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CHAPTER 2

The Movement of People

TRAVEL REFLECTED FLUCTUATIONS IN THE STATE OF BUSINESS

Expansions and contractions after 1908

Railroad travel, like freight traffic, has fluctuated in rough harmony with the general disturbances in the rest of the economy outlined by the reference chronology. Beginning with the 1908–10 expansion (the first for which we have the more sensitive monthly data), each phase of business can be matched with a corresponding phase in passenger-miles (Chart 19[1]). For example, a few months after the business contraction of 1920–21 began, travel started to decline, and continued to do so during the remainder of the reference phase and for some time thereafter. (In this as in other instances, the turning points in passenger traffic differed considerably from those in the reference chronology). During the long business expansion of 1933–37, to be sure, we have marked off

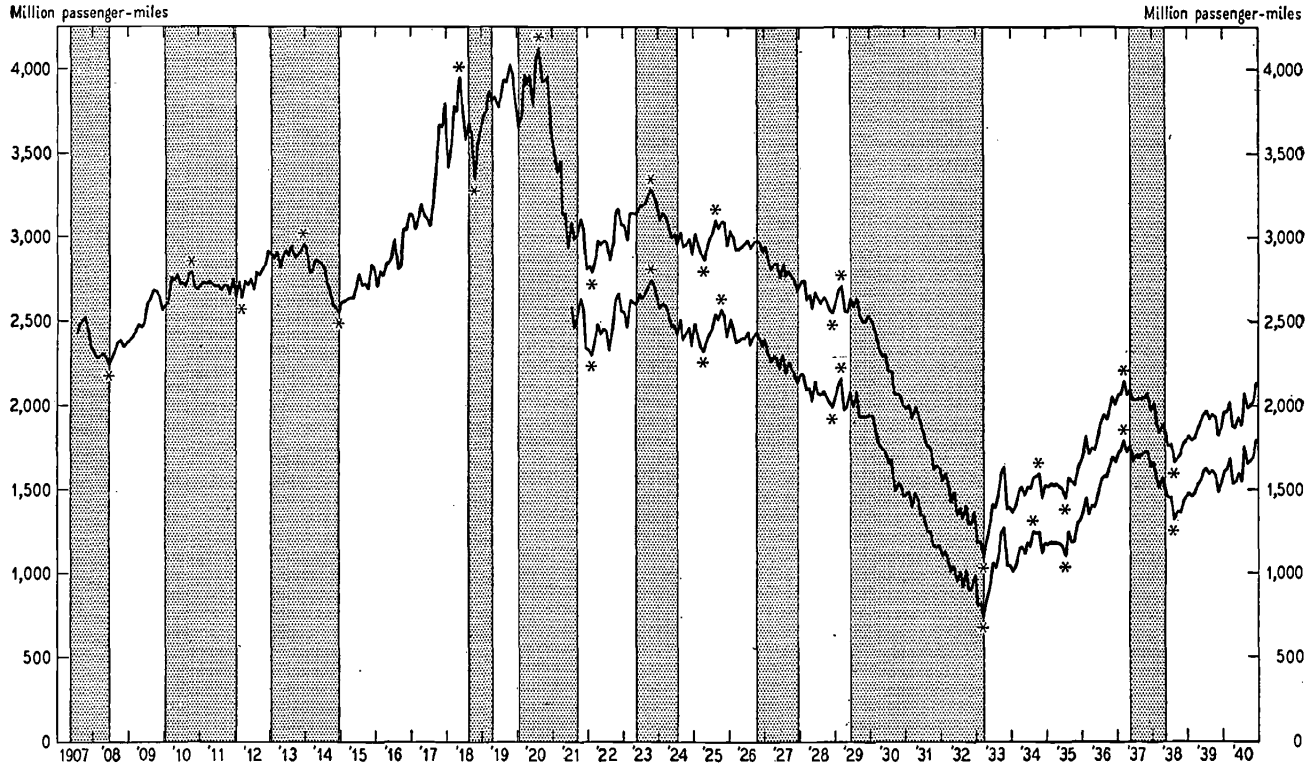
[1] We estimated passenger-miles from July 1907 to February 1919 by dividing approximate revenue per passenger-mile into aggregate passenger revenue. To obtain monthly divisors we assumed that revenue per passenger-mile at the middle of each year was the same as the average reported for the year as a whole, for 'all' roads through 1910 and Class I thereafter. This assumption yielded estimates of unit revenue for January 1, 1907 to 1916 and July 1, 1916 and 1917. We assumed further that unit revenue changed between any successive two of these dates by equal amounts every month; thus we obtained a figure for the beginning of each month from January 1, 1907 to July 1, 1917. To get unit revenue for each month we averaged the estimates for the beginning of that month and of the following month.

In the period to which we applied this procedure, the resulting errors cannot be large; it is fairly obvious from the annual data that the true (seasonally adjusted) variations in unit revenue were slight. Effective June 10, 1918, however, fares were sharply raised. Average revenue increased from 2.090 cents in 1917 to 2.414 cents in 1918. If we had raised the middle-of-1917 estimate by $\frac{1}{1}\frac{1}{2}$ of the difference each month, the resulting figures for all months before June 1918 would be much too high. Instead, we assumed that from July 1, 1917 to June 1, 1918 unit revenue changed at the same rate as from July 1, 1916 to July 1, 1917. We took 2.540 cents, the average for 1919, a year in which, as in the remainder of 1918, there was no general change, to be correct for the months July 1918 through February 1919.

The general increase in fares became effective June 10. Our estimate for May 31, 1918 is 2.134 cents. We assumed that the June average equaled (2.134 cents + 2×2.540 cents) $\div$ 3.

CHART 19

Passenger-miles, July 1907—December 1940; Noncommutation Passenger-miles, July 1921—December 1940



Shaded periods are reference contractions.

not one but three phases in travel. Passenger traffic rose to a peak in October 1934, then declined somewhat, and subsequently rose to a final peak in March 1937. But the intermediate peak was not as high as the final one, the intermediate trough not as low as the initial one. It is fair to say that during 1933–37 as a whole there was an expansion in travel corresponding to the reference phase.[2] On the other hand, we must admit that the last two specific expansions in the 1920's, especially the very last, were extremely brief and small.

What is true of passenger traffic as a whole is equally true of its principal component, travel other than commuting. Beginning with the 1921–23 expansion, the first for which we have data, there was one specific phase for every reference phase (Chart 19). In arriving at this judgment we again disregard a mild specific contraction during the long expansion of 1933–37.

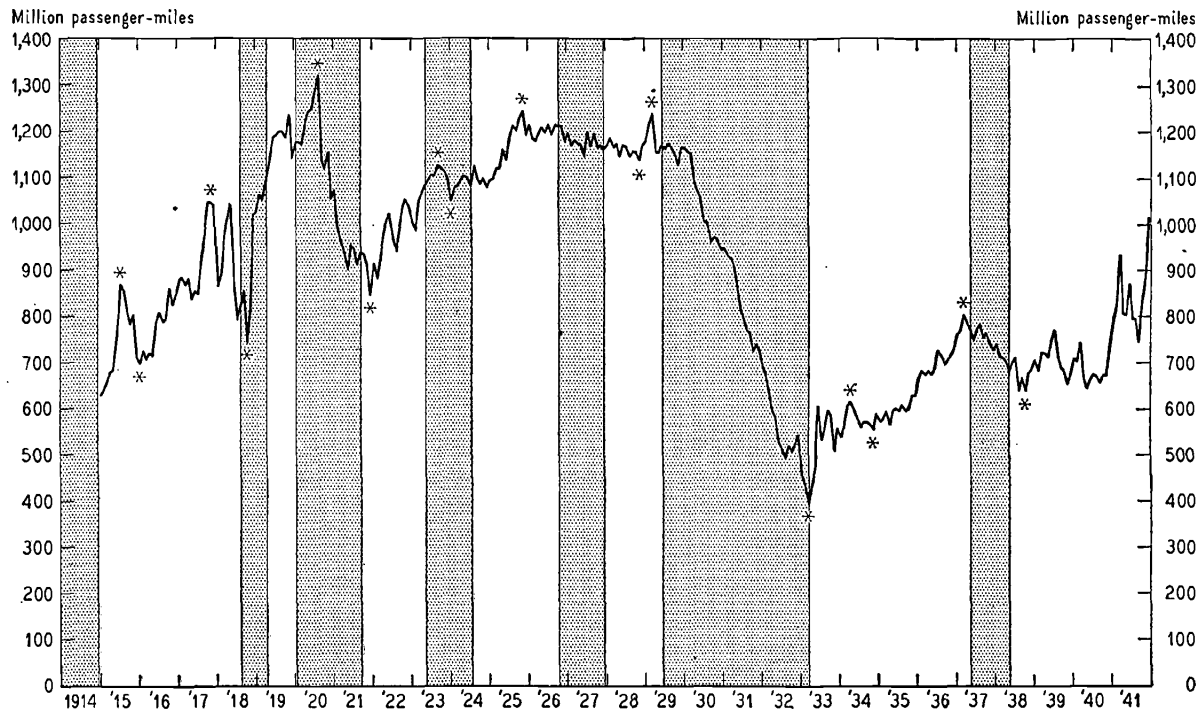
'Other than commutation' travel includes journeys in Pullman cars, for which we have monthly data beginning early enough to cover practically the entire 1914–18 business expansion.[3] Here again each reference phase can be matched by a specific phase. A long expansion in Pullman passenger-miles, beginning before and ending after the reference expansion of 1919–20, is clearly defined. Again, three phases in 1933–37 can justly be lumped into a single longer phase corresponding to the business phase. The 1914–18 expansion presents a somewhat similar situation. Chart 20 suggests that there was a trough somewhat before January 1915, lower than the trough we have marked in January 1916. This is exactly what we find in data on the revenue of the Pullman Company, which go back somewhat further. We conclude that there was a long rise from late 1914 to November 1917 which, although interrupted, corresponds to the 1914–18 reference phase.

