

Inventory

Introduction

General Mitchell International Airport (MKE) is an integral component of the transportation infrastructure serving the Milwaukee Metropolitan Area and southeast Wisconsin. Because of its airfield and facility capabilities, MKE is also a vital part of the national system of airports. The airport serves as not only the city's front door by providing visitors with an important first impression of the community, but also is the state's largest airport. The Airport provides transportation facilities that are an absolute necessity for some businesses and which are a "required" convenience for others. Additionally, MKE provides recreational and leisure travelers convenient access to air transportation with convenient non-stop and connecting service to many popular destinations.

This Federal Aviation Regulation (FAR) Part 150 Noise Compatibility Planning Study is an update of a 1993 Study that was adopted by Milwaukee County and approved by the Federal Aviation Administration in 1995. The Milwaukee County Department of Public Works Airport Division has implemented many of the recommendations contained in the previous FAR Part 150 Study. However, changing service levels, aircraft types, and number of operations to accommodate growth in passengers, subsequent to that document, have resulted in a different set of noise contours and the need for an update to the Study.

The purpose of this airport facilities Inventory Section of the Part 150 Study is to establish a baseline of existing conditions information necessary to generate new aircraft noise exposure contours. The inventory includes data concerning airport facilities, flight procedures, noise abatement procedures, noise complaints, and land use conditions and policies within the environs of the Airport.

Airport Facilities

General Mitchell International Airport (MKE) is the primary air transportation hub of southeast Wisconsin. The Airport resides on approximately 2,386 acres of land within Milwaukee County and is located primarily within the City of Milwaukee, approximately five miles south of downtown Milwaukee and adjacent to the City of St. Francis, the City of Cudahy, the City of South Milwaukee, the City of Oak Creek, the City of Franklin, and the City of Greenfield.

In 2002, the Airport was served by 15 passenger airlines including: Air Canada, AirTran, Air Wisconsin (United Express), American Eagle, America West, ATA Connection, COMAIR (Delta Connection), Continental Express, Delta, Northwest, Midwest Express, Skyway (Midwest Express), US Airways, and US Airways Express. There are approximately seven (7) scheduled all-cargo carriers serving the Airport. The Airport provides non-stop air service to 48 cities within the United States and one (1) city internationally. In terms of passenger activity, MKE was the 55th busiest US airport in 2001 with respect to scheduled enplaned passengers. The generalized Airport location is illustrated on Figure A1, *AIRPORT LOCATION MAP*.

MKE is owned and operated by Milwaukee County (County), which is led by the County Executive and a 25-person County Board of Supervisors. The County Executive and County Board of Supervisors members are elected by the public for terms of four years. The County Executive coordinates the administration of all County functions with the exception of those functions directly managed by other elected officials within the county government. The County Board of Supervisors' primary task is to determine policy and direct County government through the adoption of services and laws for the County.

The operation of the airport is conducted under the Department of Public Works, Airport Division. The Director of the Airport Division is responsible for the day-to-day operations of the airport.

Airport property boundaries are completely within Milwaukee County and the majority of the airport's property is within Milwaukee City limits; some airport property extends into the City of Oak Creek and the City of St. Francis (Figure A2, *AIRPORT VICINITY MAP*). Figure A3 depicts the Existing Airport Layout.

Milwaukee County is currently preparing an updated Master Plan package for MKE that is evaluating airside and landside facility requirements for the next 20 years.

Figure A1
Airport Location Map

(Click here to open figure)

Figure A2
Airport Vicinity Map

(Click here to open figure)

Figure A3
Existing Airport Layout

(Click here to open figure)

Airside Inventory

Runways. General Mitchell International Airport, exhibiting an Airport Reference Point (ARP) of Latitude 42° 56' 50.000"N, Longitude 087° 53' 47.700"W and an elevation of approximately 723 feet above mean sea level (AMSL), currently consists of five (5) runways:

- Runway 1L/19R – 9,690 feet long and 200 feet wide.
- Runway 1R/19L – 4,183 feet long and 150 feet wide.
- Runway 7L/25R – 4,800 feet long and 100 feet wide.
- Runway 7R/25L – 8,012 feet long and 150 feet wide.
- Runway 13/31 – 5,868 feet long and 150 feet wide.

Runway 1L/19R (north/south orientation), is 9,690 feet in total length and 200 feet in width. The Runway 19R threshold is displaced 785 feet. Runway 1L/19R is equipped with High Intensity Runway Edge Lights (HIRL) and in-pavement centerline lights. Runway 1L has precision runway markings and Precision Approach Path Indicator (PAPI) lights. The runway is equipped with Runway Visual Range Equipment (RVR). Runway 1L has a Category IIIB Instrument Landing System (ILS) with ALSF-2 approach lights and outer, middle, and inner marker beacons. The Runway 1L Instrument Landing System (ILS) also includes a Localizer and Glide Slope Antenna. Runway 19R also has precision runway markings and Precision Approach Path Indicator (PAPI). This runway end is also equipped with a Runway Visual Range Equipment (RVR). Runway 19R has a Category I Instrument Landing System (ILS) with MALSR approach lights and outer and middle marker beacons. The Runway 19R Instrument Landing System (ILS) also includes a Localizer and Glide Slope Antenna.

Runway 1R/19L (north/south orientation), is 4,183 feet in length and 150 feet in width. It is equipped with Medium Intensity Runway Edge Lights (MIRL). Runway 1R has nonprecision runway markings and Runway End Identifier Lights (REIL). Runway 19L has nonprecision runway markings and is not equipped with any visual or navigational aids.

Runway 7L/25R (southwest/northeast orientation), is 4,800 feet in length and 100 feet in width. It is equipped with Medium Intensity Runway Edge Lights (MIRL). Runway 7L has basic runway markings, Visual Approach Slope Indicator (VASI) lights, and Runway End Identifier Lights (REIL). Runway 25R has basic runway markings, Precision Approach Path Indicator (PAPI) lights, and Runway End Identifier Lights (REIL).

Runway 7R/25L (southwest/northeast orientation), is 8,012 feet in total length and 150 feet in width. The Runway 25L threshold is displaced 683 feet. Runway 7R/25L is equipped with High Intensity Runway Edge Lights (HIRL) and Precision Approach Path Indicator (PAPI) lights. The runway touchdown is equipped with Runway Visual Range Equipment (RVR). Runway 7R has a Category I Instrument Landing System (ILS)/Distance Measuring Equipment (DME) approach with SSALR approach lights and outer and middle marker beacons. The Runway 7R Instrument Landing System (ILS) also includes a Localizer, Distance Measuring Equipment (DME), and Glide Slope Antenna. Runway 25L has precision runway markings and Precision Approach Path Indicator (PAPI) lights. Runway 25L has only an Instrument Landing System (ILS) /Distance Measuring Equipment (DME) approach.

Runway 13/31 (northwest/southeast orientation), is 5,868 feet in total length and 150 feet in width. The Runway 13 threshold is displaced 741 feet and the Runway 31 threshold is displaced by 534 feet. Runway 13/31 is equipped with Medium Intensity Runway Edge Lights (MIRL). Both runway ends have nonprecision runway markings, Visual Approach Slope Indicator (VASI) lights, and Runway End Identifier Lights (REIL).

Taxiways. All runways are provided taxiway access to runway ends and connector or exit taxiways. Runway 7R/25L and Runway 1L/19R have parallel taxiways, while the other runways are linked by connector taxiways. The taxiway system has been designed to primarily provide quick and safe access to and from runway ends and the main passenger terminal. The taxiway system also provides aircraft access to cargo, maintenance, and hangar areas. Taxiway width and pavement characteristics vary depending on the aircraft specifications that utilize the facilities and runways that the taxiways serve.

Landside Inventory

Terminal. The main passenger terminal at General Mitchell International Airport, located centrally within the airport, currently consists of approximately 777,000 square feet of space and three (3) concourses (Concourses C, D, and E) equipped with 42 gates. The International Arrivals Terminal, which is located in the terminal area but separate from the main terminal building, is approximately 5,000 square feet and includes one gate.

