AIRPORT USER SURVEY REPORT

ANN ARBOR MUNICIPAL AIRPORT (ARB)
ANN ARBOR, MICHIGAN

July 2009

An airport user survey for Ann Arbor Municipal Airport (ARB) has been conducted by the Michigan Department of Transportation - Airports Division (MDOT). The purpose of the survey was to determine if there is justification of need for a proposed extension of primary Runway 6/24, based on current MDOT and Federal Aviation Administration (FAA) standards.

Runway 6/24 is presently 3,505 feet in length and 75 feet wide. The current Airport Layout Plan shows a proposed extension of this runway to an ultimate length of 4,300 feet.

Planning activities associated with the potential development of the extension began in 2007, and in that year the airport manager was requested to collect supporting aircraft operational data. Other data sources listed below were also examined as part of the survey analysis. In order to maintain consistency among the various data sources, only operational data from year 2007 was analyzed.

Based aircraft operational information was collected by Mr. Matthew Kulhanek, airport manager at ARB. The information provided was accurate as of October 18, 2007.

Itinerant (visiting) aircraft operational data was collected by the two Fixed Base Operators (FBOs) that are located on the airport. The FBOs are Solo Aviation and Ann Arbor Aviation Center. Their data collection processes were conducted over a six-month time frame, ranging from April 1, 2007 to September 30, 2007.

Records of operational activity at ARB for the entire calendar year 2007 were also obtained from the FlightAware flight tracking resource agency. FlightAware is a company that records and offers flight tracking information for both private and commercial air traffic in the United States.

During the user survey analysis, every aircraft-type listed in the various data sources was categorized according to FAA approach category, design group, and weight classifications. The various aircraft classifications and associated dimensional standards are shown on the next page. All of the operational records were carefully screened, counted, and cross-checked in order to eliminate the possibility of counting the same aircraft twice, if it was listed in more than one data source.

AIRCRAFT CLASSIFICATIONS (FAA):

APPROACH CATEGORY:

Category A:	Approach speed less than 91 knots.
Category B:	Approach speed 91 to 120 knots.
Category C:	Approach speed 121 to 140 knots.
Category D:	Approach speed 141 to 165 knots.
Category E:	Approach speed 166 knots +

DESIGN GROUP:

Group I:	Wingspan up to but not including 49 feet, tail height up to 20 feet.
Group II:	Wingspan 49 feet up to but not including 79 feet, tail heights 20 to 30 feet.
Group III:	Wingspan 79 feet up to but not including 118 feet, tail heights 30 to 45 ft.
Group IV:	Wingspan 118 feet up to but not including 171 feet, tail heights 45 to 60 ft.
Group V:	Wingspan 171 feet up to but not including 214 feet, tail heights 60 to 66 ft.
Group VI:	Wingspan 214 feet up to but not including 262 feet, tail heights 66 to 80 ft.

SMALL AIRPLANE:

An airplane of 12,500 lbs. or less maximum certificated takeoff weight.

LARGE AIRPLANE:

An airplane of more than 12,500 lbs. maximum certificated takeoff weight.

BASED AIRCRAFT ANALYSIS:

According to the Based Aircraft survey data compiled on October 18, 2007, there were 166 aircraft based at ARB. Five were helicopters, 152 were of the A-I classification, eight were of the B-I classification, and one (the only jet based at the airport) was of the B-II Large (greater than 12,500 lbs. maximum certificated takeoff weight) classification. An estimated 200 annual operations were performed by the jet aircraft.

An operation can be either a takeoff or a landing. Therefore, if a based aircraft departs the airport, and later returns, this equals a total of two operations even though it may have only been one actual flight.

Aircraft by FAA Classification:		Estimated Annual Operations:
Helicopter:	5	N/A
A-I:	152	*
A-II:	0	*
B-I:	8	*
B-II Small (<12,500 lbs.):	0	0
B-II Large (>12,500 lbs.):	1	200
C-I Large:	0	0
C-II Large:	0	0
Total:	166	

* Note: Estimated Annual Operations for A-I, A-II, and B-I classifications were not calculated as part of this analysis, as they are not a factor to the Critical Aircraft determination, nor do they provide justification for the proposed extension of the runway.

ITINERANT AIRCRAFT ANALYSIS:

Itinerant (visiting) aircraft are those that perform operations at a particular airport, but are actually based somewhere else. Itinerant aircraft information for ARB was compiled by the two FBOs that are located on the airport - Solo Aviation and Ann Arbor Aviation Center. The data sources were the pilot registration logs (airport registers) from each of their businesses. Since pilot sign-in is strictly voluntary, the registers do not account for all itinerant activity at ARB.

