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EFFECTS OF COMPETITION AND CHANGES IN ROUTE STRUCTURE ON GROWTH OF DOMESTIC AIR TRAVEL

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IN appearances before the Civil Aeronautics Board, many applicants and civic bodies claimed that the addition of competitive carriers on a route caused large increases in air travel. Also, they claimed that astronomical growth of air travel followed certification and operation of one-carrier service on routes formerly served by the connecting service of two or more carriers. These claims were based on comparisons of prewar and postwar travel taken from surveys of the Civil Aeronautics Board. American Airlines questioned the validity of many such claims, since they were based upon selected statistics, that did not show average growth tendencies of the industry.

American Airlines, therefore, decided to make a study of prewar and postwar air travel using a sample that would be broad enough to show true growth tendencies. In this sample, all of the travel was classified so as to isolate the effects of added competition and institution of one-carrier service for the first time. It was found that these factors affected growth of air travel to only a small extent, far less than has generally been claimed. It was found that other factors, not so generally recognized, caused a large part of the growth of air travel that was credited to competition and substitution of one-carrier service.

In order to determine, separately, the effect on travel growth of competitive and one-carrier service, the air travel between city-pairs was classified, and average rates of growth from the prewar to the postwar period of groups with similar travel content were compared. The effect of extraneous factors, such as growth of national income, was minimized, since they affected all groups to the same extent. The travel between city-pairs was divided into five classifications.

1. City-pairs between which "first one-carrier" service was authorized in the postwar period, but which had received connecting service by two or more carriers prewar.
2. City-pairs between which "connecting-only" service was provided in both periods.
3. City-pairs between which one-carrier service was provided in the prewar period, but which received competitive service from

one or more additional carriers postwar; these were termed "competition-added."

4. City-pairs between which the same single carrier provided service in both periods; these were termed "same one carrier."
5. City-pairs between which the same two or more competing carriers provided through service in both periods; these were termed "same competitive."

In order to classify travel as competitive or one-carrier, the following rules were used:

1. An airline must have carried 20 per cent as much traffic as the leading carrier in order to be classified as a competitor. Intent was to show real competitive impacts, not potential competition.¹
2. One-carrier service must have been used by at least 20 percent of the travel between city-pairs; otherwise the segment was classified as "connecting-only," since connecting carriers obviously provided the essential service. The 20 per cent rule was applied to prewar and postwar travel.
3. Interchange travel was considered as one-carrier travel between city-pairs where one-plane service was provided, since very little difference was found in rates of growth.²
4. If another carrier, because of its changed route structure, captured over 80 per cent of the travel formerly carried by a carrier with a more circuitous route, it was classified as "first one-carrier" travel.

THE SAMPLE

It was recognized that the size of the sample was important, if the survey was to be unbiased. For this reason, the survey covered *all* traffic to and from the first ten³ traffic markets of the nation, which were New York/Newark, Chicago, Los Angeles/Long Beach, San Francisco/Oakland, Washington, Detroit, Boston, Miami, Dallas/Fort Worth and Seattle. September 1940 travel was compared with September 1948 travel for all cities except Miami, for which March 1941 and March 1949 travel was compared, for seasonal reasons.⁴ This sample represented over 35 percent of the nation's domestic airline travel.

City-pairs with travel from 60 to 6000 postwar passengers per month were included, unless the prewar volume of travel was less than five per month. Inclusion of segments with more than 6000 passengers per month would have greatly distorted averages, and therefore tended

¹ See Appendix III for 17 additional segments where competition penetrated as low as 10 percent. Reclassification would have made no material difference in the results of this survey.

² The interchanges considered were: United-Western interchange in September 1940, and Trans World-Delta interchange in September 1948 and March 1949.

³ Based on Passenger Miles.

