



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 |
| Paul Borgstrom | Chief Pilot Representative (Delta Air Lines) |
| Mary Brindle | At-Large Community Representative (Edina City Council) |
| Pam Dmytrenko | City of Richfield Representative (City of Richfield) |
| Chris Finlayson | At-Large Airport User Representative (Endeavor Air, Inc.) |
| Christine Koppen | Cargo Carrier Representative (United Parcel Service) |
| Patrick Martin | City of Bloomington Representative (Bloomington City Council) |
| Jay Miller | City of Mendota Heights Representative (Mendota Heights City Council) |
| Linea Palmisano | City of Minneapolis Representative (Minneapolis City Council) |
| Casey Potter | Charter/Scheduled Operator Representative (Sun Country Airlines) |

MEETING AGENDA

January 20, 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: 750 382 61

- 1. Consent**
 - 1.1. Approval of November 18, 2020 Meeting Minutes
 - 1.2. Reports
 - 1.2.1. Monthly Operations Reports: November and December 2020
- 2. Public Comment Period**
- 3. Business**
- 4. Information**
 - 4.1. MSP Air Service Updates
 - 4.2. 2020 Complaint Data Assessment
 - 4.3. 2020 Fleet Mix and Nighttime Operations Assessment
- 5. Announcements**
- 6. Adjourn**



MSP NOISE OVERSIGHT COMMITTEE
DRAFT MEETING MINUTES
 Wednesday, November 18, 2020 at 6:00 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, November 18, 2020, by teleconference only. **Chair Miller** called the meeting to order at 6:00 p.m. The following were on the teleconference:

Representatives: M. Brindle, T. Cossalter, C. Finlayson, J. Hart, C. Jacobson, C. Koppen, P. Martin, D. Miller, L. Olson, C. Potter, B. Whalen

Staff: B. Juffer, K. Martin, D. Nelson, N. Pesky, M. Ross, J. Lewis

Others: H. Rand – Inver Grove Heights, L. Palmisano – City of Minneapolis, S. Norling– Mendota Heights, D. O’Leary – Sunfish Lake, L. Moore – City of Bloomington, 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; C. Jacobson; P. Martin; D. Miller; L. Olson; B Whalen

Industry Representatives: T. Cossalter; C. Finlayson; J. Hart; C. Koppen; C. Potter

1. Consent

1.1. Review and Approval of September 16, 2020 Meeting Minutes

There were no questions or revisions to the September 16th meeting minutes.

1.2. Reports

1.2.1. Monthly Operations Reports: September and October 2020

Michele Ross, Assistant Technical Advisor to the NOC provided September and October operations updates. (Presentation materials are available on macnoise.com):

| SEPT | OCT |
|---|---|
| • Total Operations: 19,835 | • Total Operations: 21,315 |
| • Nighttime Operations: 690 | • Nighttime Operations: 749 |
| • North/South/Mixed: 42/46/2 (%) | • North/South/Mixed: 57/40/3 (%) |
| • RUS (Priority 1/2/3/4): 50/1/0/49 (%) | • RUS (Priority 1/2/3/4): 50/1/0/49 (%) |
| • RJ/Narrow/Wide: 49.7/48.5/1.8 (%) | • RJ/Narrow/Wide: 49.5/48.6/1.9 (%) |
| • Complaints: 10,756 | • Complaints: 7,963 |
| • Complaint locations: 269 | • Complaint locations: 181 |
| • Top 10 Households: 62% | • Top 10 Households: 65% |

- Hours of events*: 260
 - Number of events*: 52,400
 - R17 procedure: 100%
 - EMH Corridor procedure: 95.1%
 - Crossing procedure day: 22%
 - Crossing procedure night: 38.1%
- Hours of events*: 268
 - Number of events*: 56,366
 - R17 procedure 100%
 - EMH Corridor procedure: 91.7%
 - Crossing procedure day: 18.2%
 - Crossing procedure night: 54.1%

* Aircraft sound events above 65dB.

Member Olson thanked MAC staff for the report and asked how sound measurement is captured. **Ross** clarified that the sound monitoring sites collect all sounds 24 hours a day. Sounds louder than 65dB that are eight seconds or longer are classified as sound events. These events are then analyzed and classified as either an aircraft or community event (non-aircraft). The number of events above 65dB and the time above 65dB are metrics reported to the NOC, however, there are additional metrics that can be used to measure and analyze the sound data.

1.2.2. Review of Fall Listening Session

Ross provided an overview of the Listening Session. On October 28, MAC Community Relations staff conducted a virtual Fall Listening Session. Three residents from Mendota Heights, one additional resident, and an aviation management student joined the call. Also, in attendance were FAA staff, NOC representatives Jeff Hart, Linea Palmisano, Loren Olsen, Paul Borgstrom, and Mary Brindle, MAC Commissioner Rod Skoog, and six MAC staff.

Staff presented attendees with a brief presentation, including the draft 2021 NOC Work Plan and an overview of recent MSP activity. Following this staff presentation, the meeting moved to an open forum for community members to suggest work plan items, or ask questions, etc.

Community members noted that the operational changes as a result of COVID-19 have impacted communities differently. The changes have resulted in an increase in the percentage of departures using RUS Priority 1 Runways 12L/12R while Runway 17 has been used very infrequently. It was also noted that departures from Runway 30R are impacting Minneapolis residents.

Member Olson commented that during the listening session a Mendota Heights resident noted a lot of noise from Runway 12L even though operations are down. There is a community expectation that noise would be reduced due to the reduction in the total number of MSP operations. However, with the almost exclusive use of the parallel runways, communities are not receiving the expected reprieve. After Runways 12L and 12R, Runway Use System prioritizes Runway 17 for departures. **Member Olson** requested the tower consider increasing the use of Runway 17 for departures to spread out the benefits of the reduced operations and to mitigate noise to affected neighborhoods. Even though overall operation reductions are even lower at night, where the complaints are coming from could be reviewed and a more balanced approach could be implemented.

1.2.3. Review of Residential Noise Mitigation Program Implementation Status

Chair Miller asked for a motion to approve the consent agenda items.

Member Brindle moved, and Member Martin seconded approval of the Consent items listed above. The motion passed on the following roll call vote:

Ayes: Eleven

Brindle, Cossalter, Finlayson, Co-Chair Hart, Jacobson, Koppen, Martin, Chair Miller, Olson, Potter, Whalen

Nays: None

Abstain: None

2. Public Comment Period

There were no parties in attendance who elected to make a public comment.

3. Business

3.1 NOC Work Plan, NOC 2020 Accomplishments and 2021 NOC Meeting Dates

Brad Juffer, Technical Advisor, presented the draft 2020 NOC Work Plan, the NOC 2020 Accomplishments, and 2021 NOC Meeting Dates.

The draft NOC Work Plan is composed of 3 major parts. They include the Residential Noise Mitigation Program, MSP Community Relations Specific Efforts as well as Continue Review of Public Input. Juffer noted that Item I - Update on Eagan Request to FAA was requested by Co-Chair Miller to maintain visibility to a pending FAA review of the Eagan request item. Item J - Guest Speaker: Brian Ryks, MAC Executive Director / CEO was added to the work plan and has been included in past years' work plans. Item K - MSP Air Service Updates is a new item added after September. This item is intended to provide the committee and neighbors, around the airport, with an expectation of future airline schedules before they are flown in 2021. The goal of this item, in addition to other measures that staff will be pursuing in 2021, is meant to align expectations as much as possible as travel resumes.

Meetings are proposed to be on the 3rd Wednesday of odd-numbered months as prescribed in the NOC bylaws. There were two items to note regarding the November meeting. First, as recommended by a bylaw subcommittee in 2018, the November meeting is proposed by be an evening meeting, beginning at 6:00 PM, to allow for more resident participation. Additionally, this week may conflict with a National League of Cities annual conference and may preclude some city representatives from joining. Given that conflict, MAC staff suggest revising the meeting to occur the week prior on November 10, 2021 at 6:00 PM.

Juffer then presented the 2020 NOC Accomplishments and noted Item 5, which allowed the pilot representatives to address resident concerns regarding Standard Operating Procedure (SOP) for the airlines. Item 6 was the first installment of a Complaint Data Assessment. At the request of member Olson, this report provided a detailed analysis of all MSP complaints received in 2019. Juffer commented that the Committee spent a considerable amount of time on Item 7. This work

carefully reviewed and analyzed the effect a proposal from residents in the City of Eagan may have on the community and airport. Related, Item 12 provided a guidebook for future requests to follow. Items 14 and 17 were conducted as a result of community input the previous year during a Listening Session, that were inquisitive about operations northwest of the airport. Finally, **Juffer** highlighted items 4, 9, 15, 16 and 19 as items that the NOC was engaged with FAA partners on work being conducted by the Agency.

Juffer concluded this item by noting the challenges experienced in 2020. The pandemic, local racial unrest and contentious election affected the region and country. The scheduled meeting in March had to be cancelled and work plan items had to be rearranged. The NOC was unable to gather in person and have relied on phone calls to complete work since May. The airlines, airport and the entire industry are experiencing a downturn unlike any in our history. Despite all these things, the NOC continued to meet and participate in the dialogue. Multiple NOC members attend our virtual Listening Sessions in July and October. The items on the NOC agendas were analyzed and evaluated and considered. **Juffer** thanked the Committee and its members for their participation and commitment and recognized the challenging work they do every year.