Cargo. Major air cargo facilities at MKE are concentrated in the area adjacent to Runway 7R/25L between Howell Avenue and 6th Street. The cargo area includes two multi-tenant air cargo buildings that are 38,000 square feet and 126,000 square feet. In addition to large integrated cargo carriers, such as Federal Express and UPS, several passenger airlines and freight forwarders lease space in the cargo buildings. There is

approximately 570,000 square feet of aircraft parking adjacent to the cargo buildings. Additionally, a small air cargo operator occupies two hangars along Howell Avenue north of Runway 7L/25R.

Airport Maintenance Facilities. General Mitchell International Airport is host to six civilian and two military aircraft maintenance operations. Civilian operations include: Midwest Airlines fleet of DC-9, MD-80, and Boeing 717 aircraft; Midwest Connect Airlines fleet of Beech 1900 and Dornier 328 Jet Aircraft; Air Wisconsin's support base for Canada Air Regional Jets; Air Cargo Carriers base for Shorts 330 aircraft; Cessna Aircraft maintenance facility for private and corporate Cessna Business Jets; and Werth Aviation, a general aviation aircraft maintenance provider. Military facilities conducting aircraft maintenance operation are the 128th Air Refueling Wing flying KC-135R tankers and the 440th Airlift wing that operates C-130 Hercules transports.

Ground Run-up Enclosure (GRE). In response to a growing concern over noise created by routine aircraft engine maintenance, especially at nighttime, a Ground Run-up Enclosure has been constructed. This facility, located adjacent to the terminal apron area, is a three-sided enclosure measuring 44 feet tall, 300 feet wide, and 300 feet deep. It is designed to accommodate all aircraft serving MKE. Construction of the facility was completed in October, 2002.

Air Mail Facility. The United States Postal Service (USPS) operates a 24-hour airport facility next to the corporate hangars along Howell Avenue. This location provides public access from Howell Avenue as well as secure tug access to both the air cargo complex and the terminal.

Airport Rescue and Fire Fighting Facility (ARFF). The Aircraft Rescue and Fire Fighting (ARFF) facility is located south of the passenger terminal. The County operates an Index E ARFF facility, the highest index, which is required by the FAA for airports that accommodate at least five daily departures by aircraft up to 200 feet in length (e.g., the B-767, DC-10).

Military Facilities. Two military units are located at General Mitchell International Airport: the 128th Air Refueling Wing of the Wisconsin Air National Guard (ANG) and the 440th Airlift Wing of the Air Forces Reserve. The ANG occupies approximately 58 acres on the east side of the airfield and operates KC-135 aircraft. The 440th Airlift Wing operates C-130 Hercules aircraft on a 102 acre Air Force Reserve Base located in the southwest quadrant of the airfield.

Airport Traffic Control Tower (ATCT) Facility. The FAA ATCT, located west of the passenger terminal building and vehicle parking structure, operates twenty-four hours a day. The Terminal Radar Approach Control (TRACON) facility that is responsible for MKE and other regional airports is located within the ATCT building.

General Aviation. General aviation (GA) hangars and ancillary facilities are located northeast of the passenger terminal with public access from Layton Avenue. The primary Fixed Base Operator (FBO) is Signature Flight Support, who supplies aircraft fuel, parking, hangars, passenger lounge, catering, and other flight services to the GA community. The GA facilities consist of a terminal, an itinerant aircraft parking ramp, and aircraft maintenance and storage hangars. This area includes 40 leased private hangars and T-hangars. Additionally, corporate hangars occupy land adjacent to the terminal complex along Howell Avenue, south of Runway 7R/25L near the ARFF Station.

Air Traffic Operations Activity

General Mitchell International Airport averages 213 scheduled passenger departures per day, and is served by 15 major/national and regional/commuter airlines. A summary of airport activity is provided in Table A1, *Summary of Historical Aviation Activity*. Between 1990 and 2000, passenger enplanements increased from approximately 2.2 million to 3.0 million, representing an average annual growth rate of 3.2 percent. Air cargo tonnage increased during this same time period from approximately 89.4 million pounds in 1990 to 146 million pounds in 2000, representing an average annual growth rate of 5 percent. Passenger activity declined in 2001 to 2.8 million passenger enplanements. It should be noted that the decrease in overall operations and enplanements for 2001 was influenced by the downturn in commercial passenger traffic following the terrorist events of September 11, 2001, the temporary closure of airports in the U.S., and the subsequent economic downturn.

Table A1
SUMMARY OF HISTORICAL AVIATION ACTIVITY, 1990-2002
General Mitchell International Airport Noise Study Update

Year	Passenger Enplanements¹	Air Carrier Operations	Air Taxi/Commuter Operations	General Aviation Operations	Military Operations	Total Operations
1990	2,173,648	82,054	54,404	66,852	6,091	209,401
1991	2,053,724	76,429	54,680	68,699	5,779	205,587
1992	2,176,314	74,545	56,727	63,900	7,114	202,286
1993	2,220,408	74,969	54,154	63,430	5,976	198,529
1994	2,459,175	80,093	64,579	63,514	5,416	213,602
1995	2,527,447	83,933	62,599	58,225	5,182	209,939
1996	2,647,847	86,383	59,180	48,536	5,485	199,584
1997	2,711,216	86,923	67,393	48,993	5,473	208,782
1998	2,788,696	85,158	79,223	50,007	4,819	219,207
1999	2,934,880	86,211	82,414	45,412	5,067	219,104
2000	3,101,092	87,119	91,764	41,955	4,588	225,426
2001	2,983,348	80,741	93,570	35,502	4,736	214,549
2002 ¹	2,360,530	73,997	101,126	32,273	4,836	212,232

Source: FAA Terminal Area Forecasts, 1990-2000.
¹ Forecast Data

The airlines with the largest percentage of overall operations at MKE during 2001 were Midwest Express (27.4%), Northwest (19.2%), Skyway (9.2%), Delta (7.2%), Sun Country (5.6%), Air Wisconsin (5.1%), US Airways (5.0%), American Eagle (4.1%), and TWA (3.7%). The remainder of the airlines had less than three percent of overall operations.

In 2001, approximately 2,983,348 passengers (enplaned) were accommodated at the Airport. This compares to approximately 3,101,092 passengers in 2000. The number of passengers increased steadily between 1991 and 2000, but like aircraft operations, subsequently have fluctuated from a high in 2000. MKE was ranked the 55th busiest airport in the United States for total passengers in 2001.

In 2001, the Airport provided for the transportation of 93,532 metric tons of total cargo. Approximately 84 percent of this cargo (78,707 metric tons) was freight, and approximately 16 percent (14,825 metric tons) was mail. Approximately 94 percent of the freight transported at MKE was carried in cargo aircraft and the remaining 6 percent of air freight was transported on passenger aircraft. Of the 14,825 metric tons of mail

transported at MKE, approximately 12 percent was transported on cargo aircraft and the remaining 88 percent was transported on passenger aircraft.

Airspace, Navigation, and Communication Aids

MKE, like all U.S. airports, functions within the local, regional, and national system of airports and airspace. The following illustration, Figure A4, *AIRSPACE/NAVAIDS SUMMARY*, and narrative provide a brief description of MKE's role as an element within these systems.

Air Traffic Service Areas

The FAA is responsible for the safe and efficient use of the national air space. This airspace is divided into three specific types: en-route, terminal, and tower. When an aircraft departs an airport, air traffic controllers working in an airport traffic control tower handle its movement. When the aircraft is approximately one to five miles away from the airport, the aircraft is handed off to controllers working the Terminal Radar Approach Control Facility (TRACON) located at MKE. These controllers are responsible for the airspace extending out 20 nautical miles from the Airport in all directions. The aircraft then enters the third type of airspace and becomes the responsibility of en-route controllers working in one of twenty-two domestic Air Route Traffic Control Centers (ARTCC). The en-route controllers retain control until the aircraft nears its intended destination. The air-traffic control process is then reversed for landings. MKE is contained within the Chicago ARTCC jurisdiction, which has an airspace size of 74,000 square miles.

MKE has a 24-hour, continuously operating Airport Traffic Control Tower (ATCT) that has a designated Class C airspace surface area. Aircraft that operate within an Airport Traffic Area (ATA) must be in contact at all times with the tower controllers, especially to receive approval for take-offs and landings.

