Appendix B Existing Noise Compatibility Program

This appendix includes:

- 1993 FAA Record of Approval of Noise Compatibility Program
- Noise Compatibility Program (NCP) Review Memorandum
- MSN Air Traffic Control Tower Order 8400.9I

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U.S. Department of Transportation
Federal Aviation Administration

Memorandum

Subject: **ACTION:** Transmittal of the Approved Part 150 Program for the Dane County Regional Airport (Truax Field) Madison, Wisconsin

Date: JAN 26 93

Reply to Attn. of:

From: Manager, Community and Environmental Needs Division, APP-600

To: Manager, Great Lakes Region, AGL-600

Attached is the approval package for the subject Noise Compatibility Program. Please send us a copy of your signed letter to the sponsor for our records.

Lynne Sparks Pickard
Lynne S. Pickard

Attachment

cc: AEE-300(info)

U.S. Department of Transportation
Federal Aviation Administration

Memorandum

Subject: **ACTION:** FAR Part 150 Noise Compatibility Program for Dane County Regional Airport (Truax Field) Madison, Wisconsin

Date: JAN 25 1993

From: Director, Office of Airport Planning and Programming, APP-1

Reply to Attn. of:

To: Assistant Administrator for Airports, ARP-1

Attached for your action is the Noise Compatibility Program (NCP) for the Dane County Regional Airport (Truax Field) Madison, Wisconsin (MSN) under FAR Part 150. The Great Lakes Region, in conjunction with Federal Aviation Administration (FAA) Headquarters has evaluated the program and recommends action as set forth below.

On July 26, 1992, the FAA determined that the Noise Exposure Maps (NEM's) for MSN are in compliance with the requirements of Section 103(a) of the Aviation Safety and Noise Abatement Act of 1979 (ANSA) and Title 14, CFR Part 150. At the same time, the FAA made notification in the Federal Register of the formal 180 day review period for MSN's proposed program under the provisions of section 104(a) of ANSA and FAR Part 150. The 180-day formal review period ends January 25, 1993. If the program is not acted on by the FAA by that date, it will automatically be approved by law, with the exception of flight procedures.

The MSN program describes the current and future noncompatible land uses. The NCP proposes several measures to remedy existing noise problems and prevent noncompatible land uses. Each measure is described in the attached Record of Approval.

The Assistant Administrator for Policy, Planning, and International Aviation and the Chief Counsel have concurred with the recommendations of the Great Lakes Region. If you agree with the recommended FAA determinations, you should sign the "approve" line on the attached signature page. I recommend your approval.

Paul L. Galis

Paul L. Galis

Attachments

RECORD OF APPROVAL

FAR PART 150 NOISE COMPATIBILITY PROGRAM

DANE COUNTY REGIONAL AIRPORT

MADISON, WISCONSIN

		CONCUR	NONCONCUR
Dale B. McDaniel Assistant Administrator for Policy, Planning and International Aviation, API-1	1-19-93 Date	✓	
for _____ Chief Counsel, AGC-1	1/25/93 Date	✓	
Lynnette S. Kay for Assistant Administrator for Airports, ARP-1	1/25/93 Date	✓ Approved	Disapproved

RECORD OF APPROVAL
DANE COUNTY REGIONAL AIRPORT
NOISE COMPATIBILITY PROGRAM

The Noise Compatibility Program (NCP) for Dane County Regional Airport in Madison, Wisconsin, describes the current and future noncompatible land uses based upon the parameters established in FAR Part 150, Airport Noise Compatibility Planning. Dane County recommended twenty-three (23) measures in their NCP to remedy existing noise problems and prevent future non-compatible land uses. These measures are grouped into three categories: Noise Abatement (Measures NA-1 to NA-9), Land Use Management (Measures LU-1 to LU-11) and Continuing Program (Measures CP-1 to CP-3).

Each measure of the recommended Noise Compatibility Program includes a summary of the airport operator's recommendations and a cross reference to page numbers in the NCP where each measure can be found. The NCP Study itself contains additional summary information in Tables 5-C and 5-D, on pages 5-20 and 5-25, respectively. The official Noise Exposure Maps (NEM) are located on pages I-11 and I-12 in the separate NEM Study.

The summary of each measure follows as closely as possible the airport operator's recommendations in the NCP Study. The statements contained within the summarized recommendations and before the indicated FAA approval, disapproval, or other determination do not represent the opinions or decisions of the FAA.

The approvals listed herein include approvals of measures that the airport recommends be taken by the FAA. **It should be noted that these approvals indicate only that the measures would, if implemented, be consistent with the purposes of Part 150. These approvals do not constitute decisions to implement the measures. Later decisions concerning possible implementation of the measures may be subject to applicable environmental or other procedures or requirements.**

NOISE ABATEMENT MEASURES

NA-1. Continue the existing informal runway use program. (Pages 4-5, 5-2, Appendix D-2, Comments 10 and 12 of Responses to FAA Review Comments)

Dane County proposes to continue using a previously established informal Runway Use Program (RUP). It calls for the use of Runways 31 and 36 for takeoff and Runways 18 or 13 for landing by all aircraft over 12,500 pounds. It applies with tailwinds of 5 knots or less, crosswinds of 15 knots or less, and with clear and dry runways. It is

intended to conform to the informal system established under the criteria set forth in FAA Order 8400.9.

Aircraft arrive from the north on Runway 18 and depart to the north on Runway 36. The resultant operation is a head-to-head configuration, wind, weather and air traffic permitting. Air traffic controllers are requested to honor pilot requests for downwind departures on Runway 36 and downwind arrivals on Runway 18. This informal program is set forth in Tower Order 7220.2A, dated Jan 1, 1990.

The effect of this pattern of air traffic control is clearly seen in the Noise Exposure Map contours. The benefit of this method of operation is that the bulk of the noise generated by air carrier jet aircraft in and out of Madison is directed over largely undeveloped park land north of the airport.

APPROVED AS A VOLUNTARY MEASURE, IN PART. This noise abatement measure has worked well for Dane County Regional Airport over the years and does mitigate the level of noise experienced by noise sensitive areas south of the airport. While FAA approves the continuation of the voluntary program presently in place, it does not approve using the model Letter of Agreement (LOA) in Appendix D for implementation. Since a tower order addressing the RUP procedures already exists, implementing the LOA would be redundant.

NA-2. Maintain internal tower directive requiring aircraft departing on Runway 31 to pass through 2,500 feet MSL (1,600 feet AGL) before turning left. (Pages 4-6, 5-2, 5-3, Appendix D-2, Comment 12 of Responses to FAA Review Comments)

Dane County recommends the Air Traffic Control Tower maintain the existing Runway 31 departure procedure as a beneficial noise abatement measure.

The internal operating procedure requires aircraft departing Runway 31 to pass through 2,500 MSL before turning south of 310 degrees. An early left turn from Runway 31 would place departing aircraft over the Cherokee subdivision west of the airport. By limiting such turns until reaching a specified altitude, population impacted by noise is reduced. This procedure is set forth in Tower Order 7220.2A, dated Jan 1, 1990.

APPROVED IN PART. This noise abatement measure has worked well for Dane County Regional Airport over the years and does mitigate the level of noise experienced by noise sensitive areas west of the airport. While FAA approves continuation of the procedure presently in place, it does not approve using the model Letter of Agreement (LOA) in

Appendix D for implementation. Since a tower order addressing the RUP procedures already exists, implementing the LOA would be redundant.

NA-3. Establish visual approach and departure corridors for helicopters. (Pages 4-6, 4-7, 4-8A, 5-3, Appendix D-4, Comment 13 of Responses to FAA Review Comments)

Since there are significant helicopter operations at the airport from the Wisconsin Army National Guard, Dane County should implement this noise abatement measure by entering into a Letter of Agreement with the Air Traffic Control Tower and the National Guard helicopter unit establishing the noise-compatible helicopter corridors shown in **Exhibit 4B** (page 4-8A of the NCP).

The airport staff have developed a draft procedure designating checkpoints, flight corridors, and air traffic control procedures for helicopter approaches and departures. Three checkpoints should be adopted: **Checkpoint Interstate** at the interchange of Interstates 90/94 and State Highway 30; **Checkpoint River** on the Yahara River northwest of the airport; and **Checkpoint Park** (identified on Exhibit 4B as "New Checkpoint") at the interchange of U.S. Highway 51 (a.k.a. Stoughton Road) and Interstate 90/94 adjacent to Token Creek Park. Helicopters departing to and arriving from the south would fly between the airport and Checkpoint Interstate via State Highway 30. Helicopters departing to and arriving from the north and northwest would fly directly between the airport and Checkpoint River. Helicopters departing to and arriving from the north and northeast would fly directly between the airport and Checkpoint Park. Each of these procedures is dependent on weather and operating conditions and would be subject to the discretion of the pilot-in-command and/or air traffic being able to maintain a safe operation.

The County should encourage the National Guard to prominently display maps of the corridors and to inform its pilots of the procedures. The County should also ensure that the Air Traffic Manager has the information needed to properly brief controllers and to fully implement the procedures. Adoption of a tower order, while not strictly necessary, would assist in the implementation of the procedures. (A model Letter of Agreement is included in **Appendix D.**)

The concern expressed during this study about low-flying helicopters is not so severe as to influence the noise contours, but it is the cause of potentially annoying single events and should be dealt with to the extent feasible. Helicopters often fly lower than fixed-wing aircraft and have a distinctive sound which can prove irritating even at

low sound intensity levels. As it is a good policy to route the helicopters over available noise-compatible corridors, these visual approach procedures should be adopted.

APPROVED IN PART. This measure was reviewed and approved in two parts. Concerning the first part, FAA agrees with and approves the concept of establishing VFR helicopter approach and departure corridors. However, the proposed **Checkpoint Park**, northeast of the airport, will create traffic conflicts with Runway 36 departures. The other two checkpoints will not conflict with traffic flows. Therefore, FAA approves only the remaining two checkpoints, Interstate and River, and their associated corridors.

Concerning the second part, implementation of an effective procedure does not require the formality suggested in Appendix D. A simple Letter of Agreement between the aircraft operator, i.e. the military and the Air Traffic Control Tower, in coordination with Airport Management, will suffice. Therefore, FAA approves the two checkpoints, Interstate and River, and the proposed routings, but disapproves the method of implementing the procedures suggested in Appendix D.

NA-4. Encourage use of noise abatement departure procedures by operators of jet aircraft.
(Pages 4-12 thru 4-14, 5-3)

While it is inappropriate for Dane County Regional Airport to enforce an airport-specific noise abatement departure procedure, Dane County should encourage the airlines, business jet operators and the military to make full use of their own internal noise abatement departure procedures.

Airlines fly a variation of the FAA AC 91-53 noise abatement departure profile. Operators of business jet aircraft can fly the NBAA standard departure procedure. In addition, some manufacturers describe noise abatement departure procedures suitable for their aircraft in the operator's manual. Military jet operators have already indicated an interest in quiet flying techniques when within the airport environs. Even as the military is contemplating the conversion of the relatively quiet A-10s to the louder A-16s, military officials have made inquiries as to the best way to fly the new aircraft in relation to airport neighbors.

Such noise mitigation departure procedures have been shown to be beneficial for noise abatement.

APPROVED AS A VOLUNTARY MEASURE. Noise abatement departure measures are incorporated in the INM departure profiles and

do have a degree of effectiveness.

NA-5. Encourage Air National Guard to follow through with its plans to construct a hush house for A-16 engine maintenance runups prior to converting its fleet.
(Pages 4-17, 5-4)

Dane County should encourage the Guard to follow through with its plans to construct a noise suppression structure, commonly called a "hush house", in anticipation of the increased noise levels from maintenance operations on the new aircraft.

The Air National Guard anticipates an aircraft change in the next few years with the A-10 aircraft being replaced with the A-16 aircraft. Engine maintenance for the A-10 is not unlike engine maintenance for business jet aircraft. Noise from test runups would likely be contained on airport property. The A-16 engine maintenance would be a different story. The noise contours from engine test runups for this aircraft would likely extend well beyond airport property.

Hush houses are extremely effective at attenuating noise. Construction of a hush house for A-16 runups will contain the potentially disturbing noise from these events.

APPROVED AS A VOLUNTARY MEASURE. The effectiveness of hush houses at attenuating noise levels is well documented.

