

**Frequently Asked Questions (Technical)
Environmental Assessment Study
And
800' Runway Safety Margin Extension**

PREAMBLE

These frequently asked questions (FAQ) were written based on questions and concerns expressed by concerned citizens of the greater Ann Arbor community. All questions and answers have been researched and verified by area certified flight instructors, FAASTeam safety officers, commercial pilots, aviation experts, ARB Airport Advisory Committee, and the airport manager. If you discover any inaccuracy in the supplied answers, you are requested to immediately contact Ann Arbor Municipal Airport Manager, Matt Kulhanek via email at mjkulhanek@a2gov.org.

These FAQ have been arranged into to six broad categories for ease of searching subject content. These categories are:

1. Safety (SAF question #1 – page 1)
2. Operations (OPS question #1 – page 14)
3. Environmental (ENV question #1 – page 28)
4. Economic (ECON question #1 – page 34)
5. Background (BGD question #1 – page 43)
6. Definitions (page 45)

SAFETY

SAF 1: What are the identified safety related issues at the airport?

There are three safety issues that have been identified at the airport:

- 1) penetration through the obstacle clearance surface (OCS) into the obstacle free zone (OFZ) and by tallest traffic on State Road passing underneath the nonprecision 34 to 1 instrument approach slope;
- 2) the run-up area to Rwy 24, hold short line to Rwy 24, and first 200' of parallel taxiway from the run-up area of Rwy 24 are not visible and not controlled by the tower because of line of sight issues; and,
- 3) unusually high incidence of runway overruns.

Obstacle Clearance Surface (OCS) Penetration - High traffic volume and pedestrian/motorist safety along State Road has been an issue for commuters and Township residents for several years. The Washtenaw County Road Commission (WCRC) had a study completed of the State Road Corridor with a recommendation to resolve the identified traffic safety issues by extending the four-lane boulevard from Ellsworth Road south to Textile Road. As of this writing, there is no approval authorizing the construction of any improvements to State Road from Ellsworth to Textile Road.

In July 2006, the WCRC issued its final State Road Corridor Study report (after holding public hearings). Shortly thereafter the airport manager was required under FAA CFR Part 77 to report the final recommendation because the report contained an obstruction causing a potential "Hazard to Air Navigation." The recommendation to potentially widen the State Road right-of-way to 160' or 180' will cause a "Hazard to Air Navigation" within the extended protected runway safety zone affecting nonprecision instrument approaches.

The safety issue is tall vehicle traffic potentially encroaching into the protected airspace (beginning 15') above the road surface ("Obstacle Clearance Surface" (OCS)) within the extended protected runway safety zone causing an "Obstruction to Air Navigation" the steepening of the normal nonprecision instrument OCS from 34:1 to 20:1. See FAA Part 77, sections 77.23 and 77.25. Additionally, the favored recommendation calls for widening the existing right-of-way from a two-lane road to a 180' wide four-lane boulevard at the approach end of Rwy 24.

To address the vertical encroachment and separation of the roadway from the runway, the 2007 ALP shows a curve in State Road away from the runway restoring the clear height above the minimum 15' and 34:1 slope. After a meeting with Washtenaw County Road Commission and Pittsfield Township leadership during the summer of 2007, it was agreed to remove the curve in State Road and shift the runway 150' to the SW. Upon review by the State Aeronautics Commission and FAA, their preference was also to shift the runway. The 2008 ALP reflects the 150' shift to the SW and clear height of 17' over State Road with a 34:1 slope.

There is a navigational aid relationship between the Part 77, 34:1 nonprecision instrument approach slope and the existing normal 3 degree glide slope of Rwy 24 VASI. Flying a nonprecision instrument approach into ARB Rwy 24, pilots will establish a normal 3 degree descent using the VASI (Visual Approach Slope Indicator – a "red over white" lighting system) to arrive at a calculated touch-down point on the instrument approach markings on the runway. The VASI lighting system is located about 200'+/- SW of the approach end of the runway. If the pilot maintains the 3 degree glide slope using the VASI the plane should touch down about 1,000' SW of the approach end of the runway leaving about 2,500' for the rollout. For safety reasons, when flying in visual meteorological conditions (VMC), though, pilots will use the VASI to get established on final approach then increase the rate of descent in order to touch down closer to end of the runway thereby preserving as much runway in front of them as possible for a safe full rollout, if needed.

It must be understood that in order to maintain obstacle clearances, Federal Aviation Regulations require that the pilot fly instrument approaches during IFR conditions in Class B/C/D/E airspace to runways equipped with any approved form of visual approach slope indicator (VASI, PAPI, etc.), in accordance with the instrument light indicator. Stated differently, it is illegal to fly an approach below the appropriate visual approach path, unless "a lower path is required in the interest of safety." See the following for authority.

B airspace - FAR 91.131 (a)

C airspace - FAR 91.130 (a)

D airspace - FAR 91.129 (d)(3)

E airspace - FAR 91.127 (a)

Under an IFR plan, the pilot can ignore the VASI/PAPI when flying the ILS glide slope (this is normally not a problem due to the GS antenna location), but a nonprecision VOR, GPS, LOC or circle to land must be conducted in accordance with reference to the VASI.

Additionally, there is a distinct difference between the 34:1 nonprecision instrument approach slope ("Obstacle Clearance Surface") and 3 degree glide slope. The airspace above the 34:1 OCS slope is designed to provide protected nonprecision instrument airspace keeping planes above obstacles (vehicles on State Road) while the 3 degree glide slope is designed to guide pilots to a determine landing point on the runway within the protected nonprecision instrument airspace.

Let's assume the State Road right-of-way is widened to 180' as recommended by the State Road Corridor Study and the runway is [is not] shifted to the SW by 150'. In order to maintain the protected nonprecision instrument approach the VASIs will have to be moved a few hundred feet to the SW in order to maintain the 3 degree glide slope within the protected airspace. In this assumption, moving the VASI to maintain the 3 degree glide slope without replacing the displacement would effectively shorten the runway a few hundred feet, potentially exacerbating the existing runway overrun issue.

Should the airport do nothing to preserve the protected airspace above State Road, it could potentially risk losing its nonprecision instrument runway approaches. For safety reasons, ARB would rather not risk losing its instrument approach airport status.

FAA Tower Line of Sight Issues - The 150' runway shift will nearly eliminate the blind spot from the control tower to the run-up area and hold short line of Rwy 24, and the first 200' of the parallel taxiway. Improving this line of sight allows air traffic controllers to maximize the safety and coordination of taxiing aircraft.

Runway Overrun Incidents - A runway is an inanimate object. In the case of ARB, the grooved concrete runway is 3,500' x 75' and it does not change. It is the responsibility of every pilot departing and arriving at any airport to know and understand the runway environment and weather conditions at both the departure and arrival airports prior to flying.

Procedurally, a pilot will get a weather briefing before departure and prior to entering the airspace of the arrival airport. The variability of most small general aviation airports is not knowing the weather, but rather adjusting to the dynamics of the elements of weather on final approach, crossing the threshold, flaring just before touchdown, and the roll-out. The elements of weather that can make a narrow and short runway seem even shorter are rain, sleet, snow, ice, heat, wind-shear, and cross winds. Additionally, what can also make a runway seem shorter is mechanical failure and pilot error. At ARB, most pilots have experienced one of these elements making our inanimate runway seem animate.

During the period of 1998 through 2008, there were four overrun incidents reported in the Aviation Safety Information Analysis and Sharing (ASIAS) system. No injuries and only minor damage to the planes was reported. There were two additional incidents caused by pilots being fearful of overrunning the runway. In one incident the pilot struck a tree on final approach. The second incident occurred when a pilot had braking failure and decided to roll-off the runway edge rather than the runway end at a higher rate of speed.

During the period of 1998 through 2008, there were three different overrun incidents reported in the Aviation Safety Reporting System (ASRS). No injuries and only minor damage to the planes was reported.

During the period of 1998 through 2008, there was one accident reported in the National Transportation Safety Board (NTSB) Aviation Accident and Incident Data System that was not an overrun, but involved a decision to go around because there was insufficient runway remaining to land the plane. Fortunately, there were no injuries in the accident, but the plane was a total loss.

ARB's FAA control tower opens at 8:00 a.m. and closes at 8:00 p.m., seven days a week. During non-towered hours there is no official FAA record of any overruns other than what pilots learn when talking with other pilots. There are oral and eye witness accounts of four known unreported overrun incidents.

These unreported overruns include a Cessna Citation Jet 500 (CJ), Beechcraft King Air 90, Piper 140, and a Cirrus. These have all occurred between 2000 and 2008.

SAF 2: Why are runway run-offs or overruns a safety issue?

This is a difficult question for non-pilots to comprehend if the individual has not experienced trying to maintain control over an airplane on the runway whether the procedural mishap was caused by mechanical failure, pilot error or weather related. Piloting an airplane to a full stop once having lost partial or full control of any airplane system is a difficult task. Good aviation luck is when practice and the following of good safety procedures meet opportunity. If the pilot routinely practices take-offs and landings while complying with appropriate techniques and procedures, the pilot can often avoid or prevent most runway environment accidents and

incidents. It is the unexpected and uncontrollable overrun incidents encountered by students and low-time private pilots that the airport is trying to reduce.

Between the period of 1998 and 2008, there were 11 known incidents/accidents at ARB involving overruns and run-offs. In all cases aviation luck was with the pilot and passengers as there were no reported injuries or fatalities. With a few exceptions, there was minor to no damage to the airplanes. By all accounts, the incidents/accidents were a result of mechanical failure, pilot error, and mother-nature. Of the 11 overruns, nine (82%) involved single engine small airplanes (2 to 6 seats). The other two (18%) were also small planes, an 8 passenger turboprops and a small jet used for medical flight services. Overrunning on the departure end of Rwy 06 is a significant concern as State Road is within a few hundred feet from the end of the concrete runway.

The risks involved while skidding from concrete onto grass and gravel surfaces are many. Braking action between dissimilar surfaces is considerably different. This difference can cause the nose wheel to shear off and the resultant propeller strike can cause sudden engine stoppage and possible fire and/or injury to the occupants of the aircraft.

If a malfunction occurs at take-off, pilots of small aircraft are taught that the proper procedure for aborting that takeoff is to land on the existing runway and apply brakes but be prepared to overrun the end of the runway if necessary. Alternatively, if a pilot experiences mechanical failure once airborne and without sufficient runway to land, the pilot should look 45 degrees to the left and right and pick a spot to land between the two points.

Most of the overruns at ARB have been on landing. There has been a fair mix of mechanical failures, wet runways, excessive aircraft speed, and other pilot errors.

SAF 3: How many runway run-offs or overruns have there been at the airport?

During the 10 year period beginning in 1998 through 2008, there were seven reported and four unreported overrun related incidents at ARB.

During the period of 1998 through 2008, there were four overrun incidents reported in the Aviation Safety Information Analysis and Sharing (ASIAS) system. No injuries and only minor damage to the planes was reported. There were two additional incidents caused by pilots being fearful of overrunning the runway. In one incident the pilot struck a tree on final approach. The second incident occurred when a pilot had braking failure and decided to roll-off the runway edge rather than the runway end at a higher rate of speed.

During the period of 1998 through 2008, there were three different overrun incidents reported in the Aviation Safety Reporting System (ASRS). No injuries and only minor damage to the planes was reported.

During the period of 1998 through 2008, there was 1 accident reported (2005) in the National Transportation Safety Board (NTSB) Aviation Accident and Incident Data System that was not an overrun, but involved a decision to go around because there was insufficient runway remaining to land the plane. Thankfully no injuries occurred, but the plane was a total loss.

ARB's FAA control tower hours of operation are from 8:00 a.m. to 8:00 p.m., seven days a week. During non-towered hours there is no official FAA record of any overrun other than what pilots learn while "hangar flying." There are oral and eye witness accounts of another four known unreported overruns. These include a Beechcraft King Air 90, Citation 500, Cirrus, and Piper 140. It is assumed there were no injuries and minor or no damage to the planes except for a propeller strike by the Piper 140.

