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 State Governments up to the 30th June, 1912:—

ROADS AND BRIDGES.—TOTAL LOAN EXPENDITURE OF EACH STATE AND OF THE COMMONWEALTH UP TO THE 30th JUNE, 1912.

State, etc. ...	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.*	C'wealth.
Expenditure	£1,785,813	£176,475	£923,656	£1,464,736	£251,351	£3,839,650	£8,441,681

* 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 1907 to 1912.

ROADS AND BRIDGES.—LOAN EXPENDITURE BY STATE GOVERNMENTS, 1901-2 and 1907-12.

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
1907-8 ...	1,690	23	...	...	7,956	94,443	104,112
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

1. For the calendar year 1902. 2. Not available separately. 3. Exclusive of Tasmania.

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, 265 bridges, 54 wharves, 99 jetties, and 12 ferries had 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 Illawara 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 1912 was approximately 83,194 miles, of which 9514 miles were controlled by municipalities, 67,490 by the shires, and 6190 miles were in the unincorporated areas of the Western Division. The following table gives particulars for the year 1911-12 of roads classified according to whether metalled, etc., formed only, cleared only, or natural surface :—

NEW SOUTH WALES.--APPROXIMATE LENGTH OF ROADS, 1911-12.

Classification.	Metalled, Ballasted, Gravelled etc.	Formed only.	Cleared only.	Natural surface.	Total.
	Miles.	Miles.	Miles.	Miles.	Miles.
Metropolitan...	1,104	321	241	207	1,873
Country Municipalities	2,394	1,413	1,757	2,077	7,641
Shires	10,548	7,535	18,757	30,650	67,490
Western Division	80	137	2,669	3,304	6,190
Total	14,126	9,406	23,424	36,238	83,194

(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 1911 are given in the following table :—

NEW SOUTH WALES.—BRIDGES, CULVERTS, AND FERRIES, 1911.

Particulars.	Bridges, 20 ft. span and over.		Culverts.		Ferries.
	No.	Length.	No.	Length.	No.
		ft.		ft.	
National works	265	105,322	...	...	12
Metropolitan...	126	4,787	626	50,944	3
Country municipalities	618	39,536	3,252	71,838	13
Shires	3,146	188,397	29,560	259,513	91
Western Division (unincorporated) ...	124	21,815	107	1,435	5
Total	4,279	359,857	33,545	383,730	124

(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 £24,733,861. 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 quinquennium, and for each succeeding financial year up to 1911, 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 1911.

Period.	Expenditure by Roads Department.	Expenditure by Trustees.	Total.
	£	£	£
1857 to 30th June, 1900 ...	18,714,078	1,258,027	19,972,105
1901 to 1905	3,340,299	28,944	3,369,243
1906*	457,421	1,171	458,592
1907*	407,268	549	407,817
1908*	158,005	...	158,005
1909*	118,121	...	118,121
1910*	124,652	...	124,652
1911*	125,326	...	125,326
Total	23,445,170	1,288,691	24,733,861

* Year ended 30th June.

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 forming 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.) *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 1907 to 1911:—

VICTORIA.—EXPENDITURE ON ROADS AND BRIDGES, 1901 and 1907-11.

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
1907	43,119	21,137	7,495	25,244	3,052
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

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, asphalting 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, 1911, was as follows:—

SOUTH AUSTRALIA.—ESTIMATED LENGTH OF ROADS AND STREETS, 1911.

Particulars.	Woodblocked.	Macadamised.	Other.	Total.
Miles	½	8,549	24,928½	33,478

(ii.) *Expenditure by Corporations on Main and District Roads.* The following table shews the expenditure by municipal corporations on both main and district roads during 1901-2, and each year from 1907 to 1911 inclusive:—

SOUTH AUSTRALIA.—EXPENDITURE BY CORPORATIONS ON STREETS, ROADS, AND BRIDGES, 1901-2 and 1907-11.

Year.[1]	District Roads.			Main Roads Fund.			
	Total Receipts.	Expenditure.		Receipts.		Expenditure.	
		Construction.	Maintenance.	From Main Road Grants.	Total.	Construction.	Maintenance.
	£	£	£	£	£	£	£
1901 ...	148,872	4,906	50,628	7,403	8,738	159	7,745
1907 ...	154,918	5,697	47,024	6,815	7,506	681	6,703
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

1. Up to and including the year 1903 the financial year ended on the 31st December, but after hat 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 1907-11.

Year Ended 30th June.	District Roads.			Main Roads Fund.			
	Total Receipts.	Expenditure.		Receipts.		Expenditure.	
		Construction.	Maintenance.	From Main Road Grants.	Total.	Construction.	Maintenance
	£	£	£	£	£	£	£
1901 ...	147,309	18,026	47,379	72,980	100,077	11,861	67,487
1907 ...	128,787	27,795	47,731	70,560	70,769	5,598	57,152
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

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, 1907 :—

WESTERN AUSTRALIA.—PARTICULARS OF ROADS UNDER CONTROL OF DISTRICT ROAD BOARDS, 1907 to 1911.

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.
1907 ...	975,780	35,088	60,313	13,796	109,197	126,716	9,269[1]	3,878[2]	2,088[2]	15,235[1]	491[3]	3,961[3]
1908 ...	975,780	40,491	58,311	14,707	113,509	120,088	10,821	4,760	2,337	17,918	509	4,148
1909 ...	975,781	46,034	52,382	15,869	114,285	116,723	13,085[2]	4,645[2]	2,797	20,527	554[4]	4,574[4]
1910 ...	975,793	54,115	61,301	14,201	129,617	114,947	14,167	4,622	2,958	21,747	678[5]	4,853[5]
1911 ...	975,800	59,302	100,126	16,474	175,902	141,015	15,169	4,874	3,119	23,162	653	5,211

* Approximate only.

1. Exclusive of six Boards which have not supplied the information. 2. Exclusive of seven Boards. 3. Exclusive of five Boards. 4. Exclusive of three Boards. 5. Exclusive of two 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 1907-11.

Year ended the 31st October.	No. of Municipalit's.	Length of Streets and Roads.*					Revenue.		Expenditure.	
		Paved, M't'll'd or Gr'v'lld	Form'd only.	Clear'd only.	Not Clear'd	Total.	From Rates.	From Grants.	Works and Impr'v-ments.	Street Light'g and Wat'r'g
		Miles.	Miles.	Miles.	Miles.	Miles.	£	£	£	£
1901	42	195	30	149	137	511	78,021	66,850	111,256	15,969
1907	47	441	84	304	262[2]	1,091	136,868	85,473	132,103	34,135
1908	47	474	90	323	271[1]	1,159	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[3]	525	104	309	297	1,235	138,719	13,336	87,998	30,965
1911	42	521	105	292	284	1,202	144,993	27,944	75,697	30,341

* Approximate only.

1. Exclusive of three municipalities, which have not supplied the information. 2. Exclusive of four municipalities. 3. Including also particulars of three 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 1911 as to length of roads and number of bridges and culverts under the control of the municipalities:—

TASMANIA.—ROADS AND BRIDGES IN MUNICIPALITIES, 1911.

Roads.			Bridges.	Culverts.
Macadamised or Gravelled.	Other.	Total.		
Miles. 5,461	Miles. 5,024	Miles. 10,485	No. 1,120*	No. 19,702*

* Last available figures.

(ii.) *Revenue and Expenditure,* The following table gives particulars for the year 1911 of the revenue and expenditure of municipal councils in respect of roads and bridges:—

TASMANIA.—ROADS AND BRIDGES, REVENUE AND EXPENDITURE, 1911.

Revenue.				Expenditure.
From Government.	Rates.*	All other.†	Total.	
£ 35,215	£ 156,585	£ 88,365	£ 280,165	£ 307,334

* Including receipts for power and lighting supplied. † Including current receipts from loans.

§ 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.**—Although it was early recognised that railway construction was essential to the proper development and settlement, and to the future commercial prosperity of a large country like Australia, ill supplied with navigable rivers, the progress made in opening up lines during the twenty years which followed the completion of the first line in 1855, was very slow. This was no doubt due partly to the difficulty of borrowing money at a reasonable rate of interest, owing to the depreciation of Australian securities in London, and partly to the sparseness of the population, which it was feared would not justify the necessary expenditure. In the vicinity of Sydney, also, the ranges of mountains in the districts near the coast had to be either traversed or pierced by tunnels at a considerable expenditure of time and money, thus retarding the expansions of the railway systems which now have their starting point at that city. Since the year 1875, however, greater activity in the construction of railways has been manifested, and satisfactory progress has been made in all the States of the Commonwealth. The State Governments now fully recognise the great importance to the community of carrying on the work of construction, and of conducting the administration and management of the railways on business-like principles, free from undue political influence, and yet with regard to the general development of the country. 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. In addition to these main lines and their numerous branches, there are extensive suburban systems in Melbourne and some of the other cities of Australia, a considerable portion of the suburban traffic in Sydney being conducted by means of electric tramways. All these lines which have just been referred to are connected together by the main interstate line, which permits of direct communication between the four capital cities—Brisbane, Sydney, Melbourne, and Adelaide—a distance from end to end of 1790¼ miles. The journey from Brisbane to Adelaide by rail 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 follows:—

Brisbane to Sydney ...	... 725 miles	... 26 hours 55 min.
Sydney to Melbourne ...	... 582½ ,,	... 16 ,, 51 ,,
Melbourne to Adelaide ...	... 482¾ ,,	... 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. From these main lines a number of branches have been constructed, opening up fresh agricultural areas to the ports and markets of the State. The majority such branch lines will, on being ultimately extended, form connections between

main lines and thus provide short and convenient routes between principal centres. 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 1912.* 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 1912. 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 1912.

Year.	N.S.W.	Vict.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'wlth.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1855	14	2½	*	†6¾	*	*	*	23¼
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
1909-10	3,909	3,542	4,205	1,970	2,977	673	145	17,421
1910-11	4,027	3,574	4,390	1,993	3,208	675	145	18,012
1911-12	4,908	3,673	4,633	1,997	3,430	701	145	18,677

* 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, 1912.**—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, 1912; those given for private lines are as up to the 31st December, 1911.

GOVERNMENT AND PRIVATE RAILWAYS.—COMPARATIVE MILEAGE OF STATE OWNED LINES, OF PRIVATE LINES AVAILABLE FOR GENERAL TRAFFIC AND OF PRIVATE LINES NOT SO AVAILABLE, 1911-12.

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	3,832	141	3,973	125	4,098
Victoria... ...	3,622	14	3,636	37	3,673
Queensland ...	4,266	346	4,612	21	4,633
South Australia ...	1,939	...	1,939	34	1,973
Western Australia	2,598	277	2,875	555	3,430
Tasmania ...	496	166	662	39	701
Northern Territory	145	...	145	...	145
Commonwealth	16,898	944	17,842	811	18,653

5. **Comparative Railway Facilities in Different States, 1912.**—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, 1912, 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, 1912.

State.	Population, 30th June, 1912.	Area.	Per Mile of Line Open.	
			Population.	Area.
	Number.	Sq. miles.	Number.	Sq. miles.
New South Wales*	1,739,391	310,372	457	78.1
Victoria	1,354,405	87,884	372	24.1
Queensland	633,917	670,500	137	145.3
South Australia	420,806	380,070	216	196.0
Western Australia	302,341	975,920	105	339.4
Tasmania	190,017	26,215	287	39.6
Northern Territory	3,362	523,620	23	3,602.7
Commonwealth ...	4,644,239	2,974,581	260	166.7

* Including Federal Capital Territory.

6. **Classification of Lines according to Gauge, 1911-12.**—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, 1912, of private railways open for general traffic to the 31st December, 1911, and of private railways open for special purposes to the 31st December, 1910.

GOVERNMENT AND PRIVATE RAILWAYS.—CLASSIFICATION ACCORDING TO GAUGE, 1911-12.

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.						
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
New South Wales ...	...	3,832	...	...	...	3,832
Victoria	3,500	...	...	122	...	3,622
Queensland ...	...	...	4,266	...	...	4,266
South Australia ...	626	...	1,313*	...	...	*1,939
Western Australia ...	...	...	2,598	...	...	2,598
Northern Territory...	...	...	145	...	...	145
Total, Mainland...	4,126	3,832	8,322	122	...	16,402
Tasmania... ...	...	...	472	...	24	496
Commonwealth ...	4,126	3,832	8,794	122	24	16,898
PRIVATE RAILWAYS OPEN FOR GENERAL TRAFFIC.						
New South Wales ...	45	60	36	...	...	141
Victoria	14	...	...	...	...	14
Queensland ...	...	...	239	...	107	346
South Australia ...	...	...	...	...	...	...
Western Australia ...	...	...	277	...	...	277
Tasmania... ...	...	...	156	...	10	166
Commonwealth ...	59	60	708	...	117	944
PRIVATE RAILWAYS OPEN FOR SPECIAL PURPOSES.†						
New South Wales ...	...	121	4	...	...	125
Victoria	37	...	...	...	...	37
Queensland ...	..	...	17	...	4	21
South Australia ...	...	...	58	...	...	58
Western Australia ...	...	...	493‡	...	62§	555
Tasmania	...	...	25	...	14	39
Commonwealth ...	37	121	597	...	80	835
TOTAL.						
New South Wales ...	45	4,013	40	...	...	4,098
Victoria	3,551	...	...	122	...	3,673
Queensland ...	...	...	4,522	...	111	4,633
South Australia ...	626	...	1,371*	...	...	*1,997
Western Australia ...	...	...	3,368‡	...	62	3,430
Tasmania	...	...	653	...	48	701
Northern Territory...	...	...	145	...	...	145
Commonwealth ...	4,222	4,013	10,099	122	221	18,677

* 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. † Figures are for 1909. ‡ Including 6 miles of 3 ft. 4 in. gauge. § Including 18 miles of 1 ft. 8 in. gauge.

