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# CENSUS BULLETIN.

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## TRANSPORTATION—RAPID TRANSIT IN CITIES.

DEPARTMENT OF THE INTERIOR,  
CENSUS OFFICE,

WASHINGTON, D. C., August 6, 1890.

The growth of rapid transit facilities from 1880 to 1889, inclusive, in cities having over 50,000 inhabitants is given in this bulletin, the statistics being prepared by Mr. CHARLES H. COOLEY, special agent for rapid transit facilities in cities, under the direction of Mr. HENRY C. ADAMS, special agent for transportation. The selection of cities is based upon an estimate of population made at the time the compilation of the tables was begun. The explanations given by Mr. ADAMS are necessary to insure a proper understanding of the facts submitted.

Statistics of the equipment of all roads furnishing rapid transit facilities and of their operations for the fiscal year ending in 1890 are now being collected and will be presented in future exhibits.

*Superintendent of Census.*

# TRANSPORTATION.

## GROWTH OF RAPID TRANSIT FACILITIES FROM 1880 TO 1889, INCLUSIVE, IN CITIES HAVING OVER 50,000 INHABITANTS.

BY HENRY C. ADAMS.

Street railways have never before been brought within the scope of the census statistics of transportation, and some peculiar difficulties were met with in collecting the facts presented in these tables. The chief of these difficulties arose from the ambiguity of such terms as "length of line," "length of single track," and "length of double track" when applied to street railways. For example, in the statistics of street railways collected by the railway commissioners of New York "length of line" means length of road-bed, or, what is usually the same thing, length of street occupied, while in the reports of the railway commissioners of Massachusetts the same term denotes length of all tracks except sidings. Accordingly, in the case of a road having 10 miles of double track, the "length of line" in New York would be 10 miles, and in Massachusetts 20 miles. On account of such ambiguities as this it was necessary to fix upon some definite nomenclature, and to attempt, by careful explanations, to secure returns in accordance with it. Great pains have been taken in this matter, and, it is believed, with a high degree of success. It is not unlikely, however, that some mistakes, particularly in Exhibit V, may be detected by close scrutiny. If any are discovered, it would be of great assistance should they be reported to the Census Office, in order that the statistics as finally published may be correct.

As used in these tables the term "length of line" means length of road-bed, or, in case of a railway running entirely upon streets, length of street occupied. "Length of single track" means length of that portion of the road-bed or street laid with one track only. "Length of double track" means length of that portion of the road-bed or street laid with two tracks. In determining "total length of tracks" switches and sidings are included, and double track is reckoned as two tracks. Where the word "length" alone is used, length of line is to be understood.

Of the 286 street railroads to which these statistics relate, having a total length of 3,150.93 miles, 13, having a total length of 135.75 miles, have as yet made no reports, and the information in regard to them was obtained with approximate correctness from other sources. In the case of 6 others the returns received were so imperfect that it was necessary to supplement them, and approximations amounting to 112.64 miles were resorted to. In the case of cities in the states of New York, Pennsylvania, and Massachusetts, where annual reports to railway commissioners are accessible, these outside sources of information have an official character.

Suburban lines tributary to large cities, but without their corporate limits, as well as those actually within the cities, are included. Where cities situated close together have a common street railway system, it has not been thought best to attempt a separation in these tables. Accordingly, Pittsburgh and Allegheny, in Pennsylvania, are treated in the tables as one city, as is also Newark and Elizabeth, in New Jersey. The street railway lines assigned to Boston traverse also Lynn, Cambridge, and several smaller places.

Exhibit I, on the following page, shows the number of miles of line operated in each city during the years from 1880 to 1889, inclusive. The total increase and per cent of increase during this period are shown separately for every city. The aggregate mileage of the fifty-six cities for each year is also shown.

