

SECTION XVII.

ROADS AND RAILWAYS.

§ 1. Roads and Bridges.

1. **Introduction.**—In Year Books No. 1 (pages 541 to 551) and No. 2 (pages 675 to 685), a brief historical account was given of the construction and development of roads in Australia. It is not proposed to repeat that account in the present issue of the Year Book.

2. **Expenditure on Roads and Bridges.**—Figures shewing the total expenditure on roads and bridges in the States are not available. The subjoined statement, however, gives the amounts of total loan expenditures by the States Government up to the 30th June, 1913:—

ROADS AND BRIDGES.—TOTAL LOAN EXPENDITURE OF EACH STATE AND OF THE COMMONWEALTH UP TO THE 30th JUNE, 1913.

State, etc. ...	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.*	C'wealth.
Expenditure	£1,839,076	£176,475	£923,656	£1,464,736	£301,244	£4,023,274	£8,728,461

* Including harbours, rivers, and lighthouses.

The following table shews the annual expenditure from loans on roads and bridges by the central Governments in each State and in the Commonwealth during the year 1901 and from 1908 to 1913:—

ROADS AND BRIDGES.—LOAN EXPENDITURE BY STATE GOVERNMENTS, 1901-2 and 1908-13.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
	£	£	£	£	£	£	£
1901-2 ...	150,777	47,104	...	185	740	77,536 ¹	276,342
1908-9 ...	...	237	...	...	8,120	136,674	145,031
1909-10 ...	...	50	...	...	24,117	... ²	24,167 ³
1910-11 ...	...	183	...	...	52,296	80,816	133,295
1911-12 ...	...	...	...	...	35,414	145,556	180,970
1912-13 ...	53,263	...	...	...	37,037	183,625 ⁴	273,925

1. For the calendar year 1902. 2. Not available. 3. Exclusive of Tasmania.
4. See note * to previous table.

The two tables given above shew only a small proportion of the actual expenditure upon roads and bridges in the different States, for the reason that (a) there have been large expenditures from revenue, both by the central Governments and by local authorities, and (b) the State Governments have in many cases voted grants and subsidies on the amount of rates collected, and have issued loans to local authorities either for the express purpose of the construction of roads and bridges or for the general purpose of public works construction. Returns of expenditure, where available, are given below for each State. Although no revenue is now derived directly from roads and bridges, they are indirectly of great value to the community, forming, next to railways and public lands, the most considerable item of national property.

3. **New South Wales.**—The control of all roads, bridges, and ferries in New South Wales is now regulated by the Local Government Act 1906, which came into force on the 1st January, 1907 (see Section xxvi. *Local Government*). Under the provisions of this Act, the eastern and central divisions of the State are divided into shires and municipalities for the general purposes of local government, for the endowment of which a sum of not less than £150,000 is payable annually out of the consolidated revenue on the basis of a percentage subsidy on the proceeds of the general rates received by the District Councils. The control of all roads, bridges, and ferries (except those proclaimed "National" and those in the unincorporated areas of the Western Division) has been transferred from the Roads Department to the respective shires and municipal councils, who are now responsible for their construction and maintenance. Up to December, 1912, 38 miles of roads, 273 bridges, 54 wharves, 99 jetties, and 14 ferries have been proclaimed as "National" works. Power is given to construct new roads, to widen or close existing roads, to make by-laws for the regulation of traffic, etc.; in the case of the acquisition of land for the purpose of constructing new roads or of widening existing roads, the provisions of the Roads Act 1902 are incorporated. The Minister for Works is empowered to pay subsidies to the local authorities to maintain the roads. The roads leading to and within areas of lands which are made available for closer settlement will be constructed by the Government prior to transfer to the shires, as also will roads required mainly for tourists in districts not likely to produce revenue in rates to the local authorities.

(i.) *Principal Main Roads.* The four principal main roads in New South Wales run in the same direction as, and are roughly contiguous to, the four state-owned main railway lines. (a) *The Southern Road*, 385 miles in length, runs from Sydney to Albury, and before the days of railway construction, formed part of the highway over which the interstate traffic between Melbourne and Sydney used to flow. (b) *The South Coast Road*, 250 miles long, runs from Campbelltown along the top of the coast range and across the Illawarra district as far as Bega, from which place it extends as a minor road to the southern limits of the State. (c) *The Western Road*, 513 miles long, runs through Bathurst, Orange, and many other important towns as far as Bourke, on the Darling River. (d) *The Northern Road*, 405 miles in length, runs from Morpeth, near Newcastle, as far as Maryland, on the Queensland border.

(ii.) *Length and Classification of Roads and Bridges.* The length of roads in the State (exclusive of 38 miles proclaimed as "National works") in 1913 was approximately 94,796 miles, of which 9762 miles were controlled by municipalities, 79,079 by the shires, and 5945 miles were in the unincorporated areas of the Western Division. The following table gives particulars for the year 1912-13 of roads classified according to whether metalled, etc., formed only, cleared only, or natural surface:—

NEW SOUTH WALES.—APPROXIMATE LENGTH OF ROADS, 1912-13.

Classification.	Metalled, Ballasted, Gravelled etc.	Formed only.	Cleared only.	Natural surface.	Total.
	Miles.	Miles.	Miles.	Miles.	Miles.
Metropolitan... ..	1,172	353	216	244	1,985
Country Municipalities	2,553	1,549	1,851	1,824	7,777
Shires	12,631	9,247	22,076	35,135	79,089
Western Division	91	145	3,160	2,549	5,945
Total	16,447	11,294	27,303	39,752	94,796

(iii.) *Bridges, Culverts, and Ferries.* The more important bridges have been proclaimed under the provisions of the Local Government Act as "National works" (see above), and these, together with the bridges, etc., in the Western Division, remain under the control of, and are maintained by, the Public Works Department. Particulars of bridges, culverts, and ferries in the State in 1912-13 are given in the following table:—

NEW SOUTH WALES.—BRIDGES, CULVERTS, AND FERRIES, 1912-13.

Particulars.	Bridges.		Culverts.		Ferries.
	No.	Length.	No.	Length.	No.
National works	273	ft. *	...	ft. ...	14
Metropolitan... ..	127	5,486	748	46,173	...
Country municipalities	647	37,704	3,335	89,943	13
Shires	3,435	202,704	32,394	285,989	99
Western Division (unincorporated)	117	20,576	88	845	3
Total	4,599	*	36,565	422,950	129

* Not available.

(iv.) *Expenditure on Roads and Bridges.* Since the year 1857 the total expenditure by the Roads Department and Roads Trust on roads and bridges is £24,980,691. In this expenditure is included the cost of administering the Department, services for other Departments, and payments on account of punt approaches and similar works incidental to the road traffic of the country. The amount expended from 1857 to the 30th June, 1900, for the next decennium, and for each succeeding financial year up to 1913, is given below. Until recent years, the expenditure on these works increased at a much faster rate than the population.

NEW SOUTH WALES.—EXPENDITURE BY ROAD DEPARTMENTS AND ROAD TRUSTS, 1857 to 1913.

Period.	Expenditure by Roads Department.	Expenditure by Trustees.	Total.
	£	£	£
1857 to 30th June, 1900	18,714,078	1,258,027	19,972,105
1900-09	4,605,766	30,664	4,636,430
1910-11	125,326	...	125,326
1911-12	126,111	...	126,111
1912-13	120,719	...	120,719
Total	23,692,000	1,288,691	24,980,691

The expenditure by the Department is now limited to the construction of roads in closer settlement areas and to the construction and maintenance of national bridges and ferries, and of works in the unincorporated areas of the Western Division.

4. *Victoria.*—Under the Local Government Act 1903, the control, construction, and maintenance of all roads, streets, and bridges are in the hands of Municipal Councils, who are empowered to open new roads, and to close, divert, or increase the width of any existing street or road, provided that no new road less than one chain in width may be opened without the consent of the Minister. The councils are also authorised to make and repair streets, lanes, or passages on private property, or

to form means of back access to private property, and may compel the owners of such property to pay the cost of so doing. Footways in front of houses or grounds may be kerbed, flagged, paved, or asphalted, and the owners of such houses or grounds must bear half the cost of so doing. The revenue of the councils is derived from rates which may be either ordinary or special. The councils are empowered to raise loans for the purpose of making or opening new streets and roads, and for diverting, altering, or increasing the width of streets and roads, provided that the amount of such loan must not exceed ten times the average income of the council during the three years immediately preceding.

(i.) *Country Roads Board.* With the object of improving the main roads of the State an Act (No. 2415) was passed on 23rd December, 1912, which empowers the Governor-in-Council to appoint a board, to consist of three members.

The duties of the board are to ascertain by survey and investigation what roads are main roads; the nature and extent of the resources of Victoria in metals, minerals, and materials suitable for the purposes of road-making and maintenance, and the most effective and economical methods for dealing with the same, and for supplying and utilizing the material in any part of Victoria; the most effective methods of road construction and maintenance; what deviations (if any) in existing roads or what new roads should be made so as to facilitate communication and improve the conditions of traffic; and to record, publish, and make available for general information the results of all such surveys and investigations. The duty of furnishing information that may be required is imposed on the municipal authorities.

The construction of permanent works and the maintenance of main roads are likewise to be carried out by the municipalities to the satisfaction of the board. The total cost of the works, in the first instance, is to be paid by the Treasury, but subsequently half the amount expended on permanent works and maintenance is to be refunded by the municipalities affected.

For the purpose of making permanent works, power is given to the Governor-in-Council to issue stock or debentures to the amount of £400,000 a year for five years, and the principal and interest are a charge upon the Consolidated Revenue of the State. The money so raised is to be placed to the credit of an account to be called "the Country Roads Board Loan Account," which will be debited with all payments made by the Treasurer towards the cost of permanent works. A sinking fund of 1 per cent. per annum on half the amount borrowed is authorised to be paid out of the Consolidated Revenue until half the amount borrowed is redeemed. An annual payment to the Treasurer of 6 per cent. on the amount due by each municipality in respect of permanent works is provided for, and the cost of maintenance, allocated to each municipality, must be paid before the 1st July in each year. A special rate not to exceed 6d. in the £1 on the net annual value of rateable property to meet the cost of permanent works and maintenance may be levied in any ward or riding of a municipality as the council may direct. In the event of default of payment by a municipality, the board may levy a rate to meet the amount owing. All fees and fines paid under the Motor Car Act, all moneys standing to the credit of the Municipal Fees and Fines Trust Fund, all fees paid on the registration or renewal of the registration of traction engines, and all fees received by the Crown after the 30th June, 1912, under the Unused Roads and Water Frontages Act 1903, are to be credited to the Country Roads Board Fund.

As soon as practicable after the termination of each year the board must present a report to the Minister setting forth its proceedings, the permanent works constructed, the mileage of the roads maintained, and an account of all moneys received and expended under the provisions of the Act.

(ii.) *General and Local Government Expenditure.* The gross amount expended directly by the State Government of Victoria on roads and bridges was £7,958,212 up to the end of June, 1902. The annual expenditure from ordinary revenue by municipalities is not

returned separately, but is included in Public Works Construction and Maintenance (see Section xxvi., *Local Government*). The subjoined table shews the cost from general revenue of municipalities of private streets, roads, etc., and also shews the amounts of municipal loan expenditure in 1901 and from 1903 to 1912:—

VICTORIA.—EXPENDITURE ON ROADS AND BRIDGES, 1901 and 1908 to 1912.

Financial Year. ¹	Annual Expenditure by State Government.	Municipal Loan Expenditure.		Formation of Private Roads, Streets, Lanes, etc. ²	
		Cities, Towns, and Boroughs.	Shires.	Cities, Towns, and Boroughs.	Shires.
	£	£	£	£	£
1901	72,890	16,844	12,928	18,829	4,521
1908	72,246	21,859	5,206	30,907	1,811
1909	99,572	21,389	9,058	34,285	3,603
1910	102,309	25,311	18,077	29,304	2,859
1911	67,001	41,247	24,978	41,167	5,682
1912	58,917	28,237	31,940	59,845	6,890

1. The financial years of Melbourne and Geelong end on the 31st December and the 31st August respectively; those of all other municipalities on the 30th September.

2. Including the cost of flagging, asphaltting footpaths, etc., but exclusive of loan expenditure.

5. **Queensland.**—In Queensland the construction and maintenance of public roads are controlled under a system of local self-government, for the purposes of which the whole State is divided into (a) towns and (b) shires. The duties, rights, and responsibilities of the local authorities with regard to roads, streets, and bridges are regulated by the Local Authorities Act of 1902. The councils are invested with full powers to open, close, divert, or widen streets, roads, and bridges, and to make by-laws for the regulation of traffic, etc. The members of the councils are elected by the ratepayers, and with the aid of executive officers they undertake the supervision and control of all necessary constructions and improvements of roads and bridges within their district. The rates which the councils are empowered to levy are supplemented by Government grants. Separate returns as to the expenditure by towns and shires on roads and bridges are not available, the amounts being included in the returns of expenditure on public works, particulars as to which expenditure may be found in the Section of this book on *Local Government*.

6. **South Australia.**—Under the provisions of the District Councils Acts, 1887 to 1904, and the Municipal Corporations Acts, 1890 to 1903, and of the Roads Acts, 1884 to 1908, the councils are invested with full powers as to the opening and making of new streets and roads, and the diverting, altering, or increasing the width of existing roads; as to raising, lowering, or altering the ground or soil of any street or road; and as to the construction, purchase, and management of bridges, culverts, ferries, and jetties.

(i.) *Main Roads and District Roads.* All the roads in each district are classified either as main roads or as district roads. Both classes of roads are under the direct control either of Municipal Corporations or of District Councils, but in the case of main roads the expenditure on construction and maintenance is chiefly provided for by Government grants, which are paid into a main road fund, while the expenditure on district roads is paid for out of general rates, and out of subsidies on the amount of such rates, granted by the central Government. Under the Main Roads Act 1908, a number of roads were declared to be main roads.

The total estimated length of streets and roads in South Australia up to the 30th June, 1912, was as follows:—

SOUTH AUSTRALIA.—ESTIMATED LENGTH OF ROADS AND STREETS, 1912.

Particulars.				Woodblocked.	Macadamised.	Other.	Total.
Miles	...	...	...	$\frac{1}{2}$	8,358	25,997	34,355 $\frac{1}{2}$

(ii.) *Expenditure by Corporations on Main and District Roads.* The following table shows the expenditure by municipal corporations on both main and district roads during 1901-2, and each year from 1908 to 1912 inclusive:—

SOUTH AUSTRALIA.—EXPENDITURE BY CORPORATION ON STREETS, ROADS, AND BRIDGES, 1901-2 and 1908-12.

Year. ¹	District Roads.			Main Roads Fund.			
	Total Receipts.	Expenditure.		Receipts.		Expenditure.	
		Con-struction.	Main-tenance.	From Main Road Grants.	Total.	Con-struction.	Main-tenance.
	£	£	£	£	£	£	£
1901 ...	148,872	4,906	50,628	7,403	8,738	159	7,745
1908 ...	169,058	3,968	43,538	7,178	7,917	130	8,054
1909 ...	182,145	9,218	63,474	9,679	12,312	258	11,849
1910 ...	186,979	4,031	70,660	14,392	16,000	1,178	13,999
1911 ...	212,506	5,673	63,897	12,935	14,294	1,053	13,634
1912 ...	226,068	10,907	59,609	11,477	11,865	322	12,590

1. Up to and including the year 1903 the financial year ended on the 31st December, but after that date ends on the 30th November.

(iii.) *Expenditure of District Councils on Main and District Roads.* The following table gives similar information with respect to main and district roads under the control of District Councils:—

SOUTH AUSTRALIA.—EXPENDITURE BY DISTRICT COUNCILS ON STREETS, ROADS, AND BRIDGES, 1901 and 1908-12.

Year Ended 30th June.	District Roads.			Main Roads Fund.			
	Total Receipts.	Expenditure.		Receipts.		Expenditure.	
		Con-struction.	Main-tenance.	From Main Road Grants.	Total.	Con-struction.	Main-tenance.
	£	£	£	£	£	£	£
1901 ...	147,309	18,026	47,379	72,980	100,077	11,861	67,487
1908 ...	134,169	35,161	48,289	80,834	80,875	6,277	70,343
1909 ...	140,552	35,922	60,328	79,194	79,554	10,610	69,387
1910 ...	152,091	33,853	64,079	106,096	106,221	10,752	76,150
1911 ...	164,175	44,289	63,811	110,397	111,182	24,660	82,115
1912 ...	179,249	54,342	68,108	119,331	123,154	20,414	102,759

7. *Western Australia.*—In Western Australia the construction, maintenance, and management of roads and bridges throughout the State, except those within the boundaries of municipalities, are under the control of District Road Boards, constituted by the Roads Act, 1911.

(i.) *District Roads and Bridges.* Under the provisions of this Act any part of the State, not within a municipality, may be constituted by the Governor-in-Council into a Road District, under the control of a board of not less than five, nor more than eleven members elected by the ratepayers. The board is invested with full powers for controlling and managing all roads and bridges

within the district, and is empowered to make by-laws for the general regulation of traffic, to control the weight of engines and machines permitted to cross any bridge or culvert, to regulate the speed limits of vehicles, lights to be carried by vehicles, the lighting of streets and roads, and the licensing of bicycles and motor cars. A District Road Board may not, however, construct any road or street less than sixty-six feet wide, nor any bridge or culvert at a greater cost than £100, without the consent of the Minister. The construction of the more important bridges and culverts is generally carried out by the Government, the work, after completion, being handed over to the Road Board for maintenance. In case of land being required for the purpose of constructing a new street or road, or for widening an existing street or road, the provisions of the Public Works Act of 1902 are incorporated in the Roads Act. A board may levy general rates within its district not exceeding two shillings and sixpence nor less than ninepence in the £ on the annual ratable value, and, if valued on the basis of unimproved values of lands, the general rate must not be over threepence nor under one penny in the £ on the capital unimproved value. Boards are also empowered to raise loans for works or undertakings or to liquidate existing loans, but the amount of such loans must not be greater than seven times the average ordinary revenue of the board. In the case, however, of boards already indebted, borrowing power to the extent of ten times the said average is given, less the amount of existing loan indebtedness at time of borrowing. For the purpose of paying the interest on money borrowed a board may levy a special rate. District Road Boards may also exercise the powers of Drainage Boards under the provisions of the Land Drainage Act of 1900.

(ii.) *Municipal Streets, Roads, and Bridges.* As regards roads, streets, and bridges within municipalities, these are under the control of local authorities elected under the provisions of the Municipal Corporations Act 1906. The municipal councils are invested with full powers for making, maintaining, and managing all streets, roads, and bridges within the municipal area, and may request the Governor to declare any such land reserved, used, or by purchase or exchange acquired for a street or way, to be a public highway, and on such request the Governor may, by notice in the *Gazette*, proclaim such highway absolutely dedicated to the public.

(iii.) *Length of Roads, Number of Bridges, and Expenditure on Roads and Bridges.* The following table gives particulars of the operations of the Road District Boards since the 1st January, 1908 :—

WESTERN AUSTRALIA.—PARTICULARS OF ROADS UNDER CONTROL OF DISTRICT ROAD BOARDS, 1908 to 1912.

Year ended the 30th June.	Area.	Revenue.				Expenditure.	Length of Roads.*				No. of Bridges and Culverts.	
		From General Rates.	From Grants and Subsidies.	From other Sources.	Total.		Cleared only.	Formed only.	Metalled or otherwise Constructed.	Total.	Bridges.	Culverts.
	Sq. m.	£	£	£	£	£	Miles.	Miles.	Miles.	Miles.	No.	No.
1908 ...	975,780	40,491	58,311	14,707	113,509	120,088	10,821	4,760	2,397	17,918	509	4,148
1909 ...	975,781	46,034	52,382	15,869	114,285	116,723	13,085 ⁴	4,645 ¹	2,797	20,527	554 ²	4,574 ²
1910 ...	975,793	54,115	61,301	14,201	129,617	114,947	14,167	4,622	2,958	21,747	678 ³	4,853 ³
1911 ...	975,800	59,302	100,126	16,474	175,902	141,015	15,169	4,874	3,119	23,162	653	5,211
1912 ...	975,809	70,397	64,774	36,497	171,668	196,576	16,484	4,555	3,432	24,471 ⁴	719 ⁴	5,806 ⁴

* Approximate only.

1. Exclusive of seven Boards which have not supplied the information. 2. Exclusive of three Boards. 3. Exclusive of two Boards. 4. Exclusive of five Boards.

The following table gives similar information with reference to roads controlled by municipalities under the Municipal Institutions Act 1900 and the Municipal Corporations Act 1906:—

WESTERN AUSTRALIA.—PARTICULARS OF STREETS, ROADS, AND BRIDGES UNDER THE CONTROL OF MUNICIPALITIES, 1901 and 1908-12.

Year ended the 31st October.	No. of Municipalities.	Length of Streets and Roads.*					Revenue.		Expenditure.	
		Paved, Met'ld or Gr'v'ld	Form'd only.	Clear'd only.	Not Clear'd	Total.	From Rates.	From Grants.	Works and Impr'v-ments.	Street Light'g and Wat'rg
		Miles.	Miles.	Miles.	Miles.	Miles.	£	£	£	£
1901	42	195	30	149	137	511	78,021	66,850	111,256	15,969
1908	47	474	90	323	271 ¹	1,158	139,228	67,315	103,943	31,682
1909	46	486	88	322	321	1,217	138,445	37,301	83,283	30,626
1910	42 ²	525	104	309	297	1,235	138,719	13,336	87,998	30,955
1911	42	521	105	292	284	1,202	144,993	27,944	75,697	30,341
1912	38 ³	528	103	278	312	1,221	148,538	25,902	78,576	27,322

* Approximate only.

1. Exclusive of three municipalities, which have not supplied the information. 2. Exclusive of three municipalities. 3. Including also particulars of four municipalities which were dissolved during the year.

8. *Tasmania*.—In 1906 all the existing Road Trusts and Main Road Boards were abolished by the Local Government Act, which provided that the councils of all municipalities constituted under the Act should exercise all powers conferred upon, and should be liable to all the obligations imposed upon Road District Trusts and Main Road Boards by the Roads Act of 1884. The whole State, with the exception of Hobart and Launceston, is divided into municipal districts, each of which is under the control of a warden and councillors, and is deemed to be a road district and a main road district for the purposes of the Roads Act 1884.

(i.) *Mileage of Roads and Number of Bridges*. The following table gives particulars for the year 1912 as to length of roads and number of bridges and culverts under the control of the municipalities:—

TASMANIA.—ROADS AND BRIDGES IN MUNICIPALITIES, 1912.

Roads.			Bridges.	Culverts.
Macadamised or Gravelled.	Other.	Total.		
Miles. 5,334	Miles. 4,955	Miles. 10,289	No. 1,120*	No. 19,702*

* Last available figures.

(ii.) *Revenue and Expenditure*. The following table gives particulars for the year 1912 of the revenue and expenditure of municipal councils in respect of roads and bridges:—

TASMANIA.—ROADS AND BRIDGES, REVENUE AND EXPENDITURE, 1912.

Revenue.				Expenditure. †
From Government.	Rates.	All other.*	Total.	
£ 26,051	£ 51,260	£ 100,874	£ 178,185	£ 179,451

* Including current receipts from loans. † Municipal "Works and Services," not including £9,344 from Revenue by State Government.

§ 2. Railways.

(A) General.

1. **Improvements in Railway Statistics.**—In February, 1909, a report was issued by the Commonwealth Statistician to the Minister for Home Affairs on the subject of *The Desirability of Improved Statistics of Government Railways in Australia*. In this report a number of matters were specified in respect to which there was want of uniformity in the form and basis of the statistics published in the annual reports of the Railway Departments of the several States, and the importance and desirability of obtaining more complete and uniform statistics, especially with regard to “passenger-miles” and “ton-miles,” were emphasised. This report was brought forward and considered by the Commissioners and General Managers of the Australian State Railways at their annual conference, held in Melbourne in May, 1909, with the result that resolutions were passed agreeing to publish in the annual reports of State Railway Departments the uniform statistics regarding all the matters referred to by the Commonwealth Statistician, with two exceptions, viz. :—(a) with respect to the classification of tonnage carried and the revenue derived therefrom (see further (B) paragraph 17 hereof), and (b) with respect to “passenger-mileage” and “ton-mileage” (see further (B) paragraph 18 hereof). The resolutions referred to were to take effect from 1st July, 1909.

2. **Railway Communication in the Commonwealth.**—An account of the progress in railway construction in Australia since the opening of the first line in 1855 will be found in previous issues of the Year Book (No. 6, p. 681). In the eastern, south-eastern, and southern parts of Australia there now exists a considerable network of railway lines converging from the various agricultural, pastoral and mining districts towards the principal ports, which are themselves connected by systems of lines roughly running parallel to the coast. These are shewn on the accompanying map. In the east, lines radiating from Townsville, Rockhampton, Brisbane, and Sydney extend inland in various directions for distances ranging up to over 600 miles; in the south-east there are numerous lines, those in Victoria converging towards Melbourne, while others in New South Wales have their terminus in Sydney; in the south there are three main lines, with numerous branches, running from Melbourne, while from Adelaide one main line, with several branches to the coastal towns, runs inland in a northerly direction for a distance of nearly 700 miles, and another line runs in a south-easterly direction to various ports and meeting the main line from Melbourne on the border of South Australia and Victoria. The main interstate line, (indicated by a heavier line in the map) which permits of direct communication between the four capital cities—Brisbane, Sydney, Melbourne, and Adelaide—covers a distance from end to end of 1790½ miles. This journey occupies just over three days, including one stop of 9 hours and 15 minutes at Sydney, and another of 3 hours 39 minutes at Melbourne. The distance between the capitals and the times occupied are as follow :—

Brisbane to Sydney	...	...	725 miles	...	26 hours 55 min.
Sydney to Melbourne	...	...	582½ "	...	16 " 51 "
Melbourne to Adelaide	...	...	482½ "	...	17 " 26 "

The longest railway journey which can be undertaken in Australia, on one continuous line of railway, is from Longreach in Queensland to Oodnadatta in South Australia, a total distance of 3303 miles. In Western Australia there is a connected system of main or trunk lines between the ports of the State and the agricultural, pastoral, and mining districts.

In the northern parts of Queensland and in the Northern Territory there are also a number of disconnected lines running inland from the more important ports. In Tasmania the principal towns are connected by a system of lines, and there are also, more especially in the western districts, several lines which have been constructed for the purpose of opening up mining districts.

3. Mileage Open for Traffic.—In all the States of the Commonwealth the principle that the control, construction, and maintenance of the railways should be in the hands of the Government has long been adhered to, excepting in cases presenting unusual circumstances. In various parts of the Commonwealth lines have been constructed and managed by private companies, but at the present time practically the whole of the railway traffic in the Commonwealth is in the hands of the various State Governments. A large proportion of the private lines which are at present running have been laid down for the purpose of opening up forest lands or mining districts, and are not generally used for the conveyance of passengers or the public conveyance of goods. (See *D. Private Railways*, hereinafter.)

(i.) *Mileage of Government and Private Lines, 1855 to 1913.* The subjoined table shews the mileage of both Government and private lines open for traffic (exclusive of sidings and cross-overs) in each State and also in the Commonwealth at suitable periods since the inauguration of railways in Australia in 1855 up to the year 1913. The figures from 1855 to 1881 are given as up to the end of the calendar year; later figures are as up to the end of the financial year ended on the 30th June, unless otherwise stated, excepting the mileages for private lines which are in all cases taken for the calendar year:—

GOVERNMENT AND PRIVATE RAILWAYS.—MILEAGE OPEN, 1855 to 1913.