⁴ Data from last prewar surveys by Civil Aeronautics Board is compared with Board's last published postwar surveys. September was ordinarily the largest travel month for most U. S. cities, but for Miami, March was much larger and more comparable.

to hide the growth characteristics of the many smaller segments.⁵ City-pairs with less than 5 prewar passengers were regarded as too immature to consider; nevertheless, their inclusion would have made no material change in results of this survey.⁶ City-pairs less than 150 miles apart were eliminated, except four city-pairs separated by natural barriers, which were retained, since ground travel required far more than 150 miles.⁷ In a few instances, travel of two adjacent cities was combined. To have considered travel from each separately would have distorted the survey, since the proximity of the airports allowed their alternate use.⁸

COMPARISON OF RATES OF GROWTH

1. Effect of "First One-Carrier" Service

In order to measure the effect on travel growth of the substitution of "first one-carrier" service for "connecting-only" service, a comparison was made of the growth experienced by the city-pairs receiving each type of service. This comparison showed that first one-carrier service stimulated the average rate of growth to only a limited extent.

Travel Classification	Number of City-Pairs	Passengers		Average Growth Ratio—Postwar to Prewar
		Prewar	Postwar	
First one-carrier	155	8,014	60,775	7.58
Connecting-only	57	1,456	9,818	6.74

Travel on 155 segments receiving one-carrier service for the first time in the postwar period was 7.58 times greater than prewar; however, travel on 57 segments receiving connecting-only service was 6.74 times greater. A comparison of the relative rates of growth showed that the first one-carrier travel grew only 12.5 percent faster than connecting-only travel.

As compared with the extravagant claims, it appeared that the stimulating power of one-carrier service was overrated, and that the development of connecting travel was greatly underrated. Many carriers were eager to provide effective connecting service, and the public patronized it well. The quality and convenience of well-coordinated, end-to-end connecting service, operated with the finest planes and with few stops was not generally appreciated by such claimants.

2. Effect of Added Competition

The effect of added competition on travel growth was measured by comparing average growth of segments, where competition was added in the postwar period, with that between city-pairs which continued to receive service from a single carrier in both periods. This comparison

⁵ See Appendix III-B.

⁶ See Appendix III-A.

⁷ City-pairs included and their railroad mileages were:

Chicago-Muskegon	193	Detroit-Akron	231
Chicago-Grand Rapids	184	Washington-Norfolk	224

⁸ Buffalo-Niagara Falls, Tampa-St. Petersburg, and Hartford-Springfield.

indicated that the addition of service by competing carrier had very little effect on the rate of growth of air travel.

Travel Classification	Number of City-Pairs	Passengers		Average Growth Ratio—Postwar to Prewar
		Prewar	Postwar	
Competition added	92	26,414	118,198	4.47
Same one-carrier	267	38,871	168,880	4.34

Travel on 92 segments, where competition was added, was 4.47 times greater in the postwar period, but travel on 267 segments served by a single carrier was 4.34 times greater. The difference in average rates of growth was only 3 percent, a comparatively minor difference. This comparison, showing the small increase in growth following the certification of competing carriers, reveals that such certification merely results in the distribution of normal traffic among more carriers. As a matter of fact, on some routes, where traffic volumes were small, adding competition caused all carriers to experience difficulty in operating profitably. The Civil Aeronautics Board has recognized this problem on some routes and has initiated investigations.⁹

3. Effect of Unchanged Competition

The last comparison showed that travel on segments served by competitive carriers in both periods did not grow as rapidly as travel between city-pairs served by a single carrier. This statistical finding was completely contrary to claims of those who have supported the proposition that competition has acted as a tremendous and continuous spur to travel growth.

Travel Classification	Number of City-Pairs	Passengers		Average Growth Ratio—Postwar to Prewar
		Prewar	Postwar	
Same competition	18	9,079	30,382	3.35
Same one-carrier	267	38,871	168,880	4.34

Travel on 18 segments given one-carrier service by competing carriers was only 3.35 times greater in the postwar period. This growth rate was 23 percent less than that of travel between 267 segments served by a single carrier in both periods. Travel on these latter segments was 4.34 times greater in the postwar period.

The sample indicated that competition did not provide any continuous stimulating effect.

