
STREET AND ELECTRIC RAILWAYS

PART I

STREET AND ELECTRIC RAILWAYS.

PART I.—STATISTICAL.

CHAPTER I.

SCOPE AND METHOD.

Class of railways included.—This report covers 945 street and electric railways in operation in continental United States during all or a portion of the year 1907, and three such roads in operation in Porto Rico and one in Hawaii. All railways operated exclusively by electricity, although they may be owned by steam railroads or be operating under steam-railroad charters, are included, and also the street railways operated by animal power, cable, gasoline motors, and steam. Some companies used more than one kind of power. The use of electricity by line transmission was reported by 902 companies, with 34,034.19 miles of track, while 1 company, with 22.50 miles of track, used gas-electric motors, and 1 company, with 3 miles of track, used storage batteries. The use of animal power was reported by 28 companies, with 136.11 miles of track; the use of cable by 20 companies, with 61.71 miles of track (8.96 miles of inclined plane operated by 12 companies and 52.75 miles of street cable track operated by 8 companies); and the use of gasoline motors by 5 companies, with 40.99 miles of track. Steam was used as an exclusive or auxiliary motive power by 12 companies, with 105.06 miles of track owned or leased by companies classed as "street and electric railways."

During 1907, 23 companies, with only 46.98 miles of track, reported horse cars exclusively, and 10 companies, including those operating inclined planes, with 20.70 miles of track, used the cable exclusively. All of the cars operated by gasoline motors were owned by 5 companies that used no other motive power, while only 3 companies, with 17 miles of track, reported steam as the exclusive motive power. Electricity was one of the classes of power used by every company employing more than one kind of power. Electric-railway companies owned or leased more than 65 per cent of the track used for horse cars, over 66 per cent of that operated by cable, and over 83 per cent of that operated by steam.

A number of companies that operate electric railways engage also in other business, such as the generation and sale of electric current and the manufacture and sale of gas, ice, etc.,¹ while some carry on commercial enterprises and have investments in real estate and other property not incident to the operation of the railways. The generation and sale of electricity for general commercial use is frequently so closely allied to electric-railway operations that it is impracticable to separate the statistics for the two branches of industry. In such cases the data for both branches are included in this report. If the railway company was engaged in any business foreign to the operation of the road a segregation of the statistics was required, except in the case of the capitalization, balance-sheet, and income accounts. While these three accounts represent the entire business of the respective companies, they are so arranged that it is possible to determine the extent of the interests other than those which relate to the generation and sale of electricity and the operation of the railway.

Bridge properties, tunnels, amusement parks and resorts, and turnpikes, which have been constructed or acquired by electric-railway companies, are as a rule covered by the capitalization of the railways, and statistics for them are included with those for the railways. There are several cases where properties of this character are owned by independent corporations and operated by the railway companies under a lease or contract, and in such cases the capitalization and the statistics of operation for these properties are included with those for the railways.

The report does not include statistics of ordinary steam railroads. A part or all of the trackage of a few companies is operated by both steam and electrical motive power, and some of these companies were included in the census of street and electric railways of

¹ See p. 117.

1902. By the time of the census of 1907 these mixed roads had become so numerous that it was decided to omit them as a class from the general tabulation. For the sake of comparison, however, those that were reported for 1902 were included for 1907. The following list contains the principal roads of this type that were not included in the census of 1907:

Northwestern Pacific Railroad, California.
 Los Angeles and San Diego Beach Railway, California.
 Hoboken Manufacturers Railroad, New Jersey.
 New York, New Haven and Hartford Railroad (New York Div.), New York.
 Long Island Railroad, New York.
 Bush Terminal Railroad, New York.
 Cincinnati, Georgetown and Portsmouth Railroad, Ohio.
 Felicity and Bethel Railroad, Ohio.
 Chicago, Burlington and Quincy Railroad (Deadwood Central Railroad), South Dakota.

The American Railway Traffic Company, of Brooklyn, N. Y., which owned no track but operated work cars over the track of the Brooklyn Rapid Transit system for the removal of city ashes, etc., and the Illinois Tunnel Company of Chicago, Ill., which operated small express, freight, and mail cars in subways under Chicago city, are not included in this report, because they did not engage in the general passenger and freight traffic, but were operated for a purpose different in many important respects from that of the street and electric railways. Moreover, statistics were not secured for the Pacific Coast Railway Company of California, which operated intermittently a few miles of track by electric power.

Period covered.—As a rule, the reports of the various companies cover the calendar year ending December 31, 1907, but some companies submitted data for the business year most nearly conforming to the calendar year. The reports for 318 companies were for the year ending June 30, 1907, and those for 90 companies were for the year ending September 30, 1907. Every company that was in operation during any portion of the calendar year is included, but of the 945 operating companies covered by the report, all but 55 gave statistics for the full twelve-months' period.¹

Class of companies.—Four classes of companies have been considered in collecting and compiling the statistics for street and electric railways: (1) Operating companies, (2) nonoperating lessor companies, (3) companies with roads under construction, (4) financing or holding companies.

(1) *Operating companies.*—This class includes all companies engaged in the direct operation of railway properties. Some companies operated leased property only and some operated owned property only, while others operated both owned and leased properties. There were 945 operating companies reported at the census of 1907.

(2) *Lessor companies.*—This class includes railway companies that had leased their properties to other companies for a given period at a definite rental, or under an agreement for the payment of the interest on the bonds and fixed dividends on the stock of the lessor company, or under some other arrangement that relieves the lessor of the supervision of operation. It also includes companies that had acquired franchise or other privileges and transferred them under a lease or other agreement to an operating or financing company. There were 291 lessor companies reported at the census of 1907.

(3) *Companies with roads under construction.*—This class includes companies with roads actually under construction. No road was considered as under construction unless actual grading of right of way had been started or other construction work was in progress. Companies which had only taken out incorporation papers or secured rights of way were regarded as "proposed" roads, and no statistics were secured for them. The reports of the census of 1907 showed 101 companies with roads actually under construction.

(4) *Financing or holding companies.*—This class includes companies organized for the purpose of acquiring the stock and bonds of railways for the purpose of investment. The primary object of companies of this class is to control the financial policy of the companies represented by the capitalization controlled. If a company held the stock or bonds of other companies, and also operated one or more railroads, it was classed as an "operating company" and not as a "holding company." There were 70 financing or holding companies reported at the census of 1907.

Basis of classifications.—For the purpose of bringing together, as far as possible, the statistics for companies that operate under similar conditions, three main classifications have been made. The first is based upon size on the basis of income, and distinguishes five income classes. The second is on a basis of commercial lighting relations and period of operation. The third divides the total number of companies into five groups, according to the kind of system and character of service.

The first and third classifications are applied to all of the data, both physical and financial, while the second classification is applied to the financial data only. The classifications of this census are not directly comparable with those used at the census of 1902. The reason for this and the degree of comparability of the statistics at the two censuses will appear later.

Classification according to income from railway operations.—This is the principal classification adopted for this census, and embraces both the 1907 and 1902 statistics. The arrangement of the companies is according to size as measured by the gross income from railway operations. Five classes are distinguished:

¹ See p. 118.

A. Companies with a gross annual income from railway operations of \$1,000,000 and over.

B. Companies with a gross annual income from railway operations of \$500,000 but less than \$1,000,000.

C. Companies with a gross annual income from railway operations of \$250,000 but less than \$500,000.

D. Companies with a gross annual income from railway operations of \$100,000 but less than \$250,000.

E. Companies with a gross annual income from railway operations of less than \$100,000.

A grouping according to the miles of track operated, as a measure of size, would be more stable and less liable to fluctuations and changes than the grouping according to income. But the United States Interstate Commerce Commission and the public-service commissions of the state of New York have arranged for a classification of companies according to the annual operating revenue. Although this classification was arranged by them for the purpose of accounting, it has been deemed advisable to adopt the same basis of classification for the census in order to facilitate comparisons. The classes adopted by the two government commissions are shown in the following statement:

CLASSIFICATION OF ELECTRIC RAILWAYS.

United States Interstate Commerce Commission.		Public-service commissions, state of New York.	
Class.	Annual operating revenues.	Class.	Annual gross revenue.
A	More than \$1,000,000.	A	\$500,000 and over.
B	More than \$250,000 but not in excess of \$1,000,000.	B	\$100,000 to \$500,000.
C	Not more than \$250,000.	C	Under \$100,000.

The census classification of companies enables a comparison of the statistics with the grouping devised by either of the commissions. The Census, however, does not arrange the companies according to the magnitude of their operations, because it does not consider the income from current sold for light and general commercial purposes. Of the 945 operating companies reported for 1907, 177 had electric-light departments for which statistics are included. The number of railway companies that sell current and the amounts received as income from this source are constantly increasing. The income derived by railway companies from the sale of electricity and from other enterprises, such as the manufacture of gas and the operation of ice plants and waterworks, is excluded in making the classification according to annual income from the operation of the road.

This classification by size (income) does not group the companies according to the population of cities in which operated, on account of the inclusion of so many companies doing an interurban business. Only for Classes A and E can it be fairly assumed that they represent urban companies—A, the companies in large

urban centers, and E, the companies in the smaller cities and towns. Of the 77 companies that make up Class A for 1907, there are only 10 that can be regarded as purely interurban. These 10 companies contributed 17.3 per cent of the trackage reported by all companies of Class A, only 2.9 per cent of the passengers, and 5.6 per cent of the income. Thus, aside from trackage, these 10 interurban companies are relatively insignificant and, with the exception of results based upon trackage, their inclusion in the class does not materially affect the statistics.

The preponderance of large urban companies in Class A is illustrated by the urban centers represented:

San Francisco.	Newark (N. J.).
Denver.	Jersey City.
New Haven (Conn.).	New York City.
District of Columbia.	Buffalo.
Atlanta.	Cincinnati.
Chicago.	Cleveland.
Louisville (Ky.).	Portland (Oreg.).
New Orleans.	Philadelphia.
Baltimore.	Pittsburg.
Boston.	Providence (R. I.).
Detroit.	Memphis.
Minneapolis and St. Paul.	Seattle.
St. Louis.	Milwaukee.
Kansas City (Mo.).	

Classification according to commercial lighting relations and period of operation.—At the census of 1902 the class "electric surface railways" under the general classification according to power used, was subdivided into three groups—"Without commercial lighting," "With commercial lighting," and "Part-time." This grouping was shown in the chapters treating of traffic, capitalization, and financial operations.

A combination of the statistics for companies engaged in commercial lighting and those for companies that did not sell current gives results which, from a railway standpoint at least, are unsatisfactory and to a certain extent misleading, especially in the case of some of the financial accounts. The financial accounts of companies whose operations were reported for less than a year also are not strictly comparable with those of companies operating during the entire year. While the general classification according to power, which was made in 1902, was abandoned at this census, a separation of the statistics for both 1907 and 1902, for companies with respect to commercial lighting and part-time, has been made in the chapter relating to financial operations. The 1907 classification groups—"Without commercial lighting," "With commercial lighting," and "Part-time"—differ from those in 1902 only in that no distinction as to the kind of power used has been made at the census of 1907. Thus the group of companies "Without commercial lighting" for 1907 includes all full-time railways not regularly engaged in the commercial light and power business.

Classification according to kind of system.—The installation of electric power for street-railway trac-

tion, which began in 1884, had already become an important factor by 1890, when the first census of street railways was taken; during the period intervening between the censuses of 1890 and 1902, the great majority of the roads that used power other than electric in 1890 adopted electricity as their motive power, and practically all roads built during that period used some form of electric traction. During the same period, moreover, electricity was substituted for the cable system, which had been first introduced in 1873 and which had promised for a time to become the preferred power for roads operating on grades and in territory where the density of traffic justified the heavy cost of installation. By 1902 the transformation had become practically complete, power other than electricity being then in use on only 3 per cent of the total trackage in operation.

At the census of 1902 detailed statistics were presented for the street railways operated by animal power, by cable, and by steam, as well as for the roads electrically operated, in order that such statistics might be compared with similar data for 1890 and that the extent of the change in motive power which had taken place during the intervening period, might be shown. But since the trackage operated by power other than electricity, already so small in 1902, had become even smaller by 1907, forming only 1 per cent of the total in that year, it has been thought inadvisable to carry the classification by character of power into the main tables.

By 1907 the one steam road included in the 5 companies that were classed as "steam and electric elevated" at the census of 1902, had abandoned the use of steam as a motive power. Moreover, the subway had gone into operation in New York City, operated by the same company that operated the elevated lines. A change in classification, therefore, became necessary. A group of "Electric elevated and subway railways," including only those whose elevated or subway trackage exceeds their surface trackage, assembles in one class all roads (except the mixed elevated, surface, and subway systems, in Boston, Mass., and Philadelphia, Pa.) whose chief service was in districts of high traffic density and on "ways" from which the general public were excluded, and gives a group which can fairly be contrasted with the electric surface railways, or all roads where surface tracks predominate. A classification of the statistics for 1907 only is therefore presented on these lines.

The group of "Electric elevated and subway railways" includes for 1907, 2 companies that reported 67.34 miles of elevated track, 3 companies that reported 128.45 miles of elevated and 34.08 miles of surface track, and 1 company that reported 118.05

miles of elevated and 72.48 miles of subway track. Thus there was for this class an aggregate of 6 operating companies, with 386.32 miles of elevated and subway track and 34.08 miles of surface track, or a total trackage of 420.40 miles included in the group.

The group of "Electric surface railways," on the other hand, includes 939 operating companies, with 33,983.16 miles of track, the same including the small amounts of trackage operated by power other than electric and small portions of elevated and subway and tunnel trackage operated in connection with surface tracks.

Classification according to character of service.—At the census of 1902 urban roads were subclassified into four groups, according to the population of the districts served. This classification developed a number of instructive facts, and it was desired to retain it in the census of 1907. It happens, however, the consolidation of companies, which was referred to in the census of 1902, has continued increasingly to characterize the development of electric railways and has brought under the same ownership such a large number of properties that were formerly operated as independent units that it has become practically impossible to segregate the statistics so as to present the data for specified urban districts.

There is no sharp line of demarcation between urban and interurban roads which will permit of the classification of all roads as urban or interurban. Many roads primarily urban do a large interurban business also, and vice versa, and in some cases where, although the interurban trackage exceeds the urban trackage, the volume of traffic in the urban territory exceeds that between the connecting cities and towns. It has therefore been decided to abandon the presentation of the statistics for all roads according to the population of the districts served, and to make no attempt to classify all of the roads as urban, interurban, or mixed urban and interurban. Instead of these classifications, statistics, for 1907 only, for 50 "Selected interurban lines" and for 100 "Selected small urban roads" are presented. The 100 roads which make up the latter group each had an annual income of less than \$25,000. Their operations, however, were not, in all cases, confined to the municipal limits of the cities or towns in which they operated. These two groups represent the two most widely separated classes of roads in so far as the class of service is concerned. The large number of roads between these two extremes can be assigned to no distinctive class as regards character of service, and consequently such roads have been grouped under the indefinite heading "All other railways."

CHAPTER II.

COMPARISON WITH CENSUSES OF 1902 AND 1890.

The two prior censuses of street railways covered the twelve months ending with June 30, for the years 1890 and 1902, respectively. Since 1890 the scope of the inquiry has been broadened to meet the changes incident to the more general use of electricity as a motive power, and the interests represented by the totals for 1907 differ in many important respects from those covered by the figures for the earlier censuses. In 1890 practically all railways, except those operated by steam, were correctly designated "street railways," as they were confined mainly to urban districts and operated on public streets. Many roads now included in the class of "street and electric railways" extend into rural districts and engage in business similar to that of regular steam railroads. It is impracticable to segregate the data for 1907 so as to obtain statistics for the trackage located in urban districts, although such statistics would be more directly comparable with the totals for 1890; therefore the totals for all roads included in each census are given in the comparative tables.

Increase since 1890.—Comparisons between the statistics for the street railways in continental United States at the three censuses must be made with great caution. In 1890 only 706 out of the 789 street railways in the country made reports to the Census Office. The figures of trackage, cost of construction, number of cars, number of employees, and number of passengers from the remaining 83 companies were either obtained from outside sources or estimated. The figures

secured from sources other than certified returns constituted from 4.2 to 10.4 per cent of the totals for the respective items mentioned. The returns of earnings and expenditures and of car mileage were incomplete, even in the case of many of the companies which reported fully other statistics; but these returns were not supplemented by estimates, so that the figures given as totals represent from 10 to 20 per cent less than the actual totals for all companies.

The returns for 1902 were much more nearly complete than those for 1890, as in the later year all but 2 companies covered by the statistics furnished certified returns, and in most cases all inquiries in the schedule were answered. Of the operating and lessor companies included in the census of 1902, only 20 failed to report the cost of construction, and of the operating companies, only 20 failed to furnish statistics of employees, 6 of fare passengers, and 18 of earnings and expenses. Moreover, 2 of the 6 companies that did not report the number of fare passengers were exclusively freight companies.

The statistics for 1907 represent operating companies whether they were in operation during the whole year or only a portion of the year. Six operating companies, however, failed to report financial data. (See Table 86.) While the totals for the three censuses have been made, as nearly as possible, directly comparable, there are some defects in the comparison which will be more fully explained in subsequent chapters.

TABLE I.—COMPARATIVE SUMMARY: 1890 TO 1907.

	CENSUS.			PER CENT OF INCREASE.		
	1907	1902	1890	1902 to 1907	1890 to 1902	1890 to 1907
Number of companies.....						
Operating.....	1,236	987	789	25.2	25.1	56.7
Lessor.....	945	817	700	16.7	6.2	22.9
Miles of line.....	201	170	20	71.2	750.0	1,355.0
Miles of track ¹	25,547.19	² 16,045.34	5,783.47	53.5	187.8	341.7
Operated by electricity.....	34,403.55	22,576.09	8,123.02	52.4	177.9	323.5
Operated by animal.....	34,050.69	² 21,907.59	1,201.07	55.5	1,036.0	2,598.9
Operated by cable.....	130.11	250.10	5,601.44	447.5	495.4	407.6
Operated by steam.....	61.71	240.60	488.31	474.4	450.7	487.4
Cost of construction and equipment.....	\$146.05	160.61	711.30	13.9	476.2	479.5
Number of employees.....	\$3,637,608,708	\$2,107,634,077	\$380,337,280	67.8	456.7	834.3
Number of passenger cars.....	221,429	140,769	70,764	57.3	98.9	212.9
Number of fare passengers.....	70,010	60,200	32,505	16.1	85.5	115.4
Number of fare passengers per mile of track.....	7,441,114,508	4,774,211,904	2,023,010,202	55.9	136.0	207.8
Per cent ratio of operating expenses to operating earnings.....	³ 216.522	² 212.217	249,047	2.0	14.8	413.1
	60.1	37.5	68.4			

¹ By "Miles of line," as used throughout this report, is meant length of first main track or roadbed. By "Miles of track" is meant total length of all trackage, including sidings. Thus, in the case of a double road, "Miles of track" would be double "Miles of line."

² Exclusive of 6.24 miles of duplicated line.

³ Includes 6.00 miles operated by compressed air.

⁴ Decrease.

⁵ Includes 40.99 miles operated by gasoline motors.

⁶ Exclusive of trackage of one railway carrying freight only and track not operated.

⁷ Exclusive of trackage of two railways carrying freight only and four companies not reporting fare passengers.

STREET AND ELECTRIC RAILWAYS.

TABLE 2.—COMPARATIVE SUMMARY, BY

DIVISION.	Census.	Miles of track.	MILES OF LINE.				
			Total.	Electric.	Animal.	Cable.	Steam.
United States.....	1907	84,403.56	25,547.19	25,280.93	90.15	32.14	124.97
	1902	² 22,576.99	² 10,045.34	² 10,224.38	195.21	113.93	111.82
	1890	8,123.02	6,783.47	914.25	4,001.94	283.22	524.06
Increase.....	1902 to 1907	11,826.57	8,901.85	9,065.55	⁴ 105.06	⁴ 81.79	23.15
	1890 to 1902	14,453.97	10,861.87	15,310.13	⁴ 3,896.73	⁴ 109.29	⁴ 412.24
Per cent of increase.....	1902 to 1907	52.4	53.5	55.9	⁴ 53.8	⁴ 71.7	20.7
	1890 to 1902	177.9	187.8	1,074.6	⁴ 95.2	⁴ 59.8	⁴ 78.7
North Atlantic.....	1907	18,713.37	10,154.41	10,087.08	52.32	2.84	12.17
	1902	10,104.89	7,097.19	7,573.08	66.02	5.50	51.99
	1890	2,961.85	2,063.04	273.22	1,658.51	47.27	84.94
Increase.....	1902 to 1907	3,548.48	2,457.22	2,513.10	⁴ 13.70	⁴ 2.66	⁴ 39.52
	1890 to 1902	7,213.04	5,633.25	7,300.76	⁴ 1,592.49	⁴ 41.77	⁴ 33.25
Per cent of increase.....	1902 to 1907	34.9	31.9	33.2	⁴ 20.8	⁴ 48.4	⁴ 70.5
	1890 to 1902	244.4	272.9	2,072.1	⁴ 96.0	⁴ 88.4	⁴ 89.1
South Atlantic.....	1907	2,300.73	1,717.22	1,709.09	5.38	.....	2.75
	1902	1,070.15	1,195.29	1,182.04	13.25	.....	.....
	1890	611.90	466.93	83.53	307.49	3.70	71.16
Increase.....	1902 to 1907	630.58	521.93	527.05	⁴ 7.87	.....	⁴ 7.75
	1890 to 1902	1,058.19	720.30	1,008.40	⁴ 294.24	⁴ 3.70	⁴ 71.16
Per cent of increase.....	1902 to 1907	87.8	43.7	44.6	⁴ 59.4	.....	.....
	1890 to 1902	172.9	150.5	1,314.3	⁴ 95.7	⁴ 100.0	⁴ 100.0
North Central.....	1907	12,850.53	9,832.71	9,705.15	20.05	2.51	105.00
	1902	7,815.32	5,030.33	5,523.07	50.91	56.40	.....
	1890	2,753.57	1,897.93	384.50	1,229.90	129.69	123.78
Increase.....	1902 to 1907	5,035.21	4,202.33	4,182.08	⁴ 30.86	⁴ 53.89	105.00
	1890 to 1902	5,061.75	3,792.45	5,134.51	⁴ 1,173.99	⁴ 73.20	⁴ 123.78
Per cent of increase.....	1902 to 1907	64.4	74.6	75.7	⁴ 90.6	⁴ 95.5	.....
	1890 to 1902	183.8	201.4	1,330.2	⁴ 95.9	⁴ 56.5	⁴ 100.0
South Central.....	1907	1,905.91	1,411.17	1,393.85	7.44	.88	0.00
	1902	1,322.45	1,007.10	959.45	17.75	.90	29.00
	1890	998.07	773.05	81.63	559.83	.....	131.59
Increase.....	1902 to 1907	583.46	404.07	434.40	⁴ 10.31	⁴ .02	⁴ 20.00
	1890 to 1902	353.78	234.05	877.82	⁴ 542.08	⁴ .90	⁴ 102.59
Per cent of increase.....	1902 to 1907	44.1	40.1	46.3	⁴ 58.1	⁴ 2.2	⁴ 69.0
	1890 to 1902	36.5	30.3	1,075.4	⁴ 96.3	.....	⁴ 78.0
Western.....	1907	3,633.02	2,431.68	2,304.70	4.96	25.01	0.05
	1902	1,004.18	1,115.38	985.84	47.28	51.13	81.13
	1890	836.97	612.02	91.20	306.21	102.56	112.59
Increase.....	1902 to 1907	2,028.84	1,316.30	1,408.92	⁴ 42.32	⁴ 25.22	⁴ 25.05
	1890 to 1902	707.21	502.70	804.58	⁴ 258.93	⁴ 51.43	⁴ 81.43
Per cent of increase.....	1902 to 1907	136.5	118.0	142.9	⁴ 89.5	⁴ 49.3	⁴ 80.6
	1890 to 1902	91.7	82.1	980.2	⁴ 84.0	⁴ 50.1	⁴ 72.4

¹ Includes 38.61 miles operated by gasoline motors.

² Exclusive of 12.48 miles of duplicated track.

³ Exclusive of 0.24 miles of duplicated line, but includes 5.50 miles operated by compressed air.

⁴ Decrease.

⁵ Includes 90,303,157 free passengers.

COMPARISON WITH CENSUSES OF 1902 AND 1890.

GEOGRAPHIC DIVISIONS: 1890 TO 1907.

DIVISION.	Census.	Number of passenger cars.	NUMBER OF PASSENGERS.			Cost of construction and equipment.	Number of employees.
			Total.	Fare.	Transfer.		
United States.....	1907	70,016	9,533,080,766	7,441,114,508	⁶ 2,001,966,258	⁶ \$3,637,668,708	⁶ 221,420
	1902	60,290	5,830,615,296	⁷ 4,774,211,904	1,062,403,392	⁷ \$2,167,634,077	⁷ 140,700
	1890	32,505	2,023,010,202	2,023,010,202	(⁸)	\$380,357,280	70,704
	Increase.....	1902 to 1907	8,726	3,696,465,470	2,666,902,604	1,020,502,800	\$1,470,034,081	80,600
Per cent of increase.....	1890 to 1902	27.785	3,813,605,094	2,751,201,702	(⁸)	\$1,778,270,788	70,005
	1902 to 1907	16.1	63.3	55.9	96.9	67.8	57.3
	1890 to 1902	85.5	188.5	136.0	(⁸)	450.7	98.9
North Atlantic.....	1907	35,370	4,048,001,271	3,714,134,688	933,966,583	\$1,552,220,534	107,603
	1902	31,319	3,137,000,001	2,618,528,070	518,567,922	\$1,088,032,237	75,028
	1890	14,651	1,141,187,460	1,141,187,460	(⁸)	\$109,404,200	37,412
	Increase.....	1902 to 1907	4,000	1,510,904,370	1,095,605,700	415,388,661	\$463,288,207	31,676
Per cent of increase.....	1890 to 1902	10.608	1,905,000,441	1,477,341,519	(⁸)	\$880,528,037	38,519
	1902 to 1907	13.0	48.2	41.8	80.1	42.5	41.7
	1890 to 1902	113.8	174.9	120.5	(⁸)	440.1	103.0
South Atlantic.....	1907	5,414	622,578,893	487,081,528	134,507,365	\$242,357,960	15,044
	1902	4,290	375,002,406	297,108,541	78,703,955	\$162,507,589	9,830
	1890	1,702	101,647,174	101,647,174	(⁸)	\$16,125,071	4,139
	Increase.....	1902 to 1907	1,124	240,670,307	190,782,987	55,803,410	\$79,850,380	5,205
Per cent of increase.....	1890 to 1902	2,688	274,255,322	195,551,367	(⁸)	\$146,381,018	5,700
	1902 to 1907	26.2	65.6	64.2	71.0	40.1	62.9
	1890 to 1902	152.1	209.8	192.4	(⁸)	907.8	187.7
North Central.....	1907	20,950	2,970,482,001	2,223,525,349	746,956,742	\$1,251,383,720	65,920
	1902	18,643	1,707,542,180	1,344,000,951	363,541,220	\$705,553,933	39,405
	1890	11,335	538,300,887	538,300,887	(⁸)	\$110,741,000	20,314
	Increase.....	1902 to 1907	2,316	1,262,630,911	879,524,398	383,415,513	\$545,829,796	26,515
Per cent of increase.....	1890 to 1902	7.308	1,109,232,293	805,691,064	(⁸)	\$594,812,324	19,091
	1902 to 1907	12.4	74.0	65.4	105.5	77.4	67.3
	1890 to 1902	64.5	217.2	140.7	(⁸)	537.1	94.0
South Central.....	1907	3,801	504,100,244	414,225,626	80,874,618	\$203,085,871	13,053
	1902	3,007	234,315,915	210,103,861	24,212,054	\$87,204,802	6,781
	1890	2,342	98,005,026	98,005,026	(⁸)	\$24,602,138	3,830
	Increase.....	1902 to 1907	794	269,784,320	204,121,765	65,662,564	\$115,791,069	6,322
Per cent of increase.....	1890 to 1902	605	136,310,889	112,098,835	(⁸)	\$62,692,724	2,901
	1902 to 1907	26.4	115.1	97.2	271.2	132.0	93.9
	1890 to 1902	28.4	130.1	114.4	(⁸)	254.8	75.7
Western.....	1907	4,463	787,828,267	601,247,317	186,580,950	\$388,620,005	19,809
	1902	3,031	381,757,804	304,379,572	77,378,232	\$123,345,460	8,860
	1890	2,475	143,890,655	143,890,655	(⁸)	\$38,483,071	5,000
	Increase.....	1902 to 1907	1,432	406,070,463	296,867,745	109,202,718	\$205,275,140	10,943
Per cent of increase.....	1890 to 1902	556	237,897,149	160,518,917	(⁸)	\$84,801,785	3,707
	1902 to 1907	47.2	166.4	97.5	141.1	215.1	123.4
	1890 to 1902	22.5	165.4	111.6	(⁸)	220.5	74.9

⁶ Of the 1,236 companies, 1,230 reported the cost of construction and equipment; while of the 945 operating companies, 939 reported the number of employees.
⁷ Of the 987 companies, 967 reported the cost of construction and equipment; while of the 817 operating companies, 797 reported the number of employees and 811 the number of fare passengers carried.
⁸ Not reported separately; generally, the number of passengers reported for 1890 represented fare passengers only, though in some cases the total of fare and transfer passengers was reported.

The total trackage shown in the tables throughout this report represents the mileage owned or leased by companies in continental United States. In a few instances the track extends across the border line into Canada and Mexico, so that the totals for 1907 and 1902 include 27.52 and 4.20 miles, respectively, lying outside the United States. Table 7 shows the net trackage in each state and the United States.

The increase for the street and electric railways between 1890 and 1907 is remarkable; while the increase may be slightly exaggerated as a result of the failure of some of the companies to make complete reports at the census of 1890, these omissions are partly offset by the small percentage of defective reports received at the censuses of 1902 and 1907.

As indicated by Table 2, the increase has been more pronounced in some sections of the country than in others.

TABLE 3.—Comparative summary: 1907 and 1902.

	1907	1902	Per cent of increase.
Number of operating and lesser companies.....	1,288	987	25.2
Miles of line.....	26,647.19	110,045.34	53.5
Miles of track.....	34,408.66	22,676.99	52.4
Number of cars.....	83,641	60,784	25.2
Passenger.....	70,016	60,200	16.1
All other.....	13,625	6,494	109.8
Number of power houses.....	829	805	3.0
Steam and gas engines and steam turbines:			
Number.....	2,552	2,351	8.5
Horsepower.....	2,384,518	1,800,068	88.4
Water wheels:			
Number.....	228	159	43.4
Horsepower.....	91,901	49,153	87.1
Kilowatt capacity of dynamos.....	1,728,416	895,392	91.8
Output of stations, kilowatt hours, total for year.....	4,759,180,100	2,261,484,397	110.4
Number of passengers, total.....	9,633,080,796	5,880,615,296	63.3
Fare.....	7,441,114,508	4,774,211,904	55.9
Transfer.....	1,995,658,101	1,062,403,392	87.8
Free.....	96,308,157	(¹)	.....
Car mileage (passenger, express, freight, mail, etc.).....	1,617,731,300	1,144,480,400	41.4
Condensed income account, operating companies:			
Gross income.....	\$429,744,254	\$250,504,627	71.0
Operating earnings.....	\$418,187,858	\$247,553,939	68.9
Income from other sources.....	\$11,556,396	\$2,950,628	291.7
Operating expenses.....	\$251,809,252	\$142,312,597	70.0
Net earnings (earnings less operating expenses).....	\$166,878,606	\$105,241,402	58.0
Gross income less operating expenses.....	\$178,435,002	\$108,192,030	64.0
Deductions from income (taxes and fixed charges).....	\$138,094,716	\$77,595,058	78.0
Net income.....	\$40,340,286	\$30,596,977	31.8
Dividends (operating companies only).....	\$20,454,732	\$15,882,110	66.0
Surplus.....	\$19,885,554	\$14,714,867	45.0
Capitalization, operating and lesser companies:			
Capital stock authorized, par value.....	\$2,508,054,336	\$1,529,199,539	64.0
Capital stock outstanding, par value.....	\$2,097,708,856	\$1,315,572,000	59.5
Dividends on stock, amount.....	\$54,485,274	\$33,039,171	64.9
Funded debt authorized, amount.....	\$2,322,720,837	\$1,341,429,727	73.2
Funded debt outstanding, amount.....	\$1,677,003,240	\$992,709,139	68.9
Interest on funded debt.....	\$71,408,788	\$43,578,961	64.0
Total capitalization outstanding.....	\$3,774,772,096	\$2,308,282,099	63.5
Employees and wages, operating companies:			
Salaried employees—			
Number.....	11,700	7,128	64.1
Salaries.....	\$12,909,400	\$7,439,718	73.5
Wage-earners.....			
Average number.....	209,729	133,641	59.9
Wages.....	\$138,681,633	\$80,770,449	71.0

¹ Exclusive of 0.24 miles of duplicated line.

² Exclusive of current purchased from stations not operated by electric railways.

³ Not reported separately.

⁴ Decrease.

Tables 1 and 2 cover virtually all of the statistics in the report of 1890 with which direct comparison can be made for 1902 and 1907. In the taking of the last two censuses, however, the same schedule and methods were used, and therefore it is possible to make more detailed comparisons of the statistics presented for the years covered by those censuses, which is shown in Table 3.

With a few exceptions the percentages of increase are remarkably uniform, and indicate a large growth between the two censuses. The unusual increase in the number of cars other than those for passengers is accounted for by the rapid development of freight business on interurban lines, while the very large gain in the output of stations is due largely to the increasing practice among railway companies of operating electric light and power departments. The item of income from other sources than earnings from operation comprises interest and dividends on securities of other electric railways, income from other permanent investments, and income from miscellaneous sources, such as interest on deposits and rentals from real estate. The high percentage of increase in income from such sources reflects the extent to which electric railways have become interested in these miscellaneous interests.

Number of companies.—Of the 945 operating and the 291 lesser companies in 1907, 277 operating and 81 lesser companies were not reported at the census of 1902. While the majority of these companies were new projects, some were not new properties, but were steam railroads which, already in existence in 1902, were electrified during the five years between the censuses. It is impossible in all cases to trace clearly the history of the companies reported in 1907, and it is possible that a few of the new companies may have been formed by the consolidation of existing railways. Again, other companies organized with entirely new equipment during the quinquennial period were consolidated with or absorbed by companies that were in existence in 1902. In a number of cases companies were reorganized and given new names, while in other cases combinations were made by lease, purchase of stock, or other arrangement. Similar changes were in progress during the period between 1890 and 1902. The changes resulted in a net increase of 128 in the number of operating companies between 1902 and 1907 and a net increase of 176 between 1890 and 1907. With the exception of new companies, the change in the number is due almost entirely to combinations and separations. There are comparatively few cases where the equipment of a road has been abandoned or sold to be moved elsewhere.

The increase in the number of lesser companies is significant, as it indicates the development of large

controlling companies that bring under a central management properties formerly operated as independent units. At the census of 1907 the roads owned by the 291 lessor companies were operated by 102 lessees, there being on the average 2.9 lessors to each lessee. At the census of 1902 there were 170 lessors operated by 56 lessees, or an average of 3 lessor properties to each lessee. But the majority of the lessees also operated properties other than those controlled by lease.

Railways under construction.—In addition to the operating and lessor companies, 101 companies were reported at the census of 1907 as having properties under construction and not in operation during any portion of the census year.

A large number of projected roads had companies in different stages of formation, but these roads were not included in the census. While it is possible that the number of companies reported as having roads under construction does not include all of the companies of this class, the figures are of interest since they indicate approximately the amount of new development work which was in progress during the census year.

The 101 companies with roads under construction reported 675.85 miles of track as completed by December 31, 1907, and an estimated total of 3,101.30 miles of track for the roads when completed. Their capitalization consisted of common stock, \$225,106,500 authorized and \$116,567,928 outstanding; preferred stock, \$23,100,000 authorized and \$7,265,916 outstanding; funded debt, \$255,053,000 authorized and \$108,465,000 outstanding. Thus the total outstanding capitalization had a par value of \$232,298,844. A large percentage of this outstanding capitalization is represented by the securities of the Hudson and Manhattan Railroad Company of New York. The properties of this company comprise the Hudson River tunnel system, which was opened for operation early in 1908.

Reports for companies with roads under construction were not secured at the census of 1902, and consequently the figures relating to such companies for 1907 have been excluded from all tables in this report.

Several companies, principally in Ohio, which were reported as under construction in 1907 and included in the 101 companies, had completed so small a portion of the total proposed mileage that they were not outlined on the map¹ showing operating roads and roads under construction.

Increase in size of companies.—There is no uniformity in the size or importance of the properties represented by the separate companies, and frequently, because of certain legal restrictions, several properties that practically formed one system have been reported as distinct units and counted as separate companies, while, on the other hand, where legal conditions did not prohibit, several properties have been reported

in combination and counted as one. The combination of formerly independent companies has characterized the development of electric railways during recent years, and the change in the number of companies reported at the different censuses is no indication of the increase or decrease in the industry.

Table 4 shows the average size and traffic of the operating companies at the censuses of 1907, 1902, and 1890, and gives the percentage of increase for the census periods.

TABLE 4.—Comparative size of operating companies: 1890 to 1907.

	AVERAGE PER OPERATING COMPANY. ¹			PER CENT OF INCREASE.		
	1907	1902	1890	1902 to 1907	1890 to 1902	1890 to 1907
Miles of track.....	36.41	27.63	10.56	31.8	161.6	244.8
Number of passenger cars.....	74	74	42	.....	76.2	76.2
Number of fare passengers.....	7,882,537	5,886,821	2,630,702	33.9	123.8	190.6
Number of employees.....	236	177	92	33.3	92.4	156.5

¹ In 1907, 946 companies reported track; 944, fare passengers; and 939, number of employees. In 1902, 817 companies reported track; 811, fare passengers; and 797, number of employees. In 1890 the number of operating companies reporting was 769, and this number has been used in the computations for that census.

It is probable that combination is the most important factor tending to increase the size of the units counted as separate companies by the census, although many railways extended their tracks and made material increases in the magnitude of their operations during the periods between the censuses. The figures indicate that, measured by trackage, the average operating company reported at the census of 1907 was about three and one-half times as large as the average company at the census of 1890. It will be noted that the average number of passenger cars per operating company was the same at the censuses of 1907 and 1902, this being a result of the general use of larger cars at the later census. The average number of fare passengers per car per year was 106,277 at the census of 1907, compared with 79,187 for 1902 and 62,237 for 1890. This shows an increase in the average number of fare passengers per car of 34.2 per cent for the census interval 1902 to 1907, 27.2 per cent for the period 1890 to 1902, and 70.8 per cent for the entire period 1890 to 1907.

The increase in the average size of companies, reduced to a yearly basis, was materially greater for the census interval 1902 to 1907 than it was for the period 1890 to 1902, though on a percentage basis the rate of increase was larger for the earlier period. For the five-year period 1902 to 1907 the average yearly increase of track per company was about 1½ miles compared with an average yearly increase for the twelve-year period 1890 to 1902 of approximately 1¼ miles; and the average increase in number of fare passengers per year per company for the five-year period 1902 to 1907 was 399,143, compared with an average yearly increase of 271,343 for the twelve-year period 1890 to 1902.

¹ See Map 3, facing page 264.

The increase in the size of companies is further illustrated by Table 5, which classifies the operating companies according to miles of line. The miles of line is the length of the first main track or roadbed and does not include second tracks and sidings.

TABLE 5.—Distribution of operating companies according to miles of line: 1890 to 1907.

MILES OF LINE.	1907		1902		1890	
	Number of companies.	Miles of line.	Number of companies.	Miles of line.	Number of companies.	Miles of line.
Total.....	945	25,547.19	817	16,645.34	691	5,119.53
Under 10.....	399	2,012.37	394	1,957.16	557	2,304.49
10 but under 20.....	229	3,202.58	219	3,147.23	99	1,353.42
20 but under 30.....	101	2,483.96	76	1,878.54	16	400.30
30 but under 40.....	61	2,088.58	34	1,197.88	7	251.74
40 but under 50.....	33	1,472.21	25	1,117.05	4	178.04
50 but under 60.....	27	1,407.71	16	888.33	2	101.57
60 but under 70.....	16	1,032.05	12	785.22	2	130.33
70 but under 80.....	17	1,270.94	7	532.46	1	70.48
80 but under 90.....	7	580.18	6	515.30	1	84.42
90 but under 100.....	8	768.85	3	277.12	.....	.....
100 and over.....	47	9,062.16	25	4,349.10	2	288.65

- † Exclusive of 6.24 miles of duplicated line.
 ‡ Exclusive of 78 companies that did not make precise returns of trackage.
 § Exclusive of 603.94 miles, estimated.

In 1890 four-fifths of the companies making trackage returns had less than 10 miles of line each; in 1902 slightly less than one-half of the operating companies were in this group; and in 1907 companies of this size formed only a little more than two-fifths of the total number of operating companies. The companies whose lines were under 50 miles represented 98.8 per cent of the total number of companies in 1890, 91.6 per cent in 1902, and 87.1 per cent in 1907, while the proportion that the miles of line of these companies formed of the total miles of line shows a still greater rate of decrease, the percentages for the corresponding periods being 87.7, 55.9, and 44.4. The average length of line per company in 1890 was 7.4 miles; in 1902, 20.4 miles; and in 1907, 27 miles, or almost four times the average for the earliest census. At the last census 47 companies had 100 or more miles of line each, compared with 25 in 1902 and only 2 in 1890. The average length of line of these companies increased from 119.3 miles in 1890 to 174 miles in 1902 and to 192.8 miles in 1907.

Increase in trackage and change in motive power.—

Between 1890 and 1907 the miles of track of street and electric railways increased 26,280.54 miles. The increase was, of course, greater during some years than others, but for the period of twelve years from 1890 to 1902 there was a total increase of 14,453.97 miles, giving an average of 1,204.5 miles for each year. For the five years ending with 1907 there was a total increase of 11,826.57 miles, or an annual average of

2,365.31 miles. The annual increase derived from a comparison of trackage by years indicates that the greatest development occurred during the year 1906.¹

Table 2 shows that from 1890 to 1907 the miles of line increased 19,763.72 miles, and that during each of the periods between the three censuses the percentage of increase for miles of line was greater than the percentage of increase for miles of track. This is due to the fact that a large proportion of the recent extensions consists of single-track roads operating in small towns and rural districts. During the period from 1890 to 1902 the largest percentage of increase in trackage was for the North Atlantic states, but during the five years ending with 1907 the largest percentage of increase was for the Western states. In the last-named section the interurban roads have developed very rapidly since the latter part of the decade ending with 1900.

The increase in trackage and line has been almost entirely on lines employing electricity as the motive power, as there has been a decided decrease in the track operated by the other kinds of power. In 1890 only 126 out of 706 companies reported the use of electricity on any portion of the road, 99 employing this form of power exclusively and 27 using it in conjunction with animal or cable power. By 1907 electric power had become almost universal, all but 41 companies reporting it as in use on all or a portion of the track.

Table 6 shows conclusively that by 1907 electricity had about superseded all other kinds of motive power. The percentage of total trackage operated by electric current increased from 15.5 in 1890 to 99 in 1907. Animal power was the most important form of power in 1890, being in use on 69.7 per cent of the total trackage; by 1907, however, the proportion of track-

¹ The following statement, compiled by the Electric Railway Journal, shows the total miles of track for each year from 1890 to 1907. The totals for 1890, 1902, and 1907 are not comparable with the figures obtained by the censuses for those years because there were fewer restrictions in regard to the class of companies included in the statistics presented in the Journal than in those for the census. The table, however, shows the years in which the greatest development occurred.

Miles of track, by years: 1890 to 1907.

YEAR.	Miles of track.	YEAR.	Miles of track.
1907.....	38,812	1898.....	17,549
1906.....	36,932	1897.....	15,718
1905.....	32,517	1896.....	16,094
1904.....	29,548	1895.....	14,470
1903.....	27,920	1894.....	13,588
1902.....	26,292	1893.....	12,187
1901.....	23,184	1892.....	11,634
1900.....	20,442	1891.....	10,599
1899.....	18,942	1890.....	8,123

age operated by animal power had decreased to four-tenths of 1 per cent. Cable and steam power were never used very extensively in the operation of street railways, but they assumed their greatest importance about 1890, when the cable system was used in the operation of 6 per cent and steam in the operation of 8.8 per cent of the trackage. At the census of 1907 these kinds of power, with the exception of cable power on inclined planes, had been practically abandoned and the use of compressed air, which was reported for 6.06 miles of track in 1902, had also been discontinued. In 1907, however, gasoline motor cars were operated on 40.99 miles of track and gas-electric motors were employed on 22.50 miles of track, electric power being generated by a gasoline motor and dynamo carried by the car.

TABLE 6.—Miles of track, by character of power: 1890 to 1907.

CHARACTER OF POWER.	CENSUS.			PER CENT OF TOTAL.		
	1907	1902	1890	1907	1902	1890
Total.....	34,403.56	22,576.99	8,123.02	100.0	100.0	100.0
Electric.....	34,059.69	21,907.59	1,261.97	99.0	97.0	15.5
Animal.....	136.11	259.10	5,661.44	0.4	1.1	69.7
Cable.....	61.71	240.69	488.31	0.2	1.1	6.0
Steam.....	*146.05	169.61	711.30	0.4	0.8	8.8

¹ Includes 6.06 miles operated by compressed air.
² Includes 40.99 miles operated by gasoline motors.

The changes from 1902 to 1907 in the mileage of track operated by electric, animal, cable, and steam power and in the number of companies reporting the same are shown, by states and geographic divisions, in Table 7.

TABLE 7.—MILES OF TRACK, BY CHARACTER OF POWER, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902.

STATE OR TERRITORY.	Census.	TOTAL.		ELECTRIC.		ANIMAL.			CABLE.			STEAM.				
		Net trackage in state (miles).	Trackage of companies in state.	Number of operating companies reporting—		Number of operating companies reporting—		Miles of track.	Number of operating companies reporting—		Miles of track.	Number of operating companies reporting—		Miles of track.		
				Number of operating companies.	Miles.	Electric trackage.	Electric trackage exclusively.		Animal trackage.	Animal trackage exclusively.		Cable trackage.	Cable trackage exclusively.		Steam trackage.	Steam trackage exclusively.
United States.....	1907	34,376.04	945	34,403.56	904	882	34,059.69	28	23	136.11	20	10	61.71	17	8	146.05
	1902	22,572.70	817	22,576.99	4748	4722	21,907.59	67	53	259.10	26	12	240.69	12	3	169.61
North Atlantic division...	1907	13,763.34	370	13,713.37	361	352	13,604.76	8	6	96.30	6	4	5.94	5	.....	16.37
	1902	10,186.13	361	10,164.89	4343	4333	9,933.37	15	10	120.20	11	8	11.26	3	.....	100.06
Maine.....	1907	418.12	17	424.06	16	16	421.06	1	1	3.00	.....	.....	.....	.....	.....	.....
	1902	328.50	19	331.55	18	18	328.55	1	1	3.00	.....	.....	.....	.....	.....	.....
New Hampshire.....	1907	268.38	16	247.10	16	16	247.10	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1902	174.45	7	167.65	7	7	167.65	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vermont.....	1907	113.38	10	124.31	10	10	124.31	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1902	86.05	9	80.55	9	9	80.55	.....	.....	.....	.....	.....	.....	.....	.....	.....
Massachusetts.....	1907	2,800.46	63	2,886.85	63	62	2,886.42	.....	.....	.....	.....	.....	.....	1	.....	.43
	1902	2,507.58	75	2,525.65	75	75	2,525.65	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rhode Island.....	1907	430.76	6	419.92	6	6	419.92	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1902	342.92	8	328.90	8	8	328.90	.....	.....	.....	.....	.....	.....	.....	.....	.....
Connecticut.....	1907	781.18	9	781.15	9	9	781.15	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1902	578.49	23	578.49	23	23	578.49	.....	.....	.....	.....	.....	.....	.....	.....	.....
New York.....	1907	3,809.19	101	3,884.74	97	92	3,788.24	7	4	93.30	1	.....	1.15	1	.....	2.05
	1902	2,797.00	96	2,809.91	487	481	2,506.22	12	8	115.17	2	1	3.96	2	.....	94.66
New Jersey.....	1907	1,319.80	26	1,324.12	26	26	1,324.12	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1902	865.66	26	861.28	24	24	858.66	1	1	1.22	1	1	1.40	.....	.....	.....
Pennsylvania.....	1907	3,762.07	122	3,621.12	118	115	3,602.44	.....	.....	.....	5	4	4.79	3	.....	13.89
	1902	2,504.58	98	2,480.91	92	88	2,468.70	1	.....	.81	8	6	5.90	1	.....	5.60

¹ Exclusive of 27.52 miles lying outside of the United States.
² Includes 5 companies operating 40.99 miles by gasoline motors.
³ Exclusive of 4.20 miles lying outside of the United States.
⁴ Includes 1 company operating 6.06 miles by compressed air.

⁵ Exclusive of 26.28 miles lying outside of the United States.
⁶ Exclusive of 3.05 miles lying outside of the United States.
⁷ Exclusive of 3.05 miles in Canada.
⁸ Exclusive of 23.23 miles in Canada.

STREET AND ELECTRIC RAILWAYS.

TABLE 7.—MILES OF TRACK, BY CHARACTER OF POWER, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902—Continued.

STATE OR TERRITORY.	Census.	TOTAL.			ELECTRIC.			ANIMAL.			CABLE.			STEAM.		
		Net trackage in state (miles).	Trackage of companies in state.		Number of operating companies reporting—		Miles of track.	Number of operating companies reporting—		Miles of track.	Number of operating companies reporting—		Miles of track.	Number of operating companies reporting—		Miles of track.
			Number of operating companies.	Miles.	Elec- tric track- age.	Elec- tric track- age exclu- sively.		Animal track- age.	Animal track- age exclu- sively.		Cable track- age.	Cable track- age exclu- sively.		Steam track- age.	Steam track- age exclu- sively.	
South Atlantic division...	1907	2,250.96	101	2,300.73	95	95	2,292.45	4	4	5.53				12	12	12.75
	1902	1,028.90	80	1,670.15	73	73	1,056.47	7	7	18.68						
Delaware.....	1907	104.93	4	95.93	4	4	95.93									
	1902	85.61	3	85.61	3	3	85.61									
Maryland.....	1907	551.51	13	536.18	13	13	536.18									
	1902	455.44	10	437.84	10	10	437.84									
District of Columbia..	1907	160.02	6	176.03	6	6	176.03									
	1902	146.17	8	161.97	8	8	161.97									
Virginia.....	1907	512.99	23	515.54	23	23	515.54									
	1902	353.17	21	359.30	20	20	357.30	1	1	2.00						
West Virginia.....	1907	208.72	15	266.41	15	15	266.41									
	1902	93.08	8	140.00	8	8	140.00									
North Carolina.....	1907	106.04	11	106.94	9	9	104.19							12	12	12.75
	1902	46.32	7	40.82	7	7	46.32									
South Carolina.....	1907	131.18	7	131.26	6	6	120.76	1	1	1.50						
	1902	76.98	7	70.98	5	5	73.80	2	2	3.18						
Georgia.....	1907	350.41	12	354.18	10	10	351.28	2	2	2.90						
	1902	305.38	10	300.38	8	8	296.63	2	2	3.75						
Florida.....	1907	118.20	10	118.26	9	9	117.13	1	1	1.13						
	1902	61.75	6	61.75	4	4	57.00	2	2	4.75						
North Central division...	1907	12,813.99	293	12,850.53	280	274	12,717.07	8	8	21.02	4	1	4.81	7	4	107.63
	1902	7,637.55	241	7,815.32	224	218	7,433.83	21	16	56.18	4	1	125.31			
Ohio.....	1907	3,675.86	73	3,767.10	71	70	3,723.04	1	1	1.45	1	1	.61	1		42.00
	1902	2,338.50	63	2,353.43	62	61	2,351.32	1		1.50	1	1	.61			
Indiana.....	1907	1,928.78	33	1,932.93	32	31	1,928.68	1	1	1.00				1		3.25
	1902	656.03	27	646.00	25	25	648.87	2	2	2.79						
Illinois.....	1907	2,755.50	70	2,776.46	67	66	2,739.32	1	1	1.55	1		.60	2	2	34.40
	1902	1,659.35	50	1,635.20	47	44	1,528.07	6	3	15.43	2		61.70			
Michigan.....	1907	1,323.71	24	1,275.03	24	24	1,275.03									
	1902	1,048.20	24	1,022.81	24	24	1,022.81									
Wisconsin.....	1907	676.53	20	590.65	20	20	590.65									
	1902	446.14	17	416.50	17	17	416.50									
Minnesota.....	1907	437.82	5	457.15	5	4	450.02				1		1.13			
	1902	316.27	5	339.17	5	5	338.17									
Iowa.....	1907	641.39	24	630.84	24	23	619.45							1		20.39
	1902	341.35	22	378.25	20	19	374.43	3	2	3.82						
Missouri.....	1907	800.68	14	921.07	14	13	919.20				1		2.47			
	1902	713.68	16	753.38	13	12	719.48	3	3	5.00	1		33.00			
North Dakota ⁴	1907	13.06	4	16.09	4	4	16.09									
South Dakota.....	1907	5.00	1	5.00	1	1	5.00									
	1902	2.00	1	2.00				1	1	2.00						
Nebraska.....	1907	184.34	8	218.73	5	5	211.01	2	2	3.22				1	1	4.50
	1902	119.56	4	113.66	3	3	110.55	1	1	3.11						
Kansas.....	1907	305.72	17	249.88	13	13	233.08	3	3	13.80				1	1	3.00
	1902	195.81	12	150.26	8	8	128.63	4	4	21.63						

¹ Includes 1 company operating 1.25 miles by gasoline motors.
² Includes 3 companies operating 37.49 miles by gasoline motors.
³ Operated by gasoline motors.
⁴ No company reported in 1902.

COMPARISON WITH CENSUSES OF 1902 AND 1890.

TABLE 7.—MILES OF TRACK, BY CHARACTER OF POWER, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902—Continued.

STATE OR TERRITORY.	Census	TOTAL.			ELECTRIC.			ANIMAL.			CABLE.			STEAM.		
		Net trackage in state (miles).	Trackage of companies in state.		Number of operating companies reporting—		Miles of track.	Number of operating companies reporting—		Miles of track.	Number of operating companies reporting—		Miles of track.	Number of operating companies reporting—		Miles of track.
			Number of operating companies.	Miles.	Elec-tric track-age.	Elec-tric track-age exclu-sively.		Animal track-age.	Animal track-age exclu-sively.		Cable track-age.	Cable track-age exclu-sively.		Steam track-age.	Steam track-age exclu-sively.	
South Central division.....	1907	11,914.73	90	1,905.91	84	88	1,884.00	4	4	7.78	1	.88	2	2	13.25	
	1902	*1,316.03	66	1,322.45	57	55	1,270.43	8	8	18.22	1	1.80	3	1	*13.25	
Kentucky.....	1907	402.34	13	389.13	13	13	389.13									
	1902	284.35	12	283.05	12	12	283.05									
Tennessee.....	1907	292.15	9	297.50	9	8	296.02				1	.88				
	1902	248.53	8	254.20	8	7	248.40				1	1.80	1		4.00	
Alabama.....	1907	293.86	10	291.66	9	9	280.66									
	1902	204.72	9	204.72	7	6	173.09	1	1	3.03			1	1	11.00	
Mississippi.....	1907	86.40	8	86.40	8	8	86.40								28.00	
	1902	25.30	5	25.30	5	5	25.30									
Louisiana.....	1907	238.52	11	238.52	11	11	238.52									
	1902	198.52	8	198.52	6	6	192.86	2	2	5.66						
Arkansas.....	1907	82.22	8	87.39	7	7	86.41	1	1	.98						
	1902	51.33	7	52.49	6	6	49.83	1	1	2.60						
Oklahoma ⁴	1907	100.44	8	100.44	8	8	100.44									
Texas.....	1907	418.80	23	414.87	19	19	405.82	3	3	6.80			1	1	*2.25	
	1902	7303.28	17	303.27	13	13	296.40	4	4	6.87						
Western division.....	1907	3,633.02	91	3,633.02	84	78	3,571.41	4	2	5.48	9	5	50.08	1	6.05	
	1902	1,604.18	69	1,604.18	51	43	1,413.49	16	12	50.82	10	3	102.32	6	37.55	
Montana.....	1907	69.24	5	69.24	5	5	69.24									
	1902	63.21	5	63.21	5	5	63.21									
Idaho.....	1907	73.09	2	44.24	2	2	44.24									
	1902	3.50	1	3.50	1	1	3.50									
Colorado.....	1907	317.87	11	317.37	11	11	317.37									
	1902	234.53	8	234.53	7	7	233.28	1	1	1.25						
New Mexico.....	1907	10.10	2	10.10	2	2	10.10									
	1902	2.10	1	2.10				1	1	2.10						
Arizona.....	1907	30.75	4	30.75	4	4	30.75									
	1902	17.10	2	17.10	1	1	12.00	1	1	5.10						
Utah.....	1907	122.54	3	122.54	3	3	122.54									
	1902	89.04	3	89.04	3	3	89.04									
Nevada ⁴	1907	7.15	1	7.15	1	1	7.15									
Washington.....	1907	730.27	14	764.73	14	11	743.64				2	15.04	1	6.05		
	1902	228.03	8	228.03	8	6	214.33				2	14.60				
Oregon.....	1907	259.02	8	253.41	7	7	252.39	1	1	1.02						
	1902	136.67	6	136.67	5	4	132.17				1	2.00	1	1	2.60	
California.....	1907	2,013.49	41	2,013.49	35	32	1,973.99	3	1	4.46	7	5	35.04			
	1902	829.10	35	829.10	21	16	665.96	13	9	42.37	7	3	85.72	5	35.05	

¹ Exclusive of 1.24 miles lying outside of the United States.
² Includes 1 company operating 2.25 miles by gasoline motors.
³ Exclusive of 1.15 miles lying outside of the United States.
⁴ No company reported in 1902.

⁵ Exclusive of 1.24 miles in Mexico.
⁶ Operated by gasoline motors.
⁷ Exclusive of 1.15 miles in Mexico.

