St. Louis Metropolitan Area
Missouri-Illinois
General Aviation System Plan
Working Paper IV
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DRAFT

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WORKING PAPER IV

EVALUATION OF GENERAL AVIATION SYSTEM ALTERNATIVES

INTRODUCTION

The purpose of this element of the study is to develop alternate methods to meet long-term general facility requirements to meet year 2000 forecast general aviation demand within the 8-county regional area.

Using the information developed in previous elements of this study, each alternative is compared to determine:

1. its ability to serve forecast demand,

2. its compatibility with area airspace,

3. its impact on surface transportation,

4. potential environmental impacts,

5. its economic feasibility and

6. its impact on system issues, goals and objectives.

A "do-nothing" alternative was developed in Working Paper III which assumed that no action would be taken to develop any of the airports in the region. Under this alternative, it was assumed that all of the current privately-owned airport sites would be converted to another type of land use because of increasing property taxes, low returns from airport operation, and increasing property values for some type of activity other than an airport. Recent (June, 1984) field investigations have indicated present instability at most of the sites because of these factors. As a result, the eight publicly-owned airports would have to ultimately accommodate all general aviation demand in the region. This would result in a level of demand which would be greater than these eight airports could accommodate, even if each

site was developed to its maximum potential. If all privately-owned airports were to close prior to the year 2000 and no improvements were made at the publicly-owned airports, demand would exceed capacity by over sixty percent. More likely, aviation demand in the region would be constrained with the associated negative impact on area economic growth. The demand would not appear because businesses which rely on general aviation would leave the area or remain and experience limited growth.

Another equally-important-factor relates to the accessibility of the airport. If airports are located beyond access time of 30 minutes for the user, the airport will be seldom utilized. Long travel times will therefore reduce the effectiveness of the system of airports in the 8-county region. The location of high density urbanized areas is therefore important to airport location. The closer each system airport is to the associated urbanized area, the more effective the system will perform.

Assuming all the publicly-owned airports could be developed to their maximum potential, to accommodate 418 aircraft at a single-runway airport or 636 aircraft at a dual-running airport, capacity would still fall short of demand by about twenty percent by the year 2000. About 4,120 aircraft are forecast for the 8-county area by the year 2000. Only 3,377 could be accommodated at the 8 publicly-owned airports under the most optimistic conditions. Because it is not unusual for a period of 10-years or more to elapse between the time the need for an airport is realized and the time construction is completed, long-range planning is an essential element in the process of airport development.

There are numerous alternatives available to provide adequate general aviation airport capacity in the 8-county region. One, a do-nothing alternative has been identified. Two additional alternatives are presented in this working paper.

Alternative 1 places maximum reliance on the existing eight publicly-owned airports.

Alternative 2 places maximum reliance on both the publicly-owned airports and the privately-owned airports which appear developable to meet or nearly meet FAA airport design criteria. Both alternatives are described and compared in the following pages.

DO-NOTHING ALTERNATIVE

This alternative assumes nothing would be done to increase general aviation airport capacity in the 8-county region. Only the publicly-owned site would remain over the long-term and no improvements would be made at these airports. This alternative is included to indicate the urgent need for capacity-increasing airport development improvements in the region. If a "do-nothing" alternative were to be adopted, demand would exceed capacity by 63%, as summarized in Table. 1.

TABLE 1

ESTIMATED YEAR 2000 DEMAND VS. CURRENT AIRPORT CAPACITY

AIRPORT	CURRENT AIRPORT CAPACITY	
	AIRCRAFT	OPERATIONS
Lambert (G.A. Only)	82	45,100
Spirit of St Louis	418	230,000
Bi-State Parks	472	260,000
St. Louis Regional	418	230,000
St. Charles County	302	166,000
St. Clair	238	131,000
Festus	302	166,000
Washington	302	166,000
TOTAL CAPACITY	2,534	1,394,100
TOTAL DEMAND, YEAR 2000	4,120	2,266,000

ATERNATIVE ONE

This alternative places maximum reliance on the eight publicly-owned airports in the region. As such, this alternative represents somewhat of a fall-back position in case unsolvable problems are found regarding development of several of the current privately-owned sites.