Figure A4
Airspace/NAVAIDS Summary

(Click here to open figure)

Airspace

Local airspace surrounding MKE is designated as Class C airspace, or airspace from the surface to 4,000 feet above the ground elevation surrounding those airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR (Instrument Flight Rules) operations or passenger enplanements. Figure A5, entitled *GENERALIZED CLASS C AIRSPACE ILLUSTRATION*, is shown on the following page. The exact configuration of each Class C airspace area is tailored to the individual airport. However, Class C airspace usually consists of a 5 Nautical Mile (NM) radius circle surrounding the Airport that includes the airspace from the ground surface up to 4,000 feet above ground level, and an outer area with a 10 NM radius that extends from 1,900 to 4,000 feet above the Airport elevation. Air traffic in the vicinity of the Airport is monitored using the regional ASR-9 radar unit (Airport Surveillance Radar).

Each person operating an aircraft must establish two-way radio communications with the ATCT facility providing air traffic services prior to entering Class C airspace and, thereafter, must maintain those communications within the airspace. Around MKE, the Class C airspace, within the inner 5 NM radius circle, extends from the surface (the airport elevation is 723 feet AMSL) to an elevation of 4,000 feet AMSL. Airspace within the 10 NM radius circle, extends from varying floor elevations (1,100, 1,700, 1,800, and 2,300 feet AMSL) to the same 4,000-foot AMSL altitude cap as the inner circle.

International boundaries, military airports, military operations areas, restricted areas, temporary flight restrictions, and prohibited areas can also impact airspace use in the vicinity of a civil airport. The Minnow Military Operations Area is located approximately 25 NM north of MKE, and the airspace is restricted intermittently.

Navigational Aids

A variety of navigational facilities are currently available to pilots around MKE, whether located at the Airport or located elsewhere in the region, and are available to en-route air traffic as well. Additionally, there are a number of navigational aids (NAVAIDS) that allow a variety of instrument approaches to the Airport.

Figure A5
Generalized Class C Airspace Illustration

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The NAVAIDS available for use by pilots in the vicinity of the Airport are Non-Directional Radio Beacon (NDB) facilities, VHF Omnidirectional Range/Distance Measuring Equipment (VOR/DME), and VHF Omnidirectional Range/Tactical Air Navigation (VORTAC) facilities. NDBs are general purpose low- or medium-frequency radio beacons that aircraft equipped with a loop antenna can home in on or determine its bearing relative to the sending facility. A VOR/DME system is a Very High Frequency Omnidirectional Range Station with Distance Measuring Equipment transmitting very high frequency signals, 360 degrees in azimuth oriented from magnetic north. This DME equipment is used to measure, in nautical miles, the slant range distance of an aircraft

from the navigation aid. A VORTAC is a navigational aid providing VOR azimuth, TACAN azimuth, and TACAN distance measuring equipment at a single site.

TACAN's are en route navigation stations using the ultra-high-frequency (UHF) portion of the radio spectrum and were previously used exclusively by the military. However, within the last thirty-years, most VHF and UHF airway stations have been combined to form a single nationwide airway system shared by all users of the national airspace system. Thus, VOR and TACAN facilities co-located and operating simultaneously are referred to as VORTAC stations.

Airport and regional navigational and landing aids available for MKE include an Instrument Landing System (ILS), with Localizer (LOC) and Glide Slope (GS), for Runways 1L/19R and Runway 7R. In addition, the VHF Omnidirectional Range/Distance Measuring Equipment (VOR/DME) is located on the airfield.

Additional navigational aids within the vicinity of MKE include the Timmerman VOR-DME (112.50 LJT) located 12 NM northwest of MKE, The Badger VORTAC (116.40 BAE) located 20 NM west northwest of MKE, the Burbun VOR-DME (114.50 BUU) located 24 NM southwest of MKE, the Kenosha VOR-DME (109.20 ENW) located 21 NM south of MKE, and the Horlick VOR-DME (117.70 HRK) located 11 NM south southeast of MKE. Non-Directional Radiobeacon (NDB) facilities located within proximity of the Airport include: Yanks (260 BL) located seven (7) NM north of MKE, Waukesha (359 UES) located 16 NM west northwest of MKE, Teels (242 GM) located west southwest of MKE, and Paser (206 RA) located 21 NM south of MKE.

Published instrument approach procedures at MKE are listed in Table A2, *INSTRUMENT APPROACH PROCEDURES*.

Airspace

All aircraft flights are governed by either Visual Flight Rules (VFR) or Instrument Flight Rules (IFR). Definitions are contained in FAR Part 91 and summarized below. The basic difference between VFR and IFR rules is that the pilot maintains spatial orientation of an aircraft by reference to the earth's surface for VFR and by reference to aircraft instruments for IFR. Under IFR rules, a pilot can operate in poor visibility conditions within controlled airspace. Flights under VFR rules require good visibility and maintenance of specified distances from clouds.

Table A2
INSTRUMENT APPROACH PROCEDURES
General Mitchell International Airport Noise Study Update

Approach	Designated Runway	Ceiling Minimums (AGL)	Visibility Minimums
ILS	1L	200'	1,800 feet
ILS	1L	100'	1,600 feet ²
ILS	1L	None'	600 feet ¹
ILS	7R	200'	24,000 feet
ILS	19R	200'	24,000 feet
LOC	1L	376'	2,400; 4,000 feet ³
LOC	7R	477'	2,400; 4,000; 5,000 feet ³
LOC	19R	488'	2,400; 4,000; 5,000 feet ³
LOC	25L	477'	1; 1 ¼; 1½- miles ³
NDB or GPS	1L	476'	4,000; 6,000 feet ³
NDB or GPS	7R	577'	4,000; 5,000 feet; 1½-miles ³
VOR-A	Circling	557'; 577'	1; 1 ½; 2 - miles ³

Source: U.S. Terminal Procedures, East Central (EC), Vol. 3 of 3, 20 March 2003

¹ Category III ILS – Special aircrew and aircraft certification required.

² Category II ILS – Special aircrew and aircraft certification required.

³ Depending on category of aircraft.

IFR Operations

Air carrier and many turbojet general aviation and military aircraft operating to or from the Airport under IFR, are reassigned coded flight routes and procedures referred to as Standard Instrument Departures (SIDs) procedures and Standard Arrival Routes (STAR). These DP's and STAR routes for both jet and propeller aircraft at MKE are depicted in the following Figures A6 through A11. Figures A6 through A9 reflect typical east/west traffic flows, while Figures A10 and A11 reflect typical north/south traffic flows. These figures also depict arrival and departure "gates" or fixes that are funnel points through which aircraft are assigned. Navigation of IFR aircraft within the Milwaukee TRACON airspace is generally provided by radar vectors (routes) to achieve efficient sequencing, spacing, and separation between aircraft. Therefore, actual aircraft flight tracks, particularly close to the Airport, will not conform exactly to the SIDS and STARS depicted.

In general, however, IFR arrival aircraft are cleared to the Airport by the Chicago ARTCC via these STAR while descending from en-route altitudes. These aircraft arrivals are "handed off" via radar from the ARTCC to the Milwaukee TRACON at various "gates" or fixes. In other words, there are established arrival routes that aircraft utilize and pilots are in contact with a sequence of controllers as they approach the Airport.

The TRACON assumes responsibility for guiding arriving aircraft to their final approach course at the destination airport and for separating them from each other. Lower performance aircraft, and some commuter/air-taxi aircraft, operate at lower altitudes below or clear of the jet aircraft routes. These lower performance aircraft are "laced" into arrival routes close to the Airport to minimize the effects of speed differentials.

When arriving aircraft are in the vicinity of their destination airport the TRACON gives descent instructions until they are approximately 3,000 feet above the destination airport and approximately seven nautical miles from the runway threshold on the final approach. TRACON then clears the aircraft for the final approach and instructs the pilot to contact the destination airport's tower.

Similarly, departing IFR aircraft are guided and separated from other aircraft by the Milwaukee TRACON through its delegated airspace. Shortly after departure, when the aircraft is airborne, the tower clears the aircraft to contact the TRACON for departure control. The TRACON then directs departing aircraft toward the departure fixes. Again, low performance aircraft are turned immediately after take-off to separate them from the jet departure stream and to keep them at lower altitudes. As soon as departing aircraft either pass the departure fix or climb out of the TRACON airspace, they are transferred to ARTCC for en-route control.

