**Metropolitan Aircraft Sound Abatement Council**

# 1999 MASAC Year in Review

## Continuing the Exploration of New and Innovative Ways to Address Airport Noise Issues at the Minneapolis/St. Paul International Airport

A Report Prepared for MASAC Members and MAC Commissioners

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February 22, 2000

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# Introduction

The year 1999 marked a lot of change and achievement for the Metropolitan Aircraft Sound Abatement Council (MASAC). The organization appointed a new chairperson, Mendota Heights Mayor Charles Mertensotto, in January 1999 and bid farewell to long standing Eagan Representative Jon Hohenstien as a result of a new job opportunity. A new MASAC Executive Committee was established and convened once in December 1999. Throughout the year MASAC remained committed to addressing airport noise issues by supporting, endorsing and participating in various noise information and abatement initiatives.

MASAC continued to enhance the insightful prowess of the organization by hosting informational and educational briefings by guest speakers and Metropolitan Airports Commission (MAC) staff. In addition, tours were conducted of Northwest Airline's engine test cell facility and the Federal Aviation Administration's (FAA) En-route Traffic Control Center located in Farmington, Minnesota. These briefings and tours helped provide an increased sense of understanding with respect to the aviation topics covered and contributed to continued insightful decision-making.

In addition to increased informational and educational activities, MASAC took significant action in 1999 to address noise issues at the Minneapolis/St. Paul International Airport (MSP). MASAC accomplished a lot in 1999, fostering an understanding of airport noise related topics. Activities focused on increasing noise abatement initiatives through the implementation and pursuit of new technology, noise abatement procedures, noise monitoring studies and increased communication efforts. MASAC was also given a critical role in the Part 150 Program update at MSP.

The nature of MASAC's involvement in the Part 150 update process at MSP represents the first of it's kind for the Council. This effort encompassed the majority of activities in the second half of 1999 and will continue well into 2000. The result of MASAC's activities in 1999 yielded a year marked by significant achievement, accomplishment and new possibilities.

Section

# 1 Efforts to Implement New Technology

The use of technology to address airport noise issues has become a hallmark of the Metropolitan Aircraft Sound Abatement Council (MASAC). In 1999 the Council continued its endorsement of using technology to help address airport noise issues. MASAC provided increased support for Metropolitan Airports Commission (MAC) staff's development of interactive aircraft noise and operations Internet applications. MASAC also began the process of researching possible ways to utilize Minneapolis/St. Paul International Airport's (MSP's) Differential Global Positioning System (DGPS) ground station to help abate noise in the future and participated in the preliminary evaluation of new engine run-up noise attenuating technologies. Through these activities in 1999, MASAC continued its commitment to optimizing the noise reduction possibilities and information dissemination capabilities that existing technologies can provide.

## Evaluation and Endorsement of a DGPS Requirements Assessment

On August 6, 1997, MSP became the first airport in the world to have a DGPS ground station type accepted by the Federal Aviation Administration (FAA). Following the type acceptance, on January 29, 1998, the ground station was commissioned by the FAA making it the first such commissioning in the nation. In addition to ground station type acceptance, a number of airlines are investigating the feasibility of outfitting their aircraft with the proper equipment to use the system, and the FAA is in the initial stages of developing policy to implement and manage the program.

In 1999 MASAC continued its support for developing this technology at MSP and endorsed the significant effects DGPS will have on the precise flow of air traffic in and out of MSP during inclement weather conditions in the future. In addition to maintaining fair weather capacity during bad weather and low visibility conditions, the system also offers enhanced noise abatement opportunities previously not available via airspace management tactics.

In 1999 MASAC reviewed and supported the evaluation of DGPS specifications for noise alleviation. The catalysts for the evaluation were the existing DGPS architecture in place at MSP and the resultant benefits of using the DGPS ground station to facilitate future DGPS driven operations into and out of MSP. As a result, the MAC Aviation Noise Program staff, in conjunction with industry experts, is currently undertaking a DGPS Requirements Assessment. This will provide insight into benefits that can be derived from a DGPS program at MSP. MASAC reviewed and endorsed the following areas to be evaluated in the assessment:

- Define noise impacts
- Evaluate land use capabilities
- Define airspace challenges
- Review approach procedures

- Analyze airport infrastructure
- Assess airport user requirements

Areas of concentration will be optimizing the safe and efficient use of airspace, maintaining fair weather capacity during bad weather and low visibility conditions, as well as minimizing noise impacts on the ground via new airspace management tactics and operational procedures. It is important to note that DGPS capabilities are also being investigated as possible mitigation options under the guidelines of the Part 150 update currently underway at MSP. The final results of the study will be reviewed as part of the 2000 MASAC goals and objectives.

## Support and Input Into Internet Application Development

In 1999 MASAC reviewed and provided input into, first of its kind, Internet application development. MAC Aviation Noise Program staff has developed an Internet website containing a vast amount of information on environmental and noise issues at the MAC system of airports. Through the integrated use of several software packages, MAC Aviation Noise Program staff has provided access to various reports, analyses and information. In addition, interactive database query modules are now available, providing information on aircraft operations, noise and flight tracks.

The website contains various aviation links to the Aviation Noise and Satellite Programs page, Environmental Programs page (i.e. Environmental Compliance Program and Glycol Recovery Program), Minneapolis/St. Paul International Airport home page and the Real-Time Flight Status page.

The Aviation Noise and Satellite Program page is the largest segment of the website representing next generation information dissemination through state of the art Internet applications. The site contains links to information on:

- Airport Noise and Operations Monitoring System (ANOMS) / Interactive ANOMS Reports
- Part 150 Update Process
- Filing Noise Complaints via the Internet
- Construction Operations Updates
- Geographic Information Systems (GIS)
- Global Positioning System (GPS)
- Metropolitan Aircraft Sound Abatement Council (MASAC)
- Reliever Airport Information
- Meetings and Events
- Slide Presentations
- Runway Closures and Field Maintenance Updates

Through MASAC's review and input the website has become a critical tool for providing information to the public that is consistent with the information requested by residents concerning airport noise issues. More specifically, in 1999 the MASAC Executive Committee reviewed and endorsed MAC Aviation Noise Program staff's development of the Internet Aircraft Noise Complaint Form. The form is now available on the Aviation Noise and Satellite Programs page and allows residents to submit noise complaints via the Internet. As a result of MASAC's input and MAC Aviation Noise Program staff's Internet development, the website and associated applications have been viewed by other airports and the FAA as a model of what is possible with available data and the development of applications to take that information to the Internet. The site can be accessed at www.macavsat.org.

## Investigating the Feasibility of a Ground Run-Up Enclosure

In 1998, MAC staff conducted a study to isolate the sources of ground noise at the airport. The study, conducted throughout a 10 day, 24-hour period, found that departing aircraft are the major source of ground noise impact and that run-up activity is one of many secondary noise sources.

As a result of the significant study and findings, in 1999 MASAC asked MAC staff to investigate new noise reduction technologies as part of a possible modification to the existing run-up facility and to consider the feasibility of building a new Ground Run-up Enclosure (GRE). Therefore, MAC is conducting a GRE Feasibility Study to provide information on existing impacts from the run-up pad and alternatives, recommendations, implementation strategies and site development criteria for a possible new GRE. The findings of this study will be presented to MASAC in February 2000 and to the MAC in spring of 2000.

## ANOMS Enhancements

Since the introduction of the Airport Noise and Operations Monitoring System (ANOMS) at MSP in 1992, ANOMS has become the central element of a sophisticated, evolving noise management program. ANOMS provides an airspace management software program that gathers noise data from Remote Monitoring Towers (RMTs) and correlates it to actual flight track information from the Air Traffic Control Tower. For MASAC, ANOMS has provided an objective analysis tool for the purpose of assessing airport and airspace utilization and the resultant impacts. For MAC staff, the system provides a level of airspace management capabilities previously unavailable.

ANOMS has become the focal point for data acquisition and dissemination for airspace and noise issues. As a result, in 1999 MASAC reviewed and supported two major enhancements to the system, which represent the most significant system updates since ANOMS became operational at MSP.

### ANOMS Software Upgrade to Version 6.3

In 1999 MAC's ANOMS was updated from Version 4 to Version 6.3. The update provided a new level of analytical capabilities, as well as a year 2000 compliant system. MASAC reviewed the new capabilities an upgrade would provide and fully endorsed the project.

Throughout the update process MASAC was informed on the progress of the upgrade and implementation schedules.

MASAC's support and endorsement of the ANOMS upgrade ensured community support for the expenditure and the resultant capabilities.

## Five New ANOMS Remote Monitoring Towers Added

MAC, with MASAC support, added five Remote Monitoring Towers (RMTs) to the existing 24 sites as part of the Airport Noise and Operations Monitoring System (ANOMS). RMTs provide 24-hour noise information that is integrated into the MAC's ANOMS. Through the use of RMTs and complex programming formulas, ANOMS is able to differentiate community noise – such as highway traffic, lawnmowers and construction activity – from aircraft noise.

The addition of new ANOMS RMTs was directed as part of the provisions outlined in the 1996 MSP Noise Mitigation Program. As a result of that directive, in 1999 MASAC participated in the process of adding five new ANOMS RMTs. MASAC conducted extensive study and analysis to ensure the new RMTs were properly located within the respective communities. Consideration was given to the location of existing RMTs and the actual impact based on aircraft over flights.

The five new towers raise the total number of RMTs in surrounding communities to 29. The additional towers improve the system's noise monitoring coverage at the airport and in surrounding communities and will help measure airport noise in neighborhoods surrounding MSP.

The newly installed RMTs are located at Moonshine Park in Eagan (RMT Site#25), Arkansas Avenue West in Inver Grove Heights (RMT Site#26), Anthony Middle School in South Minneapolis (RMT Site#27), 16$^{th}$ Avenue South in Richfield (RMT Site#28) and Ericsson Elementary School in South Minneapolis (RMT Site#29).

# Section 2 Informational and Educational Briefings

Metropolitan Airports Commission (MAC) Aviation Noise Program staff continued their effort to provide informative and educational briefings to the Metropolitan Aircraft Sound Abatement Council (MASAC) in 1999. Through MAC Aviation Noise Program staff briefings and guest speakers, topics covered included information on noise reducing technologies and policies, Minneapolis/St. Paul International Airport (MSP) construction updates and Part 150 Program information.

In addition, MAC Executive Director, Jeff Hamiel gave a presentation to the Council providing information on new MAC Commissioner appointments, the Low-Frequency Noise Policy Committee, the Part 150 Program, reliever airport legislation and his objection to the Raisbeck hush kit package.

The combination of these briefings provided a lot of information on timely topics related to aircraft noise and MSP.

## Part 150 Update Study Session

In February 1999 Guest speakers Evan Futterman and Kim Hughes of HNTB provided a Part 150 Update Study Session that included a significant amount of information on the Part 150 Program. The meeting provided information on Federal Aviation Regulation (FAR) Part 150, the history of the Part 150 Program at MSP, the scope of the Part 150 update at MSP and a proposed schedule.

