



DETAILED CONSULTING EXPERIENCE

PURSUIT STRATEGY ADVISOR

CLIENT: Science Applications International Corporation (SAIC)

CJSC, LLC | Principal, 2021 | New York, NY

SAIC pursued a multi-year, multi-million-dollar environmental services contract with a federal agency. CJSC, LLC provided pursuit strategy advisory services to SAIC, including environmental subject matter expertise and recommendations for teaming partners. CJSC, LLC was a subconsultant to Tech-Mark Services, LLC, which serves SAIC. Chris worked closely with the SAIC capture team to review proposal documents, make recommendations on the design of proposed consulting services (including leveraging use of SAIC-proprietary information technology tools and processes), and suggest staffing for key capabilities.

BUSINESS PROCESS ANALYST

CLIENT: CP&Y, Inc.

CJSC, LLC | Principal, 2021 | New York, NY

The architecture-engineering company CP&Y, Inc. refined its business processes for project management to increase profitability and reduce program risk. As a subconsultant to the management consulting firm Palmieri Partners, LLC, CJSC, LLC supported the wholesale revision and update of the company's project management manual based on lean management principles. Chris led the revision of project management manual chapters and assisted with the facilitation of company process improvement working group virtual meetings.

ESA SUBCONTRACT PROJECT MANAGER, Federal Aviation Administration Policy, Engineering, Analysis, and Research Support II (PEARS II) On-Call Contract

CLIENT: Federal Aviation Administration, Washington, DC

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA subcontracted to JD RoVolus as part of FAA's multi-year, multi-million-dollar PEARS II on-call contract, enabling the FAA to procure diverse technical services for multiple offices. Chris served as subcontract project manager so that ESA could provide noise modeling, environmental review, and public outreach services to the FAA for air traffic projects at Boston Logan International Airport (BOS), Teterboro Airport (TEB), and Hollywood Burbank Airport (BUR). He provided noise and aircraft performance expertise during public outreach for TEB and BOS. In addition, he performed quality control for a PEARS II project supporting FAA AEE's efforts to enhance FAA environmental modeling capabilities.

PROJECT MANAGER & TECHNICAL DIRECTOR, John F. Kennedy International Airport (JFK) 14 CFR Part 150 Noise Study PROJECT MANAGER & DEPUTY DIRECTOR, LaGuardia Airport (LGA) 14 CFR Part 150 Noise Study

CLIENT: Port Authority of New York and New Jersey, New York, NY

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

These noise and land use compatibility planning studies under Title 14 of the Code of Federal Regulations, Part 150 (14 CFR Part 150) totaling \$8 million in initial contract value are the first such studies ever undertaken by the Port Authority and are two of the largest noise studies in aviation history. Chris joined the projects in 2016 and became project manager in December of 2021.

- Led simultaneous development of the JFK and LGA Noise Compatibility Programs, closely coordinating with the client for numerous revisions and refinements. Each Program may include up to two dozen noise control strategies.
- Communicated over a dozen noise-reducing JFK and LGA flight procedure designs to airlines, city government, FAA, community groups, and the general public through in-person meetings and workshops, emails, and conference calls.
- Led discussions with FAA air traffic control staff at New York Terminal Radar Approach Control (N90) to develop analysis and modeling techniques for suggested noise abatement flight procedures.



DETAILED CONSULTING EXPERIENCE (CONTINUED)

AVIATION ENVIRONMENTAL DESIGN TOOL (AEDT) SUBJECT MATTER EXPERT

CLIENT: Internal ESA Modeling Team

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

Beginning with AEDT version 2c, Chris supported the ESA AEDT modeling team by reviewing and resolving technical process challenges with deployment and use of AEDT. He uncovered and submitted numerous AEDT bugs to the AEDT team and FAA through the AEDT website, leading to direct improvements in subsequent AEDT versions. In collaboration with ESA information technology leaders, Chris also led the deployment and optimization of AEDT distributed processing functionality at ESA, speeding up execution of critical client noise models by a factor of seven. Chris also worked closely with the director of ESA's information technology team and support staff to deploy AEDT in the Microsoft Azure cloud environment in March of 2021, providing increased flexibility for client services and enabling complete retirement of on-premises AEDT modeling computers.

