

Chapter 9

AIRPORT SYSTEM PLANNING

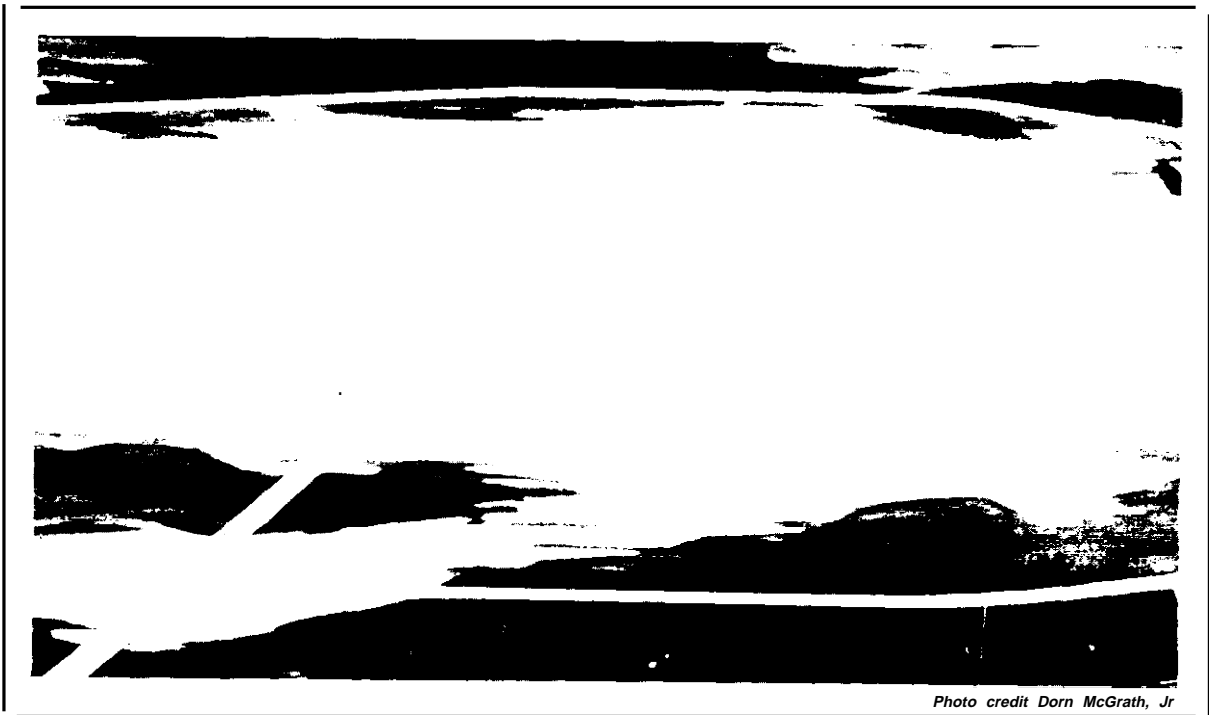


Photo credit Dorn McGrath, Jr

Contents

	<i>Page</i>
The Planning Process	189
Airport Master Planning	189
Regional Airport Planning	191
State Airport Planning	193
National Airport Planning	196
General Problems in Airport System Planning	199
Demand as an Independent Variable	199
Plans as Advocacy Documents	201
Lack of Integration Among Plans	202
National Plan of Integrated Airport Systems	203
The Congressional Mandate	203
Desirable Features of NPIAS	204

List of Tables

<i>Table No.</i>	<i>Page</i>
48. State Funding of Airport Planning	194
49. Review of State Aviation Plans	195
50. Estimated Cost of Improvements by General Categories	197
51. National Airport System Plan: System Needs by Program Objectives, 1980-89	198
52. Comparison of National and State Airport System Plans, 1982	200

AIRPORT SYSTEM PLANNING

Given the high cost and long leadtime for building or improving airports, planning is key in determining what facilities will be needed and in creating programs for providing them in a timely manner, while making wise use of resources. Planning for airport development requires more than simply scheduling the capital improvements to be made. Airports are public entities, whose managers interact with many other public and private stakeholders. Airport development plans affect other aspects of community life—e.g., through the land dedicated to aviation use or the noise or automobile traffic that the airport generates. The need for aviation development must thus be weighed against other societal needs and plans. Further, planning cannot be done for one airport in isolation; each airport is part of a network which is itself part of the national transportation system. For these reasons, airport planning involves government at all levels, as well as other public and private organizations.

Determining need and programming development at individual airports has become formalized in a process called airport master planning. While master planning in the full sense is practiced primarily by large airports, even the smallest must make use of some elements of the process to prepare for future change. At a level above airport master planning is regional system planning, which is concerned with development of all airports in a metropolitan area. It often involves dif-

ficult political decisions on development priorities among competing airports. In some cases, this responsibility is assumed by a regional or metropolitan planning agency, but many State governments have also taken on the task of developing a coordinated system plan for airports serving not only major metropolitan regions but also outlying small communities and rural areas within the State. In some cases, State agencies prepare these plans themselves; in others, they provide technical assistance and review for local planning bodies. The role of the Federal Government in airport planning includes a broad range of activities. The most comprehensive activity is the National Airport System Plan of the Federal Aviation Administration (FAA), which summarizes the development needs of roughly 3,200 airports across the country. At the other extreme, FAA has responsibility to approve, on a project-by-project basis, specific development projects for which airport sponsors are seeking Federal funds.

This chapter describes airport planning at various levels, with emphasis on the planning process and the problems facing airport planners in general. The final part of the chapter looks more closely at airport system planning from a national perspective and addresses issues that FAA will need to consider in preparing a new comprehensive planning document—National Plan of Integrated Airport Systems—called for in the Airport and Airway Improvement Act of 1982.

THE PLANNING PROCESS

Airport Master Planning

At the local level, the centerpiece of airport planning is the master plan—a document that charts the proposed evolution of the airport to meet future needs. The magnitude and sophistication of the master planning effort depends on the size of the airport. At major airports, planning may be *in* the hands of a large department capable of producing its own forecasts and supporting technical studies. At such airports, master planning is a formal and complex process that

has evolved to coordinate large construction projects (or perhaps several such projects simultaneously) that may be carried out over a period of 5 years or more. At smaller airports, master planning may be the responsibility of a few staff members with other responsibilities who depend on outside consultants for expertise and *support*. At very small airports, where capital improvements are minimal or are made *infrequently*, the master plan may be a very simple document, perhaps prepared locally but usually with the help of consultants.

While there is considerable variation in the content of the master plan and how it is used, its basic products are a description of the desired future configuration of the airport, a description of the steps needed to achieve it, and a financial plan to fund development. The master planning process consists of four basic phases: 1) airport requirements analysis, 2) site selection, 3) airport layout, and 4) financial planning.¹

The first phase, requirements analysis, specifies new or expanded facilities that will be needed during the planning period. This involves cataloging existing facilities and forecasting future traffic demand. The planner compares the capacity of existing facilities with future demand, identifying where demand will exceed capacity and what new facilities will be necessary.

The process of relating future demand to existing facilities and estimating the nature and size of needed improvements is complex. It requires detailed forecasts, since sizing depends not only on the number of passengers and aircraft in future years but also on the type of the traffic. For example, traffic consisting mainly of transfer passengers imposes requirements that are different from those where the majority of traffic is origin and destination passengers. Sizing of facilities is also affected by the distribution of activities throughout the day and by the size and operating characteristics of aircraft serving the airport. This process is simplified by the use of standard relationships between general measures, such as annual enplanements, and specific measures, such as peak-hour passenger demand.

