

**SUPPLEMENTAL REPORT  
AIRPORT USER SURVEY**

**ANN ARBOR MUNICIPAL AIRPORT (ARB)  
ANN ARBOR, MICHIGAN**

**December 2009**

This Supplemental Report is associated with the original Airport User Survey Report for Ann Arbor Municipal Airport (ARB), dated July 2009. The information contained in this supplement provides additional details and updates to the information contained in the original report.

Additional analysis of the aircraft operational data has resulted in the generation of supplemental information, three new exhibits, and updates to the numbers of annual operations performed by category B-II critical aircraft. The following paragraphs explain in detail the information provided in the new exhibits, as well as the supplemental information and updates to the operational numbers listed in the original user survey report.

**EXHIBIT No. 1: *Annual Operations Analysis by Specific Aircraft Model***

This exhibit shows annual operations at ARB by specific aircraft model, rather than only by their FAA aircraft classification as shown in the original user survey report. The various aircraft models are listed in three separate tables, based upon groupings of their FAA classifications (B-II, C-I, and C-II).

Supplemental data associated with annual operations by the Beechcraft King Air C90 has been included in the B-II category table of this exhibit. Operations by this particular model of aircraft were not included in the original July 2009 Airport User Survey Report.

**EXHIBIT No. 2: *Origin / Destination Analysis by State***

Exhibit No. 2 shows the results of an origin and destination analysis of aircraft operations conducted at ARB, based on examination of the FlightAware database from survey year 2007. Although 274 of the operations had aircraft model and ownership information blocked from the database at the aircraft owner's request, the origin and destination cities of each flight were still included.

The first column of the table shown in this exhibit lists 31 states (and Washington DC) from which operations into ARB originated, or operations out of ARB were going to as a destination. The second column lists operations attributed to each state by the 274 total operations with blocked aircraft and ownership records. The third and fourth columns list operations attributed to each state by B-II Small and B-II Large category aircraft. The last column lists the total number of operations attributed to each state.

The numbers of operations associated with each state are from the FlightAware Instrument Flight Rule (IFR) flight plan database only, and do not include records of all itinerant operations between ARB and other states. Nonetheless, the numbers shown in this exhibit confirm that in 2007, flight operations were conducted between ARB and at least 31 other states (approximately 63% of the continental US). Also, approximately 67% of the IFR flight records for the category B-II critical aircraft were between ARB and out-of-state locations. These factors confirm that there is a significant amount of flight operations being conducted at ARB that are either going to, or coming from, distant locations in other states.

### **EXHIBIT No. 3: *Small 10-Seat Aircraft Analysis***

The table in this exhibit lists *Small* aircraft models (less than or equal to 12,500 lbs. maximum certificated takeoff weight) that have 10 or more passenger seats, and that conducted operations at ARB in survey year 2007. The numbers of annual operations listed in the table are from the FlightAware IFR flight plan database only, and do not include records of all operations by aircraft of this type. The FlightAware records show that there were 425 annual operations by Small 10-seat or higher aircraft.

Exhibit No. 3 also shows that there were 211 annual operations by *Large* category (greater than 12,500 lbs. maximum certificated takeoff weight) B-II aircraft from the Based Aircraft data source and another 85 annual operations by Large category B-II aircraft from the FlightAware data source. The number of annual operations performed by the Small 10-seat or higher aircraft and the Large category aircraft combined is shown as 721.

The operational numbers listed in Exhibit No. 3 do not include blocked FlightAware operations, Visual Flight Rule (VFR) operations, or operations logged by pilots on the Fixed Base Operator (FBO) airport registers. Although the information shown is only a partial representation of all applicable aircraft, the 721 annual operations that were substantiated significantly confirm that Figure 2-2 in FAA Advisory Circular 150/5325-4B is the appropriate chart to reference in the determination of the FAA-recommended runway length of 4,200 feet at ARB.

### **UPDATED BASED AIRCRAFT ANALYSIS:**

The Based Aircraft Analysis of the original user survey report listed 200 estimated annual operations by AvFuel's B-II Large category aircraft (see page 3 of the original report). AvFuel's Chief Pilot has since confirmed in writing that the actual number of operations by their Cessna Citation XL 560 aircraft at ARB over the past three calendar years has been 224 operations in 2006, 211 operations in 2007, and 223 operations in 2008.