OTHER FACTORS AFFECTING TRAVEL GROWTH

Since competition and changes in route structure had only a minor influence on domestic air travel growth, further examination of the data was made in order to determine what factors did affect growth. It was found that several other factors had considerably more effect, but that an examination of individual city-pairs was required if their

⁹ Routes under investigation are those between Chicago and Washington (Docket No. 3660), between Twin Cities, Detroit and Washington (Docket No. 3661), and between New York and Detroit (Docket No. 3662).

growth characteristics were to be understood. The most important factors which aided or hindered growth are treated below.

1. Volume of Travel Between City-Pairs

Travel between city-pairs was classified by postwar intercity volume in order to determine whether a relationship existed between the size of segment and the rate of growth. The sample showed:

<i>Postwar Travel Volume Per Month Between City-Pairs</i>	<i>Number of City-Pairs</i>	<i>Postwar Travel</i>	<i>Average Growth Ratio—Postwar to Prewar</i>
60 to 300 passengers	316	11.8%	5.02
301 to 600 passengers	104	11.6%	5.24
601 to 1500 passengers	97	23.5%	4.82
1501 to 6000 passengers	72	53.1%	4.36
	589	100.0%	4.63

Included in the 316 city-pairs in the 60 to 300 volume group were the only four city-pairs experiencing a negative growth. Inclusion of these pairs pulled down the group average from 5.36 to 5.02 which was below that of the 301-600 volume group.¹⁰ Taking this factor into consideration, the table indicated that there existed an inverse relationship between volume and growth. The larger the travel volume, the slower was the rate of growth.

This trend was set by the competition-added travel, the same one-carrier travel, and the same-competitive travel, which constituted 82 percent of the travel in the sample, although constituting only 64 percent of the number of city-pairs.¹¹

This inverse trend can be explained. During prewar years, carriers emphasized development between larger cities. Postwar, more attention was given to travel between smaller cities and larger travel increases resulted.

This study is of further interest in that it showed the effects of competition on different volumes of travel.

<i>Postwar Travel Volume per Month</i>	<i>Competition Added</i>		<i>Same One-Carrier</i>	
	<i>City- Pairs</i>	<i>Growth Ratio</i>	<i>City- Pairs</i>	<i>Growth Ratio</i>
60 to 300 passengers	27	4.11	131	4.24
301 to 600 passengers	19	4.85	54	4.87
601 to 1500 passengers	18	4.39	53	4.36
1501 to 6000 passengers	28	4.48	29	4.23

In the 60-300 and 301-600 volume groups, where the added competition was generally incidental to the other purposes of the route structure change, the segments on which competition was added showed slower growth than the segments served by a single carrier. Competition on these routes, with small volume, was especially harmful. The costs of the competing carrier were added, but no additional revenues were generated to offset them. In the 601-1500 group, where the added competition may either have been by design or incidental, the competi-

¹⁰ See Appendix III-C.

¹¹ See Appendix I.

tion-added segments grew less than one percent faster. In the 1501-6000 group, where competition was often added by design in hopes of greatly stimulating travel, but almost invariably without findings of inadequacies of existing one-carrier services, the average rate of growth on segments where competition was added was only 6 percent greater than on segments without the added competition. Even on these large segments, therefore, no real increases in travel were generated as an offset against the substantially increased costs.

2. Leveling-Off of Air Travel

The tendency of travel to level-off is related to its stage of development in the prewar period as reflected in the volume of travel. Therefore, the tendency for growth to level-off is more pronounced on the larger segments where development is most advanced.

Leveling-off of travel on entire routes was in evidence before the war. This was shown in Civil Aeronautics Board statistics of traffic growth (passenger miles) on the various routes from September 1940 to September 1941, when average growth-ratio was 135 percent.