The greatest actual increase in the net trackage in any state was reported for Ohio, the increase amounting to 1,337.36 miles. The next largest increases were in Indiana, with 1,272.15 miles; Pennsylvania, with 1,257.49 miles; California, with 1,184.39 miles; Illinois, with 1,096.15 miles; and New York, with 1,011.29 miles. The largest relative gain occurred in Idaho, where the track increased from 3.50 miles in 1902 to 73.09 miles in 1907, or 1,988.3 per cent. The smallest actual increase, 3 miles, was reported by South Dakota, while the lowest rate of increase, 9.5 per cent, is shown for the District of Columbia and

Montana. The large gains in the mileage of track in Ohio, Indiana, California, and Illinois can be accredited mainly to development of interurban lines, while the increases in Pennsylvania and New York are due to the growth of both urban and interurban lines.

The only increases in trackage operated by animal power were reported by one company in Nebraska and one company in Oregon. The 61.71 miles of cable tracks reported for 1907 included 8.96 miles of inclined plane operated by 12 companies and 52.75 miles of street cable track operated by 8 companies. Although the amount of track operated by steam

shows a decrease, this decrease is the result of decreases reported in the case of 10 companies, amounting to 157.11 miles, or about nine-tenths of the steam trackage operated in 1902, and additions reported by 11 companies, amounting to 92.56 miles.

One of the processes in the evolution of electric-railway systems consists in the operation of a steam line as an adjunct or part of an electric system, and then in the electrification of the steam trackage. Thus in Ohio the 42 miles of steam tracks reported in 1907 for the first time were operated by a company which also operated 451 miles of track with electric power. The 20.39 miles of new steam trackage in Iowa was operated by one company in conjunction with 39.66 miles of electric trackage. In 1902 this same company operated 22 miles of trackage by both electric and steam power, while in 1907 electric power was used exclusively on this mileage. The 1 company in Washington reporting 6.05 miles of new steam tracks had 55.52 miles of electric track; the 1 company in Indiana reporting 3.25 miles of new steam tracks had 24.55 miles of electrically operated tracks. Of the 2 companies in Pennsylvania reporting new steam tracks, one had 0.33 mile of track operated by steam and 24.68 miles of track operated by electric power, and the other had 8.06 miles operated by steam and 523.50 miles operated by electricity. The 0.43 mile of new steam track in Massachusetts was operated in conjunction with a large electric-track system. The balance of the new steam trackage was in New York, Alabama, Nebraska, and North Carolina, the last named being used for summer or pleasure-resort traffic.

Number of cars.—The number of passenger cars was 85.5 per cent greater in 1902 than in 1890 and but 16.1 per cent greater in 1907 than in 1902. The use of electricity has made it possible to increase the size of the cars, and it follows that the increases in the number of fare passengers, 136 per cent from 1890 to 1902 and 55.9 per cent from 1902 to 1907, are much greater than the corresponding increases in the number of cars.¹

Traffic.—Fare and transfer passengers were reported separately at the last two censuses, and for 1907 the number of free passengers also was given as a separate total. The number of employees, police, city officials, and others carried free as "badge" passengers have probably not been reported at any census. No distinction as to the classes of passengers was made at the census of 1890,² but it is probable that there were comparatively few transfer passengers, and therefore the total number for that year is compared with the numbers of fare passengers for 1902 and 1907, the increase being from 2,023,010,202 in

1890 to 4,774,211,904 in 1902 and to 7,441,114,508 in 1907; consequently the number for 1907 was more than three and one-half times as great as the total in 1890.

The actual increase over 1890 was slightly greater than the figures indicate, because in some instances the totals for that census were based on twelve months of operation for those roads operating less than the entire year, while only the numbers actually carried during the periods of actual operation were reported for 1902 and 1907. In accepting the figures of passengers carried it should also be remembered that 5.13 per cent of the number shown for 1890 was the result of estimates based on unofficial sources, while the figures for 1902 cover 811 out of 817 operating companies, and those for 1907, 944 out of 945 such companies. Of the 6 companies not reporting passengers in 1902, 2 were exclusively freight roads and 4 were passenger roads which failed to report; the 1 company not reporting passengers in 1907 was an exclusively freight road.

Table 2 shows that the greatest absolute increase in the number of passengers carried was reported for the roads operating in the North Atlantic division, while the largest percentage of increase for the period 1890 to 1902 was for the South Atlantic division, and for the period 1902 to 1907 for the South Central division.

The uncertainty in regard to the inclusion of transfer passengers at the census of 1890 and changes in census methods detract from the value of a comparison of the figures for that census with those for 1902 and 1907. This is especially true in regard to such computations as those to determine the average number of fare passengers carried per mile of track operated. The totals indicate that this average decreased from 249,047 in 1890 to 212,217 in 1902 and increased to 216,522 in 1907. It is probable that the proportion of "saturated" trackage in 1890 was greater than in 1902 and 1907, when every small community had come to feel that it must have a car line whether it could furnish passengers or not. And yet it is quite possible that the 1890 average was somewhat too high.

It is now almost impossible to compile accurate statistics of the territory from which the electric railways of the country draw their traffic. A zone established by an arbitrary radius would be unsatisfactory, and it is impracticable to estimate the population by a personal inspection of the territory traversed by every road or to make a special enumeration for this purpose. Therefore the importance of the electric railways, as indicated by their traffic, can be established in a general way only by comparing the number of passengers carried with the total population. Statistics of this character are given in Table 8.

¹ See p. 240 for information concerning size and style of cars.

² Generally the number reported for 1890 represented fare passengers only, although in some instances, apparently, the total of fare and transfer passengers was reported.—*Report on Street and Electric Railways, 1902, p. 9.*

TABLE 8.—RELATION OF TRAFFIC TO POPULATION, BY GEOGRAPHIC DIVISIONS: 1890 TO 1907.

DIVISION.	Census.	POPULATION. ¹		Number of fare passengers.	AVERAGE NUMBER OF RIDES PER INHABITANT IN—	
		Total.	Urban (places of 8,000 and over).		Total population.	Urban population.
United States.....	1907	85,532,761	29,751,774	7,441,114,508	87	250
	1902	78,576,436	26,317,705	4,774,211,904	61	181
	1890	62,947,714	18,284,385	2,023,010,202	32	111
Increase.....	1902 to 1907	6,956,325	3,434,069	2,666,002,604	26	69
	1890 to 1902	15,628,722	8,033,320	2,751,201,702	29	70
North Atlantic.....	1907	23,779,013	14,510,828	3,714,134,688	156	256
	1902	21,778,100	12,908,940	2,618,528,070	120	202
	1890	17,406,969	9,015,383	1,141,187,460	66	127
Increase.....	1902 to 1907	2,000,817	1,541,879	1,095,605,700	36	54
	1890 to 1902	4,371,227	3,953,560	1,477,841,519	54	75
South Atlantic.....	1907	11,574,988	2,078,048	487,981,528	42	235
	1902	10,770,414	1,855,478	297,108,541	28	160
	1890	8,887,922	1,419,964	101,647,174	11	72
Increase.....	1902 to 1907	804,574	222,570	190,782,087	14	75
	1890 to 1902	1,932,492	435,514	195,551,367	17	88
North Central.....	1907	20,026,645	9,737,433	2,223,525,340	77	228
	1902	27,087,208	8,519,447	1,344,000,951	50	168
	1890	22,410,417	5,703,806	538,300,887	24	93
Increase.....	1902 to 1907	1,039,439	1,217,086	870,524,398	27	70
	1890 to 1902	4,676,789	2,725,551	805,691,064	25	65
South Central.....	1907	10,368,558	1,850,984	414,225,626	25	224
	1902	14,051,635	1,022,545	210,103,861	14	129
	1890	11,170,187	1,147,089	98,005,026	9	86
Increase.....	1902 to 1907	1,717,023	228,439	204,121,765	11	95
	1890 to 1902	3,481,398	475,450	112,008,835	5	44
Western.....	1907	4,783,567	1,574,481	601,247,817	120	382
	1902	4,280,085	1,351,280	304,370,572	71	225
	1890	3,102,260	908,053	143,800,055	46	158
Increase.....	1902 to 1907	494,472	223,105	296,867,745	55	157
	1890 to 1902	1,186,816	443,233	100,518,917	25	67

¹ Population for 1907 and 1902 is the official estimate for those years; for 1890 it is as reported at that census.

The largest increase in number of rides per inhabitant for the last census period was shown for the Western division, while in this respect the other divisions ranked as follows: North Atlantic, North Central, South Atlantic, and South Central. For the census interval 1890 to 1902 the North Atlantic division was first in rank in the increase in number of rides per inhabitant, and was followed by the North Central, Western, South Atlantic, and South Central divisions in the order named.

Car mileage.—The number of miles the cars run during the year is one of the most important facts to be considered in determining the activity of the railways. The passenger-car mileage, 383,178,085,¹ reported for 1890 did not cover the entire number of railways in operation, and therefore should not be used in a comparison of totals for the subsequent censuses. The passenger-car mileage amounted to 1,120,101,944 in 1902 and 1,583,831,199 in 1907, the increase being 463,729,255 miles, or 41.4 per cent. The car mileage for express, freight, mail, and work cars and locomotives, reported separately at the last two censuses, amounted to 24,328,522 in 1902 and 33,900,101 in 1907, the increase being 9,571,579 miles, or 39.3 per cent.

¹ In 1890 car mileage was reported for companies with 4,375.81 miles of line out of a total of 5,783.47 miles.

The average number of fare passengers per car mile as computed from the defective data for 1890 was 4.63; in 1902 it had decreased to 4.26, but for 1907 it shows an increase to 4.70. The variation in the number of fare passengers per car mile results from a number of causes. The traffic per mile is as a rule much lighter over interurban roads than over urban roads, and an increase in interurban trackage tends to decrease the number of fare passengers per passenger-car mile. On the other hand, on established interurban as well as urban roads, the increases in traffic, unless met by proportionate increases in car service, cause an increase in the number of fare passengers per passenger-car mile, and additions to car service are not made, as a rule, until the volume of traffic requires it. Other factors are the change in the average size of cars and the difference in the methods of reporting the number of passengers carried, i. e., zone as against trip passengers. During the last census period there has been a marked increase in the size of passenger cars used, which has caused an increase in the average number of passengers per car mile. Thus the number of passenger cars increased but 16.1 per cent, while the number of fare passengers increased 55.9 per cent and the passenger-car mileage, 41.4 per cent.

Cost of construction and equipment.—Inquiries on this subject have been included in the census sched-

ules, but it is admittedly impossible to obtain accurate statistics concerning the cost of construction.¹ In preparing the balance sheet the majority of the companies treated the cost of construction item as an asset to offset the liability represented by the par value of the stock and bonds, both items being book values. A few companies reported a cost of construction less than the amount of capitalization and gave the value of the franchise as an asset sufficient to counterbalance the capitalization. In most instances it was contended that the actual cost of original construction plus additions, improvements, and repairs could not be ascertained. The cost reported at each census is therefore mainly an estimate, largely controlled by the par value of the capitalization, and the results of comparisons should be considered as general indications only. The amount reported as cost of construction and equipment for 1907 is more than nine times as great as the amount reported for 1890 and over one and two-thirds times as great as the total for 1902. The totals for 1902 and 1907 are more nearly comparable with each other than either is with the total for 1890, because the same form of inquiry was used at the two later censuses, and also because during these periods there was greater uniformity among railway accountants in regard to the items that should be considered in determining the cost of construction. From 1902 to 1907 the total cost of construction and equipment increased by \$1,470,034,631, or 67.8 per cent.

The reports for the last two censuses show also the cost of new construction and equipment work charged to the plant account during the respective census years. During the census year 1902 the cost of new construction amounted to \$126,682,473 as compared with \$184,918,453 for 1907, the latter being an increase of 46 per cent over the former in the cost of the annual additions. The new construction for 1902 formed 5.8 per cent and that for 1907, 5.1 per cent of the total cost of construction and equipment. Unfavorable financial conditions in 1907 doubtless retarded new construction work during that year. These amounts do not include the cost of railway properties under construction but not in operation, but do include in many instances the cost of new work in progress by operating companies.

Capitalization.—The statistics of capital stock and funded debt were not fully reported at the census of 1890, as the capitalization and trackage were given for roads controlling only 4,542.88 line miles, or 78.5 per cent of the total mileage. Therefore the totals for that year given in the following table are not strictly comparable with the data for 1902 and 1907:

¹ The figures are no indication of the actual cash invested in plants, track, and equipment. A great many systems have changed hands since they were constructed, and it was impossible to ascertain the original cost.

TABLE 9.—Capitalization: 1890 to 1907.

	CENSUS.			PER CENT OF INCREASE.	
	1907	1902	1890 ¹	1902 to 1907	1890 to 1902
Total capitalization outstanding.....	\$3,774,772,096	\$2,308,282,099	\$449,053,609	63.5	414.0
Average per mile of line.....	\$134,901	\$130,560	98,848	3.4	32.1
Average per mile of track.....	\$100,495	\$96,287	.....	4.4	.....
Capital stock outstanding.....	2,097,708,856	1,815,872,960	272,441,843	59.5	382.9
Funded debt outstanding.....	1,677,063,240	992,709,139	176,611,826	68.9	462.1

¹ The statistics are for roads with 4,542.88 miles of line, or 78.5 per cent of the total.

² Exclusive of track for which no capitalization was reported and permanent or other investments.

The capitalization of railways necessarily includes some investments in nonrailway property. This is especially true of the totals for 1902 and 1907, which include capital invested in electric light and power plants and other interests, some of which are not allied to the operation of the roads. In the computation of the average per mile of track these investments have been deducted for 1907 and 1902, but it is impossible to determine the amount that should be deducted, if any, for 1890.

The use of electricity has made such a complete change in the equipment of railways that a comparison of the capitalization per mile of line or track, as reported for 1902 or 1907, with the average for 1890, when the majority of the roads were horse railways, necessarily shows a great increase. The period between 1902 and 1907 represents a more comparable condition, though the reorganization, concentration, and recapitalization, as well as the investments in nonrailway property, that occurred during the five-year period, should be considered in accepting the figures. The totals for both years include the capitalization of lessor as well as that of operating companies.

In 1890 the capital stock formed 60.7 per cent of the total capitalization; in 1902 the proportion had decreased to 57 per cent and by 1907 to 55.6 per cent.

The increase in the funded debt is proportionately greater than the increase in share capital. The funded debt, which in 1890 formed 39.3 per cent of the total capitalization, increased to 43 per cent in 1902, and to 44.4 per cent in 1907. Moreover, the funded debt does not comprise all of the borrowed capital chargeable to investment account. The practice of borrowing funds on promissory notes to be used for betterments and additions appears to be growing; and such indebtedness is properly a capitalization liability and would be so treated if it were possible to segregate it entirely from other current liabilities. The current liabilities amounted to \$461,248,533 at the census of 1907, \$252,145,435 at the census of 1902, and \$30,368,465 at the census of 1890. Floating debt

(loans and notes) and bills and accounts payable formed the larger part of the amount at each census. In 1907 the current liabilities constituted 12.2 per cent of the aggregate amount of capitalization, compared with 10.9 per cent in 1902 and 6.8 per cent in 1890. Although the returns of assets and liabilities for 1890 did not include all companies, it was estimated that the totals returned by the companies reporting balance sheets formed 81 per cent of the totals of all street railways, and when due allowances are made for the incomplete character of the returns for 1890 and the variations in reporting the different items of liabilities at the different censuses, it is evident that the current liabilities have increased faster than the capitalization.

Under normal conditions it would be expected that an industry would not show a very wide range in the rate of increase with respect to operating expenses, operating earnings, capitalization, and current liabilities, but in the street-railway industry there is considerable variation, especially between 1890 and 1902. The percentages of increase for the items named are shown in the following tabular statement:

The great difference between the rate of increase for capitalization and the rates for expenses and earnings, from 1890 to 1902, was evidently caused by the heavy capitalization that attended the rapid development of that period.

	PER CENT OF INCREASE.	
	1902 to 1907	1890 to 1902
Operating expenses.....	76.6	126.5
Operating earnings.....	68.9	173.2
Capitalization.....	63.5	414.0
Current liabilities.....	82.9	730.3

Investments in other than railroad property form another disturbing factor, when a comparison of the items is attempted for different years. A number of companies reported large amounts invested in the stocks and bonds of other electric-railway companies, and in electric light and power, gas, and other enterprises,¹ and in some cases the funds for such investments came from capitalization, while in others it is represented by floating indebtedness or current liabilities. These varied conditions tend to destroy the value of the comparisons between capitalization and current liabilities, and expenses and earnings.

Income and expenses.—As previously stated, the statistics of income and expenses were not reported for all companies at the census of 1890. In 1902 they were reported for 799 out of 817 operating companies, and in 1907 for 939 out of 945 operating companies.

¹ See "Net capitalization," p. 103.

TABLE 10.—DISTRIBUTION OF THE GROSS INCOME OF OPERATING COMPANIES, BY LEADING ITEMS OF EXPENDITURE: 1890 TO 1907.

ITEM.	AMOUNT.			PER CENT OF GROSS INCOME.		
	1907 ¹	1902 ²	1890	1907	1902	1890
Gross income from all sources.....	\$420,744,254	\$250,504,627	\$91,721,845	100.0	100.0	100.0
From passengers.....	382,132,404	233,821,648	89,711,830	88.9	93.3	97.8
Other operating income.....	36,056,304	13,782,451	905,381	8.4	5.5	1.0
From all other sources.....	11,555,390	2,900,628	1,104,634	2.7	1.2	1.2
Operating expenses.....	251,309,252	142,312,597	62,011,185	58.5	66.8	67.0
Deductions from income (taxes and fixed charges), total.....	138,094,710	77,595,053	13,978,903	32.1	31.0	15.2
Taxes and licenses.....	19,755,002	13,078,899	3,308,190	4.6	5.2	3.6
Interest.....	63,740,744	38,085,911	8,086,216	14.8	15.2	8.8
Rentals.....	48,022,696	25,518,225	2,561,343	11.2	10.2	2.8
Miscellaneous.....	6,575,774	912,018	23,164	1.5	0.4	(³)
Dividends.....	20,454,732	15,832,110	10,180,726	6.2	6.3	11.1
Miscellaneous payments.....			1,217,193			1.3
Surplus.....	13,885,554	14,714,867	4,333,838	3.2	5.9	4.8

¹ Exclusive of reports for 6 companies with a trackage of 292.95 miles.
² Exclusive of reports for 18 companies with a trackage of 378.00 miles.
³ Less than one-tenth of 1 per cent.

An estimate based on a 5-cent fare for each passenger carried in 1890 would increase the operating earnings for that year to the neighborhood of \$100,000,000 as compared with \$247,553,999 for 1902 and \$418,187,858 for 1907.

This comparison, as well as the comparisons of practically all of the items shown in Table 10, for the census of 1890 and the later censuses, are indicative rather than real, because it was apparently impossible to obtain complete reports at the earliest census.

During recent years railway companies have engaged more extensively in the carriage of freight, mail, and express matter, and also in the sale of electricity. It follows that the receipts from these miscellaneous sources

of operating income have increased greatly since 1890. The income from passenger service formed 99 per cent of the total income from operation in 1890, but this proportion decreased to 94.5 per cent in 1902 and to 91.4 per cent in 1907. The percentage that the income from sources other than the operation formed of the gross income was 1.2 per cent for both 1902 and 1890, and by 1907 it had increased to 2.7 per cent.

The introduction of electric traction has been an important factor in revolutionizing the relationship of operating expenses to operating earnings.² In 1890 the per cent ratio of operating expenses to operating

² See also p. 175.

earnings (operating ratio) was 73.7 for the roads operated by horse cars. For all classes of roads the per cent ratios of operating expenses to operating earnings were 68.4 for 1890, 57.5 for 1902, and 60.1 for 1907. While it is probable that the ratio of expenses to earnings in the case of a horse railway operated under the business methods now in vogue would be considerably less than the ratio for the same road operated under the methods of 1890, still the broader field of operation developed by electricity, the resulting larger investment, and the entire change in the physical equipment are important factors that should be considered in connection with the economies incident to modern business methods.

In 1907 some of the 23 railways operated exclusively by animal power were operated only for the purpose of holding franchise rights. All of these roads were small, and in the case of 7 of them operating expenses exceeded income. The miles of track of these 23 roads was but 46.98; the income from operation, \$71,205; operating expenses, \$58,702; and ratio of operating expenses to operating earnings, 82.4 per cent.

The general relative decrease in operating expenses (operating ratio) between 1890 and 1907 was accompanied by an increase in the fixed charges. The fixed charges formed only 15.2 per cent of the gross income in 1890, but by 1902 the ratio had more than doubled, forming 31 per cent in that year, and by 1907 it had increased to 32.1 per cent. Interest and rentals are the fixed charges that show the heaviest increase since 1890. The amount paid as interest on funded debt, mortgages, and floating debt in 1907 formed 14.8 per cent of the gross income, as compared with 8.8 per cent in 1890. While the total interest expense was \$8,086,216 in 1890, the interest on funded debt alone amounted to \$53,766,525, or 12.5 per cent of the gross income in 1907, and \$35,223,284, or 14.1 per cent of the gross income in 1902. It is probable that the interest on mortgages and floating debt was not an important item of expense in 1890.

The per cent distribution of the several items constituting the fixed charges of the operating companies for the three census years is given in the following statement:

Per cent distribution of fixed charges of operating companies: 1890 to 1907.

ACCOUNT.	PER CENT DISTRIBUTION.		
	1907	1902	1890
Total.....	100.0	100.0	100.0
Taxes and licenses.....	14.3	16.9	23.7
Interest.....	46.1	49.1	57.8
Rentals.....	34.8	32.9	18.3
Miscellaneous.....	4.8	1.2	0.2

The large gain shown for rentals is due to the increase in the number of leased roads. The bulk of the rentals eventually appears as interest on the bonds and dividends on the stock of the lessor companies.

Rentals and interest combined formed 80.9 per cent of the fixed charges of the operating roads in 1907, compared with 82 per cent in 1902 and 76.1 per cent in 1890. The increase in the miscellaneous item from 1902 to 1907 was due almost entirely to the greater charge to depreciation and reserve accounts in the latter year.

Number of employees.—The average number of salaried people and of wage-earners employed during the year was reported at the last two censuses. This average number corresponds, in most cases, with the number required to operate the railway systems under normal conditions. The number of laborers required for repairs and miscellaneous work may vary greatly at different seasons and the average for the entire period of twelve months would be considerably less than the greatest number employed at any one time during the year. It appears that the number reported for 1890 was the average number for the time during which each railway was in operation, and this probably resulted in obtaining a larger number than would have been reported if the same method employed in 1902 and 1907 had been followed. At the census of 1902, 20 companies, with a trackage of 417.03 miles, and at the census of 1907, 6 companies, with a trackage of 292.95 miles, failed to report the number of employees. Therefore the actual increase in the number of salaried employees and wage-earners during the period from 1890 to 1902 was somewhat greater than the 98.9 per cent shown in Tables 1 and 2. As the same form of inquiry was used and the same methods followed at the last two censuses, the 57.3 per cent of increase from 1902 to 1907 may be accepted as representing actual conditions, if allowance is made for the disproportion in the number of companies reporting the inquiry.

The number of salaried employees was not fully reported in 1890; in 1902, 7,128 such employees were returned, and in 1907, 11,700, the increase being 64.1 per cent. The ratio of salaried employees (office force) to wage-earners (conductors, motormen, laborers, etc.) varies considerably with the different companies, being dependent to a great extent upon the character of the organization and the extent of the allied interests. Therefore the average number of wage-earners to each salaried employee, as obtained from the total for all companies reporting, has but slight significance; there were, however, 18.7 wage-earners to each salaried employee in 1902 and 17.9 in 1907.

Varying conditions also control the number of passengers that can be carried to each wage-earner, but the average for all passengers for all operating companies reporting was 43,674 in 1902 and 45,454 in 1907. The returns indicate that the average was considerably less in 1890.

The inclusion of all wage-earners as a basis for passenger comparisons involves many employees in no way related to passenger traffic, noticeably employees chargeable to express and freight business, which has

developed at a higher rate than passenger traffic. The growth of interurban traffic is also a modifying factor, as the average number of passengers per wage-earner carried in long-haul interurban traffic is much below that for urban traffic.

On a basis of number of conductors and motormen employed, the average number of fare passengers was 64,415 in 1907 and 59,570 in 1902.

*Railways in Hawaii and Porto Rico.*¹—Table 11 presents the main statistics for the railways in Hawaii and Porto Rico at the censuses of 1907 and 1902.

Of the 3 companies reporting from Hawaii in 1902, only 1 was in existence in 1907. During the intervening years 1 of the other companies had gone out of business and the other had been absorbed by the company reporting at both censuses. The 2 companies in operation in Porto Rico in 1902 were reported for 1907, and in addition a third company was shown for the first time in 1907. The statistics of the companies in these outlying districts are not included in the total for the United States in any of the text or general tables.

¹ For statistics and history of electrical industries of Porto Rico, see Special Census Report, Electrical Industries of Porto Rico, 1907.

TABLE 11.—*Railways in Hawaii and Porto Rico: 1907 and 1902.*

	1907	1902	Per cent of increase.
Number of operating companies.....	14	25	^a 20.0
Miles of track.....	43.83	41.26	6.2
Number of cars.....	108	115	^a 6.1
Steam engines and turbines:			
Number.....	11	8	37.5
Horsepower.....	3,795	1,820	108.5
Dynamos:			
Number.....	14	9	55.6
Kilowatt capacity.....	2,908	1,324	119.6
Output of stations, kilowatt hours, total for year.....	5,473,303	1,044,995	423.8
Number of passengers, total.....	15,258,303	10,362,035	47.3
Fare.....	12,614,070	9,436,865	30.9
Transfer.....	2,466,537	725,170	240.1
Free.....	177,780	(⁴)	.....
Car mileage (passenger, express, freight, mail, etc.).....	2,399,516	1,913,409	25.4
Gross income.....	\$753,759	\$615,013	46.1
Operating expenses.....	\$418,432	\$330,350	20.7
Deductions from income (taxes and fixed charges).....	\$184,302	\$106,015	73.8
Capitalization:			
Capital stock authorized, par value.....	\$1,946,400	\$2,423,000	^a 19.7
Capital stock outstanding, par value.....	\$1,846,400	\$2,021,340	^a 8.7
Dividends on stock, amount.....	\$45,000	\$19,500	130.8
Funded debt authorized, amount.....	\$2,448,786	\$1,886,800	29.8
Funded debt outstanding, amount.....	\$1,004,786	\$1,103,800	37.9
Interest on funded debt.....	\$93,159	\$66,305	40.5
Salaried employees:			
Number.....	32	22	45.5
Salaries.....	\$45,789	\$25,179	81.9
Wage-earners:			
Average number.....	365	381	^a 4.2
Wages.....	\$198,142	\$177,620	11.6

¹ Includes 1 company in Hawaii and 3 in Porto Rico.
² Includes 3 companies in Hawaii and 2 in Porto Rico.
³ Decrease.
⁴ Not reported separately.

CHAPTER III.

POWER-PLANT EQUIPMENT AND OUTPUT OF STATIONS.

Traffic and financial operations are probably the most important features of the railway industry, but logically the physical equipment of the roads should be considered first. Of the equipment, the power plant is the primary unit, and statistics concerning it will be presented in advance of those for the roadbed and track. Detailed statistics for the power plants and other equipment of each railway company included in the census of 1907 are given in Tables 183 to 187. The following discussion considers the totals for all companies and for various groups of companies, the comparison of statistics being limited almost entirely to the years 1907 and 1902, because in 1890 there were comparatively few electric roads in operation and the information concerning them was not complete.

Electricity was used, wholly or in part, as the motive power in the case of 904 of the 945 companies reported as in operation during 1907 and 747 of the 817 reported for 1902, and the electric-traction companies were credited with all but a small portion of the trackage in operation at both censuses. Table 12 shows the character of the motive power used by companies with power plants and by those without power-plant equipment.

TABLE 12.—Companies with and without power-plant equipment, classified according to character of power: 1907 and 1902.

CHARACTER OF POWER.	NUMBER OF OPERATING COMPANIES.	
	1907	1902
Total.....	945	817
With power plants, total.....	570	577
Electric exclusively, total.....	554	541
Current generated.....	515	498
Steam power rented, current generated.....	3	13
Primary and electrical generators idle, current purchased.....	19	7
Primary generators idle, current purchased.....	1	.....
Electrical generators idle, current purchased.....	16	23
Electric and other kinds, total.....	15	23
Current generated.....	14	20
Primary and electrical generators idle, current purchased.....	1	.....
Primary generators idle, current purchased.....	.....	3
Cable exclusively.....	7	112
Compressed air exclusively.....	.....	1
Without power plants, total.....	369	240
Electric exclusively, current purchased.....	327	2180
Electric and other kinds, current purchased.....	7	3
Gas-electric motor exclusively.....	1	.....
Gasoline motor exclusively.....	5	.....
Cable exclusively, power rented.....	3	1
Animal exclusively.....	23	53
Steam exclusively.....	3	3

¹ Includes 1 company using cable and other than electric power.
² Includes 1 company operated by storage batteries.

Of the 904 companies operated wholly or in part with electric power in 1907, 569 had power-plant equipment, but of these, 37 reported the equipment as idle and the current as purchased. There were 335 electric-power companies that had no power plants; these purchased their power, with the exception of 1 company which employed gas-electric motors. Of the companies operating electric trackage in 1902, 564 reported power-plant equipment, although 33 of these reported the equipment as idle during the census year and the current as purchased, and 183 companies were without power plants and purchased power. The number of companies operated wholly or in part by power other than electric decreased from 96 in 1902 to 63 in 1907. In 1907 the whole or a part of the power used by 912, or 96.5 per cent, of the operating companies was supplied from central power stations in the form of electric-current and cable power; in 1902 such power was used by 759 companies, or 92.9 per cent, of the companies in operation in that year. The number of operating companies employing motive power that was not transmitted from a central generating station was 33 in 1907 and 58 in 1902.

Number and equipment of power houses.—For census purposes, a "power house" or station is understood to represent all of the equipment included under one roof. As electric power supplied from generating stations operated all but 1.1 per cent of the street and electric railway trackage in 1907, practically all of the power-house equipment was for the generation of electric current. Power generated in a central station but used for other than electric traction was reported by 10 companies operating 20.70 miles of exclusively cable trackage (including inclined planes) and 10 companies operating 41.01 miles of cable trackage in conjunction with electric trackage. The use of power not supplied from central power houses in 1907 is represented by 23 companies operating 46.98 miles of track with animal power exclusively, 3 companies operating 17 miles of track with steam locomotives exclusively, 1 company operating 22.50 miles of track with gas-electric motor cars, 5 companies operating 40.99 miles of track with gasoline-motor cars, and 1 company operating 3 miles of track with storage batteries.

The 576 operating companies that reported power plants at the census of 1907 reported 829 power houses; in 1902 there were 805 power houses, including 14 idle

stations; and in 1890 there were 182 power houses. In 1907, 110 companies had 2 or more power houses as compared with 113 such companies in 1902; the decrease is due largely to the consolidation of 2 or more separate stations.

TABLE 13.—Power-plant equipment and output of stations of operating companies: 1907 and 1902.

	1907	1902	Per cent of increase.
Main power-plant equipment:			
Power houses, number.....	829	805	3.0
Steam engines and turbines—			
Number.....	2,511	2,336	7.5
Horsepower.....	2,368,183	1,298,133	82.4
Gas engines—			
Number.....	41	15	173.3
Horsepower.....	10,335	1,025	748.6
Water wheels—			
Number.....	228	159	43.4
Horsepower.....	91,961	49,153	87.1
Auxiliary engines—			
Number.....	857	301	184.7
Horsepower.....	43,344	10,074	330.3
Dynamos, direct-current—			
Number.....	2,192	2,801	23.4
Kilowatt capacity.....	941,502	725,346	29.8
Dynamos, alternating-current—			
Number.....	932	441	111.3
Kilowatt capacity.....	781,914	173,016	351.9
Transformers—			
Number.....	1,003	473	119.3
Kilowatt capacity.....	243,467	47,361	414.0
Storage batteries, number of cells....	16,489	18,437	10.6
Boosters for outside feeders—			
Number.....	134	104	28.8
Kilowatt capacity.....	17,040	13,666	24.7
Auxiliary generators for use within plant—			
Number.....	311	71	338.0
Kilowatt capacity.....	19,162	3,793	409.0
Rotaries and motor-generator sets—			
Number.....	243	83	192.8
Kilowatt capacity.....	90,246	20,784	368.1
Electric motors used in plant or substation for miscellaneous work:			
Number.....	2,198	518	318.5
Horsepower.....	50,777	15,154	235.1
Direct-current—			
Number.....	1,462	432	238.4
Horsepower.....	29,872	10,053	107.1
Alternating-current—			
Number.....	796	86	720.9
Horsepower.....	20,905	5,101	309.8
Output of stations, kilowatt hours, total for year.....	7,760,130,100	7,261,484,397	110.4
Substation equipment:			
Rotary converters, motor-generator sets, etc.—			
Number.....	1,619	358	352.2
Kilowatt capacity.....	845,986	139,269	507.4
Transformers—			
Number.....	3,671	926	296.4
Kilowatt capacity.....	889,704	165,208	438.5
Storage batteries, number of cells....	47,205	22,040	114.2
Miscellaneous machines—			
Number.....	81	40	102.5
Kilowatt capacity.....	9,297	4,651	99.9

¹ Totals do not include 1 electric motor of 160 horsepower reported as primary power.
² Includes 252 steam turbines of 535,404 horsepower.
³ Decrease.
⁴ Exclusive of 9 transformers for which capacity was not reported.
⁵ Exclusive of 3 boosters for which capacity was not reported.
⁶ Exclusive of 1 auxiliary generator for which capacity was not reported.
⁷ Exclusive of current purchased from stations not operated by electric railways.
⁸ Exclusive of 8 rotary converters for which capacity was not reported.
⁹ Exclusive of 14 transformers for which capacity was not reported.
¹⁰ Exclusive of 3 miscellaneous machines for which capacity was not reported.

The statistics for the equipment of roads operated by power supplied from central power plants in 1890 were not complete, although 358 steam engines with 79,387 horsepower were reported as power-plant equipment. The number and power shown for that year are almost insignificant as compared with the 2,511 steam engines and turbines with 2,368,183 horsepower reported for 1907. Only 375 dynamos were reported in 1890 as compared with 3,124 for 1907.

The aggregate capacity of all apparatus furnishing primary power was 2,476,479 horsepower in 1907 and 1,349,211 horsepower in 1902; the increase was therefore 1,127,268 horsepower, or 83.6 per cent. The capacity of all dynamos was 1,723,416 kilowatts in 1907 and 898,362 kilowatts in 1902, the increase amounting to 825,054 kilowatts, or 91.8 per cent. The capacity of all dynamos, reduced to horsepower, equals 93.3 per cent of the capacity of the primary-power equipment in 1907 as compared with a ratio of dynamo capacity to primary-power capacity of 89.3 per cent in 1902.

The increase in the average capacity of all power units is a marked feature. The average horsepower per steam engine without turbines increased from 556 in 1902 to 811 in 1907; in the latter year the average for steam turbines was 2,125 horsepower, and that for steam engines and turbines, 943 horsepower. Gas engines, although the number is not large, had a large percentage of increase in horsepower and an increase of over threefold in the average capacity per engine. There was an increase of almost seven-eighths in the water power used in the industry, and the average size of water wheels was almost one-third larger in 1907 than in 1902.

While there was a large increase in dynamo capacity, the increase was chiefly in the alternating-current dynamos, the total capacity of alternating-current machines increasing 351.9 per cent and that of direct-current machines, 29.8 per cent. The size of dynamos in use shows a large increase between 1902 and 1907, the increase in direct-current machines being from an average of 254 to 430 kilowatts and that in alternating-current machines from 392 to 839 kilowatts. The average size of the transformers and rotaries also increased very considerably.

There were 251 companies in 1902 and 330 in 1907 that reported the sale of electricity to other railway companies or for general commercial use. Of the companies thus reporting the sale of current, 118 in 1902 and 177 in 1907 had regular electric-light departments. Therefore the total indicated power of the primary and electrical generators should not be considered as used in the operation of cars. It is impossible to ascertain the quantity of current sold during the year, but the importance of this branch of the service is indicated by the amount of the income received from the sale of current for light and power, which was \$20,093,302 in 1907 and \$7,703,574 in 1902. Thus the increase in income from sale of current was \$12,389,728, or 160.8 per cent, as compared with an increase in the total income from operations of 68.9 per cent, and an increase in income from railway traffic—passengers, chartered cars, freight, mail, and express—of 65.4 per cent.

While a study of the equipment and traffic of each railway system for which statistics are given in Tables 183 to 187 is essential to a proper understanding of

the data for the power generators, a grouping of the totals for all companies enables instructive comparisons. The tendency to use larger machines is indicated by the statistics given in Table 14, which shows

the number and horsepower of steam engines, gas engines, and water wheels grouped according to the indicated horsepower of the separate machines.

TABLE 14.—ENGINES AND WATER WHEELS, BY HORSEPOWER: 1907 AND 1902.

KIND AND CAPACITY.	NUMBER.			HORSEPOWER.		
	1907	1902	Per cent of increase.	1907	1902	Per cent of increase.
Steam engines and turbines, total.....	2,511	2,336	7.5	2,368,183	1,298,133	82.4
500 H. P. or under.....	1,285	1,589	19.1	379,675	421,051	19.8
Over 500 and under 1,000 H. P.....	517	430	20.2	365,939	297,257	23.1
1,000 H. P. and over.....	709	317	123.7	1,622,569	579,825	179.8
Gas engines, total.....	41	15	173.3	16,335	1,925	748.6
500 H. P. or under.....	34	15	126.7	8,435	1,025	338.2
Over 500 and under 1,000 H. P.....	5			2,900		
1,000 H. P. and over.....	2			5,000		
Water wheels, total.....	228	150	43.4	91,961	40,153	87.1
500 H. P. or under.....	172	120	33.3	32,763	22,453	45.9
Over 500 and under 1,000 H. P.....	20	12	66.7	13,188	6,850	92.5
1,000 H. P. and over.....	36	18	100.0	46,010	19,850	131.8

¹Decrease.

The largest ratios of increase, both in number and in horsepower capacity, are shown for the highest groups, and in every group the ratio of increase in horsepower was greater than the ratio of increase in number, this condition being due to the use of larger power units.

At the census of 1902 the capacity of dynamos was reported in horsepower; in 1907 the rating was stated in kilowatts. It is, therefore, impossible to make a comparison of the number and capacity of the machines grouped according to size, but Table 15 shows the number and kilowatt capacity of alternating and direct-current dynamos reported in 1907, classified according to the kilowatt capacity of each machine.

TABLE 15.—DYNAMOS, BY KILOWATT CAPACITY: 1907.

CAPACITY.	DIRECT-CURRENT DYNAMOS.		ALTERNATING-CURRENT DYNAMOS.	
	Number.	Kilowatt capacity.	Number.	Kilowatt capacity.
Total.....	2,192	941,502	932	781,914
500 K. W. or under.....	1,779	408,242	558	153,208
Over 500 and under 1,000 K. W.....	201	152,210	119	82,790
1,000 and under 2,000 K. W.....	150	207,500	147	100,400
2,000 and under 5,000 K. W.....	38	88,050	88	239,450
5,000 K. W. and over.....	18	90,500	20	116,000

The proportion of dynamos of high capacity was much greater for the alternating-current dynamos than for the direct-current machines. The number of machines with a capacity of 2,000 kilowatts and over constituted only 2.6 per cent of the total number in the case of direct-current dynamos as compared with 11.6 per cent for alternating-current dynamos.

The corresponding percentages for capacity were 19 and 45.5.

Primary power.—Steam is the predominating primary power in practically all branches of industry in the United States as a whole. Water power also has been and is being developed very extensively in sections where it is available and within transmitting distance. But in the street and electric railway industry the importance of water power lies in the large development of hydro-electric power by companies that supply it to the traction companies and other users of electric current. The statistics for street and electric railways do not show the character of the primary power used by the electric-power companies from which power was purchased for electric traction, but from the returns for all commercial electric light and power companies it appears that the water-power equipment of these electric-light companies increased from 427,254 horsepower in 1902 to 1,318,740 horsepower in 1907, an increase of 208.7 per cent, and that water power constituted 35.5 per cent of the total primary horsepower equipment of these companies in 1907 as compared with 25.6 per cent in 1902. The income of these companies from electric-railway service increased from \$2,301,343 in 1902 to \$7,829,275 in 1907, an increase of 240.2 per cent. This shows a large increase in the utilization of water power by electric-power companies, and through them by the traction companies purchasing current.

Table 16 shows for 1907 and 1902 the equipment of the power and electrical generating plants, and the output of stations, by character of primary power.

While there was an increase of 83.6 per cent in the horsepower of the primary generators, the capacity of the electrical generators increased 91.8 per cent. It is possible that improved operating conditions have actually decreased the margin of excess capacity of the prime movers over the secondary generators, but the disproportion is doubtless due mainly to the practice—which in recent years has become necessary—of carrying large installations of reserve electrical apparatus. Also some new roads have installed electrical equipment for future development, while the power-plant installations meet the present requirements only. At both censuses, moreover, for a considerable proportion of the generator capacity, which was idle all or a part of the year, no engines or wheels were reported. Again, the number of companies purchasing current was much larger in 1907 than in 1902, and some of these companies retained a part of the electrical equipment of the power plants they had ceased to operate.

In 1907 steam power represented 95.6 per cent of the total power; water power, 3.7 per cent; and gas power, seven-tenths of 1 per cent. In 1902 the corresponding proportions were 96.2, 3.6, and one-tenth of 1 per cent. The increase in the use of water and gas power was larger than these figures would indicate. In 1907 water power was used either wholly or in part by 47 companies, and idle equipment for

the utilization of such power was reported by 1 company, while in 1902 water power was reported by 38 companies. Gas engines were used by 16 companies in 1907, while in 1902 gas power was reported by only 6 companies and idle equipment was reported by 1 company.

In 1907, 8 companies, with 47.50 miles of track, used water power exclusively, and 515 companies, with 25,469.42 miles of track, used either steam power exclusively or steam and water power, while in 1902, 6 companies, with 43.73 miles of track, used water power exclusively, and 532 companies, with 19,526.68 miles of track, used steam power exclusively or steam and water power.

The number of companies using steam, water, or gas power exclusively may be understated in Table 16, since steam equipment is sometimes carried as a reserve with water and gas power, and every company that reported more than one kind of primary generators was assigned to one of the mixed groups.

The generator capacity per car is an indication of the efficiency of the machines for companies that did not sell current but not for companies that used current for purposes other than the operation of cars. As the output of stations reported for all companies includes a large amount of current sold for commercial uses, the comparison based on the total output, therefore, has little significance.

STREET AND ELECTRIC RAILWAYS.

TABLE 16.—POWER-PLANT EQUIPMENT AND OUTPUT OF STATIONS OF COMPANIES,

	TOTAL.		EQUIPMENT.	
			Steam power exclusively.	
	1907	1902	1907	1902
1 Number of operating companies with power plants.....	576	577	476	500
2 Power houses, number.....	829	1,805	639	709
3 Total horsepower.....	2,476,479	1,349,211	2,010,133	1,228,503
4 Steam engines and turbines—				
5 Number.....	2,511	2,336	2,136	2,197
6 Horsepower.....	2,368,183	1,203,133	2,010,133	1,228,506
7 Gas engines—				
8 Number.....	41	15		
9 Horsepower.....	16,335	1,925		
10 Water wheels—				
11 Number.....	228	159		
12 Horsepower.....	91,961	49,153		
13 Dynamos—				
14 Number.....	3,124	3,802	2,488	2,979
15 Kilowatt capacity.....	1,728,410	898,802	1,417,903	828,645
16 Direct-current—				
17 Number.....	2,192	2,801	1,751	2,608
18 Kilowatt capacity.....	941,502	725,340	777,280	678,932
19 Alternating-current—				
20 Number.....	932	441	737	371
21 Kilowatt capacity.....	781,914	173,016	640,623	149,713
22 Output of stations, kilowatt hours, total for year.....	2,475,130,100	2,261,484,397	4,066,046,879	2,135,237,885
23 Cars, number for companies with power plants.....	71,063	61,602	59,521	55,709
24 Miles of track for companies with power plants.....	28,110.12	20,376.07	22,790.38	18,676.30
	PER CENT OF INCREASE.			
	Total.		Steam power exclusively.	
25 Number of operating companies with power plants.....		0.2		4.3
26 Power houses, number.....		3.0		9.9
27 Total horsepower.....		83.6		63.6
28 Steam engines and turbines—				
29 Number.....		7.5		2.8
30 Horsepower.....		82.4		63.6
31 Gas engines—				
32 Number.....		178.3		
33 Horsepower.....		748.0		
34 Water wheels—				
35 Number.....		43.4		
36 Horsepower.....		37.1		
37 Dynamos—				
38 Number.....		5.4		16.6
39 Kilowatt capacity.....		91.8		71.1
40 Direct-current—				
41 Number.....		23.4		32.9
42 Kilowatt capacity.....		29.8		14.5
43 Alternating-current—				
44 Number.....		111.3		98.7
45 Kilowatt capacity.....		351.9		327.9
46 Output of stations, kilowatt hours, total for year.....		110.4		90.4
47 Cars, number for companies with power plants.....		19.9		6.8
48 Miles of track for companies with power plants.....		38.0		22.7

¹ Includes 14 power plants reported by 10 companies without power-plant equipment.
² Includes 2,500,000 kilowatts for 1 company which did not report power-plant equipment.
³ Decrease.

TABLE 17.—PER CENT DISTRIBUTION OF POWER-PLANT EQUIPMENT AND OUTPUT OF STATIONS OF COMPANIES, CLASSIFIED ACCORDING TO CHARACTER OF POWER: 1907 AND 1902.

	PER CENT OF TOTAL FOR ALL COMPANIES.											
	Steam power exclusively.		Gas-engine power exclusively.		Water power exclusively.		Mixed steam and gas-engine power.		Mixed steam and water power.		Idle power-plant equipment.	
	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902
Number of operating companies with power plants.....	82.0	86.7	1.4	0.5	1.4	1.0	1.4	0.5	6.8	5.5	6.4	5.7
Power houses, number.....	77.1	88.1	1.0	0.4	1.1	0.9	3.9	1.5	14.1	6.0	2.9	0.9
Total horsepower.....	81.2	91.1	0.3	0.1	0.2	0.2	7.2	2.2	10.3	6.1	0.9	0.3
Steam engines and turbines—												
Number.....	85.1	94.0					4.5	1.5	8.8	3.7	1.0	0.8
Horsepower.....	84.9	94.0					7.2	2.3	7.1	2.8	0.9	0.3
Gas engines—												
Number.....			39.0	40.0			61.0	40.7				13.3
Horsepower.....			40.1	49.4			59.9	45.5				5.2
Water wheels—												
Number.....					9.2	11.9			90.4	88.1	0.4	
Horsepower.....					5.2	6.0			94.5	94.0	0.3	
Dynamos—												
Number.....	79.6	90.2	0.5	0.2	0.4	0.5	5.1	0.5	12.0	6.7	2.3	1.9
Kilowatt capacity.....	82.3	92.2	0.2	0.1	0.2	0.2	6.5	1.4	9.3	5.4	1.5	0.8
Direct-current—												
Number.....	79.0	91.2	0.5	0.2	0.5	0.3	6.0	0.6	10.5	5.7	2.6	2.0
Kilowatt capacity.....	82.0	93.0	0.1	0.1	0.2	0.1	8.2	1.7	7.3	3.5	1.0	0.9
Alternating-current—												
Number.....	79.1	84.1	0.0		0.3	1.4	2.9		15.5	13.6	1.6	0.9
Kilowatt capacity.....	81.9	86.5	0.3		0.2	0.3	4.5		11.7	13.0	1.4	0.1
Output of stations, kilowatt hours, total for year.....	85.4	94.4	0.1	0.1	0.1	0.1	6.0	1.0	8.3	3.8		
Cars, number for companies with power plants.....	82.7	90.4	0.2	0.1	0.1	0.1	8.9	4.7	5.7	3.5	2.5	1.2
Miles of track for companies with power plants.....	81.1	91.2	0.6	0.1	0.2	0.2	4.5	1.7	9.5	4.7	4.2	2.2

Steam power.—There has been a greater absolute increase in steam than in any of the other kinds of power. The capacity of this class of machinery increased by 1,070,050 horsepower, or 82.4 per cent, in 1907 as compared with 1902. The use of large steam turbines has been an important factor in this increase of steam power. No steam turbines were reported separately in 1902, whereas in 1907 the horsepower of the 252 steam turbines in use amounted to 535,404, or 22.6 per cent, of the total steam horsepower.

The use of steam power exclusively was reported by 476 companies in 1907 and by 500 in 1902, not including those reporting idle equipment. The companies using steam exclusively as a primary power represented about nine-tenths of the total horsepower reported for all systems in 1902 and a little over four-fifths in 1907. On the other hand, the proportions of the total horsepower for companies using steam and water power and for the companies using steam and gas power increased between 1902 and 1907. Although the companies that reported equipment for both steam and gas power had a comparatively small percentage of the total, the increase in the proportion was greater for them than for the companies with equipment for steam and water power. Altogether, the railways using steam generators had 98.7 per cent of the total indicated horsepower in 1907 and 99.4 per cent in 1902.

The companies relying entirely upon steam for primary power operated an average of 125 cars and 47.88 miles of track per company, as compared with corresponding averages of 125 and 48.80 for all operating companies.

Gas-engine power.—Gas engines are still a comparatively unimportant factor in the power equipment

of electric railways, though they seem to be growing in favor. The reports for 1902 showed only 15 gas engines with 1,925 horsepower, including 2 engines with a combined capacity of 100 horsepower reported as idle, while in 1907 there were 41 gas engines with 16,335 horsepower. Of the 16 companies using gas engines in 1907, 8 reported them as the only kind of machine used to generate the primary power. The other 8 companies used both gas and steam engines.

As a rule the companies using gas engines exclusively operate small systems, although large engines of this type are now in operation. The reports for 1907 showed 7 gas engines, with more than 500 horsepower each and with an aggregate of 7,900 horsepower. While the railways using gas engines as the exclusive primary power in 1907 were few in number and their mileage and power-plant equipment were relatively unimportant, they exceeded in mileage and power equipment the railways using water power exclusively. The average number of cars per system in 1907 for companies that reported gas engines as their sole primary power was only 21. The companies that used gas engines reported 7.5 per cent of the total horsepower for all railways in 1907, as compared with only 2.3 per cent of the total in 1902.

Water power.—The increase in water power has been referred to in connection with Tables 13 and 16. In 1902, 6 companies and in 1907, 9 companies, including 1 reporting idle power-plant equipment, reported water as the exclusive primary power.

Water power alone has made but little progress in the railway industry directly during the last five years, and still remains a small factor in the aggregate power and power-plant equipment. A considerable quantity of current generated by water power is used for electric traction, but the major portion of

POWER-PLANT EQUIPMENT AND OUTPUT OF STATIONS.

current so generated is purchased from hydro-electric power plants and long-distance transmission companies.

Auxiliary engines.—The auxiliary engines used in main power plants for miscellaneous work increased from 301 engines with 10,074 horsepower in 1902 to 857 engines with 43,344 horsepower in 1907, an increase of 184.7 per cent in number and 330.3 per cent in horsepower. These engines have not been included in the statistics for primary-power equip-

ment, but many of them are of considerable size and they are coming into more general use in the large plants.

Power-plant equipment and output of stations of companies, classified according to income from railway operations.—Table 18 shows the power-plant equipment and output of stations for all companies, classified according to income from railway operations, for 1907 and 1902.

TABLE 18.—POWER-PLANT EQUIPMENT AND OUTPUT OF STATIONS OF COMPANIES, CLASSIFIED ACCORDING TO INCOME FROM RAILWAY OPERATIONS: 1907 AND 1902.

	TOTAL, ALL COMPANIES.		CLASSIFICATION GROUP.					
			\$1,000,000 and over.		\$500,000 but less than \$1,000,000.		\$250,000 but less than \$500,000.	
			(A)		(B)		(C)	
	1907	1902	1907	1902	1907	1902	1907	1902
Number of operating companies.....	945	817						
Power houses, number.....	829	805	77	44	50	28	82	57
Total horsepower.....	2,476,479	1,349,211	241	184	76	37	81	94
Steam engines and turbines—			1,506,880	736,832	188,684	66,820	103,830	127,473
Number.....	2,511	2,336	1,009	793	247	151	264	294
Horsepower.....	2,365,183	1,208,133	1,577,444	725,560	177,139	66,820	183,705	126,128
Gas engines—								
Number.....	41	15	7	5			4	
Horsepower.....	16,335	1,925	5,740	400			1,650	
Water wheels—								
Number.....	228	150						
Horsepower.....	61,961	49,153	28	18	10		35	5
Dynamos—			13,696	10,872	11,545		8,475	1,345
Number.....	3,124	3,302	1,140	1,062				
Kilowatt capacity.....	1,723,416	898,362	1,096,101	477,556	322	104	316	400
Direct-current—					137,394	66,812	131,265	87,257
Number.....	2,192	2,861	887	905				
Kilowatt capacity.....	941,502	726,346	607,191	393,926	245	180	184	361
Alternating-current—					77,440	58,175	62,915	71,594
Number.....	932	441	262	67				
Kilowatt capacity.....	781,914	173,016	488,910	83,630	50,045	8,637	68,350	15,663
Output of stations, kilowatt hours, total for year.....	4,759,130,100	2,261,484,307	3,491,483,244	1,421,910,468	331,467,001	196,119,892	331,527,637	210,825,064
Cars, total number.....	83,641	69,784	55,692	41,702	8,194	5,332	0,129	5,470
Miles of track.....	34,403.50	22,576.99	15,564.34	8,414.31	4,386.24	2,127.29	4,000.76	2,782.59

	CLASSIFICATION GROUP—continued.													
	\$100,000 but less than \$250,000.		Less than \$100,000.		Per cent of total.									
	(D)		(E)		A		B		C		D		E	
	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902
Number of operating companies.....	183	116	553	572	8.1	5.4	5.3	3.4	8.7	7.0	10.4	14.2	58.5	70.0
Power houses, number.....	152	127	279	303	29.1	22.9	2.2	4.6	9.8	11.7	18.3	15.8	33.7	45.1
Total horsepower.....	279,569	156,455	217,516	231,631	64.5	54.6	7.6	7.2	7.8	9.4	11.3	11.6	8.8	17.2
Steam engines and turbines—														
Number.....	433	353	558	745	40.2	33.9	9.8	6.5	10.5	12.6	17.2	15.1	22.2	31.9
Horsepower.....	235,810	140,210	194,076	209,415	68.6	55.9	7.5	7.5	7.8	9.7	10.0	10.8	8.2	16.1
Gas engines—														
Number.....	6	1	24	9	17.1	33.3								
Horsepower.....	1,080	75	7,835	1,450	35.1	20.8								
Water wheels—														
Number.....	69	28	82	108	10.1	11.3	8.3		15.4	3.1	30.3	17.6	36.0	67.9
Horsepower.....	42,690	16,170	15,555	20,766	14.0	22.1	12.6		9.2	2.7	46.4	32.0	16.0	42.2
Dynamos—														
Number.....	550	484	787	1,153	36.8	32.2	10.3	5.9	10.1	12.4	17.6	14.7	25.2	34.9
Kilowatt capacity.....	191,470	103,797	167,186	162,940	63.6	53.2	8.0	7.4	7.6	9.7	11.1	11.6	9.7	18.1
Direct-current—														
Number.....	359	394	517	931	40.5	34.8	11.2	6.3	8.4	12.6	16.4	13.8	23.6	32.5
Kilowatt capacity.....	98,300	76,732	95,647	124,919	64.5	54.3	8.2	8.0	6.7	9.9	10.4	10.6	10.2	17.2
Alternating-current—														
Number.....	191	90	270	222	28.1	15.2	8.3	3.2	14.2	10.9	20.5	20.4	29.0	50.3
Kilowatt capacity.....	93,170	27,065	71,539	38,021	62.5	48.3	7.7	5.0	8.7	9.1	11.0	15.6	9.1	22.0
Output of stations, kilowatt hours, total for year.....	387,651,740	196,300,850	217,000,578	236,328,123	73.4	62.9	7.0	8.7	7.0	9.3	8.1	8.7	4.6	10.5
Cars, total number.....	7,304	5,953	6,322	8,324	66.6	62.4	9.8	8.0	7.3	8.2	8.7	8.9	7.6	12.5
Miles of track.....	4,979.68	3,478.97	5,463.54	5,773.83	45.2	37.3	12.7	9.4	11.7	12.3	14.5	15.4	15.9	25.6

The statistics indicate not only the increase in the average size of companies but also the extent to which the larger companies dominate the industry. In the

case of Class E, which contains the smallest companies, the ratios show a decided falling off in 1907 as compared with 1902, while for Class A, which contains the

largest companies, increased proportions are shown for all important items. The changes in the intermediate classes are not so marked as those in the extreme classes.

In 1907 Class A, the largest companies, was credited with almost two-thirds of the primary horsepower and about the same proportion of the kilowatt capacity of the electrical generators reported by all companies; with almost three-fourths of the total output of stations; two-thirds the number of cars; and upward of one-half of the total miles of track. Although in 1907 the number of power houses for railways in Class E, companies with the smallest incomes, exceeded by 38 the number in Class A, the largest incomes, their primary power and the capacity of their dynamos constituted less than one-tenth of the total capacity of all

plants and the output of their stations was less than one-twentieth of that for all railways.

Nearly two-thirds of the primary steam power in 1907 was reported for Class A, whereas over two-fifths of the total water power was reported for Class D, companies with an income of \$100,000 but less than \$250,000, and almost one-half of the total power derived from gas engines was returned for railways in Class E, the smallest companies.

Power-plant equipment and output of stations of companies, classified according to kind of system and character of service.—A presentation of the power-plant equipment for selected groups of railways is given in Table 19, the division of the statistics being based upon the kind of system and the character of service.

TABLE 19.—POWER-PLANT EQUIPMENT AND OUTPUT OF STATIONS OF COMPANIES, CLASSIFIED ACCORDING TO KIND OF SYSTEM AND CHARACTER OF SERVICE: 1907.

