Minneapolis-St. Paul International Airport
Noise Oversight Committee (NOC)

NOC Committee Members

Jeff Hart	User Co-Chair, Scheduled Airline Representative (Delta Air Lines)
Dianne Miller	Community Co-Chair, City of Eagan Representative (City of Eagan)
Ryan Barette	Minnesota Business Aviation Association Representative
John Bergman	At-Large Community Representative (Apple Valley City Council)
Paul Borgstrom	Chief Pilot Representative (Delta Air Lines)
Pam Dmytrenko	City of Richfield Representative (City of Richfield)
Cheryl Jacobson	City of Mendota Heights Representative (City of Mendota Heights)
Patrick Martin	City of Bloomington Representative (Bloomington City Council)
Alex Mason	At-Large Airport User Representative (Endeavor Air, Inc.)
Linea Palmisano	City of Minneapolis Representative (Minneapolis City Council)
Casey Potter	Charter/Scheduled Operator Representative (Sun Country Airlines)

MEETING AGENDA

July 21, 2021 at 1:30 PM

Jeff Hart, Delta Air Lines, will be the acting Chairperson for the meeting

VIRTUAL MEETING FORMAT ONLY - The meeting is open to the public.
To participate, please join using the following options:
Microsoft Teams Link: Click here to join the meeting
By Phone: 612-405-6798, phone conference ID: 552 601 610#

1. **Consent**
   - 1.1. Introductions
   - 1.2. Approval of May 19, 2021 Meeting Minutes
   - 1.3. Reports
     - 1.3.1. Monthly Operations Reports: May and June 2021
     - 1.3.2. Status of Aviation Noise, Environment, and Health-Related Research Initiatives
2. **Public Comment Period**
3. **Business**
   - 3.1. Nomination and Election of Co-Chairs
   - 3.2. MAC Residential Mitigation Program Update
4. **Information**
   - 4.1. Minnetonka Mobile Sound Study Report
   - 4.2. Meet the Fleet
5. **Announcements**

Adjourn

MSP NOISE OVERSIGHT COMMITTEE
DRAFT MEETING MINUTES
Wednesday, May 19, 2021 at 1:30 PM
By Teleconference Only

Call to Order

A regularly scheduled meeting of the Minneapolis-St. Paul International Airport (MSP) Noise Oversight Committee, (NOC) having been duly called, was held Wednesday, May 19, 2021, by teleconference only. Chair Miller called the meeting to order at 1:30 p.m. The following participated in the teleconference:

Representatives: M. Brindle, R. Barrette, P. Borgstrom, B. Cloud, P. Dmytrenko, J. Hart, C. Jacobson, D. Lowman, D. Miller, L. Olson, C. Potter

Staff: C. Boyd, R. Fuhrmann, P. Hogan, B. Juffer, J. Lewis, K. Martin, D. Nelson, N. Pesky, B. Peters, B. Ryks, M. Ross, M. Takamiya, J. Welbes

Others: Beslow – FAA, Gregg Davis - Delta, H. Rand – Inver Grove Heights, J. Bergman – Apple Valley, B. Hoffman – St. Louis Park, S. Fortier – FAA, K. Mara – FAA, R. MacPherson – FAA, R. Mogush, Lynne Moore - Bloomington, T. Postiglione – FAA, N. Rao – FAA, K. Regotti – FAA, J. Ronken – FAA, A. Scipioni, and other members of the public

A quorum of four Community Representatives, and four Industry Representatives was established by roll call attendance:

Community Representatives: M. Brindle, P. Dmytrenko, C. Jacobson, D. Lowman, D. Miller, L. Olson
Industry Representatives: R. Barrette, P. Borgstrom, B. Cloud, J. Hart, Potter

1. Consent

1.1. Review and Approval of March 17, 2021 Meeting Minutes

There were no questions or revisions to the March 17th meeting minutes.

1.2. Reports

1.2.1. Monthly Operations Reports: March and April 2021

Michele Ross, Assistant Technical Advisor, provided March and April 2021 operations updates. (Presentation materials are available on macnoise.com):

MAR

- Total Operations: 23,461
- Nighttime Operations: 1,062
- North/South/Mixed: 38/54/2 (%)
- RUS (Priority 1/2/3/4): 44/7/0/49 (%)
- RJ/Narrow/Wide: 44.2/50.8/5 (%)
- Complaints: 14,404
- Complaint locations: 282
- Top 10 Households: 55%
- Hours of events*: 324
- Number of events*: 63,102
- R17 procedure: 99.3%
- EMH Corridor procedure: 94.8 %
- Crossing procedure day: 15.1%
- Crossing procedure night: 34.8%
- RUS: 50.6 %

APR

- Total Operations: 22,936
- Nighttime Operations: 1,099
- North/South/Mixed: 51/32/6 (%)
- RUS (Priority 1/2/3/4): 49/1/1/49 (%)
- RJ/Narrow/Wide: 43.4/51.3/5.3 (%)
- Complaints: 11,667
- Complaint locations: 247
- Top 10 Households: 54%
- Hours of events*: 321
- Number of events*: 62,246
- R17 procedure: 99.1%
- EMH Corridor procedure: 91.8%
- Crossing procedure day: 15.7%
- Crossing procedure night: 40%
- RUS: 51.7%

* Aircraft sound events above 65dB.

Chair Miller thanked Ms. Ross for her report, then asked the Committee if they had any questions. Hearing none, Chair Miller asked for a motion to approve the consent agenda. **Member Brindle moved,** and **Member Borgstrom seconded** approval of the Consent items listed above. The motion passed on the following roll call vote:

Ayes: Eleven

Barrette, Borgstrom, Brindle, Cloud, Dmytrenko, Hart, Jacobson, Lowman, Miller, Olson, Potter

Nays: None

Abstain: None

2. Public Comment Period

There were no questions or comments from the public.

3. Business

There were no business agenda items.

4. Information

4.1. Converging Runway Operations Update

Rebecca MacPherson, FAA Regional Administrator for the Great Lakes Region, provided an update. Converging Runway Operations (CRO) are used during periods of high operations (two morning pushes and one afternoon push) and favorable winds. Because of decreased operations as a result of the pandemic; CRO has not been used since March 2020. For the past nine months, the FAA has been considering expanding the Arrival/Departure Window (ADW), due to a small percentage of the fleet. It has been difficult to assess the impact of a shift in fleet mix on something that is not currently utilized. The FAA is modeling adjustments in the fleet mix and hopes to have a report out sometime this fall. The report will be sent for additional analysis within the FAA and a final analysis will be done by the FAA safety team to determine if any suggested changes within the window would be an improvement on current

safe standards. FAA procedures are constantly being reevaluated in an effort to improve safety and increase efficiency. The FAA will do the appropriate outreach once CRO resumes. Based on discussions last summer, internal to the FAA, if there is a change to the ADW it will still likely qualify as an environmental Categorical Exclusion (CATEX), but will need to be confirmed with noise modeling. Public outreach is not the norm, but the agency has committed to doing more outreach outside of the National Environmental Policy Act (NEPA) process. MacPherson stated her strong inclination to not tie the outreach to the NEPA analysis, as the FAA is not legally required to do so. She went on to say that in many respects it is a cleaner way to address the type of outreach that the FAA believes is appropriate and whether that is in person or via Zoom, or some combination of the two. FAA has found Zoom to be highly effective in reaching more community members, as people do not have to take time off during the day to attend a public meeting. Meetings are recorded so they can be watched when convenient. The Zoom format allows for more clear and consistent messaging. There is significant value to in person outreach and it is an appropriate thing to do, especially since the CRO has been at the airport for several years and the FAA has not done any active outreach on it. A decision by the FAA of whether to change the size of the ADW or keep it the same is not anticipated until early 2022.

4.2. MSP Air Service Updates

Brad Juffer, Technical Advisor, introduced this topic. This is the second installment of this NOC 2021 workplan item. This topic was also on the January agenda and covered at that meeting. It was noted that the NOC normally does not spend a whole lot of time looking at future airline schedules as it is usually focused on what has previously happened at the airport over the past two months. At the January meeting our presenters focused on the travel schedule that was expected for Spring break, they provided some quantitative data on daily departures and some context on what, at the time, had been a volatile airline schedule. Juffer introduced Brian Peters, Director of Air Service Development, MAC, Gregg Davis, Delta Network Planning, Casey Potter, Sun Country Airlines, to address the NOC.

Brian Peters, Director of Air Service Development, provided the following information:
MSP had 299 average daily departures in January and has trended consistently upward with about 339 in March and 346 daily departures currently. This is forecasted to increase to 404 in June and 432 in July. August daily departures are expected to be in the 430 range, with a slight drop in September as is the normal trend. There may be some variability in flight numbers due to air service continuing to recover from the pandemic. Looking at the peaks in May, there are at about 375-380 daily departures which typically occur on Thursday, Fridays, Sundays, Mondays. In June, the peak days will increase to about 430 and in July peak days are expected to increase to 460.

Delta will resume service to Reykjavik the first week of June. Air France will resume service to Paris (CDG), the second week of June. Icelandair will return service to Reykjavik. Service for all other international, Seoul and Tokyo are scheduled to resume later in the summer but may be subject to change.

Gregg Davis, Delta Network Planning, provided information about Delta's average daily departures for the last three years. Delta anticipates recovery to continue into the Fall, it is expected that September and October schedules will increase a bit higher than what is shown in August. Delta is in a tactical mode and nothing has been firmly decided past July. Delta service to Paris will resume the seventh of July. Several domestic markets will start back up in June and a handful more in July. During the pandemic Delta's flight bank structure was compressed in MSP. Starting in June, with the summer schedule, the bank structure, in MSP, will be back to normal, resuming the 0700, 1100 and 2200 departure banks.

The impact on passenger throughput after the practice of blocking middle seats was discontinued May 1 as shown in the presentation materials. There is still some variability, but passenger levels have increased about 15-20% from before the seat block removal date. There has been a steady increase through May, and it is expected to continue to grow throughout the summer.

When the seat caps came off, Delta's effective load factor dropped down into the 70% range immediately from a trending range of 75-83%. By the beginning of this week, range returned to 80% for the full cabin. With more activity, passenger counts can increase without adding additional flights.

Casey Potter, Sun Country Airlines, spoke about Sun Country's daily departures out of MSP. He mentioned that 2021 numbers are just barely below 2019 numbers and are consistent with airport operations as a whole. Daily departures are steadily ticking up to 2019 numbers entering July with thirty average daily departures. Looking past summer there are several new routes added outside of the MSP market. Potter is hopeful that daily departures will be closer to 2019 levels heading into Fall.

There were no questions, so Chair Miller moved to item 4.3.

4.3. Meet the Fleet

Brad Juffer, Technical Advisor, spoke about the MAC Community Relations office continuing to branch out and explore new touchpoints with its neighbors. Our work from home posture has required us to be creative and this is one of those efforts to bring our neighbors into our airport. To introduce our Meet the Fleet video series our original plan was to play the first video in the series however, it is not available yet. So here is an introduction of what is included. The videos will star many of our NOC pilots; they will talk about their passion for flying and show us around their own personal flying office. The videos will give views of an inside and outside close up of some of the aircrafts used on a daily basis at MSP it will provide interesting facts and figures about these aircraft discuss some of their distinguishing features and also allow our community to have a sight of planes at the airport that they may not otherwise get to see. The first video coming soon will feature the Endeavor Air CRJ-900, which is the most flown aircraft at MSP, it will star Chris Finlayson. Included on the docket after the CRJ-900 will be NOC and Delta's own Paul Borgstrom, he will provide some information on MSP newest aircraft the Airbus A220, more videos of other aircraft will be rolled out as they

become available in the Summer and Fall of 2021. As mentioned there will be inside and outside looks at each aircraft along with interesting facts and figures. Please watch the website for these upcoming videos and more details.

4.4. Review of Spring Listening Session

Michele Ross, Assistant Technical Advisor, provided an update on the April 28, 2021 Spring Listening session.

In attendance were three residents for Minneapolis, one from St. Bonifacius, FAA Staff, NOC representatives, including Chair Hart, Linnea Palmisano, Chris Finlayson, and three MAC staff.

A brief air service update was provided, along with some operations information, and an update on construction projects. A lot of the information previously provided at the March NOC meeting was shared at this listening session. After the short presentation, there was time for an open conversation. There was a resident interested in learning more about the Sound Mitigation program, staff spoke with the resident about the program after the meeting concluded. The session was brief as not too many people attended. It is a great opportunity to invite people to participate virtually, though not everyone wants to do a virtual meeting at 6pm. Future meetings will most likely provide a hybrid option for those who wish to participate virtually. That will be an ongoing process as the next phase of listening sessions are coordinated.

Questions: There were no questions regarding the listening session.

5. Announcements

Summer Listening Session

Wednesday, July 28, 2021 @ 6pm
Location TBA

July NOC Meeting

Wednesday, July 21, 2021 @ 1:30pm
Location TBA

6. Adjourn

Chair Miller thanked the members of the Committee, NOC staff and residents in attendance. The meeting was adjourned at 2:13 pm.

MEMORANDUM

ITEM 1.3.1

TO: MSP Noise Oversight Committee (NOC)

FROM: Michele Ross, Assistant Manager, Community Relations

SUBJECT: **REVIEW OF MSP MONTHLY OPERATIONS REPORTS: MAY AND JUNE 2021**

DATE: July 7, 2021

Each month, the MAC reports information on MSP aircraft operations, aircraft noise complaints, sound levels associated with MSP aircraft operations, and compliance with established noise abatement procedures on its interactive reporting website: https://customers.macnoms.com/reports.