NA-6. Construct new 6,500 foot Runway 3-21.
(Pages 4-15 thru 4-16, 4-19 thru 4-20, 4-23 thru 4-24, 4-27 thru 4-28, 5- 4, Comments 9 and 11 of Responses to FAA Review Comments)

Dane County proposes to construct a new air carrier runway, oriented 3-21, at a length of 6,500 feet. Construction of Runway 3-21 was discussed and evaluated as Alternatives Three and Six (**Exhibits 4E and 4F-3** of the NCP) and as Alternative 10 of the Master Plan study (page 5-6 and **Exhibit 5F**).

Part of the justification for a new Runway 3-21 versus lengthening the existing Runway 4-22 is the fact that lengthening Runway 4-22 will require additional relocation of U.S. Highway 51 (a.k.a. Stoughton Road). A road relocation project was recently completed on U.S. 51 adjacent to the area where further road relocation would be required. It would be very difficult to achieve another relocation of U.S. 51 in the near future. Alternatively, there is sufficient space for a new Runway 3-21 to be built without relocating U.S. 51. Also because of the condition of Runway 4-22, a lengthening project would essentially

involve full reconstruction. Because of this, construction of a completely new runway, oriented 3-21, is essentially equivalent in terms of cost.

The question of the best length for the proposed Runway 3-21 was the subject of discussion and analysis in the Airport Master Plan. While it would be desirable to have greater length, thus enabling use of the runway by the military, the proposed length of 6,500 feet will be sufficient for almost all civilian users. This alone will provide a significant noise benefit. The cost and complexity of building a longer runway was also a consideration. Any additional runway length would require the relocation of U.S. 51. As previously stated, another relocation of U.S. 51 is not considered practical. The highway was just relocated within the last two years to provide clearance off the approach end of Runway 31. That project was approved only after a controversial EIS which raised concerns among residents of neighborhoods immediately to the east. The sponsor's analysis indicated that a runway length of 6,500 feet would be sufficient for most commercial users at the airport, and would thus provide important noise benefits. It was considered unwise and not cost-effective to seek even greater runway length, thus reopening the controversial highway relocation issue.

Construction of a secondary air carrier runway allows the airport to operate for a longer period of time with its present contra-flow method of noise abatement. As has been pointed out, with increasing operations levels the airport will not be able to continue the present procedure of arrivals from the north and departures to the north. This procedure is of particular noise benefit and should be maintained as long as possible. Construction of an alternate runway will enable this.

Using the level-weighted population (LWP) analysis in the Study, an investment of $13.5 million for the new runway will relieve approximately 602 LWP (610 inside DNL 65 dB + 252 inside DNL 70 dB = 862 actual people) out of a total of 3,771 LWP (4,865 inside DNL 65 dB + 835 inside DNL 70 dB = 5,700 actual people) from significant noise impacts. This equates to a reduction of 16 percent. However, when viewed from the perspective of the cost to insulate the 372 homes occupied by the 862 actual people residing inside the DNL 65 dB, a different picture results. Assuming an average cost of $25,000 to $30,000 per house, the total insulation cost would be $9.3 to $11.2 million. Considering the additional time, effort and money to complete an insulation project of this magnitude, the final costs will be comparable to the $13.5 million cost for a new Runway 3-21. Furthermore, when combined with the fact that insulation is only effective when people remain inside their homes, justification for the new runway is even more compelling.

APPROVED.

NA-7. Adopt an informal preferential runway use system which encourages departures on Runways 3, 31, and 36 while preferring arrivals on Runways 13, 18, and 21.
(Pages 4-19 thru 4-20, 4-23 thru 4-24, 5-4 thru 5-5, Appendix D-6, Comments 10 and 12 of Responses to FAA Review Comments)

After Runway 3-21 is constructed, Dane County proposes to modify the existing informal Runway Use Program (RUP) to account for use of the new runway. Departures and arrivals on the new runway would be encouraged to and from the northeast. As with the existing RUP, it applies to all aircraft over 12,500 pounds, when tailwinds are 5 knots or less, crosswinds are 15 knots or less, and the runways are clear and dry. It is intended to conform to the informal system established under the criteria set forth in FAA Order 8400.9.

With Runway 3-21 in place, simultaneous operations are possible. Arrivals on Runway 21 and departures on Runway 36 or arrivals on Runway 18 and departures on Runway 3 are variations of the present contra-flow procedure to and from the north. Wind conditions would allow either of these simultaneous operating configurations about 25 percent of the time. Overall, departures could occur to the north on Runway 3 about 38 percent of the time and departures on Runway 36 could occur about 19 percent for a 57 percent total north departure potential. The winds and runway configuration would allow arrivals from the north about 65 percent of the time, 52 percent for Runway 21 and 13 percent for Runway 18. For 1995 baseline conditions, it was estimated only a 50 percent head-to-head north operating configuration would be possible.

Amendment of the current informal Runway Use Program which favors departures to the north and arrivals from the north would continue to provide noise abatement benefits to the heavily populated areas south of the airport.

APPROVED AS A VOLUNTARY MEASURE, IN PART. As with the existing RUP, this voluntary noise abatement measure will work well for Dane County Regional Airport in mitigating the level of noise experienced by noise sensitive areas south of the airport. While FAA approves the continuation of the voluntary program presently in place, it does not approve using the model Letter of Agreement (LOA) in Appendix D for implementation. Instead, as is done with the existing RUP, the procedures should be set forth in a tower order.

It is also important to note that the proposed operations planned for Runway 3-21 would not be simultaneous operations as defined by FAA. The FAA definition of such operations means that operations occur at the same time on two, different runways. The sponsor's proposed operational scheme would, in reality, be a sequential operation, that is, two operations would occur within the same general time frame on two different runways. To ensure that aircraft separations required by FAA Order 7110.65G are maintained, ATCT will develop procedures for the proposed runway use program.

NA-8. Adopt procedures requiring east and southbound aircraft exceeding 12,500 pounds and departing Runway 3 to climb on runway heading through 2,500 feet MSL before turning right. (Pages 4-20, 5-5, Appendix D-6, Comment 12 of Responses to FAA Review Comments)

The County proposes to encourage the Tower to establish this procedure to avoid departure turns at low altitude over populated areas northeast of the new Runway 3-21. The typical air carrier aircraft would begin the departure turn approximately three nautical miles from the start of the takeoff roll.

The procedure is very similar to the existing requirement for departures from Runway 31 and it would serve a similar purpose in avoiding low overflights of a residential area. Early right turns from Runway 3 could place departing aircraft at low altitudes over populated areas. With the procedure, aircraft would be at 1,600 feet above the ground before initiating right turns.

APPROVED IN PART. As with the existing voluntary noise abatement procedure for departures from Runway 31, here too the procedure could be effectively implemented by an Air Traffic Tower Order. Once coordinated with Airport Management, the procedure could be set forth in Tower Order 7220.2 for internal standardization. Therefore, FAA approves the concept of the proposed measure, but disapproves the Letter of Agreement process suggested in Appendix D.

NA-9. Adopt procedures requiring all aircraft exceeding 12,500 pounds and departing Runway 21 to turn left 10 degrees as soon as safe and practicable. (Pages 4-23 thru 4-24, 5-5, Appendix D-6, Comment 12 of Responses to FAA Review Comments)

Dane County recommends the Air Traffic Control Tower require aircraft exceeding 12,500 pounds and departing from Runway 21 to turn left 10 degrees and climb through 3,000 feet MSL

before turning to course headings.

The County should encourage the Air Traffic Manager to adopt a Tower Order setting forth the procedure. The proposed turn from Runway 21 is not difficult and could be implemented at Tower direction. It is also in line with present airport procedure. Currently, business jets departing on Runway 22 are directed to execute a quick left turn and fly south out of the airport environs.

Straight-out departures and right turns from Runway 21 would cause overflights of residential areas which do not presently experience aircraft overflights. While cumulative noise exposure levels would be quite low, this would likely create new noise complaints from people disturbed by loud single events. The benefits of the new runway would be eroded by introduction of new impacts. Therefore, as part of the operating configuration of the new runway layout, limitations on departures off Runway 21 are appropriate. A 10-degree left turn would place departing aircraft over the noise-compatible corridor extending south-southwest from the airport down toward the isthmus.

APPROVED IN PART. As with the existing voluntary noise abatement procedure for departures from Runway 22, here too the procedure could be effectively implemented through an Air Traffic Tower Order. Once coordinated with Airport Management, the procedure could be set forth in Tower Order 7220.2 for internal standardization. Therefore, FAA approves the concept of the proposed measure, but disapproves the Letter of Agreement process suggested in Appendix D.

LAND USE MANAGEMENT MEASURES

LU-1 City of Madison, Dane County - Maintain Existing Compatible Zoning in the Airport Vicinity

(Pages 4-33, 5-11)

A significant amount of land in the airport vicinity is already zoned for commercial and industrial use. This is shown in Exhibit 4G (following page 4-38 of the NCP). As Exhibit 1H (following page 1-27 of the NEM) shows, there is also a significant amount of open space and recreation zoning in the airport vicinity. Both of these zoning categories are considered compatible with aircraft noise.

Dane County officials recommend they and the City of Madison maintain compatible zoning in the "airport affected area". **Exhibit 5D** (following page 5-12 of the NCP) shows the airport affected area. It is defined by the DNL 60 dB contour, the approach areas southeast of Runway 13-31 and

south of the planned Runway 18L-36R, and the training pattern area for Runway 18L-36R.

Although much of this area is outside the DNL 65 dB contour, it will be subject to moderate levels of aircraft noise and frequent aircraft overflights which some residents could find annoying. The exhibit also shows areas currently zoned for commercial and industrial use, as well as for open space and recreation areas, within the boundaries of the airport affected area. It is important to preserve the existing compatible use zoning in this area.

This proposal is not intended to necessarily lock into place all compatible zoning categories in the area. The two jurisdictions should reserve the flexibility to make zoning changes in these areas as needed, provided that the changes do not create the potential for the development of non-compatible land uses. For example, zoning changes from one commercial district to another or from commercial to industrial would still be acceptable.

An advantage of this measure is that neither Dane County nor Madison have cumulative zoning ordinances, although some residential and noise- sensitive institutional uses are permitted in certain commercial districts in each jurisdiction. The disadvantage to zoning is that the ordinances are subject to amendment.

APPROVED.

LU-2 Dane County, City of Madison, Town of Burke -- Define "Airport Affected Area" for Purposes of Implementing Wisconsin Act 136 (Page 5-11)

Dane County recommends entering into an intergovernmental agreement with Madison and the Town of Burke defining the "airport affected area". The full three mile area specified in the Wisconsin Act 136 statute would cover a very large area, much more than would be significantly affected by aircraft operations at an airport of this size. By defining a somewhat smaller area, it should make compliance with the requirements of the Act more manageable for the airport staff as well as the County, Town, and City planning staffs.

In 1985, the Wisconsin legislature adopted Wisconsin Act 136, Wis. Stat. 66.31, to promote the public interests in aviation. The law has three key provisions. First, each municipality with a development plan must show the location of any publicly owned airport and "airport affected areas". These are defined as areas within three miles of the airport, although smaller areas can be defined through intergovernmental agreements. Second, the municipality with zoning authority must notify the airport owner of proposed

zoning changes within the "airport affected area". Third, if the airport owner objects to the proposed zoning change, a two-thirds vote of the municipal governing body is required to approve the change.

For purposes of implementing and administering Act 136 in the Madison area, it would be acceptable to define the "airport affected area" as shown in **Exhibit 5D.** The area is based on a composite of the DNL 60 dB contour for 1995 baseline conditions and for noise abatement plan conditions. It also includes an approximation of the training pattern area for the proposed parallel runway (18L-36R). The training pattern area extends 8,000 feet off each end and 10,000 feet east of the proposed runway.

APPROVED.

LU-3 Dane County, City of Madison -- Adopt Airport Noise Overlay Zoning
(Pages 4-35, 5-11 thru 5-12, Appendix D-8)

Dane County officials propose they and the City of Madison consider the adoption of airport noise overlay zoning. One overlay district should be established with the boundaries corresponding to a composite of the DNL 65 dB noise contours for the 1995 baseline conditions and the 1995 noise abatement plan conditions. That is, the boundary should be the outermost line defined by overlaying the DNL 65 dB contours for 1995 conditions with and without the noise abatement plan. (Suggested language for noise overlay zoning is in **Appendix D.**)

Airport noise overlay zoning establishes special standards within a noise- impacted area to help mitigate the problems caused by noise. These provisions supplement the standards of the underlying zoning classifications and would apply only to new development.

Proposed overlay zone boundaries are shown in **Exhibit 5E** (following page 5-12 of the NCP). It is recognized that the local jurisdictions may wish to make adjustments to these boundaries to relate better to local land use planning needs. For example, they may wish to adjust the boundaries to follow streets, railroads, section lines, quarter-section, and quarter-quarter-section lines in order to facilitate agreement as to the precise location of the boundaries and to simplify administration of the regulations.