## EXHIBIT I.—INCREASE OF STREET RAILWAY MILEAGE, 1880-1889, FOR FIFTY-SIX PRINCIPAL CITIES.

CITIES.	LENGTH OF LINE OPERATED, 1880-1889—(MILES).										INCREASE FROM 1880 TO 1889.	
	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	Miles.	Per cent.
Albany, N. Y.	18.50	18.50	18.50	17.97	17.97	17.97	18.46	20.36	20.96	20.44	1.94	10.49
Atlanta, Ga.	15.48	15.48	22.98	23.58	24.78	24.78	24.78	26.98	26.98	28.98	13.45	86.80
Baltimore, Md.	61.97	61.97	85.01	88.23	90.20	92.81	92.81	102.80	104.00	105.81	43.84	70.74
Birmingham, Ala.					3.00	9.84	25.76	53.36	53.36	76.94	70.94	.....
Boston, Mass.	109.00	112.01	127.32	131.43	138.71	149.10	153.93	172.07	191.79	200.86	100.86	100.86
Brooklyn, N. Y.	124.10	128.56	129.46	129.86	129.86	140.94	144.86	147.00	157.15	164.44	40.34	32.51
Buffalo, N. Y.	25.44	25.95	27.56	29.10	29.16	29.90	33.42	36.80	39.71	42.80	16.86	66.27
Charleston, S. C.	15.14	15.14	15.14	15.14	15.14	15.14	17.14	17.14	19.19	19.19	4.05	26.75
Chicago, Ill.	86.47	83.14	87.59	91.14	101.84	118.87	129.76	151.74	173.14	184.78	104.31	120.63
Cincinnati, Ohio	51.93	59.13	56.13	56.13	56.13	61.69	61.69	67.22	71.73	71.73	19.80	38.13
Cleveland, Ohio	26.41	26.41	26.73	32.84	37.40	40.43	41.18	46.43	51.95	58.70	32.29	123.20
Columbus, Ohio	18.50	18.50	18.50	18.50	19.25	19.25	19.25	19.25	19.25	20.65	2.15	11.62
Dallas, Tex.	4.00	4.00	4.00	4.00	4.25	8.75	8.75	12.75	15.00	20.07	16.07	401.75
Dayton, Ohio	9.75	13.25	13.25	13.25	13.25	13.25	13.25	13.25	13.25	18.16	8.41	86.26
Denver, Colo.	8.00	8.00	8.00	10.00	12.50	14.50	18.00	27.25	45.50	71.40	63.46	793.25
Detroit, Mich.	26.56	26.84	26.84	26.84	30.02	31.22	39.16	46.71	48.81	61.26	34.70	130.65
Fall River, Mass.	4.05	6.17	6.17	6.17	8.19	8.78	11.64	11.84	11.94	11.94	7.89	194.81
Galveston, Tex.	22.09	22.09	22.09	22.09	22.09	22.09	27.40	32.96	32.96	32.96	10.87	49.21
Grand Rapids, Mich.	10.75	10.75	10.75	10.75	10.75	10.75	11.75	10.35	21.25	24.70	13.95	129.77
Hartford, Conn.	9.25	10.80	12.05	12.05	12.05	12.05	12.05	12.05	12.05	16.80	7.55	81.62
Indianapolis, Ind.	15.00	18.00	22.00	23.00	25.00	27.00	28.00	29.00	33.00	41.99	26.99	175.93
Jersey City, N. J.	15.40	15.40	15.40	15.40	15.50	17.05	21.21	21.21	21.84	24.39	8.99	58.32
Kansas City, Mo.	9.50	9.50	9.50	9.50	9.50	11.50	21.18	40.56	68.90	84.97	75.47	794.42
Los Angeles, Cal.	11.03	11.03	11.03	13.75	13.75	17.33	18.96	41.18	71.99	82.30	71.96	646.96
Louisville, Ky.	26.25	41.50	50.00	51.00	58.25	62.75	68.63	74.33	76.33	82.31	43.06	100.71
Lowell, Mass.	5.28	5.28	5.28	5.78	6.46	6.46	7.07	20.59	22.06	22.93	17.65	334.28
Memphis, Tenn.	15.00	17.50	20.00	22.50	25.00	27.50	30.00	47.64	50.14	52.20	37.20	248.00
