaust, passed through heated lines and through a paper (cellulose) filter, collecting the particulate matter on the filter paper. The paper was placed on a reflectometer before the test and calibrated to be 100%, i.e. white and highly reflective. After the filter paper was stained by the particulates, it was measured again on the reflectometer and the resulting percentage reflection was the SN. For example, if reflectivity dropped from 100% to 35%, the SN was 35.

The subsequent FOA to correlate the SN to actual particulate density in the exhaust plume, typically in terms of micro-grams/cu. meter, was done in the early 70's (D.L. Champagne) and 80's (Whyte).[9] This was then in turn converted to particulate mass generated per kg. of fuel burned, assuming stoichiometric[10] burn conditions.

This then resulted in the first order equation:

$ER_{jMass\ of\ PM} = 0.6\ (SN)^{1.8}\ (FF)$

Where:

$ER_{jMass\ of\ PM}$ = emission rate: mg of PM emitted per second per engine type j

SN = the ICAO reported smoke number

FF = the ICAO reported fuel flow by mode in kilograms/sec

The Problem

[7] Originally implemented by the EPA in 1973. Associated with SAE ARP 1179 test procedures. Currently in ICAO procedures Annex 16 of Part 1, volume 2, Appendix B.

[8] Exhaust sample size is 16.2kg. per square meter of filter sampling area at STP, as adjusted by the gas law, PV=nRT, for sampling pressure, temperature and volume.

[9] See the FOA paper for more details.

[10] Stoichiometric meaning that the combustion occurs with exact proportions of constituents involved in the net chemical reaction; the proportions of oxygen, nitrogen, etc., combined with exact proportions of fuel chemicals, resulting in given amounts of gases, such as CO2, and heat, along with determination of the volume of these combustion products gases.

AReCO-MAAP FEIS Comments

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Comment	Response
Appendix Y continued	The commenter appears to make a number of broad, unjustified statements that do not conform with respect to the science supporting the FOA as well as to the purpose for and applicability of the FOA methodology. For instance, the commenter continually points out that the FAA is not capturing PM mass from measurement of the smoke number. This is true, but what the commenter seems to overlook is that the FOA methodology is based on a correlation to mass, rather than a direct measurement of particulate mass itself. In fact, to-date there is no internationally agreed protocol for the measurement of PM emissions from aircraft engines. Even in the absence of such a measurement protocol, the commenter suggests that the FOA methodology is "flawed" because it is based on a correlation to the "archaic smoke number." It is for this very reason that the FAA assessed the FOA's accuracy against recent, actual non-volatile PM emissions data from the German Aerospace Center (DLR) and Dr. Phil Whitefield of the University of Missouri at Rolla (head for the Congressionally-appropriated Center of Excellence for Aerospace Particulate Emissions Reduction Research). The confidence and predictive limits of FOA were calculated to be within 99 percent, which is a strong correlation with data from the newer aircraft engines. The commenter includes unsubstantiated claims in his evaluation. The statement of a 10:1 error is an unsubstantiated guess by the commenter, later admitted so by the commenter at the end of the paper. There is no justification for this statement and the FAA simply notes this aspect of the comment. At the heart of the commenter's argument to discredit the FOA methodology is the inability of filter media used in the smoke number test to exactly capture PM with an aerodynamic diameter of 2.5 micrometers, nothing more and nothing less. This seems to be a shared frustration, worldwide, since natural forces do not allow airborne PM behavior to be uniform regardless of aerodynamic diameter. The commenter's analysis did recognize the filter media's poor PM collection efficiencies for particles less than 1.0 micrometer. At these very small sizes, the motion of particles are typically governed by random molecular (Brownian) motion. As a related matter, FAA notes that these same comments were raised by AReCO in its letter of September 2, 2004 to the Administrator of the USEPA. In USEPA's response letter to AReCO dated September 22, 2005, USEPA confirmed that FAA's FOA is reasonable for use at this time.

The big problem that causes these results to be quite inaccurate and the "first order" characterization to likely be in error by factors of 2-10 on the conservative side (under estimation) of particulate mass predictions based on smoke number, lies in the measurement process that determines the smoke number itself. That is, smoke numbers are almost meaningless for modern aircraft engines!

