# APPENDIX C DEMAND/CAPACITY ANALYSIS

The following demand/capacity analysis was produced using the long-range planning methodology contained in *FAA Advisory Circular 150/5060-5, Airport Capacity and Delay*.

## FACTORS AFFECTING CAPACITY

Hourly capacity is influenced by the runway configuration, the aircraft mix, the percent of arrivals, the percentage of touch and go operations during Visual Flight Rules (VFR) conditions, and the location of exit taxiways. Hourly capacity is calculated for both VFR and Instrument Flight Rules (IFR) conditions. Weather conditions are the determining factor for this calculation.

The *1992 Master Plan* included a demand capacity analysis. Those factors have been reviewed, with any changes noted, as described below.

### Runway/Taxiway Configuration

The two runways at Springfield-Beckley Municipal airport intersect near the west end of Runway 6-24 and the north end of Runway 15-33. At the time of the *1992 Master Plan*, there was no parallel taxiway serving Runway 15-33, making use of Runway 15-33 inconvenient. With the construction of Taxiway E, Runway 15-33 has become more convenient to use. All of the military operations occur on Runway 6-24; the best instrument approach is available to Runway 6-24; and winds generally favor Runway 6-24. Runway 15-33 is used only by general aviation aircraft when the winds favor that runway. Thus, the airport still operates primarily as a one runway facility, with occasions when both runways are being used.

### Aircraft Mix

This factor considers the effect on runway capacity when the airport is used by aircraft of different sizes and speeds. Aircraft mix is the relative percentage of operations conducted by each of the four classes of aircraft.

A- Single-engine, 12,500 pounds or less maximum certified takeoff weight
B- Multi-engine, 12,500 pounds or less maximum certified takeoff weight
C- Multi-engine, 12,500 to 300,000 pounds maximum certified takeoff weight
D- Multi-engine, more than 300,000 pounds maximum certified takeoff weight

There are no Class D aircraft operating at Springfield-Beckley Municipal Airport on a regular basis. The *1992 Master Plan* identified that the Airport's fleet consisted of 68 percent Class A and B aircraft and 32 percent Class C aircraft. The fleet mix operating at the Springfield-Beckley Municipal Airport has remained similar, so the same fleet mix will be used in this analysis.

The mix index is the mathematical expression of the aircraft mix, and is the percent of C aircraft plus three (3) times the percent of D aircraft [%(C+3D)]. The mix index for Springfield-Beckley Municipal Airport is 32 percent.

#### Percentage of Arrivals and Percentage of Touch and Goes

The percentage of arrivals is the ratio of the arrivals to total operations. The percentage of touch and goes is the ratio of landings with an immediate takeoff to total operations. The overall number of arrivals and departures at the airport is equivalent, so arrivals comprise 50 percent of the total operations.

The *1992 Master Plan* identified that touch and go operations comprise approximately 20 to 25 percent of the total operations at the airport. With the growing flight school at the airport, the touch and go operations were estimated as 25 percent of the total operations.

## Weather Conditions

This factor is important in determining the percent of time that aircraft operations are conducted under VFR and IFR conditions or below visibility minimums, as the capacity of the airport differs under VFR versus IFR conditions.

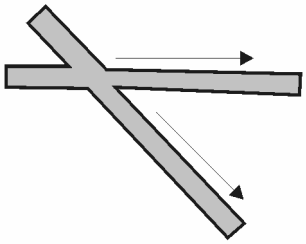
**Airfield Capacity**

Chapter 2 of *FAA Advisory Circular 150/5060-5* contains capacity and delay calculations for long range planning. These calculations are based on a number of assumptions:

- **Runway layout** can be approximated by one depicted in that chapter – it is approximated by the single runway and intersecting runway layouts.
- **Percentage of arrivals equals departures** – considered valid.
- **Percentage of touch and goes** is within the ranges in the chapter's tables – for a mix index of 21 to 50 the percent of touch and goes is 0-40, which is valid.
- **Full-length parallel taxiway**, ample runway entrance/exit taxiway and no taxiway crossing problems – both runways have full-length parallel taxiways.
- **No airspace limitations** which would adversely impact flight operations – there are no close-in impacts, more distant operations are coordinated with the airspace for Wright Patterson Air Force Base.
- **Instrument Landing System (ILS)** is present on at least one runway with the necessary air traffic control services to carry out operations in a radar environment – Runway 24 is equipped with an ILS and the local airport traffic control tower and Dayton Approach and Departure provide the necessary air traffic control services.
- **IFR weather conditions** occur roughly 10 percent of the time –considered valid.
- **Runway use configuration** that produces the greatest hourly capacity approximately 80 percent of the time – considered valid.

As shown in **Exhibit C1**, with a mix index of 32 the ASV is 195,000 operations for a single runway configuration and 200,000 when both runways are in use. Since the single runway configuration is used the most often and provides a more conservative measure, an ASV of 195,000 was identified as the annual capacity at the Springfield-Beckley Municipal Airport. The hourly capacity under VFR conditions is estimated as 74 operations per hour and under IFR as 57 operations per hour.

**EXHIBIT C1**
**CAPACITY AND ANNUAL SERVICE VOLUME FOR LONG RANGE PLANNING**

| Runway Use Configuration | Mix Index % (C=3D) | Hourly Capacity Ops/Hr VFR | IFR | Annual Service Volume Ops/Yr |
|---|---|---|---|---|
|  | 0 to 20 | 98 | 59 | 230,000 |
| | 21 to 50 | 74 | 57 | 195,000 |
| | 51 to 60 | 63 | 56 | 205,000 |
| | 81 to 120 | 55 | 53 | 210,000 |
| | 121 to 180 | 51 | 50 | 240,000 |
|  | 0 to 20 | 98 | 59 | 230,000 |
| | 21 to 50 | 77 | 57 | 200,000 |
| | 51 to 60 | 77 | 56 | 215,000 |
| | 81 to 120 | 76 | 59 | 225,000 |
| | 121 to 180 | 72 | 60 | 265,000 |

*Source: FAA Advisory Circular 150/5060-5, Airport Capacity and Delay*.

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