Within the noise overlay zoning district, it is proposed that the development of new noise-sensitive land uses would be prohibited. This would include residential uses, churches, schools, nursing homes, day care centers, and

hospitals and clinics. Exceptions would be made for existing lots of record. Noise-sensitive uses could be permitted on existing lots of record provided that the structures are sound-insulated to achieve an outdoor to indoor noise level reduction of 25 decibels.

The intent of the lot of record provision is to avoid creating severe hardships for the owners of undeveloped and platted lots. It is also intended to permit the owners of structures which may be destroyed to rebuild them.

Considerable developed land in Madison, south of the airport, is within the boundaries of the airport noise overlay zone. In order to prevent the regulations from causing problems for existing homes, which would be considered legal non-conforming uses under the terms of the proposed noise overlay zoning ordinance, language should be adopted to exempt existing homes from the effect of the regulations. It is not intended that the regulations should be interpreted to require sound insulation, for example, for existing homes undergoing expansion or remodeling.

The airport noise overlay zoning provisions also should include a requirement to notify the airport management of any land use development proposals within the overlay zone which require discretionary review or approval by the zoning boards of appeals, the planning commissions, the county board, or the city council. This is intended to give the airport management an opportunity to review and comment on applications for variance, conditional use, rezoning, and subdivision plat approval. This special notification requirement is not intended to apply to simple applications for building and zoning permits and occupancy certificates.

APPROVED.

LU-4 Dane County, City of Madison -- Amend Subdivision Regulations to Require Dedication of Noise and Avigation Easements or Plat Notes on Final Plat (Pages 4-37 thru 4-38, 5-12 thru 5-13, Appendix D-13)

Dane County proposes they, along with the City of Madison, consider amending their subdivision regulations to require the dedication of noise and avigation easements for any new subdivisions within an airport compatibility overlay zone. While the noise overlay zoning regulations should restrict the opportunities for land subdivision, this measure is recommended to provide some back-up protection in the event of unforseen events. (Suggested language for the subdivision regulation amendment is in **Appendix D.**)

The purpose of the noise and avigation easements is to put owners of property on notice that their land is subject to

frequent aircraft overflight and potentially disturbing levels of aircraft noise. The easement also would protect the airport proprietor, i.e. Dane County, from lawsuits claiming damages for noise or other airport activities. (This protection from suit would benefit only the airport proprietor, not private individuals or corporations.)

While this easement dedication requirement is considered fair and justified, both in terms of protecting the airport and in terms of providing a means of disclosing important information about a property, it may be sensitive from a legal standpoint. The consultant is unaware of any specific litigation, in any state, on the legality of dedicated noise and avigation easements. Based on a broad interpretation of the general welfare criterion, and based on longstanding legal traditions in land use control, the dedication of noise and avigation easements is clearly defensible. On the other hand, recent decisions of the U.S. Supreme Court indicate that the court is beginning to scrutinize land use controls and development exactions with a view toward vigorous protection of private property rights. (See, for example, **Nollan v. California Coastal Commission**, 107 S. Ct. 3141, 1987.) **It is important that the City and County attorneys carefully review this easement dedication proposal before it is adopted.**

If the County and City should determine that the required dedication of noise and avigation easements is not legally acceptable, they should consider a back-up measure requiring notices of potentially high noise levels to be placed on the final plat of subdivisions within the noise overlay zone. This would serve as a limited means of providing fair disclosure of the potential for disturbance caused by aircraft noise.

APPROVED.

LU-5 Dane County -- Consider Amending Subdivision Regulations to Prevent Subdivision of Land Zoned A-1 Agriculture (Pages 4-37 thru 4-38, 5-13)

Dane County proposes amending its subdivision regulations to prevent the subdivision of land zoned A-1, agriculture. This is envisioned as a means of protecting prime farmland and for urban growth management. To the extent this measure would apply to areas within the noise overlay zone and outlying areas subject to frequent aircraft overflights, it would also promote airport land use compatibility.

APPROVED.

LU-6 Dane County, City of Madison -- Amend Building Codes to

Provide Soundproofing Standards for Noise-Sensitive Development in Airport Noise Overlay Zones (Pages 4-39 thru 4-40, 5-13, Appendix D-16)

Dane County officials recommend they and the City of Madison consider adopting local amendments to the building code to provide soundproofing standards to apply within the airport noise overlay zone. This would implement the sound insulation standards contained in the overlay zoning ordinance. Since non-compatible development would be permitted only on existing lots of record, it is anticipated that these standards would receive only limited use. (Suggested language for the building code amendment is in **Appendix D.**)

It will be important for the City and County to adequately train their inspections staffs to be able to perform satisfactory inspections of sound insulation improvements. This may require special training. It may also require extra administration and extra inspections as construction occurs. The City and County should pass on any additional costs to the builder/developer through the inspections fees.

APPROVED.

LU-7 Dane County, City of Madison, Town of Burke -- Amend Local Land Use Plans to Reflect Noise Compatibility Plan Recommendations and Establish Airport Compatibility Criteria for Project Review (Pages 4-41 thru 4-42, 5-13 thru 5-14)

Dane County officials recommend they, the City of Madison and the Town of Burke amend their land use plans to reflect the recommendations of the Noise Compatibility Plan. The Noise Compatibility Plan sets forth a plan for the airport area which has been coordinated with all of the jurisdictions as well as with the airport staff. It can continue to be important in ensuring land use planning coordination in the airport area. It is important for all jurisdictions in the airport study area to officially acknowledge their separate and mutual interests in order to facilitate coordination in this important area.

While the proposed ordinance amendments will go far to ensure land use compatibility in the area, the land development process is not static. Over time, situations will arise requiring local planning staffs, planning commissions, and governing boards to make decisions on land use changes in the area. The adoption of project review criteria as part of the local land use plans, requiring the consideration of airport noise and land use compatibility, would help ensure that this important concern is not neglected during future land use deliberations.

The following guidelines will be considered. They should apply within all areas subject to noise above DNL 60 dB.

A. Determine the sensitivity of the subject land use to aircraft noise exposure levels. The F.A.R. Part 150 land use compatibility table can be used for this purpose.

B. Advise the airport management of development proposals involving noise-sensitive land uses within the DNL 60 dB noise contour.

C. Locate noise-sensitive public facilities outside the DNL 65 dB contour, if possible. Otherwise, encourage building construction to attenuate interior noise levels to DNL 45 dB.

D. Discourage the approval of urban service area amendments, rezonings, exceptions, variances, and conditional uses which introduce noise-sensitive development into areas impacted by noise exceeding DNL 65 dB. Consider similar limitations in areas impacted by noise above DNL 60 dB.

E. Where development within the DNL 60 dB contour must be permitted. encourage developers to incorporate the following measures into their site designs.

(1) Where noise-sensitive uses will be incorporated into a larger, mixed use building, locate noise-sensitive activities on the side of the building opposite the airport or, if the building is beneath a flight track, opposite the prevailing direction of aircraft flight.

(2) Where noise-sensitive uses are part of a larger mixed use development, use the height and orientation of compatible uses, and the height and orientation of landscape features such as natural hills, ravines and manmade berms, to shield noise-sensitive uses from ground noise generated at the airport.

APPROVED.

LU-8 Dane County -- Follow through with Planned Land Acquisition in Cherokee Marsh and Token Creek Park Areas
(Pages 4-45 thru 4-46, 5-14 thru 5-15, Comment 20 of Responses to FAA Review Comments)

Dane County proposes the purchase of the three unlabeled parcels (pink with green border, north and northwest of the

airport) shown on **Exhibit 5F** (following page 5-14 of the NCP). The three areas, which total approximately 178 acres, are eligible for FAA funding assistance through the noise set-aside of the Airport Improvement Program since they lie within the DNL 65 dB contour and are presently zoned single family residential according to **Exhibit 1H** (following page 1-27 of the NEM).

Exhibit 5F also shows existing park and open space land on the north side of the airport. Most of this is in the Cherokee Marsh Open Space Area. The Cherokee Marsh Revised Long-Range Open Space Plan (September 1981) proposes the acquisition of all of the shaded area as indicated on the exhibit. The Noise Abatement Plan calls for the use of the north side of the airport in order to reduce to the degree possible noise over developed areas to the south. By following through with the Cherokee Marsh Open Space program, the County will be helping to promote airport land use compatibility while also achieving the direct objective of the Open Space Plan.

APPROVED. However, a caveat is added concerning the potential non-compatibility of some "parks/open space" with aeronautical activities. Park uses sensitive to noise such as the congregation of people for educational, entertainment or camping activities or uses increasing bird activity such as wetland enhancement may not be compatible land uses.

LU-9 Dane County -- Consider Expanding Land Acquisition Boundaries in Cherokee Marsh and Token Creek Areas (Pages 4-45 thru 4-46, 5-15 Comment 20 of Responses to FAA Review Comments)

Dane County proposes to purchase the three parcels, B, C, and D, depicted on **Exhibit 5F** for parks and open space expansion. Parcel B is approximately 30 acres in size, Parcel C approximately 190 acres, and Parcel D approximately 50 acres. All are within the DNL 65 dB contour of the 1995 Noise Abatement Plan and presently zoned single family residential. Thus, acquisition costs would be eligible for FAA funding assistance through the noise set-aside of the Airport Improvement Program.

APPROVED. However, a caveat is added concerning the potential noncompatibility of some "parks/open space" with aeronautical activities. Park uses sensitive to noise such as the congregation of people for educational, entertainment or camping activities or uses increasing bird activity such as wetland enhancement may not be compatible land uses.

LU-10 Dane County -- Establish Sales Assistance or Purchase Assurance Program for Homes Impacted by Noise Above

DNL 70 dB (Pages 4-48 thru 4-51, 5-15)

Dane County recommends establishing a sales assistance or purchase assurance program which would apply to single-family homes within the DNL 70 dB contour, generally based on a combination of the 1995 baseline and noise abatement plan contours. **Exhibit 5G** shows the areas which would be affected. The boundaries have been squared off to follow lot lines and streets. South of the airport, the qualifying area is bounded by Aberg Avenue on the north, Washington Avenue on the east and south, and Pawling and North Lawn Avenue on the west. To the north, a few scattered homes on County Road CV and Hoepker Road are included. An estimated 216 homes are within the entire area, including 210 on the south side and 6 on the north side.

The intent of these programs would be to provide homeowners who are severely disturbed by noise the assurance that they could leave the neighborhood without risking financial penalty. With a purchase assurance program, the County would be the buyer of last resort. If, after a given period of time on the market, the homeowner was unable to sell the home for fair market value, as determined through professional appraisals, the County would buy the home. Program guidelines protecting the interests of the County and making the program fair and reasonable in scope would be adopted. The County would then retain a noise and avigation easement and sell the home, accepting a loss if necessary to put the home back on the tax rolls. While the property were under public ownership, it could be soundproofed or otherwise rehabilitated, if housing rehab were an objective.

A drawback of this program is the need for potentially significant administrative support. The program also raises the risk that the airport will have to be involved in property ownership and management with the various problems that entails, such as security and maintenance.

The net costs of a purchase assurance program are impossible to estimate. However, for planning purposes a total cost estimate of $17.9 million has been made. This assumes the net cost to the airport would be 10 percent of the appraised value of the homes. The cost is based on a 100 percent participation rate, so it should describe an extreme, and ultimately unrealistically high situation, although it is an estimate of the County's potential financial involvement.

A sales assistance program would operate in a similar fashion, but the County would never take title to the property. The County would make up the difference between fair market value and the best purchase offer made on the home. The County would secure a noise and avigation easement from homeowners in return for their participation in the program.

In order to prevent collusion between buyer and seller, to the detriment of the County, the airport would approve the listing price for a home and any downward adjustments of that price. This program would achieve generally the same objectives as the purchase assurance program and would probably be easier to administer. It would, however, lack the potential to facilitate housing rehabilitation and soundproofing as easily. Total costs are estimated to be equivalent to the purchase assurance program.

Purchase assurance and sales assistance programs are limited measures which are intended to provide a means of responding to the most heavily impacted people without demolishing neighborhoods and permanently disrupting the tax base. The programs are unlikely to be used by everyone who potentially may qualify which has the added advantage of keeping the cash flow requirements manageable.

It is intended that any given home would only be eligible for this program once. After the County has secured a noise and avigation easement from a home, it would no longer be eligible for the program.