During the user survey analysis, two operations were awarded to each aircraft listed on the FBO airport registers. This is due to the FAA standard of considering each landing and subsequent takeoff by each visiting aircraft, two separate operations. Also, since the data was collected over a six-month time frame (April 1, 2007 to September 30, 2007) instead of a full year, operations were again multiplied by two in order to achieve an equivalent annual operational rate for the full calendar year 2007. This resulted in a total multiplier factor of four for each aircraft listed on the registers. This method is standard procedure during the analysis phase of all airport user surveys.

Data collected from the two FBOs is shown in the following tables. Note that aircraft operations that are already accounted for in the FlightAware database have not been included in the number of estimated annual operations listed in these tables. None of the estimated annual operations listed by the Solo Aviation FBO were performed by jet aircraft. Thirty-six of the operations listed by the Ann Arbor Aviation Center FBO were performed by jets.

FBO – Solo Aviation

Aircraft by FAA Classification:		Estimated Annual Operations:
Helicopter:	1	N/A
A-I:	183	*
A-II:	3	*
B-I:	40	*
B-II Small (<12,500 lbs.):	2 **	8 **
B-II Large (>12,500 lbs.):	2 **	8 **
C-I Large:	0	0
C-II Large:	0	0
Total:	231 **	

ITINERANT AIRCRAFT ANALYSIS (continued):

FBO – Ann Arbor Aviation Center

Aircraft by FAA Classification:		Estimated Annual Operations:
Helicopter:	3	N/A
A-I:	205	*
A-II:	13	*
B-I:	59	*
B-II Small (<12,500 lbs.):	5 **	20 **
B-II Large (>12,500 lbs.):	7 **	28 **
C-I Large:	3 **	12 **
C-II Large:	1 **	4 **
Total:	296 **	

* Note: Estimated Annual Operations for A-I, A-II, and B-I classifications were not calculated as part of this analysis, as they are not a factor to the Critical Aircraft determination, nor do they provide justification for the proposed extension of the runway.

** Note: Aircraft numbers and Estimated Annual Operations shown have been corrected to avoid duplication of records already included in the FlightAware database.

FLIGHTAWARE DATABASE ANALYSIS:

As stated earlier, FlightAware is a company that records and offers flight tracking information for both private and commercial air traffic in the United States. The company maintains records of all flight activity for which Instrument Flight Rule (IFR) flight plans have been filed by pilots. The company does not keep records of flight activity that is conducted without flight plans under Visual Flight Rule (VFR) conditions.

Aircraft owners are allowed the opportunity to block specific information from the FlightAware database for security and/or privacy reasons. Unfortunately, the aircraft-types, owner or corporate names, and aircraft registration numbers are not listed in the database when aircraft owners elect to block their information. Origin and destination airport locations and dates of flights are still listed in the database for the blocked operations.

FlightAware provided records that were associated with flight activity to and from ARB during the entire calendar year 2007. Out of over 4,300 records of flight operations, 274 had blocked information. Since the FlightAware records do not include VFR flight activity, and do not include specific aircraft information for the blocked operations, they do not provide a complete history of all activity at the airport.

Judging by the distant locations associated with many of the blocked operations, some of the aircraft flown were likely of the larger categories. However, since the aircraft-type was not provided for these operations, none of them are included in the annual operations listed below. Had aircraft-type information been available for the blocked operations, the resulting operational numbers would likely have been higher.

Annual operations for all classifications of B-II and greater were calculated and are listed in the table shown below. Sixty-nine of the annual operations listed in the FlightAware database were performed by jet aircraft.

FAA Classification:	Annual Operations Included in Database:
B-II Small (<12,500 lbs.):	265
B-II Large (>12,500 lbs.):	85
C-I Large:	0
C-II Large:	0

COMBINED TOTALS OF ALL DATA SOURCES FOR YEAR 2007:

FAA Classification:	Estimated Annual Operations:
B-II Small (<12,500 lbs.):	293
B-II Large (>12,500 lbs.):	321
C-I Large:	12
C-II Large:	4

TOTAL ESTIMATED ANNUAL OPERATIONS USED IN DETERMINATION OF CRITICAL AIRCRAFT CLASSIFICATION:

Total Annual Operations, "B-II Small and Greater": **630** (293+321+12+4)

Total Annual Operations, "B-II Large and Greater": **337** (321+12+4)

Total Annual Operations, "C-I Large and Greater": **16** (12+4)

Total Annual Operations, "C-II Large": **4**

JET AIRCRAFT:	Estimated Annual Operations
Combined total from all classifications, including B-I:	**305**

CRITICAL AIRCRAFT DETERMINATION:

The Critical Aircraft is defined by the FAA as the most demanding aircraft-type that performs a minimum of 500 annual operations at a particular airport. In cases where the Critical Aircraft weigh less than 60,000 lbs, a classification of aircraft is used rather than a specific individual aircraft model.

