IOWA IN MOTION

AVIATION SYSTEM PLAN

Iowa Department of Transportation

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Aviation System Plan

Implementing Iowa's State Transportation Plan

Adopted by the Iowa Transportation Commission
September 14, 1999

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Introduction

Iowa's system of airports provides a variety of services vital to the state's economy and is an integral part of Iowa's overall transportation system. Scheduled air passenger service allows rapid access to national and international destinations. Air cargo service, which is the fastest growing mode of freight movement, is critical to many industries in Iowa. General aviation airports support business and recreational flying at communities throughout the state and are important economic assets for those communities. Growth in demand for aviation services, both passenger and air cargo, continues to outpace other transportation modes.

This 1999 Iowa Aviation System Plan (IASP) addresses issues concerning the state's investment in aviation infrastructure and its role relating to air passenger and cargo services. Throughout the 21st Century, aviation will continue to play an important role in Iowa's economic competitiveness and quality of life.

The Iowa system of publicly owned airports is shown in Figure 1. The commercial service airports in Omaha, Nebraska, and Moline, Illinois, are also shown on this map because of their close proximity to Iowa.

Iowa in Motion

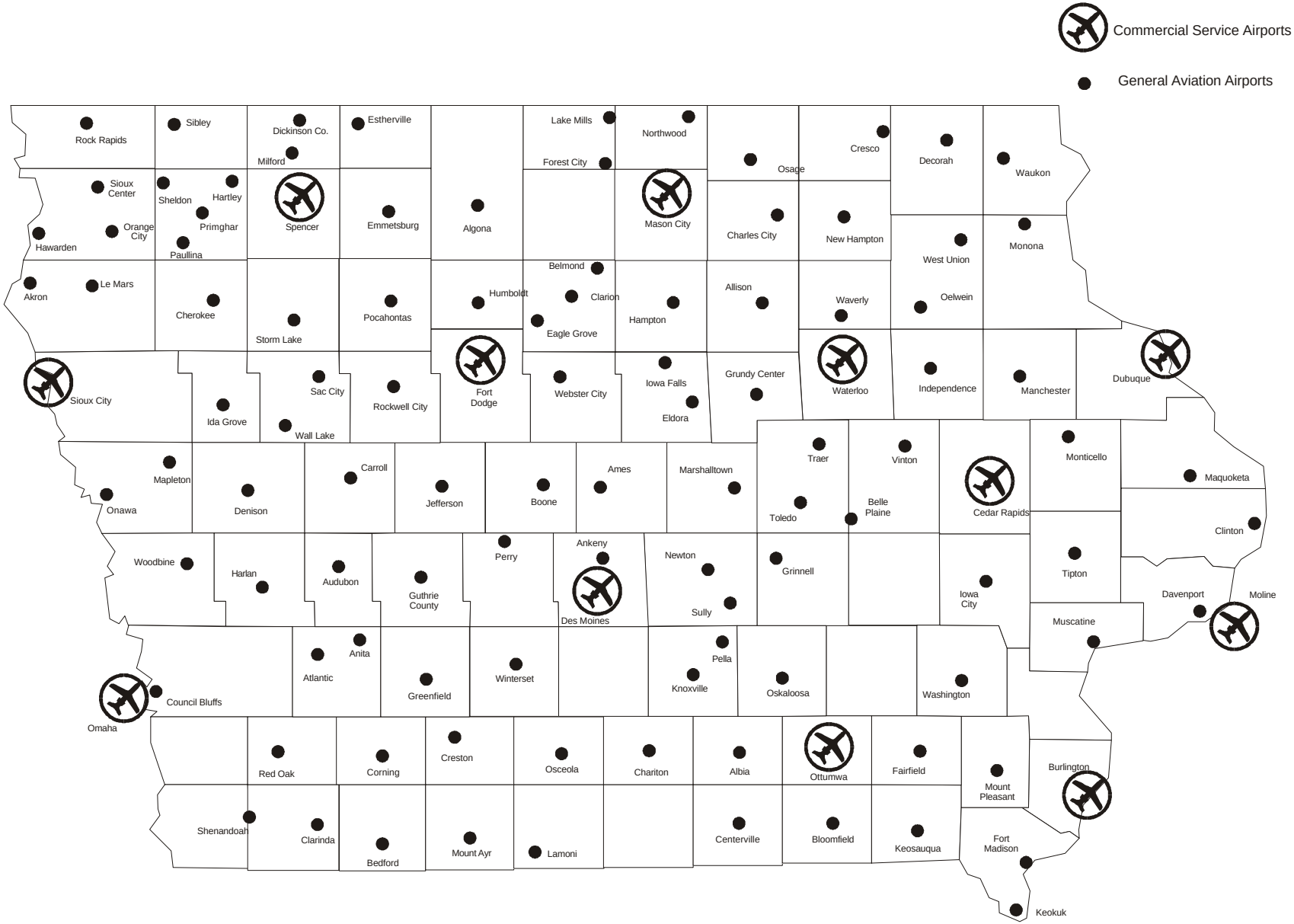
Iowa in Motion is an ongoing planning process addressing the future of Iowa's transportation system. The development of *Iowa in Motion* involves four parts, three of which have been completed.

Part I of *Iowa in Motion* examined current transportation investment strategies and, based on existing trends, identified future scenarios. Issues and concerns were identified through a public participation process which involved input from thousands of individuals, public agencies, and many private organizations. The main issues raised concerning aviation were the quality of commercial air service in the state, and the need to identify and focus on developing a system of primary general aviation airports as part of a comprehensive intermodal transportation system. There should continue to be an emphasis on aviation safety and preservation of existing infrastructure.

Part II of *Iowa in Motion* proposed several investment alternatives to address the issues which had been identified in Part I. Each alternative included an investment summary and the expected long-range impacts.

Part III of the process included extensive public input on the alternatives developed in Part II. Based on an analysis of the public input received, a draft State Transportation Plan was developed. The draft plan was also made available for public review and comment. After an analysis of the public input received, the State Transportation Plan was revised and formally adopted by the Iowa Transportation Commission in July 1997.

Figure 1
Iowa Airport System



Based on the investment directions in the State Transportation Plan, an interim planning and programming guidance document for aviation was developed and approved by the Iowa Transportation Commission. This document provided investment guidance on an interim basis for the state Airport Improvement Program and Commercial Air Service Marketing Program.

Part IV of the *Iowa in Motion* process includes the development of modal system planning documents such as this one, as well as plans for investment actions, certain management systems, performance measures, and provisions for periodic review and update of the plans when appropriate.

Iowa Aviation System Plan

The Iowa Department of Transportation periodically reviews the Iowa Aviation System Plan as part of its continuing planning process. The purpose of the IASP is to establish general policies and specific guidelines for the Iowa Department of Transportation's investment in aviation infrastructure and related services at the state's publicly owned airports. The last IASP update was adopted by the Iowa Transportation Commission in 1991. Since that time many of the plan's recommendations have been implemented. The following is a brief overview of several initiatives of the 1991 plan.

A major feature of the 1991 plan was the introduction of a stratification system for the state's publicly owned airports. The purpose of the stratification process was to determine which airports were the most important in terms of service and economic benefits. An investment strategy featuring a "top-down" funding approach was adopted. The process ranked the airports into four different levels. As a result, the higher level airports received funding priority.

Another recommendation of the 1991 plan was the development of an air service marketing program for the state's commercial service airports. The purpose of the program is to promote and improve scheduled air passenger service in the state. This program was initiated in 1992.

A channeling act was passed by the Iowa Legislature in 1993 which allowed the Iowa Transportation Commission to have more influence over federal funds flowing into the state. This has resulted in a more coordinated process for state and federal programming decisions.

A study of Iowa's air navigation and weather reporting system resulted in a Weather and Navigational Aid Plan in 1995. The plan presented a list of alternatives for further development of the Iowa Aviation Weather System (IAWS) and made recommendations for airport terminal navigation and visual aids.

The 1991 IASP recommended that an emphasis be placed on planning and programming by the individual airports. As a result, many of the airports have up-to-date development plans in place.

Scope of the 1999 Iowa Aviation System Plan

The following is a brief description of the major elements of the 1999 IASP:

- **Overview of Aviation**: This section examines the current trends and issues in aviation and identifies factors which have an impact on the state's aviation system.

- **Airport System Stratification**: The current airport stratification system is reviewed and refined, and identifies airports and infrastructure requirements which are to be the focus of investments consistent with the goals of *Iowa in Motion*.

- **Needs and Revenue Assessment**: Investment requirements for infrastructure and services to support current and future aviation operations are identified, along with potential funding sources and amounts expected to be available for investment.

- **Investment Strategy**: This section develops a strategy for investing limited state funds to support and maintain airport infrastructure and promote quality commercial air passenger service that will meet current and future demand.

- **Program Guidance**: Individual program criteria to meet the goals of the investment strategy are explained in this section.

Overview of Aviation in Iowa

Socio-economic Factors

Since 1991, when the IASP was last updated, many social and economic changes have occurred in Iowa. After losing population during the 1980s, Iowa's population started a slow growth trend. Although the state's overall population has shown a net increase in the 1990s, over half of the counties have continued to lose population. This is a continuation of a trend which began several decades ago. The majority of the population growth has occurred in and around the state's urban areas.

During this time, Iowa's economy has become increasingly diversified and experienced moderate to strong growth in many sectors. The state has also benefitted from a strong national economy.

These economic and population trends are expected to continue in the near term. Historically, socio-economic factors have been leading indicators for aviation demand and services, and have also had a major influence on the development of this IASP.

Commercial Air Passenger Service

Previous plans have focused primarily on investment in the state's general aviation airports for infrastructure and services. However, with the development of the Commercial Air Service Marketing Program, issues related to the state's 10 commercial service airports are addressed in this plan.

Air passenger service in Iowa and nationwide continues to evolve as a result of airline deregulation 20 years ago. In the deregulated environment the major airlines have developed route systems and assigned aircraft to those routes in order to better match the type of aircraft to market demand. As a result, many cities have seen changes in the type and frequency of air passenger service. Some cities have lost air service altogether, while air service to other communities has been preserved by federal subsidies under the Essential Air Service Program.

