THE GEOGRAPHIC EXPANSION OF NATIONAL AIRLINES

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Historical Context of National's Development

The American airline industry originated in 1917 when the U.S. Post Office received an appropriation from Congress to begin an experimental air service. For the next decade the mail was flown first by the U.S. Army and later by the Post Office itself.[1] In 1925 airmail operations were transferred to private industry, with specific routes being awarded to individual companies on the basis of competitive bidding.[2] Broad powers granted to the Postmaster General during this period allowed him to extend or to consolidate certain routes when he felt this was in the public interest.[3]

Interpreting these provisions quite liberally, the Postmaster General during the Hoover administration used his powers to build up certain airlines at the expense of others in an effort to create a system of financially independent companies that could provide efficient service over long distances.[4] However, in 1933 the Roosevelt administration charged that the contracts awarded during the Hoover years had involved collusion and favoritism. All existing airmail contracts were cancelled, and a general reorganization of the airline industry took place. It was during this reorganization that National Airlines came into existence.

Spatial Expansion of National's Network

National was founded in 1934 after having bid successfully on the new airmail contract between Tampa and Daytona Beach.[5] This route was initially operated with a small fleet of Stinson Trimotors. Later in the year the route was extended to Jacksonville (Fig. 1; Table 1).[6]

National Airlines 1934
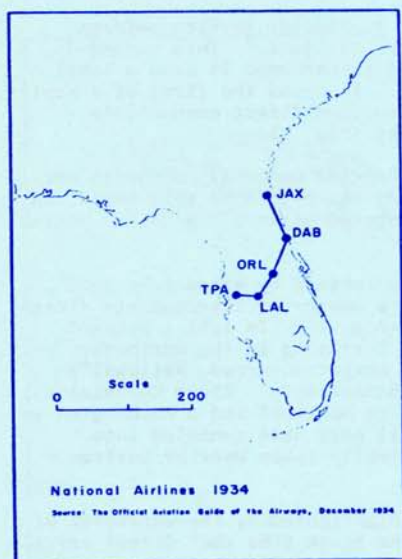Source: The Official Aviation Guide of the Airways, December 1934

Fig. 1

In 1937 the company expanded operations into Miami and in 1938 service to New Orleans began. By 1940 National was operating a fleet of Lockheed Electras serving eleven cities (Fig. 2) over a route network of about 900 miles.[7] At this time both Miami and New Orleans were marginal points in National's overall operation. However, with advances in aviation technology they steadily acquired more central positions within the airline's route structure. Jacksonville's early position of prominence within the National system, which is readily apparent in Fig. 2, owes partly to its central location and partly to its large population. During the 1930s and until shortly after 1940 Jacksonville was the largest city in Florida. The early routes between Jacksonville and New Orleans, and between Jacksonville and Miami were the nuclei around which all of National's later growth occurred. Significantly, this growth took place without the mergers and takeovers that have characterized most other airlines in this country. Northwest Airlines is the only other carrier that has grown in this steady, individualistic fashion.
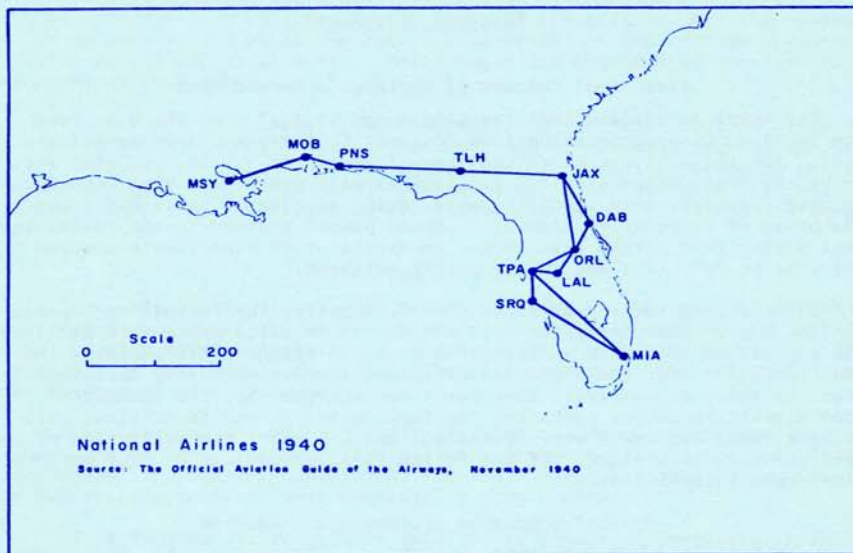
National Airlines 1940

Source: The Official Aviation Guide of the Airways, November 1940

Fig. 2

In 1944 National was granted permission to provide service between Florida and New York in competition with Eastern Airlines.[8] This extended National's route mileage to over 2400 miles and transformed it from a small regional airline into a major domestic carrier. This was the first of a series of important routes awarded to National that provided direct connections between Florida and cities outside the Southeast (Fig. 3).