[2] A similar long rise, temporarily interrupted by a mild decline, occurred in many other economic activities. The declines are not sufficiently pronounced and general, however, to win recognition in the reference chronology, whose architects discuss the problem on pp. 87–90 of *Measuring Business Cycles*. We consider the sharp rise and fall of traffic in 1933 too brief to be called a cycle.

[3] Pullman passenger-miles, unlike noncommutation and total passenger-miles, include the travel of passengers, mostly railroad officials and employees, for whose accommodation the Pullman Company is paid, although no railroad fares are charged. The original data are from the *Survey of Current Business*, January 1939, and subsequent issues.

CHART 20

Pullman Passenger-miles, January 1915—December 1941



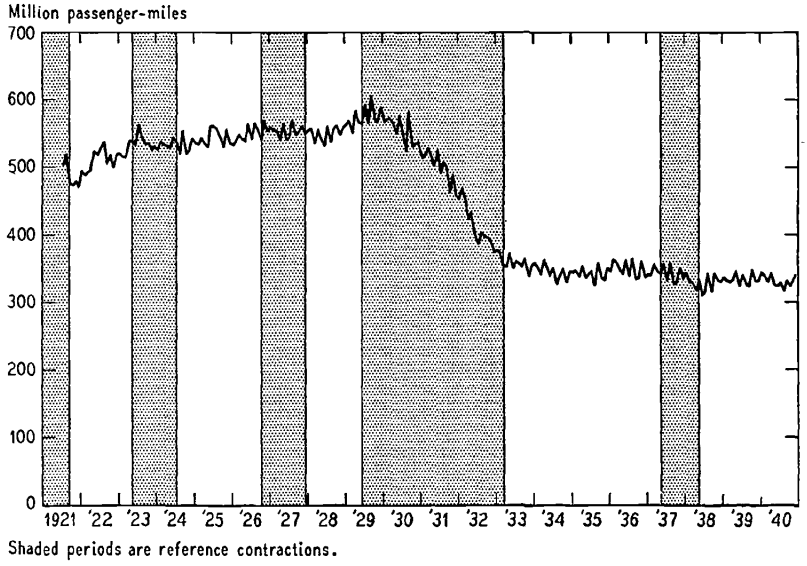
Shaded periods are reference contractions.

Changes in the rate of growth or decline of commuting

It is less obvious that there are fluctuations in commutation travel corresponding to those in business. We can see few clearly defined peaks and troughs (Chart 21); we feel unable to mark off specific cycles. Consequently, we cannot say that every reference phase was matched by a specific phase. But every comparison of adjoining phases suggests positive conformity (Table 11). In 1926–27 commuting did not decline; but the curve is flatter than in the neighboring expansions. In 1933–37 it declined, on the whole, but not as rapidly as in 1929–33 or 1937–38.

CHART 21

Commutation Passenger-miles, July 1921—December 1940



Shaded periods are reference contractions.

On the other hand, it is somewhat curious that commuting did not decline appreciably between the 1926–27 reference dates.[4] In the decade after 1920, however, this kind of traffic was subject not only to changes in the prosperity of actual or potential commuters but also to another influence. During the 1920's although not during the '30's, the population of suburban areas, and presum-

[4] In the figures as we compute them, there is no change at all, but the seasonal correction does not have hairline precision; furthermore, a slight modification in the dates compared would yield a somewhat different result.

ably the number of potential commuters, grew rapidly. Almost all commuters ride to and from one or another of a few large centers. The number of trips into and out of New York City alone was about 35 per cent of the national total in the early '20's and about 50 per cent in the late '30's.[5] The population of the New York metropolitan area, outside the large central cities, increased 52 per cent from 1920 to 1930; only 10 per cent from 1930 to 1940. Likewise, the population of the area surrounding Chicago proper increased 73 per cent in the first decade but only 12 per cent in the second.[6] The migration to the suburbs may have gone on, at a diminished rate, in the mild contraction of 1926–27; if so, it would account for the stability of the traffic.

Table 11
Commutation Passenger-miles
Change per Month between Reference Peaks and Troughs, 1929–1938

Reference date	Level of business	Months from prec. date	Commutation passenger-miles†	Change from preceding date		
				Total	Per month	
					To peak from trough	To trough from peak
			(millions)			
Sept. 1921	Trough	...	489	...	...	...
May 1923	Peak	20	537	48	2.40	...
July 1924	Trough	14	534	−3	...	−0.21
Oct. 1926	Peak	27	556	22	0.81	...
Dec. 1927	Trough	14	556	0	...	0.00
June 1929	Peak	18	575	19	1.06	...
March 1933	Trough	45	360	−215	...	−4.78
May 1937	Peak	50	348	−12	−0.24	...
May 1938	Trough	12	320	−28	...	−2.33

† Three-month average; reference date is middle month.

It is also remarkable that commuting should have declined, even slightly, during 1933–37, when other kinds of travel and economic activity at large were showing pronounced recovery. But after 1929 many highway improvements, especially designed to

[5] Percentages computed from ICC figures for the United States and data in *Railroad and Ferry Traffic in and out of New York City* (Franchise and Tariff Bureau, Transit Commission, State of New York, mimeographed, 1939), p. 13, and earlier issues.

[6] Computed from data in *Metropolitan Districts* (Census Bureau, 1930), pp. 49, 141, and releases on population and housing (1940), Series PH-1, 111, 137.

facilitate the flow of motor traffic in a metropolitan region, were made in and around New York, and no doubt in other commuting areas. Some were completed during 1933–37. They enhanced the relative attractiveness of driving to work. Even if a traveller chose to go to and from his job by railroad, it was no longer as advantageous to buy a commutation ticket rather than pay for each trip separately. Other fares had been greatly reduced; commutation fares had not changed much. In 1933–37 ordinary fare exceeded commutation fare by about 1 cent per mile; in earlier expansions the spread was 2 cents (Chart 22). Under some circumstances the difference was nominal. The average commutation fare per mile is computed on the assumption that purchasers of monthly tickets make full use of them. Some persons had occasion to go into town only two or three times a week or preferred to drive in good weather. For them the price of a monthly ticket, divided by the number of trips actually taken, may have exceeded the new low level of noncommutation fares. Some travel was probably diverted to the 'other' category. Finally, migration to the suburbs did not add to the number of potential daily riders as rapidly as in the 1920's. All these factors help to explain the absence of any marked expansion in commuting.