APPROVED.

LU-11 Dane County -- Install Sound Insulation for Schools Impacted by Noise Above DNL 65 dB (Pages 4-51 thru 4-53, 5-16)

Dane County proposes sound insulation for two schools impacted by noise above DNL 65 dB, based on 1995 baseline conditions. These are Holy Cross Lutheran School on Milwaukee Avenue and Lowell School, just north of Lake Monona. It is proposed that sound insulation be installed in both schools.

For planning purposes, soundproofing costs have been estimated at $500,000 for Lowell School and $300,000 for Holy Cross School. While these should be good enough for planning purposes, reliable estimates can only be developed after a detailed inspection of the buildings by a qualified acoustical engineer.

It is recommended Dane County cooperate with the owners, the school district and the church, to arrange for these projects. It is important for both school operators to understand that effective sound insulation depends on the schools keeping their windows closed. This could result in higher heating and cooling costs. While the capital costs of the sound insulation project are eligible for 90% FAA funding assistance, all operating costs must be borne by the school operators. These important cost implications should

be given serious attention before the school operators commit to sound insulation.

APPROVED.

CONTINUING PROGRAM

CP-1 Program Monitoring And Contour Updating (Pages 5-16 thru 5-17)

Dane County recommends that airport management maintain communications with the Madison city planning department and the Dane County Regional Planning Commission to follow their progress in implementing the land use management plan.

The airport management also must take steps to monitor compliance with the noise abatement plan. This includes checking periodically with the air traffic control tower regarding compliance with the air traffic control procedures. The airport management should also check with air carriers, business users, and military users. This can serve as a friendly reminder as to the importance which the airport management places on the program while providing an opportunity to find out about any difficulties with the application of the noise abatement measures.

Noise contour maps should be updated approximately every five years, or more often if equivalent operations levels change significantly in comparison with existing or forecast conditions. As a rule of thumb, the trigger for determining the need for contour updating is a 17% change in equivalent operations by jet aircraft, based on the FAA's Area Equivalency Method (AEM) for estimation of noise contour areas. To calculate "equivalent operations", all nighttime operations, (between 10:00 p.m. and 7:00 a.m.) must be multiplied by ten and added to daytime operations. Noise contours should be mapped and compared to previously calculated noise contours to identify significant changes, namely changes exceeding DNL 1.5 dB.

APPROVED.

CP-2 Evaluation and Update of the Plan (Page 5-17)

Dane County proposes to periodically review the Noise Compatibility Plan and consider revisions and refinements as necessary. It is important that any proposed changes be reviewed by the FAA and all affected aircraft operators and local agencies. Proposed changes should be submitted to FAA for approval after local consultation and a public hearing

in order to comply with F.A.R. Part 150.

It is anticipated that a complete plan update will be needed periodically to respond to changing conditions in the local area and in the aviation industry. A plan update can be anticipated every six to eight years. An update may be needed sooner, however, if major changes occur and later if conditions at the airport and in the surrounding area remain stable.

APPROVED.

CP-3 Complaint Response (Page 5-17)

Dane County recommends that airport management acknowledge and respond to noise complaints, even if it is not possible to take remedial action. It should be recognized that complaints are only an imperfect indicator of noise problems. The tendency of an individual to file a complaint depends on many personal variables including socioeconomic status, feelings about the aviation industry, expectations about overall neighborhood livability, housing tenure, and sensitivity to noise. Recognizing that complaints are limited in their ability to clearly elucidate the existence of noise problems, the staff should nevertheless periodically analyze the complaint records. If the geographic pattern of complaints, or the causes of complaints, indicate that consistent problems exist, the airport management should investigate and, if possible, seek corrective action.

The airport has a well-organized system of recording and responding to noise complaints. The staff has recently computerized the noise complaint records, enabling analysis of complaint trends to be handled relatively easily. The airport should maintain and enhance this system as necessary. The airport management should also be sure to get copies of any noise complaints received by the air traffic control tower.

APPROVED.

HMMH
700 District Avenue, Suite 800
Burlington, MA 01803
781.229.0707

TECHNICAL MEMORANDUM

To:	Michael Kirchner, Engineering Director
From:	Eugene Reindel, Principal in Charge
	Timothy Middleton, C.M., Principal Consultant
Date:	October 13, 2022
Subject:	Dane County Regional Airport – Truax Field (MSN) Part 150 Update Noise Compatibility Program (NCP) Review
Reference:	HMMH Project Number 312360

Harris Miller Miller & Hanson Inc. (HMMH), in association with Jones Payne Group (JPG) and Mead & Hunt (M&H) (the Study team), is assisting Dane County in completing a Noise Compatibility Planning Study (the Study) in accordance with Title 14 of the Code of Federal Regulations Part 150 (14 CFR Part 150 or simply "Part 150"). The Study includes two major elements: (1) Noise Exposure Map (NEM) and (2) Noise Compatibility Program (NCP).

Dane County completed its first Part 150 Study for MSN and submitted the documentation to the FAA in 1991. In 1993, the Federal Aviation Administration (FAA) provided a Record of Approval (ROA) which approved, in whole or in part, all twenty Dane County-recommended NCP measures, the ROA is attached as an appendix to this memo for reference. This memorandum presents the results of the Study team's review of the existing NCP including the implementation status and current compliance for each of the approved 1991 NCP measures.

The 1991 Part 150 documentation includes a detailed description of the development of the NCP and analyses of the benefits of each measure considered. The MSN NCP measures focus on the following three strategies to reduce or prevent noncompatible land use:

1. Noise Abatement (NA)
2. Land Use (LU), including noise mitigation
3. Program Management (PM)

Table 1 lists a brief description of the 1991 study's Dane County-recommended and FAA-approved NCP measures. As a part of this (2022) Part 150 Study, Dane County will determine, for each measure recommended in the 1991 MSN NCP, whether to:

- Continue with the measure as written
- Continue with the measure with minor modifications
- Eliminate the measure

In the event Dane County determines to continue with NCP measures with minor modifications and/or eliminate measures, the 2022 Part 150 Update will include a proposed "amendment" to the MSN NCP.

Table 1. NCP Measures Included the Original Part 150 Study, submitted in 1991

Noise Abatement Measures	Land Use Measures	Programmatic Measures
1. Continue the existing runway use program **/***	1. Maintain existing compatible zoning in the airport vicinity *	1. Program monitoring and noise contour updating *
2. Continue requiring aircraft departing on Runway 31 to pass through 2,500 feet MSL (1,600 feet above ground level) before turning left **	2. Define "airport affected area" for purposes of implementing Wisconsin Act 136 *	2. Evaluation and update of the plan *
3. Establish visual approach and departure corridors for helicopters **	3. Adopt airport noise overlay zoning *	3. Noise complaint response *
4. Encourage use of noise abatement departure procedures by operators of jet aircraft ***	4. Amend subdivision regulations to require dedication of noise and avigation easements of plat notes on final plat *	
5. Encourage Air National Guard to construct a hush house for a A-16 engine maintenance runups prior to converting its fleet ***	5. Consider amending County subdivision regulations to prevent subdivision of land zoned A-1 Agriculture *	
6. Build new 6,500 foot Runway 3-21 *	6. Amend building codes to provide soundproofing standards for noise-sensitive development in airport noise overlay zones *	
7. Adopt runway use system preferring departures on Runways 3, 31, and 36 and arrivals on Runways 13, 18, and 21 ***	7. Amend local land use plans to reflect noise compatibility plan recommendations and establish airport compatibility criteria for project review *	
8. Require east and southbound aircraft exceeding 12,500 pounds and departing on Runway 3 to climb on runway heading through 2,500 feet MSL before turning right **	8. Follow through with planned land acquisition in Cherokee Marsh and Token Creek Park areas *	
9. Require all aircraft exceeding 12,500 pounds and departing Runway 21 to turn left 10 degrees as soon as safe and practicable **	9. Consider expanding land acquisition boundaries in Cherokee Marsh and Token Creek areas *	
	10. Establish sales assistance or purchase assurance program for homes impacted by noise above 70 Ldn *	
	11. Install sound insulation for schools impacted by noise above 65 Ldn *	

** - Approved*
***- Approved in part*
****- Approved as a voluntary measure*

1 Review of Noise Abatement Measures

Noise abatement measures are those that control noise at the source; such measures, as shown in the table above, include airport layout modifications, noise barriers, flight path changes, preferential runway use, and arrival and departure procedures. The intention of noise abatement measures in the NCP is to reduce the number of people and noise-sensitive properties exposed to aircraft noise of 65 DNL (Day-Night Average Sound Level[1]) or greater.

Dane County-recommended noise abatement measures contained in the FAA's ROA were reviewed to assess implementation status and compliance with those measures implemented. As part of the Part 150 study, flight track and aircraft identification data for MSN was acquired from Envirosuite[2] for the calendar year 2021. This data provided the primary basis for evaluating the extent to which the approved noise abatement measures from the original 1991 MSN NCP are implemented and in compliance with the intent of measures.

Table 2 lists the nine (9) Dane County-recommended noise abatement measures approved by the FAA and summarizes the status of each measure as described in the 1991 NCP and 1993 ROA.

Table 2. Status of 1991 NCP Noise Abatement Measures

Measure Number	Flight Procedures Addressed	Implementation Status
NA-1	Continue the existing runway use program	Superseded by NA-7
NA-2	Continue requiring aircraft departing on Runway 31 to pass through 2,500 feet MSL (1,600 feet above ground level) before turning left	Implemented
NA-3	Establish visual approach and departure corridors for helicopters	Implemented
NA-4	Encourage use of noise abatement departure procedures by operators of jet aircraft	Implemented
NA-5	Encourage Air National Guard to construct a hush house for F-16 engine maintenance runups prior to converting its fleet	Implemented
NA-6	Build new 6,500-foot Runway 3-21	Implemented
NA-7	Adopt runway use system preferring departures on Runways 3, 31, and 36 and arrivals on Runways 13, 18, and 21	Implemented
NA-8	Require east and southbound aircraft exceeding 12,500 pounds and departing on Runway 3 to climb on runway heading through 2,500 feet MSL before turning right	Implemented
NA-9	Require all aircraft exceeding 12,500 pounds and departing Runway 21 to turn left 10 degrees as soon as safe and practicable	Implemented

The following subsections provide full descriptions of the noise abatement measures, implementation status, and compliance with each measure implemented as compared to the intention with the measure as provided in the 1991 NCP. For clarity, it is worth noting that Runway 13-31 has been renumbered to 14-32 since the

[1] The Day-Night Average Sound Level represents the noise energy present during a 24-hour period. DNL represents a weighted average of the noise level over a 24-hour period. Weighting is applied to noise events occurring at night (10:00 p.m. to 7:00 a.m.), with 10 dB added to the actual nighttime sound level. This 10 dB weighting accounts for greater sensitivity to nighttime noise, and the fact that events at night are often perceived to be more intrusive than daytime events.

[2] https://envirosuite.com/

1991 NCP and associated ROA was published. When the recommended noise abatement procedures refer to Runway ends 13 or 31, the analysis will show Runway ends 14 or 32, respectively, for consistency with the current runway numbers in effect at MSN.

The airport's ability to implement the existing NCP Noise Abatement Measures was impacted by weather conditions. Per company policy, most air carriers operating cannot conduct tail wind operations when winds are greater than 5 knots. Historically, the wind at DCRA is greater than 5 knots approximately 90 percent of the time based on a recent annual audit. This percentage is confirmed by the National Weather Service (NWS). Wind speed and direction are the most significant factors in the runways used and direction aircraft arrive and depart the airport.

1.1 NA-1: Continue the existing runway use program

Dane County has a runway use program preferring Runways 31 and 36 for takeoff and Runways 18 or 13 for landing by all aircraft over 12,500 pounds, weather and traffic permitting. This directs aircraft to and from the north, away from Madison. While traffic at Madison and congestion at destination airports is making this program more difficult to observe, it should remain in place.

Implementation Status: N/A.
Replaced by NA-7, which includes the new runway 3-21 (NA-6).

Compliance: N/A.
See NA-7, which includes the new runway 3-21, for details.

1.2 NA-2: Continue requiring aircraft departing on Runway 31 to pass through 2,500 feet MSL (1,600 feet above ground level) before turning left

This measure is intended to keep low flying aircraft from turning directly over the Cherokee subdivision west of the airport. This procedure is now in place and should be continued.

Implementation Status: Implemented.

Compliance: Low.