At the July NOC meeting, MAC staff will provide a summary of this information for May and June 2021. To view these summary reports prior to the meeting, visit the "Archive" section at the link above.

MEMORANDUM

ITEM 1.3.2

TO: MSP Noise Oversight Committee (NOC)

FROM: Jennifer Lewis, Community Relations Coordinator

SUBJECT: **SUMMARY AVIATION-RELATED RESEARCH INITIATIVES**

DATE: July 7, 2021

In accordance with the 2021 NOC Work Plan, MAC staff have enclosed an updated listing of aviation-related research initiatives pertaining to aircraft noise, technology, human health, and environmental topics.

A summary of the research projects that were completed, active, initiated, or anticipated in 2021 or 2022 is provided in the attached report, and includes work by the Transportation Research Board (TRB), the FAA's Centers of Excellence (ASCENT), and other researchers.

Aviation-Related Research Update

Summary of Research Pertaining to Aircraft Operations
at Minneapolis-St. Paul International Airport

July 2021

Introduction

Research is ongoing by various agencies in the U.S. and across the globe to evaluate the effects of aviation noise and other environmental impacts associated with aircraft operations.

Notable research efforts in 2020 and early 2021, with potential pertinence to flight activity at Minneapolis-St. Paul International Airport (MSP), are summarized below for consideration by the MSP Noise Oversight Committee to inform future work plans.

Federal Aviation Administration (FAA)

Neighborhood Environmental Survey (Research Efforts to Inform Aircraft Noise Policy)

The FAA conducted a nationwide survey regarding annoyance related to aircraft noise to update the scientific evidence on the relationship between aircraft noise exposure and its annoyance effects on communities around airports, based on today's aircraft fleet and operations. Docket FAA-2021-0037-001 was published to share the survey research program in January 2021. Comments on the research were solicited through April 14, 2021. The FAA's website indicates that over 4,000 comments were received, and these comments are in the process of review. The survey was a twelve-question survey sent to residents around 20 airports. MSP was not included as one of the 20 airports.

The results show that compared with the Schultz Curve representing transportation noise, the NES results show a substantially higher percentage of people highly annoyed over the entire range of aircraft noise levels (i.e., from DNL 50 to 75 dB) at which the NES was conducted. Specifically, at a noise exposure level of DNL 65 dB, the updated Schultz Curve from the 1992 FICON Report indicated that 12.3 percent of people were highly annoyed, compared to between 60.1 percent and 70.9 percent within a 95 percent confidence limit from the NES.

More detail on this docket (FAA-2021-0037-001) may be found here:
www.faa.gov/regulations_policies/policy_guidance/noise/survey/

National Aeronautics and Space Administration (NASA)

Advanced Air Transport Technology (AATT) Project

NASA's Langley Research Center is comprised of nearly 200 facilities on 764 acres in Hampton, Virginia, and employs about 3,400 civil servants and contractors. Langley works to make revolutionary improvements to aviation, expand understanding of Earth's atmosphere and develop technology for space exploration.

Aircraft noise reduction, including that of the airframe, is an important goal of the AATT Project, which is supporting a combined experimental and computational effort to better understand and mitigate the sources associated with slat noise.

AAAT Project researchers completed a round of testing in late January 2021, on an experimental leading-edge wing design with the intention to reduce the noise caused by aircraft. The goal of the test was to demonstrate the effectiveness of slat noise-reduction concepts constructed out of shape-memory alloys.

The goal is to develop technology that can be readily adopted by industry. A series of additional tests are ongoing in 2021.

More information may be found here: www.nasa.gov/feature/langley/nasa-tests-new-quiet-wing-design

Research Agency Overview

Research collaborations are conducted on an ongoing basis and detailed by the Transportation Research Board and ASCENT. More information about each research agency and the referenced projects is accessible through the website links provided for each organization and project on the following pages.

Transportation Research Board (TRB)

The mission of the Transportation Research Board (TRB) promotes innovation and progress in transportation through research. According to the TRB website, the organization facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encouraged their implementation.

The Airports Cooperative Research Program (ACRP) is sponsored by the Federal Aviation Administration (FAA) and managed by the National Academies through TRB. ACRP research topics are selected by an independent governing board appointed by the U.S. Secretary of Transportation that includes individuals from airports, universities, FAA, and the aviation industry.

Two studies were recently published as shown in the table below. The first study, *Measuring Quality of Life in Communities*, developed methods and guidance to measure the effect of an airport on the quality of life on its surrounding communities. The report includes a guidebook with methodology and a step-by-step approach for conducting a quality of life assessment.

The second study, *Evaluating the Use of Spatially Precise Diurnal Population Data in Aviation Noise Studies*, examined the potential of transitioning from modeling aircraft noise from an average day of operations to a dynamic method of assessing aircraft noise experienced by people where they are as they move about the day and night in aviation noise studies. For more information: www.trb.org/AboutTRB/AboutTRB.aspx

ASCENT

The Aviation Sustainability Center, called ASCENT—previously referred to as the FAA's Center of Excellence program—conducts aviation-related research to develop "science-based" solutions to challenges posed by aircraft operations. Projects undertaken by ASCENT are funded by the FAA, NASA, DOD, Transport Canada, and the US EPA.

For more information: https://ascent.aero/

Research Agency Project Table				
Agency	**Project #**	**Project Title**	**Project URL**	**Status**
TRB	ACRP 02-83	***Measuring Quality of Life in Communities***	http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4420	Published 2020 Report 221
TRB	ACRP 02-84	***Evaluating the Use of Spatially Precise Diurnal Population Data in Aviation Noise Studies***	http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4421	Published 2020 Document 48
TRB	ACRP03 -51	***Electric Aircraft on the Horizon -- An Airport Planning Perspective***	http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4625	Underway
TRB	ACRP 11-08	***ACRP Insight Event-- Future of Aviation***	http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4853	Underway
ASCENT	53	***Validation of Low-Exposure Noise Modeling by Open-Source Data Management & Visualization Systems Integrated with AEDT***	https://ascent.aero/project/validation-of-low-exposure-noise-modeling-by-open-source-data-management-and-visualization-systems-integrated-with-aedt/	Underway
ASCENT	61	***NOISE CERTIFICATION STREAMLINING***	https://ascent.aero/project/noise-certification-streamlining/	Underway
Agency	**Project #**	**Project Title**	**Project URL**	**Status**
ASCENT	63	***PARAMETRIC NOISE MODELING FOR BOUNDARY LAYER INGESTING PROPULSORS***	https://ascent.aero/project/parametric-noise-modeling-for-boundary-layer-ingesting-propulsors/	Underway
ASCENT	72	***AIRCRAFT NOISE EXPOSURE AND MARKET OUTCOMES IN THE US***	https://ascent.aero/project/aircraft-noise-exposure-and-market-outcomes-in-the-us/	Underway
ASCENT	75	***IMPROVED ENGINE FAN BROADBAND NOISE PREDICTION CAPABILITIES***	https://ascent.aero/project/improved-engine-fan-broadband-noise-prediction-capabilities/	Underway

Other Noteworthy Research Efforts

Environmental Health Perspective

Research results were published in the Environmental Health Perspective that pertained to how aircraft-generated ultrafine particles (UFPs) affect birth outcomes in residential areas downwind of Los Angeles International Airport (LAX). The report indicated that ultrafine particle exposures are common downwind of airfields. The study results suggest that aircraft emissions contribute to preterm birth rates, independent of noise and traffic-related air pollution exposures.

More information may be found here: https://doi.org/10.1289/EHP5732

MEMORANDUM

ITEM 2

TO: MSP Noise Oversight Committee (NOC)

FROM: Brad Juffer, Manager, Community Relations

SUBJECT: **PUBLIC COMMENT PERIOD**

DATE: July 7, 2021

Members of the public are welcome to listen to the NOC meeting. During the meeting, a public comment period of no more than 20 minutes is included on the agenda. Individuals who wish to speak during the public comment period may do so by following the directions of the chairperson.

Below are some rules of decorum for speaking at NOC meetings.

- Each speaker will have one opportunity to speak and is allotted three (3) minutes. The public comment period is limited to 20 minutes.

- The chairperson will open the public comment period by asking for participants who wish to speak to indicate their desire following the direction of the chairperson. When called upon to speak by the chairperson, the meeting organizer will unmute your line. Speak clearly into your phone and state your name and address. If you are affiliated with any organization, please state your affiliation.

- Commenters shall address their comments to the NOC and not to the audience.

- Use of profanity, personal attacks, or threats of violence will not be tolerated.

- Interruptions from the audience, such as speaking out of turn, shouting, and other disruptive behavior are not permitted.

- If special assistance is needed to make a public comment, please contact the NOC Secretary at least two days prior to the meeting by sending an email to: nocsecretary@mspmac.org.

MEMORANDUM

ITEM 3.1

TO: MSP Noise Oversight Committee (NOC)

FROM: Brad Juffer, Manager, Community Relations

SUBJECT: **NOMINATION AND ELECTION OF CO-CHAIRS**

DATE: July 7, 2021

Per the Minneapolis-St. Paul International Airport (MSP) Noise Oversight Committee (NOC) Bylaws Article 2, Part 6, the "primary representatives and alternate representatives of Designated Communities and, Users and At-Large Communities shall be appointed to serve for two (2) years." Pursuant to this bylaw provision and in consideration of the present appointment cycle, NOC appointments were required as of June 26, 2021, as the preceding appointment cycle began on June 26, 2019. Designated Communities, At-Large Communities, and Users have made their appointments.

Within the Users group, Alex Mason replaced Chris Finlayson as the At-Large representative while the primary Cargo Carrier representative remains open. All other representatives were re-appointed by their respective authorities.

Within the Community group, Cheryl Jacobson replaced Jay Miller as the City of Mendota Heights representative and Saint Paul selected Kevin Gallatin to represent the city. All other representatives were re-appointed by their respective cities. In a separate action, the At-Large Communities chose John Bergman as their primary representative and Mary Brindle as the alternate representative. The updated NOC roster is available in the packet.

The process for the selection of Co-Chairs is found in the NOC Bylaws in Article V, given below:

> *"The airport user and community segments of the Committee shall each select a Co-Chairperson who will serve at the pleasure of the appointing group. Each Co-Chairperson will serve for a two-(2) year term or until his/her representation on the Committee terminates, or until replaced by the appointing group, whichever occurs first.*
>
> *The powers and duties of the Co-Chairpersons are as follows:*
>
> 1. *To review agendas.*
> 2. *To preside over meetings - the presiding Chairperson will alternate every other meeting.*
> 3. *By the mutual consent of the Co-Chairpersons, special meetings may be called, or upon request of a majority of the Committee, four (4) users and four (4) community representatives.*

4. *To sign as Co-Chairpersons of this Committee, all instruments in writing that may require such signature, unless the membership shall otherwise direct, and to perform such other duties and tasks as these Bylaws or as the membership shall from time to time prescribe.*
5. *Each segment of the Committee, by a majority vote, shall elect their respective Co-Chairperson."*

At the July 21, 2021 NOC meeting a nomination process and vote will be conducted for airport user selection and community selection of their respective NOC Co-Chairs.

COMMITTEE ACTION REQUESTED

CONDUCT USER AND COMMUNITY CO-CHAIR NOMINATIONS AND ELECTIONS TO ESTABLISH THE RESPECTIVE CO-CHAIRS TO SERVE FOR TWO YEARS FROM JUNE 26, 2021 THROUGH JUNE 25, 2023.

MEMORANDUM

ITEM 3.2

TO: MSP Noise Oversight Committee (NOC)

FROM: Brad Juffer, Manager, Community Relations

SUBJECT: **MAC RESIDENTIAL MITIGATION PROGRAM UPDATE**

DATE: July 7, 2021

The Metropolitan Airports Commission has a long history of managing noise impacts around the Minneapolis-St. Paul International Airport (MSP). One of the elements of this comprehensive history of the noise management program includes the most extensive and unique residential mitigation program around any airport in the country. Mitigation activities near MSP began in 1992 and continue today through the Consent Decree program. The Consent Decree First Amendment has been in place since 2013 and has provided residential mitigation to eligible homes from 2017 to today.

Consent Decree History

In 1998, the MAC authorized an update to the MSP Part 150 Study. One of the largest discussion items in the Part 150 Update process focused on the mitigation program that the MAC would offer in the 60-64 dB DNL noise contour area. The FAA recognizes sensitive land uses, such as residential land uses eligible for noise mitigation under Part 150, but only within the 65 dB DNL noise contour or greater. However, as part of the Dual-Track Airport Planning Process (a process that examined moving MSP versus expanding it in its current location, undertaken at the direction of the Minnesota State Legislature), the MAC made a policy decision to provide some level of noise mitigation out to the 60 dB DNL noise contour area surrounding MSP. During the Dual-Track Airport Planning Process, an MSP Noise Mitigation Committee was developed and tasked with proposing a noise mitigation plan to be considered in conjunction with the expansion of MSP at its present location. The MSP Noise Mitigation Committee developed a final recommendation for the MAC to provide mitigation to the 60 dB DNL contour.