Wayson hints at the reason for this in the FOA paper: "Small particles are not well represented by the smoke number, the combustion process varies by engine design, and the fuel-to-air ratio will change with each mode." We agree fully with the latter two issues but focus on the first, that being the issue of "Small particles are not well represented by the smoke number…"

As previously indicated, early engines (70's/80's) were quite smoky, emitting relatively large quantities of relatively large non-volatile particulates. The smoke number measuring system was constructed to match this environment. Modern engines are almost "smokeless", with most of the non-volatile particulates being of very small size, generally characterized as "ultra-fine". Whereas, early engine particulates were concentrated in the range of 0.5-10 microns (mean diameter), today's particulates are concentrated in a 0.01-0.1 micron range, often even narrower in the 0.02-0.05 range.[11]

It is understandable that the key to using the smoke number measuring system and procedures is to capture all of the particulate matter in the exhaust sample on the filter paper, such that it becomes stained (dark) thereby reducing reflectivity and thus, determining the smoke number. What has been missed in all of these approximations is that, in fact, the specified filter paper, Whatman #4, which remains unchanged for the last 30 years, does not effectively capture ultra-fine 0.01-0.1 diameter particles.

That is to say, if the filter paper does not capture the exhaust particulates, then the (pseudo) smoke number physically cannot represent the nature (number and mass) of those particles. The end result is first, that any resulting smoke number would still be determined largely by any small amount of large particulates captured on/in the filter and so the concept of a relation to "smokiness" of the exhaust may still be relevant, though subsequent particulate size growth "down-plume" might even render this number as useless.[12]

Secondly, the more important issue here is that if the bulk of particulate emissions are ultra-fine and the filter capture little to none, then any resulting smoke number cannot predict the amounts of these ultra-fine emissions.

Stepping back, the current context of particulates is to characterize them as PM2.5, meaning that this includes all particulates of diameters from 0.0-2.5 microns. In reality, the smoke number does not characterize PM2.5 but, instead, measures a range of x-y microns and, if we assume exhaust particulates have an upper mean diameter of 10 microns, then the measured range is x-10

[11] Early engines may have had a bi-modal particulate distribution, i.e. one concentration in the 0.5-10 micron range and another in the 0.01-0.1 range.
[12] Consider a filter that captures none of the ultra-fine particulates, indicating a smoke number of zero, i.e. no smoke at all. But these particles downstream in the plume have grown to larger size through accumulation/agglomeration and adsorption mechanisms to now become visible, i.e. smoke.

microns, with x being unknown.

A literature search, admittedly not perfect,[13] could not find any discussion of smoke number related filter characteristics as a function of particulate size, especially for the specified Whatman #4 filter. The key characteristic would be filter efficiency[14] versus particle diameter and an ideal PM2.5 filter would be characterized by an efficiency of 100% for particle diameters less than 2.5 microns and 0% for diameters larger than 2.5 microns.

Notably, Whatman's description of their grade 4 filter media is:

> "Grade 4: 20-25µm
> Extremely fast filtering with excellent retention of coarse particles and gelatinous precipitates such as ferric hydroxide and aluminium hydroxide. Very useful as a rapid filter for routine cleanup of biological fluids or organic extracts during analysis. Used when high flow rates in air pollution monitoring are required and the collection of fine particles is not critical." {Emphasis added.}

Because of this dearth of information, the Whatman Company (U.K.) was contacted and they graciously agreed to test a few grade 4 filter samples. Three samples were challenged by an aerosol of cold DOP[15] particles at a face velocity of 10.5 fpm, with results shown in table 1.[16]

Table 1

Particle Size Range (µm)	Efficiency Sample 90120 (%)	Efficiency Sample 301354 (%)	Efficiency Sample 300533 (%)
0.1 to 0.2	33.0	27.8	43.9
0.2 to 0.3	39.6	34.5	48.3
0.3 to 0.4	46.4	42.5	55.1
0.4 to 0.5	52.6	49.7	59.8
0.5 to 1.0	70.2	68.0	76.9
1.0 to 3.0	94.0	94.5	96.0