MASAC and the MASAC Operations Committee remained involved in the Part 150 update process from this briefing forward. MASAC's involvement in the Part 150 update process is covered in greater detail in Section Six of this document.

## Briefings on Technology and Policy Addressing Airport Noise

### NASA'S Advanced Subsonic Technology (AST) Program

MAC Noise Program staff provided a CD-ROM presentation on NASA Langley Research Center's Advanced Subsonic Technology (AST) program. The presentation highlighted NASA's extensive work on aircraft engine technology and the noise reduction characteristics of these new designs.

The presentation provided information on the development of future Stage 4 engines and how this could be accomplished from an engine design and engineering standpoint. The briefing provided reassurance that research and development is taking place in an effort to provide Stage 4 engine technology as part of future aircraft engine designs.

### Information Dissemination Capabilities via the Internet

During 1999 MAC Aviation Noise Program staff conducted significant Internet development. As a result, an informational briefing was conducted by MAC staff to inform MASAC members on the data and interactive noise and aircraft operations reports available on the Aviation Noise and Satellite Programs home page. Demonstrations of the Internet applications were conducted in real-time.

The response and feedback received from the MASAC members was positive. Ongoing Internet development being conducted by MAC Aviation Noise Program staff, combined with the public's acceptance of the technology, has made the Internet a critical tool to help disseminate airport noise information at MSP.

### Briefing on FAA's 1998 Report on the Transition to Quieter Airplanes

MAC Aviation Noise Program staff gave a briefing which provided information about the Federal Aviation Administration's (FAA's) 1998 report to the U.S. Congress on the status of the transition to a quieter all Stage 3 aircraft fleet in the United States. The briefing highlighted a 1998 fleet compliance update relative to the 1990 Airport Noise and Capacity Act (ANCA) provision, which mandated the phase-out of all Stage 2 aircraft by January 1, 2000. MASAC members were informed that on a national level:

- 1998 marked a cumulative U.S. Stage 2 fleet reduction of 67.2% from base levels.
- The number of active Stage 3 aircraft increased from 5,719 in 1997 to 6,464 in 1998.
- The overall Stage 3 aircraft fleet percentage rose from 45.0% in 1990 to 86.9% in 1998

It was reported to MASAC that the FAA was satisfied that all known affected operators were in compliance with the scheduled December 31, 1998 interim compliance requirements.

## MSP Construction Update Briefings

### MSP Construction Projects During the Summers of 1998 and 1999

Guest Speaker Gary Warren, MAC Director of Airside Development, summarized construction projects conducted during the summer of 1998 and previewed the upcoming projects to be conducted during the summer of 1999. Mr. Warren provided information on the costs associated with the projects and added an extensive explanation of the south parallel runway reconstruction project continuation in 1999.

### Ongoing Construction Updates

Throughout the year MAC Aviation Noise Program staff provided airport construction updates and reviewed the resultant effects of the construction on airport operations.

Section

# 3 New and Enhanced Abatement Procedures

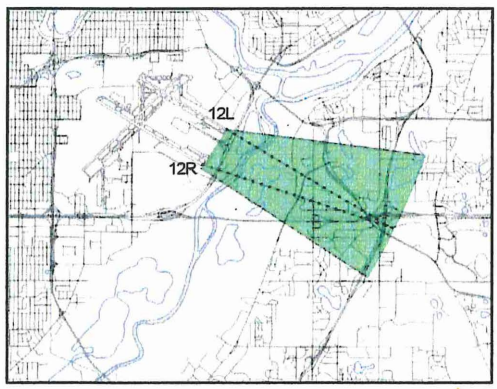
The year 1999 was productive relative to the enhancement and implementation of aircraft operational procedures that reduce aircraft noise impacts around the Minneapolis/St. Paul International Airport (MSP). Increased use of the crossing in the corridor (Eagan/Mendota Heights Departure Corridor) procedure was the result of extensive analyses conducted by Metropolitan Aircraft Sound Abatement Council (MASAC). Additionally, MASAC helped with the implementation of the Minneapolis straight-out departure procedure. These accomplishments represented the pinnacle of MASAC's success with aircraft operational proposals for the purpose of aircraft noise reduction in 1999.

## Crossing in the Corridor Analysis Detects Increased Procedural Use

### Eagan /Mendota Heights Departure Corridor Background

The conception of the Eagan /Mendota Heights Departure Corridor began in 1968. Since that time several refinements have been investigated and implemented. Although the corridor has evolved somewhat throughout the years, the original intensions remain the same; concentrating aircraft over flights above compatible land use (commercial/industrial) areas to the southeast of MSP. By concentrating aircraft over flights above commercial/industrial areas when departing runways 12L and 12R, the frequency of residential over flights is diminished significantly. This results in lower noise impacts in residential areas to the southeast of the airport.

In 1995 a proposal was submitted to the Federal Aviation Administration (FAA) requesting the implementation of the crossing in the corridor procedure. The proposal was driven by the desire to contain operations, as much as possible, in the center of the corridor when aircraft are departing in a non-simultaneous manner from runways 12L or 12R. The proposal outlined desired tracks along the ground that would maintain operations within the center of the corridor. Under non-simultaneous operational conditions, when operationally feasible for the FAA, aircraft departing 12L should maintain a track along the earth's surface of 118° (runway heading) and aircraft departing 12R should maintain a track along the earth's surface of 105°. By maintaining these tracks aircraft operations are concentrated in the center of the corridor. Although the proposal seems intuitive and straight forward, several critical variables relating to the airspace environment must be considered to conduct the crossing procedure.




• **Figure 1:** Eagan/Mendota Heights Departure Corridor with the crossing in the corridor departure tracks.

## MASAC Analyzes the Use of the Crossing in the Corridor Procedure

The crossing in the corridor procedure was designated as a topic for review by MASAC. It was decided in 1998 that MASAC and the MASAC Operations Committee would conduct an initial study to assess how often the procedure was being used. A follow-up analysis would then be conducted in 1999 to evaluate any changes relative to the initial analysis. In order to assess the procedure's use, or lack there of, the MASAC Operations Committee embarked on an analysis to provide insight into whether or not the procedure was being used. The analysis was predicated on the time periods (2300 to 0600 and weekends Sat. 1500 to Sun. 1300) that are most conducive to the use of the crossing procedure, keeping in mind the primary determinate of one local air traffic controller. Taking into account the many determinates and their quantifiable or un-quantifiable nature the analysis was structured as follows:

- The analysis first assessed when the crossing procedure was actually being used during the mentioned time periods.
- Secondly, the time of one local controller staffing was noted during the weekend time periods with the total operations during that time and those that performed the crossing procedure. *Note: an FAA assumption that one local controller was used during the nighttime periods (2300-0600) was made which eliminated the need to quantify this variable during that period.*
- A time of departure analysis was conducted to lend some insight into aircraft operation separation.
- FAA variable definitions and weather information were provided, aiding in the assessment of procedure utilization determinates.
- Looking at the mentioned topics together, allowed for the formulation of an assessment of procedure use and the variables, which were present, that contributed to the effectiveness of the procedure.

The results of the initial analysis were forwarded to the FAA for review. Following their review, the FAA requested a meeting with Metropolitan Airports Commission (MAC) Aviation Noise Program staff and committed to increasing the use of the procedure.

## 1999 MASAC Follow-Up Analysis Finds Increased Use of the Procedure

As a result of the follow-up analysis conducted by MASAC in 1999, it was found that the use of the crossing in the corridor procedure increased in every analyzed time period. The analysis evaluated the difference between the October 1997 - March 1998 analysis (conducted in 1998) and the September 1998 - February 1999 analysis (conducted in 1999). The percentage of operations performing the crossing procedure increased by:

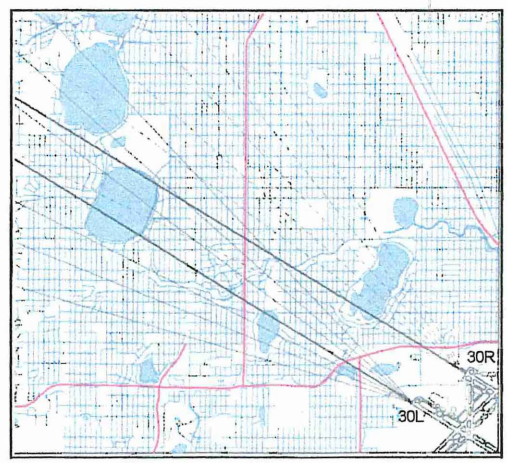
- 21.0% during the 2300 to 0600 time period
- 10.0% during the Saturday at 1500 to Sunday at 1300 time period
- 14.4% during the one local controller time period throughout the analyzed weekend time frame

The time separation between departure operations during the weekend periods still seemed to be a prevailing deterrent for procedural use during that time. The findings of this report reveled increased procedural usage relative to the crossing in the corridor procedure. *All of the analyzed time periods showed an increase in the use of the procedure relative to the previously conducted analysis.* The improvement achieved through these analyses and the resultant efforts by all parties involved is a testament to cooperative efforts. Such efforts to optimize impact reducing procedural usage is imperative to help address the impact of aircraft operations on the communities surrounding a major international airport.

## Implementation of the Minneapolis Straight-Out Departure Procedure

### Minneapolis Straight-Out Departure Procedure Background

In an effort to reduce noise impacts for residents living in the South Minneapolis area, MASAC researched and proposed the implementation of the Minneapolis straight-out departure procedure. The proposal requested to the FAA that aircraft normally given a runway heading when departing runways 30L and 30R be given a heading other than runway heading whenever conditions and FAA staff workloads permit. This procedure would provide some measure of relief for residents directly under the arrival path since they receive nearly all the noise from landing traffic.




• **Figure 2:** Runway heading departure tracks (dark lines) for runways 30L and 30R and the Minneapolis straight-out departure procedure tracks (doted lines for 30R and light solid lines for 30L).

The proposal included an analysis conducted by HNTB, as well as initial comments received from communities concerning the proposed procedure. The proposal was forwarded to the MAC Planning and Environment Committee where it was approved on November 4, 1997 and forwarded to the MAC full Commission, and approved on November 20, 1997.

MAC staff sent the request to the FAA on December 16, 1997 to modify the departure procedures based on the previous analysis conducted by HNTB with full support from the communities. HNTB's analysis indicated implementation of this proposal would result in only a 0.9 DNL change within the 65 DNL contour and a 1.0 DNL change within the 60 DNL contour. Due to the minimal DNL change in any one location throughout the contour, it was anticipated that the FAA would be able to expeditiously implement the procedure with minimal additional consideration.

### MASAC Facilitates Comment Period Resulting in Procedure Implementation

In 1999 the FAA Great Lakes Region completed the Environmental Assessment (EA) for the Minneapolis straight-out departure procedure with assistance from HNTB and MAC staff. As part of the public comment period for the EA, FAA asked MASAC to consider the EA and receive comments on the procedure for a period of one month. As a result

MASAC officially opened a comment period at its May 25, 1999 meeting and closed the comment period at the June 22, 1999 meeting. The comments received were forwarded to local FAA for inclusion in the EA determination.