In order to maintain consistency with the other survey year 2007 operational records analyzed, Exhibit No. 1 of this Supplemental Report shows the 211 actual annual operations by this aircraft in the "Based Aircraft Data Source" column of the category B-II table, instead of the original estimate of 200.

### **UPDATED ITINERANT AIRCRAFT ANALYSIS: (FBO Data Sources)**

Itinerant (visiting) aircraft operational data that was evaluated as part of the original user survey analysis was obtained from the pilot registration logs (airport registers) of two of the airport's FBOs - Solo Aviation and Ann Arbor Aviation Center. Data was examined for a six-month survey time frame, and cross-checked against FlightAware records in order to prevent counting the same aircraft twice. Any operations that were already included in the FlightAware records were not included in the operational totals that were generated from the FBO records.

The FBO records provided 40 additional operations by B-II and greater category aircraft (32 by category B-II aircraft, 6 by category C-I aircraft, and 2 by category C-II aircraft). Since this data was based on a six-month time frame instead of the full calendar year 2007, these 40 actual operations were prorated into an estimated equivalent annual rate of 80 operations. The additional 40 estimated operations were the only operations in the original user survey analysis that were obtained by prorating actual partial-year data into an estimated equivalent annual rate.

As part of the supplemental analysis, estimated operations that were originally generated as a result of prorating partial-year data were not considered in the determination of the annual operations at ARB. This eliminates the potential effect of seasonal variation in flight activity levels negatively influencing annual operational estimates. Only the 40 actual operations that were documented by the FBOs as having occurred within the six-month survey period were counted as valid operations, since they did in fact occur in 2007. No operations were attributed to the remaining six months.

Exhibit No. 1 of this supplemental report shows only the 40 actual documented operations (32 by category B-II aircraft, 6 by category C-I aircraft, and 2 by category C-II aircraft) in the column that is labeled "2 FBO Register Data Sources".

## UPDATED FLIGHTAWARE DATABASE ANALYSIS:

The FlightAware database analysis that was performed for the original July 2009 Airport User Survey Report resulted in the determination of 265 actual annual operations by B-II Small aircraft, and another 85 actual annual operations by B-II Large aircraft (see page 6 of the original report). However, the resulting numbers did not include operations by the Beechcraft King Air C90 model.

The King Air C90 is a B-II Small category aircraft, with a wingspan of 50'3". Earlier versions of the King Air 90 models (A90 and B90) have wingspans of less than 49', and are therefore category B-I Small aircraft. Since the FlightAware records that were originally analyzed for ARB did not include information which identified the specific model of each King Air 90 operation, no operations by King Air 90s were included in the original user survey analysis and report.

Although the FlightAware records do not provide information regarding the specific model of each King Air 90 operation listed, they do provide the aircraft registration N-number of each aircraft. By entering the N-number into the computerized FAA aircraft registration database, the specific model of each King Air 90 operation was able to be determined. A total of 157 operations by the B-II Small category King Air C90 model have been identified, out of 220 operations by King Air 90 models of all types.

Exhibit No. 1 of this supplemental report shows the 157 King Air C90 operations included in the "Flight Aware Data Source" column of the category B-II table. By adding these operations to the 265 operations by B-II Small aircraft and 85 operations by B-II Large aircraft that were previously identified in the original user survey report, the updated total number of actual annual operations by B-II category aircraft obtained from the FlightAware data source is 507.

The FlightAware database also confirmed usage of the airport by many large corporations, in addition to AvFuel, which is the only one actually based at ARB. Some of the other corporate users of ARB include Synergy International, Wells Fargo, Polaris Industries, Bombardier Aerospace, Avis Industrial Corporation, Thumb Energy, and NetJets. NetJets provides on-demand air charter services and corporate aircraft fractional ownership opportunities to a large number of other corporations that are located throughout the country.