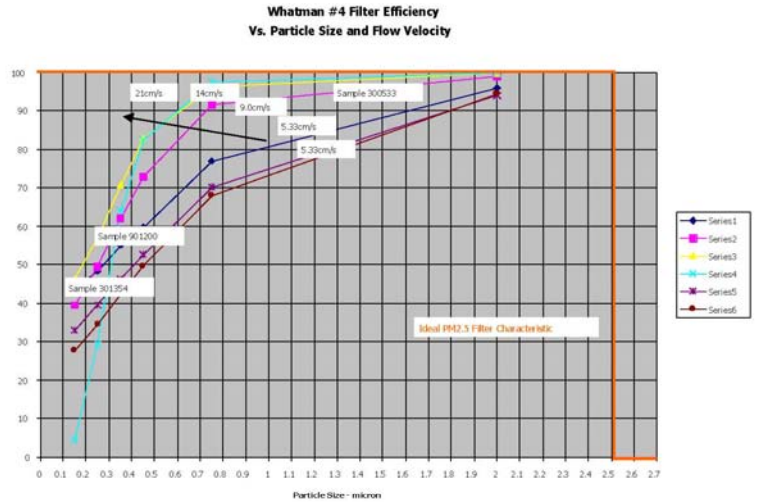
[13] A continuing problem is that many or most technical papers are "locked up" in association journals and can be accessed only by association members or piecemeal at high cost. Examples include ICAO, Waste Management Association, etc. Even government-funded studies (read: at taxpayer cost) are often not easily accessible and/or the data/information is held back from the public for extended periods. Example: The APEX studies of engine exhaust measurements.
[14] "Efficiency" would be 100% if all particles were captured and 0% if none were captured.
[15] DOP-dioctylphthalate, a liquid plasticizer to form an aerosol.
[16] Note that Whatman qualifies that, "The data is based on a non-routine test and does not form part of the product specification."

It is seen here that filter efficiency has fallen to about an average of 38% for 0.15 micron mean diameter particles, with a large downward gradient implying efficiencies approaching zero for particle diameters in the 0.01-0.04 micron range.

Subsequently, it was noticed that the filter face velocity used for these tests (10.5f/min. or 5.33cm/sec) was considerably lower than that used in the ICAO smoke test procedure. ICAO specifies the filter total stain collection spot diameter to be between 19-37.5mm, thus the face velocity, assuming the required 14L/min. flow velocity, can be calculated to be between 21-82 cm/sec, all considerably higher than the 5.33cm/sec velocity used initially by Whatman. Once again Whatman graciously agreed to run higher velocity tests on a filter sample at 9, 14 and 21cm/sec, in addition to 5.33cm/sec, to characterize the effect. Table 2 summarizes these test results.

Table 2

Sample--->	300533	300533	300533	300533	90120	301354
Mean Particle Size-Micron	*5.33 cm/sec	9.00 cm/sec	14.00 cm/sec	21.00 cm/sec	*5.33 cm/sec	*5.33 cm/sec
0.15	43.9	39.5	46.3	4.5	33	27.8
0.25	48.3	49.5	56.9	29.4	39.6	34.5
0.35	55.1	62.1	70.9	64.1	46.4	42.5
0.45	59.8	73	82.8	82.6	52.6	49.7
0.75	76.9	91.5	96.3	97.5	70.2	68
2	96	99	99.8	99.8	94	94.5



The results are best visualized in graphical form, as shown above. To clarify the graph a bit, series 5 and 6 plots correspond to filter samples 90120 and 301354, respectively, both at the lower 5.33 cm/sec face velocity. Series 1-4 correspond to sample 300533 at velocities of 5.33, 9, 14 and 21 cm/sec, respectively. Also note that efficiency points represent the mean of the diameter range. For example, the range of 1-3 microns is shown as 2 microns. This can have a distorting effect on the curves. That is, we don't really know whether 2 microns is the true mean…it might be 1.5 or 2.5 or something else within the range. This is generally unimportant to the general interpretations.

It is seen that, even with the lower face velocity (right-most series 1. 5 and 6), the filter efficiency curves are not even remotely similar to an ideal PM2.5 filter, with actual efficiencies dropping rapidly for diameters less than about 1 micron, while maintaining high efficiency above 2.5 microns.

