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## Sources of Feeder Airline Businesses - Part III: Air Cargo

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# SOURCES OF FEEDER AIRLINE BUSINESS

## † PART III: AIR CARGO

By JOHN H. FREDERICK and WILLIAM J. HUDSON

The air transport industry can not hope to reach the status of a mature industry until the potentialities of carrying express and freight by air are fully developed. Until very recently little or no interest was shown by the airlines in the promotion of this type of traffic. Probably the main reason for this indifference has been that airmail contracts have provided the airlines with basic revenues with which to develop passenger traffic, and there was no pressing need to enter into any new and highly competitive field as a source of revenues. Moreover, airports have been built with the idea of serving passengers and without regard for the requirements that the handling of air cargo shipments would necessitate. In fact, the development of air cargo was placed in the hands of the Railway Express Agency, a ground transportation agency, with the result that business men and the public in general have been conditioned to thinking of air cargo or express as an auxiliary to rail transportation, instead of a distinct and separate type of transportation service. This laxity of the air carriers combined with the high rates charged for the carriage of air express unquestionably has been detrimental to the development of this new field of airline business.

The most pressing need at the moment, in connection with both feeder and trunk airline traffic, is an investigation of the possibilities for the development of air cargo. Before the potentialities of this type of operation can be approximated, something must be found out about the kinds of goods that are likely to be carried by air, where this traffic is likely to originate, and how much business there will be. An analysis of the present status of air cargo development and an examination of some of the major business indices might serve to clarify the possibilities of air cargo. Too, the importance of airport planning for efficiently handling air cargo is another aspect of the problem which deserves the closest attention of both

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† Editor's Note.—This is the fourth article in the feeder-airline series presented by the above authors. The first appeared in the January 1942 issue of this *Journal* in an article entitled "What Is a Feeder Airline?" The second appeared in the April 1942 issue under the title "Sources of Feeder Airline Business, Part I: Passenger Traffic." The third article is the second in this particular group under the title "Part II: Air Mail" and appeared in the July 1942 issue. The present article is the last in the series.

cities and the air carriers. In examining this problem this study will endeavor to relate its findings to the possibilities for handling air cargo shipments to and from small communities through the use of feeder airlines.

The function of feeder airlines is to tie into the trunk airline system the many small communities which do not now have direct access to air transport facilities. It is believed by many people both in the air transport industry and outside of it that the potentialities of air cargo, that is, freight and express shipments by air, offers a sound economic basis for that type of airline development. There are others who look upon small towns and cities as being parasitic or satellites attached to and dependent upon the larger cities for their economic well-being. Unquestionably whatever community of interest that exists between two cities, large or small, is a reciprocal association—they are dependent upon each other.

#### *Origination and Destination of Air Express Shipments*

As of March, 1941, the population of cities to which domestic air express tariffs applied was estimated at 41,460,000 with an off-airline population of 90,209,000. These off-airline cities received air express service over the rail lines by the Railway Express Agency to the nearest airline terminal point thence by air to destination. Approximately 30 per cent of all air express shipments were handled through coordinated rail and air service. The significant fact is that these off-airline shipments were far heavier and produced about 18 per cent more gross revenue per shipment than those moving entirely by air. For example, the average air revenue for off-airline shipments for April, 1939, was \$3.059 against \$2.60 average gross revenue for shipments between airline cities.<sup>1</sup> There is ample reason to believe that if these off-airline points were connected with the trunkline carriers a tremendous increase in air cargo shipments would result therefrom. It is to be expected that most air cargo will originate with or be destined to producers, wholesalers, and retailers. Normally air cargo shipments will not be originated by consumers though some consumer purchases from retailers may, under unusual circumstances, be delivered by air shipment.

Table I shows that in 1939, the latest date for which such data is available, the greater part of air express shipments were interstate or regional. The principal movement of traffic was from the north

1. Peterson, C. G., *Air Express and Freight, the Past, Present, and Future*, a paper presented at the Air Transport Session of the Institute of the Aeronautical Sciences, January 30, 1942. p. 22.