## AIRCRAFT OPERATIONAL FORECASTS:

Year 2007 was the onset year of the current planning activities associated with the potential extension of Runway 6/24. At that time, the airport manager and FBOs were requested to collect based and itinerant aircraft operational data over the course of year 2007 for the purpose of determining project justification. This data was reviewed during the user survey analysis, which was conducted in early 2009.

FlightAware records for any given year are not published until that particular calendar year has ended, and all operations that took place during the course of that year counted. Since the user survey analysis was conducted in early 2009, the most current operational records available at the time from FlightAware were associated with calendar year 2008. Although year 2008 records were available, year 2007 records from FlightAware were used in the user survey analytical process. This was due to the importance of maintaining consistency of year of operational records in the analysis, and not combining operational data collected by the airport manager and FBOs over year 2007 with the more recent FlightAware records from year 2008. The FlightAware records, airport manager records, and FBO records from calendar year 2007 that were used in the user survey analysis were all only one-year old at the time, and still considered valid for use in determining project justification.

The FAA Terminal Area Forecast (TAF) does project a short-term approximate 22% decrease in total annual operations at ARB from user survey year 2007 through year 2009 (from 72,895 actual in 2007 to 56,956 estimated for 2009). However, beginning in year 2010, the TAF projects continuously increasing annual operations at ARB, from the year 2009 low-point through year 2030. Itinerant annual operations are even projected to surpass survey year 2007 levels prior to the end of the 2030 forecast period.

Even if the worst case short-term projected 22% decrease in total annual operations is applied to the user survey results, there is still significant justification for the runway extension. The user survey report documents a total of 750 actual annual operations by B-II category critical aircraft that justify the runway extension. A 22% decrease in this number is 585 - still well above the FAA's substantial use threshold of 500. And again, beginning in 2010, operations at ARB are projected by the FAA to begin increasing every single year from that point forward, through year 2030.

Forecasts from the MDOT Michigan Airport System Plan (MASP 2008) also project increasing itinerant and total operations at ARB from years 2010 through 2030. The MDOT forecasts further substantiate the mid-term and long-term FAA projections of a rebound in current operational activity at ARB to survey year 2007 levels.

AvFuel Corporation, which bases a B-II Large category Citation 560 Excel jet at ARB, has confirmed that their operations at ARB actually increased from 211 operations in 2007 to 223 operations in 2008. Their Chief Pilot estimates that their future operational levels could potentially increase to 350 to 450 operations per year at ARB.

The FAA TAF forecast, MDOT MASP forecast, and AvFuel's operational forecasts all provide support to the fact that survey year 2007 operational data is a very pertinent representation of estimated future operational levels at ARB.

### SUMMARY:

The supplemental analysis that was conducted after publication of the July 2009 Airport User Survey Report has resulted in additional justification in support of extension of Runway 6/24 to 4,300' in length.

Further analysis of the FlightAware IFR flight plan database has confirmed 507 actual operations at ARB in survey year 2007 by B-II category aircraft. This number does not include operations in the FlightAware records with aircraft information blocked at the owner's request, or VFR operations that were conducted without flight plans. Judging by the high number of out-of-state origin and destination locations of operations listed in the blocked category (see Exhibit No. 2), it is very likely that many of the associated aircraft were of the B-II or greater categories. Therefore, actual operations at ARB by aircraft of these categories are likely considerably higher than the 507 substantiated operations obtained from the FlightAware database.

The 507 actual operations by B-II category aircraft that were obtained from the FlightAware database also do not include operations conducted by AvFuel's based Cessna Citation XL 560, or operations obtained from the two FBO airport registers. AvFuel has confirmed 211 actual operations at ARB in 2007 with their B-II category aircraft, and data provided by the FBOs has confirmed 32 actual operations in 2007 by B-II category aircraft.

In summary, the supplemental analysis of this user survey has confirmed a total of 750 actual annual operations at ARB by category B-II aircraft. FlightAware records also confirmed that operations by aircraft in this critical aircraft category were performed by many large corporations, some of which are listed on page 4 of this report.