CHART 22

Revenue per Passenger-mile: Commutation and Other Travel, 1922–1940

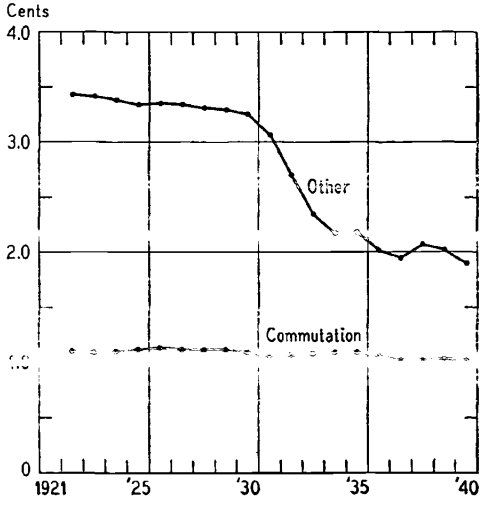
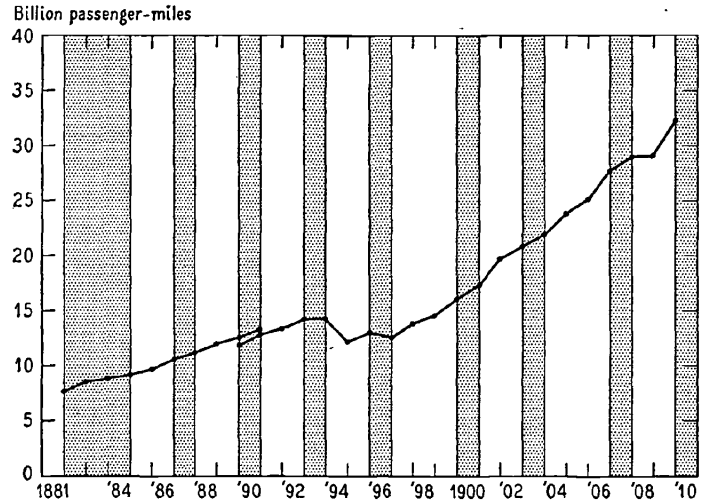


CHART 23

Passenger-miles, 1882–1910



Shaded periods are reference contractions.

Earlier times

The annual totals on which we are obliged to rely before 1908 suggest an almost continuous growth of travel from 1882 to that year (Chart 23). They disclose only 2 specific declines, from 1894 to 1895 and from 1896 to 1897, although Burns and Mitchell find 8 reference contractions in this period. Monthly figures, of course, might indicate more numerous interruptions. However that may be, 11 comparisons among reference phases suggest positive, only 4 inverse conformity (Table 12). There is also an annual statistical record, even older, of the number of journeys people took in Pullmans, although not of the number of miles they traveled.[7] Between 1875 and 1915 (when the monthly Pullman data became available) it reveals only 6 shrinkages (1876–78, 1885–86, 1891–92, 1893–95, 1896–97, 1914–15) although this long span includes 10 complete reference contractions and the three later years of another, 1873–78 (Chart 24). Thirteen rate-of-change comparisons count on the side of positive, 7 on that

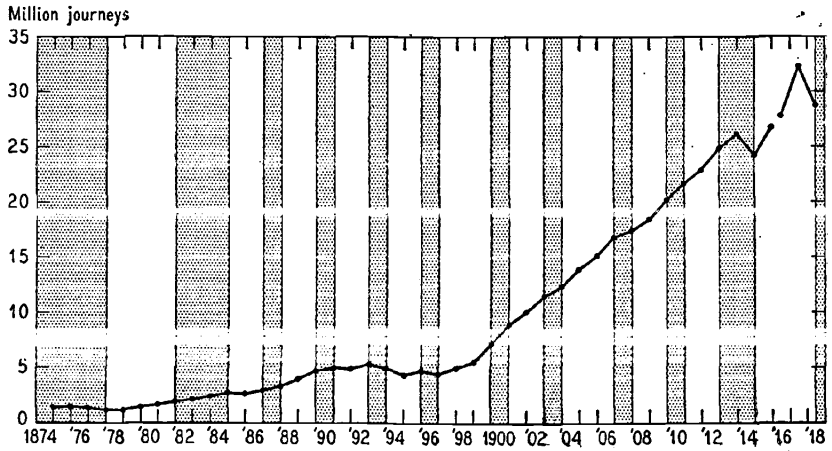
[7] We are indebted to the Pullman Company for most of the figures. The ones we use pertain to the years ended July 31, 1875–1916, and to calendar years beginning with 1916. There are also calendar-year data for 1911–15.

Table 12
Passenger-miles
Change per Year between Reference Peaks and Troughs, 1882–1910

Reference date	Level of business	Years from prec. date	Passenger-miles	Change from preceding date			Conformity suggested†
				Total	Per year		
					To peak from trough	To trough from peak	
			(millions)				
1882	Peak	...	7,688	...	...	...	...
1885	Trough	3	9,134	1,446	...	482	...
1887	Peak	2	10,570	1,436	718	...	Positive
1888	Trough	1	11,191	621	...	621	Positive
1890	Peak	2	12,522	1,331	666	...	Positive
1891	Trough	1	13,317	795	...	795	Inverse
1890	Peak	...	11,848	...	...	...	...
1891	Trough	1	12,844	996	...	996	...
1893	Peak	2	14,229	1,385	693	...	Inverse
1894	Trough	1	14,289	60	...	60	Positive
1896	Peak	2	13,049	−1,240	−620	...	Inverse
1897	Trough	1	12,257	−792	...	−792	Positive
1900	Peak	3	16,038	3,781	1,260	...	Positive
1901	Trough	1	17,354	1,316	...	1,316	Inverse
1903	Peak	2	20,916	3,562	1,781	...	Positive
1904	Trough	1	21,923	1,007	...	1,007	Positive
1907	Peak	3	27,719	5,796	1,932	...	Positive
1908	Trough	1	29,083	1,364	...	1,364	Positive
1910	Peak	2	32,338	3,255	1,628	...	Positive

† By comparison with preceding rate; e.g., 718 million with 482 million.

CHART 24
Pullman Journeys, 1875–1918



Shaded periods are reference contractions.

of inverse conformity (Table 13). Thus most of the more clumsy evidence from annual data suggests that in earlier times travel usually conformed positively to the changes in business at large indicated by the monthly chronology, as it did afterwards.

Table 13
Pullman Journeys
Change per Year between Reference Peaks and Troughs, 1878–1918

Reference date	Level of business	Years from prec. date	No. of journeys	Change from preceding date			Conformity suggested†
				Total	Per year		
					To peak from trough	To trough from peak	
			(thousands)				
1878	Trough	...	1,118	...	...	...	...
1882	Peak	4	1,860	742	186	...	...
1885	Trough	3	2,672	812	...	271	Inverse
1887	Peak	2	2,892	220	110	...	Inverse
1888	Trough	1	3,250	358	...	358	Inverse
1890	Peak	2	4,689	1,439	720	...	Positive
1891	Trough	1	4,949	260	...	260	Positive
1893	Peak	2	5,278	329	164	...	Inverse
1894	Trough	1	4,898	−380	...	−380	Positive
1896	Peak	2	4,677	−221	−110	...	Positive
1897	Trough	1	4,414	−263	...	−263	Positive
1900	Peak	3	7,164	2,750	917	...	Positive
1901	Trough	1	8,921	1,757	...	1,757	Inverse
1903	Peak	2	11,407	2,486	1,243	...	Inverse
1904	Trough	1	12,336	929	...	929	Positive
1907	Peak	3	16,874	4,538	1,513	...	Positive
1908	Trough	1	17,453	579	...	579	Positive
1910	Peak	2	20,210	2,757	1,378	...	Positive
1911	Trough	1	21,655	1,445	...	1,445	Inverse
1913	Peak	2	24,864	3,209	1,604	...	Positive
1915	Trough	2	24,252	−612	...	−306	Positive
1918	Peak	3.5	28,751	4,499	1,285	...	Positive

† By comparison with preceding rate; e.g., 271 thousand with 186 thousand.

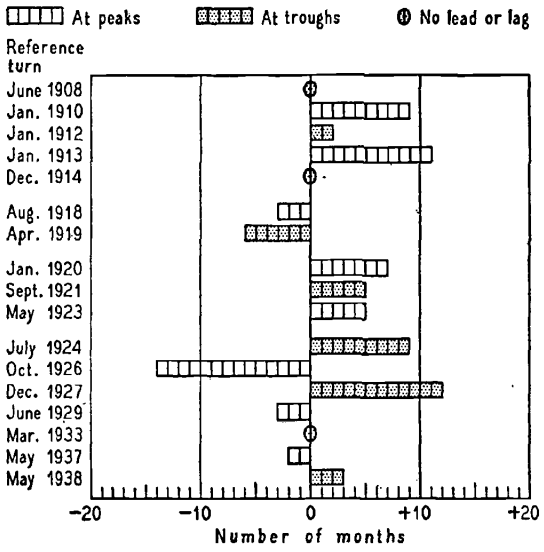
Net gains from cycle to cycle until 1920, losses afterward

While there may have been more contractions in travel before 1920 than our annual figures show, it is clear that, whatever passenger business the companies may have lost during such a period, they usually gained not only as much but more during the subsequent expansion. At almost every *reference* peak, certainly, more people rode the railroads than at any preceding reference peak. After 1920, on the other hand, the losses in each contraction were

never fully recovered in the following expansion.[8] The improvement of highways and motor cars was the principal reason for this cumulation of losses.