TABLE I  
DIRECTION OF FLOW OF AIR EXPRESS  
FOR TYPICAL STATES BY POUNDS, APRIL 1939\*

Forwarded from	Total forwarded to all states	Destination				
		New York	California	Illinois	Florida	Texas
New York .....	102,082	1,987	15,240	18,970	11,112	4,218
California .....	74,409	11,309	32,421	2,194	595	2,172
Illinois .....	44,021	13,025	4,043	166	1,503	2,764
Florida .....	6,443	1,033	396	495	196	1,415
		Total received from all states				
	397,701	60,037	68,835	36,542	20,950	19,269

\*Source: Peterson, C. G., "Air Express and Freight, the Past, Present, and Future," a paper presented at the Air Transport Session of the Institute of the Aeronautical Sciences, January 30, 1942. p. 24.

and northeastern states to the states of the south and west. The small number of intrastate shipments for each state was no doubt due to the lack of short-haul or feeder airlines having access to the towns and cities. Comparatively speaking, California was the exception to this condition because it is one of the largest states in area and has a more extensive airline development than most other states. While there are daily and monthly fluctuations in the number of shipments for each state the month of April 1939 was fairly representative of the current flow of air express shipments at that time. Since 1939, of course, the development of defense and war activities may have changed the situation here shown, but figures are not available for analysis here.

*The Volume and Commodity Characteristics  
of Air Express Shipments*

Much of the airlines' present air cargo business has been due to the rapid expansion of war industries. For the year 1941, the number of shipments by air express amounted to approximately

TABLE II  
AIR EXPRESS SHIPMENTS, 1940 AND 1941\*

Year	Gross Air Revenue	No. of Shipments	Weight (lbs.)	Ave. Wt. each (lbs.)	Ave. Chg. each	Revenue to air companies
1940	3,043,231	1,078,189	7,699,772	7.10	\$2.82	\$2,061,306
1941	4,234,993	1,310,313	11,165,812	8.50	3.22	2,865,407

\*Source: Peterson, C. G., "Air Express and Freight, the Past, Present and Future," a paper presented at the Air Transport Session of the Institute of the Aeronautical Sciences, January 30, 1942. p. 15.

1,310,313 and weighed a total of 11,165,812 pounds; compared to 1,078,189 shipments weighing 7,699,772 pounds in 1940. (See Table II). Not only was there a tremendous increase in the number of shipments and pounds of air express transported in 1941 over 1940, but the average weight of each shipment increased from 7.10 pounds to 8.50 pounds.

The detailed breakdown of air express shipments handled by the Railway Express Agency during the month of April for the years 1939 and 1941 shown in Table III will give some idea of the relative importance of the different classes of commodities to air express traffic. Of greatest importance are the shipments under machinery and hardware group which comprised 23.26 per cent of the total shipments in April, 1941; compared to 17.61 per cent in April, 1939. The impetus to shipments of machinery and machine parts of all kinds was due undoubtedly to the increased tempo of defense preparations which requires the immediate replacement of parts and the installation of new equipment in order to prevent the shut-down of plants engaged in war work.

While all categories of shipments showed a very large absolute increase in 1941 over 1939, several classes of shipments declined considerably in their relative importance to total shipments during this two year period. Machinery and hardware, printed matter, store merchandise, and valuables comprised about 66 per cent of total shipments in 1941, with the remaining 34 per cent of the total shipments made up of different kinds of goods.<sup>2</sup> It is evident from the following table that almost every item of traffic of high value and small bulk, such as the goods normally transported by the Railway Express Agency ground service, is sometimes transported by air.

The war has given renewed impetus to the air cargo business. The decentralization of war industries to the South and South-western states will have lasting effects on the economic organization of the country. Areas of the nation, particularly states in the South and West of the Mississippi River, whose economic potentialities have been undeveloped will find stimulation in this tendency toward decentralization of economic power. Decentralization will mean a greater regional specialization of production and will require greater

2. In October, 1941, the ten largest classes of lading reported by the air carriers, and their percentage of the total, were wearing apparel, 10.8%; electro-plates, 6.9%; legal papers, 6.8%; printed advertising, 6.6%; news photographs, 6.6%; magazines, 5.6%; miscellaneous machinery, 4.7%; bank securities, 4.7%; motion picture films, 4.7%; and electrical products, 4.2%. *Business Week*, February 14, 1942. p. 24.