As a result of the analysis and the public input received, the FAA issued a Finding of No Significant Impact (FONSI) on June 25, 1999 and forwarded the procedure for implementation at MSP. The procedure was put into effect July 15, 1999.

Section
# 4 1999 Noise Monitoring Studies

Quantifying airport noise levels and sources has been, and continues to be, a goal of the Metropolitan Aircraft Sound Abatement Council (MASAC). Consistent with that charter, in 1999 MASAC endorsed and evaluated two noise monitoring studies. The Northwest Airlines engine test cell facility noise monitoring study and the Minneapolis/St. Paul International Airport (MSP) engine run-up pad noise monitoring study were significant evaluations providing insight into possible noise sources around MSP and the magnitude of the resultant noise impacts.

## Northwest Airlines Engine Test Cell Noise Monitoring Study

In 1999 the Eagan Airport Relations Commission was receiving noise complaints from residents who described a low rumbling noise similar to what appeared to be aircraft engine run-ups occurring at MSP. MASAC reviewed the 1998 MSP Ground Noise Study and determined the noise that the residents were describing was most likely *not* a result of run-up activity at the MSP engine run-up pad. Another source suggested as possibly generating this type of engine run-up noise was the Northwest Airlines engine test cell facility.

In response to the residents' complaints and at the request of the Eagan Airport Relations Commission, MASAC proposed a noise monitoring study of the Northwest Airlines engine test cell facility. Metropolitan Airports Commission (MAC) Aviation Noise Program staff coordinated with the city of Eagan and Northwest Airlines to conduct the study.

Two monitoring locations within Eagan were identified by the city. Additional locations included a site adjacent to the airport and a site next to the engine test cell facility. Engine run-up times were coordinated with Northwest Airlines to provide an engine run-up noise source in the test cell. Typically Northwest Airlines only runs its engines for periods of 90 seconds at a time, but to assist with the noise monitoring Northwest Airlines agreed to run the engine for 10 minutes.

On March 16, 1999 the monitoring was conducted. The engine used was a JT9D, which is typically found on Stage 3 aircraft and is the most common engine tested in the run-up facility. Each site was manned and some of the residents were also present at the Eagan sites.

The determinations resulting from the study indicated that the engine run-up conducted in the Northwest Airlines engine test cell facility was not audible at the site located adjacent to MSP or at any of the sites located in Eagan. The Eagan residents in attendance at the monitoring sites agreed that the noise they were experiencing was not a result of aircraft engine run-ups in the testing facility. The results of the findings were presented to MASAC and the Eagan Airport Relations Commission.

## MSP Run-Up Pad Monitoring

In 1999 the MASAC Operations Committee endorsed a preliminary MSP run-up pad monitoring study to establish a baseline for the purpose of evaluating a possible new Ground Run-up Enclosure (GRE) at MSP. In early April 1999 MAC Aviation Noise Program staff conducted the monitoring.

Two off airport sites were selected, as well as one located directly adjacent to the run-up pad. The monitoring was conducted for two days in the early morning hours. The findings of the study provided a baseline for existing noise impacts resulting from the run-up pad located at MSP.

The findings of this study are being used as part of the GRE evaluation process being conducted by MASAC and the MAC.

Section 5

# Increased Communication Effort

The Metropolitan Aircraft Sound Abatement Council (MASAC) has become increasingly committed to increasing the communication efforts of the organization. In 1999 the MASAC Communication Advisory Board was established and the monthly operational and noise reports that MASAC reviews were evaluated relative to their efficiency and effectiveness in content and layout with respect to proper communication of the information. All of these efforts contributed to heightened levels of communication between MASAC, the Metropolitan Airports Commission (MAC) and the residents that live in close proximity to Minneapolis/St. Paul International Airport (MSP).

## MASAC Communications Advisory Board Established

At the June 1999 MASAC meeting, the MASAC Communication Advisory Board was established. The goal of the Board is to implement a communications plan including dissemination of MASAC related newsworthy items, postcard distribution to residents around MSP providing information on Part 150 update workshops and the public hearing, as well as the ongoing development of a quarterly MASAC newsletter.

The MASAC Communications Advisory Board held its first meeting in August 1999. Since that time the Board has produced one press release, with assistance from MAC Public Affairs, providing information on the Part 150 update and finalized content for the first quarter 2000 MASAC newsletter.

The Board will continue to publish quarterly newsletters providing information on current MASAC initiatives, accomplishments and airport related topics.

## MASAC Begins Review of Monthly Report Formats

At the July 1999 MASAC Operations Committee meeting a review of the MASAC Technical Advisor's Report (monthly operation and noise report) and the monthly Eagan/Mendota Height Departure Corridor Analysis (monthly corridor compliance report) began. The review focused on the information provided in the reports and the efficiency of data communication provided by the current layouts. After considerable review by MASAC and the MASAC Operations Committee a decision was made to concentrate on topics related to the Part 150 update for the remainder of 1999 and the first quarter of 2000 and include the report revision topics as part of the 2000 MASAC goals and objectives.

Section

# 6 MASAC and the Part 150 Update

The Part 150 update process at Minneapolis/St. Paul International Airport (MSP) is progressing at a steady rate. The Metropolitan Aircraft Sound Abatement Council (MASAC) has contributed to the ongoing Part 150 Program update process.

Through MASAC and the MASAC Operations Committee, several Part 150 update topics have been discussed and addressed as part of the update process. Community involvement through MASAC representatives is critical to MAC's Part 150 update.

As the Part 150 update process began, initial MASAC involvement focused on informational briefings on Part 150 specific topics. The briefings provided information on:

- The history of Federal Aviation Regulation (FAR) Part 150 on a national level
- The history of Part 150 Programs at MSP
- The Part 150 process
- Terminology
- Noise metrics
- The noise modeling methodology used
- Information and determinations required as part of the Part 150 update

MASAC has provided significant input into specific Part 150 update issues since the first informational briefing. MASAC has reviewed and is providing input on the following Part 150 topics:

- Validation of the noise contour modeling software (Federal Aviation Administration's Integrated Noise Model) and the modeling methodology to ensure proper representation of future noise impacts through proven modeling methods and actual noise-monitored levels in the community
- Airport and aircraft operational/procedural noise mitigation measures and policy
- Contour boundary definition for the purpose of insulation eligibility
- Existing land-use and proposed mitigation through land use measures and insulation
- Insulation priority relative to single-family, multi-family, schools, daycares and churches

In addition to providing specific input into the Part 150 update, MASAC has also supported public workshops to ensure the general public remains informed of the progress and process of the Part 150 update.

Three series of workshops have been planned. The first two series have already been conducted. The first series provided information on the Part 150 process and the 1999 Validation Contour used to validate the contour modeling software (Integrated Noise Model-INM) and the data inputs. The second series of workshops provided information on the Preliminary 2005 Unmitigated Contour (contour resulting from predicted 2005 aircraft fleet mixes and airport use configuration **without any noise mitigation procedures or policies integrated into the model)**, past Part 150 program recommendations and various aircraft and airport noise reduction recommendations. The third and final series of public workshops is scheduled for spring 2000. This workshop series will highlight MASAC's involvement in the Part 150 process and provide community and Metropolitan Airports Commission's (MAC) recommended mitigation strategies for the Part 150 update (including the sound insulation program).

Due to MASAC's unique composition of community and airline representatives, access to and coordination of critical data sets has been enhanced through the channels of MASAC. Information provided, such as forecasted aircraft counts and fleet compositions from airlines, airspace management information from the FAA and existing land use and planning information from community representatives, has been a tremendous asset to the update process.

MASAC's involvement in the Part 150 update process is critical to ensure proper public input occurs throughout the update process. Such a collaborative effort provides essential insight into the Part 150 update process.

Section 7

# MASAC's Goals for 2000

The majority of the Metropolitan Aircraft Sound Abatement Council's (MASAC's) efforts in the first half of 2000 will be concentrated on completing the Part 150 update. In addition to those activities, MASAC will be addressing issues and topics that center around the following initiatives:

- Continued pursuit of Internet development
- Ground Run-up Enclosure (GRE) Feasibility Study findings
- Guest speakers
- Assessment of Differential Global Positioning System (DGPS) requirements
- Finalize new report formats for the MASAC Technical Advisor's Report and Eagan/Mendota Heights Departure Corridor Analysis
- Assess Stage 3 fleet activity at Minneapolis/St. Paul International Airport (MSP) and receive reports from airlines on future fleet mixes
- ANOMS: Introduction to Lochard - the new ANOMS provider
- Evaluation of Part 150 recommendations for implementation
- Reviewing the status of MSP's DGPS ground station upgrade to a Local Area Augmentation System (LAAS)

MASAC's Part 150 update activities and the above areas of concentration are provided in the MASAC 2000 Goals and Objectives Calendar available in Appendix A.

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# Appendix A

## MASAC 2000 Goals and Objectives Calendar

| Projected Date 2000 | Accomplishing Party | Requirements |
|---|---|---|
| January 7 | Operations Committee | Part 150 (Land Use)<br>Metropolitan Council Land Use Measures<br>Sound Insulation of Schools and<br>Property Acquisition<br>Internet Noise Complaint Module |
| January 25 | MASAC | Part 150 Briefing Topics:<br>Standard Items for Noise Compatibility Program and Land Use Measures<br>Proposed Mitigation Measures to Carry Forward<br>Year 2000 Stage 2 Report<br>Summary of Part 150 Workshop Comments<br>Internet Complaint Module |
| February 11 | Operations Committee | Finalize 1999 Validation Contour<br>Base Case 2000 Contour<br>Update on Sound Insulation Beyond DNL 65<br>Report on GRE Feasibility Study<br>Report of Governor's Task Force on Airport Noise Mitigation Funding |
| February 22 | MASAC | GRE Feasibility Results<br>MASAC Year in Review 1999 |
| March 10 | Operations Committee | Runway Use Alternatives<br>Eagan/Mendota Heights Corridor<br>Recommendations |
| March 28 | MASAC | Guest Speaker - Jeff Hamiel |
| April 14 | Operations Committee | Land Use Measures Analysis<br>Flight Track Alternatives<br>Fleet Mix Alternatives<br>Report on GPS Requirements<br>Recommendations |
| April 25 | MASAC | Potential Sound Insulation Options Beyond DNL 65<br>Updated 1999 Validation Contour, 2000 Base Case and Updated 2005 Unmitigated Contour<br>Review of Aviation Noise Program Capabilities for Technical Advisor's Report Revision |

| | | |
|---|---|---|
| May 12 | Operations Committee | Recommended Part 150 Noise Abatement Procedures Review |
| May 23 | MASAC | Review and Receive Comments for Technical Advisor's Report Revision<br>Part 150 Update |
| June 9 | Operations Committee | Part 150 Document Review |
| June 27 | MASAC | Part 150 Update<br>Review Draft Technical Advisor's Report |
| July 14 | Operations Committee | Finalize Technical Advisor's Report |
| July 25 | MASAC | MSP 2010 Construction Update<br>Finalize Technical Advisor's Report |
| August 11 | Operations Committee | MSP Stage 3 Fleet Activity Report<br>Airline Briefing on Future Fleet Mixes |
| August 22 | MASAC | Introduction to Lochard - New ANOMS Provider |
| September 8 | Operations Committee | Evaluate Part 150 Recommendations for Implementation |
| September 26 | MASAC | MSP DGPS Local Area Augmentation System (LAAS) Upgrade Status |
| October 13 | Operations Committee | FAR Part 161 Technical Briefing |
| October 24 | MASAC | Guest Speaker - FAA Perspective on Airport Noise Issues<br>Receive Input for Year 2001 Goals and Objectives |
| November 10 | Operations Committee | Focus Activities for Upcoming Year 2001 |
| November 28 | MASAC | Review Part 150 Sound Insulation Program Progress |
| December 8 | Operations Committee | Establish Year 2001 Goals and Objectives |