The following analysis was used to determine compliance. The development of Tower Order 8400.9H establishes this Noise Abatement procedure has been implemented. Aircraft departures from Runway 32 in 2021 were analyzed using a gate positioned in parallel to Runway 32 (shown as a black diagonal line among the green Runway 32 departure flight tracks in the figure below) to determine the altitude of the flights upon turning left off of the Runway extended centerline. Of all the tracks that turned left, only 54% (1,114 out of the 2,048 jet operations) were at or above 2,500 feet when passing through the analysis gate.

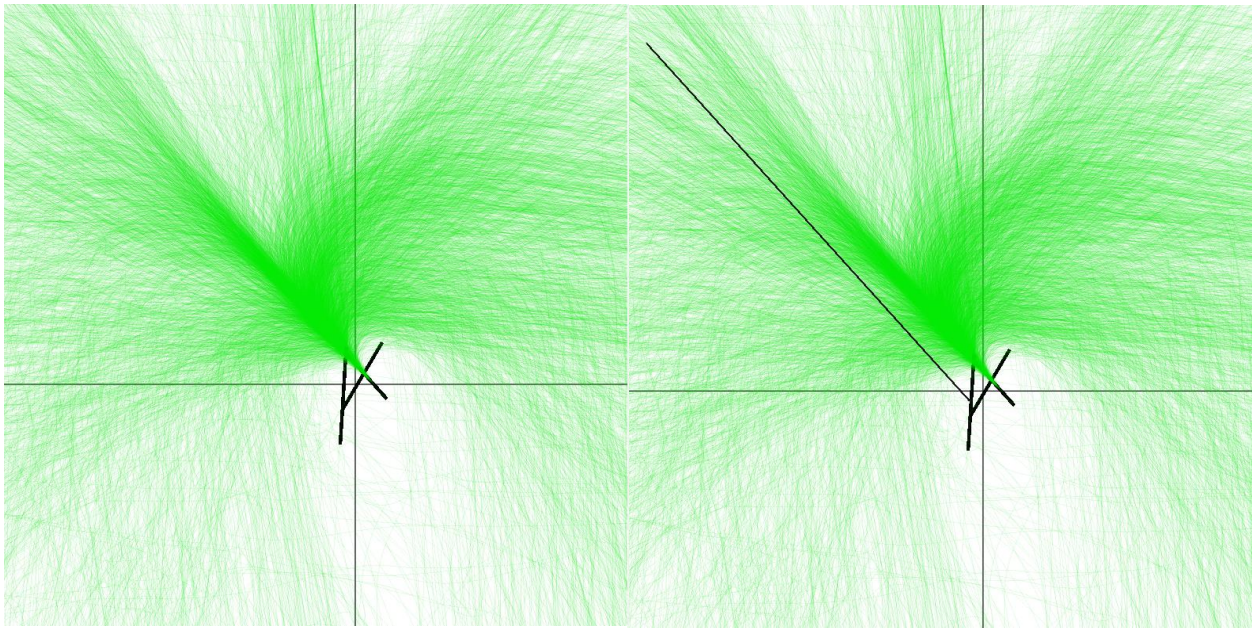


Figure 1: Departure Flight Tracks on Runway 32 with (right) and without (left) the Analysis Gate
Source: HMMH

1.3 NA-3: Establish visual approach and departure corridors for helicopters

Three noise-compatible corridors extending to the northwest and northeast over undeveloped areas and to the south and east over State Highway 30 and commercial areas have been defined. When weather and traffic conditions permit, helicopters should be routed over these corridors. This would remove low-flying helicopters from residential areas under visual flying conditions.

Implementation Status: Implemented.

Compliance: Low.

The following analysis was used to determine compliance. The development of Tower Order 8400.9H establishes this Noise Abatement procedure has been implemented. Figure 2 shows the suggested checkpoints to be used to define three corridors for helicopters to use when arriving or departing from MSN. These corridors and checkpoints were replicated using gates to represent each checkpoint – if helicopters were using these checkpoints, a wide majority of helicopter operations would be contained within the three gates defined.

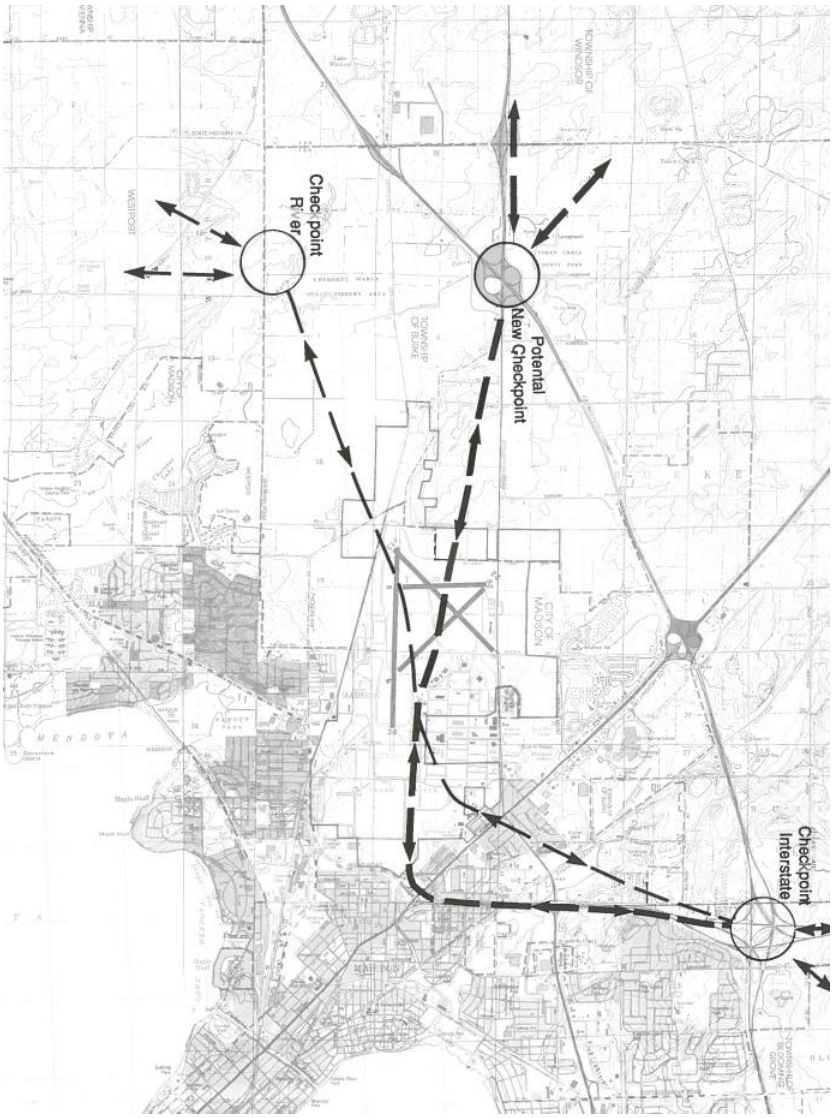


Figure 2: 1991 NA-3 Diagram of Suggested Helicopter Corridors
Source: MSN Part 150 Noise Compatibility Program Summary, February 1991

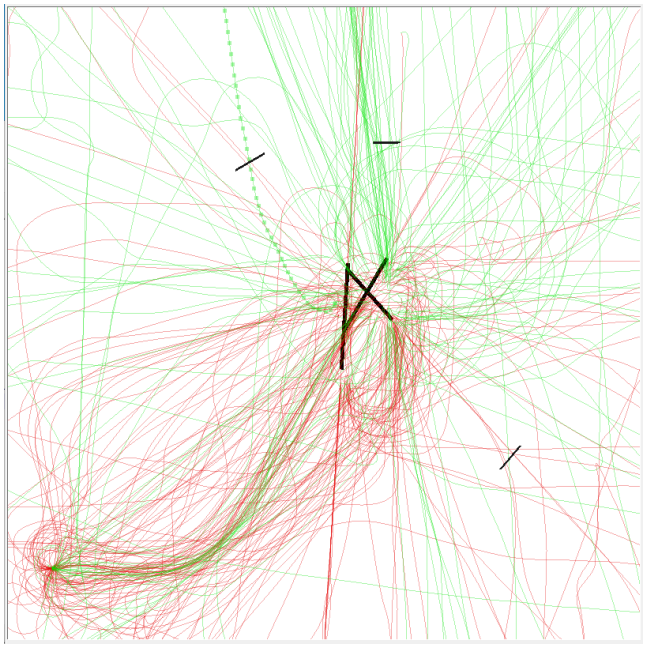


Figure 3: Helicopter Operations, with Gates corresponding to NA-3 Checkpoints
Source: HMMH, 2022

As Figure 3 shows, there is no clear pattern to which the helicopter operations comply to NA-3. Notably, our analysis shows that it appears operations seem to focus traffic to and from Verona Airport to the southwest of MSN. A conversation may be needed with local FAA depending on MSN staffs review and comment on this memo.

1.4 NA-4: Encourage use of noise abatement departure procedures by operators of jet aircraft

All airlines have established noise abatement departure procedures involving a thrust cutback after takeoff. A standard procedure is also available to operators of business jet aircraft – the NBAA standard departure procedure. In addition, some aircraft manufacturers describe noise abatement departure procedures in the operator's manuals. The airport management should encourage operators of jet aircraft to use the appropriate noise abatement departure procedure for their type of aircraft.

Implementation Status: Implemented.

Compliance: High.

Information from MSN staff and those familiar with tower procedures suggests strong compliance with NA-4 via relevant signage up around the airport, runways, and airport facilities to inform pilots of the noise abatement procedures. Additionally, this measure is a priority of both MSN staff and tower operators and is used by the tower whenever possible. The continued usage of noise abatement procedures is a frequent subject during airport meetings. It is currently not possible to determine compliance through data analysis so we must rely on the self-reporting of aircraft operators.

1.5 NA-5: Encourage Air National Guard to construct a hush house for F-16 engine maintenance runups prior to converting its fleet

The Air National Guard anticipates the replacement of the A-10 aircraft with the F-16 within the next several years. The A-10 is a very quiet aircraft, and noise from engine maintenance runups is not severe. Noise from F-16 runups, however, is much louder. The Guard plans to construct a noise suppression structure, commonly called a "hush house" for attenuating the noise from F-16 engine runups. Airport management should encourage the Guard to follow through with those plans.

Implementation Status: Implemented.

Compliance: High.

The Hush House constructed specifically for F-16 runups is set to be phased out as part of the conversion of the fleet to F-35A aircraft. Upon complete conversion of the fleet, this measure will no longer be implemented due to the Hush House's lack of compatibility with the F-35A.

1.6 NA-6: Build new 6,500-foot Runway 3-21

As operations increase, the airport will not be able to continue accepting arrivals from the north and sending departures to the north unless a new runway becomes available. The present contra-flow procedure (described in Measure 1 above) requires long separations between aircraft, which can increase delays. This will become an increasingly serious problem as traffic at Madison and congestion at destination airports increase. Construction of Runway 3-21 would allow the airport to continue operating with an improved version of its present contra-flow runway use program. The modified program is explained in Measure NA-7 below.

Implementation Status: Implemented.

Compliance: N/A.

1.7 NA-7: Adopt runway use system preferring departures on Runways 3, 31, and 36 and arrivals on Runways 13, 18, and 21

After Runway 3-21 is built, the existing runway use program should be changed to account for the use of the new runway. Departures would be encouraged on Runway 3 and arrivals on Runway 21. By continuing to favor departures to the north and arrivals from the north, the revised program would continue providing noise abatement to the heavily populated areas south of the airport.

Implementation Status: Implemented.

Compliance: Moderate.

The following analysis was used to determine compliance. The development of Tower Order 8400.9H establishes this Noise Abatement procedure has been implemented. **Table 3** presents the runway use across all operations in a sample of data from MSN. The table shows that 51% of departures and 51% of arrivals comply with NA-7 Runway Use. Please note that this data does not consider aircraft weight, which is explored further in Table 4. Bolded cells represent those operations compliant with the preferential runway usage favoring departures to the north and arrivals from the north.

To account for aircraft weight, in **Table 4**, the same data is shown for only jet aircraft departing or arriving their respective runways. As a category, jet aircraft have the largest number of models over 12,500 pounds, so this category can be used as a better estimate of compliance as intended by this measure. Included **Table 4** as well is a change in percent column which represents whether runway usage increased or decreased for jets compared to the entire data set. The rows which correspond to the compliant usages have been bolded as in Table 3. As shown compliant jet aircraft operations make up 50% of departures and 50% of arrivals – not as high as expected from a "preferential runway use program".