The second phase, site selection, is most important in the construction of a new airport. When considering the expansion of an existing airport, there is usually less choice about where to locate new facilities. Requirements for safety areas and clear zones around existing runways and taxiways, for example, mean that much apparently

“vacant” land at airports cannot be used for other purposes. New facilities can be located only in places where they, and the traffic they generate, will not interfere with existing facilities. The site selection phase for a new airport requires an in-depth analysis of alternative sites, looking closely at such factors as physical characteristics of the site, the nature of surrounding development, land cost and availability, ground access, and the adequacy of surrounding airspace. The final choice of one site over others is often quite subjective. For example, there is probably no objective way to compare the disadvantages of increased noise in some part of the community with the advantages of improved air service for the metropolitan area as a whole. The “right” choice depends on how decisionmakers weigh various criteria, and it is often a political, rather than a technical, choice.

In the third phase, airport layout, the locations of planned new facilities are mapped on the airport site. In this phase, the planner also looks at how the airport will fit into the surrounding community. A land use plan is usually prepared at this point to show existing and proposed residential, business, and industrial development around the airport and expected levels of aircraft noise. It shows areas which must have protected airspace and those where building height limitations will have to be imposed. In addition, the effect of the airport on highway and public transportation systems transit is analyzed. This step is important not only for the safety and operational efficiency of the airport and its compatibility with the surrounding community, but for the effect on the level and structure of airport operating costs. Failure to recognize the relationships between airport configuration and ongoing costs can have lasting effects on the economy of the airport and its revenue-earning potential.

The fourth and final phase, financial planning, is an economic evaluation of the entire plan of development. It looks at the activity forecasts of the first phase from the point of view of revenues and expenditures, analyzing the airport’s balance sheet over the planning period to ensure that the airport sponsor can afford to proceed. A corollary activity in this phase is preparation of a financial plan, which specifies the funding sources and

¹This discussion draws heavily from ch. 4 of Norman Ashford and Paul H. Wright, *Airport Engineering* (New York: Wiley-Interscience Publications, John Wiley & Sons, 1979). This work, in turn, is but a slightly updated version of the classic text on airport planning and design, Robert Horonjeff, *Planning and Design of Airports*, 2d ed., McGraw-Hill Series in Transportation (New York: McGraw-Hill, 1975).

financing methods for the proposed development—the portions that will be funded through Federal grants-in-aid, the size and timing of bond issues, the revenue from concessionaire rents, parking fees, landing fees, and so on.

The steps outlined above often require several years to complete, and at most airports, master planning is an ongoing and continuous process. By the time the master plan has been drawn up, much of the information may be outdated, and compilation must begin again. Thus, it is common for master plans to be wholly or partly updated on a cycle of 3 to 5 years.

The master plan is most applicable to a rather narrow planning problem, the development of a single airport. Planning of a regional airport system, which addresses problems of a broader scope, contains many elements in common with the master planning process. However, regional planning is usually less concerned with the details of siting facilities at a particular airport than with the adequacy of service in a given geographic area and the roles of different airports in meeting future needs. While the master planning process is fairly standardized, at least at larger airports, regional planning procedures vary widely among local, regional, State, and Federal agencies.

Regional Airport Planning

Regional airport planning takes as its basic unit of analysis the airport hub, roughly coincident with the boundaries of a metropolitan area. The planner is concerned with *air* transportation for the region as a whole and must consider traffic at all the airports in the region, both large and small. The practice of regional planning is relatively new and has been instituted to deal with questions of resource allocation and use which often arise when the airports in a region have been planned and developed individually and without coordination among affected jurisdictions. Regional planning seeks to overcome the rivalries and the jurisdictional overlaps of the various local agencies involved in airport development and operation. The goal is to produce an airport system that is optimum with respect to regionwide benefits and costs.

Thus, regional airport planning addresses one critical issue usually not dealt with in an airport master plan: the allocation of traffic among the airports in a region. This can be a sensitive subject. Questions of traffic distribution involve political as well as technical and economic issues, and they can greatly affect the future growth of the airports involved. One airport may be quite busy while another is underutilized. If traffic were to continue growing at the busy airport, new facilities would have to be constructed to accommodate that growth. On the other hand, if some of the new traffic were diverted to an underutilized airport, the need for new construction might be reduced and service to the region as a whole might be improved.

Although a planning agency may decide that such a diversion is in the interest of a metropolitan region and might prepare forecasts and plans showing how it could be accomplished, it may not necessarily have power to implement these plans. Where airports are competitors, it is probably not reasonable to expect that the stronger will voluntarily divert traffic and revenues to the other. The planning agency would likely have to influence the planning and development process at individual airports so that they will make decisions reflecting the regional agency's assessment of regional needs.

One way to influence planning decisions is through control over distribution of Federal and State development grants. Before 1982, regional agencies served as clearing houses for Federal funds under the review process required by Office of Management and Budget Circular A-95. While the award of Federal airport development funds depended mainly on FAA approval of the airport sponsor's application, the A-95 process required that designated regional agencies review projects before the grants were awarded. In particular, the regional agencies were required to certify that the planned improvement was consistent with Federal regulations—for example, environmental regulations.

In July 1982, the President issued Executive Order 12372, outlining a new policy for intergovernmental review of direct Federal grant programs. The purpose of the new policy is to "strengthen

1929



1959



1939



1969



1949



1979



Photo credit: Dom McGrath, Jr.

50 years of development at Los Angeles International Airport

federalism by relying on State and local processes for the State and local government coordination and review of proposed financial assistance and direct Federal development. . . .“ The intent is to give additional weight to the concerns of State and local officials with respect to federally funded development. State and local governments are encouraged to develop their own procedures (or refine existing procedures) for reviewing development plans and grant applications. Under the new policy, agencies are to certify that Federal spending is consistent with State and local objectives and priorities, instead of certifying that State and local projects comply with Federal guidelines, as they did formerly. Federal agencies, such as FAA, are expected to accommodate recommendations communicated through the State review process or to justify refusal to do so.

Some States may choose to continue using the same regional planning organizations as review agencies, while others may create new procedures and new agencies. The Executive order discourages “the reauthorization of any planning organization which is federally funded, which has a federally prescribed membership, which is established for a limited purpose, and which is not adequately representative of, or accountable to, State or local elected officials. ” However, States may choose to retain the same regional agencies—they were established under State law in the first place—but to change their function to reflect accountability to State and local rather than Federal officials. It is still too early to tell how these changes in the review procedure will affect the ability of regional agencies to influence airport planning decisions.

Much of the regional agency’s success may depend as much on negotiation and persuasion as on legal or budgetary authority. Often compromises can be reached on a voluntary basis. For example, the Regional Airport Planning Commission has been working with the three San Francisco area airports to help each develop a “noise budget” to comply with California’s strict environmental laws. Because noise is directly related to the level of aviation activity, the noise budget plan, when completed, will affect future traffic allocation among the airports. Its implementation will most likely require some diversion of new

traffic growth from busy San Francisco International to the other bay area airports.

Even where airports in a region are operated by the same authority, allocation of traffic between airports may still be difficult. For example, the Port Authority of New York and New Jersey can implement its planning decision to increase activity at Newark by instituting differential pricing, improved ground access, or other measures to increase use of that airport. Implementation of the policy, however, depends not just on control of airport development expenditures but also on the ability to influence the activities of private parties—the air carriers and passengers.