AIRCRAFT NOISE EXPERT, Naples Airport (APF) Aircraft Noise Certification Analysis

CLIENT: Naples Airport Authority, Naples, FL

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA provides a range of noise support services for Naples Airport Authority in Naples, FL. In response to community interest, ESA analyzed the 14 CFR Part 36 noise certifications of thousands of historical jet operations at Naples Airport (APF) and then estimated which jet aircraft could potentially meet more-stringent noise certification levels. Chris led the development and execution of the analysis methodology utilizing the texts of 14 CFR Part 36 and International Civil Aviation Organization (ICAO) Annex 16, Volume I along with FAA and European Union Aviation Safety Agency (EASA) certification noise levels for the many airframe-engine combinations operating at APF. Analysis results were presented at a virtual meeting of the APF Noise Compatibility Commission (NCC).

PROJECT MANAGER, Miami International Airport (MIA) Metroplex Flight Track Analysis

CLIENT: MIAMI-DADE AVIATION DEPARTMENT, MIAMI, FL

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

As a part of ESA's on-call contract with the Miami-Dade Aviation Department (MDAD), ESA was tasked to investigate community concerns related to perceived premature implementation of the FAA's South-Central Florida Metroplex project. Chris oversaw an analysis of MIA aircraft operating locations, operational counts, and times of day using several years of historical flight track data from MDAD's flight tracking system. He presented information to the client in a series of webinars. Chris also oversaw the production of draft and final technical reports documenting the analysis, while managing tasks and budgets for the project. The technical report was used by MDAD to support information-sharing with elected officials.

AIRCRAFT NOISE EXPERT, San Antonio International Airport (SAT) 14 CFR Part 150 Noise Exposure Map (NEM) Update

CLIENT: City of San Antonio, San Antonio, TX

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA led a 14 CFR Part 150 NEM update for San Antonio International Airport in San Antonio, TX. The update process involved creating NEMs for the years 2021 and 2026 to represent potential noise exposure associated with existing and forecasted future operations at the Airport. Chris supported public outreach by providing his aircraft noise subject matter expertise in response to public comments during a series of virtual public workshops on the draft NEMs.



DETAILED CONSULTING EXPERIENCE (CONTINUED)

AIRCRAFT NOISE EXPERT/TECHNICAL AUTHOR, Fort Lauderdale-Hollywood International Airport (FLL)

14 CFR Part 150 Study

CLIENT: Broward County Aviation Department (BCAD), Dania Beach, FL

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA is leading a 14 CFR Part 150 airport noise and land use compatibility study to address noise concerns at FLL. The study is evaluating the operational conditions at the Airport stemming from reconstruction and expansion of the south parallel runway – which affected residential communities in the vicinity of the expanded south runway as well as the existing north runway. Potential measures include noise abatement strategies, a new sound insulation program, and numerous programmatic measures. The project is one of the largest noise studies ever undertaken in the southeastern U.S. Chris led the production of much of the Noise Compatibility Program (NCP) on an aggressive schedule in close coordination with BCAD and the FAA. He also presented complex noise abatement concepts at the in-person Technical Committee (TC) meetings during the study, which included elected officials from multiple municipalities in the vicinity of FLL.

PROJECT DIRECTOR/BACKUP ROUNDTABLE FACILITATOR/AIR TRAFFIC NEPA EXPERT,

Santa Clara/Santa Cruz Roundtable (SCSC Roundtable) Facilitator Services

CLIENT: Cities Association of Santa Clara County, Los Altos, CA

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA facilitated the SCSC Roundtable, an aircraft community noise forum that served as a liaison between Santa Clara and Santa Cruz, CA communities and the FAA on the noise impacts of air traffic procedures. The Roundtable was established due to community concerns related to the FAA's Northern California Metroplex project. Chris served as the backup facilitator for the Roundtable, as well as the ESA Project Director in 2021. He also served as the project's air traffic NEPA expert, which included explaining the environmental review process for FAA flight procedures using language that general audiences can easily understand. He presented to the public and Roundtable members in a virtual setting.

BACKUP ROUNDTABLE FACILITATOR, Los Angeles International Airport (LAX) Community Roundtable Facilitator Services

CLIENT: Los Angeles World Airports (LAWA), Los Angeles, CA

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA facilitated the LAX Community Roundtable, an airport-community noise forum that serves as a liaison between communities, LAWA, the FAA, and aircraft operators. Chris served as the backup facilitator for the Roundtable. He also assisted with the production of presentations for the Roundtable, with a focus on explaining technical air traffic topics using language that general audiences can easily understand.