In Iowa, and in other regions of the country with low density markets, the smaller cities with commercial air service have, in some cases, seen jet service replaced with smaller turboprop commuter-type aircraft operated by regional airlines. Many of the regional airlines have integrated their operations with major air carriers through code-sharing agreements. Through these agreements, the regional air carriers provide a feeder service to the major air carriers at the larger hub airports. At the present time in Iowa, the cities of Cedar Rapids, Des Moines and Sioux City have major air carriers providing jet service. The other seven commercial service airports in the state are served by regional airlines operating turboprop aircraft.

Total passenger enplanements at Iowa's commercial service airports have increased since 1985; however, the rate of growth has lagged behind the national rate of growth. Figure 2 shows enplanement trends for all Iowa commercial service airports since 1985, compared to the national trend. Figure 3 shows enplanements by airport in 1998.

Figure 2
Index of Passenger Enplanements
1985 - 1998

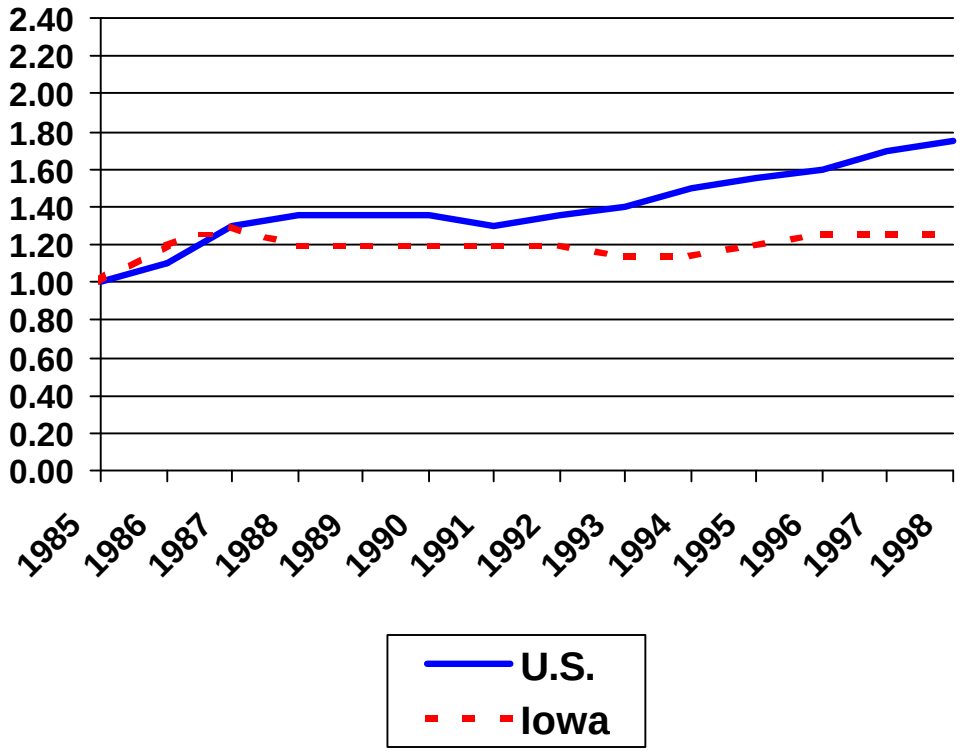
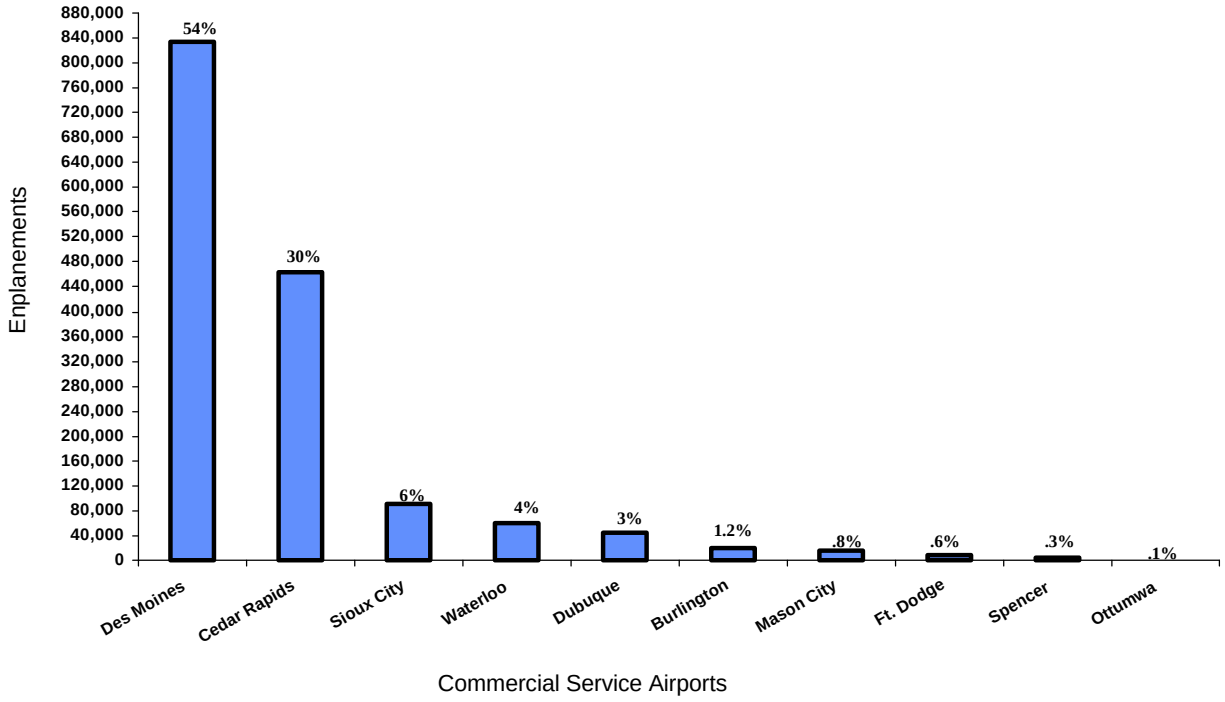


Figure 3
Iowa Commercial Passenger Enplanements
1998



Iowa and certain other regions of the country have experienced mixed results from airline deregulation. Since 1993, average air fares in the state have decreased at seven of the 10 commercial service airports while capacity--measured in the number of scheduled flights and seats available--has declined. Both of these trends are the result of market forces within the airline industry.

A major issue at the present time in Iowa and many other states is the disparity of air fares in certain markets. Airlines have developed sophisticated airfare pricing strategies whereby there can be a wide range of air fares with little relationship between trip length and cost. Travelers who are able to make advanced ticket purchases usually benefit from a variety of discounts from the full fare. Passengers who are unable to make advanced purchases generally pay much higher fares. A large segment of those paying higher fares are business travelers. This trend can have adverse effects on economic development and the potential for attracting new industry. It should be noted, however, that according to the Airline Transport Association, less than 10 percent of ticket purchases are made at or near the full-fare rate, and discounted tickets average slightly more than 60 percent of the full-fare prices.

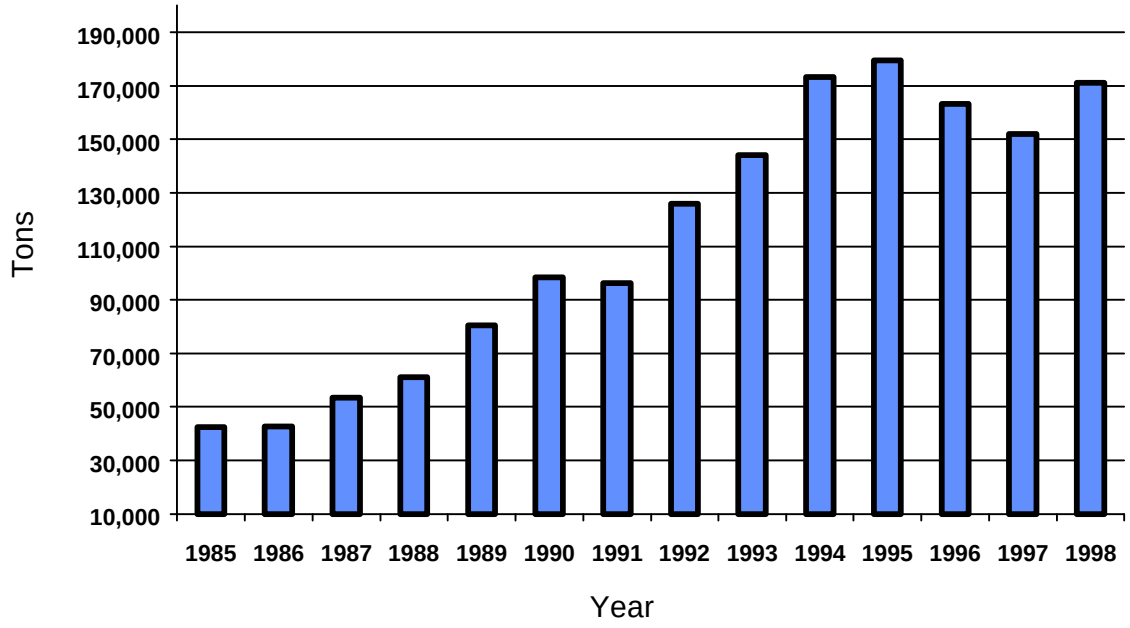
Some markets have benefitted from the presence of low-fare carriers which cause competing airlines to reduce airfares. Southwest Airlines, which is a large, low-fare carrier, has a major impact on air fares in and around markets it serves. Southwest Airlines serves both Omaha and Kansas City with low-fare service and captures a significant share of passengers which would otherwise use commercial service airports in Iowa. Other markets, both large and small, which are not served by low-fare carriers have average air fares comparable to those in Iowa.

Another major issue is the barriers some air carriers face when attempting to enter new markets. Competitive practices within the industry have made it difficult to establish new service in some markets. Capacity constraints at some major airline hubs also have the effect of restricting competition and service. Air fares to and from these airports are significantly higher than fares at non-constrained airports. Some of these competitive issues are very complex and controversial. The U.S. Department of Transportation and Congress are currently examining some of these issues as part of the Federal Aviation Administration's (FAA) funding reauthorization process.