As shown on the previous page, a total of **630** estimated annual operations were documented by aircraft in the "B-II Small and Greater" classification, which also includes some B-II Large, C-I Large, and C-II Large category aircraft. Since none of the greater categories had operational levels in excess of 500 at ARB, the current Critical Aircraft classification has been determined to be **B-II Small Aircraft**. Note that in establishing the 500-minimum annual operational threshold, it is standard procedure to also include operations from the greater categories in the determination of the Critical Aircraft classification.

Aircraft in the "B-II Small Aircraft" classification have approach speeds between 91 and 120 knots, wingspans between 49 and 79 feet, and maximum certificated takeoff weights of 12,500 lbs. or less. A representative aircraft of this class is the Beechcraft King Air 200, a twin-engine turboprop aircraft that typically seats 10-12 people, including the flight crew.

RUNWAY LENGTH RECOMMENDATIONS:

For airports with "B-II Small Aircraft" Critical Aircraft classifications, primary runway length recommendations by MDOT and FAA are as follows:

MDOT – *Source: Michigan Airport System Plan (MASP 2008):* **4,300 feet**
(statewide standard)

FAA – *Source: FAA Advisory Circular 150/5325-4B,* **4,200 feet ***
"Runway Length Requirements for Airport Design"
(airport-specific standard)

** Note: The FAA runway length recommendation was obtained from Figure 2-2 in Advisory Circular 150/5325-4B. The following specifics for ARB were used in the determination: Airport Elevation: 839 feet above mean sea level*
Temperature: 83 degrees F mean daily maximum temp of hottest month of year (July)

RUNWAY LENGTH RECOMMENDATIONS (continued):

The FAA recommended runway length of 4,200 feet at ARB was obtained by calculation from FAA Advisory Circular 150/5325-4B, *"Runway Length Requirements for Airport Design"*, a publication that is used nationally by the agency. The resulting recommended runway lengths are airport-specific, and can vary by hundreds of feet from site to site, depending on the specific airport elevations and mean daily maximum temperatures used in the calculations.

The MDOT recommendation of 4,300 feet is a statewide standard for all airports in the state with B-II Small Critical Aircraft classifications. Since airport elevations and mean maximum temperatures do not vary significantly from airport to airport in Michigan, as opposed to many other states, MDOT uses a single runway length recommendation for all airports of the same Critical Aircraft classification. The FAA-Airports District Office that oversees the state of Michigan supports our statewide runway length recommendation of 4,300 feet for all airports classified with a B-II Small Aircraft reference code.

As stated in FAA Advisory Circular 150/5325-4B, "*The design objective for the main primary runway is to provide a runway length for all airplanes that will regularly use it without causing operational weight restrictions.*" Airplanes that are classified within an airport's Critical Aircraft category are considered by the FAA to be the "regular use" aircraft of the main primary runway.

Development of the primary runway at ARB to the recommended length of 4,300 feet would allow the majority of B-II Small classification aircraft to operate at their optimum capabilities (without weight restrictions). Interstate commerce into and out of a community can be negatively impacted if business aircraft are forced to operate with load restrictions (i.e. reductions in passengers, cargo, and fuel associated with aircraft range) due to lack of suitable runway length.

Extension of the runway to the recommended length would also enhance airport operational safety. A 4,300-foot long runway would not only provide enough runway for takeoff by most regular use (Critical Aircraft category) airplanes operating at optimum capabilities, but also provide additional runway for the purpose of bringing the aircraft to a stop in an aborted-takeoff situation. In situations where pilots detect a problem with the aircraft while on the takeoff roll, they are forced to continue the takeoff and contend with the problem in the air if there is not enough runway remaining to bring the aircraft to a stop. By having enough remaining runway to safely abort a takeoff and stop the aircraft while still on the ground, a pilot would be able to avoid a potentially hazardous situation of taking to the air with a mechanically-deficient aircraft.

CONCLUSION:

This user survey analysis has shown that justification of need for the proposed extension of Runway 6/24, based on a determination of the Critical Aircraft, has been substantiated according to MDOT and FAA standards. Even though records that were analyzed likely did not include all operations performed at ARB in 2007 by category B-II and greater aircraft, the operations that were substantiated with available information were more than sufficient to make the determination that the Critical Aircraft is of the "B-II Small Aircraft" classification. With this confirmation, we find the proposed project eligible to receive state and federal funding, and recommend that the airport sponsor proceed with the planning and environmental processes associated with the proposed extension of the primary runway to an overall length of 4,300 feet.

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