The MAC published a draft Part 150 Update document in October 2000 and submitted the study, including a 2005 forecast NEM and revised NCP, to the FAA for review. In May 2002, after further consideration of the reduction in flight operations and uncertainties in the aviation industry resulting from the events of September 11, 2001, the MAC withdrew the study to update the forecast and associated noise contours.

The forecast update process began in February 2003. This effort focused on updating the Base Case year from a 2000 scenario to a 2002 scenario and updating the forecast year from 2005 to 2007. The purpose of the forecast update was to ensure that the noise contours considered the impacts of the events of September 11, 2001 and ongoing changes in the MSP aircraft fleet. In the 2004 Part 150 Update, the MAC's recommendation for mitigation in the 60-64 dB DNL

contours called for providing central air-conditioning to single-family homes that did not have it, with a possible homeowner co-pay based on the degree of noise impact. The MAC applied block-intersect methodology to the 2007 Forecast Contour to determine mitigation eligibility. With the block-intersect methodology, if any portion of a city block intersects the 60-64 dB DNL contour, all homes located on that city block would be eligible.

The cities located around MSP expressed dissatisfaction with the MAC proposal, asserting that the MSP Noise Mitigation Committee had recommended that the Full 5-decibel Reduction Package be expanded to all properties in the 60-64 dB DNL noise contours. The MAC countered that the proposal provided mitigation to the 60-64 dB DNL noise contour area and that the MSP Noise Mitigation Committee's recommendations did not specify the mitigation package that must be included. Additionally, the MAC clarified that, because homes in Minnesota have higher than the national average pre-existing noise reduction characteristics, the Full 5-decibel Reduction Package was not necessary outside the 65 dB DNL contour to achieve desired aircraft noise level reduction.

In early 2005, the Cities of Minneapolis, Eagan, and Richfield and the Minneapolis Public Housing Authority filed suit in Hennepin County District Court claiming, among other things, the MAC violated environmental quality standards and the Minnesota Environmental Rights Act (MERA) by failing to provide the Full 5-decibel Reduction Package to single-family homes in the 60-64 dB DNL contours. In September 2005, plaintiffs seeking class action certification filed a separate action against the MAC alleging breach of contract claims associated with mitigation in the 60-64 dB DNL contours. In January 2007, Hennepin County District Judge Stephen Aldrich granted the cities partial summary judgment. The court found, among other things, that the MAC, by virtue of implementing the Full 5-decibel Reduction Package, created an environmental standard that the MAC violated by recommending different mitigation in the 64 to 60 DNL noise contour area. In February 2007, the court held a trial on the cities' MERA and mandamus claims. Before the court entered final judgment post-trial, however, the parties negotiated a global settlement, a Consent Decree, resolving the cities' case and the class action suit.

Hennepin County Judge Stephen Aldrich approved a Consent Decree entered into by the MAC and the Cities of Minneapolis, Eagan, and Richfield and the Minneapolis Public Housing Authority that settled the litigation. The Consent Decree provided that it became effective only if: (1) the FAA advised the MAC in writing by November 15, 2007 that the Decree was an appropriate use of airport revenue and was consistent with the MAC's federal grant obligations; and (2) that the court approved a settlement in the class action case by January 17, 2008. Both conditions were ultimately met, and in 2008 the MAC began implementing single-family and multi-family mitigation out to the 2007 60 dB DNL noise contours and mitigation reimbursement funds out to the 2005 60 dB DNL noise contours, as the Consent Decree required. Under the Decree, mitigation activities would vary based on aircraft noise exposure. Homes with the highest aircraft noise exposure were eligible for more extensive mitigation than those with less aircraft noise exposure.

In January 2013, the MAC published the Final MSP 2020 Improvements Environmental Assessment/Environmental Assessment Worksheet (EA/EAW), which reviewed the potential and

cumulative environmental impacts of MSP terminal and landside developments needed through the year 2020.

As was detailed in the EA/EAW, the FAA's Finding of No Significant Impact/Record of Decision (FONSI/ROD), and summarized in the MAC's related Findings of Fact, Conclusions of Law, and Order, the Preferred Alternative scenario did not have the potential for significant environmental effects. The forecasted noise contours around MSP were driven by natural traffic growth that was anticipated to occur with or without implementation of the 2020 Improvements proposed in the EA/EAW.

Despite this, many of the public comments on the EA/EAW focused on future noise mitigation efforts. The past noise mitigation activities surrounding MSP, the terms of the 2007 Consent Decree and local land use compatibility guidelines defined by the Metropolitan Council were factors in the public dialogue. Additionally, the anticipated completion of the Consent Decree Residential Noise Mitigation Program in 2014 raised community interest regarding the future of noise mitigation at MSP.

In response, MAC staff, in consultation with the MSP NOC, began the process of developing a noise mitigation plan to be included in the EA/EAW. The recommended noise mitigation plan based eligibility upon actual noise contours that the MAC would prepare for MSP on an annual basis and required that a home would need to be located for three consecutive years in a higher noise mitigation impact area when compared to the home's status under the terms of the 2007 Consent Decree.

In July 2013, the Cities of Minneapolis, Richfield and Eagan, the Minneapolis Public Housing Authority and the MAC jointly filed the first amendment to the Consent Decree to Hennepin County Court. In September 2013, Hennepin County Court approved the first amendment to the 2007 Consent Decree. The first amendment contains language that binds the MAC to provide noise mitigation services consistent with the noise mitigation terms described in the EA/EAW.

The 2013 Actual Contours established the first year of candidate eligibility based on the criteria detailed in the EA/EAW. The Full 5-decibel Reduction Package was offered to single-family homes meeting the eligibility criteria inside the actual 63 dB DNL noise contour while the Partial Noise Reduction Package was offered to single-family homes in the actual 60-62 dB DNL noise contours. A uniform Multi-Family Noise Reduction Package was offered to multi-family units within the actual 60 dB DNL noise contour. Homes were mitigated in the year following their eligibility determination. The 2013 Actual Contour marked the first year in assessing the amended mitigation program.

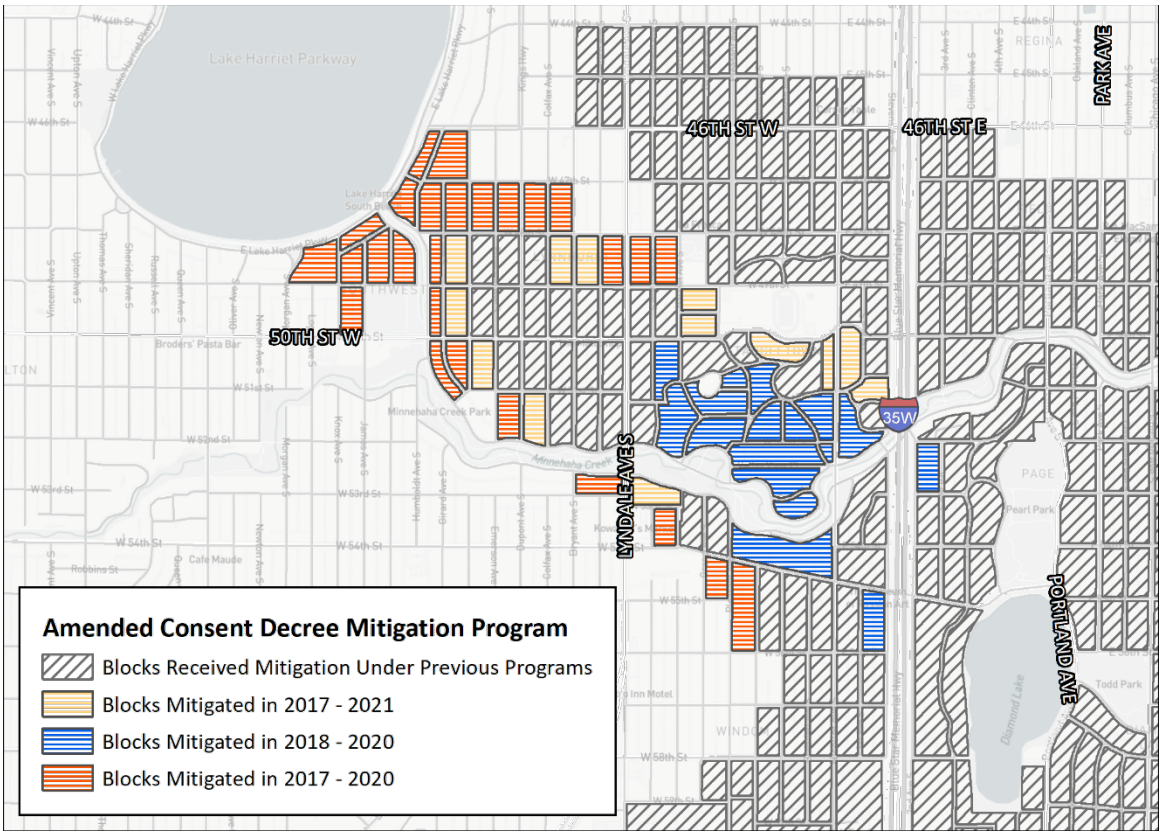
Consent Decree Duration

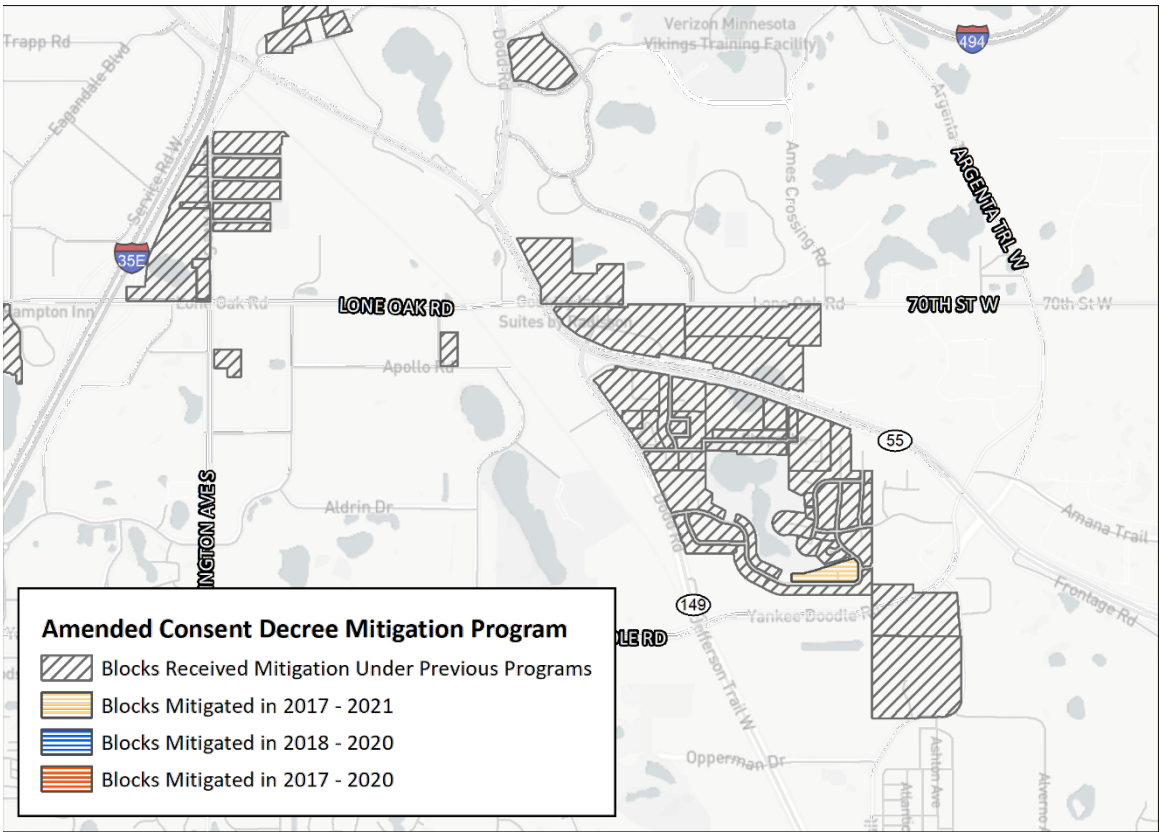
The Consent Decree First Amendment was signed by all parties and put into place in September 2013. According to the terms of the amendment, the program is terminated on December 31, 2024. Additionally, the First Amendment stipulates that a home must be located, for a period of three consecutive years, with the first of three years beginning no later that calendar year 2020 in the actual 60-64 DNL noise contour. The 2019 Actual Noise Contour Report did not have any

homes that gained their first- or second-year eligibility. The 2020 Actual Noise Contour Report did not have any homes that achieved a first-, second-, or third-year of eligibility. As prescribed by this amendment, all homes eligible for mitigation have been identified. No new homes can become eligible for this mitigation program. When MAC concludes construction activities on previously eligible homes with participating homeowners, the terms of the Consent Decree, as amended, will be satisfied.

Amended Consent Decree Results

The Consent Decree First Amendment program has been extensive and has been funded entirely by MAC generated revenue. Through April of 2021, the MAC has spent $28.8 million dollars on properties in Minneapolis and Eagan. When added to the previous sound insulation programs, the MAC has invested nearly $510 million dollars on its residential mitigation efforts. The locations of the Amended Consent Decree eligibility are included in the images below.