Figure A6
Typical Jet Aircraft East to West Traffic Flow

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Figure A7
Typical Jet Aircraft West to East Traffic Flow

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Figure A8
Typical Non-Jet Aircraft East to West Traffic Flow

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Figure A9
Typical Non-Jet Aircraft West to East Traffic Flow

(Click here to open figure)

Figure A10
Typical Jet Aircraft North/South Traffic Flow

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Figure A11
Typical Non-Jet Aircraft North/South Traffic Flow

(Click here to open figure)

Unless visual (VFR) separation is in effect, TRACON provides all IFR aircraft with a radar separation of at least three nautical miles longitudinally, or 1,000 feet of vertically within their terminal airspace. Additional longitudinal separation to avoid wake turbulence is provided for various combinations of aircraft sizes. The minimum longitudinal separation in terminal airspace is listed in Table A3.

Table A3
AIRCRAFT LONGITUDINAL SEPARATIONS
General Mitchell International Airport Noise Study Update

Lead Aircraft Classification (NM)	Trailing Aircraft Classification	Separation
Heavy	Heavy	4
Heavy	Large	5
Large	Small	4
Heavy	Small	6
B-757	Small	5
B-757	Large/Heavy	4

Source: FAA Handbook 7110.65L, "Air Traffic Control" with changes.

For the purpose of wake turbulence separation minimums, FAA classifies aircraft as Heavy, Large, or Small as follows:

- **Heavy:** Aircraft capable of take-off weights of 255,000 pounds or more whether or not they are operating at this weight during a particular phase of flight (Examples: B-747, B-777, DC-10). [Exception: the B-757 is handled as a Heavy aircraft for separation purposes].
- **Large:** Aircraft of more than 41,000 pounds, maximum certified take-off weight, up to 250,000 pounds (Examples: B-737, MD-80, Dash-8, Large Business jets).
- **Small:** Aircraft of 41,000 pounds or less maximum certified take-off weight (twin and single engine piston/turboprops, Small Business Jets).

Within the Milwaukee Class C airspace, the Milwaukee TRACON provides all VFR aircraft a radar separation of one-half nautical mile longitudinally, or 500 feet of vertical separation, from all IFR and VFR aircraft.

Airport Noise and Flight Track Monitoring

General Mitchell International Airport's Noise Programs Office maintains and operates a noise and flight track data collection and analysis program that collects and processes noise data from a permanent noise monitoring network and radar data from the FAA's ARTS radar system (Aircraft Radar Tracking System). The system also manages the noise complaint information for the airport. This system was installed in late 1999. Once collected, the TAMIS (Total Aircraft Noise Management and Information System) performs a number of processes, including determining if the flight track is a departure or an arrival, assigning a runway to the track and building a smoothed track from the raw radar points. With this system, the Noise Office is able to analyze compliance with the noise management program and investigate particular incidents concerning aircraft operations. The Noise Office also tracks the change in noise that occur over the long-term. One full year of complete data was collected for this study, consisting of operations occurring between January 1st, 2002 and December 31st, 2002. Flight data, radar tracks, noise monitoring data, and complaint information were collected, and integrated into a database for dynamic analysis and reporting.

A software program enables the exports of radar data file that includes flight information about aircraft operating on each track as well as position information on the location of each flight. This flight information includes specific data such as the ARTS aircraft type, ARTS airline code, flight number, type of operation, and runway. The position information includes the three dimensional (X, Y, and Z data from each radar sweep every four (4.6 seconds) for each flight track. Position information is given in distance relative to the ARTS radar antenna located on Airport property.

Current Noise Management Program

MKE combines elements of the Milwaukee County Airport Noise Abatement Plan with air traffic control requirements to ensure the safe and expeditious handling of air traffic. While safety is paramount to any ATC operation, noise sensitivity to the surrounding communities is also of key importance in airport operations. The following information describes the integration of noise abatement procedures with safe and expeditious air traffic control procedures. The procedures are part of an informal runway use program and participation by pilots and aircraft operators is voluntary. These procedures apply primarily to turbojet aircraft unless noted otherwise.

Policy

The FAA has a primary function to determine under what conditions flight operations may be conducted without causing degradation of safety. Under ideal conditions aircraft

takeoffs and landings should be conducted into the wind. Considerations such as delay and capacity problems, runway length, approach aids, noise abatement, and other factors may require aircraft operations to be conducted as follows:

A. In the order listed below, the following runways provide the greatest noise abatement benefits:

Takeoff	Landing
19R	1L
1L	19R
25L	7R
7R	25L

B. Runway 19R should be used for all turbojet departures, except when required for safe and efficient operations of aircraft. Using Runway 19R for departures is consistent with FAA Order 8400.9, National Safety and Operational Criteria for Runway Use Programs. Requests for use of other runways for reasons of operational necessity and safety will be honored.

C. Runway conditions should be considered when making runway assignments; i.e. wet or dry runway, slush on the runway, etc.

Procedures

For Turbojet aircraft, the following procedures are to be used:

Runway 19R – All eastbound departures shall be issued headings to track approximately 15 degrees left of the centerline until leaving 3,000 feet MSL or three (3) miles from the end of the departure runway. All westbound departures shall be issued headings to track approximately 15 degrees to the right of the centerline. After aircraft have crossed the departure end of Runway 19R, the aircraft may be turned no further right than 270 degrees until leaving 3,000 feet MSL. Runway 19R departures at the intersection of Taxiway V are allowed between the hours of 7:00 AM and 10:00 PM.

Runway 1L – Departures shall maintain runway heading until leaving 2,000 feet MSL then turn either left or right as follows:

1. All east and southbound departures shall not be assigned a heading to the right greater than 050 degrees until leaving 3,000 feet MSL or at three (3) miles from the end of the departure runway.

2. All west and southbound departures shall not be assigned a heading to the left less than 330 degrees until leaving 3,000 feet MSL or are three (3) miles from the end of the departure runway.

Runway 7R – Departures shall maintain runway heading until leaving 2,000 feet MSL then turn left or right to the tower assigned heading.

Runway 25L – Departures shall maintain runway heading until leaving 2,000 feet MSL then turn left or right to tower assigned heading. When operating on a 25L arrival configuration all east and southbound turbojet departures should be assigned Runway 19R for departure.

In all of these procedures, the only exception for turns earlier than specified is for safety considerations.

A recommendation to broadcast on the ATIS (Automated Terminal Information Service) between 10:00 PM and 6:00 AM local time: “these runway assignments are in accordance with noise abatement procedures. Request other runways only for operational necessity”.

MKE also provides restrictions for certain categories of aircraft operating between the hours of 10:00 PM and 6:00 AM local time. These restrictions are predicated on noise abatement sensitivities and are subject to meteorological conditions in place at the time of operation. These conditions include, but are not limited to: reports of significant wind shear, thunderstorms, reduced visibility, and crosswind factors.

Noise Generated During Aircraft Engine Maintenance

The routine requirement of running aircraft engines to almost full power during ground maintenance procedures can produce an unwanted amount of noise. To mitigate the effects of noise generated by these engine run-ups, MKE constructed a Ground Run-up Enclosure (GRE) to help contain engine noise during maintenance operations. All jet aircraft and turboprops over 10,500 pounds Maximum Takeoff Weight with wingspans less than 214 feet shall conduct above idle engine run-ups in the GRE subject to availability and meteorological conditions.

Should the GRE be unavailable for use due to weather or maintenance considerations, regulations are in place that specify alternative locations and aircraft headings to be used to perform above idle engine run-ups.

Sound Insulation Program

Through the previous Part 150 Study approved by the FAA in 1995, the Milwaukee County Homeowner Protection Program (HOPP) was formed as a community-based program which was developed in accordance with Federal Aviation Regulations. The goal of the HOPP program is to preserve and improve neighborhoods surrounding General Mitchell International Airport by making the interior environment of homes more compatible with exterior aircraft noise. Residential construction modifications to homes within the previous federally-approved General Mitchell International Airport noise contours established in 1993 include replacement of existing windows and doors with acoustical windows and doors, attic insulation, and air conditioning if required.

The previous Part 150 study that was approved in 1995 established a noise contour map which identified 1,761 residences eligible to participate in Phase 1 of the HOPP program. The contour line for Phase 1 (based on the 1997 forecasted noise levels) was established as a 1.5 dB buffer around the 70 DNL for sound insulation modifications. Within the 1997 68.5 DNL, Phase 1 includes three options for eligible participants: sound insulation modifications, aviation easement, and sales assistance. Homes within the 75 DNL qualified for property acquisition. Boundaries of each eligibility area were squared off to provide neighborhood continuity by using roads, alleys, back lot lines, or open land as defined by the contours.