Milwaukee, Wis.	19.57	19.57	26.58	27.03	27.36	27.83	27.99	34.00	41.96	45.73	26.16	133.67
Minneapolis, Minn.	9.00	11.70	30.03	32.73	35.43	38.13	40.83	45.90	48.00	51.50	42.50	472.22
Nashville, Tenn.	9.63	9.63	9.63	9.63	9.63	9.63	9.63	27.83	37.83	45.93	36.30	376.95
Newark and Elizabeth, N. J.	37.54	37.54	37.54	37.54	37.54	37.54	38.32	45.01	48.19	51.67	14.03	37.37
New Haven, Conn.	16.75	16.75	17.25	17.60	17.60	17.60	17.60	17.60	19.85	20.65	3.90	23.28
New Orleans, La.	85.57	91.07	91.32	101.07	101.07	101.07	101.07	104.32	104.32	104.32	18.75	21.91
New York, N. Y.	130.55	130.55	130.55	130.67	134.57	154.01	160.00	173.70	174.80	177.10	46.55	35.66
Oakland, Cal.	17.04	18.24	18.24	18.24	18.24	19.74	22.09	22.09	22.00	24.00	6.96	40.85
Omaha, Nebr.	4.50	4.50	4.50	7.00	10.00	11.00	15.00	20.50	25.50	40.42	44.92	998.22
Paterson, N. J.	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	15.50	16.00	2.50	18.52
Philadelphia, Pa.	249.19	258.19	258.19	260.99	276.42	276.92	278.42	278.42	278.92	283.47	34.28	13.76
Pittsburgh and Allegheny, Pa.	32.50	41.46	43.86	45.21	45.21	46.21	46.63	50.58	58.23	67.78	20.10	75.64
Providence, R. I.	35.30	35.30	35.40	39.30	43.76	44.62	46.08	46.02	46.66	50.48	15.18	43.00
Reading, Pa.	4.30	4.30	4.30	4.30	4.30	4.70	8.80	10.10	14.33	15.43	11.13	258.84
Richmond, Va.	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	12.02	14.37	11.37	379.00
Rochester, N. Y.	13.02	16.16	19.29	19.29	21.74	25.09	26.40	28.03	33.98	37.29	24.27	186.41
Saint Joseph, Mo.	4.75	6.25	6.25	6.25	6.25	6.25	6.25	6.75	7.55	18.10	13.44	282.95
Saint Louis, Mo.	85.20	90.83	94.24	94.24	97.31	100.05	113.75	114.75	115.75	118.75	33.55	39.38
Saint Paul, Minn.	6.00	7.00	8.00	9.00	11.00	13.00	18.00	20.33	23.00	32.00	26.00	433.33
San Francisco, Cal.	57.08	57.08	56.65	61.51	65.46	65.46	66.80	74.80	79.21	87.92	30.84	54.03
Savannah, Ga.	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	12.42	12.42	6.40	108.31
Seranton, Pa.	10.50	10.50	10.50	10.50	10.50	10.50	12.75	14.75	19.00	23.32	13.32	126.86
Syracuse, N. Y.	16.78	16.78	16.78	16.78	16.78	16.78	16.78	16.78	27.45	34.69	17.91	106.73
Toledo, Ohio	15.00	18.00	21.75	23.11	25.11	25.11	26.64	26.64	27.64	30.82	15.82	105.47
Trenton, N. J.	4.63	4.63	4.63	4.63	4.63	4.63	8.63	11.63	11.63	15.50	10.87	234.77
Troy, N. Y.	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	.....	.....
Washington, D. C.	29.47	29.47	29.47	32.52	32.52	32.52	32.52	32.52	34.22	38.77	9.30	31.56
Wilmington, Del.	3.73	5.50	5.50	5.50	5.50	5.50	5.50	5.50	7.44	8.97	5.24	140.48
Worcester, Mass.	4.00	4.00	4.57	4.85	4.85	5.00	5.75	5.75	12.55	14.86	10.86	271.50
Total	1,689.54	1,765.95	1,875.10	1,941.49	2,031.84	2,149.66	2,289.91	2,597.16	2,854.84	3,150.93	1,461.39	86.50