SAF 4: What is the difference between a runway roll-off, run-off, and overrun?

A runway "roll-off" is when an airplane rolls off from the side edge of the runway. A "run-off" and "overrun" mean the same thing, the airplane runs off from the end of the runway.

SAF 5: Why doesn't the airport widen the runway reducing the risk of roll-offs?

The airport has experienced a number of roll-offs from our 75' wide runway. To reduce these incidents, the next incremental runway width typically would be 100'. This 25' increase in runway width to a 100' would likely increase the "airplane design group" from a "II" (wingspan <79') to a "III" (wingspan <118') and result in a change to the airport's reference code classification from a B-II to a B-III.

The Airport Advisory Committee (AAC) did not recommend widening the runway because of their commitment to address safety issues without changing the airport reference code classification (B-II). The AAC was committed to resolving the right-of-way Part 77 and overrun issues without changing the airport reference class; the proposal accomplishes this without enhancing the runway to make it suitable for larger airplanes not already safely using ARB within the airplanes published performance specifications.

SAF 6: What is an aircraft "accident" and "incident"?

The FAA defines aircraft accident and incidents in 49 CFR Part 830 as:

"aircraft accident" means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.

"incident" means an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.

§ 830.5 Immediate notification. The operator of any civil aircraft, or any public aircraft not operated by the Armed Forces or an intelligence agency of the United States, or any foreign aircraft shall immediately, and by the most expeditious means available, notify the nearest National Transportation Safety Board (Board) field office when:

- (a) An aircraft accident or any of the following listed incidents occur:
 - (1) Flight control system malfunction or failure;
 - (2) Inability of any required flight crewmember to perform normal flight duties as a result of injury or illness;
 - (3) Failure of structural components of a turbine engine excluding compressor and turbine blades and vanes;
 - (4) In-flight fire; or
 - (5) Aircraft collide in flight.
 - (6) Damage to property, other than the aircraft, estimated to exceed \$25,000 for repair (including materials and labor) or fair market value in the event of total loss, whichever is less.
- (b) An aircraft is overdue and is believed to have been involved in an accident.

SAF 7: Where can I find information about aviation related accidents and incidents?

There are three types of reports citizens can access to research aviation accidents and incidents.

“The Aviation Safety Reporting System (ASRS) receives, processes, and analyzes reports of unsafe occurrences and hazardous situations that are voluntarily submitted by pilots, air traffic controllers, and others. Information collected by the ASRS is used to identify hazards and safety discrepancies in the National Airspace System. It is also used to formulate policy and to strengthen the foundation of aviation human factors safety research.”

http://www.asias.faa.gov/portal/page?_pageid=56,398034,56_398054:56_398058:56_398062&_dad=portal&_schema=PORTAL

“The Accident/Incident Data System (AIDS) database contains data records for general aviation and commercial air carrier incidents since 1978. The ASIAs database for AIDS contains incidents only because ASIAs uses the National Transportation Safety Board (NTSB) accident database as the primary source for accident information. The information contained in AIDS is gathered from several sources including incident reports on FAA Form 8020-5.”

http://www.asias.faa.gov/portal/page?_pageid=56,398034,56_398054:56_398058:56_398068&_dad=portal&_schema=PORTAL

“The National Transportation Safety Board (NTSB) Aviation Accident and Incident Data System contains information collected during a NTSB investigation of an accident or incident involving civil aircraft within the United States, its territories and possessions, and in international waters. The NTSB Board is an independent Federal agency that investigates every civil aviation accident in the United States and significant accidents in the other modes of transportation,

conducts special investigations and safety studies, and issues safety recommendations to prevent future accidents.”

http://www.asias.faa.gov/portal/page?_pageid=56,398034,56_398054:56_398058:56_398074&_dad=portal&_schema=PORTAL

SAF 8: What are the standard operating procedures (SOP) taught student pilots at ARB if there is a mechanical failure on take-off?

The 800’ runway safety margin extension would increase decision making distance by about 20% (800’ / 3,500’) during departures and arrivals reducing the probability of pilot error if SOP must be exercised. Before seeking clearance for departure, general aviation pilots are taught to mentally envision each step of the departure procedure as well as mentally envision an emergency landing plan if there is pilot error, mechanical failure, or forces of weather working against the pilot and plane.

There are two common general aviation emergency SOP on departure depending when the emergency event occurs on take-off. If emergency SOP are necessary during the departure roll to within about 25’ to 50’ above ground level (AGL), the safest SOP with the lowest level of probability of personal injury and damage to the aircraft is put the plane down on the runway, gently apply braking action so as to not initiating skidding action (risking popping main-gear tires), and overrun the runway as far as necessary bringing the plane to a safe stop.

The second general aviation emergency departure SOP is if the plane experiences a sudden mechanical failure and the plane is too high above the runway to safely return to the runway and overrun, pilots are trained to land anywhere between 45 degrees left or right of runway center-line. Pilots are reminded that usually landing straight ahead in the runway protection zone (RPZ) is the safest place for passengers and surrounding airport environs to land.

SAF 9: What are the standard operating procedures (SOP) taught student pilots at ARB if the pilot encounters mechanical failure after touchdown during rollout or runway conditions would pose a safety risk under poor braking conditions?

The 800’ runway safety margin extension would increase decision making distance by about 20% (800’ / 3,500’) during arrivals and departures reducing the probability of pilot error if SOP must be exercised. Before entering controlled airport airspace, pilots must seek a weather report and obtain any notices to airmen (NOTAM) for the arrival airport. Additionally, the SOP requires the pilot use the plane’s checklist for a self arrival briefing of landing procedures. Part of the SOP arrival briefing is understanding runway orientation, runway physical characteristics, runway protection zone (RPZ), taxiways and parking. Additionally, the SOP includes mentally envisioning a “go-around” scenario and if on short final or on the ground what action will be taken if encountering mechanical failure, braking action is less than reported, stronger than reported crosswinds and wind gusts, or other forces of weather working against the pilot and plane.

If on short final the pilot is instructed by the controller or if he/she notices an unsafe activity in or around the runway environment, the pilot should initiate a go-around SOP. On the other hand, notwithstanding controller instructions to the contrary or if beyond the go-around decision point it is better to land the plane. Pilots are trained to sparingly apply brakes and run-off the end of runway if necessary to bring the plane to a stop.

SAF 10: What is a weight and balance calculation and why is it important pilots perform this calculation at ARB?

Excerpts from Pilot's Handbook of Aeronautical Knowledge, pages 4-35 through 4-37.

"Weight and balance (W/B) computations should be a part of every preflight briefing. Never assume three passengers are always of equal weight. Instead, do a full computation of all items to be loaded on the aircraft, including baggage, as well as the pilot and passengers. It is recommended that all bags be weighed to make a precise computation of how the aircraft CG (center of gravity) is positioned."

"The importance of the CG... (is) stability, controllability, and performance. Unequal load distribution causes accidents. A competent pilot understands and respects the effects of CG on the aircraft."

"Weight and balance are critical components in the utilization of an aircraft to its fullest potential. The pilot must know how much fuel can be loaded on the aircraft without violating CG limits, as well as weight limits to conduct long or short flights with or without a full complement of allowable passengers."

"The additional weight may or may not place the CG outside of the CG envelope, but the maximum gross weight could be exceeded. The excess weight can overstress the aircraft and degrade the performance."

"Aircraft are certificated for weight and balance for two principal reasons:

1. The effect of the weight on the aircraft's primary structure and its performance characteristics.
2. The effect of the location of this weight on flight characteristics, particularly in stall and spin recovery."

"The takeoff/climb and landing performance of an aircraft are determined on the basis of its maximum allowable takeoff and landing weights. A heavier gross weight results in a longer takeoff run and shallower climb, and faster touchdown speed and longer landing roll. Even a minor overload may make it impossible for the aircraft to clear an obstacle that normally would not be a problem during takeoff under more favorable conditions."

"The detrimental effect of overloading on performance is not limited to the immediate hazards involved with takeoffs and landings. Overloading has an adverse effect on all climb and cruise

performance which leads to overheating during climbs, added wear on engine parts, increased fuel consumption, slower cruising speed, and reduced range.”

“In some aircraft, it is not possible to fill all seats, baggage compartments, and fuel tanks, and still remain within approved weight or balance limits. For example, in several popular four-place aircraft, the fuel tanks may not be filled to capacity when four occupants and their baggage are carried. In a certain two-place aircraft, no baggage may be carried in the compartment aft of the seats when spins are to be practiced. It is important to a pilot to be aware of the W/B limitations of the aircraft being flown and the reasons for these limitations.”

SAF 11: What is maximum take-off and landing weight?

As defined in the Pilots' Handbook of Aeronautical Knowledge, Glossary, page G19.

Maximum landing weight - The greatest weight that an airplane normally is allowed to have at landing.

Maximum ramp weight - The total weight of a loaded aircraft, including all fuel. It is greater than the takeoff weight due to the fuel that will be burned during the taxi and run-up operations. Ramp weight may also be referred to as taxi weight.

Maximum takeoff weight - The maximum allowable weight for takeoff.

Maximum weight - The maximum authorized weight of the aircraft and all of its equipment as specified in the Type Certificate Data Sheets (TCDS) for the aircraft.

Maximum zero fuel weight (GAMA) - The maximum weight, exclusive of usable fuel.

SAF 12: What is take-off performance?

Following are excerpts from Pilot's Handbook of Aeronautical Knowledge, pages 10-13 through 10-17.

“The minimum takeoff distance is of primary interest in the operation of any aircraft because it defines the runway requirements. The minimum takeoff distance is obtained by taking off at some minimum safe speed that allows sufficient margin above stall and provides satisfactory control and initial rate of climb. Generally, the lift-off speed is some fixed percentage of the stall speed or minimum control speed for the aircraft in the takeoff configuration. As such, the lift-off will be accomplished at some particular value of lift coefficient and AOA (angle of attack). Depending on the aircraft characteristics, the lift-off speed will be anywhere from 1.05 to 1.25 times the stall speed or minimum control speed.”

“To obtain minimum takeoff distance at the specific lift-off speed, the forces that act on the aircraft must provide the maximum acceleration during the takeoff roll.”

“In addition to the important factors of property procedures, many other variables affect the takeoff performance of an aircraft. Any item that alters the takeoff speed or acceleration rate during the takeoff roll will affect the takeoff distance.”

“If the gross weight increases, a greater speed is necessary to produce the greater lift necessary to get the aircraft airborne at the takeoff lift coefficient. As an example of the effect of a change in gross weight, a 21 percent increase in takeoff weight will require 10 percent increase in lift-off speed to support the greater weight.”

“With ISA (standard or average weather) conditions, increase the takeoff weight of the average Cessna 182 from 2,400 pounds to 2,700 pounds (11% increase) results in an increased takeoff distance from 440 feet to 575 feet (23 % increase).”

“For the aircraft with a high thrust-to-weight ratio, the increased in takeoff distance might be approximately 21% to 22%, but for the aircraft with a relatively low thrust-to-weight ratio, the increase in takeoff distance would be approximately 25% to 30%. Such a powerful effect requires proper consideration of gross weight in predicting takeoff distance.”

“The effect of pressure altitude and ambient temperature is to define the density altitude and its effect on takeoff performance. While subsequent corrections are appropriate for the effect of temperature on certain items of powerplant performance, density altitude defines specific effects on takeoff performance. An increase in density altitude can produce a twofold effect on takeoff performance:

1. Greater takeoff speed
2. Decrease thrust and reduced net accelerating force.”

“Proper accounting of pressure altitude and temperature is mandatory for accurate prediction of takeoff roll distance. The most critical conditions of takeoff performance are the result of some combination of high gross weight, altitude, temperature, and unfavorable wind. In all cases, the pilot must make an accurate prediction of takeoff distance from the performance data of the AFM/POH (airplane flight manual/pilot’s operating handbook), regardless of the runway available, and strive to a polished, professional takeoff procedure.”

SAF 13: What is landing performance?