CHART 25

Number of Months by which Turn in Passenger-miles Preceded (−) or Followed (+) Reference Turn



TURNING POINTS

Peaks and troughs in travel usually occurred some time before or after the reference dates to which we regard them as corresponding (Chart 25).[9] Many of these differences can apparently be explained by circumstances peculiar to each case or by the growth of highway competition.

[8] In World War II, however, after the last cycle to close in time for discussion here, military requirements and gasoline shortages temporarily raised rail travel to levels far higher than any previous record.

[9] As far as we can tell from the more limited data, when the turn in total passenger-miles preceded that in business, so did the turn in Pullman and noncommutation passenger-miles; when the turn in the total followed, so did the turn in Pullman and noncommutation. The only known exception is 1924, when Pullman reached bottom 6 months ahead of the reference turn, although noncommutation and total did not do so until 9 months after it. In other instances the length of the interval differed somewhat from one kind of travel to another.

Effect of war conditions

The 1918 high point in traffic preceded the reference peak by 3 months. The following trough came in October 1918 although the corresponding business turn is placed in the following April. War conditions seem to account for the earliness of both specific turns.

In the earlier months of United States participation in the war, prosperity and the more numerous occasions for doing business with the government no doubt stimulated a growing number of civilian journeys. There was of course a large increase in military travel. The combination of influences produced a sharp rise in total passenger-miles in the latter half of 1917. The expansion of both passenger and freight traffic threatened to overburden the railroads. After the government took over operations at the end of the year, it endeavored to discourage civilian patronage, partly by exhortation,[10] and partly by running fewer trains as well as fewer parlor, dining, and sleeping cars for civilian passengers.[11] Travel became inconvenient and uncomfortable as well as unpatriotic. Military movement was large enough, however, to raise the total, after a brief sag, to the peak in May. After that, while the restrictions on civilians continued in effect, army travel declined, at least in the last month of the reference phase (Chart 26).[12]

The influenza epidemic which broke out in the autumn of 1918, and which must have kept many potential travelers at home, was worst in October. Thereafter it became progressively milder.[13] "Beginning with the signing of the Armistice and continuing throughout the year 1919 much of the passenger service . . . (previously) curtailed was reestablished."[14] People who had refrained

[10] See, e.g., the statement issued by the Railroad Administration and cited in W. J. Cunningham, *American Railroads: Government Control and Reconstruction* (A. W. Shaw Co., 1922), p. 89.

[11] Walker D. Hines, *War History of the American Railroads* (Yale University Press, 1928), p. 89; Cunningham, p. 90.

[12] Pullman passenger-miles reached their peak much earlier, in Nov. 1917, as one might expect from the special restrictions on the kind of equipment used by this traffic.

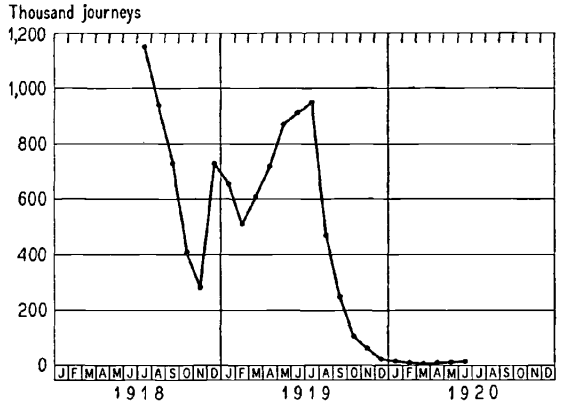
[13] Mortality rates from influenza per 100,000 population in 35 cities, raised to an annual basis, were: Aug., 2; Sept., 80; Oct., 1,774; Nov., 513; Dec., 445; Jan., 412; Feb., 204; Mar., 162; April, 66; May, 24 (*Mortality from Influenza and Pneumonia in 50 Large Cities of the United States, 1910–1929*, U. S. Public Health Service Reprints, Report 1415, p. 6).

[14] Hines, *War History . . .*, p. 89.

from traveling could now indulge any deferred plans in less discomfort and without any fear of obstructing the war. From July to November the number of soldier passengers declined; after the Armistice the soldiers began to come home in increasing number, although the movement again declined somewhat in January and February (Chart 26).[15] Conditions other than the state of business thus favored an increase of both civilian and military travel for several months before April 1919.

CHART 26

Soldier Journeys, July 1918—June 1920



Effect of motor competition

Between 1924 and 1938 peaks in travel regularly preceded peaks in business, and troughs in travel, except in 1933 (and except for an unaccountable Pullman trough in 1924) came after troughs in business. Passenger traffic began to decline before business turned downward and continued to decline for some time after business turned upward.

The exception in 1933 came in March, the month of the banking holiday. Railway travel is typically sold for cash rather than on credit. When depositors could not withdraw money from their accounts it is understandable that this particular kind of expenditure should be severely curtailed.

[15] Data from War Department, *Annual Report, 1919*, I, Part 4, pp. 4919–21, and *1920*, I, 1445–6.

As previously noted, the growing attraction of the highways was operating to decrease rail travel during the entire period covered by our monthly data. When any form of economic activity is subject to a continuously depressing influence we often find that it turns downward earlier than business and goes on declining for some time after business turns upward. This seems to have been the case with travel between 1924 and 1938, with the explainable exception in 1933.

Turns normally late?

We are left with a group of 5 turns before the war and 3 after it the dates of which are not accounted for by competition or by obvious special circumstances. All 4 of the peaks in traffic came later than those in business; 2 of the troughs coincided with reference turns, 2 came later, none earlier. The inference, if any, to be drawn from this fragile evidence is that, when changes in business are the only important influence at work, turning points in travel are likely to come late in the procession.

LONGER JOURNEYS (BUT SHORTER COMMUTING TRIPS) IN PROSPERITY

The level of passenger-miles depends partly on how often people undertake journeys and partly on how far they go. Business conditions can affect the amount of travel by influencing either the number or the length of trips.

Fluctuations after 1921 in the number of trips were similar in a general way to those in passenger-miles. Noncommutation journeys show a strong downward trend from 1921 to 1933. There were specific phases for all reference phases, but the specific expansions corresponding to the reference periods 1924–26 and 1927–29 were very brief and mild. Specific cycles in the commutation data are again hard to find. The number of commuting trips was much lower after 1929–33 than before. Both kinds of journey conformed positively to the reference chronology (Table 14).

On the whole the average length of journeys has increased since 1921, when the data begin, both in expansion and, to a large extent, in contraction (Charts 27 and 28). The progressive extension and improvement of highway facilities contributed toward this result. When contemplating a short trip, people were more likely

to choose automobile in preference to rail transport than when considering a long one. Driving a car may be a relief and a pleasure for a few hours; over long stretches a cumulative strain develops, the prospect of which is a deterrent. Automobile trips of great length almost necessitate an overnight stop with loss of time and lodging expense. Travel by bus for long distances was also very uncomfortable. Highway improvement eliminated short rail trips more rapidly than long ones, and thus tended to raise the average length.[16]

Table 14
Noncommutation and Commutation Journeys
Change per Month between Reference Peaks and Troughs, 1921–1938

Reference date	Level of business	Months from prec. date	Noncommutation				Commutation			
			Number†	Change from preceding date			Number†	Change from preceding date		
				Total	Per month			Total	Per month	
					To peak from trough	To trough from peak			To peak from trough	To trough from peak
			(millions)							
Sept. 1921	Trough	...	49.5	...	...	...	35.0	...	...	...
May 1923	Peak	20	45.0	−4.5	−.22	...	37.6	2.6	.13	...
July 1924	Trough	14	40.9	−4.1	...	−.29	36.3	−1.3	...	−.09
Oct. 1926	Peak	27	34.4	−6.5	−.24	...	37.2	0.9	.03	...
Dec. 1927	Trough	14	30.4	−4.0	...	−.29	37.1	−0.1	...	−.01
June 1929	Peak	18	27.1	−3.3	−.18	...	38.0	0.9	.05	...
March 1933	Trough	45	11.6	−15.5	...	−.34	22.6	−15.4	...	−.34
May 1937	Peak	50	21.1	9.5	.19	...	20.7	−1.9	−.04	...
May 1938	Trough	12	18.5	−2.6	...	−.22	18.5	−2.2	...	−.18

† Three-month average; reference date is middle month.