(B) Government Railways.

1. **Mileage Open, 1901 to 1912.**—The following table shews the length of Government railways open for traffic on the 30th June in the years 1901-2 and 1908-12:—

GOVERNMENT RAILWAYS.—MILEAGE OPEN FOR TRAFFIC FOR 1901-2 and 1908-12.

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	1,888	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

* 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 1911-12, 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 1911-12	74¼	99	218	4	222½	24	...	642
Average annual mileage increase (1903 to 1912)	77	26½	173	22½	120	3¾	...	423

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, 1912, the following lines were opened for traffic:—Flemington to Homebush Bay, Abattoirs Branch Line (3¼ miles); West Maitland to Dungog (32½ miles); Mucra to Urana (14¼ miles); Cooma to Nimmitabel (24¼ miles); a total of 74¼ miles.

(ii.) *Victoria.* The following lines were opened for traffic during 1911-12:—Cressy to Newtown (24½ miles); Ouyen to Kow Plains (56½ miles); Kow Plains to Murrayville (11½ miles); and Eltham to Hurst's Bridge (6½ miles); a total of 99 miles.

(iii.) *Queensland.* The increase of 218 miles in the mileage opened for traffic in 1911-12 was due to the opening of the following lines:—Herberton to Tumoulin (17 miles); Finch Hatton to Eungella Range (7 miles); Dalby to Kumbarilla (26 miles); Warwick to Maryville (19 miles); Tallwood to Thallon (38 miles); Kumbarilla to Tara

(26 miles); Pittsworth to Milmerran (27 miles); Kingaroy to Nanango (15 miles); Kirkup to Kungurri (1 mile); Rosewood to Marburg (9 miles); Oakey to 17 Miles (17 miles); and Bajool to Port Alma (16 miles). In addition, the line from Cairns to Babinda (37 miles) was purchased on 1st July, 1911, by the Government from the Mulgrave Shire Council.

(iv.) *South Australia.* The only lines opened for traffic in this State during the year 1911-12 were those from Nuriootpa to Angaston, a distance of 3½ miles, and from Torrens Bridge to Mile End (half-a-mile).

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 1911-12 and opened for public traffic:—Goomalling to Wongan Hills (33½ miles); Kununoppin to Merredin (37½ miles); Southern Cross to Bullfinch (22 miles); Katanning to Nampup (38 miles); Boyup to Kojonup (51 miles); Dumbleyung Extension (24 miles); Naraling to Yuna (11½ miles); and No. 2 Railway Mill Branch, (5 miles); a total of 222½ miles.

(vi.) *Tasmania.* During the year 1911-12 a line from Scottsdale to Branxholm (24 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 transhipments 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.

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. In § 7 of the section on Defence will be found the result of this conference.

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 following junction charges payable on interstate traffic between New South Wales and Victoria and *vice-versa* are given :—

JUNCTION CHARGES.—NEW SOUTH WALES AND VICTORIA, 1912.

General Merchandise. 1st to 3rd Classes.	Vehicles for which rate per mile operates.	Live Stock.	Empty Returns.	Other Goods.*
2s. 6d. per ton	1s. 6d. each	3s. per truck.	1s. per ton.	1s. 6d. per ton.

* No junction charge is made on wool.

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. That its solution would facilitate the development of commerce and the settlement on the land throughout the Commonwealth, is now widely recognised. The economic disadvantages of breaks of gauge, and of any artificial restrictions in regard to trade finding its proper geographical outlets, are also seen by dispassionate observers. It is obvious, too, that in the event of a foreign invasion of any part of the seaboard, the interchange and concentrations of rolling stock for the transport of men and war material would be impeded, and might result in confusion and loss. It is asserted, moreover, that unification of gauges would tend to reduce to a negligible quantity all tendency to disorganisation and undue congestion likely to occur at times of bountiful seasons; that various trades and industries would be benefited by the aggregation, at times of abnormal or periodic activity, of idle trucks from other States; that there would be a large saving in the total capital expenditure on rolling stock; in other words, that the fullest use of all rolling stock and the meeting of all exigencies would be facilitated.

As regards the unification of gauges, the question naturally arises 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 3832; Victoria and South Australia have a combined mileage of 4126 of 5 ft. 3 in. gauge; while Queensland, South Australia, Western Australia, and the Northern Territory have together 8322 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 specified the mileage (including double roads, sidings, and private coal lines) of 4 ft. 8½ in. and 5 ft. 3 in. gauges in the several States to be as follows:—

UNIFICATION OF 4 ft. 8½ in. AND 5 ft. 3 in. GAUGES IN NEW SOUTH WALES, VICTORIA, AND SOUTH AUSTRALIA, MILEAGE OPEN, 1897.

Particulars.	New South Wales.		Victoria.	South Aust.	Total.	
Gauge ...	4 ft. 8½ in.	5 ft. 3 in.	5 ft. 3 in.	5 ft. 3 in.	4 ft. 8½ in.	5 ft. 3 in.
Mileage ...	3,340	51	3,868	590	3,340	4,509

The cost of unification of the gauges as estimated by the Commissioners at the conference was as follows:—

COST OF UNIFICATION OF 4 ft. 8½ in. and 5 ft. 3 in. GAUGES, NEW SOUTH WALES, VICTORIA, AND SOUTH AUSTRALIA, 1897.

Particulars.	Alteration of Permanent Way and Works.	Alteration of Rolling Stock.	Temporary Workshops and Material.	Total.
	£	£	£	£
New South Wales, conversion from 4 ft. 8½ in. to 5 ft. 3 in.	2,518,000	1,702,000	40,000	4,260,000
Victoria, South Australia, and *New South Wales* (51 miles) conversion from 5 ft. 3 in. to 4 ft. 8½ in.	493,000	1,827,500	40,000	2,360,500

It may be seen that the difference in estimated cost in favour of change from the 5 ft. 3 in. gauge to 4 ft. 8½ in. gauge was £1,899,500. The Commissioners agreed that the work could be carried out within five years from the date of its commencement.

A conference of railway engineers representing the six States and the Federal Government was held in November, 1912, when 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. The recommendations contained in the final report of the Conference will be found in the Appendix.

Military officers have asserted that from a defence point of view it is imperative that the present mixture of gauges should be abolished. Reference has already been made (see paragraph 3 hereof) to the Railway War Conference, which was called more particularly to deal with the break of gauge problem as it would affect the transport of troops and armaments.

The question whether a broader gauge would be advantageous for the American railways was discussed in an editorial of the "Engineering News" of New York, 7th December, 1911, it there being stated "that the railway experience of the United States would not justify Australia in adopting a broader gauge for its railway system than that in use here, viz., 4 ft. 8½ in."

It also pointed out in the editorial referred to that while "it is, of course, true that our (American) large cars and locomotives are an important factor in reducing the cost of long haul freight traffic, it does not follow that the much larger cars and locomotives which would be easily possible with a wider gauge would effect an economic saving taking the country as a whole."

The entire article supports the view that a 4 ft. 8½ in. gauge is from all points the most desirable.

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 685 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 1907-12 inclusive :—

GOVERNMENT RAILWAYS.—AVERAGE MILEAGE WORKED, TRAIN MILES RUN NUMBER OF PASSENGER JOURNEYS, AND TONNAGE OF GOODS AND LIVE STOCK CARRIED, 1901 and 1907-12.

Year.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	West. Aust.	Tasmania.	N. Ter.	C'wealth
AVERAGE MILEAGE WORKED.								
1901-2	2,953	3,265	2,801	1,736	1,356	468*	145	12,724
1907-8	3,469	3,396	3,239	1,860	1,830	470	145	14,409
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	2,286	478	145	15,837
1911-12	3,799	3,543	4,144	1,938	2,471	503	145	16,543
TRAIN MILES RUN (,000 OMITTED).								
1901-2	11,649	11,285	5,666	4,196	4,508	903*	30	38,237
1907-8	14,251	10,383	6,558	5,010	3,964	1,028	31	41,225
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	5,421	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
NUMBER OF PASSENGER JOURNEYS (,000 OMITTED).								
1901-2	30,885	57,465	†8,421	9,643	8,158	762*	4	115,338
1907-8	47,487	74,907	10,420	12,839	12,946	1,439	3	160,041
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
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
1907-8	10,175	3,755	2,531	2,256	2,059	480	4	21,260
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	20,856
1910-11	10,355	4,968	3,295	2,731‖	2,489	364	2	24,204
1911-12	10,910	5,298	3,494	2,782¶	2,542	470	2	25,498

* 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. † These figures are partly estimated, the actual returns excluding journeys by season ticket holders. ‡ Exclusive of live stock. § Exclusive of live stock returns for Tasmania. ‖ Exclusive of Port Augusta-Oodnadatta line for six months ended 30th June, 1911. ¶ Exclusive of Port Augusta-Oodnadatta line.

6. **Length and Gauge of Railway Systems in each State.**—A map shewing 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 715 hereafter. In all the States the Government railways are grouped, for the convenience of administration and management, into several divisions of 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 theeyear ended the 30th June, 1912:—

GOVERNMENT RAILWAYS, 1911-12.

Particulars.	Length.	Gauge.
	Miles.	ft. in.
1. NEW SOUTH WALES.		
(i.) The Northern line and branches—		
(a) Main line. Strathfield-Wallangarra	486¼	4 8½
(b) Branch lines	475	4 8½
(ii.) The North Coast line and branches—		
(a) Main line. West Maitland-Murwillumbah ...	183¼	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	827¼	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	45¼	4 8½
(vii.) Broken Hill line. Broken Hill-Tarrawingee	40	3 6
Total	3,832	...
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	2 6
	202	5 3
(b) Branch lines	97	5 3
	29	2 6
(iii.) The North-eastern system—		
(a) Main line. Craigieburn-Wodonga	171	5 3
(b) Branch lines	30	2 6
	446½	5 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	234½	5 3
(vi.) The Western and South-western system—		
(a) Main line. Werribee-Portland	272	5 3
(b) Branch lines	44¼	2 6
	273¾	5 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	3,622½	...

Particulars.	Length.	Gauge. ft.	in.
3. QUEENSLAND.	Miles.		
(i.) The Southern division—			
(*a*) The Southern line. Ipswich-Wallangarra ...	221	3	6
(*b*) The Western line. Gowrie Junction-Cunnamulla ...	496	3	6
(*c*) The South-western line. Warwick-Talwood ...	217	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	711	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	333	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	754	3	6
(*d*) Cairns line	300	3	6
(*e*) Cooktown line	68	3	6
(*f*) Normanton line	96	3	6
Total	4,266	...	
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	158¾	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-Yeelanna	50¾	3	6
Total	1,461½	...	
5. WESTERN AUSTRALIA.			
(i.) Eastern railway—			
(*a*) Main line. Fremantle-Beverley	111	3	6
(*b*) Branch lines	127	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	368¾	3	6
(iv.) Great Southern railway—			
(*a*) Beverley-Albany Jetty	243	3	6
(*b*) Branch lines	223½	3	6
(v.) Northern railway—			
(*a*) Main line. Geraldton-Meekatharra	333½	3	6
(*b*) Branch lines	175¼	3	6
(vi.) Hopetoun-Ravensthorpe railway	34	3	6
Total	2,597½	...	

Particulars.	Length.	Gauge.
6 TASMANIA.	Miles.	ft. in.
(i.) Main line. Hobart-Evandale Junction	124¼	3 6
(ii.) Derwent Valley line. Bridgewater-Glenora	30¼	3 6
(iii.) Apsley line. Brighton Junction-Apsley	26	3 6
(iv.) Parattah-Oatlands line	4½	3 6
(v.) Fingal line. St. Mary's-Conara	46¾	3 6
(vi.) Western line. Launceston-Burnie	111½	3 6
(vii.) Chudleigh line	12½	3 6
(viii.) North-eastern line. Launceston-Scottsdale	71½	3 6
(ix.) Sorell-Bellerive line	14½	3 6
(x.) Zeehan line. Regatta Point-Zeehan	29½	3 6
(xi.) North-east Dundas tramway. Zeehan-Williamsford ...	20½	2 0
(xii.) Comstock tramway	4¼	2 0
Total	495¾	...
7. FEDERAL RAILWAYS.		
(i.) Northern Territory—		
Darwin to Pine Creek	145½	3 6
(ii.) South Australia—		
Port Augusta to Oodnadatta	477¾	3 6
Total	623¼	...
Grand total of Government railways in the Commonwealth ...	16,898½	...

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. It may here be observed that for many years past nationalisation of railways throughout Europe has been a feature of the development of railway policy, and so far there is no sign of any movement in an opposite direction. Indeed it may be said that the Governments have recognised the supreme importance of a railroad policy, not only as an element in the industrial, but even in the political life of nations, and have felt that nothing short of complete ownership and direct management of the railroads would give them the power which, for national reasons, they must exert. In America the modern tendency is to so condition the freights by Governmental action as to give at least a quasi-national character to the railways.