Regional airport planning authorities may also, if they have planning responsibility for other transportation modes, plan for the airport as part of the regional transportation system. When multimodal planning responsibility resides in one organization, there is greater likelihood that the planning agency will consider airport needs in relation to other forms of transportation in the region. Also, the regional agency may undertake to improve coordination between the various modes, so that, for example, airport developments do not impose an undue burden on surrounding highway facilities or so that advantage can be taken of opportunities for mass transit. For this to happen, however, two conditions are necessary: regionwide authority and multimodal jurisdiction.

State Airport Planning

According to the National Association of State Aviation Officials (NASAO), there are 47 State aviation agencies that carry out some form of airport planning. In 39 States, these agencies are subdivisions of the State Department of Transportation (DOT); in the others, they are independent agencies. Several States have an aviation commission in addition to an aviation agency. The commissions are usually appointed by the Governor and serve as policymaking bodies. State involvement in airport planning and development takes several forms: preparation of State airport system plans, funding of local master planning, and technical assistance for local planning. Table 48

Table 48.—State Funding of Airport Planning

State	Fiscal year	Amount
Arizona	1983	\$ 60,000
Arkansas	1982	1,255,200
Connecticut	1982	100,00
Florida	1982	250,000
Georgia	1982	20,000
Hawaii	1982	160,290
Illinois	1983	31,000
Kansas	1982	9,445
Louisiana	1982	180,000
Maine	1982-83 ^a	18,240
Maryland	1982	102,875
Massachusetts	1982	18,525
Michigan	1982	145,000
Mississippi	1983	10,000
Montana	1982	26,000
Nebraska	1982	7,750
New Hampshire	1982-83 ^a	30,000
New York	1983	33,000
North Dakota	1982~	25,000
Pennsylvania	1982	68,340
Rhode Island	1981-82 ^b	225,000
South Carolina	1982	124,000
Tennessee	1982	13,000
Utah	1982	45,000
Vermont	1982	15,500
Virginia	1982	51,700
Total^c		\$3,024,865

^aBiennial appropriation.^bCalendar year.^cIn addition to the States listed, North Carolina appropriated \$191,000 (biennial, 1982-83) and Wisconsin \$84,200 (1982) for planning purposes as part of grants for specific airport improvement projects.

SOURCE: National Association of State Aviation Officials.

shows the level of State funding of local planning efforts in 1982-83 as reported by NASAO.

Airport planning at the State level involves issues that are somewhat different from those of local or regional agencies. State governments are typically concerned with developing an airport system that will provide adequate service to all parts of the State, both rural and metropolitan. Development of airports is often seen as an essential tool for economic development or overcoming isolation of rural areas. Some State aviation agencies, in Ohio and Wisconsin for example, have set a goal to develop at least one well-equipped airport in each county. Usually the allocation of traffic between airports serving the same community is not at issue. Rather, the issue is deciding how to allocate airport development funds among candidate communities and to maintain a balance between various parts of the State.

To understand the main features of State airport plans, OTA reviewed a sample of 16 State

airport plans and conducted telephone interviews with 30 State agencies. The review focused on three areas: the circumstances of preparation, major elements of content, and the planning process. A summary of the 16 plans reviewed by OTA is shown in table 49.

Before 1970, very few States conducted extensive or systematic airport planning. An important stimulus to State agencies to initiate comprehensive planning efforts was provided by the Airport and Airway Development Act of 1970, which set aside 1 percent of airport aid moneys from the Trust Fund for this purpose each year. Most States applied for these funds promptly and typically spent from 1 to 4 years in developing State Aviation System Plans (SASP) under guidelines issued by FAA, although a few took considerably longer. Most of the States sought assistance from outside consultants in some phase of the planning activity. Among the States surveyed by telephone, approximately one-third have kept their plans up to date with additional Federal grants or State funding.

State plans typically encompass a planning period of 20 to 30 years; the year 2000 is a common planning horizon. Planning periods are normally divided into short-, medium-, and long-term segments (usually 5, 10, and 20 years, respectively). In each case, estimates of future needs have been developed by comparing existing facilities with projections of future traffic.

The major feature of the plans, and by far the bulk of each document, is a detailed listing of the actions planned by class of airport and type of improvement. The types of improvements most commonly cited are land acquisition (new sites or expansion of existing airports); pavement repair or improvement (runways, taxiways, aprons, roads, parking); installation of lighting and landing or navigation aids; and building construction (terminals, hangars, administrative facilities).

Of the 16 plans reviewed, 14 include a statement of priorities for investment based on the relative value of projects in meeting objectives of the system plan. The three dominant criteria identified by most of the States were: 1) correcting a condition related to operational safety, 2) preventing deterioration of existing facilities, and 3) ad-

Table 49.—Review of State Aviation Plans

State	Preparing agency	Preparation				Elements of plan						Coordination, review, and implementation			
		When prepared	How long to prepare	Latest update	How planning effort funded	Contractor assistance	Planning period	Constraints	Estimated costs ^a (millions)	Funding sources identified	Financing plan	Priorities & schedule	Integration with other plans ^d	External review ^c	Implementing parties identified
Arizona	State DOT	1978	d	1983	ADAP ^e	d	1979-2000	Funding	351	Yes	Yes	Yes	Yes	Yes	Yes
Indiana	State DOT, Division of Aeronautics	1971	3 years	1981	1971-HUD funds; 1981-ADAP	Yes	1981-2000	No State funding	600	Yes	Yes	Yes	Yes	None indicated	Yes
Maryland	State DOT, State Aviation Administration	1975	2 years		ADAP and State funds	Yes	1975-2000	Funding	144	Yes	Yes	Yes	Yes	None indicated	Yes
Massachusetts	Department of Public Works, Aeronautics Commission	1973	4 years	1983	ADAP	Yes	1983-2000	None	83	Yes	Yes	d	Yes	None indicated	No
Michigan	State DOT, Aeronautics Commission	1974	2 years	None	ADAP	Yes	1975-95	None	685	Yes	Yes	d	Yes	Yes	Yes
Minnesota	Department of Aeronautics	1974	1 year	1982	ADAP	1974-yes; 1982-no	1982-2000	None	365	Yes	Yes	d	d	yes	Yes
Missouri	State DOT	1978	2 years	None (forecasts revised m 1981)	ADAP	Yes	1978-2000	No State funding	40	Yes	Yes	Yes	Yes	Yes	No
Nevada	Public Service Commission	1975	d	d	ADAP	d	1975-95	None	344	Yes	Yes	Yes	Yes	Yes	Yes
North Carolina	State DOT	1979	6 years	None	ADAP	Yes	1979-2000	None	420	Yes	Yes	Yes	Yes	Yes	No
Oklahoma	Aeronautics Commission	1979 (based on 1975 data)	2 years	None	ADAP and Ozarks Commission	Yes	1979-2000	None	163	Yes	Yes	Yes	Yes	Yes	Yes
Oregon	State DOT, Aeronautics Commission	1974	d	d	ADAP	d	1975-90	None	73	Yes	Yes	Yes	Yes	Yes	Yes
Pennsylvania	State DOT	1980	3 years	None	ADAP	Yes	1980-2000	None	259	Yes	Yes	Yes	Yes	Yes	No
South Dakota	State DOT, Division of Aeronautics	1979	4 years	None	ADAP	Yes	1977-97	None	80	Yes	Yes	Yes	Yes	Yes	Yes
Virginia	State Corporation Commission, Division of Aeronautics	1975	d	None	ADAP	Yes	1975-1995	None	251	Yes	Yes	Yes	Yes	Yes	Yes
Washington	Aeronautics Commission	1977	3 years	1981	ADAP	Yes	1981-2000	None	430	Yes	Yes	Yes	Yes	Yes	Yes
Wisconsin	State DOT	1976	d	Update now m progress	ADAP	Yes	1975-95	None	333	Yes	Yes	Yes	Yes	Yes	No

^aFor latest update, in dollars of that year.