Year.	N.S.W.	Vict.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'with.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1855 ...	14	2½	*	†6½	*	*	*	23½
1861 ...	73	114	*	56	*	*	*	243
1871 ...	358	276	218	133	12	45	*	1,042
1881 ...	1,040	1,247	800	845	92	168	*	4,192
1890-1 ...	2,263	2,763	2,205	1,666	†656	†425	145	10,123
1900-1 ...	2,926	3,238	2,904	1,736	1,984	\$618	145	13,551
1910-11 ...	4,027	3,574	4,390	1,993	3,208	675	145	18,012
1911-12 ...	4,098	3,673	4,633	1,997	3,430	701	145	18,677
1912-13 ...	4,197	3,698	4,936	2,202	3,827½	729	145	19,734½

* No railways yet constructed. † To the 31st December. This line between Goolwa and Port Elliot was opened in 1854 as a horse tramway, but now forms part of the railway system. ‡ To the 31st December, 1891. § To the 31st December, 1901.

It will be seen from the above table that the rate of construction up to the year 1871 was very slow, the average annual length of lines opened from 1861 to 1871 being only 80 miles for the whole Commonwealth. By the middle of the following decade, however, the principal mountain ranges had been crossed, and the work of construction could be proceeded with at a greater rate, and at a less cost per mile. The greatest period of activity was from 1881 to 1891, when the average annual length opened for traffic was 593 miles for the whole Commonwealth; the corresponding figures for the following periods from June 1891 to June 1901, and from June 1901 to June 1911, were 343 and 452 miles respectively.

4. Comparative Mileage of State-owned and Private Lines, 1913.—The subjoined table shews for each State and for the Commonwealth (a) the length of lines owned by the respective State Governments, all of which lines are of course open for general use by the

public, (b) the length of private lines available for general use by the public, and (c) the length not so available. The mileages specified in the case of State-owned lines are as up to the 30th June, 1913; those given for private lines are as up to the 31st December, 1912:—

GOVERNMENT AND PRIVATE RAILWAYS.—COMPARATIVE MILEAGE OF STATE-OWNED LINES, OF PRIVATE LINES AVAILABLE FOR GENERAL TRAFFIC AND OF PRIVATE LINES NOT SO AVAILABLE, 1912-13.

State.	State-owned Lines.	Private Lines available for General Traffic.	Total Open for General Traffic.	Private Lines used for Special Purposes only.	Grand Total.
	Miles.	Miles.	Miles.	Miles.	Miles.
New South Wales	3,930	153½	4,083½	113½	4,197
Victoria... ..	3,647	14	3,661	37	3,698
Queensland ...	4,524	391	4,915	21	4,936
South Australia ...	2,168*	...	2,168	34	2,202
Western Australia	2,854	277	3,131	696½	3,827½
Tasmania ...	507	166	673	56	729
Northern Territory	145	...	145	...	145
Commonwealth	17,775	1,001½	18,773½	958	19,734½

* Including the Port Augusta-Oodnadatta Line (478 miles).

5. **Comparative Railway Facilities in Different States, 1913.**—The area of territory and the population per mile of line open to the public for general traffic (including both Government and private lines) on the 30th June, 1913, are shewn in the subjoined statement for each State and also for the Commonwealth:—

GOVERNMENT AND PRIVATE RAILWAYS.—COMPARISON OF RAILWAY FACILITIES IN DIFFERENT STATES, 1913.

State.	Population, 30th June, 1913.	Area.	Per Mile of Line Open.	
			Population.	Area.
	Number.	Sq. miles.	Number.	Sq. miles.
New South Wales*	1,809,667	310,372	443	76.0
Victoria	1,390,381	87,884	379	24.0
Queensland	656,224	670,500	133	136.4
South Australia	433,685	380,070	200	175.3
Western Australia	313,940	975,920	100	311.6
Tasmania	194,521	26,215	289	38.9
Northern Territory	3,756	523,620	25	3,611.1
Commonwealth	4,802,174	2,974,581	255	158.4

* Including Federal Territory.

6. **Classification of Lines according to Gauge, 1912-13.**—The subjoined tables shew the total mileage, exclusive of sidings and cross-overs, of (i.) Government railways; (ii.) Private railways open to the public for general traffic; and (iii.) Private lines used for special purposes, classified according to gauge. Particulars of Government railways are up to 30th June, 1913, of private railways open for general traffic to the 31st December, 1912, and of private railways open for special purposes to the 31st December, 1911.

GOVERNMENT AND PRIVATE RAILWAYS.—CLASSIFICATION ACCORDING TO GAUGE, 1912-13.

State.	Mileage having a Gauge of—					Total.
	5 ft. 3 in.	4 ft. 8½ in.	3 ft. 6 in.	2 ft. 6 in.	2 ft.	
GOVERNMENT RAILWAYS.						
New South Wales ...	Miles. ...	Miles. 3,930	Miles. ...	Miles. ...	Miles. ...	Miles. 3,930
Victoria ...	3,525	...	...	122	...	3,647
Queensland ...	...	...	4,524	...	...	4,524
South Australia ...	723	...	1,445*	...	...	*2,168
Western Australia ...	...	...	2,854	...	...	2,854
Northern Territory ...	...	...	145	...	...	145
Total, Mainland...	4,248	3,930	8,968	122	...	17,268
Tasmania ...	...	...	483	...	24	507
Commonwealth ...	4,248	3,930	9,451	122	24	17,775
PRIVATE RAILWAYS OPEN FOR GENERAL TRAFFIC.						
New South Wales ...	45	72½	36	...	...	153½
Victoria ...	14	...	...	...	...	14
Queensland ...	...	...	284	...	107	391
South Australia ...	...	...	...	...	...	...
Western Australia ...	...	...	277	...	...	277
Tasmania ...	...	...	156	...	10	166
Commonwealth ...	59	72½	753	...	117	1,001½
PRIVATE RAILWAYS OPEN FOR SPECIAL PURPOSES.						
New South Wales ...	...	110	3½	...	...	113½
Victoria ...	37	...	...	...	...	37
Queensland ...	...	...	17	...	4	21
South Australia ...	...	...	34	...	...	34
Western Australia ...	...	...	625	...	71½†	696½
Tasmania ...	...	...	42	...	14	56
Commonwealth ...	37	110	721½	...	89½	958
TOTAL.						
New South Wales ...	45	4,112½	39½	...	...	4,197
Victoria ...	3,576	...	...	122	...	3,698
Queensland ...	...	...	4,825	...	111	4,936
South Australia ...	723	...	1,479*	...	...	*2,202
Western Australia ...	...	...	3,756	...	71½	3,827½
Tasmania ...	...	...	681	...	48	729
Northern Territory ...	...	...	145	...	...	145
Commonwealth ...	4,344	4,112½	10,925½	122	230½	19,734½

* Including the mileage (478) of the Port Augusta to Oodnadatta line leased to the South Australian Government by the Commonwealth Government on 1st January, 1911. † Including 26 miles of 1 ft. 8 in. gauge.

B) Government Railways.

1. **Mileage Open, 1901 to 1913.**—The following table shews the length of Government railways open for traffic on the 30th June in the years 1901-2 and 1908-13:—

GOVERNMENT RAILWAYS.—MILEAGE OPEN FOR TRAFFIC FOR 1901-2 and 1908-13.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'wealth.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1901-2 ...	3,026	3,302	2,801	1,736	1,360	*462	145	12,832
1907-8 ...	3,472	3,396	3,359	1,879	1,943	463	145	14,657
1908-9 ...	3,623	3,410	3,498	1,838	2,044	463	145	15,071
1909-10 ...	3,643	3,490	3,660	1,912	2,144	469	145	15,463
1910-11 ...	3,760	3,523	3,867	†1,935	2,375	470	145	16,075
1911-12 ...	3,832	3,622	4,266	†1,939	2,598	496	145	16,898
1912-13 ...	3,930	3,647	4,524	†2,168	2,854	507	145	17,775

* To the 31st December. † Including the mileage (478) of the Port Augusta to Oodnadatta line leased to the South Australian Government by the Commonwealth Government on 1st January, 1911.

The following statement shews the actual mileage opened for traffic in the year 1912-13, and also the annual average increase in mileage opened since 1903 in each State:—

GOVERNMENT RAILWAYS.—MILEAGE OPENED ANNUALLY.

State ...	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	N.T.	C'wlth
Mileage opened during 1912-13	98	25	258	229	256	11	...	877
Average annual mileage increase (1904 to 1913) ...	79	26½	181	43	134	4½	...	468

NOTE.—Owing apparently to remeasurements of lines in New South Wales and Western Australia, the mileages given in this table do not agree with those open for traffic given in the previous table.

(i.) *New South Wales.* During the year ended 30th June, 1913, the following lines were opened for traffic:—Rookwood to Regent's Park (2 miles); Urana to Oaklands (16½ miles); and Dungog to Taree (83 miles).

(ii.) *Victoria.* The following lines were opened for traffic during 1912-13:—Noradjuha to Toolando (11½ miles); and Jeparit to Lorquon (13½ miles), a total of 25 miles.

(iii.) *Queensland.* The increase of 258 miles in the mileage opened for traffic in 1912-13 was due to the opening of the following lines:—Cordalba to Dallarnie (31 miles); Bundaberg to Woongarra Junction (1 mile); Mt. Morgan to Wowan (29 miles); Blackall to Malvernton (23 miles); Benarkin to Yarraman Creek (15 miles); Allora to Goomburra (9 miles); Thallon to Dirranbandi (39 miles); 17-Mile to Cooyar (21 miles); Westgate to Yarronvale (49 miles); Malbon to Duchess (36 miles); and Babinda to Mooliba (5 miles).

(iv.) *South Australia.* The lines opened for traffic in this State during the year 1912-13 were those from Tailem Bend to Brown's Wells (96½ miles), Yeelanna to Minnipa Hill (106½ miles), and Cummins to Ugarra (25 miles).

By the transfer to the Commonwealth Government of the line from Port Augusta to Oodnadatta, the railways of the State have undergone a reduction to the extent of 478 miles. This line has, however, been leased to the State by the Commonwealth Government as from the 1st January, 1911, and is therefore included in the mileage belonging to this State.

(v.) *Western Australia.* The following new sections of railway were taken over from the Public Works Department during the year 1912-13 and opened for public traffic:—Port Hedland-Marble Bar (114½ miles), Tambellup to Ngowangerup (23½ miles), Upper Darling Range extension (1½ miles), Northampton to Ajana (33 miles), Ngowangerup to Ongerup (34½ miles), and Quairading to Bruce Rock (48½ miles), a total of 255½ miles.

(vi.) *Tasmania.* During the year 1912-13 an extension from Burnie as far as Wynyard (11 miles) was opened for traffic.

2. Non-conformity of Gauge.—With but few exceptions, all the railway lines in the Commonwealth open for general traffic are now owned and managed by the respective States in whose territory they run, but, unfortunately for the purpose of interstate traffic, the construction of the various systems in different parts of Australia has proceeded without uniformity of gauge. In 1846 Mr. Gladstone, then Colonial Secretary, recommended in a despatch to the Governor of New South Wales that the 4 ft. 8½ in. gauge should be adopted. In 1850, however, the engineer to the Sydney Railroad and Tramway Company strongly advocated the adoption of the 5 ft. 3 in. gauge, and in 1852 an Act was passed making it compulsory that all railways in New South Wales should be constructed to the wider gauge, the Governors of Victoria and South Australia being duly advised of the step that had been taken. In 1852, however, the company mentioned, having changed its engineer, also changed its views as to the gauge question, and in the following year succeeded in obtaining the repeal of the Act of 1852 and in passing another, under the provisions of which the narrower gauge was made imperative. This step was taken without the concurrence of the other States concerned, and a considerable amount of ill-feeling arose, especially in Victoria, where two private companies had already placed large orders for rolling stock constructed to the broad gauge originally chosen. The result was that it was decided in Victoria to adhere to the 5 ft. 3 in. gauge as the standard gauge for that State, while the Sydney Railroad and Tramway Company proceeded with the construction of its lines to the 4 ft. 8½ in. gauge, and these two gauges have since been adhered to as the standard gauges of the respective States. The Queensland Government had at the outset adopted a gauge of 3 ft. 6 in. as being best suited to the requirements of the colony, and has since adhered to that gauge throughout the State, so that all goods have to be discharged and reloaded at the boundary between that State and New South Wales. In South Australia the broad gauge of Victoria was at first adopted, and the part of the interstate line between Adelaide and the Victorian boundary was constructed to that gauge, so that the line from Melbourne to Adelaide is uniform. In the lines which have been constructed more recently, however, and in the Northern Territory, the South Australian Government has, with a view to economy in construction, adopted a gauge of 3 ft. 6 in. In Western Australia and Tasmania the 3 ft. 6 in. gauge was also adopted. It was recognised in both these States that the construction of railways was essential to their proper development, but as their financial

resources would not bear a heavy initial expenditure in connection with the establishment of railway lines, it was decided to adopt the narrow gauge. In Victoria, light railways have been constructed in recent years to a gauge of 2 ft. 6 in., whilst in Tasmania short lengths have been laid down to a 2 ft. gauge.

3. Interstate Communication.—Until the railway systems of the eastern States were connected at the common boundaries the inconvenience of non-conformity of gauge was not felt. Since then, however, the necessary transshipments of both passengers and goods have been a source of trouble, delay, and expense. On the 14th June, 1883, a railway bridge over the River Murray at Wodonga was opened for traffic, and communication was then established between Melbourne and Sydney. On the 19th January, 1887, the last section of the Victorian line to Serviceton, on the South Australian border, was completed, and a junction was thus effected with the South Australian line to Adelaide. On the 16th January, 1888, a junction was effected between the New South Wales and Queensland lines at Wallangarra, but there was still a break in the line from Sydney at the Hawkesbury River, thirty-six miles from Sydney. This last link was, however, completed on the 1st May, 1889, by the opening of the Hawkesbury River bridge, 2900 feet in length, and railway communication was thus established between the four capital cities, Brisbane, Sydney, Melbourne, and Adelaide.

The effect of the transcontinental railway now under construction will be that Western Australia will also be linked to the other States and an unbroken line of communication established from one end of the continent to the other. The construction, moreover, of lines, recently decided upon, connecting Victoria with the Riverina district in New South Wales and with the wheat growing districts of South Australia, will undoubtedly facilitate interstate exchange and will allow the produce of inland areas to find its natural outlet.

4. Unification of Gauge.—The development of the railway systems of the Commonwealth has shewn that the adoption of different gauges on the main lines in the several States was a serious error. The extra cost, delay, and inconvenience incurred by the necessity of transferring through-passengers and goods at places where there are breaks of gauge, though not at present of any appreciable magnitude, are becoming more serious as the volume of business increases. As an indication of the extra cost thus involved the junction charges on interstate traffic between New South Wales and Victoria range from 1s. 6d. to 2s. 6d. per ton.

Although the cost of alteration to a uniform gauge would be great, many propositions have from time to time been put forward with the object of securing such a gauge, and attention has been drawn to the importance of the unification of gauges before further expenditure on railway construction is incurred by the States. The problem is, however, one which is by no means easy of solution, and the difficulties are increased by the introduction of what may be called questions of local or State policy.

The first question that naturally arises in considering the problem is as to which gauge should be adopted as the universal gauge of the Commonwealth. As regards Government railways only, the New South Wales gauge has a mileage of 3930; Victoria and South Australia have a combined mileage of 4248 of 5 ft. 3 in. gauge; while Queensland, South Australia, Western Australia, and the Northern Territory have together 8968 miles of 3 ft. 6 in. gauge. By far the greater part of the mileage of private railways open for general traffic has also been constructed to the 3 ft. 6 in. gauge.

The mere question of preponderance of mileage, therefore, indicates the 3 ft. 6 in. gauge for adoption. But this question is obviously subordinate to those involving engineering and economic considerations. Thus, the relative efficiency from the widest point of view, the relative costs of alterations of permanent way and rolling stock, of carrying capacity and speed, that is to say, questions of a technical nature about which figures are not available, enter into the grounds for decision. As regards the unification of the New South Wales and Victorian lines, the advantage of reducing the broad gauge to the 4 ft. 8½ in. gauge is that there would be no necessity for the alteration of tunnels, cuttings, bridges, or viaducts.

In 1897 a conference was held between the Railway Commissioners of New South Wales, Victoria, and South Australia to consider and report upon the unification of the railway gauges of these States. In their report the Commissioners estimated the cost of converting all the lines in the three States to a 5 ft. 3 in. gauge at £4,260,000, and to one of 4 ft. 8½ in. at £2,360,500. In 1903 the question was again brought up, more particularly with regard to the proposed transcontinental line, and the Engineers-in-Chief reported in favour of a gauge of 4 ft. 8½ in. At the Premiers' Conference, held in January 1912, the subject was again under consideration, but no decision was come to.

In November 1912, another conference of railway engineers representing the six States and the Federal Government was held, and the question of unification of gauge was again discussed. The necessity for such a step was emphasised, and a conclusion was come to that the relative advantages of the 5 ft. 3 in. and 4 ft. 8½ in. gauges, from the point of view of efficiency and economy of working, were approximately equal, and that the determination of the most suitable gauge should be made on the basis of cost. Owing, however, to the fact that track mileage, ton mileage, and wages, had increased 90 per cent., 200 per cent., and 50 per cent., respectively, since 1897, together with a correspondingly large increase in the cost of material, the Conference estimated the cost of converting all lines to a 5 ft. 3 in. gauge at £51,659,000 and to a 4 ft. 8½ in. gauge at £37,164,000. It recommended that the latter gauge should be adopted, and pointed out that the longer the work of conversion was delayed, the greater the cost would become. An alternative scheme by which the main trunk lines and more important branches should be converted was also proposed, as possibly meeting immediate requirements and being, from a Federal point of view, perhaps a more attractive proposition, than any other which could be suggested at the present time. The estimated cost of this limited scheme was £12,142,000. The subject was again under discussion at the Premiers' Conference, held in Melbourne, in April 1914, when it was decided to refer the matter to the Interstate Commission, that the latter body might furnish a report as to the benefits of unification, its cost, and the apportionment of such cost.

In February, 1911, a conference of officers of the Commonwealth and State Governments was held in Melbourne under the presidency of the Minister for Defence to consider matters of defence as affected by the facilities for transport of troops and armaments in the event of war. The proposal laid before the conference was that a railway central staff should be formed, so that in case of war the Defence Department would have at hand not only a well considered scheme of mobilisation, but also an organised staff of men ready to carry out the work of transport.

5. Average Mileage Worked, Train Miles Run, Number of Passenger Journeys, and Tonnage of Goods and Live Stock Carried, on Government Railways.—The table at head of page 602 gives the actual mileage open for traffic at the end of each financial year, but, in considering the returns relating to revenue and expenditure, and other matters, it is desirable to know the average number of miles actually worked during each year. The next table shews the average number of miles worked, the total number of train miles run, the number of passenger journeys, and the tonnage of goods and live stock carried by the Government railways of each State during the years 1901-2 and 1908-13 inclusive:—

GOVERNMENT RAILWAYS.—AVERAGE MILEAGE WORKED, TRAIN MILES RUN, NUMBER OF PASSENGER JOURNEYS, AND TONNAGE OF GOODS AND LIVE STOCK CARRIED, 1901 and 1908-13.

Year.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	West. Aust.	Tasmania.	N. Ter.	C'wealth.
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AVERAGE MILEAGE WORKED.

1901-2	2,953	3,265	2,801	1,736	1,356	468*	145	12,724
1908-9	3,560	3,397	3,444	1,881	1,971	470	145	14,868
1909-10	3,625	3,441	3,533	1,893	2,102	474	145	15,213
1910-11	3,713	3,505	3,795	1,915	2,296	478	145	15,837
1911-12	3,799	3,543	4,144	1,938	2,471	503	145	16,543
1912-13	3,872	3,639	4,351	2,012	2,783	508	145	17,310

TRAIN MILES RUN (,000 OMITTED).

1901-2	11,649	11,285	5,666	4,196	4,508	903*	30	38,237
1908-9	15,074	11,291	7,391	4,925	4,102	1,029	31	43,843
1909-10	15,468	11,706	8,157	5,431	4,398	1,060	30	46,240
1910-11	17,007	12,973	9,367	5,946	4,963	1,041	30	51,327
1911-12	18,521	13,836	10,327	6,244	5,227	1,047	30	55,232
1912-13	19,184	14,235	11,464	6,625	5,623	1,007	31	58,169

NUMBER OF PASSENGER JOURNEYS (,000 OMITTED).

1901-2	30,885	57,465	18,421	9,643	8,158	762*	4	115,338
1908-9	52,052	81,021	11,522	13,853	12,717	1,547	3	172,715
1909-10	53,644	85,280	13,259	15,282	13,171	1,351	3	182,290
1910-11	60,920	93,796	14,791	16,620‡	14,828	1,682	2	202,639
1911-12	70,707	104,235	17,081	18,353†	16,390	1,715	2	228,483
1912-13	79,490	111,514	19,899	19,382†	17,920	1,649	1	249,855

TONNAGE OF GOODS AND LIVE STOCK CARRIED (,000 OMITTED).

1901-2	6,468	3,434	1,882	1,392	1,888	407*	2	15,473
1908-9	9,299	4,167	2,662	2,166	1,997	483	3	20,777
1909-10	8,393	4,468	2,831	2,481	2,242	439	2	20,556
1910-11	10,355	4,968	3,295	2,791‡	2,489	364	2	24,204
1911-12	10,910	5,298	3,494	2,782†	2,542	470	2	25,498
1912-13	11,666	5,150	3,798	3,016†	2,866	465	3	26,964

* For the calendar year 1902. The average mileage worked is larger than the actual mileage open, owing to the fact that the Government Railways have running powers over certain private lines. † Exclusive of Port Augusta-Oodnadatta line. ‡ These figures are partly estimated the actual returns excluding journeys by season ticket holders. § Exclusive of Port Augusta-Oodnadatta line for six months ended 30th June, 1911. ¶ Exclusive of live stock. ¶ Exclusive of live stock returns for Tasmania.

6. Length and Gauge of Railway Systems in each State.—A map showing the State railway lines, and also some private lines open to the public for general traffic, in the different States of the Commonwealth is given on page 621 hereafter. In all the States the Government railways are grouped, for the convenience of administration and management, into several divisions or systems, some of which have already been briefly referred to above in dealing with the history of construction of the railways. The subjoined summary shews concisely the gauge and length of the main and branch lines included in each division or system of the different States of the Commonwealth for the year ended the 30th June, 1913:—

GOVERNMENT RAILWAYS, 1912-13.

Particulars.	Length.		Gauge.	
	Miles.	ft.	in.	
1. NEW SOUTH WALES.				
(i.) The Northern line and branches—				
(a) Main line. Strathfield-Wallangarra ...	486½	4	8½	
(b) Branch lines ...	475	4	8½	
(ii.) The North Coast line and branches—				
(a) Main line. West Maitland-Murwillumbah ...	266½	4	8½	
(b) Branch lines ...	18	4	8½	
(iii.) The Western line and branches—				
(a) Main line. Granville-Bourke ...	495	4	8½	
(b) Branch lines ...	781	4	8½	
(iv.) The Southern line—				
(a) Main line. Granville-Wodonga ...	381	4	8½	
(b) Branch lines ...	840½	4	8½	
(v.) The South-coast (Illawarra) line—				
(a) Main line. Sydney to Nowra... ..	93	4	8½	
(b) Branch lines ...	7	4	8½	
(vi.) Suburban lines ...	47	4	8½	
(vii.) Broken Hill line. Broken Hill-Tarrawingee ...	40	3	6	
Total	3,930			
2. VICTORIA.				
(i.) The South-eastern system—				
(a) Main lines. Dandenong-Port Albert, Aspendale-Stony Point ...	145	5	3	
(b) Branch lines ...	43½	5	3	
(ii.) The Eastern system—				
(a) Main lines. Dandenong-Bairnsdale, Bayswater-Gembrook, Croydon-Healesville ...	{ 18 202	2 5	6 3	
(b) Branch lines ...	{ 97 29	5 2	3 6	
(iii.) The North-eastern system—				
(a) Main line. Craigieburn-Wodonga ...	171	5	3	
(b) Branch lines ...	{ 30 446½	2 5	6 3	
(iv.) The Northern system—				
(a) Main line. Digger's Rest-Echuca ...	135	5	3	
(b) Branch lines ...	1,021	5	3	
(v.) The North-western system—				
(a) Main line. Rockbank-Serviceton ...	266	5	3	
(b) Branch lines ...	259½	5	3	
(vi.) The Western and South-western system—				
(a) Main line. Werribee-Portland ...	272	5	3	
(b) Branch lines ...	{ 44½ 273½	2 5	6 3	
(vii.) The Suburban system— Including the lines to Aspendale, Dandenong, Bayswater, Croydon, Hurst's Bridge, Craigieburn, Digger's Rest, Rockbank, and Werribee ...	194½	5	3	
Total	3,647½			

Particulars.		Length.	Gauge.
3. QUEENSLAND.			
(i.) The Southern division—		Miles.	ft. in.
(a)	The Southern line. Ipswich-Wallangarra ...	221	3 6
(b)	The Western line. Gowrie Junction-Cunnamulla ...	545	3 6
(c)	The South-western line. Warwick-Talwood ...	256	3 6
(d)	The Nth.-coast line. Northgate Junction-235 mls. 14 chs. ...	234	3 6
(e)	The South-coast line. Sunnybank-Tweed Heads ...	62	3 6
(f)	Suburban lines	73	3 6
(g)	Branch lines	788	3 6
(ii.) The Central division—			
(a)	The Coast line. 235 miles 14 chains-Rockhampton ...	161	3 6
(b)	The Central line. Archer Park-Longreach ...	429	3 6
(c)	Branch lines	385	3 6
(iii.) The Northern division—			
(a)	Mackay line	63	3 6
(b)	Bowen line	48	3 6
(c)	The Great Nthn. Rlwy. Townsville-Selwyn branches ...	790	3 6
(d)	Cairns line	305	3 6
(e)	Cooktown line	68	3 6
(f)	Normanton line	96	3 6
Total		4,524	...
4. SOUTH AUSTRALIA.			
(i.) The Midland system—			
(a)	Main line. Adelaide-Terowie	140	5 3
(b)	Branch lines	128	5 3
(ii.) The Northern system—			
(a)	Terowie-Quorn	94½	3 6
(b)	Other lines	455	3 6
		5	5 3
(iii.) The Southern system—			
(a)	Main line. Adelaide to Serviceton	194½	5 3
(b)	Branch lines	158½	5 3
(iv.) The South-eastern system—			
(a)	Wolseley-Mount Gambier	112	3 6
(b)	Branch lines	113	3 6
(v.)	Port Broughton line	10	3 6
(vi.) The Western system—			
	Port Lincoln-Ungarra	182½	3 6
(vii.)	Murray lands lines. Taillem Bend to Meribah ...	96½	5 3
Total		1,689½	...
5. WESTERN AUSTRALIA.			
(i.) Eastern railway—			
(a)	Main line. Fremantle-Beverley	111	3 6
(b)	Branch lines	177	3 6
(ii.) Eastern Goldfields railway—			
(a)	Main line. Northam-Laverton	520	3 6
(b)	Branch lines	346½	3 6
(iii.) South-western railway—			
(a)	Main line. Perth-Bunbury	115	3 6
(b)	Branch lines	368½	3 6
(iv.) Great Southern railway—			
(a)	Beverley-Albany Jetty	243	3 6
(b)	Branch lines	282	3 6
(v.) Northern railway—			
(a)	Main line. Geraldton-Meekatharra	333½	3 6
(b)	Branch lines	208½	3 6
(vi.)	Hopetoun-Ravensthorpe railway	34	3 6
(vii.)	Port Hedland-Marble Bar	114½	3 6
Total		2,853½	...