The average for other than commutation journeys, however, rose more rapidly in expansions than in neighboring contractions, and sometimes even declined in the latter, especially during the later stages of the 1929–33 contraction.

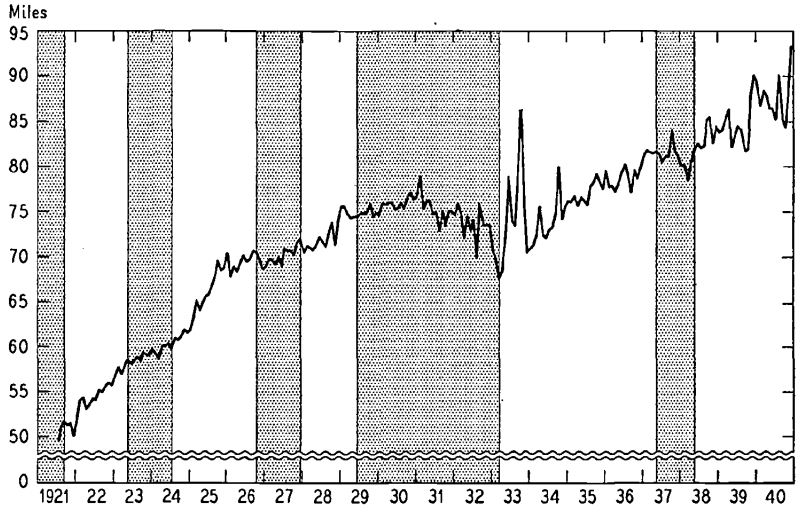
We infer that when the incomes of people who are inclined to travel by rail for pleasure are increasing, they take not only more numerous but longer journeys. When their incomes are falling, they take not only fewer but shorter ones. A similar tendency, we

[16] Another possible circumstance bearing especially on commuting may be cited. Later comers to the suburban areas may have established their homes farther and farther from town as earlier arrivals pre-empted the nearer sites.

surmise, is present in travel for business purposes. When the size and frequency of orders is increasing, it may be thought worth while to send salesmen farther and farther to obtain them. When the business obtainable per trip is declining, some of the longer trips may cease to pay for themselves.

CHART 27

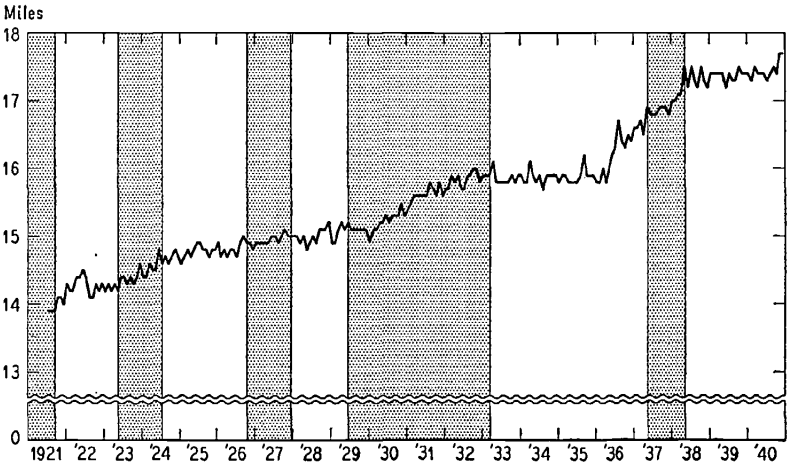
Average Journey: Noncommuters, July 1921—December 1940



Shaded periods are reference contractions.

CHART 28

Average Journey: Commuters, July 1921—December 1940



Shaded periods are reference contractions.

If highway transport had not been greatly improved during the period, the average would probably have increased in expansions and fallen in contractions. As things were, the average tended to rise in expansions both because highway development was eliminating the shorter rail trips and because improving business conditions were adding to the longer ones. In contraction the influence of business conditions opposed that of highway improvement.

In arriving at these conclusions we ignore a sharp rise during the first few months of the 1933–37 reference phase; the average temporarily ascended to levels much higher than those which prevailed afterward. In those months the activities of the federal government were greatly expanded by the establishment of the New Deal agencies. Many people went to Washington looking for jobs; when they got them they brought their families. Business men had numerous occasions for going to the capital or to regional offices in connection with the new laws and their administration. Although the persons involved may have been few in comparison with other travelers they came from all parts of the country; their journeys were long. The World Fair at Chicago may have stimulated an unusual amount of long-distance travel. It was open from late in May to the middle of November 1933. It was open also during a roughly similar period in 1934; but paid admissions were only 16,486 thousand in the 1934 season, 22,566 thousand in the preceding season. In both the peak attendance came near the end of August.[17] (Our seasonal adjustment would not discount a nonrecurring fluctuation like this.) The maximum excess above the underlying slope of the curve, about 16 miles, does not seem too great to be explained in this manner.[18]

The effect of changes in general economic conditions on the length of commutation journeys seems to be the opposite of their effect on other travel (Chart 28). The average trip lengthened more rapidly during contractions than during expansions. Residents of the suburbs who live relatively close to the center of a metropolitan area can often reach it by bus or trolley. These alternatives are usually more inconvenient and time-consuming but

[17] See the weekly figures in *A Century of Progress*, Report of the President of the Board of Trustees, March 14, 1936.

[18] The effect of New Deal activities and the Fair on travel helps also to account for the promptness of its revival after the reference trough.

cheaper. The farther out one lives, the greater the inconvenience and loss of time. It seems likely that in contractions, more of those who have short distances to travel drop out of the ranks of commuters than of those who live farther away.

Table 15

Length of Journeys of Noncommutation Passengers and of Commuters Change per Month between Reference Peaks and Troughs, 1921–1938

Reference date	Level of business	Months from prec. date	Noncommuters				Commuters			
			Length†	Change from preceding date			Length†	Change from preceding date		
				Total	Per month			Total	Per month	
					To peak from trough	To trough from peak			To peak from trough	To trough from peak
			(miles)							
Sept. 1921	Trough	...	51.4	...	...	...	14.0	...	...	...
May 1923	Peak	20	58.2	6.8	.34	...	14.3	.3	.02	...
July 1924	Trough	14	60.3	2.1	...	.15	14.7	.4	...	.03
Oct. 1926	Peak	27	70.4	10.1	.37	...	14.9	.2	.01	...
Dec. 1927	Trough	14	71.3	0.9	...	.06	15.0	.1	...	.01
June 1929	Peak	18	74.5	3.2	.18	...	15.1	.1	.01	...
March 1933	Trough	45	68.6	−5.9	...	−.13	16.0	.9	...	.02
May 1937	Peak	50	81.5	12.9	.26	...	16.7	.7	.01	...
May 1938	Trough	12	81.7	0.2	...	.02	17.3	.6	...	.05

† Three-month average; reference date is middle month.

On Chart 28 there is no clear contrast between the contraction of 1926–27 and its adjacent expansions. Our usual method of computing the rate of change also fails to indicate any difference. The computed growth during the 1921–23 expansion was less rapid than during the contraction of 1923-24, however; and growth during 1927–29 was less rapid than in the following contraction (Table 15).

Since commuting accounts for a minor part of all passenger-miles, changes in the average length of all journeys are more likely to resemble those in other than commutation travel. Beginning with the 1919–20 expansion, comparisons of each phase with the following, using annual data, suggest in each case that the net effect of declining business is to shorten, and of improving business to lengthen, journeys. When there was a shortening in both phases, it was more rapid in contraction. When there was a lengthening

in both, it was more rapid in expansion. Comparisons for earlier periods, however, do not, as a whole, indicate any consistent relation. Before 1896 they suggest that improving business tended to shorten and declining business to lengthen journeys (Table 16). Annual data for Pullman travel, beginning with 1918, show positive conformity without exception (Table 17).