It is assumed in this alternative that the publicly-owned sites will be developed to their maximum potential.

Maximum potential includes full taxiway and instrument landing system development. For a single-runway general aviation airport or an airport with intersecting runways, an annual service volume of 230,000 operations can be considered full capacity (418 aircraft in the St. Louis Region). A parallel runway general aviation airport can be developed to an annual service volume of 350,000 operations (636 aircraft). These annual service volume levels will generally keep average departure delay times under four minutes.

As summarized in Table 2, Alternative 1 assumes that the 8 publicly-owned airports will be developed to accommodate 3,377 aircraft by the year 2000. The St. Clair airport could not be expected to be developed to maximum potential because of its relatively remote location and limited area demand. The resulting demand/capacity ratio (demand divided by capacity) is 1.22. Annual demand in the region would be 22% over the system airport's combined annual service volume. Two new full-developed airports would bring demand down to 83% of system capacity and an additional two fully-developed airports would bring demand down to 71% of system capacity which is considered more appropriate for system planning purposes. This lower ratio simply allows more time for improvements to be constructed. Another alternative resulting in equal system capacity would add two fully-developed parallel runway airports and one primary/crosswind runway airport. This alternative is shown on Figure 1.

Three problems are associated with this alternative. First, many of the airports will be operating at full capacity from adjacent forecast demand. This will not allow capabilities for unexpected growth in these areas. The

TABLE 2

ESTIMATED YEAR 2000 DEMAND VS. MAXIMUM AIRPORT CAPACITY

AIRPORT	MAXIMUM YEAR 2000 BASED AIRCRAFT CAPACITY	MAXIMUM YEAR 2000 OPERATIONAL CAPACITY
LAMBERT (G.A. ONLY)	82	45,100
SPIRIT OF ST. LOUIS	636	350,000
BI-STATE PARKS	636	350,000
ST. LOUIS REGIONAL	636	350,000
ST. CHARLES COUNTY	418	230,000
ST. CLAIR	133	73,150
FESTUS	418	230,000
WASHINGTON	418	230,000
TOTAL CAPACITY	3,377 (82% OF TOTAL DEMAND)	1,858,250
TOTAL DEMAND	4,120	2,266,000
A. DEMAND/CAPACITY RATIO	1.22	1.22
ADD TWO NEW AIRPORTS	+ 836	+ 460,000
TOTAL CAPACITY	4,956	2,726,000
B. DEMAND/CAPACITY RATIO	0.83	0.83
ADD TWO ADDITIONAL AIRPORTS	+ 836	+ 460,000
TOTAL CAPACITY	5,792	3,186,000
C. DEMAND/CAPACITY RATIO	0.71	0.71

only airports offering significant reserve capacity, year 2000, would be new sites in Madison, Jefferson and St. Clair/Monroe Counties. Secondly, the only sites serving St. Charles County would be the St. Charles County Airport and the Washington Airport. Third, a minimum of three new sites would have to be developed, two of which would be parallel runway sites. If public acceptance should fail for the new sites, the remaining system airports would not be capable of meeting potential long-term demand.

In summary, this alternative would be acceptable only if no other sites could be developed. Growth would be constrained because of increased ground access time, particularly within St. Charles and St. Louis counties. Overall system results are summarized in Table 2 and demand shifts are summarized in Table 3 and Figure 1.