<i>Leveled-Off Growth</i>		<i>Very Rapid Growth</i>	
AAL Route	7—118%	BNF Route	9—164%
EAL Route	5—121%	EAL Route	6—168%
NWA Route	3—119%	CAP Route	14—184%
TWA Route	44—122%	WAL Route	13—166%

The great variations in growth shown above resulted from differences in the stages of development in September 1940. For example, American's Route 7 and Trans-World's Route 44 grew at relatively slow rates. Both routes lay in the New York-Chicago, Northeastern region, Route 44 extending to Kansas City. In this region, the previous development of competitive and non-competitive travel was intense. All important segments enjoyed high quality prewar service, and no material mileage savings were possible. Travel volume was beginning to level-off, and therefore grew at a slower rate than it did on segments that were immature and underdeveloped during prewar periods.

3. Reduction in Mileages

Between many city-pairs, certification of first one-carrier service resulted in substantial reduction of air route mileage, and in most instances this was accompanied by correspondingly reduced fares. Effects on travel growth are clearly shown in segments listed below:

<i>City-Pairs with First One-Carrier Service</i>	<i>Reduction in Circuity</i>	<i>Passengers</i>		<i>Average Growth Ratio—Postwar to Prewar</i>
		<i>Prewar</i>	<i>Postwar</i>	
Miami-Cincinnati	11%	72	921	12.8
Miami-Cleveland	15%	143	1,759	12.3
Dallas/Ft. Worth-San Diego	15%	7	210	30.0
New York-Columbia, S. C.	17%	12	202	16.8
Dallas/Ft. Worth-Denver	19%	10	462	46.2
Detroit-Indianapolis	24%	67	1,234	18.4
Washington-Syracuse	29%	55	925	16.8
Total		366	5,713	15.6
Average for 155 segments receiving First One-Carrier Service				7.6

From the foregoing tabulation, it was evident that large reduction in mileage and fares stimulated the rates of growth.

Between city-pairs, where certification of first one-carrier service resulted in little or no reduction in circuitry, the rate of growth was small.

<i>City-Pairs Growth First One-Carrier Service</i>	<i>Reduction in Circuitry</i>	<i>Passengers Prewar</i>	<i>Passengers Postwar</i>	<i>Average Growth Ratio—Postwar to Prewar</i>
Boston-Pittsburgh	4%	190	1,102	5.8
New York-Portland, Me.	4%	335	1,961	5.9
Boston-Richmond	3%	29	169	5.8
New York-Birmingham	3%	186	723	3.9
Chicago-Richmond	0%	42	219	5.2
Washington-Kansas City	0%	120	572	4.8
Boston-New Orleans	0%	35	139	4.0
Total		937	4,885	5.2
Average for 155 segments receiving First One-Carrier Service				7.6

It is evident that when mileage reductions were small or nil, tendency of first one-carrier to stimulate growth was much less.

Reduction in mileage has also resulted in greatly increased growth of other types of travel.

<i>City-Pairs</i>	<i>Reduction in Circuitry</i>	<i>Passengers Prewar</i>	<i>Passengers Postwar</i>	<i>Average Growth Ratio—Postwar to Prewar</i>
(a) Connecting-only travel				
Los Angeles-New Orleans	7.8%	32	306	9.56
Seattle-Dallas/Ft. Worth	14.2%	8	118	14.75
Chicago-Bristol	29.0%	10	135	13.50
Total		50	559	11.18
Average for 57 Connecting-only Segments				6.74
(b) Same One-Carrier Travel				
Los Angeles-Oklahoma City	15.5%	34	527	15.50
Los Angeles-Tulsa	15.3%	31	476	15.35
Washington-Tulsa	15.3%*	33	315	9.55
Total		98	1,318	13.45
Average of 267 Same One-Carrier Segments				4.34
(c) Same Competitive				
Dallas/Ft. Worth-Chicago	11.1%	421	2,093	4.97
Average of 18 Same Competitive Segments				3.35

* Prewar distance computed via Chicago via AAL.

Thus, the factor of reduced mileage encouraged growth of all types of travel, and appeared to have been much more important than type of service.

These examples all pointed to the same general trend, the greater the reduction in mileage and fares, the greater the growth, irrespective of type of service.