^dIncluding State or regional transportation or economic plans.

^cBy State or regional agencies or local authorities.

^eNot determined.

^fProgram Planning Grant under the Airport Development Aid Program (Public Law 91-258)

SOURCE: Office of Technology Assessment.

dition of airfield capacity to accommodate growth in demand.

While there are surface similarities, SASPs vary greatly in scope, detail, expertise, and planning philosophy. One State agency director freely admitted that the State system plan was basically a wish list, prepared primarily because planning funds were available and the State DOT required it. He indicated that the plan was out of date and would not be updated in the foreseeable future because it has little relevance to the agency's actual activities. On the other hand, several State agencies regard the SASP as a valuable working document that is kept current and serves as a guide in programming and distribution of State funds.

In many States, programming of funds is somewhat separate from the system planning process. While the SASP may have a long planning horizon of 20 years or more, the actual award of grants to complete particular projects is on a much shorter time scale. Some State agencies have developed methods for keeping current files on local airport projects planned for the near term (say 3 years). When airports apply for State aid (or request State assistance in applying for Federal aid) the SASP is used to assign priority for grant award as funds become available. As a rule, only a fraction of the projects outlined in the SASP are undertaken.

Each State plan reviewed by OTA tabulated estimated costs of recommended improvements and identified funding sources. Funding is almost universally identified as the primary constraint on implementation of the SASP, and nearly all contain a caveat about the availability of funds. While other factors (e.g., noise or availability of land) may have been considered in the planning process, they are seldom cited in the documents themselves.

In all States, some sort of consultation, coordination, or review by persons outside the State aviation agency, is part of the planning process. Often these are regional economic development or planning agencies created by State government. In many cases, airport planning is part of a general transportation planning process, but methods of interaction and feedback among the modal

agencies and between the State and regional agencies are described only vaguely.

Some State agencies are involved in master planning activities for local airports, especially rural or small community airports that do not have the staff to carry out master planning on their own. State agencies may provide technical assistance or actually develop local master plans. Some States also participate in airport planning for major metropolitan areas, although most leave this responsibility with the local airport authority or a regional body. In recent years, State participation in planning at the larger airports has shown some increase, a trend that may be bolstered by current Federal policy that earmarks a share of annual Trust Fund outlays for State aviation planning.

National Airport Planning

Airport planning at the national level is the responsibility of FAA, whose interests are to provide guidance for development of the vast network of publicly owned airports and to establish a frame of reference for investment of Federal funds. These interests are set forth in the National Airspace System Plan (NASP), a document required under the Airport and Airway Development Act of 1970. The NASP is a 10-year plan that is periodically updated by FAA, most recently in 1980.

The NASP is not a plan in the fullest sense. It does not establish priorities, lay out a timetable, propose a level of funding, or commit the Federal Government to a specific course of action. Instead, it is merely an inventory of the type and cost of airport developments which might take place during the planning period at airports eligible for Federal assistance. It is a tabular, State-by-State presentation of data for individual airports, listed in a common format, indicating location, role, type of service, and level of activity (enplanements and operations) currently and for 5 and 10 years in the future. Projected costs of airport needs in five categories—land, paving—lighting, approach aids, terminal, and other—are shown, also at intervals of 5 and 10 years.

Estimates of need contained in the NASP are developed by comparing FAA national and ter-

minal area forecasts to the present capacity of each airport. Much of the initial determination of need and the regular updating is performed by FAA regional offices, which monitor changes and developments being carried out at the airports. The NASP is not a simple compilation of local master plans or State Airport System Plans, although FAA does draw on these documents as sources in forming judgments about future needs and prospective airport improvements.

The NASP is not a complete inventory of airport needs. The plan contains only "airport development in which there is a *potential* Federal interest and on which Federal funds may be spent under the Airport Development Aid Program (ADAP) and the Planning Grant Program." There are two necessary conditions in the test of potential Federal interest. First, the airport must meet certain minimum criteria as an eligible recipient for Federal aid, and second, the planned improvement at that airport must be of a type that is eligible for Federal aid. Eligible projects include such projects as land acquisition for expansion of

an airfield, paving for runways and taxiways, installation of lighting or approach aids, and expansion of public terminal areas. Improvements ineligible for Federal aid are not included in the NASP—e.g., construction of hangars, parking areas, and revenue-producing terminal areas that airports are expected to build with private, local, or State funds. Thus, the total of \$12.67 billion in estimated airport needs listed in the NASP for the 1980-89 period may somewhat underestimate total airport need. The estimated cost of improvements by general categories of eligible project is shown in table 50.

On the other hand, the NASP probably overstates the amount that will actually be spent on airport improvements over the 10-year period. Many of the projects whose costs are included in the NASP will not receive Federal funds and many will not be undertaken at all. Inclusion in the NASP does not necessarily represent Federal agreement to fund a project or local commitment to carry it out. It is merely FAA's best estimate of likely future need. The goal of the NASP is to set forth "... the type and estimated cost of airport development considered by the Secretary to be necessary to provide a system of public air-

^a*National Airport System Plan, Revised Statistics, 1980-1989* (Washington, DC: Federal Aviation Administration, n.d.), p. iii.

Table 50.—Estimated Cost of Improvements by General Categories

Service level	Land	Paving lighting	Approach aids	Terminal	Other	Total cost ^a
0 to 5-year period (millions of dollars):						
Air carrier	\$1,144	\$2,322	\$ 93	\$888	\$ 768	\$5,216
Large hubs	(573)	(903)	(14)	(453)	(454)	(2,397)
Medium hubs	(220)	(460)	(7)	(222)	(94)	(1,003)
Small hubs	(188)	(362)	(20)	(130)	(68)	(768)
Nonhubs	(163)	(597)	(52)	(83)	(153)	(1,048)
Commuter service	90	208	11	0	33	343
Reliever	349	297	29	0	61	736
General aviation	809	1,293	102	0	237	2,441
Total^a	\$2,393	\$4,120	\$235	\$888	\$1,100	\$8,736
Percent of total	27%	47%	3%	10%	13%	100%
6- to 10-year period (millions of dollars):						
Air carrier	\$423	\$1,572	\$39	\$538	\$200	\$2,772
Large hubs	(71)	(715)	(8)	(294)	(116)	(1,204)
Medium hubs	(297)	(218)	(5)	(109)	(32)	(662)
Small hubs	(35)	(294)	(8)	(69)	(25)	(431)
Nonhubs	(20)	(344)	(18)	(66)	(27)	(475)
Commuter service	9	91	7	0	13	120
Reliever	71	157	12	0	18	257
General aviation	59	615	43	0	64	781
Total^a	\$561	\$2,434	\$102	\$538	\$295	\$3,931
Percent of total	14%	62%	3%	14%	7%	100%

^aFigures may not add due to rounding.

SOURCE: Federal Aviation Administration, National Airport System Plan, 1980 revision.

ports adequate to *anticipate and meet* the needs of civil aeronautics . . . “ If and when local sponsors are ready to undertake projects, they must apply for Federal funds.

The 1980 NASP relates airport system improvements to three levels of need: Level I—maintain the airport system in its current condition, Level II—bring the system up to current design standards, and Level III—expand the system.³ In 1980, the estimated cost of completing the NASP was \$12.67 billion between 1980 and 1989. Of this amount 16 percent was for maintaining the system, 18 percent for bringing the system up to standards, and 66 percent for expanding the system. The distribution of the projected needs for different classes of airports is shown in table 51.