(i.) *New South Wales.* Prior to the year 1888 the control of the State railways in New South Wales was vested in the Minister for Works, under the provisions of the Railways Act of 1858, the actual management being in the hands of a Commissioner. In 1888, however, the Act referred to was repealed by a new Act, the object of which was to improve the administration and to free it from political influences. Under this Act, as amended in 1901, three Commissioners were appointed for a period of seven years, but in 1906 an amending Act was passed, which provides for the appointment of a Chief Commissioner, with supreme power, an Assistant Commissioner for Railways, and an Assistant Commissioner for Tramways. The Chief Commissioner is required to present an annual report to Parliament, through the Minister for Railways, setting forth an account of his proceedings, and of the revenue and expenditure during the previous year. New lines are constructed by the Railway and Tramway Construction Branch of the Public Works Department, and on completion are handed over to the control of the Chief Commissioner.

(ii.) *Victoria.* In consequence of general dissatisfaction in regard to the management of the railways by political heads, a new Railway Act was passed and came into force on the 1st November, 1883. Under its provisions the management and control

of the State railways were placed in the hands of three Commissioners, who supervised the construction of new lines as well as the general management of lines already open for traffic. On the 1st January, 1892, the duty of the construction of new lines was transferred to the Board of Land and Works, and the Minister, under the provisions of the Railways Act of 1891, was given greater powers to interfere in matters of policy. In 1895 the Government appointed a Board to inquire into and report upon the general working of the Railway Department, and as a result of their report the Railways Act of 1896 was passed. The management was placed in the hands of one Commissioner until the year 1903, when the Victorian Railway Commissioners Act was passed, and the administration was again placed in the hands of three Commissioners.

Proposals for the construction of new lines are in every case, in which the estimated cost is in excess of £20,000, investigated by the Parliamentary Standing Committee on Railways, whose recommendation is submitted to the Legislature. Any new line authorised by Parliament is constructed under the supervision of the Chief Engineer for Railway Construction, who is responsible to the Minister of Railways for the time being, and is not subject to the control of the Commissioners. New lines are constructed under the authority of the Railway Lands Acquisition Acts 1893 to 1899.

(iii.) *Queensland.* The first Act referring to the construction of railways, passed by the Queensland Legislature in 1863, provided for the appointment of a Commissioner of Railways, who was to be the permanent head of the Railway Department, but was, however, also to be subordinate, as regards all matters of administration, to the Minister in charge of the railways for the time being. This arrangement was continued until the year 1868, when an Act was passed providing for the appointment of three Commissioners invested with full powers as to the administration, management, and construction of the railways, the control of which was thus removed from political influence. The functions of a Minister for Railways were not abolished, but they were so defined and limited that the Minister became in effect an intermediary between the Commissioners and Parliament, to which body the Commissioners were bound to make an annual report, setting forth an account of their proceedings, and a financial statement for the previous year. The Railways Act Amendment Act of 1896 again provided for the appointment of one Commissioner only, for a term not exceeding three years, extended in 1902 to a maximum term of seven years. Under the Act of 1896 the Commissioner is required to prepare an annual report of the Railway Department. New lines are constructed by the Commissioner under the Railways Act of 1906. Under this Act the ratepayers in any district in which a new line is constructed are liable for the amount of any deficiency in case the earnings in any year are less than the working expenses, together with interest at the rate of 3 per cent. on the cost of construction. The separation of each other by long distances of some of the railway lines in Queensland puts difficulties in the way of their economical administration and supervision, since it is found necessary to maintain, in connection with each of the principal detached lines, a separate staff of engineering and managing officials.

(iv.) *South Australia.* The Railway Clauses Consolidation Act, passed in South Australia in March, 1847, was the first Act passed in Australia referring to the construction of railways; its provisions, however, contained many obsolete clauses of English railway legislation, and were soon modified. In 1887 an Act to make better provision for the construction, maintenance, and management of railways was passed, and came into force on the 1st June, 1888; it removed the control of the railways from political influence and provided for the appointment of three Commissioners, into whose hands the management and the supervision of the railways passed. The Act of 1887 was, however, amended by the Railway Commissioners Act of 1894, which provides for one Commissioner only, assisted by a Board of Advice. Under the Act of 1894 the Commissioner has the same powers as were vested in the three Commissioners under the Act of 1887. Further amendments were made in the years 1902 and 1906, but since the Act of 1894 was passed the management, maintenance, and construction of the railways have remained in the

hands of one Commissioner, who is required to present to Parliament an annual report of his proceedings, and of the revenue and expenditure during the previous year.

(v.) *Western Australia.* From the time of the inception of railways in this State until the granting of responsible government in 1890, the construction, maintenance, and control of all railways were in the hands of an official holding the title of Commissioner of Railways, and having a seat in the Executive Council. This official was invested with very extensive powers for all purposes connected with railways, and had also to supervise the safe working and the charges made by private railway owners. On the institution of responsible government the office of Commissioner was converted into a Ministerial one; the active management was placed in the hands of an officer styled General Manager of Railways, while construction works on new lines were carried out by the Department of Public Works. In 1902 a Bill was introduced into Parliament providing for the appointment for a term of five years of a Railway Commissioner to be free from political influence. This Bill received the Vice-regal assent on the 20th December, 1902. The former Railway Acts, of which the Act in question was an amendment, continued to remain in force, with the result that certain anomalies and ambiguities arose, in consequence of which a Consolidating Government Railways Act was passed in 1904. Under its provisions the administration of all Government railways was placed in the hands of the Commissioner, who was relieved from the supervision of private railways. The construction of new railways or of extensions is left, as formerly, in the hands of the Minister controlling the Department of Public Works. The Act of 1904 was amended in certain details in 1907.

(vi.) *Tasmania.* The law relating to the control and management of the Tasmanian Government railways was amended and consolidated by the Railway Management Act of 1891, which has in turn been amended by Acts passed in 1893, 1896, 1901, and 1910. Under the last Amending Act a Railway Commissioner has been appointed for four years, in whose hands are placed the control, management, and maintenance of every Government railway.

(vii.) *Northern Territory.* On the 1st January, 1911, the railway from Darwin to Pine Creek passed from the control of South Australia with the transfer of this territory to the Commonwealth Government.

8. **Lines under Construction, and Authorised and Proposed Lines, 1912.**—The following statement gives particulars up to the 30th June, 1912, of the mileage of Government railways (*a*) under construction, and (*b*) authorised for construction but not commenced:—

MILEAGE UNDER CONSTRUCTION AND AUTHORISED, 30th JUNE, 1912.

Particulars.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	Cwlth.
Mileage under construction ...	671½	196¼	1,596	288	409¼	...	3,161
Mileage authorised	221½	53¼	617	43	355	20	1,309¾

(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, 1912, were those from Dungog to Gloucester (38¾ miles), Gloucester to Taree (44 miles), Taree to Wauchope (47½ miles), Macksville to Coff's Harbour (55 miles), and Glenreagh to South Grafton (27¼ 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 follows:—Nimmitabel to Bombala (40 miles), Moree to Mungindi (77 miles), Urana to Clear Hills (17 miles), Forbes to Stockinbingal (83½ miles), Wagga to Tumberumba (76¼ miles), Parkes to Peake Hill (31 miles), Muswellbrook to Merriwa (51 miles), Dunedoo to Coonabarabran (71 miles), Flemington to Belmore, Wardell Road to Glebe Island, and Darling Island Railway (in all 11½ miles). (*b*) *Victoria.* In this State the following lines were under construction by the Board of Land and Works on the 30th June, 1912:—*5 ft. 3 in. gauge:* White Cliffs to Yelta (9¾ miles), Bairnsdale to Orbost (60 miles), Jeparit to Lorquon (14½ miles), Gheringhap to Maroona (100¾ miles), Noradjuha to Toolondo (11¼ miles), making in all 196¼ 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, 1912, the following lines were under construction:—Woodford to Kilcoy (17 miles), Seventeen Miles to Cooyar (21 miles), Mount Morgan to the Dawson River (69 miles), Cordalba to Dallarnil (31 miles), Gayndah to Mundubbera (23 miles), Keefton to Imbil (24 miles), Blackbutt to Yarraman (15 miles), First Section to Taroom (44 miles). Of the Great Western Railway the following parts are under construction:—Section A: From Wallal westward (245 miles); Section B: From Blackall south-west (348 miles); Section D: From Malbon, south-west (328 miles). The following parts of the North Coast Railway are under construction:—Section A: From Rockhampton northwards to near St. Lawrence (123 miles); Section B: Portion from Mackay southwards to near St. Lawrence (72 miles); Section C: From Bobawaba northwards to Burdekin River (17 miles); Section D: From Ayr southwards to Burdekin River (5 miles); Section D: From Townsville northwards to near Cardwell (86 miles); Section E: From Babinda southwards to near Cardwell (88 miles); a total distance of 1596 miles. (*d*) *South Australia.* In this State the lines under construction on the 30th June, 1912, were as follows:—Tailem Bend to Brown's Well (100 miles), Port Adelaide to Glanville (1½ miles) and Port Adelaide Loop Line (1½ miles) all 5 ft. 3 in. gauge; Yeelanna to Minnipa Hill (108 miles) and Cummins to Darke's Peak (78 miles), both 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, 1912:—Port Hedland to Marble Bar (114 miles), Dwellingup to Hotham (27 miles), Wickepin to Merredin (120 miles), Northampton to Ajana (40 miles), Tambellup to Ongerup (60 miles), Quairading to Nunagin (50 miles), Hotham to Crossman (7 miles), and Canning Mills extension (1¼ miles). (*f*) *Tasmania.* At the end of the year 1911-12, there were no new lines in course of construction.

(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), Galong to Burrawa (17¾ miles), Glenreagh to Dorrigo (42 miles), Barellan to Mirool (32 miles), and Finley to Tocumwaal (11½ miles) had been authorised up to 30th June, 1912. (*b*) In *Victoria* the following lines were authorised, but their construction had not been commenced up to the end of June, 1912:—*5 ft. 3 in. gauge:* Crowland to Navarre (23 miles), Benalla to Tatong (18¼ miles), and Rushworth to Colbinabbin (12 miles). (*c*) *Queensland.* In addition to the new lines upon which work has been commenced, lines from Kingaroy to Tarong (19 miles), Pialba to Urangan (5 miles), Logan Village to Canungra (21 miles), Munbilla to Mt. Edwards (16 miles), Oakey to Mt. Russell (19 miles), Dalby to Jandowae (28 miles), Roma to Oralla (29 miles), Molanda towards Millaa Millaa (9 miles), Tomoulin to Cedar Creek (5 miles), and Cloncurrry to Mt. Cuthbert (1st section) 42 miles), have been approved of by Parliament, which has also authorised the construction of the following parts of the Great Western Railway: Section C, from Winton south-west (361 miles); and on the North Coast Railway, Section B, from Mackay Railway northwards to near Midge Point (50 miles); Section C, from near Midge Point to Proserpine (13 miles). (*d*) In *South Australia* the construction of lines from Goodwood to Willunga (29½ miles), and from Eudunda to Robertson (13½ miles), on the 5 ft. 3 in. gauge, was authorised during the year 1911-1912. 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* six lines having a total length of 352 miles were authorised for construction up to the 30th June, 1912. These lines were—Wongan to Mullewa (190 miles), Brookton to Kunjinn (47 miles), Yilliminning Eastward (71 miles), and Wagin to Darkan (44 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 necessary arrangements have now been completed for connecting the railways of the eastern and southern districts of Australia with the Western Australian lines by the construction of a line between Port Augusta, in South Australia, and Kalgoorlie, on the Western Australian goldfields, a distance of 1063 miles. 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 the proposed line. 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 715 hereof; the route *via* Tarcoola was, for several reasons, chosen in preference to that *via* Gawler Range and Fowler's Bay. It is stated in the report of the surveyors that while some part of the country which it is proposed to traverse is impossible for settlement, there is an area of good country, extending to about 9000 square miles, which can be considered favourable for pastoral development. The estimated cost of construction and equipment of the line on the basis of a 4 ft. 8½ in. gauge is £3,988,000. It is claimed that the line would be of immense benefit in the expedition of the European mails to the southern and eastern parts of the continent, and, if occasion should arise, in facilitating the transport of troops. In September, 1911, a Bill was introduced into the Commonwealth Parliament to authorise the construction of the line. The Bill became law in December following, but the construction of the line was not to be commenced until the States of South Australia and Western Australia had granted or agreed to grant such portions of the Crown lands as were necessary for the construction, maintenance, and working of the railway. In South Australia an Act has been 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 has also been passed by which all necessary lands are to be granted to the Commonwealth for railway purposes. A Railway Construction Department has been created 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. (*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, and it has been decided to appoint a Commission, which will visit the Territory and report thereon, with a view to decide by what method the Territory may be most advantageously connected with the railway systems of South Australia and Queensland.

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, 1912, amounted to £160,557,160, or to an average of £9502 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 THE 30th JUNE, 1912.