TABLE 3

SUMMARY - ALTERNATIVE 1

	AIRCRAFT				
	2000 FORECAST DEMAND (By Area)	2000 DEMAND SHIFTS	2000 TOTAL DEMAND	2000 PLANNED CAPACITY	% OF FULL DEVELOPMENT CAPACITY
DEMAND AREA 1	389				
To Washington Memorial		(189)			
From Area 3		150			
	389	(39)	350		
1. St Charles County				350	84%
DEMAND AREA 3	385				
To Area 1		(150)			
To Area 2		(158)			
From Area 4		5			
	385	(303)	82		
2. Lambert International				82	N/A
DEMAND AREA 8	419				
To Washington Memorial		(229)			
From Area 4		446			
	419	217	636		
3. Spirit of St. Louis				636	100%
DEMAND AREA 2	515				
From Area 3		158			
From Area 5		289			
	515	447	962		
4. St. Louis Regional				558	88%
5. New Site, Madison County				404	64%
				962	
DEMAND AREA 7	467				
From Area 6		393			
	467	393	860		
6. Bi-State Parks				593	93%
7. New Monroe or St. Clair Co. Site				267	42%
				860	
DEMAND AREA 10	550				
From Area 5		129			
	550	129	679		
8. Festus Memorial				418	100%
9. New Jefferson Co. Site				261	62%
				679	
DEMAND AREA 9	133				
10. St. Clair Municipal	133	0	133	133	N/A
11. Washington Memorial	0				
From Area 1		189			
From Area 8		229			
	0	418	418	418	100%
TOTALS	2,858	1,262	4,120	4,120	

ALTERNATIVE TWO

This alternative places maximum reliance on existing public use airports, both publicly and privately owned. The privately owned sites are located on sites which appear developable to meet or nearly meet F.A.A. airport design criteria.

For convenience to the reader, a brief overview of each Demand Area is presented. This overview includes the results of a second series of airport field investigations conducted in June, 1984.

The ten Demand Areas developed in Working Paper III are described and combined into four components for simplicity. Demand Areas 1, 3, 4 and 8 are combined because most of the demand from Demand Areas 3, 4 and 8 (See Figure 2) is shifted to the west. Demand Areas 2, 3 and 5 and some demand from Demand Area 3 is shifted to the east. Demand Areas 5, 6 7 and 10 are also considered together because most of this demand is shifted south and southeast. Demand Area 9 is considered separately and includes the Washington Memorial Airport.

DEMAND AREAS 1, 3, 4 AND 8 (ALTERNATIVE 2)

Demand Area 1 centers around the "Golden Triangle" area of St. Charles County. Aircraft demand is expected to be 181[1] in 1985 and 389 by the year 2000. Existing public-use airports are St. Charles County, St. Charles Municipal, Wentzville, and Washington Memorial, which is just outside this area, and the regional area, to the southwest.

The St. Charles County Airport is owned and operated by the County and has 110[2] based aircraft compared to 78 at St. Charles Municipal, 37 at Washington, and 60 at Wentzville (1983 Counts). This Airport is within the 100-year floodplain. The airport contains 312 acres which would require a large investment to protect from flooding with a perimeter levee. Access is relatively difficult via Grafton Ferry Road from Highway 44. This airport has major problems which would be costly to resolve. However, the airport remains popular with area pilots probably because of moderate tie-down and hangar rental rates and a good aircraft maintenance shop. A new 19-unit T-hangar is about to be constructed by a private investor group. This is the only publicly-owned airport in St. Charles County.

Demand Area 1 will have a total demand of 725 aircraft and 42% surplus capacity if St. Charles Municipal, St. Charles County, and the Wentzville Airports remain open and improvements keep in pace with demand. Of the three airports, Wentzville is the most questionable.

Our best information from St. Charles Municipal indicates this site should be considered for reliever status. This airport is in the 100-year flood plain but the costs of this levee would probably be less than at the St. Charles County Airport. The elevation of St. Charles Municipal is 450' MSL while St. Charles County is 438'. On the other hand, a Transport Category Airport is a consideration within St. Charles County. This would be much easier to construct at St. Charles County Airport with the County's power of eminent domain.

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[1] Table 6, Working Paper III, p. 24.
[2] Table 3.4, Working Paper I, p. 134.