Air Freight

The movement of freight by air has experienced rapid growth, both domestically and worldwide in recent years. Products moved by air freight are primarily high value or time sensitive. Many air freight movers have set up regional hub operations at smaller airports throughout the nation to avoid congestion and higher costs at the major airport hubs. In Iowa, the Des Moines International Airport and The Eastern Iowa Airport at Cedar Rapids support operations of several large air freight companies. Other commercial service and some general aviation airports also handle various types of air freight. The volume of air freight handled at Iowa airports has grown significantly in the last decade. (See Figure 4) Having these air freight operations in the state provides a high level of service and contributes to local economies in terms of employment and associated services.

Figure 4
Air Freight
1985 - 1998



General Aviation

Iowa's 103 general aviation airports play an important economic role for many communities. These airports support local and itinerant business aircraft, air taxi/charter service, delivery of medical services, aerial applications for agriculture, instructional flight training, and other types of aviation activities. Many of these airports also provide aircraft sales and service.

The general aviation industry has experienced an overall decline in Iowa and nationally in terms of number of pilots and active aircraft since the early 1980s; however, there are indications this trend is being reversed. Although the number of certified pilots continues to decline, the number of new student pilots increased 12 percent from 1996 to 1998, and the number of active aircraft and total hours flown increased for the third consecutive year. The number of new aircraft delivered in 1998 was at the highest level since 1984, and aircraft manufacturers have the largest backlog of orders for new aircraft in more than a decade. Among the factors cited for the turnaround of the general aviation industry are the current strong economy, the General Aviation Revitalization Act of 1994 which relieved aircraft manufacturers of certain product liabilities, and promotional efforts by industry trade organizations.

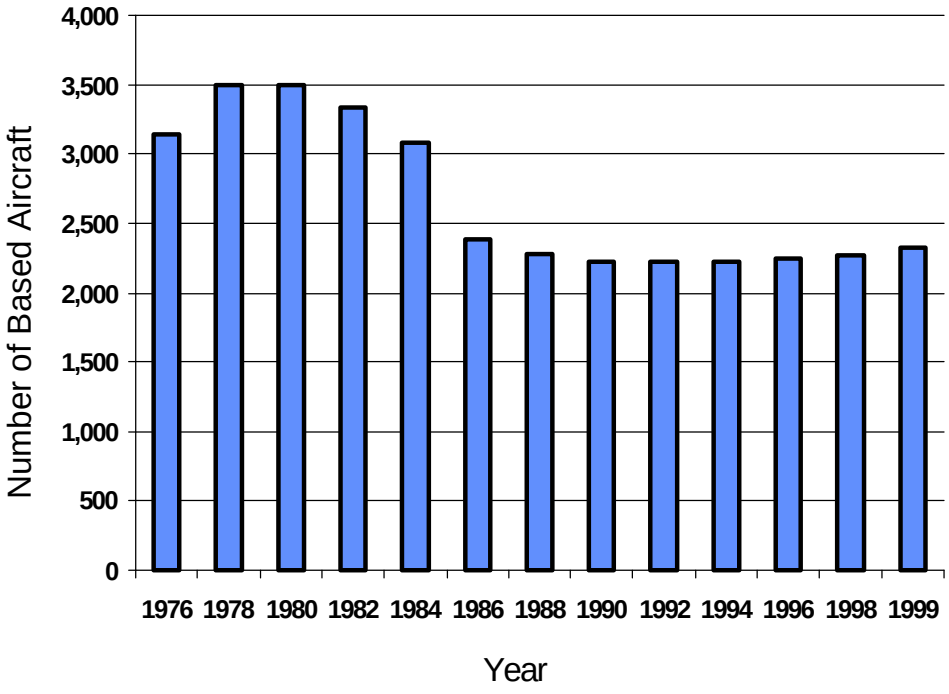
In Iowa the number of certified pilots and based aircraft has followed the national trend; however, the rate of decline in pilot numbers has slowed in the last three years. At the present time, Iowa has approximately 6,200 certified pilots. The categories of certification are as follows:

Private pilots--53%
Commercial pilots--22%
Student pilots--15%
Airline transport pilots--10%

In addition, there are 755 certified flight instructors in the state.

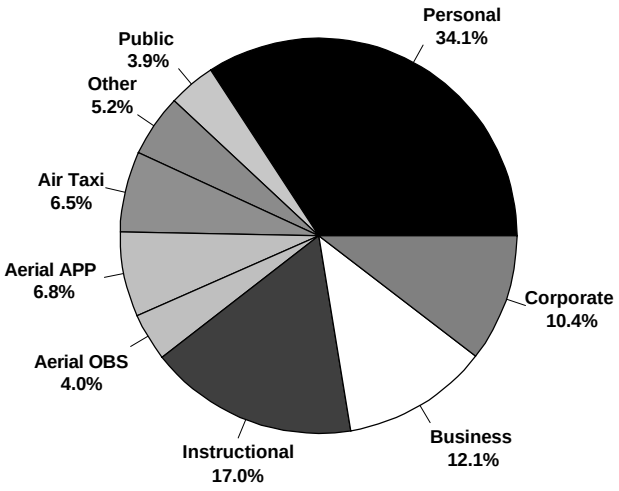
There are more than 2,300 based aircraft at Iowa's publicly owned airports. The number of aircraft based in the state declined steadily from the late 1970s until the early 1990s. Since that time the number has increased slightly. (See Figure 5) Of the aircraft based in the state, 2.6 percent are jets, 14.4 percent are multi-engine, and 83.0 percent are single-engine. These percentages are nearly identical to the national figures.

Figure 5
Iowa-based Aircraft History
1976 - 1999



Although there is no current data available on the primary use of aircraft based in Iowa, the FAA conducts an annual national survey on general aviation fleet use and operations. It is assumed that, with few exceptions, use in Iowa is similar to that indicated in the national survey. (See Figure 6)

Figure 6
Primary Uses of General Aviation Aircraft (U.S.)
1998



Another significant finding in the most recent national survey was an increase, for the first time since 1990, in general aviation operations at airports with FAA control towers. These airports record takeoffs and landings of all aircraft. There had been a substantial overall decline in general aviation activity at these airports since 1978. The increase in 1997 was 3.5 percent. Other data indicates an overall increase of general aviation activity, particularly in non-recreational operations.

There is growing evidence of investment outlays for general aviation aircraft by a segment of the business traveler market, particularly in fractional ownership of multi-engine and jet aircraft. This has allowed small businesses access to cost-efficient, general aviation travel through joint aircraft ownership. Some of the reasons for investing in aircraft include high commercial air fares in certain markets, access to locations which do not have convenient commercial air service, and the increasing congestion at major airline hubs which cause travel delays and disruptions. With the predicted increase in commercial air travel during the next 10 years, use of general aviation aircraft for business-related travel is expected to show a significant increase. In order to serve these types of aircraft, upgraded facilities will be required at many of the nation's general aviation airports.

Airport System Stratification

Iowa's Primary Airport System

As discussed earlier, two major themes emerged from the *Iowa in Motion* public input process. First, there should be a focus on developing a primary system of high-quality general aviation airports. This primary system of general aviation airports, along with the 10 commercial service airports, should be capable of handling nearly all types of general aviation aircraft and meet the vast majority of service demand within the state. Secondly, steps should be taken to preserve and improve commercial air passenger service. In addition, there should be an emphasis on safety and infrastructure preservation at all airports.

As a result of the 1991 IASP airport stratification process, the state's airports were classified into a four-level system based on national, regional, state, and local significance and the services they provided. This system plan builds on that process to identify those airports which are considered significant from transportation service, economic development, and intermodal perspectives.

Criteria

In order to identify the publicly owned airports to be included in a primary system, a set of objective criteria was used. Factors that were taken into consideration included current and future service demand, population density, existing infrastructure, geographic location, and intermodal connections. As a result, the following criteria were selected:

- Airport location within five miles of National Highway System
- Existing runway $\geq$4,000 feet
- Fixed-base operator (FBO) services
- Airport sponsor population $\geq$5,000 (1994 Census estimates)
- Minimum of 15 based aircraft registered with the state (not including ultra-lights, home-builts or gliders)

Of the 103 general aviation airports in Iowa, 31 met these criteria. In addition, three airports which met all but one of the criteria were added to this group. These 34 general aviation airports, along with the 10 commercial service airports, are designated as the Iowa Primary Airport System. (See Figure 7) These airports are located in the more densely populated areas of the state and also the areas which are predicted to have the greatest rate of economic and population growth during the next 20 years. (See Figures 8 and 9)