The classification by three levels of need is a refinement added to the latest version of the NASP. It moves in the direction of assigning priorities to different types of projects instead of the earlier practice of presenting needs as a single sum. FW selected this presentation because previous lump sum projections “often did not lend

themselves well for use in establishing the funding levels of programs intended to implement their broad findings.” The three-level system was developed as a guide to Congress, illustrating how “alternative levels of funding . . . can be based on relating NASP development needs to three levels of program objectives.”⁴

The classification system is somewhat misleading because it is not as hierarchical as it might appear, and the placement of a type of improvement at a particular program level does not necessarily reflect the priority that will be given a given project. High-priority projects—i.e., those which FAA and a local sponsor agree must be carried out as soon as possible—may not necessarily correspond with “Level I” needs in the NASP. An expansion project (Level III) at an extremely congested and important airport might be more urgent than bringing a little-used airport up to standards (Level II). Thus, if available funds were limited to 34 percent of total need (the amount needed to cover Levels I and II) it would not be possible, nor would FAA intend, to carry out only Level I and II projects and leave a vital Level III project unfunded. In any given year, the actual grants awarded are used for some projects in each program level.

³Maintaining the system includes such projects as repaving airfields and replacing lighting systems; bringing the system up to standards involves such projects as installing new light systems and widening runways; expanding the system includes construction of new airports or lengthening runways to accommodate larger aircraft.

⁴National Airport System Plan, Revised Statistics, 1980-1989, op. cit., p. 6.

Table 51.—National Airport System Plan: System Needs by Program Objectives, 1980=89
(total costs in 1978=79 billions of dollars)

	Level I: Maintain existing system	Level II: Bring airports up to standards	Level III: Expand system	Total
Air carrier	\$1.28	\$1.21	\$5.50	\$7.99
Commuter service	0.11	0.11	0.24	0.46
Reliever	0.13	0.25	0.62	1.00
General aviation	0.52	0.75	1.95	3.22
Total	\$2.04	\$2.32	\$ 8.31	\$12.67
Percent	16%	18%	66%	100%
Level I	\$2.04			
Level II (includes Level I)		\$4.36		
Level III (includes Level I and II)			\$12.67	

Level I. Sixteen percent (\$2.04 billion) of total development is related to maintaining the condition of the system; i.e., implementing special programs involving safety and security in which the FAA has special responsibilities and assuring the physical integrity of existing airports by reconstructing and rehabilitating pavements and lighting systems.

Level II. Bringing existing airports up to current design standards comprises 18 percent (\$2.32 billion) of NASP costs and includes projects such as paving, extending, widening, strengthening, and lighting existing runways; providing taxiways and clear zones when they are absent; and other work related to the present use of the airport.

Level III. Expanding the airport system includes development to accommodate the increased volume of passengers and aircraft projected for the decade, upgrading airports to accommodate larger aircraft and longer nonstop flights, and constructing new airports. Development oriented toward expanding the system comprises 66 percent (\$8.31 billion) of total 10-year needs.

SOURCE: Federal Aviation Administration, National Airport System Plan, 1980 revision.

The NASP has been criticized for drawing the Federal interest too broadly and for being more of a “wish list” than a planning document. Critics have claimed that it is merely a compilation of improvements desired by local and State authorities and that it does not represent a careful assessment of airport development projects that truly serve national airport needs as distinct from those that are primarily local or regional in character. It is true that the plan includes many very small airports of questionable importance to the national system of air transportation. The criteria for inclusion in the NASP are minimally restrictive. The principal ones are: 1) that the airport has (or is forecast to have within 5 years) at least 10 based aircraft (or engines), 2) that it be at least a 3&minute drive from the nearest existing or proposed airport currently in the NASP, and 3) that there is an eligible sponsor willing to undertake ownership and development of the airport. Clearly

there are many airports that meet these minimum criteria. As of the beginning of 1984, there were 3,203 airports qualifying for inclusion in the NASP—roughly a minimum of one airport per county.

Paradoxically, the NASP has also been criticized for just the opposite reason: it is too exclusive, in that it reflects only FAA’s interpretation of national importance and not those of State or regional planning agencies. There are about 1,000 airports, not listed in the NASP, that are integral parts of State and regional development plans; and their exclusion means that sponsors or State planning agencies cannot expect Federal aid for developing these facilities. Table 52 shows a comparison of the airports included in NASP and in State system plans. Only in three cases (Florida, Iowa, and New York) does the NASP include more airports than the State plan.

GENERAL PROBLEMS IN AIRPORT SYSTEM PLANNING

Airport planning, as practiced today, is a formalized discipline that combines forecasting, engineering, and economics. Because it is performed largely by government agencies, it is also a political process, where value judgments and institutional relationships play as much a part as technical expertise. On the whole, airport planners have been reasonably successful in anticipating future needs and in devising effective solutions. Still, mistakes have been made—sometimes because of poor judgment or lack of foresight and sometimes because of certain characteristics of the planning process itself. In effect, the process and the methods employed predispose planners toward solutions that may be “correct” for a single airport but perhaps not for the community, region, or airport system as a whole. As a result, airport plans may take on a rigidity that is inappropriate in light of changing conditions or a narrowness of focus that does not make best use of resources.

Demand as an Independent Variable

A major problem in the planning process at all levels is the tendency to treat demand as an inde-

pendent factor. Planners forecast future demand and then use those forecasts to justify the need for facilities, to frame their design, and to ascertain whether there will be sufficient revenue to pay for them.

Basic economics indicates that supply and demand exist in an equilibrium relationship that is mediated by price. When prices fall, demand increases; when prices rise, demand falls. The system is in equilibrium when price reaches a level where supply exactly equals demand. This basic relationship holds for airport supply (capacity) and demand, as in other market situations. Price in this case includes not only monetary transactions but also the speed and convenience of air transportation and the cost of delay. The planning process, however, does not typically approach airport needs from a market perspective.

The predisposition to treat demand as an independent variable in the planning process is illustrated by FAA’s guidelines to airport planners on how to make forecasts in support of master plans (written in 1971 but still current). After attributing the then current “airport crisis” to low forecasts in the past, the guidelines instruct plan-

Table 52.-Comparison of National and State Airport System Plans, 1982

State	Total airports	Airports in SASP ^b		Airports in NASP	
		Number	Percent	Number	Percent
Alabama ^a	193	84	44	72	37
Alaska ^a	689	c	—	275	40
Arizona	224	94	42	56	25
Arkansas ^a	105	86	82	66	63
California ^a	297	297	100	220	74
Colorado	312	83	27	56	18
Connecticut ^a	28	26	93	16	57
Delaware	37	4	11	4	11
Florida ^a	514	105	20	126	25
Georgia ^a	125	136d	109	111	89
Hawaii	51	17	33	16	31
Idaho		160	82	38	19
Illinois ^a	&	113	13	94	
Indiana	365	92	25	82	; ;
Iowa	355	80	23		26
Kansas	376	111	30	; ;	24
Kentucky ^a	115	73	63	54	47
Louisiana	292	95	33	60	21
Maine	160	47	29	34	21
Maryland	49	39	60	31	63
Massachusetts ^a	216	36	17	32	15
Michigan ^a	291	166	64	104	36
Minnesota ^a	597	141	24	83	14
Mississippi ^a	166	78	47	75	45
Missouri ^a	393	131	33	100	25
Montana		119	63	72	38
Nebraska ^a	; \$	121	37	76	23
Nevada	128	46	36	27	21
New Hampshire ^a	52	12	23	12	23
New Jersey	271	67		40	
New Mexico	156	60	: :	44	: :
New York	486	81	17	91	19
North Carolina ^a	286	112	39	78	27
North Dakota ^a	555	85	15	50	9
Ohio	674	126	19	105	
Oklahoma	292	174	60	104	:
Oregon ^a	410	89	22	62	15
Pennsylvania ^a	161	195d	121	91	
Rhode Island	20	6	30	6	X
South Carolina ^a	82	65	79	53	65
South Dakota	162	84	52	55	
Tennessee	82	g ¹ d	111	78	z
Texas ^a	500	292	58	226	45
Utah	89	51	57	39	44
Vermont	63	23	37	13	21
Virginia ^a	205	77	38		
Washington ^a	322	191	59	:	: ;
West Virginia	90	c	—	30	33
Wisconsin ^a	421	111	26	84	20
Wyoming	105	42	40	29	28
Totals	13,136	4,634	35	3,599	27

^aState counts used.^bSASP = State Airport System Plan; NASP = National Airport System Plan.^cNo State plan.^dIncludes planned new airports.