AIRCRAFT NOISE EXPERT, Lakeland Linder International Airport (LAL) Community Engagement Support

CLIENT: City of Lakeland, Lakeland, FL

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA provided noise support services to LAL in response to community concerns regarding new air cargo operations and flight paths. Chris led engagement with the client regarding noise communication materials such as web pages and Frequently Asked Questions (FAQs) and led ESA efforts to recommend revisions to those materials.



DETAILED CONSULTING EXPERIENCE (CONTINUED)

PROJECT MANAGER AND AEDT SUBJECT MATTER EXPERT, JFK Runway 13L-31R Upgrade

CLIENT: Port Authority of New York and New Jersey, New York, NY

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

As a subconsultant to Vanasse Hangen Brustlin (VHB), ESA performed the noise analysis associated with a proposed modification to Runway 13L-31R at JFK. Chris reviewed AEDT inputs and oversaw the modeling process while also supporting conversations between VHB, the Port Authority of New York and New Jersey, and the FAA related to detailed modeling requirements for NEPA Environmental Assessment (EA) compliance activities. In collaboration with ESA information technology leaders, he led upgrades to AEDT modeling processes that increased the speed of AEDT execution by a factor of seven. Chris also managed tasks and budgets associated with the modeling process. In addition, Chris served as an environmental modeling subject matter expert during a series of in-person public workshops. The FAA produced a Finding of No Significant Impact (FONSI) determination, allowing construction to proceed.

PROJECT MANAGER/AIR QUALITY ANALYST, Denver International Airport (DEN) Concourse Expansion Environmental Assessment

CLIENT: City and County of Denver, Denver, CO

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

As a subconsultant to Mead & Hunt, ESA analyzed and documented potential noise and emissions impacts of the DEN concourse expansion project to support the NEPA EA process. Chris used the AEDT model to calculate potential impacts of the project on aviation airborne and ground emissions, including emissions from aircraft startup, taxi, auxiliary power unit, and ground support equipment activity. Chris also led the construction emissions analysis using the ACEIT model. The FAA produced a FONSI determination, allowing construction to proceed.

AIR QUALITY ANALYST/AEDT SUBJECT MATTER EXPERT, San Bernardino International Airport Eastgate Air Cargo Facility Environmental Assessment

CLIENT: San Bernardino International Airport Authority (SBIAA), San Bernardino, CA

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

The SBIAA proposed to develop the Eastgate Air Cargo Facility, a package sorting and distribution center with an air cargo hub that would provide comprehensive air cargo services at the Airport. Approval and implementation of the proposed project required actions by the FAA, necessitating environmental analysis, coordination, and documentation to comply with the federal Clean Air Act (CAA) and NEPA. ESA assisted the SBIAA with providing NEPA documentation and air quality analysis to support a finding that the proposed project conforms to the air quality management plan established in the California State Implementation Plan. Chris provided subject matter expertise on AEDT functionality and led the aircraft emissions analysis. This included using AEDT to generate sources and emission rates for emissions dispersion analysis in support of CAA compliance activities. Chris also provided aircraft environmental modeling expertise during an in-person public workshop and hearing. The FAA produced a FONSI determination, allowing construction to proceed.



DETAILED CONSULTING EXPERIENCE (CONTINUED)

AIR QUALITY ANALYST/AEDT SUBJECT MATTER EXPERT, Snohomish County (Paine Field) Airport

New Air Service Environmental Assessment

CLIENTS: Alaska Airlines, Inc.; United Airlines, Inc.

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA led the production of an Environmental Assessment associated with amendment of the 14 CFR Part 139 airport operating certificate to allow for introduction of new passenger air service at Paine Field (PAE) in Everett, WA. This included producing NEPA documentation as well as analyzing potential noise and emissions impacts of new commercial aircraft operations. Chris used the AEDT model to calculate potential impacts of the project on aviation airborne and ground emissions, including emissions from aircraft startup, taxi, auxiliary power unit, and ground support equipment activity. He also provided environmental modeling subject matter expertise during an in-person public workshop. The FAA produced a FONSI determination for the project, allowing new air service to begin.