Excerpts from Pilot’s Handbook of Aeronautical Knowledge, pages 10-13 through 10-17.

“In many cases, the landing distance of an aircraft will define the runway requirements for flight operations. The minimum landing distance is obtained by landing at some minimum safe speed, which allows sufficient margin above stall and provides satisfactory control and capability for a go-around. Generally, the landing speed is some fixed percentage of the stall speed or minimum control speed for the aircraft in the landing configuration. As such, the landing will be accomplished at some particular value of lift coefficient and AOA. The exact

values will depend on the aircraft characteristics but, once defined, the values are independent of weight, altitude, and wind.”

“To obtain minimum landing distance at the specified landing speed, the forces that act on the aircraft must provide maximum deceleration during the landing roll. The forces on the aircraft during the landing roll may require various procedures to maintain landing deceleration at the peak value.”

“A distinction should be made between the procedures for minimum landing distance and an ordinary landing roll with considerable excess runway available. Minimum landing distance will be obtained by creating a continuous peak deceleration of the aircraft; that is, extensive use of the brakes for maximum deceleration. On the other hand, an ordinary landing roll with considerable excess runway may allow extensive use of aerodynamic drag to minimize wear and tear on the tires and brakes.”

“The effect of gross weight on landing distance is one of the principal items determining the landing distance. One effect of an increased gross weight is that a greater speed will be required to support the aircraft at the landing AOA and lift coefficient. For an example of effect of a change in gross weight, a 21% increase in landing weight will require a 10% increase in landing speed to support the greater weight.”

“The effect of wind on landing distance is large and deserves proper consideration when predicting landing distance. Since the aircraft will land at a particular airspeed independent of the wind, the principal effect of wind on landing distance is the change in the ground speed at which the aircraft touches down. The effect of wind on deceleration during the landing is identical to the effect on acceleration during the takeoff.”

“The effect of pressure altitude and ambient temperature is to define density altitude and its effect on landing performance. An increase in density altitude increases the landing speed but does not alter the net retarding force. Thus, the aircraft at altitude lands at the same IAS (indicated airspeed) as at sea level but, because of the reduced density, the TAS (true airspeed) is greater.”

“The effect of proper landing speed is important when runway lengths and landing distances are critical. The landing speeds specified in the AFM/POH are generally the minimum safe speeds at which the aircraft can be landed. Any attempt to land at below the specified speed may mean that the aircraft may stall, be difficult to control, or develop high rates of descent. On the other hand, an excessive speed at landing may improve the controllability slightly (especially in crosswinds), but causes an undesirable increase on landing distance.”

SAF 14: What is the relationship between weight and balance, ambient temperature in the summer months, and take-off and landing distance at ARB?

When designing a runway and determining length and width, engineers take into account many factors (see AC 150/5300-13, Airport Design) including performance of highest critical aircraft in the general aviation (GA) fleet using the airport, instrument approaches, mean maximum temperature, and prevailing winds to mention only a few. Airport design standards require that the runway environment be consistent with the highest critical aircraft using the airport, though at ARB this is less than 1% of the airport's operations.

In general, ARB is considered as a flight training airport with high concentrations of student pilot and local operations (40,993 or 63%). There is a relatively low amount of GA IFR (3,509 or 5.4%) and Part 135 air taxi (1,198 or 1.8%) itinerant operations. The remaining flights (19,168 or 29.5%) are almost all small GA VFR itinerant operations. This 2008 air traffic data is available through the FAA Air Traffic Activity System (ATADS).

<http://aspm.faa.gov/opsnet/sys/Airport.asp>

During summer months ARB's mean maximum temperature is 83 degrees, with the prevailing winds ranging from the southwest to northwest. In the take-off and landings FAQ (SAF #12 & SAF #13), we learned that weight effects performance contributing to increased take-off and landing distance. We also learned that density altitude will also reduce take-off performance adding to distance as well as prolonging lift during the landing flare. Depending on individual airplane performance noted in the plane's AFM/POH, take-off and landing distances can fluctuate as much as 10% to 25% making ARB's inanimate 3,500' x 75' runway animate. On any given day an aircraft may be able to takeoff from ARB but not be able to return and land; or an aircraft may be able to land at ARB but may not be able to take off.

In the spirit of safety the ARB GA pilot community strives to assure that users operate their aircraft within the operating performance specifications of their aircraft because weight and balance and prevailing weather, plays such a dominate role in effective take-off and landing distances.

SAF 15: What levels of training and experience do pilots have flying out of ARB?

There are three basic pilot constituency groups on the airport: 1) student pilots training to become private pilots; 2) private pilots and private pilots with commercial and instrument ratings; and 3) airline transport pilots (ATP) that use the airport for recreational purposes. All three pilot constituency groups possess a wide range of aviation related educational training and piloting skill sets.

Located on the airport there are three commercially operated flight schools operated by fixed based operators (FBO). There are also two nonprofit flying clubs offering flight school training to members. ARB has a high concentration of student pilots. Student pilots typically attend ground school held over a 14-week term or complete academic training from a self-study

curriculum culminating in sitting for the FAA written knowledge test. After passing the FAA knowledge test and completion of a minimum of 40 instructional hours in flight training to the satisfaction of a FAA certified flight instructor (CFI); the student pilot, after receiving an endorsement from a CFI, may take the mandatory oral and practical flight skills examination.

Once having obtained a private pilot license, a private pilot may continue advanced flight training to attain higher ratings such as commercial and instrument ratings. Private, commercial, and instrument rated pilots at the airport fly as often as practical in order to remain current (generally between 25 and 200 hours/year).

ATPs generally fly several hundred hours/year so they may possess the highest level of airman knowledge and practical skill sets.

SAF 16: Does the FAA promulgate airport safety “Best Practices”?

Yes. See the FAA’s website for airport safety “best practices.”

http://www.faa.gov/airports_airtraffic/airports/runway_safety/bestpractices.cfm

OPERATIONS

OPS 1: What is an “operation?”

An “operation” for tracking aircraft activity is known as one flight departure or one flight arrival.

OPS 2: What is a FAR Part?

FAR is an acronym more fully described as Federal Aviation Regulations. FAR is part of the United States Government’s Code of Federal Regulations, a portion of which govern the airworthiness, maintenance, and operation of aircraft. FAR Parts 91, 135 and 121 all concern the operation of various segments of aviation.

OPS 3: What is the difference between Part 91, Part 135 and Part 121 flight operations?

Part 91 - This FAR refers to a segment of aircraft operations known as general aviation. General aviation refers to all aviation other than commercial (scheduled and non-scheduled) airline operations and military aviation. For example, flights for recreation and training are carried out under Part 91. Although general aviation usually involves small aircraft, the definition depends on the nature of the operation not the size of the aircraft. During 2008, 98.1% (63,668 operations) of all operations (64,910 operations) at ARB were conducted under Part 91 general aviation rules.

Scheduled Part 135 – This FAR refers to operations that apply to smaller aircraft that carry 9 or fewer passengers on regularly scheduled routes. During 2008, there were no Scheduled Part 135 operations at ARB.

Non-scheduled Part 135 – This FAR applies to smaller aircraft conducting on-demand operations as defined in 14 CFR 119.3 with schedules that are arranged between passengers and the operator (also known as “air taxi”) and scheduled passenger-carrying operations conducted on a limited basis. This also includes cargo planes with payload capacities of 7,500 pounds or less. During 2008, 1.8% (1,198 operations) of all operations (64,910 operations) at ARB was conducted under non-scheduled Part 135 rules.

Part 121 – This FAR refers to operations that apply to major airlines and cargo carriers that fly larger transport-category aircraft. Air carriers are generally defined as operators that fly aircraft in revenue service. In March 1997, the definition of Part 121 operations changed. Prior to the change, scheduled aircraft with 30 or more seats were operated under Part 121 and those with less than 30 seats were operated under Part 135. After 1997, scheduled aircraft with 10 or more seats were classified as Part 121 operations; therefore, since 1997, most carriers that once were popularly known as “commuters” now operate under FAR Part 121. During 2008, there were no Part 121 operations at ARB.

During 2008, less than 0.07% (44 operations) of all operations (64,910 operations) at ARB was conducted under military aviation rules.

ARB airport operations were obtained from the FAA searchable website database, Air Traffic Activity System (ATADS) - Airport Operations. <http://aspm.faa.gov/opsnet/sys/Airport.asp>

OPS 4: Does the Airport have any Part 121 and Part 135 operations at the Airport?

There are no Part 121 airlines and cargo carriers based on the Airport nor do any operate to and from the Airport. To support a Part 121 operation the FAA airport design specifications mandate the airport possess: 1) a precision navigation landing system; 2) wider/longer runway; 3) greater distance separation between the runway and taxiway; and 4) the runway, taxiway and ramp must have a greatly enhanced “weight bearing capacity” than exists at the Airport. Additionally, emergency and fire fighting access roads must be installed. See FAA Advisory Circular 150/5300-13, Airport Design, and AC 150/5325-4B for applicable mandatory design specifications for all airports receiving Federal funding.

During the past three or four decades, at one time or another, there have been five or more non-scheduled Part 135 “air taxi” operators based on the Airport. All have stopped operations for business reasons. The latest start up “air taxi” service began operations at ARB in January 2009. For the period January 1 – March 31, 2009, FAA’s Air Traffic Activity System (ATADS) – showed ARB had total of 87 air taxi operations. This total includes the ARB based “air taxi” service as well as any other “air taxi” operation based at another airport, which lands or takes off at Ann Arbor.

As a comparison, for the same period (1/1 - 3/31) in 2008, ATADS showed ARB had a total of 383 air taxi operations. These 383 air taxi operations were 2.9% of all ARB operations (13,202 operations) in the first three months of 2008. The 87 air taxi operations in the first quarter of 2009 account for 0.8% of all operations (10,261 operations) at ARB during that period. Clearly, operations for the new air taxi service based at ARB and those non-based air taxi services are not having an impact on overall airport operations.

OPS 5: What is a Part 25 certificated airplane?

Part 25 certificated airplanes refers to Part 25 — Airworthiness Standards: Transport Category Airplanes. Part 25 airworthiness standards are the design standards by which all reciprocating engine powered airplanes, two-engine and three-engine turbopropeller airplanes, and turbojet powered airplanes must be certificated in order for the airplane to operate within the transport category. The majority of airplanes up to 12,500 lb Maximum Takeoff Weight are type certificated in the normal, utility, or acrobatic categories; and most airplanes certificated to Part 25 have Maximum Takeoff Weights greater than 12,500 lb, although there is no lower weight limit.

If the airplane is not designed and manufactured to Part 25 design standards the airplane cannot be put into service as a Part 135 and 121 transport category airplane. With very few exceptions, two-engine and three-engine turbopropeller and turbojet business class airplanes, regardless of weight, are constructed to this higher standard. This allows the current owners to maintain a high resale value on the aircraft so that the future owners have the option of using these airplanes in Part 91, 135, or 121 operations.

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=b7454a2a64e24846f5d12637851f2a6f&rgn=div5&view=text&node=14:1.0.1.3.11&idno=14#14:1.0.1.3.11.8.201.18.16>

Excerpt from Wikipedia, the free encyclopedia

Transport category is a category of airworthiness applicable to large civil airplanes and large civil helicopters. Any aircraft's airworthiness category is shown on its airworthiness certificate. The name "transport category" is used in the USA, Canada, Europe and many other countries.

Transport category airplanes typically have maximum takeoff weights greater than 12,500 lb (5,700 kg) although there is no lower weight limit. Transport category helicopters typically have maximum takeoff weights greater than 6,000 lb (2,720 kg) although there is no lower weight limit.

A principle behind transport category design standards is that any element in an airplane or helicopter can fail, but the risk of such a failure causing an accident should be extremely low. Consequently transport category airplanes and helicopters have duplicated elements wherever failure of one element is likely to cause an accident. For example, transport category airplanes

must have at least two engines and be flown by at least two pilots. The loads on the wings and tail planes are usually carried by multiple load paths. If one element of the primary structure fails due to metal fatigue or corrosion the remaining sound elements of the structure must carry the loads until the failed structural element is discovered in routine maintenance. This fail-safe principle is not necessary in airplanes and helicopters that are not certificated in the transport category.