Figure 7
Iowa's Primary Airport System

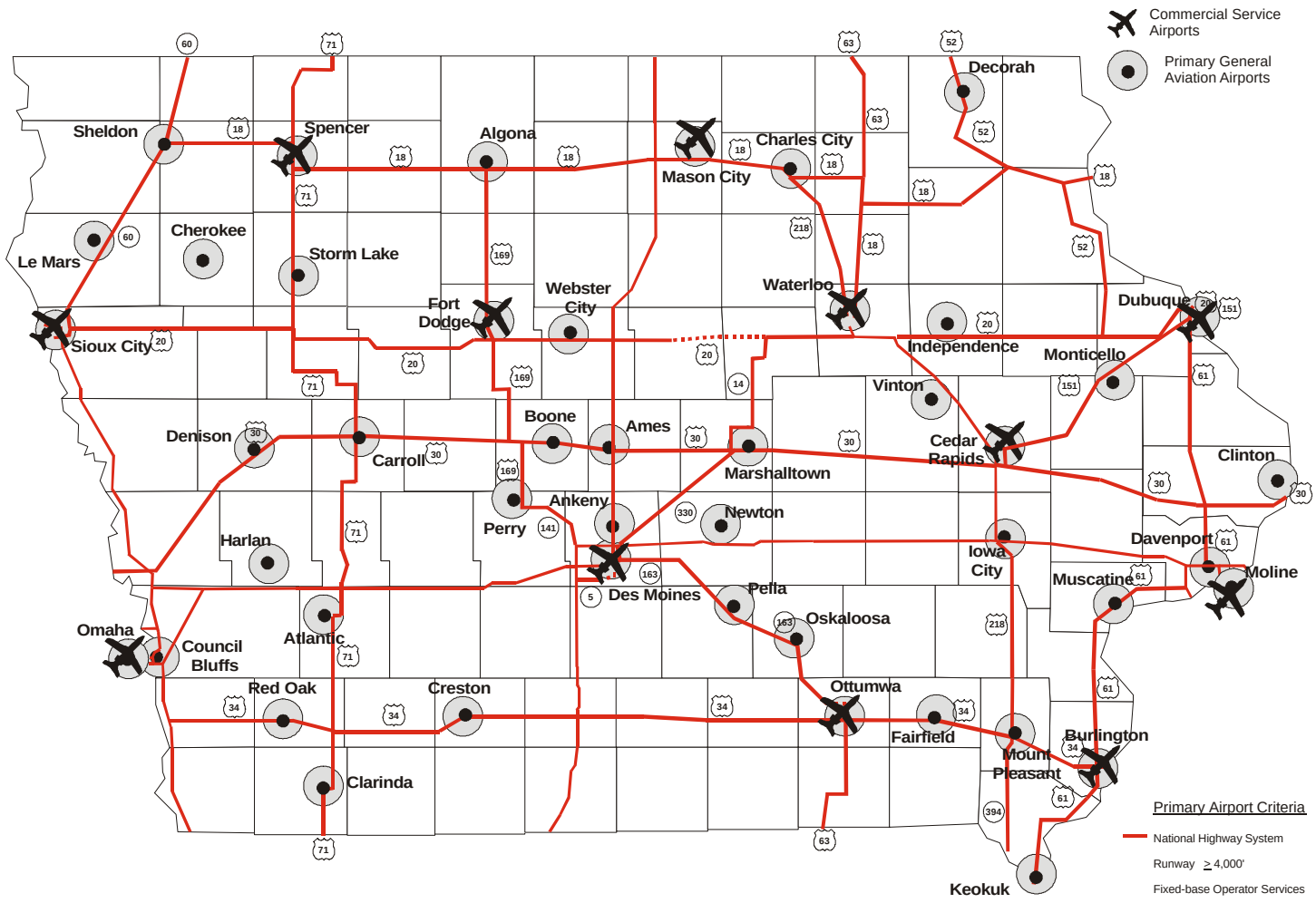
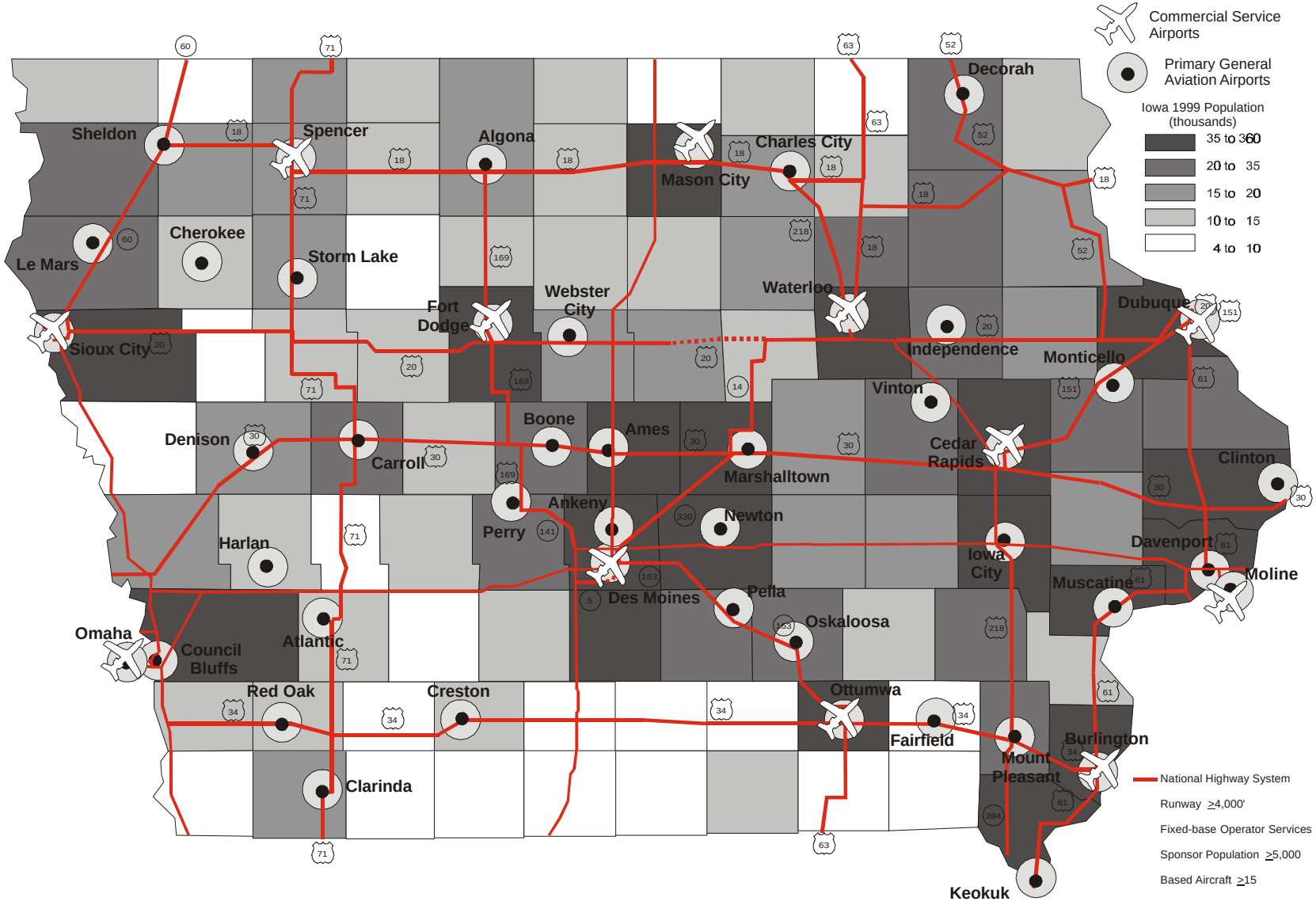
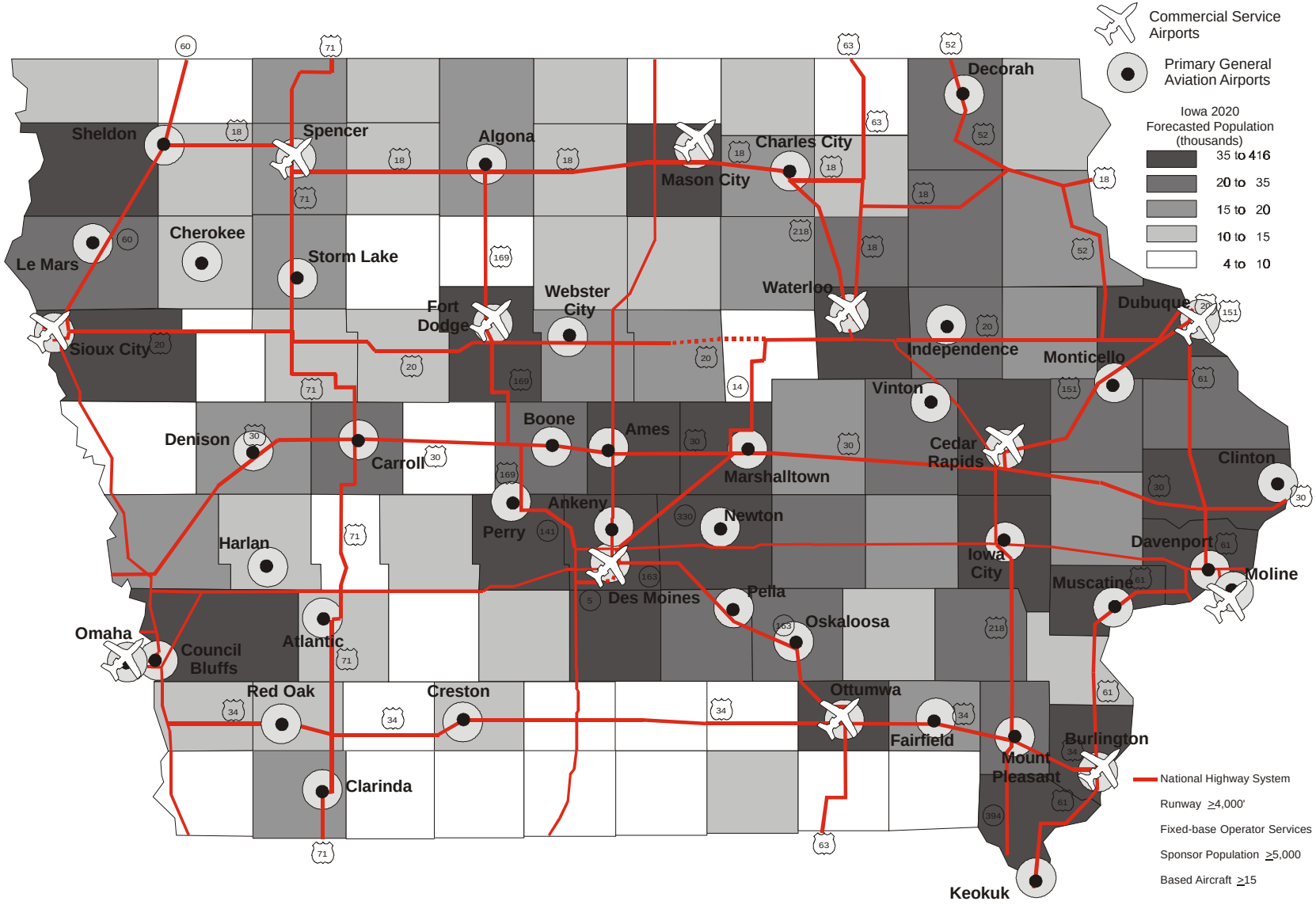


Figure 8
Iowa 1999 Population* by County



*Based on 1994 Census estimates

Figure 9
Iowa 2020 Forecasted Population* by County



*Based on 1994 Census estimates

This Primary Airport System serves the following:

- 98% of all based jet aircraft
- 87% of all based multi-engine aircraft
- 75% of all based aircraft
- 83% of all airport sponsor population

As a result of the primary airport system designation, a revised three-level stratification grouping is incorporated in this IASP. The Level 1 commercial service airports and the Level 2 primary general aviation airports comprise the primary system. All other general aviation airports are included in Level 3. (See Table 1) The department will periodically review the system level airport assignments and make recommendations to the Iowa Transportation Commission for changes when deemed appropriate.