State or Territory.	Length of Line Open.	Total Cost of Construction and Equipment.	Average Cost per Mile Open.	Cost per Head of Population.
	Miles.	£	£	£
New South Wales	3,832	53,514,903	13,967	30.76
Victoria	3,622	45,836,573	12,655	33.84
Queensland	4,266	27,751,227	6,505	43.77
South Australia	1,939	14,927,649	7,698	35.47
Western Australia	2,598	13,233,093	5,094	43.76
Tasmania	496	4,253,013	8,583	22.38
Northern Territory	145	1,040,702	7,177	309.54
Commonwealth	16,898	160,557,160	9,502	34.57

It will be seen that the lowest average cost per mile open is in Western Australia, and is only £5094, which is less than one-half of the highest average cost, namely, £13,967 in New South Wales, compared with an average of £9502 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, 1912, was £3778. In Victoria also the cost of construction has been greatly reduced in recent years. The total cost to the 30th June, 1912, of the narrow gauge (2 ft. 6 in.) lines, having a length of one hundred and twenty-two miles, was only £319,706, which gives an average cost per mile of only £2546. 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 26¼	50 64¼	...	111 10½	3,485,982	31,368	1876
Sydney to Kiama ...	4 8½	24 11¼	48 36¼	0 63½	73 31¼	2,404,955	33,126	1887
Homebush to Waratah	4 8½	74 23½	21 12	2 22¼	97 57¾	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	...	53.21	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 337.39 miles referred to in the next table was £1775.

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.
	ft. in.	Miles.	£	£	
NEW SOUTH WALES—					
Parkes to Condobolin	4 8½	62¾	131,410	2,094	1898
Burren Junction to Collarenebri	4 8½	42½	102,353	2,405	1906
VICTORIA—					
Wangaratta to Whitfield ...	2 6	30½	39,327	1,290	1899
Wycheproof to Sealake ...	5 3	48	74,817	1,562	1895
Ultima to Chillingollah ...	5 3	20¼	30,092	1,494	1909
QUEENSLAND—					
Dalby to Bell	3 6	23½	32,461	1,381	1906
Stewarts Creek to Ayr... ...	3 6	43¾	86,105	1,968	1911
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.) *Adoption of Special Means of Locomotion.* The Railway Commissioners of Victoria have obtained from America two "M'Keen" motor cars, with the view of testing their suitability for light passenger traffic on country lines. So far they have given satisfactory service, but it is yet too early to express a definite opinion as to their economic value. In South Australia the Railway Commissioner has given orders for two internal combustion engines for the haulage of traffic on light lines. It is hoped these engines will prove effective on lines ill-supplied with water for locomotive purposes, and their operations will be noted with special interest.

(iii.) *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 1912 is shewn in the following table:—

GOVERNMENT RAILWAYS.—CAPITAL COST OF CONSTRUCTION AND EQUIPMENT, 1901-2 and 1907-12.

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	12,895	7,410	3,841[1]	1,033	126,530
1907-8	45,683	41,929	22,576	13,379	10,733	3,978	1,037	139,314
1908-9	47,613	42,486	23,395	13,626	11,017	4,004	1,041	143,181
1909-10	48,925	43,142	24,336	13,863	11,377	4,049	1,041	146,733
1910-11	50,972	44,122	25,899	14,375	12,020	4,080	1,041	152,508
1911-12	53,515	45,836	27,751	14,928	13,233	4,253	1,041	160,557

COST PER MILE OPEN.

	£	£	£	£	£	£	£	£
1901-2	13,405	12,300	7,183	7,428	5,449	8,313[1]	7,124	9,860
1907-8	13,158	12,346	6,721	7,120	5,524	8,591	7,149	9,505
1908-9	13,142	12,459	6,688	7,217	5,387	8,648	7,177	9,500
1909-10	13,430	12,358	6,647	7,250	5,304	8,632	7,177	9,487
1910-11	13,555	12,522	6,696	7,429	5,060	8,676	7,177	9,486
1911-12	13,967	12,655	6,505	7,698	5,094	8,583	7,177	9,502

1. To the 31st December, 1902.

(iv.) *Loan Expenditure on Railways and Tramways.* 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 years 1901 and 1907, and on railways only for the years 1908-9 to 1911-12. Figures shewing loan expenditures on railways only are not available for years prior to 1909.

GOVERNMENT RAILWAYS AND TRAMWAYS.—LOAN EXPENDITURE, 1901-2 and 1907-12.

Year.	N.S.W.	Victoria.	Q'land.	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
1907-8	1,363	250	885	55	306	39	2,898
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

* For the calendar year 1901. † Railways only.

The following statement shews the total loan expenditure to the 30th June, 1912 :—

GOVERNMENT RAILWAYS.—TOTAL LOAN EXPENDITURE IN EACH STATE AND IN THE COMMONWEALTH to 30th JUNE, 1912.

State, etc. ...	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
	£	£	£	£	£	£	£
Expenditure ...	55,830,016	43,252,943	30,153,798	14,826,216	13,320,623	4,553,649	161,937,245

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 1908 to 1912 inclusive :—

GOVERNMENT RAILWAYS.—GROSS REVENUE, TOTAL, PER AVERAGE MILE WORKED, AND PER TRAIN MILE, 1901-2 and 1907-12.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'wealth.
TOTAL GROSS REVENUE (£,000 OMITTED).								
	£	£	£	£	£	£	£	£
1901-2	3,669	3,368	1,382	1,085	1,521	*233	13	11,271
1907-8	4,944	3,873	1,951	1,741	1,502	278	15	14,304
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
GROSS REVENUE PER AVERAGE MILE WORKED.								
	£	£	£	£	£	£	£	£
1901-2	1,242	1,031	493	625	1,122	*498	86	886
1907-8	1,425	1,141	602	936	821	591	99	993
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
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
1907-8	83.26	89.53	71.40	83.41	90.93	64.81	111.94	83.27
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

* For the calendar year 1902.

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 1907-12, 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 1907-12.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.*	North'rn Tertry.	C'wealth.
				COACHING TRAFFIC RECEIPTS (£,000 OMITTED).				
	£	£	£	£	£	£	£	£
1901-2	1,368	1,580	435	373	443	110	...	4,309
1907-8	1,850	1,936	672	511	483	137	4	5,593
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	7,885
				GOODS AND LIVE STOCK TRAFFIC RECEIPTS (£,000 OMITTED).				
1901-2	2,264	1,720	862	689	1,037	116	...	6,688
1907-8	3,043	1,868	1,251	1,185	974	132	8	8,461
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
				MISCELLANEOUS RECEIPTS (£,000 OMITTED).				
1901-2	37	68	84	36	42	7	...	274
1907-8	51	70	28	45	45	9	2	250
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

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

(i.) *New South Wales.* In New South Wales, owing, no doubt, to the reductions made in rates and fares in recent years, and to the general prosperity of the State, the traffic receipts continue to shew substantial development, the total earnings for the past year having amounted to £6,491,473, an increase over the previous year of £449,268. The increases occurred in all branches of passenger and goods traffic, except in grain, flour, etc., and wool, which shewed a decrease of £15,009.

(ii.) *Victoria.* In Victoria each sub-division of traffic shewed an increase over the figures for the previous year and was also higher than in any previous year. The most notable increase was in passengers (£243,425, or 11.17 per cent.).

(iii.) *Queensland.* In Queensland the increase in 1911-12 in gross earnings, £302,428 above 1910-11, 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 (£118,165, or 15.99 per cent.), general merchandise (£146,253, or 16.61 per cent.), and minerals £21,520, or 9.28 per cent.).

(iv.) *South Australia.* In this State the increase for the year 1911-12 in coaching traffic receipts amounted to £56,124; there was also a considerable increase in respect of minerals (£31,821); but the returns for wheat and wool shew a decrease of £57,677 and £3393 respectively. These figures are exclusive of the returns from the Port Augusta-Oodnadatta line.

(v.) *Western Australia.* In this State the earnings in 1911-12 shewed an increase, as compared with 1910-11. What may be regarded as personal traffic rendered an additional amount of £34,079, giving evidence of increased activity in business and pleasure, but goods and live stock shewed a very slight decrease (£575) on the record figures of the previous year. Miscellaneous receipts were £6681 higher than those for 1910-11.

(vi.) *Tasmania.* The gross revenue in 1911-12 shews an increase of £34,870 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 £8171; while the increase in the revenue from goods and live stock is no less than £23,845.

The following table shews for the year 1911-12 the percentage which each class of receipts bears to the total gross revenue:—

PERCENTAGE OF REVENUES FROM VARIOUS SOURCES ON TOTAL REVENUE, 1911-12.

Particulars.	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	N. Ter.	C'wlth.
	%	%	%	%	%	%	%	%
Coaching traffic receipts ...	41.47	50.29	35.27	33.18	33.48	48.70	29.66	41.28
Goods and live stock traffic receipts	57.24	48.03	63.97	64.40	62.28	47.39	39.83	56.93
Miscellaneous receipts ...	1.29	1.68	0.76	2.42	4.24	3.91	30.51	1.79

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, 1912:—

GOVERNMENT RAILWAYS.—COACHING TRAFFIC RECEIPTS PER MILE WORKED, PER PASSENGER-TRAIN MILE, AND PER PASSENGER JOURNEY, 1911-12.

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 ...	8,978	70,707	2,692	708	71.95	9.13
Victoria	7,237	104,235	2,624	740	87.02	6.04
Queensland ...	2,969	17,081	1,069	258	86.71	15.01
South Australia† ...	2,614	18,353	713	368	65.27	9.28
Western Australia ...	2,480	16,390	631	255	61.06	9.24
Tasmania ...	396	1,715	152	255	92.12	21.27
Northern Territory	10	2	4	24	83.36	470.48
Commonwealth	24,684	228,483	7,885	476	76.66	8.28

* 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 ...	1,541,407	Western Australia ...	983,469
Victoria	2,772,676	Tasmania	699,911

† Excluding the returns of the Port Augusta to Qodnadatta 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 6.04 pence in Victoria, where there is a large metropolitan suburban traffic, to 21.27 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, 96,163,296 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 Branxton lines) was 62,590,908. 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 1911-12 being 248,149,812. In Melbourne, on the other hand, the number of passengers carried on the cable tramways systems during the same period was 84,926,312; and on the St. Kilda-Brighton, Prahran-Malvern and the North Melbourne tramways was 9,905,774, making a total of 94,832,486, 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, 1912:—

GOVERNMENT RAILWAYS.—GOODS AND LIVE STOCK TRAFFIC RECEIPTS PER MILE WORKED, PER GOODS-TRAIN MILE, AND PER TON CARRIED, 1912.

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 ...	9,543	10,910	3,716	978	93.43	81.74
Victoria	6,599	5,298	2,507	707	91.19	113.55
Queensland ...	7,358	3,494	1,940	468	63.27	133.25
South Australia† ...	3,415	2,782	1,384	714	97.26	119.37
Western Australia ...	2,747	2,542	1,174	475	102.57	110.84
Tasmania... ...	650	470	148	294	54.64	75.57
Northern Territory...	20	2	5	32	55.88	596.13
Commonwealth ...	30,332	25,498	10,874	657	86.04	102.35

* 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 ...	1,541,407	Western Australia ...	983,469
Victoria	2,772,676	Tasmania	699,911

† 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 75.57 pence in Tasmania to 133.25 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 1907-12.

GOVERNMENT RAILWAYS.—TOTAL WORKING EXPENSES AND PERCENTAGES OF WORKING EXPENSES UPON GROSS REVENUES, 1901-2 and 1907-12.

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
1907-8 ...	2,715	2,436	1,054	969	1,008	202	14	8,398
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	9,899
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
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
1907-8 ...	54.91	62.89	54.01	55.68	67.10	72.70	97.22	58.71
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

* 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. ‡ Excluding the returns of the Port Augusta to Oodnadatta line for the six months ended 30th June, 1911. § Excluding the returns of the Port Augusta to 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 1911-12 amounted to £4,169,591, an increase of £478,530 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, £342,299, was mainly due to the greater traffic, to reductions in working hours and advances in salaries and wages of the staff, to a large contribution to the accident and fire insurance fund, to the

payment of £50,000 on renewals of rails, sleepers, and ballast, and extra expenditure in connection with additions and improvements.

(iii.) *Queensland.* In this State the working expenses increased from £1,563,119 (57.25 per cent.) in 1910-11 to £1,917,266 (63.22 per cent.) in 1911-12. 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 1911-12 shewed an increase of £107,765, viz., from £1,255,589 to £1,363,354. This was to a large extent due to augmented wages and extraordinary expenditure.

(v.) *Western Australia.* The cause of the increased expenditure £127,500) in 1911-12 as compared with 1910-11, is mainly due to increased train mileage.

(vi.) *Tasmania.* The working expenses in 1911-12 were £221,172, as compared with £215,530 in the previous year, being an increase of £5642.

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.

(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 1907-12:—

GOVERNMENT RAILWAYS.—WORKING EXPENSES PER AVERAGE MILE WORKED, AND PER TRAIN RUN, 1901-2 and 1907-12.

Year.	N.S.W.	Victoria.*	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	Cwlth.
WORKING EXPENSES PER AVERAGE MILE WORKED.								
	£	£	£	£	£	£	£	£
1901-2 ...	793	663	354	397	927	†370	238	602
1907-8 ...	783	717	325	521	551	429	97	583
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	95	738
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
1907-8 ...	45.72	56.31	38.56	46.44	61.01	47.12	108.83	48.89
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

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

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 1907-12:—

GOVERNMENT RAILWAYS.—DISTRIBUTION OF WORKING EXPENSES, 1901-2 and 1907-12.