AIR QUALITY ANALYST/AEDT SUBJECT MATTER EXPERT, St. Pete-Clearwater International Airport (PIE) Airco Parcel

Redevelopment Environmental Assessment

CLIENT: Pinellas County, Clearwater, FL

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA led the production of an Environmental Assessment for redevelopment of a land parcel near PIE known as the Airco Parcel. This included producing NEPA documentation as well as analyzing potential noise and emissions impacts of the redevelopment. Chris used the AEDT model to calculate potential impacts of the project on air emissions, including emissions from aircraft startup, taxi, auxiliary power unit, and ground support equipment activity. Chris also led the construction emissions analysis, using the ACEIT model. The FAA produced a FONSI determination, allowing construction to proceed.

AIR QUALITY ANALYST, Seattle-Tacoma International Airport (SEA)

CLIENT: Foster Pepper PLLC, Seattle, WA

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA was tasked by the Port of Seattle's outside legal counsel, Foster Pepper PLLC, to develop several historical sets of air emissions data for SEA aircraft operations using the Aviation Environmental Design Tool version 2c Service Pack 2. Several historical SEA Integrated Noise Model (INM) study files were converted for use in the AEDT. Chris used the AEDT results to prepare data tables depicting SEA's air emissions over time.

AIR QUALITY ANALYST/AEDT SUBJECT MATTER EXPERT, Lake Tahoe Airport (TVL) Master Plan California Environmental Quality Act (CEQA) Analysis

CLIENT: City of South Lake Tahoe, South Lake Tahoe, CA

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA prepared California Environmental Quality Act (CEQA) documentation for the Lake Tahoe Airport Master Plan. Chris used AEDT 2c to generate air emissions inventories for aircraft startup, taxi, and flight activity as well as auxiliary power unit and ground support equipment activity.



DETAILED CONSULTING EXPERIENCE (CONTINUED)

AIR QUALITY ANALYST/AEDT SUBJECT MATTER EXPERT, Lakeland Linder International Airport (LAL) Maintenance, Repair, and Overhaul (MRO) Environmental Assessment

CLIENT: City of Lakeland, Lakeland, FL

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

Under an on-call contract with the airport, ESA has been responsible for multiple EAs at LAL. These include an EA for a new Maintenance, Repair, and Overhaul complex. Chris used AEDT to generate aircraft emissions results for the MRO EA.

PROJECT MANAGER/ANALYST, Downtown Manhattan Heliport (JRB) Air Tour Compliance Monitoring

CLIENTS: Saker Aviation Services, New York, NY; New York City Economic Development Corporation, New York, NY

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

The Downtown Manhattan Heliport (JRB) is the operating location for several helicopter air tour companies that collectively operate 30,000 air tours per year. As Project Manager and Analyst for air tour compliance monitoring, Chris worked directly with the heliport operator Saker Aviation to monitor compliance with an air tour agreement between the operator and New York City. Chris analyzed helicopter flight tracks for compliance with mandatory air tour routes, and he also evaluated potential helicopter air tour complaints submitted by New York City elected officials and registered through New York City's "311" phone system.

PROJECT MANAGER/AEDT SUBJECT MATTER EXPERT, Miami-Dade Aviation Department (MDAD) Airport Noise Contour Update

CLIENT: MIAMI-DADE AVIATION DEPARTMENT, MIAMI, FL

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

As a part of ESA's on-call contract with MDAD, Chris oversaw and guided the use of AEDT to generate noise contours for Miami International Airport (MIA), Miami Executive Airport (OPF), and Kendall-Tamiami Executive Airport (TMB). He also oversaw the production of draft and final technical reports documenting the analysis while managing tasks and budgets for the noise contour production.

PRODUCTION ASSISTANT, Melbourne International Airport (MLB) 14 CFR Part 150 Update Study

CLIENT: City of Melbourne, Melbourne, FL

ESA | Senior Managing Associate, 2016 – 2021 | New York, NY

ESA prepared Noise Exposure Maps and a Noise Compatibility Program for this commercial service airport operated by the City of Melbourne. The 14 CFR Part 150 update process evaluated the current noise exposure and the extent of use of the noise compatibility program measures outlined in the previous study, as well as changes in noise exposure resulting from an increase in aircraft manufacturing and MRO activity for large commercial aircraft at the airport. Chris assisted with the production of materials for a public workshop and public hearing associated with the study.