To date, insulation modifications were provided for approximately 719 eligible homes using a “bulk parcel” bidding method. In 2001, the “single parcel” bidding method was implemented by Milwaukee County in an effort to improve the quality of construction workmanship and to offer homeowners more choice in the contractor selection process. Under this new program, each home is established as an independent construction contract, maximizing individual attention, communication, and quality. Each home receives a unique acoustic design based on pre-existing conditions and needs. To preserve continuity, each home is assigned a homeowner agent and construction manager who works with the homeowners throughout the entire nine-month process. This nine-month process includes the following primary processes:

- Homeowner Orientation
- Contractor Selection Process
- Architectural Design Process
- Design Review & Homeowner Acceptance
- Bidding Process
- Construction
- Ventilation Post-Testing
- Final Inspection and Close-out.

To date, over 1000 homes have received sound insulation modifications under Phase 1 of the HOPP program. The avigation easement option was chosen by 150 homeowners and the sales assistance option was selected by one (1) homeowner. A total of \$63 million has been spent on construction, acquisitions, churches, and schools, purchase of vacant land and consultants since the program began in 1994. In 2001, Milwaukee County elected to adopt new ventilation standards for the current HOPP Residential Sound Insulation Program. The Quality Ventilation Program (QVP) ensures that HOPP participants receive improved ventilation performance as well as the sound insulation modification.

Noise Complaint Response

MKE's Noise Programs Office operates a Noise Complaint Hotline that is available 24 hours a day to receive public comments. Filing of noise complaints can be done directly via telephone to the Noise Programs Office.

Noise complaints are evaluated to identify the cause of the noise event and determine if an aircraft is operating outside the noise plan parameters. Noise complaints are not necessarily reflective of the severity of the noise, but can be useful to the airport in identifying problems and issues that are important to the various communities surrounding the airport.

The airport staff investigates the source of each noise complaint. If an aircraft is found to be outside the preferred procedures, additional research will be done to determine why, and this information will be forwarded to the airline and/or the FAA as appropriate. All complaints are posted to the TAMIS system. In 2002, the Noise Programs Office received 369 complaints. This reflects a continued downward trend in the overall noise complaints received at the airport. The total annual noise complaints since 1999 are presented in Table A4, *TOTAL ANNUAL NOISE COMPLAINTS*.

Table A4
TOTAL ANNUAL NOISE COMPLAINTS
General Mitchell International Airport Noise Study Update

Year	Total Calls
1999	458
2000	433
2001	386
2002	369

Source: General Mitchell International Airport

Aircraft noise complaint information was obtained as part of the baseline data for this FAR Part 150 Study. These complaints, when coupled with the aircraft noise exposure contours and flight track maps, provide one means of an illustration of the locations where individuals are concerned with aircraft noise exposure. In some cases, specific noise concerns are identified which help determine which issues should be included in this FAR Part 150 Study or help identify new issues as they arise. However, because some citizens will not call noise complaint hotlines or submit complaints in writing, the complaint information is not the sole determinate of where and how people are concerned with aircraft noise.

The complaint data was then processed in order to map each complaint address, to categorize the complaints, and to correlate the complaint data with flight track data during the time period that flight track data are being analyzed. The report data categorizes the complaints by geographic area, which is depicted in Figure A12, *LOCATION OF NOISE COMPLAINTS*.

This figure shows the location of the complaints received in 2002 on a base map surround the airport. Note that there are some complaints at greater distances that are not shown on this map. Also note that not all callers provided an address, or sufficient information was not received or can not be determined. This map displays only those calls for which the locations could be determined.

The complaint data have been analyzed according to several variables: location, time of day, season, and the day of week for each call. The hotline calls for 2002 are summarized in the following tables and figure.

Figure A12
Location of Noise Complaints

(Click here to open figure)

Table A5 presents the number of complaints by community. This table shows both the total number of complaints as well as the number of complaints by individual callers. This is useful for illustrating if the calls come from a few people or many different people. As the table below indicates, the majority of complaints received originated from the City of Milwaukee.

Table A5
TOTAL NOISE COMPLAINTS BY COMMUNITY, 2002
General Mitchell International Airport Noise Study Update

Community	Total Calls	Individual Callers
Brookfield	1	1
Brown Deer	1	1
Cudahy	32	23
Franklin	2	2
Greendale	4	3
Hales Corners	2	1
Menomonee Falls	3	1
Milwaukee	272	76
Muskego	1	1
New Berlin	1	1
Oak Creek	31	15
South Milwaukee	7	7
St. Francis	6	5
Waterford	1	1
Unknown	5	5
Total	369	143

Source: General Mitchell International Airport

Table A6 presents the number of complaints by hour of the day. The highest number of complaints is associated with events between midnight and 1:00 a.m. (42 complaints); the second, third, and fourth highest number of complaints is associated with events between 5:00 and 6:00 a.m., between 4:00 and 5:00 a.m. and between 10:00 and 11:00 p.m. (31, 29 and 29 complaints, respectively). A full 60% of the complaints occur during the nighttime (defined within DNL as 10 p.m. to 7 a.m.). As detailed in the following paragraphs, these complaints are primarily associated with run-ups and ground activity noise.

Table A6
TOTAL NOISE COMPLAINTS, PER HOUR, 2002
General Mitchell International Airport Noise Study Update

Hour of Day	Total Calls	Percent of Total
12 am	42	11%
1 am	8	2%
2 am	15	4%
3 am	25	7%
4 am	29	8%
5 am	31	8%
6 am	22	6%
7 am	2	1%
8 am	5	1%
9 am	6	2%
10 am	19	5%
11 am	6	2%
12 pm	3	1%
1 pm	12	3%
2 pm	5	1%
3 pm	10	3%
4 pm	9	2%
5 pm	7	2%
6 pm	10	3%
7 pm	13	4%
8 pm	13	4%
9 pm	27	7%
10 pm	29	8%
11 pm	21	6%
Total	369	100%

Source: General Mitchell International Airport

One piece of useful information that can be derived from the noise complaint information is the identification of both the nature and source of the noise complaint. The Noise Programs Office categorizes each noise complaint relative to the source of the disturbance; such as complaints associated with a particular loud aircraft type, an aircraft at a low altitude, or an aircraft engine maintenance run-up. The results of this analysis are presented in Table A7. This table presents the total calls received and the nature of the complaint. The results show that 34 percent of the calls were associated with aircraft engine run-ups, with an additional 19 percent associated with ground movement activities. In summary, 52 percent of the complaints are associated with ground noise activities. Fourteen percent of the complaints were associated with

aircraft that were too loud while 17 percent were associated with aircraft that were perceived by the caller to be too low or off track from the expected flight patterns.

Complaints from aircraft engine run-ups have always been a significant source of complaints at the airport. As a result, the airport constructed a Ground Run-up Enclosure to mitigate the noise from aircraft engine run-ups activities. That facility became operational in November 2002. Thus the majority of the time that the complaint analysis represents was prior to the use of the GRE.

Table A7
TOTAL NOISE COMPLAINTS, PER NATURE OF CALL, 2002
General Mitchell International Airport Noise Study Update

Nature of Call	Total Calls	Percent of Total
Flight Frequency	2	1%
Flight Volume	3	1%
General Aviation	3	1%
Ground Activity	69	19%
Helicopter	8	2%
Loud Jet	49	13%
Loud Prop	5	1%
Low Aircraft	44	12%
Off Course	17	5%
Other	43	12%
Runups	126	34%
Total	369	100%

Source: General Mitchell International Airport

Table A8 presents the number of complaints per month during 2002. As would be expected for locations with seasonal climate, data shows that more complaints occur during the summer season (when windows are open) than during the winter season. The month with the most number of complaints was June with 14% of the total complaints.