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	†58	29	1,901
1907-8 ...	622	649	323	313	226	62	8	2,203
1908-9 ...	628	626	395	270	210	62	7	2,198
1909-10 ...	699	644	441	289	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
				LOCOMOTIVE, CARRIAGE, AND WAGON CHARGES (£,000 OMITTED).				
1901-2 ...	1,102	845	390	344	670	†64	3	3,418
1907-8 ...	1,250	956	417	442	484	81	4	3,634
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
				TRAFFIC EXPENSES (£,000 OMITTED).				
1901-2 ...	589	672	226	163	306	†42	2	2,000
1907-8 ...	742	613	290	196	270	50	2	2,163
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
				OTHER CHARGES (£,000 OMITTED).				
1901-2 ...	97	158	21	17	33	†8	...	334
1907-8 ...	102	218	23	19	27	9	...	398
1908-9 ...	110	254	25	21	28	10	...	448
1909-10 ...	109	264	26	26	27	11	1	464
1910-11 ...	142	265	30	26	34	11	1	509
1911-12 ...	145	257	44	29	38	12	1	526

* 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 1907-12.

GOVERNMENT RAILWAYS.—NET REVENUE AND PERCENTAGE OF NET REVENUE UPON CAPITAL COST, 1901-2 and 1907-12.

Year.	N.S.W.	Victoria.*	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'wlth.
NET REVENUE (£,000 OMITTED).								
	£	£	£	£	£	£	£	£
1901-2 ...	1,326	1,202	389	396	265	†60	—22	3,616
1907-8 ...	2,229	1,438	897	772	494	76	...	5,906
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
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
1907-8 ...	4.88	3.43	3.97	5.57	4.60	1.91	0.03	4.23
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

* 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.

(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 REVENUE PER AVERAGE MILE WORKED AND PER TRAIN MILE RUN, 1901-2 and 1907-12.

Year.	N.S.W.	Victoria.*	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'wealth.
NET REVENUE PER AVERAGE MILE WORKED.								
	£	£	£	£	£	£	£	£
1901-2 ...	449	368	139	228	195	†128	—152	284
1907-8 ...	643	423	277	415	270	161	2	410
1908-9 ...	583	490	254	371	271	162	...	398
1909-10 ...	609	473	262	407	257	153	...	404
1910-11 ...	633	513	308	412	275	131	— 11	429
1911-12 ...	611	502	269	405	219	182	— 14	392
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
1907-8 ...	37.54	33.22	32.83	36.97	29.92	17.69	3.11	34.38
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

* 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 of each State during the financial year 1911-12:—

PASSENGER JOURNEYS AND TONNAGE OF GOODS AND LIVE STOCK, 1911-12.

Particulars.		N.S.W.	Vic.	Q'land.	S.A.*	W.A.	Tas.	N.T.	C'wlth.
(*a*) PER 100 OF MEAN POPULATION.									
Passenger journeys ...	No.	4,163	7,784	2,745	4,389	5,572	886	53	5,001
Goods and live stock ...	Tons	642	396	561	665	864	242	56	558
(*b*) PER AVERAGE MILE OF LINE WORKED.									
Passenger journeys ...	No.	18,610	29,420	4,121	9,470	6,632	3,409	12	13,811
Goods and live stock ...	Tons	2,871	1,495	843	1,435	1,028	934	13	1,541

* 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 1911-12:—

METROPOLITAN, SUBURBAN, AND COUNTRY PASSENGER TRAFFIC, 1911-12.

Particulars.	Number of Passenger Journeys.			Revenue.		
	Metropolitan.	Country.	Total.	Metropolitan.	Country.	Total.
				£	£	£
N.S.W. ...	*62,590,908	8,115,820	70,706,728	*723,462	1,625,818	2,349,280
Victoria ...	†96,163,296	8,071,436	104,234,732	†959,367	1,347,774	2,307,141

* Within 34 miles of Sydney and Newcastle, and including Richmond and Branxton lines.
† Within 20 miles of Melbourne.

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 except Tasmania; 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 680 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 1911-12:—

CLASSIFICATION OF COMMODITIES CARRIED, 1911-12.

State or Territory.*	Minerals.	Firewood.	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 ...	†6,689,483	248,367	¶782,051	281,081	136,995	535,481	1,958,293	10,631,751
Victoria	‡937,498	570,849	848,732	289,028	100,368	411,684	2,139,526	5,297,685
Queensland ...	1,250,214	242,956	‖34,385	§219,318	66,232	279,721	1,400,901	3,493,727
South Australia** ...	1,359,651	125,091	407,049	82,844	23,145	96,876	687,064	2,761,720
Western Australia...	443,501	694,046	154,364	106,101	6,839	61,770	1,075,466	2,542,087
North'n Territory§§	438	††	‡‡1	††	...	24	1,432	1,895
PERCENTAGE ON TOTAL TONNAGE CARRIED.								
	%	%	%	%	%	%	%	%
New South Wales ...	†62.92	2.33	¶7.36	2.64	1.29	5.04	18.42	100.00
Victoria	‡17.70	10.77	16.02	5.46	1.89	7.77	40.39	100.00
Queensland ...	35.78	6.95	‖0.98	§6.28	1.90	8.01	40.10	100.00
South Australia** ...	48.87	4.50	14.63	2.98	0.84	3.48	24.70	100.00
Western Australia...	17.45	27.30	6.07	4.17	0.27	2.43	42.31	100.00
North'n Territory§§	23.11	††	‡‡0.05	††	...	1.27	75.57	100.00

* Tasmanian figures are not available. † Exclusive of 278,802 tons of coal, on which only shunting and haulage are collected. ‡ Coal, stone, gravel, and sand. § Sugar cane. ¶ Up journey. ‖ Flour only. ** Exclusive of the returns of the Port Augusta to Oodnadatta line †† Included in all other commodities. ‡‡ Grain only. §§ For year ended 31st December, 1911.

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 680). 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 four of the States only, viz., New South Wales, South Australia, Western Australia, and Tasmania, but is not available at all for either Victoria or Queensland. Of the four 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 three States supply particulars for all classes of passengers and goods together respectively. 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 and 1912, 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.

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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 1907-12.

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
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
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

* Not available for suburban lines. † Suburban lines only for years 1902-1910; includes distances within 34 miles of Sydney and including Richmond and Branxton. ‡ Partly estimated. § Compiled on new basis, so as to be uniform with other States. ‖ 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.

(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 last five years only. 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 1907-12.

Year ended the 30th June.	Goods Train Mileage.	Total Ton 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
1908	7,746,484	9,804	617,642	2,597,980	79.73	63.00	1.01
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
SOUTH AUSTRALIA.							
1902	2,468,326	1,392	170,523	681,045	69.09	122.48	0.96
1908	3,135,803	2,256	272,373	1,184,867	86.86	120.73	1.04
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
*** 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
1908	671,185	465	17,141	123,493	25.54	36.84	1.73
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

* Particulars for previous years not available. Exclusive of jetty returns. † Exclusive of live stock. ‡ To 31st December for year 1902, to 30th June for succeeding years. ‖ 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.

(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 1911-12 for those States for which particulars are available :—

DENSITY OF TRAFFIC PER AVERAGE MILE OF LINE WORKED, 1911–12.

Density of—	N.S.W.	S. Aust.*	W. Aust.	Tasmania.
Passenger traffic	287,204	110,042	†	68,174
Goods ,, ...	226,906	172,418	79,938	35,133

* Exclusive of the returns of the Port Augusta to Oodnadatta line. † Not available.

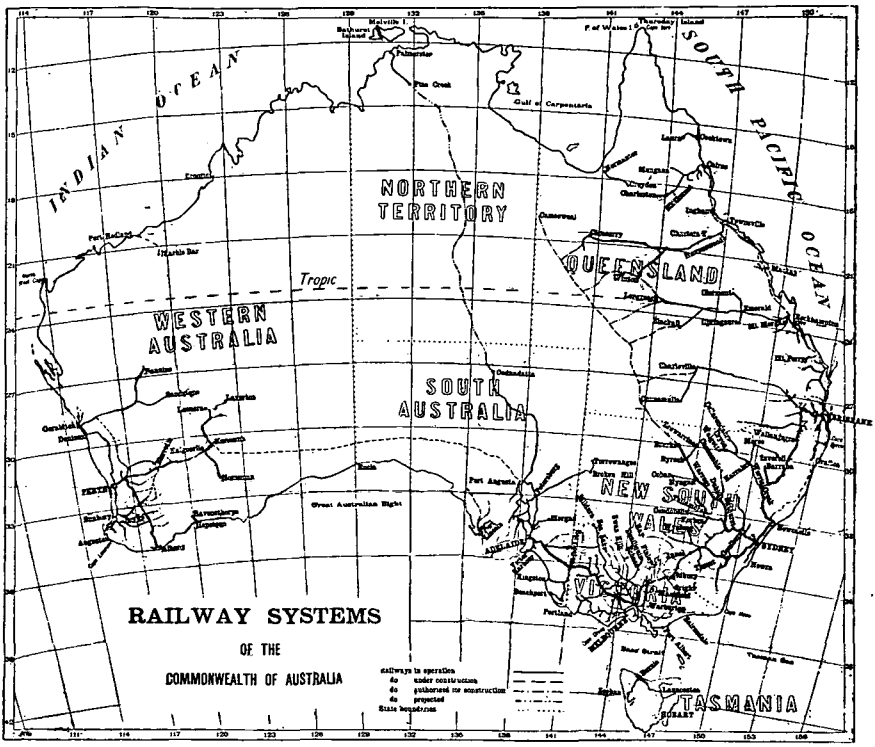
(iv.) *Classification of Commodity Ton Mileage.* New South Wales is the only State for which particulars, specifying the ton-mileage and the earnings per ton-mile for various classes of commodities, are available. It is hoped that in future years it will be possible to give corresponding particulars 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 278,802 tons of coal on which only shunting and haulage charges were collected, nor does it include £53,894 for haulage, tonnage dues, etc.

NEW SOUTH WALES.—SUMMARY OF TON-MILEAGE FOR THE YEAR ENDED 30th JUNE, 1912.

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 ...	6,021	162,696	27.02	325,786	0.48	56.64
Other minerals ...	526	22,696	43.16	53,047	0.56	4.95
Crude ores	142	14,835	104.33	29,772	0.48	1.34
Miscellaneous ...	610	52,019	85.21	142,972	0.66	5.74
Firewood	248	7,490	30.16	23,275	0.75	2.33
Fruit	80	9,211	114.72	38,455	1.00	0.75
Grain and flour ...	782	202,786	259.30	298,365	0.35	7.36
Hay, straw, and chaff ...	281	61,031	217.13	93,767	0.37	2.64
Frozen meat	27	3,443	129.38	13,908	0.97	0.25
General goods ...	1	246	335.41	2,692	2.63	0.01
A Class	521	54,535	104.77	222,590	0.98	4.90
B ,, ...	352	35,837	101.76	240,817	1.61	3.31
C ,, ...	24	1,741	73.14	17,688	2.44	0.22
1st Class	128	17,929	140.57	216,927	2.90	1.20
2nd ,, ...	216	33,803	156.33	510,312	3.62	2.03
Wool	137	41,388	302.11	331,423	1.92	1.29
Live stock	536	140,380	262.06	619,975	1.06	5.04
Total	10,632	862,016	81.08	3,181,771	0.89	100.00

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 — - — - —

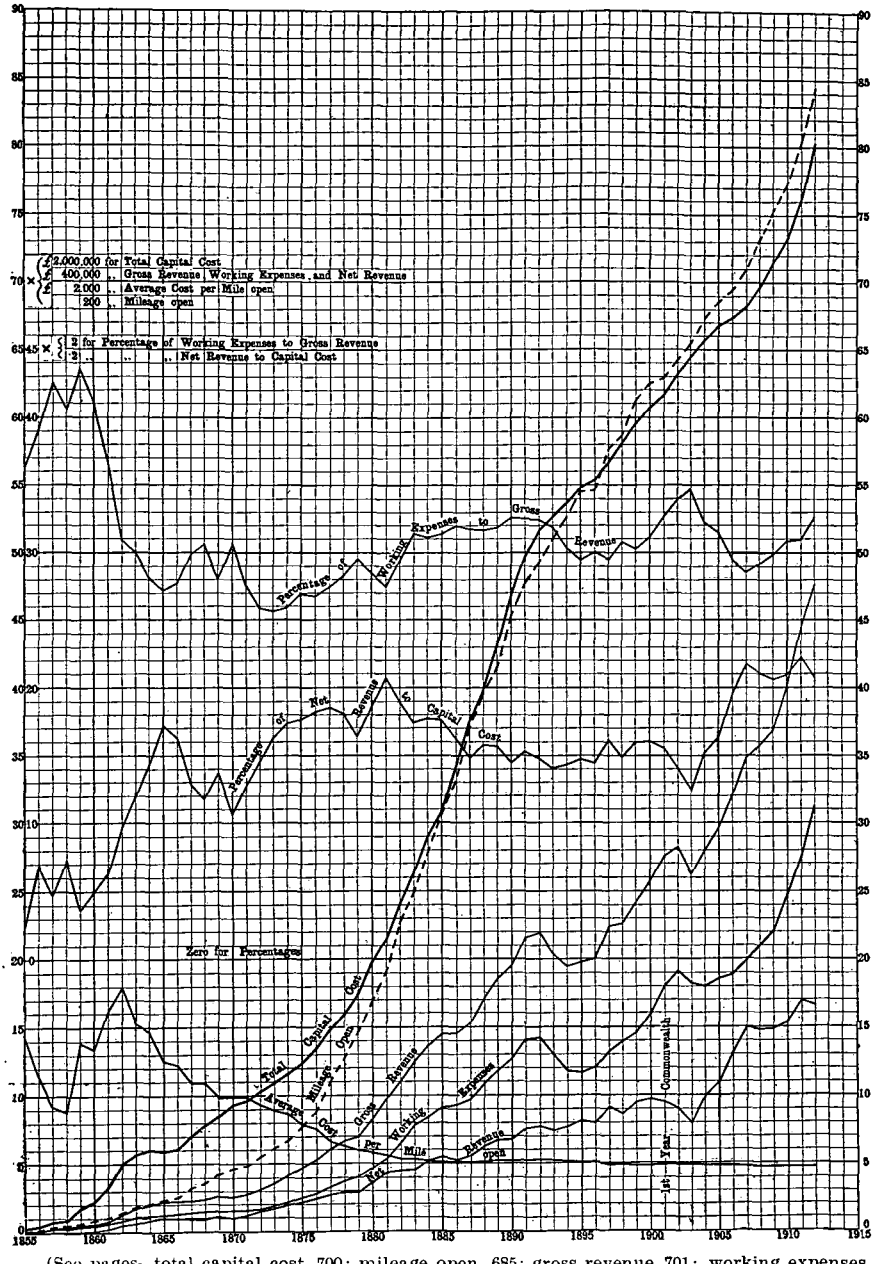
LIST OF PRINCIPAL SECTIONS OF RAILWAYS.