TABLE III  
 AIR EXPRESS SHIPMENTS BY COMMODITY GROUPS, APRIL, 1939 AND 1941\*

Commodity groups	Shipments April, 1939 % of Total	Shipments April, 1941 % of Total
Machinery and hardware: including automobile, electric, machinery, aviation and oil	11,616	25,480
Printed matter: including newspapers and racing forms, magazines, prospectuses, drawings and advertising	11,975	16,553
Store merchandise: including clothing, textiles, cosmetics, shoes, furs, and millinery	8,995	14,668
Valuables: including valuable papers, bank and stockbroker shipments, gold, currency, etc.	7,930	9,038
Electros—matrices	4,563	6,697
Jewelry—optical: including silverware, watches, lenses, and cameras	2,445	4,875
Freight manifests	2,287	4,777
News Photos	3,982	4,844
Radio parts: including transcription records	1,828	4,962
Motion picture films: including theater properties, sound parts and news reels	3,199	4,737
Cut flowers	2,109	3,972
Personal baggage and other personal shipments	115	2,396
Food: including raw samples	1,396	1,952
Medical-chemical: including drugs, serums, surgical instruments	1,371	1,603
Miscellaneous: including liquor, plastics, glassware, furniture, live insects, etc.	2,140	3,010
<b>TOTALS</b>	<b>65,951</b>	<b>109,564</b>
	100.00	100.00

\*Source: Peterson, C. G., "Air Express and Freight, the Past, Present, and Future," a paper presented at the Air Transport Session of the Institute of the Aeronautical Sciences, January 30, 1942.

efficiency and economy in the distribution of goods. It appears that air cargo is destined to play an important part in providing modern transportation services in keeping with this new tendency toward decentralization of industry.

*The Geographic Distribution of Wholesale and Retail Sales and Establishments*

The flow of goods through the channels of distribution is a complex process. The movement of products from the producer of raw materials, to the manufacturer for processing and on to the wholesaler and retailer and ultimately to the consumer requires the extensive use of transportation facilities. How, then, may air transportation fit into the national transportation pattern so as to most effectively play its part in the processes of distribution?

While the number of producing units in the nation is quite large, the possibilities of air cargo development might be more adequately presented by an analysis of wholesale and retail establishments and sales. These are the business units which more nearly reflect the comparative business activity of the several states for they are the intermediate distributive points between the producer and consumer for a large variety of goods. The extent to which these business concerns are served by airline facilities will give some idea of the future needs for new air routes for air cargo shipments.

*Wholesale Sales and Establishments.* The 1939 Census of Wholesale Trade in the United States reports 200,583 wholesale establishments of which 119,140, or about 60 percent, are located in the densely populated and highly industrialized Middle Atlantic and East and West North Central regions of the country.<sup>3</sup> The remaining 40 per cent of these establishments are widely distributed over the other six geographic divisions as shown in Table IV.

About one-third of all wholesale establishments, in cities having scheduled airline stops, are located in the Middle Atlantic area giving that region nearly 74 per cent coverage of the wholesale business by direct air cargo facilities. Although the Pacific division has only 12.86 per cent of the wholesale establishments located at airline stops, it ranked second in the proportion of houses served

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3. Wholesales trade is divided functionally into six major groups by the Bureau of the Census. This functional division is (1) service and limited function wholesalers; (2) manufacturers' sales branches carrying stocks; (3) manufacturers' sales offices, which are separate places of business apart from plants, not carrying stocks; (4) petroleum bulk stations and terminals; (5) agents and brokers; and (6) assemblers of farm products.

TABLE IV  
 DISTRIBUTION BY GEOGRAPHIC DIVISION OF WHOLESALE ESTABLISHMENTS  
 IN THE UNITED STATES AND THE PROPORTION OF ESTABLISHMENTS  
 IN CITIES WITH SCHEDULED AIRLINE SERVICE IN 1940\*

Geographic Division	Number of wholesale establishments	Per cent of total wholesale establishments in U. S.	Number of wholesale establishments with scheduled air service	Per cent of total wholesale establishments with scheduled air service	Per cent of total wholesale establishments in division with scheduled air service
New England .....	10,107	5.04	5,449	5.36	53.91
Middle Atlantic .....	45,370	22.62	33,497	32.97	73.83
East North Central.....	40,634	20.26	19,831	19.52	48.80
West North Central.....	33,136	16.52	9,204	9.06	27.78
South Atlantic .....	17,426	8.69	7,699	7.58	44.18
East South Central.....	8,198	4.09	3,460	3.41	42.20
West South Central.....	18,470	9.21	6,624	6.52	35.86
Mountain .....	7,310	3.64	2,756	2.71	37.70
Pacific .....	19,932	9.94	13,064	12.86	65.54
TOTALS.....	200,583	100.00	101,584	100.00	50.64