If an element in a transport category airplane or helicopter is not highly critical, or if its failure is relatively benign, it is possible for that element not to be duplicated. For example, most transport category airplanes do not have duplicated nosewheel assemblies; and some do not have duplicated wheels on each main undercarriage.

http://en.wikipedia.org/wiki/Transport_category

OPS 6: How does an aircraft's published take-off length correlate to the actual runway length?

This correlation is difficult and varies from airplane to airplane. Actual runway length is reduced to usable runway length based on safety factors, aviation regulations and aircraft performance calculations. Typically, published landing and take-off distances for aircraft are based on maximum take-off weight operations at sea level and 59 degree Fahrenheit temperature. ARB is 829' above sea level and has a mean 83 degree Fahrenheit temperature in July. Both of these factors have a significant impact on aircraft performance and require longer actual runway lengths than published. An airplane with a 3,500' published take-off length will not likely be able to take-off from ARB's 3,500' runway. Reducing take-off weight can improve performance, but creates other operational issues. All these factors are calculated by pilots prior to each flight based on the aircraft being flown, creating adjustments to take-off and landing distances.

Additionally, each aircraft and pilot has personal minimums that are used to calculate how much usable runway they have for take-offs and landings. These also vary by aircraft type, pilot comfort and many other factors calculated prior to each flight. These personal minimums also significantly reduce the amount of usable runway length.

For charters/air taxi operations which operate under Part 135, there are additional restrictions on landing length. In general, aircraft operating under Part 135 must be able to make a landing within 60% of the available runway length. Currently at ARB, this would require them to land within 2,100'. With the proposed 800' runway improvement, they must land within 2,580'. This restriction on usable runway length will continue to limit the types of aircraft landing at ARB.

OPS 7: How do Part 135 regulations limit operations at ARB?

Normally the most restrictive segment of any flight regarding runway length is the take off, however for FAR Part 135 (Charter/Air Taxi) operations there are additional restrictions required for landing as well. In general, Part 135 landing requirements require any aircraft operating under these portions of the regulations to be able to make a landing in 60% of the available runway length. Currently at the Ann Arbor Airport this number would be 2,100'. This means that for any charter/air taxi operator to land at the Ann Arbor Airport they will have to prove and be able to present documentation that proves that for their landing weight, aircraft configuration, temperature, etc. that they will be able to land in 2,100'. Most of the current small to mid sized jets will NOT meet this limitation with any sort of reserve fuel load.

Given the consideration for an additional 800 feet of usable runway, this would increase the available landing distance for Part 135 operations to 2,580' (60% of 4,300'). This will continue to be very restrictive for use by most charter/air taxi operators and should not result in an appreciable increase in aircraft traffic.

In general, the available landing distance needs to be at least 5,000' to meet the Part 135 requirements for most small to mid-sized corporate jets.

FAR 135.379, FAR 135.385, FAR 135.393

OPS 8: Do fractional ownership business aircraft (i.e. NetJets) utilize ARB?

Major fractional ownership operations such as NetJets operate under FAR part 91, subpart K. This regulation is a part 91 regulation with part 135 limitations on operations for fractional operators. These fractional operators must comply with runway restrictions like other part 135 operators. In addition, both major fractional operators primarily fly aircraft which do not operate well on runways less than 4,500'. Most other business fractional operators also operate as part 135 operators and do so in order to be able to offer charter services to other non owner clients. This is not to say that they cannot utilize ARB, but that they have significant restrictions based on aircraft fleet and operational regulation restrictions.

OPS 9: Provide me with an example of large airplanes that already operate on ARB's 3,500' runway, taxiways, and ramp area.

An analysis of aircraft types that can currently land versus those that may be able to land after the improvement is being completed. This analysis will be made available once completed.

OPS 10: Provide me with an example of large airplanes that do not already operate at ARB, but could operate at ARB if the runway was extended 800’.

An analysis of aircraft types that can currently land versus those that may be able to land after the improvement is being completed. This analysis will be made available once completed.

OPS 11: Will there be additional airplanes operating from ARB as a result of adding the 800’?

While the airport reference classification (B-II) will not change because of the runway improvement, it is unknown if additional planes will actually operate at ARB as a result of the 800’. It is expected that the runway improvement will allow a small additional subset of multi-engine propeller or turbojet business class aircraft to be able to operate at ARB. These additional aircraft could become actual operations only if the pilots or owners of those aircraft have a reason to come to Ann Arbor. Runway length does not determine operational usage, need or purpose to land in Ann Arbor determines operational usage. Those potential operations are very difficult to predict and would expect to be a minimal increase, if any. An analysis of aircraft types that can currently land versus those that may be able to land after the improvement is being completed. This analysis will be made available once completed.

OPS 12: What does airport reference code B-II mean?

Airport reference code refers to the FAA Airport Design standards (see AC 150/5300-13) the airport is designed for safe operation of the “critical aircraft” using the airport. The “B” represents the “aircraft approach category” and the Roman numeral “II” represents the “airplane design group.” Below is an excerpt from AC 150/5300-13 defining airplane category and group, and airport reference code.

A “critical aircraft” is the largest documented airplane with greater than 500 operations from an airport during a calendar year. Appendix 13 (pages 263-265) of the Airport Design circular provides a list of airplanes that B-II airports are designed for. This list is not inclusive of all aircraft within each airport reference code, but provides a basis for airport design.

Aircraft Approach Category. A grouping of aircraft based on 1.3 times their stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:

Category A: Speed less than 91 knots.

Category B: Speed 91 knots or more but less than 121 knots. – Ann Arbor Airport

Category C: Speed 121 knots or more but less than 141 knots.

Category D: Speed 141 knots or more but less than 166 knots.

Category E: Speed 166 knots or more.

Airplane Design Group (ADG). A group of airplanes based on wingspans or tail heights. Where an airplane is in two categories, the most demanding category should be used. The groups are as follows:

Group I: Up to but not including 49 feet (15 m) wingspan or tail height up to but not including 20 feet.

Group II: 49 feet (15 m) up to but not including 79 feet (24 m) wingspan or tail height from 20 feet up to but not including 30 feet. – Ann Arbor Airport

Group III: 79 feet (24 m) up to but not including 118 feet (36 m) wingspan or tail height from 30 feet up to but not including 45 feet.

Group IV: 118 feet (36 m) up to but not including 171 feet (52 m) wingspan or tail height from 45 feet up to but not including 60 feet.

Group V: 171 feet (52 m) up to but not including 214 feet (65 m) wingspan or tail height from 60 feet up to but not including 66 feet.

Group VI: 214 feet (65 m) up to but not including 262 feet (80 m) wingspan or tail height from 66 feet up to but not including 80 feet.

AIRPORT REFERENCE CODE (ARC), means the ARC is a coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport.

a. Coding System. The airport reference code has two components relating to the airport design aircraft. The first component, depicted by a letter, is the aircraft approach category and relates to aircraft approach speed (operational characteristic). The second component, depicted by a Roman numeral, is the airplane design group and relates to airplane wingspan or tail height (physical characteristics), whichever is the most restrictive. Generally, runways standards are related to aircraft approach speed, airplane wingspan, and designated or planned approach visibility minimums. Taxiway and taxi lane standards are related to airplane design group.

b. Airport Design. Airport design first requires selecting the ARC(s), then the lowest designated or planned approach visibility minimums for each runway, and then applying the airport design criteria associated with the airport reference code and the designated or planned approach visibility minimums.

(1) An upgrade in the first component of the ARC may result in an increase in airport design standards.

(2) An upgrade in the second component of the ARC generally will result in a major increase in airport design standards.

(3) An airport upgrade to provide for lower approach visibility minimums may result in an increase in airport design standards.

(4) Operational minimums are based on current criteria, runways, airspace, and instrumentation. Unless this is taken into consideration in the development of the airport, the operational minimums may be other than proposed.

(5) For airports with two or more runways, it may be desirable to design all airport elements to meet the requirements of the most demanding ARC. However, it may be more practical to design some airport elements, e.g., a secondary runway and its associated taxiway, to standards associated with a lesser demanding ARC.

OPS 13: What drives Ann Arbor Airport usage or the number of operations?

Airport usage is determined by a pilot or aircraft owner's need to fly to Ann Arbor. Like a seaport, an airport is a place of destination so the pilot usually needs a purpose or business reason for coming to Ann Arbor. While there is no way to substantiate why itinerant traffic stops at ARB, it is assumed they visit ARB for business reasons and area attractions. Increased usage of the airport by itinerant traffic would have to be as result of a greater demand to visit area attractions or an increased business need that did not exist in the past.

Based on historical usage, ARB has principally been a general aviation flight training airport. While it is not exactly known what drives student pilot enrollment up or down, it is generally assumed economic forces play a large role. As the demand for commercial pilots increase, it is assumed increased enrollment follows and as demand falls off, enrollment falls.

Other factors influencing operations include economic factors, aging pilot population, and competition from other discretionary hobbies. In past years, the military demand for pilots during WWII, Korean War, and Viet Nam War had generated a large population of pilots. The Greatest Generation of pilots flying during WWII and Korean Wars has largely stopped flying because of difficulty maintaining their FAA medical certificates. The Baby Boomer generation flying during the Viet Nam War is beginning to face similar challenges in maintaining a medical certificate. There is no single driver one can point to for the declining usage, but articles in aviation periodicals seem to point to these contributing factors for the decline in aviation usage.

According to FAA airport operations data available at Air Traffic Activity System (ATADS), Airport Operations, website, <http://aspm.faa.gov/opsnet/sys/Airport.asp>, 2008 total operations at ARB were:

2008 Actual Total Operations

Total Air Carrier (Part 121):	0
Total Air Taxi (Part 135):	1,198 (1.9%)
Total General Aviation (Part 91):	63,668 (98.1%)
Military Operations:	44 (<0.001%)
2008 Total Operations:	64,910

Average Monthly Operations:	5,409
Average Daily Operations:	178
Average Hourly Operations:	7.4

Within the general aviation category amount of 63,668 operations, 40,991 operations (64%) mainly consist of student and private pilots operating locally in the Ann Arbor Class D airspace. The remaining 22,677 (36%) general aviation operations is made up of instrument flight rule (IFR) and visual flight rule (VFR) itinerant traffic arriving and departing from ARB.

OPS 14: What year between 1990 and 2008 had the greatest number of control tower operations and how many operations was it?

It was 1999 and total operations were 134,554.

1999 Actual Total Operations

Total Air Carrier (Part 121):	4 (<0.002%)
Total Air Taxi (Part 135):	2,476 (1.8%)
Total General Aviation (Part 91):	132,059 (98.2%)
Military Operations:	15 (<0.01%)
1999 Total Operations:	134,554
Average Monthly Operations:	11,213
Average Daily Operations:	369
Average Hourly Operations:	15.4

Within the general aviation category amount of 132,059 operations, 90,860 operations (67.5%) mainly consist of student and private pilots operating locally in the Ann Arbor Class D airspace. The remaining 43,694 (32.5%) general aviation operations is made up of instrument flight rule (IFR), visual flight rule (VFR), and military itinerant traffic arriving and departing from ARB.

OPS 15: What level of increased or decreased flight operations at the airport would be as a result of extending the runway by 800'?

The length of ARB's general aviation runway has no fact based correlation with the number of annual operations. Operations at Ann Arbor have been as high as 134,554 (1999) and as low as 64,910 (2008), all utilizing the existing 3,500' runway. Pilots and their passengers arrive at ARB because there is purpose or business reason to come to the greater Ann Arbor area. Unless there is a newly created demand for community based activities, attractions, products and services consumed by pilots and airplane owners that do not already patronize existing area businesses, one can only assume there will be no material increase or decrease in flight operations by new users as a result of an 800' extension.