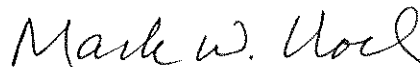
## CONCLUSION:

In the majority of airport user survey processes, determinations and recommendations are issued based on analysis of estimated annual operations obtained from various airport users. In conducting the user survey at ARB, the analysis focused on evaluation of actual annual operations performed at the airport. This is obviously a much more accurate method of calculating the total number of annual operations associated with the determination of the critical aircraft and Airport Reference Code. It also eliminates the possibility of an airport user inflating their estimated operational numbers, in the hopes of obtaining a longer runway that is not truly justified.

While the numbers listed in this report do not include every operation that occurred at ARB in survey year 2007 with B-II category aircraft, they do confirm substantial usage of the airport by aircraft of this critical aircraft category. The Origin/Destination Analysis has shown a significant number of operations between ARB and distant out-of-state locations, which is a very good indicator of corporate activity associated with interstate commerce, as opposed to pleasure flying by general aviation pilots. FlightAware records also confirmed usage of the airport by many large corporations.

The information contained in this Supplemental Report provides additional justification in support of the findings and recommendations of the original July 2009 Airport User Survey Report. The user survey analysis has shown that justification for the proposed extension of primary Runway 6/24 to 4,300-feet has been confirmed, and the proposed project has been determined to be eligible to receive state and federal funding.

Although justification for the proposed project has been substantiated according to current MDOT and FAA standards associated with runway length recommendations, neither agency requires that the runway be extended. It is ultimately – and entirely – the decision of the city of Ann Arbor whether or not to proceed with the development of the project.



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EXHIBIT NO. 1

ANNUAL OPERATIONS ANALYSIS BY SPECIFIC AIRCRAFT MODEL

Aircraft Model	FAA Approach Category	FAA Design Group	FAA Weight Class	Seating	Maximum Takeoff Weight (lbs.)	Aircraft Engine Type	Flight-Aware Data Source	Based Aircraft Data Source	2 FBO Register Data Sources	Total Annual Operations by Model
Aero Commander 695	B	II	Small	<10	<12,500	Multi-Eng	4	0	0	4
Beechcraft King Air C90	B	II	Small	10+	<12,500	Multi-Eng	157	0	0	157
Beechcraft King Air 100	B	II	Small	10+	<12,500	Multi-Eng	39	0	2	41
Beechcraft King Air 200	B	II	Small	10+	<12,500	Multi-Eng	215	0	8	223
Cessna 441 Conquest II	B	II	Small	<10	<12,500	Multi-Eng	7	0	4	11
Beechcraft King Air 300	B	II	Large	10+	12,500+	Multi-Eng	11	0	8	19
Beechcraft King Air 350	B	II	Large	10+	12,500+	Multi-Eng	43	0	4	47
Cessna Citation II 550	B	II	Large	<10	12,500+	Jet	6	0	2	8
Cessna Citation XL 560	B	II	Large	<10	12,500+	Jet	25	211	2	238
Cessna Citation 680	B	II	Large	<10	12,500+	Jet	0	0	2	2

Total B-II Category Annual Operations 507 211 32 750

Learjet 25	C	I	Large	<10	12,500+	Jet	0	0	2	2
Learjet 31	C	I	Large	<10	12,500+	Jet	0	0	2	2
Learjet 45	C	I	Large	<10	12,500+	Jet	0	0	2	2

Total C-I Category Annual Operations 0 0 6 6

IAI Westwind 1125	C	II	Large	<10	12,500+	Jet	0	0	2	4
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Total C-II Category Annual Operations 0 0 2 4

**CRITICAL AIRCRAFT CATEGORY DETERMINATION:** B-II (Based on 750 Total Annual Operations by Aircraft of this Category)

NOTE: The annual operations listed in the above tables are ACTUAL documented operations from calendar year 2007. The numbers do NOT include any ESTIMATED operations obtained through proration of partial-year data, or other methods. Operations recorded by the FBOs and listed above represent only a partial-year (six-month) time frame.

A total of 274 operations in the FlightAware database had aircraft model and ownership information blocked at the owner's request. As a result, their operational numbers are NOT included in the information shown above. Judging by the high number of out-of-state origin and destination locations of aircraft in the blocked category (see Exhibit No. 2), it is very likely that many of the associated aircraft were of the B-II and greater categories. Therefore, actual operations at ARB by aircraft of these categories are likely considerably higher than the numbers shown above.