Particulars.		Length.	Gauge.
6 TASMANIA.		Miles.	ft. in.
(i.)	Main line. Hobart-Evandale Junction ...	124 $\frac{1}{4}$	3 6
(ii.)	Derwent Valley line. Bridgewater-Glenora ...	30 $\frac{1}{4}$	3 6
(iii.)	Apsley line. Brighton Junction-Apsley ...	26	3 6
(iv.)	Parattah-Oatlands line ...	4 $\frac{1}{2}$	3 6
(v.)	Fingal line. St. Mary's-Conara ...	46 $\frac{1}{2}$	3 6
(vi.)	Western line. Launceston-Burnie ...	122 $\frac{1}{2}$	3 6
(vii.)	Chudleigh line ...	12 $\frac{1}{2}$	3 6
(viii.)	North-eastern line. Launceston-Scottsdale ...	71 $\frac{1}{2}$	3 6
(ix.)	Sorell-Bellerive line ...	14 $\frac{1}{2}$	3 6
(x.)	Zeehan line. Regatta Point-Zeehan ...	29 $\frac{1}{2}$	3 6
(xi.)	North-east Dundas tramway. Zeehan-Williamsford ...	20 $\frac{1}{4}$	2 0
(xii.)	Comstock tramway ...	4 $\frac{1}{2}$	2 0
Total ...		506 $\frac{3}{4}$	...
7. FEDERAL RAILWAYS.			
(i.)	Northern Territory—		
	Darwin to Pine Creek ...	145 $\frac{1}{2}$	3 6
(ii.)	South Australia—		
	Port Augusta to Oodnadatta ...	477 $\frac{3}{4}$	3 6
Total ...		623 $\frac{1}{4}$	...
Grand total of Government railways in the Commonwealth ...		17,775	...

7. Administration and Control of Government Railways.—In each State of the Commonwealth the policy has now been established that the railways should be kept under the control of the Government. This policy, as has been shewn, was early actualised in Australia, and, excepting in cases presenting unusual circumstances, may be regarded as the settled policy of the country. In previous Year Books (see No. 6, p. 693) will be found a description of the methods adopted by the various State Governments in the control and management of their railways.

8. Lines under Construction, and Authorised and Proposed Lines, 1913.—The following statement gives particulars up to the 30th June, 1913, of the mileage of Government railways (a) under construction, and (b) authorised for construction but not commenced :—

MILEAGE UNDER CONSTRUCTION AND AUTHORISED, 30th JUNE, 1913.

Particulars.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	Cwth.
Mileage under construction ...	534 $\frac{3}{4}$	242 $\frac{1}{4}$	360	154 $\frac{1}{4}$	471	12 $\frac{1}{4}$	1,774 $\frac{1}{2}$
Mileage authorised ...	636	224	1,551	924	143	...	2,878

(i.) *Lines under Construction.* In spite of the great extension of State railways which has taken place since the year 1875 throughout the Commonwealth, there are still, in some of the States, tracts of country of immense area, which are as yet practically undeveloped, and in which little in the nature of permanent settlement has been accomplished; the general policy in the States is to extend the existing lines inland, in the form of light railways, as settlement increases, and although it is true that lines which were not likely to be commercially successful in the immediate future have been constructed from time to time, for the purpose of encouraging settlement, the general principle that the railways should be self-supporting is kept in view. (a) In *New South*

Wales the lines under construction are chiefly of the "pioneer" class, and are made with a view to affording railway communication over level country to districts in which the traffic would not warrant the expenditure necessary to provide thoroughly equipped lines. As the traffic increases the permanent way is strengthened in order to allow the heavy types of engines to run over it. It is probable that railway extension in New South Wales, in the near future, will be mainly confined to lines of the "pioneer" class. The lines under construction on 30th June, 1913, were those from Taree to Wauchope (47½ miles), Macksville to Coff's Harbour (55 miles), and Glenreagh to South Grafton (27½ miles). The construction of 85½ miles of line necessary to connect Wauchope with Glenreagh has been authorised, and this line, when completed, will form an alternative main route between Newcastle and Brisbane. Other lines under construction are as follow:—Moree to Mungindi (77 miles), Forbes to Stockinbingal (83½ miles), Wagga to Tumbarumba (76½ miles), Parkes to Peake Hill (31 miles), Muswellbrook to Merriwa (51 miles), Dunedoo to Coonabarrabran (71 miles), Finley to Tocumwal (11½ miles), and Galong to Burrowa (17½ miles). (b) *Victoria*. In this State the following lines were under construction by the Board of Land and Works on the 30th June, 1913:—5 ft. 3 in. gauge: White Cliffs to Yelta (9¾ miles), Bairnsdale to Orbost (60 miles), Gheringhap to Maroona (100¾ miles), Crowlands to Navarre (23 miles), Benalla to Tatong (18½ miles), Rushworth to Colbinabbin (12 miles), and Chillingollah to Manangatang (18½ miles), making in all 242½ miles. (c) *Queensland*. In December, 1910, the North Coast Railway Act was passed. Under this Act a series of lines, when constructed, will link up a number of existing lines in such a way that a through line will be obtained from Rockhampton to Cairns, *via* Mackay and Townsville, a total distance of 569 miles. By the completion of this line it will be possible to travel from Cairns to the southern border of the State at Wallangarra, a total distance of about 1198 miles. At the same time the Great Western Railway Act was passed. Under this Act provision is made for the extension in a westerly or south-westerly direction of the lines already constructed to Wallal, Blackall, Winton, and Malbon, in such a manner that they will form junctions with a line to be made running north-westerly from Tobermory to Camooweal. These extensions, together with the north-westerly line, will make an aggregate distance of 1282 miles to be constructed. With the completion of both these schemes the railways of this State will be brought into direct communication with each other on both their east and west boundaries. On the 30th June, 1913, the following lines were under construction:—Woodford to Kileoy (17 miles), Gayndah to Mundubbera (23 miles), Keifton to Imbil (24 miles), Pialba to Urangan (4 miles), Logan to Canungra (21 miles), Dalby to Jandowae (28 miles), Miles to Juandah (44 miles), Cloncurry to Mount Cuthbert (42 miles), Malanda to Millaa Millaa (9 miles), and Dimbulah Junction to Mount Mulligan (29 miles). Of the Great Western Railway the following parts are under construction: Section A: From Yarronvale to Beechal Creek (26 miles); Section B: From Benlidi south-west (26 miles). The following parts of the North Coast Railway are under construction:—Section A: From Yaamba northwards towards St. Lawrence (20 miles); Section B: From Sarina southwards towards St. Lawrence (72 miles); Section D: From Ayr southwards to Burdekin River (5 miles); Section D: From Townsville northwards to Ingham (34 miles). (d) *South Australia*. In this State the lines under construction on the 30th June, 1913, were as follow:—Goodwood to Willunga (29½ miles), Brown's Well to Paringa (40¼ miles), and Pinnaroo to the Victorian Border (3½ miles), 5 ft. 3 in. gauge; Ungarra to Darke's Peak (52½ miles), Darke's Peak to the Hundred of Solomon (28½ miles), 3 ft. 6 in. gauge. (e) In *Western Australia* the following lines were in course of construction by the Public Works Department on the 30th June, 1913:—Dwellingup to Hotham (27 miles), Wickopin to Merredin (109 miles), Wongan Hills to Mullewa (198 miles), Brookton to Kunginn (50 miles), and Yilliminning to Kondinin (73 miles). (f) *Tasmania*. At the end of the year 1912-13, the line from Wynyard to Myalla was almost completed and was opened on 7th August, 1913.

(ii.) *Lines Authorised for Construction.* (a) *New South Wales*. In addition to the North coast railway extension between Wauchope and Glenreagh (85½ miles), the

construction of lines from Tullamore to Tottenham (33 miles), Condobolin to Broken Hill (373 miles), Glenreagh to Dorrigo (42 miles), Barellan to Mirool (32 miles), and Wyalong to Cudgellico (70½ miles had been authorised up to 30th June, 1913. (b) In *Victoria* the following lines were authorised, but their construction had not been commenced up to the end of June, 1913:—5 ft. 3 in. gauge. Tallangatta to Cudgewa (42½ miles), Swan Hill to Piangil (27½ miles), Sea Lake towards Pier Millan (17½ miles), Heywood to Mumbannar (39½ miles), Elmore to Cohuna (57½ miles), Hamilton to Cavendish (15½ miles), Rainbow towards Nyppo (10½ miles), and Linton to Skipton (12½ miles). (c) *Queensland*. In addition to the new lines upon which work has been commenced, lines from Kingaroy to Tarong (19 miles), Munbilla to Mt. Edwards (16 miles), Oakey to Mt. Russell (19 miles), Roma to Oralla (29 miles), Tomoulin to Cedar Creek (5 miles), and Wowan towards Dawson River (40 miles), have been approved of by Parliament, which has also authorised the construction of the following parts of the Great Western Railway: Section A, from Beechal Creek (169 miles); Section B, from 65 Miles (283 miles); Section B, from Winton (361 miles); and Section D, from Duchess (292 miles); and in the North Coast Railway, Section A, from Marlborough to St. Lawrence (81 miles); Section B, from 33 Miles south and Mackay northward (89 miles); Section C, from Midge Point to Proserpine (13 miles); Section D, from Armidale to near Cardwell (52 miles); Section E, from Mooliba to near Cardwell (83 miles). (d) In *South Australia* the construction of lines from Eudunda to Robertson (13½ miles), Mt. Gambier to the Victorian Border (12 miles), Alawoona to Loxton (21 miles), Karoonda to Peebinga (69 miles), Karoonda to Waikerie (76½ miles), on the 5 ft. 3 in. gauge, and from Minnipa to Decrés Bay (108 miles), and Yeelanna to Mt. Hope (23½ miles), on the 3 ft. 6 in gauge, has been authorised during the year 1912-13. It is proposed to electrify the Adelaide-Glenelg (6½ miles) line at an estimated cost of £115,000, and also in newly settled districts to construct light lines to be run by District Councils. (e) In *Western Australia* the following lines were authorised for construction up to the 30th June, 1913: Wagin to Bowelling (60 miles), Wyalkatchem to Mt. Marshall (52 miles) and Toodyay-Bolgart Extension (31 miles). (f) In *Tasmania* the construction of a line, 20 miles long, from Burnie to Flowerdale, was authorised by Parliament.

(iii.) *Transcontinental Lines*.—(a) *Port Augusta to Kalgoorlie Line*. The Transcontinental Railway Bill, passed in 1907 by the Federal Houses of Parliament, provided for the expenditure of a sum of £20,000 for a preliminary survey of a railway line connecting Western Australia with the eastern States. This survey was commenced in 1908, and was completed in March, 1909. The route of the preliminary survey may be seen on reference to the map on page 621 hereof; the route *via* Tarcoola was, for several reasons, chosen in preference to that *via* Gawler Range and Fowler's Bay. The estimated cost of construction and equipment of the line on the basis of a 4 ft. 8½ in. gauge, from Port Augusta in South Australia to Kalgoorlie in the Western Australia goldfields, a distance of 1063 miles, is £3,988,000. In September, 1911, a Bill was introduced into the Commonwealth Parliament to authorise the construction of the line, and became law in December following. In South Australia an Act was passed enabling the Commonwealth to acquire lands for the railway in South Australia not exceeding one-eighth of a mile wide on either side of the line, but no town lands are to be included at any time. In Western Australia an Act was also passed by which all necessary lands are to be granted to the Commonwealth for railway purposes. A Railway Construction Department was created by the Federal Government to carry out the work, and on the 14th September, 1912, the first sod of the Kalgoorlie-Port Augusta Railway was turned by the Governor-General at Port Augusta. A commencement has also been made at Kalgoorlie, and it is estimated that the line, which is being built from both ends, and will have a gauge of 4 ft. 8½ in., will be completed in three years. To the 28th March, 1914, 69½ miles had been laid in the South Australian Division, and 82½ miles in the Western Australian Division. (b) *Northern Territory Transcontinental Line*. Prior to the taking over of the Northern

Territory by the Commonwealth in 1911, the South Australian Government had on more than one occasion considered the practicability of extending the main Northern line from Adelaide, which at present terminates at Oodnadatta, as far as Pine Creek, the southern terminus of the Northern Territory line from Darwin. In 1892 an Act was passed and tenders were invited for the construction of 1063 miles of 3 ft. 6 in. line on the land grant system, the grant of land offered amounting to nearly 80 million acres, but no tenders were accepted. In the Northern Territory Acceptance Act the construction of a transcontinental line from South Australia is provided for; under that Act the property in the railways from Port Augusta to Oodnadatta and from Darwin to Pine Creek has been transferred to the Commonwealth Government as from the 1st January, 1911. While the former of these lines is being worked under the control of the South Australian Commissioner by agreement between the South Australian and Federal Governments, the latter Government contemplates taking over the control of the line at an early date. In the meantime, the extension of the Darwin-Pine Creek line southward to the Katherine River is being proceeded with by the Federal Government.

9. **Cost of Construction and Equipment of Government Railways.**—The total cost of construction and equipment of the State railways of the Commonwealth at the 30th June, 1913, amounted to £171,226,323, or to an average of £9633 per mile open for traffic. Particulars as to the capital expenditure incurred in each State are given in the following table:—

**GOVERNMENT RAILWAYS.—COST OF CONSTRUCTION AND EQUIPMENT TO
30th JUNE, 1913.**

State or Territory in which Situated.	Length of Line Open.	Total Cost of Construction and Equipment.	Average Cost per Mile Open.	Cost per Head of Population.
	Miles.	£	£	£
New South Wales	3,930	57,003,036	14,505	31.85
Victoria	3,647	47,568,336	13,043	34.21
Queensland	4,524	29,758,652	6,578	45.34
South Australia*	2,168	16,542,177	7,630	38.14
Western Australia	2,854	14,913,128	5,225	47.03
Tasmania	507	4,400,292	8,679	22.62
Northern Territory	145	1,040,702	7,177	277.07
Commonwealth	17,775	171,226,323	9,633	35.65

* Including Port Augusta-Oodnadatta line.

It will be seen that the lowest average cost per mile open is in Western Australia, and is only £5225, which is less than one-half of the highest average cost, namely, £14,505 in New South Wales, compared with an average of £9633 for the whole Commonwealth. In Western Australia there have been comparatively few engineering difficulties to contend with, and also the system has been adopted in that State of giving contractors the right to carry traffic during the period of their contracts, with the result that, at all events in all goldfields railway contracts, the cost of construction has been considerably lessened.

(i.) *Reduction of Cost per Mile in Recent Years.* The average cost per mile of the lines constructed lately in the Commonwealth is very much less than the figure given in the above table, in consequence of the construction of light "pioneer" lines, which have already been referred to, and which it was originally considered in New South Wales could be laid down at a cost of £1750 per mile (exclusive of stations and bridges). It

should also be remembered that in the early days of railway construction there were considerable engineering difficulties to overcome, and that labour was scarce and dear. Since 1892 over one thousand four hundred miles of the "pioneer" lines have been opened in New South Wales, the average cost ranging from about £2000 to £7500 per mile, according to the difficulties met in the country traversed. The lowest cost per mile for any line previously constructed had been that of the line from Nyngan to Cobar, the average cost of which, to the end of June, 1913, was £3794. In Victoria also the cost of construction has been greatly reduced in recent years. The total cost to the 30th June, 1913, of the narrow gauge (2 ft. 6 in.) lines, having a length of one hundred and twenty-two miles, was only £324,438, which gives an average cost per mile of only £2659. In the other States also the cost of construction per mile has been reduced by building light railways as cheaply as possible. Fairly substantial permanent way is laid down with reduced ballast, and, as settlement progresses and traffic increases, the road is strengthened, and the stations and siding accommodation enlarged. The subjoined table gives examples of some of the more expensive lines, most of which were built in the early days:—

GOVERNMENT RAILWAYS.—EXAMPLES OF LINES CONSTRUCTED AT LARGE CAPITAL EXPENDITURE PER MILE OPEN.

Line.	Gauge.	Length.				Total Cost.	Average Cost per Mile.	Date of Opening.
		Double Line.	Single Line.	Third Line.	Total.			
NEW SOUTH WALES—	ft. in.	m. ch.	m. ch.	m. ch.	m. ch.	£	£	
Penrith to Bathurst ...	4 8½	60 26½	50 64½	...	111 10½	3,485,982	31,368	1876
Sydney to Kiama ...	4 8½	24 11½	48 36½	0 63½	73 31½	2,404,955	33,126	1887
Homebush to Waratah	4 8½	74 23½	21 12	2 22½	97 57½	3,420,247	36,004	1889
VICTORIA—		Miles.	Miles.	Miles.	Miles.			
Melbourne to Bendigo	5 3	100.89*	...	...	100.89	4,874,518	48,315	1862
N. Geelong to Ballarat	5 3	41.45*	11.76	...	53.41	1,915,030	35,990	1862

* Double lines and over.

The next table gives instances of lines which have been constructed in more recent years at a comparatively small cost per mile.

The average cost per mile of the 436.35 miles comprised in the above table was £36,907, whereas the average cost of the 365 miles referred to in the next table was £1840.

GOVERNMENT RAILWAYS.—EXAMPLES OF LINES CONSTRUCTED AT SMALL CAPITAL EXPENDITURE PER MILE OPEN.

Line.	Gauge.	Length.	Total Cost.	Average Cost per Mile.	Date of Opening.
NEW SOUTH WALES—					
Parkes to Condobolin ...	4 8½	62½	131,584	2,097	1898
Burren Junction to Collarenebri	4 8½	42½	103,586	2,434	1906
VICTORIA—					
Wangaratta to Whitfield ...	2 6	30½	39,327	1,290	1899
Wycheproof to Sealake ...	5 3	48	76,406	1,595	1895
Ultima to Chillingollah ...	5 3	20½	30,539	1,516	1909
QUEENSLAND—					
Dalby to Bell ...	3 6	23½	35,500	1,511	1906
Jericho to Blackall ...	3 6	71½	152,158	2,137	1908
SOUTH AUSTRALIA—					
Wandilo to Glencoe ...	3 6	9	11,454	1,255	1904
Cummins to Yeelanna ...	3 6	8¾	14,104	1,598	1909
WESTERN AUSTRALIA—					
Southern Cross to Bullfinch ...	3 6	22	36,821	1,674	1911
Narrogin to Wickepin ...	3 6	26½	40,142	1,515	1909

The comparisons afforded in the two preceding tables are subject to certain limitations, inasmuch as the figures in each case represent the total cost to date, and the cost is naturally greater in the case of the older lines. Further, the figures given represent the cost of construction only (i.e., are exclusive of cost of equipment), and cannot therefore be directly compared with the average cost per mile open given in the preceding table.

(ii.) *Capital Cost of Construction and Equipment, Total and per Mile Open.* The increase in the total capital cost of construction and equipment of Government railways in each State and in the Commonwealth for 1901-2 and for each year from 1908 to 1913 is shewn in the following table:—

**GOVERNMENT RAILWAYS.—CAPITAL COST OF CONSTRUCTION AND EQUIPMENT,
1901-2 and 1908-13.**

TOTAL COST (£,000 OMITTED).

Year.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	West. Aust.	Tas.	N. Ter.	C'wealth.
	£	£	£	£	£	£	£	£
1901-2	40,565	40,614	20,119	13,770	7,410	3,841 ¹	1,019	126,338
1908-9	47,613	42,486	23,335	13,626	11,017	4,004	1,041	143,182
1909-10	48,925	43,142	24,336	13,863	11,377	4,049	1,041	146,733
1910-11	50,863	44,122	25,899	14,375	12,020	4,080	1,041	152,400
1911-12	53,140	45,836	27,751	14,928	13,233	4,253	1,041	160,182
1912-13	57,003	47,568	29,759	16,542	14,913	4,400	1,041	171,226

COST PER MILE OPEN.

	£	£	£	£	£	£	£	£
1901-2	13,405	12,300	7,183	7,428	5,449	8,313 ¹	7,124	9,860
1908-9	13,142	12,459	6,688	7,217	5,387	8,648	7,177	9,500
1909-10	13,437	12,358	6,647	7,250	5,304	8,632	7,177	9,489
1910-11	13,534	12,524	6,696	7,429	5,060	8,675	7,177	9,481
1911-12	13,867	12,655	6,505	7,698	5,094	8,583	7,177	9,479
1912-13	14,535	13,043	6,578	7,630	5,225	8,679	7,177	9,633

1. To the 31st December, 1902.

(iii.) *Loan Expenditure on Railways.* The subjoined table shews the total loan expenditure on Government railways and tramways (including lines both open and unopen) in each State during the financial year 1901-2, and on railways only for the years 1908-9 to 1912-13. Figures shewing loan expenditures on railways only are not available for years prior to 1908-9.

GOVERNMENT RAILWAYS.—LOAN EXPENDITURE, 1901-2 and 1908-13.

Year.	N.S.W.	Victoria.	Q'and.	S. Aust.	W. Aust.	Tas.	C'wealth.
	£,000.	£,000.	£,000.	£,000.	£,000.	£,000.	£,000.
1901-2*	2,244	483	751	122	579	81†	4,260
1908-9	1,710	544	1,053	241	538	69	4,155
1909-10	2,064	657	1,263	383	529	100	4,996
1910-11	2,127	1,230	1,686	591	748	82	6,464
1911-12	2,851	1,703	2,855	789	1,317*	120*	9,635
1912-13	3,614	1,231	2,067	1,207	1,949	116*	10,184

* Including Tramways. † For the calendar year 1901.

The following statement shews the total loan expenditure to the 30th June, 1913 :—

GOVERNMENT RAILWAYS.—TOTAL LOAN EXPENDITURE IN EACH STATE AND IN THE COMMONWEALTH TO 30th JUNE, 1913.

State, etc. ...	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
Expenditure ...	£ 59,448,339	£ 44,484,056	£ 32,101,216	£ 16,033,551	£ 15,237,545	£ 4,670,042	£ 171,974,749

* Including Tramways.

10. Gross Revenue, Total, per Average Mile Worked, and per Train-mile Run.—

The following table shews the total revenue from all sources, the revenue per average mile worked, and the revenue per train-mile run in each State during 1901-2 and each financial year from 1909 to 1913 inclusive :—

GOVERNMENT RAILWAYS.—GROSS REVENUE, TOTAL, PER AVERAGE MILE WORKED, AND PER TRAIN MILE, 1901-2 and 1908-13.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust. †	W. Aust.	Tas.	N. Ter.	C'wealth.
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TOTAL GROSS REVENUE (£,000 OMITTED).

	£	£	£	£	£	£	£	£
1901-2 ...	3,669	3,368	1,382	1,065	1,521	*233	13	11,271
1908-9 ...	5,028	4,178	2,103	1,639	1,509	280	13	14,750
1909-10 ...	5,486	4,444	2,338	1,841	1,637	284	12	16,042
1910-11 ...	6,042	4,896	2,731	2,045	1,844	278	12	17,848
1911-12 ...	6,491	5,219	3,033	2,148	1,885	313	12	19,101
1912-13 ...	6,749	5,205	3,322	2,298	2,038	327	15	19,954

GROSS REVENUE PER AVERAGE MILE WORKED.

	£	£	£	£	£	£	£	£
1901-2 ...	1,242	1,031	493	625	1,122	*498	86	886
1908-9 ...	1,412	1,230	611	868	765	596	90	992
1909-10 ...	1,513	1,291	662	972	779	600	84	1,054
1910-11 ...	1,627	1,397	719	1,068	807	582	79	1,127
1911-12 ...	1,709	1,473	732	1,109	763	622	81	1,130
1912-13 ...	1,743	1,430	763	1,142	732	644	101	1,153

GROSS REVENUE PER TRAIN-MILE RUN.

	d.	d.	d.	d.	d.	d.	d.	d.
1901-2 ...	75.58	71.62	58.55	62.07	81.00	*61.99	99.27	70.74
1908-9 ...	80.06	88.81	68.29	79.87	88.25	65.31	100.85	80.74
1909-10 ...	85.12	91.11	68.80	81.49	89.35	64.33	97.05	83.26
1910-11 ...	85.27	90.58	69.96	82.55	89.19	64.06	90.59	83.45
1911-12 ...	84.12	90.53	70.48	82.59	86.53	71.73	93.43	83.00
1912-13 ...	84.43	87.77	69.54	83.26	86.98	77.99	112.82	82.33

* For the calendar year 1902. Including Port Augusta-Oodnadatta line.

11. Coaching, Goods, and Miscellaneous Receipts.—The gross revenue is composed of (a) receipts from coaching traffic, including the carriage of mails, horses, parcels, etc., by passenger trains; (b) receipts from the carriage of goods and live stock, and (c) rents and miscellaneous items. The subjoined table shews the gross revenue for 1901-2 and 1908-13, classified according to the three chief sources of receipts. The total of the three items specified has already been given in the preceding paragraph hereof.

COACHING, GOODS, AND MISCELLANEOUS RECEIPTS, 1901-2 and 1908-13.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.*	North'mn Terr.	C'wealth.
COACHING TRAFFIC RECEIPTS (£,000 OMITTED).								
	£	£	£	£	£	£	£	£
1901-2	1,368	1,580	435	373	443	110	...	4,309
1908-9	2,008	2,041	730	529	489	138	4	5,939
1909-10	2,124	2,143	816	582	507	139	4	6,315
1910-11	2,386	2,355	935	650	596	144	4	7,070
1911-12	2,692	2,624	1,069	713	631	152	4	7,895
1912-13	2,940	2,762	1,153	749	646	161	4	8,415

GOODS AND LIVE STOCK TRAFFIC RECEIPTS (£,000 OMITTED).

1901-2	2,264	1,720	862	689	1,037	116	...	6,688
1908-9	2,965	2,067	1,347	1,060	974	134	7	8,554
1909-10	3,291	2,222	1,500	1,208	1,066	134	7	9,428
1910-11	3,585	2,458	1,772	1,341	1,174	124	5	10,459
1911-12	3,716	2,507	1,940	1,384	1,174	148	5	10,874
1912-13	3,705	2,353	2,140	1,496	1,299	155	5	11,153

MISCELLANEOUS RECEIPTS (£,000 OMITTED).

1901-2	37	68	84	36	42	7	...	274
1908-9	56	70	26	50	45	8	2	257
1909-10	71	79	22	50	64	11	2	299
1910-11	71	83	24	54	74	10	3	319
1911-12	84	87	23	52	80	12	4	342
1912-13	103	91	28	53	93	12	6	386

* Tasmanian figures for 1902 are for year ended the 31st December.

(i.) *New South Wales.* The total earnings for the past year amounted to £6,748,985, an increase over the previous year of £257,512. A satisfactory increase is shown in passenger traffic receipts, but the goods traffic returns decreased by over £10,000. The net increase, though substantial, is considerably below that shown in 1911-12.

(ii.) *Victoria.* In Victoria, coaching traffic receipts showed an increase of £137,670 over the previous year, the increase in passenger receipts being £121,418. Goods traffic, on the other hand, decreased by £153,344.

