FEDERAL RESERVE BANK OF CHICAGO

ANNUAL REPORT 1965

THE AIRLINES: a growth industry, credit aids expansion

To the Member Banks of the
Seventh Federal Reserve District:

It is our pleasure to submit to you the Annual Report of the Federal Reserve Bank of Chicago for the year 1965.

Continuation of the favorable growth of economic activity and of banking has highlighted the past year. Some of the more significant developments are described briefly at the beginning of this report.

A discussion of the airlines industry and its role in the economy of the Midwest and the nation is presented on pages 7-37.

Official appointments and elections during the year are reported on pages 42-44.

The volume of transactions in many department of the Bank has continued to rise as business activity in the Seventh District has expanded further (pages 40 and 41).

On behalf of the directors, officers and staff, I extend to you appreciation for your cooperation and counsel which has enabled us to provide continued high-quality financial services to the public.

Sincerely,

Charles J. Scanlon

CHARLES J. SCANLON
President

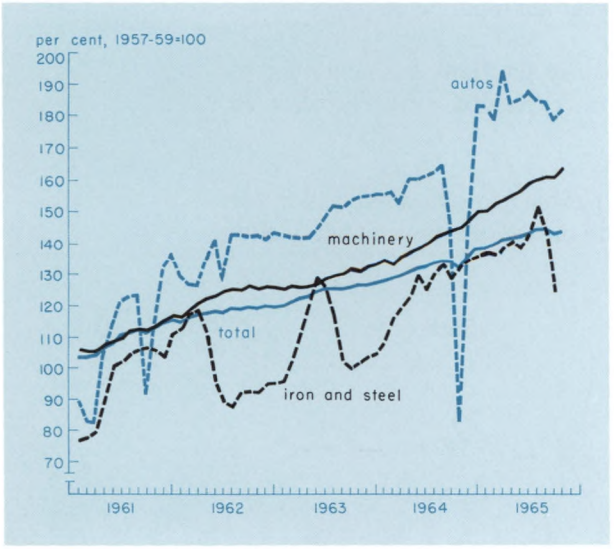
January 27, 1966

1965 IN REVIEW

Economic Developments

Business activity continued to expand at a vigorous pace in 1965 as most firms experienced strengthening demand for their products or services. Farm income rose in response to higher livestock prices and larger crop production. Credit demands were strong throughout all sectors of the economy. At year-end, output, employment, income and sales were still rising and the expectation was widespread that the uptrend in business would continue well into 1966.

Activity in major District industries moved ahead vigorously in 1965 except steel after midyear

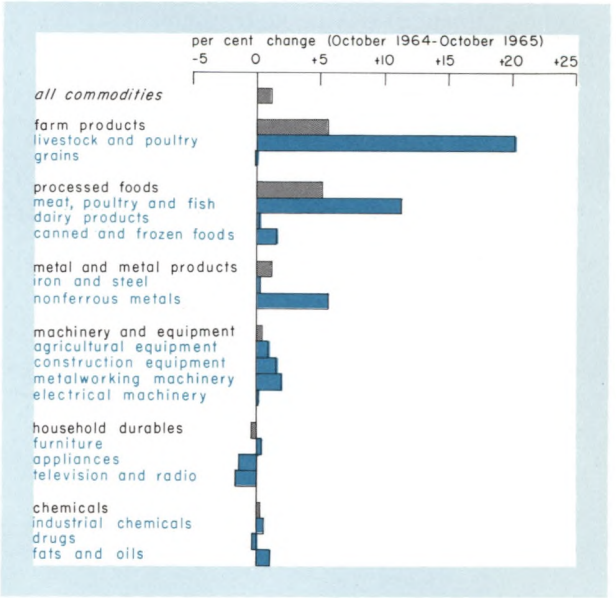


Activity in major Midwest industrial centers moved close to capacity, with the available labor force and plant facilities being utilized more fully than at any time in at least a decade. This favorable condition reflected the general increase in demand and especially the high and rising outlays for producers' and consumers' durable goods, both important in the Seventh Federal Reserve District.

Business expenditures for durable equipment in 1965 were more than 15 per cent higher than in the preceding year for the nation as a whole. Output of business equipment increased sharply, relatively much more than the 8 per cent rise in total industrial production. Moreover, order backlogs for electrical and nonelectrical machinery increased throughout the year. The continued strong demand for machinery and equipment is particularly important for such centers as Milwaukee, Rockford and Peoria.

The automobile industry experienced another record year. More than 11 million passenger cars and trucks were produced, far more than ever before. Sales of new cars, including imports, exceeded 9 million units, surpassing the previous record of 1964 by 15 per cent. The continued strong demand for autos reflected both increased incomes and willingness of many households to incur additional instalment debt.

Wholesale prices of a broad range of commodities increased during 1965



Total outstanding consumer debt increased about 12 per cent during the year while auto credit rose by about 14 per cent.

Because of the lengthy labor-management negotiations, the steel industry posed a potential source of instability throughout much of the year. Steel output reached an annual rate of more than 145 million tons in the spring and remained at a high level until early September when a collective bargaining agreement was reached. Usage of steel was at an all-time high, and, in addition, major steel users built up large inventories in the face of a possible industry-wide strike. As orders were cut back and inventories were worked down in September and October, steel production was reduced sharply, but output was rising again toward year end. Increased activity in the auto and capital equipment industries helped to offset the impact of the decline in steel output on overall business activity.

Unemployment continued to decline as activity rose. In the fourth quarter, unemployment rates in the District states ranged from 1.2 per cent in Iowa to 2.5 per cent in Illinois and Michigan and were well below the national average. Labor shortages were reported for many skills in numerous areas.

Some upward movement in wholesale prices occurred during the year especially in food and nonferrous metals. With demand rising relative to capacity, price increases were reported for a growing number of commodities after midyear.

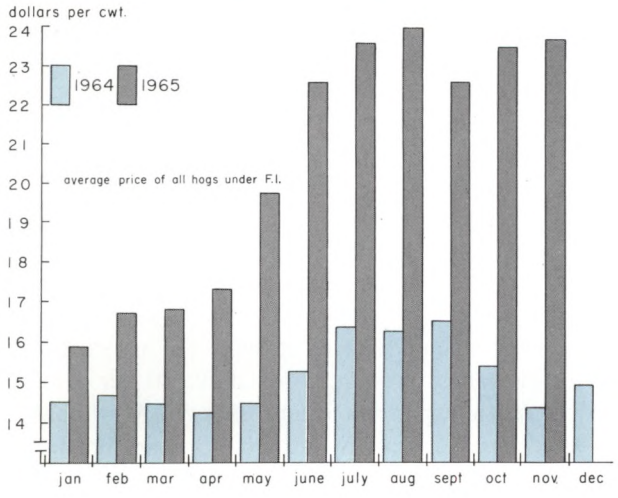
Strong rise in farm income

Net income from farming reached the highest level in more than a decade. Moreover, with the number of farms declining further, net income per farm rose to record levels. The greatly improved farm income situation resulted mainly from higher livestock prices but also was aided by increased U. S. Government payments under the feed grain and wheat programs.

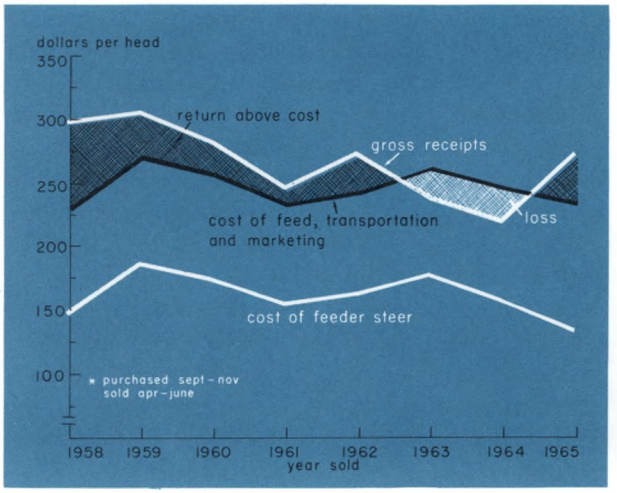
Prices of hogs rose sharply during the first half of 1965 and continued at very high levels in the remainder of the year. Even though farmers had curtailed production, their income from hogs was higher than at any time since the early Fifties. Production of beef was slightly greater than in the previous year, and prices averaged somewhat higher. Corn Belt feedlot operations turned in the highest profits in recent years. Dairy farmers also realized somewhat higher incomes—a result of small gains in both prices and production. Farmers' income from crops was somewhat higher than in 1964 as a result of the larger Government payments. The production of crops was at a record high in the District states.

With farm income increasing and bumper crops to be harvested, farmers stepped up their purchases of machinery, especially tractors and corn harvesting equipment. Also, prices of farm real estate rose at a faster pace, especially in the Corn Belt states.

Hog prices sharply above year earlier



Income from cattle feeding markedly improved



Banks continue rapid growth

Financial developments in 1965 reflected a combination of the accelerated pace of business activity and monetary policy designed to encourage economic growth with price stability. In this environment, bank credit rose faster than in other recent years but was

accompanied by rising interest rates.

Strong demand for funds by business to finance the expansion of facilities and working capital was the major force behind the record increase in member bank loans. Farmers used large amounts of credit to finance operating expenses and to purchase land and machinery. Total loans and discounts of Seventh District member banks at the end of November were 18 per cent above year-ago levels. This compares with a 15 per cent increase at all member banks in the nation and with the previous record District gain of 15 per cent in 1963.

The aggregate increase in earning assets was somewhat less than the increase in loans as some banks financed part of the loan expansion by selling U. S. Government securities. For all member banks in the District, holdings of these securities fell about 8 per cent. However, the net purchases of other securities—mainly municipals and U. S. agency issues—almost fully offset the net liquidation of Governments. On balance, total bank credit expanded by about 10 per cent in the past year, compared with a 9 per cent gain in 1964.

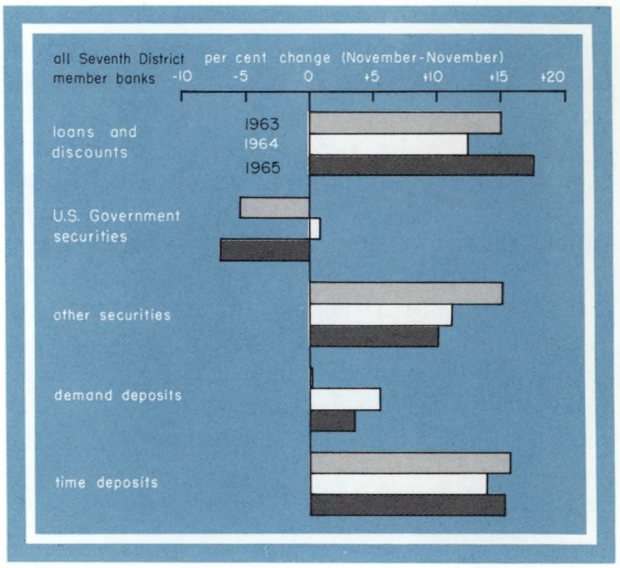
Credit demands were strong in all District areas. However, Michigan banks reported the largest loan increases—33 per cent in Detroit and 19 per cent in the rest of Michigan. Detroit banks also reported the greatest reduction in holdings of Governments.

Loans increased throughout the year in contrast to the usual pattern of substantial pay-downs in January and February. After the effects of steel stockpiling and the strong rise of foreign lending preceding the issuance of "voluntary credit restraint" guidelines had passed, loan growth slowed. The decline in Governments occurred gradually until the final quarter when it was reversed as a result of the Treasury's seasonal financing operations. Banks' acquisitions of municipals proceeded at a rapid rate in the first half but slowed markedly as the year progressed.

Much of the push behind loan demand stemmed from the business community. Statements of the large District banks where business loans are heavily concentrated indicate a sharp rise for 1965 in the rate of growth in loans to commercial, industrial and nonbank financial firms. Real estate loans also rose more rapidly than in 1964 but consumer loans at these banks slowed, contrary to the national experience. At country banks the expansion in loans on farm real estate continued at about the same rate as in the previous year.

The strong overall demands for credit in the economy have afforded profitable loan and investment opportunities which have stimulated banks to bid actively for funds. The continued acquisition of mortgages and tax-exempt securities, concurrent with meeting heavy demand for business, agricultural and consumer credit, reflects another year of substantial deposit inflows and some increase in borrowed funds. Deposits rose 9 per cent—about the same as in 1964.

Loan growth at new high in 1965



Despite increased income in the District, demand deposits rose only 3.5 per cent during 1965—slightly less than in the prior year. At agricultural banks, however, demand deposits increased considerably more than in other recent years while major city banks obtained a somewhat smaller share of the demand deposit growth.

As in other recent years, the major growth component was time deposits. Total time deposits rose about 16 per cent during the year, and by year-end time and savings accounts of District members were nearly equal to their aggregate demand deposits. Five years earlier, time and savings deposits were some 40 per cent below demand deposits of these banks.

To attract funds, many banks made further upward adjustments in rates paid on savings and time deposits. Additional upward flexibility in these rates had been gained through increases in the maximum rates permitted under Regulation Q in November 1964. The large money market banks continued to issue negotiable certificates of deposit. The net inflow from this source accounted for about 10 per cent of the aggregate expansion in time deposits. Most banks, however, grew mainly by attracting savings balances. Even at the large weekly reporting banks, savings ac-

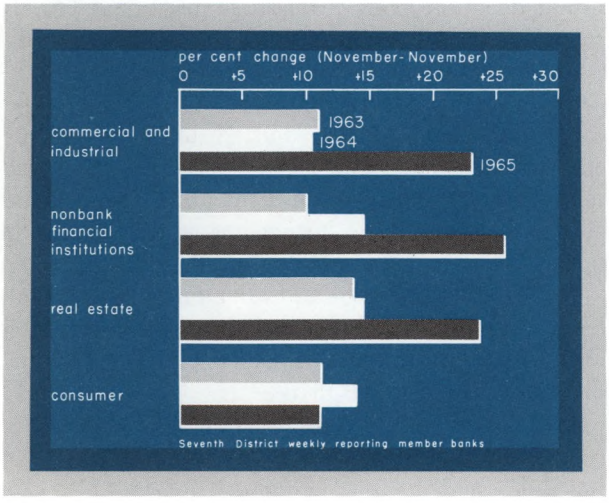
counted for 70 per cent of the total growth in time and savings deposits against 50 per cent in 1964.

A large portion of the funds used to finance loans and investments has been acquired through continued aggressive competition for the savings and short-term investment funds of individuals, corporations and governmental units. Many of these are interest-sensitive funds which can be retained only so long as banks continue to offer returns equivalent to those available on alternative investments. To the extent that such funds are received in the form of time deposits, they are subject to reserve requirements, FDIC assessments and Regulation Q ceilings.

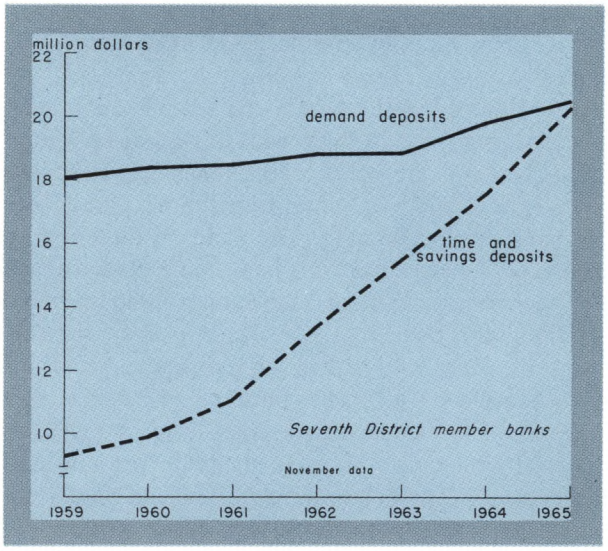
Some banks also use promissory notes, repurchase agreements and Federal funds purchases as sources of funds. While these instruments are free from the reserve requirement, maturity and rate limitations of CDs, they usually provide funds on a very short-term basis. Even notes with maturities of six months or more may be presented for payment much earlier since, in the absence of a secondary market in these instruments, the issuing bank may stand ready to repurchase them prior to maturity on request.

The volume of promissory notes outstanding is still quite small. Estimates for the country as a whole place the total at about 500 million dollars compared with about 16 billion dollars of CDs. In the late summer and fall, the rates offered by large banks on CDs pressed against the legal maximum interest rates permitted on time deposits. In these circumstances some banks boosted the amount of promissory notes outstanding. When the ceiling was again raised on all time deposits (but not savings deposits) last December, a major reason for selling notes was removed.

Large banks show big gains in business loans



Time and savings deposits account for most of deposit growth



Competition for funds with which to acquire high-yield assets has changed the historical relationships between types of bank assets and types of liabilities. At current costs, it is profitable to acquire funds only if they are invested in high-yield assets. Midyear call reports of District member banks indicated that mortgages and municipal securities amounted to one-fourth of total earning assets at reserve city banks and one-third at country banks. Moreover, loan maturities have lengthened. In the first three quarterly interest rate surveys last year, 13 per cent of the dollar volume of new loans reported were term loans, against 9 per cent five years ago. Thus, assets appear to be less liquid and liabilities more volatile.

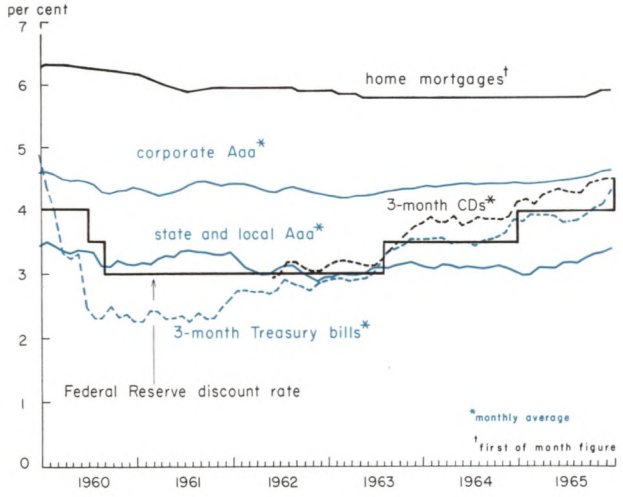
Monetary policy and interest rates

Reserves of member banks rose rapidly in the first half of 1965, leveled off in the summer and increased sharply again in December. For the year, additional reserves were supplied to the banking system at a rate of about 5 per cent—somewhat more rapidly than for any previous year in the 1961-65 expansion period. Money supply (demand deposits and currency held by the public) increased at a slightly higher rate than in 1964, and bank credit expanded at a record rate of 10 per cent. The demands for funds in the economy were so strong, however, that even with this very substantial growth in credit, interest rates moved higher, especially after midyear.

To have met the heavier credit demands of 1965 without any rise in interest rates would have required acceleration of the unusually rapid growth in money and credit that occurred throughout the year. With the economy already at capacity in many areas, this would have exerted upward pressure on prices.