In 1946 National received a route from Florida to Cuba. Although service was suspended in 1962, National still holds the rights to this route and when commercial air traffic is eventually reinstated between the United States and Cuba, National will fly there.

National's growth in the 1950s was characterized by extensions into Boston and Houston, as well as the addition of a number of intermediate cities located along the routes it already possessed (Fig. 4). In 1951 a planned merger with Colonial Airlines, a small carrier operating in the Northeast, failed to gain stockholder approval.[9] Had the merger occurred, National's development probably would not have changed substantially. Since Colonial's route structure had developed along a New York to Montreal and a Washington to Ottawa axis, a great deal of traffic would still have been funneled into Florida from the Northeast. Colonial was eventually taken over by Eastern Airlines.

National's growth during the 1960s was highlighted by the extension of its route network into California. This was the first time that direct service had been offered between California and Florida. Several competitors were later to provide similar service. The 1960s also saw the elimination of several smaller cities from the National system. Many of these cities had been important
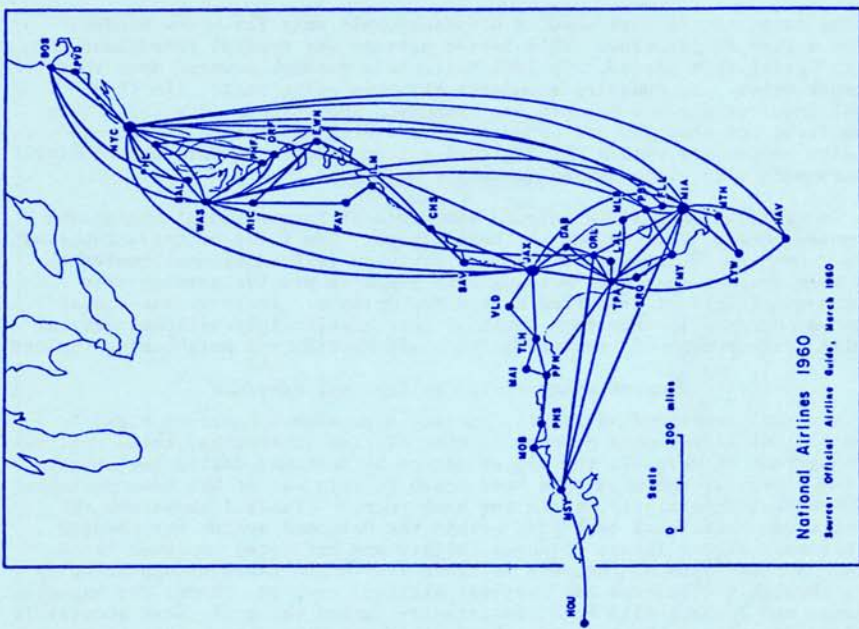
National Airlines 1960

Source: Official Airline Guide, March 1960

Scale

0   200 miles

Fig. 4

National Airlines 1945

Source: American Aviation Air Traffic Guide, December 1945
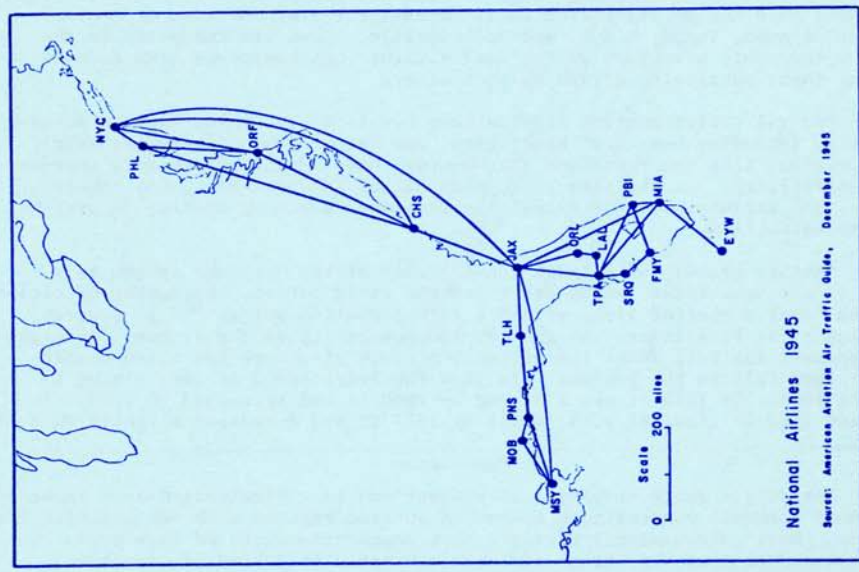
Scale