	Miles.
Townsville to Winton ...	368
Townsville to Selwyn ...	552
Rockhampton to Longreach	428
Brisbane to Cunnamulla...	604
Brisbane to Sydney (27 hrs.)	725
Newcastle to Inverell ...	405

	Miles.
Sydney to Bourke ...	508
Sydney to Hay	460
,, Nimmitabel ...	291
,, Melb'rne (17 hrs.)	582½
Melb'rne to Adelaide (17½ ,,)	482½
,, Merbein ...	358
,, Swan Hill ...	215

	Miles.
Adelaide to Broken Hill	335
,, Oodnadatta	688
Perth to Laverton ...	586
,, Meekatharra ...	640
,, Albany ...	340
Hobart to Launceston ...	133

GRAPHS SHEWING THE FINANCIAL POSITION OF THE GOVERNMENT RAILWAYS OF THE COMMONWEALTH, 1855 TO 1912.



(See pages—total capital cost, 700; mileage open, 685; gross revenue, 701; working expenses 705; net revenue, 708; average cost per mile, 700; percentage of working expenses to gross revenue, 705; percentage of net revenue to capital cost, 708.)

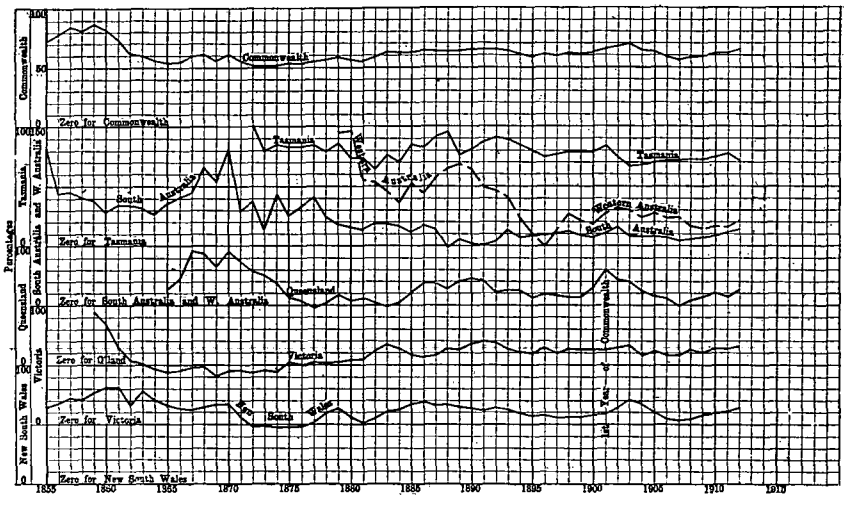
EXPLANATION OF GRAPHS.—In the above diagram the base of each small square represents throughout one year. The significance of the vertical height of each square varies, however, according to the nature of the several curves

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 shewn 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 1912.

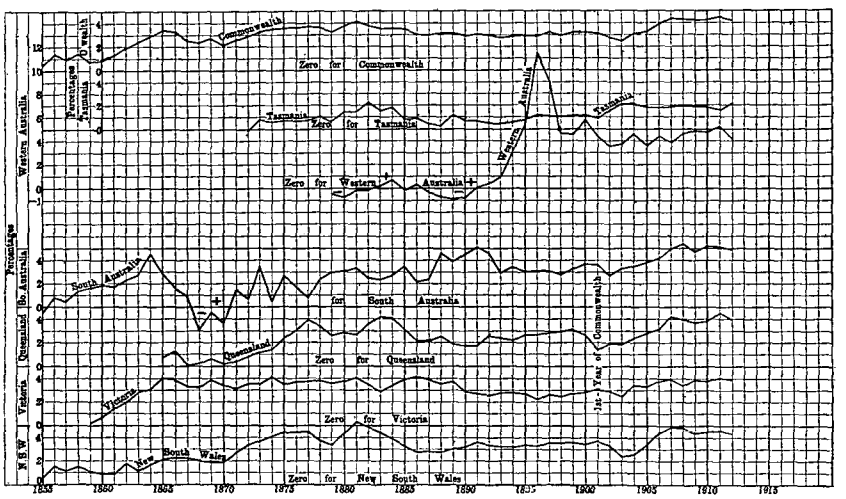


(See page 705.)

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 1912.



(See page 708.)

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.

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 systems, 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 seven 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 1907-12.

AMOUNT OF INTEREST ON RAILWAY LOAN EXPENDITURE (£,000 OMITTED).

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'wlth.
	£	£	£	£	£	£	£	£
1901-2	1,435	1,493	837	470	235	140	47	4,657
1907-8	1,649	1,484	932	494	343	149	47	5,098
1908-9	1,687	1,428	935	500	355	150	47	5,102
1909-10	1,687	1,471	973	508	368	152	47	5,206
1910-11	1,797	1,515	953	521	382	156	47	5,371
1911-12	1,906	1,511	1,070	542	415	159	47	5,650

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
1907-8	+580	— 47	— 35	+277	+151	— 73	— 46	+ 807
1908-9	+389	+235	— 59	+198	+179	— 74	— 47	+ 821
1909-10	+522	+155	— 49	+263	+173	— 80	— 47	+ 937
1910-11	+554	+282	+214	+269	+245	— 93	— 48	+1,423
1911-12	+415	+266	+ 46	+243	+126	— 68	— 48	+ 980

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
1907-8	+1.27	—0.11	—0.15	+1.99	+1.41	—1.84	—3.92	+0.58
1908-9	+0.82	+0.55	—0.26	+1.11	+1.63	—1.85	—3.98	+0.57
1909-10	+1.07	+0.36	—0.20	+1.90	+1.52	—1.97	—4.00	+0.64
1910-11	+1.09	+0.64	+0.83	+1.87	+2.04	—2.29	—4.12	+0.93
1911-12	+0.78	+0.58	+0.16	+1.63	+0.95	—1.59	—4.66	+0.61

* 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 1½ pence per mile for second-class single tickets. In Tasmania, however, the fares are computed on the general basis of 1½ 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 1½ to 1¾ 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 inter-state railway journeys as from the 1st May, 1913, and consequently these tickets will, from that date, be 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, 1912.

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, 1912.

State.	Charge per Ton in Truck-loads for a Haul of—					
	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
New South Wales	5 0	7 6	9 6	10 6	11 4	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, 1912.

State.	Charge per Ton for a Haul of—					
	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.
HIGHEST-CLASS FREIGHT.						
New South Wales	s. d. 23 0	s. d. 44 11	s. d. 78 3	s. d. 99 1	s. d. 107 5	s. d. 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.						
New South Wales	s. d. 2 6	s. d. 3 7	s. d. 5 8	s. d. 7 9	s. d. 9 10	s. d. 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 ncludes 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, 1912.**—The following table shews, so far as possible in a comparable manner, the number of locomotives and of various classes of rolling stock in use on the Government railways in each State. The figures

given are subject to certain limitations, inasmuch as the classification adopted, and also the various types of rolling stock in use, are not identical in the several States. In Victoria and Queensland, for example, the brake-vans classified under the heading of coaching vehicles are used indiscriminately for coaching and goods traffic. Again, it is believed that in New South Wales the number of passenger vehicles is really greater than that shewn, certain of the other classes of vehicles being used for composite purposes.

CLASSIFICATION OF LOCOMOTIVES AND ROLLING STOCK, 1911-12.

State or Territory	N.S.W.	Victoria.		Qld.	South Australia.				W.A.	Tasmania.		N.T.‡	Total
Gauge...	ft. in. 4 8½	ft. in. 5 3	ft. in. 2 6	ft. in. 3 6	ft. in. 5 3	ft. in. 3 6	Tramways. ft. in. 5 3	Tramways. ft. in. 3 6	ft. in. 3 6	ft. in. 3 6	ft. 2	ft. in. 3 6	—
(a) Locomotives.													
Tender	762	*460	...	496	95	†176	...	...	359	65	...	5	...
Tank	180	150	11	39	72	7	...	...		7	7	1	...
Total	942	610	11	535	167	183	...	...	359	72	7	6	2,892
(b) Coaching Stock.													
Passenger vehicles	1,244	1,311	21	597	271	120	13	2	355	165	6	4	...
,, (Joint stock)	...	12	...	...	8	...	...	...	...	...	...	...	...
Brake vans ...	297	421	1	3	31	28	...	...	20	13	...	2	...
,, (Joint stock)		2	...	...	2	...	...	...	...	...	...	...	...
Horse boxes ...		57	...	65	21	30	...	...	54	35	...	...	...
Carriage trucks ...		...	...	...	...	...	...	...	...	3	...	...	...
Post office vans ...		6	...	8	3	10	...	...	6	2	...	...	...
Other		7	...	...	2	3	...	...	6	...	...	1	...
Total	1,541	1,816	22	673	338	191	13	2	441	218	6	7	5,268
(c) Goods and Live Stock Wagons.													
Wagons	16,218	14,084	195	10,512	2,827	4,454	26	52	7,845	1,539	77	130	...
Brake vans ...	485	...	...	166	75	102	...	...	133	...	...	1	...
Departmental ...	1,085	150	...	231	106	140	...	...	86	45	...	7	...
Total	17,788	14,234	195	10,909	3,008	4,696	26	52	8,064	1,584	77	138	60,771

* Not including two passenger motors. † Not including four motors. ‡ Transferred from the South Australian Government to the Commonwealth Government on 1st January, 1911.

22. **Number of Railway Employees.**—The following table shews the number of employees in the Railway Departments of each State in the year 1901 and in each year from 1908 to 1912 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 1912, the total for the Commonwealth has increased from 42,321 to 75,663 —an increase of 33,342, or about 78.78 per cent. The largest numerical increase for the individual States was that of New South Wales, viz., 15,842.

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 1908-12.

State.	1901.		1908.		1909.		1910.		1911.		1912.	
	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	1,985	15,939	2,163	17,295	2,369	17,854	2,799	21,388	2,977	25,984
Victoria	1,432	10,524	1,649	12,900	1,644	12,825	1,831	14,735	2,111	17,622	2,243	19,910
Queensland	994	4,633	1,256	4,766	1,237	6,583	1,471	5,769	1,664	6,364	1,877	7,131
South Australia† ...	...	3,855	...	6,326	...	6,274	...	7,086	...	7,552	...	8,569
Western Australia ...	876	5,407	802	4,805	769	4,906	779	5,147	872	6,079	935	6,627
Tasmania	178	1,252	182	1,077	190	1,111	195	1,292	203	1,232	200	1,147
Northern Territory ...	†	51	†	75	†	84	†	91	6	61	7	56
Commonwealth ...	4,852	37,469	5,874	45,888	6,003	49,078	6,645	51,974	7,655	60,298	8,239	69,424

* 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 1907-8 to 1911-12 inclusive:—

GOVERNMENT RAILWAYS.—TOTAL NUMBER OF PERSONS KILLED AND INJURED, 1901 and 1907-12.

State.	1900-1.		1907-8.		1908-9.		1909-10.		1910-11.		1911-12.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
New South Wales ...	†	†	44	355	43	249	50	338	46	368	68	513
Victoria	45	371	79	970	45	451	21	353	49	829	67	362
Queensland	13	100	3	143	11	201	14	382	16	104	25	235
South Australia ...	8	50	15	132	12	155	10	243	13	215	16	186
Western Australia* ...	5	205	14	271	16	284	13	99	13	114	20	121
Tasmania	1	8	2	21	2	28	...	21	1	34	...	37
Northern Territory ...	...	...	1	...	...	...	...	...	...	1	...	...
Commonwealth ...	...	...	158	1,892	129	1,368	108	1,436	138	1,665	196	1,454

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

(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 716 to 718 have been prepared. The distribution of the railways is shewn on the map on page 715.