In order to complete the statistics of the cities included in the foregoing table use has been made in some cases of sources of information other than the census returns. The number of miles of line in the various cities regarding which information has been obtained in this manner is as follows: In Baltimore, 7 miles; in Boston, 42.08 miles; in Brooklyn, 17.25 miles; in Chicago, 49.5 miles, from 1880 to 1887, inclusive; in Denver, 8 miles; in Los Angeles, 6 miles; in Memphis, 43.06 miles; in Milwaukee, 13 miles; in Nashville, 17 miles; in New York, 13.5 miles; in Philadelphia, 10 miles; in Richmond, 3 miles; in Syracuse, 4 miles; in Toledo, 5 miles; in Trenton, 10 miles.

Exhibit II shows the increase and per cent of increase in the aggregate mileage of the roads in fifty-six cities for each of the years 1881 to 1889, inclusive.

EXHIBIT II.—INCREASE AND PER CENT OF INCREASE IN THE TOTAL MILEAGE OF FIFTY-SIX PRINCIPAL CITIES—1880-1889.

YEAR.	Total mileage.	INCREASE.	
		Miles.	Per cent.
1880.....	1,689.54		
1881.....	1,765.95	76.41	4.52
1882.....	1,876.10	109.15	6.18
1883.....	1,941.49	66.39	3.54
1884.....	2,031.84	90.35	4.65
1885.....	2,149.66	117.82	5.80
1886.....	2,289.91	140.25	6.52
1887.....	2,597.10	307.25	13.42
1888.....	2,854.94	257.78	9.93
1889.....	3,150.93	295.99	10.37
Total.....		1,461.99	86.50

In Exhibit III, on the following page, the total mileage operated in each city on December 31, 1889, is subdivided so as to show the number of miles operated by each of the various kinds of motive power.

EXHIBIT III.—LENGTH OF LINE, SHOWING MILES OPERATED BY VARIOUS KINDS OF MOTIVE POWER,  
DECEMBER 31, 1889.

CITIES.	Animal power.	Elec- tricity.	Cable.	STEAM.		Total.
				Elevated roads.	Surface roads.	
Albany, N. Y.	13.19	7.25				20.44
Atlanta, Ga.	19.48	1.95			7.50	28.93
Baltimore, Md.	105.81					105.81
Birmingham, Ala.	16.90				60.04	76.94
Boston, Mass.	151.15	49.71				200.86
Brooklyn, N. Y.	182.95	6.30		24.10	1.00	164.44
Buffalo, N. Y.	42.30					42.30
Cincinnati, Ohio	49.72	9.50	12.51			71.73
Charleston, S. C.	19.19					19.19
Chicago, Ill.	160.77		24.01			184.78
Cleveland, Ohio.	40.88	17.82				58.70
Columbus, Ohio.	19.90	0.75				20.65
Dallas, Tex.	16.07				4.00	20.07
Dayton, Ohio.	14.00	4.10				18.16
Denver, Colo.	28.99	4.35	29.02		8.50	71.40
Detroit, Mich.	48.96	12.30				61.20
Fall River, Mass.	11.94					11.94
Galveston, Tex.	32.96					32.96
Grand Rapids, Mich.	20.57		4.13			24.70
Hartford, Conn.	16.80					16.80
Indianapolis, Ind.	41.39					41.39
Jersey City, N. J.	20.74		1.40		2.25	24.39
Kansas City, Mo.	10.06	7.50	38.06	5.20	23.40	84.97
Los Angeles, Cal.	34.53	7.50	14.00		25.78	82.89
Louisville, Ky.	69.50	4.00			8.81	82.31
Lowell, Mass.	22.93					22.93
Memphis, Tenn.	52.20					52.20
Milwaukee, Wis.	40.38				5.35	45.73
Minneapolis, Minn.	33.50				18.00	51.50
Nashville, Tenn.	14.63	11.10			20.20	45.93
Newark and Elizabeth, N. J.	51.57					51.57
New Haven, Conn.	20.65					20.65
New Orleans, La.	91.62				12.70	104.32
New York, N. Y.	133.53		6.87	32.40	4.30	177.10
Oakland, Cal.	18.96		2.72		2.82	24.00
Omaha, Nebr.	21.17	23.79	4.46			49.42
Paterson, N. J.	16.00					16.00
Philadelphia, Pa.	260.47		23.00			283.47
Pittsburgh and Allegheny, Pa.	34.51	20.30	12.07			67.78
Providence, R. I.	47.48		8.00			55.48
Reading, Pa.	14.10	1.33				15.43
Richmond, Va.	5.65	8.72				14.37
Rochester, N. Y.	32.59	4.70				37.29
Saint Joseph, Mo.	1.00	17.19				18.19
Saint Louis, Mo.	97.05	1.00	20.70			118.75
Saint Paul, Minn.	22.00		10.00			32.00
San Francisco, Cal.	27.33		47.22		13.37	87.92
Savannah, Ga.	8.17				4.25	12.42
Scranton, Pa.		23.82				23.82
Syracuse, N. Y.	30.81	3.88				34.69
Toledo, Ohio.	28.32	2.00				30.32
Trenton, N. J.	15.50					15.50
Troy, N. Y.	13.48	3.00				16.48
Washington, D. C.	35.27	3.50				38.77
Wilmington, Del.	6.12	2.85				8.97
Worcester, Mass.	14.86					14.86
Total	2,351.10	200.36	255.87	61.79	221.81	3,150.93