Table A9 presents the number of complaints per day of the week in 2002. Typically, one might expect more complaints during the weekends when most people are at home, however, that is not the case for MKE. As the table indicates, all of the days are relatively similar, with Wednesday and Friday having the highest number of complaints and Saturday having the lowest number of complaints. Note that complaints from Fridays are primarily in the early morning hours that are associated with run-ups that are

occurring over the Thursday night/Friday morning time period. This could be attributed to fewer nighttime aircraft engine run-up operations during the weekends. The majority of the complaints at MKE are associated with nighttime activities which are primarily ground movement and aircraft engine run-up noise and not as much associated with flight operations.

Table A8
TOTAL NOISE COMPLAINTS, PER MONTH, 2002
General Mitchell International Airport Noise Study Update

Month	Total Calls	Percent of Total
January	24	7%
February	16	4%
March	12	3%
April	47	13%
May	21	6%
June	51	14%
July	39	11%
August	44	12%
September	43	12%
October	25	7%
November	12	3%
December	35	9%
Total	369	100%

Source: General Mitchell International Airport

Table A9
TOTAL NOISE COMPLAINTS, PER DAY OF THE WEEK, 2002
General Mitchell International Airport Noise Study Update

Weekday	Total Calls	Percent of Total
Sunday	47	13%
Monday	50	14%
Tuesday	48	13%
Wednesday	66	18%
Thursday	47	13%
Friday	66	18%
Saturday	45	12%
Total	369	100%

The data was also analyzed relative to how often individual people contact the Airport concerning noise. These results are presented in Table A10. The data show that of the total of 143 individuals that contacted the airport, 108 people contacted the Airport only once (or anonymously), while there was one person who complained 70 times during calendar year 2002. Analysis indicates that 76 percent of individuals who submitted complaints in 2002, called only once (or called anonymously). 57 percent of the total complaints originated from the same 11 individuals.

In terms of run-up and ground noise complaints, there were 52 individuals that contacted the Airport. Of these, 36 contacted the Airport only once, or anonymously, while one person called 56 times. Seventy-one percent of the run-up/ground noise complaints originated from the same seven individuals.

Table A10
NOISE COMPLAINTS, PER INDIVIDUAL CALLERS, 2002
General Mitchell International Airport Noise Study Update

Complaints Per Caller	Number of Callers	Total Number of Complaints	Percent of All Callers	Percent of All Complaints
1	108	108	76%	29%
2	20	40	14%	11%
3	4	12	3%	3%
4	1	4	1%	1%
5	2	10	1%	3%
6	2	12	1%	3%
7	1	7	1%	2%
11	1	11	1%	3%
12	1	12	1%	3%
21	1	21	1%	6%
62	1	62	1%	17%
70	1	70	1%	19%
Total	143	369	100%	100%

Source: General Mitchell International Airport

Airport Environs

The majority of the airport is located in the southern portion of the City of Milwaukee, approximately two miles west of the Lake Michigan shoreline. The study area utilized for this FAR Part 150 Study update is expected to contain the following cities: Milwaukee, Greenfield, Greendale, Franklin, Oak Creek, South Milwaukee, Cudahy, and St. Francis. Figure A13, depicts generalized Existing Land Use.

Existing Land Use

A significant amount of residential development is located within the study area, as are other noise-sensitive land uses, such as educational, religious, medical, and public facilities. The study area also encompasses parks and recreational areas, agricultural, open space, and vacant lands, as well as commercial and industrial development. The following section summarizes land uses in the immediate vicinity of MKE:

- *North:* The City of Milwaukee and the City of St. Francis are located north of MKE. Existing land use north of MKE is primarily residential with intermittent commercial and industrial uses occurring adjacent to major roadways and highways. Further north of the airport is the metropolitan center of Milwaukee and the adjacent lakefront. Land uses in these areas are primarily industrial, commercial, and recreational use. This north area also includes religious, educational, and medical facilities, as well as cemeteries.
- *South:* The City of Oak Creek, the City of South Milwaukee, and the City of Franklin are located south of MKE. Immediately south of MKE, existing land use is primarily open and agricultural uses. Further south there is a fairly equal distribution of residential, industrial, open lands, and agricultural uses. Facilities south of the airport include religious, educational, medical facilities, and cemeteries.
- *East:* The eastern boarder of MKE is nearly inclusive of the entire City of Cudahy. Immediately adjacent to the eastern boarder of the airport is primarily open land, transportation, and industrial uses. Further east of the airport lies the city center of Cudahy which is comprised of residential, industrial, commercial, parkland, and open land uses. The City of Cudahy has religious and educational land facilities within it. The City of Cudahy borders Lake Michigan on its entire eastern boarder.
- *West:* The City of Greendale and the Village of Greenfield are located west of MKE. Interstate Highway 94 (I-94) is the main north/south thoroughfare to the Airport. Additionally, the City of Milwaukee is west of MKE. Immediately adjacent to the western boarder of the airport is primarily airport, transportation, industrial, and commercial uses; however, there are a few parks and residential areas situated between the airport and I-94. Further west of the airport and I-94 is primarily residential land uses with commercial land uses located along 27th Street. Additionally, a number of educational and religious uses are located west of I-94.

Figure A13
Existing Land Use

(Click here to open figure)

In summary, properties immediately adjacent to the western, southern, and eastern borders of airport are comprised of compatible land uses; however, residential uses are very near the runway ends, particularly to the north. Generally, there is a higher concentration of residents toward the northern portion of the airport and lower residential concentrations south of the airport. Furthermore, the eastern quadrant near the airport has residential uses with open water located further east of the City of Cudahy.

An estimate of population, residential units, and noise sensitive facilities exposed to aircraft noise of 65 DNL and higher are presented in the alternatives analysis section (see the Alternatives Evaluation Chapter).

Future Land Use

The Southeastern Wisconsin Regional Planning Commission (SEWRPC) was established in 1960 as the official area-wide planning agency for the highly urbanized southeastern region of the State. The SEWRPC serves the seven counties of Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha.

The Commission was created to provide the basic information and planning services necessary to solve problems which transcend the corporate boundaries and fiscal capabilities of the local units of government comprising the Southeastern Wisconsin Region. As part of this mission, SEWRPC has developed a 2020 Land Use plan for Milwaukee County. This plan provides a generalized land use plan for Milwaukee County.

The generalized future land use plan indicates that the land uses north of the airport will consist primarily of high density urban uses and the areas east, west, and immediately south of the airport are shown as medium density urban uses. Further south of the airport is shown as a primary corridor for non residential uses; however, southeast of the airport is an isolated area of high density urban uses. Figure A14, *FUTURE LAND USE*, depicts the generalized land uses planned for areas near the airport.

Many of the jurisdictions within the vicinity of MKE have adopted land use plans described within comprehensive plans developed, or currently being developed, by each of the jurisdictions. The land use plans for the communities that have developed and approved comprehensive plans are outlined below. These communities also have adopted traditional zoning ordinances and overlay zones which divide a jurisdiction into districts and prescribe certain requirements for allowable uses to control the types of land uses on specific parcels. The various zoning codes pertaining to airport-related activities are presented in the following paragraphs.

Figure A14
Generalized Future Land Use

(Click here to open figure)

Wisconsin Jurisdictions

Significant changes to planning-related statutes for local governments were included in the 1999-2001 Wisconsin biennial budget that is sometimes referred to as Wisconsin's "Smart Growth" law. Comprehensive planning guidelines and requirements are detailed in Section 66.1001 of the Wisconsin Statutes. The state guidelines require that after January 1, 2010, all programs and actions of local governmental units that affect land use must be guided by, and consistent with, that governmental units adopted comprehensive plan. The state statutes standardize the procedure for adopting a comprehensive plan, including having the planning commission recommend the plan to the governing body, governing body adopting, and enacting the plan by ordinance, and the local government filing the ordinance.

Comprehensive plans developed in the State of Wisconsin should contain all of the following elements:

(a) *Issues and Opportunities Element.* Background information on the local governmental unit and a statement of overall objectives, policies, goals, and programs of the local governmental unit to guide the future development and redevelopment of the local governmental unit over a 20-year planning period. Background information shall include population, household, and employment forecasts that the local governmental unit uses in developing its comprehensive plan, and demographic trends, age distribution, educational levels, income levels, and employment characteristics that exist within the local governmental unit.