Should the runway length be increased by 800', there is no known fact based pilot and airplane owner survey data reliably predicting the number of increased operations as a result of a longer runway. We can, however, look at historical ARB operations data and draw some conclusion

assuming increased operations driven by the economy and not by whether the runway is at its present 3,500' or extended by 800'.

According to FAA airport operations data available at Air Traffic Activity System (ATADS), Airport Operations, website, <http://aspm.faa.gov/opsnet/sys/Airport.asp>, the following control tower operations at ARB between 1990 and 2008 were:

1990 – 2008 Average Operations

Total Air Carrier (Part 121):	1 (<0.0001)
Total Air Taxi (Part 135):	1,206 (1.2%)
Total General Aviation (Part 91):	95,364 (98.6%)
Total Military:	169 (0.2%)
1990 – 2008 Average Operations:	96,741
Average Monthly Operations:	8,062
Average Daily Operations:	265
Average Hourly Operations:	11.0

Post 9/11 (2001 – 2008) Average Operations

Total Air Carrier (Part 121):	0
Total Air Taxi (Part 135):	1,823 (2.4%)
Total General Aviation (Part 91):	74,818 (97.5%)
Total Military:	84 (0.1%)
2001 – 2008 Average Operations:	76,724
Average Monthly Operations:	6,394
Average Daily Operations:	210
Average Hourly Operations:	8.8

Scenario #1: Assume 2% Increase In Post 9/11 Average Operations

Total Operations:	78,258
Average Monthly Operations:	6,522
Average Daily Operations:	214
Average Hourly Operations:	8.9
# of Operations/Hour Increase:	0.1

Scenario #2: Assume 5% Increase In Post 9/11 Average Operations

Total Operations:	80,560
Average Monthly Operations:	6,713
Average Daily Operations:	221
Average Hourly Operations:	9.2
# of Operations/Hour Increase:	0.4

Scenario #3: Assume 10% Increase In Post 9/11 Average Operations

Total Operations:	84,396
Average Monthly Operations:	7,033

Average Daily Operations: 231
 Average Hourly Operations: 9.6
 # of Operations/Hour Increase: 0.8

Scenario #4: Assume 25% Increase In Post 9/11 Average Operations

Total Operations: 95,905
 Average Monthly Operations: 7,992
 Average Daily Operations: 263
 Average Hourly Operations: 10.9
 # of Operations/Hour Increase: 2.1

Based on the historical data and assumed multiple scenario computations, if there was any increase in operations caused solely by an additional 800', one could reasonably expect 97.5% of the increase would be generated by general aviation traffic and 2.5% coming from Part 135 small and large category airplanes. Additional traffic might be:

	# of Ops/Hr Increase	General Aviation Ops/Hr	Part 135 Ops/Hr
Scenario #1: 2% Increase:	0.1	0.0975	0.0025
Scenario #2: 5% Increase:	0.4	0.39	0.01
Scenario #3: 10% Increase:	0.8	0.78	0.02
Scenario #4: 25% Increase:	2.1	2.0475	0.0525

OPS 16: Does ARB have a noise abatement procedure pilots are requested to follow when operating from the airport?

Yes, ARB is currently rolling out a new community friendly noise abatement procedure pilots are being asked to comply when departing and arriving the airport. Printed pilot kneeboard procedures are being distributed and informational signage will be posted. Airport management has declared all quadrants surrounding the airport as noise sensitive areas.

OPS 17: What runways exist at the airport and are there any plans to create any new runways?

ARB has one paved runway and one grass/turf runway. Runway 06-24 is a grooved-concrete paved 3,500' x 75' runway. Runway 12-30 is a 2,750' x 110' grass/turf runway. There are no plans to add any additional runways or lengthen the grass/turf runway. All airport improvements are required to be shown on the ALP and approved by City Council.

OPS 18: Does the City have control over air traffic using the airport?

During control tower hours from 8:00 a.m. to 8:00 p.m. local time, Ann Arbor’s airspace reaches out 4.4 statute miles in a radius surrounding the airport up to 3,300’ MSL and is controlled by FAA control tower personnel. In addition to managing the airspace over Ann Arbor during tower hours, controllers also manage all positive ground movement on taxiways and runways. These employees are federal employees and not employees of the City of Ann Arbor.

During the hours that the tower is not in operation, pilots using the airport are required to announce their intentions on what is known as the Common Traffic Advisory Frequency or CTAF. Each airport has a discrete radio frequency. Pilots arriving are required to monitor this frequency. This allows them to maintain a listening watch and to contact other arriving and departing traffic to coordinate a landing sequence if necessary. They are also required to provide radio calls “in the blind” announcing their intentions at 10 miles out, 5 miles out and while in the traffic pattern. After entering the traffic pattern, calls are required on the downwind, base, and final approach legs. After landing a call is made when clear of the runway, and while taxiing to the final destination on the airport. Aircraft taxiing for departure and takeoff also monitor the CTAF and announce their intentions in a similar manner. This procedure is used at all airports without control towers.

The Airport Manager retains the authority to open and close runways and taxiways for maintenance and safety. The Airport Manager also is responsible for the daily management of the airport including its enterprise fund operating budget.

When the City accepts federal grant funding, it agrees:

- 1) that the funding agreement remains in full force throughout the life of the improvement or equipment acquired for the airport, but to not exceed 20 years of accepting federal funds;
- 2) that the airport has sufficient funds to operate “items funded under the agreement”;
- 3) not to sell or transfer the airport, but has authority to a transfer with approval;
- 4) that they will make the airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical activities;
- 5) to charge reasonable, and not unjustly discriminatory, prices for each unit or service;
- 6) that the sponsor (City) may prohibit or limit any given type, kind or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport or necessary to serve the civil aviation needs of the public;
- 7) that revenues generated by the airport and any local taxes on aviation fuel...will be expended by it for the capital or operating costs of the airport; and,
- 8) that when the land is no longer needed for airport purposes, they will dispose of such land at fair market value;

OPS 19: Does the City have any plans to attract air traffic from Willow Run Airport?

No. The City of Ann Arbor has not nor will it ever have plans of attracting any air traffic from Willow Run Airport.

The City of Ann Arbor understands and agrees Willow Run Airport is an excellent nearby facility and encourages large airplanes to use that facility. The City has determined Willow Run possesses the ideal runway lengths, ground services and an airport environment better suited for its many large plane users. ARB does not have the infrastructure or ground services to accommodate large planes already being served by Willow Run Airport and has no plans to create this infrastructure or provide these ground services.

OPS 20: What ground services are needed to support Part 25 certificated airplane operations?

In OPS #5 we learned that Part 25 certificated airplanes tend to be the larger multi-engine turbopropeller and turbojet powered airplanes used as corporate/business aircraft. These aircraft typically utilize airports that provide adequate services such as ground power units, jet A fuel services, waste disposal/pumping services, transient hangar spaces, de-icing fluid and application equipment (trucks and sprayers), catering services, and crew services (crew lounge, crew car, etc.). These airports typically have longer runways, crosswind runways, 24 hour FAA tower, precision ILS approaches, Customs and extensive maintenance facilities.

OPS 21: What services are available at Willow Run Airport that is not available at ARB?

Willow Run Airport offers longer runways, multiple runways, crosswind runways, 24 hour FAA tower, precision ILS approaches, Customs, catering service, crew services, de-icing operations, ground power units and extensive maintenance facilities. ARB offers none of these services or infrastructure that is attractive and frequently required for most corporate/business aircraft.

OPS 22: What caused the number of banner towing flight operations to decrease?

The reduction in banner towing operations was mostly the result of FAA rule making known as “temporary flight restrictions” (TFR) now in effect as a result of the terrorist attacks of 9/11. One hour before the start and one hour after the end of events, aircraft must remain outside of a 3-mile radius and be at least 3,000’ above the ground. This applies to NCAA stadiums that have a seating capacity greater than 30,000, NASCAR events, major league baseball games, and NFL football games.

OPS 23: What has caused the number of football Saturday airport operations to decline?

The decline in football stadium airport traffic is not known, but many in the aviation industry believe the decline may be the result of current economic conditions as well as a change in corporate policy relative to personal use and entertainment related use of corporate owned

airplanes. Other regulatory mandates affecting personal use and entertainment related use are the Internal Revenue Service (IRS) Standard Industry Fare Level (SIFL) regulations and disallowance.

IRS rules now consider the value for individuals using corporate airplanes for personal use as taxable income. The taxable consequence is known as SIFL. Since in most cases the employee cannot pay the company non-business use by an employee is generally considered a taxable fringe benefit. The value of the flight, or a portion thereof, must be included in the employee's income. In basic terms, whenever an employee or guest (including family members of the employee) uses a company airplane for non-business/personal use, the flight is taxable to the employee.

The IRS prescribes in its regulations how this personal transportation should be valued by the employer. When calculating the value of a flight deemed to be taxable, the IRS allows operators to choose between two different methods. The first method uses the fair market value or charter value of the flight. This method looks at the cost of chartering the same or comparable aircraft for the same or comparable flight. Of the two methods, the fair market value often produces a higher value for the flight. The second and more common method determines the value of the flight using a SIFL formula. The SIFL method is based on the distance traveled, size of the aircraft, the number of people accompanying the employee, and a multiple that is higher or lower depending on whether the employee is classified as "control" or "non-control."

More commonly known as disallowance, the American Jobs Creation Act of 2004 (the "Act"), signed into law by President Bush on October 22, 2004, overrides the Sutherland Lumber decision by limiting a taxpayer's ability to deduct aircraft depreciation and operating expenses when the aircraft is used to provide transportation to certain "Specified Individuals" for entertainment, amusement, or recreational purposes. The law is believed to have changed corporate personal use policy of corporate owned aircraft because of the risk of possible disallowance of losing deductibility of depreciation and operating expenses associated with the whole airplane so many corporations prohibit personal use and entertainment.

OPS 24: What military airplanes or old warbirds can currently fly into the airport?

The Yankee Air Museum located at Willow Run Airport (YIP) has flown its B-17, C-47, and B-25 into ARB in years past, but only under ideal weather conditions. Flights now are limited to low approaches to the airport and flights over the city at 1,000' above the highest obstacle (high-rise buildings, radio towers, etc.) within a 2,000' radius.

OPS 25: Why do the companies owning airships (blimps) use the airport for base of operations during special events held in SE Michigan?

The airport's proximity to local major events such as UM football, golf events in Oakland County, and other events such as NASCAR races at the Michigan International Speedway is a

significant draw. The airport's control tower, security fence and open space are convenient for the blimp operations. Also, ARB is located outside of the crowded airspace of the Detroit Metro area.

OPS 26: Why do jets and large cargo planes, frequently at night, fly right over the airport?

These jets and cargo planes are not based at ARB or operate at ARB. Standard operating procedure for Detroit air traffic controllers is to put these airplanes on the CRRUXX 3 arrival procedure vectoring aircraft over Pittsfield Township and the Ann Arbor Airport on approach into Willow Run Airport and Oakland/Pontiac Airport. Also, jets and cargo airplanes vectored into Willow Run Airport when landing on runway 5/23 pass directly over Ann Arbor's runway 6/24. People frequently mistake these aircraft as using ARB.

OPS 27: Is there a standard operating procedure (SOP) for airplanes to dump fuel on departure if there is a mechanical failure and the airplane must return to the airport for an emergency landing?

Most aircraft do not have a means of dumping fuel while in flight. The FAA only requires a fuel dumping system if the aircraft's Maximum Take Off Weight (MTOW) exceeds the Maximum Landing Weight (MLW) by more than 105%. (Examples: B707, B727, B747, B767, B777, L1011, DC8, DC10, A300, A330...) If a fuel dumping is necessary, it is usually performed over open water or sparsely populated areas at an altitude of 6000 feet (1 mile high) or greater.

ENVIRONMENTAL

ENV 1: What is an Airport Layout Plan (ALP)?