Exhibit IV shows the per cent of total mileage of the fifty-six cities operated by each kind of motive power on December 31, 1889.

EXHIBIT IV.—PER CENT OF TOTAL MILEAGE OF FIFTY-SIX PRINCIPAL CITIES OPERATED BY VARIOUS KINDS OF MOTIVE POWER.

MOTIVE POWER.	Miles.	Per cent.
Animal power.....	2,351.10	74.62
Electricity.....	260.36	8.26
Cable.....	255.87	8.12
Steam (elevated roads).....	61.79	1.96
Steam (surface roads).....	221.81	7.04
Total.....	3,150.93	100.00

Exhibit V, on the following page, shows not only the total length of line in each city on December 31, 1889, but also how much of this line is laid with single and how much with double track. The length of all tracks, including sidings, is also given.

Among other comparisons which these tables make possible, that between Exhibits I and V will be found especially significant. In Exhibit I the column giving the length of line in 1889 shows Philadelphia far ahead of all other cities. The length assigned to each of the five leading cities is as follows: Philadelphia, 283.47 miles; Boston, 200.86; Chicago, 184.78; New York, 177.10; Brooklyn, 164.44.

On turning to the last column in Exhibit V, which gives the length of all tracks, we find that as regards the position of Philadelphia the table is reversed, and that New York rises from fourth to first place. The number of miles assigned to each city in that column is as follows: New York, 368.62; Chicago, 365.50; Boston, 329.47; Brooklyn, 324.63; Philadelphia, 324.21.

The reason of these changes will be clearly seen upon examining the column in Exhibit V which gives the length of double track. The length of double track in each of the five cities is as follows: Chicago, 176.05; New York, 161.90; Brooklyn, 138.84; Boston, 104.54; Philadelphia, 39.99.

From this comparison it is seen to be a peculiarity of the Philadelphia roads, and to some extent of the Boston roads, that the tracks usually occupy different streets in going to and from a terminus instead of being laid upon the same street. The result of this is that roads in the cities named traverse a greater length of street in proportion to track length than in New York, Brooklyn, and Chicago.

On December 31, 1889, 476 cities and towns in the United States possessed rapid transit facilities, and the total number of street railways in independent operation was 807.

EXHIBIT V. LENGTH OF STREET RAILWAYS IN FIFTY-SIX PRINCIPAL CITIES ON DECEMBER 31, 1889,  
SHOWING LENGTH AND PER CENT OF DOUBLE TRACK, ETC.