# Appendix B

## 1999 MSP Aircraft Operations and Noise Summary Report

### Top 20 MSP Airport Operators for 1999

| Airline | Type of Operation | Total Count | Average Daily Operations | Percentage of MSP Airport Operators |
|---|---|---|---|---|
| Northwest Airlines | Major | 234,436 | 648.2 | 52.9% |
| Mesaba | Regional | 98,603 | 272.6 | 22.3% |
| United Airlines | Major | 14,090 | 39.0 | 3.2% |
| American Airlines | Major | 11,393 | 31.5 | 2.6% |
| Sun Country Airlines | Major | 9,438 | 26.1 | 2.1% |
| Delta Airlines | Major | 8,054 | 22.3 | 1.8% |
| Bemidji | Regional /Cargo | 6,600 | 18.2 | 1.5% |
| Trans World Airlines | Major | 6,234 | 17.2 | 1.4% |
| Vanguard Airlines | Major | 5,336 | 14.8 | 1.2% |
| US Airways | Major | 5,073 | 14.0 | 1.1% |
| Continental Airlines | Major | 4,729 | 13.1 | 1.1% |
| Great Lakes Aviation | Regional | 4,502 | 12.4 | 1.0% |
| America West | Major | 2,935 | 8.1 | 0.7% |
| Continental Express | Regional | 2,802 | 7.7 | 0.6% |
| Com Air | Regional | 2,764 | 7.6 | 0.6% |
| Ryan | Cargo | 2,336 | 6.5 | 0.5% |
| Federal Express | Cargo | 2,323 | 6.4 | 0.5% |
| Air Canada | Major | 1,927 | 5.3 | 0.4% |
| United Parcel Service | Cargo | 1,798 | 5.0 | 0.4% |
| Champion Air | Charter | 1,784 | 4.9 | 0.4% |
| Totals | | 427,157 | 1,180.9 | 96.3% |

Note: Missing ANOMS Data for 3.3 days due to FAA

# Appendix B

## 1999 MSP Aircraft Operations and Noise Summary Report

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| Totals | | 427,157 | 1,180.9 | 96.3% |

Note: Missing ANOMS Data for 3.3 days due to FAA

# 1999 Yearly Summary of MSP Carrier Jet Types

| Type | FAR Part 36 Take-Off Noise Level | Aircraft Description | Stage | Count | Percent |
|---|---|---|---|---|---|
| B742 | 110.0 | Boeing 747-200 | 3 | 1,417 | 0.4% |
| B741 | 109.4 | Boeing 747-100 | 3 | 529 | 0.2% |
| B743 | 105.5 | Boeing 747-300 | 3 | 690 | 0.2% |
| DC85 | 105.5 | McDonnell Douglas DC8-500 | 2 | 65 | 0.0% |
| DC86 | 105.5 | McDonnell Douglas DC8-600 | 2 | 1,032 | 0.3% |
| DC10 | 103.0 | McDonnell Douglas DC10 | 3 | 12,933 | 3.8% |
| B722 | 102.4 | Boeing 727-200 | 2 | 16,012 | 4.7% |
| B744 | 101.6 | Boeing 747-400 | 3 | 98 | 0.0% |
| DC8Q | 100.5 | McDonnell Douglas DC8 (Modified Stg. 3) | 3 | 2,125 | 0.6% |
| L101 | 99.3 | Lockheed L-1011 | 3 | 534 | 0.2% |
| B721 | 98.5 | Boeing 727-100 | 2 | 631 | 0.2% |
| DC9 | 98.1 | McDonnell Douglas DC9 | 2 | 17,664 | 5.2% |
| B732 | 97.7 | Boeing 737-200 | 2 | 8,620 | 2.6% |
| BA11 | 97.0 | British Aerospace (BAC) 1-11 | 2 | 11 | 0.0% |
| MD11 | 95.8 | McDonnell Douglas MD11 | 3 | 162 | 0.1% |
| B763 | 95.7 | Boeing 767-200/300 | 3 | 50 | 0.0% |
| B72Q | 94.5 | Boeing 727 (Modified Stg. 3) | 3 | 30,302 | 8.9% |
| DC87 | 94.5 | McDonnell Douglas DC8-700 | 3 | 625 | 0.2% |
| B772 | 94.3 | Boeing 777 | 3 | 12 | 0.0% |
| A306 | 94.0 | Airbus Industries A300B4-600 | 3 | 573 | 0.2% |
| A310 | 92.9 | Airbus Industries A310 | 3 | 37 | 0.0% |
| B73Q | 92.1 | Boeing 737 (Modified Stg. 3) | 3 | 2,149 | 0.6% |
| MD80 | 91.5 | McDonnell Douglas MD-80 | 3 | 18,848 | 5.6% |
| B752 | 91.4 | Boeing 757-200 | 3 | 32,157 | 9.5% |
| DC9Q | 91.0 | McDonnell Douglas DC9 (Modified Stg. 3) | 3 | 93,684 | 27.7% |
| B734 | 88.9 | Boeing 737-400 | 3 | 832 | 0.2% |
| A320 | 87.8 | Airbus Industries A320 | 3 | 47,706 | 14.1% |
| B735 | 87.7 | Boeing 737-500 | 3 | 3,757 | 1.1% |
| B738 | 87.7 | Boeing 737-800 | 3 | 15 | 0.0% |
| A319 | 87.5 | Airbus Industries A319 | 3 | 2,426 | 0.7% |
| B733 | 87.5 | Boeing 737-300 | 3 | 10,673 | 3.1% |
| B737 | 87.5 | Boeing 737-700 | 3 | 90 | 0.0% |
| BA46 | 84.9 | British Aerospace 146 | 3 | 16,183 | 4.8% |
| CARJ | 81.8 | Canadair 650 | 3 | 4,626 | 1.4% |
| E145 | 81.8 | Embraer 145 | 3 | 2,758 | 0.8% |
| F100 | 81.8 | Fokker 100 | 3 | 8,792 | 2.6% |
| F70 | 80.1 | Fokker 70 | 3 | 22 | 0.0% |
| Totals | | | | 338,840 | 100.0% |

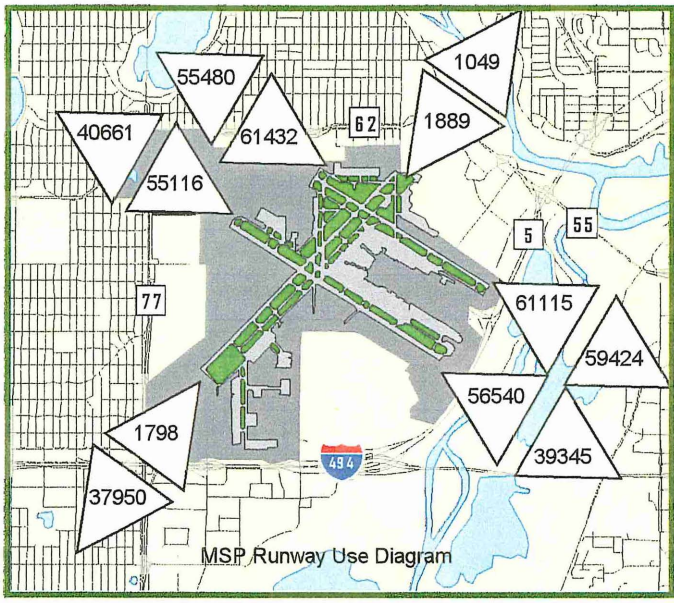
| | Count | Yearly Percents |
|---|---|---|
| Stage II | 44,035 | 13.0% |
| Stage III | 128,260 | 37.8% |
| Stage III Manufactured | 166,545 | 49.2% |
| Total Stage III | 294,805 | 87.0% |

*Note:* Stage III represent aircraft modified to meet all stage III criteria as outlined in Federal Aviation Regulation (FAR) Part 36. This Includes hushkit engines, engine retrofits or aircraft operational flight configurations.

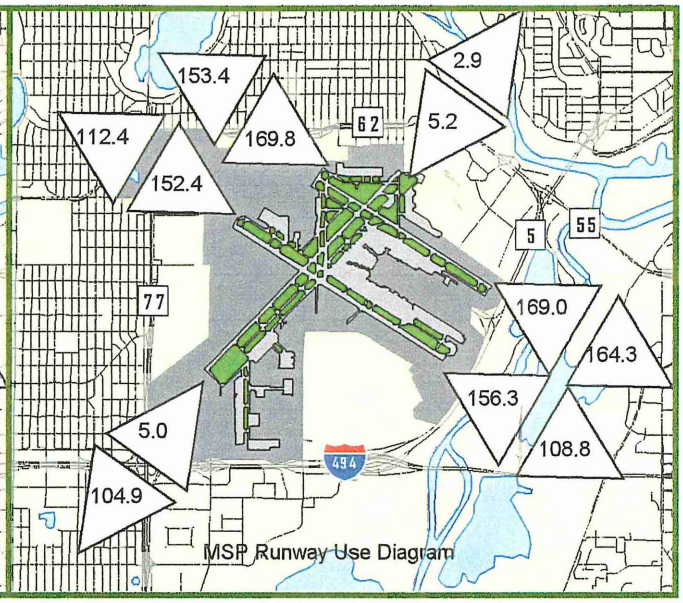
•The Provided Noise levels from FAR Part 36 are the loudest levels documented per aircraft type during take-off measured in EPNL dBA (Effective Perceived Noise Level).