Chair Miller thanked Juffer for his comments and mentioned that MAC staff has been incredibly resilient, and she appreciated the efforts taken to move this work forward. She thanked the Committee and residents for their commitment and engagement.

Co-Chair Hart also thanked Juffer, his staff, the Committee, and residents.

Co-Chair Hart moved, and **Member Finlayson seconded** to approve and recommend to the MAC Planning, Development and Environment Committee the Final 2021 MSP NOC Work Plan and Approve the List of 2020 Accomplishments and 2021 Meeting Dates, with the one edit to move the November meeting one week earlier. The motion passed on the following roll call vote:

Ayes: Eleven

Brindle, Cossalter, Finlayson, Co-chair Hart, Jacobson, Koppen, Martin, Chair Miller, Olson, Potter, Whalen

Nays: None

Abstain: None

4. Information

4.1 Update on the FAA's Survey to Re-evaluate Noise Measurement Methods

Brad Juffer, Technical Advisor, provided an update on the FAA's survey to re-evaluate noise measurements methods, noting the item was on the NOC work plan for the 4th year. It was originally added to the NOC work plan in 2016 to monitor the progress the FAA was making in its effort to test the relationship between community annoyance and noise levels. After 2016, the NOC received updates in 2018, 2019 and 2020.

Juffer discussed the history of noise measurement methods. The United States Congress in 1979 while passing the Aviation Safety and Noise Abatement Act mandated that the FAA establish a single system for measuring noise. That system had to exhibit a highly reliable relationship between noise exposure and surveyed reactions of people. This system would be applied

uniformly. Additionally, this system had to account for noise intensity, duration, and time of occurrence. At the behest of Congress, the FAA officially adopted the Day-Night Average Sound Level (DNL) for determining cumulative noise exposure under CFR Part 150 and during NEPA evaluations. In these processes the DNL 65 level is used to judge the level of significance for a project. The FAA continues to hold land use compatibility decisions should be made at a local level.

Juffer explained how DNL is calculated. The amplitude an aircraft event as well as the duration of that event is used to calculate the sound exposure level (SEL). All the SEL values are then added together. 10 dB are added to each SEL value that occurred between 10:00 PM and 7:00 AM. Because sound is logarithmic, 1 nighttime flight is equivalent to 10 daytime flights of the same SEL. All of those values are added together and averaged to represent the DNL.

Juffer then reviewed the progress made by the FAA. The FAA announced in 2015 that it would conduct a study to update the dose-response relationship that correlated noise exposure with community annoyance. This study was included in a portfolio of research undertaken by the FAA to include studying noise and sleep disturbance, cardiovascular health, and children's cognitive learning. The survey was a twelve-question survey sent to residents around 20 airports. Those airports at a minimum, needed to have at least 100 jet operations per year, and contain at least 100 households within the 60-65 dB DNL area and the 65+ dB DNL contour area. Those airports were meant to be representative of all airports by considering the geographic location, temperature, airport activity level, nighttime activity level, fleet mix and population near the airports.

Juffer provided further background about requirements placed on FAA by Congress. In October 2018, Congress passed the 2018 FAA Reauthorization Act. The legislation included several noise provisions. Section 173 and Section 188 required the FAA to submit a report to Congress that detailed alternative airplane noise metrics and a study regarding day-night average sound levels. Those reports were due to Congress within 1 year of enactment. The report was not completed and released publicly within the one-year requirement. Section 187 required the FAA to conclude the review of the relationship between noise exposure and its effects on communities and report back to Congress within 2 years. Similar to the report that satisfied requirements from section 173 and 188, the report for Section 187 has not been completed, submitted to Congress, and released publicly within that two-year deadline. Section 187 also requires the FAA's report to contain recommendations for revising Part 150.

Juffer offered to take questions from the Committee. **Member Palmisano** asked if a workgroup could be created to think of alternative ways to capture noise impact so that we can provide proactive input to the FAA? For example, if we were to look at the frequency of planes being accounted for, how might we do that?

Juffer responded that he appreciated the questions and the thought. He said that it is within the purview of the NOC to create a subcommittee if there is a desire by the Committee to do so. He mentioned that previously the MAC Noise office and now the MAC Community Relations office finds value in providing alternative noise metrics and does so on a regular basis both in NOC meetings and in monthly reports. The most notable of these would be Time Above 65 dB and Events Above 65 dB. Those metrics are prevalent in our reports. As another example, when looking at the Eagan

request, MAC was able to model both of those metrics in addition to DNL to determine the potential extent of changes within the community. MAC staff sees value in being able to do that. **Juffer** also cited the FAA report to Congress, sections 173 and 188 that stated that the FAA does note that there is value in being able to provide alternative metrics for certain occurrences and community education. It did to state that ultimately the DNL metric will be the metric that should be applied because of those three factors, intensity, time of day and duration of events and that it be applied uniformly across the country. It also noted that there were potential opportunities to use alternative metrics in certain conversations.

5. Announcements

Brad Juffer, Technical Advisor, noted the action taken in Item 3.1 sends the 2021 NOC Work Plan to the MAC PD&E Committee, December 7th at 10:30 am. Co-Chairs will present the accomplishments and the work plan to the Committee for formal approval. Anyone interested, can participate using the same dial in number and code that was used for this meeting, call 612-351-3093 and enter code 239031. The agendas are posted on Metroairports.org

Next meetings:

January NOC Meeting

Wednesday, January 20, 2021 @ 1:30pm
Virtual Teleconference

Winter Listening Session

Wednesday, January 27, 2021 @ 6pm
Virtual Teleconference

6. Adjourn

Chair Miller thanked the members of the Committee, NOC staff and residents in attendance. The meeting was adjourned at 6:51 pm.

Respectfully Submitted,
Kris Martin, Recording Secretary

MEMORANDUM

ITEM 1.2.1

TO: MSP Noise Oversight Committee (NOC)

FROM: Michele Ross, Assistant Manager, Community Relations

SUBJECT: **REVIEW OF MSP MONTHLY OPERATIONS REPORTS: NOVEMBER AND DECEMBER 2020**

DATE: January 6, 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 January NOC meeting, MAC staff will provide a summary of this information for November and December 2020. To view these summary reports prior to the meeting, visit the “Archive” section at the link above.

MEMORANDUM

ITEM 2

TO: MSP Noise Oversight Committee (NOC)

FROM: Brad Juffer, Manager, Community Relations

SUBJECT: PUBLIC COMMENT PERIOD

DATE: January 6, 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 4.1

TO: MSP Noise Oversight Committee (NOC)

FROM: Brad Juffer, Manager, Community Relations

SUBJECT: **MSP AIR SERVICE UPDATES**

DATE: January 6, 2021

The COVID-19 pandemic has substantially impacted activity at MSP. Passenger levels and associated aircraft takeoffs and landings have been depressed below normal levels since late March 2020. This reduced level of activity changed the experience for many residents living near MSP for most of 2020. It is expected that passenger levels and aircraft operations will not fully return to pre-pandemic levels for many years.

Despite this expectation, passenger bookings and airline traffic does continue to grow from the low valley experienced during the spring and summer in 2020. Multiple approved vaccinations for COVID-19 are now being administered. Widespread vaccination availability is expected by summer 2021. As more people are vaccinated and the impact of the pandemic wanes, air travel at MSP will continue to recover.

In an effort to prepare communities near MSP to the rebound in operational levels, the NOC has invited Delta Air Lines, Sun Country Airlines and the MAC's Director of Air Service Development to provide regular updates about future airline schedules and communicate how those schedules will impact airport operations.

MEMORANDUM

ITEM 4.2

TO: MSP Noise Oversight Committee (NOC)

FROM: Brad Juffer, Manager, Community Relations

SUBJECT: **2020 COMPLAINT DATA ASSESSMENT**

DATE: January 6, 2021

The 2021 NOC Work Plan includes generation of an MSP Complaint Data Assessment. The assessment examines complaint data trends from 2018 through 2020 and includes the following sections:

- 2018 – 2020 Annual Complaint and Households
 - 2020 Top 10 Households by Complaints
 - 2020 New Households filing Complaints
 - 2020 Ground Noise and Runup Complaints
- 2020 Complaints by Complaint Reason
- 2018 – 2020 Complaint filed by City
- 2018 – 2020 Households by City
- 2020 Households by Home Purchase Date
- 2018 – 2020 Complaint by Time of Day
- 2020 Complaints by Aircraft Category
- 2020 Complaints by Aircraft Type
- 2020 Top 10 Flights that Generated Complaints
- 2018 – 2020 Complaints by Airport Flow
- 2020 Complaints by Temperature and Weather Conditions

This report will be made available as an addendum to the packet prior to the meeting. Staff will present information from this report at the January 20, 2021 NOC meeting.

MEMORANDUM

ITEM 4.3

TO: MSP Noise Oversight Committee (NOC)

FROM: Brad Juffer, Manager, Community Relations

SUBJECT: **2020 FLEET MIX AND NIGHTTIME OPERATIONS ASSESSMENT**

DATE: January 6, 2021

The 2021 NOC Work Plan includes an assessment of current fleet mix and nighttime operational trends.