Table 16
Length of Journeys, All Passengers
Change per Year between Reference Peaks and Troughs, 1882–1938

Reference date	Level of business	Years from prec. date	Length	Change from preceding date			Conformity suggested[a]
				Total	Per year		
					To peak from trough	To trough from peak	
			(Miles)				
1882	Peak	...	26.60	...	...		...
1885	Trough	3	25.99	−0.61	...	−0.20	...
1887	Peak	2	24.68	−1.31	−0.66	...	Inverse
1888	Trough	1	24.79	0.11	...	0.11	Inverse
1890	Peak	2	25.04	−0.74	−0.37	...	Inverse
1891	Trough	1	23.95	−0.10	...	−0.10	Inverse
1890	Peak	...	24.06	...	...	...	...
1891	Trough	1	24.18	0.12	...	0.12	...
1893	Peak	2	23.97	−0.21	−0.10	...	Inverse
1894	Trough	1	26.43	2.46	...	2.46	Inverse
1896	Peak	2	25.50	−0.93	−0.46[b]	...	Inverse
1897	Trough	1	24.05	−0.46	...	−0.46	Inverse
1900	Peak	3	27.80	2.76	0.92	...	Positive
1901	Trough	1	28.58	0.78	...	0.78	Positive
1903	Peak	2	30.10	1.52	0.76	...	Inverse
1904	Trough	1	30.64	0.54	...	0.54	Positive
1907	Peak	3	31.72	1.08	0.36	...	Inverse
1908	Trough	1	32.86	1.14	...	1.14	Inverse
1910	Peak	2	33.50	0.64	0.32	...	Inverse
1911	Trough	1	33.48	−0.02	...	−0.02	Positive
1913	Peak	2	33.31	−0.17	−0.08	...	Inverse
1915	Trough	2	32.95	−0.36	...	−0.18	Positive
1918	Peak	3.5	38.48	5.53	1.58	...	Positive
1919	Trough	1	38.68	0.20	...	0.20	Positive
1920	Peak	1	37.30	−1.38	−1.38	...	Inverse
1921	Trough	1	35.53	−1.77	...	−1.77	Positive
1923	Peak	2	37.97	2.44	1.22	...	Positive
1924	Trough	1	38.26	0.29	...	0.29	Positive
1926	Peak	2	40.79	2.53	1.26	...	Positive
1927	Trough	1	40.23	0.56	...	0.56	Positive
1929	Peak	2	39.63	−0.60	−0.30	...	Positive
1932	Trough	3	35.36	−4.27	...	−1.42	Positive
1937	Peak	5	49.42	14.06	2.81	...	Positive
1938	Trough	1	47.65	−1.77	...	−1.77	Positive

[a] By comparison with preceding rate; e.g., −0.66 miles with −0.20 miles.
[b] More exactly, −0.465.

Table 17
Length of Pullman Journeys
Change per Year between Reference Peaks and Troughs, 1918–1938

Reference date	Level of business	Years from prec. date	Length†	Change from preceding date		
				Total	Per year	
					To peak from trough	To trough from peak
			(miles)			
1918	Peak	...	371.4	...	...	...
1919	Trough	1	367.4	−4.0	...	−4.0
1920	Peak	1	365.2	−2.2	−2.2	...
1921	Trough	1	361.7	−3.5	...	−3.5
1923	Peak	2	379.0	17.3	8.6	...
1924	Trough	1	383.8	4.8	...	4.8
1926	Peak	2	399.4	15.6	7.8	...
1927	Trough	1	400.5	1.1	...	1.1
1929	Peak	2	420.5	20.0	10.0	...
1932	Trough	3	429.1	8.6	...	2.9
1937	Peak	5	516.8	87.7	17.5	...
1938	Trough	1	532.2	15.4	...	15.4

† Computed by NBER: passenger-miles ÷ number of passengers. Passenger-miles, 1932 and prior, from *Survey of Current Business*, Jan. 1939; subsequently, like all figures for number of passengers, from *Statistics of Railways*, various issues.

CYCLES IN TRAVEL RATHER MILD

Milder than in industrial production

Travel is not only largely a service to consumers but, like all services, is perishable. Production and consumption are simultaneous. Travel is analogous to the production of perishable consumer goods, generally regarded as one of the forms of economic activity least affected by cyclical changes in business. Are the changes in travel that correspond to changes in business also relatively mild? To answer the question roughly we compare changes in travel with those in the Federal Reserve index of industrial production (Table 18), which reflects the production of many kinds of articles—producer and consumer, durable and nondurable. Since it includes the extremely variable durable goods, presumably the cyclical changes in it are greater than those in the production of perishable consumer goods and services. If travel changes rather little as business changes, the amplitude of its fluctuations should be less than that of fluctuations in the Reserve index.

Table 18

Total, Noncommutation, and Pullman Passenger-miles; Industrial Production; and Ton-miles
Percentage Change in Each between Its Own Peaks and Troughs

Passenger-miles						Industrial production (F. R. index)[a]		Ton-miles	
Total		Noncommutation		Pullman					
Date	% change from prec. date	Date	% change from prec. date	Date	% change from prec. date	Date	% change from prec. date	Date	% change from prec. date
June 1908	...							Feb. 1908	...
Oct. 1910	21							Mar. 1910	40
Mar. 1912	−2							Feb. 1911	−8
Dec. 1913	9							May 1913	26
Dec. 1914	−12							Dec. 1914	−17[b]
May 1918	48							Apr. 1918	64
Oct. 1918	−8			Oct. 1918	...	Mar. 1919	...	Mar. 1919	−21
Aug. 1920	15			Aug. 1920	55	Feb. 1920	22	Feb. 1920	27
Feb. 1922	−30	Feb. 1922	...	Dec. 1921	−29	Apr. 1921	−32	July 1921	−31
Oct. 1923	15	Oct. 1923	17	Sept. 1923	25	May 1923	62	Apr. 1923	51
Apr. 1925	−11	Apr. 1925	−14	Jan. 1924	−4	July 1924	−16	June 1924	−17
Aug. 1926	6	Oct. 1925	8	Nov. 1925	14	Oct. 1926	29	July 1926	23
Dec. 1928	−16	Dec. 1928	−20	Nov. 1928	−6	Nov. 1927	−6	Dec. 1927	−10
Mar. 1929	3	Mar. 1929	3	Mar. 1933	5	Aug. 1929	23	Aug. 1929	11
Mar. 1933	−56	Mar. 1933	−62	Mar. 1933	−65	July 1932	−52	July 1932	−55
Mar. 1937	81	Mar. 1937	120	Mar. 1937	87	May 1937	122	Apr. 1937	93
Aug. 1938	−19	Aug. 1938	−21	Oct. 1938	−16	May 1938	−32	May 1938	−31

Percentages computed from three-month averages with month shown as middle month.

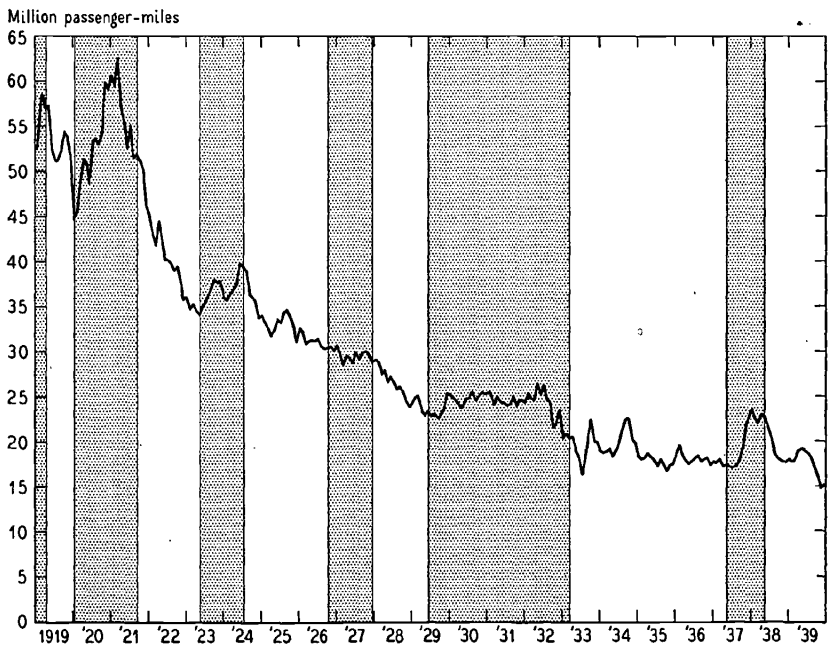
[a] Data from Board of Governors of the Federal Reserve System, *Federal Reserve Index of Industrial Production*, 1943, p. 24.

[b] February 1913, peak in Babson estimates, taken as such in computing this percentage.

If we look at the period from 1918 to 1926, we get the impression that this is true. Specific fluctuations in production were regularly greater, percentagewise, than those in traffic. This impression is strengthened by the fluctuations between 1932 and 1938. On the other hand, if we confine our attention to the partly overlapping period from 1924 to 1937, we get a quite different picture. During expansions, to be sure, variations in industrial output are greater than those in travel; but the two specific contractions in the latter were greater than those in the former. This period suggests merely that the growth of highway competition restricted the rise in passenger-miles during expansions, and accentuated the fall during contractions. Had this factor been absent, the recoveries in employment, income, and occasions for business travel might, for all the data tell us, have evoked a larger increase in travel than occurred in production.