(iii.) *Queensland.* In Queensland the increase in 1912-13 in gross earnings, £288,813 above 1911-12, is to some extent accounted for by the opening of new lines, but it is stated that the expansion of traffic upon the older established lines has been enormous. The chief increases in earnings were in respect of passengers £60,801, general merchandise £115,324, and minerals £64,589.

(iv.) *South Australia.* In this State every item of traffic gave an increased return on the figures of the previous year, the principal increases being in minerals (£39,494), general goods (£23,564), and passengers (£30,046). These figures are exclusive of the returns from the Port Augusta-Oodnadatta line.

(v.) *Western Australia.* In this State the earnings in 1912-13 shewed an increase of £153,249 as compared with 1911-12. Passenger traffic rendered an additional amount of £13,187, while goods and mineral receipts increased no less than £111,282.

(vi.) *Tasmania.* The gross revenue in 1912-13 shews an increase of £14,327 as compared with the previous year. This may be attributed to a good harvest, excellent markets on the mainland, renewed activity in mining, and the general prosperity of the State. Passenger traffic receipts afford an increase of £8659; while the increase in the revenue from goods and live stock is £6323.

The following table shews for the year 1912-13 the percentage which each class of receipts bears to the total gross revenue:—

PERCENTAGE OF REVENUES FROM VARIOUS SOURCES ON TOTAL REVENUE, 1912-13.

Particulars.	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	N. Ter.	C'wlth.
	%	%	%	%	%	%	%	%
Coaching traffic receipts...	43.56	53.06	34.72	32.58	31.22	49.15	23.3	42.17
Goods and live stock traffic receipts ...	54.9	45.19	64.44	65.08	63.2	47.23	31.46	55.88
Miscellaneous receipts ...	1.54	1.75	0.84	2.34	5.58	3.62	45.24	1.95

12. Coaching Traffic Receipts per Average Mile Worked, per Passenger-train Mile, and per Passenger Journey.—The subjoined table shews the receipts from coaching traffic per average mile of line worked, per passenger-train mile, and per passenger journey in each State and in the Commonwealth for the year ended the 30th June, 1913:—

GOVERNMENT RAILWAYS.—COACHING TRAFFIC RECEIPTS PER MILE WORKED, PER PASSENGER-TRAIN MILE, AND PER PASSENGER JOURNEY, 1912-13.

State.	Number of Passenger-Train Miles.*	Number of Passenger Journeys.	Coaching Traffic Receipts.			
			Gross.	Per Average Mile Worked.	Per Passenger-Train Mile.	Per Passenger Journey.
	No. ,000.	No. ,000	£ ,000.	£	d.	d.
New South Wales ...	9,667	79,490	2,940	759	72.99	8.87
Victoria ...	7,840	111,514	2,762	760	84.55	5.94
Queensland ...	3,288	19,899	1,153	265	84.16	13.90
South Australia† ...	2,804	19,382	749	372	64.02	9.25
Western Australia ...	2,485	17,920	646	232	62.39	8.65
Tasmania ...	437	1,650	161	316	88.42	23.43
Northern Territory	10	1	4	25	84.43	713.65
Commonwealth	26,531	249,856	8,415	486	76.12	8.08

* The returns include the undermentioned mixed-train mileage, which has been divided between passenger-train miles and goods-train miles in the proportion of one-third and two-thirds respectively in the case of the following States:—

New South Wales ...	1,446,004	Western Australia ...	1,037,360
Victoria ...	2,628,556	Tasmania ...	675,790

† Excluding the returns of the Port Augusta to Oodnadatta line.

The above table shews that, in the several States, there is a considerable difference in the amount of the average receipts per passenger journey. Disregarding the Northern Territory, this amount ranges from 5.94 pence in Victoria, where there is a large metropolitan suburban traffic, to 23.43 pence in Tasmania. The difference in these amounts cannot be accounted for by the amounts of rates charged, which are fairly uniform in the several States (see paragraph 20), but is largely due to the different traffic conditions which prevail on various lines in the Commonwealth (see paragraph 17). In order to adequately analyse these figures it would be necessary to have particulars regarding the number of passenger-miles, *i.e.*, the total distance travelled by passengers, in each State, which particulars are not generally available (see paragraph 18).

The preponderance in the number of passenger journeys in Victoria is accounted for, to a great extent, by the large number of metropolitan suburban passengers in that State. Of the total number of passengers carried in Victoria, 103,003,647 were metropolitan suburban passengers, *i.e.*, were carried between stations within twenty miles of Melbourne, while in New South Wales the number of suburban passengers (between stations within thirty-four miles of Sydney and Newcastle, and including Richmond and Braxton lines) was 70,732,975. In Sydney a large proportion of the metropolitan suburban traffic is carried on the electric and steam tramways, the number of passenger journeys during the year 1912-13 being 294,455,452. In Melbourne, on the other hand, the number of passengers carried on the cable tramways systems during the same period was 89,359,248; and on the St. Kilda-Brighton, Pahrnan-Malvern and the North Melbourne tramways was 13,617,964, making a total of 102,977,212, which is not as great as the number carried on the metropolitan suburban railways in Melbourne. This matter is referred to hereinafter. (See paragraph 17.)

13. Goods and Live-Stock Traffic Receipts per Mile Worked, per Goods-train Mile, and per Ton Carried.—The following table shews the gross receipts from goods and live-stock traffic per mile worked, per goods-train mile, and per ton carried, for the year ended the 30th June, 1913:—

GOVERNMENT RAILWAYS.—GOODS AND LIVE STOCK TRAFFIC RECEIPTS PER MILE WORKED, PER GOODS-TRAIN MILE, AND PER TON CARRIED, 1913.

State.	Number of Goods-Train Miles. *	Goods and Live-Stock Tonnage.	Goods and Live-Stock Traffic Receipts.			
			Gross.	Per Average Mile Worked.	Per Goods-Train Mile.	Per Ton Carried.
	No. '000	Tons '000.	£ '000.	£	d.	d.
New South Wales ...	9,517	11,666	3,705	956	93.45	76.22
Victoria ...	6,394	5,150	2,353	646	88.32	109.65
Queensland ...	8,176	3,798	2,141	492	62.84	135.29
South Australia† ...	3,539	3,016	1,495	743	101.38	112.33
Western Australia ...	3,138	2,866	1,299	466	99.34	108.77
Tasmania...	569	465	155	305	65.37	79.97
Northern Territory...	21	3	5	34	57.14	432.70
Commonwealth ...	31,354	26,964	11,153	644	85.37	99.27

* The returns include the undermentioned mixed-train mileage, which has been divided between passenger-train miles and goods-train miles in the proportion of one-third and two-thirds respectively in the case of the following States:—

New South Wales ...	1,446,004	} Western Australia ...	1,037,360
Victoria ...	2,628,556		Tasmania ...	675,790

† Excluding the returns of the Port Augusta to Oodnadatta line.

From the above table it may be seen that, disregarding the Northern Territory, the average amount of freight paid per ton ranges from 79.97 pence in Tasmania to 135.29 pence in Queensland. The remarks made in the preceding paragraph (12) hereof with regard to the average fare paid per passenger and to passenger-miles, apply equally to the average amount of freight paid per ton and to ton-miles.

14. **Working Expenses.**—In order to make an adequate comparison of the working expenses of the Government railways in the several States, allowance should be made for the variation of gauges and of physical and traffic conditions, not only on the railways of the different States, but also on different portions of the same system. Where traffic is light, the percentage of working expenses is naturally greater than where traffic is heavy; and this is especially true in Australia, where ton-mile rates are in many cases based on a tapering principle—*i.e.*, a lower rate per ton-mile is charged upon merchandise from remote interior districts—and where on many of the lines there is but little back-loading. Further, though efforts have been made from time to time to obtain a uniform system of accounts in the several States, the annual reports of the Commissioners do not yet comprise fully comparable data of railway expenditure.

The following table shews the total annual expenditure, comprising expenses on (a) maintenance of way, works, and buildings; (b) locomotive power—repairs and renewals; (c) carriages and wagons—repairs and renewals; (d) traffic expenses; (e) compensation; and (f) general and miscellaneous charges; and also the percentage of these expenditures upon the corresponding gross revenues in each State for 1901-2 and for each year 1908-13.

GOVERNMENT RAILWAYS.—TOTAL WORKING EXPENSES AND PERCENTAGES OF WORKING EXPENSES UPON GROSS REVENUES, 1901-2 and 1908-13.

Year.	N.S.W.	Victoria.*	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter	C'wealth.
TOTAL WORKING EXPENSES (£,000 OMITTED).								
	£	£	£	£	£	£	£	£
1901-2 ...	2,342	2,166	993	690	1,256	173†	35	7,655
1908-9 ...	2,953	2,515	1,227	940	974	204	13	8,826
1909-10 ...	3,276	2,818	1,414	1,069	1,097‡	212	13	9,999
1910-11 ...	3,691	3,099	1,563	1,256‡	1,216‡	216	13	11,054
1911-12 ...	4,170	3,442	1,917	1,363§	1,344	221	14	12,471
1912-13 ...	4,645	3,589	2,151	1,472§	1,507	217	14	13,595

PERCENTAGE OF WORKING EXPENSES TO GROSS EARNINGS.

	%	%	%	%	%	%	%	%
1901-2 ...	63.85	64.32	71.83	63.54	82.58	74.31†	276.70	67.92
1908-9 ...	58.72	60.19	58.35	57.39	64.56	72.89	99.52	59.84
1909-10 ...	59.73	63.41	60.48	58.09	66.99	74.52	101.53	61.70
1910-11 ...	61.09	63.30	57.25	61.39‡	65.95	77.55	113.67	61.94
1911-12 ...	64.23	65.95	63.22	63.46§	71.31	70.71	117.25	65.29
1912-13 ...	68.82	68.95	64.76	64.03§	73.93	66.45	94.16	68.13

* Including amounts paid for pensions and gratuities, and also special expenditures and charges for belated repairs and in reduction of deficiencies as follows:—For the year 1901-2, £115,244; and for 1907-8, £150,122. † For the calendar year 1902. ‡ Including the Port Augusta-Oodnadatta line for the six months ended 30th June, 1911. § Including the Port Augusta-Oodnadatta line. ¶ Including the cost of the replacement of rolling stock destroyed by fire (£22,649 in 1909-10 and £12,657 in 1910-11).

(i.) *New South Wales.* In this State the total working expenses in 1912-13 amounted to £4,644,881, an increase of £475,290 over the previous year. This increase was mainly owing to the large additional traffic, heavy repairs, and increased rates of pay to the staff.

(ii.) *Victoria.* In Victoria the increase in working expenses, £166,473, was mainly due to the additional train mileage, to advances in salaries and wages of the staff, and to the increased price of coal, oil, etc.

(iii.) *Queensland.* In this State the working expenses increased from £1,917,266 in 1911-12 to £2,150,991 in 1912-13. The increase is mainly due to the advances in salaries and wages, and to the expenditure which is being incurred by the additional mileage in course of construction.

(iv.) *South Australia.* In South Australia the working expenses in 1912-13 shewed an increase of £108,347, viz., from £1,363,354 to £1,471,701. This was to a large extent due to increased expenditure in the locomotive branch.

(v.) *Western Australia.* The cause of the increased expenditure (£162,623) in 1912-13 as compared with 1911-12, is mainly due to increased rates of pay.

(vi.) *Tasmania.* The working expenses in 1912-13 were £217,357, as compared with £221,172 in the previous year, being a decrease of £3815.

From the preceding table it may also be seen that during the last five financial years there have been for the whole Commonwealth increases in the percentages of working expenses to gross earnings. This increase is partly due to the fact that in four of the States, consequent on the favourable results of previous years, reductions were made in passenger fares and freight rates, while the increase in salaries and wages has also been an important factor, as well as the increased cost of materials.

(vii.) *Working Expenses per Average Mile worked and per Train Mile run.* The following table shews the working expenses per average mile worked and per train mile run in each State for the years 1901-2 and 1908-13:—

**GOVERNMENT RAILWAYS.—WORKING EXPENSES PER AVERAGE MILE WORKED
AND PER TRAIN MILE RUN, 1901-2 and 1908-13.**

Year.	N.S.W.	Victoria.*	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	Cwlth.
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WORKING EXPENSES PER AVERAGE MILE WORKED.

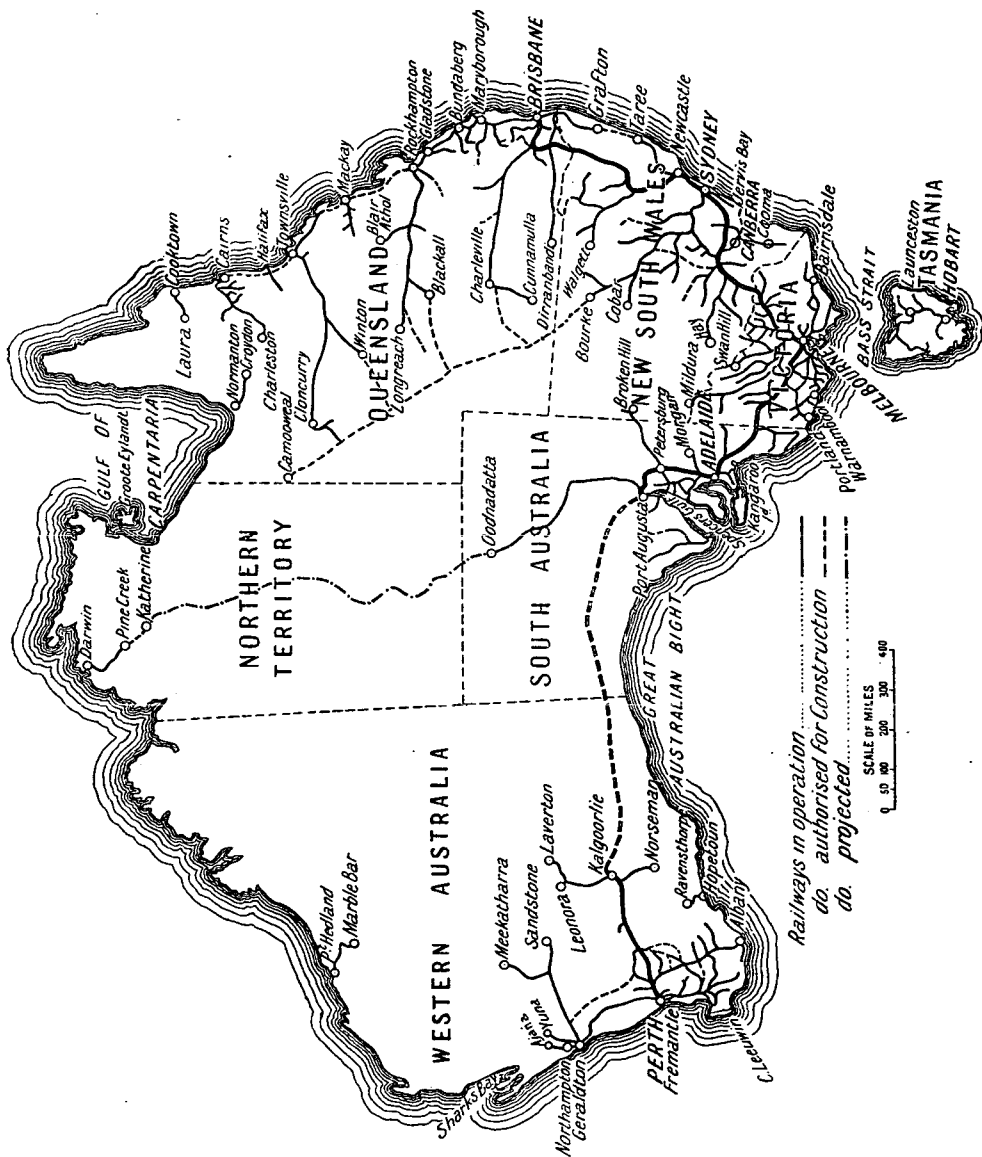
	£	£	£	£	£	£	£	£
1901-2 ...	793	663	354	397	927	†370	238	602
1908-9 ...	829	740	356	500	494	434	87	594
1909-10 ...	904	819	400	565	522	447	86	651
1910-11 ...	994	884	412	656	532	451	90	698
1911-12 ...	1098	971	463	704	544	440	92	754
1912-13 ...	1200	986	494	731	541	428	95	786

WORKING EXPENSES PER TRAIN MILE RUN.

	d.	d.	d.	d.	d.	d.	d.	d.
1901-2 ...	48.26	46.07	42.05	39.44	66.89	†46.06	274.67	48.05
1908-9 ...	47.01	53.46	39.84	45.84	56.98	47.60	100.37	48.32
1909-10 ...	50.84	57.77	41.61	47.34	59.86	47.94	98.54	51.38
1910-11 ...	52.09	57.34	40.05	50.68	58.82	49.68	102.98	51.69
1911-12 ...	54.03	59.70	44.55	52.41	61.71	50.72	109.55	54.19
1912-13 ...	58.11	60.52	45.03	53.32	64.30	51.83	106.23	56.09

* Including special expenditure and charges referred to in paragraph 14 hereof. † For the calendar year 1902.

THE GOVERNMENT RAILWAY SYSTEMS OF THE COMMONWEALTH.



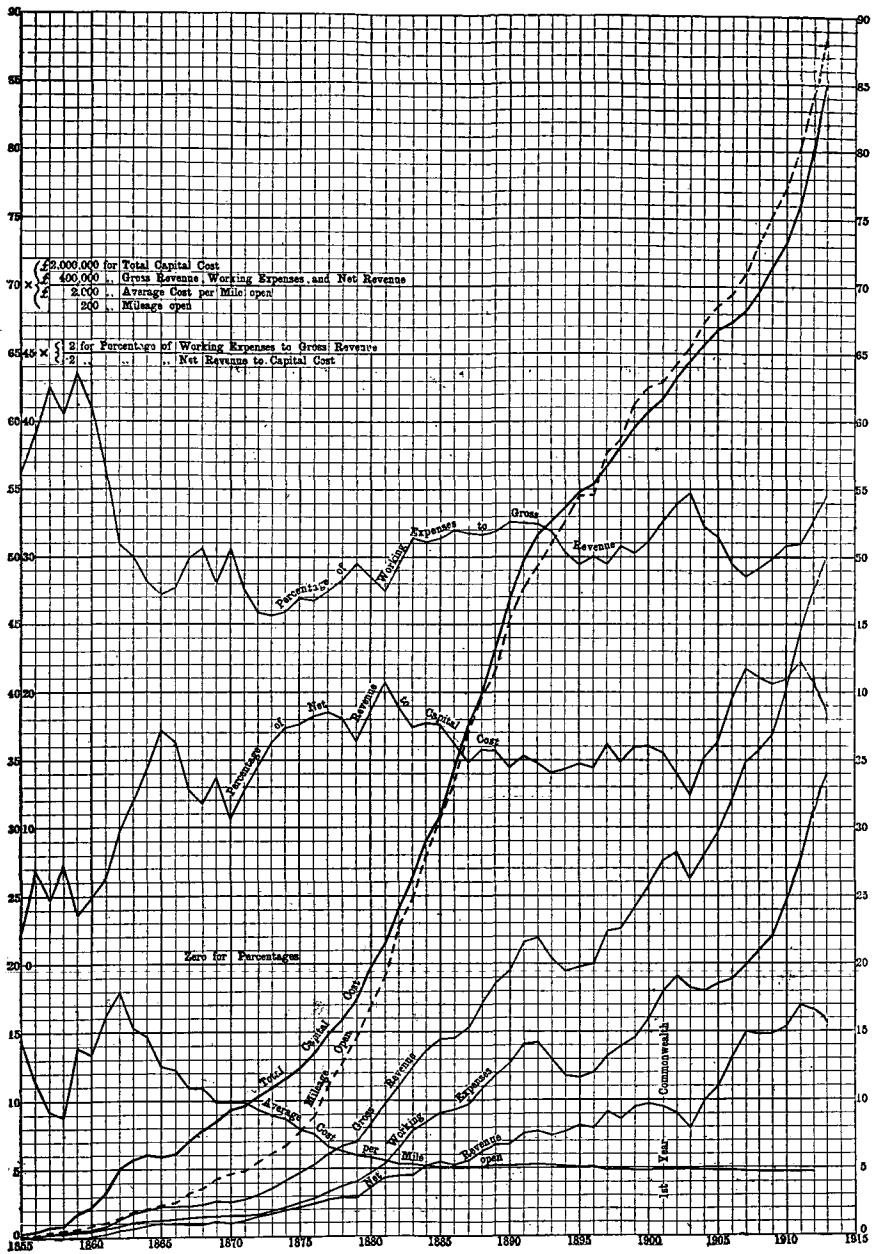
EXPLANATION OF MAP.—The continuous lines denote the existing railway lines of Australia, the heavier lines being the main routes.

Of the two transcontinental lines, viz., one joining the railways of South and Western Australia—and thus connecting continuously by railway Queensland, New South Wales, Victoria, South Australia, and Western Australia, and one connecting Oodnadatta in South Australia with Pine Creek in the Northern Territory, the former has been commenced, and is shewn - - - - ; while the latter, the construction of which is to be deferred for the present, is shewn - - - - - ;

LIST OF PRINCIPAL SECTIONS OF RAILWAYS:

Miles.	Miles.	Miles.
Townsville to Winton ... 368	Sydney to Hay ... 460	Adelaide to Broken Hill 335
Townsville to Selwyn ... 552	.. Nimmitabel ... 291	.. Oodnadatta 688
Rockhampton to Longreach 428	.. Melb'rne (17 hrs.) 582½	Perth to Laverton ... 586
Brisbane to Cunnamulla 604	Adelaide to Melb. (17 hrs.) 482½	.. Meekatharra ... 640
Brisbane to Sydney (26½ hrs.) 725	Melbourne to Merbein ... 358	.. Albany ... 340
Newcastle to Inverell ... 405	.. Swan Hill 215	Hobart to Launceston ... 133
Sydney to Bourke ... 508	.. Murrayville 357	

GRAPHS SHEWING THE FINANCIAL POSITION OF THE GOVERNMENT RAILWAYS OF THE COMMONWEALTH, 1855 to 1913.



(See pages—total capital cost, 612; mileage open, 602; gross revenue, 615; working expenses 619; net revenue, 626; average cost per mile, 614; percentage of working expenses to gross revenue, 619; percentage of net revenue to capital cost, 626.)

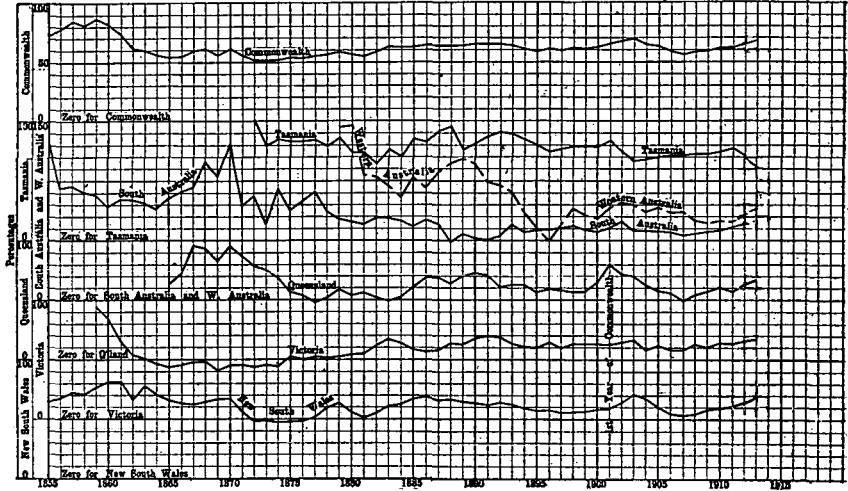
EXPLANATION OF GRAPHS.—In the above diagram the base of each small square represents throughout one year. The significance of the vertical height of each square varies, however, according to the nature of the several curves.

In the heavy curve denoting the total capital cost of the railways of the Commonwealth, the vertical side of each square denotes £2,000,000.

In the three lighter curves, representing (i.) gross revenue, (ii.) working expenses, and (iii.) net revenue, the vertical height of each single square denotes £400,000. For the curve of average cost per mile open, the vertical side of the small square denotes £2000. The mileage open is shown by a dotted curve, the vertical side of each square representing 200 miles.

For the percentages a new zero is taken at "20" on the scale for the general diagram. The vertical height of each square represents 2 per cent, in the curve shewing the percentage of working expenses to gross revenue. For the curve of percentage of net revenue to capital cost, the vertical height of each square represents only 0.2, that is to say, the vertical scale is ten times that of the preceding curve.

GRAPHS SHEWING PERCENTAGES OF WORKING EXPENSES TO GROSS REVENUE FOR GOVERNMENT RAILWAYS FOR STATES AND COMMONWEALTH, 1855 to 1913.

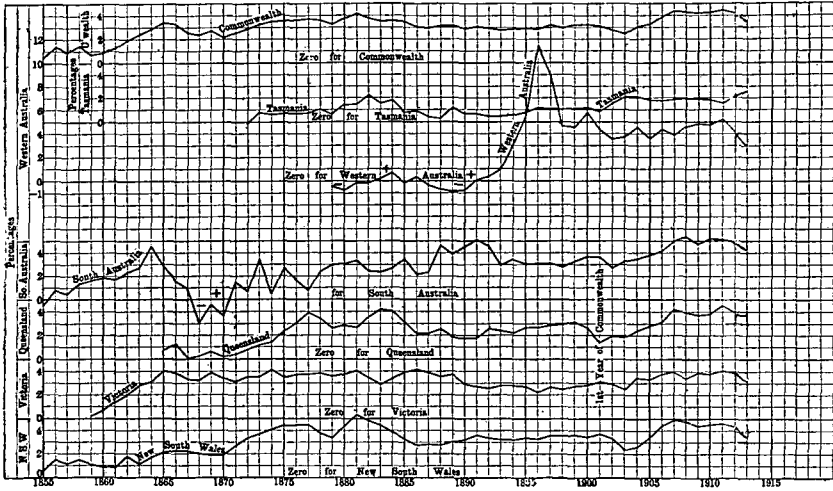


(See page 619.)

EXPLANATION OF GRAPHS.—In the above diagram the base of each small square represents throughout one year. The vertical side of a small square denotes throughout 10 per cent., the heavy zero lines being different for each State and the Commonwealth, with, however, one exception, viz., that the zero line for South Australia and Western Australia is identical.

The curve for Victoria commences in 1859; that for Queensland in 1865; that for Tasmania in 1872; and that for Western Australia in 1879, these being the years in which the Government Railway systems of the several States were inaugurated.

GRAPHS SHEWING PERCENTAGES OF NET REVENUE TO CAPITAL COST OF GOVERNMENT RAILWAYS FOR STATES AND COMMONWEALTH, 1855 to 1913.



(See page 626.)

EXPLANATION OF GRAPHS.—In the above diagram the base of each small square represents throughout one year. The vertical side of a small square denotes 1 per cent., the thick zero lines, however, for each State and for the Commonwealth being different. This was necessary to avoid confusion of the curves.

Where the curve for any State falls below that State's zero line, loss is indicated, the working expenses having exceeded the gross revenue.

The curve for Victoria commences in 1859; that for Queensland in 1865; that for Tasmania in 1872; and that for Western Australia in 1879, these being the years in which the Government railway systems of the several States were inaugurated.