An Airport Layout Plan (ALP) is a scaled drawing of existing and proposed land and facilities necessary for the operation and long term development of the airport. The ALP shows boundaries and proposed additions to all areas owned or controlled by the airport operator for airport purposes, the location and nature of existing and proposed replacement airport facilities and structures, and the location on the airport of existing and proposed non-aviation areas and improvements thereon. Simply, the ALP is a visual depiction of an airport's master plan.

The document, and revisions as needed, must be approved by the State Bureau of Aeronautics, the FAA and the City Council. Approval of an ALP by these agencies is only an approval of the airport master plan. Any specific improvement on the ALP must be separately approved by City Council prior to commencement of the project.

ENV 2: Why did the Ann Arbor City Council amend the Airport Layout Plan (ALP) in 2007?

In addition to a general periodic updating of the ALP, the July 2006 State Road Corridor Study recommendations were finalized and released by the Washtenaw County Road Commission. The airport manager was required under FAA CFR Part 77 to report the final recommendation because the report contained an obstruction causing a potential "Hazard to Air Navigation." The recommendation to potentially widen the State Road right-of-way to 160' or 180' will cause a "Hazard to Air Navigation" within the extended protected runway safety zone affecting nonprecision instrument approaches.

The safety issue is tall vehicle traffic potentially encroaching into the protected airspace (beginning 15') above the road surface ("Obstacle Clearance Surface" (OCS)) within the extended protected runway safety zone causing an "Obstruction to Air Navigation" the steepening of the normal nonprecision instrument OCS from 34:1 to 20:1. See FAA Part 77, sections 77.23 and 77.25. Additionally, the favored recommendation of the State Road Corridor Study calls for widening the existing right-of-way from a two-lane road to a 180' wide four-lane boulevard at the approach end of Rwy 24, exacerbating the existing safety issue.

To address the vertical encroachment and separation of the roadway from the runway, the 2007 ALP was adopted which depicts a curve in State Road away from the end of the runway restoring the clear height above the minimum 15' and 34:1 slope. The 2007 ALP was approved by City Council on January 22, 2007.

ENV 3: Why did the Ann Arbor City Council amend the Airport Layout Plan (ALP) in 2008?

During the approval process for the 2007 ALP, City Council directed staff to update the ALP to address the safety concerns raised during Council's January 6 and January 22, 2007 meetings. The ALP was amended in 2008 to address the three primary safety related concerns which are:

- 1) the approach end of Rwy 24 is too close to State Road and causes an obstruction to the nonprecision 34 to 1 instrument approach slope;
- 2) the run-up area to Rwy 24, hold short line to Rwy 24, and first 200' of parallel taxiway from the run-up area of Rwy 24 are not visible and not controlled by the FAA tower; and,
- 3) unusually high number of runway overrun incidents.

This amendment included removing the curve on State Road, replacing the curve with the 150' runway shift to the SW, and the 800' extension of Rwy 6/24 to the SW. The 2008 ALP was approved by City Council on September 22, 2008.

ENV 4: What is an environmental assessment Study (EA)?

An EA study is an engineering and scientific study evaluating the impact of proposed improvements at an airport within the community. Categories to be evaluated include:

- Noise
- Compatible Land Use
- Socioeconomic, Environmental Justice
- Wetlands, Jurisdictional or Non-Jurisdictional
- Floodplains
- Water Quality
- Section 4(f) and 6(f) Properties
- Historic, Architectural, Archaeological, and Cultural Resources
- Fish, Wildlife and Plants
- Air Quality
- Coastal Resources
- Wild and Scenic Rivers
- Farmlands
- Natural Resources and Energy Supply
- Light Emissions and Visual Effects
- Hazardous Materials
- Construction Impacts

The EA will be conducted subject to FAA Order 5050.4B and FAA Order 1050.1E.

http://www.faa.gov/airports_airtraffic/airports/resources/publications/orders/environmental/5050_4/

http://www.faa.gov/regulations_policies/orders_notices/media/ALL1050-1E.pdf

ENV 5: What is the environmental assessment (EA) study process?

The FAA defines an environmental assessment to include “Federal grant assistance in, or ALP approval of, new airport construction or major expansion normally requires an assessment of potential environmental impacts in accordance with FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects, and the National Environmental Policy Act of 1969.”

ENV 6: What is the noise contour level surrounding the airport?

A noise contour level map based on FAA standards is not known at this time. The environmental assessment study will generate a noise contour map depicting the sound footprint of airplane traffic on and surrounding airport environs. The noise study will include the impact of the airport’s “critical aircraft,” which is the largest aircraft making 500 operations at the airport per year. The last known time a noise study was completed was back in the early

1990's. This study does not reflect the noise level changes due to the increased development and vehicular traffic surrounding the airport over the last 15+ years.

ENV 7: Will residents be given an opportunity to make public comment?

Yes. The environmental assessment (EA) process requires a public hearing when a draft of the study is available. These public comments will be made part of the official record of the EA when submitted for review to the appropriate state and federal agencies. Additionally, the environmental consultant is targeting specific constituencies for involvement in a citizen advisory committee (CAC). These CAC members will be tasked with soliciting comments and concerns from their constituency to share with the consultant and with disseminating the consultant's progress, observations and findings to their groups. Area residents can also provide public comment at City Council or Airport Advisory Committee meetings within those boards public comment guidelines.

ENV 8: What will be the new altitude of airplanes arriving and departing on Rwy 06 and Rwy 24?

The altitude of arriving and departing planes varies significantly at any airport. Even at the same airport, the altitude would vary significantly based on numerous factors. These factors include the type of aircraft, rate of climb used, wind, temperature, and pilot preference just to name a few. A study is being done to determine the changes of altitudes based on proposed runway changes for a cross section of ARB based aircraft. This information will be made available as it is completed.

ENV 9: Will the quality of life decline as a result of the 800' runway safety margin extension?

In accordance with the FAA Order 5050.4B and FAA Order 1050.1E the environment assessment (EA) study will evaluate the following quality of life impact categories:

- Noise
- Compatible Land Use
- Socioeconomic, Environmental Justice
- Wetlands, Jurisdictional or Non-Jurisdictional
- Floodplains
- Water Quality
- Section 4(f) and 6(f) Properties
- Historic, Architectural, Archaeological, and Cultural Resources
- Fish, Wildlife and Plants
- Air Quality
- Coastal Resources
- Wild and Scenic Rivers
- Farmlands
- Natural Resources and Energy Supply
- Light Emissions and Visual Effects

- Hazardous Materials
- Construction Impacts

The EA will be conducted subject to FAA Order 5050.4B and FAA Order 1050.1E.

http://www.faa.gov/airports_airtraffic/airports/resources/publications/orders/environmental_5050_4/

http://www.faa.gov/regulations_policies/orders_notices/media/ALL1050-1E.pdf

ENV 10: Does the size of an airport and its runway have a declining effect on communities and surrounding environs?

The EA study will research and answer this question. At this time there is no empirical evidence that the size of ARB and its runways have a negative effect on the community and surrounding environs. Subject to confirmation by Pittsfield Township property assessment studies, beginning in the early 1980s through today, property values surrounding the airport have continued to appreciate until impacted by the current economic conditions in the State of Michigan. This would suggest that ARB has little negative effect on demand or desirability of the area.

ENV 11: Does the FAA have a residential noise abatement insulation program?

Yes. See the FAA's website for program details and qualifications.

Excerpt from FAA's website, Noise Compatibility Program within the Environmental Program section.

Environmental Program

Updated: 9:48 am ET March 13, 2009

The Airport Environmental Program helps airports implement the National Environmental Policy Act (NEPA) and other Federal environmental laws and regulations. This includes airport noise compatibility planning (Part 150), airport noise and access restrictions (Part 161), environmental review for airport development, and the application of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

http://www.faa.gov/airports_airtraffic/airports/environmental/

ENV 12: Can the runway be extended to the northeast instead of the southwest?

Extension of the runway to the northeast would be difficult because of the impact on State Road traffic and the location of known wetlands. This option would also fail to address the line of sight issues from the FAA tower. A northeast extension would actually make the line of site

issue worse. The FAA no longer allows roadways to cross underneath runways due to post 9/11 safety concerns. State Road would have to be completely relocated which causes significant traffic impacts to both State and Ellsworth Roads. The State Road relocation work and the runway improvement work would both encroach into known wetland areas and create significant environmental impacts.

ENV 13: What are the two shaded areas on the ALP labeled “future non-aviation revenue area”?

These two areas labeled “future non-aviation revenue area” are land that can be used, with appropriate approvals, for non-aviation use. Use of this land for non-aviation purposes must generate revenue that stays at the airport for aeronautical purposes. For non-aviation related activities, this would likely include Pittsfield Township zoning and site plan approvals.

The non-aviation revenue area along Lohr Road was added in 2005 and approved in 2007 ALP to accommodate a request by the previous Pittsfield Township administration for the possible location of public use soccer fields and other recreational activities. The area along Ellsworth Road was designated non-aviation because of the commercial frontage potential. Back in 2005, there was interest in this commercial frontage for office building development.

There are no plans to use either of these areas for other than their current use. Removal or modification of these designations would require an amendment to the ALP.

ENV 14: Will the City construct a tall chain-link fence along the perimeter of the airport and more specifically along Ellsworth and Lohr Roads?

The current ALP, as well as previous ones, show a future fence along the entire perimeter of airport owned property. The City has no plans to relocate the current fencing out to the airport’s perimeter boundary. The preliminary runway layout plan being done as part of the EA process will dictate any changes to the fence at the end of Rwy 6, though no changes are anticipated.

ENV 15: Will the airport need to acquire additional property to extend the runway 800’?

The airport currently owns the property all the way to Lohr Road on the west and Ellsworth Road to the north. The frontage along Lohr Road is leased to a local farmer and there are no plans to change that. There is no property acquisition planned or anticipated with the proposed runway improvements.

ENV 16: Why extend the runway 800’ instead of a shorter distance?

An 800’ improvement puts Rwy 06-24 at 4,300’ and should eliminate approximately 85% of the runway overruns. Please see the FAA Airport Design Standards for additional information on runway overruns (AC 150/5300-13, Appendix 8, Section 3.a and figure A8-1). An improvement

less than 800' addresses less of the overruns. Extending the runway longer than 4,300' would require significant upgrades to the entire runway and taxiways which would change the airport's classification and may allow larger planes. The Airport Advisory Committee is committed to resolving the right-of-way Part 77 and overrun issues without changing the airport's reference class and opposes any attempt to lengthen the runway beyond 4,300'.

ENV 17: Does the airport permit the use of ethylene glycol or other deicing fluids on airport grounds?

No, the airport does not permit de-icing on airport grounds using any propylene glycol or other ethylene glycol based de-icing fluids nor does it have a de-icing spray facility. De-icing is usually done by spraying aircraft with a de-icing fluid such as propylene glycol or other ethylene glycol based de-icing fluids. The airport's proximity to the City's drinking water wells prohibits the airport from providing de-icing services. The lack of de-icing capabilities aids in limiting Part 121 and 135 operations.

ENV 18: Are there any underground storage tanks located on the airport?

No, the airport does not permit underground storage tanks on airport ground. All fuel storage tanks are above ground and regularly monitored for leakage and spillage.

ECONOMICS

ECON 1: What is the source of revenue used to pay for airport improvements?

The environmental assessment study and airport improvements are 97.5% funded from federal and state sources. The City's remaining 2.5% funding comes from the airport's operating budget which is an enterprise fund comprised solely of revenue generated by airport operations. Depending on the amount needed to make airport improvements and subject to City Council approval, the airport may also borrow capital funds and repay borrowed funds from future airport operating budgets.

As an example, if a capital improvement is estimated to cost \$1.0 million, federal and state sources would supply \$975,000, the airport's portion would be \$25,000.

The following paragraphs are an excerpt from a recent transportation study titled Transportation Solutions: A Report on Michigan's Transportation Needs and Funding Alternatives, prepared by The Michigan Transportation Funding Task Force.

"Federal funding, derived from the Airport and Airway Trust Fund (AATF), is the primary funding source for airport capital projects. The AATF is derived from passenger ticket taxes, cargo taxes, commercial aviation fuel taxes, and non-commercial aviation fuel tax General Fund revenue.