	Total, all companies.	CLASSIFICATION GROUP.				
		Kind of system.		Character of service.		
		Electric elevated and subway railways. ¹	Electric surface railways. ²	Selected interurban lines.	Selected small urban roads.	All other railways.
Number of operating companies.....	045	6	930	50	100	795
Power houses, number.....	820	7	822	84	18	727
Total horsepower.....	2,470,479	157,900	2,318,579	223,133	6,080	2,247,310
Steam engines and turbines—						
Number.....	2,511	50	2,461	235	17	2,259
Horsepower.....	2,868,183	157,900	2,210,283	218,288	3,470	2,146,425
Gas engines—						
Number.....	41		41	4	1	36
Horsepower.....	10,335		10,335	1,650	110	14,575
Water wheels—						
Number.....	228		228	14	10	204
Horsepower.....	91,061		91,061	3,105	2,460	86,316
Dynamos—						
Number.....	3,124	44	3,080	273	37	2,814
Kilowatt capacity.....	1,723,410	124,780	1,598,630	146,807	5,934	1,570,615
Direct-current—						
Number.....	2,192	44	2,148	124	31	2,037
Kilowatt capacity.....	941,502	124,780	816,722	30,022	4,062	907,418
Alternating-current—						
Number.....	932		932	149	6	777
Kilowatt capacity.....	781,914		781,914	116,845	1,872	663,197
Output of stations, kilowatt hours, total for year.....	4,750,180,100	428,019,072	4,331,111,028	415,219,494	2,647,176	4,341,263,430
Cars, total number.....	83,041	4,463	79,188	5,250	618	77,764
Miles of track.....	34,403.56	420.40	33,983.10	5,567.11	560.60	28,275.76

¹ Exclusive of the mixed elevated, subway, and surface systems in Boston, Mass., and Philadelphia, Pa.
² Includes the statistics for the few railways not operated by electricity.

While the elevated and subway roads had a comparatively large average of power-plant equipment per company, they controlled a very small proportion of the equipment for all roads. The statistics in Table 19 do not show the real magnitude of the power equipment required to operate these railways, because 4 of the 6 companies purchased all or part of their current. It is of interest to note that the use of water wheels, gas engines, and alternating-current generators was confined to surface railways, as no generators of these types were reported in 1907 by the elevated and subway systems.

The power-plant equipment of the 100 selected small urban roads formed but a small proportion of the total for all roads. Of these small roads, 84 purchased all of the current used for the operation of cars, while of the 50 interurban lines, only 11 purchased

their entire current. On the other hand, all but 7 of the 50 selected interurban roads reported substation equipment, while only 7 of the 100 small roads had substations. The figures indicate the differences in the power equipment required for the large and the small companies for which the statistics are compared in other tables.

Dynamos.—The capacity of the generators, transformers, and other electric apparatus was reported in horsepower in 1902, but for the purpose of comparison with 1907 the total horsepower has been reduced to kilowatts. The indicated voltage, amperage, and the total capacity in kilowatts was returned for each machine, but only the total capacity was used in summarizing the returns. As shown in Table 13, the total number of dynamos decreased 178, or 5.4 per cent, in 1907 as compared with 1902, while the indicated

capacity increased 825,054 kilowatts. The entire decrease in number was in the direct-current machines.

The direct-current dynamos formed 70.2 per cent of the total number and represented 54.6 per cent of the total kilowatt capacity of both varieties of machines in 1907. Electrical generators were reported by 568, or all but 8, of the operating companies with power-plant equipment in 1907 as compared with 564, or all but 13, of the number of companies that reported dynamos in 1902. Of these companies, 283 in 1907 had 932 alternating-current machines, with a total capacity of 781,914 kilowatts, and 163 in 1902 had 441 alternating-current dynamos, with a total capacity of 173,016 kilowatts.

Only 69 roads were operated by the use of alternating machines exclusively in 1907, and these were equipped with 215 dynamos of 198,135 kilowatt capacity. In 1902, 13 roads had 29 alternating dynamos exclusively, of 14,372 kilowatt capacity. The large increase in this class of generators is due in part to the increasing practice of generating current for sale for general commercial use.

Transformers in main power plant.—Next to the engine and dynamo the transformer may be regarded as the most important machine directly connected with the utilization of the current. The number of these machines increased 119.3 per cent and the kilowatt capacity 414 per cent in 1907 as compared with 1902 (see Tables 13 and 22). In 1907 transformers were reported by 171 railway companies, and in 1902 by 67 such companies.

Storage batteries in main power plant.—There were 18,437 storage-battery cells reported in 1902, while in 1907 there were only 16,489 such cells, the decrease in number being 10.6 per cent. An attempt was made at both censuses to ascertain the capacity of storage-battery cells, but the results were so unsatisfactory that it was decided to abandon this feature and confine the statistics to the number of cells.

Boosters in main power plant.—Boosters, used in power plants for outside feeders, increased 28.8 per cent in number and 24.7 per cent in kilowatt capacity in 1907 as compared with 1902.

Auxiliary generators in main power plant.—This group of machines includes a considerable number of "exciters." The auxiliary generators increased rapidly between 1902 and 1907, the number showing a gain of 338 per cent and the capacity a gain of 409 per cent. While these machines are in reality dynamos, they do not generate current for delivery to the line and were therefore classed as auxiliary equipment.

Rotaries and motor-generator sets in main power plant.—The increase in rotaries and motor-generator sets in main generating stations also was very large,

being 192.8 per cent in number and 363.1 per cent in capacity.

Electric motors used in main power plant or substation.—The electric motors used in power plants or substations for miscellaneous work increased from 518, of 15,154 horsepower, in 1902 (432 direct current, of 10,053 horsepower, and 86 alternating current, of 5,101 horsepower), to 2,168, of 50,777 horsepower, in 1907 (1,462 direct current, of 29,872 horsepower, and 706 alternating current, of 20,905 horsepower).

Output of stations.—Each railway company reported the average daily output of its power plant in kilowatt hours and the total number of kilowatt hours for the entire period it was in operation during the census year. In many instances the output stated was necessarily an estimate based either on actual readings of dynamo meters for selected periods, or, as in a few cases, on the total capacity of the generators. The aggregate, however, may be accepted as a close approximation of the amount of current generated in the power plants of electric railways during the twelve months covered by the reports. The 805 power houses included in the census of 1902 reported the output for the year as 2,261,484,397 kilowatt hours as compared with 4,759,130,100 kilowatt hours for the 829 power houses included in the report of 1907. The increase in 1907 over 1902 amounted to 2,497,645,703 kilowatt hours, or 110.4 per cent. The average output per machine for the 3,302 dynamos reported for 1902 was 684,883 kilowatt hours, while the average for the 3,124 reported for 1907 was 1,523,409 kilowatt hours. At each census the total number of power houses reported included some that were not used for generating current and some that were idle, and the total number of dynamos reported also included some machines that were idle.

The output of stations showed an average of 1.98 kilowatt hours per car mile for 1902 and 2.94 kilowatt hours for 1907. These general averages, however, are based on the reports for all classes of companies, many of which operated commercial lighting plants and sold a large part of the current. For such plants it is impossible to ascertain the quantity of current consumed in the operation of cars. On the other hand, the total car mileage included a considerable amount of car mileage for animal, cable, steam, and gasoline-motor traffic, for which there is no current consumption. The general average is therefore of little value, except for comparative purposes. It should not be accepted as indicating the actual amount of current consumed per car mile.

Table 20 shows the kilowatt hours produced and other statistics for companies that did not buy or sell current in 1907.

STREET AND ELECTRIC RAILWAYS.

TABLE 20.—MISCELLANEOUS STATISTICS FOR ELECTRIC RAILWAYS THAT DID NOT BUY OR SELL CURRENT, BY STATES AND GEOGRAPHIC DIVISIONS: 1907.

STATE OR TERRITORY.	Number of operating companies.	Miles of track.	NUMBER OF CARS.					CAR MILEAGE.			NUMBER OF PASSENGERS.	
			Total.	Passenger.	All other.	Lighted by electricity.	Heated by electricity.	Total.	Passenger.	Express, freight, mail, etc.	Total.	Fare.
United States.....	176	7,341.73	20,030	18,240	2,300	10,569	9,011	406,160,204	400,238,768	5,927,430	2,490,551,629	1,967,951,933
North Atlantic division.....	38	3,333.20	10,098	9,548	1,450	10,489	6,040	207,416,548	203,942,972	3,473,570	1,200,247,699	1,050,125,115
Massachusetts.....	11	267.01	418	329	89	382	141	5,705,791	5,506,735	100,056	27,042,539	24,582,298
Connecticut.....	4	107.70	152	111	41	122	47	1,943,039	1,915,005	27,044	8,968,382	8,061,045
New York.....	22	607.06	4,235	3,687	548	4,084	2,873	78,543,434	76,184,403	2,359,031	537,924,893	306,944,592
New Jersey.....	6	146.37	188	169	17	172	83	4,354,434	4,348,974	5,460	20,378,594	16,761,543
Pennsylvania.....	39	1,425.22	4,010	4,395	545	4,832	2,720	102,336,170	101,746,194	590,976	599,340,674	520,201,878
All other North Atlantic states ¹	6	388.71	1,097	887	210	897	476	14,533,680	14,151,671	382,000	96,592,617	83,533,769
South Atlantic division.....	10	583.00	2,414	2,234	180	2,391	514	41,290,072	40,883,977	406,095	270,661,050	195,651,012
Maryland.....	3	458.99	1,094	1,542	152	1,052	237	27,920,387	27,546,122	374,265	205,182,582	146,645,182
All other South Atlantic states ²	7	124.07	720	602	28	709	227	13,369,685	13,337,855	31,830	65,475,477	49,105,830
North Central division.....	54	2,045.19	5,450	4,800	581	5,030	1,604	116,782,005	115,269,536	1,513,150	686,304,931	531,197,580
Ohio.....	17	1,176.28	3,350	3,014	342	3,093	1,052	65,504,433	64,719,062	785,371	410,782,821	312,358,112
Indiana.....	9	392.39	102	141	51	161	46	5,205,953	4,861,122	344,731	12,723,732	10,712,863
Illinois.....	10	222.55	705	686	70	698	437	16,486,394	15,367,882	118,412	50,080,267	54,071,091
Michigan.....	3	261.93	301	238	63	265	1	0,251,580	0,052,026	198,654	31,192,327	24,418,764
Wisconsin.....	6	100.23	125	117	8	123	17	2,244,812	2,242,184	2,628	6,387,014	5,363,534
Iowa.....	3	135.46	82	70	12	74	11	1,261,944	1,200,561	52,383	4,238,885	3,818,636
Kansas.....	3	44.45	55	29	6	28	10	619,096	508,710	10,980	2,451,144	2,357,692
All other North Central states ³	4	371.87	594	574	20	594	21	20,307,983	20,307,983	.....	153,508,741	118,066,018
South Central division.....	19	530.33	1,305	1,130	125	1,241	574	27,833,561	27,378,007	455,464	158,289,101	125,618,762
Kentucky.....	5	208.97	550	509	50	537	398	12,116,389	11,770,016	346,373	69,062,956	52,410,518
Texas.....	6	106.83	220	203	17	205	5	4,443,795	4,347,224	96,571	20,550,517	22,520,026
All other South Central states ⁴	8	223.53	535	477	58	499	171	11,273,377	11,260,857	12,520	61,775,718	50,682,218
Western division.....	5	240.80	469	400	60	442	270	12,843,328	12,764,180	79,142	84,988,749	65,369,464
Colorado and California.....	5	240.80	469	400	60	442	270	12,843,328	12,764,180	79,142	84,988,749	65,369,464

STATE OR TERRITORY.	NUMBER OF PASSENGERS—continued.		ENGINES AND WATER WHEELS.		DYNAMOS.		Output of stations, kilowatt hours, total for year.	Cost of operating power plants.	Fare passengers per mile of track.	Fare passengers per passenger-car mile.	Kilowatt-consumption per car mile.	Cost of current per kilowatt hour (cents).
	Transfer.	Free.	Number.	Horse-power.	Number.	Kilowatt capacity.						
United States.....	501,214,274	21,385,422	679	675,353	707	454,957	1,324,923,632	\$8,628,396	268,050	4.92	3.26	0.7
North Atlantic division.....	230,665,663	9,556,921	340	334,340	342	230,879	704,718,298	4,286,289	315,044	5.15	3.40	0.6
Massachusetts.....	2,200,295	109,946	33	11,225	36	8,647	18,390,670	194,701	91,756	4.39	3.22	1.1
Connecticut.....	798,719	148,618	11	5,325	14	3,800	5,341,253	72,642	74,692	4.20	2.75	1.4
New York.....	138,118,320	2,861,972	93	138,035	89	93,005	310,634,555	1,098,243	398,115	5.21	3.95	0.6
New Jersey.....	3,315,863	311,198	13	6,940	15	5,300	12,307,997	90,331	114,290	3.85	2.83	0.7
Pennsylvania.....	74,523,452	4,565,344	164	147,754	164	69,967	304,957,996	1,541,452	365,040	5.11	2.98	0.5
All other North Atlantic states ¹	11,570,015	1,470,843	26	25,070	24	19,260	53,070,827	388,920	214,900	5.90	3.65	0.7
South Atlantic division.....	71,327,812	3,682,235	60	70,950	67	48,456	121,020,542	913,457	335,550	4.79	2.95	0.8
Maryland.....	55,165,581	3,471,819	33	64,725	30	37,455	102,951,946	723,570	319,278	5.32	3.69	0.7
All other South Atlantic states ²	16,162,231	210,416	27	15,225	31	11,001	18,068,596	189,878	395,791	3.68	1.40	1.0
North Central division.....	150,550,084	4,607,367	210	204,339	228	137,842	393,231,060	2,593,567	200,810	4.01	3.37	0.7
Ohio.....	102,045,282	2,379,427	101	89,074	114	63,209	194,769,300	1,322,071	265,552	4.83	2.97	0.7
Indiana.....	1,434,718	576,151	20	15,190	22	10,425	10,985,488	178,292	27,302	2.20	3.26	1.0
Illinois.....	4,063,568	315,668	30	31,350	36	18,114	57,344,847	312,860	242,062	3.52	3.70	0.5
Michigan.....	5,000,263	1,173,300	10	9,700	10	6,800	24,132,840	156,698	190,927	4.03	3.86	0.6
Wisconsin.....	922,159	101,321	12	4,850	13	3,020	3,327,545	47,302	53,488	2.39	1.48	1.4
Iowa.....	420,240	.....	8	5,350	6	3,550	3,114,010	37,638	28,190	3.16	2.47	1.2
Kansas.....	31,982	61,500	6	2,025	6	1,300	1,400,800	13,726	53,041	4.03	2.81	0.9
All other North Central states ³	35,411,823	.....	23	46,830	21	31,424	92,006,140	524,380	317,576	5.82	4.53	0.6
South Central division.....	30,565,356	2,165,073	51	40,715	52	27,090	73,388,907	616,477	232,916	4.59	2.64	0.8
Kentucky.....	16,590,482	955,956	17	19,200	15	12,850	36,333,313	202,048	250,833	4.45	3.00	0.6
Texas.....	3,014,703	115,728	13	5,840	15	3,885	10,637,282	133,380	210,802	5.18	2.39	1.3
All other South Central states ⁴	10,960,111	1,093,389	21	16,175	22	10,355	26,418,312	281,049	226,736	4.50	2.34	1.1
Western division.....	18,255,459	1,373,826	18	16,000	18	10,690	31,064,825	218,606	271,325	5.12	2.49	0.7
Colorado and California.....	18,255,459	1,373,826	18	16,000	18	10,690	31,064,825	218,606	271,325	5.12	2.49	0.7

¹ Includes states as follows: New Hampshire, 2; Rhode Island, 2; Vermont, 2.
² Includes states as follows: Delaware, 2; District of Columbia, 1; Florida, 1; Georgia, 1; Virginia, 1; West Virginia, 1.
³ Includes states as follows: Minnesota, 1; Missouri, 1; North Dakota, 2.
⁴ Includes states as follows: Alabama, 1; Arkansas, 1; Louisiana, 2; Mississippi, 2; Tennessee, 2.

From the statistics of electric-railway companies that did not operate commercial lighting plants and that neither bought nor sold current, certain deductions can be drawn with respect to car mileage, number of passengers, and the consumption and cost of current. Any such deductions, however, have to be of the most general character, as even the companies which neither bought nor sold current were not on an equal footing in regard to current consumption. Practically all of the lighting of cars for all companies of this class was electrical, but the use of electric current for car heating varied greatly. The consumption of current for car heating was proportionately greater in the North Atlantic division than in the North Central division, where stoves and hot-water systems were used to a larger extent. Again, not all companies were equally exact in the keeping of car-mileage records. In some cases, though a record was kept of all regular trips, the companies did not take equal pains with work-car mileage and trips not made on a regular schedule. The consumption of current is also affected by the condition of the rail bonds. Some roads, more particularly those in rural districts, suffer from theft of the copper bonds, and the kilowatt consumption per car mile is thus increased.

The consumption of current per car mile in 1907 for railways that did not buy or sell current averaged 3.26 kilowatt hours for the United States and ranged, in the different states reporting three or more companies, from a minimum of 1.48 kilowatt hours for Wisconsin to a maximum of 3.95 kilowatt hours for New York. The cost of current per kilowatt hour also shows a wide range, from 0.5 cent per kilowatt hour in Illinois and Pennsylvania to nearly three times that amount (1.4 cents) in Connecticut and Wisconsin. Although the figures shown for the cost of current per kilowatt hour by states vary materially, the averages for the different geographic divisions conform closely to that for the United States. The use of water power, the proximity to cheap fuel, and the presence of centralized power stations in large urban centers are important factors influencing the cost of power units.

At the census of 1902 statistics of power consumption were presented for a group of 307 selected railways that did not buy or sell current. The corresponding group for 1907 contains only 176 companies. That the practice of buying and selling current was much more prevalent among electric railways in 1907 than in 1902 is brought out very clearly by the statistics for these groups of companies.

TABLE 21.—CAR MILEAGE, PASSENGERS, AND POWER CONSUMPTION OF ELECTRIC RAILWAYS THAT DID NOT BUY OR SELL CURRENT, BY GEOGRAPHIC DIVISIONS: 1907 AND 1902.

DIVISION.	Census.	Number of operating companies.	CAR MILEAGE.			Number of fare passengers.	Output of stations, kilowatt hours, total for year.	Kilowatt consumption per car mile.	Fare passengers per passenger-car mile.
			Total.	Passenger.	Express, freight, mail, etc.				
United States.....	1907	176	406,106,204	400,238,708	5,927,436	1,967,951,033	1,324,923,932	3.26	4.92
	1902	307	401,023,555	487,217,352	3,306,203	1,936,860,800	1,048,799,599	2.14	3.98
North Atlantic.....	1907	88	207,410,548	203,042,072	3,473,570	1,050,125,115	704,718,298	3.40	5.15
	1902	150	208,882,827	207,310,041	1,593,786	949,637,986	451,497,918	2.16	4.58
South Atlantic.....	1907	10	41,290,072	40,833,077	406,095	195,651,012	121,620,542	2.95	3.70
	1902	16	20,423,735	20,282,118	141,617	75,030,777	37,060,410	1.81	4.79
North Central.....	1907	54	116,782,065	115,260,536	1,513,159	531,197,580	393,231,060	3.37	4.61
	1902	108	108,255,033	106,306,315	1,838,718	688,207,660	464,298,005	2.34	3.51
South Central.....	1907	10	27,833,561	27,378,097	455,464	125,618,762	73,388,907	2.64	4.59
	1902	10	39,024,353	38,041,885	82,468	133,372,877	55,766,932	1.43	3.42
Western.....	1907	5	12,843,328	12,764,186	79,142	65,850,464	31,064,825	2.49	5.12
	1902	14	24,437,007	24,307,993	120,614	90,521,500	40,185,734	1.64	3.72

The chief interest in the above table centers in the kilowatt consumption per car mile and in the fare passengers per passenger-car mile. The range in kilowatt consumption per car mile for 1907 has been referred to in connection with Table 20. In 1902 the kilowatt consumption per car mile for railways that neither bought nor sold current ranged, for states comprising three or more companies, from a minimum of 0.72 for West Virginia to a maximum of 3.23 for Rhode Island. In every state having three or more companies of this class, with the exception of California and Connecticut, the kilowatt consumption per car mile increased, and the number of fare passengers per car mile also increased in all such states, with the exception of California, Indiana, Iowa, and

Massachusetts. The number of fare passengers per passenger-car mile, for states with at least three such companies in operation, varied in 1902 from a minimum of 2.28 in Wisconsin to a maximum of 4.99 in Pennsylvania, with an average for the United States of 3.98, whereas in 1907 the averages varied from a minimum of 2.20 in Indiana to a maximum of 5.32 in Maryland, with an average of 4.92 for all such companies. For the geographic divisions the highest consumption of current per car mile in 1907 was 3.40 for the North Atlantic division, and the lowest was 2.49 for the Western division. In 1902 the highest consumption (2.34) was reported for the North Central division and the lowest (1.43) for the South Central division. The rapid development of long inter-

urban lines and the more general use of larger cars tend to increase power consumption and are reflected in the increased average kilowatt consumption per car mile.

Substation equipment.—Substation equipment was shown for 105 companies in 1902 and for 312 companies in 1907. The units reported consist of rotary converters, motor-generator sets, and similar machines; transformers; storage batteries; and miscellaneous machines, the latter comprising boosters, potential regulators, etc. The number and capacity of the various items of substation apparatus reported at the two censuses is shown in Tables 13 and 22. The increase in the substation equipment has been in general harmony with the increase in the equipment of the generating plants, but a much larger proportion of the companies reported substations in 1907 than in 1902. During the five years between 1902 and 1907 transformers and rotary converters, the most important machines in use in substations, increased very largely—transformers, 296.4 per cent in number and 438.5 per cent in capacity, and rotaries, 352.2 per cent in number and 507.4 per cent in capacity.

The miscellaneous machines in substations aggregated 81 in number, with 9,297 kilowatt capacity, in 1907 as compared with 40 such machines, with 4,651 kilowatt capacity, in 1902. There were reported under this head in 1907, 3 frequency changers, of 4,750 kilowatts; 12 potential regulators, of 197 kilowatts; 36 boosters, including boosters for storage batteries, of 3,111 kilowatts; and 30 other machines—induction motors, constant-current generators, exciter generators, arc machines, and test-battery cells—of 1,239 kilowatt capacity.

Total auxiliary electrical equipment.—A consolidation of auxiliary equipment in main power plants and in substations is necessary to show the total number and capacity of the machines employed in the manipulation of current, as the distinction between power-plant equipment and substation equipment has not in all cases been strictly observed by companies in reporting their equipment. Table 22 shows the total auxiliary electrical equipment in use in 1907 and 1902.

TABLE 22.—AUXILIARY ELECTRICAL EQUIPMENT IN MAIN POWER PLANTS AND SUBSTATIONS: 1907 AND 1902.

	TRANSFORMERS.		STORAGE-BATTERY CELLS.		BOOSTERS FOR OUTSIDE FEEDERS.		AUXILIARY GENERATORS.		ROTARIES AND MOTOR-GENERATOR SETS.	
	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902
Total number.....	5,274	1 1,057	63,094	40,477	134	2 104	311	3 71	1,862	4 441
Kilowatt capacity.....	1,133,161	212,560	.....	.....	17,046	13,660	19,152	3,763	942,232	100,053
In main power plants:										
Number.....	1,003	1 731	16,480	18,437	134	2 104	311	3 71	243	83
Kilowatt capacity.....	243,467	47,361	.....	.....	17,046	13,660	19,152	3,763	96,246	20,784
In substations:										
Number.....	3,671	1 026	47,205	22,040	.....	.....	.....	.....	1,610	358
Kilowatt capacity.....	889,704	165,208	.....	.....	.....	.....	.....	.....	845,986	139,269

	MISCELLANEOUS MACHINES.		ELECTRIC MOTORS USED IN PLANT OR SUBSTATION FOR MISCELLANEOUS WORK.		PER CENT OF INCREASE.						
	1907	1902	1907	1902	Trans-formers.	Storage-battery cells.	Boosters for outside feeders.	Auxiliary generators.	Rotaries and motor-generator sets.	Miscellaneous machines.	Electric motors.
Total number.....	81	5 40	2,168	518	218.3	57.4	28.8	338.0	322.2	102.5	318.5
Kilowatt capacity.....	9,297	4,651	6 50,777	6 15,154	433.1	.....	24.7	400.0	488.7	99.0	236.1
In main power plants:											
Number.....	.....	.....	2,168	518	110.3	7 10.6	28.8	338.0	192.8	.....	318.5
Kilowatt capacity.....	.....	.....	6 50,777	6 15,154	414.0	.....	24.7	400.0	363.1	.....	236.1
In substations:											
Number.....	81	5 40	.....	.....	296.4	114.2	.....	.....	352.2	102.5	.....
Kilowatt capacity.....	9,297	4,651	.....	.....	438.5	.....	.....	.....	507.4	99.0	.....

1 Exclusive of 23 transformers (9 in main power plants and 14 in substations) for which capacity was not reported.
 2 Exclusive of 3 boosters for which capacity was not reported.
 3 Exclusive of 1 auxiliary generator for which capacity was not reported.
 4 Exclusive of 8 rotary converters for which capacity was not reported.
 5 Exclusive of 3 miscellaneous machines for which capacity was not reported.
 6 Horsepower.
 7 Decrease.

In 1907, 21.5 per cent of the kilowatt capacity of the transformers was reported as in main power plants and 78.5 per cent in substations, as compared with 22.3 per cent in power plants and 77.7 per cent in substations in 1902. Of the storage-battery cells, 25.9 per cent was credited to power plants and 74.1 per cent to substations in 1907, as compared with 45.5

per cent in power plants and 54.5 per cent in substations in 1902. In the case of the rotaries, 10.2 per cent of the kilowatt capacity was in power plants and 89.8 per cent in substations in 1907, as compared with 13 per cent in power plants and 87 per cent in substations in 1902.

CHAPTER IV.

TRACK AND ROLLING STOCK.

The statistics in Tables 183 to 187 show all important features concerning the physical equipment of each company. They cover not only the power plants and substations discussed in Chapter III, but the line and track construction and appurtenances, and cars. The track, roadbed, and cars are the features of equipment most closely associated with the comfort of the passengers, and the information concerning them presented in this chapter may well be considered in connection with the statistics of traffic presented in Chapter V.

TRACK AND TRACK EQUIPMENT.

The track reported as operated by the companies embraced in the census of street and electric railways includes not only the first and second main tracks but also sidings, turn-outs, and track in car barns, storage yards, etc. The length of these various kinds of track, expressed in single-track miles, amounted to 34,403.56 miles in 1907 as compared with 22,576.99 miles in 1902, an increase of 11,826.57 miles, or 52.4 per cent, between the two censuses.

TABLE 23.—Track—Character and length: 1907 and 1902.

CHARACTER.	LENGTH IN MILES.		Per cent of Increase.	PER CENT OF TOTAL.	
	1907	1902		1907	1902
Total.....	34,403.56	22,576.99	52.4	100.0	100.0
First main track.....	25,547.19	16,045.34	53.5	74.3	73.7
Second main track.....	6,938.68	5,024.12	38.1	20.2	22.3
Sidings and turn-outs.....	1,917.69	907.53	111.3	5.6	4.0
Electric power, total.....	34,059.69	21,901.53	55.5	99.0	97.0
Electric-line transmission.....	34,034.19	21,899.06	55.4	98.0	97.0
Overhead trolley.....	32,501.71	21,290.09	52.7	94.5	94.3
Conduit trolley.....	322.70	206.06	21.3	0.9	1.2
Third rail.....	1,209.78	342.91	252.8	3.5	1.5
Gas-electric motors.....	22.50	.....	.....	0.1	.....
Storage batteries.....	3.00	2.47	21.5	(*)	(*)
Animal.....	130.11	259.10	47.5	0.4	1.1
Cable.....	61.71	240.69	174.4	0.2	1.1
Compressed air.....	.....	6.06	100.0	.....	(*)
Gasoline motors.....	40.99	.....	.....	0.1	.....
Steam.....	105.06	169.61	438.1	0.3	0.8
Track owned.....	27,480.65	19,025.85	44.4	79.9	84.3
Track leased.....	6,922.91	3,551.14	94.9	20.1	15.7
Operated under trackage rights... Constructed and opened for operation during the year.....	908.31	560.92	78.0	2.0	2.5
On private right of way owned by company.....	1,820.06	1,549.73	17.4	5.3	6.9
On private right of way not owned by company.....	10,230.57	3,424.06	198.7	29.7	15.2
Within city limits.....	741.27	377.11	96.6	2.2	1.7
Outside city limits.....	17,487.21	13,208.24	.....	.....	.....
Equipped with cast-welded joints.....	13,208.24	6,855.58	.....	.....	.....
	(7)	1,642.68	.....	.....	7.3

1 Exclusive of 12.48 miles of duplicated track.
 2 Exclusive of 6.24 miles of duplicated track.
 3 Less than one-tenth of 1 per cent.
 4 Decrease.
 5 Exclusive of the mileage of Connecticut and Massachusetts.
 6 Exclusive of the mileage of Massachusetts.
 7 Not reported.

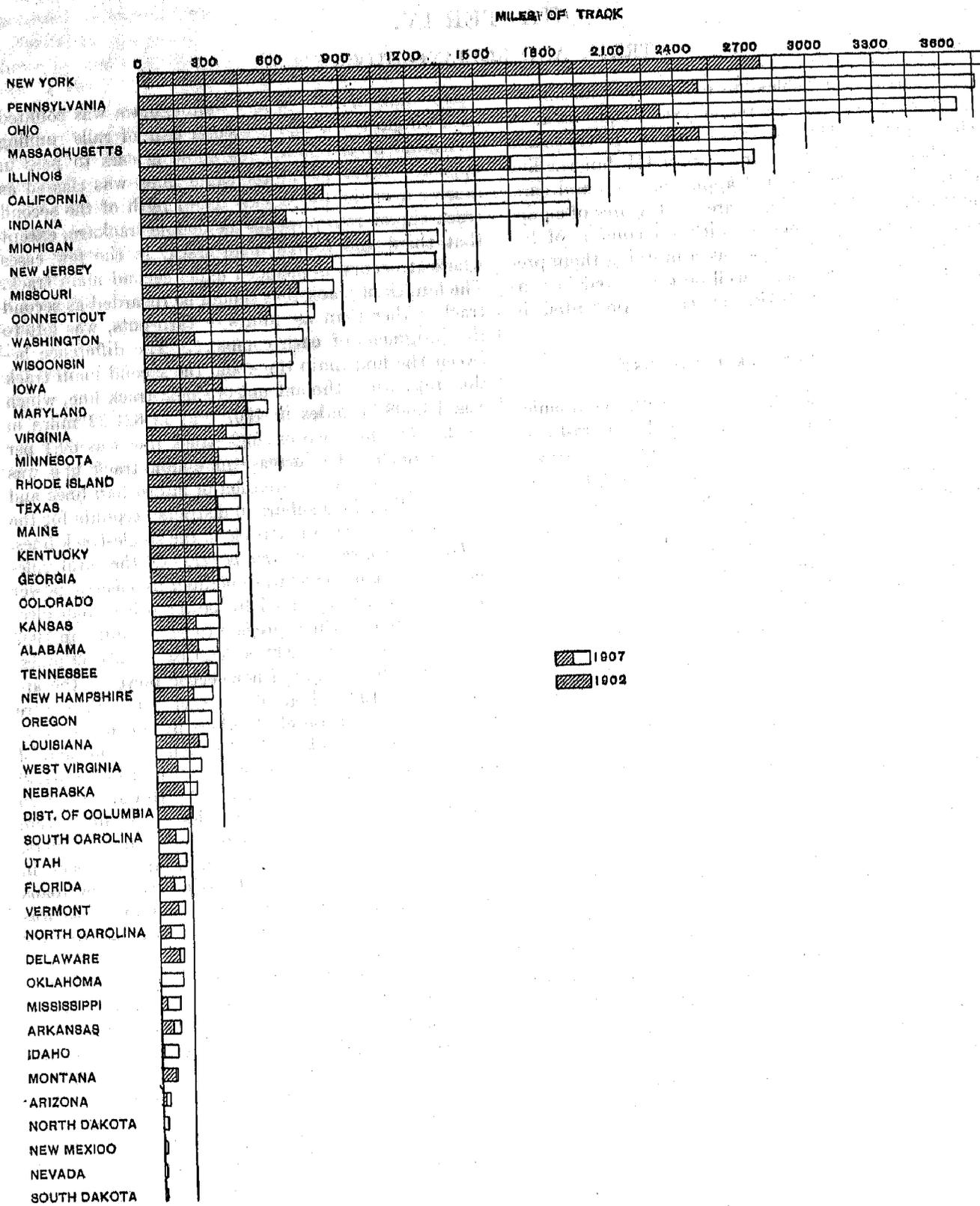
One pair of rails in any thoroughfare was counted as a single track and a second pair of rails running alongside of the first, thus allowing cars to pass in opposite directions at the same time, was classed as a second or double track. The length of the second track therefore represents the double trackage, except that third and fourth main track, in the few cases where it occurs, is included under second main track. The length of track that should be regarded as second track rather than as sidings or turn-outs, was left to the judgment of each company. The difference between the first main track and the second main track thus represents the amount of single-track line, which was 18,608.51 miles in 1907 and 11,621.22 miles in 1902. The increase in single-track line was 60.1 per cent, whereas the increase in double-track line was 38.1 per cent. The extension of interurban lines and of urban lines into suburban districts accounts for the greater percentage of increase in the single-track lines.

Track operated by electric power.—Of the total mileage, all but 1 per cent was operated by electric power in 1907. Track operated by power other than electric amounted in the aggregate to 343.87 miles in 1907 and 675.46 miles in 1902, a decrease of 331.59 miles. An interesting feature of nonelectric power is the appearance in 1907 of gasoline-motor cars which were used to the exclusion of all others by 5 companies on 40.99 miles of track. The location and mileage of these companies were as follows: 2 in Illinois, 34.49 miles; 1 in Kansas, 3 miles; 1 in North Carolina, 1.25 miles; and 1 in Texas, 2.25 miles. The lines were equipped with 13 gasoline-motor cars and 19 trailers. It should be explained, however, that the roads in Illinois, Kansas, and North Carolina were new roads that were to be electrified, while the 1 in Texas was connected with a summer resort and was operated for only a portion of the year.

The 22.50 miles of track operated with gas-electric motors in 1907 were reported by 1 company in Kansas, equipped with 3 motor cars and 6 trailers. Each motor car was equipped with gasoline engine, dynamo, storage battery of 112 cells, and 2 motors. The 2 companies that used storage batteries in 1902 on 2.47 miles of track were located, 1 in Chicago, Ill., and 1 in New York City. By 1907 the road of the latter company had been changed to a conduit electric road, while the company in Illinois had increased its track to 3 miles and was still using storage batteries to operate its cars. The use of compressed air, reported in 1902 as a motive power, was abandoned before 1907.

DIAGRAM 1.—MILES OF TRACK, BY STATES AND TERRITORIES: 1907 AND 1902.

[Based upon net trackage in each state.]



The overhead trolley, conduit trolley, and third rail are the only methods of electric contact that were reported, and they cover all electric-trackage systems in use in 1907, with the exception of those operated by gas-electric motors and storage batteries. The comparative statistics for the track operated by these different methods are shown in Table 24.

TABLE 24.—Electric track—Number of companies and miles of track, by kind of system: 1907 and 1902.

KIND OF SYSTEM.	NUMBER OF OPERATING COMPANIES REPORTING.		MILES OF TRACK.			
	1907	1902	1907	1902	Per cent of total.	
					1907	1902
Total electric.....	904	747	34,059.69	21,901.53	100.0	100.0
Overhead trolley.....	895	736	32,501.71	21,290.09	95.4	97.2
Conduit trolley.....	10	11	322.70	266.06	0.9	1.2
Third rail.....	23	11	1,206.78	342.91	3.6	1.6
Gas-electric motors.....	1	.....	23.50	.....	0.1	.....
Storage batteries.....	1	2	3.00	2.47	(²)	(²)

¹ Exclusive of 12.48 miles of duplicated track.
² Less than one-tenth of 1 per cent.

While the proportion of electric trackage operated by overhead trolley was not so large in 1907 as in 1902, the system was practically in universal use at both census periods.

Conduit trolley, the most expensive type of electric-traction construction, is in use only where municipal regulations prohibit the use of overhead trolley. The conduit-trolley trackage of the 11 companies in 1902 was distributed as follows: 178.89 miles in New York City, operated by 4 companies; 86.88 miles in the District of Columbia, operated by 6 companies (of which 1 was a Virginia company); and 0.29 mile in Bay City, Mich., operated by 1 company. The census of 1907 shows 226.56 miles of conduit trolley operated by 3 companies in the city of New York, and 96.14 miles operated by 7 companies in the District of Columbia, including 3.28 miles belonging to 2 companies operating chiefly in Virginia.

Although the third-rail system was in operation on more than three and one-half times as great a trackage in 1907 as in 1902, its use is still limited largely to elevated structures and tracks on private right of way, and consequently the mileage for this system is small. But the rapid increase in "third-rail" mileage between 1902 and 1907 gives special interest to the detailed comparative statistics, as presented in Table 25.

Though there were 23 companies using this form of line transmission in 1907, only 4—the Northwestern Elevated, and Metropolitan West Side Elevated, in Illinois; the Interborough Rapid Transit, N. Y.; and the Wilkes-Barre and Hazleton, Pa.—used it on their entire trackage. In 1902, also, only 4 of the 11 companies then using the "third rail" reported its use to

the exclusion of all other kinds, these companies being the New York, New Haven and Hartford Railroad (Berlin system) in Connecticut, and the Northwestern Elevated, South Side Elevated, and Metropolitan West Side Elevated, in Illinois.

TABLE 25.—Third-rail track, by states and companies: 1907 and 1902.

STATE AND COMPANY.	MILES.	
	1907	1902
United States.....	1,209.73	342.91
California, total.....	114.70	.....
Northern Electric Ry.....	102.74	.....
Central California Traction.....	11.96	.....
Connecticut, total.....	.....	25.89
New York, New Haven and Hartford R. R. (Berlin system, steam road in 1907).....	.....	25.89
Illinois, total.....	213.44	108.70
Northwestern Elevated R. R.....	29.57	30.37
South Side Elevated R. R.....	37.27	21.08
Metropolitan West Side Elevated Ry.....	44.92	39.34
Chicago and Oak Park Elevated R. R. (Lake Street Elevated in 1902).....	16.18	17.07
Aurora, Elgin and Chicago R. R.....	85.50	.....
Massachusetts, total.....	19.10	41.45
Boston Elevated Ry.....	19.10	16.02
New York, New Haven and Hartford R. R. (Nantasket division).....	.....	25.43
Michigan, total.....	81.13	36.03
Grand Rapids, Grand Haven and Muskegon Ry.....	37.13	36.03
Michigan United Rys.....	44.00	.....
New Jersey, total.....	132.46	.....
Atlantic City and Shore R. R.....	1.50	.....
West Jersey and Seashore R. R. (Camden and Atlantic City branch).....	130.95	.....
New York, total.....	415.86	130.16
Albany and Hudson R. R.....	37.25	39.78
Keeseville, Adirondack Chasm and Lake Champlain R. R.....	5.22	.....
Interborough Rapid Transit (Manhattan Ry., elevated, in 1902).....	100.63	40.00
Brooklyn Union Elevated R. R. (Brooklyn Rapid Transit in 1902).....	76.04	50.40
Oneida Ry.....	106.82	.....
Ohio, total.....	71.10	.....
Soloto Valley Traction.....	71.10	.....
Pennsylvania, total.....	111.50	.....
Wilkes-Barre and Hazleton Ry.....	29.89	.....
Philadelphia Rapid Transit.....	12.45	.....
Philadelphia and Western Ry.....	22.89	.....
Lackawanna and Wyoming Valley R. R.....	46.30	.....
Washington, total.....	50.41	.....
Pugot Sound Electric Ry.....	50.41	.....

Surface, elevated, and subway trackage.—Of the 34,403.56 miles of track reported for 1907, 33,966.40 miles, or 98.7 per cent, was surface trackage; 350.05 miles, or 1 per cent, elevated; and 87.11 miles, or three-tenths of 1 per cent, in subways and tunnels. At the census of 1902 the schedule of inquiry did not call for the subdivision of the trackage into the above groups, and the comparisons with that census are therefore necessarily limited. While it is not possible to determine the underground mileage in 1902, as only the length of tunnels was reported, it is possible to determine the approximate length of track carried on elevated structures. The following statement shows

the amount of such track in the various states in 1907 and in 1902:

Elevated track: 1907 and 1902.

STATE.	MILES.		Per cent of increase.
	1907	1902	
Total.....	350.05	308.94	13.3
Illinois.....	125.77	107.96	16.5
Maryland.....	1.40		
Massachusetts.....	16.70	16.02	4.2
Missouri.....	3.18		
New Jersey.....	7.26		
New York.....	183.07	184.90	1.7
Pennsylvania.....	7.67		

Elevated track in 1907 was reported by 12 companies, of which only 2 operated elevated roads exclusively, 6 operated elevated and surface tracks, 1 operated elevated and subway tracks, and 3 operated elevated, surface, and subway tracks.

In 1907 the 28.98 miles of subways and tunnels were laid with 87.11 miles of track.

Track in subways and tunnels: 1907.

	Miles.
Total.....	87.11
Illinois.....	.60
Massachusetts.....	7.75
Missouri.....	.42
New York.....	72.72
Pennsylvania.....	5.62

The trackage in subways and tunnels in 1907 was operated by 9 companies. The New York City Subway, with 72.48 miles of track, though operated as a distinct property, was reported to the Census Bureau in connection with elevated lines. The remainder of the subway trackage was operated by 3 companies that also operated surface and elevated tracks and 5 companies that operated small amounts of subway track in connection with their regular surface tracks.

Ownership of track.—The track statistics are compiled from the reports of the operating companies. The miles of track reported as owned by operating companies increased 8,454.80 miles, or 44.4 per cent, from 1902 to 1907. The trackage of lessor companies, shown separately in Table 183, is included as leased track in the total for operating companies. The leased trackage, shown in Table 184, includes not only the track of lessor companies, but all track that was operated under lease from steam railroads, bridge companies, etc., and it may or may not represent the entire trackage of either the operating or the lessor company. In obtaining the total miles of track for all companies, the trackage operated under trackage rights is included only in the report of the owning company, thus avoiding any duplication.

There has been a large increase in the leased trackage, which constituted 20.1 per cent of the miles of track

operated in 1907, as against 15.7 per cent in 1902. The miles of track operated under lease almost doubled during the census period, while the increase in total trackage was but a little over one-half.

The average length per lessor company of leased track, exclusive of track leased from steam railroads, etc., shows an increase from 20.58 miles in 1902 to 22.82 miles in 1907; while the average length of owned track per operating company increased from 23.29 miles to 29.08 miles, and the average length of all track per operating company, from 27.63 miles to 36.41 miles. The statistics for this subdivision of trackage are given in Table 26. In this table the states in which there was no leased track are grouped as "all other states" under the respective geographic divisions.

In 1902 the practice of operating trackage under a lease was confined to 14 states, and all but a few miles of the leased trackage was in 9 states. For 1907, however, leased trackage was reported in 25 states. The table shows a considerable shifting of owned and leased trackage for the two census years. In New Hampshire one-third of the trackage was under lease in 1902, while in 1907 the entire trackage was owned by operating companies. The change was caused by the failure of the operating company to fulfill its lease obligations, the operation of the properties reverting to the lessor companies. In Missouri almost one-half of the trackage was under lease in 1902 and but one-half of 1 per cent in 1907. Here the change was occasioned by the disappearance of the lessee and operating company of the St. Louis railways between 1902 and 1907. On the other hand, lessees operated nearly two-thirds of the track in Rhode Island, one-half of that in Louisiana, and four-tenths of that in Indiana in 1907, while in 1902 all the track in these states was reported as operated by the owners.

The bringing of several properties under one control or operating head, for economies of operating and for monopolistic purposes, is the strongest factor in the creation of lessee and lessor companies. But with the advent of the holding company in recent years these purposes are gained without any change being reflected in the statistics of track ownership. Thus, though several properties in Illinois, for example, were brought under one operating management and formed into one large continuous system, they were operated as separate units and reported to the Census Bureau as individual properties. State laws are also a factor in influencing the form of ownership and division of the properties. At the census of 1902 several properties in New York were reported in combination, which by 1907 had separated, in compliance with a court decision, and were reported as separate companies. The large proportion of leased track shown for Pennsylvania at both censuses is due largely to state laws which make corporate combination difficult.

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TABLE 26.—TRACK OWNED AND LEASED, RESPECTIVELY, BY OPERATING COMPANIES, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902.

STATE OR TERRITORY.	MILES.									
	Total.		Owned.		Leased.		Per cent of total.			
							Owned.		Leased.	
	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902
United States.....	34,403.50	22,576.00	27,480.65	19,025.85	6,922.91	3,551.14	79.9	84.3	20.1	15.7
North Atlantic division.....	13,713.37	10,164.89	9,461.77	7,597.72	4,251.60	2,567.17	69.0	74.7	31.0	25.3
Maine.....	424.00	331.55	424.00	328.08	.....	3.47	100.0	99.0	.....	1.0
New Hampshire.....	247.10	167.05	247.10	111.43	.....	55.22	100.0	66.5	.....	33.5
Massachusetts.....	2,880.85	2,625.65	2,339.88	2,040.41	.....	440.97	81.1	80.8	18.9	19.2
Rhode Island.....	419.92	328.90	446.97	328.90	.....	272.95	100.0	100.0	65.0	.....
Connecticut.....	781.15	578.49	563.34	543.00	.....	217.81	72.1	93.9	27.9	6.1
New York.....	3,884.74	2,809.91	2,877.14	2,287.25	1,007.60	522.66	74.1	81.4	25.9	18.6
New Jersey.....	1,324.12	861.28	926.00	623.37	.....	397.13	70.0	72.4	30.0	27.6
Pennsylvania.....	3,621.12	2,480.91	1,811.98	1,254.67	1,809.14	1,226.24	60.0	50.6	50.0	49.4
All other North Atlantic states ¹	124.31	80.55	124.31	80.55	.....	.....	100.0	100.0	.....	.....
South Atlantic division.....	2,300.73	1,670.15	2,186.31	1,660.47	114.42	9.68	95.0	90.4	5.0	0.6
Delaware.....	95.93	85.61	84.32	85.61	11.61	.....	87.9	100.0	12.1	.....
Maryland.....	536.18	437.84	525.76	431.92	10.42	5.92	98.1	98.6	1.9	1.4
Virginia.....	515.54	359.30	456.30	355.79	59.24	3.51	88.5	99.0	11.5	1.0
West Virginia.....	266.41	140.00	256.22	140.00	11.19	.....	95.8	100.0	4.2	.....
North Carolina.....	100.94	46.32	85.98	46.07	20.96	.....	80.4	99.5	19.6	0.5
Florida.....	118.26	61.75	117.26	61.75	1.00	.....	99.2	100.0	0.8	.....
All other South Atlantic states ¹	661.47	539.33	661.47	539.33	.....	.....	100.0	100.0	.....	.....
North Central division.....	12,850.53	7,815.32	10,455.55	6,842.58	2,394.98	972.74	81.4	87.6	13.6	12.4
Ohio.....	3,767.10	2,353.43	2,718.08	2,101.21	1,049.02	262.22	72.2	89.3	27.8	10.7
Indiana.....	1,932.03	646.66	1,159.68	646.66	773.25	.....	60.0	100.0	40.0	.....
Illinois.....	2,776.46	1,635.20	2,302.95	1,275.57	473.61	356.63	82.9	78.0	17.1	22.0
Iowa.....	639.84	378.25	578.62	378.25	61.22	.....	90.4	100.0	9.6	.....
Missouri.....	921.07	798.38	917.07	397.49	4.60	360.89	99.5	52.4	0.5	47.6
Nebraska.....	218.73	113.66	186.35	113.66	32.38	.....	85.2	100.0	14.8	.....
Kansas.....	249.88	150.26	248.88	150.26	1.00	.....	99.6	100.0	0.4	.....
All other North Central states ¹	2,343.92	1,779.48	2,343.92	1,779.48	.....	.....	100.0	100.0	.....	.....
South Central division.....	1,905.01	1,322.45	1,782.36	1,322.45	123.55	.....	93.5	100.0	6.5	.....
Kentucky.....	339.13	233.95	335.36	233.95	3.77	.....	99.0	100.0	1.0	.....
Alabama.....	291.66	204.72	291.16	204.72	.50	.....	99.8	100.0	0.2	.....
Louisiana.....	238.52	198.52	116.24	198.52	119.28	.....	50.0	100.0	50.0	.....
All other South Central states ²	936.60	685.26	936.60	685.26	.....	.....	100.0	100.0	.....	.....
Western division.....	3,633.02	1,004.18	3,694.66	1,602.63	38.36	1.55	93.9	90.9	1.1	0.1
Colorado.....	317.37	234.53	317.37	232.98	.....	1.55	100.0	99.8	.....	0.7
Utah.....	122.54	89.04	114.79	89.04	7.75	.....	93.7	100.0	6.3	.....
Washington.....	764.73	228.93	744.80	228.93	19.93	.....	97.4	100.0	2.6	.....
California.....	2,013.49	829.10	2,002.81	829.10	10.68	.....	99.5	100.0	0.5	.....
All other Western states and territories ³	414.89	222.58	414.89	222.58	.....	.....	100.0	100.0	.....	.....

¹ Exclusive of 12.48 miles of duplicated track.

² Includes Vermont.

³ Includes states as follows: District of Columbia, Georgia, South Carolina.

⁴ Includes states as follows: 1907—Michigan, Minnesota, North Dakota, South Dakota, Wisconsin; 1902—Michigan, Minnesota, South Dakota, Wisconsin.

⁵ Includes states as follows: 1907—Arkansas, Mississippi, Oklahoma, Tennessee, Texas; 1902—Arkansas, Mississippi, Tennessee, Texas.

⁶ Includes states and territories as follows: 1907—Arizona, Idaho, Montana, Nevada, New Mexico, Oregon; 1902—Arizona, Idaho, Montana, New Mexico, Oregon.

Trackage rights.—The track operated under trackage rights, as it is presented in the census tables, should always be regarded as a duplication of the total owned and leased track, in arriving at the total miles of track for all companies. In determining the total track operated for each individual company, however, it is necessary to include the track operated under trackage rights as well as the track owned and leased by the company; otherwise the traffic deductions based upon trackage of the individual companies would not be correct. At the census of 1902 the total miles of track reported as operated under trackage rights was 560.92, which increased to 998.31 miles in 1907, the rate of increase being 78 per cent. Though the proportion underwent a great increase, it is still small as compared with the aggregate amount of owned and leased trackage.

In localities where one company enjoys an exclusive franchise, it is impossible for another to gain entrance,

except by some form of trackage-rights agreement. Interurban lines more often gain their terminal facilities by operating over the tracks of the urban companies than by constructing and owning their own lines within the urban centers. There are several different methods of agreement between companies, but probably the two most common are trackage rights and contract arrangements. In the first case the company that owns the cars counts the car miles and the fare passengers and on this basis pays at a stipulated rate to the company owning the tracks. In the second case the company owning the tracks takes the cars of the other company, at least nominally, and operates them; records the car miles and fare passengers; and collects all fares and pays the expenses during the time the cars are operated for the other company, the net receipts being divided between the two companies upon an agreed basis.

Companies operating track under trackage rights

report to the census the length of track so operated, and show, in the operating-expense account, the amount paid for the use of such track, while with the contract arrangement no track is shown as operated under trackage rights, and no payment is reported for the use of tracks. It is not unusual for through cars of interurban lines to make a considerable mileage, under the contract arrangement, on tracks of other companies. In designating the cities in which the companies operated, it is sometimes necessary for the census to treat a company as operating in cities for which no track appeared in that company's report. Where the discrepancies in the length of track owned and in the number of cities in which the through cars were operated were great, a footnote of explanation was appended to the column presenting the figures for operated track of Table 183, the footnote reading as follows: "Cars operated by another company at terminus (or termini) of road owned."

Interurban roads entering Indianapolis, Ind., and Toledo, Ohio, have trackage-rights agreements with the local railway companies for track and terminal facilities in the cities, and their reports, as indicated above, show the amount of track operated under trackage rights and the amount paid for its use. In Cleveland, Ohio, Washington, D. C., Providence, R. I., and Manchester, N. H., cars were operated by some companies over the tracks of other companies under the contract arrangement, and no trackage-rights track or expenses for use of track were reported by the companies owning the cars. There are probably other cases of this sort that were not disclosed by the census reports.

Track constructed and opened for operation during the year.—The increase in trackage is due, of course, to the creation of new properties or the extension of existing systems. The census did not attempt to ascertain what proportion of the increase in mileage was due to each of these causes, or to apportion the increase between the censuses by years. During the year 1907, however, the new construction amounted to 1,820.06 miles, and during 1902 to 1,549.73 miles.¹ It should be understood that these figures do not represent the mileage constructed entirely within the census years, but rather the new mileage opened for operation during these periods; a large proportion of such mileage, however, was constructed entirely within the census years. The statistics for such mileage, with the percentages of increase, are shown in Table 27.

The states showing the greatest amount of new track in 1907 were California, Illinois, New York, Indiana, Washington, and Pennsylvania, in the order named; while in 1902 the ranking states were Ohio, Pennsylvania, Massachusetts, New York, California, and Illinois. Of these ranking states, those showing

the highest proportion of new track in 1907 were Washington, with 21.8 per cent, and California, with 10.2 per cent, and in 1902, Ohio, with 13.8 per cent, and California, with 10.1 per cent.

TABLE 27.—Track constructed and opened for operation during the year, by states and geographic divisions: 1907 and 1902.

STATE OR TERRITORY.	MILES.		PER CENT OF TOTAL TRackage.	
	1907	1902	1907	1902
United States.....	1,820.06	1,549.73	5.3	6.9
North Atlantic division.....	459.26	680.39	3.3	6.5
Maine.....	3.58	33.00	0.8	10.1
New Hampshire.....	24.43	5.00	9.9	3.3
Vermont.....	11.26	10.96	9.1	13.6
Massachusetts.....	27.53	102.31	1.0	6.4
Rhode Island.....	5.75	38.07	1.4	11.6
Connecticut.....	24.52	10.75	3.1	2.9
New York.....	184.12	136.87	4.7	4.9
New Jersey.....	31.78	40.47	2.4	4.7
Pennsylvania.....	146.24	215.82	4.0	8.7
South Atlantic division.....	106.10	92.90	4.6	5.6
Delaware.....	.86	21.25	0.9	24.8
Maryland.....	12.74	8.24	2.4	1.9
District of Columbia.....		5.98		3.5
Virginia.....	34.23	17.16	6.6	4.8
West Virginia.....	7.75	24.75	2.9	17.7
North Carolina.....	12.15	1.87	11.4	4.0
South Carolina.....	12.20	6.50	9.9	8.4
Georgia.....	10.90	6.20	3.1	2.1
Florida.....	15.27	1.25	12.9	2.0
North Central division.....	712.78	577.73	5.5	7.4
Ohio.....	99.65	324.70	2.6	13.8
Indiana.....	172.88	67.88	8.9	10.5
Illinois.....	196.05	82.74	7.1	5.1
Michigan.....	10.55	18.45	0.8	1.6
Wisconsin.....	85.85	17.32	14.6	4.2
Minnesota.....	7.83		17.1	
Iowa.....	59.97	47.32	9.4	12.5
Missouri.....	11.97	17.73	1.3	2.3
South Dakota.....	5.00		100.0	
Nebraska.....	27.83	3.00	12.7	2.6
Kansas.....	35.20	.50	14.1	0.4
South Central division.....	119.22	106.36	6.3	8.0
Kentucky.....	29.88	23.00	7.7	8.1
Tennessee.....	12.25	13.07	4.1	5.1
Alabama.....	11.25	4.50	3.9	2.2
Mississippi.....	.06	4.52	0.1	17.9
Louisiana.....	8.93	4.07	3.7	2.1
Arkansas.....	3.60	2.75	4.0	5.2
Oklahoma.....	28.53		28.4	
Texas.....	24.73	54.45	6.0	18.0
Western division.....	422.70	112.35	11.6	7.0
Montana.....	4.80	1.10	6.9	1.7
Colorado.....	19.18	7.97	6.0	3.4
New Mexico.....	1.50		14.9	
Utah.....	5.89	1.00	4.8	1.1
Nevada.....	.20		2.8	
Washington.....	167.08	12.04	21.8	5.3
Oregon.....	18.28	6.65	7.2	4.9
California.....	205.77	83.59	10.2	10.1

Of the states that showed relatively large amounts of new track in 1902, the largest percentage of increase in new track was 154.7 for Indiana, followed by California, with 146.2 per cent, and Illinois, with 136.9 per cent. In 1902 the new trackage constituted the largest per cent ratio (8 per cent) to the total trackage of the divisions in the South Central states, but by 1907 the greatest proportionate development for the year was in the Western states, the new trackage in those states forming 11.6 per cent of their total trackage.

Track on private right of way.—By far the larger proportion of street and electric track is on streets or

¹ For statistics of railways under construction in 1907, see p. 27.

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public thoroughfares, but the interurban companies frequently own their right of way or have obtained the privilege of operating track on private ways, and hence, in districts where interurban lines have been extensively

developed, a considerable portion of the track is on private right of way. Comparative statistics for track-age according to the ownership of the right of way are given in Table 28.

TABLE 28.—TRACK ON PUBLIC THOROUGHFARES AND PRIVATE RIGHT OF WAY, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902.