\*Compiled from the 16th Census of the United States, Wholesale Trade, 1939, Bureau of the Census, 1941 and the Airline Traffic Survey, September, 1940, Civil Aeronautics Board, 1941.



with 65.54 per cent. The New England area has scheduled airline service to more than 50 per cent of the wholesale houses in that region but contributed only 5.36 of the total number of wholesale houses with scheduled air transport services. Airline coverage of wholesale establishments in the remainder of the geographic divisions ranged from only 27.78 per cent in the West North Central division to 48.80 per cent in the East North Central. These six regions, however, account for less than 50 per cent of the total wholesale establishments with direct access to scheduled air express service, but include approximately 63 per cent of the total wholesalers in the country.

In 1940, just 50 per cent of all the wholesale establishments included in the Census report were located in cities and towns having scheduled airline service. This means that wholesalers in off-airline cities could not avail themselves of direct air express and goods destined to or from these off-airline cities had to be handled by truck or rail to or from the nearest airline terminal. Certainly, in many cases, the time lost by having to ship via ground facilities, at least part of the way, is one of the major detriments to the development of air cargo in large volume.

The geographic distribution of wholesale sales as reported by the 1939 Census of Wholesaling is shown in Table V. It is significant that of \$55,265,640,000 of sales reported for the nation, \$42,488,295,000 of sales were made by establishments located in cities with scheduled airline services. The Middle Atlantic region accounted for 34.25 per cent of the total value of wholesale sales and 87.24 per cent of these sales were made in cities having direct air connections. The very high percentage of divisional coverage is accounted for by the fact that New York City, the largest jobbing center in the country, Philadelphia, and Pittsburgh are in this region. Each of the divisions, where the largest industrial development and jobbing centers are located, show a very high percentage of the total value of wholesale sales in their divisions with direct air cargo services. The East North Central region where such large cities as Chicago, Cleveland, Detroit and others are located had direct air connections for almost half of its wholesale establishments and covering 76.85 per cent of the sales in the region. Likewise, the Pacific division with Los Angeles, San Francisco, Seattle, and Portland had direct air service to cities where 78.47 per cent of the wholesale sales in that area were made. It is of interest to observe that although each of the remaining divisions have less than

TABLE V  
 DISTRIBUTION BY GEOGRAPHIC DIVISION OF WHOLESALE SALES  
 IN THE UNITED STATES AND THE PROPORTION OF SALES  
 IN CITIES WITH SCHEDULED AIR SERVICE IN 1940\*

Geographic Division	Amount of wholesale sales (add 000)	Percent of total wholesale sales in U. S.	Amount of wholesale sales made in cities with scheduled air service (add 000)	Percent of total wholesale sales made in cities served	Percent of total divisional sales made in cities served
New England	\$ 3,171,487	5.74	\$ 2,183,445	5.14	68.85
Middle Atlantic	18,931,269	34.25	16,515,547	38.87	87.24
East North Central	11,228,015	20.32	8,628,734	20.31	76.85
West North Central	5,808,272	10.51	3,992,777	9.40	68.74
South Atlantic	4,566,652	8.26	2,792,169	6.57	61.14
East South Central	1,964,803	3.55	1,316,768	3.10	67.02
West South Central	3,457,385	6.25	2,357,811	5.55	68.20
Mountain	1,088,587	1.97	738,848	1.74	67.87
Pacific	5,049,170	9.14	3,962,196	9.32	78.47
TOTALS	\$55,265,640	100.00	\$42,488,295	100.00	76.88

\*Source: Compiled from the 16th Census of the United States, Wholesale Trade, 1939, Bureau of the Census, 1941, and the Airline Traffic Survey, September, 1940, Civil Aeronautics Board, 1941.

50 per cent of their wholesale houses served by air transportation, in no instance is less than 60 per cent of the values of the total wholesale sales in these regions within reach of air express service.