Lake Harriet Parkway
46TH ST W
46TH ST E
PARK AVE
50TH ST W
35W
LYNDALE AVES
PORTLAND AVE
Amended Consent Decree Mitigation Program
Blocks Received Mitigation Under Previous Programs
Blocks Mitigated in 2017 - 2021
Blocks Mitigated in 2018 - 2020
Blocks Mitigated in 2017 - 2020


Verizon Minnesota Vikings Training Facility
494
ARGENTA TRL W
35E
LONE OAK RD
70TH ST W
55
149
Aldrin Dr
Amana Trail
Frontage Rd
Opperman Dr
Amended Consent Decree Mitigation Program
Blocks Received Mitigation Under Previous Programs
Blocks Mitigated in 2017 - 2021
Blocks Mitigated in 2018 - 2020
Blocks Mitigated in 2017 - 2020

Previous Related NOC Action

In March 2013, the NOC unanimously approved the following action:

> THAT THE NOISE OVERSIGHT COMMITTEE SUPPORTS THE NOISE MITIGATION PROGRAM AS DETAILED IN THE FINAL EA/EAW IN PRINCIPLE AND SUPPORTS FOLLOW-UP NEGOTIATIONS BETWEEN THE PARTIES TO THE CONSENT DECREE TO ESTABLISH MUTUTALLY-AGREEABLE TERMS FOR THE MODIFICATION OF THE CONSENT DECREE CONSISTENT WITH THE 5 MARCH 2013 FAA LETTER IN APPENDIX DO OF THE FONSI/ROD FOR CONSIDERATION BY THE COURT.

In March 2018, the NOC approved the following action:

> THE NOC ESTABLISHES A GOAL TO HAVE THE 60 DB DNL CONTOUR MITIGATED BY 2024 AS PRESCRIBED BY THE CONSENT DECREE

Staff has had preliminary discussions with the other parties to the Consent Decree who have expressed an interest in continuing the program in a manner consistent with the provisions of the current program. To begin the amendment process, the parties will discuss the precise terms of a proposed amendment to the Consent Decree to be submitted to their respective governing bodies and the FAA, for a determination that it is consistent with federal law and policy regarding the use of airport revenue. Upon receiving a written determination from FAA, the parties would submit the Consent Decree amendment to the Court for its approval.

COMMITTEE ACTION REQUESTED

1) THE NOC SUPPORTS CONTINUATION OF THE NOISE MITIGATION PROGRAM, IN A MANNER CONSISTENT WITH THE PROVISIONS OF THE CONSENT DECREE, OFFERING THE SAME LEVEL OF NOISE MITIGATION BASED ON ANNUAL NOISE CONTOURS; AND
2) FURTHER, THE NOC REQUESTS THAT MAC STAFF EXPLORE CONTINUATION OF THE PROGRAM WITH THE PARTIES TO THE CONSENT DECREE FOR FUTURE CONSIDERATION BY THE COMMISSION, COURT AND FAA.

MEMORANDUM

ITEM 4.1

TO: MSP Noise Oversight Committee (NOC)

FROM: Brad Juffer, Manager, Community Relations

SUBJECT: **MINNETONKA MOBILE SOUND STUDY REPORT**

DATE: July 7, 2021

The 2021 NOC Work Plan includes conducting a Mobile Monitoring Study in the City of Minnetonka.

In 2019, the Minnetonka City Council requested that MAC conduct a mobile monitoring study within the city to assess aircraft arrival activity to MSP. The NOC added the study to the 2020 NOC Work Plan to collect measurements of aircraft related sounds associated with operations from MSP. This study was deferred to the 2021 NOC Work Plan due to a downturn in aircraft activity following the onset of the COVID-19 pandemic.

The final report study is attached, and MAC staff will provide an overview at the July 21, 2021 NOC meeting.

MINNETONKA MOBILE SOUND MONITORING REPORT

July 2021

Community Relations Office

Metropolitan Airports Commission
6040 28th Avenue South, Minneapolis, MN 55450
MetroAirports.org

Contents

1 INTRODUCTION

In 2021, the Metropolitan Airports Commission (MAC) conducted a sound study in the City of Minnetonka at the request of the Minnetonka City Council and the Minneapolis-St. Paul International Airport (MSP) Noise Oversight Committee (NOC). The study evaluated two industry standard methods for assessing aircraft sound: field-measured data and modeled data.

This study was conducted by MAC Community Relations staff, using scientific equipment and guidelines. The results of this study are intended to enhance communication about aircraft sound associated with MSP aircraft activity in the City of Minnetonka. The study captured sound data at the location of the sound monitoring equipment generated by aircraft that arrived to and/or departed from MSP or by community-related activity. Data not correlated with aircraft arriving to or departing from MSP are reported as community sound events in this report.

The sections below describe the MSP runway use, aircraft operations, weather, field-measured data collection process and analysis, AEDT modeling data and analysis, and a comparison of measured data and modeled data during the study period of May 22 – May 31, 2021.

2 BACKGROUND

The Minnetonka City Council requested that MAC conduct a mobile monitoring study within the city to assess aircraft noise levels generated from arrival activity to MSP. While this study was included on the 2020 NOC Work Plan, the study was deferred to the 2021 NOC Work Plan due to the downturn in aircraft activity following the onset of the COVID-19 pandemic.

Since 1992, the MAC has operated one of the most sophisticated and comprehensive computerized aircraft noise and flight track data collection and processing systems of its kind. The MAC Noise and Operations Monitoring System (MACNOMS) is a tool to help MAC staff analyze aircraft noise impacts around MSP and provides public access to flight tracking and detailed aircraft sound data. MAC staff utilized the MACNOMS system to assist in gathering, assembling, and correlating data in preparation of this report. A critical component of MACNOMS in an array of 39 permanent Remote Monitoring Towers (RMTs) which monitor aircraft sound events continuously in communities surrounding MSP. While there are no permanent RMTs in the City of Minnetonka, this report references data collected by the RMTs and compares them to data collected by the mobile field measurements.

It is important to note that the data collected at sound monitoring sites are not used in determining residential sound mitigation eligibility, nor are they used in the development of airport noise contours. These activities are strictly regulated by the Federal Aviation Administration (FAA), which requires the use of the Aviation Environmental Design Tool (AEDT) modeling software, which was used in preparing the modeled sound levels for this report.

3 STUDY OVERVIEW

3.1 GOAL

The goal of this study was to collect quality field-measurement recordings and modeled measurements of sound events associated with aircraft activity arriving to MSP that occur in the City of Minnetonka, specifically the northeastern portion, in accordance with established Mobile Sound Monitoring Guidelines and provide information related to the activity.

3.2 STUDY PERIOD

Mobile field-measurement equipment was deployed on May 21, 2021, and retrieved on June 1, 2021. The 10-day data collection period started at 12:00 A.M. on Saturday, May 22nd and concluded at 11:59:59 P.M. on Monday, May 31st.

3.3 MONITORING LOCATIONS

MAC Community Relations staff, in collaboration with City of Minnetonka staff, placed mobile field-measurement equipment in a single location for the duration of the study period. After consideration of various site locations, the City of Minnetonka approved use of Fire Station #2, which met the following criteria:

- The equipment was able to be secured
- The site was located on public land, owned by the City (parks, easements, out-lots, etc.)
- The site was located appropriate distances from known sources of community noises, such as major roadways, active construction, crowd assembly areas, railroad tracks, etc.
- The City and the MAC agreed that the site was located in close proximity to aircraft activity and therefore reasonable and adequate to obtain the necessary data to meet the project objectives

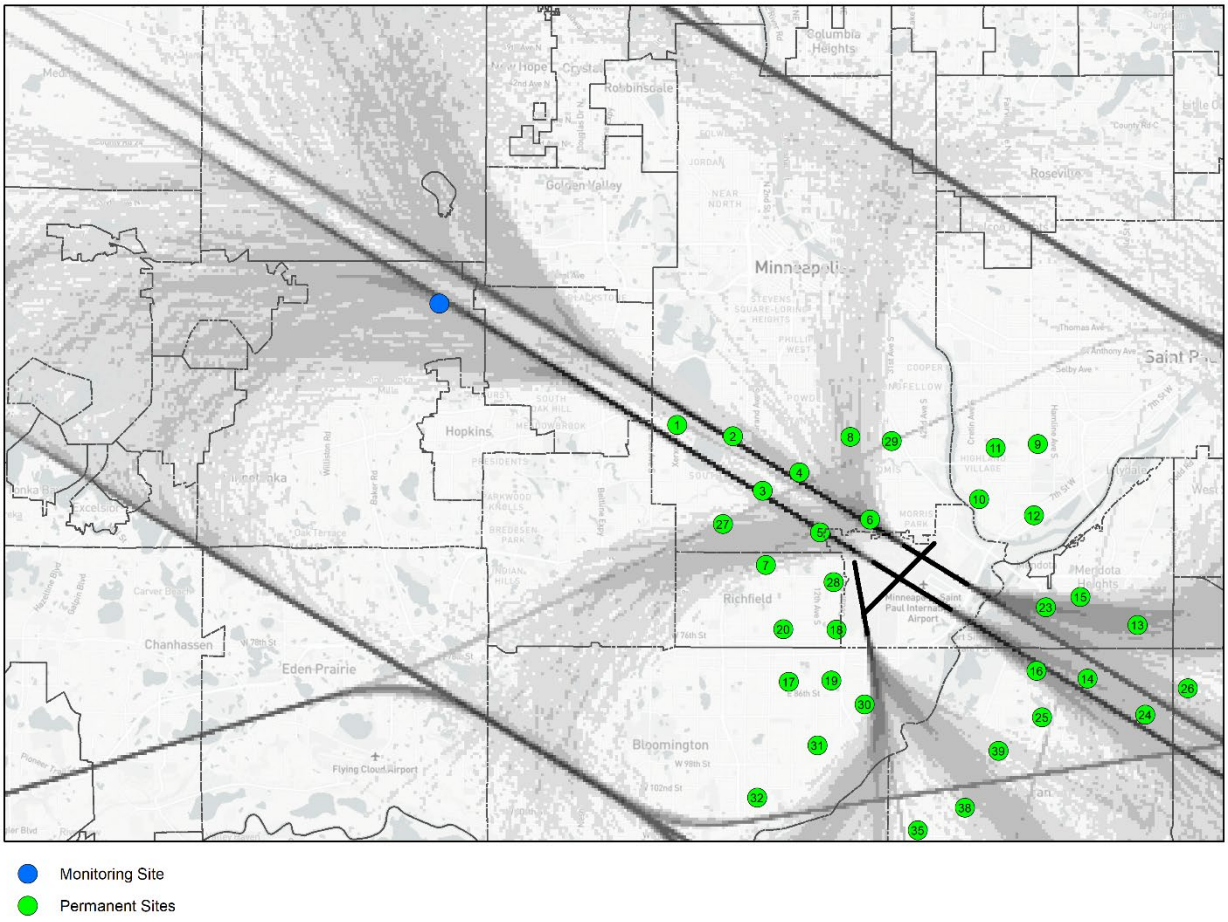
The following are the details for the mobile sound monitoring data collection site:

Minnetonka Fire Station #2

The Minnetonka Fire Station #2 site was located 1815 Hopkins Crossroad, north of the parking lot.

This location was chosen due to its proximity to MSP flight activity and position in a low community activity area while still on public property.

Monitoring Locations



3.4 EQUIPMENT AND INSTRUMENTATION

A secured weatherproof enclosure was used at the mobile monitoring site to contain the measurement and recording devices. The instrumentation is manufactured by Larson Davis and consists of a laboratory quality sound level analyzer (831A class/type 1 instrument), preamplifier (PRM831), and microphone (377B02). The preamplifier and microphone were housed within environmental protection coverings to allow sound measurements during adverse weather elements. The components used at the site is the same equipment that is used at the permanent RMTs.

The instruments are certified annually, and each site was calibrated at the start of the study. Inspections were performed often throughout the study at the site to verify instruments were operating and within tolerances, and to inspect for tampering and damage. A final calibration check was performed at the end of the study and found to be within tolerance.

3.5 MEASUREMENT PARAMETERS

The sound monitoring instrumentation was configured to monitor sound continuously utilizing slow response with A-weighting, as directed by 14 Code of Federal Regulations (CFR) Part 150 and consistent with the MACNOMS data collection. Under this configuration, the analyzer uses a sound pressure level and time trigger (when the A-weighted sound pressure level exceeds 65 decibels (dBA) for a minimum period of eight seconds) to identify and document sound events. A two-second continuation period is used to extend the sound event if the sound level falls below the trigger threshold level and then exceeds it again. These parameters are consistent with the configurations employed at the permanent RMTs.

The parameters used by the sound monitoring instrumentation account for any sound level exceedance and captures both community and aircraft sounds. The equipment and tolerances are set to be sensitive so that aircraft do not have to fly directly over the measurement site to be recorded.

3.6 AIRCRAFT-EVENT CORRELATION

This study employed a process for correlating mobile site sound data with MSP flight track data; the same process is used for correlating RMT sound data with MSP flights. The process uses both temporal (time) and spatial (space) components to match a sound event with an aircraft overflight. The mobile monitoring site used the same time and space parameters as those at the permanent RMTs which include a cylindrical area of influence with a radius of 4,000 meters, a ceiling of 2,100 meters and a time window of at least one minute around an event. Sound events that could not be correlated to MSP aircraft activity were classified as “community” events.