DETAILED FAA EXPERIENCE

PROJECT MANAGER/TECHNICAL ANALYST, Noise Analysis of Tennessee Army National Guard (ANG) Relocation to Nashville International Airport (BNA)

GROUP: FAA Air Traffic Organization (ATO) Mission Support Services, Environmental Policy Team (ATO AJV-114)

FAA Headquarters | Environmental Specialist, 2015 – 2016 | Washington, DC

The FAA's ATO performed a NEPA noise study for a relocation of Tennessee Army National Guard (ANG) helicopters to BNA from nearby Smyrna/Rutherford County Airport. Chris designed and executed the study as one of the first users of AEDT version 2b, and the results supported an ANG Record of Environmental Consideration (REC) for three new helicopter flight routes. Chris led extensive coordination between the FAA Memphis Airport District Office, Nashville Airport Traffic Control Tower, ATO Mission Support Services, Office of Environment and Energy, and the Tennessee ANG to develop a consensus on modeling methodology. His study enabled the finalization of the new helicopter routes, preventing ANG helicopters from interfering with fixed-wing aircraft and creating extensive delays at BNA.

PROJECT MANAGER, FAA ATO Mission Support Services Community Involvement Plan

GROUP: FAA Air Traffic Organization Mission Support Services, Environmental Policy Team (ATO AJV-114)

FAA Headquarters | Environmental Specialist, 2015 – 2016 | Washington, DC

The FAA's ATO began an effort to improve community involvement processes for air traffic modernization programs, including the national Metroplex program. This effort was initiated by the Vice President of ATO Mission Support Services. Chris directed a multi-stakeholder work group to develop and implement a plan for improving community involvement processes. The work group included representatives of the FAA Office of Airports (ARP), Office of Environment and Energy, ATO Mission Support Services, Office of the Chief Counsel (AGC), and the National Air Traffic Controllers Association (NATCA). Chris led the production of draft plans and policies, which he presented directly to the Vice President. His work directly influenced the refinement of community involvement processes for the FAA's national Metroplex program, improving stakeholder engagement and environmental compliance.

ENVIRONMENTAL PROTECTION SPECIALIST, FAA Order JO 7400.2L ("Procedures for Handling Airspace Matters")

Chapter 32 ("Environmental Matters") Updates

GROUP: FAA Air Traffic Organization Mission Support Services, Environmental Policy Team (ATO AJV-114)

FAA Headquarters | Environmental Specialist, 2015 – 2016 | Washington, DC

The FAA's ATO updated Chapter 32 of FAA Order JO 7400.2K to produce FAA Order JO 7400.2L with revised and refined requirements for NEPA review of FAA air traffic procedure projects. Chris provided numerous improvements to Chapter 32, including language related to environmental analysis requirements and use of air traffic environmental screening tools.

PROJECT MANAGER, Environmental Screening for Air Traffic Flight Procedure Projects

GROUP: FAA Air Traffic Organization Mission Support Services, Environmental Policy Team (ATO AJV-114)

FAA Headquarters | Environmental Specialist, 2015 – 2016 | Washington, DC

The FAA performs environmental screening activities to support the NEPA determinations of multiple ATO Mission Support Services environmental specialists around the United States. Chris directed the efforts of two technical analysts using AEDT and other internal FAA tools to perform environmental screening of proposed flight procedures in accordance with FAA Order 1050.1F ("Environmental Impacts: Policies and Procedures") and FAA Order JO 7400.2 ("Procedures for Handling Airspace Matters"). Chris also facilitated conversations between technical analysts and FAA air traffic Subject Matter Experts. His efforts ensured high quality analysis products for such high-visibility projects as Washington, DC Metroplex flight procedure post-implementation amendments; Charlotte Metroplex post-implementation amendments; and Teterboro Airport flight procedure design activities.



DETAILED FAA EXPERIENCE (CONTINUED)

AEDT SUBJECT MATTER EXPERT, FAA Order 1050.1F (“Environmental Impacts: Policies and Procedures”) Update

GROUP: FAA Office of Environment and Energy, Emissions Division (AEE-300)

FAA Headquarters | General Engineer, 2009 – 2015 | Washington, DC

The FAA’s AEE performed a significant, comprehensive update to FAA Order 1050.1. Chris reviewed and refined language related to the use of the Aviation Environmental Design Tool for NEPA reviews of FAA projects. This included reviewing and refining emissions and air quality guidance in Appendix C of the FAA Order 1050.1F Desk Reference (“Guidance on Using the Aviation Environmental Design Tool (AEDT) 2b to Conduct Environmental Modeling for FAA Actions Subject to NEPA”).