SOURCE: National Association of State Aviation Officials.

ners not to consider possible constraints on aviation demand in developing forecasts, except in certain limited cases. Rather, it advises the planner to focus on the “total demand potential” of the airport:

In the [planner’s] development of [airport activity] forecasts, an **unconstrained approach** is usually the best approach

The “unconstrained” forecast represents the potential aviation market in which all of the basic factors that tend to create aviation demand are used, **without regard to any constraining circumstances** . . . that could affect aviation growth at any specific airport or location. Using this approach, it is possible to determine the theoretical development needs in accordance with the total demand potential. For an airport serving an exceptionally high activity metropolitan area, however, potential constraints and alternative methods to reduce them should be considered (emphasis supplied).⁵

It is particularly noteworthy that the document instructs planners to consider constraints on demand solely for the purpose of finding ways to reduce them.

Treatment of demand as an independent variable is rooted in the practice of civil engineering when designers have to plan facilities for events totally beyond their control. In designing a flood control project, for example, the demand on the facility is purely a function of natural forces over which the planner can exercise no control. Demand on an airport, however, is not an uncontrollable natural phenomenon; it responds to changes in the price of using the airport. For example, there is presumably some set of market conditions under which no one would fly between the hours of 5 and 7 p.m., even though this is currently the period of peak demand. Alternatively, if adequate facilities are not provided, some demand will be suppressed. No such similar responsiveness exists in the natural demand placed on flood control facilities.

The costs of sizing the system to serve peak-period demand are very high. To the extent that passengers are willing to bear that cost, the in-

vestment in facilities to accommodate this demand is a good use of economic resources. Yet, the structure of the entire system is based on the premise that the passengers are willing to bear the cost, and they are rarely given a choice to save money by altering the time of day at which they choose to fly. While airlines sometimes provide discounts to night passengers or to those flying in slack travel seasons, these are exceptions. Usually, the price of traveling at the peak period is no more than at offpeak periods.

The lack of incentives for traveling during off-peak periods is to some extent a problem reaching beyond airport planning per se. If airport sponsors choose not to institute peak-hour prices, planners have little choice but to accommodate that decision. At the same time, however, the planning process often fails to identify alternatives to sizing facilities for unconstrained peak load. In some cases such alternatives may be preferable or, at the very least, worthy of consideration in the planning process.

Plans as Advocacy Documents

While the airport planning process may take into account the desires of the community served by the airport, the master plan itself often has a distinctly advocative flavor. This is perhaps best illustrated in a passage from the introduction to FAA’s guidelines to airport planners on master planning:

. . . This advisory circular recommends procedures to be followed in making the master plan study of the individual airport and suggests methods of coordinating, organizing, and presenting the master plan document so that it will be a viable tool for the **promotion** of airport improvements (emphasis supplied).⁶

Such use of the master plan raises some disturbing questions about the process. Should the planning process plan be a medium for promoting a particular plan for airport development, chosen by the planner or airport operator, who usually has a vested interest in building or expanding the airport? Or should it present a set of optional development paths for community decisionmakers? If advocacy of development is an appropriate use

⁵*Airport Master Plans, Advisory Circular AC 150/5070+5* (Washington, DC: Federal Aviation Administration, 1971), pp. 11, 13.

⁶*Ibid.*, p. 3.

of the master plan, then should not some forum be available to weigh airport development against other community needs and to integrate airport projects with other community plans?

In practice, the political body with jurisdiction over the airport performs this oversight function, but it is hampered by planning documents that presuppose the desirability of airport expansion. The master plan is often quite thorough in presenting alternative forms of expansion and in arraying the pros and cons of each. It is usually silent on the more fundamental questions of whether any improvement should be undertaken and what options there are besides airport development.

Lack of Integration Among Plans

Airport planning at local, regional, State, and Federal levels is not well coordinated and in-

tegrated. To some extent, this arises naturally from different areas of concern and expertise. At the extremes, local planners are attempting to plan for the development of one airport, while FAA is trying to codify the needs of several thousand airports which might request aid. Local planners are most concerned with details and local conditions that will never be of interest to a national planning body.

The lack of common goals and mutually consistent approach is also evident between Federal and State planning. Over 10 years ago, the Federal Government recognized the need to strengthen State system planning and provided funds for this purpose under ADAP, and nearly all the State Airport System Plans have been prepared with Federal funding. However, it does not seem that FAA has always made full use of these products in preparing the NASP. The State plans contain many more airports than the NASP, and the priorities assigned to airport projects by States do