4. Mileage Between City-Pairs

Classification of city-pairs by postwar mileage ranges, indicated that mileage between city-pairs had little influence on travel over 1,000 miles as shown by the following:

<i>Range</i>	<i>Number of City-Pairs</i>	<i>Percent of Travel Sample</i>	<i>Average Growth Ratio--Postwar to Prewar</i>
Over 2,000 miles	48	5.0%	5.58
1601 to 2000	50	5.9%	6.66
1201 to 1600	59	5.7%	6.02
1001 to 1200	55	7.3%	6.46

This long range travel represented a little less than one-fourth of the travel sample.

In the ranges below 1,000 miles, which constituted more than three-fourths of the travel sample, the rates of growth tended to decline as the distances became less, as clearly shown below:

<i>Range</i>	<i>Number of City-Pairs</i>	<i>Percent of Travel Sample</i>	<i>Average Growth Ratio--Postwar to Prewar</i>
1001 to 1200 miles	55	7.3%	6.46
801 to 1000	75	9.1%	5.18
601 to 800	87	10.7%	5.25
401 to 600	95	17.9%	4.19
400 and below	120	38.5%	3.97

Below 1000 miles, competition from railroads became progressively greater, and the advantages of air transportation became less pronounced; air travel growth was correspondingly retarded.

A detailed breakdown of travel growth at different ranges by types of service is shown in Appendix II. It will be noted that above 1600 miles connecting-only traffic developed considerably more than any other type of service.

5. Improvement of Airports

Improved airports at several cities have increased the reliability of service and encouraged carriers to increase frequency of service and to schedule flights at better hours. Two such cities on American's system were Charleston, W. Va., and Scranton-Wilkes Barre, Pa. In both instances, new hilltop airports were developed replacing valley airports. Results showed:

<i>City-Pairs</i>	<i>Passengers</i>		<i>Growth Ratio Postwar to Prewar</i>
	<i>Prewar</i>	<i>Postwar</i>	
(a) With Competition Added			
Boston-Charleston, W. Va.	19	121	6.4
New York-Charleston, W. Va.	93	1,105	11.9
Washington-Charleston, W. Va.	104	904	8.7
Chicago-Scranton/Wilkes Barre	14	167	11.9
Total	230	2,297	10.0
Average for 92 Segments, Competition Added			4.5
<i>City-Pairs</i>	<i>Passengers</i>		<i>Growth Ratio Postwar to Prewar</i>
	<i>Prewar</i>	<i>Postwar</i>	
(b) With Same One-Carrier Service			
Chicago-Charleston, W. Va.	39	552	14.2
Detroit-Scranton/Wilkes Barre	8	93	11.6
Total	47	645	13.7
Average for 267 Segments, Same One-Carrier			4.3

From the foregoing, it is apparent that the improved airports at Charleston and Scranton/Wilkes Barre were far more important in stimulating travel growth than was type of service. The growth of both segments was greater than the average for its group. Furthermore, the segments receiving the same one-carrier service improved more than did those over which competition was added.

6. Absorption of Growth for Adjacent City-Pairs

In some instances high rates of growth resulted from diversion of growth from adjacent city-pairs. It was a common belief that all air travel increases were clear gains, but that has not been the case. There were two kinds of such diversion.

(a) Growth was diverted to segments, which received first one-carrier service, from the normal growth of other adjacent segments. This diversion resulted in some rather large rates of growth, that could not be credited entirely to the new type service.