CHART 29

Passenger-miles per Point of Industrial Production, January 1919—December 1939



Shaded periods are reference contractions.

We can form a more conclusive opinion, however, by examining the ratio of passenger-miles to production (Chart 29). Generally speaking, from 1919 onward, it fell in expansion, rose in contraction. Again we are confronted with exceptions in the same two phases—the ratio fell in 1926–27 and 1929–33 as well as in their bordering expansions. But the fall was less rapid during the two contractions. The deceleration suggests that, although highway competition tended to reduce rail travel in these as in other phases, the general economic developments that occur in contraction retarded the rate of decline, and that those developments, unopposed, would have brought a rise in the ratio. This means that passenger-miles would not have diminished as much as the Federal Reserve index. From the unbroken inverse conformity of the ratio, we may reasonably infer that travel is cyclically more stable than the output of industrial commodities, although its relative stability was obscured at times by noncyclical influences.

Milder than in freight traffic

Travel is also more stable than the movement of commodities by rail. Fourteen of 16 specific variations in ton-miles were greater than the corresponding specific variations in passenger-miles (Table 18). In view of the large number of cases, we need not be much concerned with the two exceptions. They are similar to those discussed in the preceding section.

Since annual data up to 1908 disclose only 3 specific phases (from 1894 to 1897) in travel, few comparisons between specific phases in passenger-miles and in ton-miles are possible. But the ratio of the former to the latter is suggestive. It fell in all reference expansions except one, rose in 5 of 8 contractions (Table 19). Even when it failed to change in the direction opposite to that of business, it conformed inversely, with one exception. Travel apparently tended to be more stable than the movement of freight. If we had monthly data, and if they revealed more numerous matchable phases in the two kinds of traffic (as they probably would), it seems likely that the rises and falls in ton-miles would prove to have exceeded those in passenger-miles.

Table 19
Passenger-miles per 100 Ton-miles
Change per Year between Reference Peaks and Troughs, 1882–1910

Reference date	Level of business	Years from prec. date	P-m. per 100 t-m.	Change from preceding date		
				Total	Per year	
					To peak from trough	To trough from peak
1882	Peak	...	19.56	...	...	...
1885	Trough	3	18.58	−0.98	...	−0.33
1887	Peak	2	17.17	−1.41	−0.70	...
1888	Trough	1	17.11	−0.06	...	−0.06
1890	Peak	2	15.81	−1.30	−0.65	...
1891	Trough	1	16.40	0.59	...	0.59
1890	Peak	...	15.55	...	...	...
1891	Trough	1	15.84	0.29	...	0.29
1893	Peak	2	15.20	−0.64	−0.32	...
1894	Trough	1	17.79	2.59	...	2.59
1896	Peak	2	13.69	−4.10	−2.05	...
1897	Trough	1	12.88	−0.81	...	−0.81
1900	Peak	3	11.33	−1.55	−0.52	...
1901	Trough	1	11.80	0.47	...	0.47
1903	Peak	2	12.07	0.27	0.14	...
1904	Trough	1	12.56	0.49	...	0.49
1907	Peak	3	11.72	−0.84	−0.28	...
1908	Trough	1	13.32	1.60	...	1.60
1910	Peak	2	12.68	−0.64	−0.32	...

Commuting more stable than other travel

Since we feel unable to mark off specific phases in commuting, we have nothing to compare directly with the specific phases in other travel. But again a ratio is helpful—in this instance that of 'other' to total passenger-miles (Table 20). It rose in the expansion and fell in the contraction of the 1933–38 reference cycle. From 1921 to 1933, however, it fell in both kinds of phase. But the rate of decline was uneven. Without exception it was faster in the contractions than in the expansions.

During these six earlier phases, the commutation business of the railroads was probably less vulnerable to highway competition than other passenger travel. The former, to be sure, involved quite short distances. But the highway alternative, if suburban residents were to go to and from business in their own cars, was a twice-daily grind of driving through congested metropolitan roads and streets at rush hours. One great disadvantage of rail travel as compared with riding in one's own car—the necessity

of subordinating personal convenience to railroad timetables—was not a serious deterrent to commuting, for in this service trains were frequent and schedules were adjusted to the hours of doing business. Metropolitan highway conditions also discouraged daily travel in busses by limiting their possible speed. Rail commutation fares amounted to little over a cent per mile—less than the out-of-pocket cost of driving, at least for one person per car. The increasing attractions of the highways tended to cause a greater decline in other passenger traffic than in commuting. The growing popularity of suburban life also tended to increase the latter relatively to the former.

Table 20
Ratio of Noncommutation to Total Passenger-miles
Change per Month between Reference Peaks and Troughs, 1921–1938

Reference date	Level of business	Months from prec. date	Ratio†	Change from preceding date		
				Total	Per month	
					To peak from trough	To trough from peak
Sept. 1921	Trough	...	.8388	...	...	...
May 1923	Peak	20	.8298	.0090	−.0004	...
July 1924	Trough	14	.8220	−.0078	...	−.0005
Oct. 1926	Peak	27	.8129	−.0091	−.0003	...
Dec. 1927	Trough	14	.7958	−.0171	...	−.0012
June 1929	Peak	18	.7784	−.0174	−.0009	...
Mar. 1933	Trough	45	.6886	−.0898	...	−.0020
May 1937	Peak	50	.8315	.1429	.0029	...
May 1938	Trough	12	.8251	−.0064	...	−.0005

† Three-month average; reference date is middle month.

But these tendencies were apparently opposed in expansion, reinforced in contraction, since the decline in the ratio was less rapid in the rising phase of business. In the absence of the complicating influences, the opposing circumstances would presumably have caused a rise in the ratio during expansion, a fall in contraction. Since commuting conformed to business as matters were, it presumably would have risen and fallen with business. Since the ratio too would have risen and fallen, other travel would have increased and diminished more than commuting.

The lesser sensitivity of commuting to business disturbances is probably linked with the economic position of commuters and

the not easily dispensable part a railroad plays in their daily lives. Most of them probably enjoy rather steady employment. As long as they keep their jobs and homes they must travel to and from cities, although, as noted elsewhere, some probably use less expensive means of transport in hard times.

Not much difference between other coach and Pullman traffic

The specific expansions in Pullman passenger-miles were not consistently greater or consistently smaller than those in noncommutation passenger-miles, which are totals of noncommutation coach movement and the part of the Pullman movement that pays rail fares as well as berth or seat charges—the major portion (Table 18). In 4 phases the percentage change in Pullman traffic was larger, in 4 less than in the total.

But the relative changes in all these phases, except perhaps 1937–38, can plausibly be explained in terms of factors other than general business conditions. Pullman journeys are longer, on the average, than journeys in day coaches. In 1922 the average journey, other than commutation, was 55 miles. The average journey in Pullmans was 370 miles.[19] Since people are more likely to prefer highway to rail transport for a short journey than for a long one, the multiplication and improvement of roads and motor vehicles at first diverted coach more than Pullman travel. The lesser vulnerability of the latter could cause it to increase more in expansions and to decline less in contractions, as it did from 1921 to 1929.

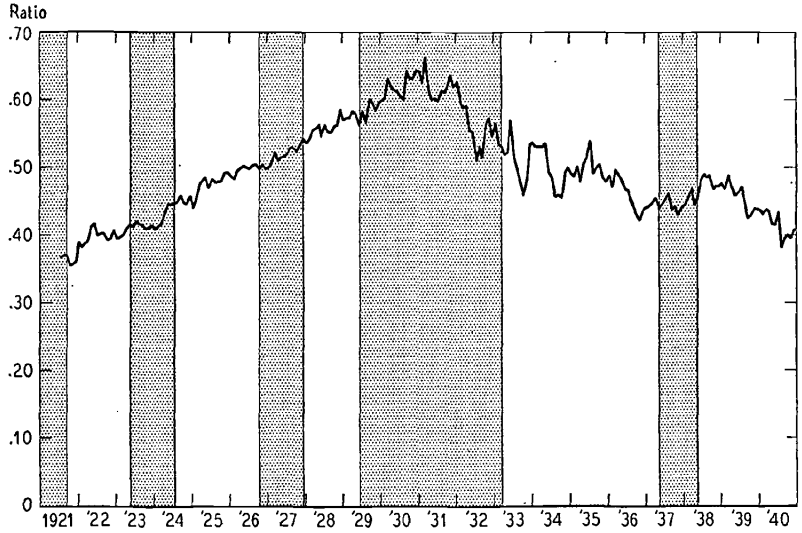
The greater decline in Pullman passenger-miles from 1929 to 1933 may be the consequence of a change in the relative fares. In this contraction passenger fares were gradually but, on the average, substantially reduced (Chart 22). During most of the period reductions were not made according to any comprehensive plan; the decline in the average may be attributed to scattered, local experiments with lower fares as a means of regaining traffic.