The report provides year-end 2020 data in comparison with historical trends. The report includes the following sections:

- MSP Fleet Mix
 - Historical Carrier Jet Trends
 - Trends in Aircraft Passenger Load Factors
 - MSP Carrier Jet Usage with Cumulative Certificated Noise Levels
 - Average Altitude Trends
- Nighttime Operations
 - Average Daily Nighttime Operations
 - Nighttime Operations by Runway, Airline, Aircraft Type, Origin/Destination
 - Trends in Nighttime Operations by Hour
 - Scheduled versus Actual Nighttime Operations by Hour

Staff will present information from this report at the January 20, 2021 NOC meeting.



**2020 ANNUAL MSP FLEET MIX AND
NIGHTTIME OPERATIONS REPORT**
JANUARY 2021

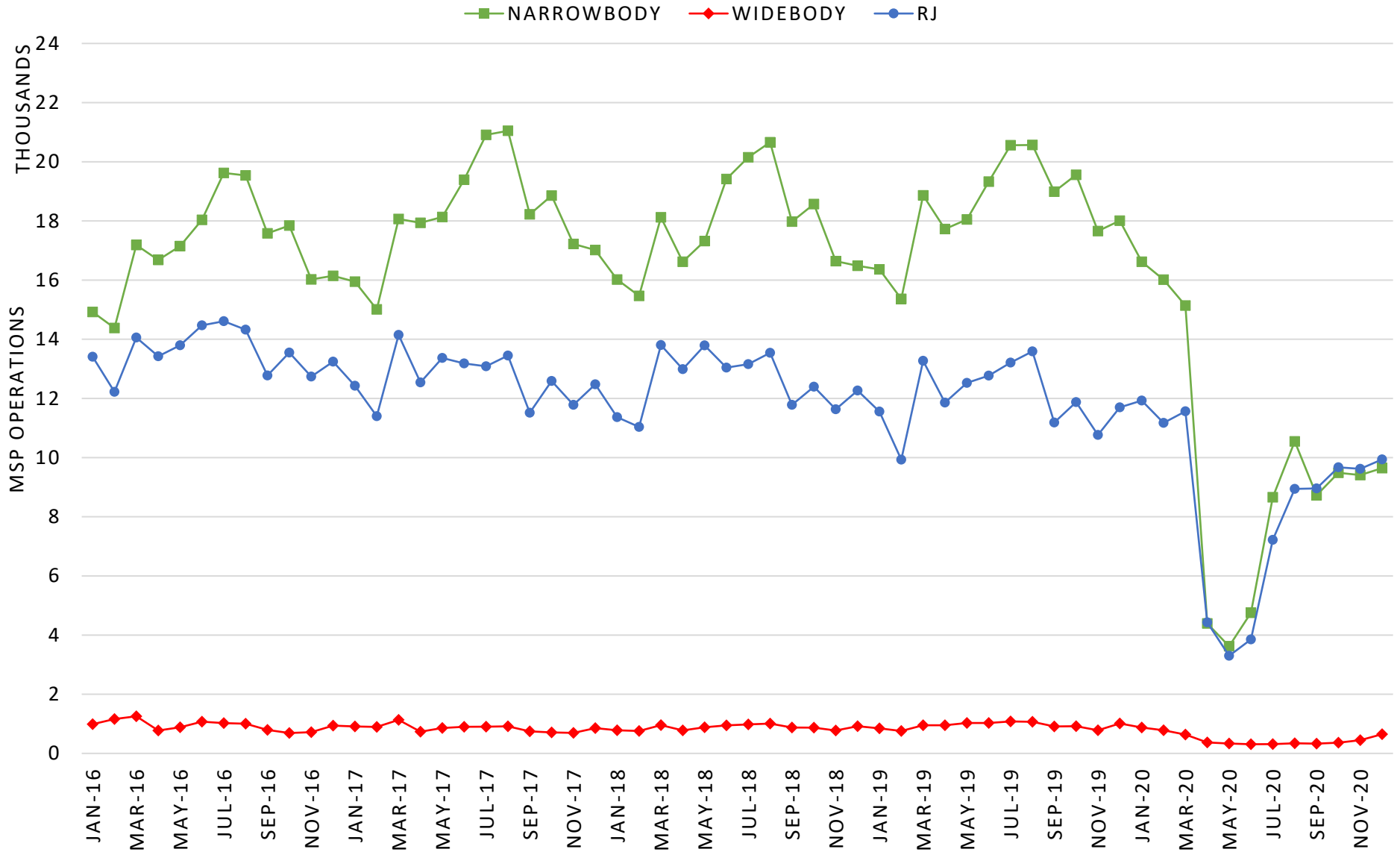
COMMUNITY RELATIONS OFFICE

2020 ANNUAL MSP FLEET MIX AND NIGHTTIME OPERATIONS REPORT

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MSP FLEET MIX REPORT

MONTHLY CARRIER JET COUNTS BY TYPE



HUSHKIT BY YEAR: 2016 - 48, 2017 - 26, 2018 - 32, 2019 - 18, 2020 - 8

MSP FLEET MIX REPORT
WIDEBODY JET ACTIVITY



| WIDEBODY | TYPE | 2016 | 2017 | 2018 | 2019 | 2020 |
|----------|--------------|-------------|-------------|-------------|-------------|-------------|
| | A124 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | A300 | 0.0% | 0.0% | 0.1% | 0.2% | 0.4% |
| | A310 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | A330 | 0.7% | 0.8% | 0.7% | 0.6% | 0.3% |
| | A340 | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% |
| | A350 | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% |
| | A380 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | B742 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | B744 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | B748 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | B762 | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% |
| | B763 | 0.9% | 0.5% | 0.8% | 1.1% | 1.1% |
| | B764 | 0.2% | 0.0% | 0.0% | 0.1% | 0.0% |
| | B767 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | B777 | 0.2% | 0.4% | 0.4% | 0.5% | 0.1% |
| | B7878 | 0.0% | 0.0% | 0.0% | 0.1% | 0.0% |
| | DC10 | 0.1% | 0.3% | 0.2% | 0.0% | 0.1% |
| | MD11 | 0.6% | 0.5% | 0.3% | 0.2% | 0.4% |
| | TOTAL | 3.0% | 2.7% | 2.8% | 3.0% | 2.6% |

MSP FLEET MIX REPORT
NARROWBODY JET ACTIVITY



| NARROWBODY | TYPE | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------------|--------------|--------------|--------------|--------------|--------------|-------|
| | A220 | 0.0% | 0.0% | 0.0% | 0.3% | 0.9% |
| | A319 | 7.2% | 6.7% | 6.4% | 6.7% | 7.0% |
| | A320 | 9.9% | 7.1% | 6.6% | 7.4% | 5.5% |
| | A320neo | 0.0% | 0.2% | 0.4% | 0.6% | 0.5% |
| | A321 | 0.5% | 0.5% | 2.2% | 6.6% | 9.6% |
| | B717 | 2.4% | 5.2% | 5.9% | 7.8% | 2.4% |
| | B72Q | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | B733 | 0.7% | 0.4% | 0.0% | 0.0% | 0.0% |
| | B734 | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% |
| | B735 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | B7377 | 4.8% | 5.0% | 4.7% | 3.8% | 2.6% |
| | B738 | 7.8% | 9.8% | 10.1% | 11.3% | 10.8% |
| | B739 | 3.8% | 5.0% | 7.5% | 8.1% | 8.0% |
| | B38M | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% |
| | B73Q | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | B757 | 5.8% | 5.9% | 6.1% | 5.1% | 5.0% |
| | DC8Q | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | DC9Q | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | MD80 | 3.6% | 2.5% | 0.3% | 0.0% | 0.0% |
| MD90 | 7.6% | 8.8% | 6.8% | 0.6% | 0.0% | |
| TOTAL | 54.1% | 57.3% | 57.0% | 58.7% | 52.4% | |