<i>City-Pairs Benefiting from First One-Carrier Service</i>	<i>Growth Ratio Postwar to Prewar</i>	
New York-Milwaukee Growth	15.33	
absorbed part of New York-Chicago Growth		3.09
New York-Bangor Growth	6.20	
absorbed part of Boston-Bangor Growth		2.96
New York-Montpelier Growth	15.89	
absorbed part of Boston-Montpelier Growth		1.70

The large growth shown for the three segments, which benefited from first one-carrier service, resulted in part from diversion of growth from three other segments, whose growth was correspondingly depressed. In 1940, the New York to Chicago travel included passengers beyond to Milwaukee, connecting by railroad and interurban. Upon certification of through service, New York to Milwaukee, this traffic was diverted from the New York-Chicago segment to the New York-Milwaukee segment.¹² The large growth of travel from New York to Bangor, and New York to Montpelier, following the extension of Northeast into New York, resulted from similar diversion of passengers from Northeast's Boston-Bangor and Boston-Montpelier segments. Many passengers were shown in prewar surveys of the Civil Aeronautics Board as having originated in Boston.

(b) Certification of service to cities, which had not received service during the prewar periods, also caused diversion of normal growth segments.

<i>City-Pairs and Character of Diversion</i>	<i>Growth Ratio Postwar to Prewar</i>	
Chicago-Buffalo Growth	3.23	
partly absorbed by certification of Chicago Toronto service over Trans-Canada.		
Chicago-Cleveland Growth	2.73	
partly absorbed by growth of Chicago-Youngstown segment.		

¹² See Transcript Page 79, Volume 2, in North Central Case, CAB Docket No. 415, et al.

Washington-Cleveland Growth partly absorbed by growth of Washington-Toledo segment.	3.08
New York-Akron Growth partly absorbed by growth of New York-Youngstown segment.	2.56

The relatively low rates of growth between these four city-pairs, resulted from loss of traffic generated by nearby cities, which received service for the first time, postwar. For example, prewar, the air travel moving from Chicago to Toronto moved via Buffalo and appeared on the surveys of the Civil Aeronautics Board as Chicago-Buffalo travel. Following certification of Trans-Canada Airlines between Chicago and Toronto, the postwar travel was shown as moving between these points. It was diverted from the Chicago-Buffalo segment.

Authorization of air service to other new cities caused similar diversion. For example:

- Topeka has diverted from Kansas City
- Terre Haute has diverted from Indianapolis and St. Louis
- Lincoln has diverted from Omaha by its greatly improved postwar service
- Toledo has diverted from Detroit as well as Cleveland
- Peoria has diverted from Chicago

In most of these instances the proportions of diversion have been small, yet they nevertheless have been factors contributing to the slower rates of growth on certain Kansas City, Indianapolis, St. Louis, Omaha, Detroit and Chicago segments.

7. Growth of International Travel and Shifts in International Gateways

While this was a study of domestic travel growth in which international segments such as New York-Montreal were eliminated, nevertheless the domestic portions of international travel were shown as domestic travel to the gateway city. It was so treated in this survey, because its deletion would have been extremely difficult.

The postwar shift of the principal gateway cities has affected travel growth. As an example, the gateway city to Mexico was shifted from Brownsville to San Antonio. The domestic portion of this international travel was formerly included in the travel to and from Brownsville. Postwar it was included in the San Antonio travel. This shift increased the growth rate of "competition-added" travel at several mileage ranges, although the traffic growth is not attributable to the creation of competition.

In the 1201 to 1600 mile range, there was only one such item which showed postwar travel nearly 16 times that of prewar; the segment was Washington-San Antonio. If travel between Washington-Monterrey and Washington-Mexico City had been excluded, the growth-ratio of this segment would have been only 7.79, or about half.

In the 1601-2000 mile range, growth of competition-added travel was 7.5 times. If New York-Monterrey and New York-Mexico City had been excluded, the growth would have been 6.67 times. Similarly, in the 1001-1200 mile range, exclusion of Chicago-Mexico City and Chicago-Monterrey travel would have reduced the growth ratio from 8.05 to 7.09.

CONCLUSIONS

1. Claims for greatly increased air travel following certification of "first one-carrier" service have not been borne out by a large, unbiased statistical sample of prewar and postwar travel.

2. Claims for greatly stimulated air travel resulting from competition have not been borne out.

3. Connecting service has been nearly as effective in developing air travel as "first one-carrier" service, and has been greatly underrated.