STATE OR TERRITORY.	MILES.															
	Total.		On public thoroughfares.				On private right of way.						Per cent of total.			
							Total.		Owned by company.		Not owned by company.		On public thoroughfares.		On private right of way.	
	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902		
United States.....	34,403.60	122,576.99	23,431.72	118,774.92	10,971.84	3,802.07	10,230.57	3,424.96	741.27	377.11	68.1	83.2	31.9	16.8		
North Atlantic division.....	13,713.37	10,164.89	10,396.23	8,855.05	3,317.14	1,309.84	2,848.20	1,125.10	408.94	184.74	75.8	87.1	24.2	12.9		
Maine.....	424.00	331.55	356.27	361.27	67.79	30.28	66.48	29.61	1.31	.67	84.0	90.9	18.0	9.1		
New Hampshire.....	247.10	167.65	196.34	193.10	50.70	4.55	50.70	4.48	.07	.07	79.5	97.3	20.5	2.7		
Vermont.....	124.31	80.55	80.67	72.70	37.64	7.79	37.28	7.42	.36	.37	90.7	90.8	30.8	9.7		
Massachusetts.....	2,886.85	2,525.65	2,022.61	2,347.90	204.24	177.75	245.11	126.99	10.13	51.66	90.8	93.0	9.2	7.0		
Rhode Island.....	419.92	328.90	312.67	256.01	107.25	72.89	104.81	72.69	2.44	.30	74.5	77.8	25.5	22.2		
Connecticut.....	781.15	578.49	737.50	505.93	43.65	72.50	38.65	72.50	5.00	.00	94.4	87.5	5.0	12.5		
New York.....	3,884.74	2,809.91	2,083.40	2,402.05	1,201.23	407.20	975.10	373.05	226.12	34.21	69.1	85.5	30.9	14.5		
New Jersey.....	1,324.12	861.28	921.35	703.15	402.77	98.13	402.31	97.04	.46	1.09	69.6	88.6	30.4	11.4		
Pennsylvania.....	3,021.12	2,480.91	2,479.36	2,042.28	1,141.76	438.63	927.64	342.20	214.12	96.37	68.5	82.3	31.5	17.7		
South Atlantic division.....	2,300.73	1,670.15	1,544.88	1,221.12	756.35	449.03	714.78	378.78	41.57	70.25	67.1	73.1	32.9	26.9		
Delaware.....	95.93	85.61	71.19	58.31	24.74	27.30	20.74	24.17	4.00	3.13	74.2	68.1	25.8	31.9		
Maryland.....	530.18	437.84	306.25	223.02	229.93	214.82	228.18	103.95	1.75	51.47	67.1	50.9	42.9	40.1		
District of Columbia.....	178.03	161.97	138.34	126.16	37.09	30.81	37.09	30.81	.00	.00	78.0	77.3	21.4	22.7		
Virginia.....	515.64	369.30	280.85	276.72	228.69	83.58	218.71	80.83	0.08	2.75	65.0	76.7	44.4	23.3		
West Virginia.....	268.41	140.00	223.26	110.70	48.15	23.90	40.15	22.20	3.00	1.10	83.8	83.4	16.2	16.0		
North Carolina.....	100.94	46.32	79.93	35.59	27.01	10.73	23.70	4.74	3.25	5.99	74.7	76.8	25.3	23.2		
South Carolina.....	131.26	76.98	73.06	58.85	58.20	13.13	56.57	15.70	1.63	2.48	55.7	76.4	44.3	23.6		
Georgia.....	354.18	300.38	279.40	260.39	74.73	33.99	73.78	30.94	1.00	3.05	78.9	88.7	21.1	11.3		
Florida.....	118.20	61.75	86.10	61.38	32.10	.87	15.20	.04	16.99	.33	72.8	90.4	27.2	0.0		
North Central division.....	12,850.53	7,815.32	7,567.96	6,158.72	5,282.57	1,650.90	5,150.34	1,568.54	132.23	93.06	58.9	78.8	41.1	21.2		
Ohio.....	3,767.10	2,353.43	2,109.88	1,716.96	1,657.22	636.47	1,017.61	632.12	39.61	4.35	56.0	73.0	44.0	27.0		
Indiana.....	1,932.93	646.66	636.99	408.74	1,295.94	177.92	1,270.40	150.03	19.43	27.29	63.0	72.5	67.0	27.5		
Illinois.....	2,770.46	1,635.20	1,727.16	1,420.83	1,049.30	214.37	1,039.49	191.29	9.81	23.08	62.2	80.9	37.8	13.1		
Michigan.....	1,275.03	1,022.81	831.86	700.93	443.17	321.88	423.73	301.01	19.44	20.27	65.2	68.5	34.8	31.6		
Wisconsin.....	590.95	416.50	415.05	347.95	174.70	63.55	174.45	57.10	.25	11.39	70.4	83.5	20.6	10.5		
Minnesota.....	467.15	338.17	401.21	324.59	55.94	13.58	55.94	13.11	.00	.47	87.8	96.0	12.2	4.0		
Iowa.....	639.84	378.25	331.32	298.78	308.52	79.47	271.75	77.40	30.77	2.07	61.8	79.0	48.2	21.0		
Missouri.....	921.67	758.38	744.63	629.51	177.04	128.87	173.31	125.56	3.73	3.31	80.8	83.0	19.2	17.0		
North Dakota.....	16.09	.00	16.09	.00	.00	.00	.00	.00	.00	.00	100.0	100.0	.00	.00		
South Dakota.....	5.00	2.00	5.00	2.00	.00	.00	.00	.00	.00	.00	100.0	100.0	.00	.00		
Nebraska.....	218.73	113.66	195.66	111.33	23.07	2.33	21.58	2.33	1.49	.89	89.5	95.0	10.5	2.0		
Kansas.....	249.88	159.23	152.21	137.10	97.07	13.16	96.02	12.33	1.05	.83	60.9	91.2	30.1	8.8		
South Central division.....	1,905.91	1,322.45	1,560.90	1,142.74	345.01	179.71	333.11	169.32	11.00	10.39	81.0	86.4	18.1	13.6		
Kentucky.....	389.13	283.95	269.64	253.53	119.40	30.42	116.49	30.17	.25	.25	69.3	89.3	30.7	10.7		
Tennessee.....	297.50	254.20	273.80	235.04	23.70	19.16	23.30	13.13	.40	6.93	92.0	92.5	8.0	7.5		
Alabama.....	291.06	204.72	194.56	134.39	97.10	70.33	96.10	70.08	1.00	.25	66.7	65.0	33.3	34.4		
Mississippi.....	86.40	25.30	79.90	24.50	6.44	7.74	6.08	.04	.70	.10	92.5	97.1	7.5	2.9		
Louisiana.....	238.52	198.52	226.64	193.06	11.88	4.50	11.88	4.56	.00	.00	95.0	97.7	5.0	2.3		
Arkansas.....	87.39	52.49	86.67	51.39	.72	1.10	.43	.50	.20	.00	99.2	97.9	0.8	2.1		
Oklahoma.....	100.44	.00	69.76	.00	30.68	.00	21.63	.00	.00	.00	69.5	.00	30.5	.00		
Texas.....	414.87	303.27	359.87	249.87	55.00	53.40	54.00	50.24	.40	3.16	80.7	82.4	13.3	17.6		
Western division.....	3,633.02	1,604.18	2,302.25	1,397.29	1,270.77	206.80	1,184.14	188.22	86.63	18.67	65.0	87.1	35.0	12.9		
Montana.....	69.24	63.21	53.80	54.79	15.38	8.42	10.62	7.42	4.76	1.00	77.8	86.7	22.2	13.3		
Idaho.....	44.24	3.50	14.44	3.50	20.80	.00	.30	.00	29.50	.00	32.0	100.0	67.4	.00		
Colorado.....	317.37	234.53	261.18	223.06	56.19	10.87	51.93	10.87	4.25	.00	82.3	95.4	17.7	4.6		
New Mexico.....	10.10	2.10	9.85	2.10	.25	.00	.25	.00	.25	.00	97.5	100.0	2.5	.00		
Arizona.....	30.75	17.10	22.75	14.10	8.00	3.00	8.00	3.00	.00	.00	74.0	82.5	26.0	17.5		
Utah.....	122.54	89.04	119.74	88.06	2.80	.38	2.80	.38	.00	.00	97.7	99.6	2.3	0.4		
Nevada.....	7.15	.00	6.40	.00	.66	.00	.66	.00	.00	.00	90.8	.00	9.2	.00		
Washington.....	704.73	228.93	410.82	141.33	353.91	87.60	339.53	71.91	14.38	15.69	53.7	61.7	46.3	38.3		
Oregon.....	253.41	136.67	166.47	116.51	86.94	20.16	86.94	20.16	.00	.00	65.7	85.2	34.3	14.8		
California.....	2,013.49	820.10	1,296.65	762.64	716.84	76.46	684.02	74.48	32.82	1.98	64.4	90.8	35.6	9.2		

* Exclusive of 12.48 miles of duplicated track.

The large increase in track on private right of way is a marked feature of electric-railway development. Of the total increase in track during the five-year period, which amounted to 11,826.57 miles, 7,169.77 miles, or 60.6 per cent, was on private right of way, and 4,656.80 miles, or 39.4 per cent, on public thoroughfares. The new track on private right of way shows an increase of 188.6 per cent over that of 1902, while that on public thoroughfares shows an increase of but 24.8 per cent.

With the exception of 7 states and the District of Columbia every state and territory had a larger percentage of increase for the miles of track on private right of way than for that on public thoroughfares, and 2 states that had no track on private right of way in 1902 reported track of that character in 1907. North and South Dakota were the only states with no track on private right of way. The greatest actual increase in private-right-of-way track was in Indiana,

where 1,118.02 miles, or over two-thirds of the total trackage of the state, was of this character. Trackage on private right of way also exceeded that on public thoroughfares in Idaho. Although in no other states did the private ownership of right of way predominate, the percentages of track on private right of way were large for Iowa, 48.2 per cent; Washington, 46.3 per cent; Virginia, 44.4 per cent; South Carolina, 44.3 per cent; Ohio, 44 per cent; Maryland, 42.9 per cent; Kansas, 39.1 per cent; Illinois, 37.8 per cent; California, 35.6 per cent; and Michigan, 34.8 per cent.

The statistics by geographic divisions show large increases in track on private right of way—for the Western division, 514.2 per cent; the North Central division, 218.9 per cent; and the North Atlantic division, 153.2 per cent. In 1902 the North Atlantic and Western divisions had the largest percentage of trackage on public thoroughfares, and the South Atlantic states the largest percentage of tracks on private right of way; in 1907 the South Central division had the largest percentage of tracks on public thoroughfares, while the North Central had the most trackage and the largest percentage of trackage on private right of way.

Track within and outside city limits.—The amount of track reported as within city limits depended largely upon the judgment of the persons who prepared the census reports, as the inquiry calling for the miles of track within city or municipal limits contained the instruction that such track should include the track in any city, town, or village "not rural in character." The division of track thus obtained would be more correctly termed "urban" and "rural" than "within" and "outside" city limits, and Table 184, which shows the trackage for each company, may be accepted as showing approximately the track laid in thickly populated urban districts as against the rural trackage.

There were several companies in Connecticut and Massachusetts whose officials did not attempt to make this classification of urban and rural trackage, claiming that it was not applicable to localities where city and township boundaries are coextensive. The totals for track within and outside of city limits, respectively, for 1907 are therefore less than the total trackage by the amount of track for Connecticut and Massachusetts, while for 1902 the totals are less by the amount of track for Massachusetts. Exclusive of the trackage for Connecticut and Massachusetts, which is largely urban, the total trackage for the country is divided into urban and rural, as follows:

	1907	1902	Per cent of increase.
Miles of track, exclusive of Connecticut and Massachusetts	30,735.50	19,472.85	57.8
Within city limits.....	17,407.21	12,956.10	34.8
Outside city limits.....	13,208.35	6,516.75	103.6

The rate of increase for rural trackage was almost three times as great as that for urban. In other words, the rural trackage furnished 6,751.60 miles and the urban trackage 4,511.11 miles of the total increase of 11,262.71 miles shown for the United States, exclusive of Connecticut and Massachusetts.

Rails.—The information concerning rails shows the maximum and minimum weight per yard of steel rails and the style of rail used. There is no uniformity in either the weight or the style of rails, but a considerable increase in the general use of heavier rails is indicated. In preparing the table showing the number of companies using rails of specified weights—maximum and minimum—in 1907 and 1902 the companies reporting rails other than those specified were included in the number for the nearest weight group.

TABLE 29.—Companies, classified according to maximum and minimum weight, respectively, of rails used: 1907 and 1902.

WEIGHT OF RAILS PER YARD.	OPERATING COMPANIES REPORTING SPECIFIED WEIGHT OF RAILS AS MAXIMUM AND AS MINIMUM.			
	1907		1902	
	Maximum weight.	Minimum weight.	Maximum weight.	Minimum weight.
Total.....	944	944	814	814
100 pounds or over.....	90	4	63	2
95 pounds.....	56	3	39	2
90 pounds.....	114	14	117	6
85 pounds.....	29	6	29	2
80 pounds.....	78	23	62	5
75 pounds.....	52	17	25	5
70 pounds.....	229	114	119	60
65 pounds.....	27	20	33	37
60 pounds.....	167	262	135	179
55 pounds.....	23	118	57	89
50 pounds.....	15	68	28	91
45 pounds.....	15	80	26	83
40 pounds.....	25	95	37	96
35 pounds.....	8	51	12	70
30 pounds.....	8	38	13	63
25 pounds or under.....	8	19	26	41

The heaviest rail in use in 1902, reported by the Union Traction Company of Philadelphia, weighed 135 pounds to the yard. In 1907 rails of 141 pounds to the yard were in use by 6 companies, located in California, Missouri, New Jersey, New York, and Pennsylvania. The lightest rails reported as "Maximum weight" were used on trackage operated by animal power and on some cable (inclined-plane) trackage. Naturally the heavier rails reported by a company are in use on its main line and the lighter rails on spurs, turn-outs, and yard and barn trackage.

In 1907, 27.5 per cent of the companies reporting weight of rails used rails with a maximum weight of 90 pounds and over, and 61.7 per cent used rails with a maximum weight ranging from 60 to 90 pounds; in 1902 the corresponding percentages were 26.9 and 48.6.

The 63 companies shown in Table 29 as reporting rails with a maximum weight of 100 pounds or over in 1902 had 6,791.77 miles of track, or 30.1 per cent of the total miles of track reported at that census. The 90 companies reporting such rails in 1907 had

11,640.88 miles of track, or 33.8 per cent of the total mileage. There was an increase of 42.9 per cent in the number of roads using these heavy rails, and an increase of 71.4 per cent in the trackage of the companies using the same in whole or in part.

In 1902, 2 companies—the Central Crosstown Railroad and the Kingsbridge Railway companies of New York City—with 14.32 miles of track, reported that their entire trackage was equipped with rails weighing 100 pounds or over; in 1907 only 1 company—the New York City Interborough Railway Company, with 8.24 miles of track—made such a report.

The following table gives the number of companies using the principal styles of rails in 1907 and 1902, respectively:

TABLE 30.—Companies, classified according to style of rails used: 1907 and 1902.

STYLE OF RAILS.	OPERATING COMPANIES REPORTING SPECIFIED STYLE OF RAIL.					
	1907			1902		
	Total.	Exclusively.	In part.	Total.	Exclusively.	In part.
T.....	900	505	395	755	367	388
Girder.....	387	30	357	413	36	377
Groove (full and half).....	117	12	105	71	7	64
Flat.....	11	.....	11	24	3	21
Tribby.....	11	.....	11	3	.....	3
Box.....	.....	.....	.....	1	.....	1

A very large majority of the companies have trackage equipped with rails of either the T or the girder type. In 1902, 364 of the 388 roads that used T rails in part reported T and girder rails, and of the 814 roads reporting upon rails, all but 10 used either T or girder rails in whole or in part. In 1907 T or girder rails were reported by all but 12 of the 944 companies reporting upon rails. T-rail construction is in some cases used on paved streets by paving up level with the top of the rail, and leaving a groove in the pavement along the inner edge.

Cross-ties.—The schedule of inquiry for electric railways for the census of 1907 contained an inquiry relating to the number, kind, and average cost of cross-ties purchased during 1907. This inquiry comprised a part of the annual investigation relating to the consumption of forest products made by the Census Bureau. The results are summarized in Table 31.

TABLE 31.—Wooden cross-ties purchased—Number and cost, by class and kind of wood: 1907.

KIND OF WOOD.	CLASS.					
	Hewed.			Sawed.		
	Number.	Cost.	Average cost per tie.	Number.	Cost.	Average cost per tie.
Total.....	6,074,291	\$3,376,477	\$0.56	3,539,649	\$2,038,568	\$0.58
Oaks.....	2,532,070	1,483,468	0.59	1,125,398	694,263	0.62
Southern pines.....	597,221	358,111	0.60	572,425	408,438	0.71
Douglas fir.....	194,807	96,065	0.49	526,561	247,198	0.47
Cedar.....	420,552	199,848	0.47	194,610	90,957	0.50
Chestnut.....	1,407,479	697,843	0.50	631,595	309,985	0.49
Cypress.....	184,034	86,015	0.47	13,755	7,985	0.58
Western pine.....	48,200	27,611	0.57	137,063	75,835	0.55
Tamarack.....	8,007	3,320	0.41	60,438	30,170	0.43
Hemlock.....	3,523	1,476	0.42	.....	.....	.....
Redwood.....	600,290	379,795	0.63	139,621	87,023	0.62
White pine.....	4,129	2,079	0.50	49,031	31,958	0.65
All other kinds.....	72,474	43,018	0.59	79,252	48,706	0.62

Overhead line construction.—By length of line, in this discussion, is meant the length of the first main track or of the roadbed. Where there is a double track or sidings and turn-outs the single-track mileage will exceed the length of line. Statistics concerning character of line construction were limited to the overhead trolley system. This system was in use on all or a portion of the line of 895 of the 945 companies reported for 1907. As the track they operated by overhead trolley constituted 94.5 per cent of the total miles of track, the statistics cover nearly all the line construction in use in the United States. The length of line operated by overhead trolley increased from 15,857.26 miles in 1902 to 25,060.29 miles in 1907, or 58 per cent.

TABLE 32.—Overhead trolley-line construction, by kind: 1907 and 1902.

KIND OF CONSTRUCTION.	MILES OF LINE.				
	1907	1902	Per cent of total.		Per cent of increase.
			1907	1902	
Total.....	25,060.29	15,857.26	100.0	100.0	58.0
Span-wire.....	14,093.16	10,220.07	56.2	64.5	37.9
Side-bracket.....	10,173.53	5,223.08	40.6	32.9	94.8
Center-pole.....	793.60	414.11	3.2	2.6	91.6

Span-wire construction.—Of the various forms of overhead line construction, span-wire was the most popular form at both censuses, though its relative

importance decreased slightly from 1902 to 1907. It was used on nearly two-thirds of the line operated in 1902 and on slightly less than four-sevenths of that in operation during 1907. While there were no states in 1907, and only 2—Idaho and Nebraska—in 1902, in which span-wire was the only form of construction used, there were 35 states in 1907 and 36 in 1902 in which the length of span-wire construction exceeded the length of all other kinds of construction combined.

Side-bracket construction.—Next to span-wire construction, side-bracket construction was in most general use. In 1907, as compared with 1902, this latter form of construction increased by 4,950.45 miles, or 94.8 per cent. This great increase—greater than that shown for either of the other forms of construction—is due primarily to the development of the interurban systems. In 1907 there were 9 states—Idaho, Indiana, Maine, Massachusetts, New Hampshire, Ohio, Rhode Island, South Carolina, and Vermont—in which the total side-bracket construction exceeded the span-wire construction. In 16 states the absolute or mileage increase in side-bracket exceeded the gain in span-wire construction. Five of these states—Ohio, Indiana, Illinois, Michigan, and Iowa—comprise the territory of most active interurban development, and they show an increase of 2,908.76 miles in side-bracket construction for 1907 over 1902 as compared with an increase of 758.25 miles in span-wire construction. The other

11 states in which the increase in side-bracket exceeded the gain in span-wire are Maine, New Hampshire, Massachusetts, Rhode Island, Virginia, South Carolina, Kansas, Kentucky, Montana, Idaho, and Arizona. Decreases in total miles of side-bracket construction in 1907 as compared with 1902 are shown for Colorado, Delaware, and Tennessee, while decreases in total miles of span-wire are shown for Maine and Montana.

Center-pole construction.—A comparatively small proportion of the overhead line is supported by center poles. In 1907, 230.53 miles, or nearly three-tenths, of the center-pole construction was in California, and most of this was new construction, the increase in that year as compared with 1902 amounting to 206.09 miles. The next largest increase was in New York, the gain being from 32.41 miles in 1902 to 105.06 miles in 1907, or 72.65 miles. The increases next in rank were 29.38 miles for Maryland, 24.51 miles for Michigan, and 22.86 miles for Massachusetts. A decrease in center-pole construction is shown in 9 states, the largest decreases being 36.36 miles in Minnesota, 8.38 miles in Georgia, and 8.11 miles in Indiana.

Line supports.—The increase in the use of steel, iron, or concrete poles for overhead line construction is a matter of considerable interest. Table 33 shows the number of companies using the different kinds of line supports and the amount of line supported thereby.

TABLE 33.—OVERHEAD TROLLEY-LINE CONSTRUCTION, BY CHARACTER OF LINE SUPPORTS: 1907 AND 1902.

CHARACTER OF LINE SUPPORTS.	MILES OF LINE.							
	Total.		Steel, iron, or concrete poles exclusively.		Steel, iron, or concrete and wooden poles.		Wooden poles exclusively.	
	1907	1902	1907	1902	1907	1902	1907	1902
Number of companies.....	895	1 734	21	14	232	180	642	531
Miles of line.....	25,000.29	15,857.20	539.57	340.80	13,238.01	8,232.20	11,232.71	7,278.20
Supported by poles.....	24,030.11	15,841.34	487.85	334.00	13,228.44	8,229.70	11,213.82	7,277.55
Steel, iron, or concrete.....	3,773.92	3,112.58	487.85	334.00	3,284.07	2,778.40	.....	.....
Wooden.....	21,156.19	12,728.76	.....	.....	9,942.37	5,451.21	11,213.82	7,277.55
Supported by elevated railroad structures, buildings, bridges, etc.	130.18	15.92	51.72	12.77	59.57	2.50	18.80	.65

¹ Exclusive of 2 companies which failed to furnish this information.

Although only 21 companies in 1907 and 14 in 1902 used steel, iron, or concrete poles exclusively, this character of supports was used on 15.1 per cent of the total miles of line in 1907 and on 19.6 per cent of the total in 1902.

Table 34 shows the miles of line and character of supports in the different states for 1907 and 1902.

All states that had 10 per cent or more of the construction supported by steel or iron poles in 1907 are shown separately in Table 34. The largest increase in steel, iron, or concrete pole line was 162.78 miles in Pennsylvania; other large increases were 120.78 miles in Missouri and 87.90 miles in New Jersey. The largest relative increase, however, was for Nebraska and amounted to 136 per cent. A considerable decrease in

miles of line with iron, steel, or concrete poles appeared in Michigan, and smaller decreases in Connecticut, Massachusetts, and Louisiana. There was a slight decrease in miles of wooden-pole line in Missouri, which state had a heavy increase in steel, iron, or concrete pole line. Minnesota and Missouri are the only states in which the mileage of line construction supported by steel, iron, or concrete poles exceeded the miles of line with wooden poles.

The decrease in iron and steel poles as shown by the census statistics does not accord with the facts. In Louisiana the decrease reflects actual conditions, as creosoted poles were substituted for the iron poles in use in 1902, and a very small part of the large decrease shown for Michigan was also actual, the result of the

removal, by 1 company, of some of its iron poles, when the streets were graded and paved. But the remainder of the decrease for Michigan, as well as the

decrease shown for Connecticut and Massachusetts, can be explained only on the ground that the iron and steel pole line reported in 1902 was overstated.

TABLE 34.—OVERHEAD TROLLEY-LINE CONSTRUCTION, BY CHARACTER OF LINE SUPPORTS, BY STATES: 1907 AND 1902.

STATE.	MILES OF LINE.								
	Total.		Steel, iron, or concrete poles.		Wooden poles.		Per cent of increase.		
	1907	1902	1907	1902	1907	1902	Total.	Steel, iron, or concrete poles.	Wooden poles.
Total.....	24,930.11	15,841.34	3,773.92	3,112.58	21,156.19	12,728.76	57.4	21.2	60.2
California.....	1,158.09	422.65	170.64	101.33	978.45	321.32	174.0	77.3	204.5
Connecticut.....	707.99	440.03	72.96	89.30	634.73	350.73	60.8	18.3	81.0
District of Columbia.....	40.12	39.18	7.44	7.44	32.39	31.74	2.4	3.0	2.0
Illinois.....	1,818.00	890.75	326.71	267.45	1,491.29	623.40	104.1	23.6	138.1
Louisiana.....	162.50	129.17	34.22	34.22	128.34	95.62	25.8	11.2	41.6
Maryland.....	331.49	258.78	110.59	119.32	220.90	139.46	28.1	0.2	51.9
Massachusetts.....	2,280.87	2,019.55	282.77	294.01	1,998.10	1,724.64	12.9	4.1	15.9
Michigan.....	930.80	774.82	107.24	160.45	823.56	605.37	20.9	36.7	37.0
Minnesota.....	261.08	189.04	138.18	100.36	122.90	80.28	37.7	26.4	53.1
Missouri.....	540.01	431.01	285.09	164.31	254.92	206.70	26.7	73.5	2.2
Nebraska.....	131.33	63.08	14.16	6.00	117.17	57.08	108.2	138.0	105.3
New Jersey.....	848.27	571.02	279.36	191.46	568.91	380.16	48.4	45.9	49.7
New York.....	2,108.87	1,532.48	563.55	485.28	1,545.32	1,047.20	37.6	10.1	47.6
Ohio.....	3,006.08	1,857.20	371.19	302.41	2,634.89	1,554.79	61.9	22.7	69.5
Pennsylvania.....	2,905.73	1,992.39	702.98	540.20	2,202.75	1,452.19	45.8	30.1	51.7
Wisconsin.....	435.53	299.13	69.70	46.10	375.83	253.03	45.0	29.5	43.5
All other states.....	7,251.19	3,929.86	228.85	182.81	7,022.34	3,747.05	84.5	25.2	87.4

¹ Exclusive of 130.18 miles of construction supported by structures other than poles.
² Exclusive of 15.92 miles of construction supported by structures other than poles.
³ Decrease.

Steel and iron supports are confined, to a large extent, to the companies operating in the larger cities. Concrete poles have lately come into use and were covered by the inquiry for 1907, but, as they were not reported apart from steel and iron poles, the extent to

which they are used can not be ascertained from the census statistics.

Cost of poles, which to many companies is an important item of expense, amounted in 1907 to \$1,459,942, as shown by Table 35.

TABLE 35.—WOODEN POLES PURCHASED—NUMBER AND COST, BY LENGTH AND KIND OF WOOD: 1907.

KIND OF WOOD.	TOTAL.			UNDER 20 FEET.			20 FEET BUT UNDER 25 FEET.			25 FEET BUT UNDER 30 FEET.			30 FEET BUT UNDER 35 FEET.		
	Number.	Cost at point of purchase.	Average cost per pole.	Number.	Cost at point of purchase.	Average cost per pole.	Number.	Cost at point of purchase.	Average cost per pole.	Number.	Cost at point of purchase.	Average cost per pole.	Number.	Cost at point of purchase.	Average cost per pole.
Total.....	207,197	\$1,459,942	\$4.01	678	\$1,093	\$2.04	2,402	\$5,211	\$2.17	20,630	\$63,412	\$3.07	92,515	\$324,069	\$3.50
Cedar.....	129,127	745,488	5.77	66	172	2.61	2,210	4,572	2.07	8,318	20,368	2.45	31,087	121,726	3.92
Chestnut.....	85,398	341,973	4.00	612	1,821	2.98	98	266	2.85	7,007	20,864	2.74	35,362	114,162	3.23
Cypress.....	54,799	223,618	4.08	.....	.....	.....	.....	.....	.....	2,102	4,155	1.98	15,893	45,893	2.90
Pine.....	13,917	88,067	6.33	.....	.....	.....	.....	.....	.....	1,416	9,115	6.43	5,500	26,438	4.81
Juniper.....	9,548	36,458	3.82	.....	.....	.....	.....	.....	.....	391	908	2.32	3,374	11,816	3.50
Oak.....	1,000	3,000	3.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000	3,000	3.00
Redwood.....	660	3,410	5.11	.....	.....	.....	.....	.....	.....	.....	.....	.....	31	248	8.00
Tamarack.....	96	408	4.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other kinds.....	2,643	17,481	6.61	.....	.....	.....	.....	.....	.....	305	1,614	5.29	298	786	2.64

KIND OF WOOD.	35 FEET BUT UNDER 40 FEET.			40 FEET BUT UNDER 45 FEET.			45 FEET BUT UNDER 50 FEET.			50 FEET BUT UNDER 55 FEET.			55 FEET BUT UNDER 60 FEET.			60 FEET AND OVER.		
	Number.	Cost at point of purchase.	Average cost per pole.	Number.	Cost at point of purchase.	Average cost per pole.	Number.	Cost at point of purchase.	Average cost per pole.	Number.	Cost at point of purchase.	Average cost per pole.	Number.	Cost at point of purchase.	Average cost per pole.	Number.	Cost at point of purchase.	Average cost per pole.
Total.....	97,003	\$459,297	\$4.73	55,271	\$342,542	\$6.20	18,713	\$159,287	\$8.51	6,372	\$65,222	\$10.24	1,500	\$15,316	\$10.21	2,104	\$23,593	\$11.21
Cedar.....	43,386	235,834	5.44	20,162	208,506	7.15	9,739	100,744	10.34	3,246	37,108	11.43	833	6,624	7.95	1,090	9,844	9.03
Chestnut.....	25,554	104,897	4.10	9,418	49,124	5.22	4,684	30,965	6.61	1,632	14,856	9.10	197	1,980	10.05	209	3,038	14.54
Cypress.....	17,987	70,683	3.93	13,579	60,352	4.89	3,946	24,912	6.31	1,015	8,150	8.03	31	293	9.45	306	3,180	10.39
Pine.....	4,071	23,616	5.80	1,816	12,330	7.08	171	1,380	8.12	312	3,276	10.50	134	1,584	11.82	398	5,628	14.14
Juniper.....	4,347	17,041	3.92	1,190	4,902	4.12	145	1,024	6.37	95	824	8.67	5	35	7.00	1	8	8.00
Oak.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Redwood.....	138	621	4.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tamarack.....	.....	.....	.....	96	408	4.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other kinds.....	1,520	6,005	4.35	20	420	21.00	28	353	12.61	72	1,008	14.00	300	4,800	16.00	100	1,895	18.95

Steam-railroad crossings.—For census purposes a protected crossing is defined as one at which a flagman is stationed, or one that has an alarm bell, elevated or depressed tracks, or similar positive protection or warning. Warning signs or orders to motormen to stop while the conductor runs forward at track crossings were not regarded by the census as a protection of railroad crossings. There were 6,279 crossings reported in 1907 as compared with 4,481 in 1902, an increase of 40.1 per cent. Of these, 3,690 were protected in 1907 as compared with 2,514 in 1902, an increase of 46.8 per cent; and 2,589 were unprotected in 1907 as compared with 1,967 in 1902, an increase of 31.6 per cent. In 1907 the protected crossings constituted 58.8 per cent of the total number and the unprotected 41.2 per cent, as compared with 56.1 per cent protected and 43.9 unprotected in 1902. The increase in the number of protected crossings is due not only to the installation on old lines of protecting devices where there were none in 1902, but also to the growing practice of installing protective devices on new lines or on extensions of old lines.

The inquiry in regard to number of steam-railroad crossings was subject to misinterpretation by the companies reporting, and some of them are known to have counted as crossings the number of separate tracks crossed rather than the number of points of intersection of the lines. Hence the number of crossings is to some extent inflated.

Table 36 shows the number of crossings, protected and unprotected, by states, for all states having at least 100 steam-railroad crossings in either 1907 or 1902.

TABLE 36.—*Steam-railroad crossings—Number protected and unprotected, respectively, by states: 1907 and 1902.*

STATE.	TOTAL.		PROTECTED.		UNPROTECTED.	
	1907	1902	1907	1902	1907	1902
United States.....	6,279	4,481	3,690	2,514	2,589	1,967
Alabama.....	112	77	63	10	49	67
California.....	224	112	102	47	122	65
Connecticut.....	103	29	98	25	5	4
Illinois.....	695	800	381	501	284	218
Indiana.....	340	234	158	103	188	131
Iowa.....	168	116	61	61	107	55
Kentucky.....	100	76	58	38	42	38
Massachusetts.....	320	282	246	257	83	25
Michigan.....	330	270	220	186	110	93
Missouri.....	144	83	95	19	49	64
New Jersey.....	271	113	202	85	69	28
New York.....	408	305	401	228	67	77
Ohio.....	554	392	348	201	206	191
Pennsylvania.....	898	488	555	193	313	295
Tennessee.....	61	157	30	90	31	67
Texas.....	105	121	33	17	102	104
Washington.....	300	20	38	3	89	26
Wisconsin.....	101	160	72	69	80	40
All other states.....	1,065	670	520	291	545	379

The largest ratios of protected crossings reported in 1907 were for Connecticut, New York, Massachusetts, and New Jersey, in the order named, and the largest ratios of unprotected crossings for Texas, Washington, Iowa, and Wisconsin. The largest absolute

increase in number of crossings was for Pennsylvania, and the highest ratio of increase for Washington.

In 1907 there was an average of 5.48 miles of track of electric railways per steam-railroad crossing as compared with only 5.04 miles per crossing in 1902. Of the states shown in detail in the table, the largest trackage per crossing in 1907 appears in the case of California, with 8.99 miles of track, followed by Massachusetts, with 8.77 miles; New York, with 8.30 miles; and Connecticut, with 7.58 miles. The lowest trackage per crossing was in Texas, with 2.13 miles of track, followed by Alabama, with 2.60 miles; Wisconsin, with 3.67 miles; Michigan, with 3.76 miles; and Iowa, with 3.81 miles.

The most marked concentration of steam-railroad crossings is in the Chicago, Ill., district. Of the 665 crossings in the state in 1907, 357 were in the Chicago district, 226 being protected and 131 unprotected; in 1902, out of a total of 809, this district reported 653 crossings, of which 528 were protected and 125 unprotected.

*Subways and tunnels.*¹—The subways and tunnels reported at the census of 1907 do not include the undercrossings of steam-railroad tracks, and for purposes of comparison the figures for the census of 1902 have been revised to eliminate tunnels of this character.

In 1907 there were 9 companies operating track in subways and tunnels, which had an aggregate length of 28.98 miles as compared with a total length of 2.87 miles of subways and tunnels operated by 4 companies in 1902. Therefore the length of subways and tunnels was over ten times as great in 1907 as in 1902. In 1902 a little more than one-half of the length of subways and tunnels was represented by the 1.62 miles of subway in Boston, Mass., operated by the Boston Elevated Railway Company, and slightly more than one-third, by tunnels of the Chicago Union Traction Company, under the Chicago River, and the remainder consisted of tunnels of the Metropolitan Street Railway Company, of Kansas City, Mo., and the United Railroads of San Francisco. The great increase of mileage between 1902 and 1907 is due to the opening of the New York City subway, operated by the Interborough Rapid Transit Company; the East Boston tunnel, operated by the Boston Elevated Railway Company; the subway of the Philadelphia Rapid Transit Company; and the tunnels of the Wilkes-Barre and Hazleton Railway Company, the Pittsburg Railways Company, and the Lackawanna and Wyoming Valley Railroad Company.

The 28.98 miles of subway and tunnels shown in Table 184 is exclusive of the 42.50 miles operated by the Illinois Tunnel Company of Chicago, Ill., which is used exclusively for mail, freight, and refuse, and,

¹ See also p. 236.

though an electric road, is engaged in a peculiar class of service. Statistics concerning it should not be combined with those for other roads. Nor is the mileage of any part of the Hudson River tunnel system (New York) included in the total length of subways and tunnels for 1907, as these properties were under construction during the census year and were opened for traffic in 1908.

Underground conduits for mains and feeders.—The miles of street occupied by underground construction, exclusive of subways and tunnels, increased from 589.30 in 1902 to 891.54 in 1907, an increase of 302.24 miles, or 51.3 per cent. There were 322.70 miles of track operated by conduit trolley during 1907, and 170.06 miles of the 891.54 miles of underground construction was reported by the conduit trolley lines. The majority of the mains and feeders are still carried overhead, and feeder conduits are found only in the larger cities.

The following table shows the miles of street occupied by underground conduits for mains and feeders as reported at the censuses of 1907 and 1902:

TABLE 37.—Miles of street occupied by feeder-conduit system, by states: 1907 and 1902.

STATE.	1907	1902	Per cent of increase.
United States.....	891.54	589.30	51.3
California.....	1.00		
Connecticut.....	1.00		
District of Columbia.....	139.99	28.90	38.4
Georgia.....	7.00	8.30	15.7
Illinois.....	33.15	32.00	1.7
Kentucky.....	4.00		
Louisiana.....	1.32		
Maryland.....	20.26		
Massachusetts.....	50.34	33.00	52.5
Michigan.....		10	100.0
Minnesota.....	36.03	14.00	163.8
Missouri.....	10.80	1.30	730.8
Nebraska.....	3.41		
New Jersey.....	14.84	3.70	301.1
New York.....	261.83	145.80	79.6
Ohio.....	2.18	6.00	63.7
Pennsylvania.....	242.50	204.80	18.4
Tennessee.....	10.00		
Utah.....	1.50		
Vermont.....	.12		
Washington.....	2.90		
Wisconsin.....	146.47	110.80	32.2

¹ Includes 3.28 miles of construction for conduit trolley in District of Columbia of roads operating in Virginia.

² Decrease.

³ Includes 130.07 miles of construction for conduit trolley in New York City.

The underground conduits for mains and feeders in 1902 were in the following cities and urban districts:

State.	City.
District of Columbia.....	Washington.
Georgia.....	Atlanta.
Illinois.....	Chicago.
Massachusetts.....	Boston and vicinity.
Massachusetts.....	New Bedford.
Massachusetts.....	Pittsfield.
Massachusetts.....	Springfield.
Michigan.....	Bay City.
Minnesota.....	Minneapolis.
Minnesota.....	St. Paul.
Missouri.....	St. Louis.
New Jersey.....	Jersey City and vicinity.
New York.....	Buffalo.
New York.....	New York City.
New York.....	Rochester.
Ohio.....	Toledo.
Pennsylvania.....	Philadelphia.
Wisconsin.....	Milwaukee.

At the census of 1907 all these cities, with the exception of Pittsfield, Bay City, and St. Louis, again appear in the list of cities from which underground-conduit systems were reported, and with them are to be joined:

State.	City.
California.....	San Francisco.
Connecticut.....	New Haven.
Illinois.....	Decatur.
Kentucky.....	Louisville.
Louisiana.....	New Orleans.
Maryland.....	Baltimore.
Missouri.....	Kansas City.
Nebraska.....	Omaha.
New York.....	Poughkeepsie.
New York.....	Schenectady.
New York.....	Syracuse.
Ohio.....	Akron.
Pennsylvania.....	Pittsburg.
Tennessee.....	Nashville.
Utah.....	Salt Lake City.
Vermont.....	Brattleboro.
Washington.....	Seattle.

CARS AND CAR EQUIPMENT.

The different types of cars used in 1907 and the improvements in construction since 1902 are described in Chapter I of Part II. The following table shows the numbers of the different varieties of cars that were reported separately at the last two censuses:

TABLE 38.—Cars—Number and kind: 1907 and 1902.

KIND.	NUMBER.				
	1907	1902	Per cent of total.		Per cent of increase.
			1907	1902	
Aggregate.....	83,641	66,784	100.0	100.0	25.2
Passenger, total.....	70,016	60,200	83.7	90.3	10.1
Closed.....	40,352	32,658	48.2	48.0	23.6
Open.....	22,537	24,250	26.0	36.3	17.1
Combination—					
Closed and open.....	6,442	3,134	7.7	4.7	105.6
Passenger and express, freight, or mail.....	567	230	0.7	0.4	137.2
Special—parlor, sleeping, dining, private, etc.....	118	(¹)	0.1		
Express, freight, and mail.....	5,660	1,114	6.8	1.7	408.0
Work and miscellaneous.....	5,011	2,800	6.0	4.3	75.2
Snowplows.....	1,883	1,727	2.3	2.6	0.0
Sweepers and sprinklers.....	1,062	703	1.3	1.2	33.0
Motor cars.....	68,874	50,090	82.3	75.0	35.8
Trailers.....	14,767	16,085	17.7	24.1	18.2
Locomotives.....	200	425	100.0	100.0	50.8
Electric.....	117	3	56.0	0.7	3,390.0
Steam.....	82	422	44.0	99.3	178.2

¹ Decrease.

² Not reported separately.

³ Includes 67 cars of exclusively animal-power roads.

⁴ Includes 587 cars of exclusively animal-power roads.

Of the total number of cars reported at the census of 1907, 83,423, or 99.7 per cent, were operated on roads that were wholly or in part electric; 97 cars, on roads that were exclusively animal; 74, on exclusively cable roads; 15, on steam roads; and 32, on gasoline-motor lines.

Passenger cars.—The relatively small increase in number of passenger cars, which is due primarily to the increase in the size of cars used, has caused a decrease in the proportion that such cars form of the total number of cars for 1907 as compared with 1902.

Although the number of open cars decreased, the increase in combination open and closed cars was large and the number of open and combination open and closed cars taken together aggregated 28,979 in 1907 as compared with 27,393 in 1902.

The inquiry regarding special cars was made for the first time at the census of 1907. The following statement distributes the total of such cars among the various kinds, as far as the distinction was indicated by the companies reporting:

Special cars: 1907.

KIND.	Number.
Total.....	118
Parlor.....	47
Private.....	32
Funeral.....	0
Pay.....	4
Sleeping.....	2
Dining.....	2
Hospital.....	1
Kind not reported.....	21

Express, freight, and mail cars.—The development of freight and express traffic on interurban and rural lines has resulted in a large increase in cars especially equipped for this service. While the increases in trackage, capitalization, earnings from operation, etc., as shown elsewhere, range from 50 to 70 per cent, the increase in number of express, freight, and mail cars and in income from freight business is over 400 per cent.

The distribution, by states, of the express, freight, and mail cars is shown in Table 39, which gives the number of such cars for every state reporting at least 100 express, freight, and mail cars in 1907.

TABLE 39.—Express, freight, and mail cars—Number, by states: 1907 and 1902.

STATE.	NUMBER.		
	1907	1902	Increase.
United States.....	5,609	1,114	4,555
Illinois.....	1,384	251	1,133
California.....	971	48	923
Washington.....	837	14	823
New York.....	425	181	244
Pennsylvania.....	412	51	361
Ohio.....	305	44	261
Oregon.....	170	5	174
Iowa.....	140	41	99
All other states.....	1,016	479	537

The St. Louis and Belleville Electric Railway Company, of Illinois, with a traffic that is entirely freight, operated the largest number of cars of this class reported for 1907.

The companies reporting the largest number of express, freight, and mail cars in 1907 were, in the order of the number of their cars, as follows:

STATE.	Name of company.	Number of express, freight, and mail cars.
Illinois.....	St. Louis and Belleville Electric Ry. Co.....	681
Washington.....	Spokane and Inland Empire R. R. Co.....	467
California.....	Northern Electric Ry. Co.....	408
Pennsylvania.....	Pittsburg Rys. Co.....	305
Illinois.....	East St. Louis and Suburban Ry. Co.....	303
California.....	Los Angeles Interurban Ry. Co.....	240
Washington.....	Puget Sound Electric Ry.....	173
Oregon.....	Portland Railway, Light and Power Co.....	153

The express, freight, and mail cars of the above 8 companies comprised nearly one-half of the total number. It is clear that the most extensive development of freight business by electric railways has taken place on the Pacific coast, where 5 of the above companies, with 1,431 cars, were operating.

Work cars and miscellaneous cars.—The statistics in regard to work cars and miscellaneous cars do not disclose any features of special note. The increase in number is in keeping with the normal increase in trackage and equipment, though, by reason of the increase in size of passenger cars, as explained above, the proportion that the number of work cars and miscellaneous cars forms of the total number of cars shows a slight increase in 1907 as compared with 1902.

Snowplows, sweepers, and sprinklers.—Snowplows are found chiefly in New England and the northern tier of states, while farther south sweepers are in more general use for clearing tracks of snow. Since the area in which snowplows are employed is restricted, the absolute increase in their number is small. The New England states reported 1,073 snowplows in 1907 as compared with 936 in 1902, and 38 sweepers and sprinklers in 1907 as compared with 30 sweepers in 1902; while the states of New York, New Jersey, Pennsylvania, Delaware, Maryland, and the District of Columbia showed 459 snowplows in 1907 as compared with 437 in 1902, and 590 sweepers and sprinklers in 1907 as compared with 477 sweepers in 1902.

Cars, by states and geographic divisions.—The statistics of distribution of the different classes of cars by geographic divisions for 1907 and 1902, given in Table 40, show again the large increase in express, freight, and mail cars in the Western and Northern states, and also show the growing use of combination closed and open cars as substitutes for open cars, particularly in the northern and western districts.

TRACK AND ROLLING STOCK.

TABLE 40.—CARS—NUMBER AND KIND, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902.

STATE OR TERRITORY.	Census.	NUMBER OF CARS.												
		Aggregate.	Passenger.					Ex-press, freight, and mail.	Work and miscellaneous.	Snow-plows.	Sweep-ers and sprin-klers.	Motor cars.	Trail-ers.	
			Total.	Closed.	Open.	Combination.								Parlor, sleep-ing, dining, and private.
					Closed and open.	Passen-ger and express, etc.								
United States.....	1907	83,041	70,016	40,352	22,537	6,442	567	118	5,069	5,011	1,883	1,062	68,874	14,767
	1902	66,784	60,290	32,058	24,259	3,184	239	(1)	1,114	2,860	1,727	703	50,699	10,085
North Atlantic division.....	1907	40,058	35,379	19,827	13,189	2,150	174	30	1,205	2,010	1,515	549	36,460	4,192
	1902	34,768	31,319	16,916	13,503	820	80		446	1,181	1,369	448	29,190	5,567
Maine.....	1907	658	484	210	261	6	6	1	68	55	56		560	92
	1902	598	476	199	274	1	2		33	48	40		469	129
New Hampshire.....	1907	363	303	147	151	1	3	1	4	24	31	1	354	9
	1902	287	244	96	146	1	1		2	10	22	3	234	53
Vermont.....	1907	159	120	48	64	3	11		11	10	9	3	185	24
	1902	105	80	31	41	2	0		7	8	8	2	90	18
Massachusetts.....	1907	8,873	7,612	3,678	3,815	104	5	10	91	345	812	13	8,550	317
	1902	8,810	7,275	3,401	3,860		5		94	197	740	4	7,801	509
Rhode Island.....	1907	1,171	952	488	428	30	5	1	87	67	65		1,049	122
	1902	820	708	371	322		15		21	40	51		762	58
Connecticut.....	1907	1,550	1,279	579	602	4	4		99	51	100	21	1,395	155
	1902	1,380	1,190	545	647		4		48	46	69	21	1,213	167
New York.....	1907	15,813	14,251	8,310	8,964	1,901	60	10	425	668	246	223	13,353	2,455
	1902	14,040	12,078	7,888	4,026	448	10		181	452	241	188	10,222	3,818
New Jersey.....	1907	2,030	2,565	1,589	933	35	5	3	13	229	38	85	2,853	77
	1902	2,165	1,942	1,083	832	22	5		9	94	45	75	1,955	210
Pennsylvania.....	1907	9,141	7,807	4,778	2,881	66	75	7	412	561	158	203	8,200	941
	1902	7,058	6,420	3,302	2,746	346	20		51	285	147	155	6,450	608
South Atlantic division.....	1907	6,002	5,414	2,498	2,078	800	24	8	232	236	22	98	5,010	992
	1902	4,904	4,290	1,997	2,011	201	21		128	116	6	65	3,746	858
Delaware.....	1907	212	197	103	92		2		1	8	1	5	212	
	1902	163	151	80	68		3			7	1	4	155	8
Maryland.....	1907	1,754	1,586	465	527	581	9	4	76	32	13	47	1,087	67
	1902	1,589	1,487	622	664	196	5		42	27	1	32	1,533	56
District of Columbia.....	1907	1,259	1,190	693	521	5		1	7	32	3	27	854	405
	1902	1,010	977	499	533	35			4	4	2	23	638	372
Virginia.....	1907	1,072	915	442	308	156	6	3	71	71	1	14	786	286
	1902	681	626	356	256	6	8		25	25	1	4	461	220
West Virginia.....	1907	448	415	213	169	30	3		10	20		3	394	54
	1902	287	272	126	134	11	1		3	11		1	276	11
North Carolina.....	1907	229	197	95	96	4	2		5	23	4		193	36
	1902	131	90	48	48	2	1		25	7			84	47
South Carolina.....	1907	189	176	113	47	15	1		4	9			170	19
	1902	135	123	78	35	8	2		0	6			106	29
Georgia.....	1907	618	549	348	194	7			33	85		1	532	86
	1902	497	454	228	223	3			17	25		1	408	89
Florida.....	1907	221	189	56	124	8	1		25	6		1	182	39
	1902	111	101	50	50		1		6	4			85	20
North Central division.....	1907	25,582	20,959	13,087	5,685	946	289	52	2,068	1,871	319	365	19,424	6,158
	1902	20,712	18,643	10,826	7,258	442	117		431	1,071	310	257	13,085	7,627
Ohio.....	1907	5,690	4,774	2,601	1,405	630	117	18	305	459	42	110	5,080	610
	1902	4,395	3,975	2,277	1,594	34	70		44	275	47	54	3,188	1,207
Indiana.....	1907	1,699	1,374	799	478	2	62	3	84	217	10	14	1,430	269
	1902	1,146	908	515	467	4	12		8	114	11	15	818	328
Illinois.....	1907	9,330	7,260	5,152	2,058	17	20	13	1,384	407	162	117	5,562	3,768
	1902	7,778	7,021	3,815	3,112	76	18		251	269	151	86	3,315	4,463
Michigan.....	1907	2,332	1,945	1,255	568	99	20	3	68	283	44	12	1,960	422
	1902	1,757	1,531	910	588	15	9		48	132	38	8	1,466	291
Wisconsin.....	1907	1,181	954	759	101	3		1	6	183	17	21	901	280
	1902	682	621	421	196	2	2		1	36	12	12	599	83
Minnesota.....	1907	754	720	716	2			2	2	22	10		730	15
	1902	1,083	1,026	717	309					32	21	4	814	269

1 Not reported separately.

STREET AND ELECTRIC RAILWAYS.

TABLE 40.—CARS—NUMBER AND KIND, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902—Continued.

STATE OR TERRITORY.	Census.	NUMBER OF CARS.												
		Aggregate.	Passenger.						Ex-press, freight, and mail.	Work and miscellaneous.	Snow-plovs.	Sweep-ers and sprin-klers.	Motor cars.	Trail-ers.
			Total.	Closed.	Open.	Combination.		Parlor, sleep- ing, dining, and private						
					Closed and open.	Passen- ger and express, etc.								
North Central division—Continued.														
Iowa.....	1907	1,080	853	474	346	1	30	2	140	56	16	15	729	351
	1902	858	675	391	281		3		41	115	10	11	535	323
Missouri.....	1907	2,557	2,270	1,772	313	174	2	9	27	105	8	57	2,319	238
	1902	2,484	2,305	1,465	527	310	3		27	80	0	60	1,932	552
North Dakota ¹	1907	52	48	18	20		1			1	2	1	27	25
South Dakota.....	1907	5	3			3				2			3	2
	1902	2	2	2										2
Nebraska.....	1907	518	483	254	209	17	2	1	3	17	4	11	455	63
	1902	205	282	163	118	1			1	5		7	271	24
Kansas.....	1907	334	275	184	80		5		10	20	4	7	210	115
	1902	232	207	141	60				10	7	8		147	85
South Central division.....														
	1907	4,177	3,801	2,467	1,094	224	12	4	68	284	2	22	3,517	660
	1902	3,240	3,007	2,015	878	103	11		82	180	10	11	2,494	755
Kentucky.....	1907	870	808	525	170	103	3	1	11	47	1	12	764	115
	1902	976	880	617	108	73	1		2	50	17	9	704	272
Tennessee.....	1907	747	684	434	238	12	5		5	52	1	5	651	96
	1902	575	555	326	222	5	2		3	14	2	1	470	105
Alabama.....	1907	596	488	313	169	0			35	73			414	182
	1902	370	311	175	125	8	3		21	38			233	137
Mississippi.....	1907	139	124	64	43	15	2		2	12		1	115	24
	1902	49	47	31	16					2			37	12
Louisiana.....	1907	631	500	554	28	15		2	1	31			556	75
	1902	670	626	551	99	0				43		1	595	75
Arkansas.....	1907	212	202	99	86	17			1	7		2	195	17
	1902	135	130	85	45				2	3			89	46
Oklahoma ¹	1907	146	117	71	45		1		8	21			112	34
Texas.....	1907	827	770	407	300	56	6	1	5	41		2	710	117
	1902	474	440	230	203	11	5		4	21			306	108
Western division.....														
	1907	7,222	4,403	1,573	401	2,316	68	15	2,006	610	25	28	4,457	2,765
	1902	3,456	3,031	904	609	1,508	10		77	312	24	12	2,178	1,278
Montana.....	1907	126	108	73	33	2			4	0	3	2	104	22
	1902	109	90	62	28				9	0	2	2	70	30
Idaho.....	1907	28	22	9		11	2		0				23	5
	1902	3	3	3									3	
Colorado.....	1907	631	474	243	91	138	2		68	45	10	4	422	209
	1902	393	352	90	86	167			1	24	11	5	345	48
New Mexico.....	1907	13	12	5		7			1				13	
	1902	8	8	0	2									8
Arizona.....	1907	27	27	5	7	15							24	3
	1902	10	17	5	8	4				2			12	7
Utah.....	1907	108	151	106	45					38	3	6	157	41
	1902	158	140	95	52	2				6	2	1	132	26
Nevada ¹	1907	7	6	2		4				1			7	
Washington.....	1907	1,762	791	354	80	314	39	4	837	116	7	11	797	965
	1902	431	312	126	77	100			14	99	6		268	163
Oregon.....	1907	670	466	323	120	10	3	1	179	18	2	5	435	235
	1902	270	250	150	77	23			5	19	1	4	200	79
California.....	1907	3,760	2,406	453	106	1,815	22	10	971	383			2,475	1,285
	1902	2,056	1,850	358	270	1,203	10		48	150	2		1,130	917

¹ No company reported in 1902.

The proportionate decrease in open cars was greatest in the North Central division, followed by the Western and the North Atlantic divisions. There was an increase in the South Central division and also in the South Atlantic division, but in the latter it was very slight. The proportionate increase in combination closed and open cars was largely in excess of the increase in all cars in the case of every division except the Western. For each division the proportionate increase in express, freight, and mail cars in 1907 as compared with 1902 was largely in excess of the corresponding increase in passenger cars.

Motor cars and trailers.—The cars reported as motor cars are those which, when in use, are operated with motors, and include the gasoline motor cars, gas-electric motor cars, storage-battery cars, and the grip cars of surface cable lines, in addition to the regular electric motor cars using transmitted current. With the class of trailers are included the cars of animal and steam roads and the cars of inclined cable roads, as well as the trailers of electric and surface cable lines. Of the 83,641 cars of all varieties reported at the census of 1907, 68,874, or 82.3 per cent, were motor cars and 14,767, or 17.7 per cent, were trailers; the percentages for 1902 were 75.9 for motor cars and 24.1 for trailers.

The marked decrease in the total number of trailers and the countervailing increase in the number of

motor cars is due, in part, to the electrification of old roads and, to a large degree, to the use of larger motor cars with the consequent abandonment of trailers. On the other hand, in certain districts, particularly on the Pacific coast, there has been an increase in the number of trailers, chiefly on lines doing a heavy freight traffic and employing electric or steam locomotives.

The greatest proportionate decrease in number of trailers was in the North Atlantic division, but decreases are also shown for the North Central and the South Central divisions. In the South Atlantic division the number of trailers increased, but the ratio of increase was less than for the motors. Only in the Western division was the ratio of increase for trailers greater than that for motors. The state of Washington in 1907 had 797 motor cars and 965 trailers as compared with 268 motor cars and 163 trailers in 1902.

The census of 1907 was the first to seek information concerning the number of motor equipments of one, two, three, and four motors, respectively, available for motor cars. It is a common practice to transfer motors from winter to summer cars and vice versa, and hence in many cases the number of motor equipments owned by a company does not equal the number of its motor cars. The number of motor equipments, however, represents approximately the number of motor cars available for service at any one time.

TABLE 41.—MOTOR CARS AND MOTOR EQUIPMENTS, BY GEOGRAPHIC DIVISIONS: 1907.

DIVISION.	Number of motor cars.	MOTOR EQUIPMENTS FOR MOTOR CARS.								
		Total.	One-motor.	Two-motor.	Three-motor.	Four-motor.	Per cent of total.			
							One-motor.	Two-motor.	Three-motor.	Four-motor.
United States.....	68,874	64,378	642	46,521	422	16,793	1.0	72.3	0.7	26.1
North Atlantic.....	30,468	33,664	191	26,272	179	7,022	0.6	78.0	0.5	20.0
South Atlantic.....	5,010	4,887	85	4,000	26	776	1.7	81.8	0.5	15.0
North Central.....	19,424	18,074	184	11,162	192	6,536	1.0	61.8	1.1	30.2
South Central.....	3,517	3,477	115	2,602	11	659	3.3	77.4	0.3	19.0
Western.....	4,457	4,276	67	2,395	14	1,800	1.6	56.0	0.3	42.1

The equipments for cars requiring two motors constituted 72.3 per cent of all in use and those for cars requiring four motors 26.1 per cent, the equipments for cars with one motor and three motors making together but 1.7 per cent of the total number. The Western division had the largest proportionate number of four-motor equipped cars, and when all equipments are reduced to a one-motor basis it is evident that the average number of motors per equipment was highest for that division, being 2.8. The averages for the other divisions were as follows: North Central, 2.7; North Atlantic, 2.4; and South Central and South Atlantic, 2.3 each. The average for the United States was 2.5. The largest proportionate number of heavy motor cars was reported from Minnesota, 637 out of 736 motor equipments, or 86.5 per cent, being four-motor; other states with large proportions of such

cars were Washington, with 64.3 per cent; Missouri, with 60.2 per cent; Wisconsin, with 57 per cent; and Rhode Island, with 50.6 per cent. The foregoing are the only states in which four-motor equipments outnumbered all other types.

Locomotives.—The decrease in the number of locomotives reported in 1907 as compared with 1902 is due to the electrification of the elevated lines of New York City. Of the 422 steam locomotives reported in 1902, 413 were in use on the Manhattan Elevated and the Brooklyn Rapid Transit system. In 1902 the returns concerning steam locomotives in use in connection with street and electric railways were not, however, complete, as in a few cases the locomotive equipment for steam trackage was not reported. The following table shows, by states and geographic divisions, the locomotives reported for the two censuses:

STREET AND ELECTRIC RAILWAYS.