15. **Distribution of Working Expenses.**—The subjoined table shews the distribution of working expenses, among four chief heads of expenditure, for the years 1901-2 and 1908-13:—

**GOVERNMENT RAILWAYS.—DISTRIBUTION OF WORKING EXPENSES,
1901-2 and 1908-13.**

Year	N.S.W.	Victoria.*	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'wealth.
MAINTENANCE (£,000 OMITTED).								
1901-2	554	490	356	167	247	158	29	1,901
1908-9	628	526	395	270	210	62	7	2,198
1909-10	699	644	441	259	243	64	7	2,387
1910-11	810	803	500	343	272	66	8	2,802
1911-12	906	893	562	346	291	64	8	3,070
1912-13	1,024	930	602	329	322	59	8	3,274

LOCOMOTIVE, CARRIAGE, AND WAGON CHARGES (£,000 OMITTED).

1901-2	1,102	845	390	344	670	164	3	3,418
1908-9	1,409	993	477	441	472	81	4	3,877
1909-10	1,616	1,226	562	512	545	85	3	4,549
1910-11	1,771	1,264	604	585	593	85	3	4,905
1911-12	1,985	1,390	794	653	656	88	4	5,570
1912-13	2,162	1,466	915	758	747	86	3	6,137

TRAFFIC EXPENSES (£,000 OMITTED).

1901-2	589	672	226	163	306	142	2	2,000
1908-9	805	641	330	210	264	51	2	2,303
1909-10	852	684	385	242	282	52	2	2,499
1910-11	968	767	429	302	317	54	1	2,838
1911-12	1,133	901	517	335	359	57	2	3,304
1912-13	1,344	948	586	357	397	61	2	3,695

OTHER CHARGES (£,000 OMITTED).

1901-2	97	158	21	17	33	18	...	334
1908-9	110	254	25	21	28	10	...	448
1909-10	109	264	27	26	27	11	...	464
1910-11	142	265	31	26	34	11	...	509
1911-12	145	257	45	29	38	12	...	526
1912-13	115	245	49	27	40	12	...	488

* Including special expenditure and charges referred to in paragraph 14 hereof.

† For the calendar year 1902.

16. **Net Revenue, Total and per Cent. of Capital Cost.**—The table given hereunder shews the net sums available to meet interest charges, and also the percentage of such sums upon the capital cost of construction and equipment in each State for the years 1901-2 and 1908-13:—

**GOVERNMENT RAILWAYS.—NET REVENUE AND PERCENTAGE OF NET REVENUE
UPON CAPITAL COST, 1901-2 and 1908-13.**

Year.	N.S.W.	Victoria.*	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'wth.
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NET REVENUE (£,000 OMITTED).

	£	£	£	£	£	£	£	£
1901-2 ...	1,326	1,202	389	396	265	160	-22	3,616
1908-9 ...	2,076	1,663	876	698	535	76	...	5,924
1909-10 ...	2,209	1,626	924	771	541	72	...	6,143
1910-11 ...	2,351	1,797	1,167	789	628	62	-1	6,793
1911-12 ...	2,322	1,777	1,115	785	541	92	-2	6,630
1912-13 ...	2,104	1,616	1,171	1,827	531	110	-1	6,358

PERCENTAGE OF NET REVENUE TO CAPITAL EXPENDITURE.

	%	%	%	%	%	%	%	%
1901-2 ...	3.27	2.96	1.94	2.98	3.58	1.56	-1.91	2.87
1908-9 ...	4.36	3.91	3.74	5.10	4.85	1.90	...	4.13
1909-10 ...	4.52	3.77	3.80	5.56	4.75	1.79	...	4.18
1910-11 ...	4.61	4.07	4.51	5.49	5.22	1.53	-0.15	4.45
1911-12 ...	4.34	3.88	3.95	5.26	4.09	2.15	-0.20	4.13
1912-13 ...	3.69	3.40	3.93	15.00	3.56	2.49	0.08	3.71

* In addition to ordinary working expenses, special expenditures and charges paid out of each year's gross revenue have been deducted; see paragraph 14 above. † For the calendar year 1902. ‡ Inclusive of Port Augusta-Oodnadatta line.

Note.—The minus sign (—) denotes net loss.

(i.) *Net Revenue per Average Mile Worked and per Train Mile Run.* Tables shewing the gross earnings and the working expenses per average mile worked and per train mile run have been given above. The net earnings, i.e., the excess of gross earnings over working expenses, per average mile worked and per train mile run are shewn in the following tables:—

**GOVERNMENT RAILWAYS.—NET REVENUES PER AVERAGE MILE WORKED AND PER
TRAIN MILE RUN, 1901-2 and 1908-13.**

Year.	N.S.W.	Victoria.*	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'wealth.
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NET REVENUE PER AVERAGE MILE WORKED.

	£	£	£	£	£	£	£	£
1901-2 ...	449	368	139	228	195	†128	-152	284
1908-9 ...	583	490	254	371	271	162	...	398
1909-10 ...	609	473	262	407	257	153	...	404
1910-11 ...	693	513	308	412	275	131	-11	429
1911-12 ...	610	502	269	405	219	182	-14	392
1912-13 ...	543	444	269	†411	191	216	-6	367

NET REVENUE PER TRAIN MILE RUN.

	d.	d.	d.	d.	d.	d.	d.	d.
1901-2 ...	28.87	25.56	16.50	22.53	14.11	†15.93	175.40	23.16
1908-9 ...	33.05	35.36	28.44	34.03	31.28	17.70	0.48	32.43
1909-10 ...	34.28	33.34	27.19	34.15	29.49	16.39	...	31.89
1910-11 ...	33.18	33.24	29.91	31.87	30.37	14.38	-12.39	31.77
1911-12 ...	30.09	30.83	25.93	30.18	24.82	21.01	-16.12	28.81
1912-13 ...	26.32	27.25	24.51	†29.94	22.67	26.17	6.58	26.24

* See footnote * to preceding table. † See footnote † to preceding table. ‡ See footnote ‡ to preceding table.

17. **Traffic Conditions.**—Reference has already been made to the difference in the traffic conditions on many of the lines of the Commonwealth (see paragraphs 12, 13, and 14 hereof). These conditions differ not only in the several States, but also on different lines in the same State, and this is true with regard to both passenger and goods traffic. By far the greater part of the population of Australia is confined to a fringe of country near the coast, more especially in the eastern and southern districts. A large proportion of the railway traffic between the chief centres of population is therefore carried over lines in the neighbourhood of the coast, and is thus, in some cases, open to sea-borne competition. On most of the lines extending into the more remote interior districts traffic is light; the density of population diminishes rapidly as the coastal regions are left behind; there is a corresponding diminution in the volume of traffic, while, in comparison with other more settled countries, there is but little back-loading.

As an indication of the different traffic conditions prevailing in the several States, the following table is given shewing the numbers of passenger journeys and the tons of goods carried (a) per 100 of the mean population; and (b) per average mile worked in each State during the financial year 1912-13:—

PASSENGER JOURNEYS AND TONNAGE OF GOODS AND LIVE STOCK, 1912-13.

Particulars.		N.S.W.	Vic.	Q'land.	S.A.*	W.A.	Tas.	N.T.	C'wth.
(a) PER 100 OF MEAN POPULATION.									
Passenger journeys	... No.	4,467	8,077	3,126	4,506	5,853	836	35	5,278
Goods and live stock	... Tons	655	373	596	701	936	235	80	569
(b) PER AVERAGE MILE OF LINE WORKED.									
Passenger journeys	... No.	20,529	30,644	4,573	9,633	6,439	3,247	8	14,434
Goods and live stock	... Tons	3,012	1,415	872	1,499	1,029	915	19	1,557

* Exclusive of the returns of the Port Augusta to Oodnadatta line.

Particulars of the actual numbers of passengers and tons of goods and live stock carried have already been given (see paragraph 5 hereof).

(i.) *Metropolitan and Country Passenger Traffic.* A further indication of the difference in passenger traffic conditions might be obtained from a comparison of the volume of metropolitan, suburban, and country traffic in each State. Particulars are, however, available only for the States of New South Wales and Victoria. The subjoined table shews the number of metropolitan and country passengers carried in each of the States mentioned and the revenue derived therefrom during the year 1912-13:—

METROPOLITAN, SUBURBAN, AND COUNTRY PASSENGER TRAFFIC, 1912-13.

Particulars.	Number of Passenger Journeys.			Revenue.		
	Metropolitan.	Country.	Total.	Metropolitan.	Country.	Total.
N.S.W. ...	*70,732,975	8,757,037	79,490,012	£819,419	£1,752,027	£2,571,446
Victoria ...	†103,003,647	8,510,261	111,513,908	†1,040,774	1,387,785	2,428,559

* Within 34 miles of Sydney and Newcastle, and including Richmond and Branxton lines.

† Within 20 miles of Melbourne, but exclusive of St. Kilda-Brighton tramway.

From this table it may be seen that the number of passenger-journeys in country districts in Victoria is slightly less than the corresponding number in New South Wales, while the number of metropolitan passenger-journeys in Victoria is far greater

than in New South Wales, although in the latter State both Sydney and Newcastle are included. In Sydney a larger proportion of the suburban traffic is carried by the tramway systems than in Melbourne.

For several years it has been recognised that the suburban passenger transport, both in Sydney and in Melbourne, was increasing so rapidly that it must eventually become impossible to cope with under the existing systems. A scheme for the electrification of the Melbourne suburban lines was under the consideration of the Victorian Government in 1908, but owing chiefly to a doubt as to its success from a financial standpoint, its adoption was for a time deferred. In November, 1912, however, a Commission was appointed by Parliament to again consider the 1908 scheme, and, acting on its report, the Government decided to at once proceed with the electrification of the suburban lines. Contracts for the construction of power-houses and the necessary equipment are already in hand at an estimated cost of £1,226,000, and it is anticipated that a portion of the suburban railway system will be electrically operated by June, 1915. In Sydney a Metropolitan Railway Construction Branch of the Railway Department has been created to deal specially with this matter. The Minister has approved of the construction of an underground city railway, the route has been decided upon, and the plans are in course of preparation. The preliminary work in the location of a system of electric railways for the eastern, western and northern suburbs is also in hand.

(ii.) *Goods Traffic.* The differing conditions of the traffic in each State might also, to some extent, be analysed by an examination of the tonnage of various classes of commodities carried and of the revenue derived therefrom. Comparative particulars regarding the quantities of some of the leading classes of commodities carried on the Government railways are available for all the States; corresponding information regarding the revenue derived from each class of commodity is not, however, generally available in a comparable form. In this connection it may be stated that the following resolution was passed at the Interstate Conference of Railway Commissioners held in Melbourne in May 1909 (see paragraph 1, page 598 hereof):—"That in view of the variations in the character and classification of the goods traffic in the different States, the sub-divisions of tonnage carried and revenue in each State shall be those which best suit local conditions."

The following table shews the number of tons of various representative commodities carried, and the percentage of each class on the total tonnage carried during the financial year 1912-13:—

CLASSIFICATION OF COMMODITIES CARRIED, 1912-13.

State or Territory.	Minerals.	Fire-wood.	Grain and Flour.	Hay, Straw, and Chaff.	Wool.	Live Stock.	All other Commodities.	Total.
TONS CARRIED.								
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
New South Wales ...	*7,513,091	225,318	*736,909	262,899	113,103	547,036	2,003,172	11,401,528
Victoria ...	†997,980	484,336	816,954	302,082	77,635	411,420	2,059,997	5,150,404
Queensland ...	1,432,954	267,365	‡33,544	†169,006	70,748	378,830	1,445,134	3,797,581
South Australia† ...	1,493,041	133,683	422,557	85,873	25,620	110,057	745,208	3,016,039
Western Australia... †	534,449	696,903	289,291	109,846	6,277	65,338	1,164,137	2,866,241
Tasmania**	70,250	13,791	††	42,890	5,215	††	167,418	299,564
North'n Territory††	567	††	‡‡	††	...	107	2,105	2,781
PERCENTAGE ON TOTAL TONNAGE CARRIED.								
	%	%	%	%	%	%	%	%
New South Wales ...	*65.90	1.93	*6.46	2.30	0.99	4.80	17.57	100.00
Victoria ...	†19.38	9.40	15.86	5.86	1.51	7.99	40.00	100.00
Queensland ...	37.73	7.04	‡0.88	†4.45	1.86	9.98	38.06	100.00
South Australia† ...	49.50	4.43	14.01	2.85	0.85	3.65	24.71	100.00
Western Australia... †	18.65	24.31	10.09	3.83	0.22	2.28	40.62	100.00
Tasmania**	23.45	4.60	††	14.32	1.74	††	55.89	100.00
North'n Territory††	20.39	††	‡‡0.07	††	...	3.85	75.69	100.00

* Exclusive of 264,722 tons of coal, on which only shunting and haulage are collected. † Up journey. ‡ Coal, stone, gravel, and sand. § Flour only. ¶ Sugar cane. †† Exclusive of the returns of the Port Augusta to Oodnadatta line. ** Exclusive of West Coast and Sorell lines. †† Inclusive in all other commodities. †† For year ended 31st December, 1912. §§ Grain only.

18. Passenger-Mileage and Ton-Mileage.—The useful comparisons and analyses which can be made with regard to the operations of the Government railways in the Commonwealth are to some extent limited by the absence in the annual reports of the Railway Departments of some of the States, of particulars relating to "passenger-mileage" (*i.e.*, the total distance travelled by passengers) and "ton-mileage" (*i.e.*, the total distance for which goods and live stock are carried), and it is not possible to furnish totals for the Commonwealth in respect of these important particulars. The matter of passenger-mileage and ton-mileage has already been referred to (see page 598). The following resolution in regard thereto was passed at the Interstate Conference of Railway Commissioners held in Melbourne in May, 1909:—"That, in view of the differing conditions in each State, and of the expense involved, it is undesirable to include passenger-mile and ton-mile statistics in the annual reports." The general question as to the desirability of collecting and publishing "passenger-mile" and "ton-mile" statistics by railway companies in the United Kingdom has been made the subject of inquiry by a departmental committee appointed by the President of the Board of Trade. The report of this committee has been published in England as a parliamentary paper.¹

Information regarding "passenger-miles" and "ton-miles" is available either wholly, or in part, for three of the States only, *viz.*, New South Wales, South Australia, and Tasmania, but is not available at all for either Victoria, Queensland, or Western Australia. Of the three States which give particulars of the nature indicated, New South Wales is the only one which furnishes the information in a classified form according to class of passengers and nature of commodities carried. The other two States supply particulars for all classes of passengers and goods together respectively. Western Australia furnished particulars as to ton-miles for the years 1907-12, but has since discontinued to record them. The mere record of the total number of passenger-miles and ton-miles for all classes of passengers and for all classes of goods respectively, although of considerable value, would appear to be insufficient to enable the whole field of railway operations to be adequately analysed, or the extent to which efficiency has been secured and improvements in working have been effected to be accurately gauged.

(i.) *Passenger-Miles.* Particulars for the whole of the Commonwealth period regarding total "passenger-miles" are available for one State only, namely, Tasmania. For the same period in New South Wales, but exclusive of 1911, 1912 and 1913, particulars are only available for suburban and extended-suburban traffic—*i.e.*, including all stations within 22 miles of Newcastle, within 34 miles of Sydney, and including Richmond and Branxton. For South Australia particulars are available for each year since 1904. No particulars are available for other States. In the tables given below the average number of passengers carried per "train," etc., is obtained by dividing the number of "passenger-miles" by the number of "passenger-train-miles." The averages given for New South Wales prior to 1911 are naturally smaller than those for the other States, since the figures for that State refer to suburban and extended-suburban traffic only.

1. See Cd. 4697. This report is also published at length in "The Statist," London, 19th June, 1909, Vol. LXII., No. 1634. In this report it is stated that ton-mile statistics have been used in India for forty years and for a longer period in America. They are now compiled by the railways of nearly all foreign countries; in England, however, they are not generally compiled. Among the more important statistics deduced from ton-miles and passenger-miles the following are mentioned:—(a) The average Train Load of goods and of passengers, obtained by dividing the ton-mileage and the passenger-mileage respectively by the train-mileage. (b) The average Wagon Load and Carriage Load, obtained by dividing the ton-mileage by the wagon-mileage and the passenger-mileage by the carriage-mileage. (c) Ton-miles per Engine Hour. (d) The average Length of Haul for goods and passengers respectively, obtained by dividing the ton-mileage and the passenger-mileage by the tonnage and the total number of passengers conveyed. (e) The average Receipts per Ton per Mile and per Passenger per Mile, obtained by dividing the goods receipts by the ton-mileage and the passenger receipts by the passenger-mileage. (f) The average Density of Traffic per mile of road or per mile of track, obtained by dividing the ton-mileage and passenger-mileage by the length of road or by the length of track.

SUMMARY OF "PASSENGER MILES," 1901-2 and 1908-13.

Year ended the 30th June.	Passenger Train Mileage.	Number of Passenger Journeys.	Total Passenger Miles.	Amount Received from Passengers.	Average Number of Passengers carried per Train.	Average Mileage per Passenger-journey.	Average Receipt per Passenger-mile.	Average Fare per Passenger-journey.
	Miles.	No. (,000 omitted).	No. (,000 omitted).	£	No.	Miles.	d.	d.
NEW SOUTH WALES.*								
1902*	†	27,999	184,064	361,849	†	6.57	0.47	2.92
1908*	†	42,730	284,465	504,646	†	6.65	0.43	2.83
1909*	2,178,895 ‡	46,734	310,399	546,904	142 ‡	6.64	0.42	2.81
1910*	2,569,072 ‡	48,147	341,498	564,463	133 ‡	7.09	0.40	2.81
1911	8,093,526	60,920	906,217	2,074,860	112	14.88	0.55	8.17
1912	8,977,767	70,707	1,091,088	2,349,279	121	15.43	0.51	7.97
1913	9,667,499	79,490	1,192,584	2,571,446	123	15.00	0.54	7.76

SOUTH AUSTRALIA.

1908	1,874,318	12,839	154,038	426,261	82	12.00	0.66	7.97
1909	1,975,455	13,855	160,763	435,430	81	11.60	0.65	7.54
1910	2,116,527	15,282	177,801	482,676	84	11.63	0.65	7.58
1911 §	2,404,729	16,620	195,216	535,527	81	11.75	0.65	7.73
1912 ||	2,614,167	18,353	213,262	589,045	81	11.62	0.67	7.70
1913 ||	2,803,952	19,382	228,707	619,094	81	11.80	0.64	7.66

TASMANIA.

1902	335,604	761	19,444	88,541	58	25.60	1.09	27.91
1908	356,845	1,439 ¶	32,639 ¶	112,987	91	22.65	0.83	18.84
1909	373,633	1,547	32,476	113,546	87	20.99	0.84	17.61
1910	375,425	1,650	34,066	115,181	91	20.65	0.81	16.75
1911	381,301	1,682	34,758	119,454	91	20.66	0.82	17.04
1912	395,907	1,715	34,292	126,886	86	19.99	0.87	17.75
1913	437,626	1,650	35,607	135,545	81	21.58	0.91	19.71

* Suburban lines only for years 1902-1910; includes distances within 34 miles of Sydney and including Richmond and Braxton. † Not available. ‡ Partly estimated. § Exclusive of the returns of the Port Augusta to Oodnadatta line for the six months ended 30th June, 1911. || Exclusive of the returns of the Port Augusta-Oodnadatta line. ¶ This and subsequent years compiled on new basis, so as to be uniform with other States.

(ii.) *Ton-Miles.* Particulars regarding total "ton-miles" are available for each year since 1901 for the States of New South Wales, South Australia, and Tasmania. Corresponding particulars for Western Australia are available for the years 1907 to 1912; figures for 1913 are not available. The average freight-paying load carried per "train" is obtained by dividing the total "ton-miles" in the fourth column by the goods-train mileage in the second column. In New South Wales the tonnage carried is exclusive of coal, on which only shunting and haulage charges are collected, and the amount of earnings specified excludes terminals. In South Australia and Tasmania they include terminals, while in Western Australia they exclude wharfage and jetty dues, but include all other charges.

SUMMARY OF "TON MILES," 1901-2 and 1908-13.

Year ended the 30th June.	Goods Train Mileage.	Total Tons Carried.	Total "Ton-Miles."	Earnings.	Average Freight-paying Load carried per "Train."	Average Miles per Ton.	Earnings per "Ton-mile."
	No.	No. (,000 omitted.)	No. (,000 omitted.)	£	Tons.	Miles.	d.

NEW SOUTH WALES.

1902	6,586,032	6,164	436,814	1,947,305	66.32	70.87	1.07
1909	7,841,413	8,972	613,469	2,544,457	78.23	68.38	1.00
1910	8,197,953	8,149	690,150	2,866,070	84.19	84.69	0.99
1911	8,913,171	10,055	810,949	3,079,783	90.98	80.65	0.91
1912	9,543,553	10,632	862,016	3,181,771	90.32	81.08	0.89
1913	9,516,748	11,402	861,940	3,153,626	90.57	75.60	0.88

SOUTH AUSTRALIA.

1902	2,468,326	1,392	170,523	681,045	69.09	122.48	0.96
1909	2,949,901	2,166	267,271	1,060,077	90.60	123.42	0.95
1910	3,303,777	2,481	303,361	1,208,373	91.82	122.27	0.96
1911*	3,451,238	2,731	328,181	1,322,339	95.09	120.15	0.97
1912†	3,414,984	2,782	334,146	1,345,879	97.87	120.11	0.97
1913‡	3,538,919	3,016	355,405	1,441,859	100.42	117.84	0.97

‡ WESTERN AUSTRALIA.

1907	1,939,959	2,091	144,856	964,653	74.67	69.26	1.60
1908	1,976,204	2,059	142,719	948,373	72.22	69.32	1.59
1909	2,011,468	1,997	143,629	945,956	71.41	71.92	1.58
1910	2,280,736	2,242	163,651	1,042,789	71.75	73.00	1.53
1911	2,548,450	2,489	182,738	1,154,662	71.71	73.42	1.52
1912	2,746,827	2,542	184,748	1,154,087	67.25	72.67	1.49

§ TASMANIA.

1902||	567,314	407	14,331	109,266	25.26	35.30	1.82
1909	655,486	467	17,257	125,375	26.33	36.92	1.74
1910	684,365	423	18,966	124,675	27.71	44.84	1.58
1911	659,750	346	16,382	115,008	24.83	47.32	1.68
1912	650,570	452	17,672	138,184	27.16	39.09	1.87
1913	568,881	447	17,325	144,073	31.17	39.67	1.94

* Exclusive of the returns of the Port Augusta to Oodnadatta line for the six months ended 30th June, 1911. † Exclusive of the returns of the Port Augusta to Oodnadatta line. ‡ Particulars for 1913 and for years prior to 1907 not available. § Exclusive of live stock. || To 31st December for year 1902, to 30th June for succeeding years.

(iii.) *Density of Traffic.* The average densities of passenger traffic and of goods traffic, obtained by dividing the passenger-mileage and the ton-mileage respectively by the average length of line worked during year, are shewn in the following table for the year 1912-13 for those States for which particulars are available :—

DENSITY OF TRAFFIC PER AVERAGE MILE OF LINE WORKED, 1912-13.

Density of—	N.S.W.	S. Aust.*	W. Aust.	Tasmania.
Passenger traffic	308,002	143,492	†	70,092
Good ,,	222,608	176,642	79,938†	34,104

* Including the Port Augusta-Oodnadatta line.

† Not available.

‡ For year ended 30th June, 1912.

(iv.) *Classification of Commodity Ton Mileage.* New South Wales is the only State for which particulars, specifying the ton-mileage and the earnings per ton-mile for various classes of commodities, are available. It is hoped that in future years it will be possible to give corresponding particulars for the other States.

The subjoined statement gives particulars for the last financial year. Miscellaneous traffic consists of timber, bark, firewood, bricks, drain-pipes, coal, road-metal in eight-ton lots, agricultural and vegetable seeds in five-ton lots, and traffic of a similar nature. A and B classes consist of lime, vegetables, tobacco leaf, caustic soda and potash, cement, copper ingots, fat and tallow, water and mining plant in six-ton lots, leather in one and three-ton lots, agricultural implements in five-ton lots, and other traffic of a similar nature. The table does not include 264,722 tons of coal on which only shunting and haulage charges were collected, nor does it include £58,411 for haulage, tonnage dues, etc.

**NEW SOUTH WALES.—SUMMARY OF TON-MILEAGE FOR THE YEAR ENDED
30th JUNE, 1913.**

Particulars.	Total Tons Carried.	Total Miles.	Average Miles per Ton.	Earnings (exclusive of Terminals).	Earnings per Ton-Mile.	Percentage on Total Tonnage.
	1000 Tons.	1000 Miles.	Miles.	£	d.	per cent.
Coal, coke, and shale	6,850	192,638	28.12	378,151	0.47	60.08
Other mineral	553	23,699	42.84	59,828	0.60	4.85
Crude ores	110	12,559	114.04	27,429	0.52	0.97
Miscellaneous	669	62,964	94.07	158,640	0.60	5.87
Firewood	225	6,328	28.09	20,847	0.80	1.98
Fruit	71	8,018	112.79	34,262	1.03	0.62
Grain and flour	737	176,670	239.74	284,878	0.39	6.46
Hay, straw, and chaff	263	52,550	199.89	80,479	0.37	2.30
Frozen meat	14	1,628	111.92	7,528	1.11	0.13
General goods	2	548	354.42	5,870	2.57	0.01
A Class	498	50,291	101.06	205,743	0.98	4.36
B ,,	354	36,668	103.64	239,301	1.57	3.10
C ,,	28	2,085	75.58	19,522	2.25	0.25
1st Class	133	19,033	143.33	216,211	2.73	1.17
2nd ,,	235	35,933	153.00	540,831	3.61	2.06
Wool	113	34,474	304.80	277,002	1.93	0.99
Live stock	547	145,854	266.63	597,104	0.98	4.80
Total	11,402	861,940	75.60	3,153,626	0.88	100.00

19. **Interest Returned on Capital Expenditure.**—It may be seen from the figures given in the table in paragraph 16 hereof, that the Government railways in Australia have, on the whole, made a substantial profit during each year since the inception of the Commonwealth, but, unfortunately, the community does not get the full benefit of this profit, owing to the high rates of interest at which money for railways was borrowed in the early days. Though the average rate during the year ended the 30th June, 1912, was 4.13 per cent., an average does not accurately express the position. At an early period the need of constructing railways for the sole purpose of opening up undeveloped districts was recognised, and lines were built which could not possibly pay for some years to come; as these railways always preceded population, the money had to be raised at an almost speculative rate of interest, frequently amounting to 6 per cent., while the more recent loans have been effected at less than 4 per cent., hence the railways have been handicapped by a burdensome interest. At the present time, also, spur lines are constructed, which can scarcely be expected to instantly return revenue in excess of the expenditure, and so must, for a time at any rate, be a charge on the more developed branches of the railway system, and tend to increase the ratio of working costs to revenue. It may be noted, however, that although the loans made for expenditure on railway construction and equipment very largely increase the amount of the public debt of the Commonwealth, forming, in fact, more than half the total debt, the money borrowed has not been sunk in undertakings which give no return, but has been expended on works which are increasingly reproductive, yielding in most cases a direct return on the capital expended, and representing a greater value than their original cost. In Europe the national debts of various countries have been incurred principally through the expenses of prolonged wars, and the money has gone beyond recovery, but in Australia the expenditure is represented to a large extent by public works which pay a direct return, which is, on the whole, greater than the amount of interest due upon capital invested. In addition to the purely commercial aspect of the figures relating to the revenue and expenditure of the Commonwealth railways, it is of great importance that the object with which many of the lines were constructed should be kept clearly in view; the anticipated advantage in building these lines has been the ultimate settlement of the country rather than the direct returns from the railways themselves, and the policy of the State Governments has been to use the railway systems of the Commonwealth for the development of the country's resources to the maximum extent consistent with the direct payment by the customers of the railways of the cost of working and interest charges. Further, the money has been spent in developing immense agricultural, pastoral and mineral resources, which add to the wealth of the community, while the benefits conferred in providing a cheap and convenient mode of transit, and in generally furthering the trade and the best interests of the Commonwealth, are incalculable.