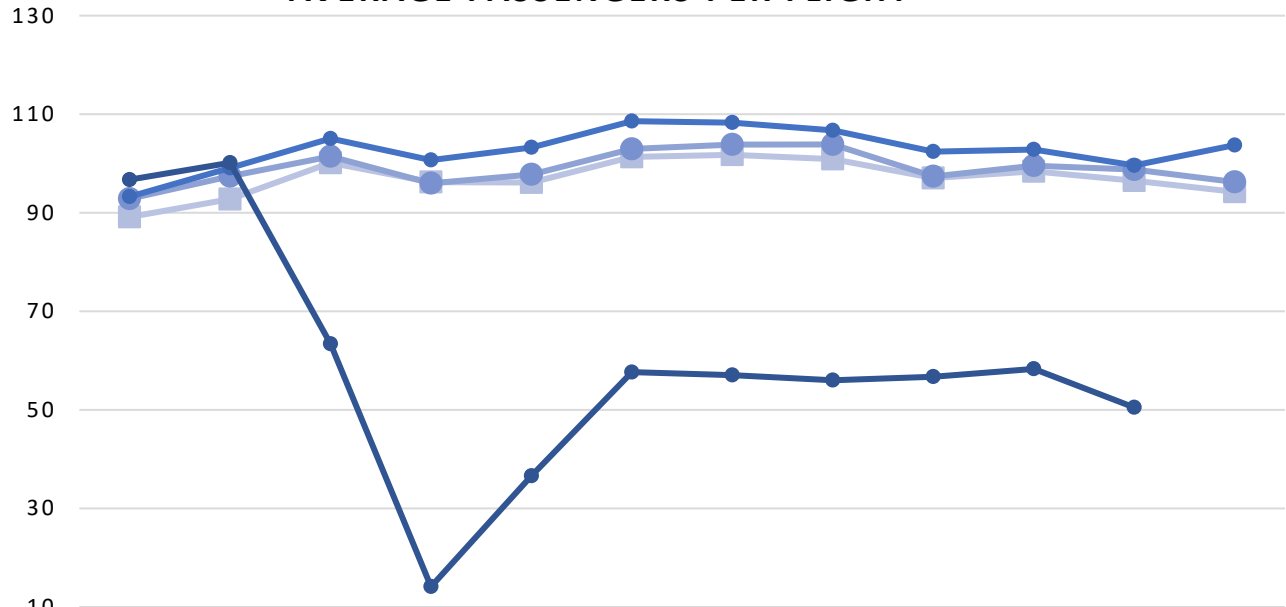
MSP FLEET MIX REPORT
REGIONAL JET ACTIVITY



| REGIONAL JET | TYPE | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------------|--------------|--------------|--------------|--------------|--------------|-------|
| | BA46 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | CRJ | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | CRJ1 | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% |
| | CRJ2 | 17.2% | 16.2% | 14.3% | 12.9% | 10.8% |
| | CRJ7 | 2.7% | 4.8% | 7.0% | 3.9% | 2.9% |
| | CRJ9 | 13.7% | 11.3% | 13.0% | 13.8% | 20.2% |
| | E135 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | E145 | 0.2% | 0.1% | 0.0% | 0.0% | 0.4% |
| | E170 | 8.7% | 7.1% | 5.5% | 7.3% | 10.6% |
| | E175 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | E190 | 0.2% | 0.5% | 0.3% | 0.4% | 0.1% |
| | J328 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| TOTAL | 42.9% | 40.0% | 40.2% | 38.3% | 45.0% | |

MSP FLEET MIX REPORT

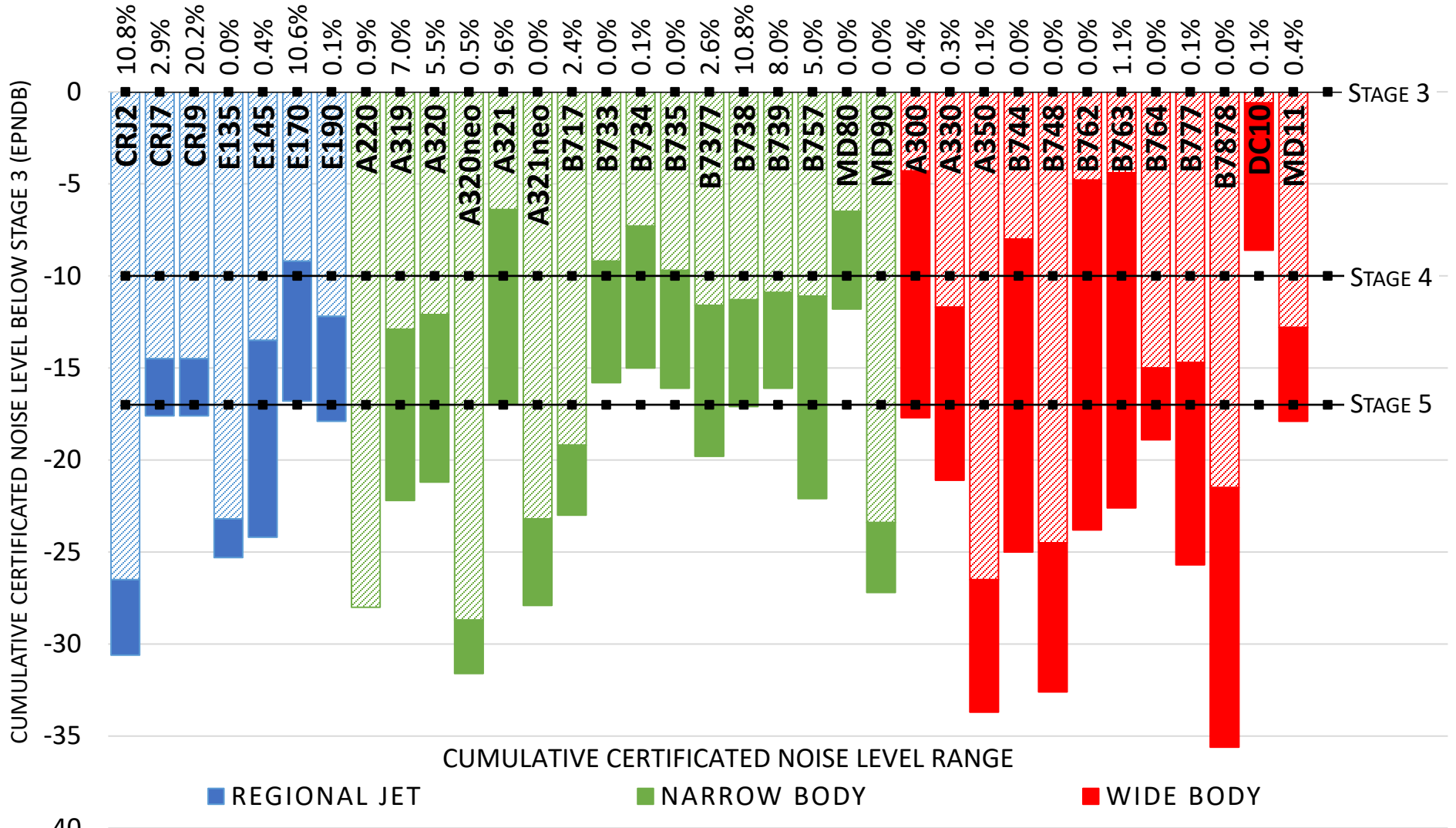
AVERAGE PASSENGERS PER FLIGHT



| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| 2017 | 89.1 | 92.8 | 100.1 | 96.2 | 96.1 | 101.3 | 101.8 | 100.9 | 97.0 | 98.4 | 96.5 | 94.2 |
| 2018 | 92.8 | 97.4 | 101.4 | 96.0 | 97.8 | 103.0 | 103.8 | 103.9 | 97.4 | 99.6 | 98.8 | 96.2 |
| 2019 | 93.3 | 99.1 | 105.1 | 100.7 | 103.3 | 108.6 | 108.3 | 106.7 | 102.4 | 102.8 | 99.6 | 103.7 |
| 2020 | 96.7 | 100.1 | 63.4 | 14.1 | 36.6 | 57.7 | 57.1 | 56.0 | 56.7 | 58.3 | 50.5 | |