Table 1
Airport Stratification

Level 1 -- Commercial Service	Airport Name	Sponsor Population	Based Jet	Based Multi-Engine	Based Single-Engine	Total Based Aircraft
	Burlington	27,573	0	5	50	55
	Cedar Rapids	113,438	14	13	104	131
	Des Moines	193,965	15	45	73	133
	Dubuque	59,084	0	14	51	65
	Fort Dodge	25,299	1	6	27	34
	Mason City	28,817	0	12	48	60
	Ottumwa	24,629	1	9	25	35
	Sioux City	82,735	10	23	32	65
	Spencer	11,141	0	7	22	29
	Waterloo	66,537	1	16	54	71
Total		**633,218**	**42**	**150**	**486**	**678**

Level 2 -- Primary General Aviation

Airport Name	Sponsor Population	Based Jet	Based Multi-Engine	Based Single-Engine	Total Based Aircraft
Algona	6,112	0	1	17	18
Ames	46,562	3	15	64	82
Ankeny	21,208	1	17	82	100
Atlantic	7,474	0	2	20	22
Boone	12,678	0	0	33	33
Carroll	9,801	0	3	14	17
Charles City	7,970	0	4	18	22
Cherokee	6,007	2	4	37	43
Clarinda	5,144	0	3	16	19
Clinton	28,966	0	5	14	19
Council Bluffs	54,850	2	6	47	55
Creston	7,655	0	1	13	14
Davenport	96,964	0	9	70	79
Decorah	8,699	0	2	22	24
Denison	6,742	0	2	15	17
Fairfield	10,256	2	7	24	33
Harlan	5,289	0	3	28	31
Independence	6,217	0	3	22	25
Iowa City	60,655	0	12	49	61
Keokuk	12,543	0	5	21	26
LeMars	9,119	3	4	12	19
Marshalltown	24,983	0	5	30	35
Monticello	3,633	0	3	17	20
Mount Pleasant	8,374	0	3	13	16
Muscatine	23,936	3	3	27	33
Newton	14,915	2	2	16	20
Oskaloosa	11,068	0	4	23	27
Pella	9,712	0	4	23	27
Perry	6,897	0	0	16	16

Level 2 -- Primary General Aviation	Airport Name	Sponsor Population	Based Jet	Based Multi-Engine	Based Single-Engine	Total Based Aircraft
	Red Oak	6,291	0	0	18	18
	Sheldon	4,934	0	6	16	22
	Storm Lake	8,923	0	1	25	26
	Vinton	5,570	0	0	25	25
	Webster City	8,030	0	4	16	20
Total		**568,177**	**18**	**143**	**903**	**1,064**

Level 3 -- Other General Aviation	Airport Name	Sponsor Population	Based Jet	Based Multi-Engine	Based Single-Engine	Total Based Aircraft
	Akron	1,488	0	1	0	1
	Albia	3,936	0	1	8	9
	Allison	1,074	0	0	2	2
	Anita	1,027	0	0	1	1
	Audubon	2,474	0	0	10	10
	Bedford	1,516	0	0	1	1
	Belle Plaine	2,943	0	0	2	2
	Belmond	2,518	0	0	2	2
	Bloomfield	2,614	0	0	5	5
	Centerville	5,883	0	4	7	11
	Chariton	4,530	0	3	18	21
	Clarion	2,821	0	0	4	4
	Corning	1,726	0	0	4	4
	Cresco	3,744	0	0	5	5
	Eagle Grove	3,713	0	1	7	8
	Eldora	2,933	0	0	1	1
	Emmetsburg	3,964	0	0	17	17
	Estherville	6,789	0	2	19	21
	Forest City	4,428	1	1	16	18
	Fort Madison	12,400	0	4	7	11

Level 3 -- Other General Aviation

Airport Name	Sponsor Population	Based Jet	Based Multi-Engine	Based Single-Engine	Total Based Aircraft
Greenfield	2,039	0	1	15	16
Grinnell	8,915	0	1	9	10
Grundy Center	2,638	0	0	2	2
Guthrie Center	1,766	0	0	3	3
Hampton	4,202	0	1	12	13
Hartley	1,782	0	0	2	2
Hawarden	2,540	0	0	6	6
Humboldt	4,412	0	0	15	15
Ida Grove	2,400	0	2	1	3
Iowa Falls	5,201	0	0	7	7
Jefferson	4,369	0	0	23	23
Keosauqua	983	0	0	1	1
Knoxville	8,490	0	2	20	22
Lake Mills	2,069	0	0	3	3
Lamoni	2,259	0	0	6	6
Manchester	5,361	0	0	4	4
Mapleton	1,217	0	1	8	9
Maquoketa	6,517	0	1	10	11
Milford	2,314	0	0	6	6
Monona	1,566	0	0	5	5
Mount Ayr	1,682	0	0	2	2
New Hampton	3,816	0	0	3	3
Northwood	1,979	0	0	6	6
Oelwein	6,769	0	0	14	14
Onawa	2,939	0	2	4	6
Orange City	5,268	0	2	1	3
Osage	3,575	0	0	6	6
Osceola	4,140	0	0	10	10
Paullina	1,191	0	0	7	7

Level 3 -- Other General Aviation	Airport Name	Sponsor Population	Based Jet	Based Multi-Engine	Based Single-Engine	Total Based Aircraft
	Pocahontas	2,079	0	1	20	21
	Primghar	1,006	0	0	0	0
	Rock Rapids	2,600	0	0	9	9
	Rockwell City	2,128	0	0	9	9
	Sac City	2,566	0	1	19	20
	Shenandoah	5,498	0	1	16	17
	Sibley	2,804	0	0	11	11
	Sioux Center	5,684	0	4	8	12
	Spirit Lake	4,064	0	2	13	15
	Sully	862	0	0	0	0
	Tipton	3,205	0	0	8	8
	Toledo	2,689	0	0	6	6
	Traer	1,714	0	0	12	12
	Wall Lake	895	0	0	1	1
	Washington	7,252	0	1	15	16
	Waukon	4,288	0	0	4	4
	Waverly	9,001	0	1	18	19
	West Union	2,712	0	0	7	7
	Winterset	4,408	0	2	16	18
	Woodbine	1,551	0	0	4	4
Total		**241,926**	**1**	**43**	**543**	**587**

Needs and Revenue Assessment

As part of the planning process, it is necessary to estimate the costs of needed capital improvements over the 20-year planning period. In addition, an estimate of available funding is necessary in order to establish investment priorities.

This section of the plan discusses commercial service needs, general aviation needs, and landside needs, followed by revenue projections and revenue sources. Lastly, a summary of needs compared to available funding is presented.

Historically, only airside facilities (runways, taxiways, aprons, navigational aids, etc.) have been eligible for state funding assistance. During the development of this plan, however, consideration was given to expanding the types of projects that are eligible for state funding assistance.

Identifying the airside needs for airport development and preservation is fairly straightforward for the near term (0-5 years); however, estimates for future time periods require certain assumptions and therefore are more speculative. The following needs are estimated in 1999 dollars.

Commercial Service Airport Needs

The current airport development plans of the commercial service airports are used to identify airside needs. In addition, a recently completed evaluation of the pavements at these airports was used as a supplement for identifying pavement preservation needs and their associated costs. Table 2 shows the estimated pavement needs for the commercial service airports through the year 2020. The needs for these airports are grouped by project type, e.g., runways, taxiways/aprons, and other. It should be noted that projects currently identified in the airports' capital programs are included in the 1999-2005 time frame. Also included in this time period are projected other needed pavement maintenance and rehabilitation projects. This will result in higher average needs in the early time period and lower average needs in the later time period.

As discussed earlier, in 1992 the Commercial Air Service Marketing Program (CASMP) was initiated. This program provides support to the commercial service airports for marketing activities to enhance and preserve air passenger service. As these airports have developed and refined their marketing programs, increased support has been provided. At the present time, the CASMP is funded at $300,000. Although a needs estimate for this type of program can be open-ended, for planning purposes, CASMP needs are assumed to remain constant at $300,000 per year. The estimate for the CASMP is included in Table 2.

Table 2
Commercial Service Airport Needs Estimate
(in Millions)

Time Period	Runways	Taxiways/Aprons	Other	CASMP	*Total*
1999-2005	$80.0	$39.0	$5.0	$2.1	*$126.1*
2006-2010	$38.0	$19.0	$5.0	$1.5	*$63.5*
2011-2020	$92.0	$43.0	$10.0	$3.0	*$148.0*
Total	*$210.0*	*$101.0*	*$20.0*	*$6.6*	*$337.6*

General Aviation Airport Needs

The dollar value of needs at the primary and other general aviation (GA) airports is identified through pavement evaluations, deficiencies noted during annual airport safety inspections, and judgments related to expansion, lighting, and new technology needs. A separate analysis of each system level is performed. Three types of needs categories are identified for these airports. The categories are as follows:

Preservation - Maintaining and preserving existing facilities at a desired condition or level of service, e.g., runway pavements at a certain pavement condition index.

Standards - Upgrading existing facilities to meet current recommended FAA design guides, e.g., building or extending a taxiway, adding or upgrading airfield lighting, etc.

Expansion - The addition of airport operating capacity, e.g., extending a runway to accommodate larger aircraft, increasing apron area for aircraft parking, etc.

Estimated needs for primary general aviation and other general aviation airports are in Tables 3 and 4. As a result of the pavement analysis, needs seem to be more substantial in the early period. This is due to having a backlog of pavements in need of improvement now. This is particularly true for the primary general aviation airports.