Federal Aviation Funding Sources

Passenger Ticket Taxes:	66%
General Fund:	24%
Non-Commercial Aviation Fuel Tax:	4%
Commercial Aviation Fuel Tax:	3%
Interest:	3%

“The State Aeronautics Fund (SAF) is the primary repository for state aviation revenue and is used in conjunction with local revenue to match available federal aid. The SAF receives revenue from license, permit, and registration fees. State sales tax at the rate of six percent of the retail price is levied on sales of aviation fuel and other aircraft related purchases.

“The excise tax on aviation fuel is the single greatest source of revenue for the SAF. The tax has never been increased since its inception in 1929 and remains at three cents per gallon. The only change to the tax on aviation fuel was a one and one-half cent per gallon rebate to interstate airlines instituted with P.A. 327 of 1945.”

State Aeronautics Fund (SAF) Revenue

Fuel Taxes:	54%
Airport Parking Tax (Net):	34%
Interest Earned on Bonds:	6%
Operation of State Aircraft:	2%
Licenses & Permits:	2%
Navigation Aid Operation:	1%
Miscellaneous:	1%

Source:

Transportation Solutions: A Report on Michigan’s Transportation Needs and Funding Alternatives, pages 9 & 10, The Report of The Michigan Transportation Funding Task Force, Prepared for Governor Jennifer Granholm and the Michigan Legislature, November 10, 2008 (with technical corrections as of 12/4/08).

ECON 2: What types of projects are eligible for federal aviation improvement program (AIP) funding?

Eligible projects include those improvements related to enhancing airport safety, capacity, security, and environmental concerns. In general, sponsors can use AIP funds on most airfield capital improvements or repairs except those for terminals, hangars, and non-aviation development. Any professional services that are necessary for eligible projects — such as planning, surveying, and design — are eligible as is runway, taxiway, and apron pavement maintenance. Aviation improvement projects must also meet Federal environmental and procurement requirements.

Projects related to airport operations and revenue-generating improvements are typically not eligible for funding. Operational costs — such as salaries, maintenance services, equipment, and supplies — are also not eligible for AIP grants.

ECON 3: How much will the environmental assessment study cost?

The total cost of the environmental assessment study is \$309,000. This includes work approved by the City for the two consultants on the project in the amount of \$298,500 and State Bureau of Aeronautics administrative costs in the amount of \$10,500. The following item were approved by City Council on February 2, 2009:

DS-3 08-1144 Resolution to Approve the October 2008 Professional Services Agreement between the City and URS Corporation Great Lakes for Work Related to the Environmental Assessment and Preliminary Engineering for the Safety Extension of Runway 6/24 at the Ann Arbor Municipal Airport (\$186,000.00)

DS-4 08-1145 Resolution to Approve the December 16, 2008 Professional Services Agreement between the City and Smith Group JJR, LLC for Work Related to the Environmental Assessment for the Safety Extension of Runway 6/24 at the Ann Arbor Municipal Airport (\$112,489.53)

ECON 4: How will the environmental assessment study be paid for?

97.5% of the cost of the environmental assessment (EA) study will be paid from Airport Improvement Program grants paid from state and federal aviation revenues. The 2.5% local share (about \$7,700) will be paid from the airport's operating budget. The following item were approved by City Council on February 2, 2009:

DS-1 08-1147 Resolution to Approve a Grant Contract with the Michigan Department of Transportation for Work Related to the Environmental Assessment and Preliminary Engineering for the Safety Extension of Runway 6/24 at the Ann Arbor Municipal Airport (\$179,000.00)

DS-2 08-1148 Resolution to Approve a Grant Contract with the Michigan Department of Transportation for Work Related to the Environmental Assessment and Integrated Noise Modeling for the Safety Extension of Runway 6/24 at the Ann Arbor Municipal Airport (\$75,000.00)

The final grant contract in the amount of \$55,000 with the Michigan Department of Transportation will be approved at a later date.

ECON 5: Can identified funds used to improve the airport be diverted to maintain other City or Township public infrastructure projects?

No. Federal funding assurances agreements require revenues generated on the airport must be used to fund airport operations and other airport capital improvements. The City is permitted to charge the airport operating budget a reasonable administrative management fee for administrative services (i.e., information services, accounting, human resources, etc.) supplied to the airport. The City charges these expenses to all enterprise funds. No Federal Airport and Airway Trust Fund (AATF) or State Aeronautics Fund (SAF) airport improvement program granting funding may be used for general City or Township infrastructure improvements not associated with an approved airport improvement project.

ECON 6: Will local property tax dollars paid by City of Ann Arbor property owners be used to pay for airport improvements?

No. The environmental assessment (EA) study and any airport capital improvements will not be funded by City property tax dollars. 97.5% of the funding source comes from state and federal aviation revenues through the Airport Improvement Program. Depending on the amount needed to make the improvements and subject to City Council approval, the City's remaining 2.5% will come from the airport's operating budget or borrowed capital funds that will be repaid from future airport budgets. The airport budget is funded by revenues generated by airport operations and receives no subsidy or tax dollars from the City.

ECON 7: Will local property tax dollars paid by Pittsfield Township property owners be used to pay for airport improvements?

No. The airport is a City owned enterprise operation and is not under the governance of Pittsfield Township. The environmental assessment (EA) study and any airport capital improvements will not be funded by Township or City property tax dollars. Revenues generated at local, state and federal levels will be the funding source for the EA and any potential runway improvements. The City is solely responsible and liable for the airport's operations and improvements.

ECON 8: Does the City of Ann Arbor levy and collect any property tax dollars on the airport?

No. By law, all taxable tangible personal property and real property is taxable by the governmental unit in which the property is located as of tax day. That governmental unit is Pittsfield Township.

ECON 9: Does Pittsfield Township levy and collect any property tax dollars on the airport?

Yes. By law, all taxable tangible personal property and real property is taxable by the governmental unit in which the property is located as of tax day. Pittsfield Township assesses

and taxes all privately owned buildings constructed on airport grounds and tangible personal property of businesses located on the airport.

A request has been made to Pittsfield Township for total real and tangible personal property taxable value and property taxes during 2008. Once available, this FAQ will be amended to include this information.

ECON 10: Does the City of Ann Arbor pay property taxes on airport owned land to Pittsfield Township?

No. By law, property owned and used by a municipality is exempt from property taxation. An airport, like any other exempt property (churches, schools, etc.) providing a public benefit is exempt from taxation. An airport is part of the nation's transportation infrastructure system just like roads/highways and sea ports. Local roads/highway infrastructure system (owned by MDOT & Washtenaw County Road Commission) are created and maintained for a public benefit so are tax exempt for the same reason as the airport.

Unlike other exempt properties, ARB generates tax revenues for Pittsfield Township from businesses located on the airport and from non-aviation use (agricultural) of airport land. ARB is also a customer of Township utility services paying full rate as would any other business and individual.

ECON 11: How does the airport serve our local community?

ARB serves the local community in many ways, including economic development and public services areas.

- 1) There are two "fixed-wing" fixed base operators (FBO), a "helicopter" FBO, two national rental car agencies, two flying clubs, four flight schools and pilot training centers, City airport staff, FAA air traffic control tower, air taxi, aircraft sales, aviation insurance and aviation fueling businesses that operate from the airport and employ staff supporting 24/7 operations of the airport.
- 2) ARB serves the Ann Arbor medical and biomedical industries with daily professional air ambulance services transporting patients, organs, radio isotopes, and other biomedical products and services.
- 3) provide recreational facilities to community based nonprofit organizations and educational opportunities to community schools by opening up the facilities for youth tours.
- 4) community pilots and aircraft owners are members of nonprofit organizations providing "no charge" charitable gifts of flight time to citizens of need. Nonprofit volunteer pilots and aircraft owners' organization serving our community are:
 - a. Wings of Mercy – nationwide network of community based pilots donate their time and aircraft to fly people of need to and from area and regional hospitals. <http://www.wingseastmi.org/>

- b. Angel Flight - nationwide network of community based pilots donate their time and aircraft to fly people of need to and from area and regional hospitals.
<http://www.angelflightmidatlantic.org/index.php>
- c. Dreams and Wings – pilot community based non-profit organization that offers motivational, inspirational, and life-changing experiences to special needs children and youth through aviation.
<http://www.dreamsandwings.us/index.html>
- d. Great Commission Air – Ann Arbor based nonprofit organization flying missionary flights in South America.
<http://www.greatcommissionair.org/about.php>
- e. Women In Aviation (99's) – national and local nonprofit organization organized to provide female aviators a network in support of their pursuit of aviation as a profession or recreational outlet.
<http://www.mich99s.org>
- f. Experimental Aircraft Association, Chapter #333 – a local nonprofit organization affiliated with the international EAA providing support to community residents relative to aviation engineering, science, design and construction of aircraft.
<http://www.eaa.org/chapters/>
- g. Civil Air Patrol – national nonprofit organization formed in alliance with U.S. Air Force supporting local and state law enforcement agencies with search and rescue, emergency relief, and Homeland Security volunteer support services.
<http://www.gocivilairpatrol.com/html/index.htm>

ECON 12: Was there ever an economic benefit/impact study conducted on ARB?

Yes, students in the Aviation Management Program of Eastern Michigan University, under the direction of the Michigan Department of Transportation, conducted an economic benefit study back in the early 1990's. As of this writing, a copy of the study was not available, but a request for a copy has been made. Study results will be made available once a copy has been obtained. The State Bureau of Aeronautics will be preparing an economic benefit/impact study this year.

ECON 13: What is the economic benefit the airport contributes to the greater Ann Arbor community and Washtenaw County?

The airport's contributing economic benefit to the greater Ann Arbor community and Washtenaw County has not been researched and documented. Community based economic development agencies should assist the City and Pittsfield Township in pursuit of such study. Serving as an example of a recent airport economic impact study, see a similar 2007 economic

impact study conducted by University of Michigan-Dearborn of Willow Run Airport (YIP) owned by Wayne County Airport Authority.

<http://www.metroairport.com/pdf/WillowRunEconomicImpact07.pdf>

ECON 14: Is the proposed 800' runway safety margin extension needed to enhance airport revenue?

No. The airport generates 83% of its revenue from hangar rental fees paid by aircraft owners based at ARB. The hangar occupancy rate is currently 98% and leaves little room for additional aircraft or additional hangar revenue. The airport also rents space to concessionaires and levies an aviation fuel flowage fee of 9¢/gallon. The aviation fuel fee would be the revenue source most likely to see an impact if additional air traffic was generated by the runway extension. The fuel fee currently generates about \$28,000 (about 310,000 gal.) or about 3% of the airport revenues. Even a significant increase in fuel sales would have only a minimal impact on airport revenue.

ARB is a general aviation airport which does not levy or collect a landing fee like most commercial airports. No landing fees are being considered at ARB and would require approval by the City Council if considered.

ECON 15: Will there be more commercial business activity on the airport and new jobs created as a result of the 800' runway safety margin extension?

Commercial business activity is driven by the local economy and not dependent on whether the 800' runway safety margin extension is constructed or not. Any new jobs created would likely be incidental to the construction of the proposed changes.

ECON 16: Will real estate market values decline as a result of the 800' runway safety margin extension?

Professional real estate appraisers measure the actions and reactions of buyers and sellers in the marketplace as of a certain date in the present based on historical population demographic and real estate sales data. Predicting future real estate value trends is very difficult with any degree of certainty because of the large number of unknown variables inherent with predicting the future. A value trend study of neighboring properties surrounding ARB could be undertaken, but the resulting study would be at best the professional appraiser's prediction of the future based on known historical data.

Generally speaking, an appraiser might begin by plotting real estate value trends based on events occurring along a timeline possibly beginning when the airport was constructed in 1928. Since ARB was in existence prior to housing development beginning in the 1980s and throughout 1990s, any positive or negative influence on property values attributable to ARB should be recognizable.