0   200 miles

Fig. 3

refueling stops in the days when an airplane could only fly a few hundred miles on a tank of gasoline. This latter pattern was typical throughout the industry during this period. By 1965 National's network covered more than 5700 route miles. By industry standards this was quite small. In 1969 National acquired a route between San Francisco and Atlanta (Fig. 5). This was the first one that did not connect Florida with an outside region, and it remains an anomaly within the National system today. Atlanta should ultimately connect with other cities served by National.

In 1977 National again entered the field of international operations with routes between Florida and northern Europe. The first of these involved service from Miami to London and Paris. Early in 1978 additional routes to Europe were awarded that gave National the right to provide service into Amsterdam and Frankfurt from Florida and New Orleans. These transatlantic flights may eventually transform National into a major international carrier that will direct much of its traffic to south Florida and neighboring regions.

Network Connectivity of National Airlines

A visual record of National's spatial expansion appears in Figs. 1 through 5. Unlike the maps printed in most airline timetables, these reflect all connections between all the cities served by National during the periods indicated. Because the maps have been drawn in this way it has been possible to construct a connectivity matrix for each year.[10] Table 1 shows how the relative accessibility of each city within the National system has changed through time. Higher levels of accessibility are reflected in lower index numbers. A comparison of the data in Table 1 with the patterns appearing in Figs. 1 through 5 discloses how National Airlines evolved. Note, for example, that Tampa and Jacksonville have consistently ranked among the most accessible of National's cities. On the other hand, although Miami is now one of the primary foci of the National system, it did not achieve the premier position until 1960. Miami's early position within the network was somewhat peripheral. The reasons for this shift, of course, involved the rapid growth of the Miami area as well as the increasing range of each new generation of aircraft. Cities that have held the position of highest accessibility at one time or another include Orlando, Tampa, Miami, and Jacksonville. From its inception to the present the route structure of National Airlines has therefore been focused more on these particular cities than on others.

Several cities outside Florida have consistently ranked high in accessibility, including New York, Washington, and New Orleans. In recent years other cities, like San Francisco and Houston, have exhibited dramatic increases in accessibility. At the same time, many cities (Newport-News, Los Angeles, Mobile, and Tallahassee, for example) experienced a steady decline in system-wide accessibility.

Another measure of network connectivity of the National system as a whole is the Beta index, which describes the ratio between the number of cities and the total number of links within a transportation system.[11] In general, the higher the Beta index, the greater the complexity of the system. As might be expected, the Beta index for National's route structure has risen considerably from 1934 to the present. In 1934 the index stood at .80, rising to 1.27 by 1940. In 1945 it was 1.52 and by 1960 it had increased to 2.02. In 1965 and 1969 it stood at 2.51, while by 1977 it had decreased slightly to 2.48.