All segments of the money market felt the impact of the strong demand for funds. Beginning in March the prevailing rate for Federal funds moved up to 4⅛ per cent and by autumn transactions at 4.25 per cent were fairly common. The yield on three-month bills rose above 4 per cent in October and reached 4.40 per cent by Mid-December on a discount basis. Yields in the bond markets began to show a rising trend in early fall. Rates on corporate securities were affected by a large volume of new issues after midyear. The tax-exempt market was strongly influenced by changes in bank demand for state and local issues. These issues have been an important outlet for time deposit funds, and spurts in their average yield during the past year occurred in corporate tax and dividend months when banks were under pressure to meet loan demand and CD maturities. The typical rate on home mortgages, after a long period of stability, moved up several basis points in October and November and, as the year drew to a close, there were scattered signs of reduced availability of mortgage credit and some further tightening of mortgage terms. Residential construction in major Seventh Federal Reserve District metropolitan areas increased substantially in 1965, however.

Interest rates move higher



SOURCE: *Federal Reserve Bulletin*, Federal Housing Administration, Salomon Brothers and Hutzler.

In early December, the Board of Governors of the Federal Reserve System approved discount rate increases from 4 to 4.50 per cent in the New York and Chicago districts (followed shortly by a like change in the other 10 districts). This action was expected to help bring about a slowing of credit growth to a rate more consistent with the growth of available labor and industrial capacity and to dampen the buildup of inflationary pressures. The move was also consistent with balance of payments objectives, although these were a less important reason than in the two previous discount rate increases in 1963 and 1964. Concurrently, the Board again changed Regulation Q to set the maximum interest rate permissible on time deposits at 5.50 per cent—up from 4 per cent on 30 to 89 day maturities and from 4.50 per cent on CDs of 90 days and longer. The ceiling on passbook savings deposit rates—now 4 per cent—was not changed.

The immediate impact of the announced changes was a further rise in yields in all segments of the money and securities markets. Many large banks indicated that they had adjusted their minimum loan rate, the prime rate, from 4.50 to 5 per cent. Bill yields rose by more than ¼ per cent and bond prices dropped sharply. Rates remained at the higher levels through the peak period of loan demand in mid-December despite a larger than seasonal flow of reserves into the banking system.

As 1966 opens . . .

The nation embarks into 1966 closer to its economic goals than in many years. On the whole, 1965 was a year of healthy economic expansion although some evidences of imbalance were perceptible late in the year. In this District, particularly, tight labor supplies and other shortages in facilities coupled with strong demand posed a threat to price stability. If current plans are carried out in the new year, additions to new plant and equipment will add substantially to productive capacity. Flows of money and credit will need to be adjusted to accommodate changes in demand and capacity. Interest rates will reflect the strength of credit demand. If loan demand continues strong, some further impact may be felt in the mortgage and tax-exempt markets.

Banks are faced with an ever more insistent challenge to maintain a proper balance between their asset mix and the nature of their liabilities. More and more, banks must weigh the costs and benefits of growth accomplished through active competition for funds and the acquisition of risk assets that will cover the accompanying rise in interest expense.

THE AIRLINES: a growth industry, credit aids expansion

On a typical day more than 250,000 persons board commercial airliners in the United States, traveling for business, pleasure or other personal reasons. Some are off on short hops, such as Chicago to Detroit, while others head for points as far away as Istanbul, Tokyo or Sydney. Each of these travelers reaches his destination in a matter of hours. Time saved compared with surface travel ranges from hours to weeks. Many travelers return home the same day after round trips of a thousand miles or more to have dinner with their families.

The jet age of air travel on U. S. airlines is now in its eighth year, starting with the first transatlantic flights in Boeing 707s late in 1958. Douglas DC-8s entered service the following year. Improved and specialized versions of these four-engined aircraft currently are in production. Meanwhile, smaller jet planes designed for shorter trips are coming into service in increasing numbers.

Almost 90 per cent of all airline passenger miles now are flown in turbine-powered planes, either pure jet or turboprop. In 1966 some of the *trunk* airlines are scheduled to complete the transition to all turbine service. By the end of the decade, all of the piston-powered aircraft probably will have been retired by the U. S. airlines. The DC-3s, DC-6s, DC-7s, Convairs, Martins and Constellations are still excellent machines but now have been outclassed.

Not only are the jets faster and more comfortable than the aircraft being replaced but also are more economical. Experience has shown that profitable operations on competitive routes require that the public be offered top-quality service in the best equipment available. Anything less may lead to deficits and possible bankruptcy or merger with a stronger line.

Following the introduction of the first jets and turboprops, the backlog of flight equipment ordered by U. S. airlines at the peak in 1959 totaled 2.5 billion dollars—double the book value of all equipment then in service. There were suggestions that financial disaster might result from "too many seats in the sky." A slowdown in the growth of air travel in the early Sixties lent credence to these fears.

Since 1962, however, total airline passenger traffic has grown at a rate of about 15 per cent each year. During the same period air freight and express traffic has increased more than 20 per cent annually. As a result, the airlines, backed by credits arranged with commercial banks and other institutions, have embarked upon a second major wave of jet aircraft acquisitions.

A recent industry survey indicates that 704 aircraft valued at 3.7 billion dollars will be acquired in the 1965-69 period—far more than the capital expenditures contemplated only two or three years ago. This program both reflects and helps to support continued economic expansion.

A story of growth

Because passenger revenues constitute 82 per cent of all operating revenues of U. S. airlines, the volume of business is measured most commonly by passenger miles (one passenger carried one mile

Both trunks and local service lines are buying new short-range jets—the BAC-111 was the first of the class

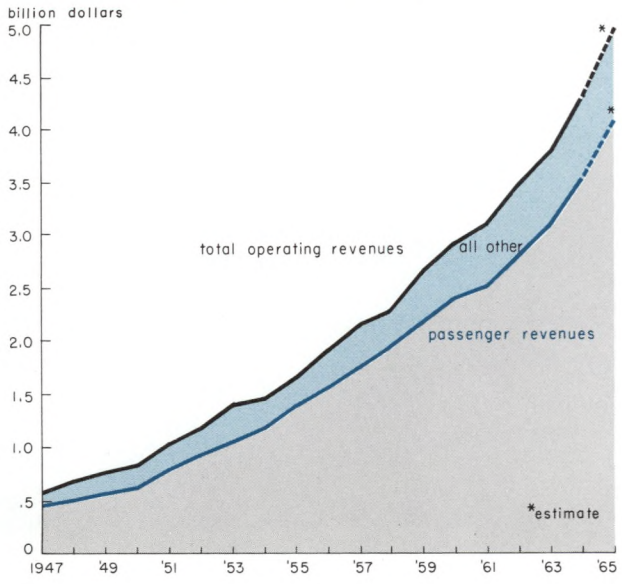
equals one passenger mile). In 1965, 95 million passengers traveled an average of roughly 700 miles each for a total of 67 billion miles, about 16 per cent more than in the previous year. Total ton miles (10 passengers and their baggage or a ton of property flown one mile) and total revenues rose by similar proportions.

Last year's increase in airline business was three times as great as the 5 per cent rise in total output of goods and services but was typical of postwar experience. From 1947 through 1965 the average annual growth in airline passenger miles was 12.8 per cent compared with a growth rate for the entire economy of 3.7 per cent. Using the alternative and more inclusive measure of revenue ton miles, the annual growth of airline services was 14 per cent in the postwar period.

According to a U. S. Department of Commerce study of 374 products and services, the airlines have expanded at double the rate of the electric utilities and the motor truck lines—their closest rivals among the major service industries. Among manufactured products, only such new items as polyethylene, high purity oxygen and air conditioners have outperformed the airlines consistently. But annual sales of these fast growing products amount to only a tiny fraction of the airlines' gross revenues, currently about 5 billion dollars.

The uptrend in airline revenues and ton miles has been slowed in the postwar recession periods of 1953-54, 1957-58, and 1960-61. Total revenues and traffic have never declined on a year-to-year basis, but the rate of advance has been highly sensitive to cyclical changes in economic activity.

Airline revenue growth has accelerated in recent years



SOURCE: Civil Aeronautics Board.

More than 70,000 passengers were handled each day during the Christmas season at Chicago's O'Hare Field

Public carrier number one

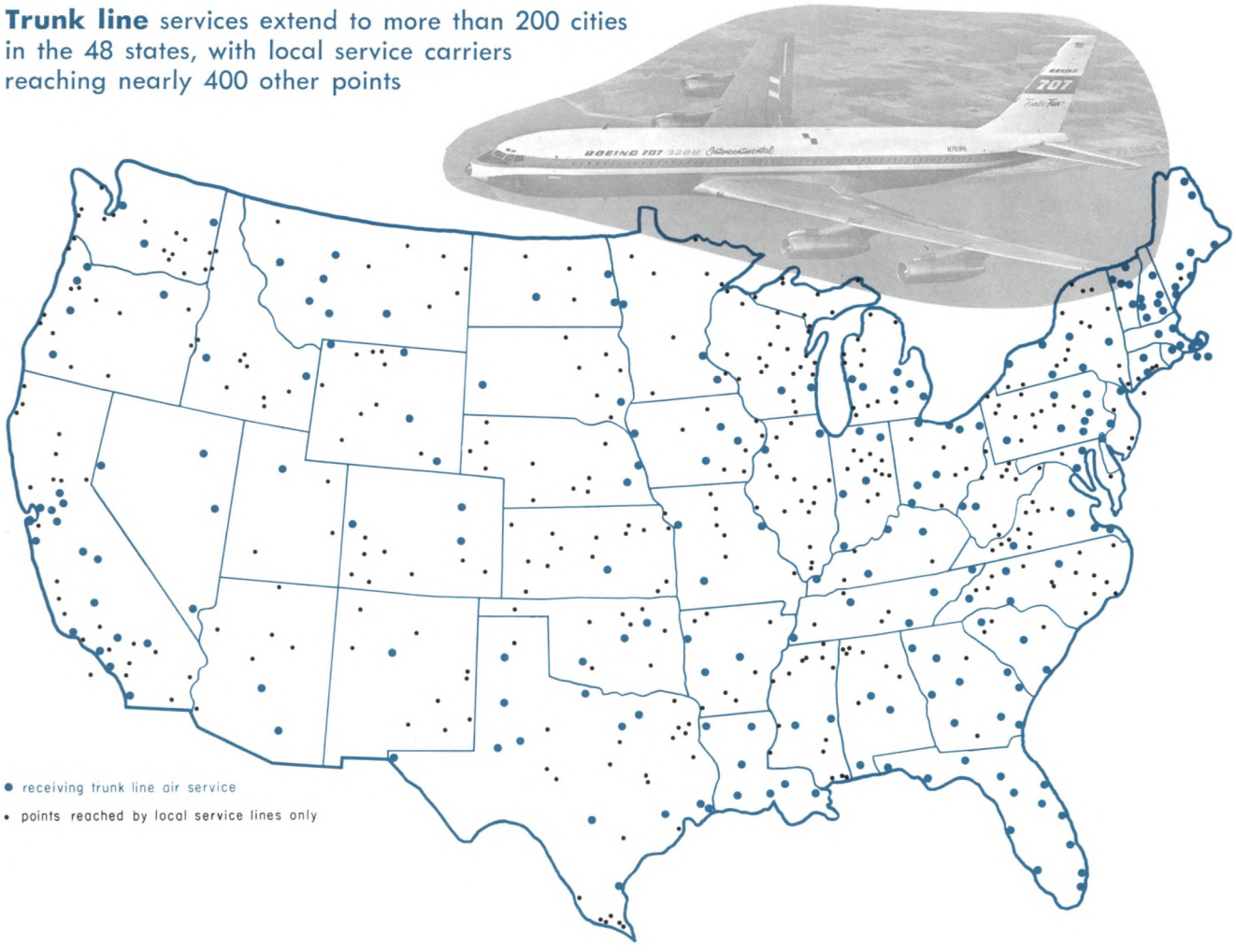
Private autos have accounted for about 90 per cent of intercity passenger miles in recent years as was the case prior to World War II. There seems little prospect that the relative place of the auto will be altered appreciably as the predominant means of travel, particularly on trips of 200 miles or less. Airline traffic growth largely reflects diversions of business from railroads, buses and ships and encouragement of travel that would not have taken place but for the availability of this rapid and comfortable means of transport.

Airline passenger travel was one of the relatively few economic activities that increased in volume throughout the Depression years. In fact, annual increases averaged almost 30 per cent in the years 1931-33. Airline passenger miles in the latter year totaled 200 million but still accounted for only a tiny fraction of intercity common carrier traffic (railroads, airlines and buses) in the United States.

With the DC-3 as the standard airliner, passenger miles passed the 1 billion mark by 1940. Even so, the airlines accounted for only 3 per cent of intercity passenger traffic handled by common carriers. Introduction of four-engined aircraft after World War II, coupled with improved service and greater public acceptance, boosted domestic airline miles over the 10 billion total in 1951. In that year airlines accounted for 17 per cent of intercity passenger miles —for the first time exceeding the first-class rail total.

Airline traffic passed the total for intercity buses in 1955, railroad travel including coach in 1957 and the total for railroads and the buses combined in 1963. In the latter year more than 51 per cent of

Trunk line services extend to more than 200 cities in the 48 states, with local service carriers reaching nearly 400 other points



all intercity common carrier passenger travel was by air. This proportion was about 55 per cent in 1965.

Improved equipment and scheduling have been heavily responsible for the growth of air travel. Relative stability of charges in the face of a generally rising price level also has been important. Despite improved service, airline fares averaged 6.1 cents per mile in 1964—compared with 5.3 cents in the years prior to World War II and 5.8 cents in the late Forties. The average of all consumer prices has more than doubled since 1939.

Average airline fares have been held down, in part, by a variety of pricing innovations. Coach service with higher density seating and fewer "frills" than first-class service was introduced by the trunk lines in 1948. Since that time a number of special arrangements have been introduced, including family plans under which the spouse and children of a passenger paying full fare are carried at a substantial discount and group plans that encourage excursions. Servicemen on leave have been carried at half price since 1963 on a standby basis. The proportion of passengers paying coach or other economy fares has increased steadily and now accounts for about 75 per cent of the total.

The increase in airline travel has been both a cause and an effect of reductions in passenger service by the railroads. Combined first-class and intercity coach railroad travel has declined in all but one of the years since World War II—the Korean War year 1951. Total railroad passenger miles in 1964 were only half as great as 15 years earlier.

Railroads for many years have regarded most of their passenger business as a losing proposition, but the regulatory process slowed withdrawal. With the growth in availability of air service and improved highways, and a more permissive regulatory climate, the railroads have gained greater freedom to reduce the number of scheduled passenger runs. The process has been cumulative. The reduction in train service

in many centers has forced reluctant travelers onto the highways or into the air.

Air service to smaller towns

Rapid development of *local service airlines,* established with the help of liberal Government subsidies in the early postwar years, has brought modern air transportation to hundreds of medium- and smaller-sized communities, most of which have been fast losing rail passenger service. While at some large cities the expansion of air operations has more than offset withdrawals of trains, the picture is different for many moderate-sized centers. Numerous thriving communities in the 5,000 to 20,000 population range today have fewer common carrier passenger schedules than in the early postwar years.

As recently as 1947, 13 one-way train operations were offered on a typical weekday by four rail lines between St. Louis and Chicago. Smaller places lying between the big terminal cities also had relatively convenient rail service. Decatur had four daily trains to Chicago; Springfield had ten; Bloomington eight; Taylorville three; Carlinville two; Lincoln three, and Pontiac had four.

Travelers from St. Louis in 1947 also could select from a total of 14 airline schedules to Chicago. But no scheduled air service to Chicago was available at any of the intermediate points. (Three flights served Peoria, which does not lie on a direct St. Louis-Chicago rail route.)

Today, of course, the air and rail schedules are quite different for some of the centers in the St. Louis-Chicago sector. A local service line, Ozark Airlines, now offers eight northward schedules daily from Springfield, three from Bloomington and six from Decatur. No other scheduled air service is available to Chicago from communities in the St. Louis-Chicago corridor.

Marked reductions in rail service have occurred since 1947. The 13-train schedule from St. Louis to Chicago has been reduced to six. One of the four railroads has no passenger operations at all on this line, and two railroads have discontinued overnight trains.

Alternatives have narrowed sharply at intermediate points. A few small communities have lost all rail service to Chicago. At Springfield, schedules northward today are down to four from ten in 1947; at Decatur there are two compared to four, and Bloomington is down to three from eight. All three of these cities now have air service, however, with schedules that give the traveler a choice of departure times as good or better than ever before.

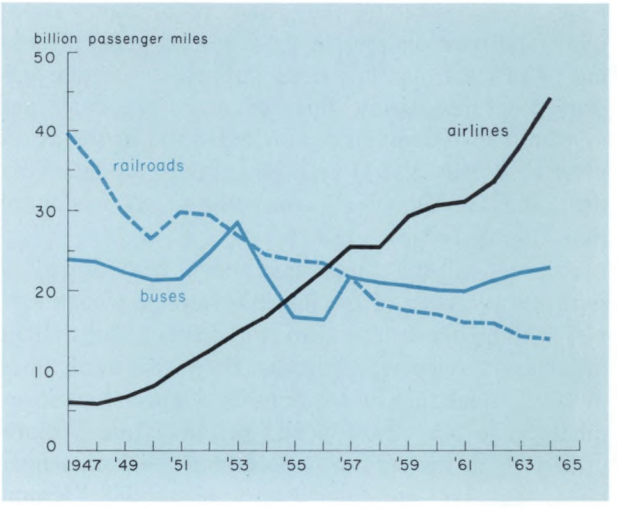
Curtailment of train services has not been accompanied by the inauguration of air scheduling at such communities as Carlinville, Dwight, Clinton, Pana, Lincoln and Pontiac. Because intercity bus operations also have been curtailed, reduced rail service at these towns has meant a net loss in common carrier passenger scheduling.

The accompanying map shows the changes in passenger service scheduling that have occurred since the war in three Midwest travel corridors from Chicago fanning outward to Sioux City-Qmaha and Detroit as well as to St. Louis. Typical Chicago-bound weekday rail and air schedules at most towns of 5,000 and more in 1947-48 are contrasted with those of 1965. Clearly, total schedules by air and rail carriers have broadened substantially at the terminal points and at some of the intermediate points.

The contraction of rail passenger operations began well before the postwar period. Probably it has been related more closely to the automobile than to the plane, especially in short- and medium-haul markets. Capture by the airlines of long-haul traffic from the rails, of course, has tended to accelerate schedule reductions at points along the rail lines as well.