This analysis of the distribution of wholesale establishments and sales indicates that, with respect to the wholesale trade of the country, one-half of the business houses accounting for three-fourths of the dollar value of the total wholesale business have direct access to scheduled airline services. Since the major air carriers rendered scheduled services to only 211 cities and towns in the United States in 1940, it is evident that the largest volume of wholesale business is concentrated at relatively few cities which are the marketing and jobbing centers for the several geographic divisions. High concentration of wholesale trade in the very large population centers is shown by the fact that the fourteen cities (including the District of Columbia), each with a population of more than 500,000 in 1940, contributed 31 per cent of the wholesale establishments and 52 per cent of the sales for the country. These fourteen cities, however, accounted for only 17 per cent of the population. Cities of 100,000 to 500,000 population contributed 23 per cent of wholesale sales, but only 12 per cent of the population. Approximately two-thirds (66 per cent) of the population but only 20 per cent of wholesale trade is found in cities of less than 50,000 population and in rural areas.<sup>4</sup>

This concentration of wholesale business does not negate the value of feeder airlines for a large proportion of the wholesale sales by establishments located at airline stops were to other establishments located in communities outside of the city in which they are situated. Wholesalers in many cities serve a trading area extending from 50 to 100 miles around the city in which they are located. The trunkline air carriers are not equipped to handle short-haul traffic so the development of air cargo traffic of that kind must necessarily be undertaken by feeder airlines if small communities are to have direct air service at all.

*Retail Sales and Establishments.* The figures in Table VI show that only 574,922 of the 1,770,355 retail establishments in the United States are located in cities having scheduled airline services. That just one-third of these retail stores are situated at airline stops is accounted for by the fact that a retail store, unlike the wholesale business, is usually a small local business enterprise. All cities and towns have retail stores of one kind or another, but a wholesaler

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<sup>4</sup> *Sixteenth Census of the United States, Wholesale Trade: 1939, United States Summary, Bureau of the Census, March 31, 1941, p. 1.*

TABLE VI  
 DISTRIBUTION BY GEOGRAPHIC DIVISION OF RETAIL ESTABLISHMENTS  
 IN THE UNITED STATES AND THE PROPORTION OF ESTABLISHMENTS  
 IN CITIES WITH DIRECT AIR SERVICE IN 1940\*

Geographic Division	Number of retail establishments	Per cent of total establishments in U. S.	Number of retail establishments with scheduled air service	Per cent of total retail establishments with scheduled air service	Per cent of total civil aviation retail establishments with scheduled air service
New England	121,888	6.88	26,538	4.61	21.77
Middle Atlantic	412,819	23.32	184,792	32.14	44.76
East North Central	364,508	20.58	129,729	22.56	35.59
West North Central	197,909	11.18	33,389	5.81	16.87
South Atlantic	199,371	11.26	53,036	9.22	26.60
East South Central	101,065	5.71	21,658	3.77	21.43
West South Central	159,768	9.02	40,375	7.02	25.27
Mountain	57,459	3.25	16,233	2.84	28.25
Pacific	155,568	8.79	69,172	12.03	44.46
TOTALS	1,770,355	100.00	574,922	100.00	32.47

\*Source: Compiled from the 16th Census of the United States, Census of Business, Volume I, Retail Trade: 1939, Part 3, Bureau of the Census (1941), and the Airline Traffic Survey, September, 1940, Civil Aeronautics Board (1941).

must locate in the larger cities serving as trading centers for a larger area comprised of many small communities.

The geographic distribution of retail establishments in the United States is almost identical, on a percentage basis, with the distribution of wholesale establishments. Two exceptions are the South Atlantic division which has only 8.69 per cent of the total number of wholesale houses reported but accounts for 11.26 per cent of the total retail establishments and the West North Central region with 16.52 per cent of the total wholesale establishments but only 11.18 per cent of the total retail establishments reported.

The dispersion of retail businesses among the many towns and cities of the country is indicated by the fact that just 32.47 per cent of all such stores are located at airline terminal points. Moreover, the Middle Atlantic, East North Central, and Pacific divisions, where the largest cities are located, each have less than 50 per cent of the retail stores served by air carriage in contrast to more than three-fourths of their wholesale establishments. The inadequacy of airline coverage of the retail business of the nation is so obvious that further comment is unnecessary other than to conclude that if the business houses of the country are to receive the benefits of air cargo and other air transportation services, there must be a considerable expansion of air routes and airline stops to include the smaller centers of population.