Conclusion

National's route structure at present can be characterized as a series of linear channels connecting a number of outside regions with one specific area, Florida. Most international carriers have route structures of this type. In the past a number of U.S. trunk airlines exhibited this kind of structure (Northeast and Capital for instance), but only National does so today. All of
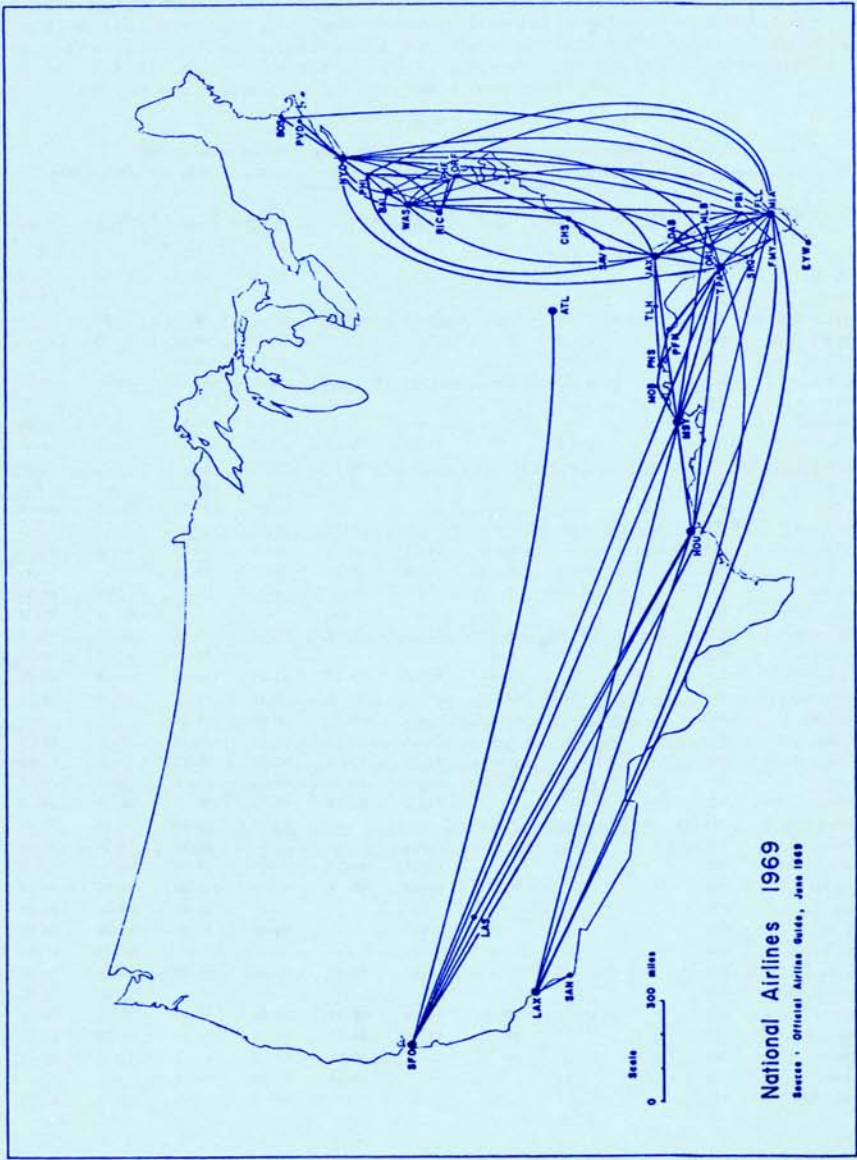
National Airlines 1969

Source: Official Airline Guide, June 1969

Scale
0   300 miles

Fig. 5

TABLE 1

RELATIVE ACCESSIBILITY OF CITIES WITHIN THE NATIONAL AIRLINES ROUTE NETWORK
First number indicates the total number of direct links connecting each city with all other cities.
Second number indicates rank-order.