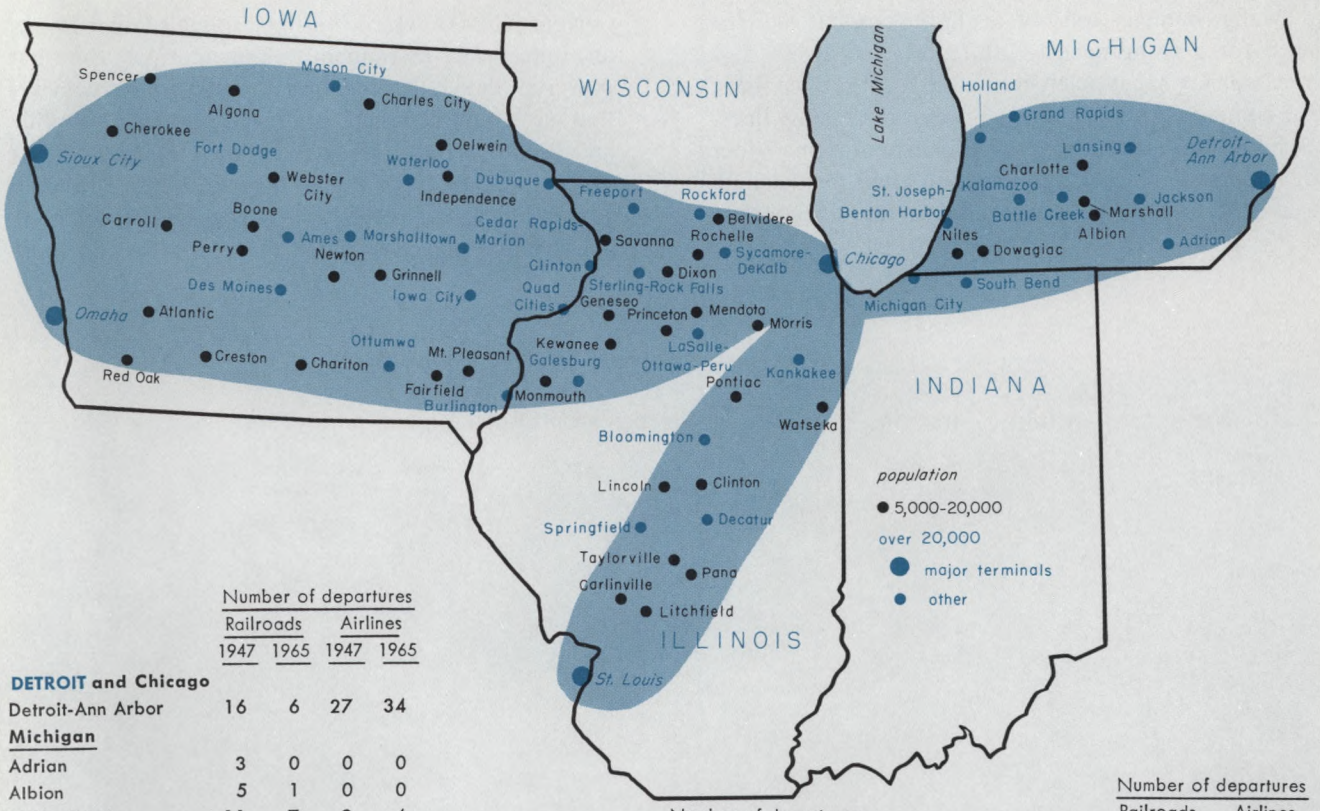
The present-day pattern of airline operation has brought the overwhelming majority of the population well within a 60 to 90 minute drive of airports with scheduled service. Residents of Chicago, New York and Los Angeles may spend almost as much time driving to or from the airport through rush-

Domestic air travel
now exceeds bus and rail combined



SOURCE: Air Transport Association.

Typical weekday rail and airline service to Chicago and three Midwest rail corridors



	Number of departures			
	Railroads		Airlines	
	1947	1965	1947	1965
DETROIT and Chicago				
Detroit-Ann Arbor	16	6	27	34
Michigan				
Adrian	3	0	0	0
Albion	5	1	0	0
Battle Creek	11	7	2	4
Charlotte	2	2	0	0
Dowagiac	5	1	0	0
Grand Rapids	3	2	6	11
Holland	3	2	0	0
Jackson	8	4	0	2
Kalamazoo	8	4	0	5
Lansing	5	3	3	0
Marshall	5	0	0	0
Niles	8	4	0	0
St. Joseph-Benton Harbor	3	2	0	3
Indiana				
Michigan City	27	18	0	0
South Bend	33	19	7	9
ST. LOUIS and Chicago				
St. Louis	13	6	13	31
Illinois				
Bloomington	8	3	0	3
Carlinville	2	2	0	0
Clinton	3	1	0	0
Decatur	4	2	0	6
Kankakee	14	7	0	0
Lincoln	3	3	0	0
Litchfield	6	3	0	0
Pana	1	0	0	0
Pontiac	4	3	0	0
Springfield	10	4	0	8
Taylorville	3	2	0	0
Watseka	5	2	0	0

	Number of departures			
	Railroads		Airlines	
	1947	1965	1947	1965
OMAHA-SIOUX CITY and Chicago				
Omaha	19	10	9	9
Sioux City	4	1	0	5
Iowa				
Algona	1	0	0	0
Ames	7	0	0	0
Atlantic	3	2	0	0
Boone	10	0	0	0
Burlington	7	5	1	4
Carroll	4	0	0	0
Cedar Rapids-Marion	13	3	3	11
Chariton	3	2	0	0
Charles City	2	0	0	0
Cherokee	2	1	0	0
Clinton	12	1	0	2
Creston	5	5	0	0
Des Moines	11	3	6	11
Dubuque	11	7	0	5
Fairfield	4	4	0	0
Fort Dodge	2	1	0	4
Grinnell	5	3	0	0
Independence	3	2	0	0
Iowa City	5	3	1	2
Marshalltown	11	3	0	0
Mason City	3	0	0	3
Mount Pleasant	2	4	0	0

	Number of departures			
	Railroads		Airlines	
	1947	1965	1947	1965
Iowa				
Newton	5	3	0	0
Oelwein	2	0	0	0
Ottumwa	6	5	0	3
Perry	2	3	0	0
Red Oak	3	4	0	0
Spencer	1	0	0	0
Waterloo	5	2	0	6
Webster City	2	1	0	0
Illinois				
Belvidere	1	0	0	0
Dixon	5	1	0	0
Freeport	5	2	0	0
Galesburg	13	11	0	2
Geneseo	3	1	0	0
Kewanee	5	3	0	0
La Salle-Ottawa-Peru	7	4	0	0
Mendota	5	3	0	0
Monmouth	4	3	0	0
Morris	3	2	0	0
Princeton	4	3	0	0
Quad Cities*	10	4	6	11
Rochelle	6	4	0	0
Rockford	5	2	0	3
Savanna	9	8	0	0
Sterling-Rock Falls	5	1	0	2
Sycamore-De Kalb	7	1	0	0

*Includes Iowa portion.

SOURCE: *Official Guide of the Railways* (September 1947 and September 1965), *Official Airline Guide* (September 1965).

hour traffic as individuals residing considerable distances from smaller airports.

Many industry observers have emphasized the need for a comprehensive third level of airline service (air taxis), supplementing the local service lines, for communities without easy access to existing lines. Several such carriers are currently in operation. Wider development of such services is limited by the high seat-mile cost of operating small aircraft seating only a few passengers.

Some early history

Near Kitty Hawk on North Carolina's Outer Banks an impressive monument commemorates the first powered flight—December 17, 1903—of a heavier-than-air craft, designed, built and piloted by Orville and Wilbur Wright. This achievement rightfully holds an honored place in the history of aviation. A full generation was to elapse, however, before commercial aviation played a significant role in the transpor-

Commercial airline operations at points in the Seventh District, year ended June 30, 1964

	Scheduled departures performed (thousands)	Passengers enplaned (thousands)	Airlines
Illinois			
Bloomington	1.6	4.2	OZ
Champaign	4.6	34.9	OZ
Chicago	172.2	7,445.5	AA,BN,CO,DL,EA, LC,NO,NW,OZ,TW,UA
Danville	2.0	6.3	LC
Decatur	3.5	20.1	OZ
Galesburg	1.0	3.9	OZ
Mattoon	1.2	2.8	OZ
Peoria	7.9	65.3	OZ
Quad Cities	8.4	99.8	OZ,UA
Rockford	2.2	8.3	OZ
Springfield	7.4	44.7	OZ
Sterling	1.3	2.3	OZ
Indiana			
Bloomington	1.4	4.6	LC
Columbus	0.5	0.2	LC
Fort Wayne	5.0	76.4	DL,UA
Indianapolis	23.7	505.7	AA,DL,EA,LC,OZ,TW
Kokomo	1.7	3.8	LC
Lafayette	3.6	17.6	LC
Marion	1.7	2.2	LC
Muncie	1.3	4.5	LC
Richmond	0.5	0.4	LC
South Bend	8.3	79.5	LC,NO,UA
Iowa			
Burlington	2.0	10.1	OZ
Cedar Rapids	8.1	74.4	OZ,UA
Clinton	1.9	4.0	OZ
Des Moines	11.0	201.8	BN,OZ,UA
Dubuque	2.9	11.0	OZ
Ford Dodge	2.6	8.4	OZ
Iowa City	1.3	6.5	OZ
Mason City	2.1	11.0	OZ
Iowa			
Ottumwa	1.9	4.7	OZ
Sioux City	5.3	34.4	BN,NO,OZ
Waterloo	6.6	37.5	BN,OZ
Michigan			
Alpena	0.7	1.8	NO
Battle Creek	1.7	16.9	NO
Benton Harbor	1.7	9.0	NO
Cadillac	0.6	0.9	NO
Detroit-Ann Arbor	57.6	1,644.7	AA,AL,DL,EA,LC, MO,NO,NW,TW,UA
Flint	5.6	28.6	NO,UA
Grand Rapids	12.1	120.0	LC,NO,UA
Jackson	1.8	4.7	LC,NO
Kalamazoo	3.3	28.0	LC,NO
Lansing	7.2	54.6	NO,UA
Manistee	1.1	2.7	NO
Muskegon	4.1	30.7	NO,UA
Pellston	2.3	8.4	NO
Port Huron	0.5	0.6	*
Saginaw	5.9	63.1	NO,UA
Traverse City	2.8	15.8	NO
Wisconsin			
Appleton	1.1	7.0	NO
Beloit	2.5	5.9	NO
Clintonville	1.4	1.3	NO
Green Bay	8.1	81.7	NO
Madison	9.6	94.0	NO,NW,OZ
Manitowoc	1.4	3.5	NO
Marshfield	0.7	1.1	NO
Milwaukee	27.6	418.9	EA,NO,NW,OZ,UA
Oshkosh	3.3	32.9	NO
Stevens Point	2.3	5.2	NO
Wausau	3.6	18.7	NO

*Service not currently provided.

Key: AL—Allegheny, AA—American, BN—Braniff, CO—Continental, DL—Delta, EA—Eastern, LC—Lake Central, MO—Mohawk, NO—North Central, NW—Northwest, OZ—Ozark, TW—TWA, UA—United.

SOURCE: *Airport Activity Statistics of Certificated Route Air Carriers* (January 1965), Civil Aeronautics Board and Federal Aviation Agency.

Large jets carry ten times as many passengers at five times the speed of yesterday's trimotors

tation system of the United States.

For several years after 1903, few people were aware that the principles of controlled flight had been mastered. There had been too many well-publicized tragic or comic failures. Moreover, eminent scientists had published articles for popular consumption "proving" that manned flight was physically impossible. As a result, the early successes of the Wrights were ignored or reported inaccurately, even by their hometown newspapers in Dayton, Ohio.

Interest in aviation grew rapidly following exhibitions by the Wrights in the United States and Europe in 1908. In 1909, Louis Bleriot flew across the English Channel. In 1911, Cal Rodgers crossed the continent from New York to Pasadena in "84 days and 15 crashes."

Aviation progressed more rapidly in Germany, France and England than in the United States, particularly under the stimulus of World War I. A huge aircraft building program was inaugurated after the United States entered the war. Despite expenditures of hundreds of millions of dollars, however, no U. S. built aircraft was used in combat.

After the armistice of November 1918 the Government abruptly canceled its orders for aircraft. But the nation then possessed a large number of newly trained pilots, hundreds of two-seat "Jennies" and DH-4s, the newly designed 400-horsepower Liberty engine, and a rudimentary airmail service.

Airmail service was inaugurated between Washington and New York in May 1918 by the Army—an operation later assumed by the post office. Despite many mishaps, this route system was continued and expanded until 1927 when it was turned over to private contractors, as directed by the Kelly Act of 1925.

In retrospect, the development and use of commercial aircraft during the Twenties appears to have been painfully slow. The most significant breakthrough doubtless was the introduction of the highly efficient and reliable Wright Whirlwind and Pratt and Whitney radial engines. The first Whirlwind, rated at only 200 horsepower, was the ancestor of the power plants of the great majority of military and commercial aircraft built in the United States until the jet age. The largest and latest models developed over 3,000 horsepower.

Charles Lindbergh's New York to Paris flight in May 1927 generated vast popular interest. This flight proved nothing except the skill and daring of the young pilot and the worth of his plane and its engine. The Atlantic had been crossed by aircraft as early as 1919 and a nonstop coast-to-coast flight had been accomplished by Army pilots in 1923. Nevertheless, aviation enthusiasm attributable to the flight resulted in a sharp surge in prices of aviation common stocks.

Suddenly, an abundance of investment funds was available for an aviation industry that had been starved for capital ever since World War I. The re-

sult was an orgy of financial manipulation and the creation of complicated holding company structures encompassing airlines, equipment manufacturing and even airfields. But a broad market for aircraft and airline service was lacking. Consequently, aviation shares subsequently declined even more than the overall market averages in the 1929-32 crash.

Ford and Fokker trimotor aircraft were introduced in 1926. Altogether about 350 of these aircraft—seating 10 to 14 persons, cruising at about 120 miles per hour and costing about 60,000 dollars each—were produced in this country from 1926-31.

The Ford Motor Company joined forces in 1925 with W. B. Stout, pioneer builder of all-metal aircraft. Later General Motors Corporation arranged with Anthony Fokker—the Flying Dutchman who was responsible for Germany's best fighters during World War I—to build commercial models in the United States. Fokker construction continued the use of tubular steel fuselages in combination with cantilever wings of wooden spars and plywood covering used in the wartime fighters.

Both Ford and General Motors disposed of their aircraft manufacturing interests in the early Thirties. GM's departure from the field may have been related to the crash of a U. S. built Fokker in 1931 that caused the death of Knute Rockne—the famous Notre Dame football coach. The publicity that followed may have slowed the development of commercial aviation, but it hastened the introduction of improved, all-metal airliners that entered service in 1933 and 1934.

Aircraft in service and on order for U. S. scheduled airlines

	1939	1949	1959	1963	1964	October 1, 1965	On order October 1, 1965
Piston two engine							
DC-3	147	449	305	197	164	150	0
Convair		112	204	202	197	197	0
Martin		24	104	75	80	87	0
Total	147	585	613	474	441	434	0
Piston four engine							
DC-4		230	73	14	15	6	0
DC-6		109	325	217	203	189	0
DC-7			220	164	121	88	0
Constellation		79	104	40	41	34	0
Super Constellation			137	111	107	72	0
Total		418	859	546	487	389	0
Turboprop two engine							
Convair 580-600			1		4	16	*
F-27 and FH-227			34	50	54	54	28
Total			35	50	58	70	28
Turboprop four engine							
Viscount			82	60	59	59	0
Electra			96	117	117	117	0
Total			178	177	176	176	0
Turbojet two engine							
Caravelle				20	20	20	0
Boeing 727**					88	144	187
Boeing 737							60
BAC-111						13	42
DC-9							122
Total				20	108	177	411
Turbojet four engine							
Boeing 707			66	133	157	183	100
Boeing 720				104	112	119	10
Convair 880-990				65	67	66	0
DC-8			18	104	114	125	25
Total			84	406	450	493	135
Other	200	69	102	139	114	127	22
Total	**347**	**1,072**	**1,871**	**1,812**	**1,834**	**1,866**	**596**

* Sixty conversions from piston engined aircraft.

** Three engines.

SOURCE: Air Transport Association.

Modern airliners emerge

Airmail payments to private contractors at first were made on the basis of weight carried. "Flying mail trucks"—specialized single-engined aircraft—were developed in the middle and late Twenties with space for two or more passengers. Mail had priority, however, and passengers were sometimes put off at terminals when a full load of mail awaited transport. Numerous small operators carried airmail under contract on designated routes between major cities.

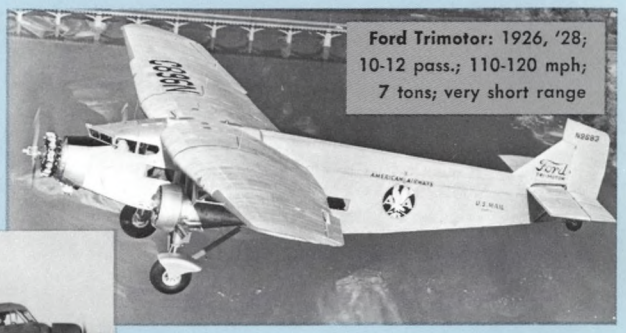
Four such air "transport" companies were merged in 1929 to form the nucleus of the present United Air Lines system. But for the most part little progress was made in developing a coordinated network of airline systems.

In 1930 the Watres Act gave the Postmaster General power to negotiate mail payments on available space-mile rather than on the basis of pounds actually carried. The intention was to motivate the airlines to acquire large, multi-engined planes and develop passenger traffic. The Postmaster General, moreover, was given wide discretion in

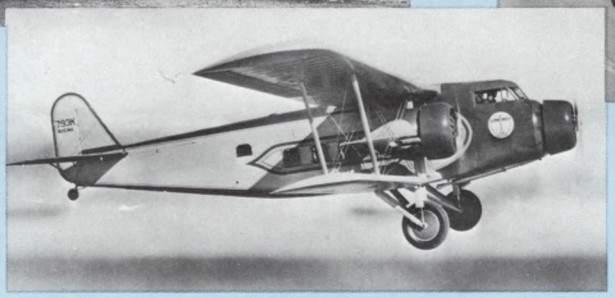
Principal aircraft used by U. S. airlines

Many plane types have been substantially modified subsequent to introduction. Changes include increased size and power and adjustments of range and seating density to specific travel markets.

Boeing 40: Entered U.S. service, 1927; modified, 1928; 4 passengers; **cruising speed,** 110 mph; **gross weight,** 3 tons; very short range

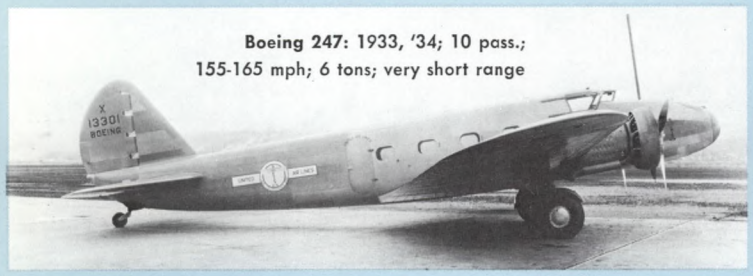


Ford Trimotor: 1926, '28; 10-12 pass.; 110-120 mph; 7 tons; very short range



Boeing 80: 1928, '29; 12-14 pass.; 115-120 mph; 9 tons; very short range

DC-3: 1936; 21-28 pass.; 170-185 mph; 13 tons; short range
DC-2 (similar to DC-3, but smaller): 1934; 14 pass.; 175 mph; 10 tons; short range



Boeing 247: 1933, '34; 10 pass.; 155-165 mph; 6 tons; very short range

DC-4: 1945; 40-68 pass.; 220-240 mph; 37 tons; medium range

DC-6 series: 1947, '51; 52-74 pass.; 300-315 mph; 50 tons; medium/long range

Lockheed Constellation: 1946; 44-64 pass.; 300 mph; 53 tons; medium/long range
Super Constellation (similar, but larger): 1951, '57; 63-99 pass.; 350 mph; 78 tons; medium/long range

awarding contracts and designating routes. As a result, he was able to encourage and even force consolidations. This led to the development of the systems of American, TWA (originally TAT) and Eastern, which together with United, have long constituted domestic commercial aviation's "Big Four." Pan American meanwhile, became the Government's "chosen instrument" to provide air transportation to Latin America, and later to Europe and Asia, in flying boats.