# 1999 MSP Runway Usage Summary of All Operations

## Total Operations Count by Runway




## Average Daily Total Operations Count by Runway



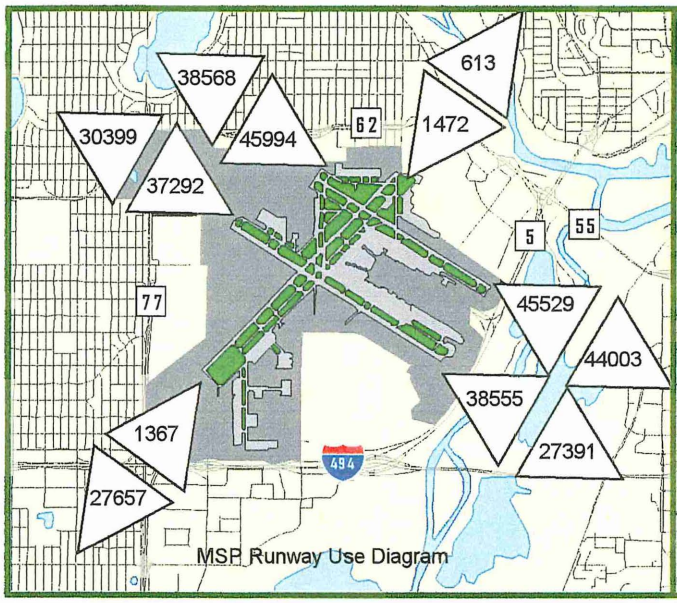

| Runway | Arrival/ Departure | Overflight Area | Count of All Operations | Average Daily Operations | Percent |
|---|---|---|---|---|---|
| 4 | Arr | So. Richfield/Bloomington | 1,798 | 5.0 | 0.7% |
| 12L | Arr | So. Minneapolis/No. Richfield | 61,432 | 169.8 | 25.8% |
| 12R | Arr | So. Minneapolis/No. Richfield | 55,116 | 152.4 | 23.2% |
| 22 | Arr | St. Paul/Highland Park | 1,889 | 5.2 | 0.8% |
| 30L | Arr | Eagan/Mendota Heights | 56,540 | 156.3 | 23.8% |
| 30R | Arr | Eagan/Mendota Heights | 61,115 | 169.0 | 25.7% |
| **Total Arrivals** | | | **237,890** | **657.7** | **100.0%** |
| 4 | Dep | St. Paul/Highland Park | 1,049 | 2.9 | 0.5% |
| 12L | Dep | Eagan/Mendota Heights | 59,424 | 164.3 | 25.4% |
| 12R | Dep | Eagan/Mendota Heights | 39,345 | 108.8 | 16.8% |
| 22 | Dep | So. Richfield/Bloomington | 37,950 | 104.9 | 16.2% |
| 30L | Dep | So. Minneapolis/No. Richfield | 40,661 | 112.4 | 17.4% |
| 30R | Dep | So. Minneapolis/No. Richfield | 55,480 | 153.4 | 23.7% |
| **Total Departures** | | | **233,909** | **646.7** | **100.0%** |
| **Total Operations** | | | **471,799** | **1304.4** | |

Note: Missing ANOMS Data for 3.3 days due to FAA

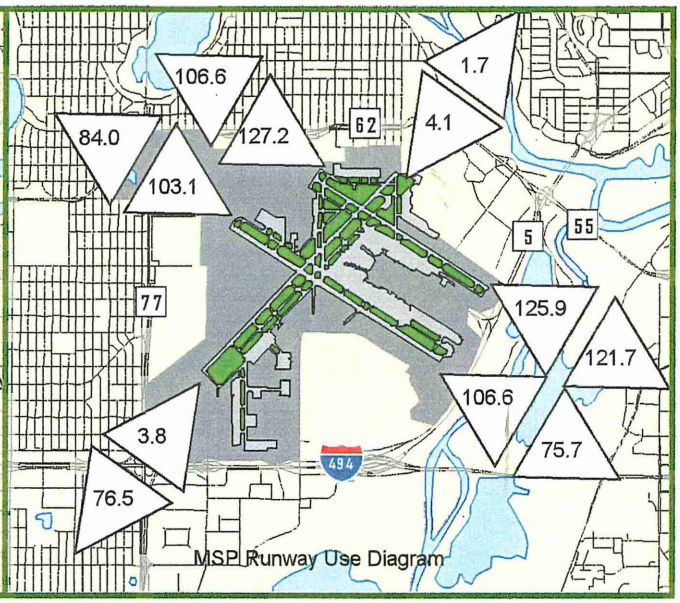
Note: Southeast end of Runway 12R/30L Closed for Reconstruction April 5 to September 11, 1999

# 1999 MSP Runway Usage Summary of Carrier Jet Operations

## Total Carrier Jet Operations Count by Runway




## Average Daily Carrier Jet Operations Count by Runway



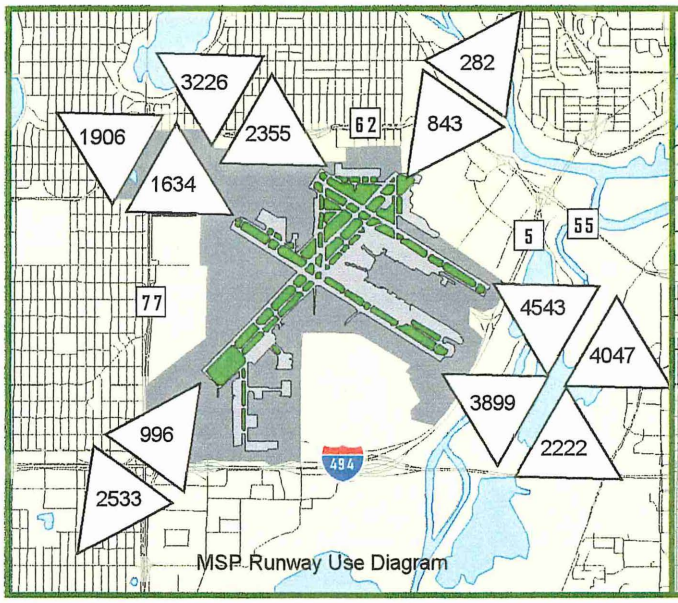

| Runway | Arrival/ Departure | Overflight Area | Count of Jet Operations | Average Daily Operations | Percent |
|---|---|---|---|---|---|
| 4 | Arr | So. Richfield/Bloomington | 1,367 | 3.8 | 0.8% |
| 12L | Arr | So. Minneapolis/No. Richfield | 45,994 | 127.2 | 27.0% |
| 12R | Arr | So. Minneapolis/No. Richfield | 37,292 | 103.1 | 21.9% |
| 22 | Arr | St. Paul/Highland Park | 1,472 | 4.1 | 0.9% |
| 30L | Arr | Eagan/Mendota Heights | 38,555 | 106.6 | 22.7% |
| 30R | Arr | Eagan/Mendota Heights | 45,529 | 125.9 | 26.7% |
| **Total Arrivals** | | | **170,209** | **470.6** | **100.0%** |
| 4 | Dep | St. Paul/Highland Park | 613 | 1.7 | 0.4% |
| 12L | Dep | Eagan/Mendota Heights | 44,003 | 121.7 | 26.1% |
| 12R | Dep | Eagan/Mendota Heights | 27,391 | 75.7 | 16.2% |
| 22 | Dep | So. Richfield/Bloomington | 27,657 | 76.5 | 16.4% |
| 30L | Dep | So. Minneapolis/No. Richfield | 30,399 | 84.0 | 18.0% |
| 30R | Dep | So. Minneapolis/No. Richfield | 38,568 | 106.6 | 22.9% |
| **Total Departures** | | | **168,631** | **466.2** | **100.0%** |
| **Total Operations** | | | **338,840** | **936.8** | |

Note: Missing ANOMS Data for 3.3 days due to FAA

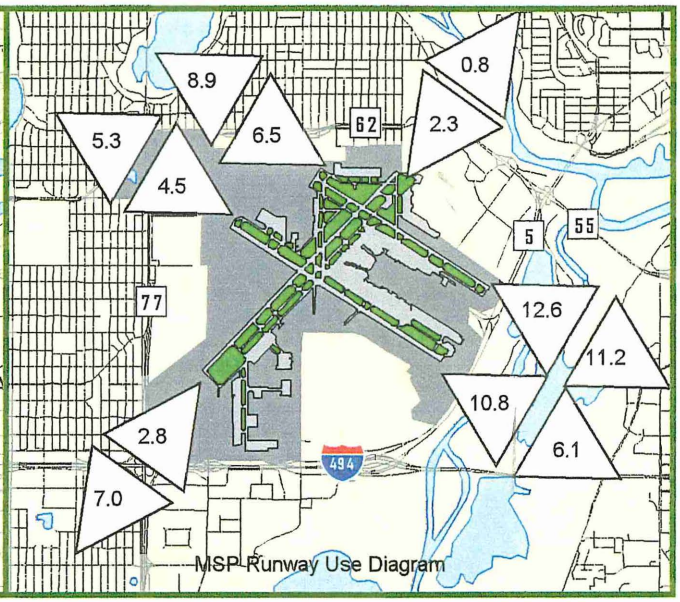
Note: Southeast end of Runway 12R/30L Closed for Reconstruction April 5 to September 11, 1999

# 1999 MSP Nighttime Runway Usage Summary of All Operations (10:30 p.m. to 6:00 a.m.)

## Total Nighttime Operations Count by Runway




## Average Daily Nighttime Operations Count by Runway



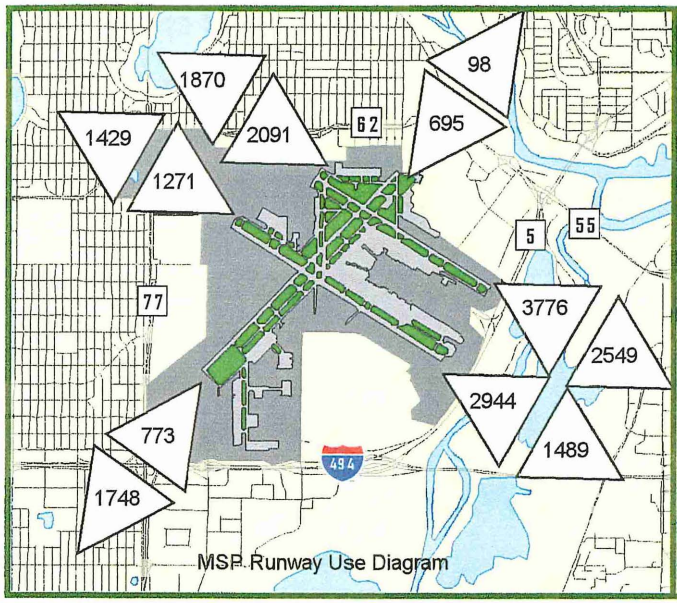

| Runway | Arrival/ Departure | Overflight Area | Count of All Nighttime Operations | Average Daily Night Operations | Percent |
|---|---|---|---|---|---|
| 4 | Arr | So. Richfield/Bloomington | 996 | 2.8 | 7.0% |
| 12L | Arr | So. Minneapolis/No. Richfield | 2,355 | 6.5 | 16.5% |
| 12R | Arr | So. Minneapolis/No. Richfield | 1,634 | 4.5 | 11.5% |
| 22 | Arr | St. Paul/Highland Park | 843 | 2.3 | 5.9% |
| 30L | Arr | Eagan/Mendota Heights | 3,899 | 10.8 | 27.3% |
| 30R | Arr | Eagan/Mendota Heights | 4,543 | 12.6 | 31.8% |
| Total Nighttime Arrivals | | | 14,270 | 39.5 | 100.0% |
| 4 | Dep | St. Paul/Highland Park | 282 | 0.8 | 2.0% |
| 12L | Dep | Eagan/Mendota Heights | 4,047 | 11.2 | 28.5% |
| 12R | Dep | Eagan/Mendota Heights | 2,222 | 6.1 | 15.6% |
| 22 | Dep | So. Richfield/Bloomington | 2,533 | 7.0 | 17.8% |
| 30L | Dep | So. Minneapolis/No. Richfield | 1,906 | 5.3 | 13.4% |
| 30R | Dep | So. Minneapolis/No. Richfield | 3,226 | 8.9 | 22.7% |
| Total Nighttime Departures | | | 14,216 | 39.3 | 100.0% |
| Total Nighttime Operations | | | 28,486 | 78.8 | |