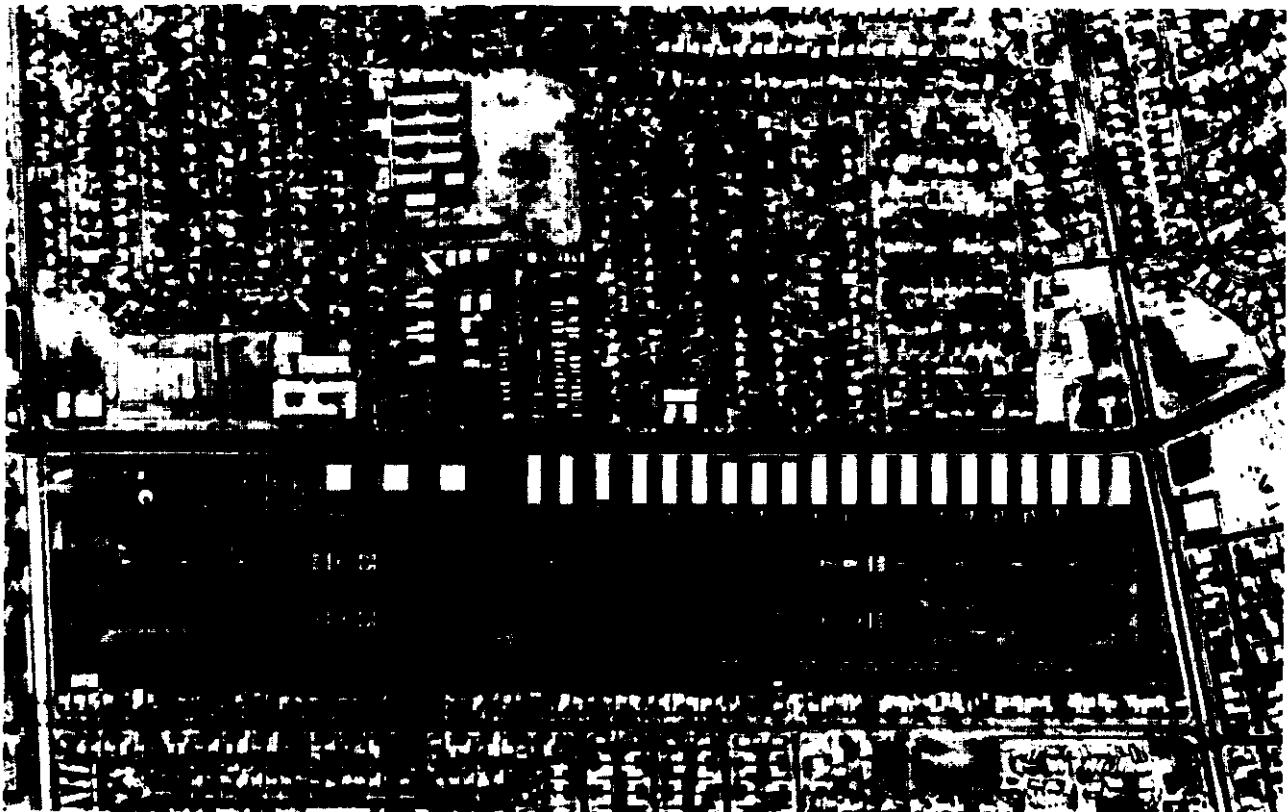


Photo credit: Aviation Division, County of Los Angeles

Urban encroachment at a GA airport

not always correspond to those of the NASP. While it is probably not desirable, or even possible, for the NASP to incorporate all elements of the State plans, greater harmony between these two levels of planning might lead to more orderly development of the national airport system.

There is also a lack of coordination between airport planning and other types of transportation and economic planning. This is particularly evident in the case of land use, where airport plans are often in conflict with other local and regional developments. Even though the airport authority may prepare a thoroughly competent plan, lack of information about other public or private development proposed in the community (or failure of municipal authorities to impose and maintain zoning ordinances) allows conflicts to develop over use of the airport and surrounding land. This problem can be especially severe where there are several municipalities or local jurisdictions surrounding the airport property.

An additional problem is the lack of integration of airport planning with that for other modes

of transportation. An airport is an intermodal transportation center, where goods and people transfer between the ground and air modes. It forms an important link in the total transportation system of a region. The ground transportation system providing access to the airport can be a significant contributor to congestion, delay, and the cost of airport operation. Yet, airport operators have little authority or influence over decisions on transportation beyond the airport property line.

At the national level, there is also a lack of integrated planning within FAA. There does not seem to be close coordination between FAA's National Airport System Plan and the National Airspace System Plan. While the two plans are based on the same aviation demand forecasts, they have not been brought under a common schedule. Nothing has been published to show how the airport improvements contained in one plan will interact with air traffic control (ATC) improvements proposed in the other.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS

The Airport and Airway Improvement Act of 1982 (Title V, Public Law 97-248) reflects a strengthened congressional commitment to airport planning. At the regional and State levels, the law dedicates 1 percent of Federal airport development funds for planning, with availability contingent on a demonstrable (not demonstrated) ability to conduct regional planning. As such, the new law provides an opportunity for State governments and regional agencies to institute or expand their planning efforts.

The Congressional Mandate

The act calls for refinement of the national airport planning process by instructing the Department of Transportation to develop a National Plan of Integrated Airport Systems (NPIAS) by September 1984. The description of this plan in the legislation makes it clear that the intent is to expand and improve planning at the national

level. Specifically, the act calls for "integrated airport system planning," which it defines as:

... the initial as well as continuing development for planning purposes of information and guidance to determine the extent, type, nature, location, and timing of airport development needed in a specific area to establish a viable, balanced, and integrated system of public-use airports.⁷

Planning includes identification of system needs, development of estimates of systemwide development costs, and the conduct of such studies, surveys, and other planning actions, including those related to airport access, as may be necessary to determine the short-, intermediate-, and long-range demands that the airport must meet.

The policy declaration points out several ways in which the planning effort is to be "integrated." It states that:

⁷Public Law 97-248, Title V, §503 (a) (7).

. . . it is in the national interest to develop in metropolitan areas an integrated system of airports designed to provide expeditious access and maximum safety. . . . [and it is in the national interest to] encourage and promote the development of transportation systems embracing various modes of transportation in a manner that will serve the States and local communities efficiently and effectively.⁸

From this it is evident that the legislation requires a plan which is “integrated” in two ways: 1) geographically, in the sense that all airports in a region are to be considered together; and 2) intermodally, in the sense that planning for the aviation should be part of the planning for the regional transportation system as a whole. The requirements of the act will bring FAA’s airport planning process into closer relation with metropolitan and regional transportation planning than ever before.

Desirable Features of NPIAS

The NPIAS is not scheduled for publication until September 1984, and it is not yet clear how FAA will respond. Certainly the task will require either major modifications of the planning process that has produced the NASP or development of a completely new planning tool to respond to the intermodal and regional aspects of the congressional mandate. As an aid to Congress in evaluating the plan when it is released, OTA offers the following general comments about features that would be desirable in an integrated national airport plan.

Comprehensiveness

First of all, the NPIAS should be truly national in scope. A national plan may not need to include every airport in the country, but it should explicitly define the interest of the Federal Government with respect to airports of all sizes and purposes. The current NASP has been criticized both for being too broad and for being too exclusive. On the one hand, many airports are included in the NASP are of scant importance to the national system of air transportation. On the other hand, the NASP excludes about 1,000 airports that are

part of State Airport System Plans or that may otherwise have some regional importance. The difficulty might be traced to the fact that airports are either “in” or “out” of the NASP. A comprehensive system plan may have to define a hierarchy of Federal interest, specifying different degrees of importance and eligibility for funding.

A complete plan will thus have to start with a careful definition of a national airport system and the airports that make it up. It is entirely possible that the degree of Federal interest will not be the same for all types of airports, depending on their size, mission, and locale. In some cases, airports may be of only local or regional importance and of no direct interest to the Federal Government. However, if the plan is to be comprehensive, these airports should be identified and perhaps earmarked for consideration in State or regional plans.

Comprehensiveness also requires that the NPIAS address all types of development. Some types of improvements, particularly those to be made with Federal funds, will be of chief concern. However, in the interest of completeness, the plan will have to assess total airport system costs, not just those eligible for funding through the Airport Improvement Program. Further, a complete plan will have to consider, from the viewpoint of total system costs, where there are more cost-effective alternatives to investment in new or expanded facilities. In addition to projects for accommodating growth, it will be necessary to consider methods for directing and managing demand growth to fit within existing capacity.

Integration

The act specifically calls for integrated region-wide planning, but formulation of the NPIAS affords FAA the opportunity to integrate the planning process even further by developing a cohesive and hierarchical planning system in which regional or statewide system planning activities are meshed into airport planning at the national level. Further, this broader concept offers the opportunity to devise a system for coordinating airport planning more closely with system planning for other modes of transportation, at both the regional and national level.

⁸Public Law 97-248, Title V, §502 (a) (9) and §502 (b).

It is especially important that the NPIAS seek to integrate airport planning with two other major FAA planning efforts—the National Airspace System Plan (NAS Plan) and the National Airspace Review (NAR). Initial funding for the NAS Plan was also approved in the 1982 Airport and Airway Improvement Act. This plan, published in early 1982, outlines FAA's future improvements to the en route and terminal area ATC systems over the next 10 years. The NAR is a 42-month study of air traffic procedures, begun in June 1982 as a joint undertaking of FAA and aviation industry representatives. Its objectives are to improve the efficiency of traffic flow in the airspace system by revising regulations and instituting new procedures that reflect technological improvements in aircraft and air traffic control.