For the single sample, increasing the face velocity increases efficiency for larger particle sizes, most likely due to momentum effects, i.e. faster particles carry increased momentum which increases impaction with filter fibers; it is more difficult for the particles to flow around fibers to make there way through (or into the interior of) the filter.[17]

[17] Millipore's Grade 4 filter paper is 250 microns thick, which is equivalent to about 10 mils (0.01 inches). For mental calibration purposes, household plastic drop cloths are typically 0.5-2 mils thick.

Importantly, at the higher velocities, the rate of filter efficiency degradation for smaller particles increases, dropping to only about 5% for particles of 0.15 micron nominal diameter. It is likely that this is generally due to the fact that the very small particles carry much less individual momentum and can ride around individual fibers, following the gas currents as they flow around the fiber. It should be noted that the highest measured velocity effect (21cm/sec) is equal to the lowest expected velocity seen in ICAO smoke testing, with the highest expected velocity being four times greater (82cm/sec). Thus, this can be considered a best case efficiency representation and it can be surmised that at these even higher face velocities, grade 4 filter efficiencies for particles one-tenth of the lower 0.15 micron measured diameter will be essentially zero, i.e. few or no particles will be captured[18] and that, therefore, no amount of particle mass below about 0.1 micron diameter will contribute to measured smoke numbers.

Other Effects

There are additional physical effects that are most likely to play a role in causing a lack of detection of fine/ultra-fine particles in the standard smoke number measurement.

One of these would be that small particles have a greater chance of burrowing into the filter paper's cellulose fiber mat and becoming more invisible if captured, as a result, as compared to larger particles that tend to be captured on or near the filter surface. This effect will tend to greatly attenuate any filter paper changes in reflectance for these small, buried particles. Any particles captured near the back surface will be indistinguishable in effect from the required standard black measurement background.[19] Captured particles will also become harder and harder to distinguish from the filter paper fibers themselves as they become smaller and smaller.

The reflectometer (actually a reflective densitometer) used to measure the smoke number may be a party to significant error itself. The light source wavelength is about 0.6 microns, so while it could theoretically resolve even individual particles and spaces between them of greater than a few microns, it certainly can't for particles/spaces of less than 0.1 micron. Notably, the original and still main use for densitometers was for printing/press and photography applications, where the former particles (spots) are typically 20-60 micron diameters and the latter 0.2-2 microns (silver halide grains).

Additionally, the densitometer light source is typically directed 45 degrees to the plane of the paper, with the reflected light-sensing photodiodes at 90 degrees. It is clear then that particles buried below the surface will quickly become shielded/shadowed from the light source by the filter fibers. Consider a reasonably dense layer of particles imbedded 25 microns deep in a nominally 250 micron thick filter paper. As compared to the same layer on the surface, the light source must penetrate through about 35 microns of filter paper and then return reflections (lack thereof) back through another 25 microns, experiencing attenuation and diffusion on both path segments. This of course would not be a significant concern with large particle sizes e.g. >1 micron diameter, as per the early smoke number applications, as they would mostly be trapped

[18] Assuming no significant new physics forces, e.g. electrostatic attraction, come into play between 0.01 and 0.1 micron diameters.

[19] Per ICAO Annex 16, section B34.3: "The backing material used shall be black with an absolute reflectance of less than 3 per cent."

on the surface. Thus, even for very small particles trapped beneath the filter surface, the 45-degree light source direction exacerbates the situation and quickly causes them to optically disappear beneath the surface.[20]

Therefore, even if the filter trapped, say, 50% of the very small particles, i.e. 50% filter efficiency, there would be great attenuation to any resulting smoke number result. If one assumes that trapping is uniform through the filter thickness and that any particles below the top 10% of the filter thickness are basically invisible to the reflectometer, then the efficiency curves above can essentially be increasingly reduced for these small particles in the 90% to 10% efficiency transition region, effectively sharpening the rate of efficiency fall off versus particle diameter.

All of these various factors that relate to net effective filter efficiencies in the transition region will also cause significant test-to-test variation in any smoke number that involves a significant contribution from transition region particles. For instance, there could be a 10:1 shift in measured results just due to a difference (up to 4:1 allowed) in filter face velocity between two testing setups.[21] Also, significant variation in efficiency characteristics could exist between filter paper samples in the transition region and below, as the grade 4 paper was not designed for such applications, nor is it typically characterized and controlled for those applications.