Note: Missing ANOMS Data for 3.3 days due to FAA

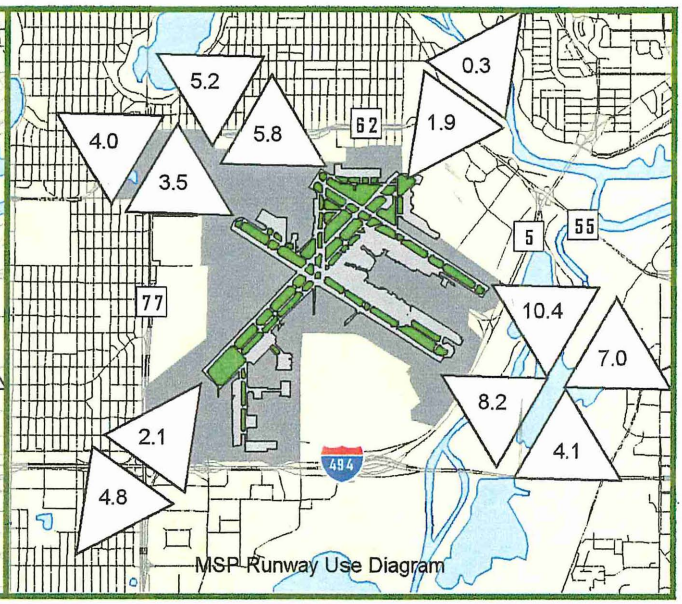
Note: Southeast end of Runway 12R/30L Closed for Reconstruction April 5 to September 11, 1999

# 1999 MSP Nighttime Runway Usage Summary of Carrier Jet Operations (10:30 p.m. to 6:00 a.m.)

## Total Nighttime Carrier Jet Operations by Runway




## Average Daily Nighttime Carrier Jet Operations by Runway

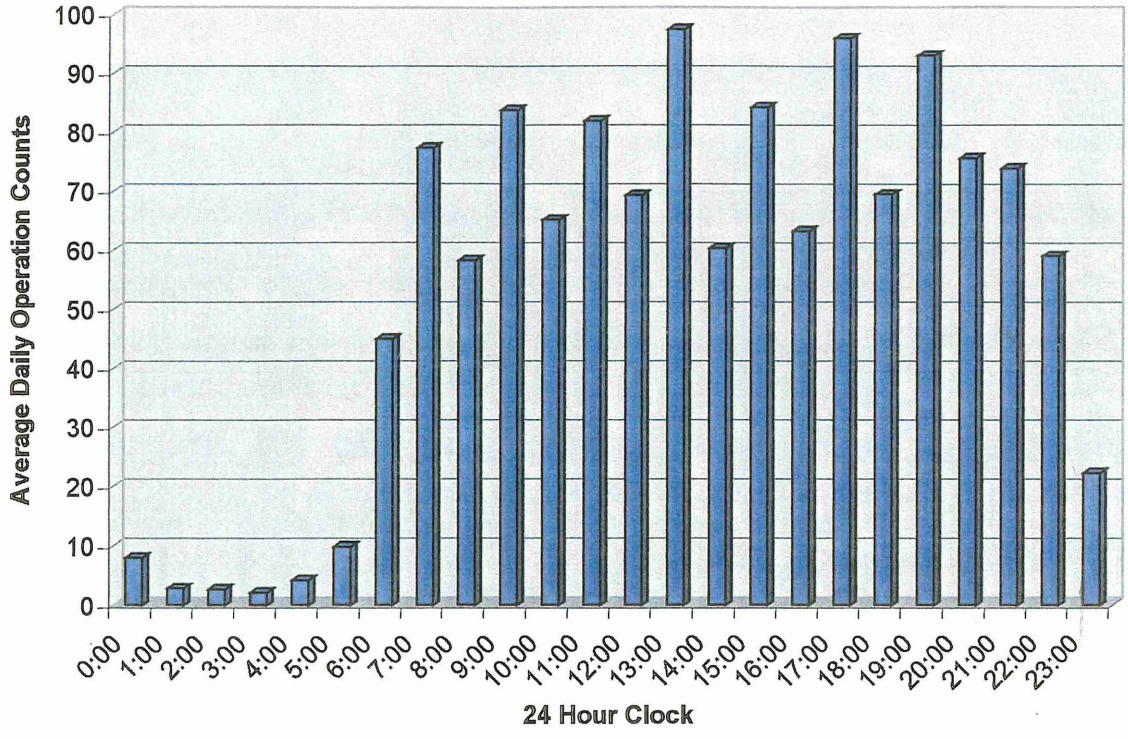



| Runway | Arrival/ Departure | Overflight Area | Count of Jet Nighttime Operations | Average Daily Night Operations | Percent |
|---|---|---|---|---|---|
| 4 | Arr | So. Richfield/Bloomington | 773 | 2.1 | 6.7% |
| 12L | Arr | So. Minneapolis/No. Richfield | 2,091 | 5.8 | 18.1% |
| 12R | Arr | So. Minneapolis/No. Richfield | 1,271 | 3.5 | 11.0% |
| 22 | Arr | St. Paul/Highland Park | 695 | 1.9 | 6.0% |
| 30L | Arr | Eagan/Mendota Heights | 2,944 | 8.2 | 25.5% |
| 30R | Arr | Eagan/Mendota Heights | 3,776 | 10.4 | 32.7% |
| **Total Nighttime Arrivals** | | | **11,550** | **31.9** | **100.0%** |
| 4 | Dep | St. Paul/Highland Park | 98 | 0.3 | 1.1% |
| 12L | Dep | Eagan/Mendota Heights | 2,549 | 7.0 | 27.8% |
| 12R | Dep | Eagan/Mendota Heights | 1,489 | 4.1 | 16.2% |
| 22 | Dep | So. Richfield/Bloomington | 1,748 | 4.8 | 19.0% |
| 30L | Dep | So. Minneapolis/No. Richfield | 1,429 | 4.0 | 15.5% |
| 30R | Dep | So. Minneapolis/No. Richfield | 1,870 | 5.2 | 20.4% |
| **Total Nighttime Departures** | | | **9,183** | **25.4** | **100.0%** |
| **Total Nighttime Operations** | | | **20,733** | **57.3** | |

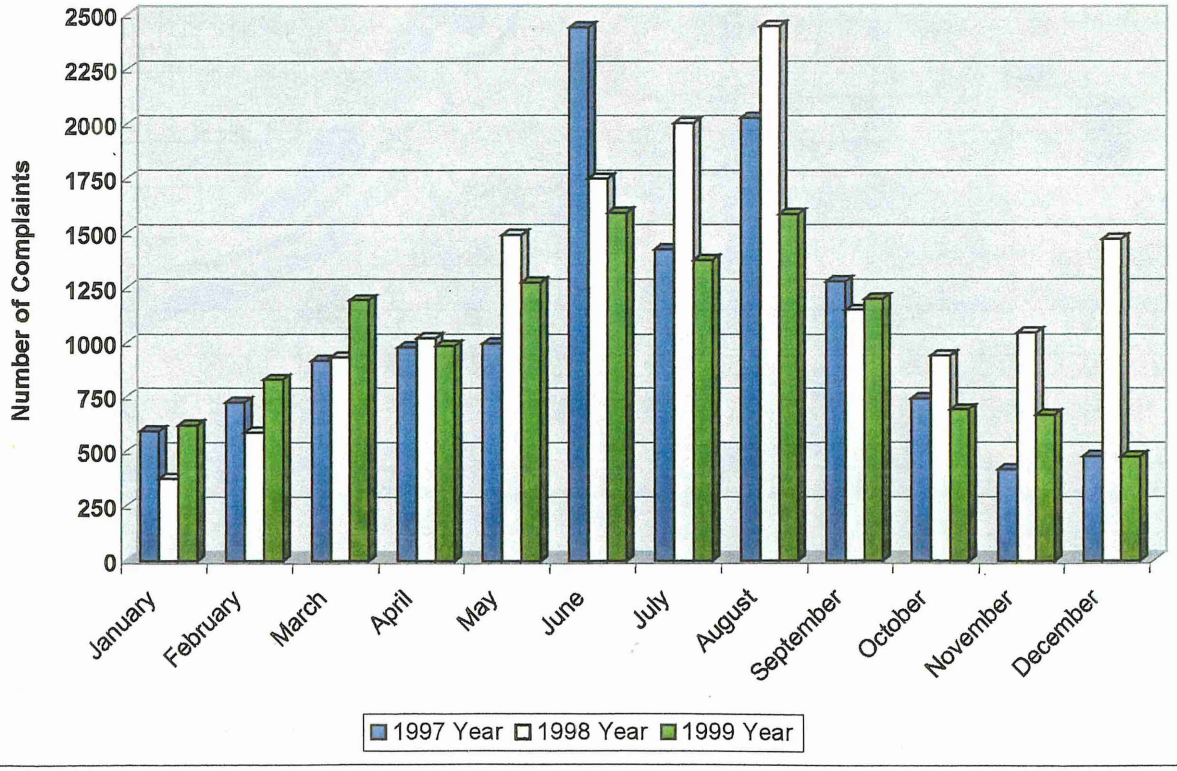
Note: Missing ANOMS Data for 3.3 days due to FAA

Note: Southeast end of Runway 12R/30L Closed for Reconstruction April 5 to September 11, 1999