Ford and Fokker trimotors were joined by Boeing trimotors and two-engined Curtis Condors in 1929 and 1930. These aircraft were all reasonably safe and reliable but slow, had limited capacity (10 to 14 passengers) and had some difficulty crossing mountain barriers. Most routes could not be operated without Federal subsidy in the form of airmail payments. Better aircraft, therefore, were a necessity.

With the withdrawal of the large auto firms from

Equipment operated by major U. S. airlines, October 1, 1965

	American	Braniff	Continental	Delta	Eastern	National	Northeast	Northwest	TWA	United	Western	Pan Am.
Piston												
Convair		16		19	20					13		
DC-4												
DC-6	36	11	1	11			17			77	5	19
DC-7	10	5		19	14			5		10		10
Constellation					37				40			
Jet and turboprop												
Viscount			11							45		
Electra	24	9			39	17		16			12	
Caravelle										20		
B-727	27				35	9		9	21	43		
B-737												
BAC-111		9										
DC-9												
B-707	34	4	7					12	65			60
B-720	22	6	6		15			16		29	18	5
CV-880, 990	19			16			4		26			
DC-8				16	17	13				49		17
Total*	172	60	26	85	177	39	27	58	153	286	35	114

	Allegheny	Bonanza	Central	Frontier	Lake Central	Mohawk	North Central	Ozark	Pacific	Piedmont	Southern	Trans-Texas	West Coast
Piston													
DC-3			14	10	16		19	23			14	18	9
Convair	21		8		8	27	26					25	
Martin	13					2		13	9	26	24		
Jet and turboprop													
F-27		14						7	9	8			9
Convair 580-600	3		1	12									
BAC-111						4							
Total	37	14	23	22	24	33	45	43	18	34	38	43	18

*Fifteen miscellaneous aircraft included in totals.

Note: All trunk lines have sizable orders outstanding for jet aircraft, especially shorter-haul types. Most local service lines are in the midst of equipment transitions. For example, North Central is buying DC-9s; Ozark plans to replace its entire present fleet with FH-227s and DC-9s; Lake Central is replacing DC-3s with Nord 262s.

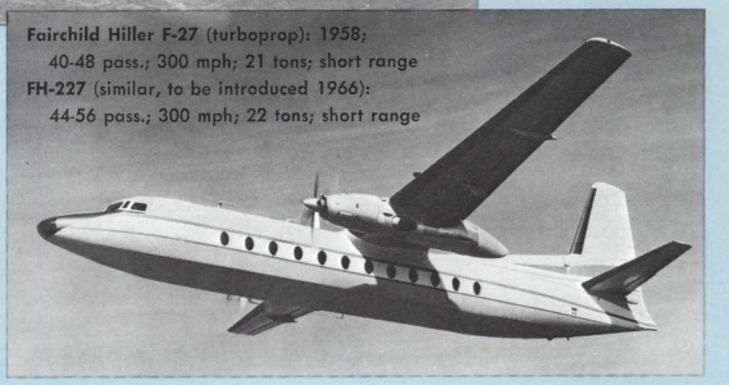
SOURCE: Air Transport Association.

Convair 240, 340, 440: 1948, '56; 44-56 pass.; 270-290 mph; 25 tons; short range
Martin 202, 404 (similar to Convair): 1947, '51; 40-44 pass.; 270-280 mph; 23 tons; short range

Boeing 377 Stratocruiser: 1949; 50-70 pass.; 300-340 mph; 73 tons; long range

DC-7 series: 1953, '56; 69-96 pass.; 350-370 mph; 61-72 tons; medium/long range

Fairchild Hiller F-27 (turboprop): 1958; 40-48 pass.; 300 mph; 21 tons; short range
FH-227 (similar, to be introduced 1966): 44-56 pass.; 300 mph; 22 tons; short range

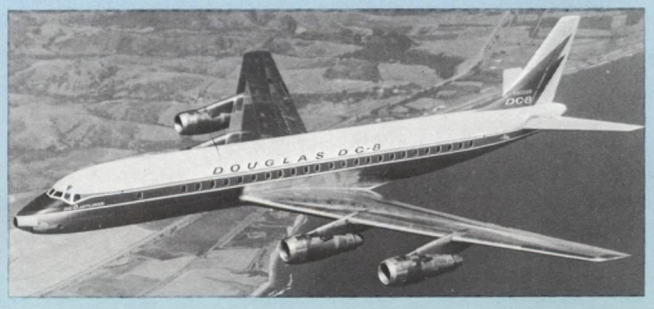


Vickers Viscount 700, 800: (British turboprop): 1955; 44-70 pass.; 320-350 mph; 32 tons; medium range

Boeing 707 series: 1958 to date; 121-199 pass.; 600 mph; 130-168 tons; long range
Boeing 720 (similar, but smaller): 1960; 104-122 pass.; 600 mph; 118 tons; medium range

Lockheed Electra L-188 (turboprop): 1959, '61; 66-91 pass.; 400 mph; 57 tons; medium range

DC-8 series: 1959 to date; 112-250 pass.; 600 mph; 137-169 tons; long range



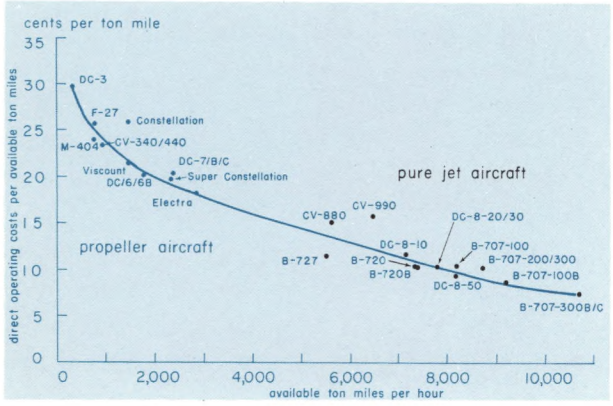
aircraft production, the lead passed to relatively small firms that specialized in the field. These were Boeing, Douglas, Lockheed and, later, Martin and Consolidated. Rapid growth of these firms was made possible largely by financing through retained earnings and progress payments made by equipment buyers. Each firm built both commercial and military types and each played a vital role in meeting the nation's World War II needs.

The first truly modern aircraft, introduced in 1933, was the Boeing 247—a two-engined, all-metal, low-wing monoplane with retractable landing gear—capable of cruising at 155 miles per hour and maintaining level flight on one engine. Despite these advances, the 247 (predecessor of the four-engined B-17 Flying Fortress) was outclassed the following year by the Douglas DC-2. In general, the DC-2 was similar to the 247 but was larger, faster and capable of longer flights.

An improved Douglas aircraft, the famous DC-3, appeared in 1936. It quickly became standard on the major airlines, which had acquired over 200 by Pearl Harbor. During World War II about 10,000 DC-3s, designated C-47s by the Army Air Force, were built. Hundreds of these planes remain in service throughout the world at the present time.

Some of the basic facts of airline economics are epitomized in the story of the DC-3. First, equipment accounts for a very large share of the carrier's physical assets. Second, superior equipment serving a competitive route immediately places operators of existing aircraft at a grave disadvantage. Third, larger aircraft offer lower operating costs per seat-mile, and hence greater profits, assuming a sufficient volume of potential traffic. Fourth, barring an accident, aircraft are virtually immortal when properly maintained.

Operating costs
are much lower for jet aircraft



SOURCE: Federal Aviation Agency.

Airframes are fabricated from aluminum, which does not rust or deteriorate in normal use. Engines, instruments and other special equipment can be replaced or renovated. Maintenance is topnotch, as it must be if the airlines are to operate safely and efficiently. As a result, aircraft normally are sold or withdrawn from service only as a result of obsolescence—the inability to compete with improved, lower-cost types.

Toward the end of the Thirties, the major airlines were cooperating with Boeing and Douglas in the development of four-engined aircraft. The principal result was the Douglas DC-4, which would have entered domestic airline service in 1942. The military preempted the first deliveries of these aircraft, however, and large-scale production (as C-54s) was ordered for the worldwide transport system necessitated by the war.

DC-4s and DC-3s built for the military were converted to civilian use after 1945 and carried the bulk of a rapidly rising air traffic while the industry awaited volume production of the postwar airliners—four-engined Lockheed Constellations, and Douglas DC-6s, Boeing Stratocruisers and the two-engined Convairs and Martins. These new aircraft had cruising speeds approaching 300 miles per hour compared with 120 for the trimotors, 185 for the DC-3s and 240 for the DC-4s. Seating capacity was raised to 50 or more, and cabins were pressurized and air conditioned. (The DC-7, cruising at 350 miles per hour, was introduced in 1953.)

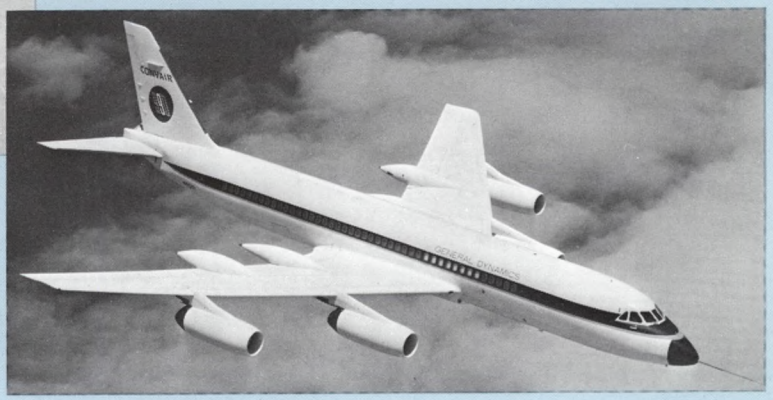
Fleets of postwar piston aircraft placed the airlines in a posture that made profitable operations possible for the trunks without the crutch of Federal airmail subsidies. The situation appeared to have stabilized. But, even then, many industry executives were looking ahead to a new era—the age of the jets.

Jet airliners cost 3 million dollars or more and fly at 600 miles an hour at altitudes in excess of 30,000 feet. Nevertheless, they can be operated at a seat-mile cost well below that of fully depreciated, four-engined piston planes. The advantages of the jets are principally in their providing more seat-miles per hour, the simplicity and ease of maintenance of their engines and strong customer appeal. U. S. built jets have set the standard for the world and are used by many foreign airlines.

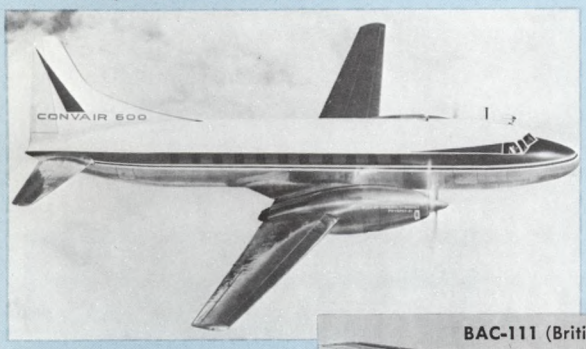
A similar equipment transition was accomplished earlier in the railroad industry. The last steam locomotives were retired from domestic service a decade

Sud SE-210 Caravelle (French): 1961;
64 pass.; 500 mph; 45 tons; medium range

Convair 900: 1960, '62; 84-121 pass.;
600 mph; 97-120 tons; medium/long range
Convair 880 (without wing pods)



Convair 580, 600 (turboprop conversion
of piston Convairs): 1964 to date; 44-52 pass.;
310-350 mph; 28 tons; short range

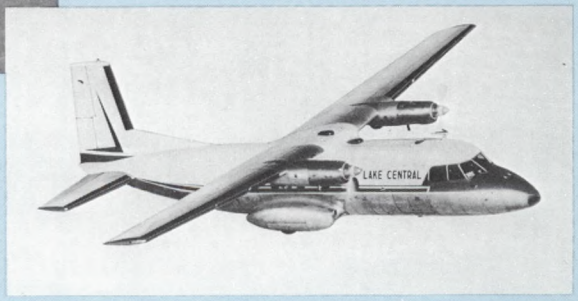


Boeing 727 series (three jets): 1964 to date:
91-170 pass.; 600 mph; 81-85 tons; medium range

BAC-111 (British): 1965 to date:
63-79 pass.; 500 mph; 39-44 tons; short range

DC-9 series: 1965 to date; 56-115 pass.;
550 mph; 39-45 tons; short range

Nord 262 (French turboprop): 1965 to date;
27 pass.; 230 mph; 12 tons; short range



Boeing 737 series (under development): 1967;
99-113 pass.; 550 mph; 43-49 tons; short range

ago because they could not compete with the diesels. Most of these engines were in excellent condition and could have been used for many additional years. But costs of operating newly purchased diesels, including the full burden of depreciation, were such that it was profitable to scrap even the newest steam locomotives.

If the pure jets had not become available in the late Fifties, piston-powered planes would have been superseded in large numbers by turbine-powered propeller aircraft—the turboprops or propjets. Vickers Viscounts, produced in Great Britain, were introduced into U. S. service in 1955 by Capital Airlines. Their higher speed and reduced noise and vibration immediately won traffic from competing piston aircraft. The Lockheed Electra, a U. S. built turboprop capable of cruising at 400 miles per hour, entered service in 1959.

Fairchild Hiller turboprops (originally a Fokker design) are used by a number of local service lines. A similar smaller plane—the French-built Nord 262—currently is being introduced by Lake Central, and a number of local service lines are converting piston-engined Convairs to turboprops. Nevertheless, the turboprop was largely leapfrogged by the U. S. airlines, because these power plants, although markedly superior to the piston engine, could not measure up to the performance of the jets on longer trips.

A defense-related industry

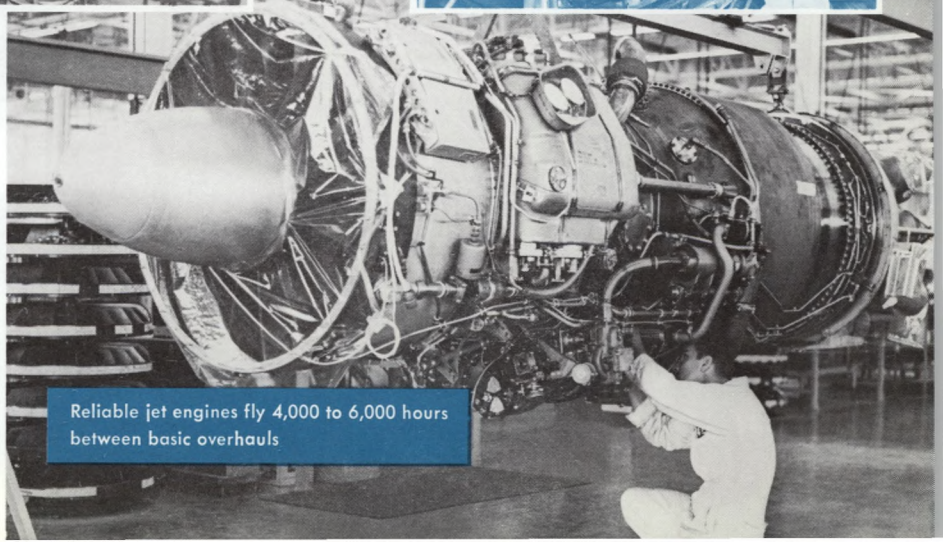
Legislation relating to the airline industry always has been influenced to a substantial degree by military preparedness considerations. The Federal Aviation Act of 1958 repeats language of the Civil Aeronautics Act of 1938 in proclaiming the Government's purpose as that of encouraging and developing an air transportation system adapted to the needs of commerce, the postal service and the national defense.

After Pearl Harbor, 221 of the airlines' fleet of 390 aircraft were taken over by the military forces. The remaining units were operated at virtual capacity under a formal system of priorities that gave preference to travelers on urgent business related to the war. In addition, airline personnel and planes flew emergency missions in the United States and to the principal theaters of war to transfer men and materials. The airlines also helped to train military airmen and operated facilities to repair and modernize equipment. Aircraft originally developed for commercial airlines were built and used in large numbers for military transport by the Air Transport Com-

Aircraft are stripped down and rebuilt during periodic overhauls in airline shops

Local service airlines, like the trunks, emphasize painstaking maintenance of aircraft

Airline inspectors use X-rays to detect flaws in aircraft structures and parts



Reliable jet engines fly 4,000 to 6,000 hours between basic overhauls

mand and the Naval Air Transport Service.

The airlines aided the Berlin airlift of 1948, military operations in Korea and, currently, are playing a role in supplying Vietnam. The Military Air Transport Service (MATS) was formed in 1948 by a union of the two services previously operated by the Air Force and the Navy. Since the mid-Fifties, MATS has been backed up by the Civilian Reserve Air Fleet, a designated group of first-line aircraft in regular service with the major airlines that are available to the Government on short notice together with experienced crews.

MATS, renamed the Military Airlift Command on January 1, 1966, operates hundreds of planes that carry personnel and material on regular routes and schedules for the armed forces throughout the world. Since 1960, the U. S. Department of Defense has contracted with the private airlines for military haulage, following a policy of leaving the "hard core" to MATS. The volume of these contracts is increasing but MATS remains "the world's largest airline."

Since World War II, some aircraft types developed by the military have been adapted for civilian use. Boeing Stratocruisers of the late Forties and early Fifties were based on the wartime B-29. Similarly, years of experience in building and operating military jet aircraft, particularly the Boeing B-47 and B-52, preceded the first commercial jet orders in 1955.

The airlines also have made extensive use of radar and other navigational and landing aids pioneered by the military. It is unlikely that the airlines would be seriously considering the purchase of supersonic transports (SST) were it not for the knowledge and experience gained through work on such military designs as the B-58, B-70 and A-11.

Air travel safety

Some potential air travelers are deterred by concern about the safety of this means of transport. Crashes are always front page news, and incidents involving some element of risk often are widely publicized even when no fatalities or injuries occur.

Statistics provide ample evidence that the chances of any given commercial airline flight ending in disaster are extremely remote. In 1941, after a careful review of the pertinent data, major life insurance companies eliminated from their regular policies special clauses relating to air travel on commercial airlines. Since that time, safety records have improved further.