A much larger proportion of retail sales were made in cities serving as airline stops in relation to the percentage of establishments located at those points. Table VII indicates that of the \$42,014,790,000 of retail sales made in 1939, \$17,547,082,000 or 41.74 per cent, were made in the 211 cities served by the major air carriers.<sup>5</sup> The Middle Atlantic, West North Central, and Pacific divisions reflect a higher percentage of total retail sales made in cities served compared to the percentage of total retail sales in the United States made by their divisions. This may be explained by the fact that the cities of largest population are situated in these divisions and because these are regions of the greatest commercial and industrial activity in the United States.

5. Wholesale sales are in excess of total retail business by approximately \$13,000,000,000. This difference according to the Bureau of the Census is due to several factors. In addition to selling to retailers, many wholesalers conduct an export business, and it is the practice of some classes of wholesalers, notably agents and brokers, to sell to other wholesale establishments. Also, many sell raw materials and capital goods to industrial, commercial, institutional and professional users; goods that normally do not move through retail channels *Ibid.*, p. 2.

TABLE VII

DISTRIBUTION BY GEOGRAPHIC DIVISION OF RETAIL SALES  
IN THE UNITED STATES AND THE PROPORTION OF  
SALES IN CITIES WITH AIR SERVICE IN 1940\*

Geographic Division	Amount of retail sales (add 000)	Per cent of total retail sales in U. S.	Amount of retail sales made in cities served (add 000)	Per cent of total retail sales made in cities served	Per cent of total divisional retail sales made in cities served
New England	\$ 3,318,214	7.89	\$ 1,008,693	5.75	30.40
Middle Atlantic	10,291,937	24.48	5,275,724	30.07	51.26
East North Central	9,251,114	22.00	4,255,882	24.25	46.00
West North Central	4,138,883	9.84	1,227,432	6.99	29.66
South Atlantic	4,368,947	10.39	1,878,987	10.71	43.01
East South Central	1,845,037	4.39	727,921	4.15	39.45
West South Central	3,101,358	7.38	1,261,570	7.19	40.68
Mountain	1,427,541	3.39	645,198	3.62	44.50
Pacific	4,298,759	10.22	2,275,675	12.97	52.94
<b>TOTALS</b>	<b>\$42,041,790</b>	<b>100.00</b>	<b>\$17,547,082</b>	<b>100.00</b>	<b>41.74</b>

\*Source: Compiled from the 16th Census of the United States, Census of Business, Volume I, Retail Trade: 1939, Part 3, Bureau of the Census (1941), and the Airline Traffic Survey, September 1940, Civil Aeronautics Board (1941).

The New England and West North Central divisions, each, show a smaller percentage of retail sales compared to the total retail sales made in cities located on airline stops than they do for total retail sales in the country. This is accounted for by the fact that the new England region contains many small towns and has few airline stops while the West North Central region, though more sparsely settled and having fewer cities, is of large area with a small number of airline stops. The other divisions show approximately the same percentage relationship for both total sales and sales made in cities served by scheduled air carriers.

The fact that only about 32 per cent of retail establishments accounting for 41 per cent of retail sales have direct air service suggests that insofar as replenishment of stocks from manufacturers or wholesalers is concerned, the retail business of the country is primarily dependent upon ground transportation facilities. Cargo carrying planes of feeder airlines might be used to provide through air service for such transactions. But from the point of view of consumer retail purchases, the local nature of these transactions does not offer much opportunity for the use of air services.

It must be remembered that in a country like the United States with such extensive geographic boundaries and with such a variety of natural resources often found far removed from centers of population, speed in the movement of goods is essential. Some of the principal geographic divisions of the country are predominantly agricultural while others are mainly industrial. Manufactured surpluses are found in the New England, Middle Atlantic and East North Central regions while agricultural surpluses occur principally in the West North Central, East South Central, West South Central, Mountain and Pacific regions. This production pattern requires the broad movement of goods over long distances and into thousands of communities large and small. These factors make it imperative to have available at all times the most modern and efficient transportation services. Air cargo will undoubtedly provide the next major improvement in our distribution process. There will be room for feeder airlines in the air cargo field. The existing trunk line carriers will benefit from this kind of air transport development. The shipping public will benefit immeasurably by the increased and more rapid services which will be made available to them.