## 1999 Average Daily MSP Operations per Hour

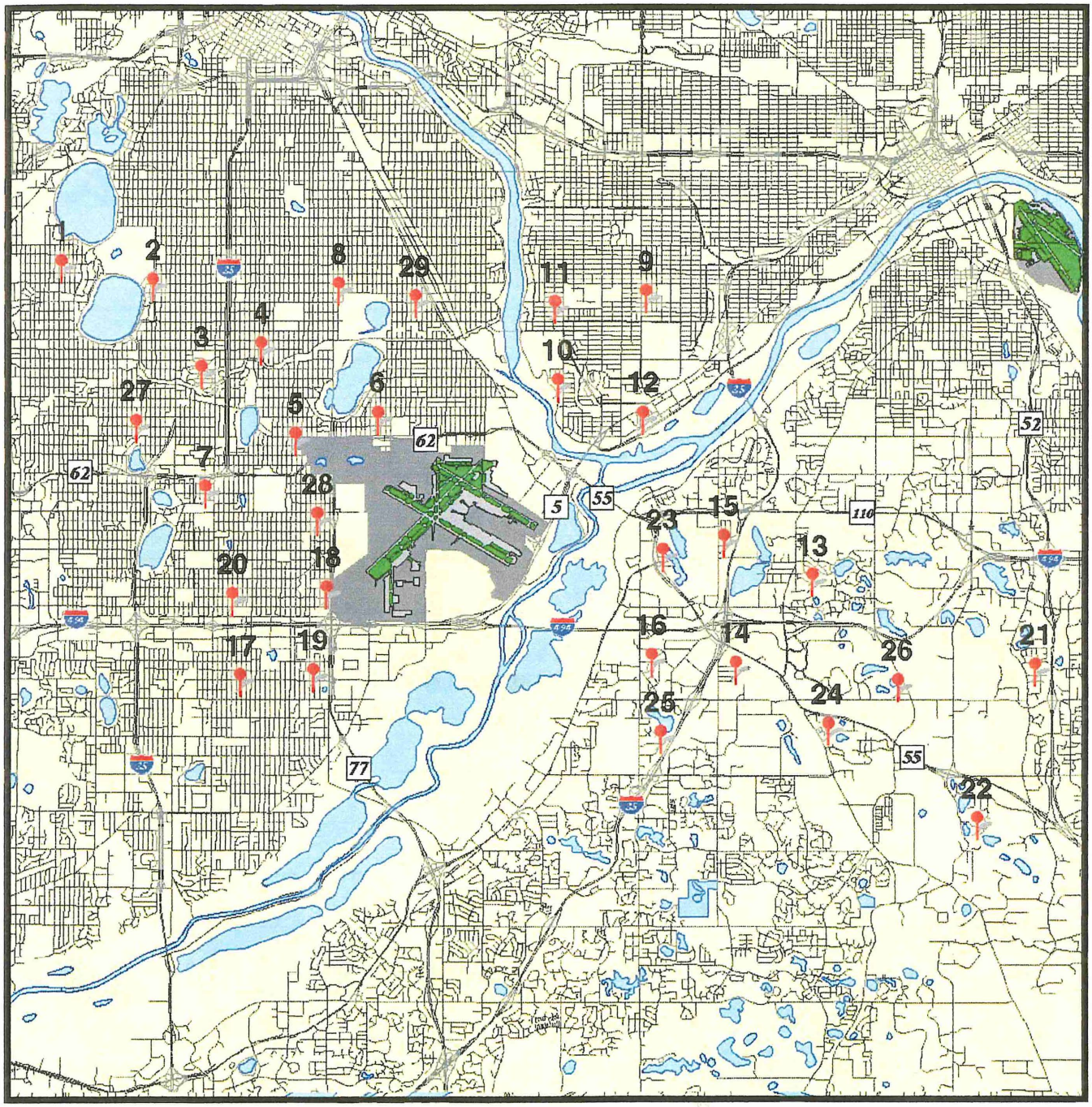



## MSP Airport Monthly Complaint Summary

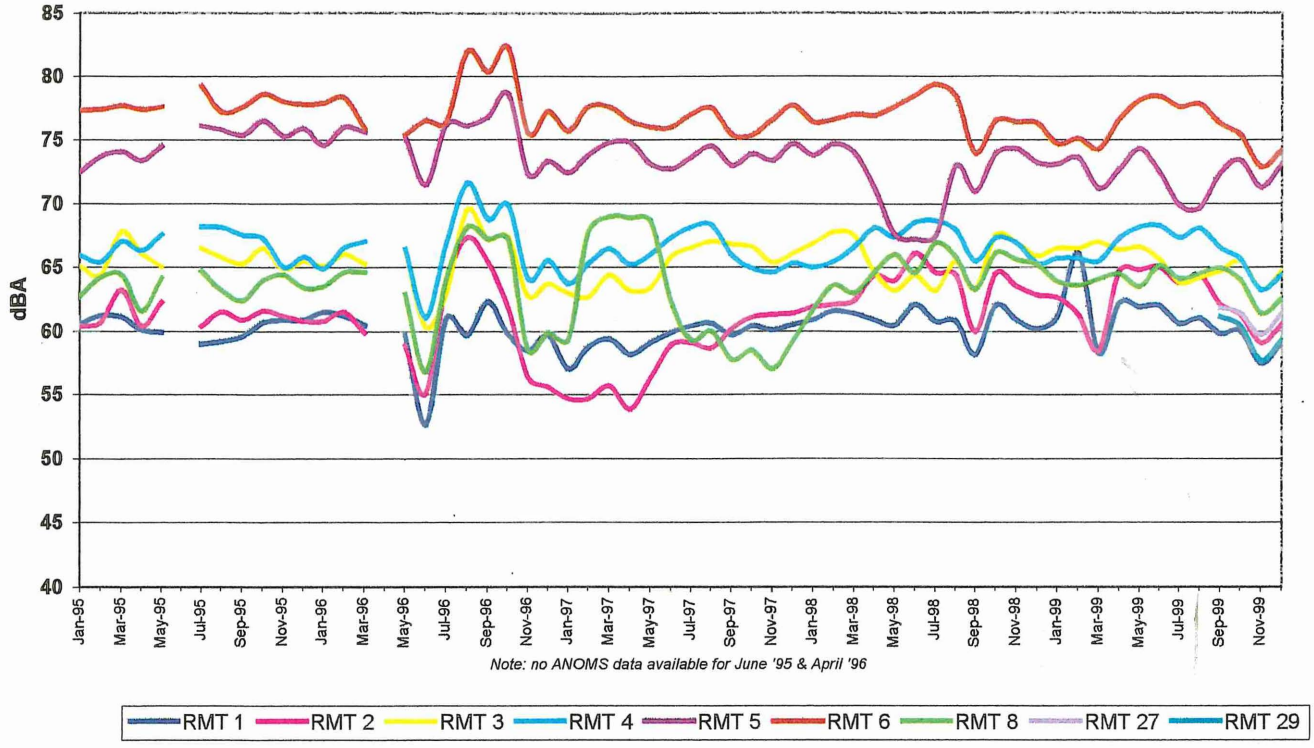


# Remote Monitoring Tower Site Locations

Airport Noise and Operations Monitoring System

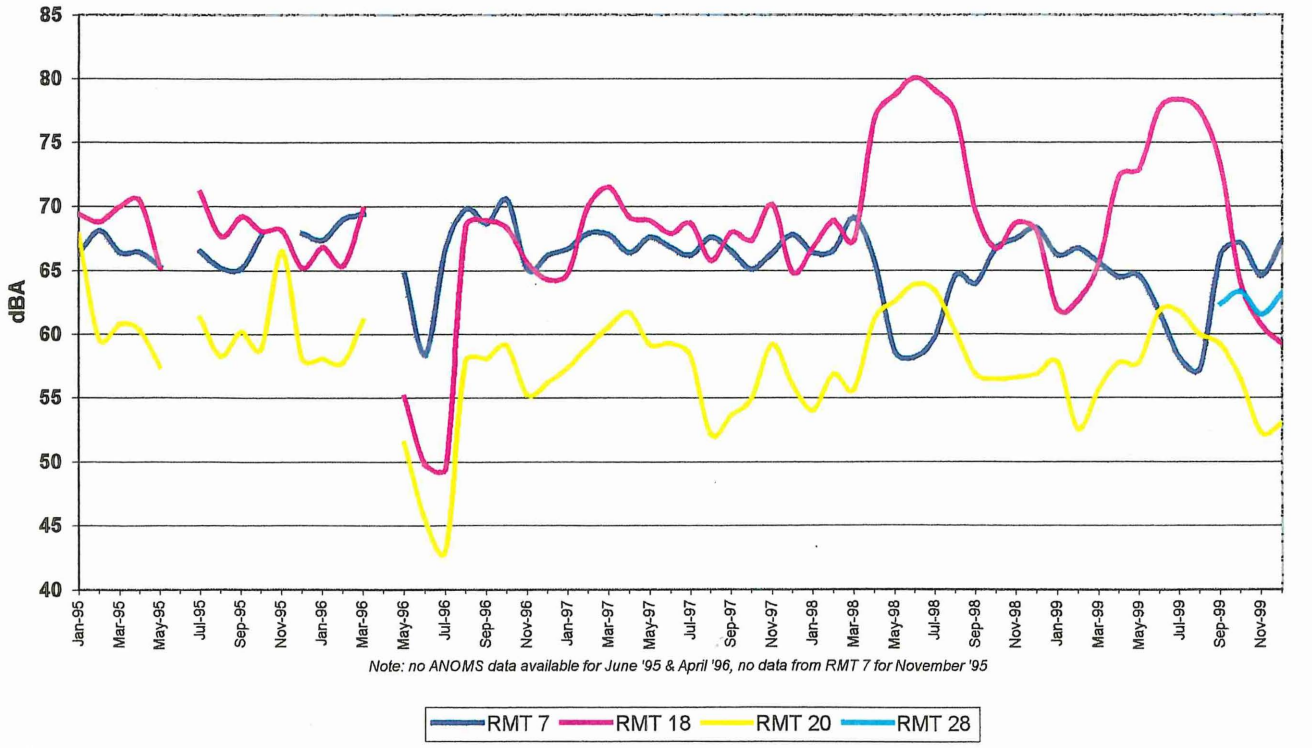


## Remote Monitoring Towers (RMTs) Located in Minneapolis
## Monthly Average DNL Jan '95 - Dec '99



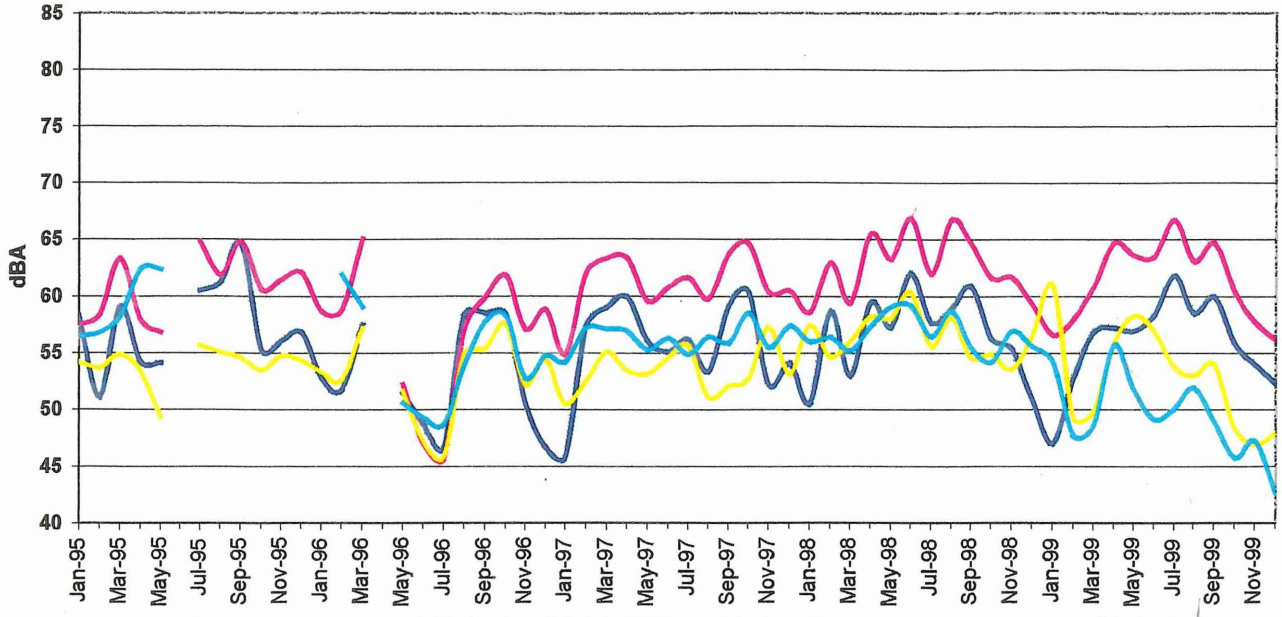

*Note: no ANOMS data available for June '95 & April '96*

## Remote Monitoring Towers (RMTs) Located in Richfield
## Monthly Average DNL Jan '95 - Dec '99




*Note: no ANOMS data available for June '95 & April '96, no data from RMT 7 for November '95*