SOURCE: MSP MONTHLY OPERATIONS REPORTS

2020 MSP CARRIER JET USAGE WITH CUMULATIVE CERTIFICATED NOISE LEVELS

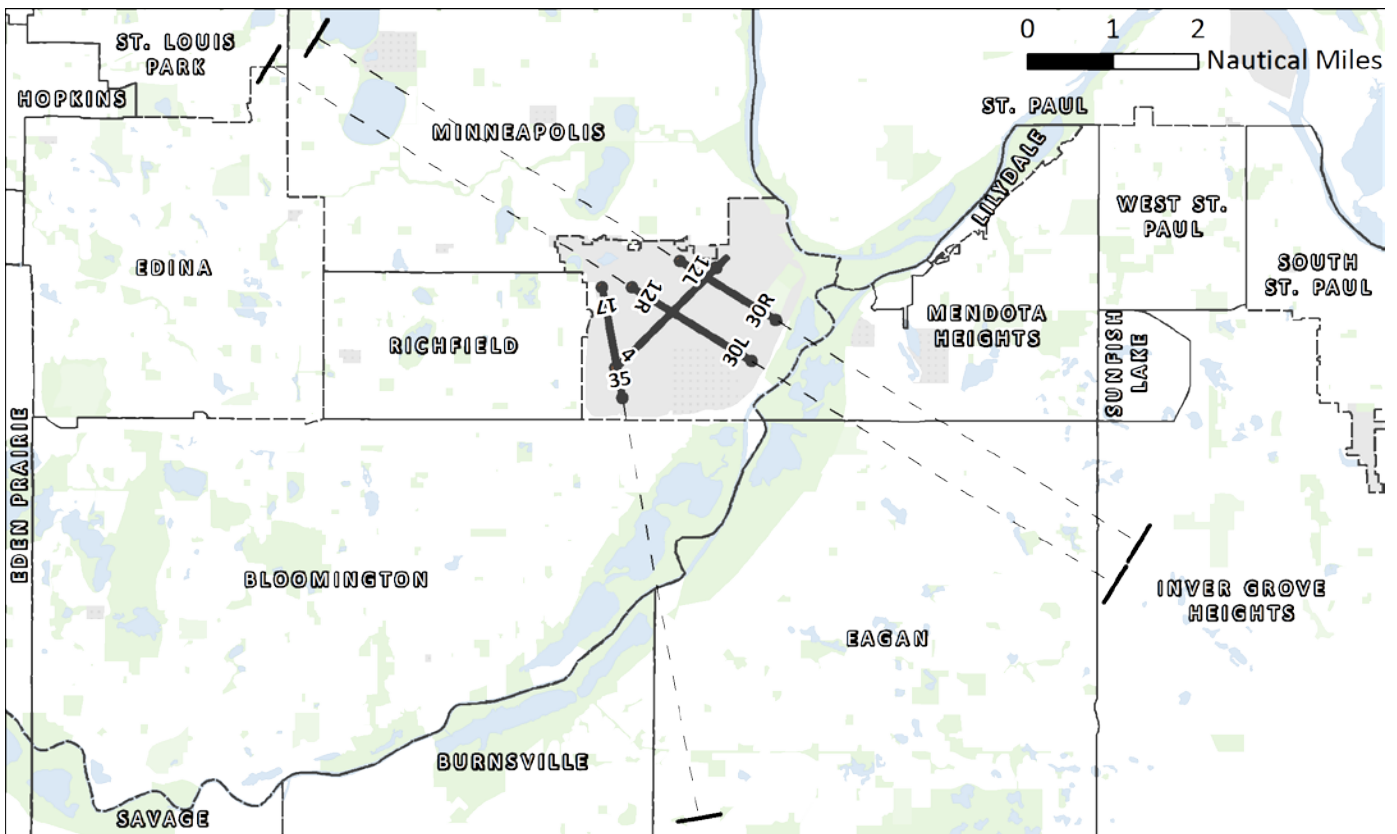
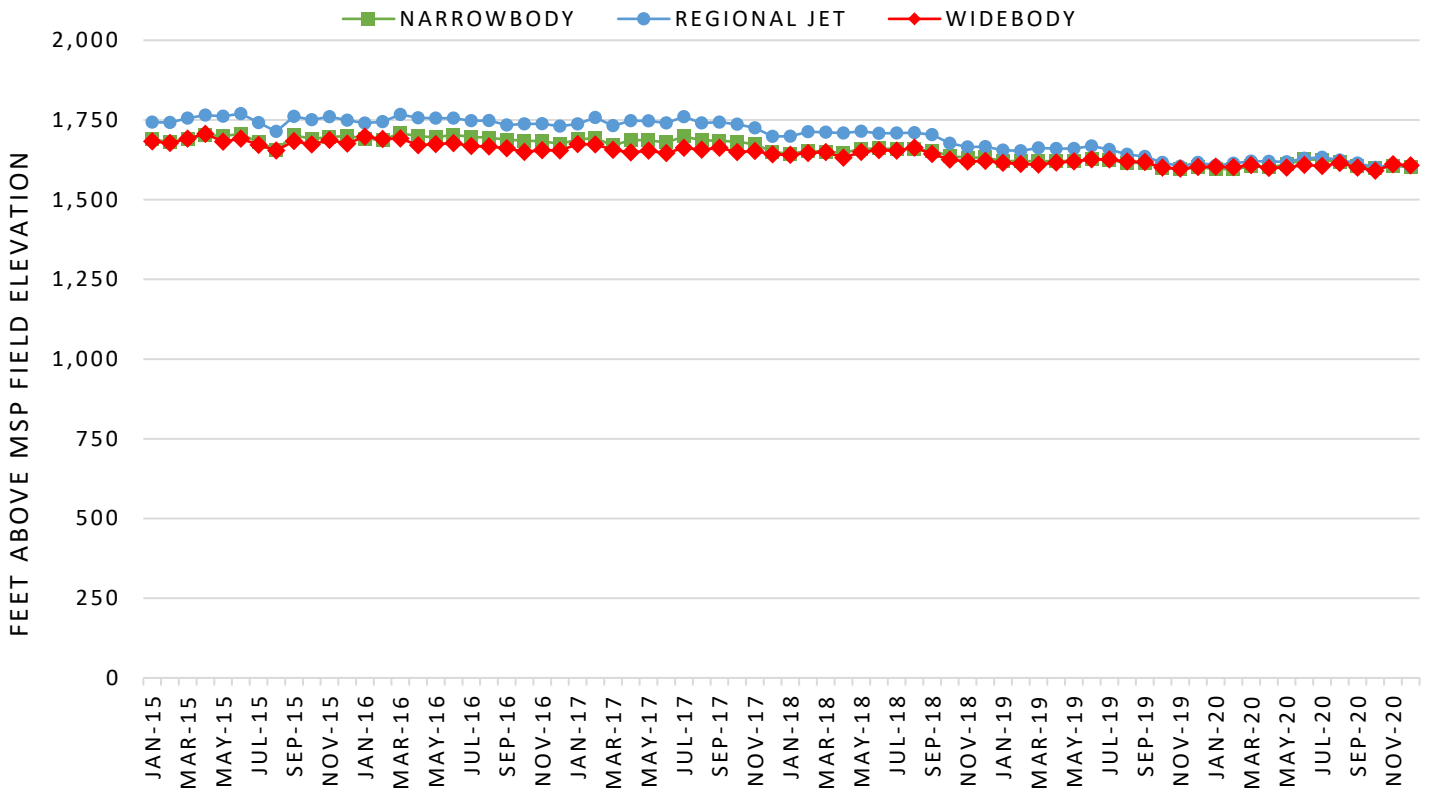


SOURCE: USAGE DATA: MACNOMS; NOISE CERTIFICATION DATA: EUROPEAN AVIATION SAFETY AGENCY

CUMULATIVE CERTIFICATED NOISE LEVELS REPRESENTED AS A RANGE TO ACCOUNT FOR MULTIPLE CERTIFICATION VARIABLES (WEIGHT,

MSP FLEET MIX REPORT

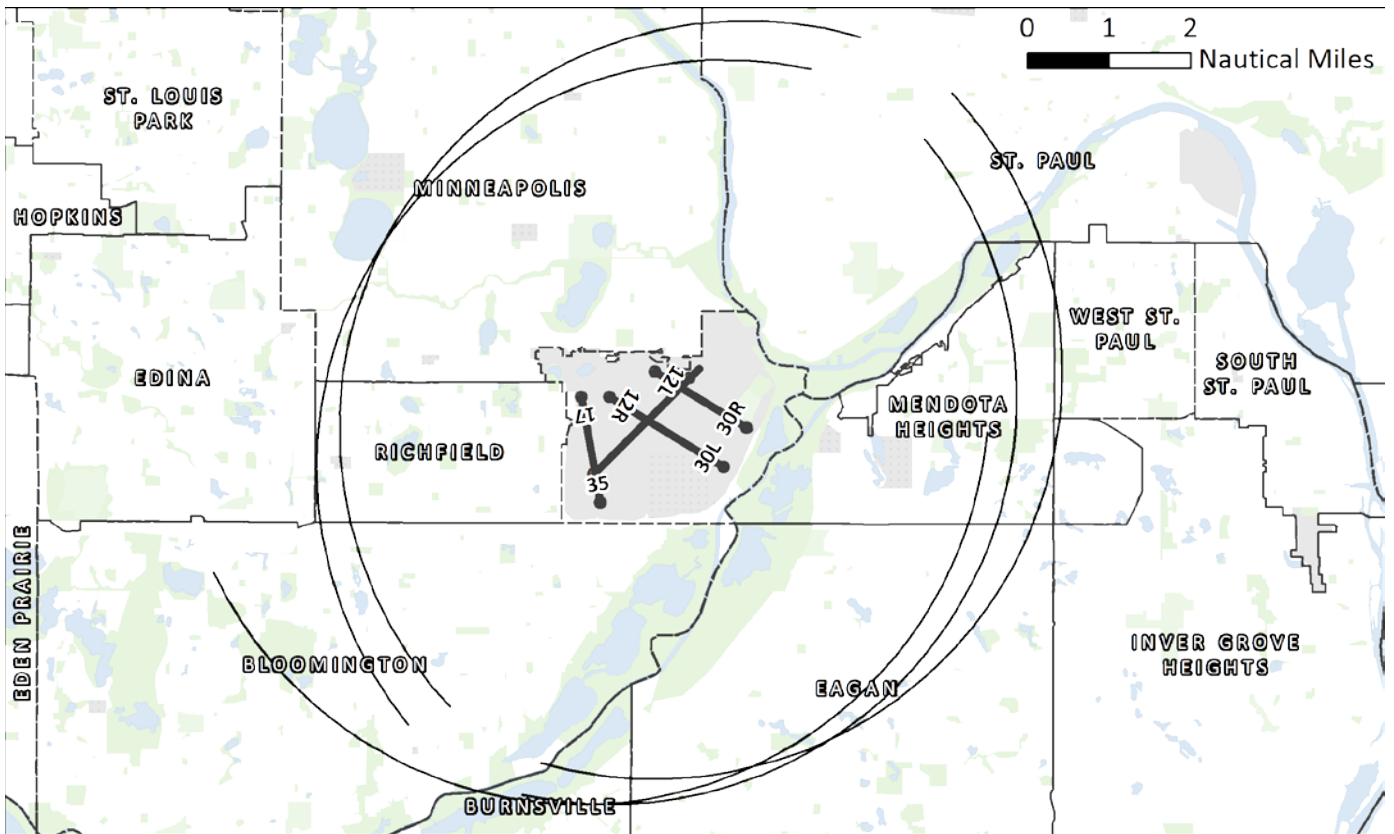
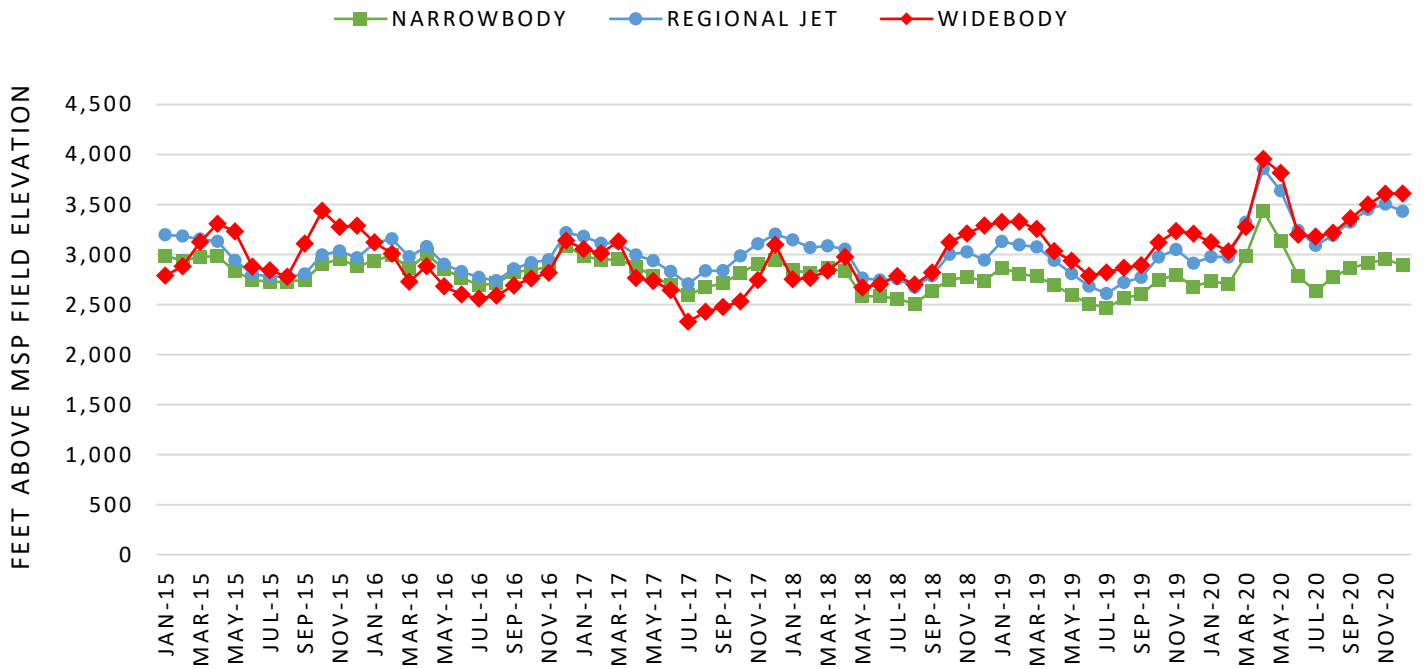
AVERAGE ALTITUDE FOR AIRCRAFT ARRIVING TO MSP