(i.) *Profit or Loss after Payment of Working Expenses and Interest.*—The net revenue of the Government railways in each State after payment of working expenses is shewn in paragraph 16 hereof. The following table shews the amount of interest payable on expenditure from loans on the construction and equipment of the railways in each State, the actual profit or loss after deducting working expenses and interest and all other charges from the gross revenue, and the percentage of such profit or loss on the total capital cost of construction and equipment:

In this table the positive sign indicates a profit, the negative a loss. For the Commonwealth as a whole there has been a net profit on the Government railways during each of the last eight years.

The same satisfactory state of affairs applies also to the States of New South Wales, South Australia proper, and Western Australia, and with the exception of the year 1907-8

to Victoria. Tasmania and the Northern Territory both shew a loss for each year of the period 1902 to 1912, as also does Queensland, with the exception of the years 1906-7, 1910-11, and 1911-12.

GOVERNMENT RAILWAYS.—INTEREST ON LOAN EXPENDITURE, PROFIT OR LOSS, AND PERCENTAGE OF PROFIT OR LOSS ON TOTAL COST, 1901-2 and 1908-13.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'wth.
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AMOUNT OF INTEREST ON RAILWAY LOAN EXPENDITURE (£,000 OMITTED).

	£	£	£	£	£	£	£	£
1901-2	1,435	1,493	837	470	235	140	47	4,657
1908-9	1,687	1,428	935	500	377	150	47	5,124
1909-10	1,687	1,471	973	508	387	152	47	5,225
1910-11	1,797	1,515	953	521	404	156	47	5,393
1911-12	1,901	1,511	1,070	542	439	159	47	5,669
1912-13	1,904	1,592	1,171	572	506	164	46	5,955

PROFIT OR LOSS AFTER PAYMENT OF WORKING EXPENSES, INTEREST, AND OTHER CHARGES (£,000 OMITTED).*

	£	£	£	£	£.	£	£	£
1901-2	-108	-291	-448	-74	+30	-81	-69	-1,041
1908-9	+389	+235	-59	+198	+157	-74	-47	+799
1909-10	+522	+155	-49	+263	+153	-80	-47	+918
1910-11	+554	+282	+214	+269	+224	-93	-48	+1,402
1911-12	+421	+266	+46	+243	+101	-68	-48	+961
1912-13	+200	+24	-1	+254	+25	-54	-45	+404

PERCENTAGE OF PROFIT OR LOSS TO CAPITAL COST OF CONSTRUCTION AND EQUIPMENT.*

	%	%	%	%	%	%	%	%
1901-2	-0.27	-0.71	-2.22	-0.59	+0.41	-2.10	-5.96	-0.82
1908-9	+0.82	+0.55	-0.26	+1.45	+1.42	-1.85	-4.49	+0.57
1909-10	+1.07	+0.36	-0.20	+1.90	+1.35	-1.97	-4.51	+0.64
1910-11	+1.09	+0.64	+0.83	+1.87	+2.87	-2.29	-4.64	+0.91
1911-12	+0.79	+0.58	+0.16	+1.63	+0.77	-1.59	-4.66	+0.60
1912-13	+0.35	+0.05	-0.00	+1.54	+0.17	-1.24	-4.37	+0.24

* The positive sign indicates a profit, the negative a loss. † Allowing for payment of special expenditure and charges (see paragraph 14 above).

20. **Passenger Fares and Goods Rates.**—Considerable reductions have been made in recent years in passenger fares and in freight rates. These fares and rates are not only changed from time to time to suit the convenience and varying necessities of the railways, but, as traffic is developed and revenue increased, they are also in many cases reduced to an extent consistent with the direct payment by the customers of the railways of the cost of working and interest charges.

(i.) *Passenger Fares.* On the Australian Government railways two classes are provided for passenger traffic. The fares charged may be classified as follows:—(a) Fares between specified stations (including suburban fares). (b) Fares computed according to mileage rates. (c) Return, season, and excursion fares. (d) Special fares for working-men, school pupils, and others. Fares in class (a) are issued at rates lower than the ordinary mileage rates. Fares in class (b) are charged between stations not included in

class (a). Generally, it may be said that mileage-rate fares are computed on the basis of about twopence per mile for first-class and about $1\frac{1}{2}$ pence per mile for second-class single tickets. In Tasmania, however, the fares are computed on the general basis of $1\frac{1}{2}$ pence per mile first-class, one penny per mile second-class, with a terminal charge of one penny, with one-sixth added to total. In New South Wales, Victoria, and Queensland the mileage rates are based upon a tapering principle, *i.e.*, a lower charge per mile is made for a long journey than for a short journey. With the exception of New South Wales and Tasmania first-class return fares are generally about $1\frac{1}{2}$ to $1\frac{3}{4}$ times the single fare, and the second-class are about 30 to 45 per cent. lower than the first-class fares. In New South Wales passenger fares were reduced on the 28th May, 1911, to the amount of £70,000 per annum, and the issue of return tickets abolished except between stations in the Sydney and Newcastle suburban areas, and between the States and in the tourist districts. In Tasmania the issue of return tickets has been discontinued except in a few special cases. In Western Australia special summer recreation fares have been granted by which women and children can travel distances up to 800 miles and return for fares of 25s. and 12s. 6d. respectively. These concessions enable them to escape the heat of the goldfields and spend the summer at one of the coastal towns. In April, 1913, the New South Wales Government decided to discontinue the issue of return tickets for interstate railway journeys, and consequently these tickets are no longer available between State and State, except between Victoria and South Australia.

The following table shews the passenger fares for different distances charged in each State, between stations for which specific fares are not fixed:—

ORDINARY PASSENGER MILEAGE RATES ON GOVERNMENT RAILWAYS, 1913.

State.	For a journey of—					
	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.
FIRST-CLASS SINGLE FARES.						
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
New South Wales*	4 6	10 9	23 3	35 9	48 3	58 0
Victoria	7 6	15 0	30 0	44 6	58 2	72 0
Queensland	8 6	16 0	31 0	45 1	58 2	71 4
South Australia†	8 4	16 8	33 4	50 0	66 8	83 4
Western Australia	8 4	16 8	33 4	50 0	66 8	83 4
Tasmania	7 5	14 8	29 3	...	...	...
Average‡	7 5	14 11	30 0	45 1	59 7	73 7
Average per passenger-mile‡ d.	1.78	1.79	1.80	1.80	1.78	1.77
SECOND-CLASS SINGLE FARES.						
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
New South Wales*	2 0	7 1	14 9	22 1	25 8	33 6
Victoria	5 0	10 0	20 0	29 8	38 10	47 10
Queensland	5 8	10 4	19 9	28 2	35 8	43 2
South Australia†	5 3	10 5	20 10	31 3	41 8	52 1
Western Australia	5 3	10 5	20 10	31 3	41 8	52 1
Tasmania	5 0	9 10	19 7	...	...	...
Average‡	4 8	9 8	19 4	28 6	36 8	45 9
Average per passenger-mile‡ d.	1.12	1.16	1.16	1.14	1.10	1.10

* Inclusive of suburban rates for 34 miles. † Ordinary mileage rates are not published; the amounts given are therefore computed from fares between specified stations. ‡ Exclusive of Tasmania for hauls of 300 miles and upwards.

(ii.) *Parcel Rates.* In all the States parcels may be transmitted by passenger train upon payment of the prescribed rates, which are based upon weight and distance carried. The rates vary slightly in the different States. In New South Wales they range from threepence for a parcel not exceeding 3 lbs. for any distance up to 75 miles, to eleven shillings and threepence for a parcel weighing from 84 lbs. to 112 lbs., for a distance of 500 miles. In Victoria the charge for a parcel weighing from 84 lbs. to 112 lbs. for a distance over 450 miles is twelve shillings. The rate in Queensland for a parcel weighing from 85 to 112 lbs. for 500 miles is twelve shillings and sixpence; in South Australia eleven shillings and threepence; in Western Australia thirteen shillings; and in Tasmania for a distance of 250 miles the rate is five shillings and sixpence.

(iii.) *Goods Rates.* The rates charged for the conveyance of goods and merchandise may generally be divided into three classes, viz.:—(a) Mileage rates, (b) District or "development" rates, and (c) Commodity rates. In each of the States there is a number—ranging from 8 in Victoria to 15 in Tasmania—of different classes of freight. Most of the mileage rates are based upon a tapering principle, *i.e.*, a lower charge per ton-mile is made for a long haul than for a short haul; but for some classes of freight there is a fixed rate per mile irrespective of distance. District rates are charged between specified stations and are somewhat lower than the mileage rates, excepting in Western Australia, where the terms refer to a special toll of 1s. per ton on goods travelling over certain "district" railways as part payment of the extra cost of working lines laid for developmental purposes through sparsely settled districts. In addition to the ordinary classification of freights under class (a), certain commodities, such as wool, grain, agricultural produce, and crude ores, are given special rates, lower than the mileage rates, under class (c).

Space will not permit of anything like a complete analysis of goods rates in the several States being here given. As an indication of the range and amount of such rates the subjoined tables are given. The first table shews for each State the truck-load rates charged for hauls of different distances in respect of agricultural produce not otherwise specified; these special rates are here given for this class of produce, since it is generally forwarded in truck-loads.

RATES FOR AGRICULTURAL PRODUCE IN TRUCK-LOADS ON GOVERNMENT RAILWAYS, 1913.

State.	Charge per Ton in Truck-loads for a Haul of—					
	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.
New South Wales	s. d. 5 0	s. d. 7 6	s. d. 9 6	s. d. 10 6	s. d. 11 4	s. d. 12 0
Victoria	5 6	8 6	10 6	12 4	14 0	15 8
Queensland	4 7	8 9	11 0	12 0	13 0	14 0
South Australia	6 2	8 9	12 11	17 1	21 3	25 5
Western Australia	6 3	8 11	12 1	17 0	22 0	24 0
Tasmania	6 9	9 8	13 0	...	...	...
Average*	5 8	8 8	11 6	13 9	16 3	18 3
Average per ton-mile* d.	1.36	1.04	0.69	0.55	0.48	0.43

* Exclusive of Tasmania for hauls of 300 miles and upwards.

The next tables shew for each State the ordinary mileage rates charged per ton for hauls of different distances in respect of (a) the highest-class freight, and (b) the lowest-class freight:—

ORDINARY GOODS MILEAGE RATES ON GOVERNMENT RAILWAYS 1913.

State.	Charge per Ton for a Haul of—					
	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.

HIGHEST-CLASS FREIGHT.

	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
New South Wales	23	0	44	11	78	3	99	1	107	5	115	9
Victoria	21	3	42	0	79	6	108	9	133	9	158	9
Queensland	41	8	75	0	133	4	191	8	220	10	235	5
South Australia	27	1	52	1	97	11	134	7	166	8	194	2
Western Australia	32	1	54	2	97	6	135	5	167	11	195	0
Tasmania	33	9	54	0	100	0	...	...	...	...	...	...
Average*	29	9	53	8	97	9	133	11	159	4	179	9
Average per ton-mile* d.	7.14		6.44		5.86		5.35		4.88		4.31	

LOWEST-CLASS FREIGHT.

	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
New South Wales	2	6	3	7	5	8	7	9	9	10	11	11
Victoria	4	3	6	8	10	0	11	10	13	6	15	2
Queensland	4	7	8	9	15	0	19	2	23	4	27	6
South Australia †	4	2	7	10	13	7	17	9	21	11	26	1
Western Australia	5	0	8	4	14	2	19	2	23	4	27	6
Tasmania	5	0	6	9	8	6	...	...	...	...	...	...
Average*	4	2	7	0	11	1	15	1	18	5	21	7
Average per ton-mile* d.	1.00		0.84		0.66		0.60		0.55		0.51	

* Exclusive of Tasmania for hauls of 300 miles and upwards. † Less 20 per cent. for artificial manures.

The classification of commodities varies in the several States. Generally, the highest-class freight includes expensive, bulky, or fragile articles, while the lowest-class comprises many ordinary articles of merchandise, such as are particularly identified or connected with the primary industries of each State.

In New South Wales, for example, the highest-class freight comprises such articles as boots, drapery, drugs, groceries, furniture, liquors, crockery and glassware, cutlery, ironmongery, confectionery, and carpets. In the same State the lowest-class freight includes agricultural produce, ores, manures, coal, coke, shale, firewood, limestone, stone, slates, bricks, screenings, rabbit-proof netting, timber in logs, and posts and rails.

21. **Numbers and Description of Rolling Stock, 1913.**—The following table shews the number of locomotives and rolling stock in use on the Government railways in each State, classified according to gauge:—

CLASSIFICATION OF LOCOMOTIVES AND ROLLING STOCK, 1912-13.

STATE.	GAUGE.					
	5 ft. 3 in.	4 ft. 8½ in.	3 ft. 6 in.	2 ft. 6 in.	2 ft. 0 in.	Total.
LOCOMOTIVES.						
New South Wales	...	998	...	...	...	998
Victoria...	656	...	...	12	...	668
Queensland	...	...	588	...	...	588
South Australia	174	...	195	...	...	369
West Australia...	...	...	386	...	...	386
Tasmania	...	...	76	...	7	83
Northern Territory	...	...	6	...	...	6
Total	830	998	1,251	12	7	3,098
PASSENGER VEHICLES.						
New South Wales	...	1,338	...	...	...	1,338
Victoria...	1,366	...	...	25	...	1,391
Queensland	...	...	629	...	...	629
South Australia	311	...	134	...	...	445
West Australia...	...	...	369	...	...	369
Tasmania	...	...	167	...	6	173
Northern Territory	...	...	4	...	...	4
Total	1,677	1,338	1,303	25	6	4,349
ALL OTHER VEHICLES.						
New South Wales	...	19,590	...	...	...	19,590
Victoria...	16,329	...	...	212	...	16,541
Queensland	...	...	11,819	...	...	11,819
South Australia	3,347	...	4,941	...	...	8,288
West Australia...	...	...	9,078	...	...	9,078
Tasmania	...	...	1,657	...	77	1,734
Northern Territory	...	...	142	...	...	142
Total	19,676	19,590	27,637	212	77	67,192

22. **Number of Railway Employees.**—The following table shows the number of employees in the Railway Departments of each State in the year 1901 and in each year from 1909 to 1913 inclusive, classified according to (a) salaried staff, and (b) wages staff.

From these figures it will be seen that there has been a steady increase in the number of persons engaged in the Railway Departments of the several States. During the period from 1901 to 1913, the total for the Commonwealth has increased from 42,321 to 83,503—an increase of 41,182, or about 97 per cent. The largest numerical increase for the individual States was that of New South Wales, viz., 18,627.

Separate returns for salaried and wages staff are not available for South Australia; the number of salaried staff is therefore included in the wages staff.

**GOVERNMENT RAILWAYS.—NUMBER OF EMPLOYEES IN RAILWAY DEPARTMENTS,
1901 and 1909-13.**

State.	1901.		1909.		1910.		1911.		1912.		1913.	
	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.
New South Wales* ...	1,372	11,747	2,163	17,295	2,369	17,854	2,799	21,388	2,977	25,984	3,180	28,566
Victoria ...	1,432	10,524	1,644	12,825	1,831	14,735	2,111	17,622	2,243	19,910	2,471	21,115
Queensland ...	994	4,633	1,237	6,583	1,471	5,769	1,664	6,364	1,877	7,131	2,136	8,114
South Australia† ...	...	3,855	...	6,274	...	7,086	...	7,552	...	8,569	...	8,754
Western Australia ...	876	5,407	769	4,906	779	5,147	872	6,079	935	6,627	1,016	6,734
Tasmania ...	178	1,252	190	1,111	195	1,292	203	1,232	200	1,147	204	1,131
Northern Territory ...	†	51	†	84	†	91	6	61	7	56	7	75
Commonwealth ...	4,852	37,469	6,003	49,078	6,645	51,974	7,655	60,238	8,239	69,424	9,014	74,489

* Exclusive of gate-keepers with free house only. † Separate returns for salaried and wages staffs are not available; the number of salaried staff is included with the wages staff.

23. **Accidents.—Number of Killed and Injured.**—The subjoined table gives particulars of the number of persons killed and injured through train accidents and the movement of rolling stock on the Government railways in each State for the year 1900-1, and for each of the years 1908-9 to 1912-13 inclusive:—

**GOVERNMENT RAILWAYS.—TOTAL NUMBER OF PERSONS KILLED AND INJURED,
1901 and 1909-13.**

State.	1900-1.		1908-9.		1909-10.		1910-11.		1911-12.		1912-13.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
New South Wales ...	*	*	43	249	50	338	46	368	68	513	84	582
Victoria ...	45	371	45	451	21	353	49	829	67	362	36	723
Queensland ...	13	100	11	201	14	382	16	104	25	235	27	349
South Australia ...	8	50	12	155	10	243	13	215	16	186	18	226
Western Australia† ...	5	205	16	284	13	99	13	114	20	121	15	189
Tasmania ...	1	8	2	28	...	21	1	34	...	37	...	43
Northern Territory ...	...	...	...	...	...	...	...	1	...	...	...	...
Commonwealth ...	...	...	129	1,368	108	1,436	138	1,665	196	1,454	180	2,062

* Not available. † The returns up to and including the year 1908-9 include all accidents which have occurred on railway premises as well as those caused through train accidents and movement of rolling stock.

(c) Graphical Representation of Government Railway Development.

1. **General.**—Its railways are so important a factor in the development of Australia that it has been deemed desirable to graphically represent the main facts of their progress from their beginning, viz., from 1855 onwards. To this end the graphs shewn on pages 622 to 624 have been prepared. The distribution of the railways is shewn on the map on page 621.

2. **Capital Cost and Mileage Open** (page 622).—The graph shews that the ratio between these elements was, naturally enough, very variable from 1855 to 1870,

consequent upon progressive decrease in cost of construction. It then became subject to a more regular change, implying reduction of average cost.

3. **Cost per Mile Open.**—The fluctuations in cost per mile open are clearly indicated by the graph on page 622. In 1855 the cost per mile open was no less than £28,430; by 1858 it had fallen to £17,752, when it rose again to a maximum of £35,958 in 1862. It then diminished rapidly till 1883—when it reached £10,496 per mile—then slowly till 1887, when it amounted to £10,017 per mile. Again rising, this rate attained to £10,537 in 1892, since when it has, on the whole, been declining, reaching its lowest value, £9486, in 1911.

4. **Gross Revenue.**—This graph (page 622) exhibits considerable irregularities, the most striking of which are the maxima at 1892 and 1902. The fall commencing in 1892 was in consequence partly of the commercial crisis and partly of the then droughty conditions of several of the States, while that of 1902-3 was due to drought. In the latter case the recovery was very rapid.

5. **Working Expenses and Net Revenue.**—The characteristics of these graphs (page 622), are similar to those of "Gross Revenue," and the same remarks apply. It may be noted, however, that the working expenses are increasing at a faster rate than gross and net revenue.

6. **Percentage of Working Expenses to Gross Revenue.**—This is shewn for each State and for the Commonwealth on page 623, and for the Commonwealth only, on a larger scale, on page 622. The curve shews considerable fluctuations, but points also to the fact that, although a slight rise occurred in 1908, there was from 1903 to 1907 a rapid, and therefore very satisfactory, decline in the percentage of working expenses to gross revenue; since 1907, however, there has been a steady increase. The fluctuations of this percentage, for the individual States, call for no special comment.

7. **Percentage of Net Revenue on Capital Cost.**—For the Commonwealth this graph is shewn on a large scale on page 622 and on page 624 both for Commonwealth and States. After exhibiting somewhat remarkable oscillations in the earlier years, and less marked ones between 1885 and 1900, and also a rapid fall to 1903, the curve from that year shews a well marked increase until the year 1908, a slight fall occurring in that year and in 1909. The rise in 1911 is followed by a fall in 1912, and again in 1913. Maxima were reached in 1865, 1877, 1881, 1907, and 1911—viz., 3.44, 3.71, 4.14, 4.37 and 4.43 per cent.

For the individual States the results are in general very satisfactory, although the increases in the percentages for recent years have not been quite maintained in the years 1912 and 1913, with the exception of Tasmania, the figures for which State constituted a maximum in 1913.

The remarkable maximum for Western Australia in 1896 is consequent upon the large use made of the western railways at the time of the development of the Western Australian goldfields.

8. **General Indications of Graphs.**—Reviewing the cost of railways, as a whole, it may be noted that for the periods indicated the average cost per mile open is as follows:—

**GOVERNMENT RAILWAYS.—AVERAGE COST PER MILE OF LINE OPEN,
COMMONWEALTH, 1855 to 1912.**

Period ...	...	...	...	1855-1872.	1873-1882.	1883-1892.	1893-1902.	1903-1912.
Cost per mile	...	...	...	£ 24,561	£ 13,700	£ 10,286	£ 10,010	£ 9,614

For the period 1903 to 1907 the fall in percentage of working expenses on gross revenue was from 69.51 to 57.18 per cent., but it then gradually increased to 68.13 per cent. in 1913. The rise of the percentage of net revenue on total capital cost for the years 1903 to 1907 was from 2.48 to 4.37 per cent. For the years 1908 to 1910 fell off, but rose to 4.43 per cent. in 1911, falling to 4.14 per cent. in 1912, and to 3.71 per cent. in 1913.

While the sinister influence of the drought of 1902 is strikingly shewn in the curves (a) by the fall in the gross and net revenue in 1902-3, (b) by the fall in the percentage of net revenue on capital cost, and (c) by the increase of working expenses on gross revenue, the rapidity of recovery is even more striking, and goes to indicate the great elasticity of the economic condition of the Commonwealth. Although during the last two years there has been a decrease in the percentage, the fact that a group of railways, necessarily constructed largely in accordance with a policy of widespread development of Australia's resources rather than as mere commercial enterprises, and costing so large a sum as £171,226,323 for construction and equipment up to the 30th June, 1913, should, nevertheless, yield so large a revenue, bringing in for the year 1912-13 a return, as already pointed out, of no less than 3.71 per cent.

(D.)—Private Railways.

1. **Total Mileage Open, 1913.**—As has been stated in a previous part of this Section (see A. 3) a number of private railway lines have from time to time been constructed in the Commonwealth. By far the greater proportion of such lines, however, has been laid down for the purpose of hauling timber, coal, or other minerals, and is not generally used for the conveyance of passengers or for public traffic; in many cases the lines are often practically unballasted and are easily removable, running through bush and forest country in connection with the timber and sugar-milling industries, and for conveying firewood for mining purposes. Many of these lines may perhaps be said to be rather of the nature of tramways than of railways. Private railways referred to herein include (a) lines open to the public for general passenger and goods traffic; and (b) branch lines from Government railways and other lines which are used for special purposes and which are of a permanent description. Other lines are referred to in the part of this Section dealing with Tramways (see § 3, *Tramways*).

The following table gives particulars of private railways in the Commonwealth open for traffic up to the 30th June, 1913. A classification of these lines according to their gauge has already been given (see A. 6).

MILEAGE OF PRIVATE RAILWAYS OPEN, 1913.

Particulars.	N.S.W.	Victoria.	Q'land.	S.A.	W.A.	Tas.	C'wealth.
For general traffic ...	153½	14	391	...	277	166	1,001½
For special purposes ...	113½	37	21	34	696½	56	958
Total ...	267	51	412	34	973½	222	1,959½

2. **Classification of Private Railways.**—The subjoined statement gives particulars regarding private railways, so far as returns are available, in each State for the year 1912-13. In this statement the lines inset are sub-branches from the main branches specified.

CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1912.

Railway Lines.	Gauge.	Length	Nature of Traffic Carried, etc.
NEW SOUTH WALES.			
	ft. in.	Miles.	
1 BRANCHES FROM NORTHERN LINE, N.S.W. GOVT. RLYS.—			
East Greta to Stanford-Merthyr and connections...	4 8½	24½	Coal and passengers
Hexham-Minni	4 8½	6	" "
Brown's line to Richmond Vale	4 8½	11½	Coal
Three other sub-branches	4 8½	5	"
Newcastle-Wallsend Co.'s lines	4 8½	4½	"
Five sub-branches... ..	4 8½	4	"
Waratah Coal Co.'s line	4 8½	4½	"
Old Burwood Pit	4 8½	7½	"
Gunnedah Coal Co.'s line	4 8½	4½	"
Twelve other branches	4 8½	16	Coal, coke, ores & stone.
Total	4 8½	88½	
2. BRANCHES FROM NORTH-COAST LINE GOVT. RAILWAYS—			
New Redhead Coal Co.'s lines, Adamstown to Burwood			
Extended, and Dudley lines	4 8½	8	Coal and passengers
Seaham Coal Co.'s lines, Cockle Creek to West Wall-			
send and Seaham collieries	4 8½	6	" "
Nine other branches	4 8½	9	Coal
Total	4 8½	23	
3. BRANCHES FROM SOUTHERN LINE, N.S.W. GOVT. RLYS.—*			
Liverpool-Warwick Farm	4 8½	¾	Racecourse traffic
4. BRANCHES FROM S. COAST LINE, N.S.W. GOVT. RLYS.—†			
Mount Kembla Coal Co.	4 8½	7½	Coal
Corrimal and Balgownie	4 8½	3½	"
Australian Smelting Co., Dapto	4 8½	2½	Ores
Mount Keira Coal Co., Belmore Basin	4 8½	3	Coal
Nine other branches	4 8½	14	"
Mount Pleasant Coal Co.	3 6	3½	"
Total	4 8½	31½	
	3 6	3½	
5. BRANCHES FROM WESTERN LINE, N.S.W. GOVT. RLYS.—			
Commonwealth Oil Corporation's line from Newnes			
Junction	4 8½	33	General
Eleven other branches	4 8½	6½	Coal, metal, and ores.
Total	4 8½	39½	
6. SILVERTON TRAMWAY—			
Broken Hill and Cockburn	3 6	36	General
7. DENILQUIN-MOAMA LINE	5 3	45	"
Total for State	4 8½	182½	
	3 6	39½	
	5 3	45	

* Three other branch private lines having a total length of 94 miles have been constructed for the conveyance of minerals, but are now closed. † The Illawarra Harbour and Land Corporation's line, 6½ miles long, constructed for general traffic is not now working.

CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1912 (Continued).

Railway Lines.	Gauge.	Length	Nature of Traffic Carried, etc.
VICTORIA.*			
1. KERANG TO KOONDRUCK TRAMWAY	ft. in. 5 3	Miles. 14	General
2. ALTONA BAY RAILWAY— Williamstown racecourse and pit at Altona	5 3	2½	Sand and stone
3. TOOBORAC into bush	5 3	24	Firewood
4. TRAWALLA to WATERLOO	5 3	8	" and gravel
5. CARISBROOK to NEW HAVILAH MINE	5 3	2½	" & mining timber
Total for State... ..	5 3	51	

* The Rosstown railway, running between Elsternwick and Oakleigh railway stations, about 5 miles in length, is not in use.

QUEENSLAND.