The usual method of comparing the safety of various means of transportation is to use fatalities per

Office work aloft—
equipment is provided on some flights

100 million passenger miles. Each year since 1951 this rate for scheduled airlines has been less than one. In the 10-year period, 1954-63, the fatality rate averaged 0.41 for the airlines compared with 0.12 for railroads, 0.16 for intercity buses and 2.43 for private autos. On a mileage basis, therefore, it appears that an intercity trip in a car is six times as dangerous on the average as a similar trip by plane.

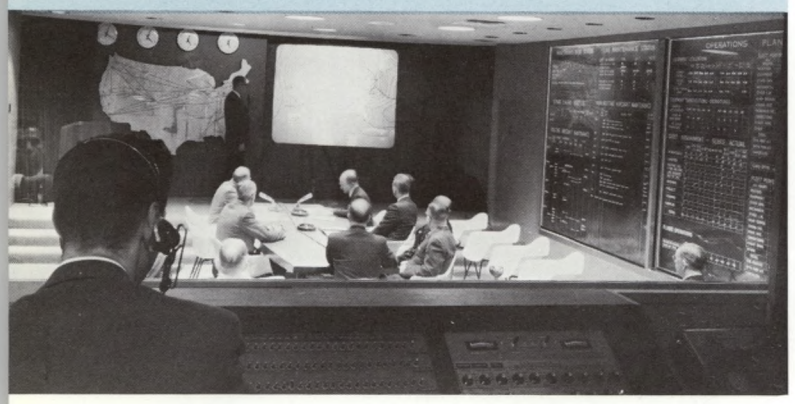
Commercial airlines perform almost 4 million departures and landings each year. On the experience of recent years, the chance of a fatal accident during any one trip is about one in a half million. A theoretical "average passenger" might make daily round trips for several centuries before becoming involved in a fatal accident. Several of the local service airlines have never had a fatality in hundreds of millions of passenger miles. This is why trip insurance can be sold so cheaply even though underwriters must absorb selling and administration costs.

Despite evidence of a high degree of safety in air travel, it is clear that some risk exists whenever any vehicle is in motion. The airlines guard against the special hazards of air transportation by careful selection and training of personnel, painstaking maintenance and use of the latest navigational aids and safety devices. Concern for each of these factors is necessary, although expensive.

The airlines and their suppliers perfected two-way radios, de-icers, controllable-pitch propellers, flaps and air brakes during the Thirties; also the radio beam was substituted for lighted beacons to guide traffic on the airways. Strides were made in weather

forecasting and Instrument Landing Systems (I.L.S.) were introduced in the early postwar period. In the mid-Fifties, many aircraft were equipped with airborne radar to warn of storm centers ahead. Radios and altimeters have been continually improved and backed up by one or more alternative systems.

Airline meteorologists operate weather analysis stations at key cities along their routes



Each day airline executives review their system's operating picture

Improved engines have played a large role in advancing air safety. The best piston engines are certified to fly 3,000 hours between overhauls. For the simpler jets and turboprops with rotary motion rather than the reciprocating action of pistons, this period has more than doubled. The chance of any properly maintained engine, piston or turbine failing in flight is very small. Since engines are independent of one another, the statistical possibility of two failing on the same trip is negligible.

Airlines have their own high safety standards and are constantly on the alert to new ideas and concepts. They also are under the safety supervision of the Civil Aeronautics Board (CAB) and Federal Aviation Agency (FAA). Since the mid-Twenties these agencies and their predecessors have had the responsibility of certificating aircraft and flight personnel, as well as the airlines as operating organizations. These certificates can be withdrawn whenever evidence arises of defects or negligence.

The FAA promulgates and enforces air safety rules and is responsible for navigational aids on the airways, landing aids at the airports and control of aircraft movements from takeoff to touchdown. The CAB carefully investigates accidents to ascertain a "probable cause," so that similar difficulties may be avoided thereafter.

Deterrents to air travel

Factors other than safety tend to deter expansion of air travel. Among these are the time spent going to and from large city airports, occasional postponements and cancellations of flights and delays sometimes encountered in baggage handling.

Modern airports typically are located far from downtown business districts. Principal runways commonly exceed two miles in length and large acreages are required for hangars, terminal buildings, auto parking and other facilities. In addition, outlying locations are desirable so that airports are beyond proximity to tall structures and densely populated urban areas.

Travel time to airports has been reduced by the expansion of expressway systems. Helicopter services carry passengers to and from airports in Chicago, Los Angeles, New York and San Francisco.

Cancellations of flights have been reduced to about 1 per cent of the total for major lines, mainly because of improved reliability of equipment and instruments, but also because of such factors as better weather information and faster snow removal. Airlines have attempted to reduce operating delays and some report that 85 per cent of all flights now arrive at their destinations on time or within 15 minutes. As a result of these efforts, much of the seasonal tendency for air traffic to decline in the winter months has been eliminated.

Better airport lighting, improved instruments and careful training of aircrews and FAA air traffic controllers have steadily reduced the "landing minimums" at most terminals. At the largest, most modern airports landings of properly equipped aircraft are permitted when visibility is restricted to a ceiling of 200 feet and one-half mile ahead. Improved systems, now being introduced, will reduce these limits to 100 feet and one-quarter mile. Finally, experi-

ments are under way on systems that are expected to make possible the ultimate achievement of zero-zero landings in which the approach and touchdown are guided and controlled entirely by instruments.

The more prosaic problem of baggage handling also is yielding to solution. At some airports passengers are relieved of their baggage at curbside, instead of having to carry it into the building. Some airlines, as a result of new equipment and techniques, are making most baggage available to passengers as soon as they can reach the point of delivery.

Who flies where

To carry passengers or property interstate on a scheduled basis, an airline must obtain a certificate of "public convenience and necessity" from the CAB for each route (except for the air taxi exemption for aircraft of under 12,500 pounds). In the late Twenties and early Thirties, regular passenger service was provided by those lines that had been awarded contracts to carry airmail. The Civil Aeronautics Act of 1938 provided for certification of permanent routes and for subsidy payments, where necessary, to maintain adequate service on these routes.

At present there are 24 certificated domestic passenger-cargo lines and three all-cargo lines. Eleven of the domestic route carriers are known as the trunk lines, while 13 are designated local service lines. The trunks are the descendants, directly or indirectly, of the air carriers that operated the "grandfather routes" certificated on a permanent basis in 1938 on the strength of satisfactory previous performance on mail contracts.

Stewardesses—both decorative and helpful

Multimillion dollar computer systems of major airlines confirm reservations in seconds

The local service carriers, often called *feeder lines,* were certificated in the early postwar years as second level airlines to serve smaller localities and connect these with major airports served by the trunk lines. Actually, the great bulk of the passengers using local lines complete their journeys on these routes and are not "fed" to the trunks.

In only a few instances do the operations of local service lines overlap one another. In general, each is the sole supplier of feeder, or local services, within a given geographical area. Although the local service lines have greatly increased their route mileage and traffic volume, all are smaller than any of the trunks. To some extent, the local carriers compete with the trunk lines, sharing with them numerous *city-pair* travel markets. Nevertheless, the local lines usually are at a competitive disadvantage vis-a-vis their trunk line rivals, owing to the intermediate stops required and their inability in most instances to match the equipment that the trunks use.

As airline traffic increased in the late Thirties, the CAB moved to encourage competition by certificating two, three and even more carriers to serve individual routes having high traffic densities. When more than

one airline offers service over a given route—for example, Chicago to Washington or to New York—rivalry can become intense. Although fares are regulated by the CAB, airlines compete on the basis of schedules, speed and comfort of equipment, classes of service, efficient handling of reservations, consistency of on-time performance, food, entertainment, speed of baggage handling and the charm and beauty of stewardesses. Each line advertises extensively, using television, radio, large newspaper ads and billboards to exploit its services as well as the attractions of the area it serves.

Selected major routes of the trunk lines are shown on the accompanying table. United, American and TWA have extensive nationwide systems. Operations of the other trunks are more or less regional in nature, although Delta, Northwest and National have coast-to-coast routes.

Areas of operations of most local service lines are indicated roughly by their names. Among these are Allegheny, Mohawk, Piedmont, Southern and Pacific. Principal local carriers in the Midwest are North Central (Michigan, Wisconsin and Minnesota), Ozark (Iowa, Illinois and Missouri) and Lake Central (Indiana, Michigan and Ohio).

Most of the domestic trunks and a few of the local service lines also operate international schedules, mainly to Canada, Mexico and Central America but also to Europe and Africa (TWA), the Far East (Northwest and TWA) and South America (Delta and Braniff). Pan American operates routes that extend around the globe but not within the 48 states.

Trunk line nonstop jet and turboprop services over 15 major intercity routes, September 1965

	United	American	TWA	Eastern	Others
New York and					
Chicago	X	X	X		NW
Boston		X	X	X	NA, NE
Washington	X	X	X	X	BN, NA
Los Angeles	X	X	X		
San Francisco	X	X	X		
Miami				X	NA, NE
Chicago and					
Los Angeles	X	X	X		CO
San Francisco	X	X	X		
Washington	X	X	X		
Miami				X	DL, NW
Washington and					
Los Angeles	X	X	X		
Miami				X	NA
San Francisco	X		X		
Boston		X		X	NE
Los Angeles and					
San Francisco*	X		X		WA

*Nonstop jet service also is provided by Pacific Southwest Air Lines, a non-certificated intrastate carrier.

Key: BN—Braniff, CO—Continental, DL—Delta, NA—National, NE—Northeast, NW—Northwest, WA—Western.

SOURCE: *Official Airline Guide* (September 1965).

Route competition

The CAB is regularly confronted with applications by airlines for certificates of "public convenience and necessity" to operate additional routes, or for permanent certifications of routes granted on a temporary basis. Such certificates resemble franchises and once obtained comprise—along with trained personnel—the principal nonphysical assets of the airlines.

Certificates covering densely traveled long hauls are eagerly sought, while authorization of additional competition is often opposed vigorously by airlines already operating these routes. Valuable route certificates have been allotted to certain financially weak carriers in order to maintain them as going concerns. Decisions of the CAB sometimes have been appealed to the Federal courts.

Once certificated for a given route, an airline usually is required to provide a minimal service, even if operations prove to be unprofitable. The CAB now employs a "use it or lose it" formula in connection with its administration of subsidies to determine whether a given point generates sufficient traffic to continue receiving service. In recent years the trunks have voluntarily given up various routes serving smaller centers to the subsidized local service lines.

Since its formation in 1938, the CAB has allowed

The champion—a DC-3 built in 1939; 13 years with a trunk line; then a local; recently converted to executive use; 9 years of flying time; 260 million passenger miles

no new entry into the ranks of the trunk carriers. In fact, the number of these airlines has been reduced by mergers from 18 in 1938 to 11 at the present time.

Vast changes have taken place in the route systems of the individual carriers notwithstanding the "freeze" on the number of trunk lines. Once useful distinctions between the big three or four and the others have lost much of their meaning.

Fifteen of the most important city-pair routes are served by at least two trunk lines providing nonstop jet or turboprop flights. Most commonly these markets are served by three carriers, but some have as many as five or six. The three largest carriers play major roles in these markets. United, American and TWA are rivals on seven of the 15 routes.

Generally, the greater the number of suppliers of a service, the more determined any one of them will be to innovate, offer improvements in quality or lower prices. It is widely thought, therefore, that the interests of consumers will be served best in unregulated industries when the number of firms on the supply side is "large." Whether this is the case also in regulated industries is a debated issue.

In many industries, a firm's expansion into a new market area entails a considerable capital investment and commitment of operating expenditures. This is especially true of the railroads, where extension of service into a new territory calls for substantial outlays for land, grading, station structures and trackwork as well as increased operating costs.

Expansion of an airline's route network is relatively less costly than for a railroad, particularly because the airway is already there to be used. Setting up operations at new points, however, may require the acquisition of terminal space and equipment servicing facilities, the hiring of ground personnel and sales promotion in a new market. Where, however, a carrier already operates at two cities but not between, connecting service can be provided readily, assuming sufficient equipment and qualified personnel are available.

Entry of an airline into a market may be felt keenly by the lines already operating. Existing operators may maintain schedule frequency or even increase it to retain their market shares, with adverse effects on load factors and earnings.

At any time, the domestic airline market as a whole is delicately balanced. A marked change made in any one segment of the market is likely to require subtle compensating adjustments elsewhere if the interests of equity and efficiency are to be adequately served. Clearly, the responsibility of the CAB in connection with route awards is weighty and the problems involved in making suitable assignments of operating rights is highly involved.

The CAB has followed a policy of increasing competition on routes where the volume of traffic was sufficient to permit additional carriers to operate profitably. Some students of the airline industry have advocated freedom of entry to new markets for all qualified operators. Proponents of the present system fear that a more liberal policy would lead to excess capacity and ruinous competition.

Mergers of domestic airlines also must be approved by the CAB. In some cases, mergers have been permitted when financial difficulties have threatened the continuation of operations. Since 1950, five trunk lines and six local service lines have merged and ceased to exist as independent carriers. The most recent and most important of the postwar mergers was the 1961 consolidation of Capital and United. As a result, United became the largest domestic airline, surpassing American.

During the early Sixties, mergers of Pan American and TWA, and American and Eastern were proposed, but the CAB did not give its approval. Since then, these lines have followed independent expansion policies and apparently have lost interest in the mergers.

Total transport revenues of U. S. scheduled airlines, year ended June 30, 1965

Trunk lines	Domestic	International and territorial	Total	Local service	Domestic
		(million dollars)			
American	563	9	572	Allegheny	24
Eastern	406	58	464	Bonanza	11
TWA	446	169	615	Central	7
United	661	51	712	Frontier	16
Braniff	101	15	116	Lake Central	9
Continental	99		99	Mohawk	27
Delta	253	4	257	North Central	24
National	148		148	Ozark	17
Northeast	42		42	Pacific	10
Northwest	153	79	232	Piedmont	20
Western	108	10	118	Southern	13
				Trans-Texas	15
Pan American*		605	605	West Coast	9

*Aside from Pan American, the largest international airline was Trans-Caribbean with revenues of 26 million dollars. Flying Tiger was the largest all-cargo line with revenues of 53 million dollars. BOAC and Air France, the two largest foreign-owned free world airlines, are approximately the size of Delta.

SOURCE: Civil Aeronautics Board.

Air terminals

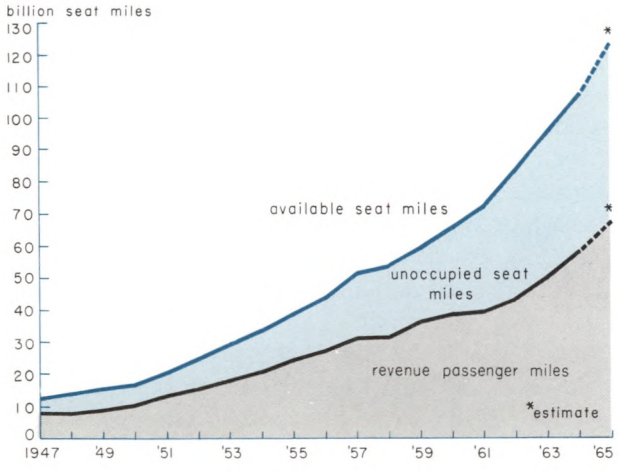
Unlike the railroads, the airlines do not build and maintain their rights-of-way and terminals. (Court actions have determined that the air itself is not under control of property owners.) The FAA maintains the "airways" on which commercial airliners (and other aircraft) are kept on course through radio beams, radar and other aids. In addition, airports have benefited from a variety of Federal and local government aids.

Most civilian airports are owned and operated by cities, counties or special authorities. Maintenance of a suitable airport has been a matter of local pride for many communities and many have utilized general obligation bonds to provide facilities, in some cases in excess of their needs.

Various Federal relief agencies, especially the WPA, invested about 400 million dollars in airports during the Thirties. A much larger outlay was made during World War II in the construction of airports that subsequently were turned over to municipalities for civilian use. Since the Federal Airport Act of 1946, the Government has made more than 700 million dollars available to local public airport agencies on a dollar matching basis to aid in the development and improvement of airport facilities. The largest airports, such as Chicago's O'Hare Field ("the World's Busiest") and New York's Kennedy International Airport, cover thousands of acres and represent investments of hundreds of millions of dollars.

Airports obtain revenues from aircraft landing or takeoff fees (usually assessed by weight), rentals of hangars and other terminal buildings, sales of fuel and payments made by concessionaires of such facilities as restaurants and parking lots (usually under contracts awarded on competitive bidding).

Rise in available seats
has outpaced passenger traffic gains



SOURCE: Civil Aeronautics Board.

Milwaukee's Mitchell Field—extension of jet runway required a tunnel for highway traffic

The FAA and the airlines have continuously pressed local authorities to raise standards to permit airports to handle expanding traffic more efficiently and safely. Of course, airport facilities are used by *general aviation* (private aircraft other than the commercial airliners) and the military as well as the airlines.

The Administrator of the FAA maintains a periodically revised National Airport Plan. In March 1964 he reported that a 1.1 billion dollar investment was required for airport improvements in the period to 1967.

Excise taxes

Until recently, Federal funds devoted to the construction, maintenance and operation of airports and airways have come from general tax revenues, including, of course, the proceeds of certain taxes upon air transportation. But, these air transportation taxes simply were elements of the elaborate Federal excise system.

A tax on passenger travel by air, rail and bus was imposed during World War II partly to finance war expenditures and partly to discourage civilian travel. Legislation enacted in 1962 repealed the 10 per cent passenger travel tax then in force as an excise and reimposed (at half the old rate) a selective levy, now termed a *user charge,* on air travel only. The tax on air passenger fares currently yields roughly 165 million dollars annually. Collections, which are paid into

the Treasury's general fund, are regarded as a charge for the use of airways and airports financed largely by the Federal Government.

Similarly an airline user fee is the 2 cents per gallon tax on high-test gasoline, although proceeds are earmarked for the highway fund. In the President's fiscal 1966 Budget message, delivered in 1965, a similar levy on airline jet fuel (high-grade kerosene) was proposed, but no action was taken by Congress during 1965. It is expected that the proposal will be reintroduced, since the user charge principle has gained wide support as an element of the national transportation policy.

Productivity rises

About 40 per cent of the operating expenses of the airlines are accounted for by wages and salaries. In 1964 compensation of 190,000 employes exceeded 1.5 billion dollars. Total employment has increased appreciably each year since 1958.

Revenue ton miles flown per airline worker has increased steadily in the postwar period as a result of increases in aircraft size, more extensive use of mechanical equipment to handle baggage and cargo, more efficient engines, use of electronic equipment for handling reservations and improved managerial techniques. In 1964 the airlines produced 42,000 revenue ton miles per employe compared with 28,000 five years earlier, and only 10,000 in the early postwar years.