Table 3
Primary General Aviation Airport Needs Estimate
(in Millions)

Time Period	Preservation	Standards	Expansion	*Total*
1999-2005	$50.0	$13.0	$9.0	*$72.0*
2006-2010	$20.0	$8.0	$8.0	*$36.0*
2011-2020	$40.0	$9.0	$6.0	*$55.0*
Total	*$110.0*	*$30.0*	*$23.0*	*$163.0*

Table 4
Other General Aviation Airport Needs Estimate
(in Millions)

Time Period	Preservation	Standards	Expansion	*Total*
1999-2005	$28.0	$4.0	$3.0	*$35.0*
2006-2010	$21.0	$6.0	$2.0	*$29.0*
2011-2020	$42.0	$6.0	$4.0	*$52.0*
Total	*$91.0*	*$16.0*	*$9.0*	*$116.0*

Landside Needs

In addition to the airside development needs previously identified, many of the hangars, terminal buildings, and other structures at the state's airports are aging and in need of rehabilitation or replacement. At some airports, there is excess hangar capacity, while shortages exist at other locations. A landside inventory in 1995 revealed that a significant number of these structures are at least 30 years old. This inventory, however, was limited in scope and not sufficient for estimating needs. Therefore, a survey of airport sponsors or operators will be conducted to determine the adequacy of existing landside facilities, and to estimate the cost of bringing those facilities up to a desired level. In support of meeting landside needs, the department has proposed a revolving loan program focused on hangars and other revenue-producing improvements.

Revenue Projections

Iowa's airports rely primarily on federal and state grants for airport development and preservation. The federal share has accounted for nearly 90 percent since 1991. Since a significant portion of federal funding support is discretionary and based on annual appropriations by Congress, it is difficult to make long-range projections. However, for planning purposes, historic data is used to project future levels of support. The revenue forecasts are for federal and state airport development grants, and the required matching funds are assumed to be from local sources.

Revenue Sources

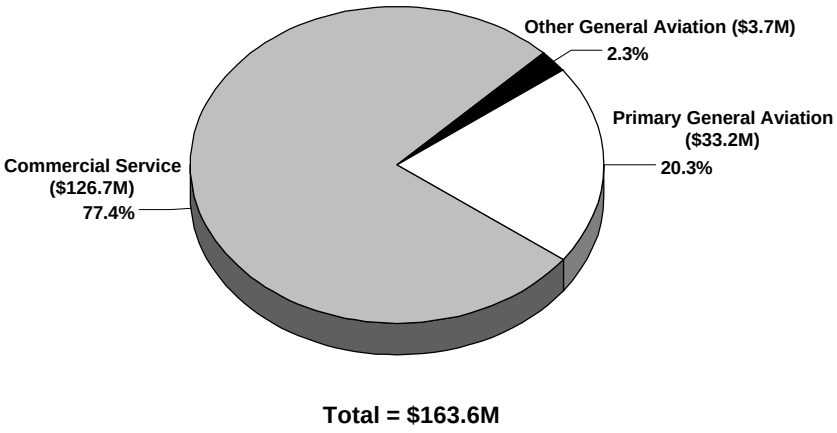
Federal Funds

The source of federal funds is the Airport and Airway Trust Fund that is supported primarily by user taxes. The majority of the funds come from a passenger ticket tax on domestic airline flights. There are other taxes on fuel, cargo waybills, and arrival and departure fees on international flights. An annual allocation from the trust fund is awarded to the Airport Improvement Program (AIP) which is used for airport development projects. Airports eligible for these funds are part of the FAA National Plan of Integrated Airports System (NPIAS) . There are approximately 3,300 airports included in the system nationwide, with 80 located in Iowa.

Under the federal AIP, there are two major funding categories--entitlement and discretionary. The entitlement funds for commercial service airports are distributed by a formula based on enplanements and are awarded to the commercial service airports which have at least 10,000 annual passenger enplanements. For general aviation airports, entitlement funds are based on a population formula and are administrated by the FAA. The discretionary funds are also administrated by the FAA and awarded based on FAA priorities. Federal AIP funds have historically required a 10 percent local match.

From 1991 through 1999, Iowa averaged approximately $18.2 million annually in federal grants. Of this amount 77.4 percent was awarded to the commercial service airports. The primary general aviation airports received 20.3 percent, with the remaining 2.3 percent going to other general aviation airports. (See Figure 10)

Figure 10
Federal AIP Funding
FY 1991-1999
(Millions)



State Funds
State revenues generated from aviation are in the form of fuel taxes and aircraft registration fees, and since 1991 these revenues have been deposited into the state's General Fund. Annually, the Legislature makes an appropriation supporting the state aviation programs. The revenues collected from aviation users have generally matched the annual appropriations for aviation programs. From 1991 - 1997 the appropriation averaged just less than $2.5 million annually. During the 1998 state legislative session, a bill was passed that reduced the total amount of registration fees collected on aircraft based in the state. It is assumed that state funding will continue at its present level. Of the total appropriation, approximately $2 million has been programmed annually for the state AIP. The balance has been devoted to non-infrastructure programs, i.e., Commercial Air Service Marketing, runway marking, Automated Weather Observation System (AWOS) maintenance, windsocks, education, etc. Commercial service airports not receiving federal entitlement funds

(airports with under 10,000 annual enplanements) are eligible for the state AIP program. A 30 percent local match has historically been required for all projects. Figure 11 shows funding by system level from FY 1991-1999 for the state AIP. Figure 12 shows total funding by system level for the state and federal AIPs.

Figure 11
State AIP Funding
FY 1991-1999
(Millions)

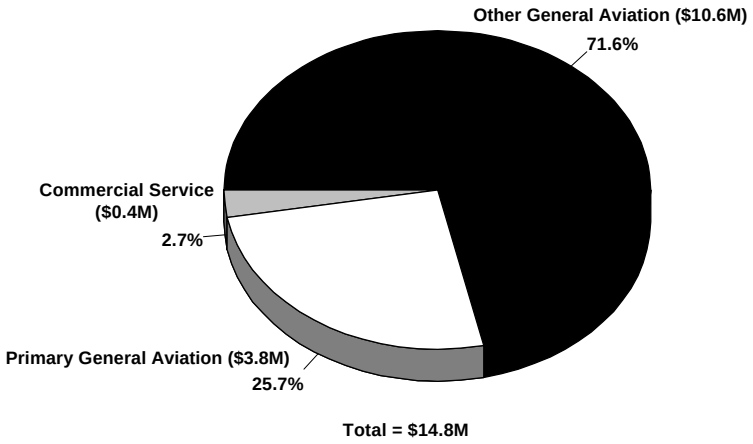
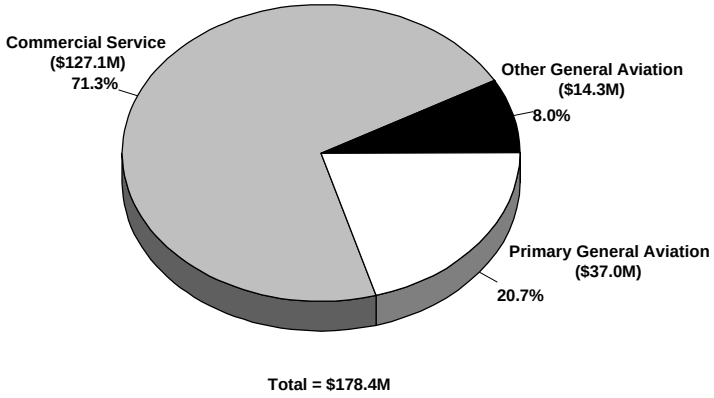


Figure 12

Total Federal/State AIP Funding
FY 1991-1999
(Millions)



Local Funds
Local funds are used for maintenance, airport operating expenses, matching funds for state and federal grants, capital improvements, and other miscellaneous projects. These revenues come from a variety of sources including municipal bonds, income from airport operations, various local taxes, private donations, etc. In addition, commercial service airports derive revenues from aircraft landing fees and other airport operations, such as parking fees, concessions, etc.

Generally, the amount of local revenue varies widely and is dependent on the level of airport activity and the amount of sponsor or community support. However, some airports are self-sufficient and do not receive any funding support from local/community taxes.

Passenger Facility Charge (PFC)
The PFC is a relatively new funding mechanism for commercial service airports which was approved by Congress in 1990. The PFC is a fee charged to passengers for each segment of a trip. At the present time, the maximum charge is $3 per passenger for each trip segment and is limited to a maximum of $12 for any round-trip ticket purchase. For Iowa, this amounted to approximately $3.9 million in 1999. The air carriers collect these charges, and payments are made directly to the airports. The larger airports have benefitted the most from this program due to their higher number of enplanements. This program has also indirectly benefitted the smaller non-hub commercial service and general aviation airports. Under this program, many of the larger airports forfeit a portion of their AIP entitlement funds which become available to the smaller commercial service and general aviation airports.

Vertical Infrastructure Funds
The 1998 Iowa Legislature appropriated $945,000 from the Rebuild Iowa Infrastructure Fund for capital improvements at the state's 10 commercial service airports. Improvements financed using these funds must meet the eligibility requirements for vertical infrastructure projects. The 1999 legislature renewed this appropriation for Fiscal Year 2000 at $1 million. In addition, a $500,000 appropriation was made for general aviation airports.

Needs versus Funding

Table 5 presents a comparison of the projected airside improvement needs and the projected funding support for commercial service and general aviation airports during the 20-year planning period. The funding amounts in Table 5 are represented in 1999 dollars, with future funds reflecting the loss in purchasing power.