The three segments of the aviation system—airports, ATC facilities, and airspace use pro-

cedures—need to be developed in coordination. Piecemeal development could lead to inefficiencies, bottlenecks, and misdirected investment. For example, it would probably be a waste of resources to add runway capacity at an airport if the ATC system cannot be upgraded to handle the additional traffic in that area until several years later. Conversely, there is little advantage in seeking to move traffic more expeditiously between airports only to have it encounter delays in the terminal areas where improvements have not yet been scheduled or implemented. Integrated development of airports, ATC facilities, and air traffic procedures will be necessary to obtain maximum benefit from any one of the parts and to ensure cost-effective investment.

Priorities

Another important consideration will be the identification of priorities for implementation and

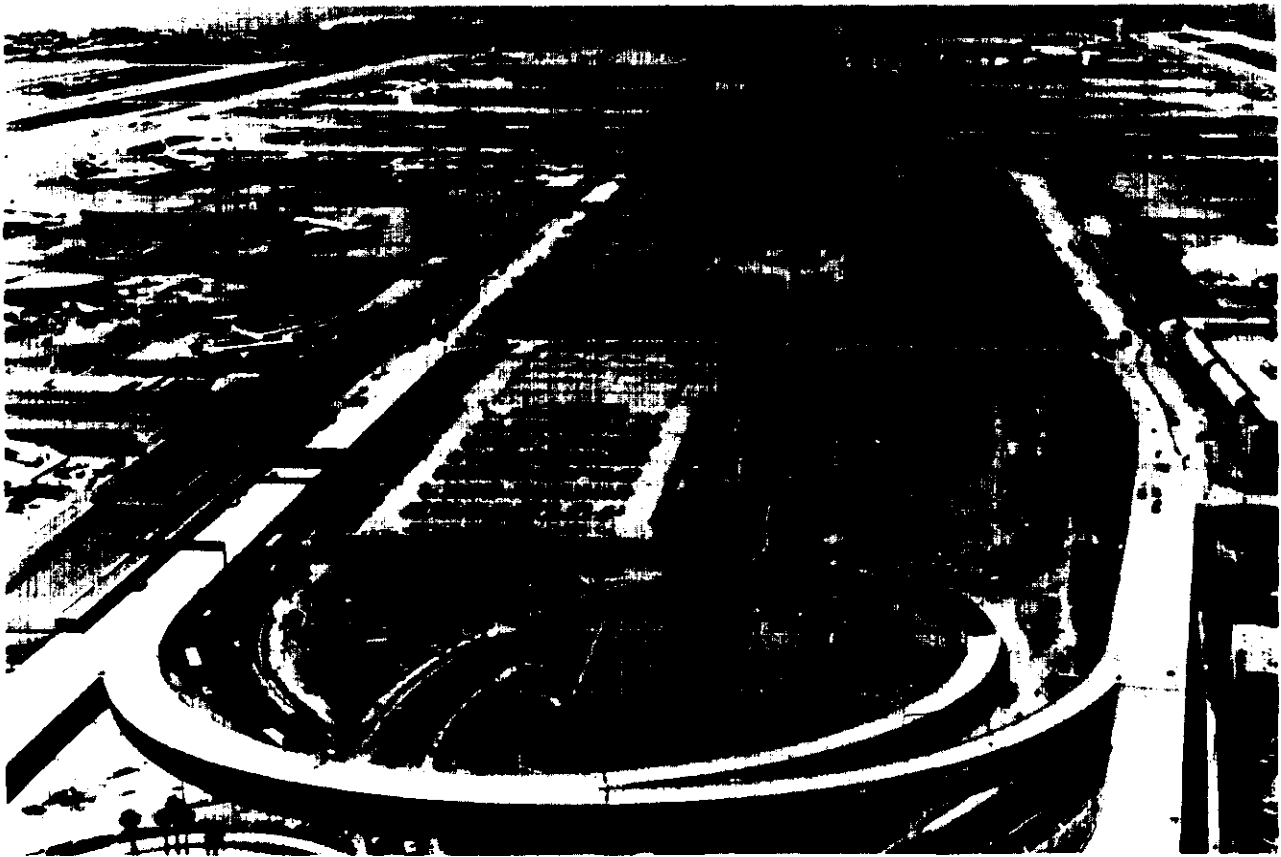


Photo credit: Federal Aviation Administration

Recently completed airfield, terminal, and landside expansion at Los Angeles International Airport

funding by class of airport and type of need. FAA attempted in the latest version of the NASP to classify needs according to three levels of program objectives: 1) maintain existing system, 2) bring airports up to standards, and 3) expand the system. Within these levels, gross estimates of needs for each class of airport (air carrier, general aviation, etc.) are made. While this classification system represents a good start, it is still not fully satisfactory. The NPIAS plan should include a scheme for relating specific types of airport projects to systemwide objectives and assigning priorities to specific projects. Such priorities could aid FAA in evaluating the systemwide effects of specific program actions and serve as a guide in the distribution of capital development funds.

Multiple Planning Horizons

Another desirable characteristic of the plan would be the use of multiple planning horizons. Development of airports is an ongoing process and a given plan of improvements often takes a number of years to complete. The large-scale investments are often “lumpy,” and a period of intense development and heavy investment at an airport may be followed by a lull of several years. The use of several planning horizons—perhaps of 5, 10, and 20 years—would aid in integrating short-term improvements into smoother long-term investment paths at each airport. It would also help to relate improvements at individual airports to broader system goals. Given the uncertainties of forecasting, long-range projections are subject to greater error and therefore must be treated more flexibly. Procedures for periodic revision and updating of the plan would allow for these longer-range projections and decisions to be reviewed and adjusted. Use of multiple planning horizons is already a characteristic of the NASP, which sets out airport-by-airport needs on a 5- and 10-year basis. The horizon might usefully be extended to 20 years, with the latter 10-year period intended as no more than an approximation (or “early warning”) of long-range trends and need.

Time phasing of improvements is an important feature that has been missing in previous FAA air-

port system plans. As a general rule, planned airport developments should be related to an overall schedule determined by forecasted growth, expected leadtime, and relationships with the elements of the NAS Plan and the NAR. The development schedule for all parts of airspace system—airports, ATC facilities, and air traffic procedures—should be tied together in a common planning framework. For example, if under the NAS Plan an airport is to receive ATC improvements that will increase airside capacity, this should be reflected in the airport system plan as it may dictate other terminal or landside improvements. Conversely, in planning ATC improvements to increase capacity, implementation should be scheduled first at those airports where they will have the most beneficial effect.

It may be well, insofar as possible, to build these schedules around “trigger events.” For example, instead of scheduling improvement at some airport for a particular year, implementation might be made conditional on passenger enplanements or aircraft operations reaching some specified level. This approach has two advantages. It provides protection against the inevitable inaccuracy of forecasts, and it allows flexibility in matching improvements with need.

Coordination and Review

There will be a need for periodic review and update. To see that the broadest range of interests are taken into account, the initial planning and the review process should be conducted in cooperation with State, regional, and local planning authorities and with the aviation community at large. The consultative planning technique recently employed by FM in the National Airspace Review and the Industry Task Force on Airport Capacity Improvement and Delay Reduction has been useful not only in helping FAA recognize and accommodate diverse interests, but also in enriching the planning process. Involvement of other planning agencies and private organizations representing airport users in a continuing dialogue will ensure that improvements contemplated in the NPIAS are in harmony with user needs and the objectives of State, regional, and local aviation agencies.