4. No reliance at all can be placed on claims which were based on samples, biased in their selection of city-pairs.

5. Other factors have influenced growth of air travel much more than either the addition of competition or certification of "first one-carrier" service. In making comparisons, these other factors must be considered; otherwise the comparisons are distorted.

APPENDIX I

*Comparative Growth of Postwar and Prewar Air Travel
at Ten Leading Cities as Affected by Type of Service
Classified by Volumes of Travel*

<i>Type of Service</i>	<i>City-Pairs</i>	<i>Passengers</i>		<i>Growth Ratio</i>	<i>Percent of Group Travel</i>
		<i>Prewar</i>	<i>Postwar</i>		
60-300 Passengers					
First one carrier	108	2,305	15,549	6.75	25.6%
Connecting only	48	986	5,527	5.61	56.3
Competition added	27	1,219	5,015	4.11	4.2
Same one carrier	131	4,585	19,428	4.24	11.5
Same competitive	2	32	290	9.06	0.9
Total	316	9,127	45,809	5.02	11.8%
301-600 Passengers					
First one carrier	19	1,377	8,657	6.29	14.2%
Connecting only	7	304	2,714	8.93	27.6
Competition added	19	1,791	8,693	4.85	7.4
Same one carrier	54	4,662	22,687	4.87	13.4
Same competitive	5	482	2,420	5.02	8.0
Total	104	8,616	45,171	5.24	11.6%
601-1,500 Passengers					
First one carrier	20	2,251	18,539	8.24	30.5%
Connecting only	2	166	1,577	9.50	16.1
Competition added	18	3,997	17,560	4.39	14.9
Same one carrier	53	11,311	49,260	4.36	29.2
Same competitive	4	1,178	4,219	3.58	13.9
Total	97	18,903	91,155	4.82	23.5%
1,501-6,000 Passengers					
First one carrier	8	2,081	18,030	8.66	29.7%
Connecting only
Competition added	28	19,407	86,930	4.48	73.6
Same one carrier	29	18,313	77,505	4.23	45.9
Same competitive	7	7,387	23,453	3.17	77.2
Total	72	47,188	205,918	4.36	53.1%

<i>Aggregate</i>					
First one carrier	155	8,014	60,775	7.58	100.0%
Connection only	57	1,456	9,818	6.74	100.0%
Competition added	92	26,414	118,198	4.47	100.0%
Same one carrier	267	38,871	168,880	4.34	100.0%
Same competitive	18	9,079	30,382	3.35	100.0%
Total	589	83,834	388,053	4.63	100.0%

Source: CAB Surveys of Airline Travel for September 1940, March 1941, September 1948, and March 1949.

APPENDIX II

*Comparative Growth of Postwar and Prewar Air Travel
at Ten Leading Cities as Affected by Type of Service
Classified by Distance Between Cities*

<i>Travel Classification</i>	<i>City-Pairs</i>	<i>Passengers</i>		<i>Growth Ratio</i>	<i>Percent of Travel</i>
		<i>Prewar</i>	<i>Postwar</i>		
1. Over 2,000 miles					
First one-carrier	20	842	5,123	6.08	
Connecting only	4	104	843	8.11	
Competition added	10	2,003	10,442	5.21	
Same one carrier	13	525	2,955	5.63	
Same competitive	1	10	81	8.10	
Total	48	3,484	19,444	5.58	5.01%
2. 1,601-2,000 miles					
First one-carrier	13	359	2,999	8.35	
Connecting only	10	232	2,468 ¹	10.64	
Competition added	7	1,579	11,844	7.50	
Same one carrier	16	747	3,297	4.41	
Same competitive	4	499	2,128	4.26	
Total	50	3,416	22,736	6.66	5.86%
3. 1,201-1,600 miles					
First one-carrier	13	603	4,316	7.16	
Connecting only	16	396	2,639 ¹	6.66	
Competition added	1	33	527	15.97	
Same one carrier	27	2,442	13,122	5.37	
Same competitive	2	174	1,350	7.76	
Total	59	3,648	21,954	6.02	5.66%
4. 1,001-1,200 miles					
First one-carrier	16	1,100	9,047	8.22	
Connecting only	6	228	1,374	6.03	
Competition added	6	493	3,970	8.05	
Same one carrier	27	2,575	13,994	5.43	
Same competitive	
Total	55	4,396	28,385	6.46	7.31%
5. 801-1,000 miles					
First one-carrier	19	805	5,564	6.91	
Connecting only	10	259	1,046	4.04	
Competition added	7	1,346	6,046	4.49	
Same one carrier	38	3,465	19,108	5.51	
Same competitive	1	966	3,670	3.80	
Total	75	6,841	35,434	5.18	9.13%
6. 601-800 miles					
First one-carrier	30	1,059	9,296 ²	8.78	
Connecting only	4	74	344	4.65	
Competition added	16	2,496	12,653	5.07	
Same one carrier	34	3,071	13,906	4.53	
Same competitive	3	1,174	5,140	4.38	
Total	87	7,874	41,339	5.25	10.65%