Conclusions

The ICAO smoke number measuring system is basically incapable of adequately measuring any particles of diameter less than about 0.5 microns. This was not a serious problem in the early years of commercial jet aviation as the smoke, for which the test was intended, was comprised of relatively large particles, i.e. >0.5 microns and upwards towards 10 microns in diameter, which became visible in exhausts as the wavelength of visible light is 0.4-0.7 microns. But it is a serious problem when attempting to correlate smoke numbers to engine (non-volatile) particulate mass, targeted at placing such mass calculations in a PM2.5 context, when the predominant portions of such emitted particles fall into the ultra fine category, with diameters in the 0.01-0.05 micron diameter range.

As such, any correlations offered, such as in the FOA paper, the results of which have now been officially incorporated into the FAA's EDMS emissions tool, are seriously flawed and the actual emission masses are substantially under calculated, perhaps by factors of as much as 10:1.[22] Since the FAA has also recently put forth the conclusion that volatile engine exhaust particulates are estimated to be three times the non-volatile component (upon which we do not comment here), the total calculated (volatile + non-volatile) particulate mass emissions, also now encapsulated into EDMS, are in serious error as well, in the same proportion.

[20] This would certainly have to be the case with a black filter background (at about 250 microns depth), which of necessity must be largely unseen by the densiometer in order not to "wash out" and desensitize the effects of surface layer deposits/stains.

[21] This would not be seen for large particles, where the net efficiency shift might be between perhaps 97 and 94 %.

[22] A better guess might have been made if it was known what specific aircraft (engines) were used for the correlation test of figure 2 in the FOA paper, though it is guessed that most are "old" engines, which may well correlate reasonably to similar associated old smoke numbers. Several attempts to get information on the identities of those engines were unsuccessful.

Comment	Response
Appendix Z	Please see response to comment 14.

Appendix Z

Mercury Emissions Calculations

Aircraft
AReCO estimated today's yearly aircraft LTO fuel use of 654,142,125 lbs., assuming an average of about 203 gallons of fuel use per LTO and 492,750 LTO's per year. Assuming the mercury EI is the same as diesel GSE (see below; kerosene jet fuel is similar to diesel fuel), 31 ppb by weight, then yearly mercury emissions are:
Hg= 654,142,125*31E-9 = 20.3 lbs/year. Applying a nominal 1.2 factor for expanded operations yields aircraft mercury emissions of 24.3 lbs/year.

The minimum value, based on Shumway's study is 1 ppb, which yields an expanded operations emission of 0.8 lbs. [Note: 1 ppb seems significantly low in respect to other emission factors, such as below.]

GSE
The EIS does not specifically state GSE yearly fuel use. We derive 2002 diesel fuel use by assuming that 56% of the GSE are reciprocating diesel, emitting benzene, and 44% are non-benzene emitting alternately fueled [p. 5.6-57] and the benzene emission factor is per the FEIS [p.I-155], equal to 0.128 lbs/1000 gallons of fuel burn. We thus calculate an effective benzene EI of 0.022 lbs/ton of fuel burn and, knowing that the total year 2002 GSE benzene emission is 20.303 tons [p. I-57], we derive that 2002 GSE deisel fuel use is 922.9 tons.

Applying the EIS stated GSE mercure emission factor of 0.2 lbs/1000 gallons, using fuel density of 6.5 lbs/gallon, the yearly GSE mercury emissions are computed to be 57.2 lbs. Applying a 1.2 operations expansion factor results in yearly mercury emissions of 69 lbs/year.

Stationary natural gas combustion facilities.
The total yearly natural gas combustion at O'Hare is 991,793,435 cubic feet [p. J-99]. The mercury emission factor is 26.4E-4 lbs/million cubic feet [p.I-155]. Simple multiplication yields a total yearly mercury emission of 2.62 lbs.

Summary
Not counting other mercury emission sources such as from on-airport vehicular traffic, construction vehicles (mostly diesel), etc., the total amount of (1.2 expanded operations) O'Hare mercury emissions will be in the range of about 72-96 lbs, most likely toward the high side.