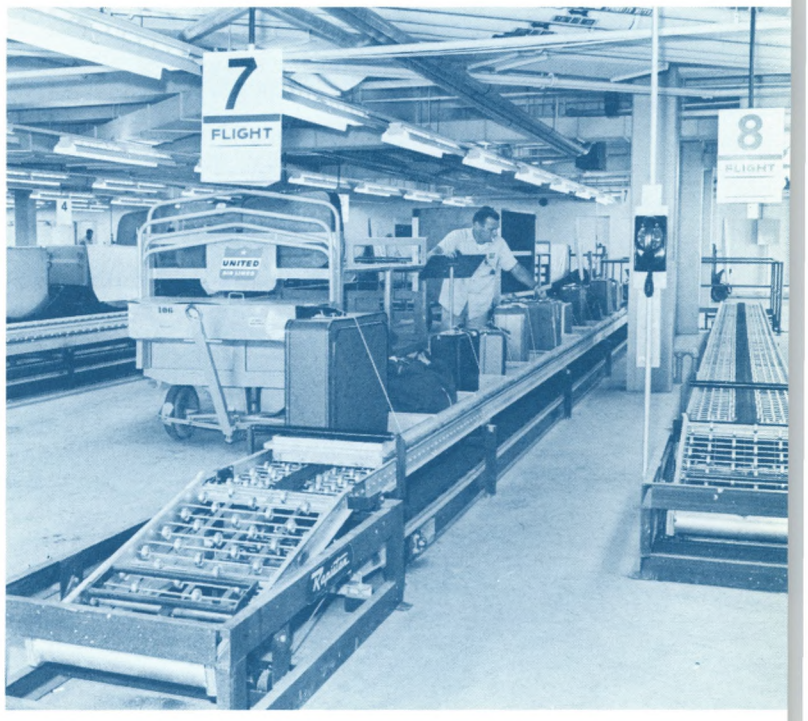
The average annual compensation per airline employe now exceeds 8,000 dollars, well above the average for most other industries. About 15 per cent of airline employes are flight personnel—pilots, engineers and stewards and stewardesses. Annual salaries of pilots, numbering 15,000, start at about 12,000 dollars. Captains of large jets with responsibility for as many as 180 passengers, together with equipment valued at as much as 8 million dollars, may earn 33,000 dollars per year.

Airlines always have placed emphasis upon high caliber employes, with adequate intelligence, training, personality and appearance. Public confidence is influenced directly by the airline personnel with whom passengers come in contact. An even larger number of persons behind the scenes also play vital roles in maintaining efficient operations.

Aside from the pilots, perhaps the most distinctive airline employes are the stewardesses, who serve meals and refreshments and attempt to keep passengers happy and comfortable. The first stewardesses were added to flight crews in 1931 by United, and most other airlines followed suit soon afterward. Almost as many stewardesses are employed as pilots and co-pilots, but turnover of these young ladies is much more rapid. The typical stewardess serves less than two years before resigning, usually to get married.

The emergence of freight

From the earliest days the airlines have carried express and freight shipments, as well as passengers and mail. But until the postwar period, revenues from these operations remained only a small proportion of the total.



Improved equipment speeds baggage handling

Freight and express accounted for less than 3 per cent of total airline revenues before World War II. By 1964, this proportion had more than doubled. It appears that air freight will continue to grow relative to passenger business. In fact, some industry analysts visualize the time when airline freight revenues will rival passenger ticket sales. Large investments are being made by the airlines in freight terminals, handling equipment and sales promotion.

Numerous pilots trained by the Army and Navy acquired one or more war surplus aircraft soon after World War II and attempted to establish profitable air freight operations. In 1949, the CAB certificated four all-cargo lines to operate domestic routes. Meanwhile, the established passenger lines also began to emphasize air freight to help utilize available capacity more fully.

Most freight is still carried along with passengers or in aircraft that have been retired from passenger service. Increasingly, however, the airlines are acquiring jet aircraft such as the Douglas DC-8F that are specifically designed for commercial air cargo use. Some recent orders are for "quick change" aircraft, especially the Boeing 727 QC that can be converted from passenger to cargo service in about 30 minutes, thus permitting passengers to be carried in the daytime and freight at night.

The jet air freighters can lift as much as 45 tons for medium-range hauls and 40 tons coast to coast. Moreover, cargo moves at 600 miles an hour. (Unlike surface vehicles and propeller aircraft, the jets operate most efficiently at or near top speed.) As a result, a large jet can do three or four times the work of a four-engined piston plane and at half the cost.

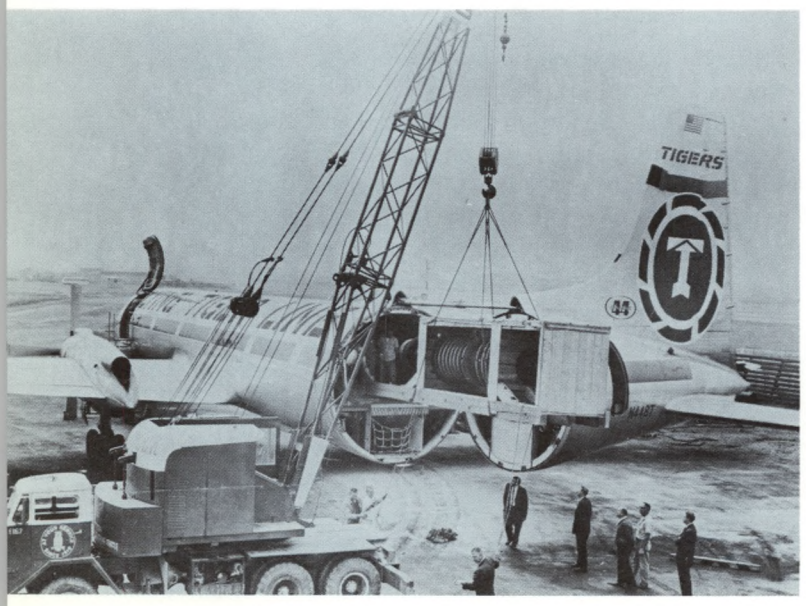
Charges for air freight have averaged about 20 cents per ton mile in recent years, about seven times as high as railroad charges. Of course, the make-up of traffic of the two carriers varies greatly. On small-lot items the cost relationship is much closer. Some industry analysts visualize average rates on air freight as low as 10 cents per ton mile, compared with 3 cents or so for the rails and 6 to 7 cents for trucks.

Air freight offers advantages, other than speed, in reductions in packaging costs and less risk of damage or pilferage. Use of sealed containers that can be interchanged with any surface carrier is likely to become important in the future.

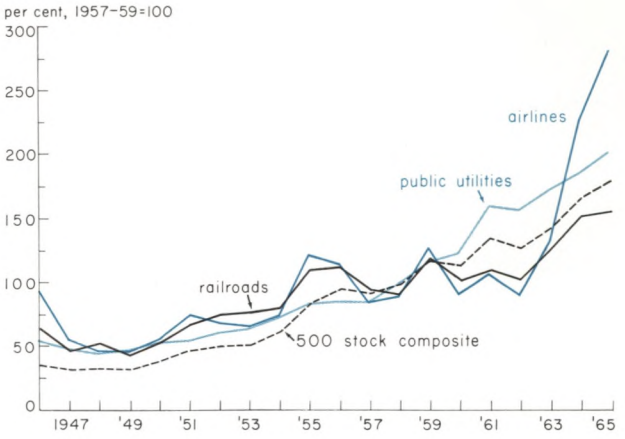
Producers of electronic components and other industrial products with high values relative to weight or bulk use air freight in large volume. In addition, there are significant movements of certain fresh fruits and vegetables—especially strawberries—and style merchandise. A dramatic example of the possibilities inherent in jet freight was the shipment of thousands of calves to Italy during the summer of 1964, not as prize stock but for slaughter.

Manufacturers in many cases have been able to reduce inventories and eliminate regional warehouses while improving service to customers through the use of air freight. Increasingly, light manufacturing facilities are being located within easy trucking distance of major airports.

A specialized air freighter—
the Canadair CL-44 swingtail turboprop



Surge in airline stock prices reflects improved profits



SOURCE: Standard and Poor's.

Financing the airlines

The fundamental purpose of any private industry is to supply a product or service at a price that will attract enough customers to assure profitable operations. Buyers of common stocks, and their investment advisors, are constantly re-evaluating the success of various industries, and more particularly individual firms, in meeting this goal. Since 1962 the average price of airline stocks has risen sharply, but only about in line with improved profits (see chart).

Airline shares sell at the relatively low ratios, by today's standards, of 10 to 14 times current annual earnings because of uncertain prospects for revenues and profits. Stocks of other leading industries commonly sell at 15 to 20 times earnings, and much higher multiples exist for "growth" firms in such industries as electronics and pharmaceuticals.

With the introduction of the jets, there were hopes

that the airlines were on the threshold of a substantial rise in profits. Although acquisition and introduction of the new equipment involved expenditures of vast sums of money, individual lines were prepared to make these investments and lenders were ready to help with financing for two main reasons. First, the jets, on paper, appeared to offer lower-cost transportation. Second, past experience indicated that no airline could survive if it did not provide service equivalent to that offered by competitors.

Jets proved even more attractive to the public than had been expected. After various introductory problems were overcome, moreover, these aircraft were even more economical to operate than had been assumed in advance planning. However, the period from late 1958 to early 1962, when most of the jets now on hand were acquired, was a time of sluggish growth for the economy. As a result, airline traffic and revenues rose less than had been anticipated. Profits declined and some lines reported deficits.

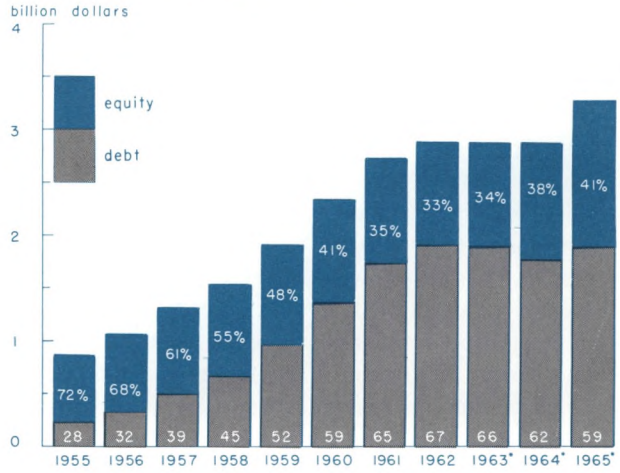
The surge in airline traffic and profits since 1962 reflects the large, sustained upswing in general business activity. Airline traffic, despite a strong growth trend, has been sensitive to changes in economic activity.

Few major industries are so concerned with *leverage* as the airlines. Basically, high leverage means that if a firm does well profit-wise, it is likely to do very well indeed. On the other hand, if operations fall below a certain minimum, deficits can be substantial.

Leverage in the airline industry is measured in both operating and financial terms. A substantial proportion of the expenses of each airline is incurred whether planes fly or not. This is true of depreciation, most administrative and selling expenses, and even, in part, salaries of flight crews. Second, when planes do fly, the proportion of seats and cargo capacity utilized has almost no effect upon direct operating costs, conventionally measured to include flight crew compensation, fuel and oil, insurance, maintenance and depreciation.

Telescopic loading bridges—passengers board and leave planes without going outdoors or using stairs

Airline debt
larger than equity since 1958



*Data for 1963-65 are June 30.

SOURCE: Civil Aeronautics Board.

Because of these factors, airlines make vigorous efforts to keep aircraft in the air as much as possible—on charter flights as well as scheduled trips. Individual flights are profitable whenever a margin of revenues over direct expenses can be obtained.

Over the years the airlines have steadily increased the proportion of each day that aircraft are in flight. Short-haul aircraft currently average 8 or 9 hours of every 24 in the air and large aircraft, used for longer trips, 10 to 12 hours. (These proportions are calculated on an annual basis and include periods when planes are out of service for overhaul.)

One of the most commonly cited airline operating statistics is the *load factor*—the proportion of available seat miles or ton miles utilized. For the trunks the passenger load factor has averaged about 55 per cent in recent years. A passenger riding a jet on a densely traveled route at a rush hour, Friday through Monday, may feel that the airlines are operating at or near capacity. But aircraft in service are available around the clock and some flights proceed with only a few passengers.

Attention often is focused on the *break-even point*—the proportion of available airline seats that must be occupied to pay all operating expenses, including overhead. As the break-even load factor is exceeded, revenue available for payment of interest, income taxes, dividends and re-investment rises sharply.

Load factors and break-even points can be calcu-

lated readily for particular types of aircraft and even for individual flights. For piston aircraft break-even points have been reached at load factors of 50 per cent or more. For some large jets on long hauls, the break-even point is said to be less than 40 per cent.

Break-even load factors are related to a measure of operating expense that includes certain components of a more or less fixed nature, especially depreciation, insurance, maintenance and overhead. Typically, an individual flight will be profitable if receipts exceed out-of-pocket, or marginal cost, which need not include any portion of overhead expenses. Thus, a given schedule or charter flight may be economical to operate with only a handful of occupied seats or a moderate cargo of freight if the revenue generated is enough to defray direct salary expense, fuel costs and landing fees. Anything earned over and above these direct expenses represents cash income that would otherwise not be received. While it usually is true that the higher a load factor, the more profitable the operation, it does not follow that light loads necessarily lose money.

Another measure of airline leverage is the *operating ratio*—total operating expenses as a percentage of total operating revenues. Because airline capital investment consists mostly of aircraft that generate substantial depreciation charges, airline operating ratios are comparatively high, averaging only 90 per cent. Such ratios are much higher than those of most railroads, whose investment accounts include not only equipment but also substantial holdings of right-of-way and terminal properties, which have no airline counterpart. Obviously, any factor that raises revenues or reduces expenses will increase operating profits by a similar amount.

Financial leverage is reflected in the airline balance sheets as in other industries. In the early years, the capital structure of the industry consisted largely of the stockholders' equity—capital stock and surplus. The bulk of any return to capital, therefore, represented return to equity. Since the first wave of the jet acquisitions was completed, 60 per cent or more of the capital structure of the airlines has consisted of long-term debt. Returns to capital now must be divided between debt and equity. Since interest on debt is fixed by contract, returns to capital in excess of interest charges accrue to the equity interest, thereby providing leverage.

Most of the trunk and some of the local service airlines now have convertible debentures (convertible into shares of stock) as part of their capital structures. Increases in market values of shares make it desirable, at some point, for bondholders to exercise their option to convert to stock. This, of course, tends to decrease the debt-to-equity ratio and facilitate new borrowings. Most of the increase in airline equity, aside from retained profits, has come through the conversion route in the postwar period. Sales of new common stock have been rare.

Major assets and liabilities of all scheduled airlines

	1955	1960	June 30, 1965
	(million dollars)		
Current assets	580	929	1,372
Investments and special funds	86	211	308
Operating property and equipment, net	675	2,191	3,298
Other assets	17	117	94
Total assets	**1,358**	**3,448**	**5,072**
Current liabilities	386	707	1,048
Deferred Federal income taxes	22	149	391
Other liabilities	8	123	56
Long-term debt	274	1,508	2,076
Stockholders' equity	668	961	1,501
Total liabilities	**1,358**	**3,448**	**5,072**

SOURCE: Civil Aeronautics Board.

The decline of subsidies

Most airlines throughout the world have been subsidized, at least initially, by their respective governments. Commonly, foreign governments own their nation's principal airline in whole or in part. Some government lines are operated to promote national prestige, despite substantial operating losses. The policy of the U.S. Government has been to encourage the growth of private airlines principally by providing navigational aids, controlling entry and operation rights, and direct assistance in financing local airports. Where necessary, subsidies have been paid to supplement operating revenues—but always with a view toward the time when each line could stand on its own feet.

When the post office flew the mail, and for many years under private contracts, the Government paid more for the service than the total revenue provided by sale of airmail stamps. Clearly, airmail was heavily subsidized under these arrangements.

From 1930 until 1953, airmail payments were used to subsidize the broader concept of an air transport industry that would carry passengers, express and

freight, as well as mail. Payments for carrying a given volume of mail were based on "need," and varied greatly among the various airlines. This system was criticized on the grounds that it did not encourage efforts to upgrade service and promote managerial efficiency, because such improvements tended to reduce subsidies.

The early system of airmail payments was directly responsible for one of the most unfortunate chapters in the history of commercial aviation. Following congressional investigations starting in 1933, all airmail contracts were cancelled in February 1934 because of charges that these had not been negotiated properly. For over two months the Army Air Corps flew the mail on reduced schedules. Several aircraft and 12 airmen were lost in a series of crashes. In early May 1934, the airmail was returned to private carriers after changes in bidding procedures.

Starting in 1953, mail payments have been prescribed by the CAB (generally after negotiation) on the basis of estimates of the cost of the service, including a fair return and, where necessary, subsidies have been paid openly as *public service revenues*. The major trunks and the international passenger-cargo carriers have been "off subsidy" since the mid-Fifties.

Airline subsidies were less than 85 million dollars in 1964 or about 2 per cent of total revenues. This proportion has been declining gradually in recent years. Local service lines received almost 80 per cent of the subsidy paid in 1964 with the rest going to the Alaskan and other territorial lines and the helicopter services. Only the smallest trunk, Northeast, currently receives subsidy payments, mainly because its New England operations resemble those of local lines.

Elaborate electronic flight simulators help to train pilots and engineers in procedures

A variety of specialized ground equipment helps reduce "turnabout" time for big jets

Some observers foresee the time, perhaps two or three years hence, when several of the local service lines will be able to operate profitably without subsidy. Newly purchased short-haul jets may do the job for certain locals if sufficient traffic can be generated to exploit the inherent operational economies of these aircraft.

Domestic airmail is now hauled at rates of 27 cents a ton mile, well below that on air express and at a small fraction of the post office's airmail revenue. Mail payments, once the main source of income for the airlines, now account for only about 3 per cent of the gross revenue of the domestic operators.

For over a decade the post office has experimented with sending some first-class mail by air on a non-priority basis at rates comparable to those paid on air freight. As a result, there has been speculation for years that "all up mail," merging airmail and first class, might be feasible.

In November 1965 the Postmaster General stated that plans were being pressed "to provide a new class of priority mail that will be delivered overnight almost everywhere in the country." This move has been encouraged, in part, by the reduction in schedules of trains that can carry mail expeditiously.

The allowable return

Following the long General Passenger Fare Investigation, the Civil Aeronautics Board determined in 1960 that earnings of 10.5 per cent (after taxes but before interest) on invested capital (defined by formula but approximately equal to long-term debt and

equity) constituted a *fair return* for the trunk airlines. The CAB's rate base amounts to about 70 per cent of the total assets, in contrast to the rate base normally used in utility regulation that approximates total assets.

When first announced, the 10.5 per cent rate of return seemed academic, because the airlines as a group were barely breaking even. The CAB, however, recently reasserted its adherence to this guideline, at a time when returns to capital were believed to be at or near the "fair" level.

From 1950 through 1955 the return on debt and equity combined for the trunk lines as a group ranged between 11.2 and 14.2 per cent. Thereafter the rate declined, reaching a low of 1.5 per cent in 1961. The rate reached 10.1 per cent in 1964, and there was a further increase to about 12 per cent in 1965. Still higher rates have been projected for 1966.

Many problems arise concerning the usefulness and precision of the fair return concept in the airline industry. First, there are controversies concerning the definitions of both return to capital and the rate base. Agreement is lacking on the treatment of such important factors of income determination as the investment tax credit, the selection of useful lives and residual values of equipment for purposes of depreciation and the allocation of costs between domestic and international operations.