[19] It is true that when a passenger rides continuously over several railroads, each counts him as a passenger, and the figure of 55 miles is therefore too low to represent the average completed journey. But the journey as a whole can hardly involve more than 2 or at most 3 railroads. Travel between New York and Chicago usually involves the use of but one railroad, many trans-continental trips only 3. As the 55-mile figure includes Pullman travel, the average for coach travel would be lower.

No detailed information about individual reductions is available, but it seems possible that coach fares were more severely and extensively cut than Pullman fares. If so, the reductions may have limited the decline in coach more effectively than that in Pullman travel.

CHART 30

Ratio of Pullman to Noncommutation Passenger-miles, July 1921—December 1940



Shaded periods are reference contractions.

The process of cutting fares culminated in the reduction of the basic charges during the expansion of 1933–37. While both Pullman and other fares were reduced, the differential cost to the traveler of Pullman as compared with coach journeys increased (Table 21).[20] The widening of the margin may explain the

[20] A basic fare is an amount in cents per mile ordinarily used over a wide area to construct the actual fares. Because of excursions, vacation fares, application of short-line fares over longer competing routes, etc., the average revenue per passenger-mile is usually less than the basic fare. Of the competitive reductions after 1929, none, until 1932, was widespread and uniform enough to justify describing the readjustment as a new basic fare, although the collective effect was substantial. Chart 22 therefore shows earlier reductions than Table 21.

Equalization of rates over circuitous routes, lower charges in upper berths and chair cars, and other factors reduce the average revenue of the Pullman Company to a level below the basic charge.

Table 21

Basic Passenger Fares, August 26, 1920–March 24, 1940

(Cents per mile)

Date first effective	East	South			West		
		One way	Round trip		One way	Round trip	
			Long return limit	Short return limit		Long return limit	Short return limit
Coach Fare							
Aug. 26, 1920	3.60	3.60	3.60	3.60	3.60	3.60	3.60
July 1, 1932[a]			2.88	2.88			
Jan. 1, 1933[b]		1.50	1.50	1.50			
Apr. 1, 1933[c]		2.00	2.00	2.00			
Dec. 1, 1933		1.50	1.50	1.50	2.00	1.80	1.80
June 1, 1936	2.00						
Nov. 15, 1937		2.00	2.00	2.00			
Dec. 15, 1937							
July 26, 1938	2.50						
Jan. 15, 1939		1.50	1.50	1.50			
Mar. 24, 1940	2.00						
Pullman Fare							
Aug. 26, 1920	3.60	3.60	3.60	3.60	3.60	3.60	3.60
July 1, 1932[a]			2.88	2.88			
Jan. 1, 1933[b]			2.00	2.00			
Apr. 1, 1933[c]		3.00	3.00	3.00			
Dec. 1, 1933		3.00	2.50	2.00	3.00	2.50	2.00
June 1, 1936	3.00						
Nov. 15, 1937							
Dec. 15, 1937				2.25			2.25
July 26, 1938							
Jan. 15, 1939							
Mar. 24, 1940							
Pullman Cost[d]							
Aug. 26, 1920	4.68	4.68	4.68	4.68	4.68	4.68	4.68
July 1, 1932[a]			3.96	3.96			
Jan. 1, 1933[b]			3.08	3.08			
Apr. 1, 1933[c]		4.08	4.08	4.08			
Dec. 1, 1933		3.72	3.22	2.72	3.72	3.27	2.72
June 1, 1936	3.72						
Nov. 15, 1937							
Dec. 15, 1937				2.97			2.97
July 26, 1938							
Aug. 1, 1938	3.756	3.756	3.256	3.006	3.756	3.256	3.006
Jan. 15, 1939							
Mar. 24, 1940							
Pullman Differential[e]							
Aug. 26, 1920	1.08	1.08	1.08	1.08	1.08	1.08	1.08
July 1, 1932[a]			1.08	1.08			
Jan. 1, 1933[b]			1.58	1.58			
Apr. 1, 1933[c]		2.08	2.08	2.08			
Dec. 1, 1933		2.22	1.72	1.22	1.72	1.42	0.92
June 1, 1936	1.72						
Nov. 15, 1937		1.72	1.22	0.72			
Dec. 15, 1937				0.97			1.17
July 26, 1938	1.22						
Aug. 1, 1938	1.256	1.756	1.256	1.006	1.756	1.456	1.206
Jan. 15, 1939		2.256	1.756	1.506			
Mar. 24, 1940	1.756						

Table 21—*Concluded*

Footnotes to Table 21

History of basic fares from ICC Bureau of Statistics, *Railway Passenger Revenue and Passenger-Miles* (Statement 4037, mimeographed, 1940), and that of basic Pullman charge and surcharge from 214 ICC 174 (decided 1936), *Passenger Fares and Surcharges* and 227 ICC 644, *Increased Pullman Fares and Surcharges, 1937* (decided 1938). On the nature of a basic fare, see text, note 20.

[a] Changes effective only on parts of Southern Railway.

[b] Changes effective only on Southern Railway.

[c] Changes effective only on Louisville & Nashville, Mobile and Ohio, Nashville, Chattanooga, & St. Louis, and Central of Georgia.

[d] Pullman fare plus Pullman charge for berth or seat of 0.72 cents through July 31, 1938, and 0.756 cents beginning August 1; plus, also, Pullman surcharge of 0.36 cents through November 30, 1933 in South and West, and May 31, 1936 in East.

[e] Pullman cost minus coach fare.

Table 22

Ratio of Pullman to Noncommutation Passenger-miles
Change per Month between Reference Peaks and Troughs, 1921–1938

Reference date	Level of business	Months from prec. date	Ratio[a]	Change from preceding date			Conformity suggested[b]
				Total	Per month		
					To peak from trough	To trough from peak	
Sept. 1921	Trough	...	.3652	...	...	...	...
May 1923	Peak	20	.4129	.0477	.0024	...	...
July 1924	Trough	14	.4470	.0341	...	.0024	None
Oct. 1926	Peak	27	.5020	.0550	.0020	...	Inverse
Dec. 1927	Trough	14	.5382	.0362	...	.0026	Inverse
June 1929	Peak	18	.5747	.0365	.0020	...	Inverse
Mar. 1933	Trough	45	.5277	−.0470	...	−.0010	Positive
May 1937	Peak	50	.4466	−.0811	−.0016	...	Inverse
May 1938	Trough	12	.4596	.0130	...	.0011	Inverse

[a] Three-month average; reference date is middle month.

[b] By comparison with preceding rate; e.g., .0024 with .0024.

greater recovery in coach than in Pullman travel. Striking improvements in the comfort and attractiveness of coach equipment were a contributing factor.

In the remaining phase, 1937–38, coach declined more than Pullman movement. The cost differential was narrowed in the South during the contraction, but this change in price relations in one region seems too small to account for the relative change in the national figures.

Although the Pullman travel just considered includes the

movement of railway employees, while noncommutation passenger-miles do not include any free travel, our remarks with respect to the differential effect of highway competition and of rate changes apply primarily to the traffic that pays revenue to both the railroads and the Pullman Company. The coach component therefore probably had smaller specific expansions and greater contractions from 1921 to 1929, smaller contractions and a larger expansion for 1929 to 1938.

None of these phases, however, tells us anything about the relative size of the disturbances that would have occurred if general fluctuations in business had been the sole important influence. The ratio of Pullman to all other-than-commutation passenger-miles is not much more helpful. It increased steadily from 1922 to 1930; no difference between expansion and contraction is readily observable in the rate of growth, except in 1937–38 (Chart 30[21]). The usual computations, it is true, suggest inverse conformity in 5 of 7 instances (Table 22). They imply that Pullman tends to be somewhat more stable cyclically than other traffic. It is not clear, however, that this would be true of travel by others than railway employees; the goings and comings of the latter might be sufficiently more stable to account for the not very large differences in computed rates.[22]

[21] Since no-rail-fare movement is included in the dividend but not the divisor, the level is somewhat exaggerated throughout.

[22] Annual ratios of the number of Pullman to the number of rail passengers, including commuters, 1882–1923, do not conform at all to the reference chronology. Eleven comparisons suggest positive, 12 inverse conformity. If commuters could be excluded, however, there would probably be more of the latter instances, fewer of the former.