CITIES.	LENGTH OF LINE.				Length of all tracks, including sidings.
	Single track.	Double track.		Total length of line.	
		Miles.	Per cent.		
Albany, N. Y.	9.59	10.55	51.61	20.44	31.67
Atlanta, Ga.	27.38	1.55	5.30	28.93	34.78
Baltimore, Md.	42.73	63.08	59.02	105.81	171.74
Birmingham, Ala.	70.79	6.15	7.99	76.94	90.81
Boston, Mass.	98.32	104.54	52.05	200.88	329.47
Brooklyn, N. Y.	25.60	138.84	84.43	164.44	324.63
Buffalo, N. Y.	21.74	20.56	48.61	42.30	63.75
Cincinnati, Ohio	12.04	59.09	82.38	71.78	130.82
Charleston, S. C.	13.50	5.09	29.05	19.19	25.38
Chicago, Ill.	8.73	175.05	95.28	181.78	365.50
Cleveland, Ohio	8.64	50.06	85.23	58.70	108.77
Columbus, Ohio	9.00	11.65	56.42	20.65	34.10
Dallas, Tex.	16.37	3.70	18.44	20.07	25.04
Dayton, Ohio	7.75	10.41	57.32	18.16	28.57
Denver, Colo.	42.03	29.43	41.18	71.46	101.69
Detroit, Mich.	43.93	17.33	28.29	61.20	85.15
Fall River, Mass.	7.69	4.55	88.11	11.94	16.49
Galveston, Tex.	25.96	7.00	21.24	32.96	39.96
Grand Rapids, Mich.	16.57	8.13	32.02	24.70	36.83
Hartford, Conn.	16.80			16.80	17.24
Indianapolis, Ind.	17.78	23.81	57.04	41.39	65.00
Jersey City, N. J.	5.50	18.89	77.45	24.89	45.78
Kansas City, Mo.	28.53	55.44	66.42	84.97	143.24
Los Angeles, Cal.	61.02	21.37	25.94	82.39	105.30
Louisville, Ky.	69.92	12.39	15.05	82.31	96.75
Lowell, Mass.	22.93			22.93	25.48
Memphis, Tenn.	52.20			52.20	52.20
Milwaukee, Wis.	14.87	30.86	67.48	45.73	76.94
Minneapolis, Minn.	13.04	38.46	74.08	51.50	91.31
Nashville, Tenn.	37.73	8.20	17.85	45.98	55.47
Newark and Elizabeth, N. J.	10.05	35.52	68.88	51.57	90.19
New Haven, Conn.	17.00	3.65	17.68	20.65	25.05
New Orleans, La.	49.57	54.75	52.48	104.32	150.32
New York, N. Y.	15.20	161.90	91.42	177.10	368.62
Oakland, Cal.	17.43	6.52	27.17	24.00	31.09
Omaha, Nebr.		49.42	100.00	49.42	98.84
Paterson, N. J.	15.00	1.00	6.25	16.00	17.00
Philadelphia, Pa.	243.43	30.69	14.11	283.47	324.21
Pittsburgh and Allegheny, Pa.	18.72	49.06	72.38	67.78	117.79
Providence, R. I.	44.35	6.13	12.14	50.48	58.34
Reading, Pa.	13.93	1.50	9.72	15.43	17.22
Richmond, Va.	10.84	3.53	24.57	14.37	19.18
Rochester, N. Y.	20.69	15.60	44.52	37.29	53.89
Saint Joseph, Mo.	4.57	13.62	74.88	18.19	31.81
Saint Louis, Mo.	72.49	46.26	33.06	118.75	165.26
Saint Paul, Minn.	1.30	30.70	95.94	32.00	64.70
San Francisco, Cal.	36.40	51.52	58.60	87.92	140.18
Savannah, Ga.	12.42			12.42	13.55
Scranton, Pa.	23.22			23.22	25.67
Syracuse, N. Y.	28.64	6.05	17.44	34.69	44.13
Toledo, Ohio	21.79	9.03	29.30	30.82	44.03
Trenton, N. J.	13.50	2.00	12.90	15.50	18.25
Troy, N. Y.	7.02	9.40	57.40	16.48	26.10
Washington, D. C.	9.83	28.91	74.57	88.77	67.68
Wilmington, Del.	7.10	1.87	20.85	8.97	11.27
Worcester, Mass.	11.74	3.12	21.00	14.86	17.98
Total	1,580.24	1,570.69	49.85	3,150.93	4,371.21