TABLE 42.—Electric and steam locomotives, respectively, by states and geographic divisions: 1907 and 1902.

STATE OR TERRITORY.	NUMBER OF LOCOMOTIVES.					
	Total.		Electric.		Steam.	
	1907	1902	1907	1902	1907	1902
United States.....	209	425	117	3	92	422
North Atlantic division.....	50	410	34		26	410
Maine.....	8		8			
New Hampshire.....	1	1	1			1
Massachusetts.....	3		2		1	
Rhode Island.....	4		4			
New York.....	29	414	12		17	414
New Jersey.....	4	1	4			1
Pennsylvania.....	10		3		7	
South Atlantic division.....	9	2	3	1	6	1
District of Columbia.....	1		1			
Virginia.....	6		1		5	
North Carolina.....	2	2	1	1	1	1
North Central division.....	67	4	31	2	30	2
Ohio.....	11		6		5	
Indiana.....	11		2		9	
Illinois.....	17	2	10	2	7	
Michigan.....	4		2		2	
Wisconsin.....	7		1		6	
Minnesota.....	1		1			
Iowa.....	10	2	5		5	2
Missouri.....	3		3			
Nebraska.....	1				1	
Kansas.....	2		1		1	
South Central division.....	6		3		3	
Alabama.....	3				3	
Mississippi.....	2		2			
Oklahoma.....	1		1			
Western division.....	68	3	40		22	3
Colorado.....	3		1		2	
Utah.....	4		3		1	
Washington.....	26		19		7	
Oregon.....	10	1	7		3	1
California.....	23	2	15		8	2
Idaho.....	1				1	
New Mexico.....	1		1			

The largest number of electric locomotives was reported as in use in the Western states, the number of such locomotives being particularly large in the Pacific

Coast states. The Spokane and Inland Empire Railroad Company of Washington reported the largest number, 15 locomotives—9 electric and 6 steam.

Fenders and brakes.—With the exception of data concerning the protected steam-railroad crossings, the only information concerning safety appliances reported to the Census Bureau relates to the number of cars equipped with fenders and brakes. The statistics concerning fenders are presented in Table 43.

TABLE 43.—Equipment of cars—Fenders, by geographic divisions: 1907 and 1902.

DIVISION.	TOTAL NUMBER OF CARS.		CARS EQUIPPED WITH FENDERS.				PER CENT OF INCREASE.	
	1907	1902	Number.		Per cent of total number of cars.		Total number of cars.	Cars equipped with fenders.
			1907	1902	1907	1902		
United States.....	83,041	66,784	58,925	43,273	70.4	64.8	25.2	30.2
North Atlantic.....	40,658	34,763	30,535	23,738	75.1	68.3	17.0	25.6
South Atlantic.....	6,002	4,604	4,240	3,199	70.7	68.5	30.4	32.7
North Central.....	25,582	20,712	17,270	12,310	67.5	59.4	23.5	40.3
South Central.....	4,177	3,240	2,050	1,673	49.3	51.6	28.0	53.6
Western.....	7,222	3,456	4,200	2,345	58.3	67.9	106.0	79.9

Although as a rule only motor cars are equipped with fenders, yet in many cases trailers also are thus protected, and the table therefore shows the ratios of fender equipments to all cars. Pilots and wheel and truck guards, when reported, have been tabulated as fenders, their inclusion in specific cases being shown by notes in Table 185.

Table 44 presents the statistics for brakes and the proportions the several classes of hand, air, and other mechanically braked cars formed of the total number of cars for 1907 and 1902.

TABLE 44.—EQUIPMENT OF CARS—BRAKES, BY GEOGRAPHIC DIVISIONS: 1907 AND 1902.

DIVISION.	TOTAL NUMBER OF CARS.		NUMBER OF CARS WITH BRAKES.										PER CENT OF INCREASE.					
			Hand brakes.		Air brakes.		Other mechanical brakes.		Per cent of total number of cars.						Total number of cars.	Number of cars with brakes.		
									Hand brakes.		Air brakes.		Other mechanical brakes.			Hand brakes.	Air brakes.	Other mechanical brakes.
			1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902				
United States.....	83,041	66,784	78,384	63,000	31,084	7,906	3,803	5,148	33.7	11.8	37.0	11.8	4.5	7.7	25.2	23.1	300.8	126.1
North Atlantic.....	40,658	34,763	37,054	34,300	13,075	4,830	1,161	2,020	32.2	13.0	32.2	13.0	2.9	5.8	17.0	0.8	170.2	142.7
South Atlantic.....	6,002	4,604	5,790	4,335	1,120	104	1,104	269	96.5	94.2	18.7	3.0	18.4	5.8	30.4	33.0	582.0	310.4
North Central.....	25,582	20,712	24,667	18,457	12,104	2,488	677	1,987	96.0	89.1	47.5	12.0	2.0	9.6	23.5	33.1	388.9	166.9
South Central.....	4,177	3,240	3,746	3,107	901	117	1	24	89.7	98.4	23.7	3.6	(?)	0.7	28.6	17.2	747.0	196.8
Western.....	7,222	3,456	6,627	3,401	4,334	207	860	842	91.8	98.4	60.0	8.6	11.0	24.4	100.0	94.0	1,359.3	2.1

¹ Decrease.

² Less than one-tenth of 1 per cent.

The large increase in the use of air brakes in 1907 as compared with 1902 is a marked feature of the statistics, 37.9 per cent of all cars being equipped with air brakes in 1907 compared with 11.8 per cent in 1902. This increase is probably due to the use of larger cars. The state of New York had the largest number of cars equipped with air brakes in 1907, the number being

5,536 and forming 35 per cent of the total number of cars reported for the state as compared with 2,070, or 14.7 per cent, in 1902. The next largest number of air brakes was in Illinois, where 4,492, or 48.1 per cent of all cars, were equipped with such brakes in 1907 as compared with 1,529, or 19.7 per cent, in 1902. The states showing the highest ratios of cars equipped with

air brakes to total cars are Minnesota, with 84.2 per cent (635 cars) of the total cars in 1907 as compared with 5.4 per cent (58 cars) in 1902; Washington, with 77.2 per cent (1,360 cars) in 1907 as compared with 9.5 per cent (41 cars) in 1902; Missouri, with 68.6 per cent (1,754 cars) in 1907 as compared with 4 per cent (100 cars) in 1902; and Michigan, with 65.7 per cent (1,566 cars) in 1907 as compared with 10.4 per cent (183 cars) in 1902.

The brakes reported as "Other mechanical" brakes undoubtedly include many belonging in the hand-

brake class. The returns in some cases are incomplete and do not permit of a satisfactory classification. The group included 411 electric or magnetic brakes for 1907 as compared with 1,055 for 1902, and 1,999 track brakes in 1907 as compared with 1,495 in 1902.

Lighting and heating of cars.—In addition to its use as a motive power, electricity has furnished an ideal method of lighting and heating cars, and is rapidly displacing stoves and other heating systems on all lines having electric power. The statistics for this phase of the industry are given in Table 45.

TABLE 45.—EQUIPMENT OF CARS—LIGHTING, BY GEOGRAPHIC DIVISIONS: 1907 AND 1902.

DIVISION.	TOTAL NUMBER OF CARS.		NUMBER OF CARS LIGHTED.								PER CENT OF INCREASE.					
			Total.		By electricity.		By oil, etc.		Per cent of total number of cars lighted.		Total number of cars.	Number of cars lighted.				
												By electricity.	By oil, etc.	Total.	By electricity.	By oil, etc.
			1907	1902	1907	1902	1907	1902	1907	1902	1907						1902	1907	1902
United States.....	83,641	66,784	73,877	62,369	72,992	55,703	885	6,606	98.8	89.3	1.2	10.7	25.2	18.5	31.0	186.7
North Atlantic.....	40,658	34,793	37,387	32,661	37,022	30,083	365	2,578	99.0	92.1	1.0	7.9	17.0	14.5	23.1	185.8
South Atlantic.....	6,002	4,004	5,700	4,486	5,672	4,400	28	36	99.5	99.2	0.5	0.3	30.4	28.5	28.9	122.2
North Central.....	25,582	20,712	22,074	19,216	21,785	16,114	289	3,102	98.7	83.9	1.3	16.1	23.5	14.9	35.2	190.7
South Central.....	4,177	3,240	3,902	3,086	3,938	2,955	24	81	99.4	97.3	0.6	2.7	28.6	30.5	33.3	170.4
Western.....	7,222	3,456	4,754	3,020	4,675	2,151	179	869	96.2	71.2	3.8	28.8	109.0	57.4	112.7	179.4

¹Decrease.

Electric lighting is now in use on practically all lighted cars of electric roads. The 1.2 per cent of cars lighted by oil, etc., in 1907 represents substantially the lighted cars of animal, cable, steam, and gasoline-motor lines, as but 47 of the cars lighted by oil, etc., were reported by roads having electric power exclusively. In 1907 the lighted cars comprised 88.3 per cent of the total number compared with 93.4 per cent of the total number in 1902. The decrease in the proportionate number of lighted cars is due to the increase in number and proportion of freight cars. The South

Atlantic division had the largest proportionate number of lighted cars at both censuses—95 per cent in 1907 and 96.4 per cent in 1902, and the Western division the smallest proportionate number—65.8 per cent in 1907 and 87.4 in 1902. The large number of non-lighted cars in the Western division is explained by the fact that a large number of freight cars without lighting equipment were used in that division.

Table 46 presents comparative statistics with respect to the heating of cars.

TABLE 46.—EQUIPMENT OF CARS—HEATING, BY GEOGRAPHIC DIVISIONS: 1907 AND 1902.

DIVISION.	NUMBER OF CARS.						NUMBER OF CARS HEATED.								PER CENT CARS HEATED FORM OF OTHER THAN OPEN CARS.		PER CENT OF INCREASE.					
	Total.		Other than open.		Open.		Total.		By electricity.		By stoves, etc.		Per cent of total number of cars heated.				Other than open cars.	Cars heated.				
													By electricity.		By stoves, etc.			Total.	By electricity.	By stoves, etc.		
	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907				1902	
United States.....	83,641	66,784	61,104	42,525	22,537	24,259	43,006	30,159	31,370	19,021	12,527	11,138	71.5	63.1	28.5	36.9	71.9	70.9	43.7	45.6	65.0	12.5
North Atlantic.....	40,658	34,793	27,469	21,200	13,189	13,503	22,749	16,054	19,608	12,181	3,081	4,473	86.5	73.1	13.5	26.9	82.8	78.3	29.2	36.6	61.5	131.1
South Atlantic.....	6,002	4,004	3,024	2,593	2,078	2,011	2,192	1,141	2,115	1,113	77	28	90.5	97.5	3.5	2.5	55.9	44.0	51.3	92.1	90.0	175.0
North Central.....	25,582	20,712	19,897	13,454	5,085	7,258	16,234	11,013	7,005	4,524	9,229	6,489	43.2	41.1	56.8	58.9	81.6	81.9	47.9	47.4	54.8	42.2
South Central.....	4,177	3,240	3,083	2,371	1,094	878	1,449	812	1,369	731	80	81	94.5	90.0	5.5	10.0	47.0	34.2	30.0	78.4	87.3	11.2
Western.....	7,222	3,456	6,731	2,847	491	609	1,282	539	1,222	472	60	67	95.3	87.6	4.7	12.4	19.0	18.9	136.4	137.8	158.9	110.4

¹Decrease.

In 1907, 52.5 per cent of all cars were equipped with heating apparatus as compared with 45.2 per cent of all cars in 1902. Consideration of heating facilities is preferably, however, confined to closed cars, and the percentages given in the above table are on this basis.

An examination of the returns for the several companies disclosed the fact that a considerable number of open passenger cars were reported as equipped with heating apparatus. This can be explained only on the assumption that a considerable number of these

open cars are convertible and that the heating apparatus for use when converted into a closed car was reported. The group of cars "Other than open" includes in addition to closed passenger cars all combination cars—closed and open, and passenger and express—all parlor, sleeping, dining, private, express, freight, mail, and work cars, as well as snowplows, sweepers, and sprinklers. In 1907 there were 61,104 cars of this group as compared with 42,525 in 1902, an increase of 43.7 per cent. Of these cars, 71.9 per cent had means for heating in 1907 and 70.9 in 1902. The North Atlantic division had the largest proportion of heated cars among the cars other than open cars in 1907, 82.8 per cent, as compared with 78.3 per cent in 1902, followed by the North Central division, with 81.6 per cent in 1907 as compared with 81.9 in 1902. The Western division, partly on account of the large number of express or freight cars that were not heated, had the smallest percentage of heated cars at both censuses, although it had the largest proportionate increase in the number of closed cars and in the number of heated cars.

The equipments in use for heating by means other than electric current comprise chiefly stoves and hot-water systems. At the census of 1907 the inquiry as to the kind of heating system in use was not in all cases specifically answered, but the details, so far as reported, are given in the following table:

TABLE 47.—Number of cars heated by stoves and heating systems other than electric: 1907.

DIVISION.	NUMBER.				All other.
	Total.	By stoves.	By hot-water systems.	By hot-water systems or stoves.	
United States.....	12,527	5,442	3,700	1,400	11,907
North Atlantic.....	3,081	1,949	1,005	.....	127
South Atlantic.....	77	9	41	.....	27
North Central.....	9,220	3,380	2,713	1,400	1,727
South Central.....	80	58	8	.....	14
Western.....	60	40	2	.....	12

¹ Includes 28 steam systems and 1,870 kind not reported.

One company in Kansas, which used gas-electric motor cars, heated the cars with the waste heat from the gas engines by means of a hot-water system.

Car houses.—There were 1,764 separate structures for the housing of cars reported in 1907 as compared with 1,634 in 1902, an increase of 130 buildings, or 8 per cent. While the increase in number of buildings exceeded by 2 the increase in the number of operating companies, the relative increase is much less than the relative increase in the total number of cars. That

there was probably both a consolidation of separate structures between the censuses and an enlargement of existing ones is suggested by the fact that in 1902 the average number of cars per structure was but 41, while in 1907 it had increased to 47, and, on the other hand, that the number of car houses per operating company in 1902 was 2 and in 1907 slightly less than 1.9.

Car houses were not reported by 114 of the 945 operating companies in 1907 nor by 83 of the 817 in 1902. Several companies expressly stated that no shelter for cars had been constructed, while others reported only a combination car and power house, in which cases the structure was classified and tabulated as a power house rather than as a car barn. There were also a number of companies that either by a temporary or a permanent arrangement used the car houses of other companies.

Telephone line exclusively for operation of railways.—There were 406 companies in 1907 and 257 in 1902 that reported the ownership or operation of telephone lines as an aid to their regular car-dispatching system, or in establishing communication with conductors at points along the line and between different offices and sections of the system. In 1907 there were 14,546 miles of telephone line used exclusively for this purpose as compared with 5,868 miles in 1902, an increase of 8,678 miles, or 147.9 per cent. All of this line is exclusive of any line of local telephone exchanges that is also utilized by the companies. The 3 states that had the greatest telephone mileage for railway operation in 1907 were Ohio, with 2,856 miles; Indiana, with 1,773 miles; and Massachusetts, with 1,505 miles. The following companies reported 200 miles or over of telephone line in use: Pacific Electric Railway Company and Los Angeles Interurban Railway Company, of California; Indiana Union Traction Company and Terre Haute, Indianapolis and Eastern Traction Company, of Indiana; Old Colony Street Railway Company and Boston and Northern Street Railway Company, of Massachusetts; Ohio Electric Railway Company and Lake Shore Electric Railway Company, of Ohio; and Milwaukee Electric Railway and Light Company, of Wisconsin.

TRACK AND CARS BY GROUPS OF COMPANIES.

Track and cars of companies, classified according to income from railway operations.—The statistics pertaining to track and cars for all operating companies, classified according to their income from railway operations, are given in the following table for 1907 and 1902:

TABLE 48.—TRACK AND CARS OF COMPANIES, CLASSIFIED ACCORDING TO INCOME FROM RAILWAY OPERATIONS: 1907 AND 1902.

	Census.	Total, all companies.	CLASSIFICATION GROUP.					Per cent of total.				
			\$1,000,000 and over.	\$500,000 but less than \$1,000,000.	\$250,000 but less than \$500,000.	\$100,000 but less than \$250,000.	Less than \$100,000.	A	B	C	D	E
			(A)	(B)	(C)	(D)	(E)					
Number of operating companies.....	1907	945	77	50	82	183	553	8.1	5.3	8.7	19.4	58.5
	1902	817	44	28	57	116	572	5.4	3.4	7.0	14.2	70.0
Miles of track, total.....	1907	34,403.56	15,564.34	4,380.24	4,009.70	4,970.68	5,463.54	45.2	12.7	11.7	14.5	15.9
	1902	22,576.99	8,414.31	2,127.29	2,782.59	3,478.97	5,773.83	37.3	9.4	12.3	15.4	25.6
Overhead trolley.....	1907	32,501.71	14,487.11	4,249.18	3,720.43	4,764.32	5,280.67	44.6	13.1	11.4	14.7	16.2
	1902	21,290.09	7,645.66	2,024.02	2,719.89	3,327.78	5,572.74	35.9	9.5	12.8	15.6	20.2
All other electric.....	1907	1,557.98	906.89	119.98	289.33	173.93	67.85	58.2	7.7	18.6	11.2	4.4
	1902	611.44	385.27	54.91	16.11	121.97	33.18	63.0	9.0	2.6	19.9	5.4
All other kinds.....	1907	343.87	170.34	17.08	.....	41.43	115.02	49.5	5.0	.....	12.0	33.4
	1902	675.40	383.38	48.36	40.59	29.22	167.91	56.7	7.2	6.9	4.3	24.9
Owned.....	1907	27,480.65	10,119.09	3,703.91	3,657.93	4,601.40	5,338.32	36.8	13.7	13.3	16.7	19.4
	1902	19,025.85	5,543.07	1,926.34	2,542.53	3,344.96	5,668.35	29.1	10.1	13.4	17.6	29.8
Leased.....	1907	6,922.91	5,445.25	622.33	351.83	378.28	125.22	78.7	9.0	5.1	5.5	1.8
	1902	3,551.14	2,870.04	200.95	240.06	134.01	105.48	80.8	5.7	6.8	3.8	3.0
Track operated under trackage rights.....	1907	998.31	480.93	49.26	102.26	162.27	197.59	48.8	4.9	10.2	16.3	19.8
	1902	590.92	68.04	53.11	116.56	141.87	181.34	12.1	9.5	20.8	25.3	32.3
Track on private right of way, total.....	1907	10,971.84	3,167.60	1,611.63	1,724.62	2,105.52	2,362.38	28.9	14.7	15.7	19.2	21.5
	1902	3,802.07	668.93	216.61	606.41	772.89	1,537.23	17.6	5.7	16.0	20.3	40.4
Owned by company.....	1907	10,280.57	3,089.23	1,575.23	1,665.56	1,804.00	2,096.55	30.2	15.4	16.3	17.6	20.5
	1902	3,424.06	541.46	205.85	581.71	696.98	1,398.96	15.8	6.0	17.0	20.4	40.8
Not owned by company.....	1907	741.27	78.46	36.40	59.06	301.52	265.83	10.6	4.9	8.0	40.7	35.9
	1902	377.11	127.47	10.76	24.70	75.91	138.27	33.8	2.9	6.5	20.1	36.7
Number of cars, total.....	1907	83,041	55,692	8,194	6,129	7,304	6,322	66.6	9.8	7.3	8.7	7.6
	1902	66,784	41,702	5,332	5,470	5,956	8,324	62.4	8.0	6.2	8.9	12.5
Motor.....	1907	68,874	48,506	5,758	4,596	5,244	4,770	70.4	8.4	6.7	7.6	6.9
	1902	50,099	31,043	4,060	4,121	4,661	5,908	63.0	8.0	8.1	9.2	11.7
Trailer.....	1907	14,767	7,186	2,436	1,533	2,060	1,552	48.7	16.5	10.4	14.0	10.5
	1902	16,085	9,759	1,266	1,340	1,295	2,416	60.7	7.9	8.4	8.1	15.0
Passenger cars, number.....	1907	70,016	49,004	6,160	4,515	5,318	5,019	70.0	8.8	6.4	7.6	7.2
	1902	60,290	38,543	4,856	4,789	5,279	6,823	63.9	8.1	7.9	8.8	11.3

The changes in the proportions that the several classes formed of the respective totals show the movement toward larger companies during the five-year period between 1902 and 1907. In all of the leading items—miles of track, track owned, track on private right of way, and car equipment—the classes of the larger companies, Classes A and B, made large gains, and the smaller company classes show, in the main, corresponding decreases. The general proportionate increase is particularly noticeable in the companies of Class B, those having an income from railway operations of from \$500,000 but less than \$1,000,000, as indicated by Table 49, which gives the percentages of increase of the leading items for the several classes.

A comparison of the car equipment with the miles of track operated shows a proportionate decrease in the former, due in part to the use of larger cars and in part to the fact that track extensions are generally into districts of relatively low traffic density. Thus in 1907 the average number of cars per mile of track, which for all companies was 2.4, ranged from 3.6 cars per mile of track for the companies of Class A down to

1.2 for those of Class E, as compared with an average in 1902 of 3 cars for all companies and a range from 5 cars for companies of Class A to 1.4 cars for those of Class E. It will be noted that the number of trailers in use decreased for all companies and for Classes A and E, the classes with the largest and the smallest incomes, while the intermediate classes show gains, the largest being in Class B. This is accounted for largely by the growth in express and freight business of companies belonging to these middle classes.

TABLE 49.—Per cent of increase of track and cars of companies, classified according to income from railway operations: 1902 to 1907.

	PER CENT OF INCREASE.					
	Total.	A	B	C	D	E
Miles of track, total.....	52.4	85.0	106.2	44.1	43.1	15.4
Owned.....	44.4	82.5	95.4	43.9	37.6	15.8
Leased.....	94.9	89.7	209.7	46.6	182.3	18.7
Track on private right of way.....	188.6	373.5	644.0	184.4	172.4	53.7
Number of cars, total.....	25.2	33.5	53.7	12.0	22.6	124.1
Motor.....	35.8	51.9	41.6	11.5	12.5	119.3
Trailer.....	18.2	125.4	92.4	13.6	59.1	135.8
Passenger cars.....	16.1	27.1	26.9	15.7	7	126.4

¹ Decrease.

STREET AND ELECTRIC RAILWAYS.

Track and cars of companies, classified according to kind of system and character of service.—A similar presentation of the statistics relating to track and cars is

given in Table 50 for 1907, for companies, classified by kind of system and by character of service.

TABLE 50.—TRACK AND CARS OF COMPANIES, CLASSIFIED ACCORDING TO KIND OF SYSTEM AND CHARACTER OF SERVICE: 1907.

	Total, all companies.	CLASSIFICATION GROUP.				
		Kind of system.		Character of service.		
		Electric elevated and subway railways. ¹	Electric surface railways. ²	Selected interurban lines.	Selected small urban roads.	All other railways.
Number of operating companies.....	945	0	939	50	100	795
Miles of track, total.....	34,403.56	420.40	33,983.16	5,567.11	580.69	28,275.76
Overhead trolley.....	32,501.71	25.89	32,475.82	5,068.65	555.47	26,877.59
All other electric.....	1,557.98	394.51	1,168.47	466.46	5.22	1,096.30
All other kinds.....	343.87		343.87	42.00		301.87
Owued.....	27,480.65	201.35	27,189.30	3,940.07	580.69	22,970.89
Leased.....	6,922.91	120.05	6,793.86	1,618.04		5,304.87
Track on private right of way, total.....	10,971.84	118.78	10,853.06	3,583.16	193.33	7,195.35
Owued by company.....	10,230.57	116.31	10,114.26	3,447.69	181.22	6,602.26
Not owued by company.....	741.27	2.47	738.80	136.07	12.11	593.09
Number of cars, total.....	83,641	4,453	79,188	5,259	618	77,704
Motor.....	68,874	2,433	66,441	3,420	484	64,901
Traller.....	14,767	2,020	12,747	1,830	134	12,808
Passenger cars, number.....	70,016	4,320	65,696	3,246	401	65,279

¹ Exclusive of the mixed elevated, subway, and surface systems in Boston, Mass., and Philadelphia, Pa.

² Includes the statistics for the few railways not operated by electricity.

The electric elevated and subway railways operate in districts of the highest traffic density. Naturally the items for this small group of railways do not form large percentages of the totals of the several items relating to track, except in the case of track designated as "All other electric," which is track of the third-rail system used on the strictly elevated and subway lines. The car equipment of the roads of this group is necessarily large, averaging 10.6 cars per mile of track in 1907, or 29.7 cars per mile of line. The total number represents a line of cars approximately 40 miles long, or more than one-fourth of the length of the roads.

The 50 selected interurban roads operated a relatively large amount of leased track, the proportion that such track formed of all leased track being 23.4

per cent, while the ratio of all their trackage to all track reported in 1907 was only 16.2 per cent. This group had a still larger proportionate part, 32.7 per cent, of the track on private right of way.

The car equipment per mile of track operated by these interurban lines is naturally low, as compared with roads operating solely in urban districts; in 1907 the average number of cars per mile of track was only 0.9 for the interurban lines, as against 2.4 for all companies, and 1.1 for the group of 100 small urban roads. The last group, though relatively large in absolute number of companies, had small ratios of track and car equipment. This group comprises roads that were entirely electric and that owned all the track on which their cars ran.

CHAPTER V.

TRAFFIC.

The statistics showing the traffic of each railway company for the year 1907 are shown in detail in Table 187. These, as well as the statistics for all other phases of the industry, are of greatest interest when compared with similar data for some previous year. It is impracticable, however, to make comparisons in detail for each company in the United States, and consequently the figures for the last two censuses will be shown only for groups of companies and for large representative systems.

The state totals relating to passengers, car miles, car hours, and accidents represent the aggregate for

the companies credited to the respective states, and not necessarily the exact statistics of traffic within the several state lines, since a number of companies operated track in more than one state. Table 183 shows the state location of trackage for each company and the net trackage in each state.

Statistics for the more important items of traffic as reported in 1907 and 1902 are given in Table 51 for the states and geographic divisions. The per cent distribution and percentages of increase for the geographic division totals appear in Table 52.

TABLE 51.—PASSENGERS AND CAR MILEAGE, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902.

STATE OR TERRITORY.	Census.	NUMBER OF PASSENGERS.				Transfer points.	Fare passengers per mile of track.	CAR MILEAGE.			Fare passengers per car mile.
		Total.	Fare.	Transfer.	Free.			Total.	Passenger cars.	Express, freight, mail, and work cars, including electric and steam locomotives.	
United States.....	1907	9,533,080,700	¹ 7,441,114,508	1,995,658,101	90,308,157	7,376	¹ 216,522	1,617,731,300	1,583,631,199	33,900,101	4.70
	1902	5,836,615,206	² 4,774,211,904	1,002,403,302	(³)	4,455	² 212,217	1,144,430,460	1,120,101,944	24,328,522	4.20
North Atlantic division.....	1907	4,648,091,271	3,714,134,688	899,771,941	34,184,042	3,400	271,025	747,022,896	738,203,124	9,620,772	5.03
	1902	3,137,090,901	2,618,528,979	518,507,022	(³)	1,020	257,040	565,480,857	545,481,224	20,005,633	4.80
Maine.....	1907	40,657,875	30,730,146	3,787,801	130,838	27	80,615	9,074,009	8,802,070	271,890	4.17
	1902	27,506,582	25,405,164	2,011,418	.....	14	70,807	6,816,071	6,389,750	426,021	3.99
New Hampshire.....	1907	22,020,103	20,086,600	1,704,139	220,274	2	81,200	4,776,054	4,650,029	120,025	4.31
	1902	12,234,120	11,304,908	920,212	.....	5	67,432	3,214,870	3,214,011	208	3.52
Vermont.....	1907	7,400,680	7,103,082	357,508	.....	7	57,140	1,810,853	1,771,087	38,800	4.01
	1902	4,501,523	4,274,806	286,717	.....	6	53,070	1,412,528	1,283,005	123,503	3.82
Massachusetts.....	1907	814,586,310	597,409,848	213,574,726	3,541,730	378	207,035	118,671,549	117,108,135	1,563,414	5.10
	1902	605,258,939	461,745,615	143,513,324	.....	250	182,822	101,373,975	100,115,307	1,258,668	4.61
Rhode Island.....	1907	104,273,001	91,171,989	11,559,102	1,511,910	131	217,118	15,737,078	15,335,805	402,173	5.95
	1902	62,394,165	62,279,165	115,000	.....	3	189,356	12,200,893	12,173,911	122,982	5.12
Connecticut.....	1907	146,169,623	122,553,772	23,457,233	148,618	135	156,880	26,668,982	25,677,625	1,081,357	4.79
	1902	93,368,167	77,447,101	15,911,066	.....	90	134,104	20,180,690	19,728,233	458,457	3.03
New York.....	1907	2,123,242,239	1,657,686,801	455,906,610	9,648,828	1,942	426,718	336,783,703	332,600,950	4,276,753	4.99
	1902	1,424,915,703	1,144,491,509	280,424,194	.....	1,157	407,305	251,312,176	234,279,043	17,033,133	4.89
New Jersey.....	1907	345,202,599	269,009,070	60,329,479	6,774,050	432	203,220	55,658,531	55,020,951	638,580	4.89
	1902	228,082,103	183,976,899	39,105,204	.....	118	219,414	35,372,340	35,355,733	16,613	5.35
Pennsylvania.....	1907	1,044,488,841	912,233,290	120,065,103	12,190,388	436	251,920	178,750,577	177,443,372	1,307,205	5.14
	1902	678,785,599	642,513,812	36,271,787	.....	271	258,983	133,501,699	132,035,071	566,628	4.83
South Atlantic division.....	1907	622,578,893	487,981,528	125,024,241	9,573,124	602	212,690	105,825,575	104,955,444	870,131	4.65
	1902	376,902,496	297,198,541	78,703,955	(³)	466	179,258	80,327,031	79,409,630	918,292	3.74
Delaware.....	1907	19,282,805	15,723,757	3,227,211	331,837	25	163,009	4,013,211	3,901,161	22,050	3.94
	1902	11,440,702	9,056,569	1,484,143	.....	26	116,301	3,006,798	2,969,238	37,560	3.35
Maryland.....	1907	211,402,192	162,208,326	55,614,404	3,510,462	106	283,987	20,351,027	28,063,797	387,260	5.26
	1902	135,625,650	99,989,552	35,636,098	.....	144	228,370	24,832,662	24,238,490	594,172	4.13
District of Columbia.....	1907	130,490,524	91,599,056	38,439,924	481,544	68	520,190	19,385,292	19,377,792	7,500	4.73
	1902	90,203,941	66,162,321	24,041,020	.....	60	408,485	10,139,141	10,082,204	56,937	4.11
Virginia.....	1907	88,614,999	77,300,268	9,531,818	1,782,913	105	149,940	18,000,351	17,960,718	135,633	4.30
	1902	52,369,902	44,275,661	8,094,241	.....	113	127,682	12,335,072	12,304,104	30,968	3.60
West Virginia.....	1907	44,616,042	42,749,821	1,183,122	683,099	25	161,071	8,206,777	8,247,777	40,000	5.18
	1902	22,183,794	21,706,870	476,924	.....	3	155,049	6,734,171	6,734,171	.....	3.22

¹ Fare passengers reported for 944 operating companies only, representing 34,366.51 miles of track operated.
² Fare passengers reported for 811 operating companies only, representing 22,496.85 miles of track operated.
³ Not reported separately.

STREET AND ELECTRIC RAILWAYS.

TABLE 51.—PASSENGERS AND CAR MILEAGE, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902—Continued.

STATE OR TERRITORY.	Census.	NUMBER OF PASSENGERS.				Trans-fer points.	Fare pas-sengers per mile of track.	CAR MILEAGE.			Fare pas-sengers per car mile.
		Total.	Fare.	Transfer.	Free.			Total.	Passenger cars.	Express, freight, mail, and work cars, including electric and steam locomotives.	
South Atlantic division—Continued.											
North Carolina.....	1907	15,858,022	14,080,151	1,652,848	119,023	13	132,439	3,808,204	3,800,045	58,559	3.70
	1902	0,783,095	5,337,307	1,440,328	.....	8	115,228	1,070,978	1,620,209	47,079	3.28
South Carolina.....	1907	18,277,930	15,604,035	2,104,371	478,930	30	119,569	3,825,478	3,805,370	20,108	4.12
	1902	10,748,724	9,056,818	1,691,900	.....	27	117,052	2,520,231	2,502,844	17,387	3.62
Georgia.....	1907	71,820,430	59,700,469	10,154,550	1,905,424	108	170,973	14,000,261	14,488,830	111,431	4.12
	1902	37,004,301	32,463,851	4,540,510	.....	93	108,070	10,733,423	10,630,820	42,603	3.04
Florida.....	1907	22,215,334	18,880,055	3,115,087	210,292	32	159,725	4,388,974	4,310,384	78,590	4.38
	1902	9,541,727	8,249,542	1,292,185	.....	13	133,596	2,349,449	2,502,403	90,986	3.65
North Central division.....											
	1907	2,070,482,001	2,228,525,340	715,310,251	31,040,401	2,117	173,316	531,048,940	518,928,111	12,120,835	4.28
	1902	1,707,542,180	1,344,000,951	303,541,229	(¹)	1,580	173,356	306,847,433	304,127,215	2,720,218	3.69
Ohio.....	1907	608,500,507	480,843,805	122,195,401	5,500,301	280	127,793	124,480,321	120,596,305	3,883,050	3.99
	1902	350,788,221	285,434,579	71,853,042	.....	189	121,284	88,990,438	83,135,144	801,294	3.43
Indiana.....	1907	109,110,331	137,547,183	27,277,709	4,285,370	95	71,100	41,809,611	39,504,004	1,805,007	3.48
	1902	80,974,221	60,265,707	14,718,454	.....	92	102,458	21,095,357	20,931,738	163,599	3.17
Illinois.....	1907	903,580,254	703,403,137	283,335,431	6,700,085	838	254,019	170,332,063	166,040,747	3,085,316	4.22
	1902	590,598,228	403,100,080	127,407,242	.....	592	287,035	121,142,474	120,835,074	307,400	3.83
Michigan.....	1907	237,073,790	183,239,012	47,410,475	6,424,282	142	143,713	45,830,200	44,388,125	1,448,075	4.13
	1902	140,440,783	113,910,092	20,523,791	.....	110	111,376	33,040,839	32,333,404	713,375	3.52
Wisconsin.....	1907	132,330,221	102,771,360	28,898,500	609,352	92	173,007	21,790,284	21,722,884	70,400	4.73
	1902	78,282,492	62,537,300	15,745,192	.....	89	150,150	15,009,884	16,528,124	81,760	4.03
Minnesota.....	1907	175,451,502	130,122,311	30,158,450	170,735	104	207,763	24,370,694	24,370,694	.....	5.59
	1902	90,098,703	73,230,012	17,402,181	.....	77	216,597	15,092,887	15,092,887	.....	4.67
Iowa.....	1907	73,611,748	61,430,800	11,114,440	1,057,448	69	90,024	17,128,619	16,647,266	481,353	3.69
	1902	44,070,534	38,559,589	5,510,045	.....	61	101,942	11,809,254	11,088,888	120,360	3.30
Missouri.....	1907	492,716,513	346,361,741	140,454,246	5,900,520	403	375,798	60,137,091	68,015,923	522,008	5.05
	1902	290,092,823	211,808,737	78,284,086	.....	342	279,291	55,702,091	55,326,272	430,719	3.83
North Dakota ²	1907	2,105,800	1,871,904	233,806	.....	3	110,345	389,218	389,218	.....	4.81
South Dakota ²	1907	125,515	125,515	.....	.....	.....	25,103	48,000	48,000	.....	2.58
Nebraska.....	1907	61,731,806	49,323,051	11,975,339	433,410	60	225,497	10,350,712	10,248,974	107,738	4.81
	1902	27,610,504	22,228,825	5,391,179	.....	40	195,509	6,273,045	6,238,210	35,735	3.56
Kansas.....	1907	24,027,005	20,360,380	3,250,310	384,306	25	81,585	5,790,633	5,748,711	50,922	3.55
	1902	7,970,581	6,832,064	1,138,517	.....	18	61,406	2,417,304	2,417,304	.....	2.83
South Central division.....											
	1907	504,100,244	414,225,626	80,316,010	0,558,002	363	217,337	65,380,691	94,042,280	1,344,402	4.40
	1902	234,315,015	210,103,801	24,212,054	(¹)	114	158,875	63,230,655	63,043,804	192,854	3.38
Kentucky.....	1907	107,798,404	85,858,031	20,545,140	1,394,423	42	220,643	18,750,421	18,345,627	404,794	4.68
	1902	61,083,130	50,293,852	5,389,278	.....	21	198,253	15,477,507	15,461,572	25,935	3.04
Tennessee.....	1907	99,208,212	73,740,080	22,820,807	2,601,350	42	247,880	15,928,762	15,884,012	44,150	4.04
	1902	45,470,511	35,097,835	9,778,076	.....	40	140,432	10,138,003	10,134,910	3,084	3.52
Alabama.....	1907	62,923,421	52,197,482	8,842,346	1,883,593	63	178,067	11,785,298	11,554,680	230,618	4.52
	1902	23,741,093	22,748,871	993,092	.....	12	111,122	6,152,896	6,043,479	109,417	3.76
Mississippi.....	1907	10,312,012	0,084,086	1,008,289	160,537	19	105,140	2,796,703	2,702,023	6,840	3.25
	1902	3,127,040	3,101,015	26,025	.....	3	122,570	923,090	923,090	.....	3.36
Louisiana.....	1907	94,785,724	85,193,032	8,046,350	1,546,742	28	357,176	20,500,652	20,174,162	332,490	4.22
	1902	60,285,120	55,843,843	4,041,277	.....	15	278,782	18,594,800	18,594,800	.....	2.98
Arkansas.....	1907	20,910,339	17,145,387	3,078,070	602,282	21	106,194	4,331,294	4,320,034	2,200	3.90
	1902	7,835,599	6,880,470	955,090	.....	11	131,082	2,144,776	2,144,106	580	3.21
Oklahoma ²	1907	11,089,973	9,502,472	1,503,032	23,500	21	94,608	2,470,202	2,400,668	18,534	3.80
Texas.....	1907	97,005,109	81,496,650	14,342,422	1,166,097	127	106,439	18,805,299	18,500,583	304,716	4.41
	1902	32,165,682	30,037,060	2,127,710	.....	12	99,047	9,804,017	9,750,779	53,238	3.08
Western division.....											
	1907	787,828,267	601,247,317	175,235,652	11,345,208	804	105,495	137,547,192	127,612,231	0,934,961	4.71
	1902	381,757,804	304,379,572	77,378,232	(¹)	390	190,225	68,631,587	68,040,092	401,525	4.47
Montana.....	1907	14,089,040	13,862,231	145,231	82,187	11	200,206	2,432,477	2,432,477	.....	5.70
	1902	0,917,002	0,858,502	58,500	.....	3	108,503	1,354,822	1,313,042	40,880	6.22
Idaho.....	1907	1,507,335	1,323,964	157,246	23,125	7	20,095	385,095	378,585	7,380	3.51
	1902	314,340	314,340	.....	.....	.....	80,811	164,250	164,250	.....	1.91
Colorado.....	1907	93,083,653	73,458,498	18,302,433	1,802,752	85	231,460	14,506,838	14,297,798	209,040	5.14
	1902	52,327,717	42,371,560	9,956,127	.....	55	183,805	8,925,060	8,924,560	500	4.76
New Mexico.....	1907	1,074,598	1,020,048	27,300	18,250	1	101,880	240,050	248,450	600	4.14
	1902	73,000	73,000	.....	.....	.....	34,762	61,320	61,320	.....	1.19

¹ Not reported separately.² No company reported in 1902.³ One company failed to report traffic in 1902.

TABLE 51.—PASSENGERS AND CAR MILEAGE, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902—Continued.

STATE OR TERRITORY.	Census.	NUMBER OF PASSENGERS.				Transfer points.	Fare passengers per mile of track.	CAR MILEAGE.			Fare passengers per car mile.
		Total.	Fare.	Transfer.	Free.			Total.	Passenger cars.	Express, freight, mail, and work cars, including electric and steam locomotives.	
Western division—Cont'd.											
Arizona.....	1907	2,058,861	1,901,861	128,000	29,000	7	61,849	918,054	918,054		2.07
	1902	799,710	797,970	1,740		2	46,965	306,600	306,600		2.60
Utah.....	1907	20,430,893	21,105,491	5,055,462	270,040	35	172,238	4,540,085	4,463,398	86,687	4.74
	1902	13,799,819	11,493,501	2,306,318		7	129,082	3,047,222	3,047,122	100	3.77
Nevada.....	1907	661,025	620,000	31,025	10,000	2	86,718	250,000	250,000		2.48
Washington.....	1907	142,496,001	110,506,620	29,951,966	2,037,415	112	144,504	24,864,214	22,943,472	1,420,742	4.82
	1902	42,533,743	41,544,228	980,515		57	181,471	8,378,420	8,285,417	93,003	5.01
Oregon.....	1907	63,930,947	49,469,483	12,146,734	2,324,730	73	195,176	15,025,037	10,470,327	4,554,710	4.72
	1902	23,666,753	18,729,442	4,937,311		20	137,641	4,781,105	4,719,355	61,750	3.97
California.....	1907	441,895,205	327,977,151	109,230,255	4,687,799	471	162,890	74,785,472	71,219,670	3,565,802	4.01
	1902	241,325,720	182,196,999	59,128,721		225	219,753	41,612,788	41,217,496	295,292	4.42

¹ No company reported in 1902.

TABLE 52.—PER CENT DISTRIBUTION AND PER CENT OF INCREASE OF PASSENGERS AND CAR MILEAGE, BY GEOGRAPHIC DIVISIONS: 1907 AND 1902.

DIVISION.	Census.	PER CENT OF TOTAL.					PER CENT OF INCREASE.									
		Number of passengers.				Transfer points.	Car mileage.			Number of passengers.				Car mileage.		
		Total.	Fare.	Transfer.	Free.		Total.	Passenger cars.	Express, freight, mail, etc., cars.	Total.	Fare.	Transfer.	Transfer points.	Total.	Passenger cars.	Express, freight, mail, etc., cars.
United States.....	1907	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	63.3	55.9	87.8	65.6	41.4	41.4	30.8
	1902	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0							
North Atlantic.....	1907	48.8	49.9	45.1	35.5	47.3	46.2	28.4	48.2	41.8	73.5	81.8	32.3	35.3	51.9	
	1902	53.7	54.8	48.8	(?)	43.1	49.4	48.7	32.2							
South Atlantic.....	1907	6.5	6.6	6.3	9.9	8.2	6.5	6.6	65.0	64.2	58.9	29.2	31.7	32.2	5.2	
	1902	6.4	6.2	7.4	(?)	10.5	7.0	7.1								
North Central.....	1907	31.2	29.9	35.8	32.9	28.7	32.8	35.8	74.0	65.4	96.8	33.5	44.8	42.5	345.6	
	1902	20.3	28.2	34.2	(?)	35.6	32.1	32.5								
South Central.....	1907	5.3	5.0	4.0	9.0	4.0	5.9	5.9	115.1	97.2	231.7	218.4	50.8	49.2	697.1	
	1902	4.0	4.4	2.3	(?)	2.0	5.5	5.6								
Western.....	1907	8.3	8.1	8.8	11.8	10.9	8.5	8.1	106.4	97.5	120.5	117.9	100.7	87.6	1,021.3	
	1902	6.5	6.4	7.3	(?)	8.3	6.0	6.1								

¹ Decrease.

² Not reported separately.

Number of passengers.—It is probable that more interest centers around the number of passengers carried than around any other feature of the railway service. While the increases in the capital, miles of track, rolling stock, etc., show the development of the industry, no fact is so impressive as the great number of people carried on these railways during the year, and the constant increase in the traffic.

The total number of passengers in 1907 aggregated 9,533,080,766 as compared with 5,836,615,296 in 1902, the increase being 3,696,465,470, or 63.3 per cent. The statistics for 1907, however, include 96,308,157 free passengers. This class was not specifically reported in 1902, and if included in that year, probably figured under transfer passengers. The number of fare passengers is the basis used in this report for all deductions in regard to passenger traffic, since the transfer pas-

sengers as a rule represent a duplication and since the free passengers comprise a class of passengers which is nonrevenue producing. Although transfer passengers in some cases pay an additional charge for transfers, the returns do not permit of the segregation of passengers paying an extra fare per transfer. The per cent distribution by class of passengers in 1907 and in 1902 is shown in the following statement:

CLASS OF PASSENGERS.	PER CENT DISTRIBUTION.	
	1907	1902
Total.....	100.0	100.0
Fare.....	78.1	81.8
Transfer.....	20.9	18.2
Free.....	1.0	

The New York City Railway Company, of New York, reported the largest number (523,032,340) of all passengers carried in 1907, also the largest number (403,532,402) in 1902, when it was known as the Interurban Street Railroad Company. The Sulphur Rock Railway Company, of Arkansas, returned the smallest number (1,300) for 1907, and the Chicago General Electric Railway Company, of Illinois, the smallest number (72) for 1902. In comparing the number of passengers carried by companies, the changes due to consolidation, leasing, etc., must be taken into account, as the extent of a system owned or controlled by a company often shows radical change from year to year and from census to census.

When states are ranked with respect to the number of passengers carried, New York is first for 1907, with 2,123,242,239 passengers, or 22.3 per cent of the total for all companies; Pennsylvania second, with 1,044,488,841, or 11 per cent of the total; and Illinois third, with 993,589,254, or 10.4 per cent of the total; while for 1902 New York was first, with 1,424,915,703 passengers, or 24.4 per cent of the total for all companies; Pennsylvania second, with 678,785,599, or 11.6 per cent of the total; and Massachusetts third, with 605,258,939, or 10.4 per cent of the total.

The relative increase was largest in the South Central division, followed by the Western, North Central, South Atlantic, and North Atlantic divisions. The proportion of the total number decreased for the North Atlantic division and increased for each of the other divisions.

Fare passengers.—This class of passengers was reported by all of the 945 operating companies in 1907, except the 1 exclusively freight road in Illinois, which had 15 miles of track. Of the 817 companies in 1902, 6 with 80.14 miles of track did not report fare passengers, but 2 of these were engaged in freight traffic only. The total number (7,441,114,508) for the last of the series of five years was 55.9 per cent greater than the total for the first year of the period.

The largest proportionate increases in fare passengers are shown for the Western and South Central divisions, while the numerical increases were largest for the North Atlantic and North Central divisions.

Transfer passengers.—Of the 811 companies which reported passengers in 1902, 408, or 50.3 per cent, granted transfers at one or more points on the road. For 1907, of the 944 companies that reported passengers, 522, or 55.3 per cent, issued transfers, though in 15 cases the number of transfer passengers was not reported. The total number of transfer passengers carried in 1902 was 22.2 per cent as great as the number of fare passengers. By 1907 the ratio had increased to 26.8 per cent. The New York City Railway Company, of New York, reported the largest number (178,261,972) of transfer passengers at the census of 1907, these passengers forming 51.7 per cent of the number of fare passengers carried by the company. At the census of

1902 the greatest number of passengers riding on transfers (115,524,487) was returned by the same company (then the Interurban Street Railroad) and formed 40.1 per cent of the number of fare passengers carried by the company.

The privilege of transferring appears to be enjoyed more generally by the patrons of the street railways in the District of Columbia than by those in any other state, for in the District the proportion that passengers riding on transfers formed of the number of fare passengers carried in 1907 was 42 per cent, as compared with 40.6 per cent for Missouri and 40.3 per cent for Illinois, which were next in rank. At the census of 1902 Missouri had the largest proportionate number of transfers, with 37 per cent, the District of Columbia being second, with 36.3 per cent.

The North Atlantic division returned the largest proportion of the total number of transfer passengers carried both in 1907 and in 1902, but the ratio decreased from 48.8 per cent in the earlier year to 45.1 per cent in the later year. The largest relative gain was in the South Central division and the smallest in the South Atlantic division.

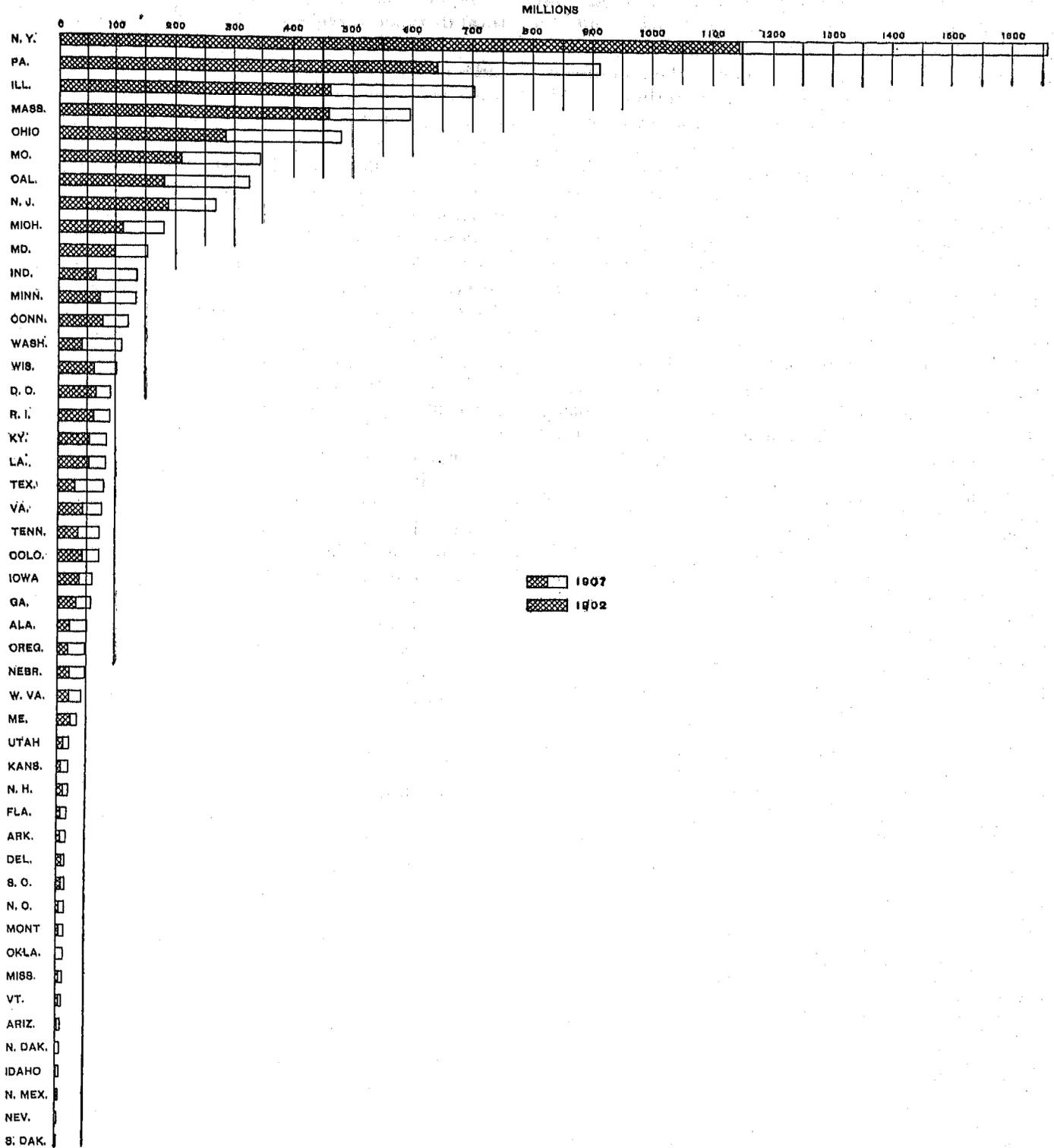
Transfer points.—There were 4,455 transfer points reported in 1902 as compared with 7,376 in 1907. This represents an increase of 65.6 per cent, but it is less than the rate of increase in transfer passengers. Although the term "transfer points" is intended to represent the junctions or geographic points where traffic is interchanged, some uncertainty surrounds the totals for such points, since the reporting companies did not all place precisely the same interpretation upon the inquiry. For example, 1 company at first reported 246 points for 1907 as against 21 in 1902, but later reduced the larger number to 69, with the explanation that by actual count there were 69 different points in the city where passengers could transfer from one line to another, but that in the first instance they had counted some of these points more than once, with the idea of reporting the number of lines crossing a given transfer point. It is not impossible that similar confusion elsewhere was uncorrected, to the impairment of the totals.

When geographic divisions are considered, the largest percentage of increase of transfer points as of transfer passengers was in the South Central states and the smallest in the South Atlantic.

Free passengers.—The free passengers, reported separately for the first time in 1907, include employees of the road and local government and other persons riding on passes, but do not include so-called "badge passengers"—policemen, letter carriers in uniform, and employees of the road carried without the presentation of a ticket or pass—since no record is kept of the last-mentioned class of passengers. Of the 944 operating companies reporting passengers, 628, or two-thirds, reported free passengers.

DIAGRAM 2.—NUMBER OF FARE PASSENGERS, BY STATES AND TERRITORIES: 1907 AND 1902.

[Based upon totals for companies credited to the several states but does not necessarily represent the actual traffic within state lines.]



Car mileage.—Car mileage has generally been employed both by steam and electric railways as the unit of service. Lately the car hour has been much used and was reported by 734 of the 945 operating companies included in the census of 1907. The car hour may be the better unit for general application, but it is not in universal use and the older and more familiar unit of car mile must be relied upon as the unit of comparison in census statistics. The desirability of the car mile as a scientific unit of measurement is well recognized.¹

While the car mile is the most available unit and serves fairly well for general comparative purposes, traffic statistics and averages based upon it must not be accepted without consideration of the following facts: (1) All companies do not keep accurate records of the number of miles each car travels during the year, and hence estimates were made for a number of systems; (2) there is a great difference in the size of the cars of the different companies and in the conditions under which they are operated; (3) there is a lack of uniformity in the method of computing car mileage where trailers are used. Some companies treat the motor car and trailer as a single car in making the

¹ The business of transportation has its own units of comparison, and each class or kind of transportation has its own and many of them, as it is further divided into distinctions of kind of service.

Electric railways are by the nature of their business but little, if at all, interested in or have use for most of the efficiency units of the steam railways, nor can either of them use those of steamboats. Thus it is that each kind of transportation must search for and test its own units.

Electric railways have lately become awake to the fact that the car mileage of horse-car days is not sufficient for present-day electric operation. And it is now searching for something to which it can tie as an effective unit. The latest step to the betterment of its efficiency unit was taken when it adopted the car hour as another means of proving both value and efficiency.

* * * It is doubtful if the time is near that the value and the efficiency of a company can be wholly gauged by the use of but one unit. It seems necessary that more than one will be required for some time to come. For purposes of its own, a company may use any one unit, but one only will not suffice for comparison with other companies. That is usually what is desired in a unit. It is especially true, if the operating and other conditions are not the same. * * *

Car mileage consists of two kinds, dead mileage and revenue mileage. Revenue mileage means the miles run by cars on regular runs, ready to bring in revenue. Dead mileage is well described by its name, that is, it consists of the miles run from and to the car house in order to arrive at its starting place upon its regular route. This mileage is literally dead. Frequently the cars make this trip twice a day with gates closed, permitting no passengers, and so, in a sense it is waste mileage, for if the car barns could be placed at some middle spot, there would be no dead mileage, because the cars would start from their barns upon their route. But this is very seldom permissible, through the cost of land and other causes; therefore dead mileage is a necessity, and as such must be included with revenue mileage to get the total mileage to do and doing business. Many companies do not do this, and this fact permits a better showing than actually is made. * * * Frequently the cost of this dead mileage will be so large that it will be good business policy to change the location of the barns that it may be reduced to its minimum.

One of the uses of car mileage is for the demonstration of the efficiency of car equipment. Many parts of the car and electrical equipment are renewed after attaining a certain mileage, and frequently some parts are purchased with the guarantee to make a certain mileage. * * * Thus maintenance has a use for car mileage, and custom has made its relation to earnings and expenses so familiar that it will continue as one of the units used in comparisons of street-railway operation.—*Electric Railway Accounting, W. B. Brockway, 1906.*

computation, while others consider each car as a separate unit.

In 1907 all of the 945 operating companies reported their car mileage; in 1902, 5 of the 817 companies failed to report this feature of their traffic statistics. The total distance traveled by all classes of cars increased from 1,144,430,466 miles in 1902 to 1,617,731,300 miles in 1907, or 41.4 per cent, representing an average of 17,136 miles per car for 1902 and 19,341 miles for 1907. When the total car mileage is divided by the miles of track of the roads, the result is an average of 50,819 car miles per mile of track in 1902 and 47,052 in 1907. These averages show that if the mileage were distributed equally over the entire trackage constructed at the end of the respective census years, each mile of track would have been covered by 50,819 cars in 1902 and 47,052 cars in 1907. The decrease in the average number of car miles per mile of track reflects the fact that the track has been extended into regions of low-traffic density.

The total car mileage in 1907 was made up of 97.9 per cent of passenger-car mileage and 2.1 per cent of express, freight, mail, and work car mileage; the latter including the mileage of electric and steam locomotives. At the census of 1902 the percentages were the same as those for 1907. The passenger-car mileage increased by 463,729,255 miles, or 41.4 per cent, but this rate of increase was not so great as the rate for the number of fare passengers carried (55.9).

The increase in the freight and express business of electric roads is better indicated by the income from this source, which amounted to \$6,792,017 in 1907 and to \$1,439,769 in 1902, than by the increase in the car mileage of the cars engaged in this class of work, as a considerable amount of such traffic is carried in combination passenger cars and the mileage for such cars is included in passenger-car mileage. Also the express, freight, and mail car mileage is combined with that of work cars and electric and steam locomotives. The total express, freight, mail, work, and locomotive car mileage amounted to 33,900,101 miles in 1907, an increase of 39.3 per cent over the 24,328,522 miles reported for 1902. But of the total for 1902, 15,201,575 represented the car miles run by steam locomotives on the elevated railways of the Manhattan Railway and Brooklyn Rapid Transit Company of New York. The use of steam locomotives on these roads has since been abandoned, and the roads electrified. When this mileage for steam locomotives is excluded, the rate of increase for the remaining mileage is 271.4 per cent, a percentage much greater than that for passenger-car mileage.