		1934	1937	1940	1945	1947	1950	1960	1965	1969	1977
Atlanta, Ga.	ATL	--	--	--	--	--	--	--	--	97-32	92-30
Baltimore, Md.	BAL	--	--	--	--	--	79-20	90-16	80-23	68-14	79-20
Boston, Mass.	BOS	--	--	--	--	--	--	91-18	70-12	73-16	80-24
Charleston, S.C.	CHS	--	--	--	36- 4	63-15	69- 9	89-15	78-19	79-23	65-10
Daytona Beach, Fla.	DAB	7- 2	21- 6	26- 5	--	52- 8	73-14	86-12	71-13	67-12	73-18
New Bern, N.C.	EWN	--	--	--	--	--	95-28	92-20	--	--	--
Key West, Fla.	EYW	--	--	--	47-12	--	82-22	94-25	78-19	78-21	--
Fayetteville, N.C.	FAY	--	--	--	--	--	--	123-36	--	--	--
Fort Lauderdale, Fla.	FLL	--	--	--	--	--	--	87-14	--	72-16	65-10
Fort Myers, Fla.	FMY	--	16- 4	--	55-17	62-14	79-20	85-11	75-16	76-19	71-17
Gulfport, Miss.	GPT	--	--	--	--	70-23	94-27	--	--	--	--
Havana, Cuba	HAV	--	--	--	--	51- 7	72-11	81- 8	--	--	--
Houston, Tex.	HOU	--	--	--	--	--	--	116-33	84-25	65- 9	63- 7
Wilmington, N.C.	ILM	--	--	--	--	64-17	88-25	120-34	--	--	--
Jacksonville, Fla.	JAX	10- 4	--	22- 1	26- 1	39- 2	48- 1	62- 2	56- 4	57- 3	53- 4
Lakeland, Fla.	LAL	7- 2	13- 2	28- 6	44-10	56-12	75-16	93-23	--	--	--
Las Vegas, Nev.	LAS	--	--	--	--	--	--	--	112-30	94-31	82-25
Los Angeles, Calif.	LAX	--	--	--	--	--	--	--	63- 8	67-12	69-15
Miami, Fla.	MIA	--	21- 6	34- 8	32- 3	44- 3	55- 4	61- 1	48- 1	47- 1	49- 2
Melbourne, Fla.	MLB	--	--	--	--	--	--	93-23	67-11	70-15	73-18
Mobile, Ala.	MOB	--	--	37-10	50-16	64-17	83-24	110-31	86-28	89-28	83-27
New Orleans, La.	MSY	--	--	46-11	37- 6	50- 6	70-10	83- 9	62- 7	59- 5	56- 6
Marianna, Fla.	MAI	--	--	--	--	64-17	90-26	113-32	--	--	--
New York, N.Y.	NYC	--	--	--	36- 4	57-13	73-14	65- 4	56- 4	58- 4	51- 3
Norfolk, Va.	ORF	--	--	--	49-13	47- 5	96-29	86-12	73-14	74-18	70-16
Orlando, Fla.	ORL	6- 1	16- 4	22- 1	39- 8	69-22	65- 6	68- 6	59- 6	63- 7	63- 7
West Palm Beach, Fla.	PBI	--	--	--	42- 9	63-15	67- 8	79- 7	66-10	64- 8	66-12
Panama City, Fla.	PFN	--	--	--	--	--	82-22	91-18	75-16	79-23	91-28
Newport News, Va.	PHF	--	--	--	--	--	--	92-20	79-21	88-26	99-31
Philadelphia, Penn.	PHL	--	--	--	49-13	64-17	75-16	83- 9	64- 9	65- 9	79-20
Pensacola, Fla.	PNS	--	--	30- 7	49-13	45- 4	62- 5	122-35	74-15	77-20	67-13
Providence, R.I.	PVD	--	--	--	--	--	--	92-20	84-25	89-29	79-20
Richmond, Va.	RIC	--	--	--	--	--	76-19	94-25	83-24	93-30	--
San Diego, Calif.	SAN	--	--	--	--	--	--	--	89-29	97-32	91-28
Savannah, Ga.	SAV	--	--	--	--	53-9	72-11	94-25	84-25	66-11	82-25
San Francisco, Calif.	SFO	--	--	--	--	--	--	--	112-30	78-21	63- 7
Sarasota, Fla.	SRQ	--	13- 2	34- 8	44-10	55-11	75-16	95-30	75-16	78-21	68-14
Tallahassee, Fla.	TLH	--	--	25- 3	38- 7	54-10	66- 7	90-16	79-21	84-25	79-20
Tampa, Fla.	TPA	10- 4	12- 1	25- 3	31- 2	35- 1	51- 2	63- 3	51- 2	51- 2	47- 1
Valdosta, Ga.	VLD	--	--	--	--	58-14	72-11	94-25	--	--	--
Washington, D.C.	WAS	--	--	--	--	--	54- 3	66- 5	55- 3	61- 6	54- 5

the other major domestic airlines either blanket entire regions (e.g., Eastern, Braniff, Delta, Western, and Continental) or provide primary connections between the east and west coasts via many intermediate points (e.g., United, American, T.W.A., and Northwest). Thus, perhaps more than any other line, National can be considered to be Florida's own airline.

* * *

1. R. E. G. Davies, *A History of the World's Airlines* (London: Oxford University Press, 1964), p. 40.

2. Ibid., p. 55

3. John H. Frederick, *Commercial Air Transportation* (Homewood, Illinois: Richard D. Irwin Co., 1961), p. 72.

4. Frank J. Taylor, *High Horizons* (New York: McGraw-Hill, 1964), p. 77.

5. Davies, *History*, p. 132.

6. *The Official Aviation Guide of the Airways* (Chicago: The Official Aviation Guide Co., August 1935), p. 48.

7. *The Official Aviation Guide* (Chicago: The Official Aviation Guide Co., August 1939), p. 47.

8. Davies, *History*, p. 252.

9. Roy Roadcap, ed., *World Airline Record* (Chicago: Roadcap and Associates, 1965), p. 370.

10. For a discussion of connectivity matrices see K. J. Kansky, *Structure of Transport Networks: Relationships Between Network Geometry and Regional Characteristics*, University of Chicago, Department of Geography Research Paper no. 84, (Chicago, 1963), pp. 28-29; and Peter Haggett, *Geography: A Modern Synthesis* (New York: Harper and Row, 1972), p. 337.

11. For a description of the Beta index see Peter Haggett, *Locational Analysis in Human Geography* (New York: St. Martin's Press, 1966), p. 238.