2. **Capital Cost and Mileage Open** (page 716).—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 716. 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 716) 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 716), are similar to those of "Gross Revenue," and the same remarks apply. It may be noted, however, that the working expenses in 1912 increased 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 717, and for the Commonwealth only, on a larger scale, on page 716. 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 716 and on page 718 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. Maxima were reached in 1865, 1877, 1881, 1907, and 1911—viz., 3.44, 3.71, 4.14, 4.36 and 4.45 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 year 1912, with the exception of Tasmania, the figures for which State constituted a maximum in 1912.

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 68.80 to 57.18 per cent., but it then gradually increased to 65.29 per cent. in 1912. The rise of the percentage of net revenue on total capital cost for the years 1903 to 1907 was from 2.53 to 4.36 per cent. For the years 1908 to 1910 it fell off, but rose to 4.45 per cent. in 1911, falling to 4.13 per cent. in 1912.

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. Still more remarkable is 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 £160,557,160 for construction and equipment up to the 30th June, 1912, should, nevertheless, yield so large a revenue, bringing in for the year 1911-12 a return, as already pointed out, of no less than 4.13 per cent.

(D.)—Private Railways.

1. **Total Mileage Open, 1912.**—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, 1912. A classification of these lines according to their gauge has already been given (see A. 6).

MILEAGE OF PRIVATE RAILWAYS OPEN, 1912.

Particulars.	N.S.W.	Victoria.	Q'land.	S.A.	W.A.	Tas.	C'wealth.
For general traffic ...	141	14	333	...	277	166	931
For special purposes ...	125	37	21	34	555	39	811
Total ...	266	51	354	34	832	205	1,742

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 1911-12. In this statement the lines inset are sub-branches from the main branches specified.

CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1911-12.

NEW SOUTH WALES.

Railway Lines.	Gauge. ft. in.	Length. Miles.	Nature of Traffic Carried, etc.
1 BRANCHES FROM NORTHERN LINE, N.S.W. GOVT. RLYS.—			
East Greta to Stanford-Merthyr and connections...	4 8½	24¾	Coal and passengers
Hexham-Minmi	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	4¾	,,
Five sub-branches...	4 8½	4	,,
Waratah Coal Co.'s line	4 8½	4¼	,,
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 Wallsend 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	3¾	,,
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	3¼	,,
Total	4 8½ 3 6	31½ 3½	
5. BRANCHES FROM WESTERN LINE, N.S.W. GOVT. RLYS.—			
Commonwealth Oil Corporation's line from Newnes Junction	4 8½	32	General
Eleven other branches	4 8½	6¾	Coal, metal, and ores
Total	4 8½	38½	
6. SILVERTON TRAMWAY—			
Broken Hill and Cockburn	3 6	36	General
7. DENILIQUIN-MOAMA LINE	5 3	45	,,
Total for State	4 8½ 3 6 5 3	181½ 39½ 45	

* Three other branch private lines having a total length of 24 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, 1911-12 (Continued).

VICTORIA.*

Railway Lines.	Gauge. ft. in.	Length Miles.	Nature of Traffic Carried, etc.
1. KERANG TO KOONDROOK TRAMWAY	5 3	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.

	ft. in.	Miles.	
1. BRANCHES FROM GREAT NORTHERN LINE, GOVT. RLYS.—			
Three branch lines	3 6	2¼	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	1¾	Coal
Stafford's lines to coal mines	3 6	½	„
4. BRANCHES FROM CAIRNS LINE, GOVT. RAILWAYS—			
Greenhill branch	2 0	4¼	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, Boonmoo to Rocky Bluffs	2 0	21¼	„ „ „
Mount Molloy tramway	3 6	20	„ „ „
5. BRANCH FROM SOUTH-COAST LINE, GOVT. RAILWAYS—			
Beaudesert tramway to Rathdowney, Tabooba Junction to Lamington	3 6	36†	„ (chiefly timber [and dairy produce
6. INGHAM TRAMWAY—			
East Ingham to Mount Fox	2 0	30⅔	General (chiefly sugar)
Lucinda to East Ingham	2 0	17	„
7. GERALDTON TRAMWAY—			
Geraldton towards Herberton...	2 0	20¼	„ (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	38	„
Total for State...	3 6 2 0	255⅔ 111¼	

† Including sidings.

SOUTH AUSTRALIA.

	ft. in.	Miles.	
BROKEN HILL PROPRIETARY CO.'S LINE—			
Iron Knob to Spencer's Gulf	3 6	34	Carriage of iron stone flux

CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1911-12 (Continued).

Railway Lines.	Gauge.	Length	Nature of Traffic Carried, etc.
WESTERN AUSTRALIA.*			
	ft. in.	Miles.	
1. MIDLAND RAILWAY—			
Joining Govt. lines at Midland Junction & Walkaway	3 6	277	General
2. W.A. GOLDFIELDS FIREWOOD SUPPLY CO.'S LINE—			
From Kurrawang into bush	3 6	72	Firewood
3. KALGOORLIE AND BOULDER FIREWOOD CO.'S LINE—			
Goodwood railway, from Lake Side into bush ...	3 6	35	,,
Lancefield railway into bush	2 0	26	,,
Laverton to junction Lancefield railway	2 0	4½	,,
4. W.A. JARRAH SAWMILLS LINE—			
From Kirrup to mills and into bush	3 6	6½	Timber
5. TIMBER CORPORATION CO.'S LINE—			
From Greenbushes to mills and into bush	3 6	15	,,
6. S.-WEST TIMBER HEWERS' CO-OP. SOCIETY'S LINE—			
From Collie into bush	3 6	8¾	,,
7. MILLAR'S KARRI AND JARRAH CO.'S LINES—			
Upper Darling Range railway, from Pickering Brook to Canning mills and bush	3 6	12½	,,
Jarrahdale and Rockingham railway, from Mundiging to Rockingham and bush	3 6	51	,,
Yarloop railway to mills and bush	3 6	51½	,,
Mornington mills rly., from Wokalup to mills & bush	3 6	24½	,,
Ferguson River railway, from Dardanup to mills and into bush	3 6	32¼	,,
Karridale railway, to Hamelin & Flinders Ports from Karridale and into bush	3 6	58	,,
Collie Mills railway, from Worsley into bush ...	3 6	15½	,,
8. BUNNING BROS. LTD. LINES—			
From Lion Mill, Argyle, and Cardiff to bush ...	3 6	c 21	,,
9. NORTH DANDALUP S.M. RAILWAY—			
To mill and bush	3 6	8	,,
10. SEXTON AND DRYSDALE'S BUSH RAILWAY—			
From Noggerup to bush	3 6	4½	,,
11. SWAN SAW MILL RAILWAY—			
From Lowden to mill and bush	3 6	5	,,
12. W.A. TIMBER AND FIREWOOD CO. LTD. LINE—			
Kurramia railway, from Kalgoorlie-Kanowna railway to bush	3 6	48	Firewood
13. SONS OF GWALIA GOLD MINING CO.'S LINE—			
Railway into bush	1 8	18	,,
14. MURCHISON FIREWOOD CO.'S LINE—			
Nallan wood railway, from Nallan siding to bush ...	3 6	24	,,
15. WHIM CREEK TO BALLA RAILWAY	2 0	13¾	Copper Ore
Total for State...	3 6 2 0 1 8	769¾ 44½ 18	

*To the 31st December, 1909.

TASMANIA.

	ft. in.	Miles.	
1. EMU BAY RAILWAY CO.'S LINES—			
Burnie to Waratah	3 6		
Guildford to Zeehan	3 6	104	General
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*	3 6	13	Timber
5. TASMANIAN GOLD MINING CO.'S LINE—			
Beaconsfield to Beauty Point†	3 6	3½	Minerals and occasionally passengers
6. ZEEHAN TRAM CO.'S LINE—			
Emu Bay railway to British Queen	2 0	2½	Minerals and occasionally 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 2 0	180½ 24½	

* Terminal points not fixed in May, 1908, as extension is still under construction. †Also branchlines as follows:—Electric railway, 1½ miles long, to reduction works, 2 ft. gauge; surface railways, horse, ¾ mile long, 2 ft. gauge. ‡Extensions 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 1911 was 141, and of lines used for special purposes, 125 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 1911 of the operations of lines open for general traffic are given, so far as available, in the table on page 733.

(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-Minmi 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 32 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 40 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, 1912, was £40,110, paid out of a loan advanced by the Victorian Government. The total length is 14¼ 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 Muagana,

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 1¼ 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 Karri and Jarrah Company's Lines.* These lines have mostly been built under special timber concessions and leases. There were, at latest date available, in all seven 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 245 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 730.

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, 1911.**—The tabular statement given below shews particulars, so far as returns are available, for the year 1911 of all private railways open to the public for general traffic in the Commonwealth :—

PARTICULARS OF PRIVATE RAILWAYS OPEN FOR GENERAL TRAFFIC, 1911.

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. ,000.	Tons ,000.	No.	No.	No.	No.
NEW SOUTH WALES.												
Deniliquin-Moama	45	162,672	20,439	11,057	655	39,148	17	39	51	4	6	63
Silverton Tramway	36	438,453	193,583	68,612	...	161,164	56	1,056	270	16	17	617
East Greta Railway	8	152,202	45,769	30,106	7,610	323,712	688	41	211	14	32	29
Seaham Colliery Co.	6	16,000	736	*b*	*b*	6,300	10	44	9	2	3	...
New Redhead Co. ...	8	90,000	3,717	1,035	2,913	*b*	*b*	*b*	8	*e*	*e*	*e*
Hexham-Minmi ...	6	*b*	1,078	755	...	9,683	13	2	9	2	5	...
C'wlth. Oil Corp'r'n	32	203,272	2,727	9,734	10,961	38,620	5	31	60	5	2	34
Total (*a*) ...	141	1062599	268,049	121,299	22,139	578,627	789	1,213	618	43	65	743
VICTORIA.												
Kerang-Koondrook	14	40,110	5,230	3,015	1,258	19,000	14	*b*	10	2	2	6
QUEENSLAND.												
Chillagoe Railway	103	420,276	67,563	19,956	...	103,412	29	97	155	8	2	158
Stannary Hills ...	21	65,320	6,764	6,282	...	31,963	4	41	8	3	2	76
Mount Garnet ...	33	100,000	2,389	2,901	...	11,518	2	3	12	1	1	4
Invicta Mill ...	9	16,015	498	...	367	816	*b*	*b*	*b*	*e*	*e*	*e*
Beaudesert ..	36*c*	98,000	9,419	4,673	2,905	30,400	16	15	30	1	3	*e*
Douglas-Mossman...	18	43,274	4,493	2,858	1,452	8,000	2	*b*	*b*	*b*	1	*b*
E. Ingham-Mt. Fox	30½	55,306	1,571	*d* 460	2,299	*b*	2	*b*	*b*	*b*	1	*b*
Lucinda-E. Ingham	17	*b*	1,026	*b*	*b*	*b*	8	*b*	*b*	*b*	2	*b*
Bowen-Proserpine	38½	103,682	5,549	3,957	2,037	12,245	*b*	*b*	10	*e*	*e*	*e*
Geraldton Tramway	20	49,938	*f* 3,396	2,604	1,959	16,988	5	19	15	2	2	21
Mt. Molloy ,,	20	45,813	2,319	3,293	*b*	9,924	2	3	10	*e*	*e*	7
Total (*a*) ...	346	997,624	104,987	46,984	11,019	225,266	70	178	240	15	14	266
WESTERN AUSTRALIA.												
Midland Railway ...	277	1265874	129,394	91,509	*b*	534,237	71	*g* 74	360	11	16	314
TASMANIA.												
Emu Bay Railway...	104	611,125	60,761	31,550	19,721	141,435	32	71	118	10	6	152
Mt. Lyell Railway...	22	216,086	31,489	21,694	...	54,827	32	121	83	7	7	127
Nth. Mt. Lyell Rly.	30	316,638	2,976	4,819	...	7,145	6	11	18	4	3	56
Magnet Railway ...	10	18,750	429	1,727	...	7,280	1	...	8	2	1	4
Total (*a*) ...	166	1162599	95,655	59,790	19,721	210,687	71	203	227	23	17	339
Total for Cwlth.(*a*)	944	4528806	603,315	322,597	54,137	1567817	1,015	1,693	1,455	94	114	1,668

(*a*) Incomplete. (*b*) Not available. (*c*) Including sidings. (*d*) Exclusive of one guard's salary. (*e*) Government rolling-stock used. (*f*) Exclusive of £1471 received from special tram rate levy on land. (*g*) Carried also 227,000 head of live stock.

§ 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 shews the total mileage of tramway lines open for general passenger traffic in each State and in the Commonwealth at the end of the year 1911-12, 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, 1911-2.