3.7 SOUND MODELING

In addition to field-measurement data, MSP aircraft activity from May 22, 2021, through May 31, 2021, was modeled using the FAA’s modeling tool, AEDT, Version 3d.

With actual monitoring, as noted above, events are documented when the analyzer detects a sound level over 65 dBA for eight seconds or longer. Due to the nature of environmental monitoring, MACNOMS must take measures to attempt to filter out community and other ambient sounds before assigning aircraft sound events to a specific operation. The AEDT model does not have community sounds to filter out. Additionally, modeling provides sound data over a wider area compared to monitoring, which only allows data to be collected near the field-measurement site.

Conversely, AEDT must make assumptions about aircraft performance, flap configurations, engine settings, aircraft model types, weight, and weather. AEDT uses standard aircraft thrust settings, standard departure climb rates as well as standard arrival descent rates, which may not represent actual operating characteristics. Additionally, modeling requires aircraft substitutions. While many aircraft have sound data available in the model, all aircraft types operating at MSP are not represented and need to use a substitute aircraft in the model. While the goal of conducting monitoring studies and producing modeling results are similar and will often times produce the same sound metric results, the differences between actual monitoring and sound modeling will result in variances between the data due to community sound, measurement parameters, and necessary model assumptions.

The AEDT model can produce various sound metrics. Two metric options available are the Number Above Sound Level and Time Above Sound Level. For this analysis, MAC staff evaluated the number of operations at or above 65 dB and the duration of time spent above 65 dB.

This modeled sound analysis depicts aircraft sound events from actual aircraft activity at MSP for the same time period as the field-measurement site (May 22, 2021 through May 31, 2021). The model uses inputs such as runway use, aircraft fleet mix, aircraft performance and thrust settings, topography, and atmospheric conditions. Actual flight tracks for arrivals and departures were used. The location where the levels are modeled is the same location as the field-measurement site.

Quantifying aircraft-specific sound characteristics in AEDT is accomplished using a comprehensive sound database that has been developed under 14 CFR Part 36. As part of the airworthiness certification process, aircraft manufacturers are required to subject aircraft to a battery of sound measurement tests. Using federally adopted and endorsed algorithms, this aircraft-specific sound information is used in the generation of model outputs. Justification for such an approach is rooted in national standardization of sound quantification at airports. Appendix 5.1 of this report includes the fleet mix and Appendix 5.2 includes weather data utilized in the AEDT model for this analysis.

AEDT uses a grid pattern of individual noise measurement points, known as receptors, and calculates sound at each of these points. The grid pattern for this study included 24,000 unique points spaced 0.1 nautical miles apart for a grid sized 20 by 12 nautical miles to fully cover the City of Minnetonka and neighboring communities.

Additionally, AEDT uses standard weather inputs that are typically available for a study comprising a full year of data. For this study, standard weather inputs were changed to represent the average weather conditions for the study period. Section 5.2 shows a summary of the temperature and reported wind speeds during the study period. Moderate temperatures from 39° - 86° were experienced throughout the study period. Additionally, precipitation was recorded during six days of the study. A wind rose depicting all reported winds for the study period is also included in Section 5.2.

4 DISCUSSION / SUMMARY OF FINDINGS

The study time period was selected to increase the likelihood that South Flow configurations would be prevalent at MSP. As shown in the Runway Use Airport Configurations provided in Appendix 5.1, in a South flow, aircraft arrive to Runways 12L and 12R over the study area and Runways 12L, 12R and 17 are used for departures. This provides the most ideal configuration to conduct monitoring for the purpose of this study. Section 5.1 provides further data on specific runway use. For the 10 days of the study, South Flow was utilized for 27 percent of the time and Straight South Flow was used 36 percent of the time. Like South Flow, Straight South Flow uses most of the same runways but does not include departures on Runway 17. The combined 63 percent provided a reasonable amount of opportunity to collect sound data for the study at the monitoring site.

The location of monitoring sites is impacted by normal community activities. Each site within the MAC's permanent RMT system records events with sound sources that are not aircraft related. The MAC has numerous protocols in place to determine whether the sound source of events is generated by community or aircraft activity. As discussed in Section 2.6, the MAC uses an automated system to correlate events with MSP aircraft traffic using spatial and temporal data. Additionally, MAC staff reviews events and related attributes to ensure accuracy in this matching process. The MAC also has developed a noise event classification system using a convolutional neural network–generally referred to as machine learning—to further determine the likelihood that a noise event was created by an aircraft or by a community source. These current protocols and process enhancements increase the likelihood that community events will not impact the aircraft data collected at both permanent and mobile field-measurement sites.

During the study period, there were 7,719 total MSP aircraft operations. Within one mile of the monitoring site, there were 1,971 MSP operations, 92 percent of which were arrivals. The most noticeable aircraft within one mile of the site would be arrivals to Runway 12L or 12R or departures from Runway 30L or 30R. The average altitude of the 1,810 aircraft arriving to Runway 12L or 12R within one mile of the site was 2,936 feet. The average altitude of the 120 aircraft departing from Runway 30L or 30R was 6,003 feet within one mile of the monitoring site. The remaining 41 aircraft near the site were at a higher altitude because they were utilizing different runways at MSP.

There were 176 sound events recorded at the mobile field-measurement site during the study period. Of the 176 recorded events, 144 were correlated to an MSP aircraft overflight. The remaining 32 were community produced events. Sound events correlated to aircraft had an average sound exposure level (SEL) of 78.7 dB. SEL is the total sound energy expressed in one second. The SEL metric allows for the comparison of sound events of varying durations. As shown in the Aircraft Count Above table below, there were no aircraft sound events that exceeded an LA_{max} of 80 dB. The LA_{max} metric is the maximum A-weighted sound level observed for a period, event, or interval of interest.

The estimated average background sound level (utilizing the statistical LA_{90} method) was 44.5 dBA. The loudest measured sound events were identified as community-based (e.g. lawn mowers, vehicles, people, etc.).

Summary of Measured Events

Date	Aircraft	Community	Total
5/22/2021	6	4	10
5/23/2021	14	1	15
5/24/2021	14	4	18
5/25/2021	2	1	3
5/26/2021	3	1	4
5/27/2021	57	3	60
5/28/2021	7	11	18
5/29/2021	16	4	20
5/30/2021	20	3	23
5/31/2021	5	0	5
Total	**144**	**32**	**176**

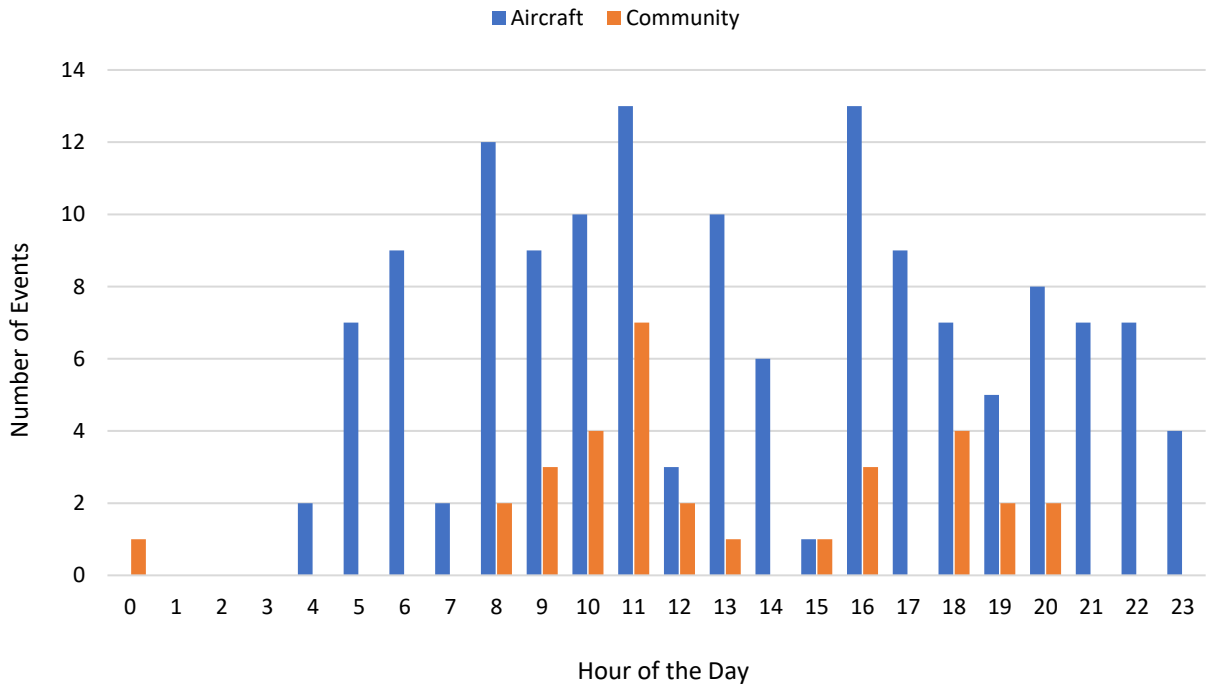
Aircraft Count Above (LA_{max}) - $N_{(level)}$

Date	N_{65}	N_{80}	N_{90}	N_{100}
5/22/2021	6	-	-	-
5/23/2021	14	-	-	-
5/24/2021	14	-	-	-
5/25/2021	2	-	-	-
5/26/2021	3	-	-	-
5/27/2021	57	-	-	-
5/28/2021	7	-	-	-
5/29/2021	16	-	-	-
5/30/2021	20	-	-	-
5/31/2021	5	-	-	-
Total	**144**	**-**	**-**	**-**

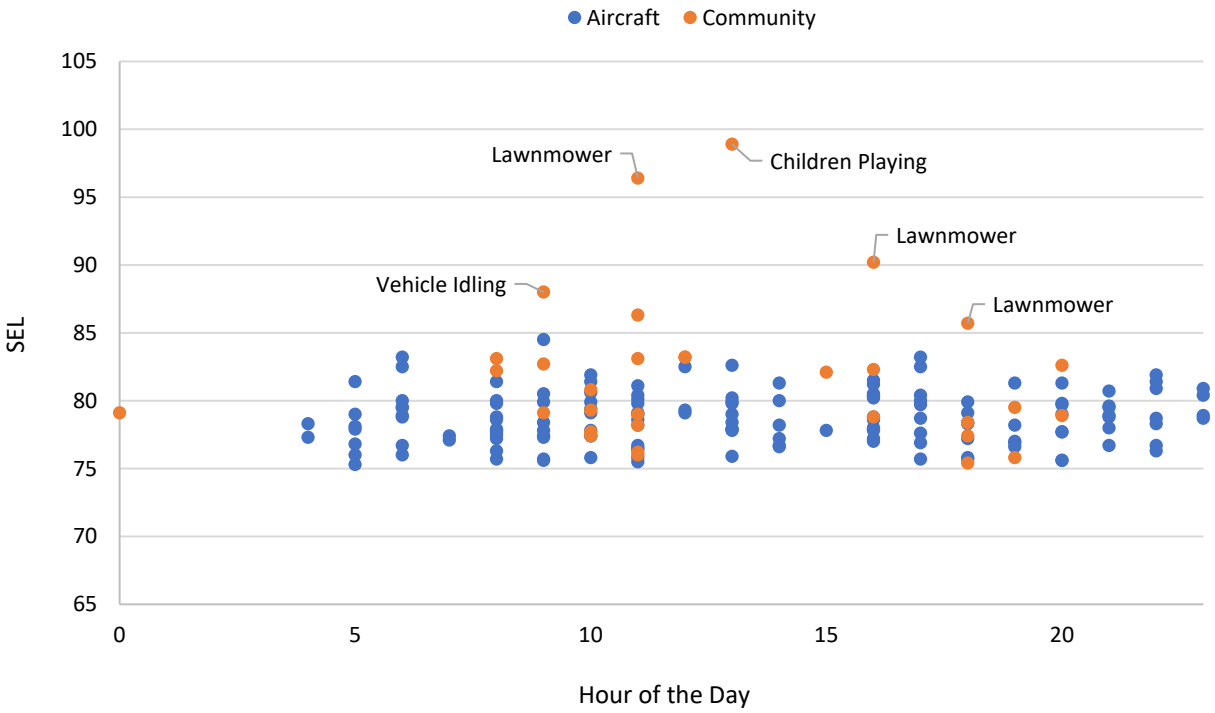
Aircraft Time Above (seconds) – $TA_{(level)}$

Date	N_{65}	N_{80}	N_{90}	N_{100}
5/22/2021	69	-	-	-
5/23/2021	180	-	-	-
5/24/2021	187	-	-	-
5/25/2021	24	-	-	-
5/26/2021	32	-	-	-
5/27/2021	819	-	-	-
5/28/2021	91	-	-	-
5/29/2021	199	-	-	-
5/30/2021	259	-	-	-
5/31/2021	59	-	-	-
Total	**1,919**	**-**	**-**	**-**

Sound Event Count by Hour



LA_{sel} vs Hour



Top 10 Measured Aircraft Events

Date/Time	Flight Number	Aircraft	Operation	Runway	LA_{max} (dB)	Duration (seconds)	3D Distance (ft)
5/27/2021 9:53	SWQ3615	B734	A	12L	76.5	18	2,015
5/27/2021 11:13	DAL2025	A220	A	12R	75.6	9	2,875
5/28/2021 6:40	DAL2114	A319	A	12L	74.3	14	2,598
5/30/2021 22:06	AAL1578	B738	A	12R	73.5	15	2,172
5/27/2021 13:37	SCX270	B738	A	12R	73.1	17	2,161
5/23/2021 17:32	UPS560	A300	A	12R	73.1	16	2,185
5/27/2021 23:53	AAL2402	B738	A	12L	73	18	3,011
5/28/2021 10:09	NKS570	A320	A	12R	72.6	11	2,750
5/27/2021 16:27	DAL654	A319	A	12R	72.5	16	2,479
5/27/2021 17:17	UPS2560	B748	A	12R	72.4	29	3,032

There were 41 modeled aircraft sound events above 65 dB at the location of the field-measurement site during the study period. The model also indicated that at the field-measurement site, the time above 65 dB was 4.88 minutes during the 10-day study period.