(b) *Housing Element.* A compilation of objectives, policies, goals, maps and programs of the local governmental unit to provide an adequate housing supply that meets existing and forecasted housing demand in the local governmental unit. The element shall assess the age, structural, value, and occupancy characteristics of the local governmental unit's housing stock. The element shall also identify specific policies and programs that promote the development of housing for residents of the local governmental unit and provide a range of housing choices that meet the needs of persons of all income levels and of all age groups and persons with special needs, policies and programs that promote the availability of land for the development or redevelopment of low-income and moderate-income housing, and policies and programs to maintain or rehabilitate the local governmental unit's existing housing stock.

(c) *Transportation Element.* A compilation of objectives, policies, goals, maps and programs to guide the future development of the various modes of transportation, including highways, transit, transportation systems for persons with disabilities, bicycles, walking, railroads, air transportation, trucking, and water transportation. The element shall compare the local governmental unit's

objectives, policies, goals and programs to state and regional transportation plans. The element shall also identify highways within the local governmental unit by function and incorporate state, regional and other applicable transportation plans, including transportation corridor plans, county highway functional and jurisdictional studies, urban area and rural area transportation plans, airport master plans and rail plans that apply in the local governmental unit.

(d) *Utilities and Community Facilities Element.* A compilation of objectives, policies, goals, maps and programs to guide the future development of utilities and community facilities in the local governmental unit such as sanitary sewer service, storm water management, water supply, solid waste disposal, on-site wastewater treatment technologies, recycling facilities, parks, telecommunications facilities, power-generating plants and transmission lines, cemeteries, health care facilities, child care facilities and other public facilities, such as police, fire and rescue facilities, libraries, schools and other governmental facilities. The element shall describe the location, use and capacity of existing public utilities and community facilities that serve the local governmental unit, shall include an approximate timetable that forecasts the need in the local governmental unit to expand or rehabilitate existing utilities and facilities or to create new utilities and facilities and shall assess future needs for government services in the local governmental unit that are related to such utilities and facilities.

(e) *Agricultural, Natural, and Cultural Resources Element.* A compilation of objectives, policies, goals, maps and programs for the conservation, and promotion of the effective management, of natural resources such as groundwater, forests, productive agricultural areas, environmentally sensitive areas, threatened and endangered species, stream corridors, surface water, floodplains, wetlands, wildlife habitat, metallic and nonmetallic mineral resources, parks, open spaces, historical and cultural resources, community design, recreational resources and other natural resources.

(f) *Economic Development Element.* A compilation of objectives, policies, goals, maps and programs to promote the stabilization, retention, or expansion, of the economic base and quality employment opportunities in the local governmental unit, including an analysis of the labor force and economic base of the local governmental unit. The element shall assess categories or particular types of new businesses and industries that are desired by the local governmental unit. The element shall assess the local governmental unit's strengths and weaknesses with respect to attracting and retaining businesses and industries, and shall designate an adequate number of sites for such businesses and industries. The

element shall also evaluate and promote the use of environmentally contaminated sites for commercial or industrial uses. The element shall also identify county, regional, and state economic development programs that apply to the local governmental unit.

(g) *Intergovernmental Cooperation Element.* A compilation of objectives, policies, goals, maps and programs for joint planning and decision making with other jurisdictions, including school districts and adjacent local governmental units, for siting and building public facilities and sharing public services. The element shall analyze the relationship of the local governmental unit to school districts and adjacent local governmental units, and to the region, the state, and other governmental units. The element shall incorporate any plans or agreements to which the local governmental unit is a party under Sections 66.0301, 66.0307 or 66.0309 (*note: previously, s. 66.30, 66.023, or 66.945*) The element shall identify existing or potential conflicts between the local governmental unit and other governmental units that are specified in this paragraph and describe processes to resolve such conflicts.

(h) *Land Use Element.* A compilation of objectives, policies, goals, maps and programs to guide the future development and redevelopment of public and private property. The element shall contain a listing of the amount, type, intensity and net density of existing uses of land in the local governmental unit, such as agricultural, residential, commercial, industrial, and other public and private uses. The element shall analyze trends in the supply, demand, and price of land, opportunities for redevelopment and existing and potential land-use conflicts. The element shall contain projections, based on the background information specified in paragraph (a), for 20 years, in 5-year increments, of future residential, agricultural, commercial, and industrial land uses including the assumptions of net densities or other spatial assumptions upon which the projections are based. The element shall also include a series of maps that shows current land uses and future land uses that indicate productive agricultural soils, natural limitations for building site development, floodplains, wetlands and other environmentally sensitive lands, the boundaries of areas to which services of public utilities and community facilities, as those terms are used in paragraph (d), will be provided in the future, consistent with the timetable described in paragraph (d), and the general location of future land uses by net density or other classifications.

(i) *Implementation Element.* A compilation of programs and specific actions to be completed in a stated sequence, including proposed changes to any applicable zoning ordinances, official maps, sign regulations, erosion and storm water control ordinances, historic preservation ordinances, site plan regulations, design

review ordinances, building codes, mechanical codes, housing codes, sanitary codes or subdivision ordinances, to implement the objectives, policies, plans and programs contained in paragraphs (a) to (h). The element shall describe how each of the elements of the comprehensive plan will be integrated and made consistent with the other elements of the comprehensive plan, and shall include a mechanism to measure the local governmental unit's progress toward achieving all aspects of the comprehensive plan. The element shall include a process for updating the comprehensive plan. A comprehensive plan under this subsection shall be updated no less than once every 10 years.

Wisconsin Law 114.135

Wisconsin Law 114.135 provides public airport owners the authority to impose height limitations on structures within three miles of their airport. This zoning authority protects the community and airspace for air traffic to and from the airport. Height limitation zoning may be adopted and enforced by the public airport owner and may extend beyond municipal boundaries. This statute applies to all structures, towers, smokestacks, silos, and buildings to assure safe operations to and from the airport.

Airport Noise Overlay Zones (ANOZ) or districts are an important consideration for possibly regulating land use around an airport. The ANOZ is a district that is incorporated into a local zoning ordinance. The benefit of adopting airport overlay zoning is that it promotes compatible land uses for specific distances around airports. The boundaries of an airport noise overlay zone are usually based on the development of noise exposure contours. From this, restrictions on permitted land uses and limits on building (structure) heights can be developed.

Milwaukee County, as owner and operator of General Mitchell International Airport, has adopted an airport zoning ordinance establishing height limitations within three miles of the approaches to the airport. The zoning ordinance, adopted in 1961, sets height limitations only. Seven height zones, ranging from 35 feet to 300 feet, are established in roughly concentric rings extending outward from the airport.

Enforcement of the County Airport Zoning Ordinance is bolstered through provisions in the zoning codes of the City of Cudahy, City of Milwaukee, City of Oak Creek, and the City of St. Francis which either acknowledge and defer to the County regulations (Oak Creek and Milwaukee) or adopt the County's regulations as local regulations (Cudahy and St. Francis). Other municipalities that do not border the airport, but are within 3 miles, have not officially adopted an Airport Zoning Ordinance.

The following paragraphs describe the planning and zoning initiatives at each of the cities in the vicinity of the airport.

City of Milwaukee

The City of Milwaukee, with an approximate population of 596,974, conducts its comprehensive planning through the “Comprehensive Plan Series”, which is a series of reports and documents that collectively compose the City’s Comprehensive Plan. The series includes, among others, area plans, functional plans, and studies. The City of Milwaukee has not developed any recent plans regarding MKE or its surrounding areas.

Zoning

The City of Milwaukee Zoning Code does not directly refer to airports or the areas surrounding them; however, the Zoning Code does reference the County and State regulations specifying maximum building heights. In any area within the City of Milwaukee where the height limitations of the Milwaukee County Airport approach height ordinances are applicable, such height limitations shall apply, except where the height limitations of Zoning Code are more restrictive. Exceptions permitted under s. 200-44 and objects of natural growth shall not exceed the height limitations established by the Milwaukee County general ordinances and by s. 114.136, Wisconsin Statutes.

City of St. Francis

The City of St. Francis, with an approximate population of 8,662, is located just north northeast of the airport with airport property within city limits. The City of St. Francis has prepared a Draft Comprehensive Plan that is currently under sub-committee and public review. The draft plan does not contain specific goals and polices relating to MKE; however, potential development sites within the airport environs are identified and being planned for compatible land use.