Express, freight, mail, and miscellaneous car miles were reported by 436 companies in 1907 as compared with 104 in 1902. In 1907 the largest amount of mileage of this class (4,500,000) was reported by the Portland Railway, Light and Power Company of

Oregon, and the smallest (16) by the New York, New Haven and Hartford Railroad Company (New Canaan branch) of Connecticut.

Fare passengers per mile of track.—By density of traffic is meant the number of passengers carried over a given length of track, and it necessarily varies for the different companies according to the miles of track and the amount of travel. A correct idea of the density of traffic can be obtained only by an examination of the statistics for each company given in Table 187,¹ and the increase or decrease by a summarization of the data for roads operated in the same territory during different years. Of course, an extension of track into rural districts where travel is comparatively light tends to reduce the average number of passengers carried per mile. The combination of the data for two or more companies located in different cities and operated under different conditions results in an average that is apt to be misleading.

The general statistics given in Table 51 for all companies show that there was an increase of 4,305, or 2 per cent, in the number of fare passengers per mile of track during 1907 as compared with 1902. There is naturally a wide variation in the average. The averages by states, excluding the District of Columbia, ranged in 1907 from 25,103 in South Dakota to 426,718 in New York, while the averages by companies ranged from 563 for the Pacific Railroad and Steamship Company to 7,821,429 for the Los Angeles Electric Incline Railway, both in California.

The North Atlantic states, on account of their urban population and street-railway development in urban centers, showed the greatest number of passengers per mile of track at both censuses—257,640 in 1902 and 271,025 in 1907. But the South Central group showed both the largest actual gain and the largest relative gain in 1907 as compared with 1902, the actual increase being from 158,875 to 217,337, or 58,462 passengers per mile, the rate of increase being 36.8 per cent. In this group of states there was a comparatively low rate of increase in trackage with a high rate in number of fare passengers. In the Western division the number of fare passengers per mile of track actually decreased from 190,225 in 1902 to 165,495 in 1907, or 13 per cent, as a result of the large interurban development in the southern and northern parts of California and of the decrease in the number of passengers per mile of track for the San Francisco companies, which in 1907 had not regained the traffic that had been developed before the earthquake in 1906.

¹The averages for each company are based on the total miles of track operated by it, including in a number of cases a certain amount of track belonging to other companies and operated jointly under trackage rights.

There were 9 states in which the number of fare passengers per mile of track decreased in 1907 as compared with 1902, but in each case the explanation is found in a more rapid addition of trackage than of passengers carried.

Fare passengers per car mile.—In addition to the previously mentioned uncertainties surrounding the car mile as a unit of measurement of service, there are others to be noted—such as the varying use of large and small cars and the different methods of recording fare passengers on suburban and interurban lines—when the ratio of number of fare passengers carried to the number of car miles run is considered. For all operating companies the average in 1907 was 4.70 as compared with 4.26 in 1902, an increase of 10.3 per cent. Though the uncertainties in the data for car miles and passengers can not be measured, as there is no basis upon which to determine the extent of the disturbing factors, yet it may be stated that the main factors tending to increase the ratio are the increase in traffic in urban centers, normally attending growth of population, and the more general use of larger cars. Conversely, the extension of track into thinly populated districts operates to reduce the average number of passengers carried per car mile. In the main the results of these counteracting influences are shown in the ratios for the states and selected groups.

As in the case of passengers per mile of track, the ratio of passengers per car mile was highest in the North Atlantic group of states, while the largest increase was again in the South Central states, where there was very little interurban development but an increase in the population served.

The largest number of passengers per car mile in 1907 was 5.95, for Rhode Island, and the lowest, 2.07, for Arizona, as compared with extremes of 5.35 for New Jersey and 1.19 for New Mexico in 1902. There were 20 companies in 1907 that reported an average of less than one person per car mile, but in the case of 10 of these companies the low ratio was due to the practice of counting through passengers on interurban lines as trip rather than as zone passengers. The other 10 companies were found to be small animal-power roads, new roads just beginning operations, or roads operated only to hold franchises.

Maximum density of traffic.—The operating conditions of railways in centers of dense population and congested business districts are very different from those in the average city or those of long and fast interurban lines. The surface, elevated, and subway lines of New York City, Chicago, Philadelphia, and Boston have been selected as typical of this class of railways, and their traffic statistics for 1907 and 1902 are here presented separately.

STREET AND ELECTRIC RAILWAYS.

TABLE 53.—MAXIMUM DENSITY OF TRAFFIC—SELECTED RAILWAYS: 1907 AND 1902.

LOCATION AND KIND OF SYSTEM.	NUMBER OF OPERATING COMPANIES.		MILES OF TRACK OPERATED.		NUMBER OF FARE PASSENGERS.		FARE PASSENGERS PER MILE OF TRACK.		PASSENGER-CAR MILEAGE.		FARE PASSENGERS PER CAR MILE.	
	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902
New York (Manhattan and Bronx boroughs), N. Y.:												
Surface, elevated, and subway, total.....	7	12	651.04	510.06	802,087,004	620,977,109	1,222,311	1,220,222	165,075,775	111,031,025	5.22	5.65
Surface.....	6	11	461.41	392.92	412,770,720	411,717,824	894,605	1,047,841	66,288,005	65,960,182	6.23	6.24
Elevated and subway.....	1	1	100.63	117.14	440,287,884	216,259,346	2,368,095	1,837,025	98,792,770	45,071,743	4.55	4.78
Chicago, Ill.:												
Surface and elevated, total.....	7	7	933.95	855.59	548,618,412	394,056,000	587,417	461,268	122,213,396	96,546,464	4.40	4.09
Surface.....	3	3	787.35	734.33	411,033,347	294,809,570	522,110	401,407	86,136,759	69,301,892	4.77	4.25
Elevated.....	4	4	146.60	121.26	137,535,065	99,846,480	688,106	823,408	36,076,637	27,154,572	3.81	3.08
Philadelphia, Pa.:												
Surface.....	1	1	1610.85	475.46	424,275,833	325,801,003	684,481	685,235	81,263,251	59,375,543	5.22	5.40
Boston, Mass.:												
Surface, elevated, and subway....	1	1	457.65	404.04	271,084,815	222,484,811	592,341	540,427	51,830,188	45,772,836	5.23	4.80

¹ Includes 7.07 miles of elevated and 3.23 miles of subway track.

The roads included in the table, representative of street-railway management under fairly comparable conditions, are operated by the following companies: For New York City, *surface*, 1907—New York City Railway; New York City Interborough Railway; Forty-second Street, Manhattanville and St. Nicholas Avenue Railway; Dry Dock, East Broadway and Battery Railroad; Southern Boulevard Railroad; and Union Railway Company of New York City: 1902—the 4 last-named roads and the Interurban Street Railroad; Central Crosstown Railroad; Fulton Street Railroad; Thirty-fourth Street Crosstown Railway; Twenty-eighth and Twenty-ninth Street Crosstown Railroad; Third Avenue Railroad; and Kingsbridge Railway. *Elevated and subway*, 1907—Interborough Rapid Transit: 1902—Manhattan Railway. For Chicago, *surface*, 1907 and 1902—Chicago City Railway; Chicago Union Traction; and Chicago Consolidated Traction. *Elevated*, 1907 and 1902—Chicago and Oak Park Elevated Railroad (Lake Street Elevated Railroad in 1902); Metropolitan West Side Elevated Railway; Northwestern Elevated Railroad; and South Side Elevated Railroad. For Philadelphia, 1907 and 1902—Philadelphia Rapid Transit (Union Traction was the operating company in 1902). For Boston, 1907 and 1902—Boston Elevated Railway. These selected roads carried 2,106,046,664 fare passengers, or 28.3 per cent of the total for the United States in 1907, and 1,569,919,943, or 32.9 per cent of the total, in 1902.

The maximum density of passenger traffic was cen-

tered in Manhattan and Bronx boroughs of New York City at both censuses, and the average for these boroughs increased by 93,089 passengers per mile of track from 1902 to 1907. All of this increase, however, was in the traffic of the elevated and subway roads, as the average for surface lines decreased from 1,047,841 to 894,605. The figures for the "Elevated and subway" represent only elevated lines in 1902 and elevated and subway lines in 1907. With the opening of the subway, a large amount of the traffic in the most congested districts was directed thither, as is shown by the decreased average for the surface lines.

Philadelphia had the next highest average number of passengers per mile of track, with 684,481 in 1907 and 685,235 in 1902. Although the elevated lines in Chicago had a heavier passenger traffic per mile at both censuses, the ratio for surface and elevated lines in that city taken together was considerably lower than the ratio in Philadelphia. The slight decrease in the traffic density in Philadelphia between the census years is probably to be explained by the extension of lines into the suburbs and outlying districts.

Of the selected roads under consideration, the largest number of passengers carried per car mile run in 1907, namely, 6.23, was on the surface lines of New York City.

The few street-cable roads still in operation are located in districts of heavy traffic and they, as well as the inclined cable railways, naturally show a very large number of persons carried per mile of track.

TABLE 54.—TRAFFIC OF EXCLUSIVELY CABLE ROADS: 1907 AND 1902.

	CABLE ROADS.									
	Total.		Surface.		Inclined-plane.		Per cent of decrease.			
	1907	1902	1907	1902	1907	1902	Total.	Sur-face.	In-clined-plans.	
Number of operating companies.....	10	12	2	2	8	10	16.7	.....	20.0
Miles of track.....	20.70	23.65	17.79	18.54	2.91	5.11	12.5	4.0	43.1	
Number of fare passengers.....	11,993,043	10,066,958	7,523,493	12,208,123	4,470,450	3,768,835	25.4	38.8	118.6	
Fare passengers per mile of track.....	579,418	679,364	422,005	663,320	1,536,227	737,541	14.7	36.2	1108.3	
Passenger-car mileage.....	1,050,040	2,400,078	806,029	2,214,612	244,011	284,466	57.9	63.6	13.0	
Fare passengers per car mile.....	11.41	10.42	0.33	5.55	18.25	13.10	177.7	168.1	138.7	

¹ Increase.

² Exclusive of 24,751 fare passengers for which car miles were not reported.

The companies included in the table were operated exclusively by cable power, and although they operated only 20.70 miles of track their traffic was considerable and the density of traffic per mile of track and per car mile was high.

Traffic, by character of power.—As all but 1 per cent

of the total trackage reported by street and electric railways in 1907 was operated by electric power, it follows that a correspondingly high proportion of traffic was electric. This is shown by the statistics given in Table 55.

TABLE 55.—TRAFFIC, BY CHARACTER OF POWER: 1907 AND 1902.

	CHARACTER OF POWER.									
	Total.		Electric. ¹		Animal exclusively.		Cable exclusively.		Steam exclusively. ²	
	1907	1902	1907	1902	1907	1902	1907	1902	1907	1902
Miles of track.....	34,403.56	22,570.00	34,277.80	22,383.16	40.98	158.12	20.70	23.05	57.00	12.06
Per cent of total.....	100.0	100.0	99.6	99.6	0.1	0.7	0.1	0.1	0.2	0.1
Number of passengers, total.....	0,533,080,766	5,830,615,296	0,517,612,898	5,771,087,177	1,100,733	45,535,621	13,787,595	19,822,553	480,540	169,046
Per cent of total.....	100.0	100.0	99.8	98.0	(³)	0.8	0.1	0.3	(³)	(³)
Fare.....	7,441,114,508	4,774,211,004	7,427,453,692	4,724,418,169	1,180,733	33,550,832	11,003,043	16,000,958	477,140	169,046
Per cent of total.....	100.0	100.0	99.8	99.0	(³)	0.7	0.2	0.3	(³)	(³)
Transfer.....	2,001,060,258	1,062,403,392	2,000,169,206	1,040,660,008	10,000	11,078,789	1,703,052	3,755,505	3,400	(³)
Per cent of total.....	100.0	100.0	99.9	98.5	(³)	1.1	0.1	0.4	(³)	(³)
Transfer points.....	7,376	4,455	7,358	4,372	1	72	7	11	(³)	(³)
Per cent of total.....	100.0	100.0	99.9	98.1	(³)	1.0	0.1	0.2	(³)	(³)
Car mileage, total.....	1,617,731,300	1,144,430,406	1,616,028,642	1,136,152,035	383,614	5,669,053	1,063,600	2,500,478	255,444	108,300
Per cent of total.....	100.0	100.0	99.9	99.3	(³)	0.5	0.1	0.2	(³)	(³)
Passenger cars.....	1,583,831,199	1,120,101,044	1,582,208,469	1,111,875,100	369,006	5,648,107	1,050,940	2,400,078	201,704	70,050
Per cent of total.....	100.0	100.0	99.9	99.3	(³)	0.5	0.1	0.2	(³)	(³)
Express, freight, mail, etc., cars.....	33,900,101	24,328,362	33,820,173	24,276,926	13,618	21,540	12,660	1,400	53,650	28,050
Per cent of total.....	100.0	100.0	99.8	99.8	(³)	0.1	(³)	(³)	0.2	0.1

¹ Includes miles of animal, cable, and steam track operated in connection with electric trackage: 1907—218.20 miles; 1902—475.57 miles.
² Includes 40.99 miles of track in 1907 operated exclusively by gasoline-motor cars.
³ Less than one-tenth of 1 per cent.
⁴ Includes 60,308,157 free passengers.

The railways operated exclusively by animal power carried only eight-tenths of 1 per cent of the total number of passengers in 1902. By 1907 the proportion had decreased to less than one-tenth of 1 per cent. The purely cable roads carried only three-tenths of 1 per cent in 1902, and only one-tenth of 1 per cent in 1907, while the roads operated exclusively by steam

locomotives and gasoline motors hauled less than one-tenth of 1 per cent at each census.

Passenger traffic of electric railways and steam railroads.—A comparative showing of the passenger business of the street and electric railways and the steam railroads for 1907 and 1902 is given in the following table:

TABLE 56.—PASSENGER TRAFFIC OF STREET AND ELECTRIC RAILWAYS AND STEAM RAILROADS: 1907 AND 1902.

	NUMBER OF FARE PASSENGERS.			RECEIPTS FROM PASSENGERS.		
	1907	1902	Per cent of increase.	1907	1902	Per cent of increase.
Street and electric railways.....	7,441,114,508	4,774,211,004	55.9	\$382,132,404	\$233,821,548	63.4
Steam railroads ¹	873,905,133	649,878,505	34.5	564,606,343	392,063,248	43.7

¹ Statistics of railways, annual reports of Interstate Commerce Commission.

The service of the steam railroads and urban electric railways is so dissimilar that a comparison of the number of passengers carried has but slight significance. Such a comparison indicates, however, that the traffic of street and electric railways increased much more rapidly than that of steam railroads. The steam roads, during the year ending June 30, 1907, carried 873,905,133 passengers an average distance of 31.72 miles. The average distance traveled could not be ascertained for the electric railways, but it was of course very much less than the average length of ride on the steam railroads.

The average length of journey per passenger on the

steam railroads for each fiscal year from 1889 to 1907 is given in the following statement:

Average length of journey per passenger on steam railroads.¹

FISCAL YEAR.	Miles.	FISCAL YEAR.	Miles.
1907.....	31.72	1897.....	25.04
1906.....	31.51	1896.....	25.50
1905.....	32.21	1895.....	24.02
1904.....	30.64	1894.....	26.43
1903.....	30.10	1893.....	23.97
1902.....	30.30	1892.....	23.82
1901.....	28.58	1891.....	24.18
1900.....	27.80	1890.....	24.06
1899.....	27.89	1889.....	24.47
1898.....	26.70		

¹ Statistics of railways, annual reports of Interstate Commerce Commission.

STREET AND ELECTRIC RAILWAYS.

Beginning with 1898 there was a marked increase in the average length of journey per passenger, due in a large degree, no doubt, to the growth of electric railways and the deflection of suburban and short-haul travel to electric lines. The marked temporary increase in 1894 was probably caused by the World's Fair in Chicago.

Traffic in relation to population.—It is impracticable to ascertain the exact population of the areas from which the street and electric railways draw their traffic. The entire population of every city in which such roads operate may be regarded as within the area of passenger service, though in many instances sections of the city are not traversed by the railway and the

population is benefited only indirectly. The population of adjacent territory served by interurban roads can be approximated only by including the entire population of all minor civil divisions traversed, and such an estimate would probably be excessive and misleading. But there is a close relation between the population, which represents the possible or available traffic, and the actual number of passengers carried, and the only practicable method of showing this relationship is to take the entire population of large areas, although only a part, and in some instances a very small part, of the area is traversed by the railway. This comparison is made in Table 57.

TABLE 57.—RELATION OF PASSENGER TRAFFIC TO TOTAL AND URBAN POPULATION, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902.

STATE OR TERRITORY.	Census.	Number of operating companies.	POPULATION. ¹			Number of fare passengers.	AVERAGE NUMBER OF RIDES PER INHABITANT.	
			Total.	Urban (places of 3,000 and over).	Ratio of urban to total population.		Total population.	Urban population.
United States.....	1907	² 944	85,532,761	29,751,774	34.8	7,441,114,508	87	250
	1902	³ 811	78,576,436	26,317,705	33.5	4,774,211,904	61	181
North Atlantic division.....	1907	370	23,779,013	14,510,828	61.0	3,714,134,688	156	256
	1902	360	21,778,196	12,968,949	59.6	2,618,528,979	120	202
Maine.....	1907	17	717,832	179,939	25.1	36,730,146	51	204
	1902	19	709,072	169,011	24.1	25,495,164	36	151
New Hampshire.....	1907	16	436,128	179,397	41.1	20,086,690	46	112
	1902	7	418,602	164,772	39.4	11,304,998	27	69
Vermont.....	1907	10	351,495	44,971	12.8	7,103,082	20	158
	1902	9	345,885	40,411	11.7	4,274,806	12	106
Massachusetts.....	1907	63	3,083,013	2,368,514	76.8	597,469,848	194	252
	1902	75	2,917,796	2,199,926	75.4	461,745,615	158	210
Rhode Island.....	1907	6	509,692	411,422	82.2	91,171,989	182	222
	1902	8	445,938	365,328	81.9	62,279,165	140	170
Connecticut.....	1907	9	1,021,683	577,861	56.5	123,583,772	120	212
	1902	22	941,184	514,390	54.7	77,447,101	82	151
New York.....	1907	101	8,386,673	6,015,886	71.7	1,667,686,801	198	276
	1902	90	7,533,611	5,201,822	70.2	1,144,491,500	152	216
New Jersey.....	1907	26	2,248,332	1,400,526	62.3	269,099,070	120	192
	1902	26	1,969,821	1,222,935	62.1	188,976,890	96	155
Pennsylvania.....	1907	122	7,032,915	3,332,312	47.4	912,233,290	130	274
	1902	98	6,505,887	3,000,348	46.1	642,513,812	99	214
South Atlantic division.....	1907	101	11,574,988	2,078,048	18.0	487,981,528	42	235
	1902	70	10,770,414	1,855,478	17.2	297,198,541	28	160
Delaware.....	1907	4	196,104	86,420	44.1	15,723,757	80	182
	1902	3	187,461	79,000	42.1	9,956,559	53	126
Maryland.....	1907	13	1,260,000	616,582	47.8	152,268,326	118	247
	1902	10	1,217,174	574,370	47.2	99,989,552	82	174
District of Columbia.....	1907	6	312,548	312,548	100.0	91,569,056	293	298
	1902	8	288,384	288,384	100.0	66,162,321	229	229
Virginia.....	1907	23	1,002,025	337,158	16.9	77,300,268	30	229
	1902	20	1,869,440	280,858	15.1	44,275,661	23	154
West Virginia.....	1907	15	1,096,096	89,677	8.2	42,749,821	39	477
	1902	8	998,004	76,371	7.7	21,766,870	22	284
North Carolina.....	1907	11	2,086,912	123,609	5.9	14,086,151	7	114
	1902	7	1,948,984	101,105	5.2	5,337,367	3	53
South Carolina.....	1907	7	1,472,734	111,165	7.5	15,694,635	11	141
	1902	7	1,378,150	103,312	7.5	9,056,818	7	88
Georgia.....	1907	12	2,481,617	292,366	11.8	59,790,459	24	204
	1902	10	2,298,713	259,275	11.3	32,463,851	14	125
Florida.....	1907	10	646,142	108,523	16.8	18,889,055	29	174
	1902	6	554,104	86,794	15.7	8,249,542	15	96

¹ Population for 1907 and 1902 is the official estimate for those years.

² Exclusive of 1 company with 15 miles of track, for which fare passengers were not reported.

³ Exclusive of 6 companies with 80.14 miles of track, for which fare passengers were not reported.

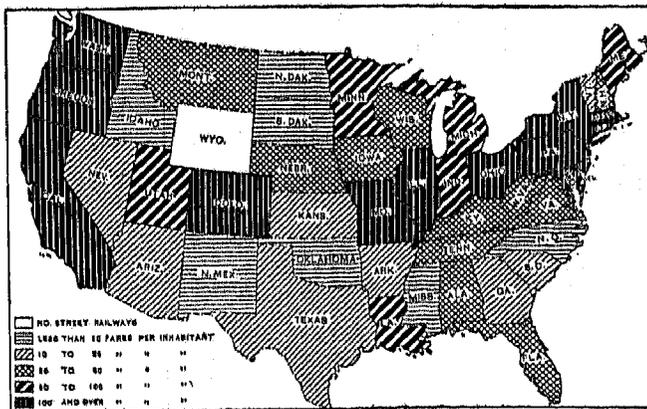
TABLE 57.—RELATION OF PASSENGER TRAFFIC TO TOTAL AND URBAN POPULATION, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902—Continued.

STATE OR TERRITORY.	Census.	Number of operating companies.	POPULATION. ¹			Number of fare passengers.	AVERAGE NUMBER OF RIDES PER INHABITANT.	
			Total.	Urban (places of 8,000 and over).	Ratio of urban to total population.		Total population.	Urban population.
North Central division.....	1907	292	29,026,645	9,737,433	33.5	2,223,525,349	77	228
	1902	238	27,087,200	8,510,447	31.5	1,344,000,951	50	158
Ohio.....	1907	73	4,497,198	1,884,494	41.9	480,843,805	107	255
	1902	63	4,262,372	1,672,272	39.3	285,434,579	67	171
Indiana.....	1907	33	2,743,805	763,629	27.8	137,547,183	50	180
	1902	27	2,581,575	640,564	25.2	66,255,767	26	102
Illinois.....	1907	69	5,518,100	2,706,468	50.7	703,493,137	127	252
	1902	49	5,019,628	2,421,403	48.2	403,190,986	92	191
Michigan.....	1907	24	2,611,790	883,447	33.8	183,239,012	70	207
	1902	24	2,480,764	778,917	31.4	113,916,992	46	146
Wisconsin.....	1907	20	2,202,011	726,193	31.7	102,771,360	45	142
	1902	17	2,127,974	602,988	31.2	62,537,300	29	94
Minnesota.....	1907	5	2,071,318	619,955	29.9	136,122,311	66	220
	1902	5	1,822,106	612,873	28.1	78,236,612	40	143
Iowa.....	1907	24	2,201,331	441,612	20.1	61,439,800	28	139
	1902	22	2,301,427	393,834	17.1	38,559,589	17	98
Missouri.....	1907	14	3,405,901	1,100,481	32.3	346,301,741	102	315
	1902	16	3,187,031	906,901	31.3	211,808,737	66	212
North Dakota.....	1907	4	487,890	13,681	2.8	1,871,994	4	137
	1902	(²)	344,778	10,767	3.1			
South Dakota.....	1907	1	476,631	13,084	2.7	126,515	(²)	10
	1902	(¹)	420,808	11,072	2.6			
Nebraska.....	1907	8	1,068,849	215,916	20.2	40,323,051	46	228
	1902	4	1,087,626	182,148	16.7	22,228,325	20	122
Kansas.....	1907	17	1,651,331	278,473	16.9	20,386,880	12	73
	1902	11	1,452,217	220,728	15.6	6,832,064	5	30
South Central division.....	1907	90	16,368,553	1,850,984	11.3	414,225,626	25	224
	1902	66	14,651,635	1,622,545	11.1	210,103,861	14	129
Kentucky.....	1907	13	2,340,152	412,613	17.6	85,858,031	37	208
	1902	12	2,202,804	375,301	17.0	56,203,852	26	150
Tennessee.....	1907	9	2,107,785	333,240	15.2	73,746,086	34	221
	1902	8	2,070,354	280,068	13.6	35,697,835	17	127
Alabama.....	1907	10	2,049,407	163,827	8.0	52,197,482	25	319
	1902	9	1,801,755	143,260	7.6	22,748,871	12	159
Mississippi.....	1907	8	1,734,430	50,523	2.9	9,084,086	5	180
	1902	5	1,603,604	43,733	2.7	3,101,015	2	71
Louisiana.....	1907	11	1,565,762	348,600	22.3	85,103,632	54	244
	1902	8	1,434,033	324,104	22.6	55,843,843	30	171
Arkansas.....	1907	8	1,430,010	80,028	6.2	17,145,387	12	191
	1902	7	1,347,034	74,891	5.6	6,880,470	5	62
Oklahoma.....	1907	8	1,414,177	44,104	3.1	9,562,472	7	215
	1902	(²)	897,748	27,031	3.1			
Texas.....	1907	23	3,617,936	408,440	11.3	81,496,650	28	200
	1902	17	3,203,303	352,597	11.0	30,037,966	9	85
Western division.....	1907	91	4,783,557	1,574,481	32.9	601,247,317	126	382
	1902	68	4,289,085	1,351,286	31.5	304,379,572	71	225
Montana.....	1907	5	313,615	98,591	31.4	13,862,231	44	141
	1902	5	266,120	75,968	28.5	6,858,502	26	90
Idaho.....	1907	2	213,028			1,326,964	6	
	1902	1	176,416			314,340	2	
Wyoming.....	1907	(²)	105,530	20,843	19.8			
	1902	(²)	98,527	21,880	22.2			
Colorado.....	1907	11	628,216	230,254	38.1	73,458,468	117	307
	1902	7	559,715	212,003	37.9	42,371,590	76	200
New Mexico.....	1907	2	219,830			1,029,048	5	
	1902	1	202,316			73,000	(²)	
Arizona.....	1907	4	147,214			1,901,861	13	
	1902	2	129,869			797,970	6	
Utah.....	1907	3	322,028	79,624	24.6	21,105,491	65	265
	1902	3	289,519	71,866	24.8	11,493,501	40	160
Nevada.....	1907	1	42,335			620,000	15	
	1902	(²)	41,331					
Washington.....	1907	14	630,712	204,404	41.9	110,506,620	175	418
	1902	8	558,055	189,138	33.9	41,544,228	74	220
Oregon.....	1907	8	484,938	122,677	25.3	49,459,483	102	403
	1902	6	429,330	103,033	24.2	18,729,442	44	180
California.....	1907	41	1,675,211	749,188	44.7	327,977,151	196	438
	1902	35	1,537,837	676,498	44.0	182,196,990	118	269

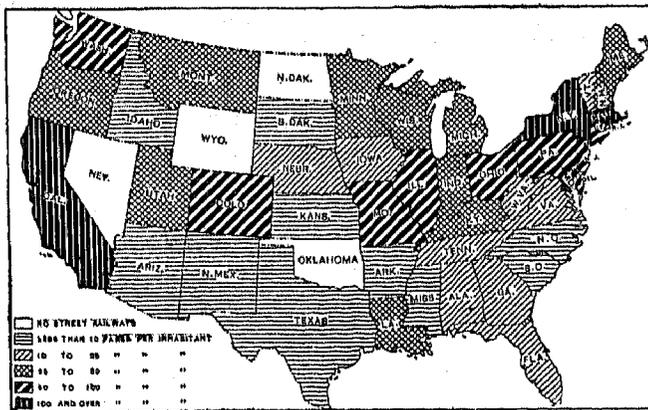
¹ Population for 1907 and 1902 is the official estimate for those years. ² No company reported. ³ Less than 1. ⁴ 1 company reported, but no fare passengers.

The extension of the interurban lines has resulted in some interstate traffic on the electric railways. There is also a considerable interstate travel when cities are located near the state line, as is the case with cities such as Kansas City, Kans., Kansas City, Mo., and Washington, D. C., and numerous places near the state lines of Connecticut, Rhode Island, and Massachusetts. While the increase in the trolley travel between states detracts from the value of the statistics for the different states, the interstate passengers form but a small proportion of the total number carried within the limits of most states, and the averages may be accepted as indicating the relationship between population and passenger traffic, and as giving an idea of the extent of the development of electric railways in the different states and geographic divisions, and of the growth of the patronage they receive from those within reach of their service. As a rule, the urban population controls the average number of rides per inhabitant. The presence of large cities in a state, with the resulting great density of traffic, necessarily increases the average number of rides per inhabitant for the entire population of the state.

MAP 1.—Average number of fare passengers per inhabitant, by states and territories: 1907.



MAP 2.—Average number of fare passengers per inhabitant, by states and territories: 1902.



It is not to be assumed that all of the inhabitants of a state nor that even all of the inhabitants of places of 8,000 and over are served by the electric railways.

In no case, with the exception of the District of Columbia, can it be said that all of the inhabitants of a state are within reach of electric railways. But the relative gains in the average number of rides per inhabitant, in the case of the total and the urban population, for the states and geographic divisions, afford an index to the growth of traffic in the different localities. The District of Columbia can be taken as representative of an urban district where all of the inhabitants were served by electric railways at both censuses. With an increase in population of 8.4 per cent, the number of fare passengers increased 38.4 per cent, and the average number of rides per inhabitant increased from 229 in 1902 to 293 in 1907, or 27.9 per cent. Considering all states, but excluding the District of Columbia, New York had the highest number of rides per total population in 1907, and South Dakota the lowest. In 1902 the corresponding extremes were indicated for Massachusetts and New Mexico. Between 1902 and 1907 Washington increased its average by 101, the greatest gain for any of the states.

The percentages of estimated increase in population, in number of fare passengers carried, and in the average number of rides per inhabitant, for the geographic divisions, are given in the following table:

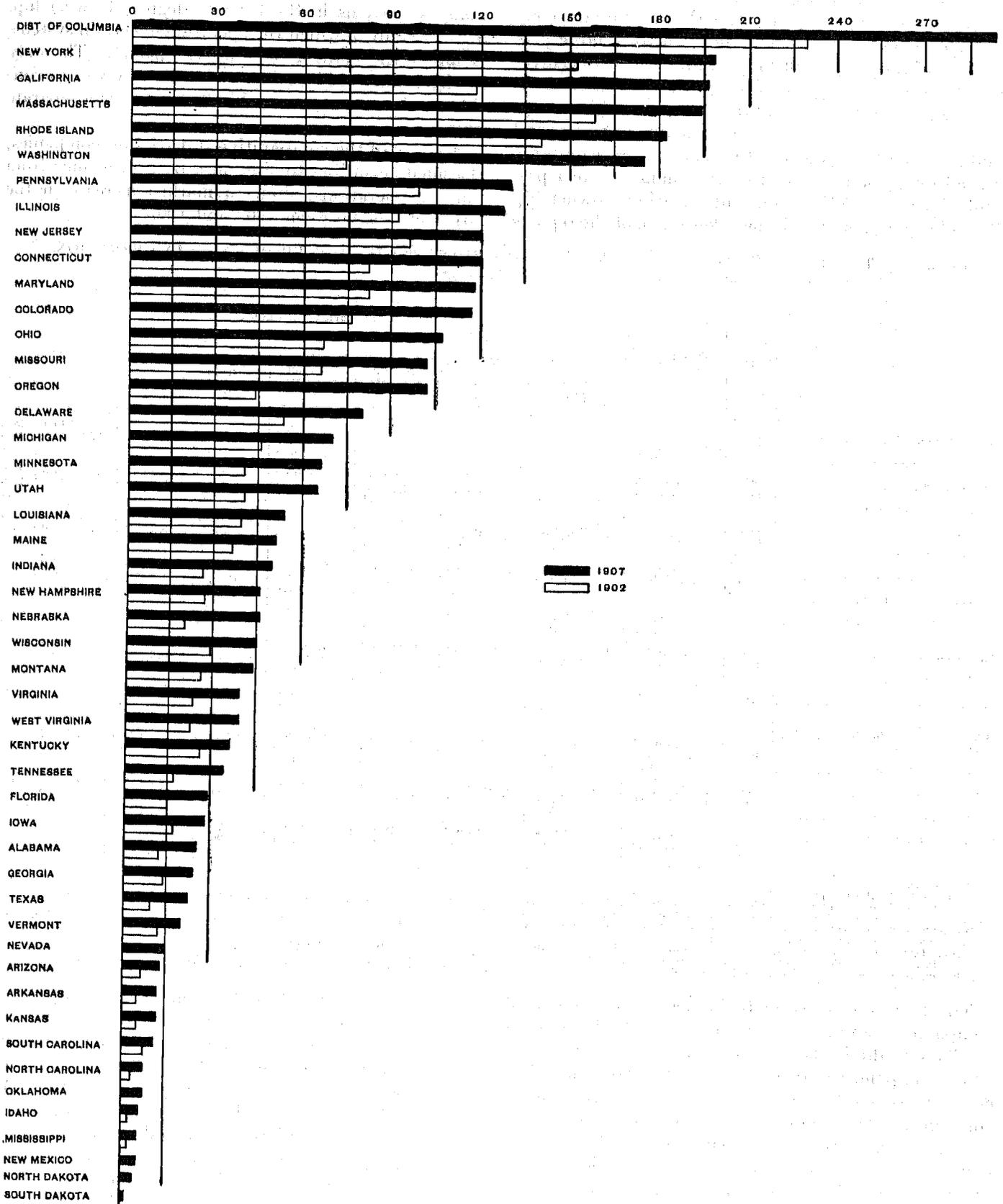
TABLE 58.—Per cent of increase in population, fare passengers, and average number of rides per inhabitant: 1902 to 1907.

DIVISION.	POPULATION.		Number of fare passengers.	AVERAGE NUMBER OF RIDES PER INHABITANT IN—	
	Total.	Urban (places of 8,000 and over).		Total population.	Urban population.
United States.....	8.0	13.0	55.0	42.6	38.1
North Atlantic.....	9.2	11.9	41.8	30.0	26.7
South Atlantic.....	7.5	12.0	64.2	50.0	46.0
North Central.....	7.2	14.3	65.4	54.0	44.3
South Central.....	11.7	14.1	97.2	78.6	73.6
Western.....	11.5	16.5	97.5	77.5	69.8

As stated above, the number of passengers carried by the steam railroads increased from 649,878,505 in the fiscal year 1902 to 873,905,133 in the fiscal year 1907, a gain of 34.5 per cent. These totals represented an average of 8 rides per inhabitant in 1902 and 10 rides in 1907, on the basis of the estimated population in those years. The comparative figures for electric railways and steam railroads are as follows:

	AVERAGE NUMBER OF RIDES PER INHABITANT.		
	1907	1902	Per cent of increase.
Street and electric railways.....	87	61	42.6
Steam railroads.....	10	8	25.0

DIAGRAM 8.—AVERAGE NUMBER OF FARE PASSENGERS PER INHABITANT, BY STATES AND TERRITORIES: 1907 AND 1902.



Traffic of companies, classified according to income from railway operations.—The street and electric railways are no exception to the rule that a comparatively small number of large companies control a large proportion of the annual business of all. This concentration is probably as pronounced in the case of the railways as in the case of any other branch of industry. In some instances systems located in different cities and and reported to the Census Bureau as separate units are owned by the same company. To make a correct presentation of the statistics for centralization of ownership it would be necessary to bring together all of the reports

for such properties and consider them as a single return. But this would be impracticable, because there are many variations in the form or degree of ownership, or the extent to which the operation of certain systems is under the control of other companies. The only method that could be followed uniformly was to consider each company named in Table 183 as a separate unit.

A study of the comparative statistics for companies, classified according to size, on a basis of income from railway operations, shows a marked increase in the larger classes between 1902 and 1907.

TABLE 59.—TRAFFIC OF COMPANIES, CLASSIFIED ACCORDING TO INCOME FROM RAILWAY OPERATIONS: 1907 AND 1902.

	Census.	Total, all companies.	CLASSIFICATION GROUP.					Per cent of total.				
			\$1,000,000 and over. (A)	\$500,000 but less than \$1,000,000. (B)	\$250,000 but less than \$500,000. (C)	\$100,000 but less than \$250,000. (D)	Less than \$100,000. (E)	A	B	C	D	E
			Number of operating companies.....	1907 1902	946 817	77 44	50 28	82 57	183 116	553 672	8.1 5.4	5.3 3.4	8.7 7.0	10.4 14.2	58.5 70.0
Per cent of increase.....		15.7	75.0	78.6	43.9	57.8	13.3					
Miles of track.....	1907 1902	34,403.56 22,576.99	15,564.34 8,414.31	4,886.24 2,127.29	4,009.76 2,782.59	4,079.08 3,478.97	5,493.54 5,773.83	45.2 37.3	12.7 9.4	11.7 12.3	14.5 16.4	15.9 25.6
Per cent of increase.....		52.4	85.0	106.2	44.1	43.1	15.4					
Number of fare passengers.....	1907 1902	7,441,114,598 4,774,211,904	5,026,200,180 3,357,700,250	584,885,974 388,317,716	450,999,780 340,234,327	452,781,532 336,108,868	326,247,042 342,754,743	75.6 70.3	7.0 8.1	6.1 7.3	6.1 7.0	4.4 7.2
Per cent of increase.....		55.9	67.6	50.6	29.1	34.7	14.8					
Number of transfer passengers.....	1907 1902	* 2,091,960,258 1,092,403,392	1,815,602,175 837,046,245	110,202,968 79,596,052	77,070,173 61,137,321	52,038,817 55,972,457	27,907,125 28,051,317	86.8 78.8	5.7 7.5	3.7 5.8	2.5 5.3	1.3 2.7
Per cent of increase.....		90.9	116.0	49.8	26.1	17.0	12.4					
Fare passengers per mile of track.....	1907 1902	* 216,522 * 212,217	301,701 399,058	133,370 182,541	112,476 125,507	91,371 97,707	59,741 59,790					
Passenger-car mileage.....	1907 1902	1,538,831,109 1,120,101,044	1,110,233,959 712,065,200	139,504,319 90,506,952	110,950,376 95,977,498	117,728,249 100,885,025	96,855,296 114,634,263	70.7 63.6	8.8 8.6	7.0 8.6	7.4 9.0	6.1 10.2
Per cent of increase.....		41.4	57.2	44.5	15.6	10.7	15.9					
Fare passengers per car mile.....	1907 1902	4.70 4.20	5.03 4.72	4.19 4.02	4.06 3.64	3.85 3.33	3.30 2.99					
Mileage of express, freight, mail, etc., cars.....	1907 1902	33,900,101 * 24,328,522	16,308,555 10,787,452	7,990,015 686,419	3,980,035 1,186,954	3,635,305 871,970	1,935,231 1,795,527	48.1 81.3	23.6 2.8	11.7 4.9	10.7 3.6	5.9 7.4
Per cent of increase.....		39.3	17.6	1,064.1	235.3	316.0	10.6					
Total car mileage.....	1907 1902	1,617,731,300 1,144,430,400	1,135,592,514 731,882,668	147,495,234 97,196,371	114,939,411 97,164,452	121,363,614 101,756,995	98,340,527 116,429,790	70.2 64.0	9.1 8.5	7.1 8.5	7.5 8.9	6.1 10.2
Per cent of increase.....		41.4	55.2	51.7	18.3	19.3	15.5					
Car miles per mile of track.....	1907 1902	* 47,052 * 50,819	73,000 86,681	33,633 45,690	28,065 34,919	24,417 20,581	18,008 20,230					

1 Decrease.
 2 Includes 96,308,157 free passengers.
 3 Exclusive of 1 company with 15 miles of track which did not report fare passengers (an exclusively freight road) and 22.05 miles of track not operated, distributed as follows: 9.46 miles in Class A, 0.79 mile in Class B, 24.27 miles in Class D, 2.50 miles in Class E.
 4 Exclusive of 6 companies with 80.14 miles of track which did not report fare passengers (2 companies with 22.85 miles were exclusively freight roads), distributed as follows: 39 miles in Class D and 41.14 miles in Class E.
 5 Includes 15,201,575 car miles run by steam locomotives on Brooklyn Rapid Transit and Manhattan (elevated) railways.
 6 Exclusive of 22.05 miles of track not operated, distributed as follows: 0.49 miles in Class A, 0.79 mile in Class B, 9.27 miles in Class D, 2.50 miles in Class E.
 7 Exclusive of 5 companies with 57.47 miles of track for which car miles were not reported, distributed as follows: 39 miles in Class D and 18.47 miles in Class E.

The largest proportionate increases in number of companies were in Classes B and A, while the number in Class E diminished. While in 1902, 70 per cent of all companies were in Class E, in 1907 that class constituted but 58.5 per cent of the total number of companies. On the other hand, the proportion of the total number in the case of each of the other classes increased. In miles of track the concentration is even more marked. The highest percentages of increase in track were again in Classes B and A, the ratios of increase in Classes C and D were about equal, while the miles of track in Class E decreased. The miles of

track in Classes C, D, and E constituted less proportionate parts of the total track in 1907 than in 1902, while Classes A and B gained largely in proportion between the two censuses. In number of fare passengers carried the increase was greatest in Class A. Although Class E is the only group showing a decrease, yet Classes B, C, and D represented, each of them, a smaller proportion of the total in 1907 than in 1902.

It will be observed that the average number of fare passengers per mile of track increased slightly for the country as a whole. In each of the four upper classes the increase in trackage was proportionately greater

than the increase in the number of fare passengers carried, while in Class E the ratio of decrease in trackage was slightly greater than the decrease in the number of fare passengers, with the result that for each class there appears a decrease in the average number of passengers per mile of track. This is apparently due to the fact that as a rule the new trackage is in districts where the traffic is not so dense as in the old territory. The average number of passengers per mile of track shows a progressive gradation from 361,701 in 1907 and 399,058 in 1902 for Class A to 59,741 in 1907 and 59,790 in 1902 for Class E.

Although, as before noted, the average number of fare passengers per mile of track increased for the United States as a whole, it decreased for each of the class groups. There was, moreover, a decrease in the average for each class in the North Central division, and with the exception of the small roads of Class E, a decrease in the North Atlantic and Western divisions, while in the South Atlantic and South Central

divisions there was an increase in the average for each class with the exception of Class D of the South Atlantic. That is, as a rule, in the North Atlantic and North Central and Western states the activity in the development of electric lines was greater than in the South Atlantic and South Central states. In the states of the latter divisions the increase in traffic was large and proportionately greater than the growth in track mileage.

Traffic of companies, classified according to kind of system and character of service.—The chief traffic statistics are given in Table 60 for companies, classified both according to kind of system and to character of service. The first classification aims to give the group of electric elevated and subway railways in comparison with all other electric railways or surface roads, and the second classification, a comparison of the groups of selected interurban roads, selected small urban roads, and all other railways.

TABLE 60.—TRAFFIC OF COMPANIES, CLASSIFIED ACCORDING TO KIND OF SYSTEM AND CHARACTER OF SERVICE: 1907.

	Total, all companies.	CLASSIFICATION GROUP.				
		Kind of system.		Character of service.		
		Electric elevated and subway railways. ¹	Electric surface railways. ²	Selected interurban lines.	Selected small urban roads.	All other railways.
Number of operating companies.....	945	6	930	60	100	795
Miles of track.....	34,403.50	420.40	33,983.10	5,507.11	560.00	28,275.70
Number of fare passengers.....	7,441,114,508	635,653,072	6,805,461,430	303,238,580	24,450,000	7,113,419,322
Number of transfer passengers.....	³ 2,091,900,268	5,051,921	2,086,914,337	37,545,285	1,208,204	2,083,212,079
Fare passengers per mile of track.....	⁴ 216,522	⁵ 1,514,866	⁶ 200,380	54,470	43,619	⁷ 251,903
Passenger-car mileage.....	1,583,831,199	143,268,267	1,440,562,932	100,791,812	8,361,861	1,474,077,520
Fare passengers per car mile.....	4.70	4.44	4.72	6.01	2.92	4.82
Mileage of express, freight, mail, etc., cars.....	33,900,101	300,208	33,533,893	6,090,725	148,000	27,664,377
Total car mileage.....	1,617,731,300	143,634,475	1,474,096,825	106,888,537	8,510,860	1,502,331,903
Car miles per mile of track.....	⁷ 47,052	⁸ 342,305	⁸ 43,404	10,200	15,179	⁷ 53,173

¹ Exclusive of the mixed elevated, subway, and surface systems in Boston, Mass., and Philadelphia, Pa.

² Includes the statistics for the few railways not operated by electricity.

³ Includes 90,308,157 free passengers.

⁴ Exclusive of 1 company with 15 miles of track which did not report fare passengers (an exclusively freight road) and 22.05 miles of track not operated.

⁵ Exclusive of 0.79 mile of track not operated.

⁶ Exclusive of 1 company with 15 miles of track which did not report fare passengers (an exclusively freight road) and 21.20 miles of track not operated.

⁷ Exclusive of 22.05 miles of track not operated.

⁸ Exclusive of 21.20 miles of track not operated.

The group of electric elevated and subway railways, though numerically small, represents a relatively large proportion of the passenger traffic. While the group had but 1.2 per cent of all trackage, it handled 8.5 per cent of all fare passengers and had an average car mileage per mile of track eight times that of the average for all other roads. Since the operations of this small group of roads were carried on in districts of the highest traffic density in the cities of New York and Chicago, the average number of fare passengers per mile of track for such roads was large, amounting to 1,514,866, or over seven times the average for the electric surface railways.

The number of fare passengers per car mile necessarily represents the average for all service. The statistics do not permit of a showing either of the maxi-

imum number of fare passengers per car mile during hours of heavy travel or of the minimum during hours of light travel. It would perhaps be expected that the congested condition of traffic on the electric elevated and subway lines, particularly those of the New York companies, during the rush hours of morning and evening, would cause a large average for the number of fare passengers per car mile, but the average for such companies was only 4.44, which is less than the average for all companies. Apparently the congestion of traffic during rush hours is to a large extent balanced by lightness of traffic during intermediate periods.

In the classification by character of service, the group of selected small urban roads had the least number of fare passengers per mile of track operated and

the least number of fare passengers per car mile. As both the selected interurban and the small urban roads operated in rural and urban districts of low-traffic density, the number of fare passengers per mile of track was low for each group, namely, 54,470 for the interurban group and 43,619 for the small urban lines, as against an average of 216,522 for all roads.

In the case of the number of fare passengers and the number of fare passengers per car mile, the statistics for interurban lines are not strictly comparable with the statistics for urban roads on account of the difference in the methods used in counting fare passengers. Some interurban roads follow the practice of steam railroads and count passengers by the trip, while others use the zone method. The latter method gives results comparable with the returns for urban roads, while the former does not. This difference in the methods of counting is reflected in the difference in the average fare per passenger for the selected interurban lines (8.4 cents) and the average fare per passenger for all roads (5.15 cents). (See Table 68.)

Car hours.—The car hour as a unit for comparative statistics for electric railways has grown greatly in favor, especially with larger companies. At the census of 1902 only 390, or 47.7 per cent, of the 817 operating companies reported the use of the car-hour unit, the companies using it carrying 45.6 per cent of the fare passengers, while in 1907, 734, or 77.7 per cent, of the 945 companies employed it, these companies carrying 86 per cent of the fare passengers. The car-hour unit has many advantages over the car-mile unit as a means of measuring railway operations.¹

¹ While there may be many units for special purposes, there are but one or two that can be used in a broad way. Of them all, the car hour at the present time comes closest to satisfaction, and it seems certain that only the most radical change in operating conditions can ever weaken its value.

In few words, the car hour is simply the hours the cars are out of the barns in service, and includes all time they are held by blockades or other causes. It is based upon the principle that but little of the operating expense can be stopped or even checked when a day has started, and that if most of the cars are blocked, the expense in large degree will be continued even though the earnings may wholly cease. And it is right that a unit should continue, because operating efficiency requires it should.

This is a point where car mileage is not equal to its test. For in a blockade the mileage ceases, the car has stopped, but the car hour (the car being away from the barn and under expense) keeps on. The car mile would protect the earnings, as the earnings have stopped with the car. But it is not so fair to the expenses, which must show a high cost per car mile, as they have not ceased for a moment even if the mileage has.

Another point in favor of the car hour is that it absorbs the difference in speed. To the car mile, a mile is a mile, and that is all there is to it—but to the car hour, if the car may be run twice as fast and earn twice as much by doubling the trips, it gains that much in earning efficiency per hour, and it should, but the car mile would show no gain from the increased speed.

No method was employed that was at all satisfactory to arrive at the average speed of a line until the car hour was used, to divide into the car miles run.

* * * The idea of a general unit to be applied to all purposes is not yet attained, nor is it liable to be; probably the most generally useful unit to-day is the car hour, with others suitable to special needs.—*Electric Railway Accounting, W. B. Brockway, 1906.*

Table 61 gives the car-hour statistics for the roads reporting car hours for 1907 and 1902.

TABLE 61.—Car-hour statistics: 1907 and 1902.

	1907	1902
Number of operating companies reporting car hours.....	734	390
Car hours, total.....	151,338,044	65,880,342
Passenger cars.....	148,678,052	65,408,287
Express, freight, mail, etc., cars.....	2,660,892	466,055
Number of fare passengers for companies reporting passenger-car hours.....	6,401,840,576	2,176,880,550
Fare passengers per passenger-car hour.....	48.06	33.28

The passenger-car miles of the companies reporting car hours was 1,345,000,289 in 1907 and 554,586,711 in 1902. A computation of the average passenger-car miles per car hour gives an average speed of 9.06 miles for 1907 as compared with 8.48 miles for 1902. These averages of course are based on car miles traveled during the entire time the cars were in service, including nonrunning time due to blockades or other causes, and do not therefore give an idea of the average speed at which cars travel under normal conditions.

Fare passengers per car hour.—The number of fare passengers per car hour shows an increase from 33.28 in 1902 to 43.06 in 1907, but this apparently large increase is, to a considerable degree, due to the fact that the car-hour unit was used and car-hour figures reported in 1907 by several companies in dense urban districts that did not report such figures in 1902. For example, the Manhattan Railway Company (elevated) of New York did not report the use of the car-hour unit in 1902, while in 1907 this unit was reported by the Interborough Rapid Transit Company for all of its traffic, including that of its lessor, the Manhattan Railway Company.

The method of counting fare passengers, i. e., by trip or by zone, affects the statistics, and in some cases the car hours are computed only for such time as the cars were actually in motion, rather than for the time the cars were out of the barn. A very high average number of fare passengers per car hour in one case led to inquiry and was explained as being due largely to the fact that passengers had been counted by 5-cent zones and that car hours had been reported only for actual running time.

Thirty-six of the 50 companies comprising the group of selected interurban roads reported both car miles and car hours. These 36 companies operated 4,253.30 miles of track, carried 228,796,680 fare passengers, and reported 74,508,257 car miles and 6,762,854 car hours; they had, therefore, an average speed of 11 miles per hour, 53,793 fare passengers per mile of track, 3.07 fare passengers per car mile, and 33.83 fare passengers per car hour.

Accidents.—The census schedule required each railway company to report separately the numbers of passengers, employees, and other persons killed and the numbers injured during the year. The class "Other persons" includes pedestrians and persons riding in vehicles that came in collision with cars. It is to be noted, also, that the numbers reported include all persons injured in connection with the operation of the power plant and the rolling stock, or in line construction. The character or degree of the injury was not considered in answering the inquiry. Each company was requested to report all accidents of which they had made record during the year.

The number of persons killed by street and electric railways in 1907 and 1902 is shown in the following table:

TABLE 62.—Persons killed by street and electric railways: 1907 and 1902.

CLASS.	1907	1902	Per cent of Increase.
Number of persons killed, total.....	2,411	1,218	97.0
Passengers.....	547	265	106.4
Employees.....	207	122	143.4
Other persons.....	1,567	831	88.6
Number of car miles per person killed.....	670,979	939,598	* 28.6
Number of passenger-car miles per passenger killed..	2,895,487	4,226,800	* 31.5

¹ Exclusive of 4 companies which failed to furnish information concerning accidents.

² Decrease.

The relative increase in the numbers killed, largely exceeding, as it does, the relative gains in number of passengers, car mileage, or electric-railway business in general, is startling. The increase in the number of deaths by accident shows most plainly in the decreased average number of car miles per person killed and in the decreased average number of passenger-car miles per passenger killed. In this connection it is interesting to consider the amount paid by street-railway companies for damages and legal expenses in connection with damage suits or settlements. This expenditure increased from \$9,395,545 in 1902 to \$18,176,305 in 1907, or 93.5 per cent, a rate almost equal to the rate of increase in number of persons killed.

Much the larger proportion of persons reported as killed at both censuses were pedestrians or persons riding in vehicles which came in collision with cars, such persons being classed in the table as "Other persons." In 1902, 68.2 per cent of the total number of persons killed were "Other persons," 21.8 per cent were passengers, and 10 per cent were employees, as compared with 65 per cent "Other persons" in 1907, 22.7 per cent passengers, and 12.3 per cent employees. This shows a slight increase in the proportion of passengers killed in 1907 and an increase in the proportion of employees killed, and a decrease in the proportion of killed in the "Other persons" class.

The following tabular statement gives the number of persons injured as reported at the censuses of 1907 and 1902:

Persons injured by street and electric railways: 1907 and 1902.

CLASS.	1907	1902
Total.....	118,200	247,429
Passengers.....	66,721	20,690
Employees.....	8,637	3,669
Other persons.....	42,842	17,040

¹ Includes 230 persons not classified by class.

² Exclusive of 4 companies which failed to furnish information concerning accidents.

In 1902, 1 company, with 1,323 accidents, failed to distinguish those killed from those injured, and they were all included in the injured class. In the same year 3 companies, with 23 persons killed and 1,983 injured, reported accidents to passengers and employees under "Other persons," and 1 company, with 12 persons killed and 656 injured, reported "Other persons" under "Passengers."

There is no uniformity in the practice of companies in deciding what constitutes an injury. In some cases every mishap reported by the car men, no matter how trifling, if occurring in the neighborhood of a car, is entered as an injury. Therefore many wholly unimportant accidents are included, and it is possible that such accidents form the larger portion of the total number of accidents in the case of the persons reported as injured at both censuses. Hence no special deductions can be based upon the figures for the number of persons injured.

Table 63 gives, for street and electric railways and for steam railroads, the number of passengers killed per 100,000,000 passengers carried, and the number of employees killed per 1,000 employees.

TABLE 63.—Fatality rates for passengers and employees, street and electric railways and steam railroads: 1907 and 1902.

CLASS.	1907	1902
Passengers killed per 100,000,000 passengers carried:		
Street and electric railways.....	7.4	5.6
Steam railroads.....	69.8	53.1
Employees killed per 1,000 employed:		
Street and electric railways.....	1.3	0.9
Steam railroads.....	2.7	2.5

The percentages of increase in number of passengers killed per unit number carried are approximately the same for both classes, being 32.1 for electric railways and 31.5 for steam railroads. In the case of employees killed, however, the proportionate increase for street and electric railways (44.4 per cent) greatly exceeds that for steam railroads (8 per cent), although the ratio of killed to number employed on electric railways is still a trifle less than one-half that for steam railroads.

Another interesting view of the figures may be gained by considering the average number of fare

passengers carried per passenger killed and the average number of employees per employee killed:

TABLE 64.—Average number of passengers per passenger killed, and average number of employees per employee killed, by street and electric railways and steam railroads: 1907 and 1902.

	AVERAGE NUMBER OF FARE PASSENGERS PER PASSENGER KILLED.		AVERAGE NUMBER OF EMPLOYEES PER EMPLOYEE KILLED.	
	1907	1902	1907	1902
Street and electric railways.....	13,003,600	13,015,894	746	1,164
Steam railroads.....	1,432,031	1,833,706	309	401

A decrease in the number of passengers carried per passenger killed or in the number of employees per employee killed represents of course an increase in mortality risk. Cognizance should be taken of the relatively great average length of journey for passengers on steam railroads. In the case of employees the figures are on the same footing.

The numbers reported killed, for companies, classified according to income from railway operations, according to kind of system, and according to character of service, are given in Table 65, for 1907 and 1902.

TABLE 65.—Persons killed, by groups of companies: 1907 and 1902.

CLASSIFICATION GROUP.	NUMBER OF PERSONS KILLED.			
	1907	1902	Per cent of total.	
			1907	1902
Total, all operating companies.....	2,411	1,218	100.0	100.0
Companies, classified according to income from railway operations:				
(A) \$1,000,000 and over.....	1,066	090	09.1	56.7
(B) \$500,000 but less than \$1,000,000.....	223	00	0.2	7.9
(C) \$250,000 but less than \$500,000.....	214	130	8.9	10.7
(D) \$100,000 but less than \$250,000.....	173	121	7.2	9.0
(E) Less than \$100,000.....	135	181	5.0	14.0
Companies, classified according to kind of system:				
Electric elevated and subway railways ²	64	.....	2.7	.....
Electric surface railways ²	2,347	.....	97.3	.....
Companies, classified according to character of service: ¹				
Selected interurban lines.....	220	.....	9.1	.....
Selected small urban roads.....	8	.....	0.3	.....
All other railways.....	2,183	.....	90.5	.....

¹ This classification not made in 1902.

² Exclusive of the mixed elevated, subway, and surface systems in Boston, Mass., and Philadelphia, Pa.

³ Includes the statistics for the few railways not operated by electricity.

In order to make an intelligent comparison of the number of persons killed as distributed in the different groups, it is necessary to consider the statistics in connection with the traffic. The number of fare passengers carried affords the best basis for traffic comparisons. Although the great majority of persons killed were persons other than passengers or employees, yet the number of passengers carried is an index of density of population, and density of population is obviously a controlling factor in the fatality rate. The number killed can thus be measured by a fare-passenger unit and the relative mortality standing of the different groups of companies ascertained.

Table 66 shows, for each group of companies, the percentage of the total number of fare passengers covered by the group and the number of persons killed per 100,000,000 fare passengers carried.

TABLE 66.—Per cent of traffic (on basis of fare passengers), and number of persons killed per unit of fare passengers, by groups of companies: 1907 and 1902.