MEASUREMENT GATE IS FIVE NAUTICAL MILES FROM THE THRESHOLD OF THE ARRIVAL RUNWAY

MSP FLEET MIX REPORT

AVERAGE ALTITUDE FOR AIRCRAFT DEPARTING FROM MSP

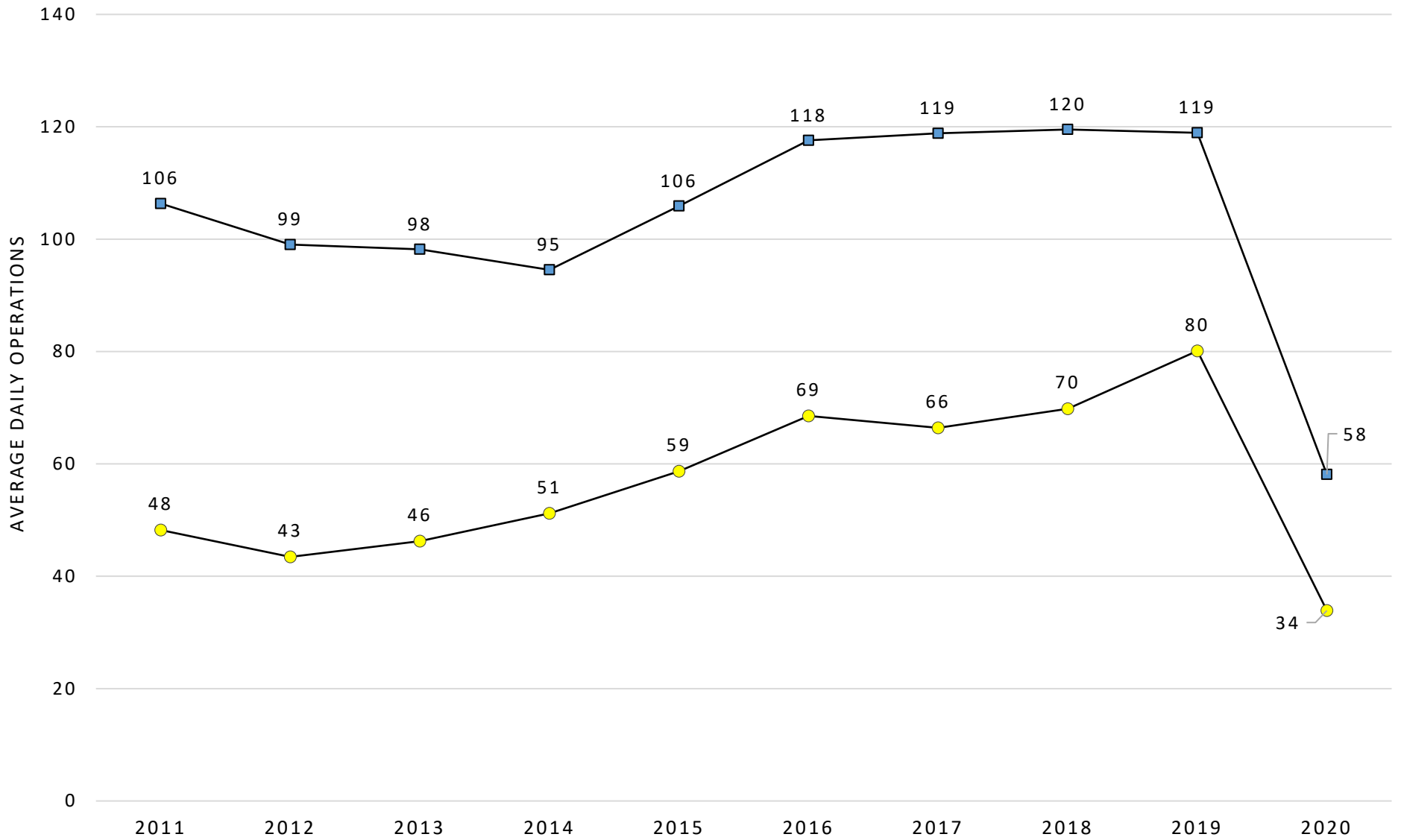


MEASUREMENT GATE IS AN ARC FIVE NAUTICAL MILES FROM THE START OF TAKEOFF ROLL

MSP NIGHTTIME OPERATIONS REPORT

AVERAGE DAILY NIGHTTIME OPERATIONS

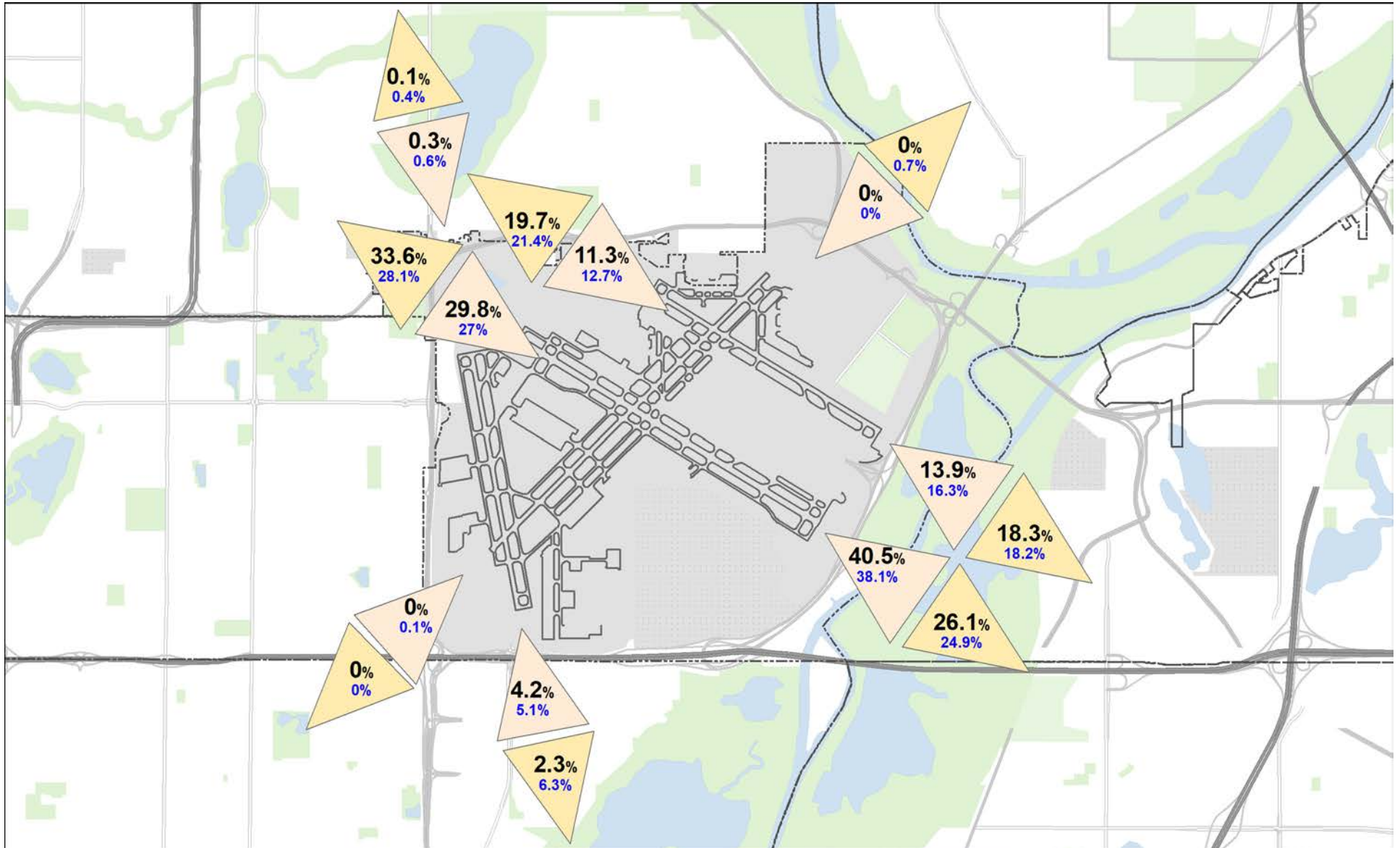
● 10:30 PM - 6:00 AM ■ 10:00 PM - 7:00 AM