Zoning

The St Francis Zoning Code divides the City into 10 districts consisting of various residential, institutional, and business districts; which are distributed in accordance with *City of St. Francis District Zoning Map*. In addition to the zoning map, the City of St. Francis has also adopted a Height District Map that divides the City into five height districts ranging from a maximum height of 35 feet to a maximum height of 150 feet. The height restrictions are intended to ensure that no obstructions to aviation to and from MKE are erected within the city limits.

City of Cudahy

The City of Cudahy, with an approximate population of 18,429, is located east of the airport and is situated directly between the eastern airport property boundary and Lake

Michigan. The City of Cudahy has prepared a Comprehensive Development Plan dated July 1994. This plan directly addresses the interrelationships between MKE and the City. In fact Object 53 of the plan is to “*Avoid the construction of new housing units in areas that are subject to unacceptable levels of aircraft noise as recommended in the General Mitchell International Airport F.A.R. 150 Noise Compatibility Study.*” The recommendations and plans outlined in the Comprehensive Development Plan directly incorporate the findings and plans identified in the previous Part 150 Noise Compatibility Study prepared in 1993.

Zoning

Because of the City of Cudahy’s location, immediately adjacent to MKE, various zoning and related height limitations are in place at the city, county, and federal levels. The City of Cudahy’s Zoning Code regulates building heights and includes a height district map. Under the Zoning Code, the City of Cudahy is divided into five height districts ranging from a maximum height of 25 feet to a maximum height of 150 feet.

City of South Milwaukee

The City of South Milwaukee, with an approximate population of 21,256, is located southeast of the airport less than one mile from airport property. The City of South Milwaukee has prepared a Comprehensive Plan that has not yet been adopted by the City. The draft plan does not contain specific goals and policies relating to MKE.

Zoning

Given the City of South Milwaukee’s location in relation to the runways, no portion of the city is within the existing or future 65-DNL Noise Contours. The City of South Milwaukee Zoning Code does not contain any ordinances or overlays pertaining to the airport or its operations.

City of Oak Creek

The City of Oak Creek, with an approximate population of 28,456, is located south of the airport with portions of airport property within city limits. The City of Oak Creek has prepared a Comprehensive Plan that was adopted by City Council on April 1, 2002. The Comprehensive Plan recommends an “Airport Clear Zone” as part of the Resource Protection Areas developed under the plan. The Comprehensive Plan states that “*Keeping this corridor free from most development (particularly residences) is in the best interest of the community and Airport for safety and noise reasons.*”

The Comprehensive Plan provides general recommendations for future land use with the City, including air transportation. This category includes lands used for MKE and designated “clear zones” surrounding the Airport. These areas are based on recommendations contained in the 1992 Airport Master Plan.

Zoning

The City of Oak Creek's Zoning code does not directly address the airport or noise resulting from aircraft operations. However, the Zone Code does include a requirement that the development of planned antennas and towers needs to receive clearance from the FAA.

City of Franklin

The City of Franklin, with an approximate population of 30,749, is located southwest of the airport. The City of Franklin's Comprehensive Master Plan is the City's primary land use planning policy document. The plan was adopted in 1992. The Comprehensive Master Plan sets forth the land use objectives of the City and conceptually maps future land use districts and infrastructure for the entire City for a 20-year planning time-frame.

The existing Comprehensive Master Plan places a strong emphasis on neighborhood-based residential development. The majority of the undeveloped land in the northern two-thirds of the City is conceptually laid-out for residential development.

One of the expected outcomes of the Economic Development Strategic Plan will be to revise district plans and neighborhood plans for those areas with significant economic development potential. The objective of the anticipated revisions of the Comprehensive Master Plan will be to achieve a land use and development pattern that maximizes the opportunities for economic development.

Zoning

The zoning ordinance regulates day-to-day land use and development permitting decisions made by the Plan Commission and City Council. Effective August 1, 1998, the City adopted the Unified Development Ordinance, which incorporates the zoning ordinance and other development-related codes. After adoption of the Economic Development Strategic Plan, it is anticipated that the City will be making changes in the zoning regulations to reflect the recommendations contained in this report and the other economic studies.

The Airport Overlay (AO) District boundaries are based upon the previous *General Mitchell International Airport. Part 150 Noise Compatibility Study: Noise Exposure Maps and Noise Compatibility Program* dated October 1993.

The City of Franklin has adopted an Airport Overlay District that is intended to:

1. Allow for the coordination, planning, and development of land uses in the vicinity of General Mitchell International Airport, but limits uses and requires noise protection.

2. Control conflicts between land uses and noise generated by aircraft and to protect the public health, safety, and welfare from the adverse impacts associated with excessive noise.
3. Ensures that land uses in the airport noise impact area are mutually compatible with airport noise.
4. Provide acoustical performance standards.
5. Be in addition to and shall overlay all other zoning districts where it is applied so that any parcel of land or lot lying in the AO District shall also lie in one or more of the other zoning districts. The effect is to create a zoning district which has the characteristics and limitations of the underlying district, together with the characteristics and limitations of the AO District.
6. Provide adequate notice to land owners and prospective land owners that airport operations should be considered as possibly affecting the use of property within the AO District.
7. Regulate land uses within designated existing or projected airport impact areas by providing height restrictions which will assure safe, unobstructed access for all aircraft which enter and exit General Mitchell International Airport.

Airport noise impact areas (numbered AO Districts) have been established in order to distinguish between the severity of the levels of noise impact so that appropriate uses and acoustical performance standards can be established to mitigate the adverse impacts of aircraft noise in order to protect the public health, safety, and welfare. For the purpose of administering the Airport Overlay district regulations, there shall be two (2) Airport Noise Impact Areas established as follows: AO-1 District for areas of L_{dn} 65-70 and AO-2 District for areas of L_{dn} 70-75.

Village of Greendale

The Village of Greendale is located west of the airport with no airport property within city limits. The Village of Greendale does not have a comprehensive plan because of the stated reason that the village is fully developed.

Zoning

The Village of Greendale has prepared an Official Zoning Map in accordance with its municipal code. The Village of Greendale's Zoning code does not directly address the airport or noise resulting from aircraft operations.

City of Greenfield

The City of Greenfield, with an approximate population of 35,568, is located west of the airport. The City of Greenfield Comprehensive Plan is the City's primary land use planning policy document. The plan was adopted in 1992. The Comprehensive Plan sets forth the land use objectives of the City.

Zoning

The zoning ordinance regulates day-to-day land use and development permitting decisions made by the Plan Commission and City Council. The Zoning Code includes an Airport Overlay District boundaries are based upon the General Mitchell International Airport study titled *General Mitchell International Airport. Part 150 Noise Compatibility Study: Noise Exposure Maps and Noise Compatibility Program* dated October 1993. The City of Greenfield has adopted an Airport Overlay District that is intended to:

1. Protect the public health, safety, and welfare from the adverse impacts associated with excessive noise generated by aircraft associated with General Mitchell International Airport.
2. Regulate land uses within designated existing or projected airport noise impact areas of General Mitchell International Airport.
3. Control potential conflicts between land uses and noise generated by aircraft associated with General Mitchell International Airport and establish requirements to minimize such noise.
4. Promote the coordination, planning, and development of land uses near General Mitchell International Airport with limitations on use types which may be impacted by noise generated by aircraft associated with General Mitchell International Airport.
5. Ensures that land uses in the airport noise impact area are mutually compatible with airport noise associated with General Mitchell International Airport.
6. Provide acoustical performance standards to minimize the effects of airport noise associated with General Mitchell International Airport.
7. Be in addition to and shall overlay all other zoning districts where it is applied so that any parcel of land or lot lying in the AO District shall also lie in one (1) or more of the other zoning districts of the City of Greenfield so as to create a zoning district that has the characteristics and limitations of the underlying district, with the characteristics and limitations of the AO District.

8. To provide adequate notice to landowners and prospective landowners that airport operations associated with General Mitchell International Airport should be considered as possibly affecting the use of property within the AO Airport Overlay District.

Airport noise impact areas (numbered AO Districts) have been established in order to distinguish between the severity of the levels of noise impact so that appropriate uses and acoustical performance standards can be established to mitigate the adverse impacts of aircraft noise in order to protect the public health, safety, and welfare. For the purpose of administering the Airport Overlay district regulations, there shall be two (2) Airport Noise Impact Areas established as follows: AO-1 District for areas of L_{dn} 65-70 and AO-2 District for areas of L_{dn} 70-75.