*The Airport Problem*

The problem of air cargo services to small communities lies only in part in the technical development of suitable aircraft and operating procedures. The establishment of air cargo routes, and all other air routes, is equally dependent upon the adequacy of airport facilities at the communities intended to be served. Airport inadequacy has been the primary retarding factor in the expansion of air transport services in the United States. Even though suitable equipment were available and a rational rate structure determined upon now, few new scheduled airline stops could be added to the airway system because of the poor quality of existing airports. The possibility of an economically sound air cargo service would be greatly increased by the development of a national airport system designed to meet the requirements for air cargo as well as air mail and passenger services.

In the planning of an airport system, airports may be placed either with respect to the distribution of population and of business activity or with reference to a somewhat uniform geographical distribution. In connection with the former, the Civil Aeronautics Authority in 1938 estimated that there would be needed a total of about 3,000 airports in order that there might be an airport within 30 minutes driving distance of every reasonably compact population group of as many as 5,000 persons and within 1 hour's driving time of all sections having a mean population density of as much as four persons per square mile. With reference to a uniform geographical distribution, airports could be so located that every point in the United States would be within 15 miles of an airport, if slightly more than 5,000 fields were maintained.<sup>6</sup>

When these two plans are compared to the present status of airport facilities as shown in Table VIII, it may be seen that airport development is considerably under the minimum suggested for either of the suggested bases. The numerical inadequacy of present airport facilities is further complicated by the fact that many of these existing airports are too small for commercial use and lack service facilities for the handling of air transport traffic, either passenger or cargo.

The airport summary as given in Table VIII indicates that at the beginning of 1942 only nine per cent of the total commercial, municipal and intermediate airports were authorized to be used by

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6. *Airport Survey*, Report to the Congress of the United States by the Civil Aeronautics Authority, March, 1939, pp. 82-83.



TABLE VIII  
 THE LOCATION BY GEOGRAPHIC DIVISION OF COMMERCIAL, MUNICIPAL,  
 AND INTERMEDIATE AIRPORTS AND THEIR UTILIZATION BY SCHEDULED  
 DOMESTIC AIR CARRIERS AS OF JANUARY 1, 1942\*

Geographic Division	Total airports <sup>1</sup>	Per cent of total airports	Number of airports serving scheduled airline stops	Per cent of total airports serving scheduled airline stops	Per cent of airports utilized
New England .....	97	4.22	17	8.06	13.40
Middle Atlantic .....	238	10.35	16	7.58	6.72
East North Central .....	406	17.66	24	11.37	5.91
West North Central .....	266	11.57	28	13.27	10.53
South Atlantic .....	322	14.01	31	14.69	9.63
East South Central .....	102	4.44	21	9.95	20.59
West South Central .....	304	13.22	22	10.46	7.24
Mountain .....	313	13.61	32	15.16	10.22
Pacific .....	252	10.96	20	9.48	7.94
<b>TOTALS</b> .....	<b>2,299</b>	<b>100.00</b>	<b>211</b>	<b>100.00</b>	<b>9.18</b>

\*Source: Civil Aeronautics Authority, *Civil Aeronautics Journal*, January 5, 1942.  
<sup>1</sup>Army, Navy, miscellaneous Government and private airports number 185 omitted.

scheduled air carriers. Both the number of existing airports and the number designated as scheduled airline stops appear to be relatively evenly distributed between the several geographic divisions. The important fact to note is the very small percentage of utilization of these airports for scheduled airline service. This situation, as was mentioned earlier, is explained by the fact that the great majority of the fields are beneath the minimum requirements for commercial use.<sup>7</sup>

Probably the main reason why airports do not come up to the minimum standards required for commercial air transportation is that most of them are not paying their way. Of approximately 650 municipal airports in the United States investigated in 1940 not more than 15 per cent were paying their way or breaking even. The remainder had operating deficits, requiring appropriations out of general municipal tax funds to balance their budgets.<sup>8</sup> Local governments are reluctant to spend money for the support and maintenance of airports unless they can receive the benefits of scheduled airline service. The burden of airport maintenance falls especially hard on smaller cities and on cities of limited resources. Unlike most public improvements which may be proportional in size and expense to the size of the city, the landing area of an airport of a city of a hundred thousand population must be the same size as the landing area on an airport of a million population to accommodate the same size planes. Other improvements such as the quality of the runways, the standard of the lighting equipment must be the same on an airport owned by a small city as on an airport owned by a large city.