PROJECT CO-MANAGER, Aviation Environmental Design Tool (AEDT) Version 2a and 2b Development

GROUP: FAA Office of Environment and Energy, Emissions Division (AEE-300)

FAA Headquarters | General Engineer, 2009 – 2015 | Washington, DC

Chris was a co-manager of AEDT 2a and 2b development for four years, overseeing the release of AEDT 2a (which replaced the Noise Integrated Routing System) and directing the majority of AEDT 2b development. He was the primary manager of software development tasks executed by four organizations to create AEDT 2b, which replaced the Integrated Noise Model (INM), the Emissions and Dispersion Modeling System (EDMS), and the Noise Integrated Routing System (NIRS) for aviation environmental regulatory compliance and became the required model for NEPA analysis of air traffic airspace and procedure projects. The AEDT also replaced the System for Assessing Aviation’s Global Emissions (SAGE) and the Model for Assessing Global Exposure to the Noise of Transport Aircraft (MAGENTA) for FAA domestic and international policy analysis, Chris directed implementation of numerous software development process improvements using the Scrum methodology. He also oversaw the design and launch of the AEDT Operations and Maintenance (O&M) website featuring a bug submission and tracking system for AEDT users. Chris raised public awareness of the AEDT by giving presentations at events hosted by the American Association of Airport Executives, the University of California at Davis, the Transportation Research Board, and other organizations.

PROGRAM MANAGER: FAA Aviation Emissions and Air Quality Handbook

GROUP: FAA Office of Environment and Energy, Emissions Division (AEE-300)

FAA Headquarters | General Engineer, 2009 – 2015 | Washington, DC

Chris co-managed production of the FAA Aviation Emissions and Air Quality Handbook Version 3, including substantial updates to guidance on emissions analysis methodologies and use of AEDT. The Handbook was first produced in the 1980s and last updated in the early 2000s. Greenhouse gas emissions calculation methodologies were also added for Version 3. Handbook is used nationwide for NEPA, Clean Air Act, and greenhouse gas analysis of aviation projects.

PROJECT MANAGER, Emissions and Dispersion Modeling System (EDMS) Versions 5.1.4 and 5.1.4.1

GROUP: FAA Office of Environment and Energy, Emissions Division (AEE-300)

FAA Headquarters | General Engineer, 2009 – 2015 | Washington, DC

Chris managed the creation of the EDMS versions 5.1.4 and 5.1.4.1, where system databases and model output formats were updated. These were the last versions of the EDMS, which was later replaced by AEDT 2b. Chris facilitated conversations between users and EDMS developers to enhance the quality of the EDMS software.



DETAILED FAA EXPERIENCE (CONTINUED)

FAA LIAISON, Airport Cooperative Research Program (ACRP)

GROUP: FAA Office of Environment and Energy, Emissions Division (AEE-300)

FAA Headquarters | General Engineer, 2009 – 2015 | Washington, DC

Chris was the FAA liaison to several ACRP projects, including ACRP 02-42 (“Understanding Air Quality and Public Health Studies Related to Airports”), ACRP 02-45 (“Methodology to Improve EDMS/AEDT Quantification of Aircraft Taxi/Idle Emissions”), ACRP 02-58 (“Dispersion Modeling Guidance for Airports Addressing Local Air Quality Health Concerns”), and ACRP 02-63 (“Quantifying Airport Ground Access Vehicle Activity for Emissions Modeling”). He used his expertise in emissions, air quality, the AEDT, and aviation environmental modeling to increase the quality of Requests for Proposals and assist in the selection of project contract teams.

PROJECT MANAGER, Partnership for Air Transportation Noise and Emissions Reduction (PARTNER)

Projects 11, 16, and 33

GROUP: FAA Office of Environment and Energy, Emissions Division (AEE-300)

FAA Headquarters | General Engineer, 2009 – 2015 | Washington, DC

Chris managed university tasks for several air quality research projects under the FAA Center of Excellence named PARTNER, which was later replaced by the Aviation Sustainability Center (ASCENT) Center of Excellence. Chris oversaw the production of numerous scientific journal articles describing measurement and modeling campaigns that advanced industry knowledge on how aviation impacts air quality and human health. Projects were based at Harvard School of Public Health and Boston University School of Public Health (PARTNER Project 11), University of North Carolina at Chapel Hill (Project 16), and University of California at San Diego (Project 33). Journal articles were published in high-profile academic journals such as “Atmospheric Environment.” Chris participated in multiple PARTNER Advisory Board and FAA Aviation Emissions Characterization Roadmap meetings to share research results with community groups, regulators, airport operators, aircraft operators, and industry associations.