MSP NIGHTTIME OPERATIONS REPORT
NIGHTTIME OPERATIONS BY RUNWAY
(10:30 PM – 6:00 AM)

| RWY | ARR / DEP | OVERFLIGHT AREA | 2020 | | | 2017 - 2019 AVERAGE | | |
|-----------------------------------|-----------|-------------------------------|-----------------|-------------------------|-------|---------------------|-------------------------|-------|
| | | | TOTAL NIGHT OPS | AVERAGE DAILY NIGHT OPS | % | TOTAL NIGHT OPS | AVERAGE DAILY NIGHT OPS | % |
| 04 | ARR | SO. RICHFIELD/BLOOMINGTON | 0 | 0.0 | 0.0% | 24 | 0.1 | 0.1% |
| 12L | ARR | SO. MINNEAPOLIS/NO. RICHFIELD | 1,038 | 2.8 | 11.3% | 2,328 | 6.4 | 12.7% |
| 12R | ARR | SO. MINNEAPOLIS/NO. RICHFIELD | 2,733 | 7.5 | 29.8% | 4,970 | 13.6 | 27.0% |
| 17 | ARR | SO. MINNEAPOLIS | 26 | 0.1 | 0.3% | 112 | 0.3 | 0.6% |
| 22 | ARR | ST. PAUL/HIGHLAND PARK | 0 | 0.0 | 0.0% | 8 | 0.0 | 0.0% |
| 30L | ARR | EAGAN/MENDOTA HEIGHTS | 3,720 | 10.2 | 40.5% | 7,011 | 19.2 | 38.1% |
| 30R | ARR | EAGAN/MENDOTA HEIGHTS | 1,276 | 3.5 | 13.9% | 3,001 | 8.2 | 16.3% |
| 35 | ARR | BLOOMINGTON/EAGAN | 390 | 1.1 | 4.2% | 933 | 2.6 | 5.1% |
| TOTAL NIGHTTIME ARRIVALS | | | 9,183 | 25.2 | | 18,387 | 50.4 | |
| 04 | DEP | ST. PAUL/HIGHLAND PARK | 1 | 0.0 | 0.0% | 53 | 0.1 | 0.7% |
| 12L | DEP | EAGAN/MENDOTA HEIGHTS | 588 | 1.6 | 18.3% | 1,447 | 4.0 | 18.2% |
| 12R | DEP | EAGAN/MENDOTA HEIGHTS | 839 | 2.3 | 26.1% | 1,976 | 5.4 | 24.9% |
| 17 | DEP | BLOOMINGTON/EAGAN | 73 | 0.2 | 2.3% | 499 | 1.4 | 6.3% |
| 22 | DEP | SO. RICHFIELD/BLOOMINGTON | 1 | 0.0 | 0.0% | 1 | 0.0 | 0.0% |
| 30L | DEP | SO. MINNEAPOLIS/NO. RICHFIELD | 1,081 | 3.0 | 33.6% | 2,232 | 6.1 | 28.1% |
| 30R | DEP | SO. MINNEAPOLIS/NO. RICHFIELD | 634 | 1.7 | 19.7% | 1,695 | 4.6 | 21.4% |
| 35 | DEP | SO. MINNEAPOLIS | 3 | 0.0 | 0.1% | 30 | 0.1 | 0.4% |
| TOTAL NIGHTTIME DEPARTURES | | | 3,220 | 8.8 | | 7,933 | 21.6 | |
| TOTAL NIGHTTIME OPERATIONS | | | 12,403 | 34.0 | | 26,320 | 72.0 | |

MSP NIGHTTIME OPERATIONS REPORT
NIGHTTIME OPERATIONS BY RUNWAY MAP
(10:30 PM – 6:00 AM)



MSP NIGHTTIME OPERATIONS REPORT
NIGHTTIME OPERATIONS BY AIRLINE
 (TOP 15 BY COUNT)

| 2020 | AIRLINE | ID | COUNT | PERCENT OF AIRLINE OPERATIONS OCCURRING AT NIGHT | PERCENT OF CONTRIBUTION TO NIGHTTIME TOTAL |
|--------------|------------------------|-----|-------|--|--|
| | DELTA | DAL | 2,688 | 3.60% | 21.67% |
| | SUN COUNTRY | SCX | 2,355 | 16.00% | 18.99% |
| | UPS | UPS | 1,359 | 38.80% | 10.96% |
| | SKYWEST AIRLINES | SKW | 1,203 | 2.20% | 9.70% |
| | FEDEX | FDX | 725 | 23.80% | 5.85% |
| | SOUTHWEST | SWA | 577 | 6.90% | 4.65% |
| | AMERICAN | AAL | 572 | 8.70% | 4.61% |
| | SPIRIT | NKS | 492 | 14.10% | 3.97% |
| | GULF & CARIBBEAN CARGO | TSU | 366 | 95.80% | 2.95% |
| | REPUBLIC AIRLINES | RPA | 355 | 7.20% | 2.86% |
| | ALASKA | ASA | 239 | 18.00% | 1.93% |
| | ATLAS AIR (USA) | GTI | 223 | 76.60% | 1.80% |
| | FRONTIER AIRLINES | FFT | 220 | 17.80% | 1.77% |
| | UNITED | UAL | 191 | 6.40% | 1.54% |
| ENDEAVOR AIR | EDV | 130 | 0.40% | 1.05% | |

| 2019 | AIRLINE | ID | COUNT | PERCENT OF AIRLINE OPERATIONS OCCURRING AT NIGHT | PERCENT OF CONTRIBUTION TO NIGHTTIME TOTAL |
|------------------------|-------------------|-----|--------|--|--|
| | DELTA | DAL | 8,370 | 5.60% | 28.63% |
| | SKYWEST AIRLINES | SKW | 4,541 | 4.70% | 15.53% |
| | SUN COUNTRY | SCX | 3,781 | 17.80% | 12.93% |
| | SOUTHWEST | SWA | 1,958 | 12.50% | 6.70% |
| | AMERICAN | AAL | 1,640 | 11.80% | 5.61% |
| | UPS | UPS | 1,254 | 37.20% | 4.29% |
| | SPIRIT | NKS | 1,093 | 14.20% | 3.74% |
| | REPUBLIC AIRLINES | RPA | 899 | 8.50% | 3.07% |
| | UNITED | UAL | 859 | 12.20% | 2.94% |
| | FEDEX | FDX | 855 | 27.30% | 2.92% |
| | ATLAS AIR (USA) | GTI | 590 | 77.00% | 2.02% |
| | JETBLUE AIRWAYS | JBU | 533 | 26.50% | 1.82% |
| | FRONTIER AIRLINES | FFT | 511 | 16.10% | 1.75% |
| | ENDEAVOR AIR | EDV | 487 | 1.80% | 1.67% |
| GULF & CARIBBEAN CARGO | TSU | 377 | 98.20% | 1.29% | |