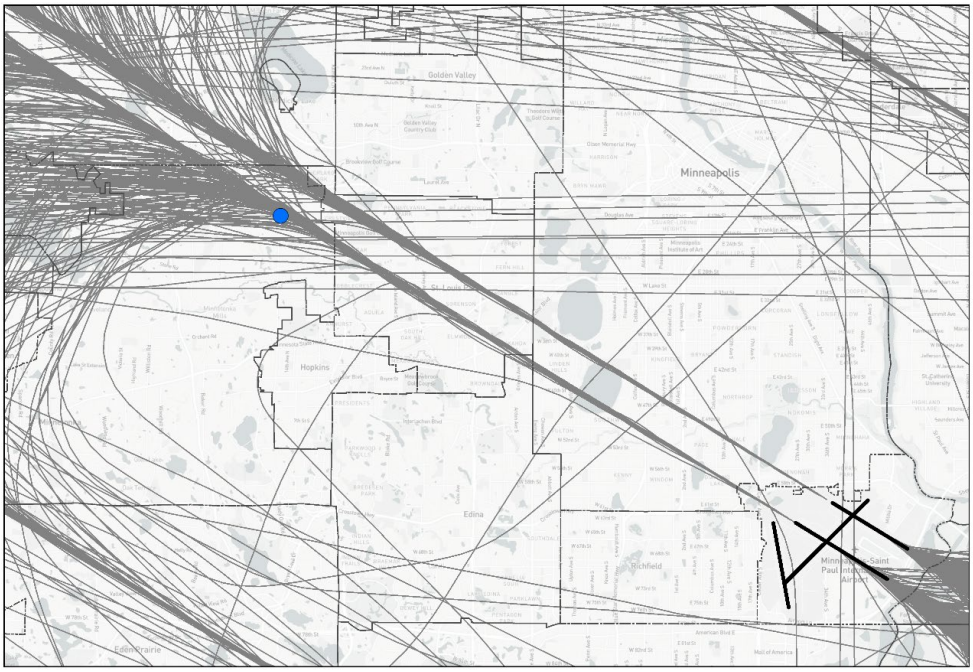
Metric	Modeled Events	Measured Events	(+/-)
Number Above	41	144	103
Time Above (seconds)	293	1,919	1,626

The field-measurement site recorded the highest number of events on May 27. Rain and wind may have contributed to the number and duration of measured aircraft events by adding to the loudness and extending the amount of time sound events exceeded the measurement threshold. On May 27th, there were 9 modeled events and 57 measured events, when rain was audible on recorded events. The use of a visual or instrument aircraft approach procedure will subtly change the area in which aircraft overfly. Instrument meteorological conditions (IMC) occur when weather conditions cause visual conditions to drop below the minimum required to operate using visual flight referencing. At MSP, Air Traffic Control (ATC) will determine whether conditions are IMC or visual meteorological conditions (VMC) using all available weather information. Conversely, per the FAA, a visual approach is an Air Traffic Control (ATC) authorization for an aircraft to proceed visually and clear of clouds to the airport. Aircraft assigned a visual approach will often overfly a different portion of the community when arriving to MSP while aircraft assigned an instrument approach, during IMC, will follow more consistent flight tracks and line up at a greater distance from the airport, as shown in the graphics below. On May 27th, MSP operated almost 17 hours in IMC and on May 29th, MSP operated for 24 hours in VMC.

Events, Operation, Time in Approach Type and Flow

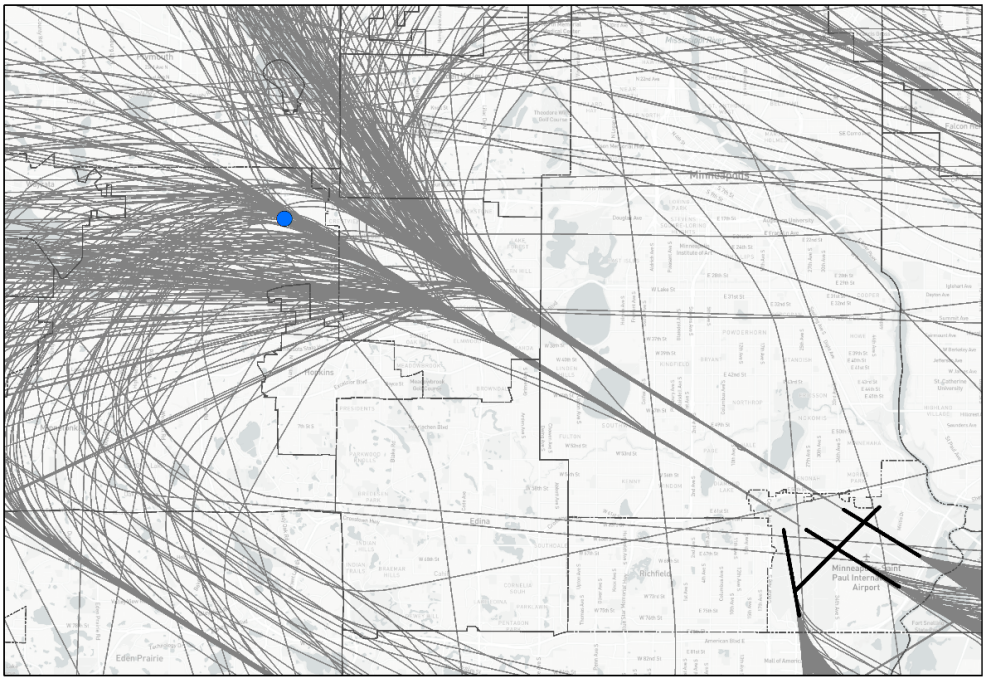
Day	Number of Aircraft Events Above 65 dB	MSP Arrivals (Within 1 Mile of Monitoring Site)	Instrument Meteorological Conditions (hours)	Visual Meteorological Conditions (hours)	North/Mixed A Flow (hours)	South Flow (hours)
22-May	6	130	9.50	14.50	5	16
23-May	14	327	10.50	13.50	-	23
24-May	14	192	9.50	14.50	6	13
25-May	2	39	3.75	20.25	15	5
26-May	3	-	-	24.00	18	-
27-May	57	414	16.75	7.25	1	19
28-May	7	207	0.75	23.25	1	20
29-May	16	148	-	24.00	3	18
30-May	20	316	14.00	10.00	-	23
31-May	5	39	4.50	19.50	16	4
Total	**144**	**1,812**	**69.00**	**171.00**	**65**	**141**

MSP Operations – May 27, 2021 (IMC)



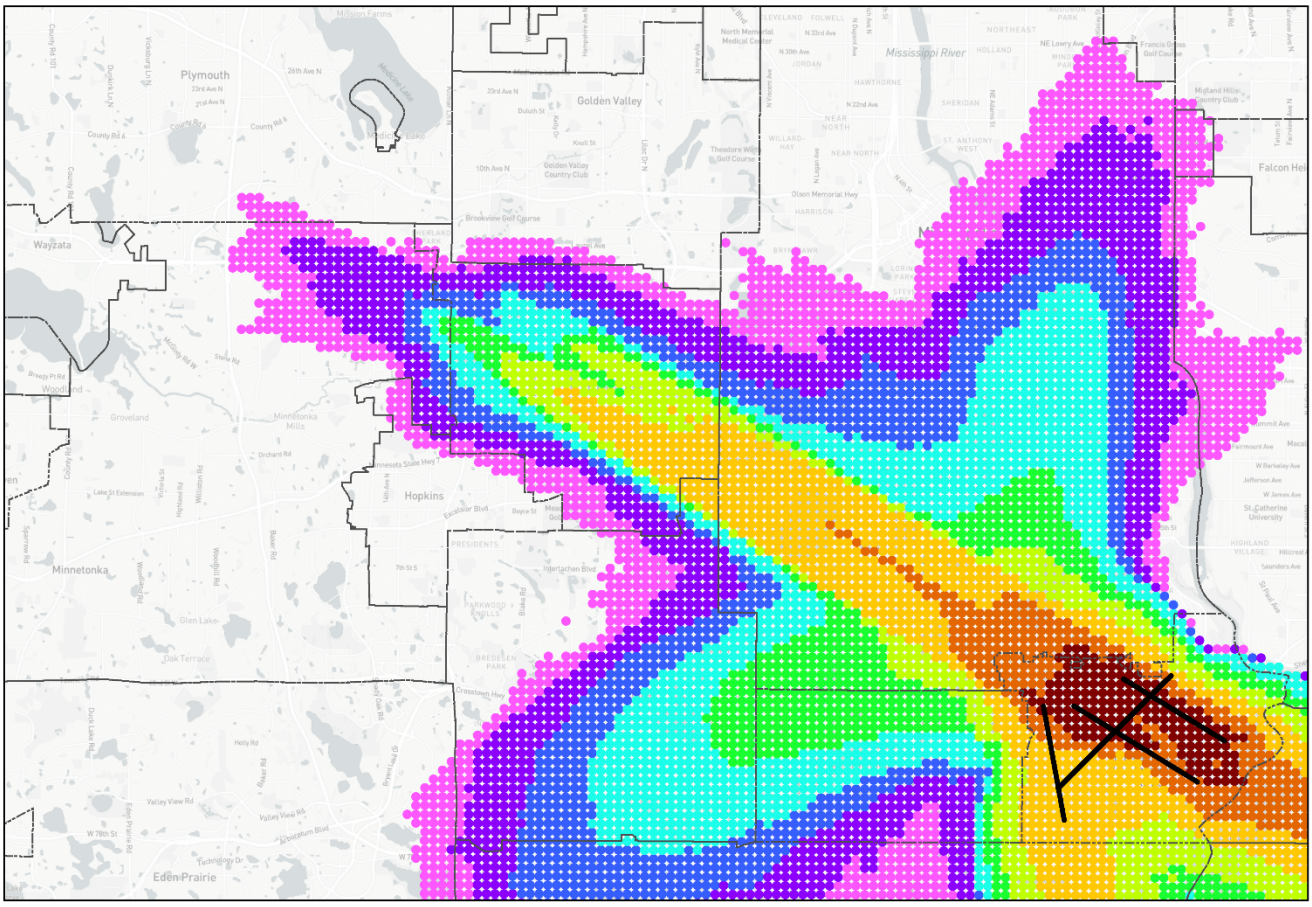
MSP Operations
May 27, 2021

MSP Operations – May 29, 2021 (VMC)



MSP Operations
May 29, 2021

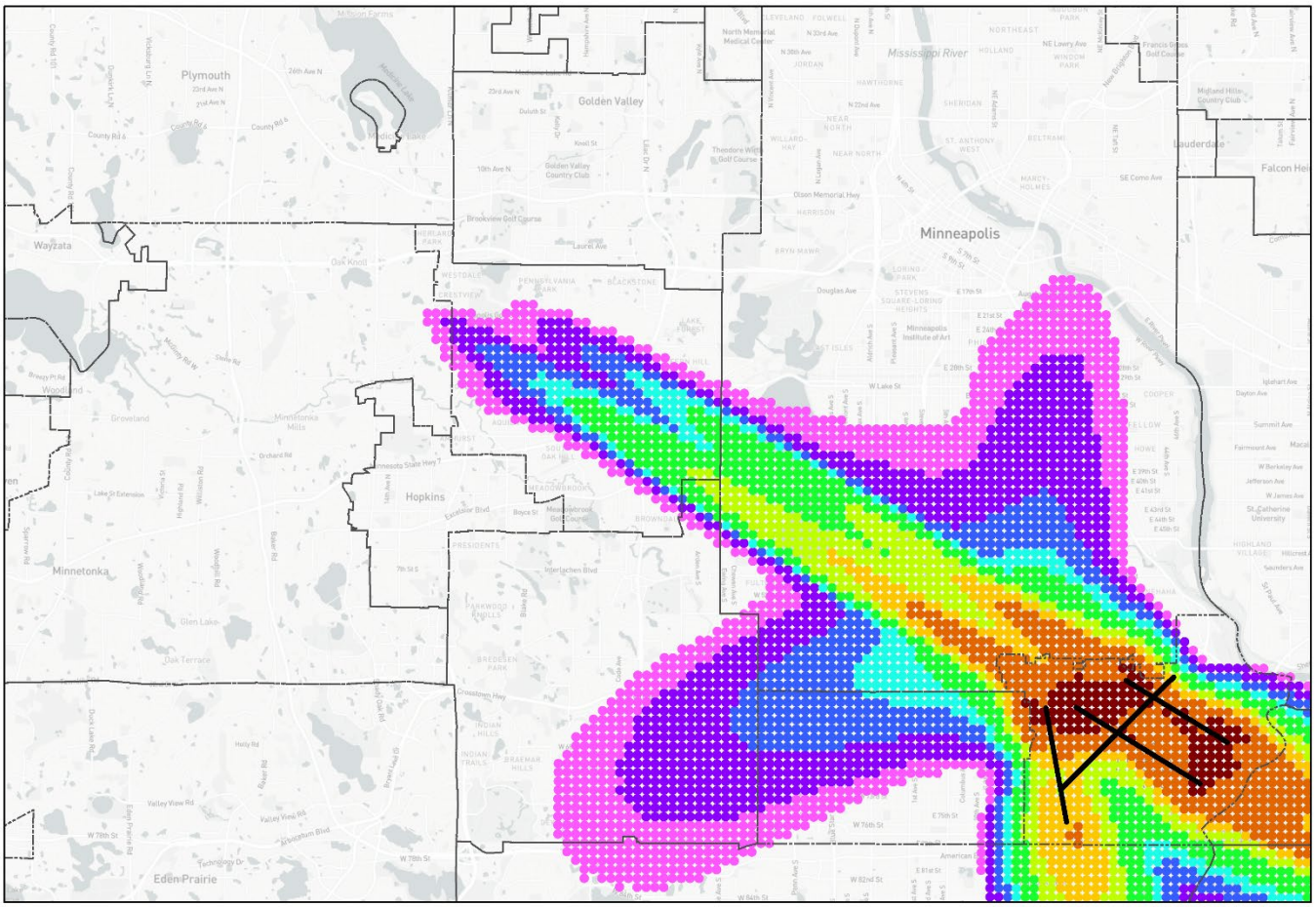
Modeled Sound Events – Number of Events Above 65dB