SELECTED PUBLICATIONS

COMPARING AERODYNAMIC MODELS FOR NUMERICAL SIMULATION OF DYNAMICS AND CONTROL OF AIRCRAFT

CITATION: Citation: Sequeira, Christopher & Willis, David & Peraire, J. (2006). Comparing Aerodynamic Models for Numerical Simulation of Dynamics and Control of Aircraft. 10.2514/6.2006-1254.

Stability and control derivatives are routinely used in the design and simulation of aircraft, yet other aerodynamics models exist that can provide more accurate results for certain simulations without a large increase in computational time. In this paper, several aerodynamics models of varying fidelity are coupled with a six degrees of freedom rigid body dynamics simulation tool to model various geometries under a number of different initial conditions. The aerodynamics models considered are: stability derivatives, strip theory methods, quasi-steady vortex lattice methods, and unsteady panel methods. Through dynamic simulations using a virtual wind tunnel, differences between the various aerodynamics models are examined.

The simulations that were examined were primarily concerned with the short period mode in the longitudinal direction. Initial examinations were performed on single-surface geometries and showed good agreement between all models. The follow-up simulations of conventional- and canard-type aircraft configurations showed variations due primarily to the inclusion of a wake model for domain vorticity in the vortex lattice and unsteady panel methods. Although dynamics are considered, the simulations performed did not show unsteady aerodynamics effects causing significant differences in short-period responses. This suggests that the quasi-steady approaches traditionally considered are adequate for the majority of stability and control simulations. The use of unsteady panel methods is only required when reduced frequencies increase to the point where Theodorsen's lag function contributes significantly to the aerodynamic behavior. This would be the case for high frequency forced flapping flight but is generally not the case for aircraft.

QUANTIFYING THE RELATIONSHIP BETWEEN AIR TRAFFIC MANAGEMENT INEFFICIENCY, FUEL BURN AND AIR POLLUTANT EMISSIONS

CITATION: Ohsfeldt, M., Thrasher, T., Waitz, I., Ratliff, G., Sequeira, C., Thompson, T., Graham, M., Cointin, R., Gillette, W., & Gupta, M. (2007). Quantifying the relationship between air traffic management inefficiency, fuel burn and air pollutant emissions. 234-242. Paper presented at 7th USA/Europe Air Traffic Management Research and Development Seminar, ATM 2007, Barcelona, Spain.

Worldwide air travel demand has increased significantly over the past 30 years, leading to an increased number of flights, associated delays, fuel consumption, and aircraft air pollutant emissions. Demand for aviation is expected to grow three-fold over the next two decades and could potentially lead to an increase in aviation related emissions of air pollutants.

This study quantifies the contribution of aircraft emissions at 148 airports that lie within the air quality non-attainment or maintenance areas to the county-level emissions inventories. We also quantify how inefficiency in air traffic management contributes to increased aircraft-related fuel burn and emissions. A baseline fuel burn and emission inventory is presented, consisting of realistic aircraft operations and including delays due to air traffic management inefficiencies. At most of the evaluated airports (~52%), aircraft emissions are a relatively small contributor (<1%) to county level emissions of the criteria pollutants considered in this analysis. Reducing ground delays can significantly impact those airports with high taxi times, leading to potential airport reductions of between 10% and 25% in fuel burn and emissions. A sample efficiency initiative is used to demonstrate the potential reduction in delays, and hence, in fuel burn and emissions.



SELECTED PUBLICATIONS (CONTINUED)

AN ASSESSMENT OF THE HEALTH IMPLICATIONS OF AVIATION EMISSIONS REGULATIONS

CITATION: Sequeira, C. J. 2008. An assessment of the health implications of aviation emissions regulations. S.M., Massachusetts Institute of Technology.

Inventories of aircraft emissions from the year 2005 were assessed. It was estimated that aircraft were responsible for 140 to 160 yearly incidences of premature mortality from exposure to ambient PM_{2.5}. Ammonium sulfate concentrations caused 46% to 69% of the incidences, while ammonium nitrate caused 18% to 20%. Organics-related volatile primary PM caused 6% - 18%, nonvolatile primary PM caused 5% - 14%, and sulfates-related volatile primary PM caused 0% to 4% of the incidences. A policy strategy that reduces fuel sulfur content to 15 ppm would reduce incidences by 38% and may be cost-beneficial.