*AIRLINE OPERATIONS OCCURRING AT NIGHT REPRESENTS THE PERCENTAGE OF RESPECTIVE AIRLINE SCHEDULE THAT OCCURS AT NIGHT

*CONTRIBUTION TO TOTAL IS RESPECTIVE AIRLINE CONTRIBUTIONS TO OVERALL MSP NIGHT OPERATIONS

MSP NIGHTTIME OPERATIONS REPORT
2020 NIGHTTIME OPERATIONS BY AIRCRAFT
 (TOP 15 BY COUNT)

| AIRCRAFT CODE | DESCRIPTION | COUNT | NOISE LEVEL CERTIFICATION (EPNdB BELOW STAGE 3) |
|------------------|-------------------------------|-------|---|
| B738 | BOEING 737-800 | 2,890 | 11.3 - 17.1 |
| B757 | BOEING 757-200 | 1,825 | 11.1 - 22.1 |
| A320 | AIRBUS INDUSTRIES A320 | 1,243 | 12.1 - 21.2 |
| A321 | AIRBUS INDUSTRIES A321 | 919 | 6.4 - 17 |
| CRJ2 | CANADAIR REGIONAL JET CRJ-200 | 858 | 26.5 - 30.6 |
| B739 | BOEING 737-900 | 769 | 10.9 - 16.1 |
| E170 | EMBRAER 170 | 620 | 9.2 - 16.8 |
| CRJ9 | CANADAIR REGIONAL JET CRJ-900 | 551 | 14.5 - 17.6 |
| B763 | BOEING 767-300 | 515 | 4.4 - 22.6 |
| B7377 | BOEING 737-700 | 422 | 11.6 - 19.8 |
| A300 | AIRBUS INDUSTRIES A300 | 358 | 4.3 - 17.7 |
| A319 | AIRBUS INDUSTRIES A319 | 341 | 12.9 - 22.2 |
| MD11 | MCDONNELL DOUGLAS MD11 | 233 | 12.8 - 17.9 |
| CRJ7 | CANADAIR REGIONAL JET CRJ-700 | 159 | 14.5 - 17.6 |
| B717 | BOEING 717 | 94 | 19.2 - 23 |

NOISE CERTIFICATION DATA SOURCE: EUROPEAN AVIATION SAFETY AGENCY

CUMULATIVE CERTIFICATED NOISE LEVELS REPRESENTED AS A RANGE BELOW STAGE 3 NOISE LEVELS TO ACCOUNT FOR MULTIPLE CERTIFICATION VARIABLES (WEIGHT, MODEL, ENGINE TYPE, AIRFRAME CONFIGURATION, ETC)

MSP NIGHTTIME OPERATIONS REPORT
2020 NIGHTTIME OPERATIONS BY ORIGIN AND DESTINATION
 (TOP 15 BY COUNT)

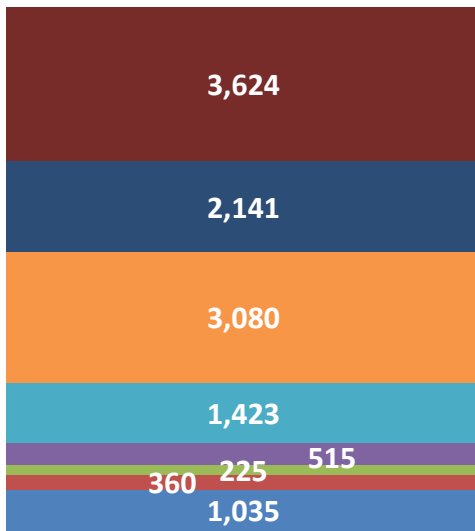
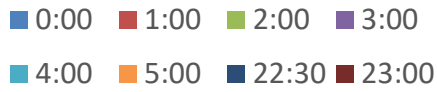
| AIRPORT CODE | ORIGIN AIRPORT | COUNT |
|-------------------------|-----------------------|--------------|
| PHX | PHOENIX | 613 |
| LAX | LOS ANGELES | 504 |
| LAS | LAS VEGAS | 503 |
| SEA | SEATTLE | 494 |
| DEN | DENVER | 449 |
| SDF | LOUISVILLE | 419 |
| MEM | MEMPHIS | 399 |
| ATL | ATLANTA | 386 |
| DFW | DALLAS FORT WORTH | 376 |
| IND | INDIANAPOLIS | 321 |
| SFO | SAN FRANCISCO | 285 |
| PHL | PHILADELPHIA | 266 |
| MIA | MIAMI | 235 |
| RFD | ROCKFORD | 225 |
| MCO | ORLANDO | 208 |

| AIRPORT CODE | DESTINATION AIRPORT | COUNT |
|-------------------------|----------------------------|--------------|
| ATL | ATLANTA | 232 |
| TVF | THEIF RIVER FALLS REGIONAL | 170 |
| CVG | CINCINNATI | 165 |
| FLL | FT. LAUDERDALE | 126 |
| PHX | PHOENIX | 122 |
| FAR | FARGO | 115 |
| MIA | MIAMI | 109 |
| ONT | ONTARIO | 102 |
| DEN | DENVER | 96 |
| ORD | CHICAGO O'HARE | 88 |
| YWG | WINNIPEG | 85 |
| BJI | BEMIDGI REGIONAL | 79 |
| ABR | ABERDEEN | 77 |
| MSN | MADISON | 75 |
| RST | ROCHESTER MN | 75 |

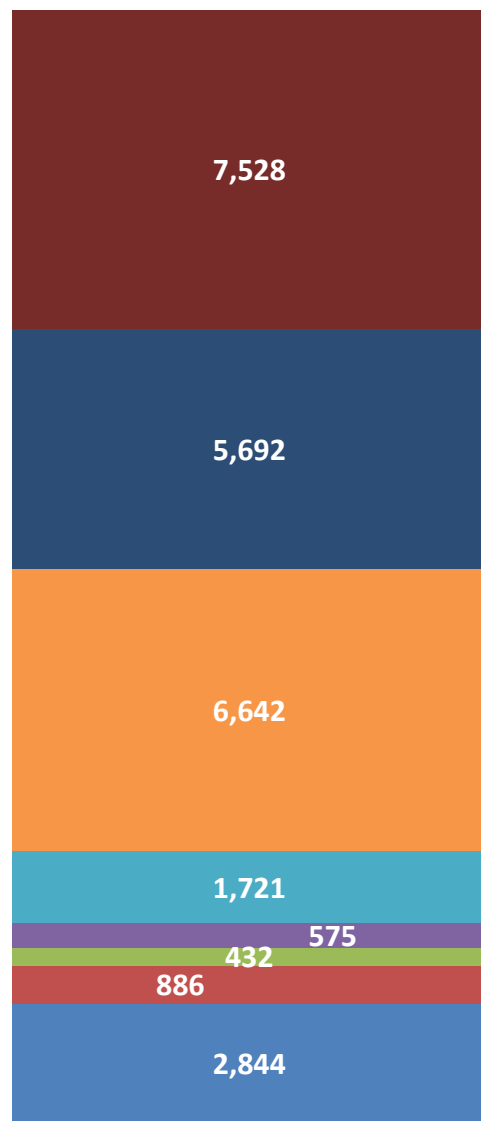
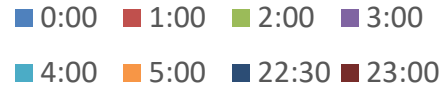
MSP NIGHTTIME OPERATIONS REPORT

NIGHTTIME OPERATIONS BY HOUR

2020



3-YEAR HISTORICAL AVERAGE



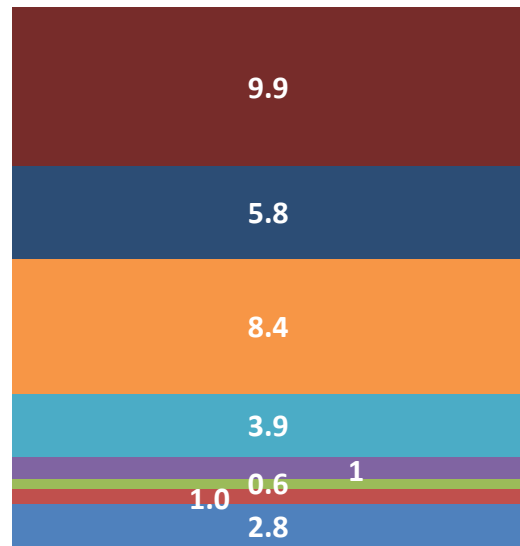
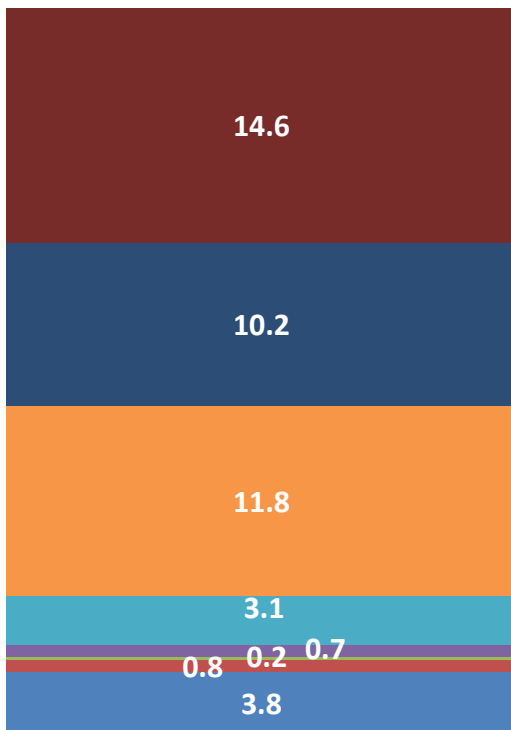
MSP NIGHTTIME OPERATIONS REPORT
SCHEDULED VERSUS ACTUAL OPERATIONS
 (AVERAGE BY HOUR)

DAILY SCHEDULED NIGHT OPERATIONS

0:00 1:00 2:00 3:00
 4:00 5:00 22:30 23:00

DAILY ACTUAL NIGHT OPERATIONS

0:00 1:00 2:00 3:00
 4:00 5:00 22:30 23:00



GENERAL AVIATION AND CHARTER AIRCRAFT OPERATORS DO NOT REPORT SCHEDULED OPERATIONS



Metropolitan Airports Commission

6040 28th Avenue South, Minneapolis, MN 55450

macnoise.com

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