No general agreement exists on the number of years to be averaged in determining whether returns to capital meet the standard. On the rate base, there are differences of opinion concerning the inclusion or exclusion of such items as leaseholds and advance payments on new aircraft.

Even if difficulties relating to rate base, fair return and income determination are resolved, the question remains of what to do about it. Earnings of electric utilities usually can be raised or lowered by adjusting charges. But while these utilities are virtual monopolists in their market areas, and elasticity of demand is relatively low in the short run, the airlines invariably have competition from other modes of transport and often from other airlines. As the CAB stated in 1960, it is "faced with the facts that a large part of the domestic route structure is served by two or more carriers in competition and that fares must be uniform between them, notwithstanding that one carrier's revenue need may be less than another's."

Normally, the CAB exercises its jurisdiction over fares and charges through approval or disapproval of proposed changes filed by individual lines. Because of higher returns on invested capital since 1963, the CAB has been pressing for lower passenger fares. In 1965 a number of cuts were made in payments for mail and other Government contract work, baggage allowances were raised and proposed surcharges on new jet services were rejected. (Existing jet surcharges were not disturbed.)

Returns to capital of all scheduled airlines

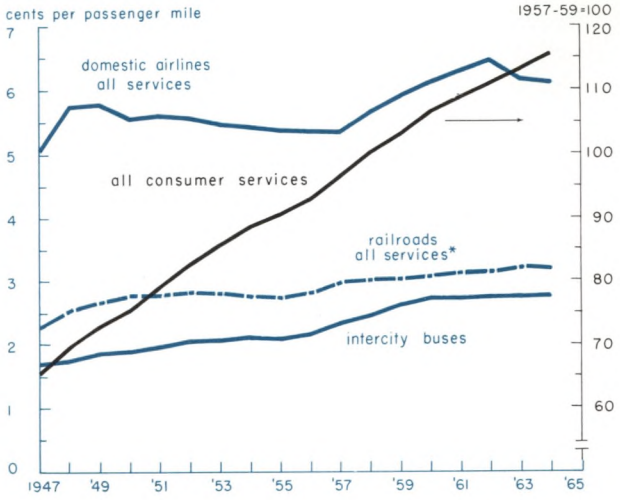
	Interest	Dividends	Retained earnings	Total returns to capital[1]	Rate of return: On equity and debt	Rate of return: On equity
	(million dollars)				(per cent)	
1955	11	26	50	87	10.0	12.1
1956	15	31	53	99	8.9	11.1
1957	24	35	6	65	5.2	5.5
1958	34	35	16	85	5.5	5.9
1959	46	42	22	110	6.2	7.8
1960	66	37	–21	82	3.2	1.0
1961	94	35	–59	70	2.1	–3.9
1962	111	34	18	163	5.7	5.5
1963*	112	38	26	176	6.2	6.7
1964*	104	50	102	256	8.5	13.0
1965*	106	51	239	396	12.0	21.1

[1]Before interest but after income taxes.

*Year ended June 30.

SOURCE: Civil Aeronautics Board.

Transportation fares have risen much less than prices of other services



* Excludes occupancy charge for first-class travel.

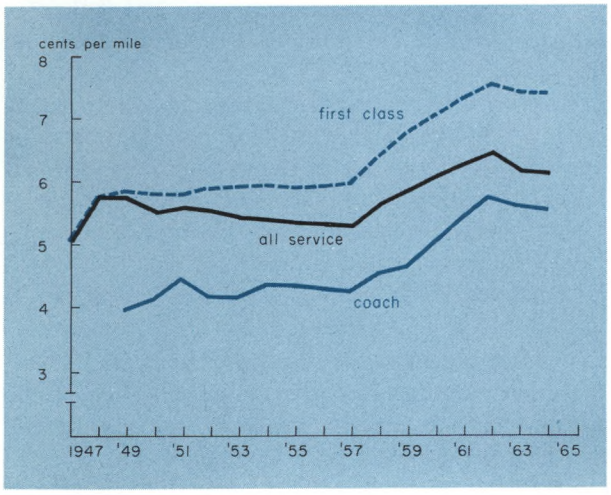
SOURCE: Interstate Commerce Commission and Bureau of Labor Statistics.

Recent statements of CAB personnel have indicated that the Board would like to see additional fare cuts in the form of still more attractive group and family plans, experiments with lower fares at off-peak hours and provision of spartan service with fewer amenities than those now customarily offered on coach service.

Agreement is lacking on the impact of lower fares and charges on profits, because of uncertainties concerning the demand elasticity for airline service. Appreciable fare cuts doubtless would help to fill empty seats, but what would be the net effect upon total revenues and earnings? Over the years, fares usually have been reduced when volume of traffic and profits were rising rapidly, and increases have been requested and approved in years such as 1958, 1960 and 1962 when traffic growth was less than anticipated and earnings were under pressure.

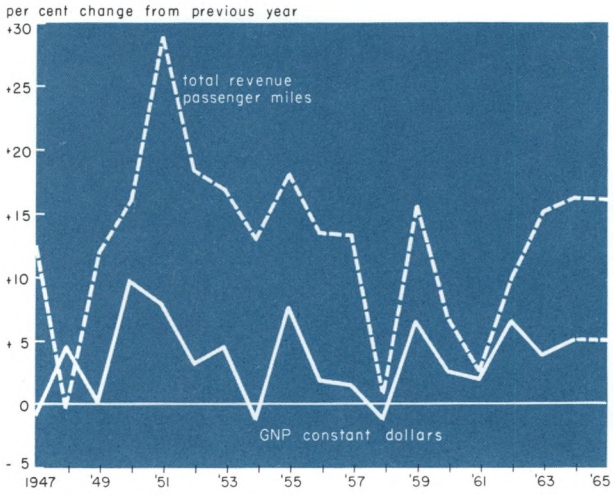
Implementation of the fair return concept in the airline industry requires rather a different approach than that used in most utility regulation. Partly this is because of still uncertain growth prospects and the vast changes that have occurred in airline equipment and operations and partly because the CAB must consider the needs of *each* carrier for "sufficient revenue . . . to provide adequate and efficient service." Nevertheless, it is clear that because profits have risen substantially the industry and the CAB are in a better position to re-evaluate the existing structure of fares and charges. A prominent airline executive suggested in December 1965 that a new general fare investigation be launched.

Average airline fares have declined since 1963



SOURCE: Interstate Commerce Commission.

Gains in airline traffic have fluctuated more than changes in total output



SOURCE: Civil Aeronautics Board and Department of Commerce.

Money for equipment

Investment and credit analysts find the airlines to be a well documented industry from a purely statistical standpoint. Standardized quarterly reports of operating and financial results are filed with, and published by, the CAB. Similar equipment typically is operated by a number of lines and detailed cost comparisons for each type are available. Also, since 1934 the airlines have been engaged solely in the transportation of passengers and property by air. The domestic trunks and local service lines are not affiliated with aircraft manufacturers, or other forms of transportation.

Even with comprehensive data available, a large element of judgment enters into any prognosis for the industry or for particular airlines. Because of rapid growth and other special characteristics of airline operations, rule-of-thumb balance sheet ratios are not used as widely as in most other industries. Airline earnings, moreover, have tended to fluctuate sharply. Nevertheless, banks, insurance companies and other institutional lenders have been willing to finance a large proportion—75 per cent or more in some cases—of the capital investments in the past decade. Partly, this is because awards of competing routes are restricted, and because of the belief that airline bankruptcies will be prevented by subsidies or mergers. But the main reason is the confidence that lenders have that cash flow will be more than adequate to

cover debt service even for lines that fail to earn net profits over periods of several years.

In 1961 the airlines, as a group, suffered a net loss of almost 40 million dollars. Interest amounted to 94 million dollars that year, but depreciation and amortization allowances exceeded 400 million dollars amply covering debt service, including scheduled principal payments, for most lines. In the 12 months ending June 1965, depreciation and amortization amounted to 400 million dollars while net profits, at a record high, totaled 290 million dollars. Interest payments in the recent period were 106 million dollars. Additional cash also became available from equipment sales and deferred taxes. Total cash flow has increased each year during the past decade (see table).

During the airlines' early years, aircraft were depreciated in three to four years. After World War II a seven-year term was used commonly. At present, the airlines use various expected useful lives for book purposes, ranging from 10 to 16 years, and a residual value of 10 or 15 per cent. Many lines use a shorter life for tax purposes. (The Treasury's 1962 guideline suggests six years.)

Airline equipment financing commonly is provided by groups of large banks (usually located on the line's routes), insurance companies or a combination of these institutions. In some cases there are cooperative plans with banks taking the shorter maturities of note issues—up to 5 or 10 years—and the insurance companies taking maturities of 20 years and more.

Major sources of "cash flow" for all scheduled airlines

	Depreciation of flight equipment	Other depreciation and amortization	Increase in deferred income taxes	Retained earnings	Total
			(million dollars)		
1955	124	16	12	50	202
1956	133	18	15	53	219
1957	189	25	18	6	238
1958	181	28	29	16	254
1959	211	38	36	22	307
1960	257	58	30	–21	324
1961	337	68	5	–59	351
1962	325	77	41	18	461
1963*	330	74	43	26	473
1964*	326	86	90	102	604
1965*	329	71	96	239	735

*Year ended June 30.

SOURCE: Civil Aeronautics Board.

Movies, stereo, beverage and fine food—luxuries of today's first class air passenger

Most airlines have continuing revolving credits with one or more banks. The credit line is based, in part, upon the depreciated value of all equipment in service. As a need arises, existing loan agreements can be amended and extended or converted to amortized term loans. Credit ratings of the airlines have been upgraded through the years. Most of the trunks borrow from commercial banks near the prime rate (paid by the largest and strongest commercial borrowers) or at a premium of .25 to .75 per cent above this rate. Revolving credit agreements usually provide that changes in the prime rate be reflected in changes in rates on outstanding loans.

As much as 90 per cent of equipment loans, ranging up to 10 million dollars, to local service, territorial and helicopter airlines may be guaranteed by the CAB under legislation enacted in 1957 and extended in 1962. Loans are guaranteed only if adequate financing would not be available without this aid.

Financing of new aircraft purchases typically is arranged before purchase programs are announced. Funds are advanced as down payments and subsequent progress payments become due. Often principal payments are deferred for two or three years until the new planes have been integrated into the airline's operations and are contributing to revenues.

Unlike many railroads, airlines do not have out-

standing mortgage bond issues with *after-acquired property clauses* that take precedence over short-term debt on claims to property. On the contrary, long-term debt typically is subordinated to short-term debt. For this reason, the equipment trust certificate method, devised originally to bypass the after-acquired property clauses, has not been used in aircraft financing.

Although chattel mortgages have been used to secure aircraft equipment loans, most of the outstanding loans to the major lines by banks or insurance companies are unsecured. However, loan agreements contain "negative pledges" which state that aircraft will not be sold or subjected to a prior lien without the lender's permission. Other negative covenants in loan agreements specify restrictions on dividends and salaries and upon the issuance of additional debt. Affirmative covenants relate to adequate maintenance of aircraft, payment of taxes and minimum working capital. Should any of these covenants be disregarded, the lender may demand immediate payment of the principal of the loan.

The airlines have benefited substantially from the 7 per cent investment tax credit but, because of large equipment programs coupled with moderate profits, many airlines cannot take full advantage of the tax credit, which is limited to 25 per cent of a given year's tax. As a result, some lines have entered into lease agreements for the acquisition of new equipment. Lessors in a position to take full advantage of the tax credit buy and take title to aircraft, and adjust rental payments to share the benefits of the tax credit with lessees. Of course, long-term leases are virtually the equivalent of debt and are treated as such by investment analysts.

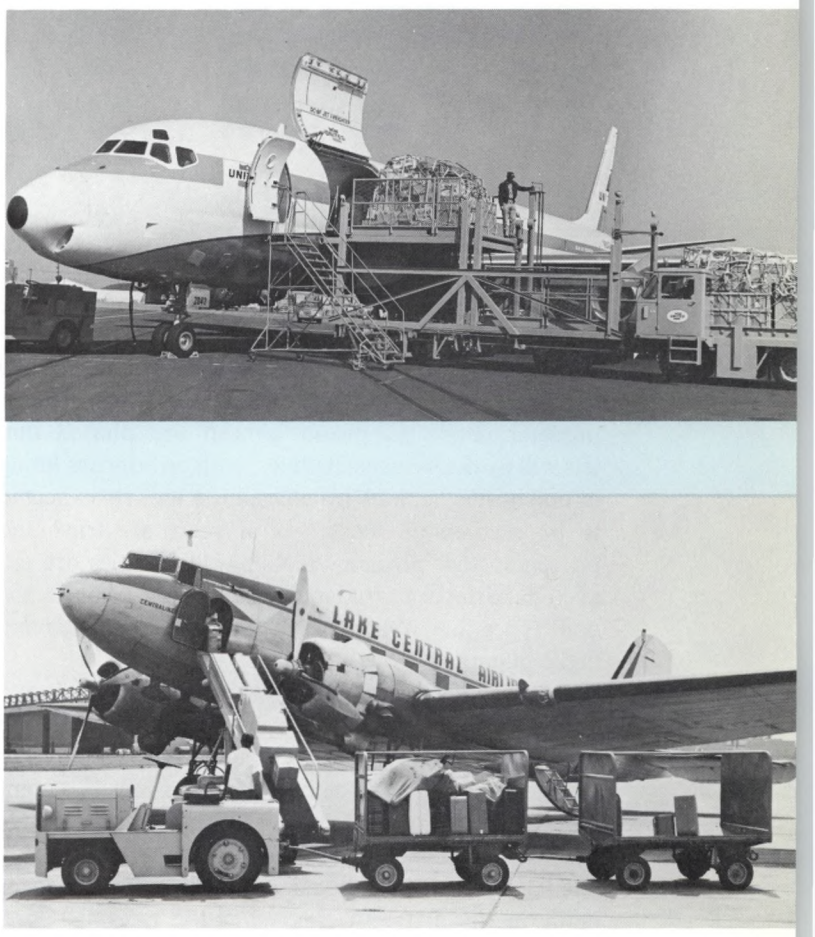
Aircraft leasing has been arranged with both leasing companies and commercial banks. Because of the investment tax credit, a syndicate of banks may be able to provide equipment to an airline at an effective interest rate of about 2 per cent, while anticipating earnings of over 5 per cent on the lease. The final cost to the airline and the extent of the profit to the banks will depend upon a number of unknowns, but, most importantly, the residual value of the aircraft accruing to the lessors as owners 10 to 16 years hence.

Toward the Seventies

The airlines can be expected to continue to grow in importance in the economy in the years ahead. Barring business recessions, industry and Government studies indicate that passenger traffic may rise 10 per cent or more annually—at least double the probable rate of expansion of total output. Cargo ton miles are likely to increase at an even faster pace.

Air transport will have an increasing impact upon the pattern of location of new production facilities. Moreover, the availability of rapid transit by air to any part of the nation or the globe enables business firms to expand their market areas more readily.

Rapid loading and unloading of palletized cargo speeds delivery of air freight



Some DC-3s are being converted to all-cargo carriers by local service lines

Distances can be measured more meaningfully today in air time rather than miles. Trimotors carried passengers coast to coast in 28 hours in 1929. In the late Thirties this trip took 16 hours, compared with at least 60 hours by train. The first nonstop transcontinental flights in DC-7s, starting in 1953, took 8 hours. With the introduction of the jets, this time was cut to five hours. Supersonic transports (SSTs) may halve this schedule a decade or so hence. (Schedules normally are faster on West to East flights with prevailing winds.)

Merchandising air travel—
pastel planes and high style uniforms

For some years to come, the nature if not the total numbers of the commercial air fleets appears predetermined. As piston aircraft are phased out, jets will fly the longer schedules, with turboprops filling in on shorter hauls. Virtually all the models expected to be used in the next several years are tried and proven so that no new "teething" difficulties are expected. Airlines are reducing the number of basic aircraft types they operate to facilitate maintenance and flight planning.

Production is now under way on "stretched-out" versions of aircraft now in service. Longer DC-8s will carry a maximum of 250 passengers compared to 173 at present. New Boeing 727s will carry 170 compared to 90 in present models. Even the short-range DC-9s, just being introduced, are being ordered in lengthened versions to carry 115 persons—twice as many as the first four-engined piston aircraft. Costs per available seat mile are expected to be reduced 20-25 per cent by these higher capacity aircraft. Longer-range aircraft also in production will permit nonstop flights well in excess of 5,000 miles, the longest now scheduled.

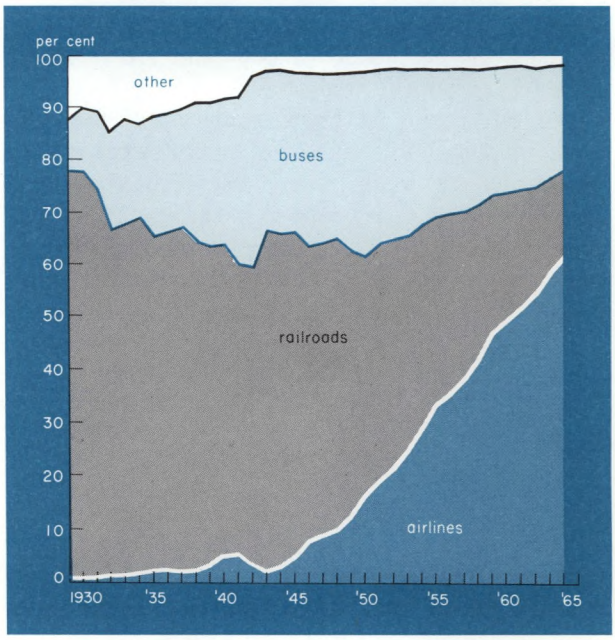
Experiments continue on short takeoff and landing aircraft (STOL) and vertical takeoff and landing types (VTOL) to permit use of airports close to the downtown areas of large centers. Work is being pushed on supersonic transports to carry over 200 passengers at almost three times the speed of sound (Mach 3), and a giant transport for the Government (the C5A) that might carry 650 passengers if a civilian version were developed. But these radically different aircraft are not expected to enter the domestic air transport picture until the Seventies. Possibly, earlier additions to present fleets will be aircraft seating 350 to 400.

The new short- and medium-haul jets are releasing the four-engined models for the long trips, 1,500 miles or more, on which they achieve their greatest economies of operation. Extensive use is being made of computers in handling reservations, accounting, maintenance and flight planning.

Air freight, despite great progress, has merely begun to tap its potential market. Passenger traffic will continue to gain as the economy grows and incomes rise. Business travel, which accounts for two-thirds of current airline passenger miles will continue to increase, but this sector of the market already has been largely captured by the airlines. Moreover, business firms, increasingly, are providing their own seat-miles through 30,000 or more company owned aircraft.

The largest potential passenger traffic gains are likely to occur in nonbusiness private travel. Aversion to flying is much less prevalent in the younger age groups. Vacations are lengthening steadily and continued increases in spendable income and more liberal credit plans aid in financing longer trips. Only one-fourth of 1 per cent of personal consumption ex-

Airline share of consumer outlays for intercity travel has risen sharply



SOURCE: Department of Commerce.