7. 401-600 miles					
First one-carrier	22	1,587	10,106 ²	6.37	
Connecting only	6	135	979	7.25	
Competition added	19	5,856	25,727 ³	4.39	
Same one carrier	45	6,843	27,319 ⁴	3.99	
Same competitive	3	2,153	5,342 ⁵	2.48	
Total	95	16,574	69,473	4.19	17.90%
8. 400 miles or less					
First one-carrier	22	1,659	14,324 ²	8.63	
Connecting only	1	28	125	4.46	
Competition added	26	12,608	46,989 ³	3.73	
Same one carrier	67	19,203	75,179 ⁴	3.91	
Same competitive	4	4,103	12,671 ⁵	3.09	
Total	120	37,601	149,288	3.97	38.47%
9. Aggregate 1 to 8					
First one-carrier	155	8,014	60,775	7.58	
Connecting only	57	1,456	9,818	6.74	
Competition added	92	26,414	118,198	4.47	
Same one carrier	267	38,871	168,880	4.34	
Same competitive	18	9,079	30,382	3.35	
Total	589	83,834	388,053	4.63	100.00%

¹ 52 percent of connecting only travel in 2nd and 3rd highest ranges.

² 55 percent of first one-carrier travel in these three lowest ranges.

³ 61 percent of competition added travel in two lowest ranges.

⁴ 61 percent of same one-carrier travel in two lowest ranges.

⁵ 59 percent of same competitive travel in two lowest ranges.

Source: CAB Surveys of Airline Travel of September 1940, March 1941, September 1948 and March 1949.

APPENDIX III

Comparative Growth of Postwar and Prewar Air Travel at Ten Leading Cities as Affected by Type of Service

A. City-Pairs with Less Than 5 Prewar Passengers				
Type of Service	Pairs City	Prewar Passengers	Postwar	Ratio Growth
60-300 Passengers				
First one carrier	21	35	2,434	69.54
Connecting only	14	30	1,118	37.27
Competition added	1	3	126	42.00
Same one carrier	11	30	991	33.03
Total	47	98	4,669	47.64
B. City-Pairs with More than 6,000 Postwar Passengers				
Over 6,000 Passengers				
Competition added	9*	41,065	156,838	3.82
Same one carrier	3	6,480	24,414	3.77
Same competitive	3	22,094	55,892	2.53
Total	15	69,639	237,144	3.41
C. City-Pairs with Negative Growth				
60-300 Passengers				
Connecting only	1	101	79	0.78
Same one carrier	3	568	415	0.73
Total	4	669	494	0.74
D. City-Pairs — 10 to 20 Percent Competitive				
First one carrier	1	211	681	3.23
Same one carrier	16	4,227	17,557	4.15
Total	17	4,438	18,238	4.11

* Included Detroit-Cleveland 164 miles by railroad.

Source: CAB Survey of Airline Travel for September 1940, March 1941, September 1948 and March 1949.