## EXHIBIT NO. 2

ORIGIN / DESTINATION ANALYSIS BY STATE

Origin / Destination Analysis of IFR Aircraft Operations Between ARB and Other States (Records from FlightAware 2007 Database)				
STATE	Aircraft Type & Category Blocked	B-II Small Category	B-II Large Category	Totals by State
1 Alabama	0	1	0	1
2 Arizona	1	0	0	1
3 Arkansas	2	1	0	3
4 Connecticut	5	2	0	7
5 Florida	29	3	3	35
6 Georgia	5	6	12	23
7 Illinois	25	64	5	94
8 Indiana	6	21	1	28
9 Iowa	1	20	3	24
10 Kansas	3	0	0	3
11 Kentucky	2	13	0	15
12 Maine	2	0	0	2
13 Maryland	1	3	7	11
14 Massachusetts	5	0	1	6
15 Michigan	79	162	20	261
16 Minnesota	2	3	2	7
17 Missouri	0	5	0	5
18 Nebraska	3	0	1	4
19 New Hampshire	1	2	0	3
20 New Jersey	9	2	4	15
21 New York	6	5	1	12
22 North Carolina	4	1	1	6
23 Ohio	16	38	13	67
24 Pennsylvania	14	23	4	41
25 South Carolina	0	4	0	4
26 South Dakota	4	18	0	22
27 Tennessee	2	5	0	7
28 Texas	30	0	0	30
29 Virginia	1	3	0	4
30 Washington DC	5	1	2	8
31 West Virginia	1	7	0	8
32 Wisconsin	10	9	4	23
No Record	0	0	1	1

<b>Totals by Category</b>	<b>274</b>	<b>422</b>	<b>85</b>	<b>781</b>
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IFR Aircraft Operation Totals by Category:

Within Michigan	79	162	20	261
Outside of Michigan	195	260	64	519
No Record	0	0	1	1

NOTE: The numbers of operations listed above are ACTUAL documented operations from calendar year 2007. The numbers do NOT include any ESTIMATED operations obtained through proration of partial-year data, or other methods.

The numbers shown above are from the FlightAware IFR Flight Plan Database only, and do NOT include records of all itinerant operations between ARB and other states. Nonetheless, the numbers shown above confirm that in 2007, flight operations were conducted between ARB and at least 31 other states and Washington DC (approx 63% of the continental US). Approximately 67% of these IFR flight records were between ARB and out-of-state locations.

EXHIBIT NO. 3

SMALL 10-SEAT AIRCRAFT ANALYSIS

Small Airplanes Having 10 or More Passenger Seats (Records from FlightAware 2007 Database)							
Aircraft Model	FAA Approach Category	FAA Design Group	FAA Weight Class	Seating	Maximum Takeoff Weight	Aircraft Engine Type	Annual Operations
Cessna Caravan 208	A	II	Small	10+	<12,500	Single-Eng	11
Swearingen Merlin III	B	I	Small	10+	<12,500	Multi-Eng	3
Beechcraft King Air C90	B	II	Small	10+	<12,500	Multi-Eng	157
Beechcraft King Air 100	B	II	Small	10+	<12,500	Multi-Eng	39
Beechcraft King Air 200	B	II	Small	10+	<12,500	Multi-Eng	215

Total Small 10-Seat Aircraft Annual Operations

425

Total B-II Large Category Aircraft Annual Operations

Based Aircraft Data Source (B-II Large):  
FlightAware Data Source (B-II Large):

211  
85

Grand Total Annual Operations at ARB Applicable to Figure 2-2 in FAA Advisory Circular 150/5325-4B:

721

NOTE: The annual operations listed above are ACTUAL documented operations from calendar year 2007. The numbers do NOT include any ESTIMATED operations obtained through proration of partial-year data, or other methods.

The numbers shown in the table above are from the FlightAware IFR Flight Plan Database only, and do NOT include records of all small aircraft operations at ARB with 10-seat or greater aircraft models. Nonetheless, the above analysis confirms that Figure 2-2 in FAA AC 150/5325-4B is the appropriate chart to reference in the determination of the FAA-recommended runway length for Ann Arbor Municipal Airport.