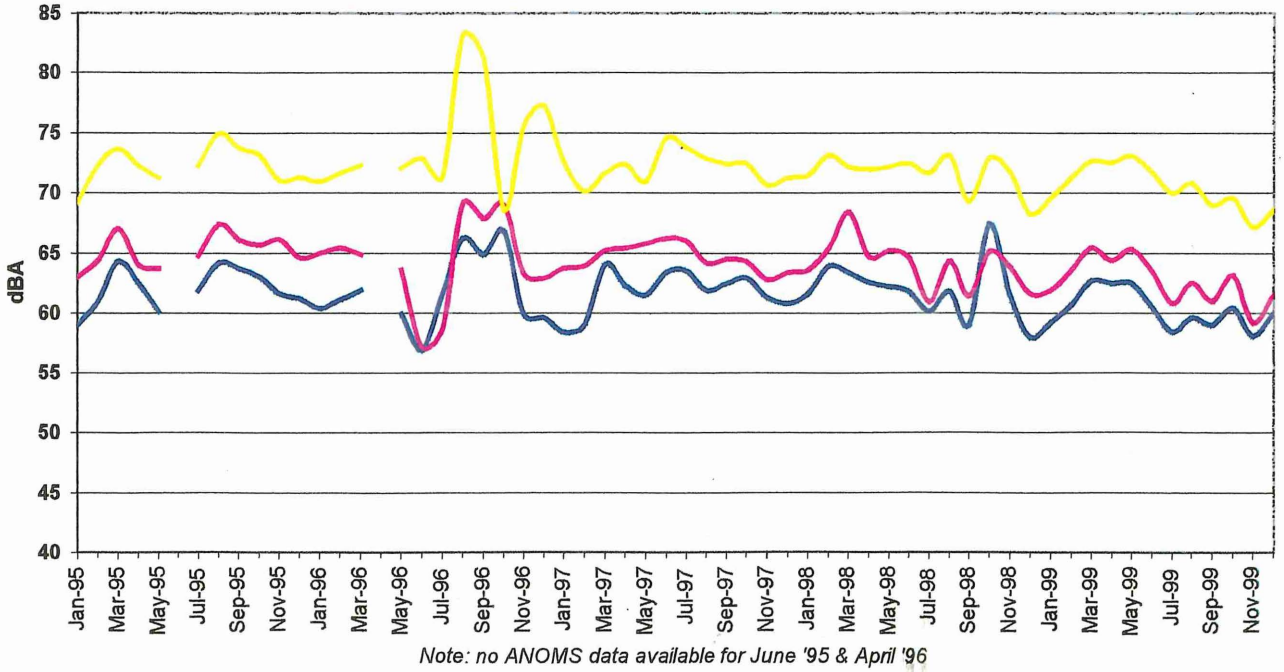
## Remote Monitoring Towers (RMTs) Located in St. Paul
## Monthly Average DNL Jan '95 - Dec '99




*Note: no ANOMS data available for June '95 & April '96, no data from RMT 12 for July '95 to January '96 due to construction accident*

RMT 9 RMT 10 RMT 11 RMT 12

## Remote Monitoring Towers (RMTs) Located in Mendota Heights
## Monthly Average DNL Jan '95 - Dec '99




*Note: no ANOMS data available for June '95 & April '96*

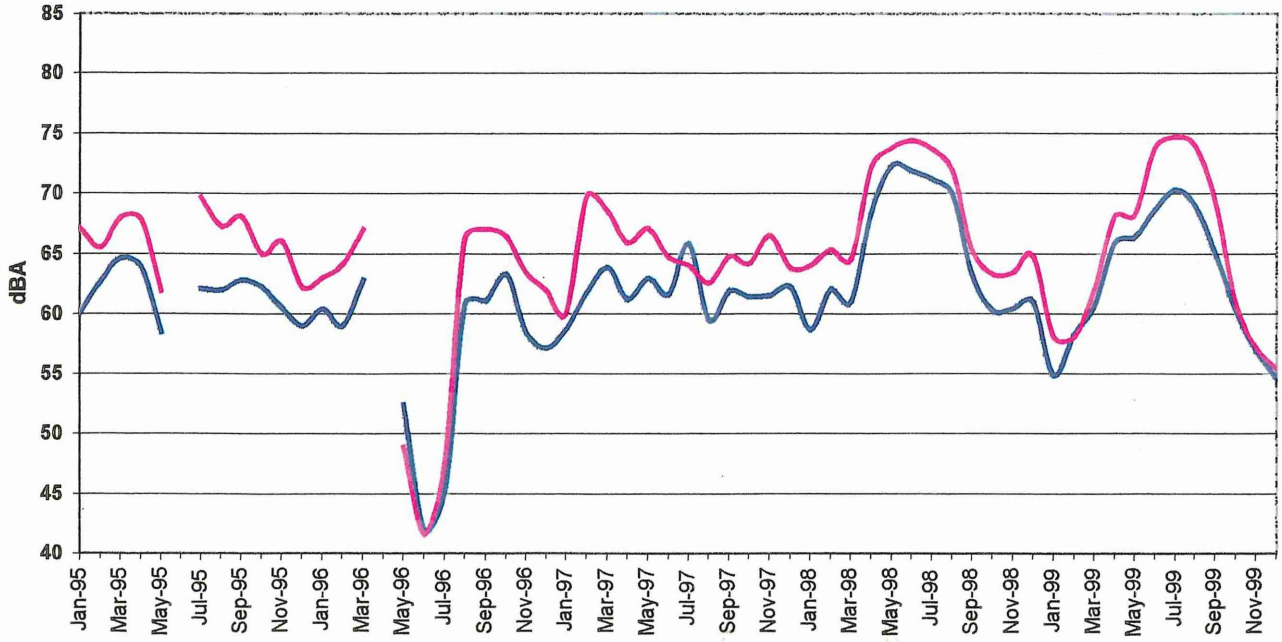
RMT 13 RMT 15 RMT 23

## Remote Monitoring Towers (RMTs) Located in Eagan
## Monthly Average DNL Jan '95 - Dec '99


*Note: no ANOMS data available for June '95 & April '96*

RMT 14 RMT 16 RMT 24 RMT 25

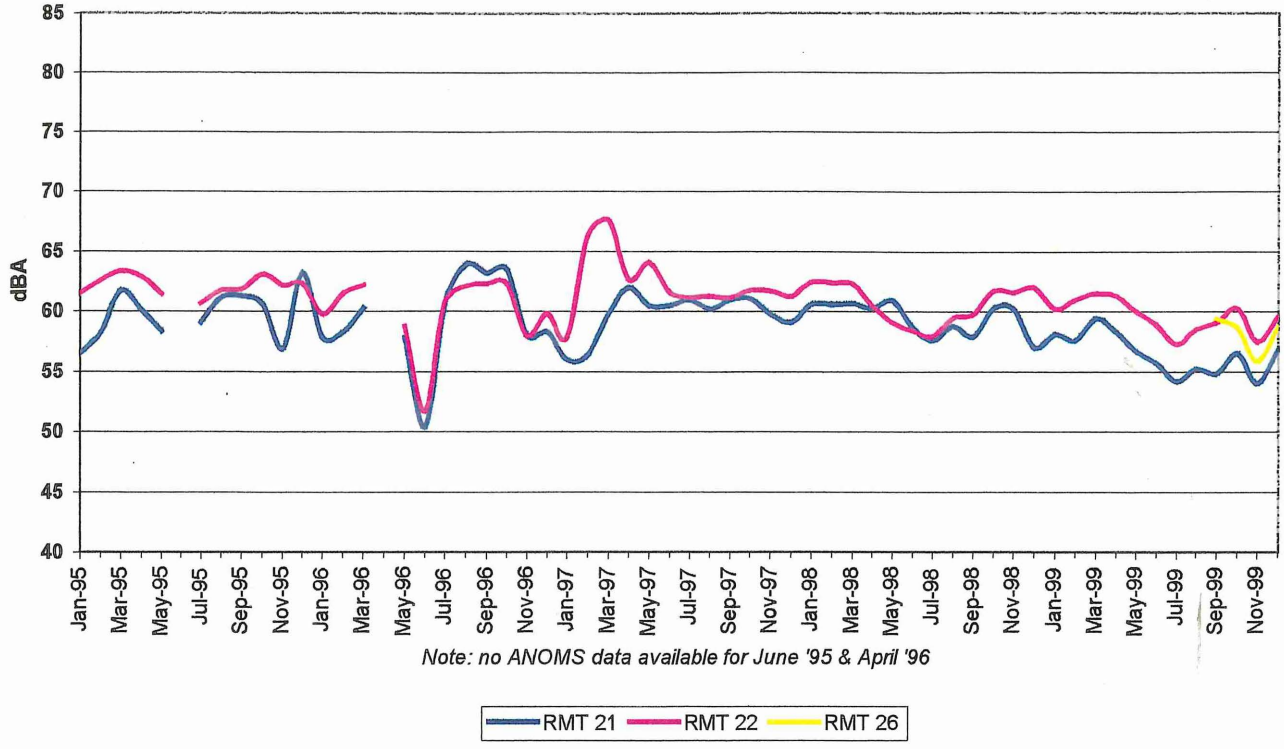
## Remote Monitoring Towers (RMTs) Located in Bloomington
## Monthly Average DNL Jan '95 - Dec '99




*Note: no ANOMS data available for June '95 & April '96*

RMT 17 RMT 19

## Remote Monitoring Towers (RMTs) Located in Inver Grove Heights
## Monthly Average DNL Jan '95 - Dec '99




*Note: no ANOMS data available for June '95 & April '96*