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	133	52	34	48	53	15	335
Steam	67	1	...	...	...	...	68
Cable	...	46	...	...	...	...	46
Horse	...	13	...	24	28	...	65
Total	200	112	34	72	81	15	514
ACCORDING TO CONTROLLING AUTHORITY.							
Government ...	196	5	...	18	28	...	247
Municipal	...	15	...	48	12	6	81
Private	4	92	34	6	41	9	186
Total	200	112	34	72	81	15	514

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, 1912, seven such systems in operation within the metropolitan area, the most important being the city and suburban lines, 98 miles in length (168½ miles single track); the North Shore line, 18½ miles in length (26¾ miles single track); and the Ashfield to Mortlake line, 8½ miles in length. 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. The line from Ashfield to Mortlake (8½ miles) has been converted from steam to electric traction (February

1912). 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, 1¾ 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 3¼ 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. New sub-stations have been erected at Darlinghurst, Leichhardt and Burwood.

(*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, 1912, was 28 miles. At Broken Hill and Parramatta the first sections of the tramways were opened in 1902. On the 30th June, 1912, the mileage open at Broken Hill amounted to 9, and at Parramatta to 6¾ 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 1907-12:—

NEW SOUTH WALES.—PARTICULARS OF WORKING OF GOVERNMENT TRAMWAYS, 1901-2 and 1907-12.

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
1907-8	132¾	3,732,991	1,011,994	809,065	202,929	79.95	5.44
1908-9	151¼	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	195¾	5,664,324*	1,581,393	1,331,413	249,980	84.19	4.41

* £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 surplus of £57,696 in 1911-12, as compared with £47,627 in the preceding year. During the year 1911-12, 266,789,546 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, 1911-12.

Line.	Length	Total Cost.	Gross Revenue.	Working Expenses.	Interest.	Profit or Loss.*
	Miles.	£	£	£	£	£
Sydney and Suburban—						
Electric	131¾	5,153,321	1,460,625	1,209,321	174,594	+76,710
Steam	8¼	38,622	7,415	9,305	1,389	— 3,279
Total... ...	140	5,191,943	1,468,040	1,218,626	175,983	+73,431
Parramatta Steam	6¾	37,247	5,970	7,319	1,340	— 2,689
Sutherland to Cronulla ,,	7½	43,140	8,674	5,571	1,453	+ 1,650
Newcastle ,,	28	276,201	72,324	71,488	9,386	— 8,550
East to West Maitland ,,	4½	38,110	5.338	5,307	1,371	— 1,340
Broken Hill ,,	9	77,683	21,047	23,102	2,751	— 4,806
Total... ...	195¾	5,664,324	1,581,393	1,331,413	192,284	+57,696

* 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, 1912.

Permanent Way.	Rolling Stock.	Power-house, Sub-stations, and Plant.	Machinery.	Workshops.	Furniture.	Total.
£3,187,371	£1,250,524	£989,653	£68,261	£166,123	£2,392	£5,664,324

The average cost per mile open was £16,292 for permanent way and £12,661 for all other charges, making a total of £28,952 per mile.

During the year 1911-12, four new extensions, amounting in all to a length of 16 miles, were opened for traffic. On the 30th June, 1912, eight extensions, having a total length of 11 miles, were under construction, and up to the same date four additional extensions, amounting to about 3½ miles, had been authorised for construction.

(*e*) *Sydney Electric Tramways.* The total route mileage of the city and suburban lines is 98, of the North Shore line 18½ miles, of the Ashfield-Mortlake line 8½ miles, and of the Manly-The Spit line 6¾ miles, making the total length of the electric tramways in Sydney 131¾ miles. The current for the operation of these 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 1911-12, was 77,534,279 kilowatt-hours, of which the direct-current supply was 16,160,139, and the alternating current 61,374,140 kilowatt-hours. The following table gives particulars of the working of the electric tramways for the financial years 1901-2 and 1907-12 :—

NEW SOUTH WALES.—PARTICULARS OF SYDNEY ELECTRIC TRAMWAYS, 1901-2 and 1907-12.

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
1908	146½	3,288,480	37,422	16,517	159,723
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

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
1908	925,224	735,442	189,782	775	4,714
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

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

The net revenue on capital invested was 4.89 per cent. in 1911-12 as against 4.87 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 3½ 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 1911 the number of tram miles run was about 17,936, and the number of passengers conveyed about 96,357.

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 1911 were received from four companies, and shew that these companies had 61 boats in commission, which were licensed to carry a total of 39,024 passengers, or an average of 639 per boat and per trip. The total number of passengers carried during the year is stated as 29,700,000, an average of 81,370 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 907 persons. The gross revenue during 1911 amounted to £274,624, and the expenditure to £173,259, thus giving

a net revenue of £101,365. 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 and St. Kilda. This system has a track mileage of 13¾ 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 and Bendigo, constructed and run by a private company. A number of tramways has been constructed for special purposes in various parts of the State under the provisions of the Tramway Act 1890. The work of constructing electric tramways at Geelong was commenced in January, 1911, and the line was opened for traffic in January, 1912. This system has a length of five and a quarter miles of single track, the gauge being 4 ft. 8½ in.

(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 4½ 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 8½ 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 1908 to 1912:—

MELBOURNE CABLE TRAMWAYS—PARTICULARS OF WORKING, 1901-2 and 1908 to 1912.

Year ended the 30th June.	Tram Mileage.	Number of Passengers Carried.	Revenue.			Working Expenses.			
			Traffic Rec'pts.	Other.*	Total.	Wages.	Repairs & Maintenance.	Other.*	Total.
	No.	No.	£	£	£	£	£	£	£
1902	9,226,883	47,261,572	454,683	20,152	474,835	125,596	68,689	75,269	269,554
1908	9,810,808	63,954,512	545,269	40,561	585,830	153,040	64,993	60,606	278,639
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

* 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, 1912, exclusive of rolling-stock, was £44,197, and of rolling-stock was £16,393, making a total of £60,590. 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, 1907 to 1912:—

ST. KILDA-BRIGHTON ELECTRIC STREET TRAMWAY, 1907 to 1912.

Year ended 30th June.	Mileage Open.	Capital Cost.	Car Mileage.	Passengers Carried.	Gross Revenue.	Working Expenses.	Interest.	Net Profit or Loss.‡
		£			£	£	£	£
1907	5.13	52,939	303,777	1,030,242	9,590	17,392*	1,980	—9,782
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

* Including an amount of £9941 for replacement of rolling stock, car-shed and equipment destroyed by fire. † Including an amount of £3311 for replacement of rolling-stock, etc., caused by fire. ‡ Profit is indicated by +, Loss by —.

The average fare paid per passenger was 2.13 pence in 1911-12 as against 2.17 pence in 1910-11. The gross revenue in 1911-12 was 9.81 pence per passenger car mile and £2926 per mile of track open. In the same year the percentage of working expenses on gross revenue was 88.5 as against 76.4 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, 1912, was 7¼ miles, the guage of line being 4 feet 8½ inches. The number of passengers carried during the same period was 2,405,478.

(*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 total track mileage (including double track 4 miles) is 13¾ miles, the total capital cost being £182,560. 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, 1912, the current used for traction purposes was 1,039,049 kilowatt-hours, and the number of tram miles run was approximately 705,551, the number of passengers carried 5,825,378, the gross revenue £38,876, and the working expenses (excluding interest and renewals reserve) £24,719. The number of cars in use was 26, and the number of persons employed 140. An additional 25 miles of track is in course of construction, linking up the suburbs of Kew, Hawthorn, Caulfield, and St. Kilda with the existing system.

(*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. Over 5 million passengers were carried during 1911, the gross revenue being £47,817, and the working expenses £31,525.

(*e*) *The Geelong Electric Tramways.* This line, which is privately owned, was opened for traffic in January, 1912, and up to the 31st August of that year the cost of construction and equipment was £37,275. The car mileage was for the same period 83,971 miles, and the number of passengers carried 421,779.

(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 1907 to 1912 inclusive:—

VICTORIA.—PARTICULARS OF WORKING OF ELECTRIC TRAMWAYS, 1907 to 1912.

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.
1907	34	222,486*	1,790	1,793	7,037	48,554*	34,522*	78	379
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	43⅔	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

* * 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 are 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 1912. 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. 732).

(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...	30¾	4,915,202	3,367,972	27,221,466	177,567	*	107	619
1909...	30¾	5,099,663	3,321,803	29,732,338	192,371	*	*	614
1910...	30¾	5,441,032	3,524,036	32,419,276	214,265	*	119	654
1911...	34⅓	*	3,671,963	36,443,222	243,344	*	128	736
1912...	34⅓	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, 1912, a length of 48 route miles had been electrified and opened for traffic, the corresponding length of track opened being 85 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, 1912, was £1,332,034. The following table gives particulars of the tramways for the year ended 31st July, 1912.

SOUTH AUSTRALIA.—ADELAIDE ELECTRIC TRAMWAYS.—PARTICULARS OF WORKING, 1911-12.

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
	Miles.	£	Kil'w'tt-hrs.	No.	No.	£	£	No.	No.
1912	48.3	1,332,034	7,687,317	4,657,994	37,846,808	277,060	181,020	158	1,057

* 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, 1911-12.

Particulars.	Length.	Gauge.	Nature of Traffic.
GOVERNMENT TRAMWAYS.			
	Miles.	ft. in.	
Moonta, Moonta Bay, and Hamley Flat	5⅕	5 3	Passengers and goods.
Gawler	1⅛	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 Mundoora ...	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 twenty-eight 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 fourteen and three quarter miles. The remaining thirteen and a half miles belonging to the Government are made up of eleven 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, 1912, shew that the capital cost of the line to that date was £50,569, the gross revenue for the year being £3269, and the working expenses £720.

(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. It is intended by the Government to take over this tramway system in May, 1913, when it will be run in conjunction with the Government railways. On the 31st December, 1911, there were 22½ miles of line open, the total cost of construction and equipment to that date being £479,791. During the year 7,858,928 passengers were carried, the gross revenue being £86,528 and the working expenses £45,441. Forty-eight motors were in use, and the number of employees was 204. 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 1911 the total mileage of the whole system—in Kalgoorlie and Boulder City—amounted to 19 miles, the total cost of construction and equipment being £449,104. During the year 2,695,000 passengers were carried. 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, 1911, there were 8¾ miles of line open for traffic, the cost of construction and equipment at that date being £105,026. This line has a gauge of 3 ft. 6 in. During the year 3,750,000 passengers were carried.

(*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.

(*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 1907-11:—

WESTERN AUSTRALIA.—PARTICULARS OF ELECTRIC TRAMWAYS, 1901 and 1907-11.

Year.	Mileage Open for Traffic.*	Total Cost of Construction and Equipment	Current Generated.	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	No. of Cars in Use.	No. of Persons Employed.
	Miles.	£	Kilowatt-hrs.	No.	No.	£	£	No.	No.
1901	16¼	367,037	†	721,056	†	46,270	26,673	30	§
1907	45¼	†	4,049,980	2,247,889	14,050,086	143,403	89,266	89	330
1908	47½	968,567	4,065,616	2,316,325	13,136,065	142,182	91,770	89	354
1909	50	1,018,548	3,952,386	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

* For the years 1907 to 1911 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 5¾ miles, the gauge of track being 3 ft. 6 in. An extension of a mile to High Street is under construction, and a further extension of a mile is proposed. The total cost of construction and equipment to the end of October, 1912, amounted to £59,337. Fourteen cars with motors were in use; and the number of employees totalled 80. The number of passengers carried during the year 1911-12 was 1,986,599 and the car mileage was 266,098 miles. The gross revenue for the same period was £14,783, and the working expenses £10,409.

(i.) *Hobart Electric Tramways.* These tramways were opened for traffic in 1893, the total cost of construction and equipment to the 31st December, 1911, 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 1907-11:—

TASMANIA.—PARTICULARS OF WORKING OF HOBART ELECTRIC TRAMWAYS, 1901 and 1907-11.

Year.	Mileage Open for Traffic.	Total cost of Construction and Equipment.	Current Generated	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	Number of Cars in Use.	Number of Persons Employed.
	Miles.	£	Kilowatt-hours	No.	No.	£	£	No.	No.
1901	9	90,000	...	321,633	1,734,120	16,097	11,735	20	90
1907	9	90,000	607,324	445,505	2,504,773	24,421	13,635	22	102
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

8. **Electrical Traction in Commonwealth, 1911-12.**—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, and for the Perth and Kalgoorlie tramways in Western Australia, are for the calendar year 1911; for the Brisbane tramways the returns are for the calendar year 1912; and for other tramways the returns are, generally, for the financial year 1911-12:—

ELECTRIC TRAMWAYS IN COMMONWEALTH, 1911-12.

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. ...	133	5,167,121	72,982	23,053	250,786	1,463,025	1,211,858	1,055	8,147
Victoria ...	52	*497,100	3,504	2,703	15,343	*106,478	*73,436	119	501
Queensland ...	34	†	5,799	3,508	36,375	243,668	†	128	762
South Australia	48	1,332,034	7,687	4,658	37,847	277,060	181,020	158	1,057
West. Australia	53	1,039,421	4,395	2,360	14,400	158,657	93,003	104	359
Tasmania ...	15	151,458	1,323	750	5,350	47,563	29,719	42	181
Commonwealth	335	8,187,134 ‡	95,690	37,032	360,101	2,296,451 ‡	1,589,036 ‡	1,606	11,007

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