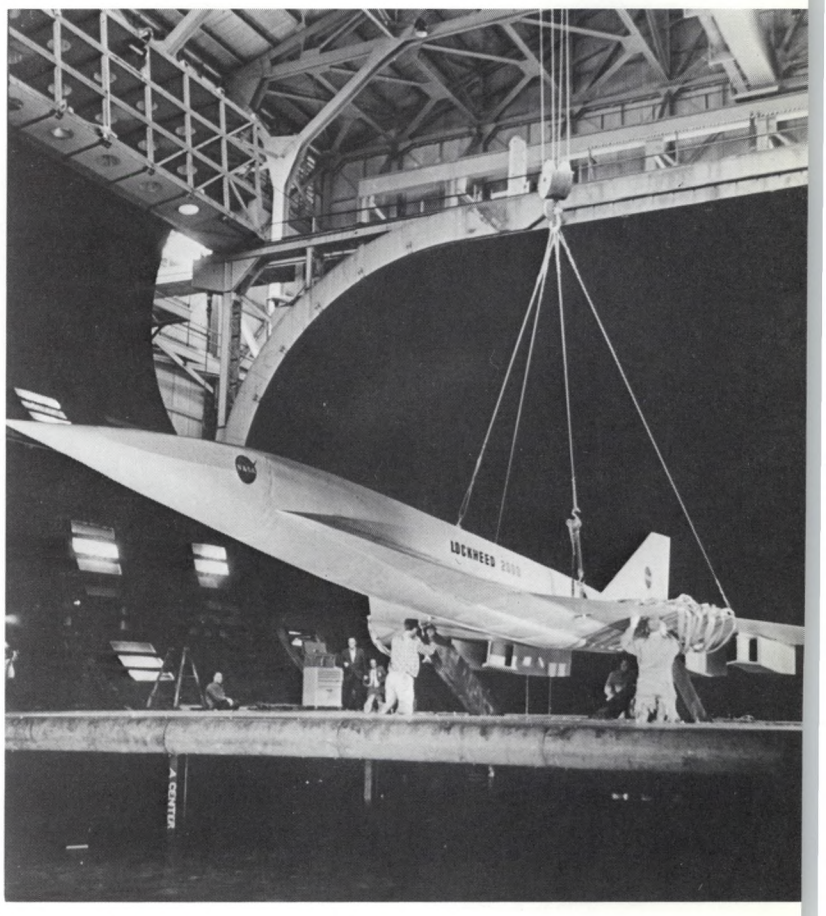
penditures now are allotted to airline ticket purchases. Airline managements are devoting their efforts to raise this proportion.

Commercial air transportation has reached its present "basic industry" stage in a remarkably short time. The route and scheduling patterns and the services and equipment familiar today in trunk line operations have mostly emerged in the postwar years. Local service lines are wholly a product of this era.

As recently as two or three years ago, earnings of the carriers were a cause for deep concern about the industry's ability to gain a firm financial foundation of profitability. The turnaround in airline profits has raised the rate of return for the trunks near the target level and the end of subsidies may be in sight for at least some of the local service lines.

These developments pose a challenge not only for the industry but for regulation and official policy in air transportation. The emergence of substantial and rising profits may be taken as a clear sign that the air travel market is capable of sustaining even more schedules and services than are offered now with the added equipment and ground facilities to provide them.

A stepped-up inflow of investment and additions of new schedules and new routes can be expected to emerge. Clearly, an important goal of public policy and company managements will be to secure further adaptation of the industry to the fast growing market for air transport.



Testing a scale model of a supersonic transport—2,000 miles per hour at 70,000 feet in 197?

Acknowledgments

The photographs in this section of the Annual Report were provided by: American Airlines: Cover, p. 13, p. 15—top right, p. 20—upper left, p. 21, p. 22—upper left, p. 23—bottom left and top right, p. 31—top right; The Boeing Company: p. 9, p. 15—top left, upper center, middle left, p. 17—upper right, lower center, p. 19—middle right, bottom left; Braniff International: p. 36; Continental Airlines: p. 34; Delta Airlines: p. 20—lower left; Douglas Aircraft Company, Inc.: p. 15—middle right, lower center, lower right, p. 17—upper center, lower right, p. 19—lower left; Fairchild Hiller Corporation: p. 17—middle right; The Flying Tiger Line, Inc.: p. 28; General Dynamics, Convair Division: p. 19—upper right, middle left; Lake Central Airlines: p. 19—lower right, p. 35—lower right; Lockheed Aircraft Corporation: p. 15—lower left, p. 17—lower left, p. 37; Milwaukee County Airport Department: p. 26; Mohawk Airlines Inc.: p. 7, p. 19—middle; North Central Airlines, Inc.: p. 17—upper left, p. 20—upper right, p. 24; O'Hare Airport, Department of Aviation, Chicago: p. 8, p. 29 (Metro News Photo); United Air Lines: p. 17—middle left, p. 19—upper left, p. 20—lower right, p. 22—lower left, p. 27, p. 31—bottom left, p. 35—upper middle.

STATEMENT OF CONDITION

Assets	December 31, 1965	December 31, 1964
Gold certificate account	$ 2,209,495,047	$ 2,206,999,165
Redemption fund for Federal Reserve notes	318,065,650	286,967,695
Total gold certificate reserves	$ 2,527,560,697	$ 2,493,966,860
Federal Reserve notes of other Banks	84,885,000	61,576,000
Other cash	21,681,905	25,467,304
Discounts and advances:		
Secured by U. S. Government securities	$ 15,150,000	$ 2,250,000
Other	5,822,000	4,230,000
Total discounts and advances	$ 20,972,000	$ 6,480,000
U. S. Government securities	6,741,835,000	6,301,968,000
Total loans and securities	$ 6,762,807,000	$ 6,308,448,000
Cash items in process of collection	1,508,172,050	1,401,288,509
Bank premises	20,490,517	21,531,320
Other assets	139,775,425	85,007,199
Total assets	$11,065,372,594	$10,397,285,192
Liabilities		
Federal Reserve notes	$ 6,890,642,145	$ 6,386,416,530
Deposits:		
Member bank reserves	$ 2,814,282,453	$ 2,638,238,929
U. S. Treasurer—general account	49,264,892	81,055,420
Foreign	21,300,000	31,020,000
Other	21,549,218	17,652,737
Total deposits	$ 2,906,396,563	$ 2,767,967,086
Deferred availability cash items	1,080,076,243	999,000,819
Other liabilities	30,930,843	94,695,057
Total liabilities	$10,908,045,794	$10,248,079,492
Capital accounts		
Capital paid in	78,663,400	74,602,850
Surplus	78,663,400	74,602,850
Total liabilities and capital accounts	$11,065,372,594	$10,397,285,192
Ratio of gold certificate reserves to Federal Reserve note liabilities	36.7%	39.1%
Contingent liability on acceptances purchased for foreign correspondents	$ 20,391,200	$ 17,314,800

STATEMENT OF EARNINGS AND EXPENSES

	1965	1964
Current earnings:		
Discounts and advances	$ 3,933,396	$ 2,774,280
U. S. Government securities	253,958,466	223,502,248
Foreign currencies	1,979,944	901,823
All other	68,997	48,541
Total current earnings	$259,940,803	$227,226,892
Current expenses:		
Operating expenses	$ 27,909,462	$ 28,372,033
Federal Reserve currency	4,003,946	3,117,641
Assessment for expenses of Board of Governors	1,223,900	1,224,500
Total	$ 33,137,308	$ 32,714,174
Less reimbursement for certain fiscal agency and other expenses	3,724,823	3,691,606
Current net expenses	$ 29,412,485	$ 29,022,568
Current net earnings	$230,528,318	$198,204,324
Additions to current net earnings:		
Profit on sales of U. S. Government securities (net)	$ —	$ 103,881
All other	195,230	94,065
Total additions	$ 195,230	$ 197,946
Deductions from current net earnings:		
Loss on sales of U. S. Government securities (net)	1,301	—
All other	40,359	35,766
Total deductions	$ 41,660	$ 35,766
Net deductions from (—) or additions to current net earnings	$ 153,570	$ 162,180
Net earnings before payments to U. S. Treasury	$230,681,888	$198,366,504
Dividends paid	4,626,284	4,373,219
Payments to U. S. Treasury (interest on Federal Reserve notes)	221,995,054	259,234,935
Transferred to surplus	$ 4,060,550	$—65,241,650
Surplus account		
Surplus, January 1	$ 74,602,850	$139,844,500
Transferred to surplus—as above	4,060,550	—65,241,650
Surplus, December 31	$ 78,663,400	$ 74,602,850

OPERATIONS

		1965	1964
Clearing and collection	Dollar amount (in millions)		
	Commercial bank checks	262,867	237,462
	Government checks*	17,186	16,777
	Other items	1,127	519
	Number of pieces (in thousands)		
	Commercial bank checks	745,431	687,893
	Government checks*	94,692	93,759
	Other items	1,794	1,716
Currency and coin	Dollar amount (in millions)		
	Currency received and counted	5,578	5,559
	Coin received and counted	38	47
	Coin wrapped	83	67
	Unfit currency withdrawn from circulation	833	864
	Number of pieces (in millions)		
	Currency received and counted	866	893
	Coin received and counted	536	348
	Coin wrapped	969	703
	Unfit currency withdrawn from circulation	159	222
Safekeeping of securities†	Dollar amount (in millions)		
	Securities received	15,957	16,792
	Securities released	16,118	16,410
	Coupons detached	260	262
	In safekeeping on December 31	8,476	8,637
	Number of pieces (in thousands)		
	Securities received	383	426
	Securities released	350	369
	Coupons detached	3,008	2,913
	In safekeeping on December 31	1,526	1,493
Discount and credit	Dollar amount (in millions)		
	Total loans made during year	11,033	11,384
	Daily average outstanding	95	77
	Number of banks accommodated during year	171	179
Investment	Purchases and sales of securities for member banks		
	Dollar amount (in millions)	1,812	1,799
	Number of transactions	18,075	17,150
Transfer of funds	Dollar amount of funds transferred (in millions)	686,256	570,905
	Number of transfers (in thousands)	672	615

*Includes postal money orders. †Including collateral custodies.

Services to the U.S. Treasury

	1965	1964
Marketable securities		
Dollar amount (in millions)		
Issued	15,513	15,200
Servicing:		
Securities received	18,021	15,806
Securities delivered	21,439	20,961
Redeemed	19,280	20,050
Number of pieces (in thousands)		
Issued	344	348
Servicing:		
Securities received	212	209
Securities delivered	551	513
Redeemed	664	724
Savings bonds		
Dollar amount (in millions)		
Issued	1,528	1,576
Servicing:		
Bonds received for reissue	154	160
Bonds delivered on reissue	154	160
Bonds delivered on replacement	5	5
Redeemed	1,068	1,028
Number of pieces (in thousands)		
Issued	24,127	22,880
Servicing:		
Bonds received for reissue	699	699
Bonds delivered on reissue	784	779
Bonds delivered on replacement	70	60
Redeemed	16,393	15,313
Federal tax receipts processed		
Dollar amount (in millions)	8,201	7,793
Number of pieces (in thousands)	1,937	1,912

Requests for additional copies of this Annual Report should be addressed to:

Research Department
Federal Reserve Bank of Chicago
Box 834
Chicago, Illinois 60690

DIRECTORS

FRANKLIN J. LUNDING
Chairman of the Finance Committee
Jewel Tea Company
Chicago, Illinois
Chairman and Federal Reserve Agent

JAMES H. HILTON, Director of Development
Iowa State University of Science and Technology
Ames, Iowa
Deputy Chairman

JOHN H. CROCKER, Chairman of the Board
The Citizens National Bank of Decatur
Decatur, Illinois

WILLIAM A. HANLEY, Director
Eli Lilly & Company
Indianapolis, Indiana

GERALD F. LANGENOHL, Treasurer
and Assistant Secretary (Retired)
Allis-Chalmers Manufacturing Company
Milwaukee, Wisconsin

WILLIAM E. RUTZ, Director
and Member of the Executive Committee
Giddings & Lewis Machine Tool Company
Fond du Lac, Wisconsin

HARRY W. SCHALLER, President
The Citizens First National
Bank of Storm Lake
Storm Lake, Iowa

JOHN W. SHELDON, President
Chas. A. Stevens & Co.
Chicago, Illinois

KENNETH V. ZWIENER, Chairman of the Board
Harris Trust and Savings Bank
Chicago, Illinois

DETROIT BRANCH

JAMES W. MILLER, President
Western Michigan University
Kalamazoo, Michigan
Chairman

JOHN H. FRENCH, JR., President
City National Bank of Detroit
Detroit, Michigan

MAX P. HEAVENRICH, JR., President
Heavenrich Bros. & Company
Saginaw, Michigan

C. LINCOLN LINDERHOLM, President
Central Bank
Grand Rapids, Michigan

FRANKLIN H. MOORE, Chairman of the Board
and President
The Commercial and Savings
Bank of St. Clair County
St. Clair, Michigan

GUY S. PEPPIATT, Chairman of the Board
Federal-Mogul Corporation
Detroit, Michigan

RAYMOND T. PERRING
Chairman of the Board
The Detroit Bank and Trust Company
Detroit, Michigan

MEMBER OF FEDERAL ADVISORY COUNCIL

EDWARD BYRON SMITH, Chairman of the Board
The Northern Trust Company
Chicago, Illinois

December 31, 1965

OFFICERS

CHARLES J. SCANLON, President

HUGH J. HELMER, First Vice President

ERNEST T. BAUGHMAN, Vice President

JOHN J. ENDRES, General Auditor

ARTHUR M. GUSTAVSON, Vice President

PAUL C. HODGE, Vice President, General Counsel and Secretary

LAURENCE H. JONES, Vice President and Cashier

CLARENCE T. LAIBLY, Vice President

CARL E. BIERBAUER, Assistant Vice President

GEORGE W. CLOOS, Senior Economist

LE ROY A. DAVIS, Assistant Vice President

LE ROY W. DAWSON, Assistant Vice President

FRED A. DONS, Assistant General Auditor

DANIEL M. DOYLE, Assistant Vice President

ELBERT O. FULTS, Assistant Vice President

VICTOR A. HANSEN, Assistant Vice President

ARNOLD J. ANSCHUTZ, Assistant Cashier

HARRIS C. BUELL, JR., Assistant Chief Examiner

JOHN J. CAPOUCH, Assistant Cashier

FRANCIS C. EDLER, Assistant Cashier

LESTER A. GOHR, Assistant Cashier

RICHARD A. MOFFATT, Vice President

HAROLD J. NEWMAN, Vice President

LELAND M. ROSS, Vice President

HARRY S. SCHULTZ, Vice President

BRUCE L. SMYTH, Vice President

RUSSEL A. SWANEY, Vice President

EDWARD A. HEATH, Assistant Vice President and Assistant Secretary

JAMES R. MORRISON, Chief Examiner

KARL A. SCHELD, Assistant Vice President

ROBERT E. SORG, Assistant Vice President

JOSEPH J. SRP, Assistant Vice President

LYNN A. STILES, Senior Economist

CHARLES G. WRIGHT, Assistant Vice President

WILLIAM O. HUME, Assistant Cashier

ERICH K. KROLL, Assistant Cashier

WARD J. LARSON, Assistant Counsel and Assistant Secretary

RAYMOND M. SCHEIDER, Assistant Cashier

CARL W. WEISKOPF, Assistant Chief Examiner

DETROIT BRANCH

RUSSEL A. SWANEY, Vice President

RICHARD W. BLOOMFIELD, Assistant Vice President

GORDON W. LAMPHERE, Assistant General Counsel

PAUL F. CAREY, Assistant Cashier

LOUIS J. PUROL, Assistant Cashier

W. GEORGE RICKEL, Assistant Cashier

December 31, 1965

Appointments, Elections and Retirements

During the year the following appointments and elections were announced, effective January 1, 1966:

Henry T. Bodman, Chairman of the Board, National Bank of Detroit, Detroit, Michigan, was appointed Member of the Federal Advisory Council from the Seventh Federal Reserve District for 1966 to succeed Edward Byron Smith, Chairman of the Board, The Northern Trust Company, Chicago, Illinois.

Franklin J. Lunding, Chairman of the Finance Committee, Jewel Tea Company, Chicago, Illinois, was redesignated Chairman of the Board and Federal Reserve Agent for 1966.

Guy S. Peppiatt, Chairman of the Board, Federal-Mogul Corporation, Detroit, Michigan, was reappointed Director of the Detroit Branch Board for a three-year term ending December 31, 1968 and was designated Chairman of the Branch Board for 1966.

Harry W. Schaller, President, The Citizens First National Bank of Storm Lake, Storm Lake, Iowa, was reelected Director for a three-year term ending December 31, 1968.

John W. Sheldon, President, Chas. A. Stevens & Co., Chicago, Illinois, a Director since 1961 was designated Deputy Chairman for 1966.

B. P. Sherwood, Jr., President, Security First Bank & Trust Co., Grand Haven, Michigan, was appointed Director of the Detroit Branch Board for a three-year term ending December 31, 1968, to succeed C. Lincoln Linderholm, President, Central Bank, Grand Rapids, Michigan.

Elvis J. Stahr, Jr., President, Indiana University, Bloomington, Indiana, was appointed Director for a three-year term ending December 31, 1968, to succeed James H. Hilton, Director of Development, Iowa State University of Science and Technology, Ames, Iowa.

Joseph O. Waymire, Vice President and Treasurer, Eli Lilly and Company, Indianapolis, Indiana, was elected Director for a three-year term ending December 31, 1968, to succeed William A. Hanley, Director, Eli Lilly and Company.

Laurence H. Jones, Vice President and Cashier, relinquished the title of Cashier.

Carl E. Bierbauer, Assistant Vice President, was promoted to Cashier.

William O. Hume, Assistant Cashier, was promoted to Assistant Vice President.

Ward J. Larson, Assistant Counsel and Assistant Secretary, was promoted to Assistant General Counsel and Assistant Secretary.

Rudolph W. Dybeck was elected Assistant Cashier.

The employes listed below, all with service records of more than 25 years, retired in the course of the year from the Bank:

Olive R. Almquist	Winifred M. Hyland
Elmer C. Bagaasen	Hortense Leader
Helen A. Baldus	Dorothy Malcomb
John Borsig	Matt W. Malone
Fred W. Burgess	Lillian H. Ohnmeis
Grant E. Erickson	Ingeborg C. Paulson
John Gibson	Walter W. Peterson
Ruth D. Hamilton	Charles M. Rust

The following employes retired after association with the Head Office or Detroit Branch for more than 40 years:

Agnes V. Buckley	Frank Lane
Morris Bonnem	Arthur G. Langlois
Lawrence E. Howes	Wilma W. Ritchie
Milton C. Laibly	Herbert H. Spencer-Smith

These 24 retired employes of the Bank represent more than 870 years of service to this institution.


FEDERAL RESERVE BANK OF CHICAGO
INCORPORATED MAY 18, 1914
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