Table 3. Runway Use

Runway	Number of Departures	Departure Percentage	Number of Arrivals	Arrival Percentage
3	**685**	**3%**	1202	5%
14	263	1%	**1153**	**5%**
18	5707	25%	**6549**	**28%**
21	5193	23%	**4082**	**18%**
32	**5124**	**22%**	2602	11%
36	**6052**	**26%**	7617	33%
Total	23024	100%	23205	100%

Source: HMMH, 2022

Table 4: Runway Use by Jet Aircraft Types

Runway	Number of Departures	Departure Percentage	Change from All Aircraft Types, Departures	Number of Arrivals	Arrival Percentage	Change from All Aircraft Types, Arrivals
3	**363**	**2%**	**-1%**	450	3%	-2 %
14	52	0%	-1%	**346**	**2%**	**-3 %**
18	5570	35%	+10%	**5791**	**37%**	**+2 %**
21	2182	14%	-9%	**1658**	**11%**	**-7 %**
32	**1913**	**12%**	**-10%**	517	3%	-8 %
36	**5738**	**36%**	**+10%**	6897	44%	+11%
Total	15818	100%		15659	100%	

Note: Totals may not match exactly due to rounding

Source: HMMH, 2022

Table 4 shows the tendency for jet aircraft to consistently depart and arrive from runways 18 and 36. These runways are the only runways which have an increase in percentage of operations when looking at jets rather than the entire aircraft operations sample. If there was strict compliance to the preferential runway use, this data would show a higher percentage of operations in the cells that have been highlighted. Instead, there remains departures on runway 18 and arrivals on runway 36 that correspond with opposite aircraft flow which is not the intent of this measure. However, given the fact that 90% of the time winds are 5 knots or greater, more research is required to determine whether northerly operations tend to occur on days when winds are less than 5 knots.

1.8 NA-8: Require east and southbound aircraft exceeding 12,500 pounds and departing on Runway 3 to climb on runway heading through 2,500 feet MSL before turning right

This is intended to avoid departure turns at low altitude over populated areas northeast of the new Runway 3-21. This procedure would require aircraft to climb to 1,600 feet above the ground before beginning right turns.

Implementation Status: Implemented.

Compliance: High.

To evaluate compliance for NA-8, the aircraft types which operate at MSN were researched to determine their weight. Once weight was determined, those that were above 12,500 lbs. were selected from the departures on Runway 3. Tracks which were not turning right were filtered out of the data set, after which all tracks entering the gate displayed in **Figure 4** were evaluated for their altitude upon crossing. Of the 235 operations which crossed through the gate, 207 of them were at or above 2,500 ft. MSL at the time of their crossing, signifying a relatively high compliance rate of approximately 88%.

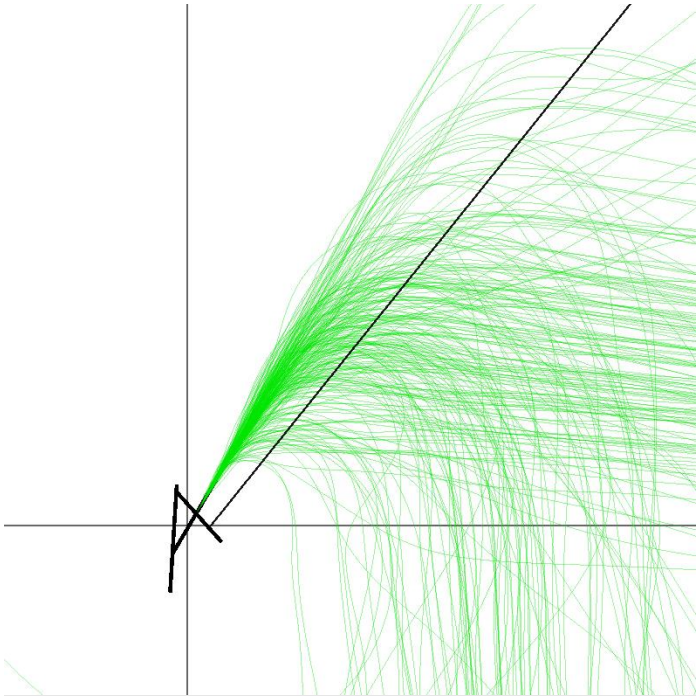


Figure 4: Departures above 12,500 lbs. turning right on Runway 3
Source: HMMH

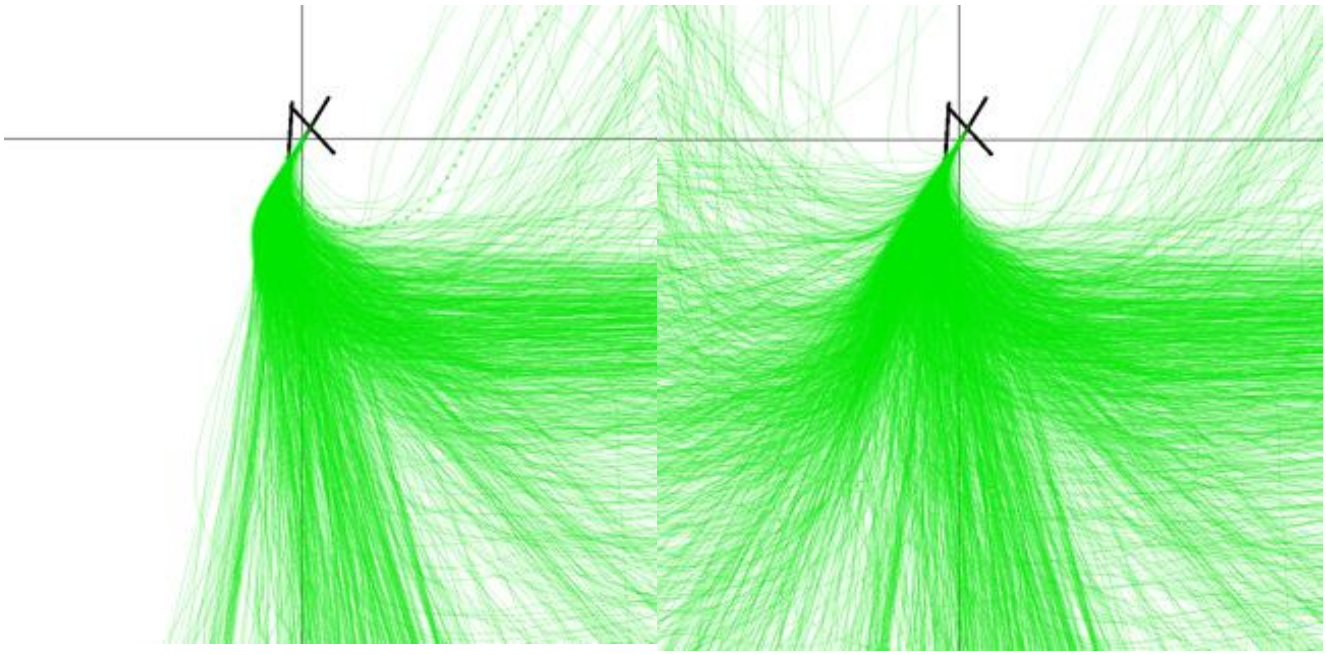
1.9 NA-9: Require all aircraft exceeding 12,500 pounds and departing Runway 21 to turn left 10 degrees as soon as safe and practicable

Straight-out departures and right turns from Runway 21 would cause overflights of residential areas southwest of the airport which have not previously been exposed to low aircraft overflights. While cumulative noise exposure would be quiet low, this 10-degree left turn would put aircraft over the noise compatible corridor extending south-southwest from the airport toward the isthmus.

Implementation Status: Implemented.

Compliance: Low.

The following analysis was used to determine compliance. The development of Tower Order 8400.9H establishes this Noise Abatement procedure has been implemented. To determine compliance with NA-9, the aircraft types which operate at MSN were researched for their weight. Once weight was determined, those that were above 12,500 lbs. and turned left were selected from the departures on Runway 21. Refer to **Figure 5** for the original departures above 12,500 lbs. on runway 21 (at right in the figure), and only those departures that turned left (at left in the figure). Neither of the figures indicate an immediate 10-degree left turn.



Left: Compliant aircraft which completed the 10-degree turn. Right: All departures above 12,500 lbs.

Figure 5: Departures above 12,500 lbs. on Runway 21

Source: HMMH

2 Review of Land Use Measures including Noise Mitigation

The original 1991 Part 150 documentation recommended ten Land Use measures for inclusion in the NCP, all of which were approved. This section lists each of these measures and the status of implementation. Based on the results of the NEM update, Dane County will determine whether the existing land use measures are required to continue to minimize noncompatible land uses within the 65 DNL contour per Part 150 regulations.

Table 5. Status of 1991 NCP Land Use (noise mitigation) Measures

Measure Number	Flight Procedures Addressed	Implementation Status
LU-1	Maintain existing compatible zoning in the airport vicinity	Implemented
LU-2	Define "airport affected area" for purposes of implementing Wisconsin Act 136	Implemented
LU-3	Adopt airport noise overlay zoning	Not Implemented
LU-4	Amend subdivision regulations to require dedication of noise and avigation easements of plat notes on final plat	Implemented
LU-5	Consider amending County subdivision regulations to prevent subdivision of land zoned A-1 Agriculture	Not Implemented
LU-6	Amend building codes to provide soundproofing standards for noise-sensitive development in airport noise overlay zones	Not Implemented
LU-7	Amend local land use plans to reflect noise compatibility plan recommendations and establish airport compatibility criteria for project review	Implemented
LU-8	Follow through with planned land acquisition in Cherokee Marsh and Token Creek Park areas	Not Implemented
LU-9	Consider expanding land acquisition boundaries in Cherokee Marsh and Token Creek areas	Not Implemented
LU-10	Establish sales assistance or purchase assurance program for homes impacted by noise above 70 Ldn	Implemented
LU-11	Install sound insulation for schools impacted by noise above 65 Ldn	Not Implemented

2.1 LU-1: Maintain existing compatible zoning in the airport vicinity

Much land in the airport vicinity is zoned for commercial, industrial open space, and recreation use. All of these zoning categories are compatible with aircraft noise. Dane County and Madison should maintain compatible zoning in the "airport affected area," discussed below and shown on the enclosed map. This would prevent the encroachment of residential development into these areas.

Implementation Status: Implemented.

Measure LU-1 recognizes the significant amount of compatibly zoned land in the vicinity of the Airport and recommends that zoning be maintained by Dane County and the City of Madison. This land, referred to as the "airport affected area," is defined by the 60 dB DNL contour and shown on Exhibit 5D of the NCP. The NCP notes that while compatible zoning should be maintained, changes from one type of compatibility to another is acceptable.

The measure was implemented through Dane County Ordinance, Chapter 78. The ordinance defines the "airport affected area" via the "Airport Affected Area Map," dated 1996 and on record at the county clerk's office.

Figure 6 on the next page shows the "airport affected area" as defined in the original 1991 NCP Document. No such map was discovered in the County records during review of this measure.