Commercial air transportation is now at the point where its continued development can be seriously handicapped by lack of airport planning. Even the newest airports have been built with the idea of serving passengers and without providing adequate

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7. *Ibid.* pp. 31-32. The tentative minimum standards for airports set up by the Civil Aeronautics Authority are divided into four classes; Class I having the lowest rating and Class IV the highest. The major differences among the four classes are found in the size of landing area as expressed in lengths of landing strips required and in the specifications for navigational and servicing facilities.

The Authority classified the 1,907 civil airports existing January 1, 1939 and found that 85 per cent of them were of Class I, while 3 per cent could not support a Class I rating. About 10 per cent were Class II, two per cent Class III, and not a single airport which would meet all of the requirements for Class IV.

Of the 206 airports designated for use by scheduled air carriers in 1939, one-third were in Class I, a little over half in Class II, and only about one-tenth in Class III.

Since this survey in 1939 the standards of many airports have been raised with the aid of Federal funds administered by the Civil Aeronautics Board and the War Department.

8. *Financing Municipal Airport Operation*, Report No. 143 of the American Municipal Association, Chicago, December, 1940, p. 1.

terminal facilities for handling present or future air cargo. The development of air cargo traffic will bring about a differentiation or specialization of airports which will require a diversity of airport development to meet the needs of each locality. Large cities will require separate airports for serving passengers and for handling air cargo. A single airport may suffice for all types of traffic in communities of small size, and depending upon the nature of its business activities.

The small cargo carrying plane of the type which would be operated by feeder airlines provides the logical means for transporting property for short distances from or to major terminal points where they can be transferred to through flights. Shippers, however, will use air cargo only if it is more advantageous to them than the services of competing ground carriers. The important advantages of air transport service are speed and frequency of schedules. And without airports of proper design to insure efficient handling and transfer of shipments, the saving in air-transit time on short-haul flights will be lost. It becomes apparent, therefore, that airports for handling air cargo should be located as near as possible to the business district of a city so as to be in close proximity to the terminals for other methods of transportation and to cut down the distance and, consequently, the time required to render fast truck pick up and delivery service for air shipments. This will require that all ground handling equipment and methods be extremely efficient in order to provide for rapid loading and unloading between scheduled flights and the proper coordination of air and ground carriers.

For those communities which are too small to support an airport of sufficient size to permit the landing of regular cargo carrying planes, air cargo services might be provided through the use of small planes equipped with an automatic pick-up and delivery device such as is now used by All American Aviation and which provides that type of service in several eastern states. This would permit the pick-up and delivery of small parcels while the plane is in flight and obviate the necessity for heavy investment by a small community in an airport beyond the requirements to serve its needs.

Until proper airports and ground handling facilities are provided, the development of air cargo will be hampered. This is a problem which demands the interest of business men and local government officials as well as the airlines. The present air carriers are more than anxious to make their services available to

the public wherever and whenever they are needed, but they cannot do so without the wholehearted cooperation of the shipping public. In this respect the business interests of a community can provide much valuable information to local planning committees and the air carriers on which the present and future airport requirements best suited to meet the needs of the community may be based.

### *Conclusion*

In summarizing the preceding discussion it may be said that the rapid growth of air cargo business in recent years indicates that a more comprehensive development of that phase of air transport service in the future is possible. Whenever speedy transmission of property is required, air cargo is the logical means of transportation. That many types of merchandise may be profitably carried by air was shown by the commodity breakdown of air express shipments. What additional products and how much will be transported by air in the future is largely unpredictable and will depend upon technological developments in equipment design and construction. But even with present equipment air cargo operations could be expanded tremendously if the air carriers had access to the hundreds of small communities not now served by scheduled airlines. This would require the establishment of feeder airlines using small planes to provide short-haul air cargo service to and from terminal points and small communities and between small communities.

From an operations standpoint a major handicap to the development of an adequate air cargo system has been the lack of airports designed and constructed to meet the needs for this specialized type of service. Although much can be done to overcome this present condition by the improvement of existing airports, what is really needed is a national airport plan which will coordinate local, regional, and national airport requirements into an integrated whole. In this plan airport requirements for the efficient handling of air cargo shipments is a major factor to be considered and it is the responsibility of the shippers and other business interests in each community to see that the possibilities of air cargo are regarded in their proper light.