1. BRANCHES FROM GREAT NORTHERN LINE, GOVT. RLYS.— Three branch lines	ft. in. 3 6	Miles. 2½	Mineral traffic
2. BRANCHES FROM NORTH-COAST LINE, GOVT. RAILWAYS— Bundaberg to Millaquin	3 6	2	Sugar
Avondale to Invicta Mill	3 6	9	General (chiefly sugar)
3. BRANCH FROM WESTERN LINE, GOVT. RAILWAYS— Munro's tramway to Perseverance	3 6	10	Timber & farm produce
Gulland's lines to coal mines	3 6	1½	Coal
Stefford's lines to coal mines	3 6	½	"
4. BRANCHES FROM CAIRNS LINE, GOVT. RAILWAYS— Greenhill branch	2 0	4½	Sugar
Chillagoe railway, Mareeba to Mungana	3 6	103	General (chiefly coal and
Mount Garnet tramways, Lappa Jn'tn to Mt. Garnet	3 6	33	" " [minerals]
Stannary Hills tramway, Boomoo to Rocky Bluffs	2 0	21½	" " "
Mount Molloy tramway	3 6	20	" " "
5. BRANCH FROM SOUTH-COAST LINE, GOVT. RAILWAYS— Beaudesert tramway to Rathdowney, Tabooba Junction to Lamington	3 6	34	" (chiefly timber
6. INGHAM TRAMWAY— East Ingham to Mount Fox	2 0	30½	General (chiefly sugar)
Lucinda to East Ingham	2 0	17	"
7. GERALDTON TRAMWAY— Geraldton towards Herberton... ..	2 0	20½	" (chiefly sugar)
8. MOSSMAN TRAMWAY— Port Douglas to S. Mossman and Mowbray Rivers	2 0	18	"
9. BRANCH FROM BOWEN LINE— Bowen to Proserpine	3 6	38½	"
10. BRANCH FROM CENTRAL LINE GOVT. RAILWAYS— Barcardine to Aramac	3 6	42	" (chiefly stock)
11. BRANCH FROM CLEVELAND LINE GOVT. RAILWAYS— Norman Park to Belmont	3 6	4½	"
Total for State... ..	3 6 2 0	300½ 111½	

SOUTH AUSTRALIA.

BROKEN HILL PROPRIETARY Co.'s LINE— Iron Knob to Spencer's Gulf	ft. in. 3 6	Miles. 34	Carriage of ironstone flux
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CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1912 (Continued).

Railway Lines.	Gauge.	Length	Nature of Traffic Carried, etc.
WESTERN AUSTRALIA.*			
1. MIDLAND RAILWAY— Joining Govt. lines at Midland Junction & Walkaway	3 6	Miles. 277	General
2. W.A. GOLDFIELDS FIREWOOD SUPPLY CO.'S LINE— From Kurrawang into bush	3 6	96	Firewood
3. KALGOORLIE AND BOULDER FIREWOOD CO.'S LINE— Goodwood railway, from Lake Side into bush	3 6	21	"
Lancefield railway into bush	2 0	26	"
Laverton to junction Lancefield railway	2 0	6½	"
4. W.A. JARRAH SAWMILLS LINE— From Kirupp to mills and into bush	3 6	26	Timber
5. TIMBER CORPORATION CO.'S LINE— From Greenbushes to mills and into bush	3 6	17½	"
6. S.-WEST TIMBER HEWERS' CO-OP. SOCIETY'S LINE— From Holyoake into bush	3 6	14½	"
7. MILLAR'S TIMBER TRADING CO.'S LINES— Upper Darling Range railway, from Pickering Brook to Canning mills and bush	3 6	8½	"
Jarrahdale and Rockingham railway, from Mundigiting to Rockingham and bush	3 6	56½	"
Yarloop railway to mills and bush	3 6	58	"
Mornington mills rly., from Wokakup to mills & bush	3 6	41½	"
Ferguson River railway, from Dardanup to mills and into bush	3 6	39½	"
Karridale railway, to Hamelin & Flinders Ports from Karridale and into bush	3 6	51½	"
Collie Mills railway, from Worsley into bush	3 6	16½	"
Kirupp Saw mills into bush	3 6	20½	"
Marrinup saw mills into bush	3 6	5½	"
Jarrah woods saw mills into bush	3 6	7½	"
8. BUNNING BROS. LTD. LINES— From Lion Mill, Argyle, and Cardiff to bush	3 6	26½	"
9. NORTH DANDALUP S.M. RAILWAY— To mill and bush	3 6	10	"
10. SEXTON AND DRYSDALE'S BUSH RAILWAY— From Noggerup to bush	3 6	5	"
11. SWAN SAW MILL RAILWAY— From Lowden to mill and bush	3 6	10	"
12. W.A. TIMBER AND FIREWOOD CO. LTD. LINE— Kurramia railway, from Kalgoorlie-Kanowna railway to bush	3 6	58	Firewood
13. SONS OF GWALLA GOLD MINING CO.'S LINE— Railway into bush	1 8	26	"
14. MURCHISON FIREWOOD CO.'S LINE— Nallan wood railway, from Nallan siding to bush	3 6	28	"
15. WHIM CREEK TO BALLA RAILWAY	2 0	13	Copper Ore
16. BUCKINGHAM BROS. S.M. RAILWAY— From Muja to bush	3 6	3	Timber
17. WILGARRUP KARRI AND JARRAH CO.'S LINE— Railway into bush	3 6	3	"
Total for State...		{ 3 6 902 2 0 45½ 1 8 26	

* To the 31st December, 1912.

TASMANIA.

1. EMU BAY RAILWAY CO.'S LINES— Burnie to Waratah	ft. in. 3 6	} Miles. 104½	General
Guildford to Zeehan	3 6		
Rayna to Dundas	3 6		
2. MOUNT LYELL MINING AND RAILWAY CO.'S LINES— Strahan to Queenstown	3 6	22	"
Gormanston to Kelly Basin	3 6	30	"
3. SANDFLY COLLIERY CO.'S LINE— North-west Bay Co.'s jetty to mine	2 0	12	Minerals
4. HUON TIMBER CO.'S LINE* Emu Bay railway to British Queen	3 6	30*	Timber
5. TASMANIAN GOLD MINING CO.'S LINE— Beaconsfield to Beauty Point†	3 6	3½	Minerals and occasion- ally passengers
6. ZEEHAN TRAM CO.'S LINE Emu Bay railway to British Queen	2 0	2½	Minerals and occasion- ally passengers
7. DUCK RIVER RAILWAY— Leesville to Parish of Williams†	3 6	8	Chiefly timber
8. MAGNET SILVER MINING CO.'S LINES— Magnet Junction to Magnet	2 0	10	Minerals and passengers
Total for State...	{ 3 6 198 2 0 24½		

* Approximate. † Also branch lines as follows:—Electric railway, 1½ miles long, to reduction works, 2 ft. gauge; surface railways, horse, ½ mile long, 2 ft. gauge. ‡ Extension under construction.

3. **New South Wales.**—In this State the mileage of private railways open to the public for general traffic at the end of 1912 was 153½, and of lines used for special purposes, 113½ miles. Most of these lines were constructed primarily for the purpose of conveying coal from the mines to the Government railway systems. Particulars for the year 1912 of the operations of lines open for general traffic are given, so far as available, in the table on page 647.

(i.) *Private Railways Open for General Traffic.* The most important of the lines open for general traffic are as follows:—(a) *The Deniliquin-Moama Line.* In 1874 permission was granted by the New South Wales Government to a private company to construct a line forty-five miles long from Deniliquin, in the Riverina district, to Moama, connecting with the Victorian Railway system at the Murray Bridge, near Echuca. The line was opened in 1876, the land required being granted by the Government. (b) *The Cockburn-Broken Hill Line.* This line is owned by the Silverton Tramway Company. It was opened in 1888, and connects Broken Hill with the South Australian railway system, having a total length of 36 miles. (c) *East Greta Line.* This line, belonging to the East Greta Coal Mining Company, runs from East Greta Junction, on the Northern line of the Government railways, to Stanford Merthyr, a distance of 8 miles. (d) *The New Redhead Coal Company's Railway.* The lines owned by this company branch from the Northern line of the Government railways, and run from Adamstown to Burwood Extended Colliery, and from Adamstown to Dudley Colliery, a total distance of 8 miles. The lines are worked by the Railway Department, coal waggons being supplied in part by the coal companies using the line. The colliery companies using the line pay a way-leave for right to run their coal over the line, and the Railway Commissioners allow the New Redhead Company a proportion of the revenue from the passenger and goods traffic. (e) *The Seaham Coal Company's Railways.* This line runs from Cockle Creek to West Wallsend and Seaham Collieries, and has a total length of 6 miles. (f) *Hexham-Minni Railway.* This line branches from the Northern line of the Government railways and has a length of 6 miles. Further particulars are not available. (g) *The Commonwealth Oil Corporation's Railway.* This line runs from Newnes Junction on the Great Western line of the Government railways to the company's refinery, a distance of 93 miles. The Shay geared type of locomotive is in use on this line. (h) *The Warwick Farm Line* is a short line, three-quarters of a mile in length, connecting the Government line near Liverpool with the Warwick Farm Racecourse. Government rolling-stock is used.

In addition to the lines referred to above, legislative sanction was obtained in 1890 for the construction of a private line from the flux quarries at Tarrawingee to the Broken Hill line, a distance of 36 miles. The line was purchased by the Government in 1901, and is operated by the Silverton Tramway Company under lease from the Chief Commissioner, who pays the working expenses and receives the ordinary earnings and one-half the net receipts on special and holiday traffic.

4. **Victoria.**—In Victoria the only private railway open for general traffic is the Kerang-Koondrook tramway, opened in 1889. The cost of construction of this line to the end of September, 1913, was £39,182, paid out of a loan advanced by the Victorian Government. The total length is 14½ miles. The line is at present controlled by the Kerang Shire Council, but proposals have recently been made for its transfer to the Railway Department.

A line running from Elsternwick to Oakleigh, a distance of about 5 miles, has been constructed by a private company, but is not in use.

5. **Queensland.**—In this State private railways open for general traffic may be grouped under two heads:—(i.) Lines constructed primarily for mining purposes and (ii.) Shire tramways.

(i.) *Mining Railways.* (a) *The Chillagoe Railway.* The most important of these is the Chillagoe railway, constructed under the Mareeba to Chillagoe Railway Act 1897, and opened in 1901. This line runs from Mareeba, on the Cairns railway, to Mungana,

a distance of 103 miles. (b) *The Stannary Hills Line*. This line branches from the Chillagoe railway at Boonmoo and runs to Rocky Bluff, *via* Stannary Hills, a total distance of 21 miles. The gradients on this line, which has a gauge of 2 feet, range as high as 1 in 27, while the radius of some of the curves is as low as $1\frac{1}{4}$ chains. An additional length of 8 miles has been surveyed with a view to extending the line. (c) *The Mount Garnet Railway*. This line also branches from the Chillagoe railway at Lappa Junction and runs for a distance of 33 miles, as far as Mount Garnet.

(ii.) *Shire Tramways*. Under Part XV. of the Local Authorities Act of 1902 provision is made whereby not less than one-third of the ratepayers in any district may petition the local authority to apply to the Governor for the constitution of a tramway area. The Governor may define the area and may also approve of the plans and specifications of the proposed tramway. The amount which may be advanced by the Government for the construction or purchase of a tramway may not exceed a sum equal to £3000 for every mile of its length. As regards repayment of loans, no sum need be paid during the first three years, but after the expiration of that period the principal and interest must be repaid by half-yearly instalments on the basis provided for by the 'Local Works Loans Act, 1880 to 1899.' For the purpose of raising the money to pay these instalments the local authority may levy a rate upon all ratable property within the tramway area. The money required for the tramway may be raised by the local authorities by the issue of debentures.

6. **South Australia.**—In this State there are no private railways open for general traffic. The only private line is that owned by the Broken Hill Proprietary Company, running from Iron Knob to the seaboard near the head of Spencer's Gulf, a distance of 34 miles. The line is utilised for the carriage of flux for use in connection with the smelting works at Port Pirie.

7. **Western Australia.**—Owing to the Government's past difficulty in constructing lines urgently required for the development of the country, private enterprise was encouraged to undertake the work of construction on the land-grant principle, and two trunk lines were thus constructed. The greater part of the private lines now open, however, have been constructed in connection with the timber industry. (i.) *The Midland Railway*. This line is 277 miles in length, and runs from the Midland Junction, ten miles from Perth, to Walkaway, where it joins the Government line running to Geraldton. It was constructed under a concession of 12,000 acres of land per mile of line constructed, to be selected along the entire route of the railway. (ii.) *The Great Southern Railway*. This line, which was built by private enterprise under the land-grant system, is 242 miles in length, and was acquired by the Government by purchase on the 1st January, 1897. The total price paid, with all the interests of the private company and of the original concessionaire, was £1,100,000, which was divided by the Government for book-keeping purposes into £300,000 for the land and £800,000 for the railway. (iii.) *Millar's Timber Trading Company's Lines*. These lines have mostly been built under special timber concessions and leases. There were, at latest date available, in all ten lines situate in various parts of the State extending into the bush, whence logs are brought to the mills. The total length of these lines was approximately 306 miles. (iv.) *Other Lines*. There are also a number of other lines in various parts of the State used chiefly in connection with the timber industry. These are specified in the tabular statement on page 644.

8. **Tasmania.**—In this State there are three private lines open for general traffic. They are all situated in the western part of the island.

(i.) *The Emu Bay Railway Company*. The lines owned by this company run from Burnie to Waratah, from Guildford to Zeehan, and from Rayna to Dundas, and have a total length of 104 miles.

(ii.) *The Mount Lyell Mining and Railway Company*. The Mount Lyell railway runs from Regatta Point, Strahan to Queenstown, and the North Mount Lyell line from Kelly Basin to Linda. The former line, 22 miles in length, was constructed in 1895-6,

while the latter line, 30 miles long, was taken over from the North Mount Lyell Copper Company on the amalgamation of the two companies in 1903. The line from Kelly Basin to Linda is now run only intermittently.

(iii.) *The Magnet Silver Mining Company's Railway.* This line runs from Magnet Junction, near Waratah, on the Emu Bay Company's line to Magnet, a distance of 10 miles.

9. *Operations of Private Railways, 1912.*—The tabular statement given below shews particulars, so far as returns are available, for the year 1912 of all private railways open to the public for general traffic in the Commonwealth:—

PARTICULARS OF PRIVATE RAILWAYS OPEN FOR GENERAL TRAFFIC, 1912.

Line.	Miles Open.	Capital Cost.	Gross Revenue.	Expenses.		Train Miles.	Passenger Journeys.	Tons of Goods, etc.	No. of Employees.	Rolling Stock.		
				Working.	Interest etc.					Locos.	Coaches.	Wagons.
	No.	£	£	£	£	No.	No.	Tons	No.	No.	No.	No.
NEW SOUTH WALES.												
Deniliquin-Moama	45	162,672	17,877	10,148	281	36,201	16	34	47	4	6	63
Silvertown Tramway	36	457,592	205,071	65,350	<i>b</i>	158,368	59	1,070	290	18	<i>c</i>	690
East Greta Railway	20	274,216	67,644	40,383	8,088	366,083	844	50	231	15	26	40
Seaham Colliery Co.	6	16,000	994	<i>b</i>	<i>b</i>	5,895	11	8	9	2	4	892
New Redhead Co.	8	90,000	5,388	1,870	1,937	<i>b</i>	<i>b</i>	<i>b</i>	12	<i>c</i>	<i>c</i>	<i>c</i>
Hexham-Minmi	6	<i>b</i>	1,105	886	<i>b</i>	9,000	14	2	9	1	4	1
C'wth. Oil Corp'n	33	194,519	815	6,346	14,528	21,600	1	7	40	6	2	95
Total (a)	154	1,194,999	298,894	124,983	24,834	597,147	945	1,171	638	46	42	1,771
VICTORIA.												
Kerang-Koondrook	14	39,182	4,714	2,829	1,809	19,000	14	<i>b</i>	9	2	2	7
QUEENSLAND.												
Chillagoe Railway	103	420,276	72,589	23,011	...	109,542	28	122	121	8	2	161
Stannary Hills	91½	65,320	5,564	4,511	...	18,073	4	22	8	3	2	76
Mount Garnet	33	<i>b</i>	2,412	2,959	<i>b</i>	11,950	2	3	12	1	1	7
Invicta Mill	8½	19,446	538	<i>e</i> 282	972	<i>b</i>	<i>b</i>	<i>b</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Beaudesert	34	92,000	9,210	5,172	2,905	30,644	11	15	29	1	3	<i>c</i>
Douglas-Mossman	18	42,000	4,492	2,380	1,452	12,675	7	7	12	2	3	18
E. Ingham-Mt. Fox	30½	55,307	5,205	1,342	2,757	25,410	5	67	<i>b</i>	7	5	93
Lucinda-E. Ingham	17	<i>b</i>	900	367	<i>b</i>	<i>b</i>	7	<i>b</i>	1	<i>b</i>	<i>b</i>	<i>b</i>
Bowen-Proserpine	38½	102,819	5,979	3,950	2,104	12,246	<i>b</i>	<i>b</i>	10	<i>c</i>	<i>c</i>	<i>c</i>
Geraldton Tramway	20	51,756	<i>b</i>	1,633	<i>b</i>	16,575	3	16	11	1	2	17
Mt. Molloy	20	45,813	2,319	3,293	<i>b</i>	9,924	2	3	10	<i>c</i>	<i>c</i>	7
Belmont Tramway	4½	20,853	323	851	...	4,793	1	2	<i>b</i>	<i>c</i>	<i>c</i>	<i>c</i>
Total (a)	348½	915,590	109,531	49,751	10,190	251,832	70	257	214	23	18	379
WESTERN AUSTRALIA.												
Midland Railway	277	126,587½	144,752	85,867	<i>b</i>	511,568	75	117	329	17	20	345
TASMANIA.												
Emu Bay Railway	104½	611,469	66,400	28,433	19,625	149,506	34	89	114	10	10	150
Mt. Lyell Railway	22	216,066	22,610	17,545	<i>b</i>	40,348	22	79	138	7	7	128
Nth. Mt. Lyell Rly.	30	316,638	2,653	4,691	<i>b</i>	7,177	3	10	20	4	3	56
Magnet Railway	10	18,750	463	1,482	<i>b</i>	7,280	2	1	8	3	1	4
Total (a)	166½	1,162,943	92,126	52,151	19,625	204,311	61	179	280	24	21	338
Total for Cwth. (a)	959½	4,578,589	650,017	315,581	56,458	1,583,858	1,165	1,724	1,470	112	103	2,840

(a) Incomplete. (b) Not available. (c) Government rolling-stock used. (d) Salaries and wages only. (e) Maintenance only.

§ 3. Tramways.

1. **General.**—Tramway systems are in operation in all the States of the Commonwealth, and in recent years considerable progress has been made in the adoption of electrical traction, the benefit of which is now enjoyed by a number of the principal towns of the Commonwealth.

There are also in many parts of Australia private tramway lines which are used for special purposes, usually in connection with the timber, mining, or milling industries. Though efforts have been made to collect particulars of these lines, the returns are generally too incomplete for publication.

(i.) *Total Mileage Open and Classification of Lines.* The following table shows the total mileage of tramway lines open for general passenger traffic in each State and in the Commonwealth at the end of the year 1912-13, classified (a) according to the motive power utilised and (b) according to the nature of the authority by which the lines are controlled:—

TRAMWAYS.—CLASSIFICATIONS OF MILEAGE OPEN FOR PASSENGER TRAFFIC, 1912-13.

Nature of Motive Power and Controlling Authority.	N.S. Wales.	Victoria.	Q'land.	South Australia.	Western Australia.	Tas.	C'wealth.
ACCORDING TO MOTIVE POWER.							
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
Electric	142½	56	34	49½	52½	16	350½
Steam	69½	1	...	...	...	...	70½
Cable ... ..	...	46	...	...	...	...	46
Horse ... ..	...	13	...	26	26½	...	65½
Total	212	116	34	75½	79	16	532½
ACCORDING TO CONTROLLING AUTHORITY.							
Government	208	5	...	20	26½	...	259½
Municipal ... ..	...	17	...	49½	12	7	85½
Private	4	94	34	6	40½	9	187½
Total	212	116	34	75½	79	16	532½

2. **New South Wales.**—In this State the Tramways, with but few comparatively unimportant exceptions, are the property of the Government, and are under the control of the Railway Commissioners.

(i.) *Government Tramways.* In Sydney and suburbs the Government tramways are divided into distinct systems. There were in June, 1913, seven such systems in operation within the metropolitan area, the most important being the city and suburban lines, 104½ miles in length (189½ miles single track); the North Shore line, 18½ miles in length (32 miles single track), the Ashfield to Mortlake line, (8½ miles); and Manly to the Spit (10 miles). All of these systems are now operated by electricity. There are two systems on which the motive power used is steam, namely—(a) from Kogarah to Sans Souci, 5½ miles in length, and (b) from Arncliffe to Bexley, 2½ miles long,

There are also Government steam tramways in operation at Newcastle, Broken Hill, Parramatta, from East to West Maitland, and from Sutherland to Cronulla. The gauge of line on all the Government tramways is 4 feet 8½ inches.

(a) *Sydney Tramways.* In the early sixties a horse tramway, 1½ miles long, was constructed in Sydney. Owing to the rails being laid higher than the road surface, the inconvenience thus caused to other traffic necessitated its removal, and it was not until September, 1879, that the first steam tramway was opened, running from Bridge-street to Hay-street *via* Hunter-street. In the following few years these steam tramways were considerably extended. The electric system was not introduced into the city until the close of the year 1899, though it had at that time been in operation for some years in North Sydney. The tramways in the heart of the city, running along King-street to the suburb of Woollahra, as well as those in North Sydney, were originally worked by underground cables, and have since been converted into electric lines on the overhead trolley system. In December, 1899, the electric tramway, extending from the Circular Quay along George-street to the Redfern Station, and thence to the densely-populated district of Pyrmont, was opened for traffic. This tramway is a double track, and is 3½ miles in length. Single lines have been constructed along Castlereagh and Pitt streets, with the object of relieving the traffic along George-street. The whole of the steam tramways in Sydney and suburbs, with the exception of the Kogarah-Sans Souci, and the Arncliffe-Bexley, have now been converted into electric lines, and provision for the extra power required for the electrification of the former of these lines has been made at the central power station. A new sub-station has been erected at Narrabeen.

(b) *Other Tramway Systems.* In Newcastle the first section of the tramways, from Perkins-street to Plattsburg, was opened in 1887; the total length open on the 30th June, 1913, was 28 miles. At Broken Hill and Parramatta the first sections of the tramways were opened in 1902. On the 30th June, 1913, the mileage open at Broken Hill amounted to 9, and at Parramatta to 6½ miles. The line from East to West Maitland, 4½ miles long, was opened in February, 1909. There are also three short lengths of tramways in New South Wales run by private companies. Further particulars are given below.

(c) *Particulars of all Government Tramways.* The following table shews the total length, the capital cost, the gross revenue, working expenses, and net earnings, and the percentages of working expenses on gross revenue, and of net earnings on capital cost, for the financial years 1901-2 and 1908-13:—

**NEW SOUTH WALES.—PARTICULARS OF WORKING OF GOVERNMENT TRAMWAYS,
1901-2 and 1908-13.**

Year ended the 30th June.	Total Length of Lines Open.	Capital Expended on Lines Open.	Gross Revenue.	Working Expenses.	Net Earnings.	Percentage of Working Expenses on Gross Revenue.	Percentage of Net Earnings on Capital Cost.
	Miles.	£	£	£	£	per cent.	per cent.
1901-2	104	2,829,363	631,757	541,984	89,773	85.79	3.19
1908-9	151½	4,252,731	1,097,565	875,560	222,005	79.77	5.61
1909-10	165½	4,668,797*	1,185,568	983,587	201,981	82.96	4.33
1910-11	190	5,121,586*	1,365,631	1,143,949	221,682	83.77	4.33
1911-12	195½	5,664,324*	1,581,393	1,331,413	249,980	84.19	4.41
1912-13	208	6,699,305*	1,754,566	1,572,190	182,376	89.61	2.94

* £47,455 of this sum has been paid from the Consolidated Revenue, and no interest is payable thereon.

The net result, after providing for all working expenses and £192,284 for interest on the capital invested, was a deficit of £32,456 in 1912-13, as compared with a surplus of £57,696 in the preceding year. During the year 1912-13, 294,455,452 passengers were carried without any accident resulting in loss of life to any of the passengers.

(d) *Particulars of Different Systems of Government Tramways.* In the subjoined statement particulars are given of the working of the electric and steam tramways in Sydney, and of the other Government tramways at Parramatta, Sutherland, Newcastle, Maitland, and Broken Hill.

**NEW SOUTH WALES.—PARTICULARS OF THE WORKING OF THE VARIOUS
GOVERNMENT TRAMWAYS, 1912-13.**

Line.	Length	Total Cost.	Gross Revenue.	Working Expenses.	Interest.	Profit or Loss.*
	Miles.	£	£	£	£	£
Sydney and Suburban—						
Electric	141½	6,162,063	1,616,686	1,433,972	196,446	—13,732
Steam	8½	38,614	8,299	13,568	1,340	— 6,609
Total... ..	149¾	6,200,677	1,624,985	1,447,540	197,786	—20,341
Parramatta Steam	6¾	36,714	6,732	7,031	1,281	— 1,580
Sutherland to Cronulla „	7½	46,925	10,423	7,023	1,581	+ 1,819
Newcastle „	29½	295,246	84,411	79,539	10,081	— 5,209
East to West Maitland „	4½	38,125	5,464	6,683	1,329	— 2,548
Broken Hill „	10	81,618	22,551	24,374	2,774	— 4,597
Total... ..	208	6,699,305	1,754,566	1,572,190	214,832	—32,456

* The positive sign indicates a profit, the negative a loss.

The total capital cost shewn in the preceding table was made up as follows :—

**CAPITAL COST OF NEW SOUTH WALES GOVERNMENT TRAMWAYS AS AT
30th JUNE, 1913.**

Permanent Way.	Rolling Stock.	Power-house, Sub-stations, and Plant.	Machinery.	Workshops.	Furniture.	Total.
£3,513,784	£1,547,450	£1,342,108	£91,275	£202,296	£2,392	£6,699,305

The average cost per mile open was £16,904 for permanent way and £15,324 for all other charges, making a total of £32,228 per mile.

During the year 1912-13, twelve new extensions, amounting in all to a length of 12 miles, were opened for traffic. On the 30th June, 1913, two extensions, having a total length of a mile, were under construction, and up to the same date two additional extensions, amounting to about 3¾ miles, had been authorised for construction.