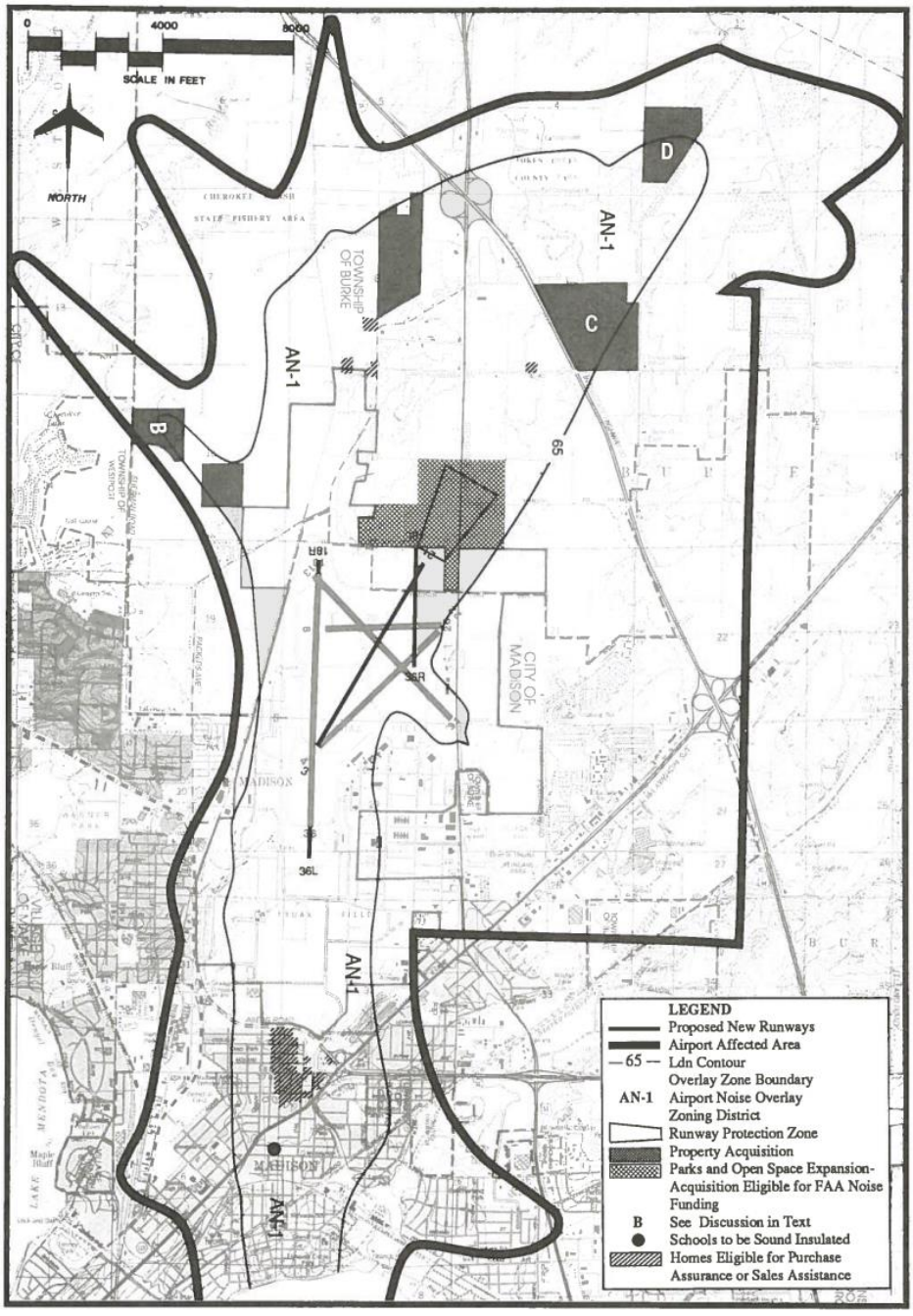


Figure 6: Approximate Airport Affected Area as of 1991
Source: 1991 MSN Part 150 Noise Compatibility Study

2.2 LU-2: Define "airport affected area" for purposes of implementing Wisconsin Act 136

Wisconsin Act 136, Wis. Stat. 66.31, has three key provisions. First, each municipality with a development plan must show the location of any publicly owned airport and "airport affected areas." These are defined as areas within three miles of the airport, although smaller areas can be defined through intergovernmental agreements. Second, the municipality with zoning authority must notify the airport owner of proposed zoning changes within the "airport affected area." Third, if the airport owner objects to the proposed zoning change, a two-thirds vote of the municipal governing body is required to approve of the change.

For purposes of implementing and administering Act 136 in the Madison area, it is recommended to define the "airport affected area" as shown in the attached map. The area is based on a composite of the 60 Ldn contour for 1995 baseline conditions and for noise abatement plan conditions. It also includes an approximation of the training pattern area for the proposed parallel runway (18L-36R).

Implementation Status: Implemented.

Measure LU-2 provides for the definition of an "airport affected area" so that Wisconsin Act 136 may be implemented. Firstly, the Act requires municipalities to show the location of any publicly owned airports and subsequently affected areas. These are defined as areas within three (3) miles of the Airport, unless otherwise agreed upon by the affected municipalities. Secondly, the Act requires a municipality with zoning authority to notify the Airport of any proposed changes within the "airport affected area." Finally, the Act requires that if the Airport objects to the proposed zoning change, a two-thirds vote of the municipal governing body must be reached for the change to be approved. Recognizing that the three-mile requirement in the Act would be a much larger area than what would be significantly impacted by the Airport's operations, the NCP recommends the appropriate municipal bodies agree upon an "airport affected area."

The measure was implemented through Dane County Ordinance Chapter 78, which defines a specific "airport affected area" in place of a three-mile boundary. As stated in LU-1, no "airport affected area" map was discovered in the County records during review of this measure.

The Ordinance also notes the intention of the County to enter into agreements with affected municipalities so that they may adopt the "airport affected area." Conversations with Dane County and MSN will continue during the Part 150 Study process to determine continued implementation moving forward.

2.3 LU-3: Adopt airport noise overlay zoning

Airport noise overlay zoning establishes special standards within a noise-impacted area to help mitigate the problems caused by noise. These provisions supplement those of the underlying zoning classifications and would apply only to new institutions, except on existing lots of record. Where noise-sensitive uses are permitted on lots of record, soundproofing would be required. The overlay district boundaries should correspond to a composite of the 65 Ldn noise contours for 1995 based on both baseline conditions and noise abatement plan conditions

Implementation Status: Not implemented.

Measure LU-3 recommends Dane County and the City of Madison adopt an Airport Noise Overlay Zone. This zone would establish specific standards for new development, with the goal of mitigating noise from Airport operations. The NCP recommended the zone correspond to the 1995 forecast 65 dB DNL noise contour, with the acknowledgement that some adjustment may be necessary to compensate for local land use planning. New noise-sensitive land uses would be prohibited within the overlay zone, with certain exceptions such as existing lots of record. Like LU-2, the NCP recommended a requirement in which the Airport is notified of significant land use development proposals within the overlay zone.

The measure has not been implemented, per currently available documentation. However, while there is no specific reference to a noise overlay zone in the Dane County Ordinance, Chapter 78 requires that any change

in land use be from one compatible land use to another. This in addition to the implementation of LU-1 and LU-2, essentially achieves the same effect as the overlay zone.

2.4 LU-4: Amend subdivision regulations to require dedication of noise and avigation easements of plat notes on final plat

Dane County and Madison should amend their subdivision regulations to require the dedication of noise and avigation easements for new subdivisions within the airport noise overlay zone. While the noise overlay zoning regulations should restrict opportunities for land subdivision, this would provide back-up protection in case of unforeseen events. The noise and avigation easements would help to inform prospective property buyers that the land is subject to frequent aircraft overflight and aircraft noise. It would also protect the airport proprietor (Dane County), from lawsuits claiming damages for noise or other airport activities.

Implementation Status: Implemented.

Measure LU-4 recommends Dane County and City of Madison revise their subdivision regulations so that avigation easements are conveyed for any new subdivisions within a noise overlay zone. This measure would ensure property owners are aware of the frequency and levels of aircraft noise exposure. The measure states that if easements are not deemed acceptable by the City and County, a notice of potential high noise levels should be placed on the final plat of subdivisions within the overlay zone; this would serve as an alternative disclosure for property owners.

The measure was implemented via Dane County Ordinance, Chapter 75. The ordinance states that the below notation must be placed on the plat or certified survey map for any approved subdivision within the airport affected area:

“Lands covered by this [plat] [certified survey map] are located within an area subject to heightened noise levels emanating from the operation of aircraft and equipment from a nearby airport.”

2.5 LU-5: Consider amending County subdivision regulations to prevent subdivision of land zoned A-1 Agriculture

Dane County is considering amending is subdivision regulations to prevent the subdivision of land zoned A-1, agriculture. This is a way to protect prime farmland and guide urban growth. To the extent this measure would apply to areas affected by noise and frequent aircraft overflights, it also would promote airport land use compatibility by discouraging residential development.

Implementation Status: Not implemented.

Measure LU-5 recommends that Dane County consider amending its zoning regulations to prevent the subdivision of land zoned A-1, agriculture. The goal of this amendment would be to protect farmland, manage the growth of urban areas, and ensure land use compatibility where applicable.

This measure was not implemented; there is no such regulation found in the Dane County Ordinances.

2.6 LU-6: Amend building codes to provide soundproofing standards for noise-sensitive development in airport noise overlay zones

The County and City should amend building codes to provide soundproofing standards for use within the airport noise overlay zone. This would implement the sound insulation requirements of the noise overlay zoning ordinance

Implementation Status: Not implemented.

Measure LU-6, assuming the establishment of an airport noise overlay zone, recommends Dane County and the City of Madison amend their building codes to include soundproofing standards for new developments within the overlay zone.

The measure was not implemented as a specific airport noise overlay zone was not established.

2.7 LU-7: Amend local land use plans to reflect noise compatibility plan recommendations and establish airport compatibility criteria for project review

Dane County, the City of Madison, and the Town of Burke should amend their land use plans to reflect the recommendations of the Noise Compatibility Plan. The adoption of project review criteria as part of the local land use plans, requiring the consideration of airport noise and land use compatibility, would help ensure that these important concerns are not neglected during future land use deliberations.

Implementation Status: Implemented.

Measure LU-7 stated that Dane County, the City of Madison, and the Town of Burke amend their local land use plans to reflect recommendations of the NCP. Continued coordination amongst jurisdictions is necessary to maintain land use compatibility. As such, the measure recommended the following guidelines for future land use review:

A. Determine the sensitivity of the subject land use
B. Advise the Airport of development proposals
C. Locate noise-sensitive public facilities outside the 65 dB DNL contour and encourage building construction that brings interior noise levels to 45 dB DNL
D. Discourage approval of urban area amendments that allow for noise-sensitive development
E. Where development within the 60 dB DNL contour must be allowed, encourage developers to adjust their designs to shield noise-sensitive areas of the building

This measure was implemented; ongoing support for the Airport's promotion of compatible land uses is noted in the Dane County Land Use Plan, which notes the participation of local municipalities.

2.8 LU-8: Follow through with planned land acquisition in Cherokee Marsh and Token Creek Park areas

The Cherokee Marsh Revised Long-Range Open Space Plan (September 1981) proposes the acquisition of plan in the marsh and along Token Creek north of the airport. By following through with that program, the County will be helping to promote airport land use compatibility while also achieving the direct objective of the Open Space Plan. The attached map shows three areas proposed for acquisition which would be eligible for FAA funding assistance through the noise set-aside of the airport improvement program since they lie within the 65 Ldn contour.

Implementation Status: Not implemented (further investigation needed).

Measure LU-8 notes the planned acquisition of land to the north side of the Airport, as proposed in the 1981 Cherokee Marsh Revised Long-Range Open Space Plan. This acquisition would support the Noise Abatement Plan which calls for use of the north side of the Airport, with the goal of reducing the noise exposure of the developed areas to the south of the Airport. Exhibit 5F of the NCP highlights the proposed acquisition areas. Three of the proposed areas, totaling 178 acres, were eligible for FAA-funding at the time of NCP publication, as they are within the 65 dB DNL contour.

More investigation is needed to determine the implementation status of this measure. While land acquisition is noted on the Airport website (https://www.msnairport.com/about/ecomentality/noise_faq), detailed acquisition history should be confirmed with the Airport.

2.9 LU-9: Consider expanding land acquisition boundaries in Cherokee Marsh and Token Creek areas

The attached map shows three parcels, B, C, and D, as proposed for parks and open space expansion. All are within the 65 Ldn contour, based on 1995 conditions with the Noise Abatement Plan. Thus, acquisition costs would be eligible for FAA funding assistance through the noise set-aside of the Airport Improvement Program. As an option to outright acquisition by the County, private development for park and recreation uses, such as golf courses, riding clubs, or private wildlife sanctuaries, would also be acceptable.

Implementation Status: Not implemented (further investigated needed).

Measure LU-9 is a continuation of LU-8 and recommends the expansion of the planned land acquisition to the north of the Airport. Three specific parcels are highlighted on Exhibit 5F, and all were eligible for FAA-funding at the time of NCP publication.

More investigation is needed to determine the implementation status of this measure. While land acquisition is noted on the Airport website (https://www.msnairport.com/about/ecomentality/noise_faq), detailed acquisition history should be confirmed with the Airport.

2.10 LU-10: Establish sales assistance or purchase assurance program for homes impacted by noise above 70 Ldn

Dane County should consider a sales Assistance or purchase assurance program for single-family homes within the 70 Ldn contour, based on a combination of the 1995 baseline and noise abatement plan contours. South of the airport, the qualifying area is bounded by Aberg Avenue on the north, Washington Avenue on the east and south, and Pawling and North Lawn Avenue on the west. To the north, a few scattered homes on County Road CV and Hoepker Road are included. An estimated 216 homes are within the entire area, including 210 on the south side and six on the north side.

These programs would give homeowners who are severely disturbed by noise the assurance that they could leave the neighborhood without risking financial penalty. A purchase assurance program would make the County the buyer of last resort. If, after a given period of time on the market, the homeowner was unable to sell the home for fair market value, as determined through professional appraisals, the County would buy the home. The County would then retain a noise and avigation easement and sell the home, accepting a loss if necessary to put the home back on the tax rolls.