Modeled Events Above 65 dB

- < 1 per day
- 1 to 2 per day
- 2 to 5 per day
- 5 to 10 per day
- 10 to 25 per day
- 25 to 50 per day
- 50 to 100 per day
- 100 to 200 per day
- 200 to 300 per day
- > 300 per day

Modeled Sound Events – Time Above 65dB



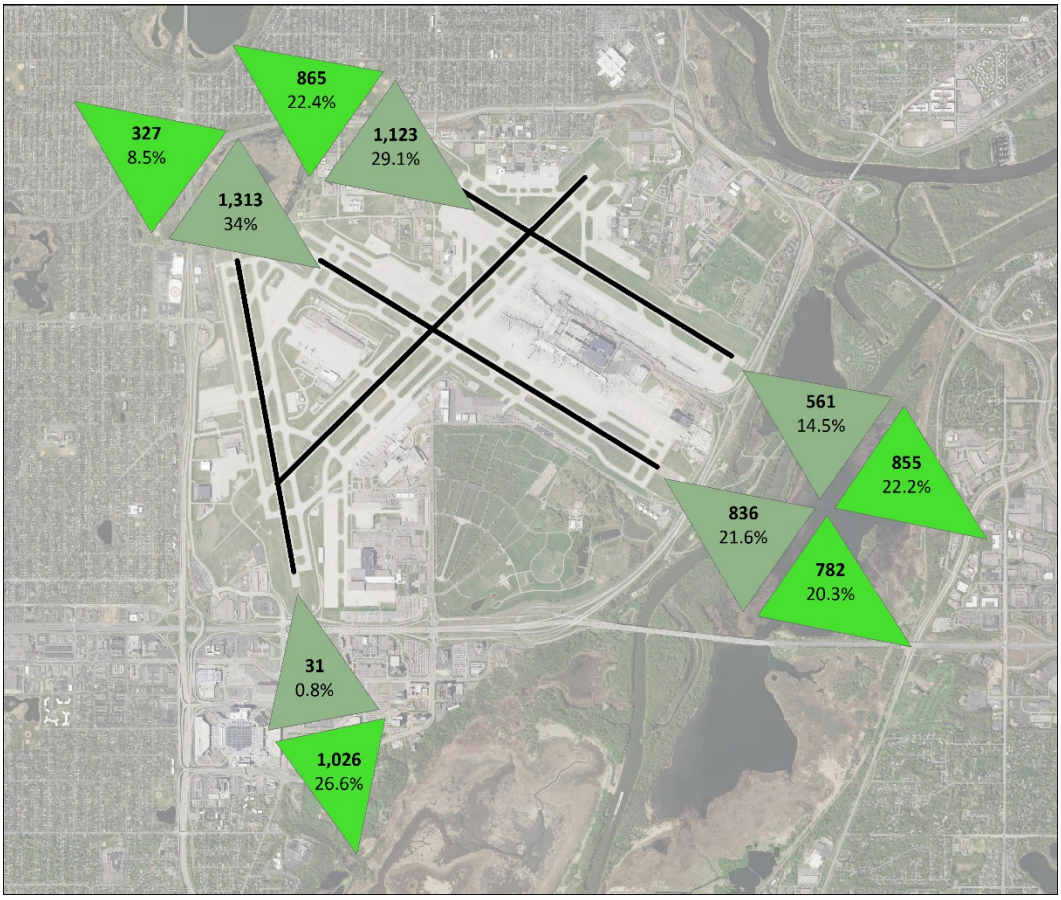
Modeled Time Above 65 dB

- < 1 min per day
- 1 to 2 min per day
- 2 to 5 min per day
- 5 to 10 min per day
- 10 to 15 min per day
- 15 to 30 min per day
- 30 to 45 min per day
- 45 to 60 min per day
- 1 to 2 hours per day
- > 2 hours per day

5 APPENDIX

5.1 AIRCRAFT OPERATIONS

MSP Runway Use



Runway	Arrival Count	Arrival Percent		Departure Count	Departure Percent
4	-	-		-	-
12L	1,123	29.1%		855	22.2%
12R	1,313	34.0%		782	20.3%
17	-	-		1,026	26.6%
22	-	-		-	-
30L	836	21.6%		327	8.5%
30R	561	14.5%		865	22.4%
35	31	0.8%		-	-
Total	**3,864**	**100%**		**3,855**	**100%**

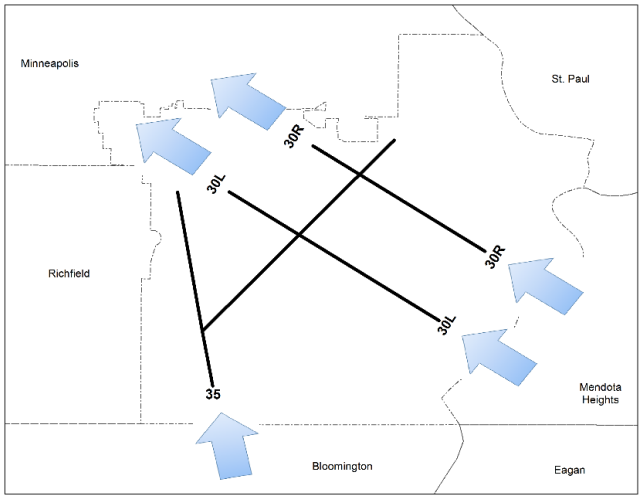
Airport Configuration (# of Hours by Day)

Day	Mixed A	Mixed B	North	Straight North	Opposite	South	Straight South	Unusual	Unlabeled	Total
22-May	2			3		6	10		1	22
23-May						8	15			23
24-May	6					7	6	1	2	22
25-May	2			13	2	1	4		1	23
26-May				18	4					22
27-May				1	1		19		1	22
28-May			1			13	7		2	23
29-May		1	3			12	6			22
30-May						13	10			23
31-May	7			9			4		1	21
Total	**17**	**1**	**4**	**44**	**7**	**60**	**81**	**1**	**8**	**223**

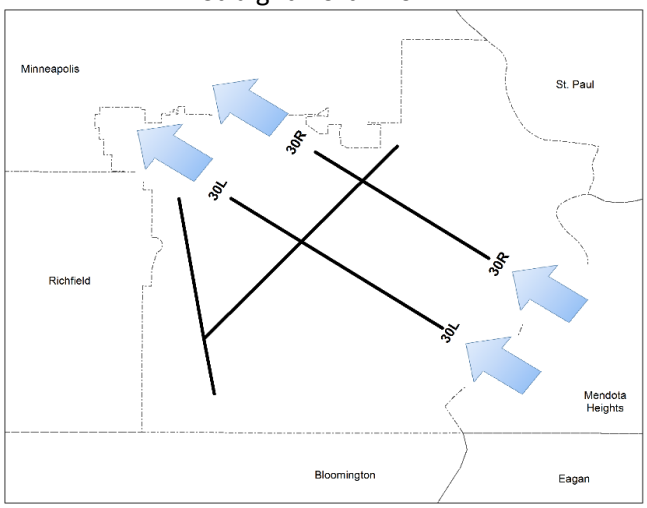
HOURS WITHOUT DATA MAY INCLUDE HOURS DURING CONFIGURATION TRANSITION OR HOURS WITHOUT OPERATIONS