CLASSIFICATION GROUP.	PER CENT OF TOTAL NUMBER OF FARE PASSENGERS.		PERSONS KILLED PER 100,000,000 FARE PASSENGERS.	
	1907	1902	1907	1902
Total, all operating companies.....	100.0	100.0	32.4	25.6
Companies, classified according to income from railway operations:				
(A) \$1,000,000 and over.....	75.6	70.3	29.6	20.5
(B) \$500,000 but less than \$1,000,000.....	7.9	8.1	38.1	24.7
(C) \$250,000 but less than \$500,000.....	6.1	7.3	47.5	37.2
(D) \$100,000 but less than \$250,000.....	6.1	7.0	38.2	36.0
(E) Less than \$100,000.....	4.4	7.2	41.4	62.8
Companies, classified according to kind of system: ¹				
Electric elevated and subway railways ²	8.5	.....	10.1	.....
Electric surface railways ²	91.5	.....	34.5	.....
Companies, classified according to character of service: ¹				
Selected interurban lines.....	4.1	.....	72.6	.....
Selected small urban roads.....	0.3	.....	32.7	.....
All other railways.....	95.0	.....	30.7	.....

¹ This classification not made in 1902.

² Exclusive of the mixed elevated, subway, and surface systems in Boston, Mass., and Philadelphia, Pa.

³ Includes the statistics for the few railways not operated by electricity.

A comparison of the proportions of the total number of fare passengers carried with the proportion of the total number of persons killed (Table 65) for the several groups shows that in Class A the percentage of the total number of persons killed was less than the proportionate amount of traffic, both in 1907 and in 1902, and that in Class B in 1902 the percentage of killed was less. In Class B for 1907 and in Classes C, D, and E at both censuses the proportions for the killed were in excess of the respective proportions for traffic. The number killed by the electric elevated and subway lines was relatively small when compared with the traffic of those lines, while for the selected interurban lines the proportion was high, since the elevated and subway group of companies with 8.5 per cent of the traffic had but 2.7 per cent of the total number of persons killed, while the group of selected interurban lines with only 4.1 per cent of the traffic had 9.1 per cent of the killed.

In each of the classes of companies, according to income, with the exception of Class E, the number killed per 100,000,000 passengers carried increased. The largest increase in ratios was in Class B, for which there was an increase of 54.3 per cent. Class A was second in this respect, with an increase of 44.4 per cent in the proportion. The number killed in the group of electric elevated and subway lines per unit of traffic was less than one-third of the average for the United States, while the number for the group of selected interurban roads was more than twice the total average.

Table 67 is a comparative summary of persons killed, by states and geographic divisions, for 1907 and 1902.

TABLE 67.—PERSONS KILLED, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902.

STATE OR TERRITORY.	Census.	NUMBER OF PERSONS KILLED.				STATE OR TERRITORY.	Census.	NUMBER OF PERSONS KILLED.			
		Total.	Passen- gers.	Em- ployees.	Other persons.			Total.	Passen- gers.	Em- ployees.	Other persons.
United States.....	1907 1902	2,411 1,218	547 265	297 122	1,567 831	North Central division—Continued.					
North Atlantic division.....	1907 1902	1,000 532	212 126	129 57	665 350	Michigan.....	1907 1902	98 55	19 7	10 4	67 44
Maine.....	1907 1902	4 4	1 1		3 3	Wisconsin.....	1907 1902	54 12	13 8		33 12
New Hampshire.....	1907 1902	2 2	1 1		1 2	Minnesota.....	1907 1902	20 11		3	20 8
Vermont.....	1907 1902	(¹) 2	1 1		1 1	Iowa.....	1907 1902	15 19	2 5	2 3	11 11
Massachusetts.....	1907 1902	98 82	23 18	14 9	61 55	Missouri.....	1907 1902	105 116	30 16	8 10	67 90
Rhode Island.....	1907 1902	21 17	1 1	2 2	18 15	North and South Dakota.....	1907 1902	(¹) (¹)			
Connecticut.....	1907 1902	51 14	9 1	8 3	34 10	Nebraska.....	1907 1902	15 3	5 1	1 1	9 2
New York.....	1907 1902	444 178	87 61	67 30	290 87	Kansas.....	1907 1902	8 1	2 1	1 1	5 1
New Jersey.....	1907 1902	113 47	19 6	11 4	83 37	South Central division.....	1907 1902	134 85	40 10	15 11	79 64
Pennsylvania.....	1907 1902	273 186	71 37	27 9	175 140	Kentucky.....	1907 1902	14 9	2 1	2 1	10 7
South Atlantic division.....	1907 1902	141 49	27 9	15 7	99 33	Tennessee.....	1907 1902	22 21	11 3	4 6	7 12
Delaware.....	1907 1902	2 6	1 1		2 5	Alabama.....	1907 1902	22 15	15 1	1 1	7 13
Maryland and District of Columbia..	1907 1902	52 10	11 3	0 2	35 5	Mississippi.....	1907 1902	8 2	1 1	2 1	5 1
Virginia.....	1907 1902	34 9	9 1	0 1	19 7	Louisiana.....	1907 1902	31 27	1 1	1 1	30 26
West Virginia.....	1907 1902	13 12	3 2	1 2	9 8	Arkansas.....	1907 1902	9 4	3 2	3 1	3 1
North Carolina.....	1907 1902	7 2		1 1	7 1	Oklahoma.....	1907 1902	(¹) (¹)			
South Carolina.....	1907 1902	5 4	2 1		3 3	Texas.....	1907 1902	28 7	8 2	8 1	17 4
Georgia.....	1907 1902	24 3	2 1	2 1	20 2	Western division.....	1907 1902	278 63	68 17	41 2	169 44
Florida.....	1907 1902	4 3			4 2	Montana.....	1907 1902	1 2			1 2
North Central division.....	1907 1902	852 489	200 104	97 45	555 340	Colorado.....	1907 1902	23 10	6 2	4 1	13 7
Ohio.....	1907 1902	190 116	47 19	26 0	117 88	Washington.....	1907 1902	38 1	5 1	11 1	22 1
Indiana.....	1907 1902	73 20	11 2	9 3	53 15	Oregon.....	1907 1902	9 9	2 3	1 1	6 5
Illinois.....	1907 1902	276 136	71 54	32 12	173 70	California.....	1907 1902	199 37	51 9	23 1	125 28
						All other Western states and terri- tories. ²	1907 1902	8 4	4 3	2 1	2 1

¹ None reported.

² Includes states and territories as follows: 1907—Arizona, Idaho, Nevada, New Mexico, and Utah; 1902—Idaho, New Mexico, and Utah.

The most marked feature is the relative increase in the numbers for the states of the Western division. The number for this division formed 11.5 per cent of the total in 1907 as compared with 5.2 per cent of the total in 1902. The rate in the states of the South Atlantic division also increased slightly, from 4 per cent of the total in 1902 to 5.8 per cent of the total in 1907. In all the other divisions there was a decrease.

*Fares.*¹—The census schedule for 1907 contained

¹ See also Ch. II, Part II.

no inquiry concerning fares, but the general average that can be obtained by the division of the total income from passenger service by the total number of fare passengers carried during the year is interesting, although it gives little idea of the prevailing rates.

The average receipt per fare passenger for the street and electric railways in 1902 was 4.94 cents, compared with an average receipt per passenger for the steam roads of 60.47 cents. In 1907 the average receipt per fare passenger was 5.15 cents for the electric roads and 64.6 for the steam roads.

STREET AND ELECTRIC RAILWAYS.

TABLE 68.—Average fare per passenger, by groups of companies for street and electric railways, and for steam railroads: 1907 and 1902.

[Obtained by the division of the total income from passenger service by the total number of fare passengers carried.]

CLASSIFICATION GROUP.	AVERAGE FARE PER FARE PASSENGER (CENTS).	
	1907	1902
Street and electric railways, total ¹	5.15	4.04
Companies, classified according to income from railway operations:		
(A) \$1,000,000 and over.....	4.99	4.84
(B) \$500,000 but less than \$1,000,000.....	5.57	4.08
(C) \$250,000 but less than \$500,000.....	5.85	5.40
(D) \$100,000 but less than \$250,000.....	5.85	5.31
(E) Less than \$100,000.....	5.54	5.14
Companies, classified according to kind of system: ²		
Electric elevated and subway railways ³	4.97	.....
Electric surface railways ⁴	5.17	.....
Companies, classified according to character of service: ⁵		
Selected interurban lines.....	8.40	.....
Selected small urban roads.....	5.27	.....
All other railways.....	5.01	.....
Steam railroads ⁶	64.61	60.47
Average journey per passenger, miles.....	31.72	30.30
Average rate per mile, cents.....	2.01	1.99

¹ Exclusive of reports for 6 companies in 1907 and 18 companies in 1902 which failed to furnish financial data.
² This classification not made in 1902.
³ Exclusive of the mixed elevated, subway, and surface systems in Boston, Mass., and Philadelphia, Pa.
⁴ Includes the statistics for the few railways not operated by electricity.
⁵ Statistics of railways, annual reports of Interstate Commerce Commission.

Surprising as it may seem, there was an increase in the average fare per passenger in every income class of companies, from 1902 to 1907, the greatest gain, 0.59 cent, occurring in the second class (B). The highest average fare prevailed in the middle class (C), and the lowest in the largest class (A). The exchange of passengers between companies, which is most common in the larger cities and among the large companies, operates to reduce the average fare received.

The average fare for the selected interurban lines was not so high as might be expected, but many of them do a mixed urban and interurban business and collect fares upon the zone basis. On the other hand, the average fare for the selected small urban roads (5.27 cents) was slightly higher than the average for all railways. Several of the small roads operated between closely connected towns, while for others the line extended to parks or other points outside of the city limits, a double fare being charged.

Mail, express, and freight business.—The carriage of mail, express, and freight matter is a comparatively new but rapidly developing branch of interurban traffic.

TABLE 69.—INCOME FROM MAIL, EXPRESS, AND FREIGHT BUSINESS, BY GEOGRAPHIC DIVISIONS: 1907 AND 1902.¹

CHARACTER OF BUSINESS AND DIVISION.	1907			1902			PER CENT NUMBER OF COMPANIES REPORTING SPECIFIED BUSINESS FORM OF NUMBER REPORTING FINANCIAL DATA.		PER CENT OF INCREASE.		
	Number of operating companies reporting financial data.	Number of companies reporting specified business.	Amount of income from specified business.	Number of operating companies reporting financial data.	Number of companies reporting specified business.	Amount of income from specified business.	1907	1902	Number of companies reporting financial data.	Number of companies reporting specified business.	Amount of income from specified business.
<i>Mails carried for Government.</i>											
United States.....	930	385	\$646,575	799	286	\$432,080	41.0	35.8	17.5	34.0	49.6
North Atlantic.....	365	170	289,234	350	145	200,730	46.6	40.7	2.5	17.2	44.1
South Atlantic.....	100	45	60,924	75	24	40,090	45.0	32.0	33.3	87.5	37.5
North Central.....	293	115	233,461	235	83	145,621	39.2	35.3	24.7	38.6	60.3
South Central.....	90	28	10,121	60	11	10,658	31.1	10.7	36.4	154.5	79.4
Western.....	91	27	44,845	67	28	28,008	20.7	34.3	35.8	17.4	56.8
<i>Express business.</i>											
United States.....	939	229	1,500,802	799	117	401,672	24.4	14.6	17.5	65.7	288.6
North Atlantic.....	365	103	780,341	350	65	125,419	28.2	18.3	2.5	58.5	522.2
South Atlantic.....	100	15	76,333	75	4	13,187	15.0	5.3	33.3	275.0	478.9
North Central.....	293	87	579,355	235	38	253,050	20.7	10.2	24.7	128.9	128.9
South Central.....	90	7	9,204	60	3	0,243	7.8	4.5	30.4	133.3	48.4
Western.....	91	17	115,509	67	7	3,773	18.7	10.4	35.8	142.9	2,961.5
<i>Freight business.</i>											
United States.....	939	342	5,231,215	799	195	1,038,097	36.4	24.4	17.5	75.4	403.9
North Atlantic.....	365	121	1,008,075	350	79	410,527	33.2	22.2	2.5	53.2	150.4
South Atlantic.....	100	41	210,013	75	33	74,735	41.0	44.0	33.3	24.2	181.8
North Central.....	293	120	2,361,059	235	63	320,010	41.0	26.8	24.7	90.5	322.9
South Central.....	90	22	108,301	60	8	41,250	24.4	12.1	36.4	175.0	307.9
Western.....	91	38	1,423,108	67	12	178,957	41.8	17.9	35.8	210.7	695.3

¹ Exclusive of 6 companies in 1907 and 18 in 1902 which failed to furnish financial data.

In 1907, 385 companies reported that they carried mails for the Federal Government, and that they received \$646,575 for the service. In 1902, 286 companies reported that they engaged in the same service and received a revenue of \$432,080. Thus there was an increase of 34.6 per cent in number of companies and 49.6 per cent in amount of income. The North

Atlantic states were represented both by the largest number of companies carrying mail and the largest revenue therefrom at both censuses, but the South Central states had the largest percentage of gain in number of mail-carrying companies and in income. There were 6 companies in 1907 that realized over \$30,000 each from their mail contracts, and in the

case of two the amount exceeded \$40,000. The District of Columbia was the only civil division in 1907 where every railway company carried mail for the Government. Rhode Island had the next largest proportion—5 mail-carrying companies out of 6 in the state. In 16 states the railways carrying mail constituted at least one-half of the total number of operating companies in 1907 as compared with only 10 such states in 1902.

Although the number of railways engaged in carrying express matter was considerably less than the number of those carrying mail, the amount of income from express traffic in 1907 was over twice that received for hauling mail matter.

Freight traffic on electric railways made rapid strides during the five years between the censuses. The number of companies reporting a freight business increased by 75.4 per cent and the income, by 403.9 per cent. The bulk of the income from this class of service in 1907, 45.1 per cent of the total, was earned by the railways operating in the North Central division. In 1902 the North Atlantic division returned the largest proportion, 40.1 per cent, of the total freight income. The great development of interurban electric railways in Ohio, Indiana, Illinois, and Michigan between 1902 and 1907 is the chief cause of the change. The largest proportionate gain in freight traffic, as measured by income, occurred in the Western division, the increase for that division being from \$178,957 in 1902 to \$1,423,168 in 1907, or 695.3 per cent. This division also ranked second in gross income from freight business at the census of 1907.

The rate of gain in the total income from freight business for the United States, 403.9 per cent, approximates closely to that for express, freight, and mail cars, 408.9 per cent.¹

Of the 945 operating companies reporting in 1907, only 1—the St. Louis and Belleville of Illinois—was engaged exclusively in freight traffic. It reported 631 express, freight, and mail cars and 15 miles of track. There were 2 other roads reported at the census of 1907 which should be noted as exclusive freight roads—the American Railway Traffic Company of Brooklyn, N. Y., and the Illinois Tunnel Company of Chicago, Ill.—although, as previously stated,² they were not included in the general statistics for 1907. The former owned no track but operated cars over track of the Brooklyn Rapid Transit system for the removal of the city ashes, while the latter was engaged in express, freight, and mail traffic in subways under the city of Chicago.

Parks and pleasure resorts.—Amusement resorts for the purpose of attracting travel have become a prominent feature of electric-railway operations. At the census of 1902 the statistics presented were confined to the number of companies operating parks and the number of parks. At the present census the scope has been extended to show the investment made by electric-railway companies in pleasure parks, and the estimated number of visitors annually.

Table 70 presents the comparable statistics in regard to parks or pleasure resorts operated by electric-railway companies in 1907 and 1902.

¹ See p. 63.

² See p. 20.

TABLE 70.—NUMBER OF PARKS OR PLEASURE RESORTS, BY GEOGRAPHIC DIVISIONS: 1907 AND 1902.

DIVISION.	NUMBER OF OPERATING COMPANIES.		NUMBER OF COMPANIES REPORTING PARKS OR PLEASURE RESORTS.		NUMBER OF PARKS OR PLEASURE RESORTS.		PER CENT NUMBER OF COMPANIES REPORTING PARKS OR PLEASURE RESORTS FORM OF ALL OPERATING COMPANIES.		PER CENT OF INCREASE.		
	1907	1902	1907	1902	1907	1902	1907	1902	Number of companies.	Number of companies reporting parks or pleasure resorts.	Number of parks or pleasure resorts.
United States.....	945	817	357	289	407	352	37.8	35.4	15.7	23.5	32.7
North Atlantic.....	370	361	134	115	183	140	36.2	31.9	2.5	16.5	30.7
South Atlantic.....	101	80	53	40	73	54	52.5	50.0	20.3	32.5	35.2
North Central.....	293	241	95	89	116	98	32.4	36.9	21.6	6.7	18.4
South Central.....	90	66	43	26	57	37	47.8	39.4	36.4	65.4	54.1
Western.....	91	69	32	19	38	23	35.2	27.5	31.0	68.4	65.2

Of the 817 operating companies in 1902, more than one-third, 35.4 per cent, reported one or more parks or resorts. In 1907 the proportion of companies reporting such parks had increased to 37.8 per cent. The number of parks increased from 1902 to 1907 by 115, or 32.7 per cent.

More than one-half of the operating companies in the states of the South Atlantic division and nearly one-half of those in the South Central division operated pleasure parks in 1907, while in the other divisions approximately one-third had these accessories for traffic. The percentages of increase in number of

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parcs in the states of the Western and the South Central divisions are noticeably large.

Table 71 gives the statistics for parks or pleasure resorts, by geographic divisions, for 1907.

TABLE 71.—STATISTICS OF PARKS OR PLEASURE RESORTS, BY GEOGRAPHIC DIVISIONS: 1907.

DIVISION.	Number of operating companies reporting parks or pleasure resorts.	Number of parks or pleasure resorts.	COST OR INVESTMENT IN PARKS OR RESORTS.			RENTAL OF HIRED PARKS OR RESORTS.		ESTIMATED NUMBER OF VISITORS.		
			Number of parks or resorts represented.	Amount.	Average cost or investment per park or resort.	Number of parks or resorts represented.	Amount.	Number of parks or resorts represented.	Number of visitors.	Average number of visitors per park or resort.
United States.....	357	407	374	\$13,071,402	\$30,555	89	\$46,522	401	51,327,380	127,038
North Atlantic.....	134	183	128	5,389,334	42,104	40	17,162	150	21,402,663	143,234
South Atlantic.....	53	73	66	2,131,012	32,288	12	4,690	68	7,130,323	105,337
North Central.....	95	110	97	3,168,993	32,618	24	20,930	105	11,061,377	105,340
South Central.....	43	57	50	753,788	15,070	10	2,940	48	6,434,107	134,044
Western.....	32	38	33	2,235,275	67,675	3	800	30	5,172,010	172,430

The amounts reported as paid for rental of parks represent in most cases the rental of ground. In many cases companies reported both rental and investment, the land being leased and the improvements and fittings made by the company.

The large amount invested in pleasure parks shows the importance attached to them as agencies for promoting traffic. In a number of individual cases the investment exceeded \$100,000, and in three cases it amounted to \$500,000 or more. The largest average investment per resort is shown for the Western division, and the largest rental for the North Central, while the

sum of the items, investment and rental, is largest for the North Atlantic division.

The number of visitors reported is the result of estimates made by the companies. As a rule, each visitor is a patron of the road both going to and returning from the park or resort, and can be said to represent two fare passengers, and in some cases four, since frequently the parks or resorts are located some distance from the urban center and a second fare is charged for the distance traveled outside of the city limits. Thus it can probably be said that the visitors reported represent more than 100,000,000 fare passengers.

CHAPTER VI. CAPITALIZATION.

Basis of statistics.—The capitalization of street and electric railway companies consists of their capital stock and funded debt. The capital stock of many companies is divided into two classes of securities, common stock and preferred stock, which, as a rule, differ from each other only in the preference given the latter with respect to dividends and with respect to the distribution of assets in case of liquidation, when the preferred shares frequently have to be paid in full before the holders of the common shares receive anything. The capital represented by funded debt takes a variety of forms, and the dividing line between funded debt and floating debt is not sharply defined. In general, funded debt is indebtedness evidenced by obligations issued in a group by a corporation, bearing a fixed rate of interest, and usually secured by a mortgage on property of the company. The classification of funded debt which is adopted by the Interstate Commerce Commission for steam railroads, and which applies equally well to street and electric railways, is as follows:

Mortgage bonds which evidence indebtedness secured by a lien on the road and its franchises.

Income bonds, or bonds which are a lien on revenue only, or which, if a lien on the road and its franchises, can claim payment of interest only when earned.

Miscellaneous funded obligations, such as collateral trust bonds, etc., which comprise funded obligations that are liens on specified property, and therefore distinct from liens on the road and its franchises.

The term "debentures," sometimes used, does not have a fixed meaning. In general, it is used to apply to corporate obligations bearing a fixed rate of interest which are not secured by a mortgage. Sometimes a specific fund or property is pledged by the debentures, in which case they are usually termed "mortgage debentures."

There are other classes of securities which are intermediate between funded debt and floating debt, notably receivers' certificates, which partake of the nature of bonded indebtedness, as they take precedence over funded and so-called current liabilities; but as they are necessarily short-lived and are either soon paid or funded, they are not treated as a part of the funded debt.

Increase since 1902.—The following table summarizes the statistics for capital stock, funded debt, dividends, and interest reported by street and electric railways at the censuses of 1907 and 1902:

TABLE 72.—Capital stock, funded debt, dividends, and interest of operating and lessor companies combined: 1907 and 1902.

	1907	1902	Per cent of increase.
Number of companies.....	1,230	980	25.6
Capital stock:			
Authorized, par value.....	\$2,508,054,330	\$1,620,109,689	64.0
Common.....	2,098,885,736	1,355,920,056	54.8
Preferred.....	409,168,600	274,189,633	136.1
Outstanding, par value.....	2,007,708,856	1,315,572,960	69.6
Common.....	1,770,920,070	1,187,642,781	49.6
Preferred.....	236,788,786	127,930,179	150.8
Dividends, amount.....	54,485,274	33,039,171	64.9
On common stock.....	44,900,706	28,737,887	56.5
On preferred stock.....	9,584,568	4,301,284	121.4
Funded debt:			
Authorized, amount.....	2,322,720,837	1,341,420,727	73.2
Outstanding, amount.....	1,077,003,240	902,709,139	68.9
Interest.....	71,408,788	43,578,061	64.0
Total capitalization outstanding.....	3,774,772,006	2,308,282,009	63.5

¹ Exclusive of 8 companies which failed to report capitalization.

² Exclusive of 7 companies which failed to report capitalization.

Street and electric railways are operated under corporate ownership almost entirely, the exceptions being one municipal railway operated in Louisiana by the city of Monroe water, light, and traction department; one railway operated at Bismarck by the state of North Dakota; and a few railways owned and operated by individuals. In the case of the railways under state or individual ownership which reported no capital stock or bonds, the cash investment or floating debt¹ has been reported. For incorporated companies which had not yet issued stocks or bonds, the floating debt or the value of the investment has been included. The nature of the capitalization reported when other than capital stock or funded debt is noted in Table 133, which shows the capitalization for each company in detail.

Some form of capitalization was reported for each of the 1,236 operating and lessor companies in 1907, except the six electric divisions of steam railroads (see Table 86), while in 1902, 7 of the 987 companies did not report capitalization. The total amounts reported as the par value of outstanding common stock include \$4,536,820 for 1907 and \$525,404 for 1902, which represent cash investment, floating debt, etc., while the total amounts reported as funded debt include \$30,629,091 for 1907 and \$1,719,159 for 1902, which represent debt other than regular funded obligations.

The amount shown as interest on funded debt is the amount charged as a deduction from income in the

¹ See also p. 182.

income account, and therefore does not represent the full interest charge on the outstanding funded debt, as some companies charged part of the interest to construction account, while others defaulted entirely on interest payments. A full explanation of these conditions will be given in the analysis of the statistics as to dividends and interest.

The increase in capitalization is commonly referred to as an indication of the increase in railway construction. It is, however, but one of many factors which should be considered to indicate the extent of the development. The par value of the total outstanding capital stock and bonds reported for 1907 shows an increase of \$1,466,489,997, or 63.5 per cent, over the total for 1902, while the track mileage increased by 11,826.57 miles, or 52.4 per cent. Of these two factors, the increase in the miles of track is the more satisfactory indication of the extent of the actual increase in the electric-railway facilities. The large increase in the amount of the outstanding securities of the street and electric railways of the country from 1902 to 1907 (63.5 per cent) kept pace with the increase in passengers carried (63.3) and gross income (71.6).

The common stock formed the largest proportion of the total outstanding capitalization at both censuses, although this proportion decreased from 51.5 per cent in 1902 to 47.1 per cent in 1907. The preferred stock increased from 5.5 per cent of the total in 1902 to 8.5 per cent in 1907, and the funded debt, from 43 per cent in 1902 to 44.4 per cent in 1907.

The relative increase or decrease in capitalization is dependent upon so many factors and underlying causes that the subject can be treated only in a general way in the census statistics. Many of the causes which have operated to increase, relatively, the capitalization of street and electric railways during the past twenty-five years were stated at some length in the last census report on the industry.¹ While these causes have continued to be operative during the census period from 1902 to 1907, there are several others that have been more particularly active during the same period. These causes are (a) the large increase in the use of private rights of way attending the development of interurban lines; (b) the increased cost of construction due to heavier and larger track, power-plant and rolling-stock equipment; (c) the much larger proportion of investments that are not strictly connected with railway operations proper, and yet are represented in the capitalization, such as electric light and power plants, gas, water, and ice plants, and ferry, wharf, and terminal properties; and (d) the admittedly large increase in cost of materials, which

¹ See Report on Street and Electric Railways, 1902, p. 47 et seq.

was not less than 20 per cent between the two census years.²

Another aspect of the increase in capitalization is found in the results of consolidation, and the reconstruction of track, rolling-stock, and power-plant equipment. Many roads, as they exist to-day, are consolidations of a large number of roads. The capitalization of a consolidated company may be determined by various causes. The market value of securities depends chiefly on the earning power of the road. Hence, if a railway entering a consolidation was earning large dividends, its stock would be taken in and carried at a figure well above its par value, and at least at its market value. The expense of financing consolidations, which includes expenditures for commissions to bankers and syndicates purchasing the securities of the constituent companies and underwriting or guaranteeing the new securities, also figures as a factor in the present capitalization of a consolidated road. And perhaps these conditions more than any other conditions have operated to swell the capitalization of all electric-railway companies.

The necessity of changing, improving, and even rebuilding both line and equipment to keep pace with the march of progress is another important factor to be considered. Some roads of thirty years' standing have witnessed changes from horsepower to cable and then from cable to electric power, and with few exceptions all roads whose existence goes back more than a quarter of a century have passed through the transition stage from horse to electric power. The amount of submerged capital due to these changes is enormous. Very few companies have charged off against investment account sufficient depreciation to cover the lost capital represented by these changes.

Current liabilities.—Undoubtedly a part of the current liabilities of many street and electric railways should be considered as capitalization in order to show the total obligations outstanding against the property. But it is impossible to determine what part of the current debts reported by the several companies has entered into the construction accounts. The schedule of inquiry used in 1902 called only for the following liability accounts in the balance sheet in addition to the capitalization of stocks and bonds, bills and accounts payable, interest due and accrued, dividends due, and sundries. In 1907 the further subdivisions of real-estate mortgages and floating debt (loans and notes) were required. These current liabilities amounted to \$461,248,533 in 1907 and \$252,145,435 in 1902, and constituted 12.2 and 10.9 per cent, respectively, of the total capitalization. Of the total for 1907, \$4,059,805

² Bulletin 81, on wholesale prices, 1890 to 1908, Bureau of Labor, Department of Commerce and Labor, March, 1909.

represented real-estate mortgages and \$278,927,097 floating debt, and if it be assumed that all of this was used for construction and equipment purposes, it would give an aggregate of \$4,057,758,998 as the gross capitalization of the operating and lessor railway companies reported in 1907.

On account of the uncertainty existing in the current-liability accounts and their unstable nature, only the capitalization of stocks and bonds and deductions relating to capitalization statistics are included in the tables. But whenever a considerable floating debt was reported by a company, this fact is noted against the total capital stock and funded debt outstanding as appearing in Table 183.

The following statement shows the current liabilities reported at both censuses in comparison with the capitalization. It shows that the rate of increase for the current liabilities was much greater than that for capitalization, and probably indicates a change in the policy of financing new projects and improvements to old ones.

Capitalization and current liabilities: 1907 and 1902.

	1907	1902	Per cent of increase.
Capitalization, total.....	\$3,774,772,096	\$2,308,282,099	63.5
Capital stock outstanding.....	2,097,708,856	1,315,672,960	50.5
Funded debt outstanding.....	1,077,063,240	992,709,139	68.9
Current liabilities, total.....	461,248,533	252,146,436	82.9
Real-estate mortgages.....	4,059,805	(1)	-----
Floating debt (loans and notes).....	278,927,097	(1)	-----
Bills and accounts payable.....	81,241,278	101,704,634	210.3
Interest due and accrued.....	25,317,190	14,497,670	74.6
Dividends due.....	3,909,390	2,543,823	53.7
Sundries.....	57,703,767	133,399,308	256.7

¹ Not reported separately; probably included in "bills and accounts payable" and "sundries."
² Decrease.

Capitalization of operating and lessor companies.—The total capitalization, dividends, and interest reported for street and electric railways at the census of 1907 is shown in the following table, classified so as to indicate the amounts reported respectively by operating companies and lessor companies:

TABLE 73.—CAPITAL STOCK, FUNDED DEBT, DIVIDENDS, AND INTEREST OF OPERATING AND LESSOR COMPANIES, RESPECTIVELY: 1907.

	Total.	Operating companies.	Lessor companies.	PER CENT OF TOTAL.	
				Operating companies.	Lessor companies.
Number of companies.....	11,230	1,939	291	76.3	23.7
Capital stock:					
Authorized, par value.....					
Common.....	\$2,508,054,336	\$1,884,798,076	\$623,256,260	75.1	24.9
Preferred.....	2,098,885,736	1,528,264,576	570,621,160	72.8	27.2
Outstanding, par value.....	400,168,600	350,533,500	52,635,100	87.1	12.9
Common.....	2,097,708,856	1,543,289,002	554,439,854	73.6	26.4
Preferred.....	1,776,920,076	1,270,590,322	506,329,754	71.5	28.5
Dividends, amount.....	320,788,780	272,678,680	48,110,100	85.0	15.0
On common stock.....	54,485,274	26,454,732	28,030,542	48.6	61.4
On preferred stock.....	44,060,706	19,283,245	25,077,551	42.8	57.2
Funded debt:	9,524,478	7,191,487	2,332,991	75.5	24.5
Authorized, amount.....					
Outstanding, amount.....	2,322,720,837	1,788,187,137	534,533,700	77.0	23.0
Interest.....	1,677,063,240	1,268,607,372	408,455,868	75.6	24.4
Total capitalization outstanding.....	71,408,788	53,786,525	17,702,263	75.2	24.8
	3,774,772,096	2,811,876,374	962,895,722	74.5	25.5

¹ Exclusive of 6 companies which failed to report capitalization.

Full statistics as to the capitalization of these two classes of companies were not presented separately in the last census report. It was stated in that report, however, that of the total outstanding capitalization in 1902, \$532,813,318 represented the securities of lessor companies, \$332,603,890 of this amount representing capital stock and \$200,209,428 representing bonds. These amounts constituted 23.1, 25.3, and 20.2 per cent, respectively, of the totals reported for all companies at that census as compared with corresponding percentages of 25.5, 26.4, and 24.4 for 1907. From this it is evident that so far as capitalization is concerned there was a slight increase in the importance of the nonoperating railways during the five years which elapsed between the two censuses. The changes in operating management, however, which have previously been referred to, affect to a certain extent the showing for the two classes of companies at different periods.

Capitalization and cost of construction.—In making their returns for the balance-sheet inquiry on the schedule the majority of the companies reporting inserted an amount for the cost of construction, equipment, and real estate that practically equaled the par value of their outstanding stocks and bonds.¹ There were, of course, many exceptions to this rule, due largely to the practice followed by some companies of reinvesting surplus earnings in plant and equipment without a corresponding increase in capitalization. The following table compares the net capitalization² reported by both operating and lessor companies with the cost of construction, equipment, and real estate reported in the balance-sheet inquiry at the censuses of 1907 and 1902:

¹ See also p. 180.

² The deductions used to arrive at the net capitalization are stated on p. 103.

TABLE 74.—*Net capitalization and cost of construction, equipment, and real estate: 1907 and 1902.*

	1907	1902	Per cent of increase.
Net capitalization.....	\$3,400,107,809	\$2,117,619,302	60.6
Cost of construction, equipment, and real estate.....	3,037,668,708	2,187,634,077	87.8

¹ Exclusive of capitalization to the amount of \$38,148,800 for 13 companies which failed to report cost of construction, equipment, and real estate.

The two amounts approximate agreement more nearly than might be expected, the difference being proportionately greater in 1907 than in 1902. The net capitalization formed 97.7 per cent of the amount reported as cost of construction and equipment in 1902 and 93.5 per cent in 1907. The decrease in the percentage shown for 1907 is probably more apparent than real, since some elements were included in the construction and equipment total for 1907 that were not treated as cost of construction and equipment at the census of 1902. This is explained more fully in the analysis of the balance-sheet accounts in Chapter VII. The question of the relation of capitalization to the value of the property capitalized has many aspects. Some roads have no funded debt, and the capital stock stands for actual cash that has gone into the construction and equipment of the road. In the case of other roads, road construction and equipment are represented as having been paid for by full-paid capital stock and bonds. If every road came within one or the other of the above classes, the par value of the outstanding stock of a given railway company plus the bonded debt at its face value would in fact represent the capital that has gone into the road. But in the case of some companies stock on which only 20, 40, or 50 per cent has been paid in is nevertheless carried on the books at full par value and receives dividends, when any, as if fully paid up. In the case of other companies the bonds have built the road and the stock represents mainly franchise value, etc. In still other cases bonds and preferred stock represent capital actually invested in the business, while common stock stands for franchise value, and, in general, a real or assumed surplus earning capacity. These three sorts of cases are fairly typical; variations from type are numerous and complicated.

Taking the street and electric railway industry as a whole, it is impossible to differentiate that part of the capitalization which represents actual invested capital that has gone into construction, equipment, and operation, either past or present, from that which represents franchise values, earning power, or stock bonus. All that can safely be said in general of the aggregate capitalization is that the term "capitalization" represents an amount on which "the public" is asked to assume that the business will pay, either at once or in the future, a return in the shape of dividends or interest.

Capitalization of holding companies.—The capitalization thus far considered does not represent the whole of the financial structure maintained by the street and electric railways of the United States. In addition to the companies for which statistics have been presented, there are a large number of purely holding organizations, including both incorporated companies and unincorporated associations, organized to control the financial policies and management of operating and lessor companies. These companies have capital stock or participating shares and funded securities based upon the securities of the operating companies controlled by them.

While some of the financing or holding companies have control of the operation of the properties in which they are interested, this control is usually exercised in an advisory capacity and does not take the form of actual, direct supervision of the details incident to the running of the system. These companies may be divided into two classes:

(a) Incorporated companies duly organized as holding corporations. These companies often have funded debt in the form of collateral trust bonds secured by the stocks and bonds and other indebtedness of the controlled companies.

(b) Voluntary associations, managed by a board of trustees and having participating shares, generally both preferred and common, which are handled on the stock exchange on the same basis as the stock of incorporated companies. These shares in some cases have no stated par value, but in case of liquidation the preferred shares are generally to be rated at \$100.

The voluntary holding associations are at present, so far as known, confined to Massachusetts. The state law is a barrier to the direct capitalization of the franchise value or earning power of a road, but there is apparently no provision against the substitution of participating shares of a nonincorporated holding organization for the stock of the incorporated companies.

In both cases the securities of the holding organization are substituted, so far as the general public is concerned, for the securities of the underlying companies to the extent that the securities of the latter are owned by the holding organization. Moreover, in the case of both classes of holding companies, the operating companies remain as distinct corporations, each with its own officers and board of directors, but their earnings go to the treasury of the holding company.

Another phase of railway operation is represented by organizations which act merely as managers and do not own the roads or the stock of the operating companies. Companies that have transferred, in whole or in part, the operation of their properties to organizations of this character, preserve in every respect their complete independence and are affiliated only through the common management.

Reports were secured for 70 financing or holding companies whose investments were chiefly in stocks and bonds of electric railways and electric light and power companies. The par value of their outstanding capitalization amounted to \$954,695,373. In many cases, however, the investments of these companies extend to public utility corporations and other industries not of an electrical character, only minor investments being in the stocks and bonds of electrical corporations.

The following tabular statement shows the capitalization of holding companies in 1907:

Capital stock, funded debt, dividends, and interest of holding companies: 1907.

Number of companies.....	70
Capital stock:	
Authorized, par value.....	\$780,021,374
Common.....	550,008,050
Preferred.....	223,052,424
Outstanding, par value.....	663,361,158
Common.....	484,241,080
Preferred.....	170,120,072
Dividends, amount.....	11,858,057
On common.....	6,187,380
On preferred.....	5,166,268
Funded debt:	
Authorized, amount.....	495,140,076
Outstanding, amount.....	291,334,215
Interest.....	11,616,034
Total capitalization outstanding.....	954,695,373

In considering these statistics it should be remembered that in many instances the capitalization is based on other properties as well as those represented by the railway plant, line, and equipment, and also that on the other hand the statistics may not represent all companies of this class, since it is more difficult to secure reliable information concerning holding and financing companies than concerning operating companies.

In so far as the par value of the securities of the holding companies is in excess of the par value of the securities of the companies which are controlled by the holding companies, this plan of centralization results in an increase of the amount of securities put on the market. Thus the difference between the par value of the securities outstanding of the holding companies and the par value of the securities of companies owned by them should give the net increase in the amount of securities available for investment. But in order to ascertain the amount of this increase exactly, the reports of these organizations should give the stock and bonds owned by them at their par value, whereas in some cases it would appear that such companies carry them in their accounts at cost or book value. Hence only approximate conclusions can be drawn from the statistics as to the extent to which the capitalization of the holding companies represents a net increase. Again, it was not possible for the census to obtain complete or exact balance-sheet statements in the case of all of the holding companies reporting, and it was necessary to supplement the data reported by those given in trade journals, etc.; but so far as could be

ascertained the assets of the 70 holding companies were approximately as follows:

Total assets.....	\$1,048,407,343
Stocks and bonds of other electric railways and light plants.....	763,858,954
Treasury stocks and bonds.....	10,600,200
Other permanent investments.....	133,133,377
All other assets.....	96,704,812

If the amounts reported under the head of treasury securities and other permanent investments outside of the electrical industries (\$193,783,577) are deducted from the par value of the outstanding securities of the holding companies, a total of \$760,911,796 results as the capitalization of the holding companies chargeable to their electric railway and light interests; but the securities of companies operating electrical properties which were held by the holding companies were carried in the balance sheet at \$763,858,954. It is evident, therefore, either that the capitalization of the holding companies, so far as it relates to the electric properties owned and controlled by them, shows a fairly close correspondence to the par value of the securities of the companies owned by the holding companies, or else that the figures do not reveal the true relation between the capitalization of the holding and subsidiary companies. The close apparent agreement between the value of electrical securities held by the holding companies and their outstanding capitalization chargeable to electrical industries, if real, may be explained on the ground that a chief purpose of many holding companies is not to increase the capitalization of the controlled companies, but to enable the men in the holding company to obtain or retain control of large concerns with relatively small capital.

The income of the holding companies comes in the main from dividends and interest on the securities of the controlled companies, which they receive and distribute as dividends and interest on their own securities. Often these returns represent a much lower rate of dividend or interest to investors of the holding company than that which was declared on the original securities; for example, an operating company may pay a dividend of \$12,000 (6 per cent on \$200,000) which is redistributed as a 4 per cent dividend on the capitalization of the holding company—the par value of whose securities is 50 per cent greater than the par value of the securities of the operating company. Hence the holding companies constitute, in some cases, a channel for the distribution of the earnings among a greater volume of securities at a lower rate of return.

A comparison of the dividends on holding-company stock with the total par value of such stock outstanding is misleading, since not all stock pays dividends. The following statement avoids this difficulty by analyzing the securities of holding companies with respect to dividends and interest for the year 1907:

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Analysis of dividends and interest of holding companies: 1907.

Common stock:	08
Number of companies reporting.....	10
Number of companies declaring dividends.....	\$150,882,450
Amount on which dividends were declared.....	\$0,187,389
Amount of dividends.....	
Average rate of dividends on dividend-paying common stock, per cent.....	3.94
Preferred stock:	38
Number of companies reporting.....	25
Number of companies declaring dividends.....	\$128,740,851
Amount on which dividends were declared.....	\$5,160,208
Amount of dividends.....	
Average rate of dividends on dividend-paying preferred stock, per cent.....	4.01
Funded debt:	42
Number of companies reporting.....	\$280,465,389
Amount outstanding.....	\$11,610,034
Amount of interest.....	
Average rate of interest, per cent.....	4.14

¹Exclusive of funded debt to the amount of \$10,808,820 for 5 companies which failed to report interest.

The average rates of dividends and interest are considerably lower for holding companies than for operating and lessor railway companies—the latter showing rates of 5.58 per cent for common stock, 4.59 per cent for preferred stock, and 4.42 per cent for bonds, as compared with rates of 3.94, 4.01, and 4.14 per cent, respectively, for the holding companies.

Charter companies.—Besides the operating, lessor, and holding companies for which statistics are presented in this report, there is another class of companies in close alliance with the street and electric railway interests of the country. These companies—known as “charter companies”—are formed to obtain rights of way or franchises, especially in the larger cities. Though a considerable number of such companies reported at the census of 1907, no statistics are presented for them, for the reason that they have only, as a rule, a nominal capitalization, and so far as the Census Office could ascertain, they have made no use of their franchises or rights of way.

Analysis of dividends and interest.—The extent to which the street railways of the country afford a return on capital invested in them is a matter of great interest, not only to those intimately connected with the industry but to the public generally. Of the 1,230 operating and lessor companies reporting capitalization at the present census, 1,016 made some return on their capital stock or funded indebtedness, or both, during the year 1907. These companies had an outstanding capitalization of \$3,555,721,268, or 94.2 per cent of the total for the 1,230 companies, and paid dividends and interest amounting to \$125,954,062, an average rate of 3.54 per cent on the whole of their outstanding capitalization. The extent to which individual companies declared or paid dividends during the census year, together with the rates of interest on bonds for each company, is shown in Table 183.

When the totals for all companies are considered, it is necessary, in order to arrive at trustworthy results, to separate the dividend and interest paying companies and securities from those for which no dividends or interest were reported.

TABLE 75.—*Analysis of dividends and interest of operating and lessor companies combined: 1907 and 1902.*

	1907	1902	Per cent of increase.
Number of companies.....	1,230	1980	25.5
Common stock:			
Number of companies reporting.....	1,227	974	26.0
Number of companies declaring dividends.....	321	258	24.4
Amount outstanding, par value.....	\$1,776,020,070	\$1,187,642,781	49.6
Amount on which dividends were declared.....	\$805,210,600	\$560,326,121	43.7
Per cent dividend-paying stock forms of all common stock.....	45.3	47.0	
Amount of dividends.....	\$44,960,706	\$28,737,887	60.5
Average rate of dividends on all common stock, per cent.....	2.53	2.46	
Average rate of dividends on dividend-paying common stock, per cent.....	5.58	5.13	
Preferred stock:			
Number of companies reporting.....	204	85	140.0
Number of companies declaring dividends.....	97	40	142.5
Amount outstanding, par value.....	\$320,788,780	\$127,030,170	160.8
Amount on which dividends were declared.....	\$207,718,830	\$83,869,055	147.7
Per cent dividend-paying stock forms of all preferred stock.....	64.8	67.7	
Amount of dividends.....	\$9,524,478	\$4,301,284	121.4
Average rate of dividends on all preferred stock, per cent.....	2.97	3.47	
Average rate of dividends on dividend-paying preferred stock, per cent.....	4.50	5.13	
Funded debt:			
Number of companies reporting.....	992	781	27.0
Amount outstanding.....	\$1,677,063,240	\$992,700,139	68.9
Amount of interest.....	\$71,468,788	\$43,578,961	64.0
Average rate of interest, per cent.....	4.42	4.47	

¹Exclusive of 6 companies which failed to report capitalization, interest, and dividends.

²Exclusive of 7 companies which failed to report capitalization. There were 30 companies in all which failed to furnish information concerning interest and dividends; these companies had \$18,937,745 common stock, \$4,000,000 preferred stock, and \$17,325,000 funded debt outstanding.

³There were 50 companies in 1907 with \$60,034,066 funded debt outstanding which failed to report interest. The funded debt of these companies has been excluded in arriving at this average.

It will be noted that the average dividend rate on preferred stock for 1907—4.59 per cent—was less than the average rate shown for 1902 and also less than the average rate for common stock in both 1907 and 1902. The relatively high average rate of return on common stock was due largely to the fact that a number of lessor companies which had only common stock received a rental that represented a very high rate of dividends on the par value of their own securities.

Of the 1,230 companies reporting capitalization in 1907 there were only 3 that did not report common stock; of these, 1 was municipally owned, 1 was a moribund company that reported only bonds, and 1 reported only preferred stock and bonds. Technically there can be no preferred stock except in connection with common stock, but for census purposes the stock of the latter company was allowed to stand.

The proportion of common stock paying a dividend in 1907 was slightly less than in 1902, but the rate of dividend on such stock increased from 5.13 per cent in 1902 to 5.58 per cent in 1907. By reference to Tables 79 and 80 it will be seen that in 1907 a large proportion of the companies declared dividends of from 6 to 8 per cent on the common stock—104 of the 321 dividend-paying companies falling in this group—and also that 76 of the 97 companies paying dividends on pre-

ferred stock paid dividends of from 5 to 7 per cent. In preparing the tables referred to, companies with more than one rate of dividend were classified according to the average rate of dividend paid.

Dividends declared by operating companies which are controlled by holding companies, through the ownership of the entire issue of their stock, are generally paid to the holding companies. In some cases, however, the net income of the operating company is carried directly to the credit of the holding company, which is entitled, as the holder of the entire capital stock, to all the surplus earnings from which dividends can be paid. This practice, which reduces the dividend showing for the operating companies, has been noted in Table 183 whenever it was reported.

As already noted the amount shown as interest on funded debt does not represent the total interest charge for the year on the total par value of the outstanding debt. It is a common practice among street railways to charge all or a part of the interest to the plant account while construction is going on, so that it does not appear in the income account from which the census figures of interest on funded debt are taken. Again there were companies that did not report any interest charge for 1907. The fixed charge of interest on bonds should be computed on all outstanding funded debt, except possibly for companies in bankruptcy, but in many cases conditions existed which operated to prevent the showing of any interest charge in the statistics. At the present census there were 50 companies with funded debt outstanding that did not show any interest charge in the income account. Of these, 8 charged the entire amount to construction account; 5 defaulted on their interest; 9 had deposited bonds as collateral; 13 had the payment of interest waived by special agreement; 4 were in the hands of receivers. The remaining 11 gave various reasons or no reason at all for omission of interest. The funded obligations of these 50 companies have been excluded in arriving at the average interest rate of 4.42 per cent shown in the table to be compared with the average rate of 4.47 per cent shown at the census of 1902. The statistics as a whole are not conclusive as to whether there was an actual reduction in the average rate of interest reported at the present census as compared with that of 1902. Conditions are brought out more clearly by Table 76, which classifies the companies for 1907 and 1902 according to the rates of interest on their bonds and indicates a general movement toward cheaper rates.

In all cases where companies have several bond issues bearing different rates of interest, they were classified in the table according to the average rate paid on the whole debt.

The balance-sheet statements of the several companies reveal items of \$25,317,196 in 1907 and \$14,497,670 in 1902 for interest due and accrued; but it is impossible to determine whether or to what

extent these figures represent defaulted interest, or merely annual or quarterly accruals, and interest for which the coupons had not yet been presented.

TABLE 76.—Operating and lessor companies reporting funded debt, grouped by rate of interest: 1907 and 1902.

RATE GROUP.	COMPANIES REPORTING FUNDED DEBT.			
	Number.		Per cent of total.	
	1907	1902	1907	1902
Companies reporting funded debt.....	992	781	100.0	100.0
Number of companies paying interest at the rate of—				
3 per cent but less than 4.....	7	3	0.7	0.4
4 per cent but less than 5.....	124	81	12.5	10.4
5 per cent but less than 6.....	716	532	72.2	68.1
6 per cent but less than 7.....	117	137	11.8	17.5
7 per cent but less than 8.....	2	4	0.2	0.5
8 per cent and over.....	1	.....	0.1	.....
Number of companies for which rate was not reported.....	25	24	2.5	3.1

Tables 77 to 81, inclusive, separate the combined capitalization of operating and lessor companies, as reported at the census of 1907, into two classes—that on which dividends or interest were paid and that on which no dividends or interest were paid. The tables relating to common stock exclusively and preferred stock exclusively, further group the dividend-paying companies according to the rates of dividends declared.

TABLE 77.—Capitalization—Amount, dividends, and interest for operating and lessor companies paying either dividends on stock or interest on funded debt, and amount for companies not paying either dividends or interest: 1907.

	Companies reporting capitalization.	Companies paying either dividends on stock or interest on funded debt.	Companies not paying either dividends on stock or interest on funded debt.
Number of companies.....	1,230	1,016	214
Aggregate capitalization:			
Amount authorized, par value.....	\$4,830,776,173	\$4,480,408,539	\$350,368,034
Amount outstanding, par value.....	\$3,774,772,096	\$3,555,721,268	\$219,050,828
Amount of dividends and interest.....	\$125,954,062	\$125,954,062	.....
Average rate of dividends and interest, per cent.....	3.34	3.54	.....

The total dividend and interest payments represent an average rate of 3.34 per cent on the total outstanding capitalization of all companies. But some companies paid neither interest nor dividends. If the capitalization of these companies, 5.8 per cent of the total, be excluded from the calculation, the average rate rises to 3.54 per cent. In other words, if the companies paying either interest or dividends had had only one form of security in their actual capitalization, they would have paid an average of 3.54 per cent on that single security.

As the total capitalization of the 1,016 companies reporting dividends or interest includes large amounts of stock on which no dividends were paid, the total dividends and total interest should be severally con-

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sidered in connection with the stock and bonds, respectively, on which they were paid. Some companies having both common and preferred stock paid dividends on one class of stock but none on the other. It is, however, of interest to know the total capital stock of all companies which paid dividends on either common or preferred stock during the census year, and statistics in reference to this point are given in Table 78.

The par value of the outstanding shares of the 381 companies paying dividends represented 58.4 per cent of the total for the 1,228 companies that reported capital stock, and the amount of dividends paid, \$54,485,274, was equal to an average rate of 4.45 per cent on the outstanding stock.

TABLE 78.—Capital stock—Amount and dividends for operating and lessor companies paying dividends either on common or preferred stock, and amount for companies not paying dividends: 1907.

	Companies reporting capital stock.	Companies paying dividends either on common or preferred stock.	Companies not paying dividends either on common or preferred stock.
Number of companies.....	1,228	381	847
Capital stock:			
Amount authorized, par value.....	\$2,508,054,836	\$1,365,061,770	\$1,142,992,566
Amount outstanding, par value.....	\$2,097,708,856	\$1,224,337,480	\$878,371,376
Amount of dividends.....	\$54,485,274	\$54,485,274	
Average rate of dividends, per cent.....	2.60	4.45	

¹ Exclusive of 2 companies which did not report capital stock.

TABLE 79.—COMMON STOCK—AMOUNT AND DIVIDENDS FOR OPERATING AND LESSOR COMPANIES PAYING DIVIDENDS, GROUPED BY RATE OF DIVIDENDS, AND AMOUNT FOR COMPANIES NOT PAYING DIVIDENDS: 1907.

RATE GROUP.	Number of companies.	COMMON STOCK, PAR VALUE.						
		Authorized.		Outstanding.		Dividends.		
		Amount.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	Average rate per cent.
Companies reporting common stock.....	1,227	\$2,098,885,736	100.0	\$1,776,920,076	100.0	\$44,960,796	100.0	2.58
Companies paying dividends on common stock.....	321	904,576,676	43.1	805,210,600	45.3	44,960,796	100.0	5.58
Less than 1 per cent.....	2	7,500,000	0.4	7,500,000	0.4	38,500	0.1	0.51
1 per cent but less than 2.....	17	61,317,200	2.9	59,969,900	3.4	635,217	1.4	1.06
2 per cent but less than 3.....	20	67,708,120	3.2	62,566,202	3.5	1,303,514	2.9	2.08
3 per cent but less than 4.....	20	67,708,120	3.2	62,566,202	3.5	1,977,304	4.4	3.19
4 per cent but less than 5.....	18	62,376,500	3.0	62,026,000	3.5	4,241,554	9.4	4.07
5 per cent but less than 6.....	29	116,842,100	5.6	104,206,638	5.9	4,724,162	10.5	4.99
6 per cent but less than 7.....	50	102,087,000	4.9	94,722,100	5.3	9,052,636	20.1	6.10
7 per cent but less than 8.....	81	212,919,600	10.1	145,427,760	8.2	9,593,750	21.3	6.94
8 per cent but less than 9.....	23	140,104,050	6.7	137,791,950	7.8	2,081,022	4.6	7.91
9 per cent but less than 10.....	19	48,420,100	2.3	41,440,400	2.3	3,682,136	8.2	8.59
10 per cent and over.....	4	45,001,200	2.1	48,888,000	2.8	6,790,396	15.0	13.88
Companies not paying dividends on common stock.....	906	1,194,309,060	56.9	971,709,476	54.7			

¹ Exclusive of 3 companies which did not report common stock.

The presentation given in Table 78 does not show the true rate of dividends on stock. The true rate on common stock is indicated to some extent by the statistics in Table 79, which is confined to this class of stock.

Of the 1,227 companies that reported common stock, 321 paid dividends amounting to \$44,960,796 on common stock, the par value of which was \$805,210,600; the average rate was thus 5.58 per cent. The outstanding common stock of these 321 dividend-paying companies comprised 45.3 per cent of the total for the 1,227 companies reporting common stock. Some companies did not pay dividends on the entire amount of common stock outstanding, and it was impossible in all cases to determine exactly the amount of stock of a company which should be credited as paying dividends, but after making proper allowance as far as possible for the condition referred to, it

appears that the average rate of dividend was nearer 5.69 per cent than the 5.58 per cent shown in the table.

Of the 321 companies, 176 reported the payment of dividends of 6 per cent or more. The par value of the outstanding common stock of these companies, \$414,236,300, formed 51.4 per cent of the total common stock on which dividends were paid, and the average rate for the issue was 7.73 per cent. The 145 companies that paid dividends of less than 6 per cent reported \$390,974,300 as the par value of their outstanding common stock, and on that amount the average rate of dividend was 3.30 per cent.

As has been noted before, the dividend rates on the common stock are decidedly higher than the rates on preferred stock, for which statistics are presented in Table 80.

TABLE 80.—PREFERRED STOCK—AMOUNT AND DIVIDENDS FOR OPERATING AND LESSOR COMPANIES PAYING DIVIDENDS, GROUPED BY RATE OF DIVIDENDS, AND AMOUNT FOR COMPANIES NOT PAYING DIVIDENDS: 1907.

RATE GROUP.	Number of companies.	PREFERRED STOCK, PAR VALUE.						
		Authorized.		Outstanding.		Dividends.		
		Amount.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	Average rate per cent.
Companies reporting preferred stock.....	204	\$406,168,600	100.0	\$320,788,780	100.0	\$9,524,478	100.0	2.97
Companies paying dividends on preferred stock.....	97	235,120,100	57.5	207,718,830	64.8	9,524,478	100.0	4.69
1 per cent but less than 2.....	3	13,700,000	3.3	9,200,000	2.9	102,000	1.1	1.11
2 per cent but less than 3.....	1	9,000,000	2.2	8,707,900	2.7	195,928	2.1	2.25
3 per cent but less than 4.....	5	23,292,900	5.7	23,292,900	7.3	759,113	8.0	3.26
4 per cent but less than 5.....	5	9,050,000	2.2	9,050,000	2.8	362,000	3.8	4.00
5 per cent but less than 6.....	40	115,143,300	28.1	101,761,000	31.7	4,595,327	48.2	4.52
6 per cent but less than 7.....	30	53,283,900	13.0	44,231,130	13.8	2,590,377	27.2	5.86
7 per cent but less than 8.....	4	3,700,000	0.9	3,700,000	1.2	255,333	2.7	6.90
8 per cent but less than 9.....	1	6,400,000	1.6	6,400,000	2.0	512,000	5.4	8.00
9 per cent but less than 10.....								
10 per cent and over.....	2	1,550,000	0.4	1,375,000	0.4	152,400	1.6	11.08
Companies not paying dividends on preferred stock.....	107	174,048,500	42.5	113,069,950	35.2			

Only 97 of the 204 companies having preferred stock paid dividends in 1907, but the par value of the outstanding preferred stock of these companies formed 64.8 per cent of all preferred stock reported. As in the case of common stock, some preferred stock paid no dividends even when other preference shares issued by the same company received dividends. A deduction of such stock from the outstanding issues of the 97 companies, so far as this may be done, results in changing the average rate of dividends from the 4.59 per cent shown in the table to 4.84 per cent.

The following table shows the number of companies reporting funded debt at the census of 1907, the amount of debt, both authorized and outstanding, and the amount of interest paid. It also distinguishes between the companies that did and did not pay interest.

TABLE 81.—Funded debt—Amount and interest for operating and lessor companies paying interest, and amount for companies not paying interest: 1907.

	Companies reporting funded debt.	Companies paying interest.	Companies not paying interest.
Number of companies.....	1 992	924	1 08
Amount of funded debt authorized.....	\$2,322,720,837	\$2,211,345,746	\$111,375,091
Amount of funded debt outstanding.....	\$1,677,063,240	\$1,617,029,174	\$60,034,066
Amount of interest.....	\$71,408,788	\$71,408,788	
Average rate of interest, per cent..	4.26	4.42	

¹Includes 18 companies having authorized funded debt but none outstanding.
²Includes authorized funded debt to the amount of \$27,805,000 for which there was none outstanding.

Net capitalization.—To ascertain the net capitalization representative of the street and electric railway industry, cognizance must be taken of the stocks and bonds of other street and electric railway companies, treasury stocks and bonds, and nonrailway investments returned by the reporting companies.

It frequently happens that one railway company owns securities of another railway company, in some cases all of the stock or enough to give control. Such

cases necessarily occasion a duplication in the capitalization reported to the extent that the securities of one company are owned by the other. Hence, in ascertaining the net capitalization chargeable against railway trackage and equipment, the total amount of the stocks and bonds of street and electric railway companies that are owned by other street and electric railway companies should be deducted from the total outstanding capitalization. In computing the net capitalization the *par value* of these intercompany holdings should be deducted, but as such securities are often carried and reported at their cost or book value, the par value was not ascertainable.