A sales assistance program would be similar, but the County would never take the title to the property. The County would make up the difference between fair market value and the best purchase offer made on the home. The County would secure a noise and avigation easement from homeowners in return for their participation in the program.

Implementation Status: Implemented.

Measure LU-10 recommends a sales assistance or purchase assurance program be established for single-family homes within the 70 dB DNL contour. Recommended areas are shown on NCP Exhibit 5G. The goal of these programs is to provide financial assistance to homeowners wishing to move from the most heavily noise impacted areas. These programs are voluntary, and an avigation easement would be conveyed in exchange for the Airport's assistance in selling the properties.

This measure was implemented; a Home Sales Assistance Program was instituted per the Airport's website (https://www.msnairport.com/about/ecomentality/noise_faq). The Sales Assistance Program was comprised of two components; the sale of an avigation easement in exchange for a $2,000 cash payment or receive assistance from the Airport in the sales of their home. Of the 300 eligible parcels, 185 chose the avigation easement option and 13 parcels chose to have assistance with the sale of their home. There were 102 parcels that did not participate in the program.

2.11 LU-11: Install sound insulation for schools impacted by noise above 65 Ldn

Two schools are impacted by noise above 65 Ldn, based on 1995 baseline conditions – Holy Cross Lutheran School on Milwaukee Avenue and Lowell School, just north of Lake Monona. If technically feasible, sound insulation should be installed in both schools. Both school operators should understand that effective sound insulation requires keeping the windows closed. This could raise heating and cooling costs. While the capital costs of the sound insulation project are eligible for 90% FAA funding assistance, all operating costs must be borne by the school operators.

Implementation Status: Not implemented.

Measure LU-11 pinpoints two schools within the 65 dB DNL contour, based on the 1995 forecast NEM, and recommends them for sound insulation. At the time of publication an estimate of $500,000 was provided for Lowell School and $300,000 for Holy Cross School.

This measure has not been implemented; and will be reassessed during the NCP process.

3 Implementation of Program Management Measures

In the FAA-approved NCP and the 1993 ROA, program management measures (PM) are labeled and referenced as continuing program (CP) measures. For this Part 150 update, existing CP measures are referred to as program management measures.

Three PM measures were recommended in the original Part 150 documentation, all of which the FAA approved. A description of each of these measures is provided below along with information about the implementation status of each measure.

Table 6. Status of 1991 NCP Program Management Measures

Measure Number	Flight Procedures Addressed	Implementation Status
PM-1	Program monitoring and noise contour updating	Implemented
PM-2	Evaluation and update of the plan	Implemented
PM-3	Noise complaint response	Implemented

3.1 PM-1: Program monitoring and noise contour updating

The airport management should follow the progress of the Madison city planning department and the Dane County Regional Planning Commission in implementing the land use recommendations. They also should check periodically with the Airport Traffic Control Tower to verify compliance with the noise abatement procedures. If the airport has a major increase in operations or a major change in the aircraft fleet, the Ldn contour maps should be updated to determine the impact of the changes.

Implementation Status: Implemented

Airport management maintains continued contact with the City of Madison, Dane County, and the FAA Air Traffic Control Tower regarding airport related issues including compliance with noise abatement procedures.

3.2 PM-2: Evaluation and update of the plan

The airport management should periodically review the Noise Compatibility Plan and consider refinements, as necessary. As a rule of thumb, the Plan should be updated every six to eight years.

Implementation Status: Implemented.

Since the 1991 study, the airport has periodically reviewed the Noise Compatibility Plan. As a result of the 115th Fighter Wing transitioning their fleet aircraft from F-16 to F-35A, the airport decided to initiate a Part 150 Study for the first time since 1991. Dane County is currently in the process of updating the MSN Noise Compatibility Planning study.

Dane County website contains a "Part 150 Noise Study" page[3] with the following links:

- Links to current information on this Part 150 Study
- A link to the FAA Part 150 Homepage

[3] Part 150 Noise Study on the Dane County website: Part 150 Noise Study (msnairport.com)

3.3 PM-3: Noise complaint response

The airport management should continue recording and responding to noise complaints. These should be evaluated to determine if a pattern of common problems is occurring and is in need of attention.

Implementation Status: Implemented.

Airport management has implemented an online noise report form for residents to submit noise complaints. This is part of the overall noise complaint program. The airport determines patterns based on the complaints received and follows up as appropriate.

Dane County website contains the following links:

- A "Noise FAQ" page[4] providing answers to frequently asked questions about noise-related issues specific to MSN
- A "Noise Report Form" page[5] for submitting noise complaints or noise questions/comments

[4] Noise FAQ page on the Dane County website: Noise FAQ (msnairport.com)
[5] Noise Report Form on the Dane County website: https://www.msnairport.com/about/ecomentality/noise_report_form

ORDER

MSN ATCT
8400.9I

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIR TRAFFIC CONTROL TOWER
MADISON, WISCONSIN

SUBJ: Informal Runway Use Noise Abatement Program, Converging Flow Operations and Opposite Direction

1. PURPOSE. This order establishes facility policy and procedures used for the Converging Flow Operations and the Informal Runway Use Program.

2. DISTRIBUTION. This order is distributed to AGL-530, Wisconsin Terminal Hub, and all facility personnel via facility binders.

3. CANCELLATION. MSN ATCT Order 8400.9H Informal Runway Use Noise Abatement Program and Converging Flow Operations dated September 26, 2002

4. EFFECTIVE DATE. December 17, 2012

5. BACKGROUND. Converging Flow exists (except when applying the provisions of FAA7110.65, par. 5-8-4) if a departing aircraft has the potential of passing within 3 miles of an arriving aircraft.

   Madison's Part 150 Noise Study identifies the most effective noise abatement procedure as placing aircraft over the less densely populated areas north of the airport. This often requires converging flow operations. Due to high closure rates and the low altitude of participating aircraft, converging flow operations require intense air traffic direction and have little margin for error.

   Additionally, converging flow operations may be conducted for reasons other than noise abatement (practice approaches, pilot request, etc.). Therefore, converging flow operations and noise abatement are interdependent but addressed separately.

6. POLICY. It is the policy of the FAA and this facility to help reduce aircraft noise to the extent practical and consistent with safety.

7. PROCEDURES. Noise abatement shall be accomplished using the methods described below as safety allows. Traffic permitting, turbojet aircraft exceeding 12,500 pounds or more departing runway 3, should climb on runway heading to 2,500 feet before turning east or southbound. Turbojet aircraft exceeding 12,500 pounds or more departing runway 32 should climb on runway heading to 2,500 feet before turning southwest bound. Turbojet aircraft 12,500 pounds or more departing runway 21 should be turned to a 200º heading as soon as practicable. Turbojet intersection departures are not authorized except runway 32 from E, runway 36 from A6, and runway 18 from A2. The most effective noise abatement method is to take-off runway 36, 32 and 3, land runway 18, 14 and 21.

   a. Noise Abatement - If aircraft will not be placed in a converging flow situation, the following items apply:
      (1) These procedures apply to all turbojet aircraft 12,500 pounds or heavier.
      (2) Unreasonable delays are defined as a delay exceeding 5 minutes.
      (3) There should be no significant wind shear or thunderstorms, which affect the use of the selected runways such as:
         (a) That reported by the Weather System Processor.
         (b) Pilot reported wind shear.
         (c) No thunderstorms on the initial takeoff departure path or final approach path (within 5 NM) of the selected runway(s).
      (4) When utilizing landing runways associated with this program the visibility shall not be less then one statute mile (RVR 5000).
      (5) There should be no snow, slush, ice, or standing water present or reported (other than isolated patches which do not impact braking effectiveness) on that width of the applicable runway(s). Braking effectiveness must be "good" and no reports of hydroplaning or unusually slippery runway surfaces.

(6) Wind (see appendix 1)
(a) Clear and dry runways.
1. The crosswind component, including gust values, must not exceed 20 knots.
2. The tailwind component must not exceed 5 knots.
(b) Runways not clear or not dry.
1. The crosswind component, including gust values, must not exceed 15 knots.
2. No tailwind component may be present except winds reported as "calm" (0-3 knots) may be considered to have no tailwind component.
3. The runway must be grooved (36, 32 and 21).

b. Converging Flow Requirements – Before placing aircraft in a converging flow situation ensure that the following additional safety parameters exist, otherwise hold traffic until the converging flow aircraft is no longer a factor:
(1) Ceiling and visibility allow the Local Controller a clear view of the inbound aircraft from a point not less than 5 miles from the airport, to the landing runway.
(2) Traffic advisories are exchanged between participating aircraft.

8. CONVERGING FLOW:

a. NORTH TRAFFIC OPERATIONS (RWY 36/32/3) – The operation is conducted per Local Control's approval and restrictions. Approach Controller(s) should determine if the proposed converging flow operation is warranted with regard to traffic and weather conditions. If the operation seems feasible it should be APREQed with Local Control when the aircraft is 20 - 25 miles out. The outcomes are as follows:
(1) LC approves the aircraft "direct." Required phraseology "(*acid*), DIRECT APPROVED". This aircraft is expected to be controlled so as to proceed directly to the specified runway without delay.
(2) LC approves the converging flow runway with restrictions. Required phraseology is "(*acid*) (*restrictions)* APPROVED." Radar shall vector the converging flow arrival so as not to be a factor to LC until on final (i.e. stay wide or maintain an altitude above the departure area).
(3) LC denies approach's request.

b. SOUTH TRAFFIC OPERATIONS (RWY 18/14/21) – The operation is conducted per the Radar Controller(s) approval and restrictions. Ground Control shall APREQ converging flow departures with Local Control prior to taxi. Local Controller must determine the feasibility of the converging flow departure. Aircraft should not be west of the runway 14 final until above 2,500 MSL. The outcomes are as follows:
(1) Radar releases the aircraft.
(a) Required phraseology is, "(heading/on course), (other restrictions as applicable) RELEASED."
(b) The local controller releasing a converging flow departure shall coordinate said release with the receiving radar controller and advise the other radar controller. Advising the other radar controller may be omitted if the departure will not be within 3 NM of that controller's airspace 5 miles after departure, (i.e. a R/W 32 departure enroute to LNR, the East controller need not be advised).
(2) Radar approves the request, but does not release the aircraft.
(a) Required phraseology, "APPROVED HOLD FOR RELEASE"
(b) The aircraft is taxied to runway 36, 32 or 3 and local reinitiates coordination for the actual release.
(3) Radar denies the request.

9. OPPOSITE DIRECTION

a. General:

(1) The initiating area of specialization is responsible for making all verbal coordination required to accomplish an opposite direction arrival or departure.
(2) All coordination must be on a recorded line and must state "opposite direction".
(3) All coordination must include call-sign, aircraft type and arrival or departure runway.

Example-
"RADAR LOCAL APPREQ, OPPOSITE DIRECTION CHQ5018, EMBRAER RUNWAY 36."

LOCAL RADAR APPREQ, OPPOSITE DIRECTION DAL420, AIRBUS, RUNWAY 18."

(4) The cutoff points for the MSN ATCT are the 10 mile final to all runways.
(5) Restrict opposite direction same runway operations with opposing traffic inside the applicable cutoff point unless an emergency exists.
(6) Traffic advisories shall be given to both the arriving and departing aircraft.

Example-
"OPPOSITE DIRECTION TRAFFIC (DISTANCE) MILE FINAL (type aircraft)."

"OPPOSITE DIRECTION TRAFFIC DEPARTING RUNWAY (number), (type aircraft)."

b. Opposite Direction Departures:

(1) The tower must verbally request all opposite direction departures from radar, stating the aircraft call-sign, aircraft type and departure runway.
(2) The tower must ensure that required longitudinal or lateral separation exists before any other type of separation is applied (i.e. Visual Separation).
(3) The tower must ensure that the departing aircraft becomes airborne and has been issued a turn to avoid conflict prior to the cutoff point.

c. Opposite Direction Arrivals:

(1) Radar must verbally request all opposite direction arrivals from the tower, stating the aircraft call-sign, aircraft type and arrival runway.
(2) Radar must ensure that an opposite direction arrival aircraft will not cross the cutoff point prior to an aircraft crossing the opposite runway threshold.
(3) The tower must ensure that the departing aircraft becomes airborne and has been issued a turn to avoid conflict prior to the cutoff point.

Dennis J Vincent
Air Traffic Manager
MSN ATCT

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