Table 5
Needs versus Funding
(in Millions)

Commercial Service Airports

Time Period	Federal Funds	State Funds	Local Funds	Total Funds	Needs	Balance
1999-2005	$77.0	$3.0	$8.0	$88.0	$126.1	($38.1)
2006-2010	$46.0	$2.0	$5.0	$53.0	$63.5	($10.5)
2011-2020	$74.0	$2.0	$8.0	$84.0	$148.0	($64.0)
Total	*$197.0*	*$7.0*	*$21.0*	*$225.0*	*$337.6*	*($112.6)*

Primary General Aviation and Other General Aviation Airports

Time Period	Federal Funds	State Funds	Local Funds	Total Funds	Needs	Balance
1999-2005	$26.0	$13.0	$5.0	$44.0	$107.0	($63.0)
2006-2010	$15.0	$8.0	$3.0	$26.0	$65.0	($39.0)
2011-2020	$25.0	$12.0	$5.0	$42.0	$107.0	($65.0)
Total	*$66.0*	*$33.0*	*$13.0*	*$112.0*	*$279.0*	*($167.0)*

Based on the above comparison, it would appear there will be a significant shortfall in available funding to meet projected needs, assuming funding levels fail to keep pace with inflation. However, it should be noted that all desirable needs were included in this summary, and many of those needs are not of an urgent nature, such as building new runways or lengthening existing ones. The above shortfall in funding will not necessarily result in unsafe or substantially reduced service, but rather it will limit the ability of airports to improve infrastructure and provide additional services.

However, since state funding has remained stable at the same level since 1991, state funding support for aviation could, at a minimum, be increased by $1 million per year. This would do two things: 1) help make up for past inflation and lost buying power; and 2) mitigate or return some of the early period needs.

The outcome of the debate on funding reauthorization of the Federal Airport Improvement Program will have a major impact on future airport funding for both commercial service airports and general aviation airports. Because the outcome is still uncertain, major proposals for aviation funding at the state level need to be considered carefully.

Investment Strategy

As discussed earlier, the public input process for *Iowa in Motion* indicated that the state's aviation investment should focus on promoting and improving commercial air passenger service, along with developing a primary system of high-quality general aviation airports. In addition, there should be an emphasis on safety and preservation at all airports. A balanced investment in these areas should provide long-term economic benefits and operational efficiency for the state airport system.

Throughout the remainder of this plan, a number of actions and objectives are highlighted. These represent new or existing aviation activities and policies the department will follow.

Office of Aviation

The department should create an Office of Aviation to focus on improving both commercial air service and general aviation in the state.

By developing an Office of Aviation, the department will increase its focus on the air transportation element of Iowa's intermodal transportation system. The department's role will primarily be one of advocacy and coordination to support fair and equitable market-based services. As part of that effort, the department will:

- closely monitor issues and trends related to air service and other passenger transportation modes on both a local and national level;
- support federal initiatives to reduce competitive barriers within the industry and improve service to small and medium-sized communities;
- be a focal point for the exchange of data and other critical information for all passenger transportation modes;
- coordinate policy development with other state and federal agencies and private sector interests;
- participate in and support local, regional, and national modal and intermodal transportation studies; and
- facilitate the development of service councils comprised of transportation users and suppliers to provide a forum for interaction and exchange of information on various issues.

Commercial Service Airports

Infrastructure
The 1991 IASP developed two separate investment strategies for commercial service airports and general aviation airports. This plan continues to recognize commercial service airports as performing a service function distinct from the general aviation airports. At the same time, it is understood that these airports play an important role supporting general aviation activities. The commercial service airports which have at least 10,000 passenger enplanements annually receive federal entitlement funds each year based on a formula related to the number of enplanements. These airports will continue to rely on federal grants for the majority of their capital improvement projects. The department will monitor federal funding levels as they relate to needs. If state assistance becomes necessary, then an action plan will be prepared.

The commercial service airports which are not currently eligible for federal entitlement funds are eligible for the state AIP as well as federal discretionary grants.

Service
The department will continue to focus on marketing activities that promote and preserve air passenger service in partnership with the airports.

The types of projects eligible under the Commercial Air Service Marketing Program will be expanded in order to give airports more flexibility in their marketing efforts. A specific list of eligible projects will be developed by the department in collaboration with the commercial service airports for approval by the Iowa Transportation Commission.

The department will also employ several non-investment strategies relating to policy and support initiatives undertaken to improve the quality of commercial air service in Iowa. At the present time, several pieces of federal legislation dealing with air service are pending. The final form of these bills will have a major impact on what actions the department will take.

General Aviation Airports
The department will give programming priority to those general aviation airports which have been designated as part of the primary airport system.

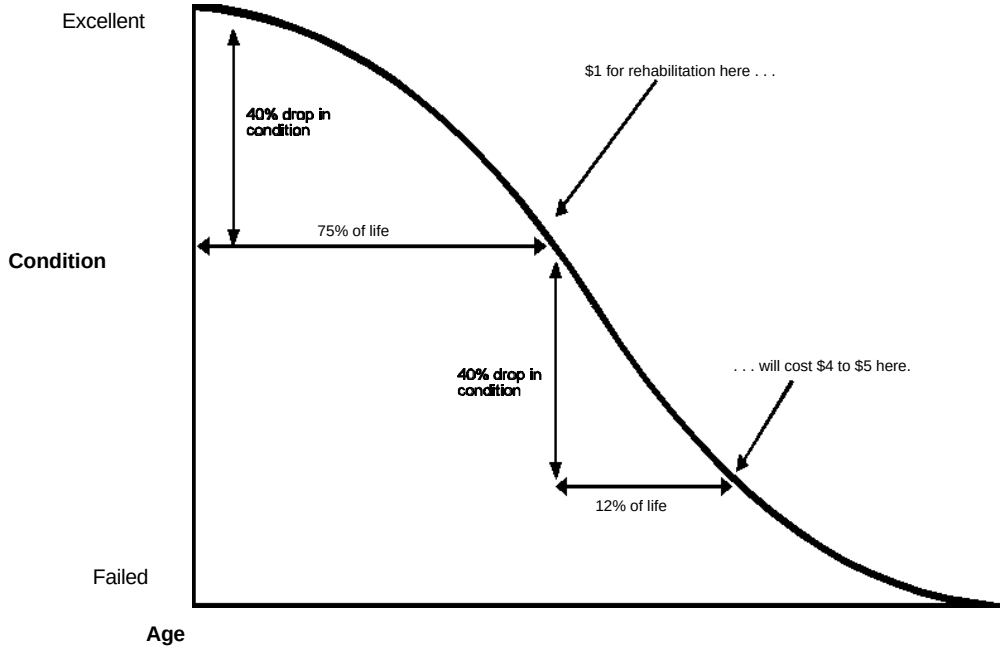
The state will invest in projects that fall into the following four general categories and order of priority.

- Safety
- Preservation
- Standards
- Expansion

Pavement Management

Historically, investment in pavements has represented by far the largest outlay of funding for both the state and federal AIP. At the present time, there are approximately 44 million square feet of various types of pavement in runways, taxiways, and aprons at the state's general aviation airports. The overall condition of these airport pavements is considered to be fairly good. However, airport pavements deteriorate relatively slowly over the first 75 percent of their life and rapidly from that point on. Therefore, as these pavements age, there will be an increasing need for preventive maintenance and rehabilitation in order to preserve and maximize pavement life. Figure 13 illustrates typical airport pavement deterioration and repair cost characteristics. Proper routine preventive maintenance can extend the service life of pavements before major rehabilitation is required. As shown in Figure 13, timely investment in major pavement rehabilitation is very cost effective, while delaying repairs results in much higher costs.

Figure 13
Pavement Condition versus Cost of Repair



The department will require that airport sponsors establish and maintain a pavement management system in order to receive Airport Improvement Program grants for pavement projects.

Guidelines for establishing a pavement management system will be developed by the department.

Economic Development

The department will give greater consideration to the economic development aspects of airport infrastructure improvement projects.

Airport expansion projects related to economic development will be evaluated based on the creation of new jobs and other beneficial regional impacts. The Iowa Department of Economic Development may have an advisory role in evaluating these types of projects. During the annual programming cycle a portion of the AIP funding will be reserved for part of the fiscal year in order to respond to immediate development opportunities. The department will make recommendations to the Iowa Transportation Commission concerning the programming of these types of projects. Specific guidelines for evaluating economic development projects will be developed.

Through the Channeling Act, the department will recommend approval of those federally funded project applications that are consistent with this plan's investment strategies.

These strategies are intended to direct limited resources to those projects and activities which will provide the greatest return in terms of service and efficiency. They are also intended to respond to new economic opportunities when they arise.

Program Guidance

In order to be consistent with this plan's investment strategies, several modifications to current state programs are being implemented.

State Airport Improvement Program

The department will implement several changes to the current Airport Improvement Program in the areas of eligibility, project prioritization, and project match ratios.

The AIP supports capital improvement projects and planning activities at the general aviation airports and at those commercial service airports that do not meet the criteria for federal entitlement funds.

The AIP under this plan is outlined in Table 6.

Table 6
Iowa Airport Improvement Program

1. Top-down funding approach by giving investment priority to the primary airport system with an emphasis on safety and preservation.

2. Project Type Prioritization - Safety projects will continue to have the highest priority, followed by preservation, standards, and expansion projects.

3. Eligibility limited to airside projects only.

4. To be eligible for AIP funding, airports must meet criteria covering:
   - public ownership
   - financial capability
   - management, operations, and maintenance programs
   - airport development planning
   - zoning and land use programs
   - compliance with annual state safety inspection

5. Eligible costs include planning, engineering, and construction.

6. All projects require final approval by the Iowa Transportation Commission.

Eligibility
Both applicant eligibility and project eligibility are outlined in Table 7.

Table 7
Iowa Airport Improvement Program Eligibility

In order to ensure that projects programmed under the AIP are consistent with the investment strategy, criteria for applicant and project eligibility have been established and are outlined below.

Applicant Eligibility

- Airport must be publicly owned and designated in the state system of the 1999 IASP.
- Commercial service airports not eligible for federal entitlement funds are eligible for Iowa AIP funds.
- Airport must demonstrate a commitment to support the continued operation, maintenance and development of its facilities. Evidence of support shall include, but not be limited to, the following:
  - N sponsor resolution committing funds for local match with project application;
  - N policies and procedures concerning airport maintenance;
  - N assurance that state-funded projects will be maintained in accordance with Iowa DOT recommendations;
  - N assurance the airport will remain open to public use;
  - N airport must possess a current master plan or development plan and five-year capital improvement plan; and
  - N established land use and height zoning ordinances, which affect the airport and its future development.