Furthermore, it is a common practice to use treasury bonds as collateral security for floating indebtedness. Such bonds are securities of the company which have been duly authenticated and are in condition for delivery if sold, and are regarded as a part of the outstanding bonded liability of the company. But it will be seen that in such cases the inclusion of such treasury bonds of the company in the bonded indebtedness results in a duplication, since the amount of the loan is represented in the funded debt by the hypothecated bonds and in the floating debt by "loans or notes payable." To the extent that such treasury bonds are in use as collateral for floating indebtedness, dollar for dollar, they represent a simple duplication, but when, as is frequently the case, the par value of the hypothecated bonds exceeds the proceeds of the loan, the duplication is proportionately aggravated. Further, some companies carry a part of their stocks and bonds in the treasury as current assets. These stocks and bonds are regarded as issued and outstanding, and form a "bookkeeping" liability. They are in condition for negotiation and delivery without any further action or authority on the part of the directors. Hence stocks and bonds of a company held in its own treasury or hypothecated are to be deducted from the gross capitalization in ascertaining the net capitalization.

The problem is further complicated by the fact that many companies possess interests in nonrailway enterprises in the form of investments for the production of current for light and power, the manufacture of gas and ice, the operations of ferries, real estate operations, etc.¹ The gross capitalization in such cases covers all departments of the company's operations, with the nonrailway investments and net income therefrom carried as separate items in the balance sheet and income accounts. Hence the investments in nonrailway enterprises should also be deducted from the gross capitalization to ascertain the net amount chargeable to railway operations.

Some uncertainty surrounds the amount shown in the balance-sheet statement as "other permanent investments," since a division of the property assets between railway and nonrailway interests was not carried in the ledger accounts of many companies. In these cases a segregation based upon estimate was obtained. Again, such investments, when carried, may have been assigned too high a valuation, and their deduction would make the net capitalization too low. And yet, all things considered, the deduction of investments in the securities of other railway companies and in nonrailway property from the total capitalization to ascertain the net capitalization chargeable to the railway industry gives the nearest approximation to the truth.

The investment in lighting plants when reported in combination with railway operations was treated as part of the cost of construction and equipment of the railway and the gross expense and income carried in the income account.² Whenever the nonrailway interests are considerable, or the company operates an electric-light plant, the fact is noted in Table 183.

The total amount invested in securities and in nonrailway properties reported in 1907 amounted to \$374,664,197, equivalent to 9.9 per cent of the total capitalization, as compared with \$152,513,997, or 6.6 per cent of the total capitalization in 1902. When these amounts are deducted from the total capital stock and funded debt, totals are obtained of \$3,400,107,899 for 1907 and \$2,155,768,102 for 1902, which amounts should be considered as the net capitalization chargeable against the trackage and equipment of street and electric railways, with the exception that some investments in electric-light plants are included. These are the amounts upon which the statistics as to the net capitalization per mile of track for all companies have been based.

¹ As a rule, the total capitalization of a company engaged in more than one industry is included in the census statistics, but there were a few cases when the railway interests were small compared to the total business of the company where the capitalization was apportioned between the several departments and only the part assignable to the electrical industries reported. These cases are noted in Table 183. For list of industries operated in connection with electric railways, see p. 117.

² See p. 116.

Capitalization per mile of track.—The gross capitalization per mile of track is arrived at by dividing the capitalization—that is, the total outstanding capital stock and funded debt—by the total miles of trackage for which corresponding data regarding capitalization were reported. The net capitalization per mile of track is found by dividing the net outstanding capitalization (as described in the foregoing section) by the track mileage for which capitalization was reported.

Table 183 shows the capitalization per mile of track reported for each company, together with state and United States totals, for 1907. In order not to disclose any part of the financial data of individual companies, the capital invested in securities and nonrailway property has not been deducted in making the calculation by companies, and the figures show, therefore, the total or gross capitalization, the net capitalization being shown only in the totals for states and other groups.

The gross capitalization per mile of track for all companies increased from \$103,099 in 1902 to \$111,569 in 1907, and the net capitalization from \$96,287 to \$100,495. A mile of track is taken as the unit of measure rather than a mile of line, as it is a unit which results in the most comparable statistics. In some cases roads are double tracked, the outgoing and incoming tracks being on the same street, while in other cases the outgoing and incoming tracks are on different streets, and though the amount of trackage may be the same in each case, roads in the latter class will have twice the length of line of roads belonging to the former class.

The net capitalization per mile of track may have considerable statistical value when the companies are taken in the aggregate or in groups, but the gross capitalization shown for individual companies has but little significance. In some cases the capitalization covers investments in lighting plants and other properties, while in others it does not. Again, the capitalization in many cases includes franchise values and earning capacity; in some cases it represents only cost of the construction and equipment of railway property; while in some cases, on the contrary, surplus earnings have gone into betterments and additions until the actual invested capital exceeds the capitalization.

In some instances the capitalization has been changed during the census interval, so that the relation of capitalization to trackage at the present census is not properly comparable with that at the preceding census. For example, one electric road at the census of 1902 reported a capitalization of less than \$2,500 per mile of track, the surplus earnings over and above moderate dividends having gone into its construction account. During the census interval the capital stock was increased so as to cover the accumulation of former invested capital and to capitalize the franchise

value or earning power without any material change in plant investment or in the physical characteristics of the property, so that now the capitalization per mile of track is over \$60,000 and approximates the average capitalization for the majority of the companies of the same size.

Attention should again be called to the fact that in some cases a large amount of capital in excess of the current liability requirements is represented by floating debt in the form of promissory notes. This occurs more particularly in Massachusetts and is probably due to the operation of the state law regulating the capitalization of railway companies. A considerable amount of the capital thus secured is for purposes of construction and equipment and should therefore properly be included along with funded debt in the capitalization in order to give the total capitalization per mile of track. Though the amount of floating debt of this character which should be classed as capitalization is small compared with the funded debt for the country at large, yet it is a considerable factor in the case of Massachusetts and results in a lower capitalization per mile of track for that state than is actually the case. As has already been pointed out, however, it is impossible to segregate the floating debt that represents money borrowed for purposes of construction or equipment, and therefore this form of capitalization has been excluded from the calculations, although where the amount of floating debt was large this fact is noted for each company in Table 183.

Again, in cases where money employed for purposes of construction or equipment or for investment in the securities of other railway companies or nonrailway enterprises was obtained from proceeds of debt carried in the form of "floating debt," the deduction of such investments from the capitalization gives misleading results and a net capitalization per mile of track below the true figure. Manifestly in such cases all securities representative of money invested, whether in the form of capital stock, funded debt, or floating debt, should be included, if it be possible, to determine the capitalization per mile of track.

Another phase of the problem is illustrated by an operating company affiliated with another operating company, the former carrying a floating debt to the amount of several millions, a minor portion of which is represented by permanent investments in nonrailway properties, while the greater part has been loaned to the affiliated corporation. This latter corporation has employed the several millions of money loaned to it for construction and equipment, and its own capitalization falls short of representing the true capitalization per mile of track unless it includes the large amount carried as floating debt. Hence a proper presentation of the capitalization chargeable to trackage requires the exclusion of the floating debt in the case of the former company and the inclusion of it in the case of the latter company. The conditions vary so greatly that no one

plan of presentation of the capitalization per mile of track will fit all cases.

In the case of a company operating leased trackage there are often heavy investments in betterments and additions to the leased property, which investments are covered by the capitalization of the lessee company, with the result that this company shows an excessive capitalization per mile of trackage owned, and the company owning the leased road shows a capitalization per mile of owned track which is too low, as it does not embrace the betterments and additions made by the lessee and operating company. When the statistics of capitalization and of owned trackage of the lessee and lessor roads are considered in connection with each other, however, the disjoined factors are brought together and figures are obtained showing the total capitalization chargeable to the aggregate of the owned trackage reported for both companies. In all cases the capitalization shown for operating and lessor companies in Table 183 has been figured on the combined totals for such companies.

A comparison of the capitalization per mile of track for individual companies in the two census years 1907 and 1902 is misleading unless all the conditions affecting the calculations are known. Likewise, the average capitalization reported both for individual companies and for separate states at the present census must be considered with due allowance for all the elements affecting the comparability of the statistics. The range of the average is nevertheless interesting. The highest capitalization per mile of track in 1907 (\$1,833,333) was reported by the General Electric Railway Company, of Illinois, and the lowest (\$1,725) by the Fryeburg Horse Railroad Company, of Maine. In 1902 the two extremes were represented by the Union Consolidated Elevated Railway Company (lessor), of Illinois (\$3,702,632), and the Red Lion and Windsor Street Railway Company, of Pennsylvania (\$400). Among the different states, exclusive of the District of Columbia, Louisiana had the highest capitalization per mile of track in 1907, \$198,631, and South Dakota the smallest, \$17,000, compared with averages in 1902 of \$177,532 for New York and \$11,050 for Arizona.

While the range in the averages for individual companies and states is very great, the average for the different geographic divisions conforms more closely to that for the United States.

Net capitalization per mile of track, by geographic divisions: 1907 and 1902.

DIVISION.	1907	1902	Per cent of increase.
United States.....	\$100,495	\$96,287	4.4
North Atlantic.....	109,578	105,050	4.3
South Atlantic.....	112,013	114,289	12.0
North Central.....	96,292	89,808	0.5
South Central.....	96,649	69,343	39.4
Western.....	97,075	76,612	27.9

¹ Decrease.

STREET AND ELECTRIC RAILWAYS.

It will be noted that the increases, 1902 to 1907, have tended toward uniformity in the averages. Also that the decrease in the average for the South Atlantic division has brought it more in harmony with the averages for the other divisions in 1907. The decrease in the average for the South Atlantic states was probably due largely to a more careful segregation of railway and nonrailway property in the balance sheets of several large companies for 1907 than 1902.

Capitalization per mile of track of street and electric railways and steam railroads.—Comparisons between the capitalization per mile of track for street and electric railways and for steam roads can be made only with considerable reservation. In order to make such comparisons it is necessary to reduce the figures to a common basis. The Interstate Commerce Commission

computes the relation of capitalization to trackage on a basis of line mileage, that is, the length of the road, while the statistics for street and electric railways are based on the total track mileage, including double tracks and sidings. In preparing the comparative figures for the two industries shown in the following table it was not possible to exclude all the duplication due to the miles of track operated under trackage rights by steam railroads. Hence the resulting estimates for the capitalization per mile of track for the steam railroads are lower than they would be if the basis was the same as that employed for street and electric railways. With this understanding Table 82 is presented, to show the comparative statistics for street and electric railways and steam railroads in 1907 and 1902.

TABLE 82.—CAPITALIZATION STATISTICS OF STREET AND ELECTRIC RAILWAYS AND STEAM RAILROADS: 1907 AND 1902.

	STREET AND ELECTRIC RAILWAYS.		STEAM RAILROADS.		PER CENT OF INCREASE.	
	1907	1902	1907	1902	Street and electric railways.	Steam railroads.
Miles of track ¹	38,838.54	22,380.04	315,890.06	208,808.25	51.1	17.5
Total capitalization.....	\$3,774,772,090	\$2,308,282,099	\$16,082,140,683	\$12,134,182,964	63.5	32.5
Total capitalization per mile of track.....	111,569	103,099	50,909	45,141	8.2	12.8
Investments in securities and nonrailway property.....	374,064,197	162,613,997	3,625,045,854	2,578,158,083	145.7	36.8
Net capitalization.....	3,400,197,899	2,155,768,102	12,556,200,829	9,556,024,281	57.7	31.4
Net capitalization per mile of track.....	100,495	96,287	39,747	35,550	4.4	11.8

¹ Exclusive of trackage for which no capitalization was reported.

The table shows that though, in general, the relative increase in miles of track and total capitalization has been proportionately greatest for the street and electric railways, the rate of increase in capitalization per mile of track has been greatest for the steam roads.

The investments of street and electric railway companies in the securities of other railway companies and in nonrailway properties were equivalent to 9.9 per cent of the total capitalization in 1907 as compared with 6.6 per cent in 1902, a relatively large increase, while in the case of the steam railroads the corresponding percentage has remained approximately constant, such investments being equivalent to 21.9 per cent of the total capitalization in 1907 compared with 21.2 per cent in 1902.

The ratio between the capitalization per mile of track of steam railroads on the one hand, and of street and electric railways on the other, was very nearly the same for the two census years—being 1 to 2.19 in 1907 compared with 1 to 2.28 in 1902; while the corresponding ratio for net capitalization per mile of track was 1 to 2.53 for 1907 compared with 1 to 2.71 in 1902.

Capitalization statistics of companies, classified according to income from railway operations.—The conditions determining the relative amount of capitalization per mile of track, and its character in the case of large

companies, differ in many important respects from those affecting the capitalization of smaller systems. This is shown in a measure by the statistics contained in Table 83, which presents statistics in reference to the capitalization of companies, classified according to income from railway operations.

In considering the capitalization of street and electric railway companies when classified according to the magnitude of their operations, the chief interest centers about the relation between capitalization and physical equipment, so far as the latter can be measured or gauged on the basis of miles of track owned. If the conditions under which large and small companies operate were substantially the same, then the relation of capitalization to trackage would be practically the same for all classes. A study of the statistics shows that along with the increase in magnitude of operations there is, in general, an increase in the amount of capitalization, whether in the form of stock or bonds, in proportion to the trackage. The amount of both stock and bonds outstanding per mile of track reported for companies in Class A is above the average shown for the United States at both censuses, while the corresponding amounts shown for all of the other groups are below the United States averages.

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TABLE 83.—CAPITALIZATION STATISTICS OF OPERATING AND LESSOR COMPANIES COMBINED, CLASSIFIED ACCORDING TO INCOME FROM RAILWAY OPERATIONS: 1907 AND 1902.

	Census.	Total, all companies.	CLASSIFICATION GROUP.					Per cent of total.				
			\$1,000,000 and over.	\$500,000 but less than \$1,000,000.	\$250,000 but less than \$500,000.	\$100,000 but less than \$250,000.	Less than \$100,000.	A	B	C	D	E
			(A)	(B)	(C)	(D)	(E)					
Number of operating and lessor companies.....	1907 1902	1,230 980	240 132	99 49	115 84	209 131	567 584	19.5 13.5	8.0 5.0	9.3 8.0	17.0 13.4	46.1 59.6
Per cent of increase.....		25.5	81.8	102.0	36.9	59.5	2.9					
Miles of track ¹	1907 1902	33,833.54 22,389.04	15,846.60 8,386.01	4,382.20 2,127.29	3,954.58 2,749.94	4,774.10 3,421.58	5,376.06 5,703.32	45.4 37.5	13.0 9.5	11.7 12.3	14.1 15.3	15.9 25.5
Per cent of increase.....		51.1	83.0	106.0	43.8	39.5	5.7					
Capital stock outstanding, par value..	1907 1902	\$2,097,708,856 \$1,315,572,960	\$1,359,504,140 \$72,003,911	\$212,490,538 \$100,041,796	\$141,291,744 \$103,314,282	\$218,256,654 \$121,167,320	\$169,105,780 \$117,545,651	64.7 66.3	10.1 7.7	6.7 7.9	10.4 9.2	8.1 8.9
Per cent of increase.....		59.5	55.5	110.5	36.8	80.1	43.9					
Common, par value.....	1907 1902	\$1,776,920,076 \$1,187,042,781	\$1,134,409,840 \$780,733,905	\$175,034,538 \$90,532,041	\$121,036,544 \$93,079,745	\$187,110,499 \$109,717,420	\$158,722,055 \$112,979,070	63.8 65.7	9.9 7.0	6.8 7.9	10.5 9.2	8.9 9.5
Per cent of increase.....		49.6	45.3	94.0	29.2	70.5	40.5					
Dividends, amount.....	1907 1902	\$44,960,796 \$28,737,887	\$40,336,194 \$25,335,338	\$2,080,553 \$1,347,657	\$1,363,606 \$878,202	\$751,810 \$712,131	\$428,033 \$404,509	80.7 88.2	4.6 4.7	3.0 3.1	1.7 2.5	1.0 1.6
Percent of increase.....		56.5	59.2	54.4	55.3	5.6	7.7					
Preferred, par value.....	1907 1902	\$320,788,780 \$127,930,179	\$222,154,300 \$91,870,000	\$36,856,000 \$10,409,155	\$20,255,200 \$9,634,537	\$31,140,155 \$11,449,900	\$10,383,125 \$4,500,581	69.3 71.8	11.5 8.1	6.3 7.5	9.7 9.0	3.2 3.6
Per cent of increase.....		150.8	141.8	254.1	110.2	172.0	127.4					
Dividends, amount.....	1907 1902	\$9,524,478 \$4,301,284	\$7,599,325 \$3,555,493	\$754,440 \$373,224	\$421,524 \$148,042	\$304,840 \$156,425	\$111,349 \$3,100	79.8 82.7	7.9 8.8	4.5 3.4	6.7 3.0	1.2 1.5
Percent of increase.....		121.4	113.7	99.5	186.8	305.8	76.5					
Capital stock per mile of track....	1907 1902	\$62,001 \$58,760	\$88,395 \$104,044	\$43,489 \$47,451	\$35,729 \$37,570	\$45,717 \$35,413	\$31,455 \$20,610					
Per cent of increase.....		5.5	15.0	2.2	4.9	29.1	52.0					
Funded debt outstanding, amount....	1907 1902	\$1,677,063,240 \$992,700,139	\$1,087,249,675 \$620,792,432	\$186,257,100 \$86,441,650	\$132,042,400 \$87,358,513	\$157,509,150 \$100,547,500	\$114,004,915 \$97,509,044	64.8 62.5	11.1 8.7	7.9 8.8	9.4 10.1	6.8 9.8
Per cent of increase.....		68.9	75.1	116.5	51.2	56.7	16.8					
Interest on funded debt, amount.....	1907 1902	\$71,408,788 \$43,578,001	\$46,109,706 \$28,599,148	\$5,025,092 \$4,083,458	\$6,148,904 \$3,808,352	\$8,737,774 \$3,772,851	\$4,440,712 \$3,545,152	64.5 65.6	11.2 9.4	8.0 8.3	9.4 8.7	6.2 8.1
Per cent of increase.....		64.0	61.4	96.5	70.4	78.6	25.4					
Funded debt per mile of track....	1907 1902	\$49,568 \$44,339	\$70,846 \$74,019	\$42,503 \$40,035	\$33,390 \$31,707	\$32,992 \$29,336	\$21,206 \$17,107					
Per cent of increase.....		11.8	4.3	4.6	5.1	12.3	24.0					
Total capitalization, outstanding....	1907 1902	\$3,774,772,096 \$2,308,282,099	\$2,443,813,815 \$1,493,396,343	\$398,747,038 \$187,383,446	\$273,334,144 \$190,672,705	\$375,765,804 \$221,714,820	\$283,110,695 \$215,114,695	64.7 64.7	10.6 8.1	7.2 8.3	10.0 9.6	7.5 9.3
Per cent of increase.....		63.5	63.6	112.8	43.4	69.5	31.6					
Total capitalization per mile of track.....	1907 1902	\$111,569 \$103,090	\$159,241 \$178,063	\$90,993 \$88,086	\$69,118 \$60,337	\$78,709 \$64,799	\$52,661 \$37,717					
Per cent of increase.....		8.2	10.6	3.3	0.8	21.5	39.6					
Investments in securities and non-railway property, amount.....	1907 1902	\$374,004,197 \$152,613,997	\$212,395,041 \$128,387,767	\$57,591,742 \$7,289,960	\$14,592,648 \$5,723,972	\$57,263,915 \$4,406,924	\$32,820,851 \$6,708,334	56.7 84.2	15.4 4.8	3.9 3.8	15.3 2.9	8.8 4.4
Per cent of increase.....		145.7	65.4	600.3	164.9	389.3	1.4					
Net capitalization.....	1907 1902	\$3,400,107,899 \$2,155,708,102	\$2,231,418,774 \$1,365,008,536	\$341,155,890 \$180,099,486	\$258,741,496 \$184,948,323	\$318,501,830 \$217,307,896	\$250,289,844 \$208,406,311	65.6 63.3	10.0 8.4	7.0 8.6	9.4 10.1	7.4 9.7
Per cent of increase.....		57.7	63.5	89.4	39.9	46.6	20.1					
Not capitalization per mile of track.....	1907 1902	\$100,495 \$96,287	\$145,402 \$102,755	\$77,850 \$34,000	\$65,428 \$67,250	\$66,715 \$63,511	\$46,556 \$36,541					
Per cent of increase.....		4.4	10.7	8.0	2.7	5.0	27.4					

¹ Exclusive of 6 companies which failed to report capitalization.
² Exclusive of 7 companies which failed to report capitalization.
³ Decrease.
⁴ Exclusive of track for which no capitalization was reported: 1907—570.02 miles (includes 292.95 miles for 6 companies which failed to report capitalization and 277.07 miles leased from steam railroads, bridge companies, etc.), distributed as follows: 217.74 miles in Class A, 4.04 miles in Class B, 55.18 miles in Class C, 205.53 miles in Class D, 87.43 miles in Class E; 1902—187.95 miles (includes 134.98 miles for 7 companies which failed to report capitalization and 52.97 miles leased from steam railroads, bridge companies, etc.), distributed as follows: 27.40 miles in Class A, 32.65 miles in Class C, 57.39 miles in Class D, 70.51 miles in Class E.

It should be remembered that Class A includes the companies operating in urban districts of highest density. The percentage of increase from 1902 to 1907 in capital stock reported by companies in Class A is not so large as the percentage of increase in trackage, nor is the percentage of increase in funded debt equal to that in trackage, though it is greater than the percentage of increase in capital stock. It will be noted, however, that, although both the total and net capitalization per mile of track, as well as the amount of stock and

funded debt, respectively, outstanding per mile, has decreased so far as the companies in Class A are concerned, increases are shown in all these respects for the companies belonging to Classes D and E, while for those belonging to the intermediate Classes B and C, increases are shown in some of the respects indicated and losses in others. The amount of investments in securities of other companies and in nonrailway properties, the increase in which has been particularly heavy for the companies belonging to Classes B and D,

are, however, a disturbing factor, as such investments affect the amount of both stock and funded debt reported, and have no necessary relation to the operated property. For this reason the net capitalization per mile of track is the only proper basis for comparison. There is apparently a tendency toward a relative decrease in the net capitalization per mile of track in the case of the larger companies becoming progressively stronger in proportion to the increase in magnitude of operations. Thus the net capitalization per mile of track of the companies belonging to Class E increased \$10,015, or 27.4 per cent; those belonging to Class D show a lesser amount of increase, viz, \$3,204, or 5 per cent; those in Class C show an actual decrease of \$1,828, or 2.7 per cent; those in Class B a still larger decrease, viz, \$6,810, or 8 per cent; while those in Class A show a decrease of \$17,353, or 10.7 per cent.

All groups show an increase in the amount of dividends paid, both in the aggregate and on common and preferred stock, respectively, except that the companies belonging to Class E show a decrease in the amount of dividends paid on common stock. In a general way, the larger companies show larger amounts proportionally disbursed as dividends than do the smaller companies. Although the capital stock reported for each class includes stock upon which dividends were not paid, yet the average rate of dividends as based upon the total stock outstanding can be taken as showing the general trend. For all companies the sum paid in dividends represented an average rate of 2.60 per cent on the total outstanding stock in 1907 and 2.51 per cent in 1902. While the amount disbursed as dividends in 1907 by the companies belonging to Class A represented an average rate of 3.53 per cent upon the total capital stock outstanding as compared with 3.31 per cent in 1902, the other classes with but one exception, Class C (0.99 in 1902 and 1.27 in 1907), show decreases in the

average rate. The amount paid out in dividends by the companies belonging to Class B represented an average rate of 1.33 per cent on their total capital stock in 1907 as against an average of 1.71 per cent in 1902; Class E, an average rate of 0.32 per cent in 1907 compared with 0.45 per cent in 1902, a decrease in each case; while for Class D the average rate in 1907 was 0.64 per cent compared with 0.72 per cent in 1902, also a proportional decrease.

Capitalization statistics of companies, classified according to kind of system and character of service.—The construction of an elevated or subway system necessarily requires a greater investment per mile than is required for a surface line. There were no companies that operated subway trackage exclusively in 1907 and only 2 companies—in Chicago, Ill.—that operated exclusively over elevated trackage. The Manhattan Railway of New York City is an elevated road exclusively, but is leased to and operated by the same company that operates the subway, and was covered in the census returns by a combined report made for both the elevated and subway. There were in all 15 companies that operated either elevated and subway, elevated and surface, subway and surface, or elevated, subway, and surface trackage; but some of these companies operated only a small portion of elevated or subway and tunnel trackage in connection with their surface trackage. In fact, there were only 6 operating companies, with their 3 lessor companies, which could be considered as mainly elevated and subway systems.¹ These companies make up the group included under the head of "Electric elevated and subway railways" in the following table, which gives statistics as to capitalization for all companies, classified according to the kind of system and character of service.

¹ See also p. 22.

TABLE 84.—CAPITALIZATION STATISTICS OF OPERATING AND LESSOR COMPANIES COMBINED, CLASSIFIED ACCORDING TO KIND OF SYSTEM AND CHARACTER OF SERVICE: 1907.

	Total, all companies.	CLASSIFICATION GROUP.				
		Kind of system.		Character of service.		
		Electric elevated and subway railways. ¹	Electric surface railways. ²	Selected inter-urban lines.	Selected small urban roads.	All other railways.
Number of operating and lessor companies.....	\$1,230	9	1,221	90	100	1,040
Miles of track.....	439,833.54	416.80	33,410.74	5,453.29	500.69	27,816.56
Capital stock outstanding, par value.....	\$2,097,708,856	\$160,745,600	\$1,030,003,350	\$247,322,080	\$8,033,000	\$1,841,763,080
Common, par value.....	\$1,770,920,070	\$142,037,000	\$1,034,882,470	\$186,253,200	\$8,448,000	\$1,583,218,780
Dividends, amount.....	\$44,900,796	\$7,078,952	\$37,281,844	\$800,726	\$29,053	\$44,031,417
Preferred, par value.....	\$320,788,780	\$18,707,900	\$302,080,880	\$02,008,880	\$186,000	\$268,634,900
Dividends, amount.....	\$9,624,478	\$446,928	\$9,078,550	\$954,668	\$1,750	\$8,568,000
Capital stock per mile of track.....	\$62,001	\$385,066	\$87,064	\$45,353	\$16,397	\$80,204
Funded debt outstanding, amount.....	\$1,077,003,240	\$133,787,000	\$1,543,276,240	\$107,597,000	\$7,000,400	\$1,472,459,840
Interest on funded debt, amount.....	\$71,408,788	\$5,265,452	\$66,213,336	\$8,470,239	\$253,378	\$62,730,171
Funded debt per mile of track.....	\$49,698	\$320,986	\$46,183	\$30,234	\$12,498	\$52,920
Total capitalization outstanding.....	\$3,774,772,096	\$204,632,500	\$3,480,230,500	\$444,919,080	\$15,030,490	\$3,314,213,520
Total capitalization per mile of track.....	\$111,609	\$706,652	\$104,147	\$81,587	\$27,893	\$110,132
Investments in securities and nonrailway property, amount.....	\$374,004,197	\$27,018,732	\$340,746,465	\$41,003,440	\$324,072	\$332,040,079
Net capitalization.....	\$3,400,767,899	\$200,613,768	\$3,139,484,131	\$403,225,634	\$15,314,318	\$2,982,167,447
Net capitalization per mile of track.....	\$100,495	\$630,068	\$93,770	\$73,942	\$27,314	\$107,175

¹ Exclusive of the mixed elevated, subway, and surface systems in Boston, Mass., and Philadelphia, Pa.

² Includes the statistics for the few railways not operated by electricity.

³ Exclusive of 6 companies which failed to report capitalization.

⁴ Exclusive of 570.02 miles of track for which no capitalization was reported (includes 202.95 miles for 6 companies which failed to report capitalization and 277.07 miles leased from steam railroads, bridge companies, etc.), distributed as follows: 3.60 miles electric elevated and subway railways, 566.42 miles electric surface railways, 113.82 miles selected interurban lines, and 469.20 miles all other railways.

The long interurban and the short urban lines represent, in some respects, the two extremes of capitalization. The selection of the roads to be included in the two groups—selected interurban lines and selected small urban roads—however, was not made with the intention of including in the interurban group those roads that had the largest aggregate capital or the largest investment per mile of track, nor in the group of small roads those that showed the other extreme. There are roads not included in either of these groups which show a wider divergence in this respect. As explained on page 22, the selection was made with the object of including in each group a sufficient number of roads to be representative of the class, irrespective of their capitalization. The group of electric elevated and subway railways, representing as it does the most expensive track construction of any class of street or electric railways, has both a total and a net capitalization per mile of track nearly seven times larger than that reported for the remaining electric surface railways. Although the trackage of this group of electric elevated and subway roads constituted but 1.2 per cent of the total for all roads, its total capitalization formed 7.8 per cent of the total. The investments of the companies belonging to this group in securities and nonrailway property were equivalent to 9.5 per cent of their total capitalization compared with 10 per cent for the electric surface railways.

A similar review of the companies classified by character of service shows that the capitalization per mile of track for the selected interurban lines is somewhat less than that for all other railways, though nearly three times that for the small urban roads. This is due to the fact that the large urban systems, including the elevated and subway lines, fall under this classification into the "All other railways" group.

The investments of the small urban roads in securities and nonrailway property were equivalent to only 2.1 per cent of their total capitalization compared with 10 per cent for the group of "All other railways."

The average rate of dividends in 1907 for the several groups of companies is shown in the following tabular statement:

CLASSIFICATION GROUP.	AVERAGE RATE OF DIVIDENDS PAID ON—		
	Total stock.	Common stock.	Preferred stock.
Kind of system:			
Electric elevated and subway railways.....	5.05	5.41	2.38
Electric surface railways.....	2.30	2.28	3.01
Character of service:			
Selected interurban lines.....	0.75	0.49	1.54
Selected small urban roads.....	0.36	0.35	0.95
All other railways.....	2.86	2.78	3.31

It should be remembered that the capital stock of each group includes the nondividend-paying stocks as well as those on which dividends were paid, and

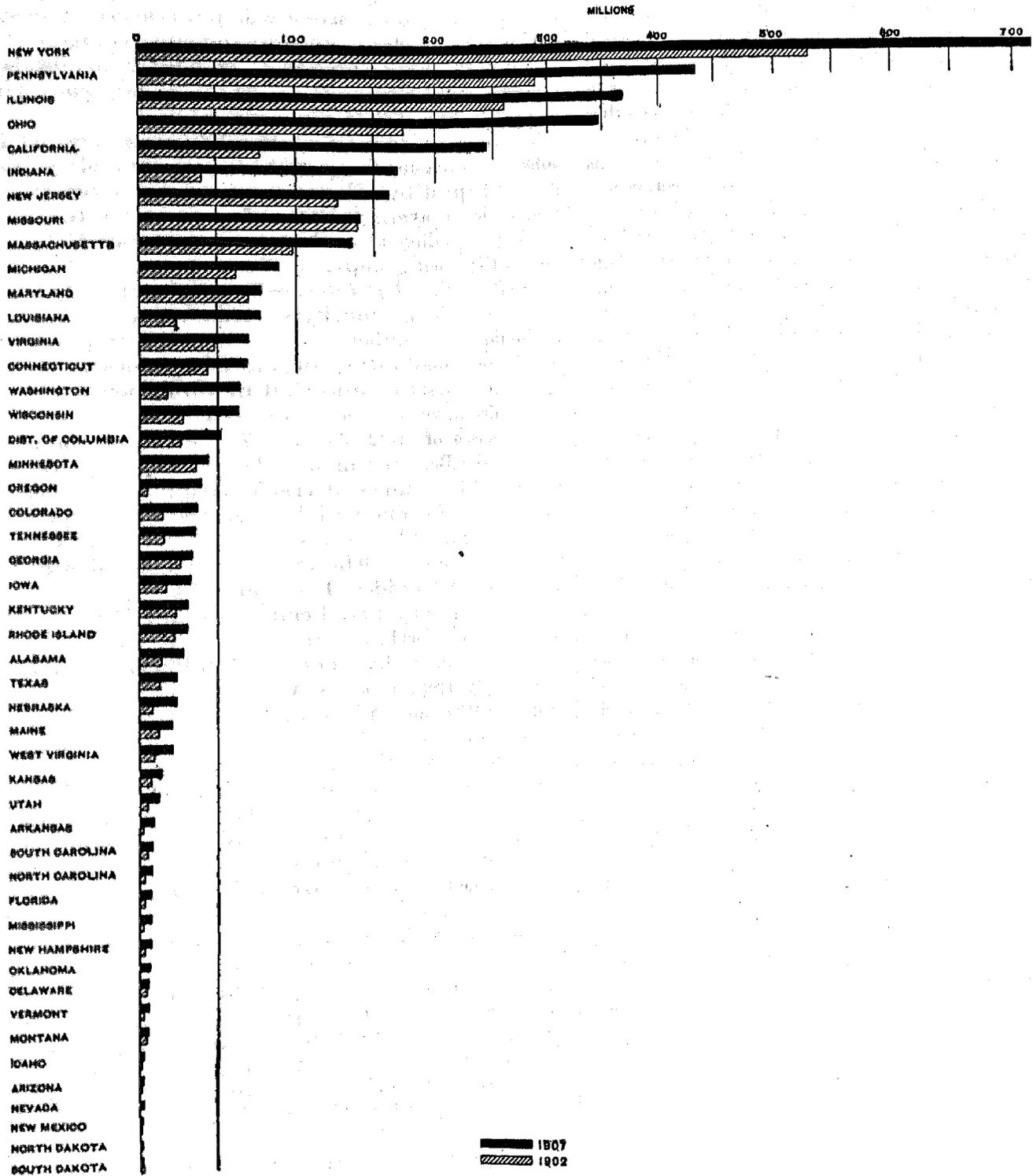
hence these percentages fail to indicate the average rate of return on the stocks which actually paid dividends. For example, in the small group of "Electric elevated and subway railways" the \$7,678,952 paid in dividends on common stock was paid on stock amounting to \$105,323,500, representing an average rate of 7.29 per cent, while the \$445,928 paid in dividends on preferred stock was paid on \$13,707,900, which gives an average rate of 3.25 per cent.

The total dividends disbursed by the elevated and subway companies formed 14.9 per cent of the total dividends paid by all companies, and represented a much higher average rate of return on their total stock outstanding than for the companies comprising any of the other groups.

Capitalization, by states.—In considering the statistics as to capitalization by states as given in Table 85, it should be remembered that the totals represent the aggregate capitalization of the companies credited to the respective states, and that in a number of instances companies have been accredited to different states at the censuses of 1902 and 1907. Thus at the census of 1902 the Bennington and Hoosick Valley Railway, which had 16.52 miles of track with a total capitalization of \$382,000, and which operated between Hoosick Falls, N. Y., and Bennington, Vt., was credited to New York state, although the track mileage was about equally divided between the 2 states. By 1907 the company had been reorganized as the Bennington and North Adams Street Railway, and the track in Vermont had been extended, so that it was accordingly treated as a Vermont concern. Several states now require all companies doing an interstate business to incorporate within the state (usually with only a nominal capitalization), although the property may be largely in another state and the original company may have been created elsewhere. For this reason it was impossible longer to assign companies to the states in which incorporated, and they were therefore assigned to the states in which the principal property or operating office is located.

The relationship existing between operating and lessor companies also affects the capitalization statistics when it is attempted to make comparisons for the same state for different periods. For example, in 1902 the Exeter, Hampton and Amesbury Street Railway Company was operating under lease a group of properties which were located in New Hampshire and Massachusetts, and as the statistics for lessor companies are shown in the census reports under the state of the operating company, the aggregate capitalization, both of the operating and the lessor companies, was credited to New Hampshire. In 1907 the properties which had formerly been operated under lease by the New Hampshire company were operating as separate units and assigned some to New Hampshire and some to Massachusetts.

DIAGRAM 4.—CAPITALIZATION OUTSTANDING, OF OPERATING AND LESSOR COMPANIES COMBINED, BY STATES AND TERRITORIES: 1907 AND 1902.



The companies credited to New York in 1907 reported the largest aggregate outstanding capitalization (\$714,494,687), those in Pennsylvania the second largest (\$433,004,263), and the railways in Illinois the third largest (\$367,533,800). These 3 states also led in 1902 with a capitalization of \$529,135,045, \$287,292,195, and \$260,085,683, respectively. South Dakota returned the smallest capitalization in 1907, \$85,000; and New Mexico the smallest in 1902, \$25,000.

As was the case in respect to the traffic reported, the states of the North Atlantic division had the largest proportion of the total capitalization at both censuses,

reporting a capitalization of \$1,122,542,269 for 1902 and \$1,576,798,676 for 1907, or 48.6 and 41.8 per cent, respectively, of the totals for the United States. The Western division made the largest gain of any geographic division in its percentage of the total, from 5.5 in 1902 to 10.8 in 1907, while the North and South Atlantic divisions showed a decrease in 1907.

Statistics showing, for each state and geographic division, the amount of capital stock and funded debt authorized and outstanding, the amount of dividends and interest paid, and the capitalization per mile of track for 1907 and 1902 are presented in Table 85.

TABLE 85.—TRACK, CAPITAL STOCK, FUNDED DEBT, AND CAPITALIZATION PER MILE OF TRACK, FOR OPERATING

STATE OR TERRITORY.	Census.	Miles of track.	CAPITAL STOCK.				
			Total par value.		Common.		
			Authorized.	Outstanding.	Par value.		Dividends.
					Authorized.	Outstanding.	
United States.....	1907	84,408.56	\$2,508,054,330	\$2,097,708,850	\$2,098,885,736	\$1,776,920,070	\$44,980,796
	1902	22,576.09	1,520,190,589	1,316,572,960	1,355,020,066	1,187,042,781	28,737,887
North Atlantic division.....	1907	13,713.37	1,015,023,590	888,781,612	927,733,460	800,462,512	31,353,126
	1902	10,164.80	736,062,055	666,204,204	698,076,455	628,521,037	18,214,075
Maine.....	1907	424.06	11,300,000	10,044,713	10,325,000	0,000,718	184,044
	1902	381.55	6,444,300	5,053,055	6,444,300	5,053,055	67,820
New Hampshire.....	1907	247.10	4,522,200	4,518,700	4,452,200	4,448,700	74,170
	1902	167.05	2,403,200	2,333,200	2,353,200	2,283,200	8,250
Vermont.....	1907	124.31	3,000,000	3,370,000	3,000,000	3,370,000	18,000
	1902	80.55	1,885,000	1,835,100	1,870,000	1,820,100	8,000
Massachusetts.....	1907	2,880.85	83,013,350	74,460,175	76,013,350	68,000,175	3,277,689
	1902	2,525.05	70,115,000	59,378,002	63,715,000	52,978,002	2,070,455
Rhode Island.....	1907	410.92	24,555,400	24,555,400	24,355,400	24,355,400	850,000
	1902	328.90	16,475,000	16,375,000	16,475,000	16,375,000	700,000
Connecticut.....	1907	781.15	21,707,100	20,371,900	12,544,200	11,500,200	121,257
	1902	578.49	31,032,000	25,211,040	27,832,000	21,100,500	275,062
New York.....	1907	3,884.74	454,380,000	378,047,540	422,255,000	350,482,040	16,317,307
	1902	2,800.01	300,451,805	276,205,072	294,396,805	270,374,935	6,826,754
New Jersey.....	1907	1,324.12	82,020,000	74,211,380	81,520,900	73,176,280	910,398
	1902	861.28	60,645,250	68,173,440	68,220,250	67,178,440	425,140
Pennsylvania.....	1907	3,621.12	320,305,520	298,301,795	201,758,320	204,153,905	9,509,361
	1902	2,480.01	235,711,100	211,728,495	211,708,900	191,201,115	7,173,485
South Atlantic division.....	1907	2,300.73	108,063,152	127,306,240	132,088,152	106,519,554	1,555,021
	1902	1,070.15	116,257,300	81,422,171	92,682,300	72,885,000	681,240
Delaware.....	1907	65.03	2,002,000	2,001,005	2,732,000	2,732,000	72,200
	1902	55.01	2,270,000	2,204,000	2,270,000	2,204,000	9,331
Maryland and District of Columbia.....	1907	712.21	72,248,500	48,460,050	49,748,500	39,014,050	725,000
	1902	593.81	67,559,000	33,570,556	43,550,000	33,506,250	607,247
Virginia.....	1907	515.54	46,010,210	33,671,860	30,685,210	27,746,860	101,750
	1902	359.30	30,359,000	21,812,000	24,634,000	17,087,000	270
West Virginia.....	1907	205.41	12,578,333	10,924,075	12,578,333	10,924,075	26,400
	1902	140.00	4,924,500	4,273,000	4,924,500	4,273,000	22,000
North Carolina.....	1907	100.04	5,851,000	4,409,800	4,551,000	3,353,100	17,500
	1902	46.32	3,275,000	1,996,625	2,825,000	1,657,000	-----
South Carolina.....	1907	131.26	4,295,000	3,984,200	3,095,000	3,384,200	-----
	1902	76.08	2,801,400	2,689,400	2,701,400	2,489,400	720
Georgia.....	1907	354.18	18,117,100	18,110,400	14,367,100	14,360,400	443,771
	1902	300.38	13,020,000	12,057,000	9,920,000	9,857,000	952
Florida.....	1907	118.26	5,761,000	4,834,800	4,731,000	4,164,800	168,400
	1902	61.75	1,940,400	1,940,400	1,749,400	1,749,400	40,720
North Central division.....	1907	12,850.53	878,710,840	720,580,300	705,784,840	591,550,705	9,228,068
	1902	7,815.32	538,157,783	444,747,219	444,214,450	376,900,478	8,549,736
Ohio.....	1907	3,767.10	260,828,500	230,845,875	212,088,500	190,033,050	3,114,766
	1902	2,353.43	120,507,200	108,803,650	110,657,200	99,643,650	2,289,554
Indiana.....	1907	1,032.03	131,790,500	64,223,070	105,740,500	75,830,200	457,160
	1902	646.60	10,474,710	10,635,028	17,361,377	15,245,887	-----
Illinois.....	1907	2,776.40	241,984,800	200,154,400	191,234,800	170,358,550	2,516,701
	1902	1,035.20	205,518,173	160,527,410	169,518,173	134,810,316	4,484,722
Michigan.....	1907	1,275.03	40,780,000	38,607,400	35,715,000	34,388,400	560,750
	1902	1,022.81	30,120,000	29,033,100	26,875,000	26,588,100	510,500
Wisconsin.....	1907	500.65	41,597,000	20,804,400	36,997,000	25,264,400	795,854
	1902	410.50	23,344,000	15,178,600	18,710,000	10,553,700	30,563
Minnesota.....	1907	457.15	27,050,000	23,005,000	24,050,000	20,905,000	1,005,000
	1902	338.17	25,300,000	23,280,000	20,800,000	18,780,000	600,400
Iowa.....	1907	630.84	27,740,000	20,603,040	23,660,000	18,061,846	204,500
	1902	378.25	11,039,700	10,541,200	10,080,700	9,591,200	107,660
Missouri.....	1907	921.67	68,305,540	59,434,040	45,415,549	40,448,740	291,840
	1902	753.38	60,502,000	68,334,100	68,692,000	50,354,400	313,337
North Dakota and South Dakota.....	1907	21.09	885,000	460,080	785,000	460,080	-----
	1902	2.00	100,000	100,000	100,000	100,000	-----
Nebraska.....	1907	218.73	23,667,500	13,864,585	16,467,500	7,664,685	223,037
	1902	113.06	6,135,000	6,012,125	5,435,000	5,312,225	206,000
Kansas.....	1907	240.88	14,013,000	8,525,785	13,613,000	8,125,785	52,460
	1902	150.26	6,027,000	5,912,000	6,027,000	5,912,000	4,000

The net capitalization per mile of track is based upon the total miles of track, less track for which no capitalization was reported, and total outstanding capitalization, less permanent or other investments, if any.

CAPITALIZATION.

AND LESSOR COMPANIES COMBINED, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902.

CAPITAL STOCK—continued.			FUNDED DEBT.			Total capitalization outstanding.	Net capitalization per mile of track. ¹	
Preferred.			Amount authorized.	Amount outstanding.	Amount of interest.			
Par value.		Dividends.						
Authorized.	Outstanding.							
\$400,168,000 173,279,533	\$320,788,780 127,980,179	\$0,524,478 4,301,284	\$2,322,720,837 1,841,429,727	\$1,677,063,240 992,709,139	\$71,468,788 43,578,961	\$3,774,772,096 2,308,282,099	\$100,495 96,287	1 2
87,890,100 41,987,200	79,319,100 37,778,187	3,079,432 1,566,765	901,693,954 659,101,523	688,017,064 450,248,066	28,102,513 20,553,730	1,570,708,070 1,122,542,299	109,578 105,060	3 4
1,035,000	1,035,000	1,750	15,813,000 7,213,000	11,039,000 6,155,000	407,021 270,860	21,083,713 11,208,055	49,481 32,116	5 6
70,000 50,000	70,000 50,000		2,580,000 1,590,000	2,580,000 1,550,000	80,515 70,675	7,107,700 3,880,200	28,704 23,108	7 8
15,000	15,000	750	3,375,000 1,450,000	2,548,667 931,600	102,737 36,721	5,918,667 2,706,700	41,931 34,348	9 10
6,400,000 6,400,000	6,400,000 6,400,000	512,000 512,000	72,257,500 40,823,000	60,270,000 37,966,942	2,646,831 1,753,660	134,730,175 97,345,544	46,533 30,067	11 12
200,000	200,000		11,341,200 9,900,000	7,070,200 6,221,200	287,005 205,360	31,625,600 22,596,200	81,494 75,979	13 14
9,162,900 4,100,000	8,865,700 4,045,050	291,999	49,114,091 24,801,000	47,081,091 17,433,500	737,305 708,608	67,452,991 42,045,140	84,852 74,496	15 16
32,075,000 6,056,000	27,565,500 5,830,737	938,126 54,110	485,712,663 408,114,173	336,447,138 252,929,373	14,231,277 11,436,803	714,494,087 529,135,045	173,096 177,532	17 18
1,400,000 1,425,000	1,035,100 905,000	43,500 22,500	95,928,000 75,072,750	80,260,500 57,490,750	3,965,219 2,630,943	130,471,880 125,664,190	135,439 148,155	19 20
37,547,200 23,942,200	34,147,800 20,437,880	1,292,087 977,395	165,563,500 90,221,600	134,702,468 75,563,700	5,704,603 3,368,082	433,004,263 287,292,195	109,072 103,267	21 22
30,575,000 23,575,000	20,786,695 8,536,271	690,016 66,125	201,871,583 130,700,000	155,785,369 115,091,908	5,530,958 4,200,770	283,091,008 106,514,070	112,013 114,289	23 24
170,000	169,995		3,425,000 2,424,000	3,070,000 2,424,000	67,000 30,000	5,971,995 4,688,990	62,254 54,772	25 26
22,500,000 14,000,000	8,555,000 73,306	425,000	93,827,000 64,030,000	79,319,700 61,639,194	2,700,280 2,606,657	127,788,759 95,218,750	158,812 158,608	27 28
7,225,000 5,725,000	5,925,000 4,725,000	33,125	52,447,000 30,167,000	34,770,800 25,891,314	911,314 467,662	68,442,650 47,703,314	131,231 124,845	29 30
1,000,000 450,000	1,050,700 397,965	5,000	8,101,250 2,825,000	3,887,750 1,880,500	190,615 80,310	8,297,550 3,876,125	64,214 70,250	31 34
600,000 100,000	600,000 100,000		5,700,000 3,650,000	4,760,000 3,336,000	238,050 161,259	8,750,200 5,925,400	56,786 * 76,973	35 36
3,750,000 3,100,000	3,750,000 3,100,000	200,018 33,000	18,903,000 17,700,000	16,789,600 13,081,500	807,568 642,712	34,000,000 26,030,100	88,436 * 86,687	37 38
1,030,000 200,000	730,000 200,000	80,000	4,335,000 2,304,000	2,775,000 1,531,000	112,088 62,220	7,600,860 3,480,400	63,042 56,363	39 40
172,932,000 93,943,333	129,038,685 67,846,741	3,311,495 2,081,804	778,077,300 413,830,204	567,149,700 324,579,043	25,181,533 14,910,213	1,287,739,000 769,326,202	90,292 80,808	41 42
48,740,000 9,850,000	40,812,825 9,250,000	1,030,401 344,000	156,909,000 73,048,500	116,289,000 61,242,000	5,204,063 2,350,093	347,134,875 170,135,650	70,001 71,805	43 44
20,050,000 2,173,333	18,303,710 1,089,141	249,898 33,974	92,974,300 25,502,637	72,063,350 23,142,477	3,151,628 952,219	166,287,320 40,077,505	82,307 * 61,076	45 46
50,750,000 46,000,000	29,705,850 25,708,100	353,928 261,243	254,292,000 134,616,667	167,379,400 99,558,267	7,084,031 4,110,070	367,533,800 260,085,683	115,341 135,507	47 48
5,065,000 3,245,000	4,219,000 2,445,000	120,780 92,500	58,319,000 43,018,000	48,625,000 32,596,800	2,244,763 1,504,111	87,233,300 61,629,900	63,288 58,233	49 50
4,600,000 4,625,000	4,600,000 4,624,900	272,333 270,000	51,887,000 28,281,400	32,208,250 13,058,350	1,292,035 624,205	62,072,650 28,236,950	71,326 66,094	51 52
3,000,000 4,500,000	3,000,000 4,500,000	210,000 270,000	23,684,000 14,768,000	20,912,500 13,226,000	1,050,325 864,422	44,817,500 36,506,000	59,587 107,952	53 54
4,077,000 950,000	2,691,200 950,000	15,000 10,000	25,836,000 6,770,333	12,804,500 6,770,333	660,785 344,830	33,497,546 17,314,533	55,070 45,641	55 56
22,950,000 21,900,000	18,986,200 17,979,700	727,160 769,287	86,455,000 77,840,000	80,836,000 71,474,816	3,798,020 3,087,404	140,270,949 139,808,916	150,217 152,206	57 58
100,000			300,000	300,000	16,000	769,980 100,000	36,500 50,000	59 60
7,200,000 700,000	6,199,900 699,900	294,995 30,800	12,250,000 2,760,000	9,540,000 2,395,000	423,375 119,750	23,404,585 8,407,125	106,266 73,907	61 62
400,000	400,000	28,000	15,171,000 3,375,000	6,190,800 1,115,000	246,608 55,500	14,716,585 7,027,000	56,917 40,700	63 64

¹ Gross capitalization without the deduction of permanent or other investments.

STREET AND ELECTRIC RAILWAYS.

TABLE 85.—TRACK, CAPITAL STOCK, FUNDED DEBT, AND CAPITALIZATION PER MILE OF TRACK, FOR OPERATING

	STATE OR TERRITORY.	Census.	Miles of track.	CAPITAL STOCK.				
				Total par value.		Common.		
				Authorized.	Outstanding.	Par value.		Dividends.
						Authorized.	Outstanding.	
65	South Central division.....	1907	1,905.91	\$130,487,200	\$110,007,530	\$94,877,200	\$85,395,330	\$1,470,584
66		1902	1,322.45	58,367,900	50,336,800	48,007,900	39,085,800	367,698
67	Kentucky.....	1907	389.13	10,970,000	10,047,400	13,070,000	12,767,400	400,738
68		1902	283.95	12,365,000	11,330,900	9,855,000	8,830,000	246,000
69	Tennessee.....	1907	297.50	17,590,000	17,499,100	11,030,000	10,970,200	70,070
70		1902	254.20	13,725,000	8,100,400	13,725,000	8,160,400	
71	Alabama.....	1907	201.06	13,325,000	12,980,900	0,825,000	0,480,900	40,868
72		1902	204.72	7,736,900	7,096,900	0,386,900	0,346,900	
73	Mississippi.....	1907	86.40	0,150,000	3,037,880	5,350,000	3,474,580	
74		1902	25.30	1,075,000	620,600	1,075,000	620,500	
75	Louisiana.....	1907	238.52	47,094,700	40,839,700	20,704,700	20,700,700	454,004
76		1902	198.52	12,569,700	12,484,900	7,400,700	7,384,000	107,198
77	Arkansas.....	1907	87.30	4,890,000	4,846,000	3,300,000	3,345,000	60,228
78		1902	52.40	1,065,300	885,300	1,065,300	885,300	
79	Oklahoma ^a	1907	100.44	5,150,000	4,145,800	5,000,000	3,095,800	150,000
80	Texas.....	1907	414.87	10,308,500	13,371,150	10,808,500	11,001,150	104,170
81		1902	303.27	0,831,000	0,150,900	8,431,000	7,750,900	14,500
82	Western division.....	1907	3,633.02	314,503,575	241,304,075	238,402,075	183,001,075	1,344,007
83		1902	1,004.18	81,303,051	72,778,506	77,030,051	60,340,506	024,238
84	Montana.....	1907	60.24	3,740,275	2,781,275	3,140,275	2,407,275	10,830
85		1902	63.21	2,005,613	2,045,613	2,005,613	2,045,613	
86	Colorado.....	1907	317.37	34,790,000	17,008,500	38,000,000	17,112,300	300,000
87		1902	234.53	8,185,904	7,502,804	7,001,904	7,338,804	181,250
88	Washington.....	1907	704.73	54,000,800	40,454,000	34,890,800	20,518,000	118,367
89		1902	228.93	11,115,000	11,030,400	8,115,000	8,030,400	37,528
90	Oregon.....	1907	253.41	22,028,000	22,428,000	15,391,400	14,801,400	150,000
91		1902	136.07	4,050,000	2,788,550	3,850,000	2,588,550	40,048
92	California.....	1907	2,013.49	178,348,000	147,734,000	130,208,000	114,247,100	740,800
93		1902	820.10	51,392,434	40,022,000	51,392,434	40,022,000	653,412
94	All other Western states and territories ^a	1907	214.78	10,750,000	0,005,000	15,000,000	5,815,000	
95		1902	111.74	4,525,000	3,318,100	4,525,000	3,318,100	3,000

¹The net capitalization per mile of track is based upon the total miles of track, less track for which no capitalization was reported, and total outstanding capitalization, less permanent or other investments, if any.

²Gross capitalization without the deduction of permanent or other investments.

CAPITALIZATION.

AND LESSOR COMPANIES COMBINED, BY STATES AND GEOGRAPHIC DIVISIONS: 1907 AND 1902—Continued.

CAPITAL STOCK—continued.			FUNDED DEBT.			Total capitalization outstanding.	Net capitalization per mile of track. ¹	
Preferred.			Amount authorized.	Amount outstanding.	Amount of interest.			
Par value.		Dividends.						
Authorized.	Outstanding.							
\$35,610,000	\$34,272,200	\$1,211,535	\$136,401,000	\$99,586,117	\$4,732,848	\$219,253,647	\$96,649	65
10,350,000	10,350,000	469,100	57,361,000	43,234,100	2,000,014	93,569,900	69,343	66
3,300,000	3,200,000	126,200	21,380,000	15,726,000	750,646	31,773,400	81,464	67
2,500,000	2,500,000	125,000	14,030,000	12,204,300	591,672	23,535,200	82,885	68
6,560,000	6,528,000	205,000	22,805,000	19,348,000	977,083	36,847,100	122,048	69
3,500,000	3,500,000	210,000	14,240,000	8,686,400	441,222	10,846,800	63,984	70
1,350,000	1,350,000	81,000	16,625,000	15,181,667	692,487	28,162,567	87,457	71
800,000	463,300	81,000	8,594,000	6,678,500	254,653	14,375,400	65,584	72
17,300,000	17,130,000	544,335	4,100,000	3,502,500	178,810	7,440,380	71,406	73
5,100,000	5,100,000	255,000	700,000	644,000	32,175	1,270,500	80,217	74
1,500,000	1,500,000	45,000	46,274,000	29,145,000	1,333,103	75,984,700	108,631	75
150,000	150,000	81,000	10,929,000	10,010,000	470,530	22,404,000	113,813	76
2,500,000	1,710,000	8,100	5,356,000	4,453,000	212,623	9,208,600	90,024	77
1,400,000	1,400,000	8,100	1,438,000	1,058,000	50,850	1,043,300	36,251	78
76,161,500	57,372,100	1,262,000	3,100,000	2,029,000	85,200	6,174,800	50,268	79
3,424,000	3,424,000	117,500	16,761,000	10,200,950	496,896	23,572,100	55,230	80
600,000	374,000	18,700	6,530,000	3,652,000	152,912	13,103,300	43,208	81
1,724,000	886,200	7,124	305,177,000	166,525,000	7,854,936	407,889,075	97,075	82
224,000	224,000	438,176	80,347,000	53,554,023	2,724,225	126,329,689	76,612	83
20,100,000	10,936,900	112,500	2,200,000	1,550,000	77,500	4,331,275	30,705	84
3,000,000	3,000,000	438,176	1,275,000	1,275,000	68,375	3,820,613	52,533	85
7,537,500	7,537,500	375,000	34,975,000	19,450,000	981,523	37,448,500	80,686	86
200,000	200,000	5,000	13,065,000	8,395,500	443,145	15,058,364	68,011	87
42,050,000	33,487,500	423,000	02,577,000	23,414,000	990,714	63,868,000	75,702	88
4,150,000	4,150,000	47,367,000	0,200,000	7,747,813	374,163	13,784,213	82,652	89
17,060,000	17,060,000	8,099,600	25,450,000	16,599,000	861,983	30,027,900	83,202	90
3,220,000	3,220,000	2,861,150	6,130,000	2,737,000	128,710	5,525,550	40,430	91
17,060,000	17,060,000	2,861,150	162,015,000	96,812,400	4,504,559	244,547,000	114,681	92
3,220,000	3,220,000	2,861,150	47,367,000	30,539,500	1,579,043	76,561,599	90,166	93
17,060,000	17,060,000	2,861,150	17,060,000	8,099,600	378,657	18,665,500	81,770	94
3,220,000	3,220,000	2,861,150	3,220,000	2,861,150	140,780	6,170,250	40,242	95

² No company reported in 1902.

⁴ Includes states and territories as follows: 1907—Idaho, New Mexico, Arizona, Utah, and Nevada. 1902—Idaho, New Mexico, Arizona, and Utah.