Runway Use Airport Configurations

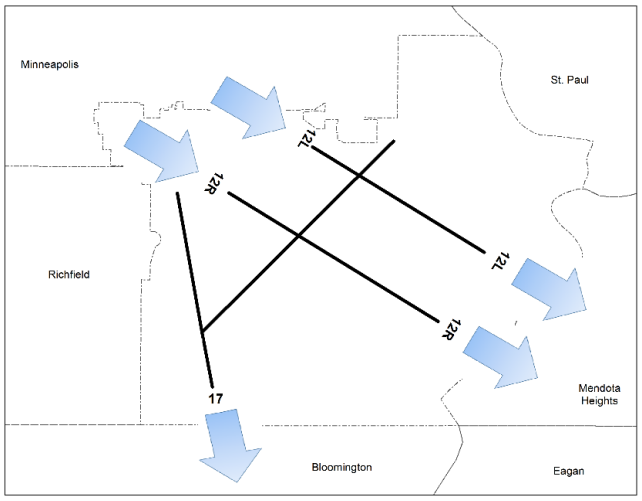
North Flow



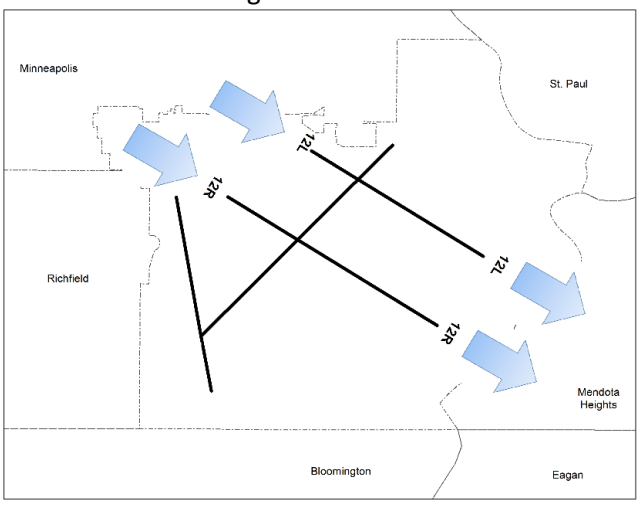
Straight North Flow



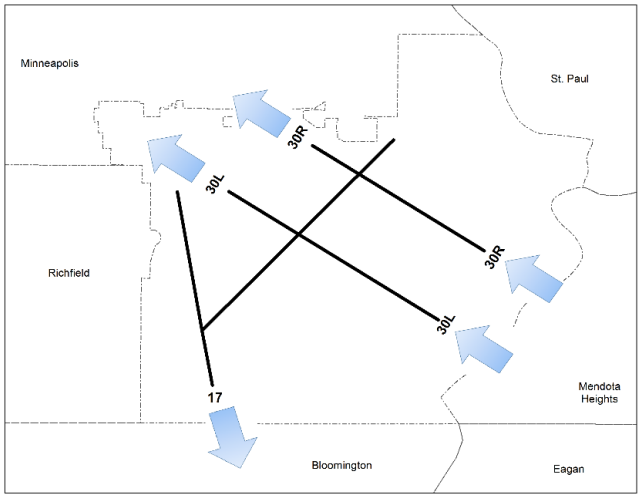
South Flow



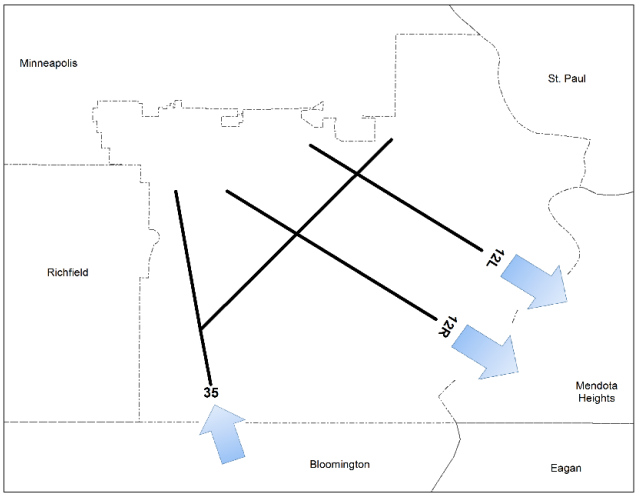
Straight South Flow



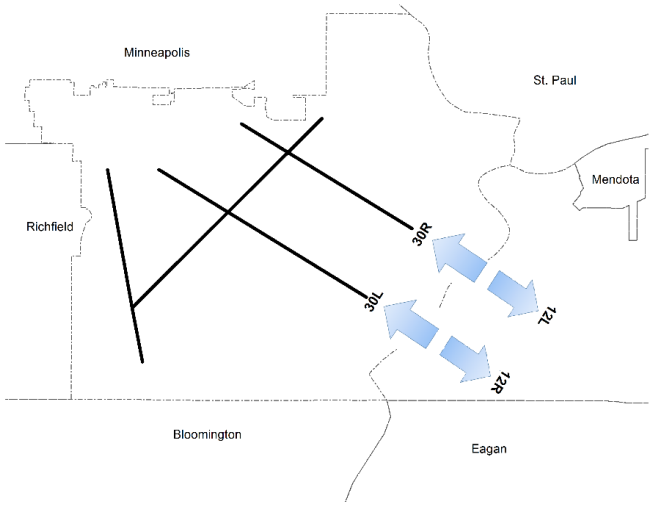
Mixed Flow A



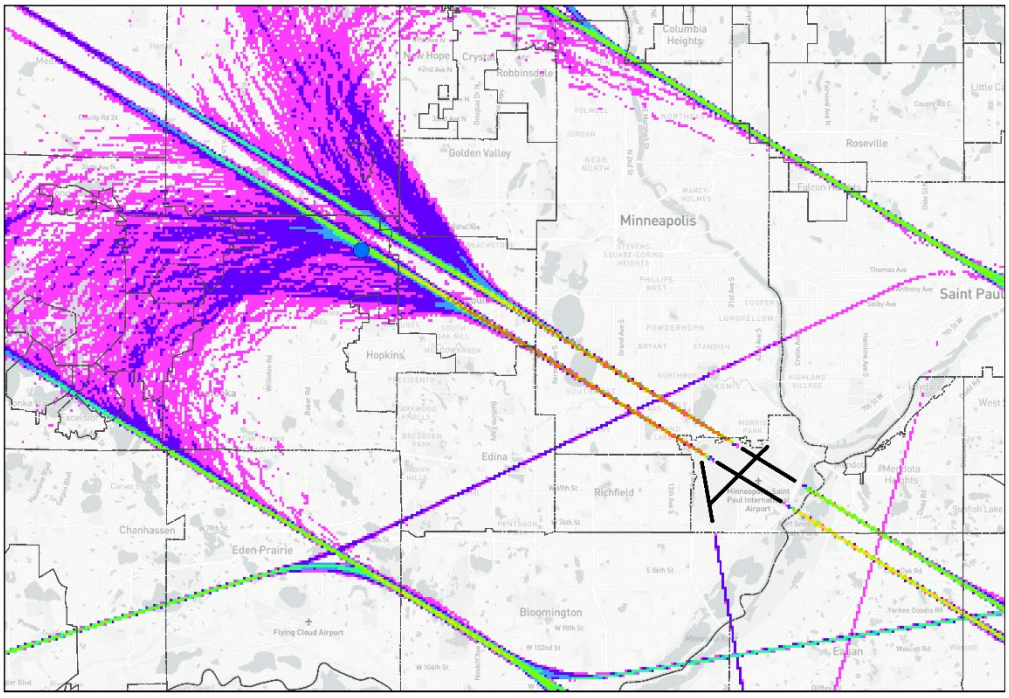
Mixed Flow B



Opposite Flow

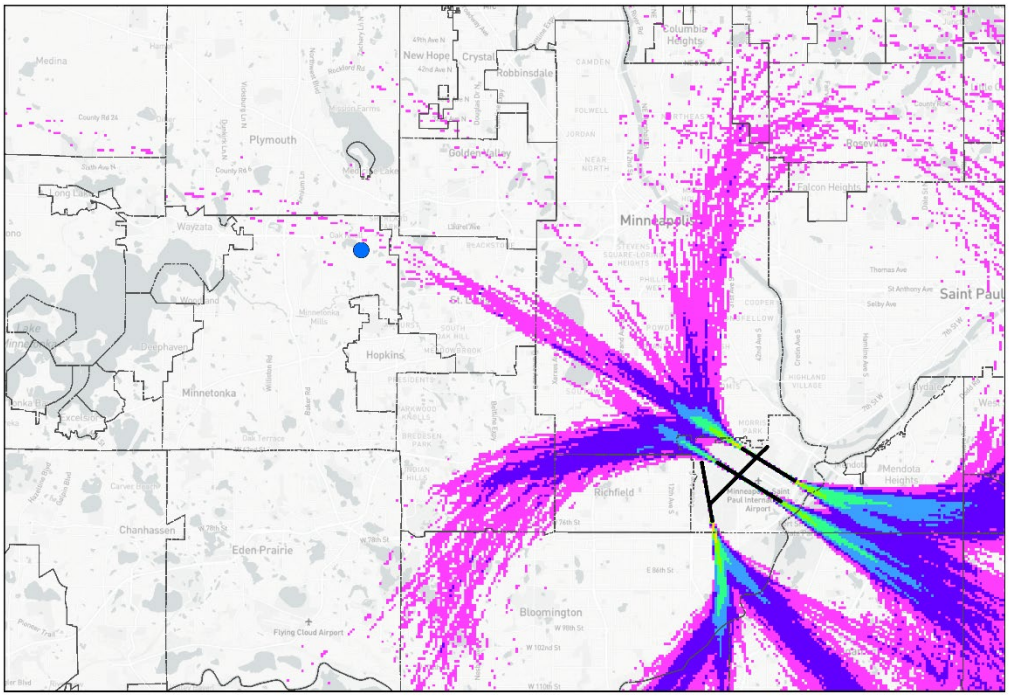


Density Maps



Low High

MSP Arrival Density
May 22 - May 31, 2021



Low High

MSP Departure Density
May 22 - May 31, 2021

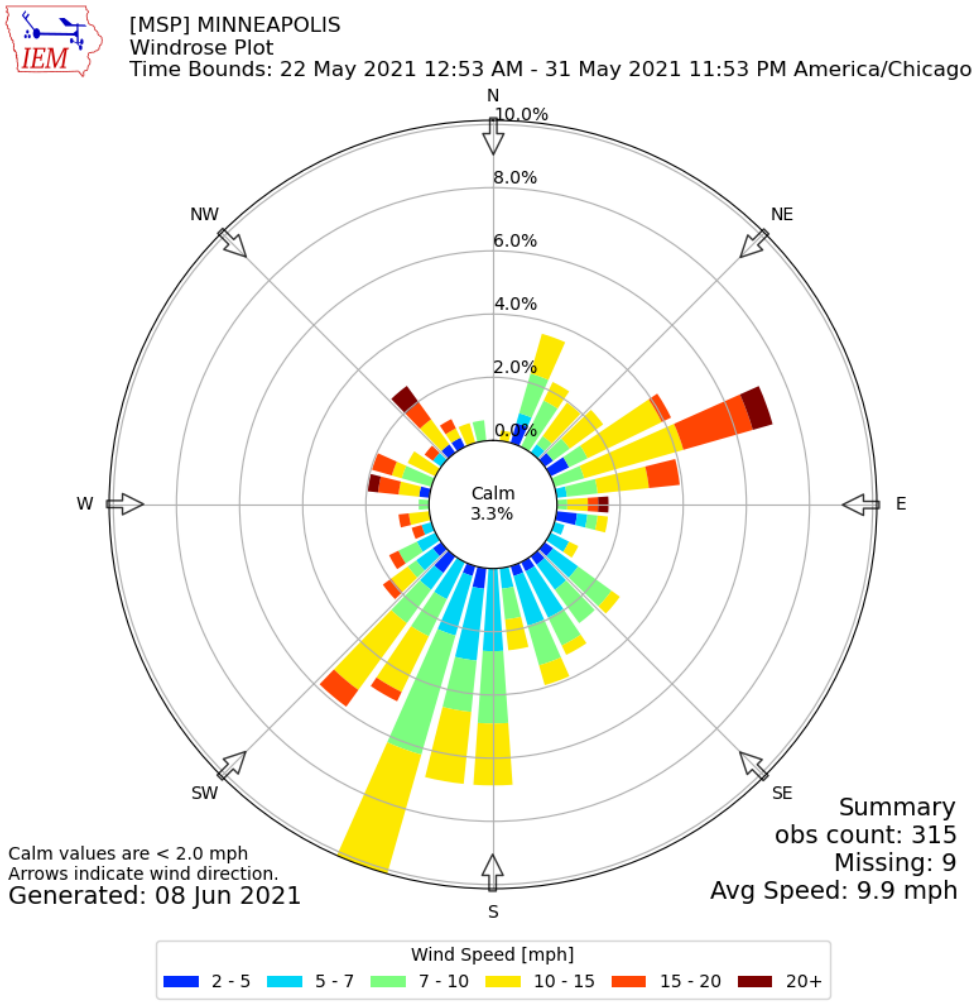
Top 10 Fleet Composition - MSP Operations During Study Period

Category	Aircraft Type	Operations
Regional Jet	Canadair CRJ-900	1,707
Regional Jet	Canadair CRJ-200	883
Narrowbody	Boeing 737-800	812
Narrowbody	Airbus A321	775
Narrowbody	Boeing 737-900	622
Narrowbody	Boeing 757-200	504
Narrowbody	Airbus A320	456
Regional Jet	Embraer E-170	347
Narrowbody	Airbus A319	343
Narrowbody	Airbus A220	223

5.2 WEATHER

Daily Observation – NOAA MSP Station

Date	Day	Low (f)	High (f)	Rain (in)	Max Wind Speed (mph)
5/22/2021	1	68	83	0.15	15
5/23/2021	2	66	78	-	14
5/24/2021	3	67	86	0.3	15
5/25/2021	4	64	86	0.43	22
5/26/2021	5	55	65	-	22
5/27/2021	6	42	56	0.09	23
5/28/2021	7	39	60	0.9	15
5/29/2021	8	43	65	-	13
5/30/2021	9	54	61	0.01	12
5/31/2021	10	52	77	-	13



5.3 GLOSSARY

Aircraft Operation

Aircraft arriving or departing from MSP, or an aircraft that performed both an arrival and departure.

A-Weighting

A-Weighting is a standard filter used by acoustic measurement devices and can be applied to acoustic measurements. It is frequency filter that attempts to emulate the way human hear.

Day-Night Level (DNL)

The FAA established DNL as the primary metric for aircraft noise analysis and expressing aircraft noise exposure in the United States. "DNL" is the acronym for Day-Night Average Sound Level, which represents the total accumulation of all sound energy, with a 10-decibel penalty applied for each sound event between 10:00 P.M. and 7:00 A.M. DNL has been widely accepted as the best available method to describe aircraft noise exposure and is the industry standard for use in aircraft noise exposure analyses and noise compatibility planning. It also has been identified by the U.S. Environmental Protection Agency as the principal metric for airport noise analyses.

Decibel (dB/dBA)

Sound levels are measured in Decibels, a logarithmic scale of energy referenced to human hearing. Sound levels are reported in dB; dBA is the Decibel value after the A-Weighting filter is applied.

LA_{eq} (Equivalent Sound Level) Equivalent sound level

The representation of a time-varying sound as an equivalent steady state A-weighted sound level for the period or interval of interest.

LA_{max} (Maximum A-weighted Sound Level)

This is maximum A-Weighted Sound Level observed for the period, event, or interval of interest.

LA_{90} (Sound Level Exceeded 90 Percent of the Time)

The LA90 is a common and typical method to estimate the background sound levels or sound levels seen most of the time. It is a statistical based metric which provides us with which A-Weighted sound level that is exceeded 90 percent of the time.

Number Above

The "Number Above", also referred to as N-level sound metric or Count Above, is the total number of aircraft sound events that exceeded a specified sound level threshold (LA_{max}). This report contains a

count of departure events and arrival events recorded with field-measurement equipment when the maximum sound level of those events exceeds 65, 80, 90, and 100 dB levels.

SEL (Sound Exposure Level)

Sound Exposure Level is the total sound energy expressed in one second. Numerically, the energy is equivalent but allows for the comparison of sound events with varying durations.

Time Above Metric

The "Time Above" noise metric measures the total time or percentage of time that the A-weighted aircraft noise level exceeds an indicated level. Time Above data are summarized for arrival and departure events based on one-second intervals.

MEMORANDUM

ITEM 4.2

TO: MSP Noise Oversight Committee (NOC)

FROM: Brad Juffer, Manager, Community Relations

SUBJECT: **MEET THE FLEET**

DATE: July 7, 2021

The MAC Stakeholder Engagement department and Community Relations office is always striving to grow our community engagement efforts and expand our offerings to connect with the many people that are interested in our airports. Unfortunately, the COVID-19 pandemic has not allowed us to meet in person, strengthen the bond we have with our communities or foster new relationships.

To continue to provide our communities with an insight into aviation, MAC staff have begun an exciting video series to bring our airports to our neighbors. In partnership with our talented NOC pilots, Meet the Fleet will give viewers a behind-the-scenes view of different aircraft types that frequently use MSP. The videos feature commentary from pilots sharing interesting facts about specific aircraft, identifying characteristics, common routes flown and up-close footage of the fleet.

At the July 21, 2021 NOC meeting, staff will share the first Meet the Fleet video with more planned in 2021.