(e) *Sydney Electric Tramways.* The current for the operation of the city and suburban tramways is generated at the power-house at Ultimo, which has been erected at a total cost of £989,653, including the cost of the sub-stations and plant. The current generated at the power-house is partly continuous and partly alternating, and is used both for lighting and traction purposes. The standard voltage of the continuous current is 600; the alternating current is transmitted by means of high-tension cables to sub-stations, where it is converted to continuous current at the standard voltage. The total output of the power-house, for both lighting and traction purposes, during the year 1912-13, was 89,113,036 kilowatt-hours, of which the direct-current supply was 11,022,341, and the alternating current 78,090,695 kilowatt-hours. The following table gives particulars of the working of the electric tramways for the financial years 1901-2 and 1909-13 :—

**NEW SOUTH WALES.—PARTICULARS OF SYDNEY ELECTRIC TRAMWAYS,
1901-2 and 1909-13.**

Year ended 30th June.	Mileage Open for Traffic (Track).	Total Cost of Construction and Equipment.	Output of Power-house for Traction Purposes.	Tram Miles Run.	Passengers Carried.
	Miles.	£	Kilowatt-hours '000	No. '000.	No. '000.
1902	52	1,285,014	15,472	6,175	63,517
1909	169½	3,756,198	42,299	17,813	173,733
1910	184½	4,235,170	45,500	19,394	187,574
1911	201¾	4,585,240	61,163	21,120	214,975
1912	223	5,153,321	70,920	23,016	250,786
1913	242¾	6,162,063	79,840	25,480	275,977

Year ended 30th June.	Gross Revenue.	Working Expenses.	Net Revenue.	Number of Cars in Use.	Number of Persons Employed.
	£	£	£		
1902	340,742	257,557	83,185	436	2,855
1909	1,009,498	785,404*	224,094	906	5,514
1910	1,092,582	888,415	204,167	939	6,065
1911	1,256,672	1,033,229	223,443	985	6,667
1912	1,460,625	1,209,321	251,304	1,048	8,138
1913	1,616,686	1,433,972	182,714	1,220	9,048

* Including £50,500 written off for depreciation, etc.

The net revenue on capital invested was 2.96 per cent. in 1912-13 as against 4.89 per cent. in the preceding year.

(ii.) *Private Tramways.* There are two private tramway lines in New South Wales open for general traffic. (a) There is an electric tramway running from Rockdale to Brighton-le-Sands, a distance of one and a-quarter miles with a gauge of 4 ft. 8½ in. This line was originally opened as a steam tramway in 1885, but was subsequently converted into electric. The total cost to the end of 1911 was £13,800. During that year the number of tram-miles run was 37,000. (b) A private steam tramway passes through the township of Parramatta. Commencing at the park gates, it runs as far as the Duck River, a distance of 3¼ miles, where it connects with the Parramatta River steamers, conveying passengers and goods to and from Sydney. This line, the gauge of which is 4 ft. 8½ in., was opened for traffic in 1883. In 1912 the number of tram miles run was about 18,000, and the number of passengers conveyed about 96,000.

Particulars regarding private tramways used for special purposes are not available.

(iii.) *Sydney Harbour Ferries.* As the ferry services on the waters of Port Jackson are mainly subsidiary to the suburban railway and tramway systems, it has been thought advisable to include them here rather than under shipping. Returns for the year 1912 were received from four companies, and shew that these companies had 65 boats in commission, which were licensed to carry a total of 43,858 passengers, or an average of 674 per boat and per trip. The total number of passengers carried during the year is stated as 32,777,000, an average of 89,800 per day. In addition to the ordinary passenger traffic there are two lines providing for vehicular traffic, which afford the only rapid means of transit between the city and the northern suburbs. The four companies employed during the year a total of 888 persons. The gross revenue during 1912 amounted to £303,149, and the expenditure to £207,423, thus giving

a net revenue of £95,726. The services are well managed, and the boats constructed during recent years—double-ended screwboats—are claimed to be superior in size and equipment to boats employed on similar service in any part of the world.

3. **Victoria.**—In Melbourne there is a number of tramway systems carried on under the control of various authorities, the most important being the cable system worked by the Melbourne Tramway and Omnibus Company. There are also three lines of electric tramways, one running from St. Kilda to Brighton, a distance of five and one-eighth miles, belonging to the Government, and under the control of the Railway Commissioners; one from Flemington Bridge to the Saltwater River and Keilor Road, a distance of seven and a-quarter miles, run by a private company; and one connecting the southern suburbs of Prahran, Malvern, Caulfield, St. Kilda, Hawthorn and Kew. This system has a track mileage of 38 miles and is controlled by a joint municipal trust. There is also a private cable tramway, two and a-quarter miles in length, between Clifton Hill and Preston. There are also two tramways worked by horses—one, seven miles in length, running from Sandringham to Cheltenham *via* Beaumaris, and privately owned, the other, one and a-half miles long, from Brunswick to Coburg, and owned by the Coburg municipality, while three similar services are worked by the Melbourne Tramway and Omnibus Company, *viz.*, Victoria Bridge to Kew, Richmond Bridge to Hawthorn, and the Zoological Gardens lines. It is intended to electrify the Brunswick-Coburg line at an early date. There is a short steam tramway, about one mile long, at Sorrento, and there are also systems of electric tramways at Ballarat, Bendigo, and Geelong, constructed and run by private companies. A number of tramways has been constructed for special purposes in various parts of the State under the provisions of the Tramway Act 1890.

(i.) *Melbourne Cable Tramways.* The Melbourne Omnibus Company began its services by the initiation of omnibus services in 1869, and in 1878 the company changed its name to the Melbourne Tramway and Omnibus Company, with a view to the introduction of a tramway system in the city and suburbs of Melbourne. It was not, however, until the year 1883, when the Melbourne Tramway and Omnibus Company's Act was passed, that the necessary authority was given by Parliament for that purpose. Under this Act the company was empowered to construct tramways in the streets of Melbourne and suburbs, with the consent of the municipalities interested, who had the option of electing to construct the tramways themselves. All the municipalities decided to exercise the option conferred upon them, and, according to the provisions of the Act, a Tramways Trust was formed. This body, which is composed of seven members from the Melbourne City Council and one member each from the councils of eleven of the surrounding municipalities, received full power to construct tramways, and to borrow money for that purpose, secured on the municipal properties and revenues and on the tramways themselves. The Trust raised sufficient funds to pay for the construction of the tramway-tracks and the engine-houses from which the cables are worked. It was required by the original Act, as amended in 1892, to complete the tramways by the end of the year 1893, and to grant a thirty-two years' lease of the tramways to the company, dating from the 1st July, 1884—when the liability for interest on the loans commenced—and expiring on the 1st July, 1916. The company is required to find sufficient capital to build the rolling-stock and to equip the lines and engine-houses with all necessary working requisites. The company pays to the Trust annually the interest due upon the loans raised, and also a sufficient sum as a sinking or redemption fund, to repay by its accumulation the principal of the loans raised by the Trust, and at the expiration of the lease must hand back the lines in good working order to the Trust. The expenses of the Trust were paid out of the loan up to the end of the year 1903, but since that date have been paid by the company to an amount not exceeding £1000 per

annum, the municipalities being liable for the remainder. The total amount the Trust was empowered to borrow was £1,650,000, which has been raised in London by means of debentures bearing interest at $4\frac{1}{2}$ per cent. The premiums received amounted to £55,794, making a total of £1,705,794. This amount had been expended by the end of the year 1893, when further loan expenditure ceased. The first line—that to Richmond—was opened to traffic in November, 1885, and the work being rapidly pushed on, the others were opened at short intervals, and the whole system was completed in 1891. The complete system consists of forty-three and a half miles of double-track cable lines, using constantly over ninety miles of wire rope, and four and a half miles of double-track horse lines. The gauge of track is 4 feet $8\frac{1}{2}$ inches.

(a) *Particulars of Working.* The subjoined statement shews the tram mileage, the number of passengers carried, and the revenue and expenditure for the years 1901-2 and 1909 to 1913:—

**MELBOURNE CABLE TRAMWAYS.—PARTICULARS OF WORKING, 1901-2 and
1909 to 1913.**

Year ended the 30th June.	Tram Mileage.	Number of Passengers Carried.	Revenue.			Working Expenses.			
			Traffic Rec'pts.	Other.*	Total.	Wages.	Repairs & Main- tenance	Other.*	Total.
			£	£	£	£	£	£	£
1902	No. 9,226,883	No. 47,261,572	454,683	20,152	474,835	125,596	68,689	75,269	269,554
1909	9,856,345	66,522,463	565,601	43,059	608,660	162,093	69,681	64,516	296,290
1910	10,010,975	68,695,853	581,390	45,307	626,697	162,956	78,022	63,540	304,518
1911	10,636,440	76,295,825	644,187	40,140	684,327	182,845	77,319	60,620	320,784
1912	11,313,212	84,926,712	715,524	45,268	760,792	205,883	76,040	61,996	343,919
1913	11,839,473	89,359,248	751,091	44,000	795,091	252,270	70,485	63,848	386,603

* Including amounts on account of omnibus lines.

It may be noted that the "Wages" item in the above table does not represent all that is paid in wages by the company, as a considerable portion is merged in the item "Repairs and maintenance." The figures under working expenses classed as "Other" comprise feed, fuel, licenses, rates, insurance, law costs, stationery and office expenses, salaries of staff, and directors' and auditors' fees.

(ii.) *Electric Tramways.* There are in Melbourne three electric tramway systems, namely (a) the St. Kilda-Brighton line, (b) the North Melbourne tramways, and (c) the Prahran-Malvern system.

(a) *The St. Kilda-Brighton Line.* Under the St. Kilda and Brighton Electric Street Railways Act 1904 the Board of Land and Works was authorised to construct a tramway from St. Kilda to Brighton. The amount of interest payable on the cost of the land acquired for the tramway was guaranteed by the municipalities of St. Kilda and Brighton for a period of twenty years, and authority was given by the Act to the municipalities to levy either a general or special rate not exceeding one shilling in the pound for the purpose of paying the guarantee. The profit, if any, during the first twenty years is to be set off in reduction of the guarantee. The line was opened for traffic in May, 1906, and the extension to Brighton Beach was opened in the following year. A proposal has been made to extend the line along the foreshore as far as Mordialloc. The capital cost to the 30th June, 1913, exclusive of rolling-stock, was £65,944, and of rolling-stock was £22,189, making a total of £88,133. The gauge of track is 5 ft. 3 in. The subjoined statement gives particulars of the working of this line for the financial years ended the 30th June, 1909 to 1913:—

ST. KILDA-BRIGHTON ELECTRIC STREET TRAMWAY, 1908-13.

Year ended 30th June.	Mileage Open.	Capital Cost.	Car Mileage.	Passengers Carried.	Gross Revenue.	Working Expenses.	Interest.	Net Profit or Loss.*
1908	5.13	£ 57,523	335,007	1,146,484	10,374	£ 14,299†	£ 2,140	£ -6,065
1909	5.13	58,054	338,214	1,265,492	10,941	9,075	2,038	— 172
1910	5.13	58,612	340,254	1,361,925	11,885	9,860	2,092	— 67
1911	5.13	59,007	346,849	1,410,907	12,852	9,819	2,107	+ 926
1912	5.13	60,590	367,306	1,674,918	15,012	13,283	2,078	— 349
1913	5.13	88,133	413,939	1,916,618	16,829	15,808	3,093	-2,072

* Profit is indicated by +, Loss by —. † Including an amount of £3311 for replacement of rolling-stock, etc., caused by fire.

The average fare paid per passenger was 2.09 pence in 1912-13 as against 2.13 pence in 1911-12. The gross revenue in 1912-13 was 9.76 pence per passenger car mile and £3088 per mile of track open. In the same year the percentage of working expenses on gross revenue was 93.9 as against 88.5 in the preceding year.

(b) *The North Melbourne Tramways*, extending through the northern suburbs to the Saltwater River and to Keilor Road, were constructed by a private company, and were opened for traffic towards the end of the year 1906. The route mileage for year ended 30th September, 1913, was 11½ miles, the gauge of line being 4 feet 8½ inches. The number of passengers carried during the same period was 2,591,000.

(c) *The Prahran-Malvern Tramway*. This line has been constructed under the control of a trust, which consists of five members appointed from the councils of Prahran, Malvern, St. Kilda, and Caulfield. The municipalities of Hawthorn and Kew have now been included in the scheme and will have equal representation on the trust. The total track mileage to 30th December, 1913, was 15½ miles, the total capital cost being £238,000, but an additional 22 miles has since been opened, the cost of the extension being £171,815. The gauge of the track is 4 ft. 8½ in. The current is supplied by the Melbourne Electric Supply Company Limited at a price varying according to the consumption of current and the price of fuel. Any surplus revenue, after providing for operating expenses, interest, sinking fund and renewal reserve, is to be paid to the municipal councils interested in proportion to the car mileage run in their respective districts. The lines were opened for traffic on 31st May, 1910. During the year ended 30th September, 1913, the current used for traction purposes was 1,913,266 kilowatt-hours, and the number of tram miles run was approximately 995,972, the number of passengers carried 9,110,656, the gross revenue £59,123, and the working expenses (excluding interest and renewals reserve) £39,686. The number of cars in use was 53, and the number of persons employed 260. It is intended to construct an additional 6 miles of line.

(d) *The Ballarat and Bendigo Electric Tramways* are under the control of a private company, and run along the main streets and to and from the outlying suburbs of the two cities. The total length of lines open for traffic is 22 miles, the gauge being 4 ft. 8½ in. During 1912, 5,737,143 passengers were carried, the gross revenue being £51,907, and the working expenses £35,820.

(e) *The Geelong Electric Tramways*. This line, which is privately owned, was opened for traffic in January, 1912, and up to the 31st August, 1913, the cost of construction and equipment was £43,910. The system has a length of 5½ miles of single track, the gauge being 4 ft. 8½ in. The car mileage was for the year ending on that date 184,788 miles, and the number of passengers carried 949,941. For the same period the revenue was £11,980, and the expenditure £9784.

(f) *Particulars of Working of all Electric Tramways.* The following table gives particulars of the working of all electric tramways in Victoria for each year from 1908 to 1913 inclusive:—

VICTORIA.—PARTICULARS OF WORKING OF ELECTRIC TRAMWAYS, 1908 to 1913.

Year.	Mileage Open for Traffic.	Total Cost of Construction and Equipment.	Current Generated for Traction Purposes at Central Stations.	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	Number of Cars in Use.	Number of Employees.
	Miles.	£	Kilowatt-hrs. (000 omitted.)	No. (000 omitted.)	No. (000 omitted.)	£	£	No.	No.
1908	34½	272,180*	1,562*	1,963	7,519	69,296	55,740	95	338
1909	34½	290,815	2,185	1,904	7,497	66,148	50,820	95	312
1910†	34½	275,458*	2,314	1,930	7,889	54,727*	40,087*	97	317
1911	43½	406,815‡	2,998	2,376	12,198	84,545‡	56,562‡	117	408
1912	52	497,100‡	3,504	2,703	15,343	106,478‡	73,436‡	119	501
1913	57	771,204	4,569	3,210	20,305	140,566‡	101,098‡	167	625

* Incomplete. † Exclusive of Prahran-Malvern Tramway, which was opened for traffic on 31st May, 1910. ‡ Exclusive of North Melbourne Tramway.

(iii.) *Private Tramways for Special Purposes.* There is in Victoria a number of tramways used for special purposes, chiefly in connection with the timber, mining, and milling industries. These lines have been constructed either under authority of the Department of Public Works, pursuant to Section 36 of the Tramway Act 1890, or under leases or licenses issued by the Department of Lands and Survey, pursuant to Sections 144 and 145 of the Land Act 1901. Particulars of these lines are too incomplete for publication.

4. *Queensland.*—In this State there is a system of electric tramways running through the streets of the city and suburbs of Brisbane and controlled by a private company which has its head office in London. The total length of the Brisbane system was thirty four and one-third miles at the end of the year 1913. There is also a number of tramways, having a total length of about 640 miles, run in connection with sugar mills. Particulars of Shire tramways have been given in the part of this section dealing with private railways (see p. 646).

(i.) *Brisbane Electric Tramways.* These tramways are run on the overhead trolley system, the voltage of the line current being 550. The total cost of construction and equipment to the end of the year 1909 was approximately £1,250,000, the gauge of line being 4 ft. 8½ in. The following table gives particulars of these tramways for the calendar years 1901 and 1908-12.

QUEENSLAND.—BRISBANE ELECTRIC TRAMWAYS, PARTICULARS OF WORKING, 1901 and 1908-12.

Year.	Mileage Open for Traffic.	Current Generated.	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	No. of Cars in Use.	Number of Persons Employed
	Miles.	Kilowatt-hrs.	No.	No.	£	£	No.	No.
1901 ...	21	3,192,955	2,756,443	16,183,801	111,483	64,710	79	375
1908 ...	30½	4,915,202	3,367,972	27,221,466	177,567	*	107	619
1909 ...	30½	5,099,663	3,321,803	29,732,338	192,371	*	*	614
1910 ...	30½	5,441,032	3,524,036	32,419,276	214,265	*	119	654
1911 ...	34½	*	3,671,963	36,443,222	243,344	*	128	736
1912 ...	34½	5,798,622	3,508,410	36,375,652	243,668	*	128	762

* Not available.

(ii.) *Sugar-Mill Tramways.* There is a number of tramways in various parts of Queensland used in connection with the sugar-milling industry, chiefly for the purpose of hauling cane to the mills. Some of these lines are of a permanent nature, running through sugar-cane plantations, while others are portable lines running to various farms.

5. **South Australia.**—Up to the year 1906 there was a number of horse tramways in the principal streets of Adelaide and suburbs run by various private companies. Power to acquire part of these lines, with a view to their electrification, was given to the Adelaide Corporation by the Municipal Tramways Trust Act 1906. In accordance with the provisions of the Act, a Trust consisting of eight members, of whom two were nominated by the Governor, two elected by the City Corporation, and two each by the Suburban Corporations and the District Councils, was formed in 1907, and a length of forty-nine route miles of horse traction tramways was purchased from the private companies at a cost of £283,357. On the 9th March, 1909, the electric car system was inaugurated on the Kensington route. At the end of July, 1913, a length of 49½ route miles had been electrified and opened for traffic, the corresponding length of track opened being 88 miles. The power-house is located at Port Adelaide, nine miles from the city. It is equipped with three 1500-kilowatt turbo-alternators generating current at 11,000 volts, which are stepped down and passed through rotary converters to direct current at 600 volts. The cost of construction and equipment on the 31st July, 1913, was £1,350,710. The following table gives particulars of the tramways for the year ended 31st July, 1913 :—

SOUTH AUSTRALIA.—ADELAIDE ELECTRIC TRAMWAYS.—PARTICULARS OF WORKING, 1912-13.

Year.	Mileage Open for Traffic.	Capital Cost.	Current Generated.	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.*	No. of Cars in Use.	No. of Persons Employ'd
1913	Miles.	£	Kil'w'tt-hrs.	No.	No.	£	£	No.	No.
	49.7	1,350,710	9,169,269	5,140,706	41,576,483	310,240	207,319	170	1,113

* Inclusive of price of current.

There are also in South Australia nineteen and three-quarter miles of Government horse tramways in country districts, worked in connection with the railway system, and six and one-quarter miles of private tramways used for passenger service. The subjoined statement gives various particulars of these lines :—

SOUTH AUSTRALIA.—PARTICULARS OF HORSE TRAMWAYS, 1912-13.

Particulars.	Length.	Gauge.	Nature of Traffic.
GOVERNMENT TRAMWAYS.			
	M es.	ft. in.	
Moonta, Moonta Bay, and Hamley Flat	5½	5 3	Passengers and goods.
Gawler	1½	5 3	" "
Victor Harbour and Breakwater	1	5 3	" "
Dry Creek and Magazine	1	2 0	Explosives.
Magazine and Broad Creek	1½	2 0	" "
Port Broughton and Mundoorra	10	3 6	Passengers and goods.
PRIVATE TRAMWAYS.			
Port Adelaide and Alberton	2¼	5 3	Passengers.
Glenelg and Brighton	4	4 8½	" "

6. **Western Australia.**—In this State there are a number of horse tramways, amounting in all to a length of $26\frac{1}{2}$ miles, which are the property of the Government. Of these the most important is the line between Roeburne and Cossack, constructed on a 2 ft. gauge and under the control of the Colonial Secretary's Department. The length of this line is $12\frac{1}{2}$ miles. The remaining $14\frac{1}{2}$ miles belonging to the Government are made up of ten short lengths, varying from two and a half chains to four and a quarter miles, worked in connection with the jetties at various ports for the purpose of providing the necessary communication between such jetties and the goods sheds or warehouses. Most of these short lines are leased at annual rentals, and are under the supervision of the Harbour Master. Their maintenance and improvement is in the hands of the Public Works Department. In addition to these Government lines there are electric tramway systems at Perth and Kalgoorlie, carried on by private companies, and at Fremantle and Leonora, under municipal control.

(i.) *Government Tramways.* Particulars as to the working of the Government horse-tramways or as to the rents received therefrom are not generally available. The returns of the Roeburne-Cossack line for the year ended 30th June, 1913, shew that the capital cost of the line to that date was £49,319, the gross revenue for the year being £3353, and the working expenses £2498.

(ii.) *Electric Tramways.* There are now five towns in Western Australia which enjoy the benefits of electric tramway systems, namely, Perth, Fremantle, Kalgoorlie, Boulder City, and Leonora.

(a) *The Perth Electric Tramways* were opened for traffic by a private company in 1899, and the system has since been extended to many of the outlying suburbs. This tramway system was taken over by the Government on 1st July, 1913, and is now running in conjunction with the Government railways. On the 31st December, 1912, there were $22\frac{1}{2}$ miles of line open, the total cost of construction and equipment to that date being £486,291. During the year 10,242,934 passengers were carried, the gross revenue being £101,046 and the working expenses £50,576. Fifty-one motors were in use, and the number of employees was 242. The gauge of line is 3 ft. 6 in.

(b) *The Kalgoorlie and Boulder City Tramways* are also run by a private company, the first line being opened in 1902. At the beginning of 1904 legislative authority was given for the construction of lines in Boulder City and suburbs, and in November, 1904, the last section of the Boulder system was completed. At the end of the year 1912 the total mileage of the whole system—in Kalgoorlie and Boulder City—amounted to 19 miles, the total cost of construction and equipment being £449,128. During the year, 2,489,833 passengers were carried, the gross revenue being £37,811 and the working expenses £26,497. The gauge of this line is 3 ft. 6 in.

(c) *The Fremantle Tramways* were opened in November, 1905, under the control of the municipality. On the 31st August, 1913, there were $8\frac{3}{4}$ miles of line open for traffic, the cost of construction and equipment at that date being £101,554. This line has a gauge of 3 ft. 6 in. During the year 4,115,000 passengers were carried, the gross revenue being £32,000 and the working expenses £25,300.

(d) *The Leonora-Gwalia Tramway*, three miles in length, formerly a steam tramway, was opened for traffic by electrification on 5th October, 1908. This tramway is under municipal control, and has a gauge of 3 ft. 6 in. The cost of construction is approximately £5500, and during the year ended 31st October, 1913, 99,925 passengers were carried.

(e) *Particulars of Working of all Electric Tramways.* The subjoined table shews, so far as returns are available, particulars of the working of all electric tramway systems in the State for the years 1901 and 1908-12.

**WESTERN AUSTRALIA.—PARTICULARS OF ELECTRIC TRAMWAYS,
1901 and 1908-12.**

Year.	Mileage Open for Traffic.*	Total Cost of Construction and Equip- ment	Current Generated.	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	No. of Cars in Use.	No. of Persons Em- ployed.
	Miles.	£	Kilowatt-hrs.	No.	No.	£	£	No.	No.
1901	16½	367,037	†	721,056	†	46,270	26,673	30	†
1908	47½	968,567	4,065,616	2,316,325	13,136,065	142,182	91,770	89	354
1909	50	1,018,548	3,952,366	2,304,616	13,579,603	144,320	98,236	101	366
1910	53	1,035,357	3,741,628	2,139,524	12,420,830	139,824	88,110	106	381
1911	53	1,039,421	4,395,044	2,360,341	14,399,558	158,657	93,003	104	359
1912	53	1,042,474	4,535,424	2,527,155	16,947,301	172,474	103,927	105	431

* For the years 1908 to 1912 inclusive, miles of route are given; for 1901 the figures represent miles of single track. † Not available. ‡ Exclusive of Leonora Tramway.

7. *Tasmania.*—In Hobart there is a system of electric tramways, amounting in all to a length of nine miles, owned by a private company. Under the authority of the Launceston Tramway Act of 1906 the Launceston City Council entered into an agreement with a private company for the construction of a system of electric tramways in the city and suburbs of Launceston. The agreement provided that the company was to run the tramways for a period of twenty-five years, when the Council could purchase the lines and stock at cost price; the electric power required was to be supplied by the Council. This agreement, however, lapsed, and the Council has constructed the tramways, and is running them as a municipal undertaking. The system, which was opened on the 16th August, 1911, has a route mileage of about 7¼ miles, the gauge of track being 3 ft. 6 in. The total cost of construction and equipment to the end of July, 1913, amounted to £70,871. Fourteen cars with motors were in use; and the number of employees totalled 80. The number of passengers carried during the year 1912-13 was 2,170,000 and the car mileage was 327,565 miles. The gross revenue for the same period was £17,155, and the working expenses £13,332.

(i.) *Hobart Electric Tramways.* These tramways were opened for traffic in 1893, the total cost of construction and equipment to the 31st December, 1912, being £92,121. The line has a 3 ft. 6 in. gauge. The following table gives particulars of the working of this system for the years 1901 and 1908-12:—

**TASMANIA.—PARTICULARS OF WORKING OF HOBART ELECTRIC TRAMWAYS,
1901 and 1908-12.**

Year.	Mileage Open for Traffic.	Total cost of Construc- tion and Equip- ment.	Current Generated	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	Number of Cars in Use.	Number of Per- sons Em- ployed.
	Miles.	£	Kilowatt- hours	No.	No.	£	£	No.	No.
1901	9	90,000	...	321,633	1,734,120	16,097	11,735	20	90
1908	9	90,000	622,207	453,773	2,677,018	26,789	14,446	23	105
1909	9	90,824	748,878	490,410	2,772,047	27,502	15,682	25	105
1910	9	91,788	746,377	518,024	3,074,782	29,490	16,820	25	108
1911	9	92,121	845,403	484,295	3,363,500	32,780	19,310	28	110
1912	9	92,121	949,926	493,005	3,821,293	36,381	20,758	28	110

8. **Electrical Traction in Commonwealth, 1912-13.**—The subjoined table gives particulars of electric tramways for each State and the Commonwealth. The returns for the Hobart tramways in Tasmania, for the Ballarat and Bendigo tramways in Victoria, for the Rockdale-Brighton-le-Sands in New South Wales, for the Perth and Kalgoorlie tramways in Western Australia, and for the Brisbane tramways, are for the calendar year 1912; and for other tramways the returns are, generally, for the financial year 1912-13:—

ELECTRIC TRAMWAYS IN COMMONWEALTH, 1912-13.

State.	Mileage (Route) open for Traffic.	Capital Cost.	Current Generated.	Tram Miles Run.	No. of Passengers Carried.	Gross Revenue.	Working Expenses.	No. of Cars, Motors, and Trail'rs	No. of Employees
	Miles.	£	Kilowatt-hours (,000 omitted).	No. (,000 omitted).	No. (,000 omitted).	£	£	No.	No.
N.S.W. ...	142½	6,175,463	80,904	25,513	275,983	1,619,186	1,436,605	1,220	9,056
Victoria ...	56	*544,467	4,569	3,210	20,305	*128,586	*91,314	168	625
Queensland ...	34	†	5,799	3,508	36,376	243,668	165,014	129	762
South Australia ...	49½	1,350,710	9,169	5,141	41,576	310,241	207,319	170	1,113
West. Australia ...	52½	1,042,474	4,535	2,527	16,947	172,474	103,927	107	431
Tasmania ...	16	162,992	1,406	821	5,991	53,536	34,090	45	161
Commonwealth	350½	9,276,106	106,382	40,720	397,175	2,527,691	2,038,269	1,839	12,148

* Exclusive of North Melbourne Tramway. † Not available. ‡ Incomplete.