Other factors to qualify in a future value trend study might be the number of annual operations, typical planes operating at ARB during the years under study, and a comparison of those planes that might operate at ARB as a result of the additional 800'. Another factor to measure is the affect on value trends attributable to Part 135 operations at ARB over the years. Part 135 air charter/air taxi service has been operating out of ARB for decades before real estate development began in 1980s.

What the appraiser would be measuring is any negative impact forces external to individual properties surrounding the airport. Such external forces might be airport operations, high volume road traffic on Ellsworth and Lohr Roads, surrounding land use, etc. Measurement of negative impact on value caused by forces external to the property is known as "economic obsolescence."

A study of economic obsolescence would most likely examine any differences between the average list price and average negotiated sale price for homes abutting ARB with similar homes not influenced by identified external forces. The best evidence of measured economic obsolescence home owners may have today should be qualified in the real estate mortgage appraisal obtained at the time of purchase as well as possibly noted on the township's appraisal record card for each of the impacted homes.

Serving as one example of how a study could be undertaken for a given development, the appraiser might stratify sales prices of homes within Stonebridge along Lohr Road comparing them with similar homes throughout the development. This comparison might indicate any negative impact attributable to Lohr Road traffic volume and noise since the whole development is beneath ARB airspace. Another possible indicator of influence being located underneath the approach/departure end of Rwy 24, home sales located north of the main Lohr Road entrance could be stratified and compared with the home sales located south of Lohr Road entrance. This comparison might be an indicator of economic obsolescence attributable to being located under the approach/departure end of the Rwy24 since both sample selections will possess any economic obsolescence attributable to the high traffic volume and noise from Lohr Road.

ECON 17: What is an aerotropolis?

Excerpt from Detroit Regional Aerotropolis website.

An Aerotropolis is an emerging type of urban form comprised of aviation-intensive businesses and those businesses that need to be readily connected to their customers. These businesses, and related enterprises, extend outward from a major airport. Aerotropoli have emerged across the globe in the 21st century as air transportation has become a vital component of business operations.

<http://www.detroitregionaerotropolis.com/>

ECON 18: Is the City of Ann Arbor and/or Ann Arbor Municipal Airport a partner or affiliated with Detroit Regional Aerotropolis?

No. The City of Ann Arbor and its airport are not partners nor affiliated with the Detroit Regional Aerotropolis. According to the Detroit Regional Aerotropolis website, its partners are:

Local Communities

City of Belleville
City of Romulus
City of Taylor
City of Ypsilanti
Huron Charter Township
Van Buren Charter Township
Ypsilanti Charter Township
Washtenaw County
Wayne County

Airports

Detroit Metropolitan Airport
Willow Run Airport

Private & Non-Profit Partners

Detroit Renaissance
Southeast Michigan Council of Government
Detroit Regional Chamber
Next Energy
UPS
DTE Energy
Walbridge

<http://www.detroitregionaerotropolis.com/partners.htm#local>

ECON 19: Will ARB compete with YIP for aerotropolis air freight operations?

No. The type of aircraft used in aerotropolis related commercial business activities will be operated under FAA Part 135 and 121 rules. ARB runway, taxiway and all other infrastructure is physically inadequate to support these types of commercial activities. More importantly, it would be a violation of FAA rules to operate large airplanes of the magnitude and scope supporting aerotropolis (Part 135 and 121) operations from ARB.

ECON 20: Are there any special interest group(s) the runway is being extended to accommodate?

No. There are no special interest groups that have requested and/or have been involved in the Airport Advisory Committee's (AAC) recommendation to City Council to consider the 800' runway safety margin extension. At no time before that City Council meeting or after the meeting did the airport manager or AAC have any conversations with any special interest groups to extend the runway for their special benefit or to accommodate any special need. Any claims that the 800' runway safety margin extension recommendation was advanced to serve a special interest group is patently false and distracting from the real issue of human safety.

ECON 21: Has the University of Michigan requested the City of Ann Arbor extend the runway so that the University can sell skyboxes at the Stadium?

No, at no time has University of Michigan requested the City extend the runway to aid in selling skyboxes or tickets at the Stadium.

ECON 22: Is it required by law for sellers of residential property to disclose to potential buyers the existence or proximity of an airport near the property for sale?

Yes, SELLER DISCLOSURE ACT, Act 92 of 1993, mandates in Sections 565.954 and 565.957, that any potential buyer be supplied with a written statement of any “farm or farm operation in the vicinity; or proximity to a landfill, airport, shooting range, etc.”

BACKGROUND

BGD 1: When was the airport built?

The actual date of when local aviators begin using a grass strip on farm land located several miles south of the City of Ann Arbor is uncertain. The Ann Arbor Airport was formally dedicated on October 9, 1928, though local aviators may have been using a grass strip on farm land prior to that. Discoverable local, state and federal documentation suggests the first terminal building was constructed in the early 1930’s.

The first dedicated use terminal building was the nucleus of operations at the Ann Arbor Municipal Airport for nearly three decades. According to a June 16, 1972 historical document prepared by the City Administrator’s Office, “The Ann Arbor Airport is one of the oldest continuing institutions in the Ann Arbor area. Its beginning goes back to the end of World War I, when barnstorming aviators identified the level field with ideal approaches as an airfield and exhibition ground.”

Notes extracted from Ann Arbor City Council Minutes.

April 1930 – Communication received “From Clarence M. Young, Assistant Secretary of Commerce, Washington, D.C., relative to an intermediate landing field between Jackson and Detroit, drawing attention to narrow runways and insufficient lighting with an approximate cost of improvements, was received and referred to Part and Sanitary Committee and Park Board.”

July 1935 “Mr. Gallup mentioned that a number of CWA (Civil Works Administration) projects would be completed at no cost to the city. The total of the projects was \$22,150.” No mention was made of the airport administration building, but it was most likely included in the CWA projects since the timing seems right.

May 1936 “Gentlemen – Your Park and Sanitary Committee respectfully recommends that \$200.00 be appropriated from unappropriated funds to the Airport fund of the Park Department for the purchase of materials necessary to complete the administration building at the Municipal Airport.”

Historic Significance

The airport property is important because it is associated with significant historic events. According to the Ann Arbor District Library web site, the airport terminal building was a part of FDR’s New Deal. “Of the many state and federal aid programs during the remainder of the decade, the Public Works Administration had the greatest impact on Ann Arbor. Continuing the pattern of municipal work relief, PWA funds allowed the city to undertake far-reaching public improvements such as the sewage treatment plant, the water softening plant, and miles of connecting sewers and drains. A brick terminal containing office space was added to the airport and Ann Arbor High School was expanded. City council proceedings were indexed and the city hall and several school buildings were decorated with murals.”

Ann Arbor Airport’s formal beginning dates to 1927 when the Board of Water Commissioners deeded most of the present site to the Board of Park Commissioners for the establishment of an airport.” The Ann Arbor Airport history further describes the property as “an essential part of city life for airmail service, recreation, pilot training, and to some extent, commerce and health and the City made substantial investments in the Airport. In 1933 the city constructed the first administration building on State Street at a cost of \$10,000 and its first fixed base operator’s hangar at a cost of more than \$10,000.”

BGD 2: Does the City of Ann Arbor have or did it ever have any plans to close the airport?

The City of Ann Arbor has no plans to close the airport. Over the history of the airport, various attempts to close the airport have been made; but for regulatory and political reasons a resolution authorizing closure of the airport has never been approved.

BGD 3: Why does the City not annex the airport into the City?

In the 1970’s, the City considered annexing City owned airport lands to gain governance over the lands in which City operations and public services are provided. Located on the airport, there are four underground water wells supplying a portion of the City’s drinking water. Additionally, the airport is part of the City’s transportation system connecting the City to the state and region. Finally, the majority of airport tenants, customers, and general aviation users utilize the airport for training, recreation, and small business transportation to nearby regional customers. The City and Pittsfield Township ultimately agreed to not annex the airport property in 1978. Both sides have abided by this agreement ever since.

DEFINITIONS

Miscellaneous FAA DEFINITIONS not otherwise referenced in a FAQ, but commonly used in airport design discussions. As used in Part 77, the following terms mean:

Airport Elevation. The highest point on an airport's usable runway expressed in feet above mean sea level (MSL).

Airport Layout Plan (ALP). The plan of an airport showing the layout of existing and proposed airport facilities.

Airport Reference Point (ARP). The latitude and longitude of the approximate center of the airport.

Clear Zone. See Runway Protection Zone.

Declared Distances. The distances the airport owner declares available for the airplane's takeoff run, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

Takeoff run available (TORA). The runway length declared available and suitable for the ground run of an airplane taking off;

Takeoff distance available (TODA). The TORA plus the length of any remaining runway or clearway (CWY) beyond the far end of the TORA;

NOTE: The full length of TODA may not be usable for all takeoffs because of obstacles in the departure area. The usable TODA length is aircraft performance dependent and, as such, must be determined by the aircraft operator before each takeoff and requires knowledge of the location of each controlling obstacle in the departure area.

Accelerate-stop distance available (ASDA). The runway plus stopway (SWY) length declared available and suitable for the acceleration and deceleration of an airplane aborting a takeoff; and

Landing distance available (LDA). The runway length declared available and suitable for a landing airplane.

Fixed By Function NAVAID. An air navigation aid (NAVAID) that must be positioned in a particular location in order to provide an essential benefit for civil aviation is fixed by function. Exceptions are:

- a. Equipment shelters, junction boxes, transformers, and other appurtenances that support a fixed by function NAVAID are not fixed by function unless operational requirements require them to be located in close proximity to the NAVAID.

b. Some NAVAIDs, such as localizers, can provide beneficial performance even when they are not located at their optimal location. These NAVAIDS are not fixed by function.

Frangible NAVAID. A navigational aid (NAVAID) which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft. The term NAVAID includes electrical and visual air navigational aids, lights, signs, and associated supporting equipment.

Hazard to Air Navigation. An object which, as a result of an aeronautical study, the FAA determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities, or existing or potential airport capacity.

Inner-approach OFZ. The airspace above a surface centered on the extended runway centerline. It applies to runways with an approach lighting system.

Inner-transitional OFZ. The airspace above the surfaces located on the outer edges of the runway OFZ and the inner-approach OFZ. It applies to runways with approach visibility minimums lower than 3/4-statute mile (1,200 m).

Large Airplane. An airplane of more than 12,500 pounds (5 700 kg) maximum certificated takeoff weight.

Object. Includes, but is not limited to above ground structures, NAVAIDs, people, equipment, vehicles, natural growth, terrain, and parked aircraft.

Object Free Area (OFA). An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

Obstacle Clearance Surface (OCS). An inclined obstacle evaluation surface associated with a glidepath. The separation between this surface and the glidepath angle at any given distance from GPI defines the MINIMUM required obstruction clearance at that point.

Obstacle Free Zone (OFZ). The OFZ is the airspace below 150 feet (45 m) above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway, and for missed approaches. The OFZ is sub-divided as follows:

Obstruction to Air Navigation. An object of greater height than any of the heights or surfaces presented in Subpart C of Code of Federal Regulation (14 CFR), Part 77. (Obstructions to air navigation are presumed to be hazards to air navigation until an FAA study has determined otherwise.)

Runway Blast Pad. A surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

Runway OFZ. The airspace above a surface centered on the runway centerline.

Runway Protection Zone (RPZ). An area off the runway end to enhance the protection of people and property on the ground.

Runway Safety Area (RSA). A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

Shoulder. An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection.

Small Airplane. An airplane of 12,500 pounds (5,700 kg) or less maximum certificated takeoff weight.

Taxilane (TL). The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

Taxiway (TW). A defined path established for the taxiing of aircraft from one part of an airport to another.

Taxiway Safety Area (TSA). A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

Threshold (TH). The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.

Displaced Threshold. The portion of pavement behind a displaced threshold may be available for takeoffs in either direction and landings from the opposite direction.

Relocated Threshold. The portion of pavement behind a relocated threshold is not available for takeoff or landing. It may be available for taxiing of aircraft.

Visual Runway. A runway without an existing or planned straight-in instrument approach procedure.