Project Eligibility

- Proposed improvement project is restricted to airside facilities and equipment
- Airport must demonstrate the need and justification for the proposed improvement by meeting one or more of the following criteria:
  - N project listed in the airport master plan or capital improvement plan;
  - N deficiency as noted in the state safety inspection;
  - N deficiency as noted in the annual sufficiency report;
  - N other review or analysis conducted by the airport; or
  - N demonstration of an operational need or evidence of a significant economic development impact for expansion projects.

Project Prioritization

The 1991 IASP featured a project priority ranking system which has been successfully used for the annual AIP programming process. This plan utilizes a modified version of the 1991 ranking system which is consistent with the investment strategies discussed earlier. (See Table 8)

Table 8
Project Prioritization

Project Type	Priority Rank 1 = Highest Priority: Primary General Aviation	Priority Rank 1 = Highest Priority: Other General Aviation
I. Safety		
1. Obstruction removal and/or displacement	1	2
2. Land for clear zone protection	3	4
3. Security fencing	5	6
4. Runway treatment for skid prevention	7	8
5. Other safety projects as documented (based on safety analysis)	9	10
II. Preservation		
1. Primary runway surface preservation or repair, and/or replacement of lighting including slope indicators	11	12
2. Taxiway surface preservation or repair, and/or replacement of lighting	13	14
3. Airfield navigation aids repair and/or replacement	15	16
4. Airfield drainage, right-of-way preservation, etc.	17	18
5. Secondary runway surface preservation, including lighting and slope indicators	19	20
6. Apron, ramp, and other surface preservation including repair and/or replacement of lighting	21	22
7. Other preservation projects as documented	23	24
III. Standards		
1. Land acquisition and/or preparation	25	26
2. Primary runway improvements and/or extension including lighting	27	28
3. Airfield items including wind indicators, etc.	29	30
4. Taxiway construction and/or extension including lighting	31	32
5. Secondary runway construction and/or extension including lighting	33	34
6. Apron/ramp construction and/or extension including lighting	35	36
7. Other standards projects as documented	37	38
IV. Expansion		
1. Land acquisition and/or preparation	39	
2. Primary runway improvements and/or extension including lighting	40	
3. Airfield items including wind indicators, etc.	41	
4. Taxiway construction and/or extension including lighting	42	
5. Secondary runway construction and/or extension including lighting	43	
6. Apron/ramp construction and/or extension including lighting	44	
7. Other expansion projects as documented	45	

The department will make final determination of project type

Project eligibility and prioritization will be reviewed annually in order to allow for optimal flexibility in the programming process. Recommended changes will be presented to the Iowa Transportation Commission for approval. All airport sponsors will be notified well in advance of annual AIP application deadlines. The review will be conducted by department staff with input from the airport community.

Project Match Ratios
All state AIP project types under the 1991 IASP required a 30 percent local funding match. Due to an increased emphasis on safety and preservation, a change in local match ratios is needed.

The department will implement a variable match ratio for state airport improvement project funding based on project type.

Table 9 outlines the revised project funding match ratios for state airport improvement projects.

Table 9
Project Funding Match Ratios

Project Type	State	Local
Safety	90%	10%
Preservation	80%	20%
*Planning Activities	70%	30%
Standards	60%	40%
Expansion	50%	50%
AWOS	50%	50%

*Airport Master Plans/Airport Layout Plans

At the present time, the federal AIP continues to require a 10 percent local match for capital improvement projects. All designated primary airports are currently eligible for federal AIP funding.

Commercial Air Service Marketing Program

The Commercial Air Service Marketing Program has supported ongoing marketing efforts by the individual commercial service airports. Since this program was initiated in 1992, airport staffs have gained experience developing marketing initiatives which are effective in promoting and retaining local air carrier service. Eligible projects have been limited to those outlined in rules set forth when the program began.

The department will continue the Commercial Air Service Marketing Program with some refinements and improvements.

These program refinements include:

(1) Expand project eligibility to include all marketing activities directly related to promotion and preservation of commercial air service. Eligible activities include the following:

a. shared advertising and promotional costs with local air carriers for new or expanded service;

b. data collection, research, and preparation work for proposals to attract new air carrier service;

c. promotional activities associated with the Internet; and

d. promotional and educational activities for business groups, travel agents, etc.

Note: The purchase of equipment, salaries for airport personnel, and costs associated with routine airport operations are not eligible under this program.

(2) The amount funded under the program is to be distributed equally among the 10 commercial airports. The funding match ratio will be 50 percent state/50 percent local. Unused allocations shall be apportioned on request to other commercial service airports based on the most current FAA passenger enplanement data.

The department will continue to monitor this program and recommend modifications based on input from the commercial service airports.

Automated Weather Observation System (AWOS)

At the present time, the department owns and maintains AWOS units at 30 airports in the state. This system of weather reporting devices was purchased through a federal AIP grant in 1992 and installed at airports designated by the FAA. An AWOS unit allows pilots to obtain real-time weather conditions at airports where the units are located. This can be done by telephone, radio communication, or personal computer. In addition, these units allow for certain types of flight operations at AWOS-equipped airports which otherwise would not be permitted. There are also two AWOS units in the state which are owned by the FAA. The FAA and National Weather Service own and maintain similar devices at 14 additional airports. The AWOS system incorporates a communications network which links the individual units and is part of a national weather reporting network. The department provides the maintenance and communications support for the system.

The department, through the state Airport Improvement Program, will fund two Automated Weather Observation System installations per year with a match ratio of 50 percent state/50 percent local.

Primary system airports without AWOS units will have priority. The department will use the 1995 Iowa Weather and Navigational Aid Plan as a guide to determine the priority of project applications for non-primary airports.

Other Programs

The following current programs will be continued:

- Runway Marking - Provides funding for marking runways and taxiways at public airports. (100% state)

- Windsock - Enhances safety by providing windsocks to all public airports as needed. (100% state)

- Aviation Promotion/Education - Supports activities which promote the development of aeronautics in the state. (100% state)

- Airport Directory/Aeronautical Chart - Funds the biannual publication of the directory and chart for use by pilots and other members of the aviation community. (100% state)

- Facilities and Equipment - Provides short-notice funding for the replacement of critical airport safety equipment, e.g., approach lighting, navigational aids, obstruction lighting, etc. (70% state/30% local)

- AWOS - Provides communication support and maintenance of AWOS equipment. (100% state)

Other Issues

The department, in conjunction with the aviation industry and airport communities, will continue to monitor and seek resolution to several aviation related issues.

Airport Authorities

The development of regional/multi-jurisdictional airport authorities can result in multiple benefits to certain areas of the state. By combining resources, several jurisdictions can develop and maintain a single high-quality airport. In addition, the greater concentration of based aircraft and service demand could result in a higher priority for both state and federal AIP funding. In an effort to encourage and support the development of multi-jurisdictional authorities, the department will consider providing the local funding match for federally funded AIP projects and giving a higher priority to state-funded AIP projects. The department also has a role in providing information and facilitating dialogue for those jurisdictions wishing to pursue the development of airport authorities.

Airport Operations Count Program
The department completed an airport operations count of approximately 70 general aviation airports during 1999. The system of measuring operation counts was modified from previous methods, and the equipment used in the process was upgraded. These operation counts are used as part of airport stratification review and are taken into consideration during the AIP programming process. The operations count program will be continued, with each airport being counted once every four years.

Land Use
Many of Iowa's airports are not able to make infrastructure or operational upgrades due to restrictions associated with development around airport property. This plan re-emphasizes the need for sound land use practices around airports in the form of zoning ordinances and other measures to establish and preserve clear zones for safety and future development. Statutes relating to these issues are in Chapter 329 of the Code of Iowa.

Federal Block Grants
Currently, nine states (not including Iowa) participate in the federal block grants program in which they receive lump sum federal entitlement funds for programming under federal guidelines. The department supports this program if the federal guidelines are lifted and full programming authority is granted to the states.

Conclusion

Both the commercial service and general aviation segments of the aviation industry continue to evolve in response to market forces, new technologies and regulatory actions. Within this dynamic environment, the Iowa Aviation System Plan provides direction for the development of Iowa's system of publicly owned airports. It also addresses efforts to maintain and improve commercial air passenger service in the state. The plan identifies the airport infrastructure needs and initiatives the state can take to maintain a safe and efficient operating environment for aviation and respond to economic development opportunities.

The state role as outlined in the plan's investment strategies will focus on the following actions:

- support efforts to ensure high-quality commercial air passenger service for all areas within the state;

- invest in general aviation airports which provide the greatest return in terms of economic development and service; and

- emphasize safety and preservation of infrastructure at all airports.

In order to achieve the goals of the Iowa Aviation System Plan, adequate funding support from both state and federal sources must be obtained. The department will continue to monitor aviation issues as they relate to the state's airport infrastructure needs and commercial air passenger service.

Glossary

AIP (Airport Improvement Program): Annual federal and state programs which provide grants to airports for infrastructure development and preservation.

AWOS (Automated Weather Observation System): A system of weather-reporting devices which provide real-time weather conditions at airports where the units are located.

Channeling Act: Legislation enacted in 1993 which requires federal Airport Improvement Program applications from general aviation airports be approved by the Iowa Transportation Commission.

Commercial Service Airport: An airport which provides regularly scheduled air passenger service.

FAA (Federal Aviation Administration): An agency within the U.S. Department of Transportation which oversees and regulates civil aviation.

FBO (Fixed-Base Operator): A private sector business located at an airport providing a variety of aviation services.

General Aviation: Aviation operations and activities other than scheduled commercial air service.

IAWS (Iowa Aviation Weather System): A series of weather data recording stations and a communications network for the dissemination of weather information.

IASP (Iowa Aviation System Plan): A plan developed by the Iowa Department of Transportation to guide the state's investment in aviation infrastructure and related services at Iowa's publicly owned airports.

NPIAS (National Plan of Integrated Airports System): Approximately 3,300 airports which have been designated as the national system of airports by the Federal Aviation Administration and are eligible for federal Airport Improvement Program grants.

PFC (Passenger Facility Charge): A fee charged to airline passengers for each segment of a trip.